INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

STORMWATER POLLUTION PREVENTION PLAN

For

West End Lofts

Wolcott Ave

City of Beacon, New York

June 27, 2017

<u>Owner Information:</u>

City of Beacon
1 Municipal Plaza
Beacon, New York 12508

<u>Applicant Information:</u>

Kearney Realty & Development Group
34 Clayton Boulevard
Baldwin Place, New York 10505

Note: This report in conjunction with the project plans make up the complete Preliminary Stormwater Pollution Prevention Plan.

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CONTENTS

1.0 INTRODUCTION

1.1 Project Description

The West End Lofts project is located on a parcel between Beekman Street and Wolcott Avenue, immediately south of the Beacon City Hall property. The subject property is located in the City's Linkage District and is identified as Tax Map No. 5954-26-688931. The applicant, Kearney Realty & Development Group wishes to construct three buildings containing 98 apartments. The project will also require subdivision approval to arrange the final property lines with the City, and place Buildings 1 and 2 on one lot, and Building 3 on a second lot.

1.2 Existing Site Conditions

The subject project is located on one tax parcel between Beekman Street and Wolcott Avenue, immediately south of the Beacon City Hall property. The existing ground cover on the site is characterized as a mixture of woods and open grassed areas. The property generally drains from east to west down towards Beekman Street.

The hydrologic soils groups for the project consists of B soils. The designations of the onsite soils located within the proposed limits of disturbance consist of Dutchess-Cardigan Complex (DwB), Nassau-Cardigan Complex (NwC), and Udorthents (Ud), as identified on the Soil Conservation Service Web Soil Survey. The soils boundaries are shown on Figure 2 and 3 of this report. Soil testing was completed and witnessed on the site, the results of the testing are shown on Figure 4 of this report.

As previously stated, the stormwater runoff from the existing properties generally drains from east to west towards the existing city drainage infrastructure along Beekman Street. The analysis included in the project SWPPP utilizes one design point, at an existing drain inlet along Beekman Street, to assess the stormwater runoff from the property and any potential impacts from development to the existing natural resources on the property. The Pre-Development Drainage Map (Figure 2 of this report) shows the location of Design Line 1. The contributing area to Design Point 1 is identified as subcatchment PRE 1.

1.3 Proposed Site Conditions

As previously stated, the proposed application includes the construction of three (3) apartment buildings, asphalt parking areas, pedestrian walkways and associated appurtenances. Mitigation for the newly created impervious surfaces will be provided in the form of proposed stormwater management practices (SMP's) discussed further in later sections of this report. The proposed SMP's will be designed to capture and treat runoff from the impervious surfaces associated with the proposed buildings, parking areas and walkways.

It is proposed to maintain the existing drainage patterns on the site to the maximum extent practical in the proposed condition to minimize the impact to the existing downstream conveyance systems. Stormwater treatment for the subject project will be accomplished with several different practices including cisterns, hydrodynamic separators for pretreatment, and subsurface detention systems prior to the proposed surface sand filter. The surface sand filter has been sized to capture and treat the Water Quality Volume from the developed area of the proposed development after the application of Runoff Reduction practices.

The stormwater runoff from the proposed development will be captured in a collection system and conveyed to the detention systems. Pretreatment of the stormwater runoff will be provided with hydrodynamic separators online in the collection system prior to the subsurface detention systems. The detention systems have been designed to act as flow splitters, discharging the water quality volume to the surface sand filter for treatment, while detaining the bypassing the larger storm events. The contributing areas to the detention systems and surface sand filter are shown as subcatchment 1.1 and 1.2. The area immediately tributary to the surface sand filter is shown on subcatchment 1.0 and the untreated /

undeveloped portion of the contributing area to the Design Point is shown as subcatchment 1.3. The subcatchments are shown in Figure 3 of this report.

As shown in the following sections of this report, the stormwater quality and quantity for the proposed development have been mitigated to the maximum extent practicable to minimize the impacts to the existing conditions to each of the downstream receiving conveyance systems. Additionally, an erosion and sediment control plan has been prepared in accordance with the New York State Standards and Specifications for Erosion and Sediment Control to protect the existing waterbodies and drainage features during construction activities and in the post development condition.

2.0 STORMWATER MANAGEMENT

The proposed stormwater management system for the West End Lofts has been designed to meet the requirements of local, city, and state stormwater ordinances and guidelines, including but not limited to those of the City of Beacon and the NYSDEC.

Since the subject project proposes the disturbance of more than one (1) acre, coverage under the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit No. GP-0-15-002 is required. In order to meet the requirements, set forth by this permit, the latest edition of the NYSDEC *New York State Stormwater Management Design Manual* (NYSSMDM) was referenced for the design of the proposed stormwater management system. The NYSSMDM specifies five design criteria that are discussed in detail below. They are Runoff Reduction Volume, Water Quality Volume, Stream Channel Protection Volume, Overbank Flood Control, and Extreme Flood Control. The first two of the requirements relates to treating water quality, while the later pertain to stormwater quantity (peak flow) attenuation.

To address stormwater quantity requirements of the NYSDEC, the “HydroCAD” Stormwater Modeling System,” by HydroCAD Software Solutions LLC in Tamworth, New Hampshire, was used to model and assess the peak stormwater flows for the subject project. HydroCAD is a computer aided design program for modeling the hydrology and hydraulics of stormwater runoff. It is based primarily on hydrology techniques developed by the United States Department of Agriculture, Soil Conservation Service (USDA, SCS) TR-20 method combined with standard hydraulic calculations. For details on the input data for the subcatchments and design storms, please refer to Appendices B and C.

The input requirements for the HydroCAD computer program are as follows:

Subcatchments (contributing watershed/sub-watersheds)

- Design storm rainfall in inches
- CN (runoff curve number) values which are based on soil type and land use/ground cover
- Tc (time of concentration) flow path information
- Watershed Area in Acres

Stormwater Basins

- Surface area at appropriate elevations
- Flood elevation
- Outlet structure information

The precipitation values and intensity duration frequency (IDF) curves for the 1-Year, 10-Year, 100-Year 24-hour design storm events and rainfall distribution curves utilized for this report were obtained from the information provided by Northeast Regional Climate Center (NRCC) and the Natural Resources Conservation Service (NRCS) which is available online at *www.precip.eas.cornell.edu.* The values provided for all design storms analyzed have been listed below.

Table 2.0.1 – Precipitation Values for Corresponding Design Storms

Design Storm	24-Hour Rainfall
1-Year	2.6”

Design Storm	24-Hour Rainfall
10-Year	4.7”
100-Year	8.3”

The CN (runoff curve number) values utilized in this report were referenced from the USDA, SCS publication *Urban Hydrology for Small Watersheds*. The following is a summary of the various land uses/ground covers and their associated CN values utilized in this report.

Table 2.0.2 – Project Ground Cover and Associated Curve Numbers (CN)

Land Use/Ground Cover	CN Value
Woods, B Soil	55
>75% Grass Cover, B Soil	61
Impervious Surface, B Soil	98

2.1 NYSDEC Runoff Reduction Volume, RR_v

The Runoff Reduction Volume (RR_v) criterion is intended to replicate pre-development hydrology by maintaining preconstruction infiltration, peak flow runoff, discharge volume, as well as minimizing concentrated stormwater flow. As stated in Chapter 4 of the Design Manual, RR_v may be treated with standard SMP’s with RR_v capacity sized in accordance with the Chapter 4/6 requirements, or with green infrastructure practices (GIP’s) sized in accordance with the requirements set forth in Chapter 5. Runoff reduction is achieved when runoff from a site is captured, directed to a SMP or a GIP, infiltrated to the ground, reused, or removed by evapotranspiration, so it does not contribute to the stormwater discharge from the site. The goal for each site is to reduce the entire WQ_v (100%) through the implementation of GIP’s and standard SMP’s with RR_v capacity. However, if 100% of the WQ_v cannot be reduced by applying a combination of green infrastructure techniques and standard SMP’s with RR_v capacity, “they must, at a minimum, reduce runoff from a percentage of the impervious area constructed as part of the project using the green infrastructure techniques and standard SMPs with RR_v capacity. In addition, the designer must provide justification in the SWPPP that evaluates each of the green infrastructure techniques listed in Table 3.2 and identify the specific site limitations that make application of the technique(s) infeasible.”

The project SWPPP cannot provide 100% of the WQ_v through the implementation of GIP’s or standard SMP’s with RR_v capacity. This is because the onsite soils although belonging to Hydrologic Soil Group B, were found have a shallow depth to rock across the entire site, thus eliminating the possibility to utilize infiltration practices for treatment of the RR_v / WQ_v. With respect to runoff volume, the project SWPPP addresses and satisfies the RR_V requirements of the Design Manual. In order to meet these requirements to the maximum extent practicable, the project SWPPP has minimized the creation of impervious surfaces to the maximum extent practicable. The types of GIP’s and standard SMP’s with RR_v capacity that can be employed onsite are limited. The project SWPPP as required by the Design Manual meets and exceeds the RR_v minimum required. In addition, as required by the Design Manual, an analysis evaluating each of the green infrastructure techniques in Table 3.2 has been provided in Appendix F. For this project there are two (2) types of practices employed towards meeting the RR_v requirements.

The project proposes extensive landscaping around the site and cisterns are proposed to collect the roof runoff from each of the proposed buildings. Cisterns sized in accordance with the Design Manual will be applied as a GIP with volume reduction towards meeting the RR_v minimum. Each cistern will be sized to treat the roof area tributary to it. Each cistern will have an overflow to direct stormwater runoff to the the downstream stormwater practices. The cistern sizing calculations have been provided in Appendix I of this SWPPP.

It should be noted that landscaping including tree planting is proposed throughout the site. Tree Planting, is a GIP identified in the design manual, which results in an area reduction. Each tree that is planted within 10 feet of an impervious surface, and is at least 6 feet in height, and has a 2-inch caliper, allows 100 s.f. of impervious surface to be eliminated from the RRv / WQ_v calculation. There are twenty one (21) new trees proposed to be planted throughout the site which meet the Tree Planting requirements for which runoff reduction volume credit was applied.

For a calculation of the Initial WQ_v / RR_v, the RR_v minimum, the RR_v / WQ_v required, and the RR_v provided, refer to Appendix A. In calculating the RR_v minimum, onsite soils belongs to the Hydrologic Soil Groups B. These soil groups have a specific reduction factor of 0.40. The table below summarizes the RR_v requirements for the site, as calculated in Appendix A. As can be seen in the following table the RR_v provided has been maximized and exceeds RR_v minimum:

Table 2.1.1 Runoff Reduction Volume Summary

Drainage Area	Initial WQ_v / RR_v (c.f.)[1]	RR_v Minimum (c.f.)	RR_v provided through GIP with Area Reduction (c.f.)[2]	WQ_v RR_v Required (Initial WQ_v / RR_v minus RR_v provided through GIP with Area Reduction) (c.f.)	RR_v Provided through GIP with Volume Reduction (c.f.)	Percentage of RR_v Minimum Provided compared to RR_v Minimum (excluding GIP with Area Reduction)	Remaining WQ_v to be treated in downstream standard SMP (WQ_v RRv Required minus RR_v Provided) (c.f.)[3]
Tributary Area to Sand Filter 1.0P (Subcatchments 1.1 and 1.2)	9,148	3,669	233	8,915	3,824	104%	5,091

[1] Refer to Appendix A for Initial WQ_v Calculations

[2]The RR_v provided through GIP with Area Reduction is calculated in Appendix A.

[3] The proposed sand filter 1.0P will be designed to treat 5,091 c.f. of WQ_v.

As noted in the table above the project has provided greater than the RR_v minimum. By implementing GIP's to the greatest extent practicable, and exceeding the RR_v minimum, the NYSDEC RR_v requirement has been addressed. As 100% of the WQ_v / RR_v required was not provided for subcatchment 1.1 and 1.2, a downstream standard SMP must be provided to treat the difference between the WQ_v / RR_v required and the RR_v provided. A sand filter will be provided as the primary downstream stormwater management practices to treat the remaining WQ_v for the subcatchments. As previously stated, a surface sand filter is being provided to satisfy to meet stormwater quality/quantity requirements of the NYSDEC.

2.2 NYSDEC Water Quality Volume, WQ_v

Since 100% of the WQ_v / RR_v required was not provided through GIP's or standard SMP's with RR_v capacity, a downstream standard SMP must be provided. An F-1, surface sand filter will be provided to satisfy the NYSDEC requirements. The remaining WQ_v from Subcatchment 1.1 and 1.2, 5,091 cf is proposed to be treated in the surface sand filter.

The sand filter has been selected as the proposed stormwater management practices for the reasons listed below:

- Onsite soil testing proved that shallow depth to rock was evident across the entire site and ultimately eliminated the potential use of any infiltration practices. The stormwater filter practice F-1 is capable to treatment of residential development with a maximum drainage area of 5 acres and will be designed as an offline practice.

As required by the Design Manual the Sand Filter has been sized to hold 75% of the Required WQ_v / RR_v, as well as provide the required filter area as required by Section 6.4.4 of the Design Manual. A hydrodynamic separator is proposed for pretreatment prior to the surface sand filter and the subsurface detention systems are proposed to act as flowsplitters prior to the surface sand filter such that the sand filter is an offline practice.

As indicated above, and demonstrated in the following calculations the sand filter sizing is based on the volume of runoff required to be treated and the formulas specified in the Design Manual. The volume of runoff required to be treated is equal to the remaining WQ_v after application of Green Infrastructure Practices. As can be verified in table 2.2.1 below the required volume, based on the formulas in the Design Manual, has been provided below the overflow weir in the outlet structure. The routings in Appendix C show a flow over the weir in the 1-year storm event. This is because the formulas required by the Design Manual and calculations performed by HydroCAD for flow through the filter are not the same, and will not result in the same outflow. The routings in Appendix C were provided to demonstrate the CP_v requirement was met and utilize the required TR-20 methodology. The sizing calculations were based on the required formulas in Chapter 6. The following three (3) tables summarizes the Sand Filter Sizing:

Table 2.2.1 Sand Filter Volume Sizing Summary

Sub-catchment	Remaining WQ_v (c.f.) (From Table 2.2.1)	Pre-Treatment	Minimum % WQv Storage Required in Sand Filter	Minimum Storage Volume Required (c.f.)	Storage Provided in Pre-Treatment[1] (c.f.)	Storage Provided in Sand Filter[2] (c.f.)
1.1 & 1.2	5,091	Hydrodynamic Separator	75%	3,800	0	3,821

[1] Hydrodynamic separation will be provided for pre-treatment, and has been sized for the WQ_v peak flow.

[2] The storage volume is calculated as the volume between the bottom of practice to the weir elevation of the outlet structure at elevation 108.6.

Table 2.2.2 Sand Filter Area Calculations

$$A_f = (WQ_v)(d_f) / [(k)(h_f + d_f)(t_f)]$$

Subcatchment	Remaining WQ_v (c.f.) (From Table 2.2.1WQ_v	D_f (depth of filter, feet)	K (Permeability in feet / day)	h_f (Avg height of water above filter bed, feet)	t_f (Design filter bed drain time, days)	Required A_f (Area of filter, s.f.)	Provided A_f (Area of filter, s.f.)
1.1 & 1.2	5,091	1.5	3.5	1.5	1.67	383	450

As recommended in the Design Manual the length of underdrain provided shall be based on 10% of the proposed filter bed area and a 3-foot-wide zone of influence. Therefore, the recommended length of underdrain piping for a stormwater filter practice can be calculated as follows:

(0.1 x (Proposed Filter Bed Area ft²)) / 3 ft = ***Recommended Underdrain Length (ft)***

Table 2.2.3 Sand Filter Underdrain Sizing Summary:

ID	Proposed Filter Bed Area (sf)	10% of Filter Bed Area (sf)	Recommended Length of Underdrain (ft)	Provided Length of Underdrain (ft)
Surface Sand Filter 1.0P	450	45	*45 sf / 3 sf* = **15 ft**	**46 ft**

The above tables illustrate the water quality volume treatment requirements set forth in the NYSSMDM have been met with the design of the surface sand filter.

2.3 NYSDEC Stream Channel Protection Volume, CP_v

The Stream Channel Protection (CP_v) criterion is intended to protect stream channels from erosion and is accomplished by the 24-hour extended detention of the center-of-mass of the one-year, 24-hour storm event. As noted in Chapter 4 of the NYSSWMDM, the Stream Channel Protection requirement does not apply for sites tributary to a fifth order or larger stream. The subject project discharges to the City of Beacon stormwater collection system with a direct discharge to the Hudson River, a fifth order stream in the State of New York. Although the requirement to Stream Channel Protection is not required for the subject project, as previously discussed onsite detention systems have been provided to mitigate the peak flows for the larger design storms to mitigate the impacts to the downstream collection system.

2.4 NYSDEC Overbank Flood Control, Q_p, and Extreme Flood Control, Q_f

The Overbank Flood Control (Q_p) requirement is intended to prevent an increase in the frequency and magnitude of out-of-bank flooding events generated by urban development. Overbank control requires storage to attenuate the post-development 10-year, 24-hour peak discharge to pre-development rates. The Extreme Flood Control (Q_f) requirement is intended to prevent the increased risk of flood damage from large storm events, maintain the boundaries of the pre-development 100-year flood plain, and protect the physical integrity of stormwater management practices. Extreme flood control requires storage to attenuate the post-development 100-year, 24-hour peak discharge to pre-development rates. As shown in Table 2.4.1 attenuation for both the 10-year and 100-year 24-hour storms has been provided thus satisfying the Q_p and Q_f requirements. The following table summarizes the pre and post development peak flows expected for the proposed project.

Table 2.4.1– Pre and Post-Development Peak Flows

24-HOUR DESIGN STORM PEAK FLOWS (c.f.s.)				
	10-YEAR (Overbank Flood Control)		100-YEAR (Extreme Flood Control)	
	Pre	Post	Pre	Post
Design Point 1	6.2	4.9	15.8	15.5

As shown in the above table the peak flows discharging to the each of the design lines in the proposed condition have been mitigated to slightly below the existing condition levels. Since the rate of runoff in the proposed condition is less than the existing condition, the proposed onsite stormwater improvements will mitigate the potential impact of the peak flows to the downstream drainage system in the final condition.

3.0 STORMWATER CONVEYANCE SYSTEM

The stormwater collection and conveyance systems for the project will consist of catch basins and HDPE pipe. The system will be sized to collect and convey at minimum the 10-year, 1-hour design storm using the Rational Method. The Rational Method is a standard method used by engineers to develop flow rates for sizing collection systems. The Rational Method calculates flows based on a one-hour design storm. The corresponding calculations are shown in Appendix H of this report.

4.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control should be accomplished by four basic principles: diversion of clean water, containment of sediment, treatment of dirty water, and stabilization of disturbed areas. Diversion of clean water should be accomplished with swales. This diverted water should be safely conveyed around the construction area as necessary and discharged downstream of the disturbed areas. Sediment should be contained with the use of silt fence at the toe of disturbed slopes and excavation of the temporary sediment basin. Disturbed areas should be permanently stabilized within 14 days of final grading to limit the required length of time that the temporary facilities must be utilized. The owner will be responsible for the maintenance of the temporary erosion control facilities.

4.1 Temporary Erosion and Sediment Control Facilities

Temporary erosion and sediment control facilities should be installed and maintained as required to reduce the impacts to off-site properties. The owner will be required to provide maintenance for the temporary erosion and sediment control facilities. In general, the following temporary methods and materials should be used to control erosion and sedimentation from the project site:

- Stabilized Construction Entrance
- Silt Fence Barriers
- Storm Drain Inlet Protection
- Sediment Traps with optional Dewatering Devices

A stabilized construction entrance should be installed at the entrance to the site as shown on the plan. The design drawings will include details to guide the contractor in the construction of this entrance. The intent of the stabilized construction entrance is to prevent the “tracking” of soil from the site. Dust control should be accomplished with water sprinkling trucks if required. During dry periods, sprinkler trucks should wet all exposed earth surfaces as required to prevent the transport of air-borne particles to adjoining areas.

Siltation barriers constructed of geosynthetic filter cloth should be installed at the toe of all disturbed slopes. The intent of these barriers is to contain silt and sediment at the source and inhibit its transport by stormwater runoff. The siltation barriers will also help reduce the rate of runoff by creating filters through which the stormwater must pass.

4.2 Permanent Erosion and Sediment Control Facilities

Permanent erosion and sediment control will be accomplished by diverting stormwater runoff from steep slopes, controlling/reducing stormwater runoff velocities and volumes, and vegetative and structural surface stabilization. All of the permanent facilities are relatively maintenance free and only require periodic inspections. The owner will provide maintenance for all the permanent erosion and sediment control facilities.

The temporary sediment trap shall be cleaned of all sediment and debris, and converted to an extended detention dry stormwater basin per the final elevations and dimensions, and stabilized with the vegetation as indicated on the project drawings. Riprap aprons will be used at the discharge end of all piped drainage systems. Runoff velocities will be reduced to levels that are non-erosive to the receiving waterbodies through use of these aprons.

Other than the buildings and paved surfaces, disturbed surfaces will be stabilized with vegetation. The vegetation will control stormwater runoff by preventing soil erosion, reducing runoff volume and velocities, and providing a filter medium. Permanent seeding should optimally be undertaken in the spring from March 21st through May 20th and in late summer from August 15th to October 15th.

5.0 IMPLEMENTATION, MAINTENANCE & GENERAL HOUSEKEEPING

5.1 Construction Phase

Details associated with the implementation and maintenance of the proposed stormwater facilities and erosion control measures during construction are shown on the project drawings. A Construction Sequence has been provided to guide the contractor in the installation of the erosion control measures as well as the site plan features. In accordance with NYSDEC SPDES General Permit GP-0-15-002 no phase will exceed the maximum of 5 acres of disturbance at any given time as less than 5 acres of disturbance is proposed. The erosion control plan includes associated details and notes to aid the contractor in implementing the plan.

During construction, a Site Log Book, Appendix E, is required to be kept per NYSDEC SPDES General Permit GP-0-15-002. Erosion and sediment control inspections are required to be conducted as necessary under coverage of the permit (minimum twice a week) and an updated logbook and a copy of the SWPPP is required to be kept on site for the duration of the construction activities. The Construction Site Log Book is an appendix taken from the *New York Standards and Specifications for Erosion and Sediment Control* (Blue Book).

In addition to the proposed erosion and sediment control facilities, the following good housekeeping best management practices shall be implemented to mitigate potential pollution during the construction phase of the project. The general contractor overseeing the day-to-day site operation shall be responsible for the good housekeeping best management practices included in the following general categories:

- Material Handling and Waste Management
- Establishment of Building Material Staging Areas
- Establishment of Washout Areas
- Proper Equipment Fueling and Maintenance Practices
- Spill Prevention and Control Plan

All construction waste materials shall be collected and removed from the site regularly by the general contractor. The general contractor shall supply waste barrels for proper disposal of waste materials. All personnel working on the site shall be instructed of the proper procedures for construction waste disposal.

Although it is not anticipated any hazardous waste materials will be utilized during construction, any hazardous waste materials shall be disposed of in accordance with federal, state, and local regulations. No hazardous waste shall be disposed of on-site. Hazardous waste materials shall be stored in appropriate and clearly marked containers and segregated from the other non-waste materials. All hazardous waste shall be stored in a structurally sound and sealed shipping containers located in the staging areas. Material safety data sheets, material inventory, and emergency contact numbers will be maintained in the office trailer. All personnel working on the site shall be instructed of the proper procedures for hazardous waste disposal.

Temporary sanitary facilities (portable toilets) shall be provided on site during the entire length of construction. The sanitary facilities shall be in an alternate area away from the construction activities on the site. The portable toilets shall be inspected weekly for evidence of leaking holding tanks.

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

All construction equipment and maintenance materials shall be stored in a designated staging area. Silt fence shall be installed down gradient of the construction staging area. Shipping containers shall be utilized to store hand tools, small parts, and other construction materials, not taken off site daily. Construction waste barrels, recycling barrels and if necessary hazardous waste containers shall be located within the limits of the construction staging area.

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

Vehicles and equipment shall be inspected on each day of use. Any leak discovered shall be repaired immediately. All leaking equipment unable to be repaired shall be removed from the site. Ample supplies of absorbent, spill-cleanup materials, and spill kits shall be located in the construction staging area. All spills shall be cleaned up immediately upon discovery. Spent absorbent materials and rags shall be hauled off-site immediately after the spill is cleaned for disposal at a local landfill. All personnel working on the site shall be instructed of the proper procedures for spill prevention and control. Any spill large enough to discharge to surface water will be immediately reported to the local fire / police departments and the National Response Center 1-800-424-8802.

During the initial year of planting, the plants may require watering to germinate and establish. Note that several seedings may be required during the first year to completely establish vegetation on the site.

5.2 Long Term Maintenance Plan

Each spring the paved areas should be cleaned to remove the winter's accumulation of traction sand. After this is completed, all drain inlets sumps and the stormwater basins should be cleaned. All pipes should be checked for debris and blockages and cleaned as required. During the cleaning process, the drain inlets, catch basins, and pipes should be inspected for structural integrity and overall condition; repairs and/or replacement will be made as required.

The stormwater facilities for the subject project have been designed to minimize the required maintenance. This section discusses the minimum maintenance requirements to insure long-term performance of the stormwater facilities. Initially the stormwater facilities will require an increased maintenance and inspection schedule until all portions of the site are stable. Generally, the stormwater facilities consist of either collection and conveyance components or treatment components.

The stormwater collection and conveyance system is composed of HDPE, drainage pipe and precast concrete drainage structures. The owner will assume the maintenance responsibilities for the drainage system. Minimal maintenance is typically required for these facilities. All pipes should be checked for debris and blockages and cleaned as required. All drain inlet sumps, including the sumps within the hydrodynamic separators, shall be inspected bi-annually and cleaned to removed deposited sediment. During the cleaning process, the pipes should be inspected for structural integrity and overall condition; repairs and/or replacement should be made as required. Additionally, the detention systems shall be checked for deposited sediment as well. Visual inspection of system through the inspection ports shall take place yearly, and the system shall be cleaned / jetted as necessary to remove deposited sediment.

The stormwater facilities have been designed to limit the routine maintenance requirements. Initially the filter will require regular maintenance until the permanent vegetation is established. Permanent vegetation is considered established when 80% of the final plant density is established. Vegetation should be inspected weekly during construction as part of coverage under NYSDEC SPDES General Permit GP-0-15-002 during construction and in the permanent condition. Damaged areas should be immediately re-seeded and re-mulched. The floor of the filter will be planted with a seed mixture that contains plants that are tolerant of occasional flooding. The seed mixtures contain several plant species that vary slightly in their needs for survival. It is expected that not all of the species will survive within the basin due to variations such as water, nutrients, and light. During the initial year of planting, the plants may require watering to germinate and become established. Note that several seedings may be required during the first year to completely establish vegetation within the basin. After the initial year of establishment, the filter does not need to be fertilized or watered. A natural selection process will occur over the first few years, such that the species within the seed mixture most suitable to the conditions will survive.

Refer to the Sand Filter Inspection & Maintenance checklist found in Appendix G of this report prepared for all portions of this project the requirements to insure long-term performance of all stormwater facilities.

The maintenance of the stormwater cisterns will be in accordance with the guidance provided in the NYSSMDM. The specifics of the cistern maintenance is shown on the Permanent Stormwater Facilities Maintenance Schedule on the project plans and is summarized as follows:

- The cisterns should be pumped out and lowered prior to the winter months to provide storage for snow melt in winter and spring months and prevent against ice and freeze damage. The irrigation pumps should be inspected and tested every spring to ensure system functionality.
- The roof areas from the buildings should be inspected to ensure that particulate matter or other contaminants are not entering the downspouts / roof drains.
- The gutters and downspouts should be inspected monthly for leaks and obstructions.
- The cistern including the pumps, inlet and outlet pipes should be inspected monthly to ensure the system is functioning as designed. Any sediment should be removed, and repairs to the irrigation system should be made as necessary.

APPENDIX A

NYSDEC Runoff Reduction Calculations

RRv Calculation Worksheet - Subcatchment 1.1 & 1.2

Project: West End Lofts
Project #: 16226.100
Date: 5/30/2017

INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

1. RRv Initial = Water Quality Volume (WQv) *0.210 ac-ft* = *9,148 c.f.*

2. *RRv Minimum* = [(P) (Rv) (S) (Aic)] /12 where…

P = Rainfall (in.) = 1.40 in.

Rv = 0.05 + 0.009 (100%) = 0.95

S = Hydrologic Soil Group Specific Reduction Factor = 0.40

[HSG A = 0.55] [HSG B = 0.40] [HSG C = 0.30] [HSG D = 0.20]

Aic = Total area of new impervious cover = 1.9 Acres

RRv Minimum = *3,669 c.f.*

3. *RRv Required* = RRv Initial - Green Infrastructure Practice (GIP) with Area Reduction

GIP with Area Reduction Applied in Project

5.3.1 Conservation of Natural Area	0 sf
5.3.2 Sheet Flow to Riparian Buffers or Filter Strips	0 sf
5.3.4 Tree Planting / Tree Box	2,100 sf
5.3.5 Disconnection of Rooftop Runoff	0 sf
5.3.6 Stream Daylighting	0 sf

RRv Required *0.205 ac-ft* = *8,915* c.f.

4. *RRv Provided*

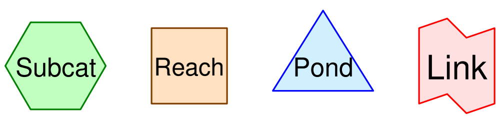
GIP with Volume Reduction Applied in Project	WQv Treated (c.f.)	% of WQv Applied to *RRv Provided*	*RRv Provided (c.f.)*
5.3.3 Vegetated Open Swales [HSG A / B = 20%] [HSG C / D = 10%] {Modified HSG C - D = 15% - 12%]			N/A
5.3.7 Rain Garden [No underdrains / Good Soils = 100%] [With underdrains / Poor Soils = 40%]		40%	
5.3.8 Green Roof [RRv provided equals volume provided in Green Roof]		100%	N/A
5.3.9 Stormwater Planters [Infiltration Planters = 100%] [Flow Through HSG C = 45%] [Flow Though HSG D = 30%]		45%	N/A
5.3.10 Rain Tank / Cisterns (Refer to Appendix I for Cistern Sizing Calculations)	3824	100%	3824
5.3.11 Porous Pavement		100%	0
Infiltration Practice (Standard SMP)		100%	0
Bioretention Practice (Standard SMP) [Without Underdrains HSG A/B = 80%] [With Underdrain HSG C\D = 40%]		40%	N/A
Dry Swale (Open Channel Practice) (Standard SMP)* [HSG A/B = 40%] [HSG C/D = 20%]	0	40%	0
RRv Provided =			*3,824*

5. Summary

RRv Initial	=	9,148 c.f.	
RRv Required	=	8,915 c.f.	
RRv Minimum	=	3,669 c.f.	
RRv Provided	=	3,824 c.f.	
WQv Required for Downstream SMP	=	5,091 c.f.	(= RRv Required - RRv Provided)

APPENDIX B

Pre-Development Computer Data



Routing Diagram for West End Lofts - Pre Development
Prepared by Insite Engineering , Printed 5/22/2017

Summary for Subcatchment PRE 1:

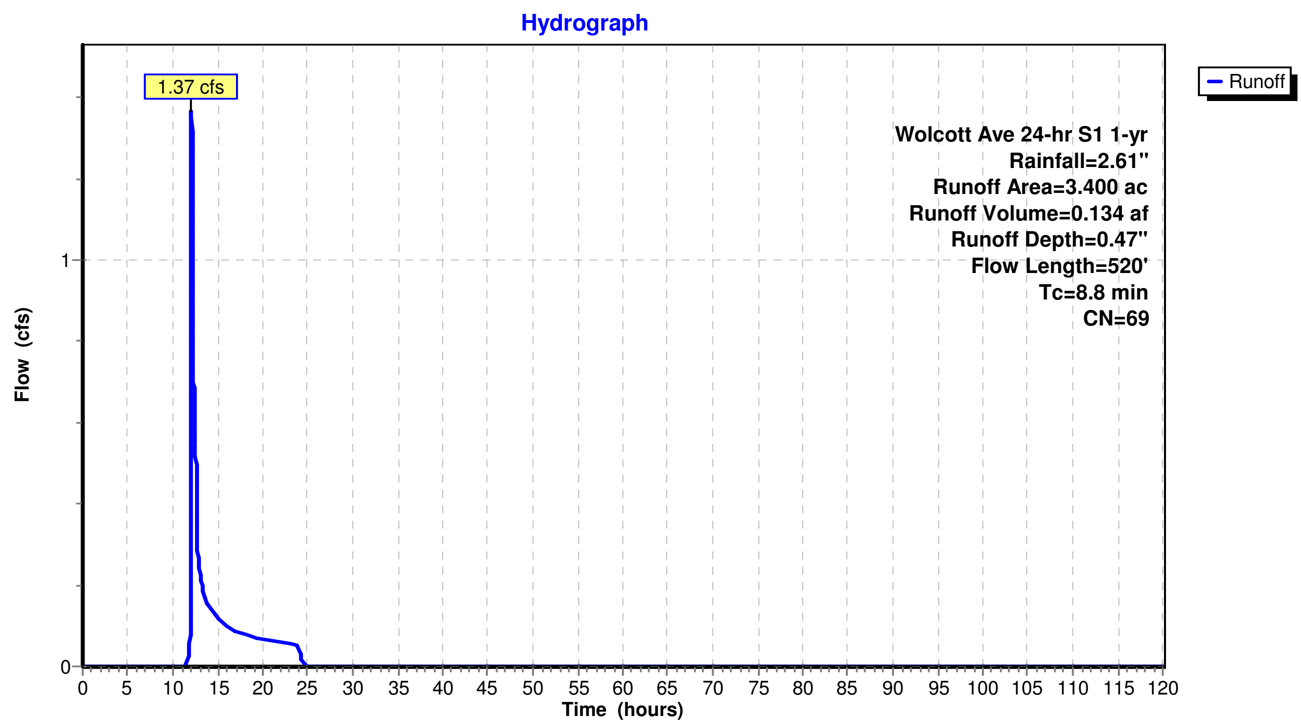
Runoff = 1.37 cfs @ 12.09 hrs, Volume= 0.134 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr Rainfall=2.61"

Area (ac)	CN	Description
0.800	55	Woods, Good, HSG B
1.700	61	>75% Grass cover, Good, HSG B
0.900	98	Paved parking, HSG B
3.400	69	Weighted Average
2.500		73.53% Pervious Area
0.900		26.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	300	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	120	0.1800	2.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	520	Total			

Subcatchment PRE 1:



Summary for Subcatchment PRE 1:

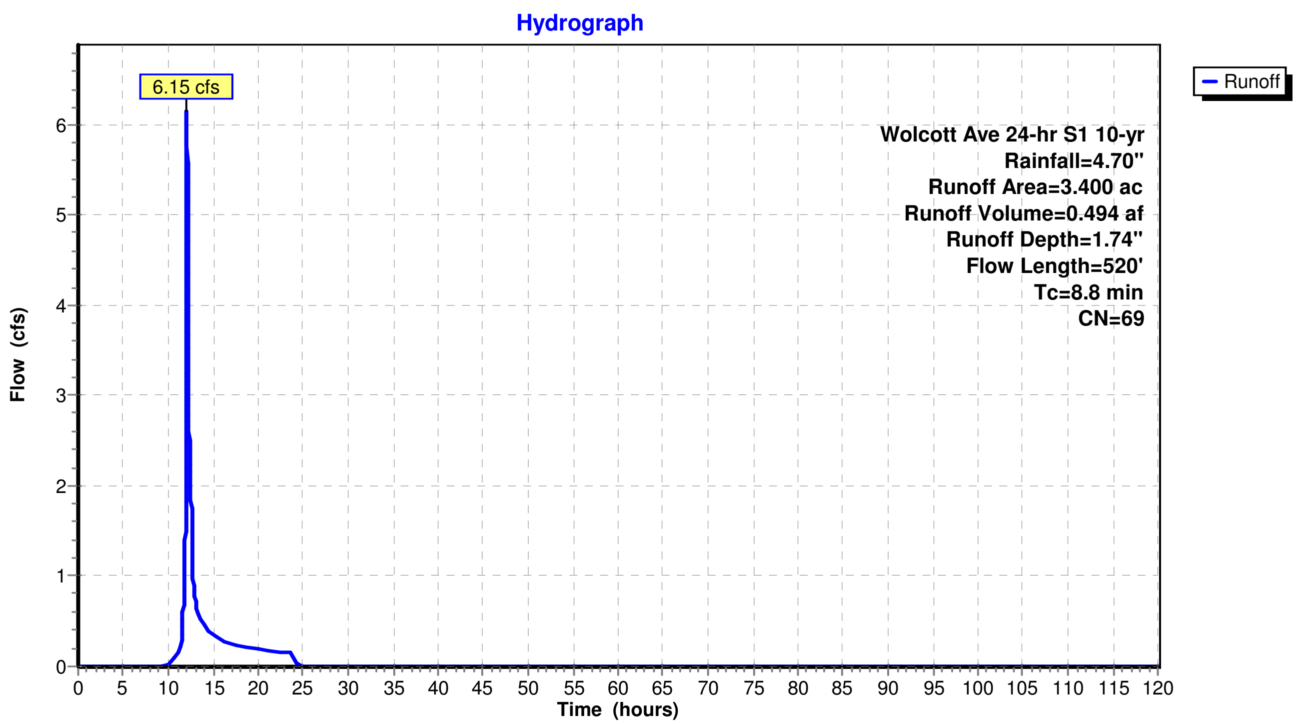
Runoff = 6.15 cfs @ 12.08 hrs, Volume= 0.494 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.800	55	Woods, Good, HSG B
1.700	61	>75% Grass cover, Good, HSG B
0.900	98	Paved parking, HSG B
3.400	69	Weighted Average
2.500		73.53% Pervious Area
0.900		26.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	300	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	120	0.1800	2.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	520	Total			

Subcatchment PRE 1:



Summary for Subcatchment PRE 1:

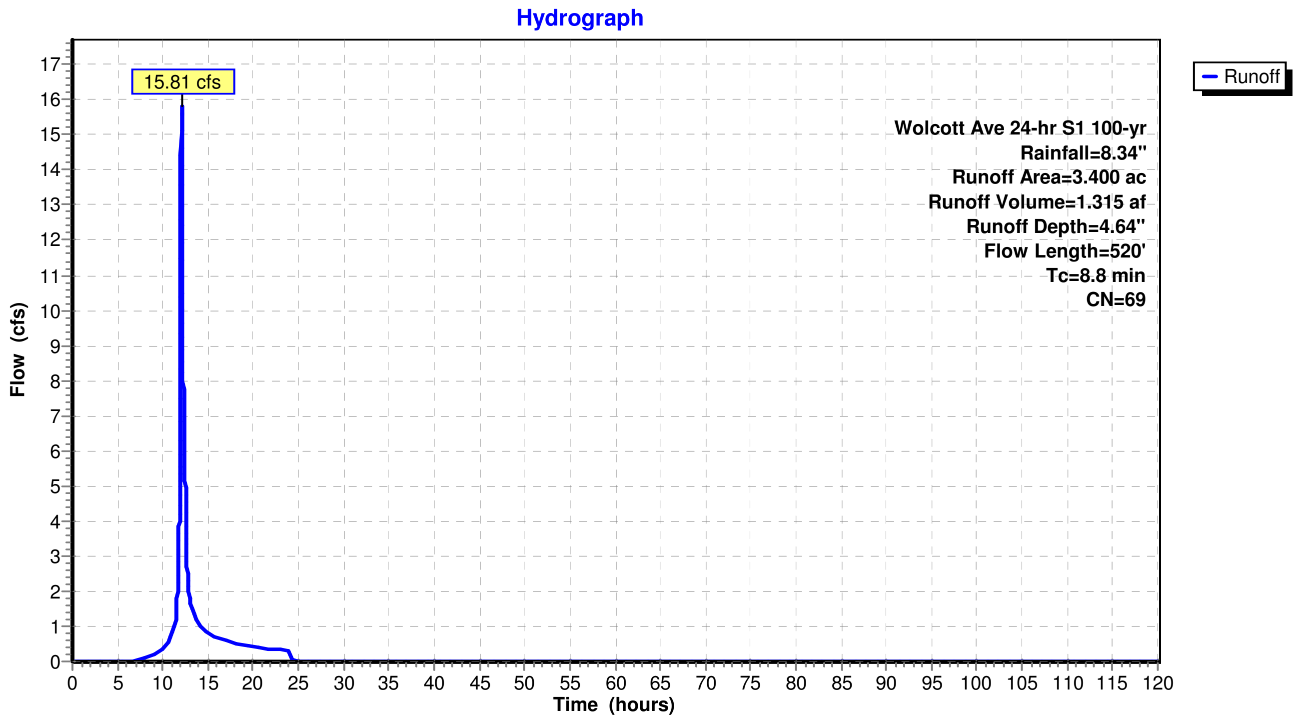
Runoff = 15.81 cfs @ 12.07 hrs, Volume= 1.315 af, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 100-yr Rainfall=8.34"

Area (ac)	CN	Description
0.800	55	Woods, Good, HSG B
1.700	61	>75% Grass cover, Good, HSG B
0.900	98	Paved parking, HSG B
3.400	69	Weighted Average
2.500		73.53% Pervious Area
0.900		26.47% Impervious Area

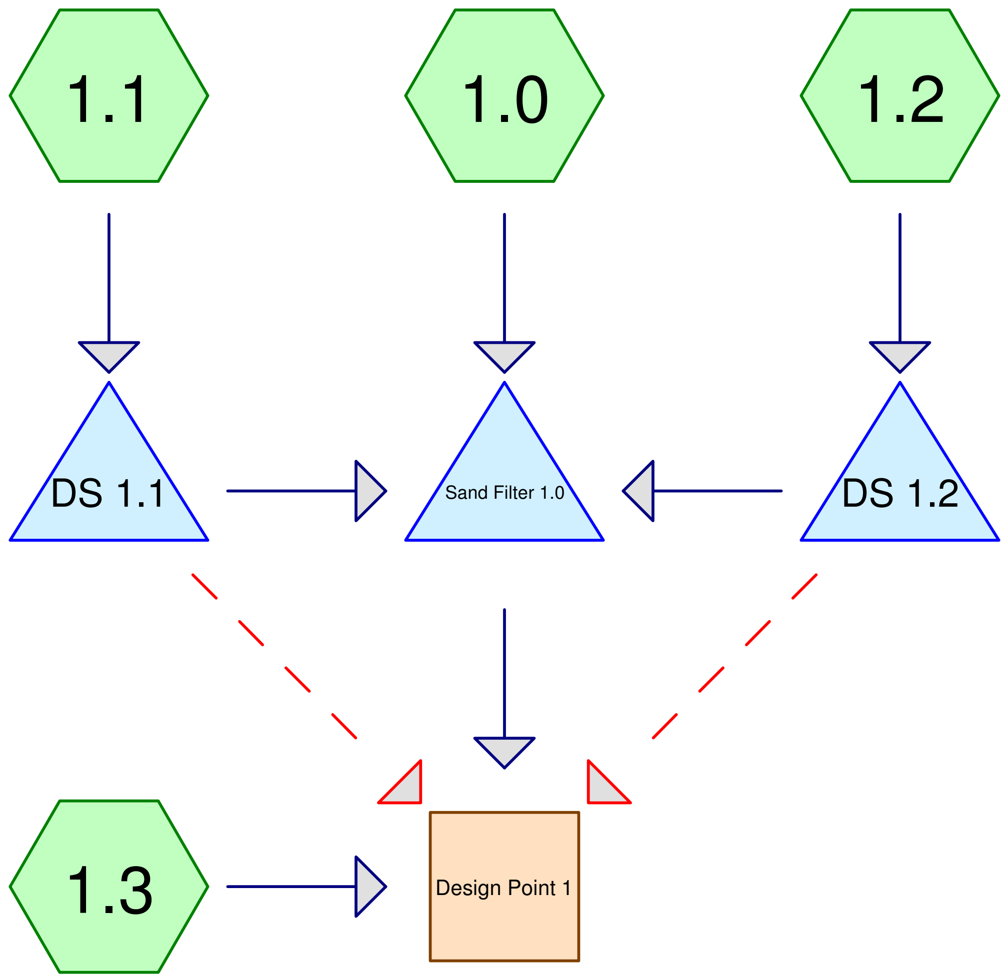
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	300	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	120	0.1800	2.97		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	520	Total			

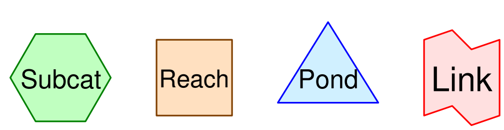
Subcatchment PRE 1:



APPENDIX C

Post-Development Computer Data





Routing Diagram for West End Lofts - Post Development
Prepared by Insite Engineering , Printed 5/30/2017

Summary for Subcatchment 1.0:

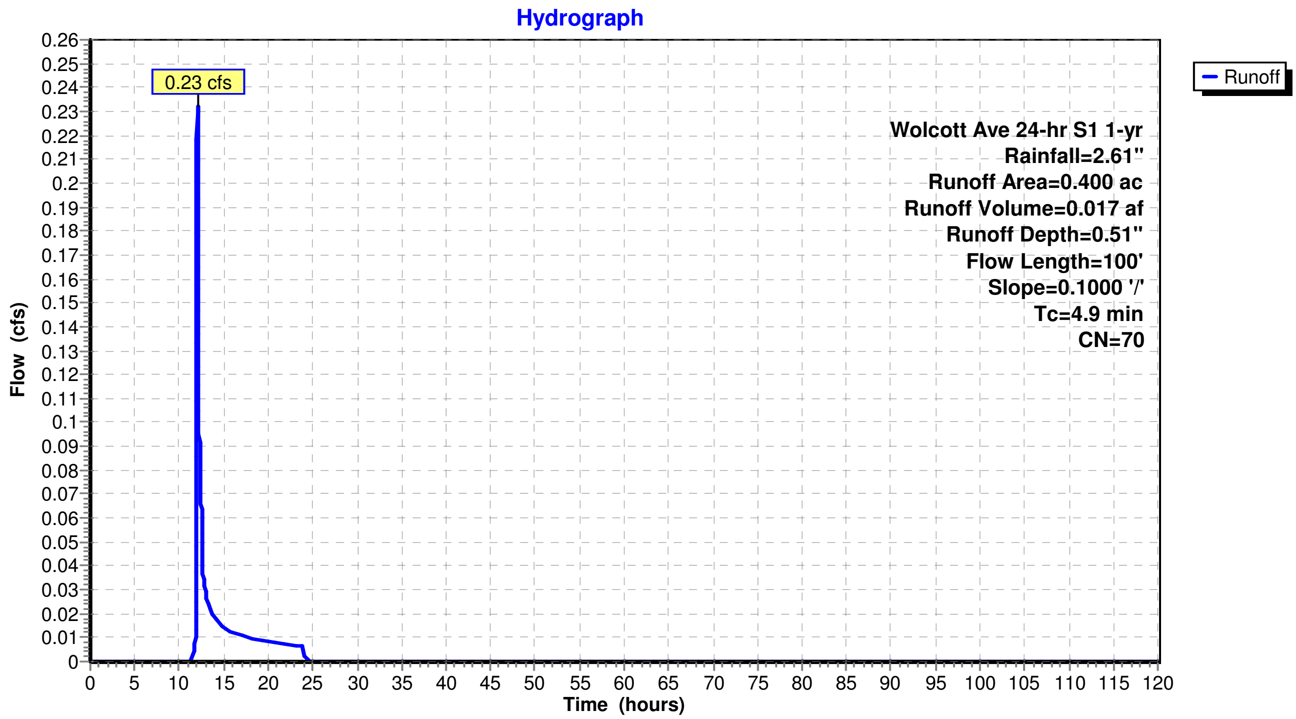
Runoff = 0.23 cfs @ 12.04 hrs, Volume= 0.017 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr Rainfall=2.61"

Area (ac)	CN	Description
0.300	61	>75% Grass cover, Good, HSG B
0.100	98	Paved parking, HSG B
0.400	70	Weighted Average
0.300		75.00% Pervious Area
0.100		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1000	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"

Subcatchment 1.0:



Summary for Subcatchment 1.1:

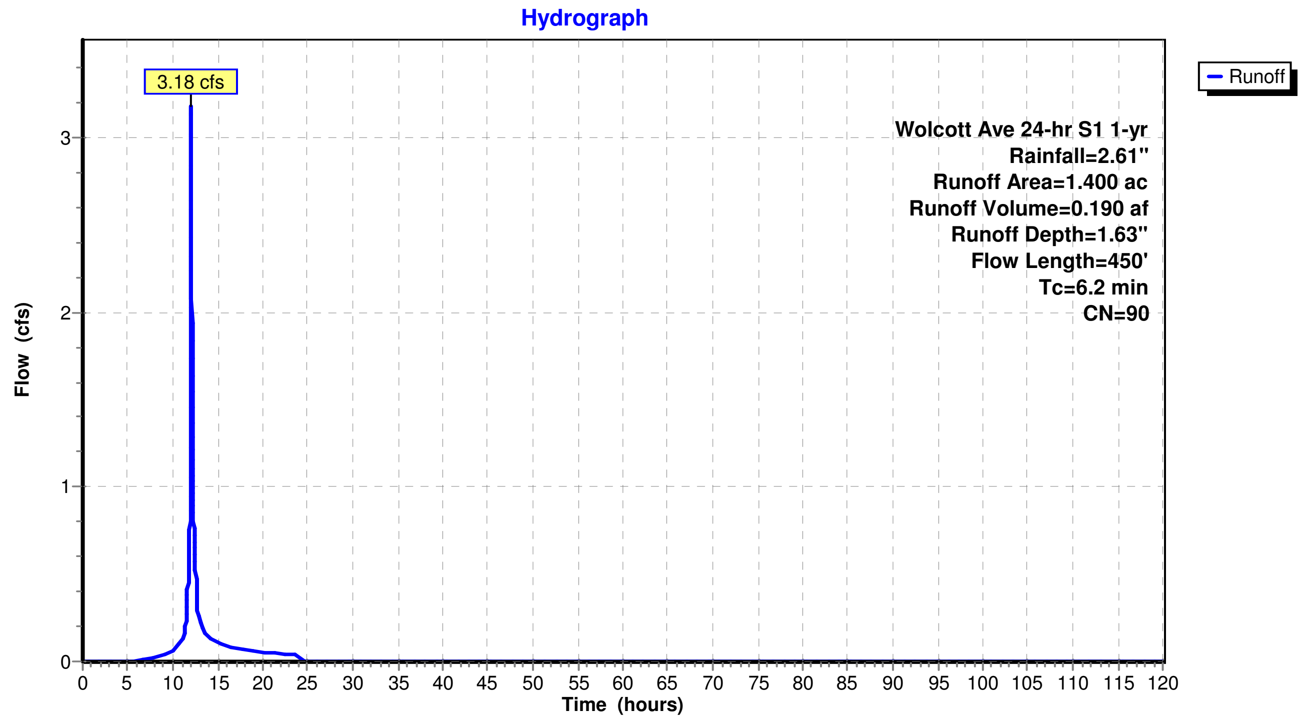
Runoff = 3.18 cfs @ 12.04 hrs, Volume= 0.190 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr Rainfall=2.61"

Area (ac)	CN	Description
1.100	98	Paved parking, HSG B
0.300	61	>75% Grass cover, Good, HSG B
1.400	90	Weighted Average
0.300		21.43% Pervious Area
1.100		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.9	190	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	220	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.2	450	Total			

Subcatchment 1.1:



Summary for Subcatchment 1.2:

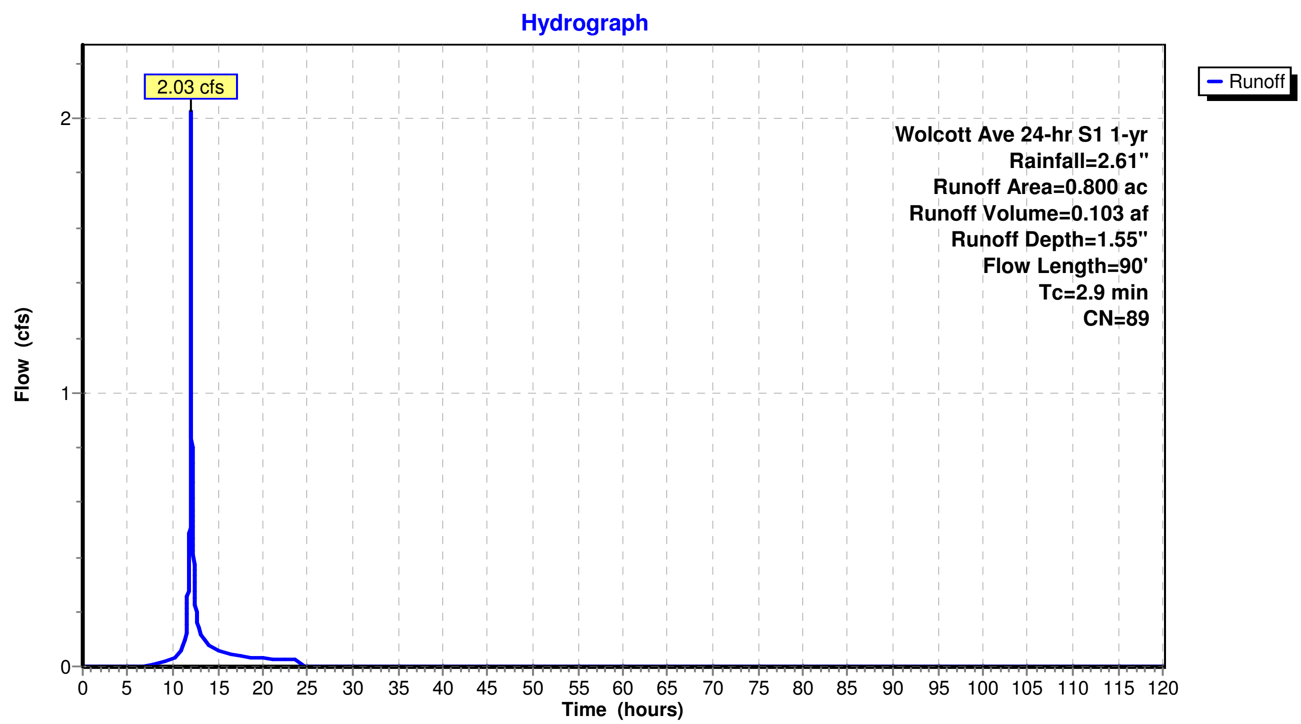
Runoff = 2.03 cfs @ 12.01 hrs, Volume= 0.103 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr Rainfall=2.61"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG B
0.200	61	>75% Grass cover, Good, HSG B
0.800	89	Weighted Average
0.200		25.00% Pervious Area
0.600		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	40	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	30	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.9	90	Total			

Subcatchment 1.2:



Summary for Subcatchment 1.3:

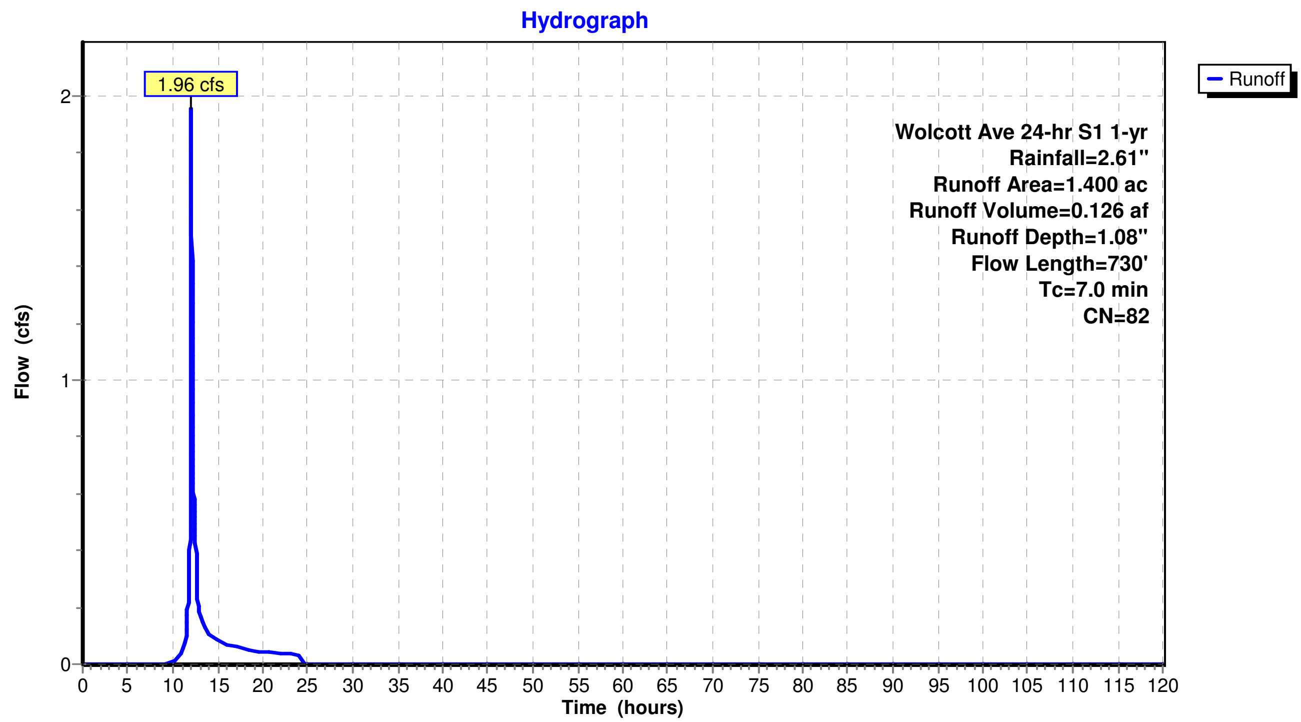
Runoff = 1.96 cfs @ 12.05 hrs, Volume= 0.126 af, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr Rainfall=2.61"

Area (ac)	CN	Description
0.500	61	>75% Grass cover, Good, HSG B
0.800	98	Paved parking, HSG B
0.100	55	Woods, Good, HSG B
1.400	82	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	80	0.0400	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.5	75	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	575	0.0800	14.89	18.27	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
7.0	730	Total			

Subcatchment 1.3:

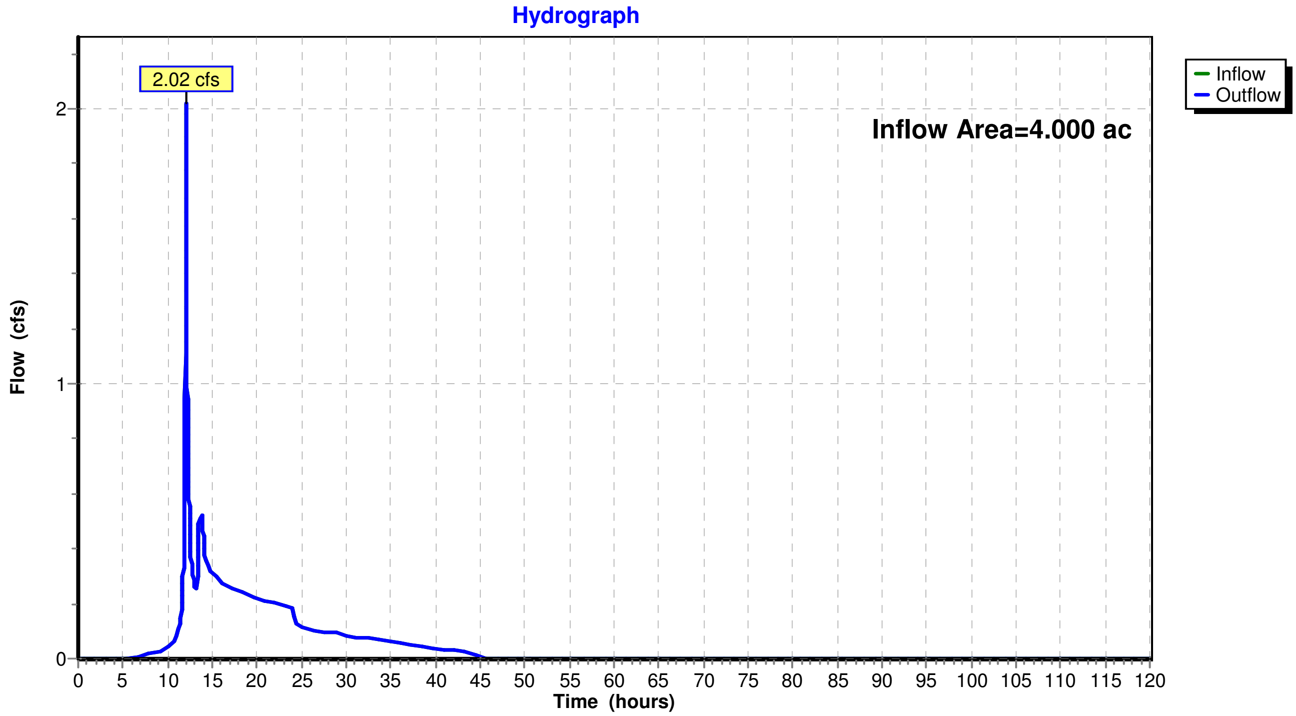


Summary for Reach Design Point 1:

Inflow Area = 4.000 ac, 65.00% Impervious, Inflow Depth = 1.31" for 1-yr event
Inflow = 2.02 cfs @ 12.05 hrs, Volume= 0.436 af
Outflow = 2.02 cfs @ 12.05 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach Design Point 1:



Summary for Pond DS 1.1:

Inflow Area = 1.400 ac, 78.57% Impervious, Inflow Depth = 1.63" for 1-yr event
Inflow = 3.18 cfs @ 12.04 hrs, Volume= 0.190 af
Outflow = 0.15 cfs @ 13.82 hrs, Volume= 0.190 af, Atten= 95%, Lag= 107.0 min
Primary = 0.15 cfs @ 13.82 hrs, Volume= 0.190 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 135.61' @ 13.82 hrs Surf.Area= 0.116 ac Storage= 0.089 af

Plug-Flow detention time= 268.8 min calculated for 0.190 af (100% of inflow)
Center-of-Mass det. time= 268.8 min (1,094.9 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.00'	0.135 af	**27.50'W x 183.00'L x 4.50'H Field A** 0.520 af Overall - 0.183 af Embedded = 0.337 af x 40.0% Voids
#2A	134.50'	0.147 af	**ADS N-12 36** x 45 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 5 Rows of 9 Chambers
		0.281 af	Total Available Storage

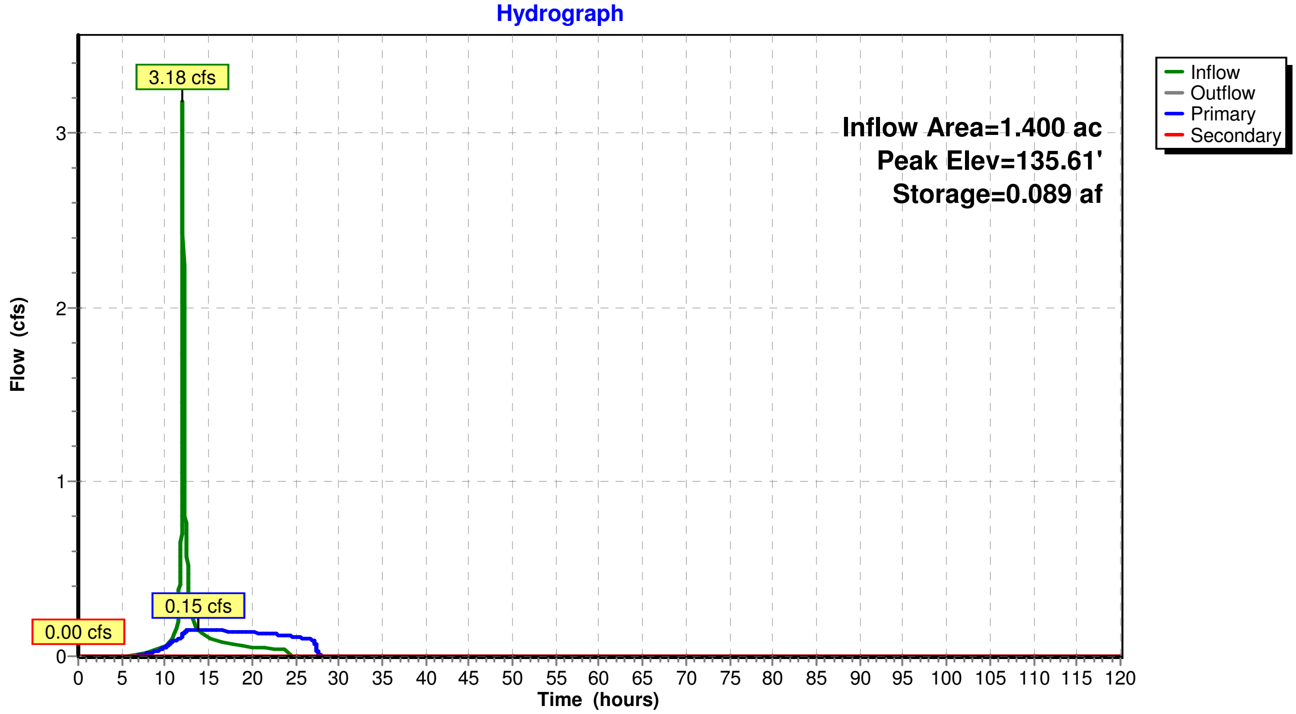
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	133.50'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.50' / 133.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	136.40'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.40' / 136.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	133.00'	**1.9" Vert. Orifice/Grate** C= 0.600

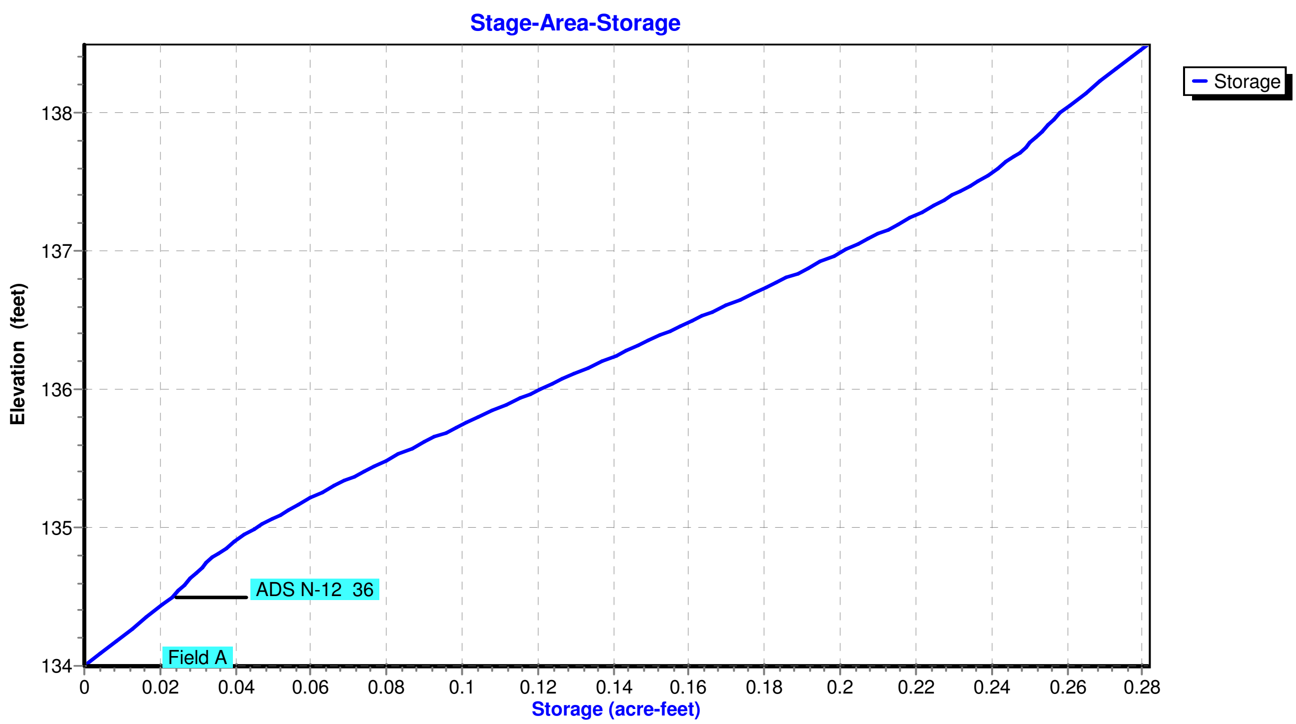
Primary OutFlow Max=0.15 cfs @ 13.82 hrs HW=135.61' (Free Discharge)
└─**3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.66 fps)
  └─**1=Culvert** (Passes 0.15 cfs of 0.37 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Pond DS 1.1:



Pond DS 1.1:



Summary for Pond DS 1.2:

Inflow Area = 0.800 ac, 75.00% Impervious, Inflow Depth = 1.55" for 1-yr event
Inflow = 2.03 cfs @ 12.01 hrs, Volume= 0.103 af
Outflow = 0.39 cfs @ 12.33 hrs, Volume= 0.103 af, Atten= 81%, Lag= 19.4 min
Primary = 0.39 cfs @ 12.33 hrs, Volume= 0.103 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 129.45' @ 12.33 hrs Surf.Area= 0.063 ac Storage= 0.023 af

Plug-Flow detention time= 17.9 min calculated for 0.103 af (100% of inflow)
Center-of-Mass det. time= 17.9 min (846.1 - 828.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0.074 af	**22.25'W x 123.00'L x 4.50'H Field A** 0.283 af Overall - 0.098 af Embedded = 0.185 af x 40.0% Voids
#2A	129.00'	0.078 af	**ADS N-12 36** x 24 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 4 Rows of 6 Chambers
		0.152 af	Total Available Storage

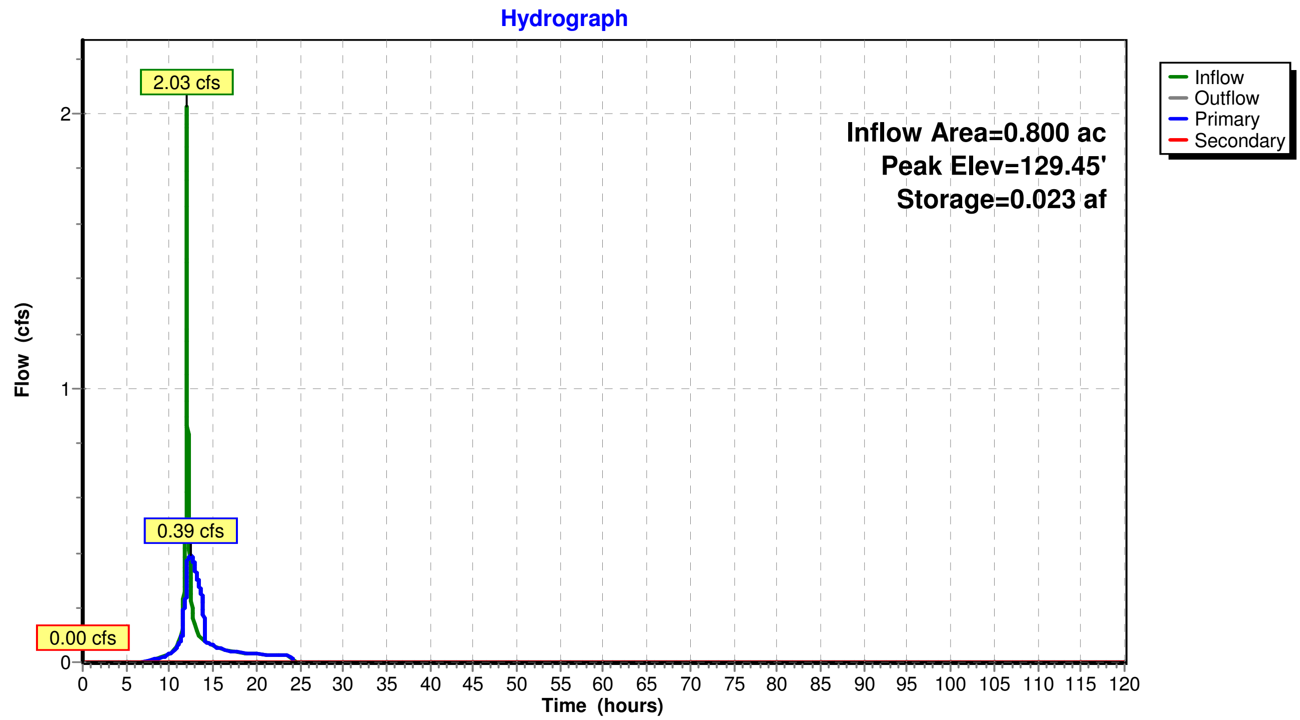
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**4.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	132.40'	**6.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.40' / 131.40' S= 0.2000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

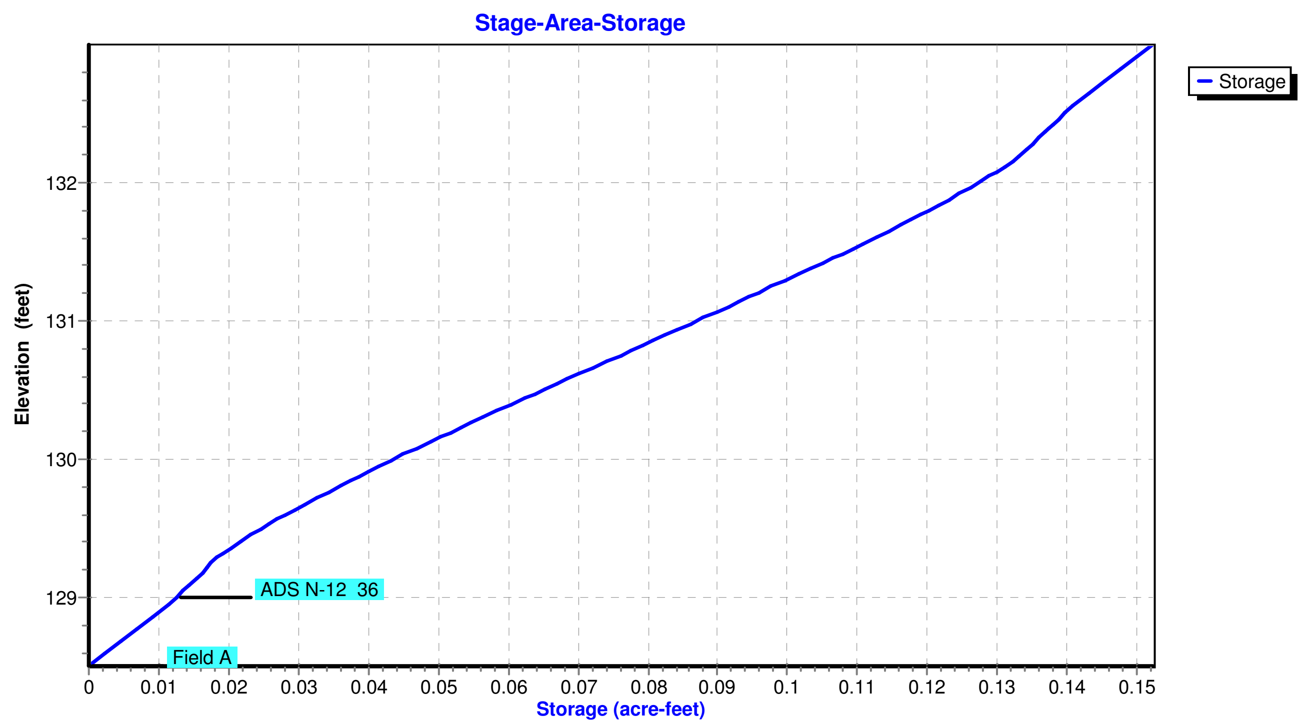
Primary OutFlow Max=0.39 cfs @ 12.33 hrs HW=129.45' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.39 cfs @ 4.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond DS 1.2:



Pond DS 1.2:



Summary for Pond Sand Filter 1.0:

Inflow Area = 2.600 ac, 69.23% Impervious, Inflow Depth = 1.43" for 1-yr event
Inflow = 0.72 cfs @ 12.05 hrs, Volume= 0.310 af
Outflow = 0.41 cfs @ 13.73 hrs, Volume= 0.310 af, Atten= 43%, Lag= 101.3 min
Primary = 0.41 cfs @ 13.73 hrs, Volume= 0.310 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 108.57' @ 13.73 hrs Surf.Area= 2,540 sf Storage= 3,741 cf

Plug-Flow detention time= 351.7 min calculated for 0.310 af (100% of inflow)
Center-of-Mass det. time= 351.8 min (1,354.0 - 1,002.2)

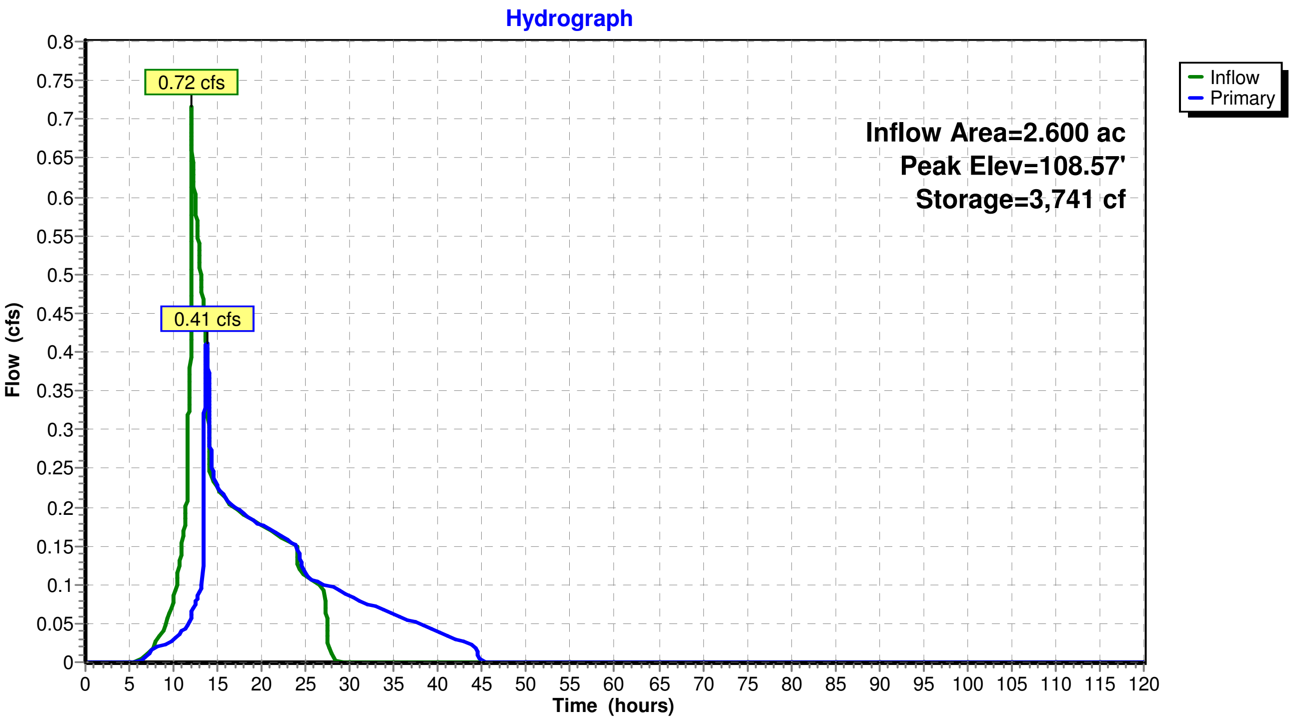
Volume	Invert	Avail.Storage	Storage Description
#1	106.00'	8,350 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.00	450	0	0
108.00	2,000	2,450	2,450
110.00	3,900	5,900	8,350

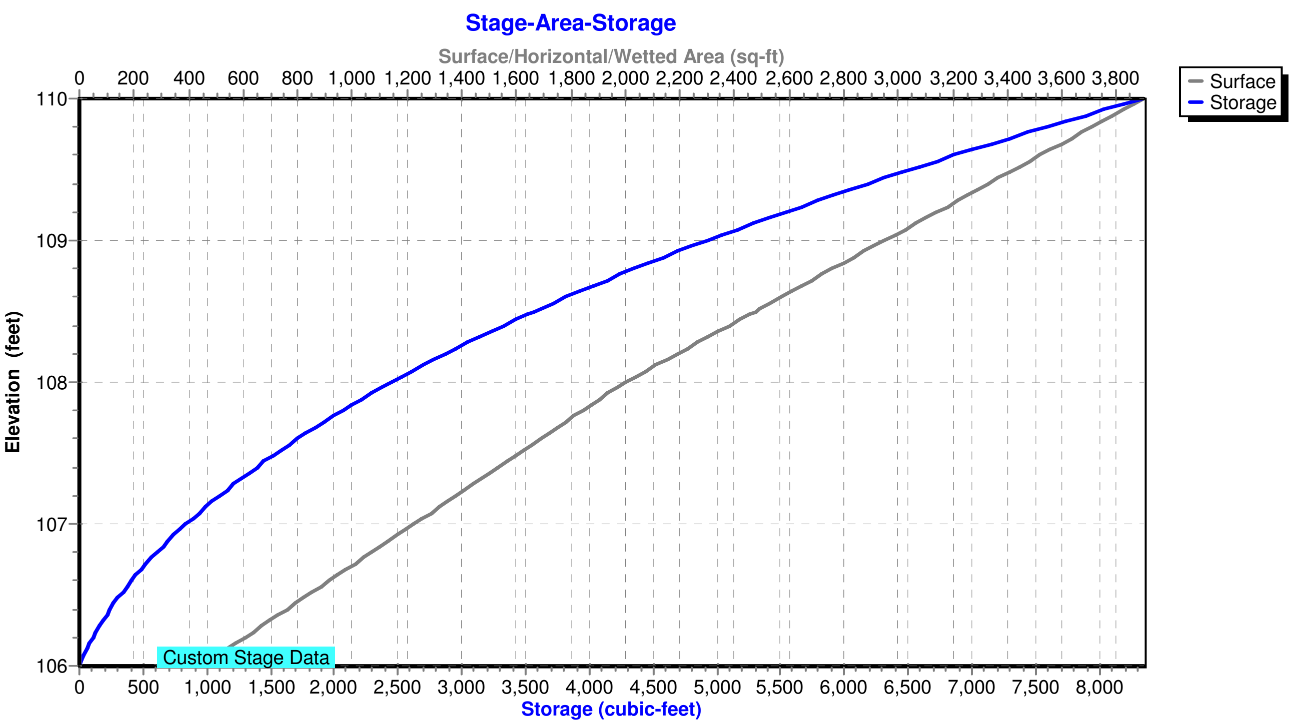
Device	Routing	Invert	Outlet Devices
#1	Device 2	108.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Primary	103.00'	**12.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 103.00' / 101.80' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	106.00'	**1.750 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.40 cfs @ 13.73 hrs HW=108.57' (Free Discharge)
2=Culvert (Passes 0.30 cfs of 7.10 cfs potential flow)
1=Broad-Crested Rectangular Weir (Weir Controls 0.30 cfs @ 0.73 fps)
3=Exfiltration (Exfiltration Controls 0.10 cfs)

Pond Sand Filter 1.0:



Pond Sand Filter 1.0:



Summary for Subcatchment 1.0:

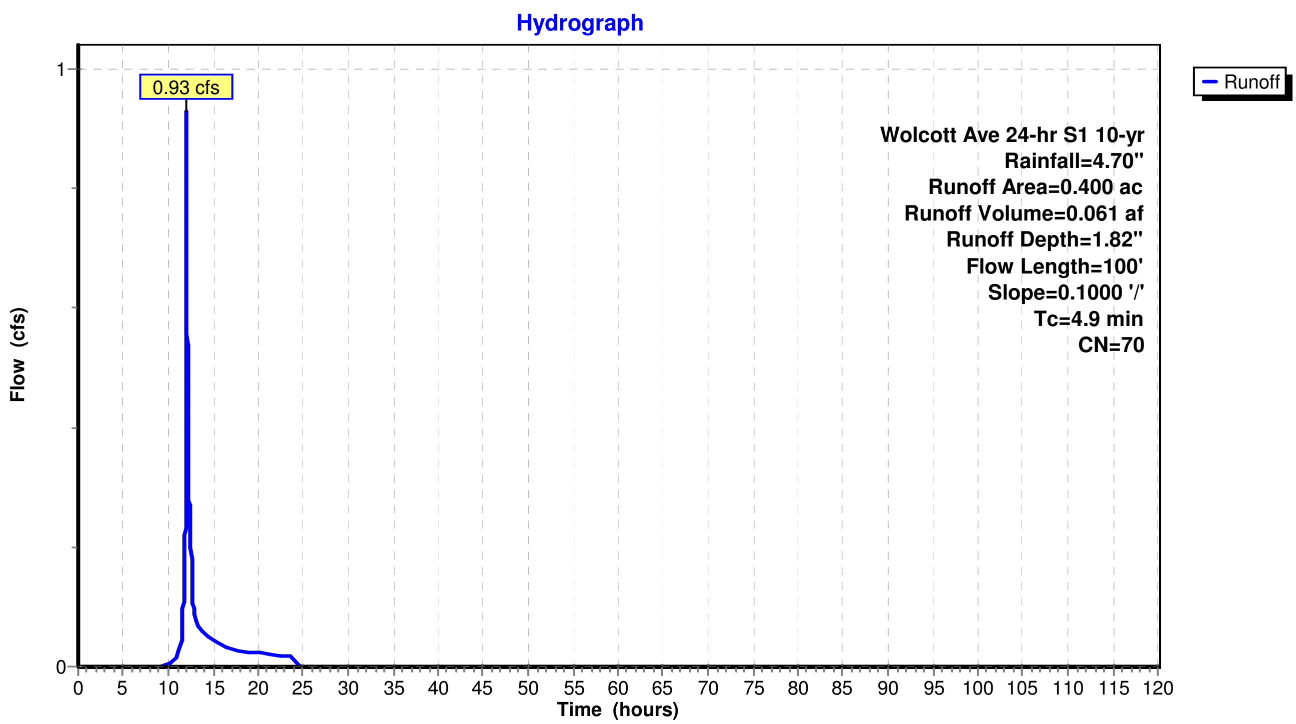
Runoff = 0.93 cfs @ 12.03 hrs, Volume= 0.061 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.300	61	>75% Grass cover, Good, HSG B
0.100	98	Paved parking, HSG B
0.400	70	Weighted Average
0.300		75.00% Pervious Area
0.100		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1000	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"

Subcatchment 1.0:



Summary for Subcatchment 1.1:

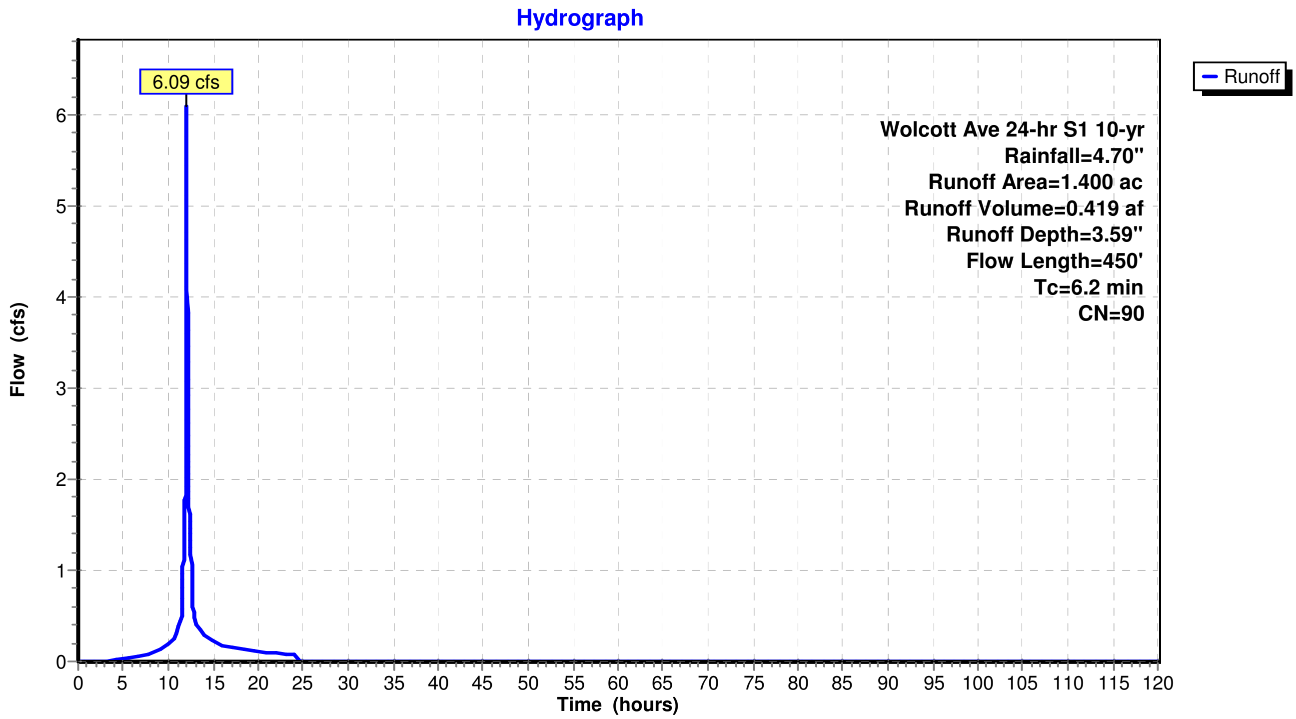
Runoff = 6.09 cfs @ 12.04 hrs, Volume= 0.419 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.100	98	Paved parking, HSG B
0.300	61	>75% Grass cover, Good, HSG B
1.400	90	Weighted Average
0.300		21.43% Pervious Area
1.100		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.9	190	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	220	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.2	450	Total			

Subcatchment 1.1:



Summary for Subcatchment 1.2:

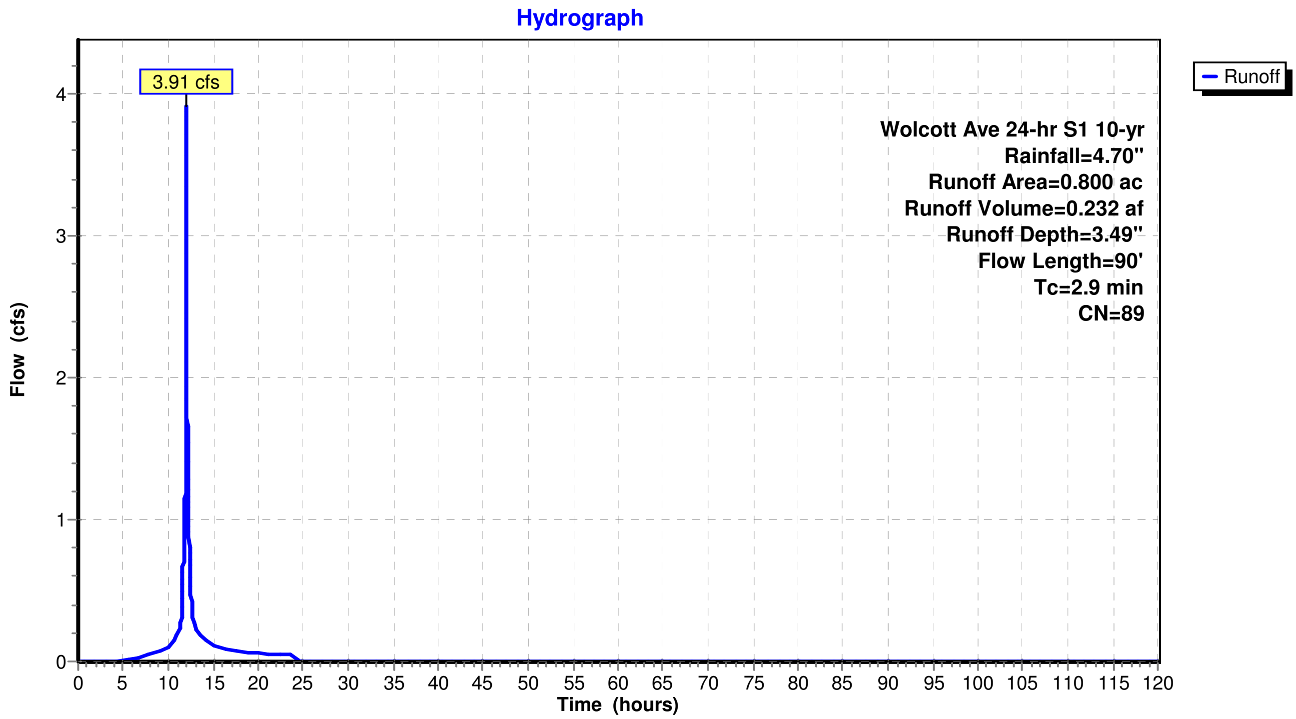
Runoff = 3.91 cfs @ 12.01 hrs, Volume= 0.232 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG B
0.200	61	>75% Grass cover, Good, HSG B
0.800	89	Weighted Average
0.200		25.00% Pervious Area
0.600		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	40	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	30	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.9	90	Total			

Subcatchment 1.2:



Summary for Subcatchment 1.3:

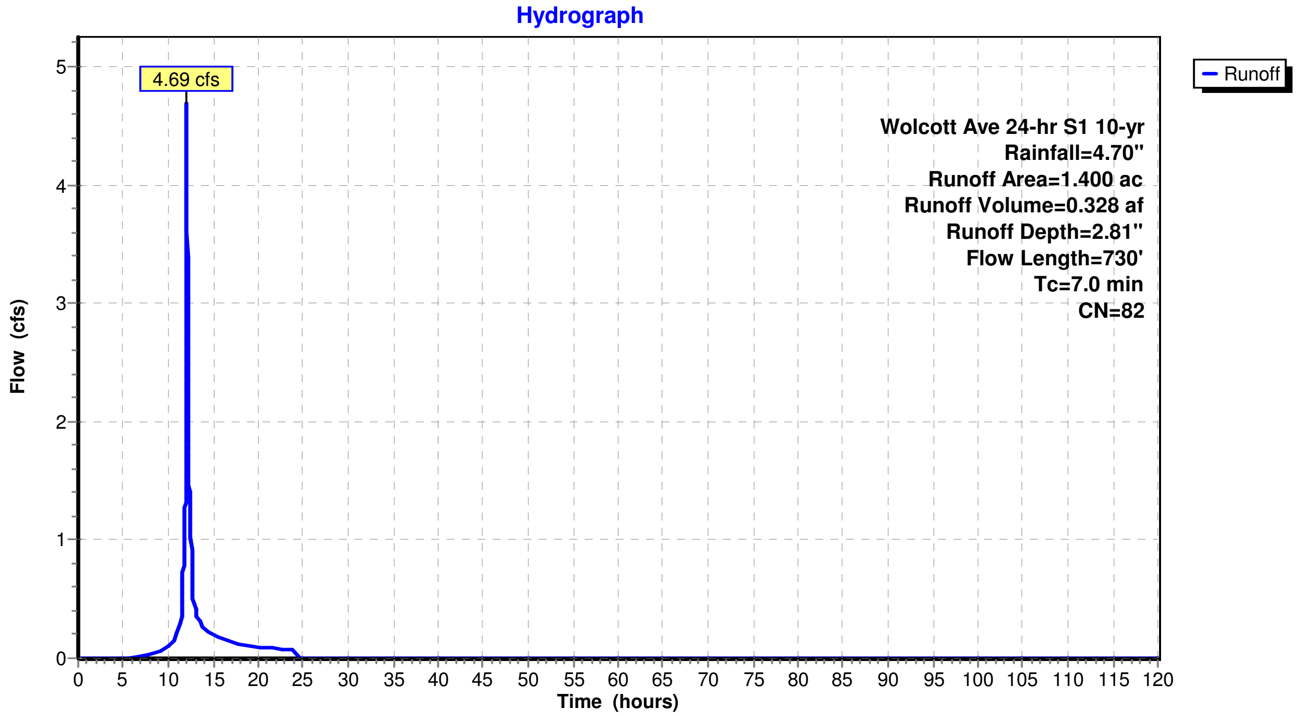
Runoff = 4.69 cfs @ 12.05 hrs, Volume= 0.328 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.500	61	>75% Grass cover, Good, HSG B
0.800	98	Paved parking, HSG B
0.100	55	Woods, Good, HSG B
1.400	82	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	80	0.0400	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.5	75	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	575	0.0800	14.89	18.27	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
7.0	730	Total			

Subcatchment 1.3:

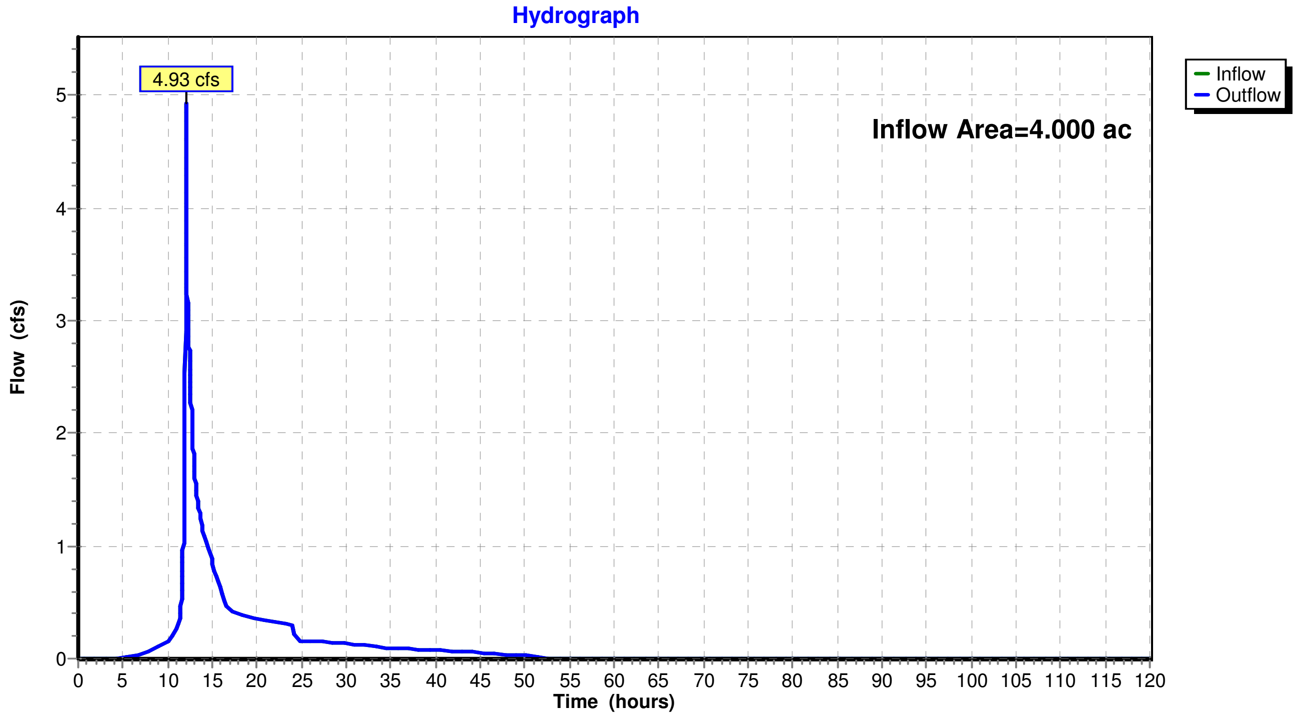


Summary for Reach Design Point 1:

Inflow Area = 4.000 ac, 65.00% Impervious, Inflow Depth = 3.12" for 10-yr event
Inflow = 4.93 cfs @ 12.06 hrs, Volume= 1.040 af
Outflow = 4.93 cfs @ 12.06 hrs, Volume= 1.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach Design Point 1:



Summary for Pond DS 1.1:

Inflow Area = 1.400 ac, 78.57% Impervious, Inflow Depth = 3.59" for 10-yr event
Inflow = 6.09 cfs @ 12.04 hrs, Volume= 0.419 af
Outflow = 0.93 cfs @ 12.59 hrs, Volume= 0.419 af, Atten= 85%, Lag= 32.9 min
Primary = 0.18 cfs @ 12.59 hrs, Volume= 0.339 af
Secondary = 0.75 cfs @ 12.59 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 136.84' @ 12.59 hrs Surf.Area= 0.116 ac Storage= 0.188 af

Plug-Flow detention time= 358.4 min calculated for 0.419 af (100% of inflow)
Center-of-Mass det. time= 358.4 min (1,159.6 - 801.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.00'	0.135 af	**27.50'W x 183.00'L x 4.50'H Field A** 0.520 af Overall - 0.183 af Embedded = 0.337 af x 40.0% Voids
#2A	134.50'	0.147 af	**ADS N-12 36** x 45 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 5 Rows of 9 Chambers
		0.281 af	Total Available Storage

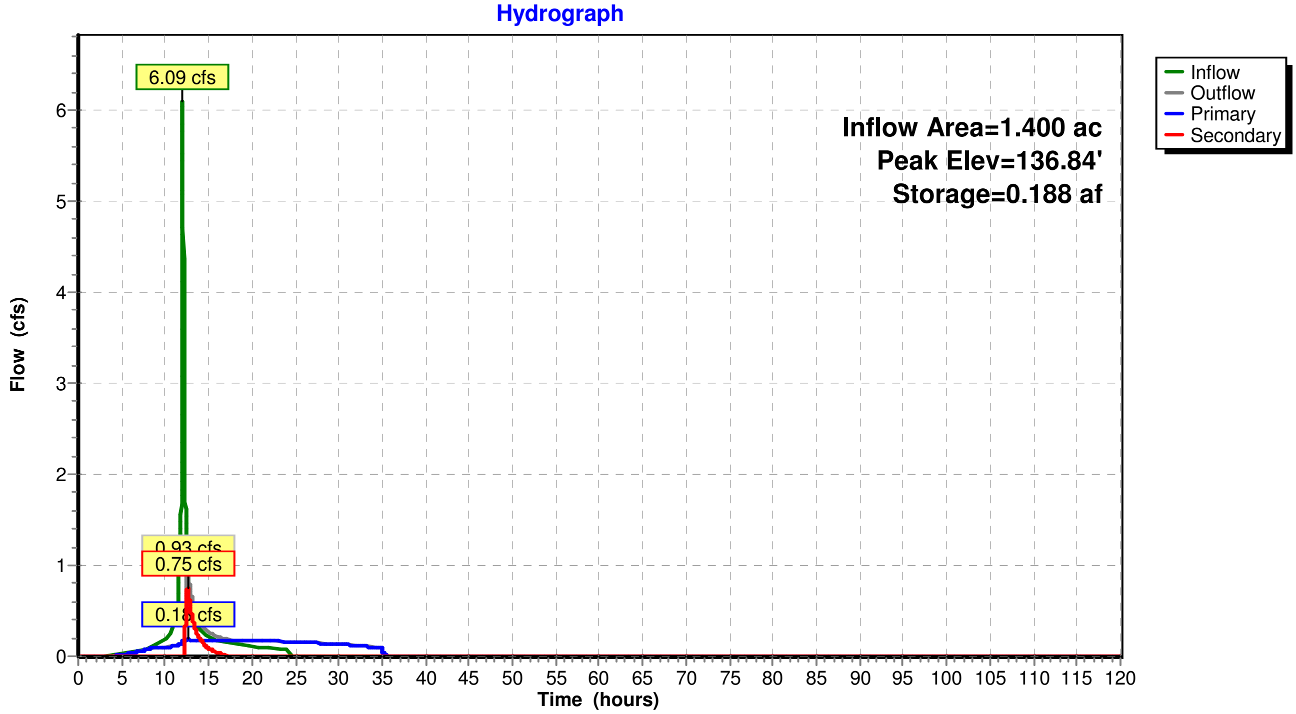
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	133.50'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.50' / 133.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	136.40'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.40' / 136.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	133.00'	**1.9" Vert. Orifice/Grate** C= 0.600

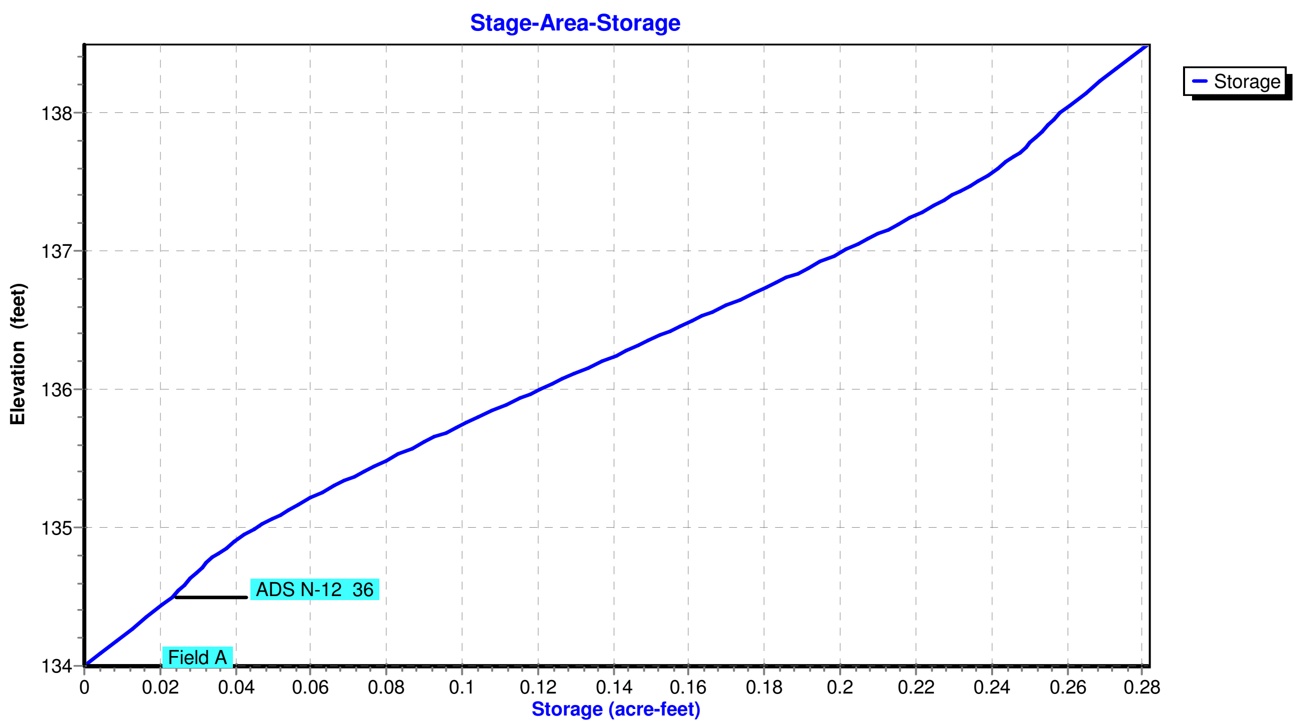
Primary OutFlow Max=0.18 cfs @ 12.59 hrs HW=136.84' (Free Discharge)
↑—**3=Orifice/Grate** (Orifice Controls 0.18 cfs @ 9.33 fps)
  ↑—**1=Culvert** (Passes 0.18 cfs of 0.46 cfs potential flow)

Secondary OutFlow Max=0.74 cfs @ 12.59 hrs HW=136.84' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.74 cfs @ 2.25 fps)

Pond DS 1.1:



Pond DS 1.1:



Summary for Pond DS 1.2:

Inflow Area = 0.800 ac, 75.00% Impervious, Inflow Depth = 3.49" for 10-yr event
Inflow = 3.91 cfs @ 12.01 hrs, Volume= 0.232 af
Outflow = 0.54 cfs @ 12.54 hrs, Volume= 0.232 af, Atten= 86%, Lag= 31.9 min
Primary = 0.54 cfs @ 12.54 hrs, Volume= 0.232 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 130.59' @ 12.54 hrs Surf.Area= 0.063 ac Storage= 0.069 af

Plug-Flow detention time= 40.7 min calculated for 0.232 af (100% of inflow)
Center-of-Mass det. time= 40.7 min (843.4 - 802.7)

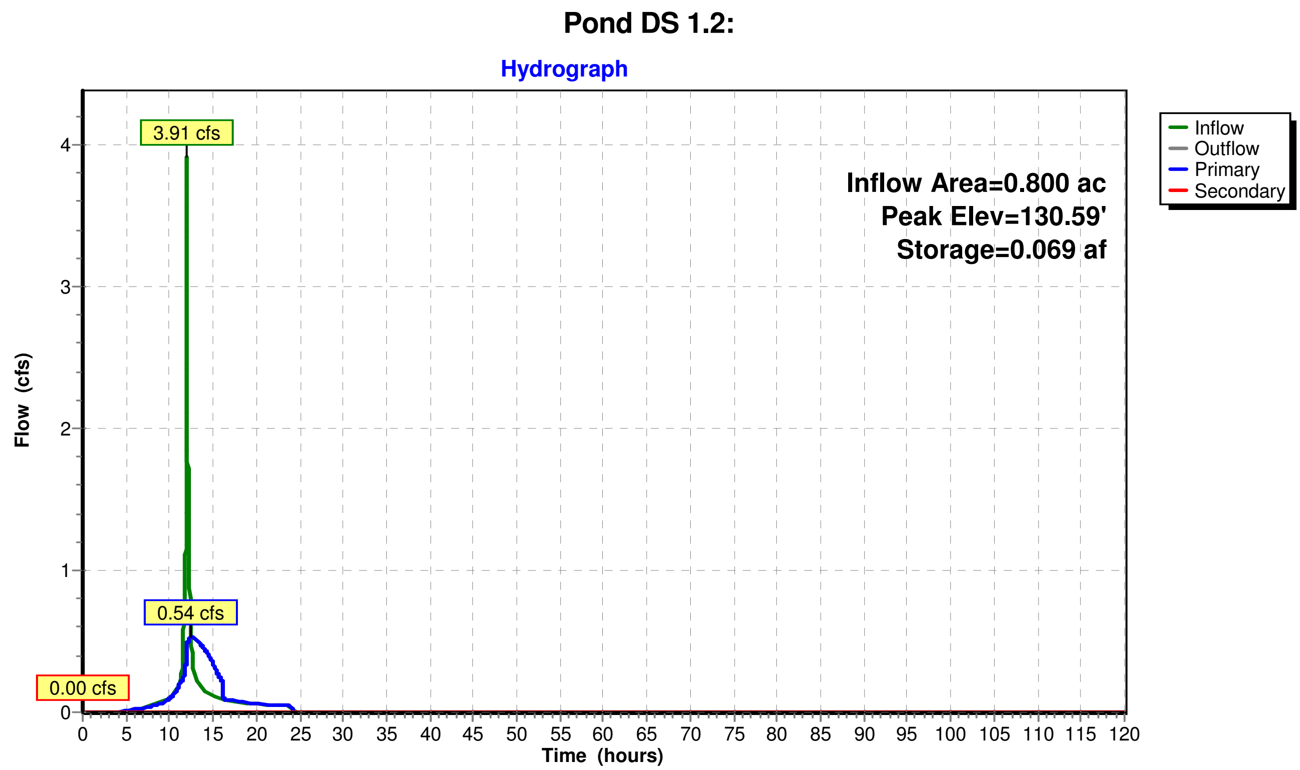
Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0.074 af	**22.25'W x 123.00'L x 4.50'H Field A** 0.283 af Overall - 0.098 af Embedded = 0.185 af x 40.0% Voids
#2A	129.00'	0.078 af	**ADS N-12 36** x 24 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 4 Rows of 6 Chambers
		0.152 af	Total Available Storage

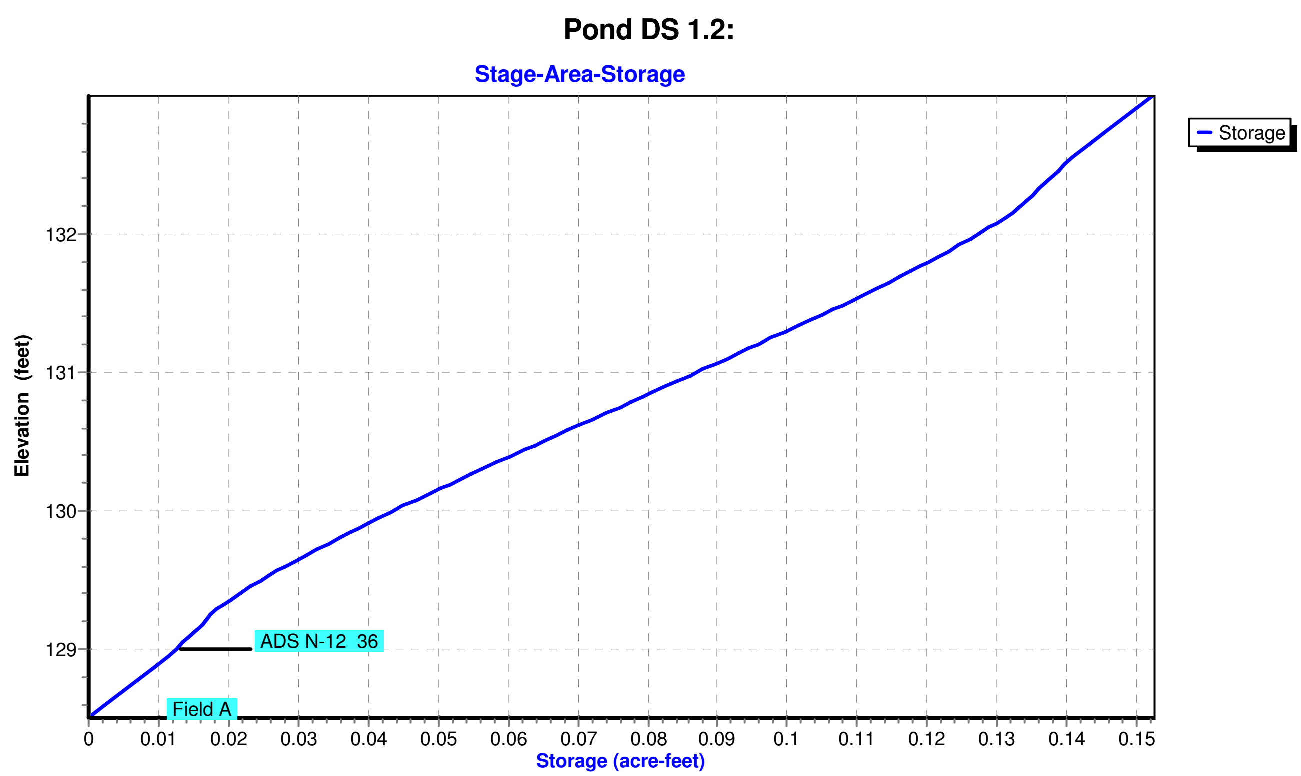
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**4.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	132.40'	**6.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.40' / 131.40' S= 0.2000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.54 cfs @ 12.54 hrs HW=130.59' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.54 cfs @ 6.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)


Pond DS 1.2:
Hydrograph
3.91 cfs
0.54 cfs
0.00 cfs
Inflow Area=0.800 ac
Peak Elev=130.59'
Storage=0.069 af
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
1
2
3
4
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120


Pond DS 1.2:
Stage-Area-Storage
Storage
ADS N-12 36
Field A
Elevation (feet)
Storage (acre-feet)
129
130
131
132
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.11
0.12
0.13
0.14
0.15

Summary for Pond Sand Filter 1.0:

Inflow Area = 2.600 ac, 69.23% Impervious, Inflow Depth = 2.92" for 10-yr event
Inflow = 1.55 cfs @ 12.03 hrs, Volume= 0.632 af
Outflow = 1.01 cfs @ 12.27 hrs, Volume= 0.632 af, Atten= 35%, Lag= 14.1 min
Primary = 1.01 cfs @ 12.27 hrs, Volume= 0.632 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 108.64' @ 12.27 hrs Surf.Area= 2,610 sf Storage= 3,930 cf

Plug-Flow detention time= 249.9 min calculated for 0.632 af (100% of inflow)
Center-of-Mass det. time= 249.9 min (1,309.9 - 1,060.0)

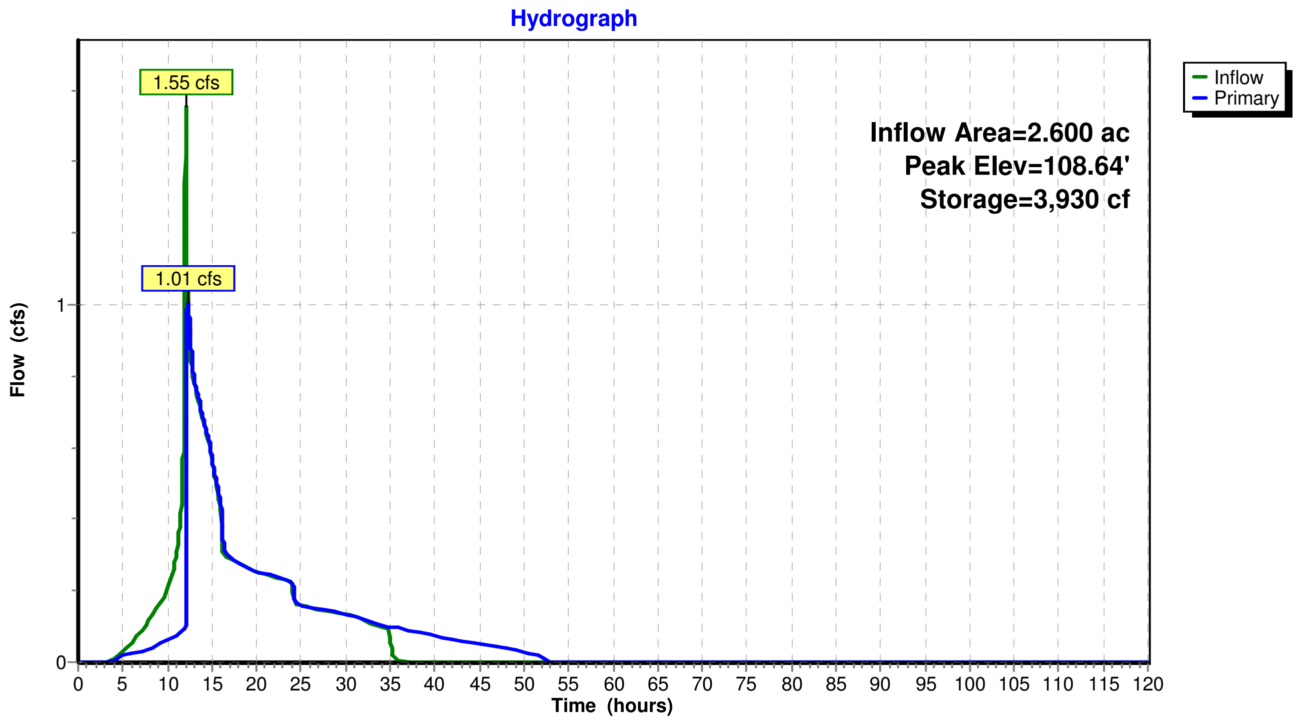
Volume	Invert	Avail.Storage	Storage Description
#1	106.00'	8,350 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.00	450	0	0
108.00	2,000	2,450	2,450
110.00	3,900	5,900	8,350

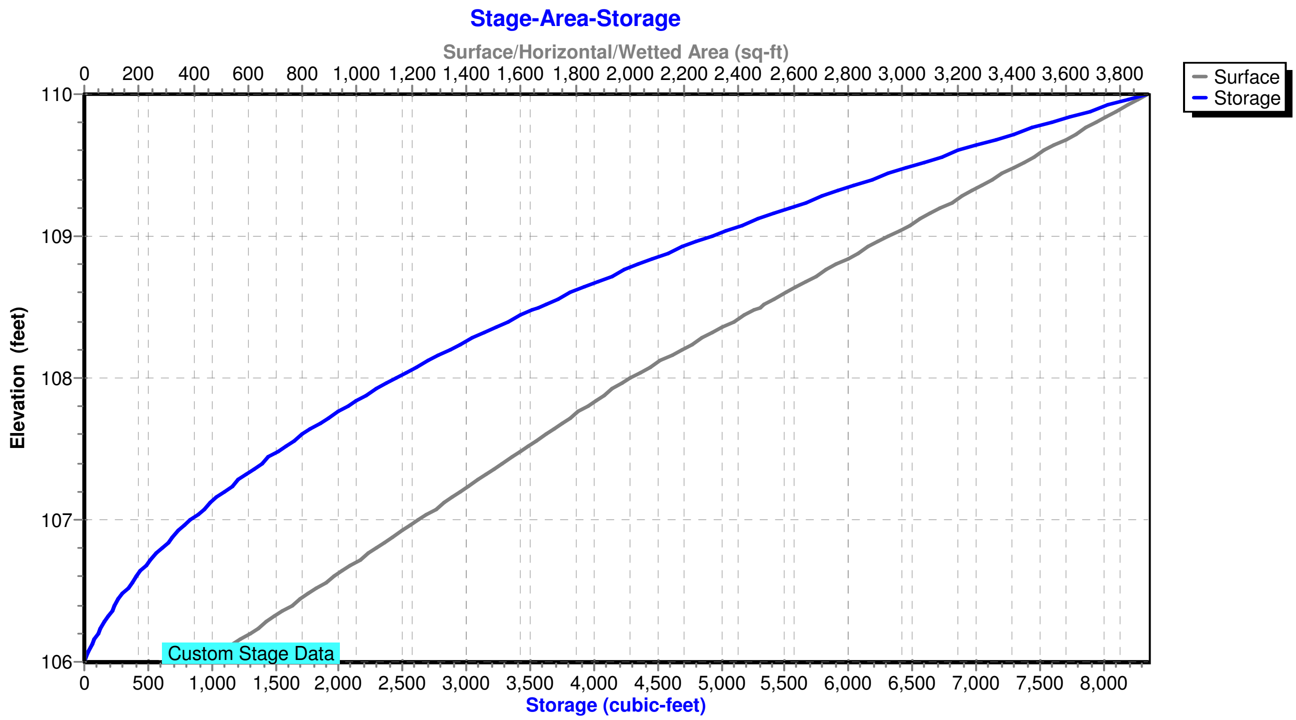
Device	Routing	Invert	Outlet Devices
#1	Device 2	108.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Primary	103.00'	**12.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 103.00' / 101.80' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	106.00'	**1.750 in/hr Exfiltration over Surface area**

Primary OutFlow Max=1.00 cfs @ 12.27 hrs HW=108.64' (Free Discharge)
└─**2=Culvert** (Passes 0.90 cfs of 7.15 cfs potential flow)
  └─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 1.05 fps)
└─**3=Exfiltration** (Exfiltration Controls 0.11 cfs)

Pond Sand Filter 1.0:



Pond Sand Filter 1.0:



Summary for Subcatchment 1.0:

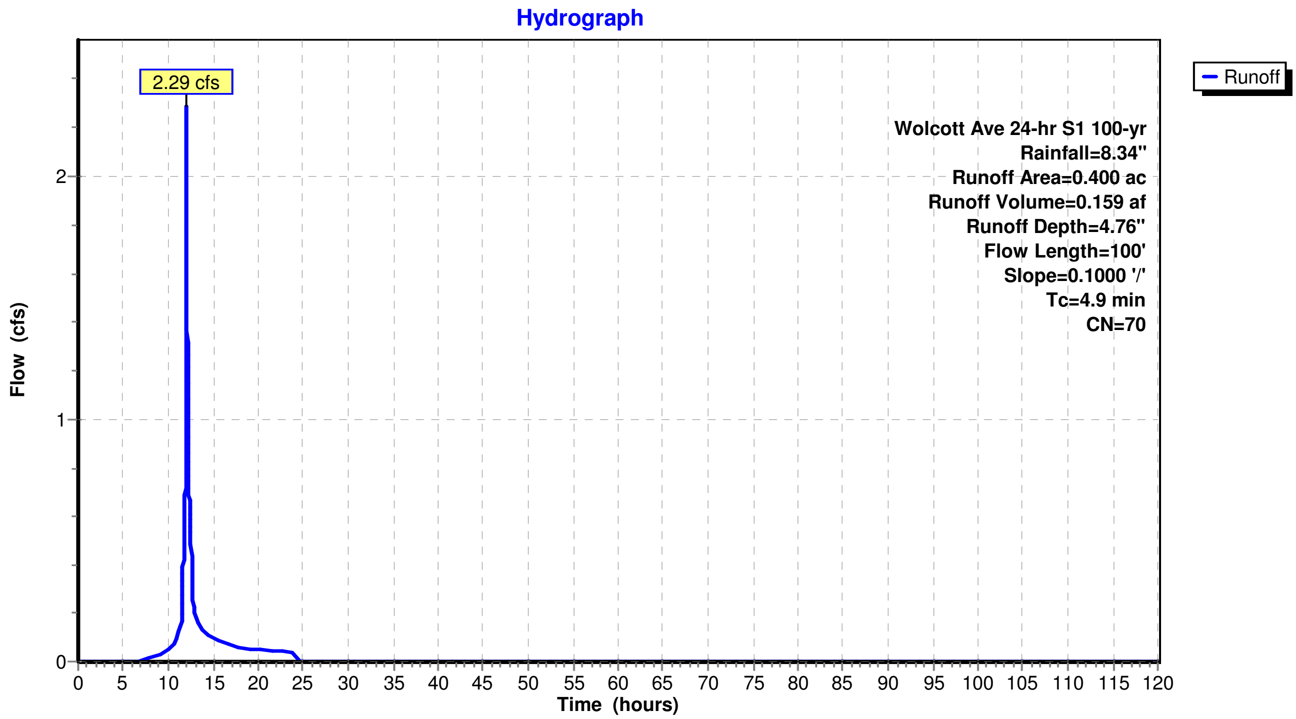
Runoff = 2.29 cfs @ 12.03 hrs, Volume= 0.159 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 100-yr Rainfall=8.34"

Area (ac)	CN	Description
0.300	61	>75% Grass cover, Good, HSG B
0.100	98	Paved parking, HSG B
0.400	70	Weighted Average
0.300		75.00% Pervious Area
0.100		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1000	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"

Subcatchment 1.0:



Summary for Subcatchment 1.1:

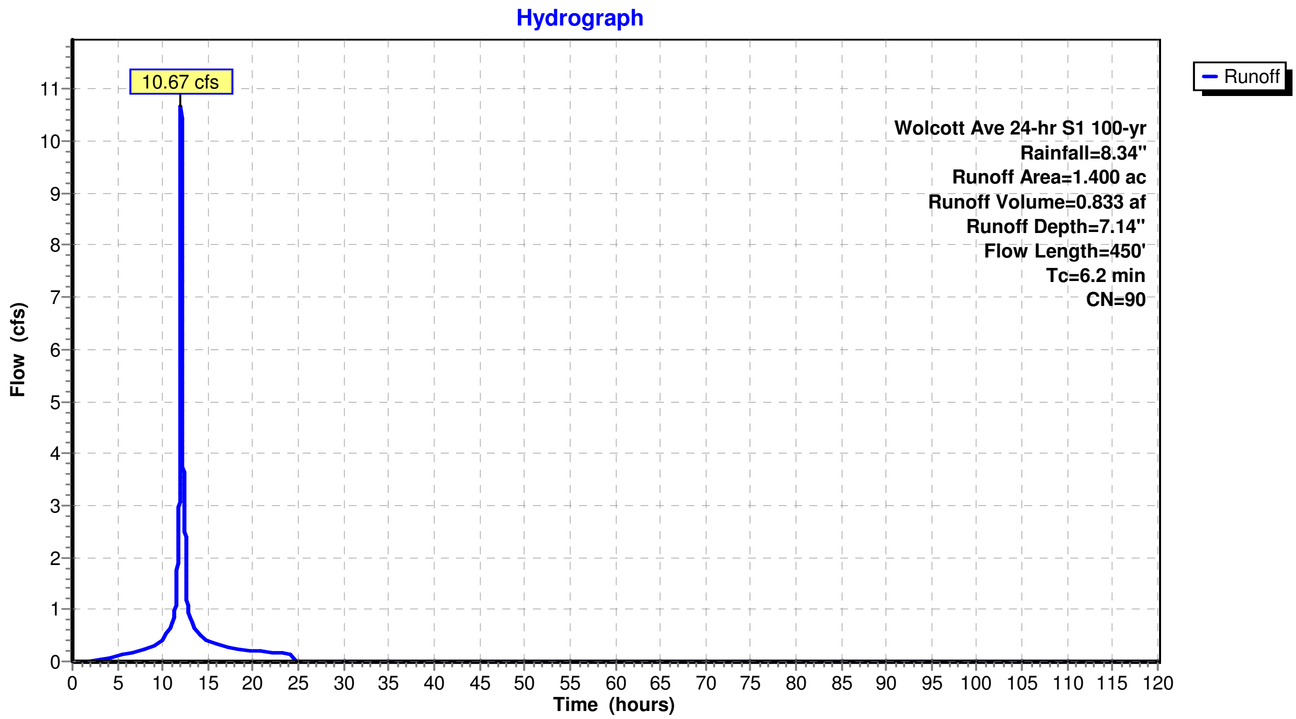
Runoff = 10.67 cfs @ 12.04 hrs, Volume= 0.833 af, Depth= 7.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 100-yr Rainfall=8.34"

Area (ac)	CN	Description
1.100	98	Paved parking, HSG B
0.300	61	>75% Grass cover, Good, HSG B
1.400	90	Weighted Average
0.300		21.43% Pervious Area
1.100		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.9	190	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	220	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.2	450	Total			

Subcatchment 1.1:



Summary for Subcatchment 1.2:

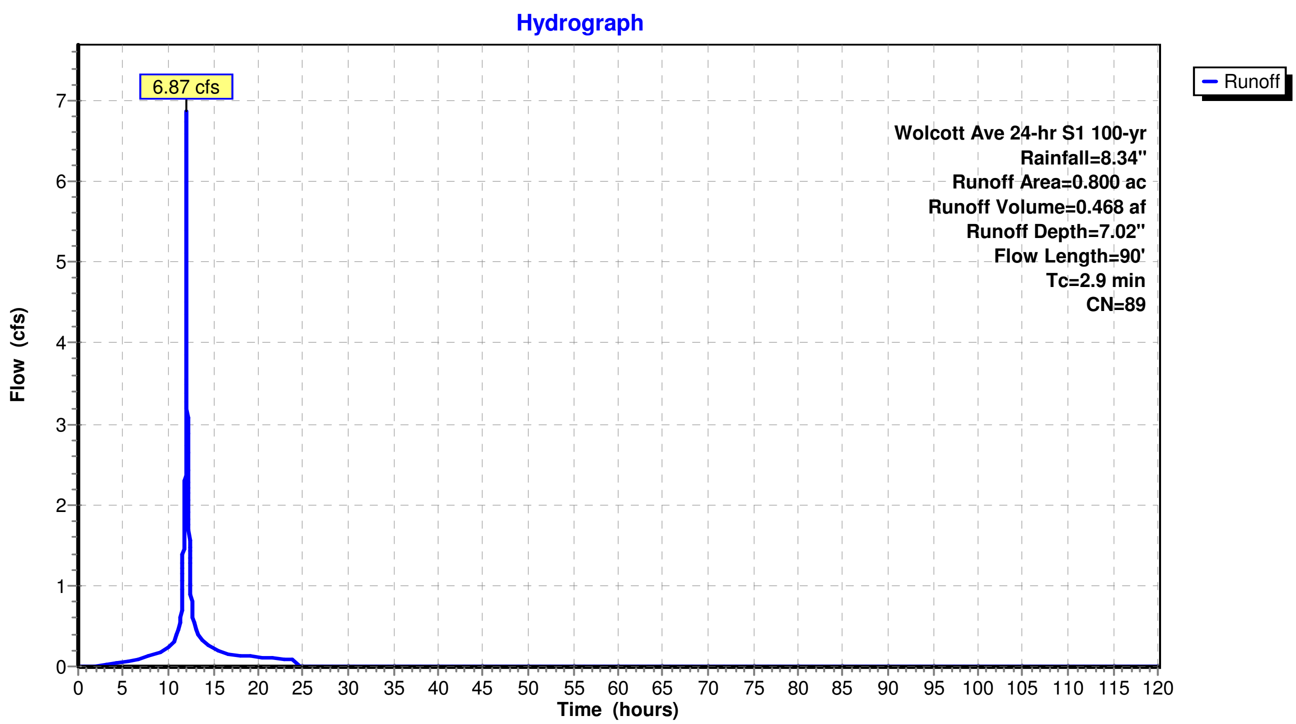
Runoff = 6.87 cfs @ 12.01 hrs, Volume= 0.468 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 100-yr Rainfall=8.34"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG B
0.200	61	>75% Grass cover, Good, HSG B
0.800	89	Weighted Average
0.200		25.00% Pervious Area
0.600		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	40	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	30	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.9	90	Total			

Subcatchment 1.2:



Summary for Subcatchment 1.3:

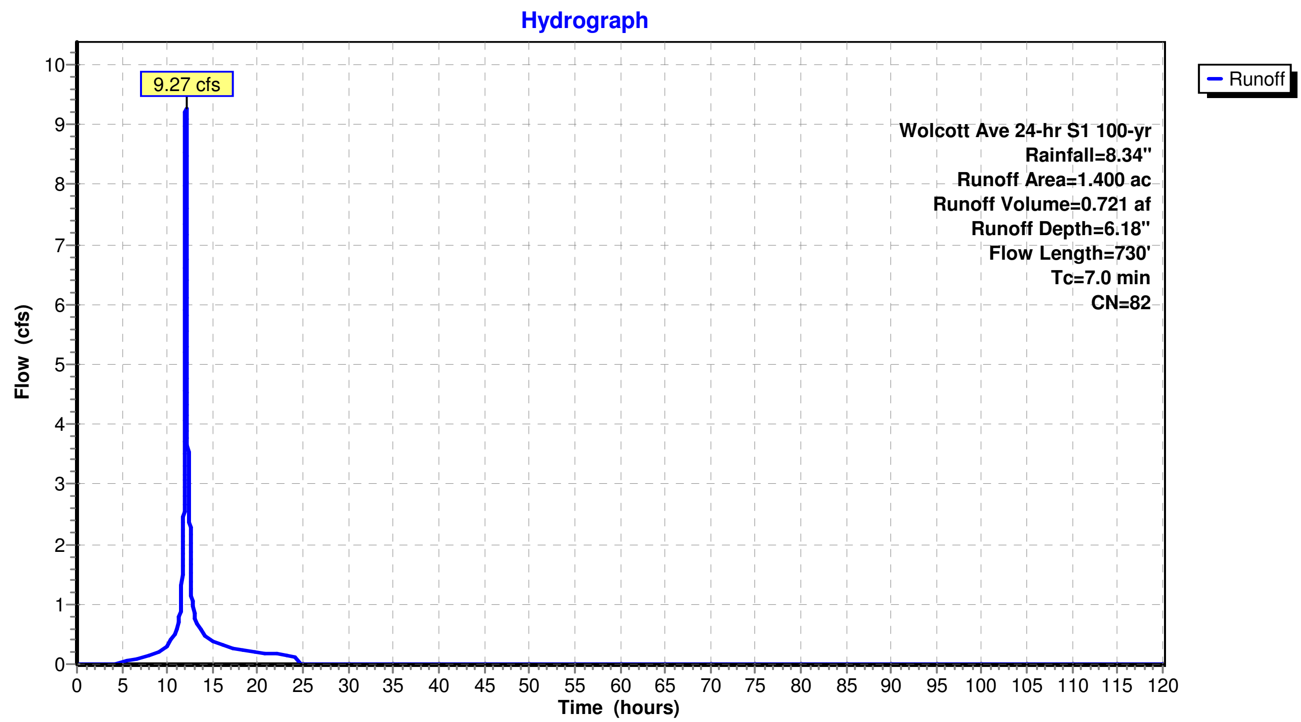
Runoff = 9.27 cfs @ 12.05 hrs, Volume= 0.721 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 100-yr Rainfall=8.34"

Area (ac)	CN	Description
0.500	61	>75% Grass cover, Good, HSG B
0.800	98	Paved parking, HSG B
0.100	55	Woods, Good, HSG B
1.400	82	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	80	0.0400	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.5	75	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	575	0.0800	14.89	18.27	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
7.0	730	Total			

Subcatchment 1.3:

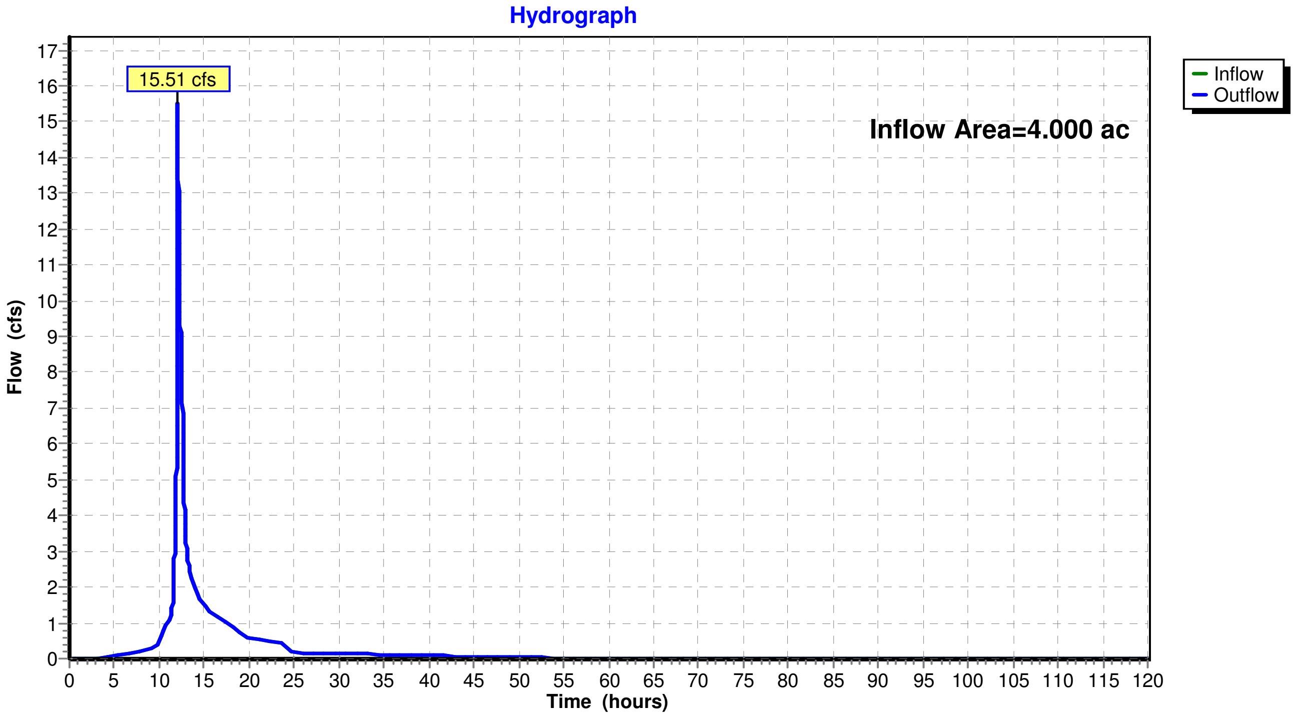


Summary for Reach Design Point 1:

Inflow Area = 4.000 ac, 65.00% Impervious, Inflow Depth = 6.54" for 100-yr event
Inflow = 15.51 cfs @ 12.06 hrs, Volume= 2.181 af
Outflow = 15.51 cfs @ 12.06 hrs, Volume= 2.181 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach Design Point 1:



Summary for Pond DS 1.1:

Inflow Area = 1.400 ac, 78.57% Impervious, Inflow Depth = 7.14" for 100-yr event
Inflow = 10.67 cfs @ 12.04 hrs, Volume= 0.833 af
Outflow = 4.90 cfs @ 12.19 hrs, Volume= 0.833 af, Atten= 54%, Lag= 8.9 min
Primary = 0.22 cfs @ 12.19 hrs, Volume= 0.413 af
Secondary = 4.68 cfs @ 12.19 hrs, Volume= 0.420 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 138.43' @ 12.19 hrs Surf.Area= 0.116 ac Storage= 0.278 af

Plug-Flow detention time= 237.6 min calculated for 0.833 af (100% of inflow)
Center-of-Mass det. time= 237.6 min (1,017.9 - 780.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.00'	0.135 af	**27.50'W x 183.00'L x 4.50'H Field A** 0.520 af Overall - 0.183 af Embedded = 0.337 af x 40.0% Voids
#2A	134.50'	0.147 af	**ADS N-12 36** x 45 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 5 Rows of 9 Chambers
		0.281 af	Total Available Storage

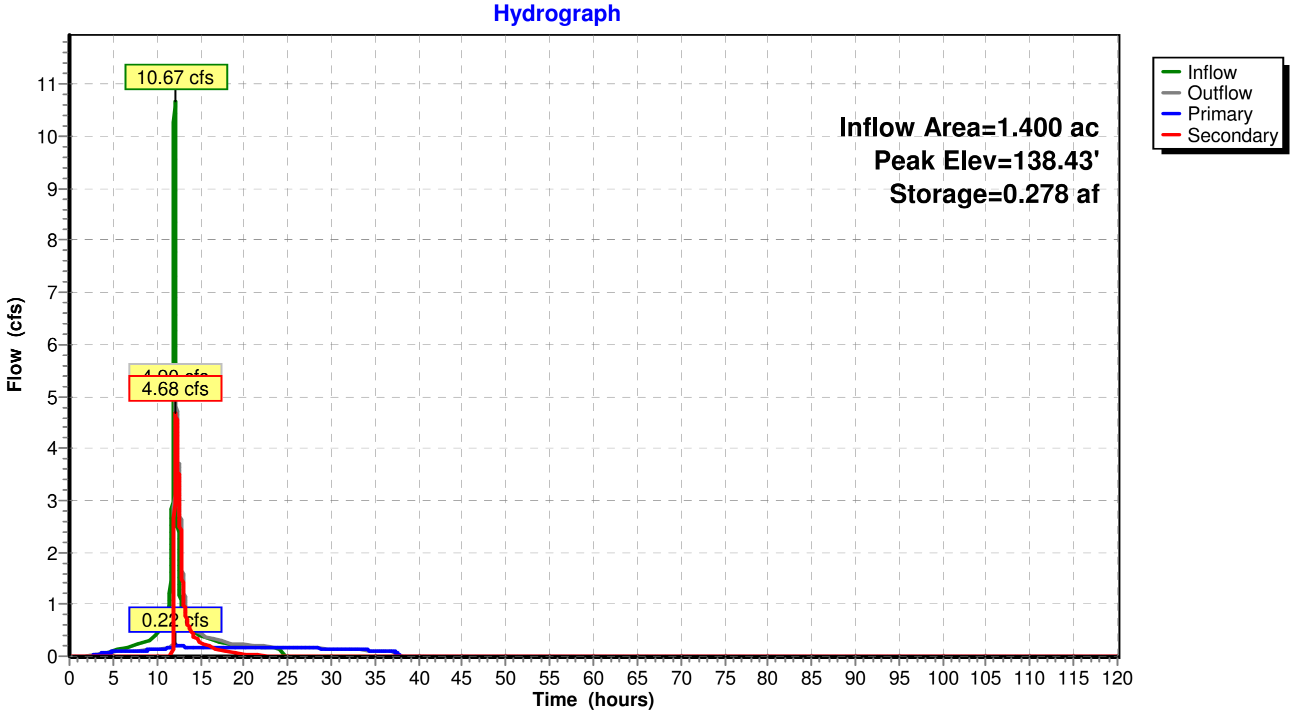
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	133.50'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.50' / 133.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	136.40'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.40' / 136.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	133.00'	**1.9" Vert. Orifice/Grate** C= 0.600

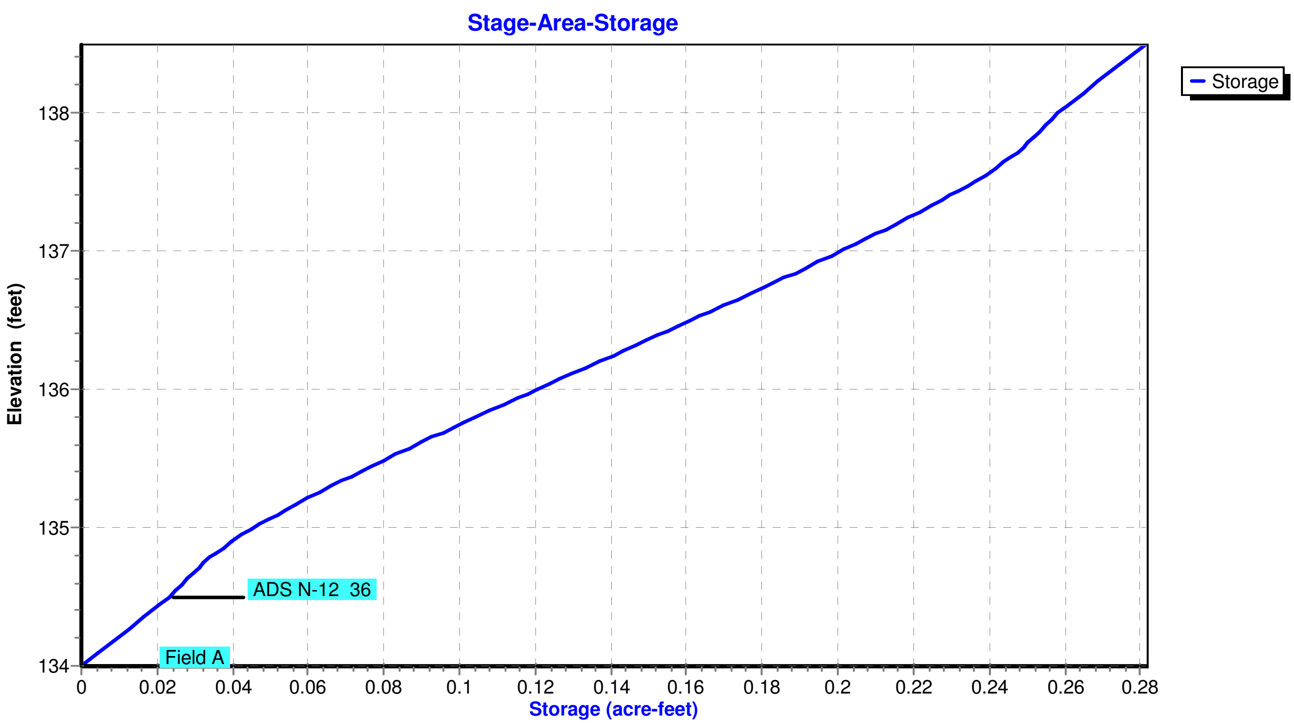
Primary OutFlow Max=0.22 cfs @ 12.19 hrs HW=138.43' (Free Discharge)
↑**3=Orifice/Grate** (Orifice Controls 0.22 cfs @ 11.14 fps)
  ↑**1=Culvert** (Passes 0.22 cfs of 0.55 cfs potential flow)

Secondary OutFlow Max=4.68 cfs @ 12.19 hrs HW=138.43' (Free Discharge)
↑**2=Culvert** (Inlet Controls 4.68 cfs @ 5.96 fps)

Pond DS 1.1:



Pond DS 1.1:



Summary for Pond DS 1.2:

Inflow Area = 0.800 ac, 75.00% Impervious, Inflow Depth = 7.02" for 100-yr event
Inflow = 6.87 cfs @ 12.01 hrs, Volume= 0.468 af
Outflow = 1.26 cfs @ 12.52 hrs, Volume= 0.468 af, Atten= 82%, Lag= 30.7 min
Primary = 0.75 cfs @ 12.52 hrs, Volume= 0.450 af
Secondary = 0.52 cfs @ 12.52 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 132.95' @ 12.52 hrs Surf.Area= 0.063 ac Storage= 0.151 af

Plug-Flow detention time= 69.4 min calculated for 0.468 af (100% of inflow)
Center-of-Mass det. time= 69.4 min (850.4 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0.074 af	**22.25'W x 123.00'L x 4.50'H Field A** 0.283 af Overall - 0.098 af Embedded = 0.185 af x 40.0% Voids
#2A	129.00'	0.078 af	**ADS N-12 36** x 24 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 4 Rows of 6 Chambers
		0.152 af	Total Available Storage

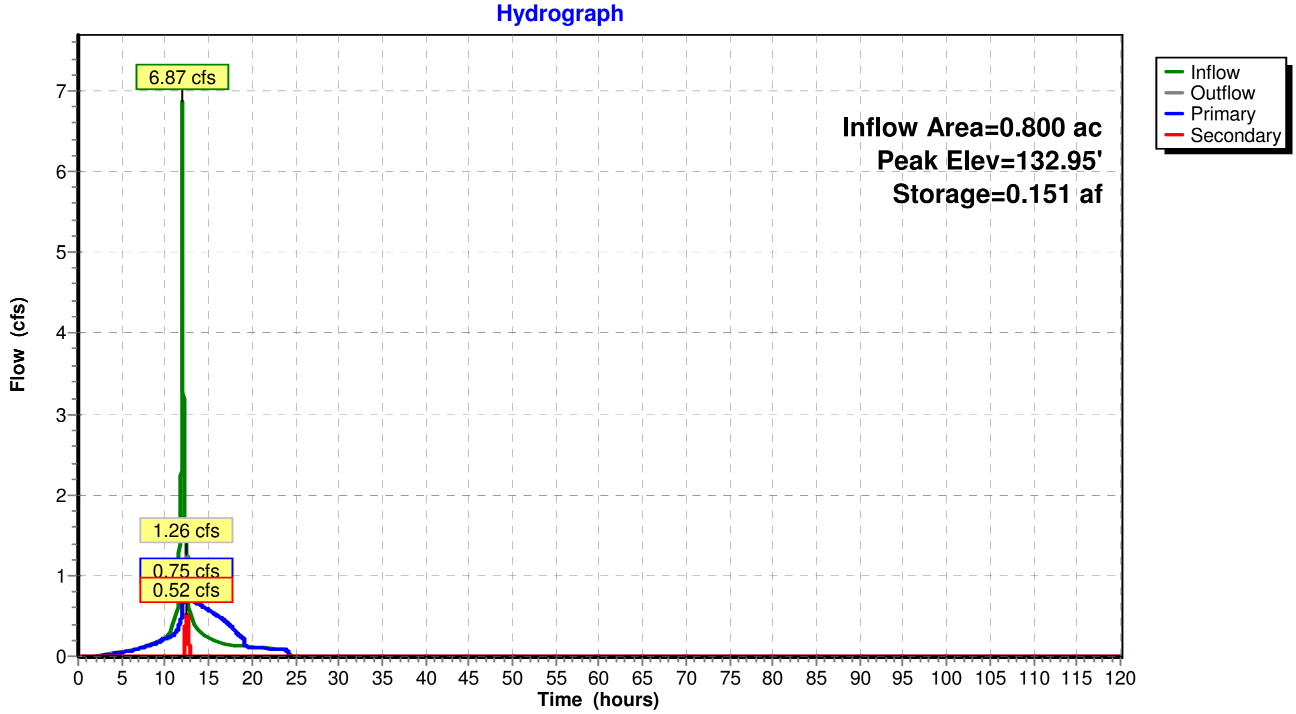
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**4.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	132.40'	**6.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.40' / 131.40' S= 0.2000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

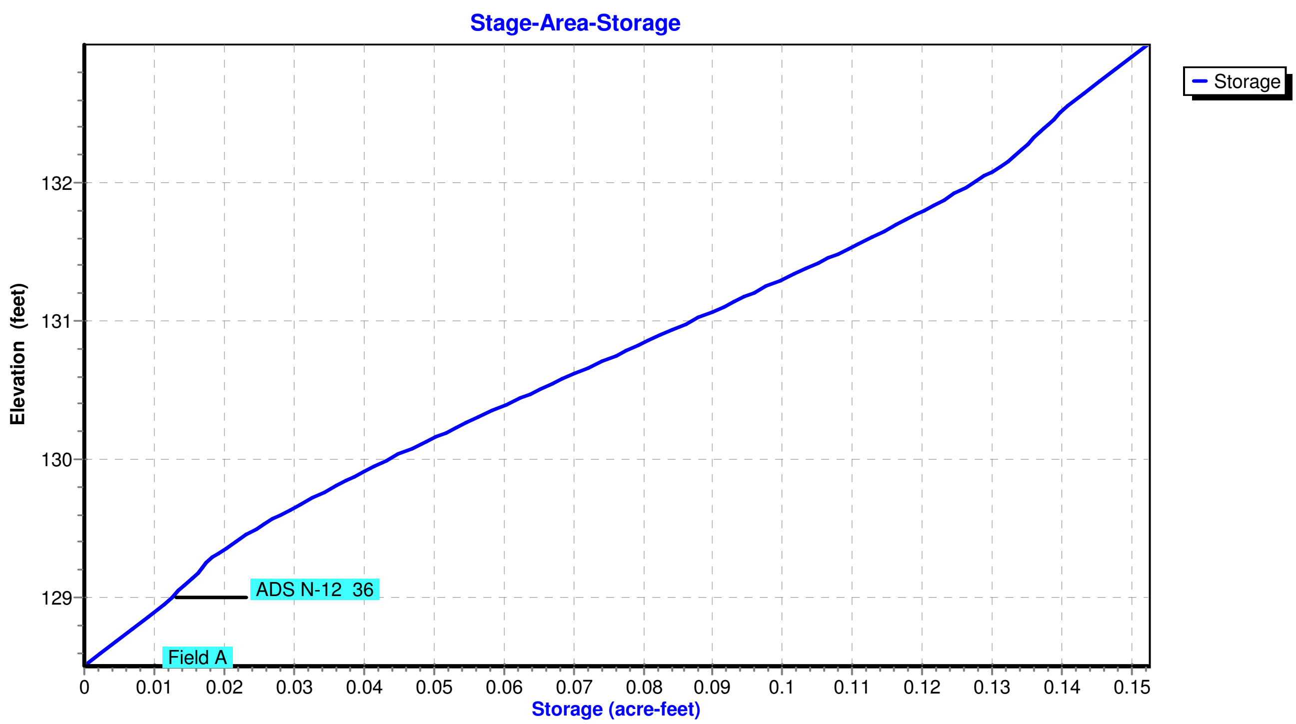
Primary OutFlow Max=0.75 cfs @ 12.52 hrs HW=132.95' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.75 cfs @ 8.58 fps)

Secondary OutFlow Max=0.52 cfs @ 12.52 hrs HW=132.95' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.52 cfs @ 2.63 fps)

Pond DS 1.2:



Pond DS 1.2:



Summary for Pond Sand Filter 1.0:

Inflow Area = 2.600 ac, 69.23% Impervious, Inflow Depth = 4.72" for 100-yr event
Inflow = 3.10 cfs @ 12.03 hrs, Volume= 1.022 af
Outflow = 2.67 cfs @ 12.07 hrs, Volume= 1.022 af, Atten= 14%, Lag= 2.4 min
Primary = 2.67 cfs @ 12.07 hrs, Volume= 1.022 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 108.78' @ 12.07 hrs Surf.Area= 2,742 sf Storage= 4,302 cf

Plug-Flow detention time= 181.9 min calculated for 1.022 af (100% of inflow)
Center-of-Mass det. time= 182.0 min (1,189.0 - 1,007.0)

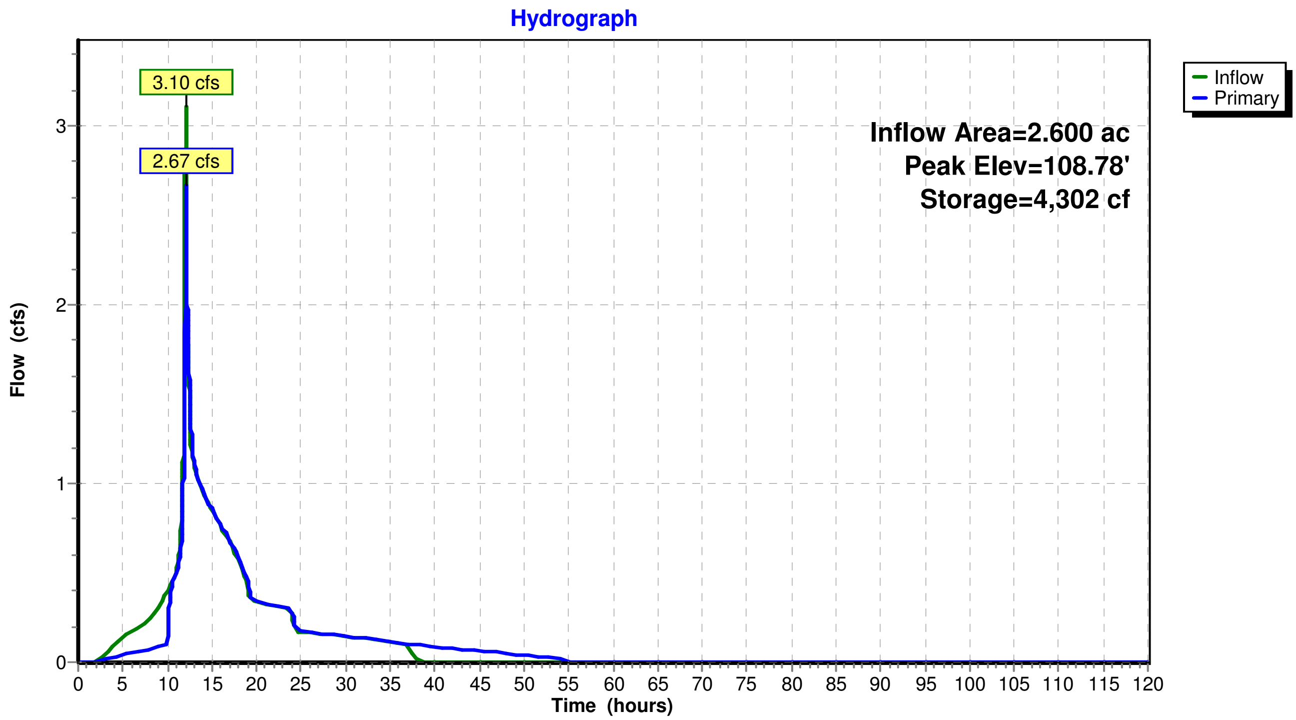
Volume	Invert	Avail.Storage	Storage Description
#1	106.00'	8,350 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.00	450	0	0
108.00	2,000	2,450	2,450
110.00	3,900	5,900	8,350

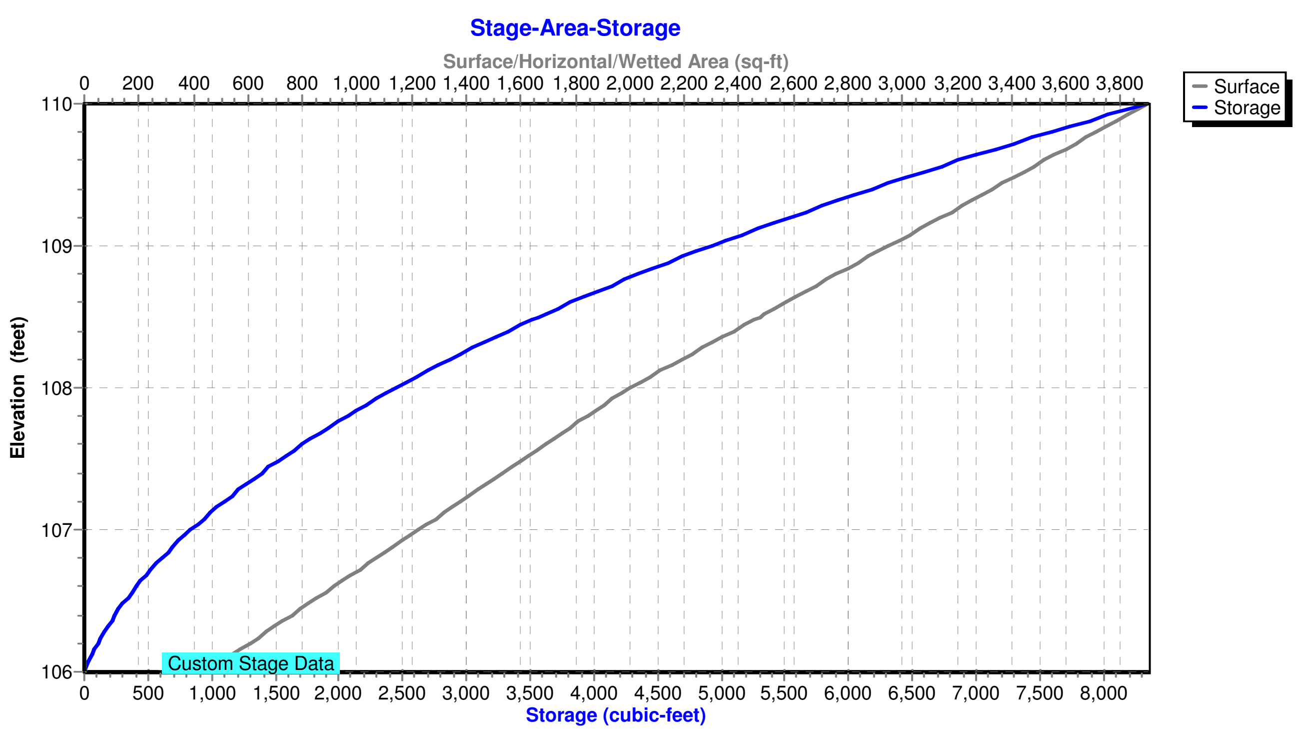
Device	Routing	Invert	Outlet Devices
#1	Device 2	108.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Primary	103.00'	**12.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 103.00' / 101.80' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	106.00'	**1.750 in/hr Exfiltration over Surface area**

Primary OutFlow Max=2.66 cfs @ 12.07 hrs HW=108.78' (Free Discharge)
2=Culvert (Passes 2.55 cfs of 7.23 cfs potential flow)
1=Broad-Crested Rectangular Weir (Weir Controls 2.55 cfs @ 1.51 fps)
3=Exfiltration (Exfiltration Controls 0.11 cfs)

Pond Sand Filter 1.0:



Pond Sand Filter 1.0:



Summary for Subcatchment 1.0:

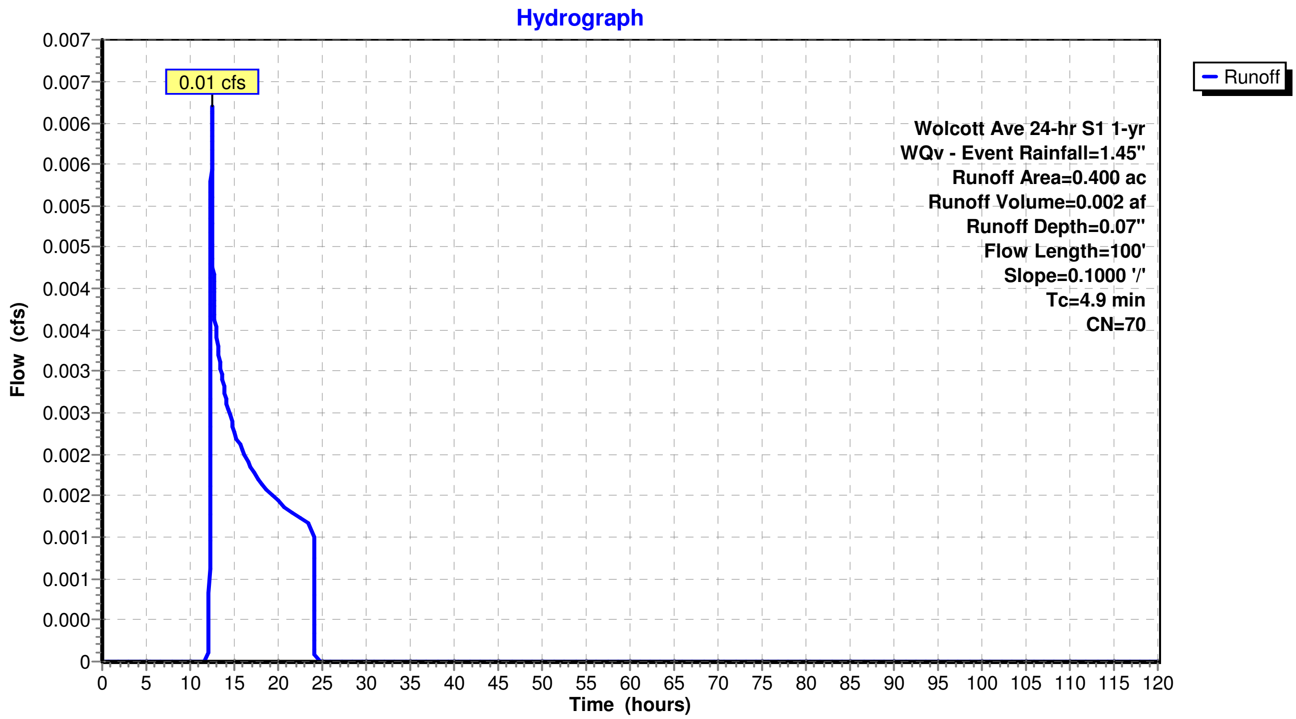
Runoff = 0.01 cfs @ 12.52 hrs, Volume= 0.002 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr WQv - Event Rainfall=1.45"

Area (ac)	CN	Description
0.300	61	>75% Grass cover, Good, HSG B
0.100	98	Paved parking, HSG B
0.400	70	Weighted Average
0.300		75.00% Pervious Area
0.100		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1000	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"

Subcatchment 1.0:



Summary for Subcatchment 1.1:

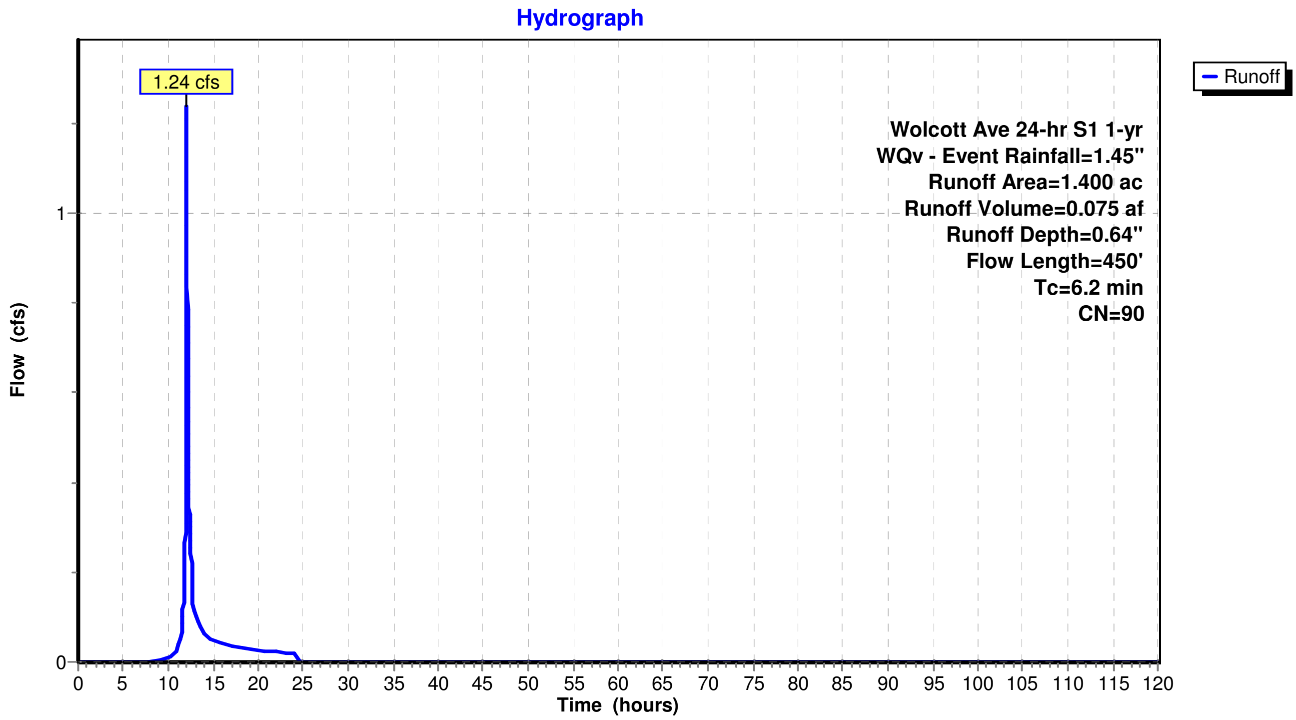
Runoff = 1.24 cfs @ 12.04 hrs, Volume= 0.075 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr WQv - Event Rainfall=1.45"

Area (ac)	CN	Description
1.100	98	Paved parking, HSG B
0.300	61	>75% Grass cover, Good, HSG B
1.400	90	Weighted Average
0.300		21.43% Pervious Area
1.100		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.9	190	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	220	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.2	450	Total			

Subcatchment 1.1:



Summary for Subcatchment 1.2:

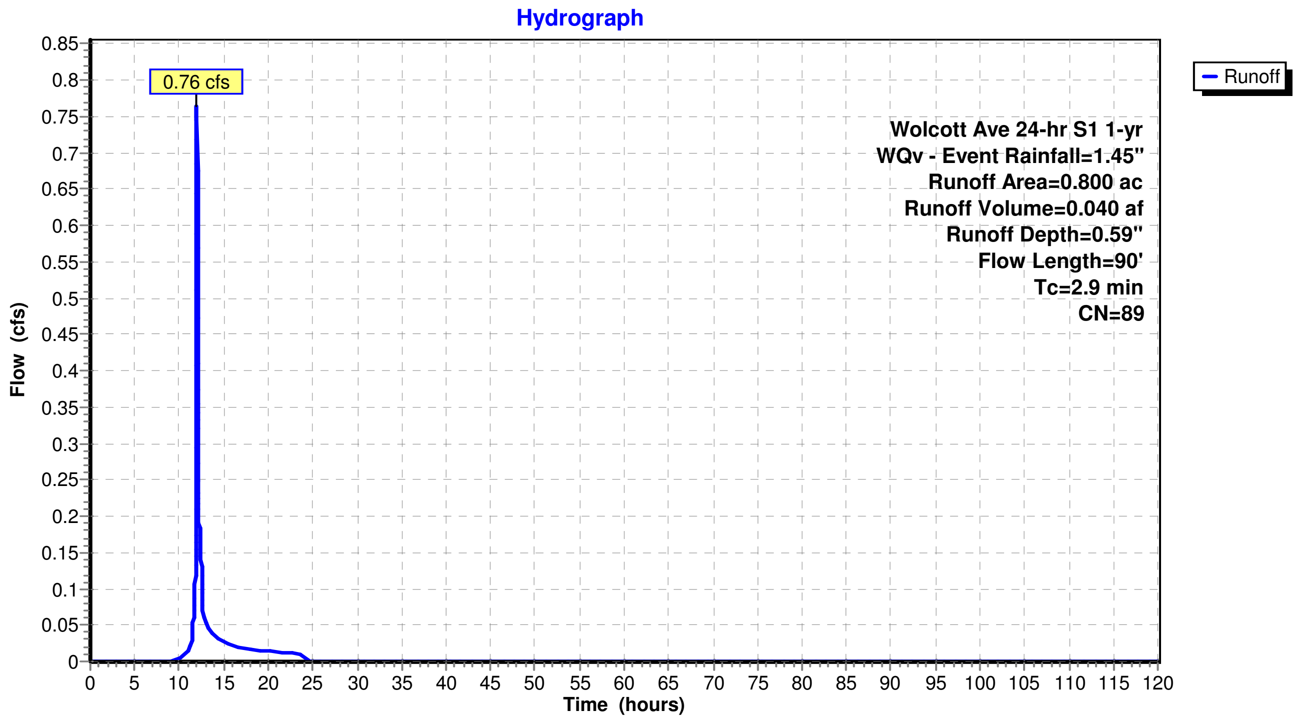
Runoff = 0.76 cfs @ 12.01 hrs, Volume= 0.040 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr WQv - Event Rainfall=1.45"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG B
0.200	61	>75% Grass cover, Good, HSG B
0.800	89	Weighted Average
0.200		25.00% Pervious Area
0.600		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	40	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	30	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.9	90	Total			

Subcatchment 1.2:



Summary for Subcatchment 1.3:

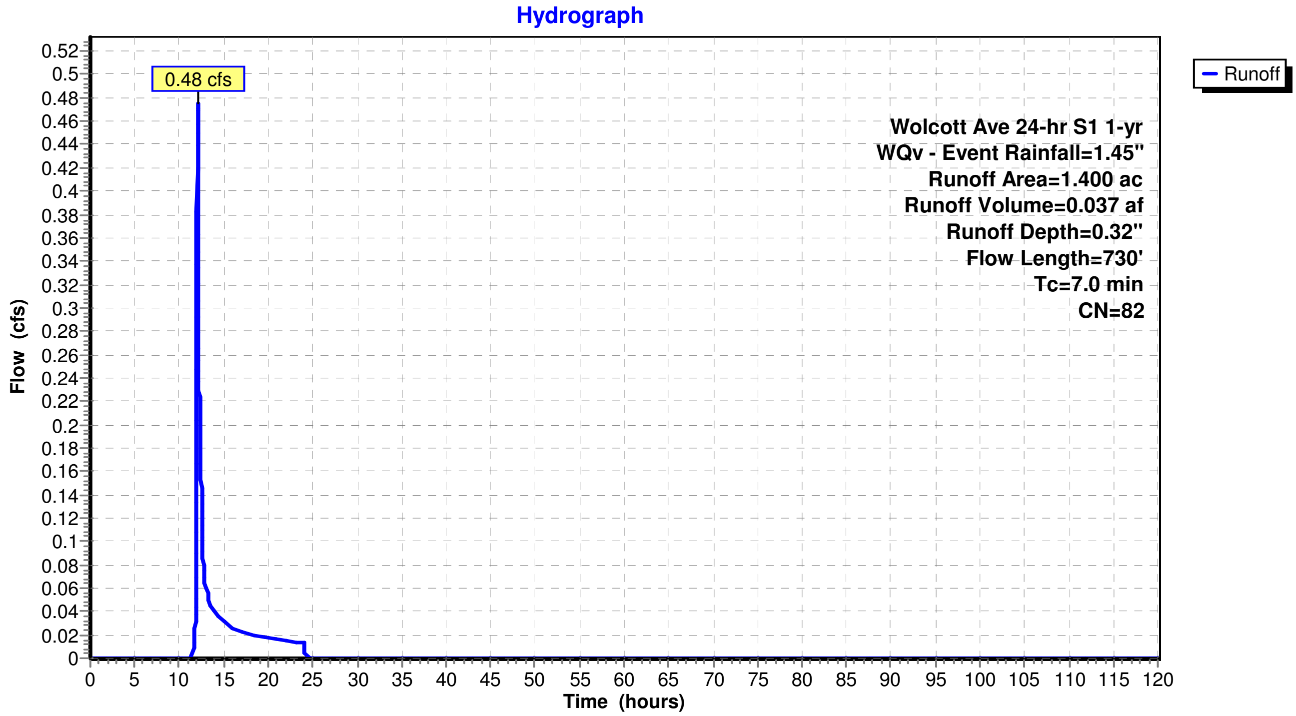
Runoff = 0.48 cfs @ 12.06 hrs, Volume= 0.037 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Wolcott Ave 24-hr S1 1-yr WQv - Event Rainfall=1.45"

Area (ac)	CN	Description
0.500	61	>75% Grass cover, Good, HSG B
0.800	98	Paved parking, HSG B
0.100	55	Woods, Good, HSG B
1.400	82	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	80	0.0400	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.5	75	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	575	0.0800	14.89	18.27	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
7.0	730	Total			

Subcatchment 1.3:

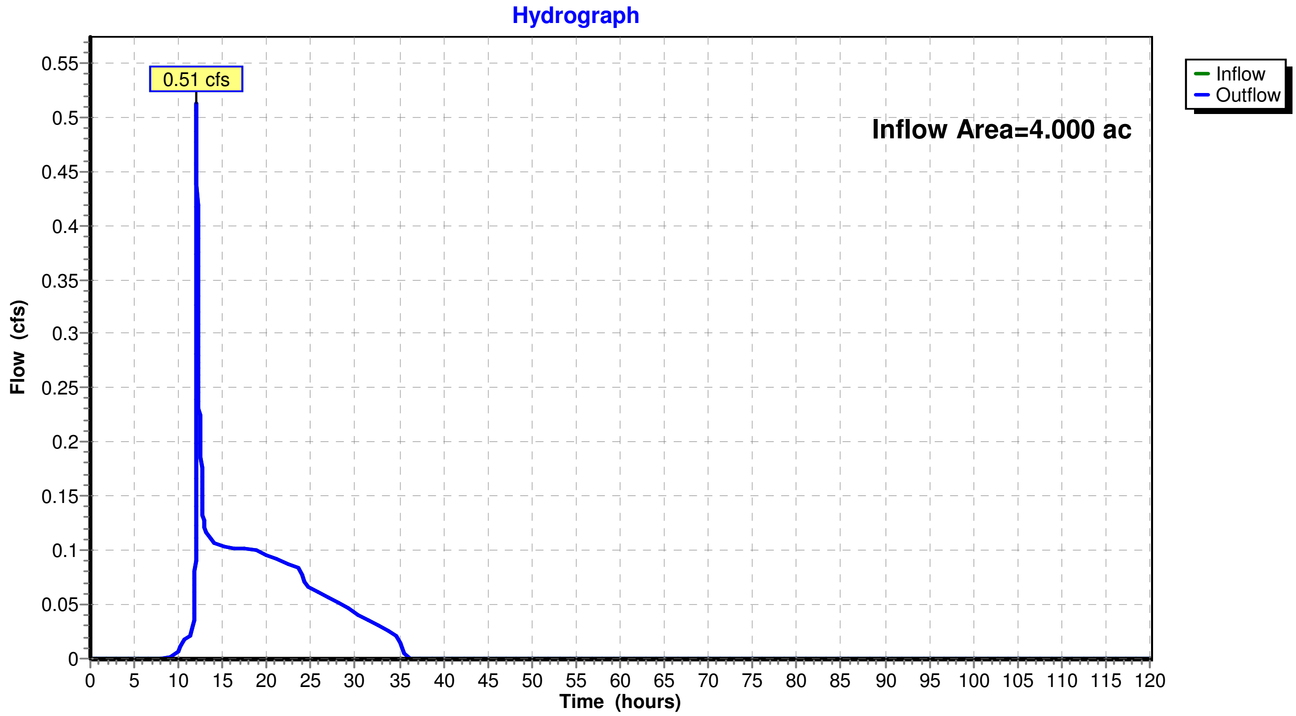


Summary for Reach Design Point 1:

Inflow Area = 4.000 ac, 65.00% Impervious, Inflow Depth = 0.46" for WQv - Event event
Inflow = 0.51 cfs @ 12.06 hrs, Volume= 0.154 af
Outflow = 0.51 cfs @ 12.06 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach Design Point 1:



Summary for Pond DS 1.1:

Inflow Area = 1.400 ac, 78.57% Impervious, Inflow Depth = 0.64" for WQv - Event event
Inflow = 1.24 cfs @ 12.04 hrs, Volume= 0.075 af
Outflow = 0.12 cfs @ 12.85 hrs, Volume= 0.075 af, Atten= 91%, Lag= 48.4 min
Primary = 0.12 cfs @ 12.85 hrs, Volume= 0.075 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 134.60' @ 12.85 hrs Surf.Area= 0.116 ac Storage= 0.027 af

Plug-Flow detention time= 89.0 min calculated for 0.075 af (100% of inflow)
Center-of-Mass det. time= 89.0 min (946.1 - 857.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.00'	0.135 af	**27.50'W x 183.00'L x 4.50'H Field A** 0.520 af Overall - 0.183 af Embedded = 0.337 af x 40.0% Voids
#2A	134.50'	0.147 af	**ADS N-12 36** x 45 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 5 Rows of 9 Chambers
		0.281 af	Total Available Storage

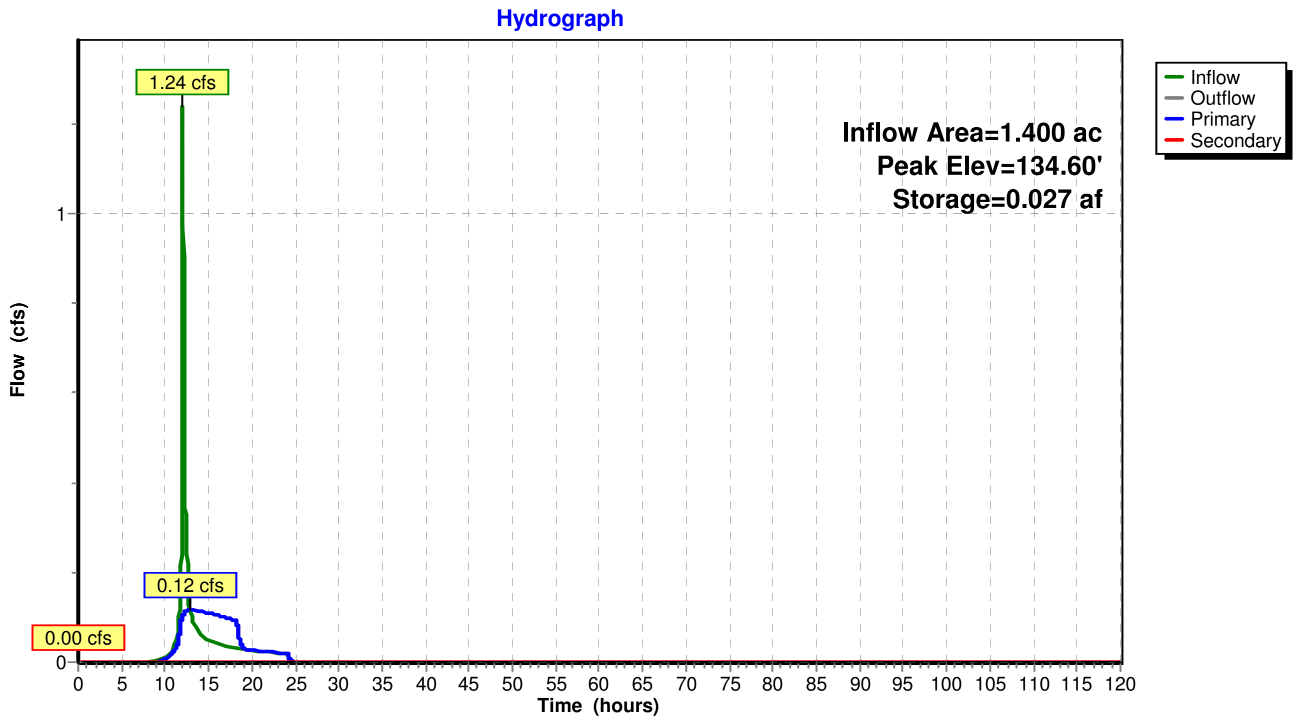
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	133.50'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.50' / 133.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	136.40'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.40' / 136.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	133.00'	**1.9" Vert. Orifice/Grate** C= 0.600

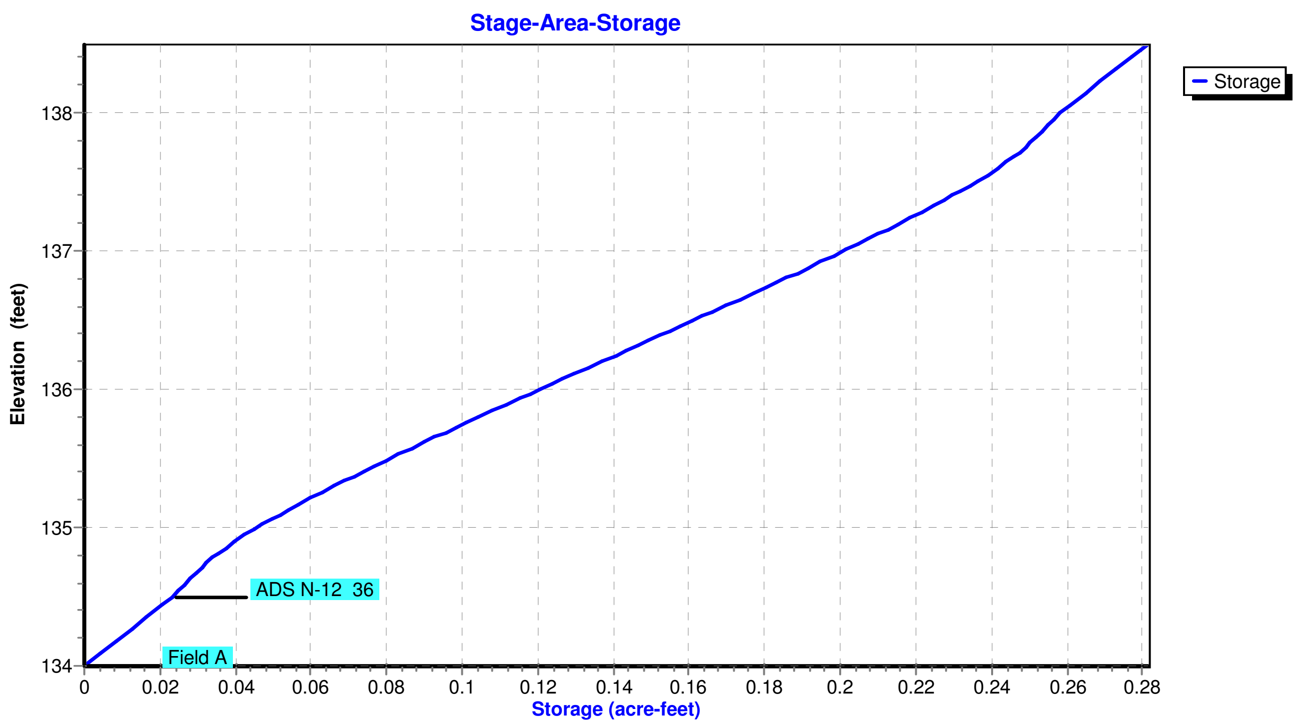
Primary OutFlow Max=0.12 cfs @ 12.85 hrs HW=134.60' (Free Discharge)
└─**3=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.93 fps)
  └─**1=Culvert** (Passes 0.12 cfs of 0.27 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Pond DS 1.1:



Pond DS 1.1:



Summary for Pond DS 1.2:

Inflow Area = 0.800 ac, 75.00% Impervious, Inflow Depth = 0.59" for WQv - Event event
Inflow = 0.76 cfs @ 12.01 hrs, Volume= 0.040 af
Outflow = 0.26 cfs @ 12.14 hrs, Volume= 0.040 af, Atten= 66%, Lag= 8.1 min
Primary = 0.26 cfs @ 12.14 hrs, Volume= 0.040 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 128.71' @ 12.14 hrs Surf.Area= 0.063 ac Storage= 0.005 af

Plug-Flow detention time= 6.5 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 6.5 min (867.0 - 860.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0.074 af	**22.25'W x 123.00'L x 4.50'H Field A** 0.283 af Overall - 0.098 af Embedded = 0.185 af x 40.0% Voids
#2A	129.00'	0.078 af	**ADS N-12 36** x 24 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 4 Rows of 6 Chambers
		0.152 af	Total Available Storage

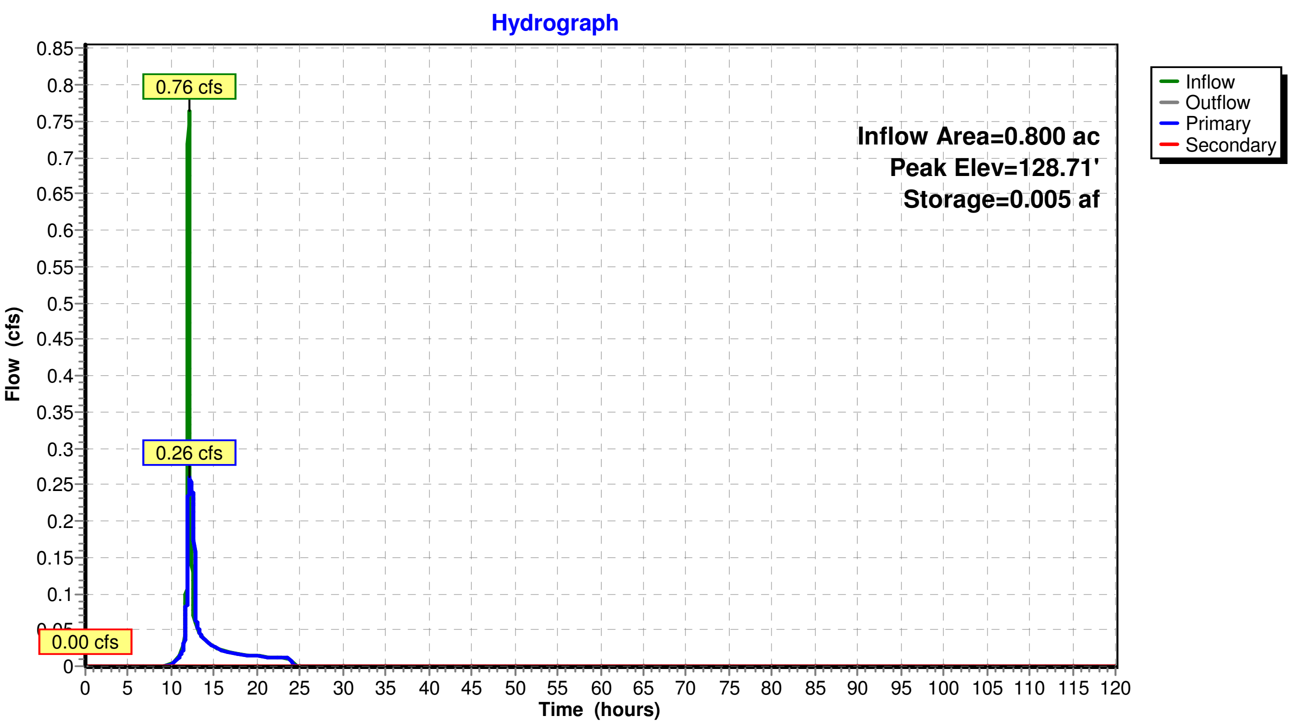
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**4.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	132.40'	**6.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.40' / 131.40' S= 0.2000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

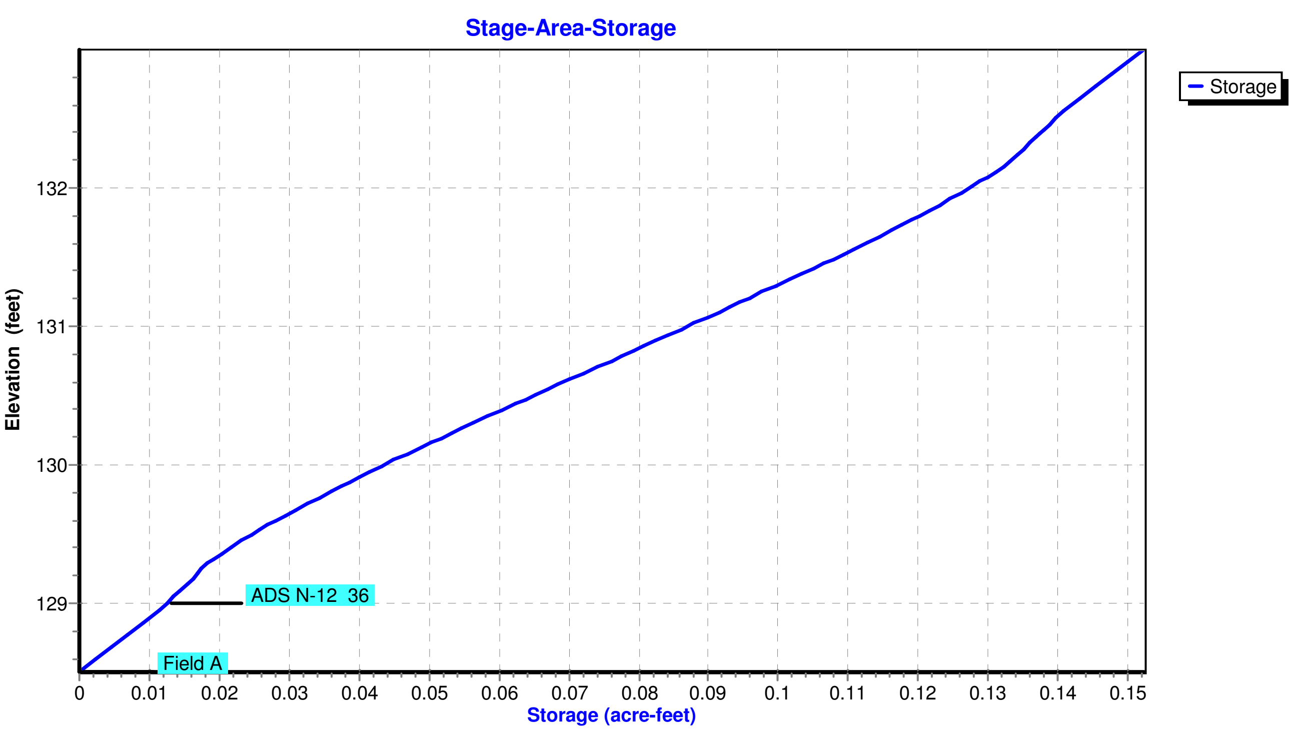
Primary OutFlow Max=0.26 cfs @ 12.14 hrs HW=128.71' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.26 cfs @ 2.98 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond DS 1.2:



Pond DS 1.2:



Summary for Pond Sand Filter 1.0:

Inflow Area = 2.600 ac, 69.23% Impervious, Inflow Depth = 0.54" for WQv - Event event
Inflow = 0.37 cfs @ 12.24 hrs, Volume= 0.117 af
Outflow = 0.08 cfs @ 18.43 hrs, Volume= 0.117 af, Atten= 78%, Lag= 371.5 min
Primary = 0.08 cfs @ 18.43 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 108.01' @ 18.43 hrs Surf.Area= 2,014 sf Storage= 2,479 cf

Plug-Flow detention time= 377.9 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 377.9 min (1,298.9 - 921.0)

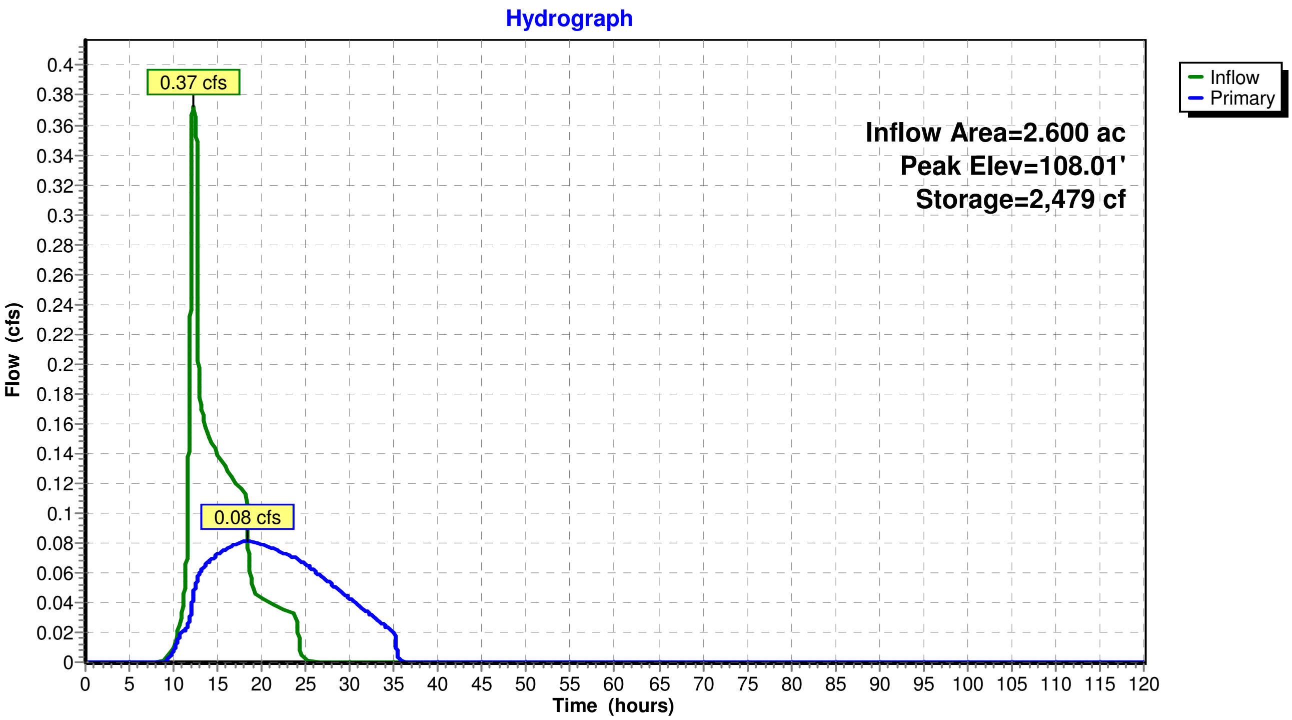
Volume	Invert	Avail.Storage	Storage Description
#1	106.00'	8,350 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.00	450	0	0
108.00	2,000	2,450	2,450
110.00	3,900	5,900	8,350

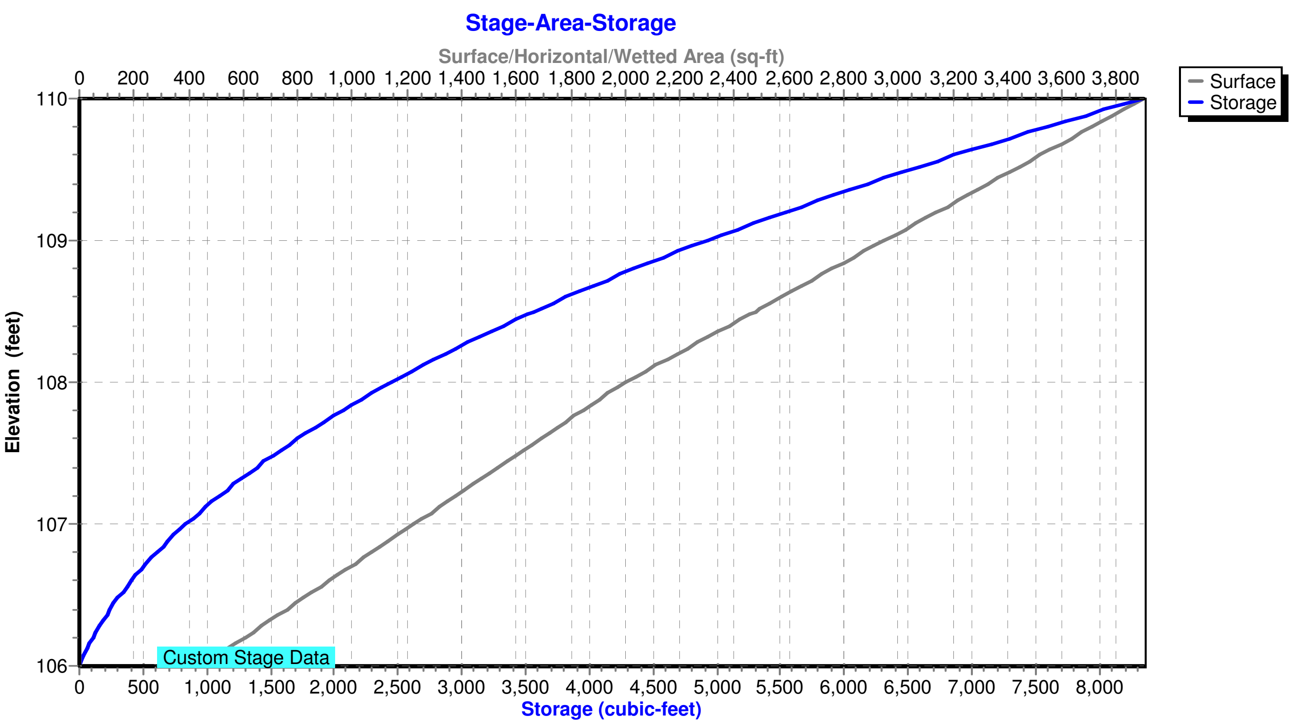
Device	Routing	Invert	Outlet Devices
#1	Device 2	108.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Primary	103.00'	**12.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 103.00' / 101.80' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	106.00'	**1.750 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 18.43 hrs HW=108.01' (Free Discharge)
—**2=Culvert** (Passes 0.00 cfs of 6.75 cfs potential flow)
 —**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
—**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond Sand Filter 1.0:



Pond Sand Filter 1.0:



APPENDIX D

Project and Owner Information

Site Data:

West End Lofts
City of Beacon
Dutchess County, New York

Owner Information:

City of Beacon
1 Municipal Plaza
Beacon, New York 12508

Applicant Information:

Kearney Realty & Development Group
34 Clayton Boulevard
Baldwin Place, New York 10505

Party Responsible for Implementation of the Stormwater Pollution Prevention Plan (Including Maintenance During and After Construction):

Kearney Realty & Development Group
34 Clayton Boulevard
Baldwin Place, New York 10505

Qualified Professional Responsible for Inspection of the Stormwater Pollution Prevention Plan:

Inspector to be determined at time of construction

APPENDIX E

NYSDEC SPDES for Construction Activities Construction Site Log Book

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

Properly completing forms such as those contained in this document meet the inspection requirement of NYSDEC SPDES GP 0-10-001 for Construction Activities, or superceding permit. Completed forms shall be kept on site at all times and made available to authorities upon request.

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 (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.

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. Contractors 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."

____

Signature of Contractor Date

____

Print Name Title

____

Signature of Trained Contractor Date

____

Print Name of Trained Contractor Title

Name of Contracting Firm ____________________________________

Street Address ____________________________________

City, State, Zip ____________________________________

Telephone No. ____________________________________

A copy of this statement shall be retained as part of the Stormwater Pollution Prevention Plan (SWPPP) for a period off at least five (5) years after the subject property is stabilized.

e. 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? ___________________

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 7-day period;

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

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 (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.

<u>Note</u>: 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:

APPENDIX F

NYSDEC Stormwater Design Manual Chapter 5 Analysis

Table Key:
- ● = Practice Used in Accordance with Chapter 5 Requirements
- o = Practice Not Used
- \- = Practice is Not Applicable

NYSDEC Chapter 5 Requirements	Subcatchments			Remarks
	1.1	1.2	1.3	
Chapter 5, Section 5.1: Preservation if Natural Features and Conservation Design				
Practices				
Preservation of Undisturbed Areas	●	●	-	See Note #2
Preservation of Buffers	-	-	-	
Reduction of Clearing & Grading	●	●	-	See Note #5
Locating Development in Less Sensitive Areas	●	●	-	See Note #5
Open Space Design	-	-	-	
Soil Restoration	-	-	-	
Chapter 5, Section 5.2: Reduction of Impervious Cover				
Practices				
Roadway Reduction	-	-	-	
Sidewalk Reduction	-	-	-	
Driveway Reduction	●	-	-	See Note #1
Cul-de-sac Reduction	-	-	-	
Building Footprint Reduction	●	●	-	See Note #4
Parking Reduction	●	●	-	See Note #5
Conservation of Natural Areas	-	-	-	See Note #2
Sheetflow to Riparian Buffers or Filter Strips	-	-	-	
Vegetated Swale	-	-	-	
Tree Planting / Tree Pit	●	●	-	See Note #6
Disconnection of Rooftop Runoff	-	-	-	
Stream Daylighting	-	-	-	
Rain Gardens	-	-	-	
Green Roofs	-	-	-	
Stormwater Planters	-	-	-	
Rain Barrels / Cisterns	●	●	-	See Note #7
Porous Pavement	-	-	-	See Note #3

Notes:

1. The proposed driveway entrance has been designed to provide a minimum width for safe ingress and egress for the development.
2. Although no formal calculations have been provided, the subject project has provided conservation of natural areas to the maximum extent practical.
3. Due to earthwork with cuts and fills across portions of the parking areas and onsite soil testing that revealed shallow depth to rock the use porous pavement has been eliminated from the design.
4. The proposed buildings are multi-story, thus minimize the building footprints.
5. The reduction in clearing and grading, as well as the driveway and parking areas foot print reduction will be enforced with the approval of the project SWPPP. Notes on the project plans, establish that any changes in the project plans would require an amended approval from the necessary regulatory agencies.
6. As noted in Appendix A, there are 21 trees within 10 feet of proposed impervious surfaces that have been used in the application of the tree planting aspect of Green Infrastructure counting towards RRv treatment. In addition to the trees take taken credit for, the proposed site will be heavily landscaped as part of the site design.
7. As noted in Appendix A and sized in Appendix I, the roof runoff from all the buildings will be directed to cisterns sized in accordance with the Design Manual. The cisterns will provide RRv treatment of the roof runoff for all proposed buildings. The cisterns will be utilized to irrigate the significant landscaping proposed on each of the lots.

APPENDIX G

NYSDEC Sand Filter Maintenance Checklist

Sand/Organic Filter 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 area cleared		
Facility location staked out		
2. Excavation		
Size and location		
Side slopes stable		
Foundation cleared of debris		
If designed as exfilter, excavation does not compact subsoils		
Foundation area compacted		
3. Structural Components		
Dimensions and materials		
Forms adequately sized		
Concrete meets standards		
Prefabricated joints sealed		
Underdrains (size, materials)		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Completed Facility Components		
24 hour water filled test		
Contributing area stabilized		
Filter material per specification		
Underdrains installed to grade		
Flow diversion structure properly installed		
Pretreatment devices properly installed		
Level overflow weirs, multiple orifices, distribution slots		
5. Final Inspection		
Dimensions		
Surface completely level		
Structural components		
Proper outlet		
Ensure that site is properly stabilized before flow is directed to the structure.		

Comments:

Actions to be Taken:

APPENDIX H

Pipe Sizing Calculations

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

CONVEYANCE SYSTEM SIZING CALCULATIONS
Design Storm: 10-Year

PROJECT: West End Lofts
JOB NUMBER: 16226.100
BY: ZMP DATE: 5-30-17
CHK: ZMP DATE: 5-30-17

STRUCTURE		IMPERVIOUS AREA			PERVIOUS AREA			CA	TIME OF CONC. (min.)			I	Q (cfs)		PIPE DESIGN				
FROM	TO	A (ac.)	C	CA	A (ac.)	C	CA		INLET	PIPE	TOTAL		DESIGN	CAP.	V(ft/s)	n	s (%)	L (ft)	DIA (in)
DMH 17*	DMH 16	-	-	-	-	-	-	-	-	-	-	-	0.9	3.7	8.8	0.012	8.04	97	8
DMH 16	ES 15	-	-	-	-	-	-	-	-	-	-	-	0.9	7.9	15.2	0.012	36.67	30	8
CB 9	CB 8	0.36	0.9	0.32	0.14	0.3	0.04	0.37	8	-	8	5.7	2.1	3.9	5.0	0.012	1.00	33	12
CB 8	CB 7	0.36	0.9	0.32	0.04	0.3	0.01	0.70	8	-	<8	5.7	4.0	8.8	11.0	0.012	5.19	54	12
CB 7	CB 6	0.04	0.9	0.04	0.01	0.3	0.00	0.74	8	-	<8	5.7	4.2	5.2	7.3	0.012	1.79	56	12
CB 6	CB 5A	0.05	0.9	0.05	0.01	0.3	0.00	0.79	8	-	<8	5.7	4.5	7.0	6.1	0.012	1.00	80	15
CB 5A	HDS 5	0.49	0.9	0.44	0.10	0.3	0.03	1.26	8	-	<8	5.7	7.2	9.9	8.8	0.012	2.00	5	15
HDS 5	DS 1.1	-	-	-	-	-	-	1.26	8	-	<8	5.7	7.2	9.9	8.8	0.012	2.00	5	15
YD 12B	YD 12A	0.01	0.9	0.01	0.07	0.3	0.02	0.03	5	-	<5	7.2	0.2	5.0	3.2	0.012	1.71	70	12
YD 12A	CB 12	0.01	0.9	0.01	0.05	0.3	0.02	0.05	5	-	<5	7.2	0.4	6.5	4.6	0.012	2.81	64	12
CB 12	CB 11	0.06	0.9	0.05	0.02	0.3	0.01	0.11	5	-	<5	7.2	0.8	4.1	4.1	0.012	1.15	26	12
CB 11	HDS 10	0.42	0.9	0.38	0.06	0.3	0.02	0.51	5	-	<5	7.2	3.7	3.9	5.6	0.012	1.00	11	12
HDS 10	DS1.2	-	-	-	-	-	-	0.51	5	-	<5	7.2	3.7	6.5	8.6	0.012	2.86	14	12
EX DI2	DMH 1B	0.80	0.9	0.72	0.50	0.3	0.15	0.87	9	-	9	8.1	7.0	24.9	12.2	0.012	4.80	77	18
DMH 1B	DMH 1A	0.00	0.9	0.00	0.00	0.3	0.00	0.87	9	-	<9	8.1	7.0	28.1	13.3	0.012	6.09	92	18
DMH 1A	SDI 1	0.00	0.9	0.00	0.00	0.3	0.00	0.87	9	-	<9	8.1	7.0	33.5	12.2	0.012	8.65	37	18
OS SF*	SDI 1	-	-	-	-	-	-	-	-	-	-	-	0.9	4.3	4.3	0.012	1.24	97	12
DS 1.1*	DHM 4B	-	-	-	-	-	-	-	-	-	-	-	0.9	8.6	7.2	0.012	5.00	5	12
DMH 4B	DMH 4	-	-	-	-	-	-	-	-	-	-	-	0.9	13.6	9.9	0.012	12.39	46	12
DS 1.2*	DMH 4A	-	-	-	-	-	-	-	-	-	-	-	0.0	2.7	0.0	0.012	20.00	5	6
DMH 4A	DMH 4	-	-	-	-	-	-	-	-	-	-	-	0.0	1.4	0.0	0.012	5.50	20	6
DMH 4	DMH 3	-	-	-	-	-	-	-	-	-	-	-	0.9	16.5	11.3	0.012	18.23	79	12
DMH 3	DMH 2	-	-	-	-	-	-	-	-	-	-	-	0.9	15.3	10.8	0.012	15.69	65	12
DMH 2	SDI 1	-	-	-	-	-	-	-	-	-	-	-	0.9	12.2	9.2	0.012	10.00	39	12
SDI 1	EX DI	-	-	-	-	-	-	-	-	-	-	-	8.8	134.2	24.4	0.012	30.00	45	24

* Flows taken from the 10-year 24-hour design storm. See Appendix C for additional information.

APPENDIX I

Cistern Sizing Calculations

Cisterns are proposed to store the WQv from the roof runoff from each of the three (3) proposed buildings. The Cisterns have been designed in accordance with the sizing criteria in Chapter 5 of the NYSDEC Design Manual. The sizing for each of the cisterns for each building is is as follows:

Cistern #1 (Includes Roof Runoff from Building #1 & Portion of Building #2)

The water quality volume shall be $WQ_v = \frac{(P)(R_v)(A)}{12}$

Where,

WQ_v = water quality volume (cubic feet)
P = 90% Rainfall Event Number = 1.4
R_v = 0.05 + 0.009(I), where I is percent impervious cover = 0.95
A = contributing area in acres = 17,800 sf

$$WQ_v = \frac{(1.4)(0.95)(17{,}800)}{12} = 1{,}973 \text{ cf}$$

Required Cistern Volume = WQ_v (7.5 gals/cf)
= 1,973 cf (7.5 gals/cf)
= 14,798 gallons

Proposed #1 Cistern #1 is 15,000 gallons, which is capable of treatment of the WQv / RRv of 1,973 cf for Building #1 and southern portion of Building #2. As shown on the project plans, Cistern #1 has an overflow to direct the stormwater runoff above the RRv provided to the downstream detention system.

Cistern #2 (Includes Roof Runoff from portion of Building #2 & portion of Building #3)

The water quality volume shall be $WQ_v = \frac{(P)(R_v)(A)}{12}$

Where,

WQ_v = water quality volume (cubic feet)
P = 90% Rainfall Event Number = 1.4
R_v = 0.05 + 0.009(I), where I is percent impervious cover = 0.95
A = contributing area in acres = 12,000 sf

$$WQ_v = \frac{(1.4)(0.95)(12{,}000)}{12} = 1{,}330 \text{ cf}$$

Required Cistern Volume = WQ_v (7.5 gals/cf)
= 1,330 cf (7.5 gals/cf)
= 9,975 gallons

Proposed Cistern #2 is 10,000 gallons, which is capable of treatment of the WQv / RRv of 1,973 cf for the northern portion of Building #2 and eastern portion of Building #3. As shown on the project plans, Cistern #2 has an overflow to direct the stormwater runoff above the RRv provided to the downstream detention system.

Cistern #3 (Includes Roof Runoff from Portion of Building #3)

The water quality volume shall be $WQ_v = \frac{(P)(R_v)(A)}{12}$

Where,

WQ_v = water quality volume (cubic feet)
P = 90% Rainfall Event Number = 1.4
R_v = 0.05 + 0.009(I), where I is percent impervious cover = 0.95
A = contributing area in acres = 4,700 sf

$WQ_v = \frac{(1.4)(0.95)(4{,}700)}{12} = 521$ cf

Required Cistern Volume = WQ_v (7.5 gals/cf)
= 521 cf (7.5 gals/cf)
= 3,907 gallons

Proposed Cistern # 3 is 5,000 gallons, which is capable of treatment of the WQv / RRv of 521 cf for the western portion of Building #3. As shown on the project plans, Cistern #3 has an overflow to direct the stormwater runoff above the RRv provided to the downstream surface sand filter.

The total WQv / RRv treatment volume provided within the all the cisterns is 3,824 cf, which is greater that the RRv Minimum (3,669 cf) shown and calculated in Appendix A of this report.

APPENDIX J
Hydrodynamic Separator Sizing

Matt Gironda

From: Glode, Kate <KGlode@conteches.com>
Sent: Tuesday, March 01, 2016 11:49 AM
To: Matt Gironda
Subject: FW: Hydrodyanamic Units

Matt,

Please see the correspondence below from the NYS DEC about the use of manufactured treatment flow rates for pretreatment units.

Thanks,

Kate Glode, EIT
NY Stormwater Consultant

Contech Engineered Solutions LLC
Albany, NY 12054
Mobile: 518-410-1287
KGlode@conteches.com
www.ContechES.com

From: Gasper, David J (DEC) [mailto:david.gasper@dec.ny.gov]
Sent: Monday, July 20, 2015 3:43 PM
To: Kohl, Lauren
Cc: Houston, Jim
Subject: RE: Hydrodyanamic Units

Lauren,

Yes, your understanding is correct, provided all other pertinent pretreatment criteria from the Design Manual are met. Please let me know if you have any questions.

From: Kohl, Lauren [mailto:L.Kohl@ctmale.com]
Sent: Monday, July 20, 2015 3:37 PM
To: Gasper, David J (DEC)
Cc: Houston, Jim
Subject: Hydrodyanamic Units

Good afternoon Dave,

Thanks so much for your prompt response. I just wanted to memorialize this dialogue in an e-mail, in the event that we're asked to provide documentation supporting our selection of a specific hydrodynamic unit.

For pre-treatment only, the manufacturers' flow rates can be used when sizing a unit to pre-treat 100% of the water quality flow. For treatment of re-development or new development stormwater runoff, NJCAT or other approved testing agency flow rates must be used when sizing the unit(s).

Thanks again for your assistance,

Lauren

Lauren Kohl, PE
Civil Engineer II
Tel 518.786.7618
L.Kohl@ctmale.com

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Guidelines for the Use of Hydrodynamic Separators on ConnDOT Projects

TABLE 2 - PERFORMANCE MATRIX FOR CONNDOT APPROVED HYDRODYNAMIC SEPARATORS

Maximum WQF (cfs)	**Product Model**								
	Downstream Defender	*Flogard*	*High Eff. CDS*	*Hydroguard*	*Stormceptor OSR*	*Stormceptor STC*	*Vortechs*	*Vortsentry*	*V2B1*
0.4	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	450	1000	VS30	2
0.5	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	900	1000	VS30	2
0.6	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	900	1000	VS40	2
0.7	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	900	1000	VS40	2
0.8	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	900	1000	VS40	2
0.9	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1200	1000	VS40	3
1.0	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1800	1000	VS40	3
1.1	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1800	1000	VS40	4
1.2	6-ft	DVS-48	2015	HG 5	140	2400	1000	VS50	4
1.3	6-ft	DVS-60	2015	HG 5	140	2400	1000	VS50	4
1.4	6-ft	DVS-60	2015	HG 5	140	2400	2000	VS50	4
1.5	6-ft	DVS-60	2020	HG 5	140	2400	2000	VS50	6
1.6	6-ft	DVS-60	2020	HG 5	140	2400	2000	VS50	6
1.7	6-ft	DVS-60	2020	HG 5	250	2400	2000	VS50	6
1.8	6-ft	DVS-60	2020	HG 6	250	2400	2000	VS50	7
1.9	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	7
2.0	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	7
2.1	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	9
2.2	6-ft	DVS-72	2025	HG 6	250	3600	2000	VS60	8
2.3	6-ft	DVS-72	3020, 3020-D	HG 6	250	3600	2000	VS60	8
2.4	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	2000	VS60	8
2.5	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	3000	VS60	10
2.6	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	3000	VS60	11
2.7	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS60	11
2.8	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS70	11
2.9	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS70	12
3.0	6-ft	DVS-72	3035; 3035-D	HG 7	390	4800	3000	VS70	12

TABLE 2 - PERFORMANCE MATRIX FOR CONNDOT APPROVED HYDRODYNAMIC SEPARATORS (continued)

Maximum WQF (cfs)	**Product Model**								
	Downstream Defender	*Flogard*	*High Eff. CDS*	*Hydroguard*	*Stormceptor OSR*	*Stormceptor STC*	*Vortechs*	*Vortsentry*	*V2B1*
3.1	8-ft	DVS-72	3035; 3035-D	HG 7	390	4800	3000	VS70	12
3.2	8-ft	DVS-72	3035; 3035-D	HG 7	390	4800	3000	VS70	12
3.3	8-ft	DVS-72	3035; 3035-D	HG 7	390	4800	3000	VS70	14
3.4	8-ft	DVS-72	3035; 3035-D	HG 7	390	6000	3000	VS70	14
3.5	8-ft	DVS-72	3030; 3030-DV, 3030-D; 4030-D	HG 7	390	6000	3000	VS70	14
3.6	8-ft	DVS-72	4030	HG 7	390	6000	3000	VS70	14
3.7	8-ft	DVS-84	4030	HG 8	390	6000	3000	VS70	14
3.8	8-ft	DVS-84	4030	HG 8	390	6000	4000	VS70	13
3.9	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS70	15
4.0	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	15
4.1	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	15
4.2	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	16
4.3	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	16
4.4	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	16
4.5	8-ft	DVS-84	4030	HG 8	390	7200	4000	VS80	16
4.6	8-ft	DVS-84	5640-D	HG 8	390	7200	4000	VS80	17
4.7	8-ft	DVS-84	5640-D	HG 8	390	7200	4000	VS80	17
4.8	8-ft	DVS-84	5640-D	HG 8	390	7200	4000	VS80	17
4.9	8-ft	DVS-84	5640-D	HG 8	390	11000s	4000	VS80	17
5.0	8-ft	DVS-84	5640-D	HG 9	390	11000s	4000	VS80	19
5.2	8-ft	DVS-84	4040-D	HG 9	390	11000s	4000	VS80	20
5.4	8-ft	DVS-96	4040-D	HG 9	390	11000s	4000	VS100	20
5.5	8-ft	DVS-96	4045-D	HG 9	390	11000s	5000	VS100	18
5.6	8-ft	DVS-96	4045-D	HG 9	560	11000s	5000	VS100	18
6.0	8-ft	DVS-96	4040	HG 9	560	11000s	5000	VS100	18
6.1	8-ft	DVS-96	4040	HG 9	560	11000s	5000	VS100	21

TABLE 2 - PERFORMANCE MATRIX FOR CONNDOT APPROVED HYDRODYNAMIC SEPARATORS (continued)

Maximum WQF (cfs)	**Product Model**								
	Downstream Defender	*Flogard*	*High Eff. CDS*	*Hydroguard*	*Stormceptor OSR*	*Stormceptor STC*	*Vortechs*	*Vortsentry*	*V2B1*
6.3	8-ft	DVS-96	4040	HG 9	560	11000s	5000	VS100	25
6.4	10-ft	DVS-96	4040	HG 9	560	11000s	5000	VS100	25
6.5	10-ft	DVS-96	4040	HG 10	560	11000s	5000	VS100	25
6.9	10-ft	DVS-96	4040	HG 10	560	11000s	5000	VS100	25
7.0	10-ft	DVS-96	4040	HG 10	560	11000s	5000	VS100	22
7.1	10-ft	DVS-96	5042-D	HG 10	560	11000s	5000	VS100	22
7.2	10-ft	DVS-96	5042-D	HG 10	560	13000s	5000	VS100	22
7.3	10-ft	DVS-96	4045	HG 10	560	13000s	5000	VS100	22
7.5	10-ft	DVS-96	5653-D	HG 10	560	13000s	7000	VS100	22
7.7	10-ft	DVS-120	5653-D	HG 10	560	13000s	7000	VS100	22
7.8	10-ft	DVS-120	5653-D	HG 10	560	13000s	7000	VS100	50
7.9	10-ft	DVS-120	5653-D	HG 10	780	13000s	7000	VS100	50
8.0	10-ft	DVS-120	5658-D	HG 10	780	13000s	7000	VS100	50
8.2	10-ft	DVS-120	5658-D	HG 10	780	16000s	7000	VS100	50
8.5	10-ft	DVS-120	5658-D	HG 12	780	16000s	7000	VS100	50
8.6	10-ft	DVS-120	5658-D	HG 12	780	16000s	7000	VS100	50
8.9	10-ft	DVS-120	5678-D	HG 12	780	16000s	7000	VS100	50
9.0	10-ft	DVS-120	5678-D	HG 12	780	16000s	7000	VS120	50
9.2	10-ft	DVS-120	5678-D	HG 12	780	16000s	7000	VS120	50
9.5	10-ft	DVS-120	5050-DV	HG 12	780	16000s	7000	VS120	50
9.6	10-ft	DVS-120	5050-DV	HG 12	780	16000s	7000	VS120	50
10.0	10-ft	DVS-120	5050-DV	HG 12	780	16000s	9000	VS120	50
10.1	10-ft	DVS-120	5050-DV	HG 12	780	16000s	9000	VS120	50
10.5	10-ft	DVS-120	5050-DV	HG 12	780		9000	VS120	50
10.9	10-ft	DVS-120	5050-DV	HG 12	780		9000	VS120	50
11.0	10-ft	DVS-120	7070-DV	HG 12	780		9000	VS120	50
11.2	10-ft	DVS-120	7070-DV	HG 12	1125		9000	VS120	50

TABLE 2 - PERFORMANCE MATRIX FOR CONNDOT APPROVED HYDRODYNAMIC SEPARATORS (continued)

Maximum WQF (cfs)	**Product Model**								
	Downstream Defender	*Flogard*	*High Eff. CDS*	*Hydroguard*	*Stormceptor OSR*	*Stormceptor STC*	*Vortechs*	*Vortsentry*	*V2B1*
11.5		DVS-120	7070-DV	HG 12	1125		9000	VS120	50
11.8		DVS-120	7070-DV	HG 12	1125		9000	VS120	50
11.9		DVS-120	7070-DV	HG 12	1125		9000	VS120	60
12.0		DVS-120	7070-DV	HG 12	1125		9000	VS120	60
12.1		DVS-120	7070-DV	HG 12	1125		9000	VS120	60
12.5		DVS-120	7070-DV	HG 12	1125		11000	VS120	60
13.0		DVS-120	7070-DV		1125		11000	VS120	60
13.5		DVS-120	7070-DV		1125		11000	VS120	60
13.6		DVS-120	7070-DV		1125		11000	VS120	60
14.0		DVS-144	7070-DV		1125		11000	VS120	60
14.5		DVS-144	7070-DV		1125		11000		60
14.9		DVS-144	7070-DV		1125		11000		60
15.0		DVS-144	7070-DV		1125		16000		60
15.5		DVS-144	7070-DV		1125		16000		60
15.7		DVS-144	7070-DV		1125		16000		60
16.0		DVS-144	7070-DV				16000		60
16.5		DVS-144	7070-DV				16000		60
17.0		DVS-144	7070-DV				16000		
17.5		DVS-144	7070-DV				16000		
18.0		DVS-144	7070-DV				16000		
18.5		DVS-144	7070-DV				16000		
19.0		DVS-144	7070-DV				16000		
19.7		DVS-144	7070-DV				16000		
20.0		DVS-144	10060-DV				16000		
21.5		DVS-144	10060-DV				16000		
22.3		DVS-144	10060-DV				1319		
25.0			10060-DV				1319		
25.2			10060-DV				1319		

FIGURES

PROJECT:

WEST END LOFTS

WOLCOTT AVENUE, BEACON, NEW YORK 12508

DRAWING:

LOCATION MAP

PREPARED BY:

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place • Carmel, New York 10512
Phone (845) 225-9690 • Fax (845) 225-9717
www.insite-eng.com

DATE:	1-17-16
SCALE:	1" = 400'
PROJECT NO.:	16226.100
FIGURE:	1

LEGEND

	EXISTING PROPERTY LINE TO BE EXTINGUISHED
	PROPOSED PROPERTY LINE
	EXISTING CONCRETE CURB
	EXISTING TREE LINE
	EXISTING TREES
	EXISTING TREE TO BE REMOVED
	EXISTING FENCE
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	EXISTING UTILITY POLES WITH OVERHEAD WIRES
G	EXISTING GAS LINE
12"W	EXISTING WATER MAIN
	EXISTING DRAINAGE PIPE
DI CB	EXISTING DRAINAGE STRUCTURE
	EXISTING LIGHT POLE

SOILS LEGEND

SOILS	DESCRIPTION	HYDROLOGICAL GROUP
DwB	Dutchess–Cardigan complex, undulating, rocky, 1% to 6% slopes	B
NwC	Nassau–Cardigan complex, rolling, very rocky	B,C
Ud	Udorthents, smoothed	A/D
	NRCS Soil Boundary Line	

LEGEND

PRE 1	SUBCATCHMENT
SF →	TIME OF CONCENTRATION SHEET FLOW
SCF →	TIME OF CONCENTRATION SHALLOW CONCENTRATED FLOW

GENERAL NOTES:

1. Property line shown hereon is based on contract of sale and requires a lot line realignment with the city parcel to the north.
2. Topography shown hereon is based upon aerial photography dated April 14, 2003 and is photogrametrically compiled. Elevations shown hereon conform to the North American Vertical Datum of 1988 (N.A.V.D, 1988) as derived by GPS observation. The contour interval is 2'.
3. No special flood areas are associated with this project parcel.
4. Drainage boundaries shown hereon are based on field observations / site assessments.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
1	3-27-17	REVISION PER TOWN ENGINEER COMMENTS	ZMP

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PROJECT:

WEST END LOFTS

WOLCOTT AVENUE, BEACON, NEW YORK 12508

DRAWING:

PRE DEVELOPMENT DRAINAGE MAP

PROJECT NUMBER	16226.100	PROJECT MANAGER	J.C.C.	FIGURE NO.
DATE	1-17-17	DRAWN BY	Z.M.P.	2
SCALE	1" = 30'	CHECKED BY	Z.M.P.	

LEGEND

	PROPOSED PROPERTY LINE
	EXISTING CONCRETE CURB
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	EXISTING FENCE
	EXISTING UTILITY POLES WITH OVERHEAD WIRES
G	EXISTING GAS LINE
12"W	EXISTING WATER MAIN
	EXISTING DRAINAGE PIPE
DI CB	EXISTING DRAINAGE STRUCTURE
S	EXISTING SEWER MAIN
	PROPOSED CURB
	PROPOSED EDGE OF SIDEWALK
	PROPOSED SEATING WALL
	PROPOSED RETAINING WALL
	PROPOSED GUIDERAIL
	PROPOSED FENCE
140	PROPOSED 10' CONTOUR
138	PROPOSED 2' CONTOUR
134.8 ×	PROPOSED SPOT GRADE
	PROPOSED CATCH BASIN
	PROPOSED DRAINAGE MANHOLE
	PROPOSED HDPE DRAINAGE PIPE (SEE TABLE FOR SIZES)
RD	PROPOSED 6"Ø PVC SDR 35 ROOF DRAIN

SOILS LEGEND

SOILS	DESCRIPTION	HYDROLOGICAL GROUP
DwB	Dutchess–Cardigan complex, undulating, rocky, 1% to 6% slopes	B
NwC	Nassau–Cardigan complex, rolling, very rocky	B,C
Ud	Udorthents, smoothed	A/D
	NRCS Soil Boundary Line	

LEGEND

1.1	SUBCATCHMENT
SF 1.0	STORMWATER MANAGEMENT PRACTICE
SF →	TIME OF CONCENTRATION SHEET FLOW
SCF →	TIME OF CONCENTRATION SHALLOW CONCENTRATED FLOW
PF →	TIME OF CONCENTRATION PIPE FLOW

GENERAL NOTES:

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3. No special flood areas are associated with this project parcel.
4. Drainage boundaries shown hereon are based on field observations / site assessments.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

NO.	DATE	REVISION	BY
2	5–30–17	REVISION PER TOWN ENGINEER COMMENTS	ZMP
1	3–27–17	REVISION PER TOWN ENGINEER COMMENTS	ZMP

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PROJECT:

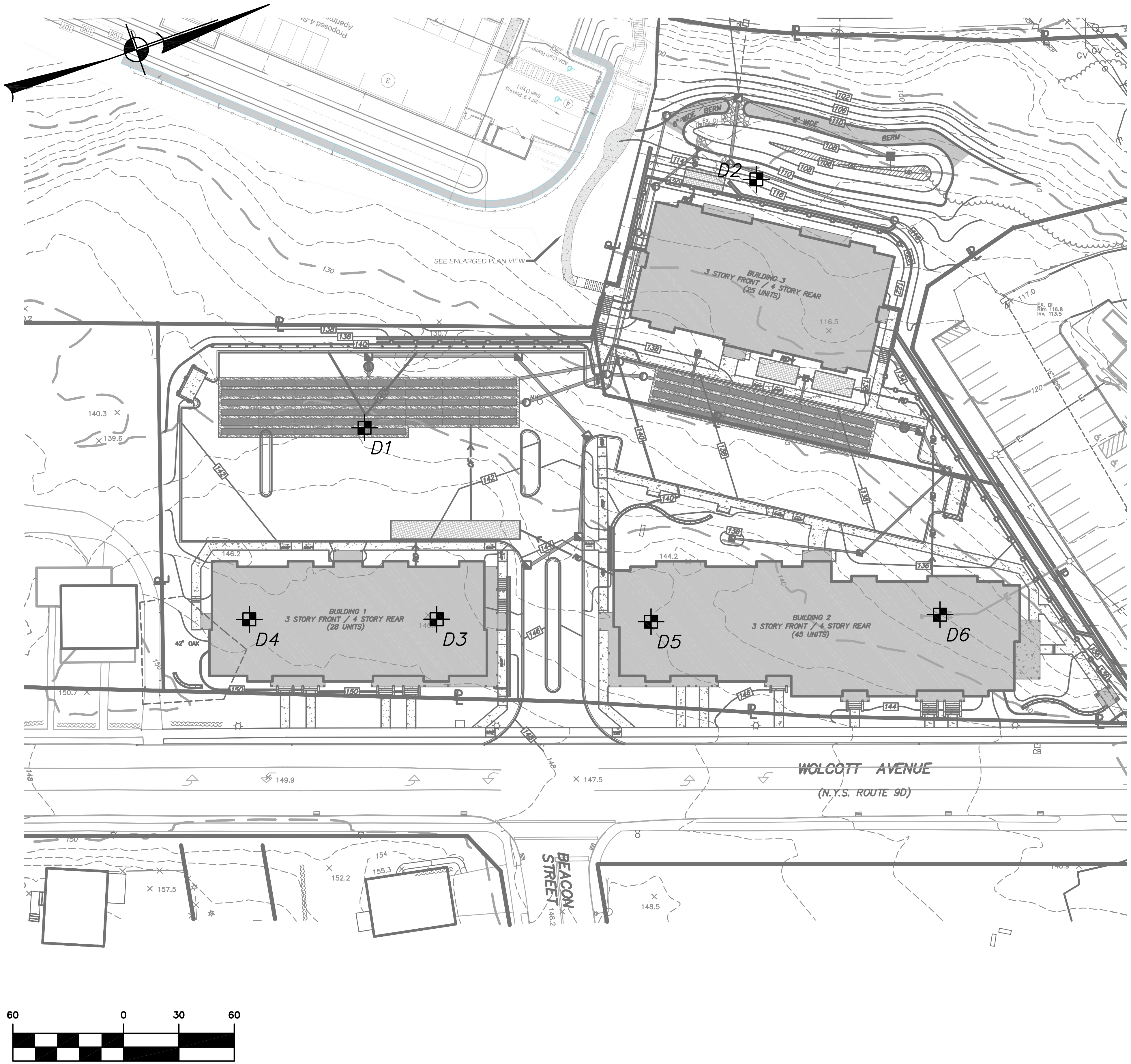
WEST END LOFTS

WOLCOTT AVENUE, BEACON, NEW YORK 12508

DRAWING:

POST DEVELOPMENT DRAINAGE MAP

PROJECT NUMBER	16226.100	PROJECT MANAGER	J.C.C.	FIGURE NO.
DATE	1–17–17	DRAWN BY	Z.M.P.	3
SCALE	1" = 30'	CHECKED BY	Z.M.P.	



GENERAL NOTES:

1. Property line shown hereon is based on contract of sale and requires a lot line realignment with the city parcel to the north.

2. Topography shown hereon is based upon aerial photography dated April 14, 2003 and is photogrametrically compiled. Elevations shown hereon conform to the North American Vertical Datum of 1988 (N.A.V.D, 1988) as derived by GPS observation. The contour interval is 2'.

3. No special flood areas are associated with this project parcel.

DEEP HOLE TEST RESULTS:
DEEP TESTS PERFORMED: 3-9-17
DEEP TESTS OBSERVED BY:
ZACHARY M. PEARSON, P.E., INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
ERIC ROGGE, LANC & TULLY ENGINEERING AND SURVEYING P.C.

D-1: 0"-2" TOPSOIL
2"-48" BROWN SANDY LOAM
48"-72" LOOSE SHALE ROCK
NO GROUNDWATER.

D-2: 0"-2" TOPSOIL,
2"-42" MISC. ASPHALT, AND CONCRETE FROM FORMER ROAD MATERIALS
ROCK AT 42", NO GROUNDWATER.

D-3: 0"-3" TOPSOIL,
3"-72" BROWN SANDY LOAM WITH MISC. CONSTRUCTION DEBRIS
ROCK AT 72", NO GROUNDWATER.

D-4: 0"-4" TOPSOIL
4"-18" BROWN SANDY LOAM
18"-68" LOOSE SHALE ROCK
NO GROUNDWATER.

D-5: 0"-3" TOPSOIL,
3"-60" BROWN SANDY LOAM AND LOOSE SHALE ROCK MIX
NO GROUNDWATER.

D-6: 0"-3" TOPSOIL,
3"-96"+ MISC. FILL WITH CONSTRUCTION DEBRIS
NO ROCK, NO GROUNDWATER.

DATE:	3-28-17
SCALE:	1" = 60'
PROJECT NO.:	16226.100
FIGURE:	4

PREPARED BY:
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PROJECT: WEST END LOFTS
WOLCOTT AVENUE, BEACON, NEW YORK 12508

DRAWING: SOIL TESTING RESULTS