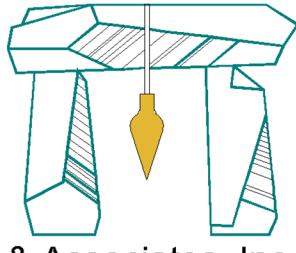


DeCelle-Burke-Sala



& Associates, Inc.

**Engineering Report
For
Milton Hill Development
Definitive Residential Subdivision
at
34 Milton Hill Road
in
Milton, Massachusetts**

Prepared by:

DeCelle-Burke-Sala & Associates, Inc.
1266 Furnace Brook Parkway
Suite 401
Quincy, MA 02169

Prepared for:

Joshua D. Wild
174 Dorchester Street
Boston, MA 02127

May 23, 2022

Table of Contents

Section 1 –	<u>Project Narrative</u> Existing Conditions Proposed Conditions Stormwater Management
Section 2 -	<u>Management Plans</u> Stormwater Operation & Maintenance Plan Erosion Control and Construction Management Plan
Section 3 -	<u>Supporting Maps</u> Assessors Map USGS Map Soils Map ACEC Map NHESP Map FEMA Panel Chapter 91 Map
Section 4 -	<u>Stormwater Management Data</u> Checklist for Stormwater Report Standard 4 Compliance HydroCAD calculations Existing Conditions 2-Year 10-Year 25-Year 100-Year Proposed Conditions 2-Year 10-Year 25-Year 100-Year Watershed Maps

SECTION 1 - PROJECT NARRATIVE

Existing Conditions

The project locus consists of one parcel located at the end of Milton Hill Road in Milton, Massachusetts. The parcel has an address of 34 Milton Hill Road with an Assessor's identification of Map F Block 8 Lot 9, and is zoned Residence A. The area of the lot is approximately 195,368 S.F.

The project locus contains a $2,197 \pm$ S.F. vacant single family house in a dilapidated state, located in the southwesterly portion of the site. The project locus is accessed off of Milton Hill Road by a single asphalt driveway. The asphalt driveway transitions to a dirt driveway, which wraps around the rear of the existing single family house and provides access to the attached garage. Along the southerly edges of the existing driveway are two stone walls with one being adjacent to the attached garage. South of the existing house is a chain link fenced in area. The slope adjacent to the Neponset River is lined with a rip-rap slope along the majority of the frontage with the river. There is an existing wall and boat ramp with a damaged dock in the northeasterly portion of the site along the Neponset River.

The site is vegetated by tree growth along the westerly portion of the site. The tree growth extends to the northerly portion of the site adjacent to the Neponset River. The majority of the land adjacent to the Neponset River is heavily vegetated with dense undergrowth. The middle and southerly majority of the site is vegetated by lawn. The site has a significant slope which starts in the southwest corner of the site at elevation 95' and slopes down to the Neponset River which has a mean high water of elevation 5.0'. All of the elevations mentioned above reference the North American Vertical Datum of 1988 (NAVD88).

The existing house is serviced by existing water, gas, sewer, and underground electric/communication services which connect to the utilities within the Milton Hill Road layout. There are currently no stormwater control structures on the project locus. The stormwater runoff flows freely overland and down the slope with the majority of the runoff going towards the Neponset River, and smaller portions going to the abutters to the east and west.

There are numerous wetland resource areas that are located on-site. Adjacent to the Neponset River, FEMA flood zone AE elevation 11.0 extends onto the site which partially coincides with the Coastal Bank located on-site. The northerly portion of the site adjacent to the Neponset River is located with the Neponset River Estuary Area of Critical Environmental Concern (ACEC). The central resource features of the Neponset River Estuary ACEC are the Neponset River and portions of its tributaries, the estuary, salt marshes, floodplains, fishery habitat, and diverse wildlife habitat. Based upon observations made during the site inspection, there is an unmapped intermittent stream located on the site. Based upon the watershed area, the unmapped stream in the eastern portion of the site would be designated as intermittent and would not contain a Riverfront Area under the Act/Regulations. Based upon the stream mapping, the Neponset River would be designated as perennial and Riverfront Area under the Act/Regulations exists on site up gradient from the Mean Annual High Water Line El. 5.0. For tidal rivers, the Mean Annual High-water Line is coincident with the Mean High Water Line determined under 310 CMR 10.23 (see 310 CMR 10.58(2)(a)2.c.). Due to the sites proximity to the Neponset River, the 100-

ft. and 200-ft. riverfront areas extend onto the site. Wetlands are present on-site and were delineated by EcoTec, Inc. on January 27, 2022. Wetlands delineated on-site are described below in a Table 1 provided from “Wetland Resource Evaluation, 34 Milton Hill Road, Milton, MA” by EcoTec, Inc., dated April 6, 2022.

Flag Numbers	Flag Type	Wetland Types and Locations
Start A1 to A17 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands or Bank located in the northeastern portion of the site that is associated with an intermittent stream.
Start B1 to B5 Stop (B5 connect to C1)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in/near the southeastern portion of the site that is associated with an intermittent stream. B1 and B2 are offset flags as wetland is located off-site, on private property. Locate B1 15 feet eastward of flag location and locate B2 8 feet eastward of flag location.
Start C1 to C7 Stop (C7 connect to D1)	Pink Flags	Edge of recently placed fill and boundary of Bordering Vegetated Wetlands located in the southeastern portion of the site that is associated with an intermittent stream. This area has been recently cleared/ altered/ filled and the actual BVW boundary may be located under the fill material. Further evaluation may need to be done when fill is removed to determine BVW boundary in this area.
Start D1 to D18 Stop (D1 connect to C7)	Blue Flags	Boundary of Bordering Vegetated Wetlands or Bank located in the central portion of the site that is associated with an intermittent stream.
CB20 to CB21 (CB16 stop at west side of boat ramp, CB17 start at east side of boat ramp)	Red Flags	Possible landward boundary of Salt Marsh at the toe of slope/wall. This area contains Phragmites and may qualify as Salt Marsh if it extends landward up to the highest tide line, that is the spring tide of the year (tide of greatest amplitude during the approx. 14-day tidal cycle).
CB1 to CB21	Red Flags	Top of Coastal Bank. This delineation assumes that the slope below the flags is >4:1 and that the limit of Land Subject to Coastal Storm Flowage is not above the flags. Profiles of the Bank may be necessary to determine/confirm the delineated boundary in accordance with the DEP Wetlands Program Policy 92-1: Coastal Banks.

Table 1

The Natural Resources Conservation Service (NRCS) has mapped the soils for the project locus as Paxton fine sandy loams.

Proposed Conditions

The proposed project is a two lot residential subdivision which will include the construction of two new single family houses. Access to the subdivision will be provided off of Milton Hill Road by a 30-ft. wide private way, which ends at a 150-ft. by 30-ft. hammerhead. The proposed street layout will have 18-ft. of pavement with sloped granite curbing. The pavement in the hammerhead will contain a 47-ft. by 18-ft. turnaround area. Each proposed single family house will be provided access to the street by a curb cut and asphalt driveway.

The street will be graded to have a 8-percent (8%) slope for the first approximately 150-ft. The road will briefly transition to a 4-percent (4%) slope adjacent to the proposed driveway for Lot 1 for approximately 25-ft. The road will transition to a 6-percent (6%) slope for approximately 100-ft. before leveling out at the end of the road adjacent to Lot 2. The leveled area adjacent to Lot 2, including the proposed driveway on Lot 2 will have approximately a 2-percent (2%) slope to allow for proper drainage. A retaining wall is proposed along a portion of the road from approximately Station 1+60 extending to the proposed house on Lot 2 along the easterly side of the roadway. The retaining wall was designed so as to not encroach onto the 25-ft. Milton By-law Wetland No-Disturb Zone with proposed structures, grading, and construction activities. The wall is approximately 4-ft. in height at its highest point. On the westerly side of the road from Station 1+70 to Station 2+70 is another proposed retaining wall located on Lot 1.

Both proposed houses are proposed to have an E-One pump chambers that will collect and pump the wastewater produced from the proposed single family dwellings. A 1-1/2" force main will connect to the existing sewer system located in Milton Hill Road. A proposed 4-in. DICL water main is to be extended down the proposed way from the existing water main in Milton Hill Road and stub at the end of the proposed way. The proposed single family houses will connect to the proposed main with 1-inch Type "K" copper water services and curb stops brought to grade. Electric and communications shall be run underground from the existing underground electric and communication services in Milton Hill Road and service both of the proposed houses. The gas main in Milton Hill Road is proposed to be extended down the proposed road to provide the proposed house with access to gas services.

Stormwater generated by the proposed street will be collected, detained, and partially recharged to meet local and state regulations. The stormwater generated by the proposed street will be captured by a series of deep sump catch basins and detained and infiltrated using two underground infiltration structures. Total Suspended Solids are removed to 44% efficiency due to the proximity to a critical area, a Contech CDS-6 oil/grit separator structure is proposed. All captured flows are directed to System "1". Flows are captured from the entire proposed roadway, a majority of Lot 1, and a portion of Lot 2. System "1" is composed of 45 - 4-ft.x4-ft.x4-ft. concrete chambers in a 5 by 9 configuration, with 18-in. of surrounding stone and 6-in. of stone below. System "1" is designed to overflow for the 2, 10, 25, and 100-year storms via an 8-in. HDPE pipe to proposed drain manhole 3. From drain manhole 3 the flows are directed to System "2" by an 8-in. HDPE pipe. System "2" is identical to System "1", as it utilizes 45 - 4-ft.x4-ft.x4-ft. concrete chambers in a 5 by 9 configuration, with 18-in. of surrounding stone and 6-in. of stone below. System "2" utilizes an 8-in. HDPE pipe for outlet control, directing stormwater down gradient to a rip-rap outlet designed to dissipate flow velocities for erosion control.

It is the intent of this stormwater management system to meet MADEP's ten stormwater management standards. The required recharge volume is met and the TSS requirement is also met with 80% TSS removal through the use of deep sump catch basins, oil/grit separator, and the additional sediment captured in the bottom stone surface of the infiltration structures.

Stormwater Management

This office generated hydrographs for both existing and proposed conditions to compare overall stormwater offsite flows for various storms. We calculated land coverage numbers (CN) using Hydrologic Group "C" soils, and calculated Times of Concentration based upon the flow paths for both existing and proposed conditions for hydrograph generation. Minimum Times of Concentrations were used where the calculated times were under 6 minutes. Impervious land coverage increases but the majority of runoff will now be treated and recharged. The peak runoff rates for the 2, 10, 25 and 100-year storm events are reduced.

The results of the calculations are tabulated below for comparison with the existing and proposed condition values. The project also complies with the following stormwater management standards outlined in the Massachusetts Stormwater Handbook:

Standard 1 - No new stormwater conveyances discharge untreated stormwater directly to the waters of the Commonwealth.

Standard 2 - Post-development discharge rates do not exceed pre-development discharge rates. The site has been graded to allow for the collection of a majority of the stormwater runoff and allow for infiltration to best match the existing site hydraulics. Three design points have been compared when determining the peak discharge rates for the project locus. The first is the peak rate of discharge to easterly abutters, the second is the peak rate of discharge to the north towards the Neponset River, and the third is the peak rate of discharge to westerly abutters.

Standard 3 - Minimal recharge is fulfilled on-site due to existing soil recharge rates. Calculations are provided below, as well as the HydroCAD report provided in Section 4 of this report.

R_v = Required Recharge Volume
K = Saturated Hydraulic Conductivity

$$\begin{aligned} \text{Total Impervious Area} &= 16,112 \text{ ft}^2 \\ \text{Total Impervious Area Collected} &= 13,257 \text{ ft}^2 \\ \text{Adjustment Factor} &= 16,112 \text{ ft}^2 / 13,257 \text{ ft}^2 = 1.22 \end{aligned}$$

$$\begin{aligned} Rv &= \text{Target Depth Factor for C-soils in ACEC} \times \text{impervious areas collected} \\ Rv &= (1 \text{ in}/12 \text{ in per ft.}) \times (13,257 \text{ ft}^2) = 1,105 \text{ ft}^3 \\ \text{Adjusted Rv} &= 1,105 \text{ ft}^3 \times 1.22 = 1,348 \text{ ft}^3 \end{aligned}$$

$$\begin{aligned} \text{Storage Provided System 1} &= 2,663 \text{ ft}^3 \text{ (See HydroCAD Report)} \\ \text{Storage Provided System 2} &= 2,663 \text{ ft}^3 \text{ (See HydroCAD Report)} \end{aligned}$$

Drawdown Time = $Rv/(K \times \text{Bottom Area})$
Drawdown Time = $1,648 \text{ ft}^3/(0.52 \text{ in/hr} \times 1\text{ft}/12\text{in}) \times 994.5 \text{ ft}^2$
Drawdown Time = 37.8 Hours

For each System 1 & 2 the required drawdown times have been met. The calculations are included in the HydroCAD report.

- Standard 4 - The project meets the TSS removal requirements through the use of deep sump catch basins with outlet hoods, oil/grit separator, along with the added treatment of detention basins.
- Standard 5 - The project locus does not qualify as a land use with higher potential pollutant loads.
- Standard 6 - The project locus does not lie within an Area of Critical Environmental Concern.
- Standard 7 - The project does not qualify as a redevelopment project based upon the increase of impervious area. The project is however subject to the Stormwater Management Standards only to the maximum extent practicable as a small residential project including four or fewer single family lots that have a stormwater discharge that may potentially affect a critical area.
- Standard 8 - A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities has been included in Section 2.
- Standard 9 - A long term operation and maintenance plan has been developed for this property to ensure the stormwater management systems are function as designed and is included in Section 2.
- Standard 10 - Per Standard No. 10 of the MassDEP Stormwater Management Standards, there shall be no illicit discharges to the stormwater management system. The Property Manager is responsible for implementing the Operation and Maintenance Plan and overseeing activities at the facility to prevent illicit discharges to the drainage system from occurring. It is strictly prohibited to discharge any products or substances onto the ground surface or into any drainage structures, such as catch basin inlets, manholes, or drainage outlets that would be a detriment to the environment.

It is DBS's belief that the project complies with the Stormwater Management Standards. The project as proposed will protect the abutter in the short term through proper construction and erosion protection techniques. It will also protect the environment from long term impacts due to the improved stormwater controls.

Stormwater Runoff Comparison Chart for Pre- and Post-Construction Easterly Flows

2-Year Storm (3.37")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	0.82	Flow off-site	0.20
10-Year Storm (5.27")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	1.79	Flow off-site	0.51
25-Year Storm (6.46")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	2.44	Flow off-site	0.73
100-Year Storm (8.29")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	3.45	Flow off-site	1.08

Stormwater Runoff Comparison Chart for Pre- and Post-Construction Northerly Flows

2-Year Storm (3.37")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	1.58	Flow off-site	1.33
10-Year Storm (5.27")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	3.53	Flow off-site	2.87
25-Year Storm (6.46")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	4.83	Flow off-site	3.86
100-Year Storm (8.29")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	6.88	Flow off-site	5.52

Stormwater Runoff Comparison Chart for Pre- and Post-Construction Westerly Flows

2-Year Storm (3.37")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	0.46	Flow off-site	0.46

10-Year Storm (5.27")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	1.09	Flow off-site	1.07

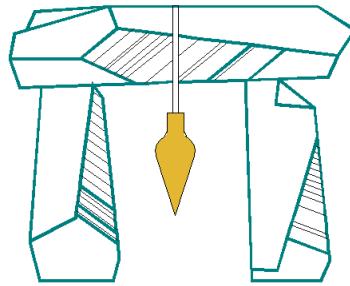
25-Year Storm (6.46")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	1.51	Flow off-site	1.48

100-Year Storm (8.29")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	2.18	Flow off-site	2.14

SECTION 2 - MANAGEMENT PLANS

Stormwater Operation & Maintenance Plan Erosion and Sedimentation Control Plan

DeCelle-Burke-Sala



& Associates, Inc.

**Stormwater Operation & Site Maintenance Plan
for
Milton Hill Development
Definitive Residential Subdivision
at
34 Milton Hill Road
in
Milton, Massachusetts**

Prepared by:

DeCelle-Burke-Sala & Associates, Inc.
1266 Furnace Brook Parkway
Suite 401
Quincy, MA 02169

Prepared for:

Joshua D. Wild
174 Dorchester Street
Boston, MA 02127

May 23, 2022

Introduction

This Stormwater Operation & Maintenance Plan is (OMP) for the residential subdivision located at 34 Milton Hill Road in Milton, Massachusetts. The OMP is outlined below to provide long term operation and maintenance procedures of the stormwater controls installed to manage the stormwater flow generated on the site and improve runoff quality. The landowners are required to implement the procedures and ensure the long term benefits of the stormwater controls approved and installed for this project. The OMP provides simple operational and maintenance procedures for the stormwater control structures as well as perform various tasks to remove pollutants from areas that would have potential to be picked up on site and moved via stormwater offsite.

The landowners shall be responsible to inspect, maintain and operate the stormwater management system as well as inspect the grounds for eroded areas and collected pollutants. Appointing a responsible person in charge to implement this OMP on behalf of the landowners is preferred but the landowners shall be responsible at all times for implementing this OMP.

Responsible Party - Joshua D. Wild
174 Dorchester Street
Boston, MA 02127

The responsible party listed above is responsible for inspecting, maintaining and keeping copies of maintenance records for the following plan and will be referred to as “The Site Manager” for the remainder of this report. If another individual/company is responsible for the every day management of the property the name and contact information shall be made available to the Milton Engineering Department. The responsible party can expect a yearly budget of \$1,500 to \$2,000 per year to maintain this site. The inspection and maintenance report generated by the Site manager shall be submitted to the Milton Engineering Department for review and record.

Non-Structural Operations

Pavement Sweeping

Pavement sweeping will be performed twice during the year, in April-May and in September-October. The Site Manager shall contract with a property management company that provides street sweeping services. The company shall be in good standing in the Commonwealth of Massachusetts and experienced in performing these services. All sweepings shall be disposed of by the hired company off-site in a legal manner.

Snow Management

Proper snow management practices will be implemented to minimize runoff and pollutant loading impacts. Plowed or shoveled snow will be placed in pervious areas at the edges of the driveways/roadway where it can slowly infiltrate. Snow will be placed on to pervious areas that are not subject to excessive shade from buildings or vegetation. All accumulated sediment from snowmelt shall be removed each spring.

Structural Operations

Catch Basins and Deep Sump Drain Manholes

The three catch basins and three deep sump drain manholes were installed to capture stormwater runoff and provide pretreatment for TSS and oils. To ensure maximum capacity and efficiency, the deep sump catch basins and manhole sums will be cleaned when half of the available capacity of the sump has been used or at a minimum of once per year. The Manager shall inspect the sums at least twice per year. The Site Manager shall hire a contractor in good standing in the Commonwealth of Massachusetts with experience in cleaning stormwater sums with a vacuum truck. All sediment and water retrieved from the sums shall be disposed of by the hired company off-site in a legal manner. The Manager shall provide a written inspection report of which an example form is attached.

Underground Concrete Structure

The two underground concrete infiltration structures were installed for detaining and infiltrating stormwater runoff to prevent down-gradient flooding. Inspection manholes are brought to grade to allow the Site Manager to inspect the chambers and determine if ponding or accumulating sediment has occurred within the structure or at the outlet control structure located within the chamber. The Site Manager shall inspect the chambers twice per year. If the chambers require service then the Site Manager shall hire a contractor in good standing in the Commonwealth of Massachusetts with experience in cleaning underground chambers to perform this task in compliance with all local and state laws specifically regarding confined space cleaning. All sediment and water retrieved from the chambers shall be disposed of by the hired company off-site in a legal manner. The Site Manager shall provide a written inspection report of which an example form is attached.

Site Management

The entire property shall be inspected on a quarterly basis for rutting, potholes, broken curbing, depressions, eroded areas and any other site damage caused by vehicular or human activity. The driveways, sidewalks and roadway shall be inspected for broken pavement, potholes, oxidation, rutting and cracking. If evidence of any deterioration of pavement occurs a pavement repair plan shall be implemented that may include, crack sealing or pavement pitching. The Manager shall hire a contractor in good standing in the Commonwealth of Massachusetts with experience in paving to repair any potholes, broken curbing or other damaged paved area.

Landscaped areas shall be inspected to identify any erosion or dying plants. If any erosion is observed on site the area shall be raked as necessary to maintain grade and revegetated as needed. A cause of the erosion shall be identified to prevent future incidents. Solutions may include slope reinforcement or minor regrading to prevent channelization of runoff. Grassed areas shall be raked out and seeded as necessary to maintain an even vegetated surface. The Manager shall hire a landscaper in good standing in the Commonwealth of Massachusetts with experience in re-vegetating eroded areas.

Record Keeping

Records of the inspections and maintenance for the Non-Structural and Structural Operations performed or organized by The Site Manager for the property shall be up to date, available for review and inspection on-site and submitted to the Town of Milton Engineering Department for review and record. Records shall be backlogged for three years before they are disposed of. An example record keeping sheet is attached.

Illicit Discharge Statement

Per Standard No. 10 of the MassDEP Stormwater Management Standards, there shall be no illicit discharges to the stormwater management system. The Property Manager is responsible for implementing the Operation and Maintenance Plan and overseeing activities at the facility to prevent illicit discharges to the drainage system from occurring. It is strictly prohibited to discharge any products or substances onto the ground surface or into any drainage structures, such as catch basin inlets, manholes, water quality units, forebays, basin or drainage outlets that would be a detriment to the environment.

Property Manager: _____ **Date** _____

Pine Gardens Definitive Subdivision at 34 Milton Hill Road

Stormwater Operation & Site Maintenance Plan

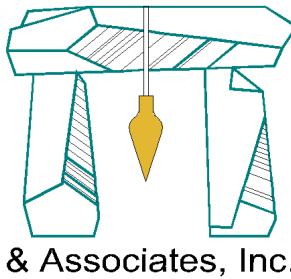
INSPECTION SCHEDULE AND EVALUATION CHECKLIST

Best Management Practice	Inspection Frequency	Date Inspected	Contractor	Current Conditions and Minimum Maintenance / Repairs, if necessary	Completed Maintenance / Repair (i.e. date, contractor, tasks complete, etc...)
Site Sweeping	Biannual				
Catch Basins and Deep Sump Drain Manholes	Biannual				
Underground Concrete Chambers	Biannual				
Pavement/Curbings	Quarterly				
Vegetated Areas	Quarterly				
Overall Site Condition	Quarterly				

Property Manager: _____

Date _____

DeCelle-Burke-Sala



& Associates, Inc.

**Erosion & Sedimentation Control Plan
for
Milton Hill Development
Definitive Residential Subdivision
at
34 Milton Hill Road
in
Milton, Massachusetts**

Prepared by:

DeCelle-Burke-Sala & Associates, Inc.
1266 Furnace Brook Parkway
Suite 401
Quincy, MA 02169

Prepared for:

Joshua D. Wild
174 Dorchester Street
Boston, MA 02127

May 23, 2022

Table of Contents

Section 1.0	- Plan Objectives	Page 3
Section 2.0	- Introduction	Page 3
Section 3.0	- Current Site Conditions	Page 3-6
Section 4.0	- Project Description	Page 6-7
Section 5.0	- Erosion & Sedimentation Control Plan	Page 7-10
5.1	- Major Const. Sequence for Site	Page 7-9
5.2	- Best Management Practices	Page 9-10
5.2.1	- Dumpster	
5.2.2	- Sweeper	
5.2.3	- Crushed Stone Apron	
5.2.4	- Erosion Control Barrier	
5.2.5	- Dust Control	
5.2.6	- Disturbed Surface Control	
5.2.7	- Temporary Stormwater Control	
5.2.8	- Inlet Protection Control	

1.0 - Plan Objectives

- To protect abutting properties and wetland resources from construction related pollutant impacts generated from land disturbance and construction activities located adjacent to environmentally sensitive areas;
- Control existing, and potential erosion, sediment transport and pollutant impact events by installing and maintaining construction related Best Management Practices (BMP's) to reduce and/or prevent the discharge of stormwater pollutants into wetland resources of the Commonwealth of Massachusetts;
- To protect surface stormwater quality, ground water quality, and minimize off-site sediment transport into the wetland resources during construction;
- To prevent local and off-site flooding by controlling peak rates and volumes of stormwater runoff during construction; and
- To eliminate illicit discharges to stormwater drainage systems that causes pollution during construction.

2.0 - Introduction

This Erosion and Sedimentation Control Plan (The “Plan”) has been devised for the construction of a two-lot residential subdivision at 34 Milton Hill Road in Milton, Massachusetts. The purpose of the Plan is to protect the surrounding environment from contaminated stormwater during construction of the development. The stormwater will be treated before release and surfaces stabilized to minimize erosive events by implementing, installing and maintaining construction related Best Management Practices (BMP's) to reduce and/or prevent the discharge of stormwater pollutants into wetland resources of the Commonwealth of Massachusetts. The BMP's are described in the Stormwater Management Standards developed by the Massachusetts Department for Environmental Protection and it is our belief that short-term construction related pollution prevention generated from this site can be achieved.

3.0 - Current Site Conditions

The project locus contains a $2,197 \pm$ S.F. vacant single family house in a dilapidated state, located in the southwesterly portion of the site. The project locus is accessed off of Milton Hill Road by a single asphalt driveway. The asphalt driveway transitions to a dirt driveway, which wraps around the rear of the existing single family house and provides access to the attached garage. Along the southerly edges of the existing driveway are two

stone walls with one being adjacent to the attached garage. South of the existing house is a chain link fenced in area. The slope adjacent to the Neponset River is lined with a rip-rap slope along the majority of the frontage with the river. There is an existing wall and boat ramp with a damaged dock in the northeasterly portion of the site along the Neponset River.

The site is vegetated by tree growth along the westerly portion of the site. The tree growth extends to the northerly portion of the site adjacent to the Neponset River. The majority of the land adjacent to the Neponset River is heavily vegetated with dense undergrowth. The middle and southerly majority of the site is vegetated by lawn. The site has a significant slope which starts in the southwest corner of the site at elevation 95' and slopes down to the Neponset River which has a mean high water of elevation 5.0'. All of the elevations mentioned above reference the North American Vertical Datum of 1988 (NAVD88).

The existing house is serviced by existing water, gas, sewer, and underground electric/communication services which connect to the utilities within the Milton Hill Road layout. There are currently no stormwater control structures on the project locus. The stormwater runoff flows freely overland and down the slope with the majority of the runoff going towards the Neponset River, and smaller portions going to the abutters to the east and west.

There are numerous wetland resource areas that are located on-site. Adjacent to the Neponset River, FEMA flood zone AE elevation 11.0 extends onto the site which partially coincides with the Coastal Bank located on-site. The northerly portion of the site adjacent to the Neponset River is located with the Neponset River Estuary Area of Critical Environmental Concern (ACEC). The central resource features of the Neponset River Estuary ACEC are the Neponset River and portions of its tributaries, the estuary, salt marshes, floodplains, fishery habitat, and diverse wildlife habitat. Based upon observations made during the site inspection, there is an unmapped intermittent stream located on the site. Based upon the watershed area, the unmapped stream in the eastern portion of the site would be designated as intermittent and would not contain a Riverfront Area under the Act/Regulations. Based upon the stream mapping, the Neponset River would be designated as perennial and Riverfront Area under the Act/Regulations exists on site up gradient from the Mean Annual High Water Line El. 5.0. For tidal rivers, the Mean Annual High-water Line is coincident with the Mean High Water Line determined under 310 CMR 10.23 (see 310 CMR 10.58(2)(a)2.c.). Due to the sites proximity to the Neponset River, the 100-ft. and 200-ft. riverfront areas extend onto the site. Wetlands are present on-site and were delineated by EcoTec, Inc. on January 27, 2022. The Natural Resources Conservation Service (NRCS) has mapped the soils for the project locus as Paxton fine sandy loams.

4.0 - Project Description

The proposed project is a two lot residential subdivision which will include the construction of two new single family houses. Access to the subdivision will be provided off of Milton Hill Road by a 30-ft. wide private way, which ends at a 150-ft. by 30-ft. hammerhead. The proposed street layout will have 18-ft. of pavement with sloped granite curbing. The pavement in the hammerhead will contain a 47-ft. by 18-ft. turnaround area. Each proposed single family house will be provided access to the street by a curb cut and asphalt driveway.

The street will be graded to have an 8-percent (8%) slope for the first approximately 150-ft. The road will briefly transition to a 4-percent (4%) slope adjacent to the proposed driveway for Lot 1 for approximately 25-ft. The road will transition to a 6-percent (6%) slope for approximately 100-ft. before leveling out at the end of the road adjacent to Lot 2. The leveled area adjacent to Lot 2, including the proposed driveway on Lot 2 will have approximately a 2-percent (2%) slope to allow for proper drainage. A retaining wall is proposed along a portion of the road from approximately Station 1+60 extending to the proposed house on Lot 2 along the easterly side of the roadway. The retaining wall was designed so as to not encroach onto the 25-ft. Milton By-law Wetland No-Disturb Zone with proposed structures, grading, and construction activities. The wall is approximately 4-ft. in height at its highest point. On the westerly side of the road from Station 1+70 to Station 2+70 is another proposed retaining wall located on Lot 1.

Both proposed houses are proposed to have an E-One pump chambers that will collect and pump the wastewater produced from the proposed single family dwellings. A 1-1/2" force main will connect to the existing sewer system located in Milton Hill Road. A proposed 4-in. DICL water main is to be extended down the proposed way from the existing water main in Milton Hill Road and stub at the end of the proposed way. The proposed single family houses will connect to the proposed main with 1-inch Type "K" copper water services and curb stops brought to grade. Electric and communications shall be run underground from the existing underground electric and communication services in Milton Hill Road and service both of the proposed houses. The gas main in Milton Hill Road is proposed to be extended down the proposed road to provide the proposed house with access to gas services.

Stormwater generated by the proposed street will be collected, detained, and partially recharged to meet local and state regulations. The stormwater generated by the proposed street will be captured by a series of deep sump catch basins and detained and infiltrated using two underground infiltration structures. Total Suspended Solids are removed to 44% efficiency due to the proximity to a critical area, a Contech CDS-6 oil/grit separator structure is proposed. All captured flows are directed to System "1". Flows are captured from the entire proposed roadway, a majority of Lot 1, and a portion of Lot 2. System "1" is composed of 45 - 4-ft.x4-ft.x4-ft. concrete chambers in a 5 by 9 configuration, with 18-

in. of surrounding stone and 6-in. of stone below. System “1” is designed to overflow for the 2, 10, 25, and 100-year storms via an 8-in. HDPE pipe to proposed drain manhole 3. From drain manhole 3 the flows are directed to System “2” by an 8-in. HDPE pipe. System “2” is identical to System “1”, as it utilizes 45 - 4-ft.x4-ft.x4-ft. concrete chambers in a 5 by 9 configuration, with 18-in. of surrounding stone and 6-in. of stone below. System “2” utilizes an 8-in. HDPE pipe for outlet control, directing stormwater down gradient to a rip-rap outlet designed to dissipate flow velocities for erosion control.

It is the intent of this stormwater management system to meet MADEP’s ten stormwater management standards. The required recharge volume is met and the TSS requirement is also met with 80% TSS removal through the use of deep sump catch basins, oil/grit separator, and the additional sediment captured in the bottom stone surface of the infiltration structures.

5.0 - Erosion & Sedimentation Control Plan

The contractor shall implement an Erosion and Sedimentation Control Plan that protects the surrounding environment from sediment laden stormwater runoff generated during construction activities and from other pollutants generated from construction activities such as litter and dust. Construction sequencing is part of managing a site as is implementing many BMP's that assist in controlling construction related pollutants.

5.1 - Major Construction Sequence for Site

The sequence is developed to contain all potential sedimentation and erosion incidents that could occur during the construction of the project. The contractor however is responsible to manage the site effectively to control offsite sediment transport which may not be included in this plan. The sequence will coordinate the work within the erosion control barrier and coordinate other sedimentation control features to reduce the stress upon the erosion control barrier as well as limit off-site sediment transport. The sequencing is as follows:

- Place safety fence around property to limit access and protect the public.
- Place erosion control barrier at limit of work where possible. The barrier shall be 12" diameter mulch wattles.
- Provide inlet protection for existing drainage structures on and off-site to minimize sediment buildup in the catch basins.
- Install crushed stone construction entrance to reduce soil tracking off-site by construction vehicles.
- Cut and cap/disconnect all existing utilities as shown on the plans.
- Raze existing building.
- Grub site and remove/stockpile loam on site.
- Install temporary drainage controls

- Rough grade the site.
- Install proposed roadway drainage. Install silt sacks in catch basins as soon as they have been installed.
- Install concrete infiltration structures.
- Install sewer system.
- Install water supply, gas supply and electrical supply.
- Final grade the proposed roadway.
- Install asphalt binder course for roadway.
- Install sloped granite curbing.
- Excavate for proposed foundations.
- Construct proposed foundations.
- Extend utility services to the proposed foundations.
- Begin vertical construction.
- Install roof drain infiltration systems.
- Final grade the site.
- Install asphalt binder course for driveways.
- Install final landscaping, including hydroseed, plantings, light poles, walkways, handicap ramps and stairs.
- Place final asphalt top coat on roadway and driveways.
- Clean up site.

The contractor has several procedures to perform to maintain the site. They include but are not limited to:

- Clean erosion control barrier of debris, silt and sand.
- Replace erosion control barrier at limit of work as needed. Barrier to be inspected on a daily basis or after any large storm events.
- Remove and replace crushed stone apron when stone is overburdened with silt.
- Sweep the site as necessary to minimize vehicle soil tracking and sediment laden runoff.
- Any stockpiled soils to be covered to minimize fugitive dust and surrounded with erosion control barrier to minimize sediment transport.
- Maintain a covered dumpster on site to minimize wind blown debris from littering neighborhood and resource areas.
- Have a water truck onsite during the demolition portion of the project and during rough grading to minimize fugitive dust.
- Clean and maintain temporary drainage controls
- Clean nearby downstream catch basins of debris and sediment.

5.2 - Best Management Practices

The contractor shall use various types of structural and non-structural methodologies to minimize offsite pollution from construction activities. The following is a list of some BMP's that can be utilized; however, it is the contractor's responsibility to implement his strategies to minimize offsite sediment transport and fugitive dust and trash.

5.2.1 - Dumpster

The contractor shall have a dumpster on-site for the disposal of construction debris. The contractor shall cover the dumpster as needed to prevent wind blown debris from becoming litter in the environment.

5.2.2 - Mechanical or Hand Sweeper

The contractor shall sweep the site by mechanical means or by hand to reduce the sediment build-up on-site. This will reduce the surrounding area becoming impacted from construction related offsite sediment pollution.

5.2.3 - Crushed Stone Construction Apron

A crushed stone apron shall be installed at the entrance to the site to assist in removing caked soil on construction vehicles tires. The apron shall be a minimum of twenty five feet long and twenty feet wide. The contractor shall inspect the apron on a daily basis and supplement new stone as needed

5.2.4 - Erosion Control Barrier

An erosion control barrier shall be installed at the down-gradient Limit of Work and used around the site as needed. The barrier shall be used around soil stockpiles and localized excavations on site. The barrier needs to be effective in controlling sediment transport and not becoming strained as the project moves forward. The barrier shall be 12" diameter mulch wattle or approved equal. The contractor shall inspect the barriers on a daily basis and after any significant storm event and repair any damaged or stressed areas as needed.

5.2.5 - Dust Control

The use of a water truck or other method to spray water over the site during the dry season to minimize blown dust shall be implemented. The water shall not be excessively spread so erosive forces occur. The contractor shall sweep the pavement once installed and cover stockpiled soils as needed to minimize dust.

5.2.6 - Disturbed Surface Maintenance

The contractor shall stabilize the ground surface as needed to prevent erosion. Stabilization of surfaces includes the placement of pavement, rip rap, soldier piles, wood bark mulch and the establishment of vegetated surfaces. Upon the completion of construction of a particular phase, all surfaces should be stabilized even though it is apparent that future construction efforts will cause their disturbance. Vegetated cover should be established during the proper growing season and should be enhanced by soil adjustment for proper pH, nutrients and moisture content. Surfaces that are disturbed by erosion processes or vandalism should be stabilized as soon as possible. Areas where construction activities have permanently or temporarily ceased should be stabilized within 14 days from the date of last construction activity, except when construction activity will resume within 21 days (e.g., the total time period that construction activity is temporarily ceased is less than 21 days). Hydro-mulching of grass surfaces is recommended, especially if seeding of the surfaces is required outside the normal growing season. Mulching may be used for temporary stabilization. Hay bale dikes or silt fences should be set where required to trap products of erosion and should be maintained on a continuing basis during the construction process. Wheel ruts should be filled in and graded to prevent concentration of stormwater runoff. Vehicle tracks leading downhill should be blocked during periods of intense precipitation by hay bales, dikes or silt fences which should be constructed to entrap the sediment.

5.2.7 - Temporary Stormwater Controls

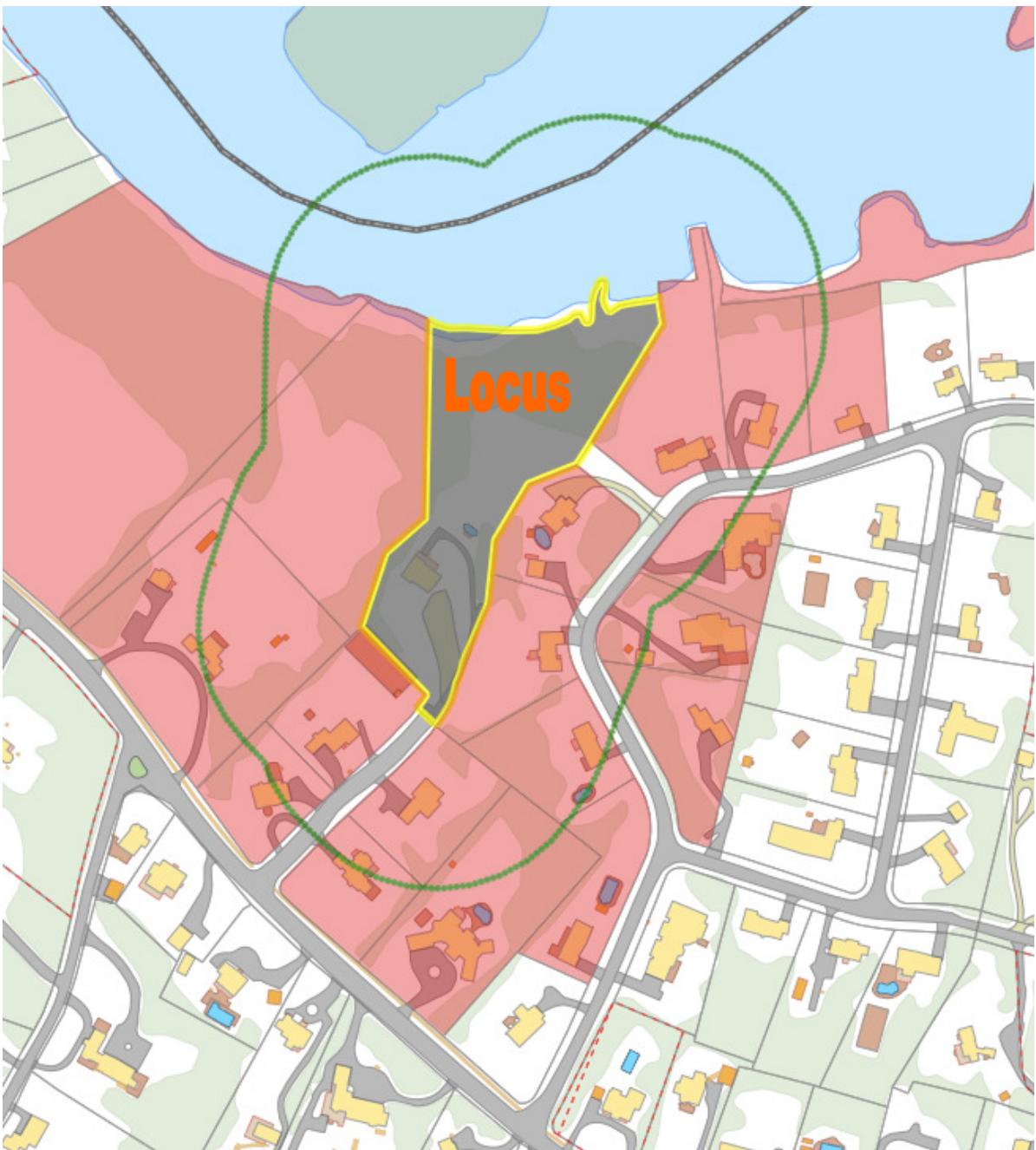
The contractor shall rough grade the site as to not concentrate the stormwater runoff and cause erosive forces. The contractor shall use a level spreader or other temporary stormwater control device to treat construction site runoff for suspended solids. The catch basins and manholes can be installed to assist in capturing the construction site runoff once installed but the sumps will need to be cleaned out of all sediment before connecting the tanks to the recharge system and final paving. The use of silt sacks on the catch basin will help minimize the cleaning of the sumps. The contractor shall sweep the pavement once installed as needed to minimize suspended solids in the stormwater.

5.2.8 - Inlet Protection Control

The contractor shall install catch basin silt sacks on and off-site as needed to protect from construction related sediment. The silt sacks shall be inspected weekly to determine if replacement or repairs are needed.

SECTION 3 - SUPPORTING MAPS

Assessors Map
USGS Map
Soils Map
ACEC Map
NHESP Map
FEMA Panel
Chapter 91 Map



Map F Block 9 Lots 8

DATE:
May 23, 2022

TITLE:

Milton Assessors MAP

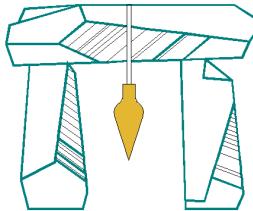
SCALE:
NOT TO SCALE

PREPARED FOR:

**Joshua D Wild
174 Dorchester Street
Boston, MA 02127**

DeCelle-Burke-Sala

PROJECT TITLE:



& Associates, Inc.

**Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186**



DATE:
May 23, 2022

TITLE:

USGS MAP

SCALE:
NOT TO SCALE

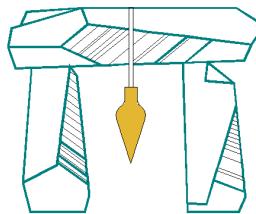
PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127

DeCelle-Burke-Sala

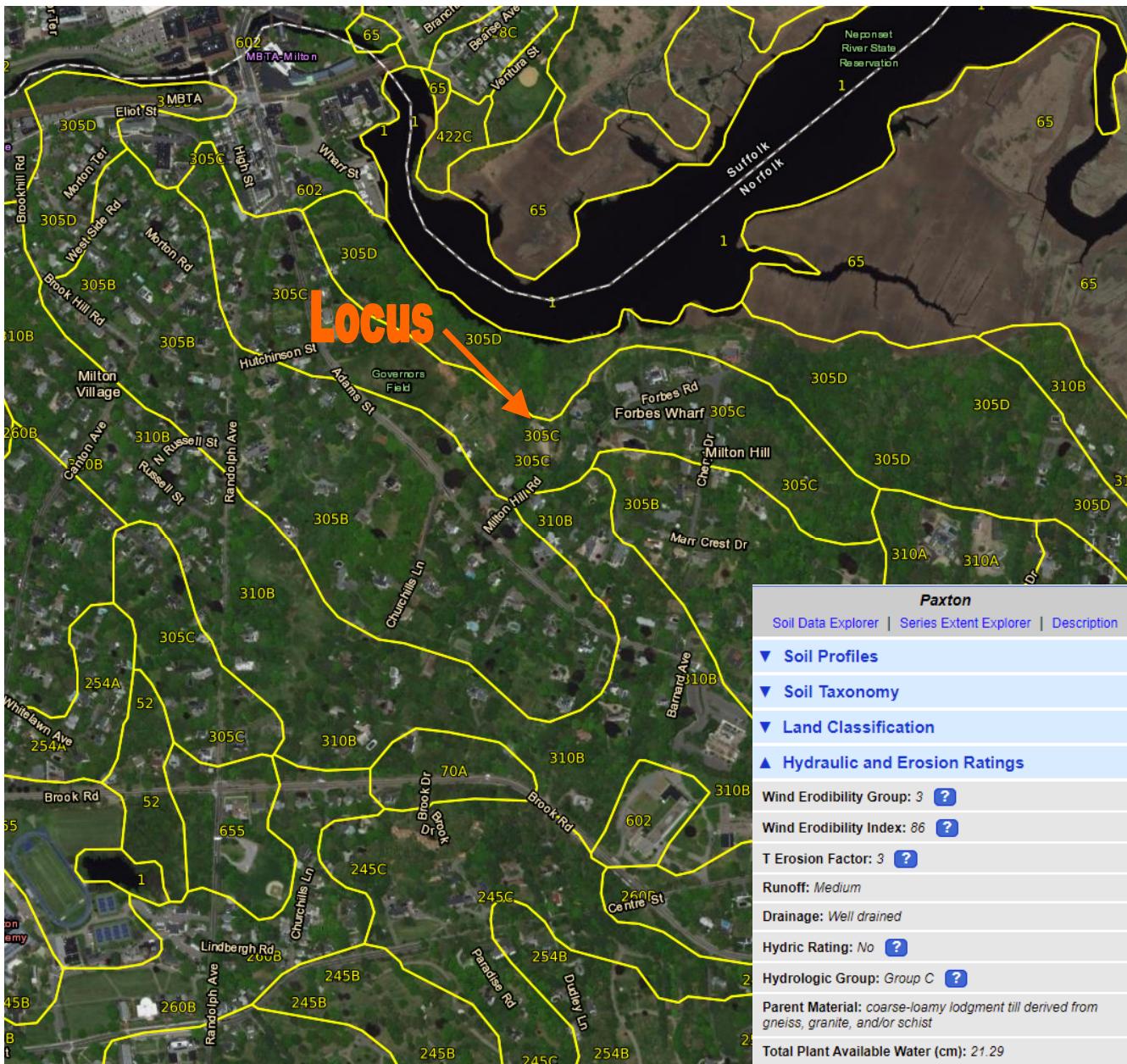
PROJECT TITLE:

Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186



& Associates, Inc.

1266 Furnace Brook Parkway, Suite 401 Quincy, MA 02169
(617) 405-5100 (O) (617) 405-5101 (F)



DATE:
May 23, 2022

TITLE:

Soils MAP

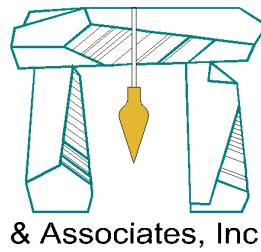
SCALE:
NOT TO SCALE

PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127

DeCelle-Burke-Sala

PROJECT TITLE:



Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186



DATE:
May 23, 2022

TITLE:

ACEC MAP

SCALE:
NOT TO SCALE

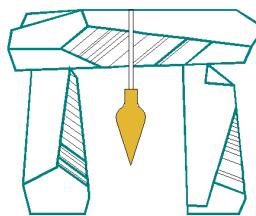
PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127

DeCelle-Burke-Sala

PROJECT TITLE:

Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186



& Associates, Inc.

1266 Furnace Brook Parkway, Suite 401 Quincy, MA 02169
(617) 405-5100 (O) (617) 405-5101 (F)



DATE:
May 23, 2022

TITLE:

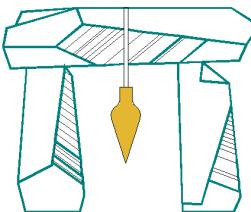
NHESP Panel

SCALE:
NOT TO SCALE

PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127

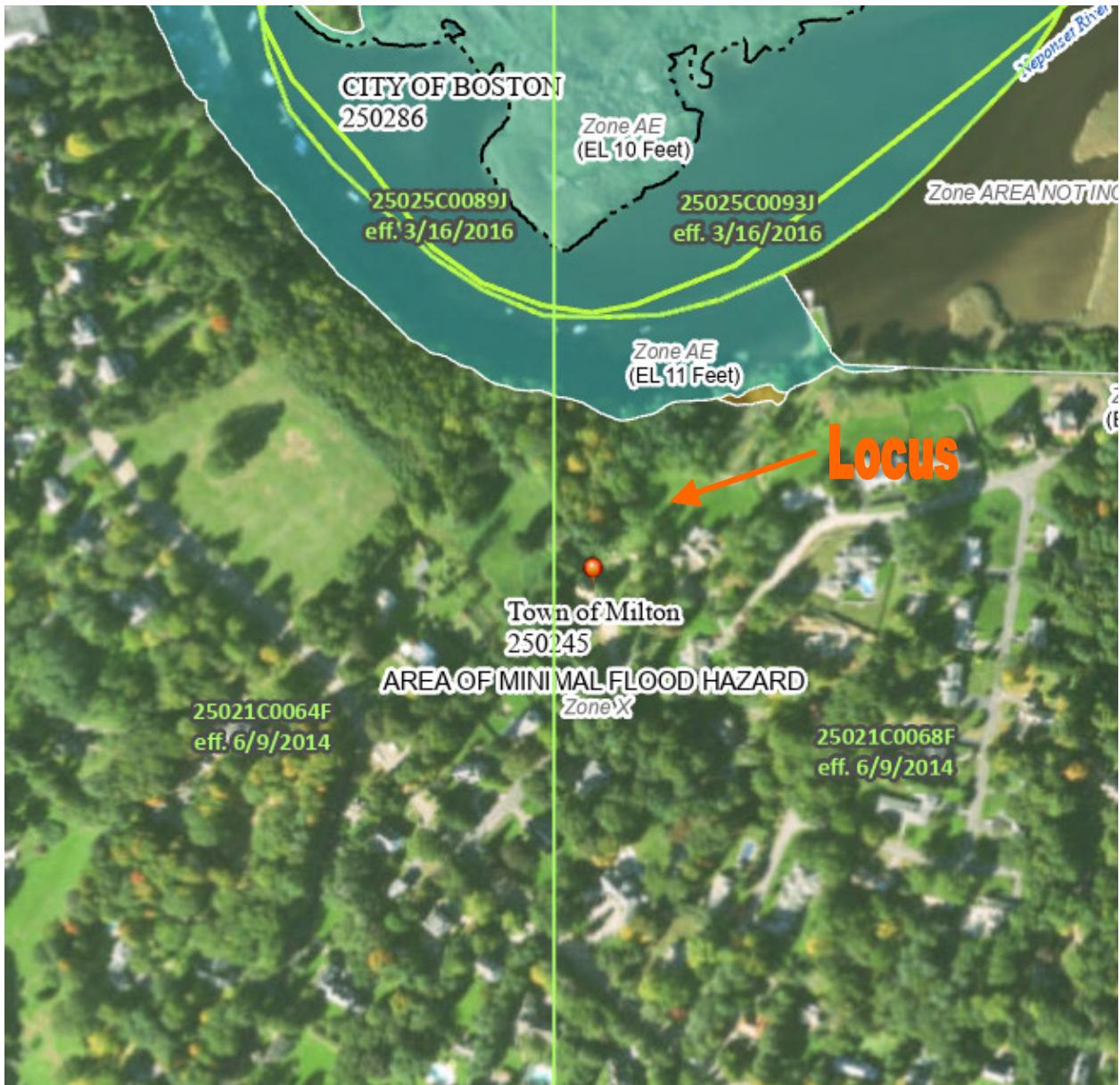
DeCelle-Burke-Sala



& Associates, Inc.

PROJECT TITLE:

Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186



DATE:
May 23, 2022

TITLE:

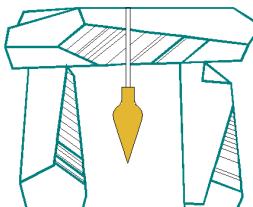
FEMA Panel

SCALE:
NOT TO SCALE

PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127

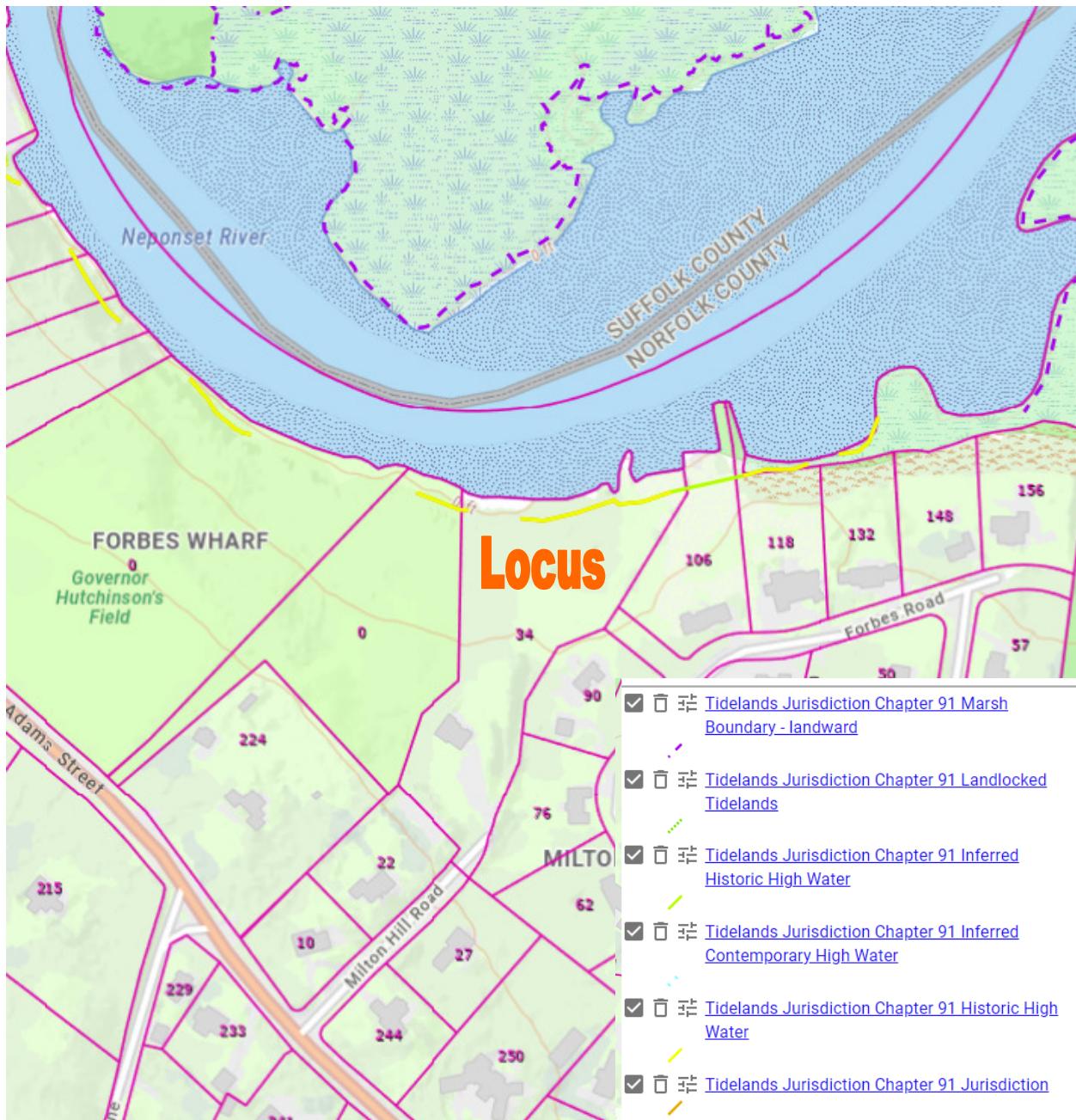
DeCelle-Burke-Sala



& Associates, Inc.

PROJECT TITLE:

Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186



DATE:
May 23, 2022

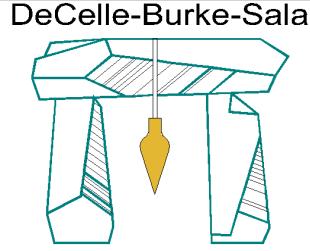
TITLE:

Chapter 91 MAP

SCALE:
NOT TO SCALE

PREPARED FOR:

Joshua D Wild
174 Dorchester Street
Boston, MA 02127



PROJECT TITLE:

Milton Hill Development
Definitive Subdivision Plan
34 Milton Hill Road
Milton, MA 02186

SECTION 4 - STORMWATER MANAGEMENT DATA

Checklist for Stormwater Report

Standard 4 Compliance

HydroCAD calculations:

Existing Conditions

2-Year

10-Year

25-Year

100-Year

Proposed Conditions

2-Year

10-Year

25-Year

100-Year

Watershed Maps



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

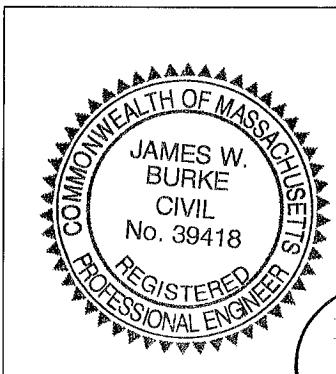
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
 - Credit 1
 - Credit 2
 - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): Recharge Structures

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
- The Required Water Quality Volume is reduced through use of the LID site Design Credits.
- Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

The BMP is sized (and calculations provided) based on:

- The $\frac{1}{2}$ " or 1" Water Quality Volume or
- The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the proprietary BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.

LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

All exposure has been eliminated.

All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- Limited Project
- Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- Bike Path and/or Foot Path
- Redevelopment Project
- Redevelopment portion of mix of new and redevelopment.

Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

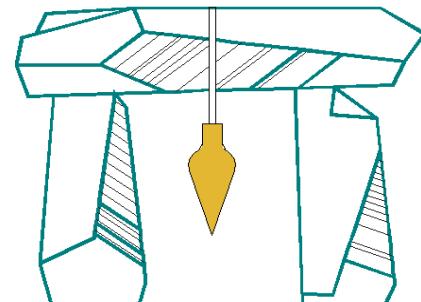
- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.



& Associates, Inc.

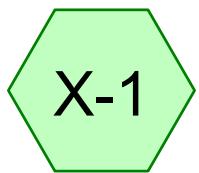
Project: **Milton Hill Development**
Location: **34 Milton Hill Road, Milton, MA**
Date: **5/23/2022**

Pretreatment Tss Removal Calculation

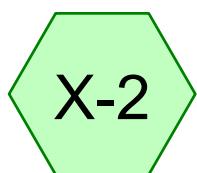
BMP	TSS Removal	Start Load	Amount Removed	Remaining Load
Deep Sump Catch Basin w/ 12R Snout	25%	100%	25%	75%
Oil/Grit Separator	25%	75%	19%	56%
Underground Infiltration System	80%	56%	45%	11%
Remaining Load		11%	0%	11%

DeCelle-Burke-Sala Associates, Inc.

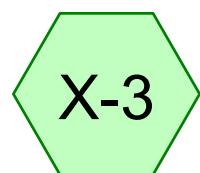
1266 Furnace Brook Parkway, Quincy, MA 02169
PH:(617)-405-5100 FX:(617)-405-5101



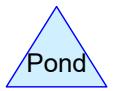
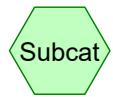
Easterly Flows



Northerly Flows



Westerly Flows



Routing Diagram for 34 Milton Hill Rd - Drainage Chambers
Prepared by Decelle-Burke-Sala & Associates, Inc., Printed 5/24/2022
HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

34 Milton Hill Rd - Drainage Chambers

Prepared by Decelle-Burke-Sala & Associates, Inc.

HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Printed 5/24/2022

Page 2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
50,591	74	>75% Grass cover, Good, HSG C (X-1, X-2, X-3)
7,680	87	Dirt roads, HSG C (X-1, X-2)
3,521	98	Paved parking, HSG C (X-1, X-2)
2,197	98	Roofs, HSG C (X-2, X-3)
23,222	70	Woods, Good, HSG C (X-1, X-2, X-3)
87,211	76	TOTAL AREA

Summary for Subcatchment X-1: Easterly Flows

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 2,600 cf, Depth= 1.33"

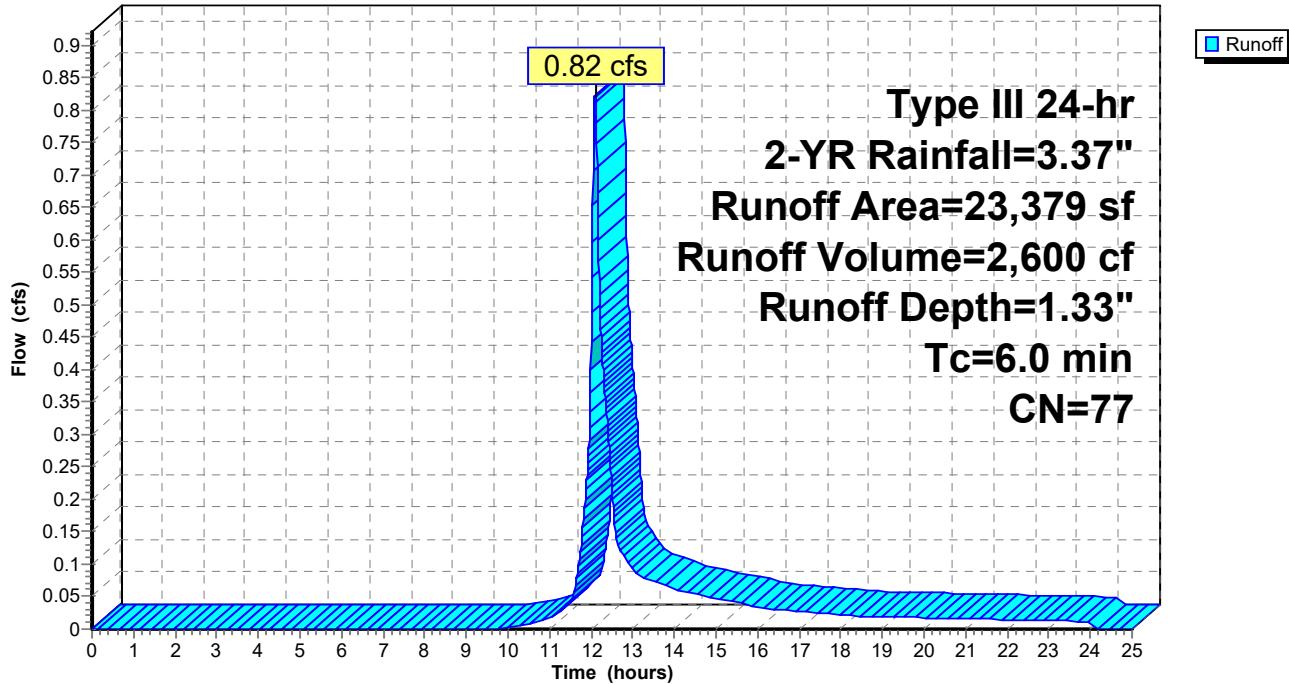
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
2,838	98	Paved parking, HSG C
3,615	87	Dirt roads, HSG C
0	98	Roofs, HSG C
6,371	74	>75% Grass cover, Good, HSG C
10,555	70	Woods, Good, HSG C
23,379	77	Weighted Average
20,541		87.86% Pervious Area
2,838		12.14% Impervious Area

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

Subcatchment X-1: Easterly Flows

Hydrograph



34 Milton Hill Rd - Drainage Chambers

Prepared by Decelle-Burke-Sala & Associates, Inc.

HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-YR Rainfall=3.37"

Printed 5/24/2022

Page 4

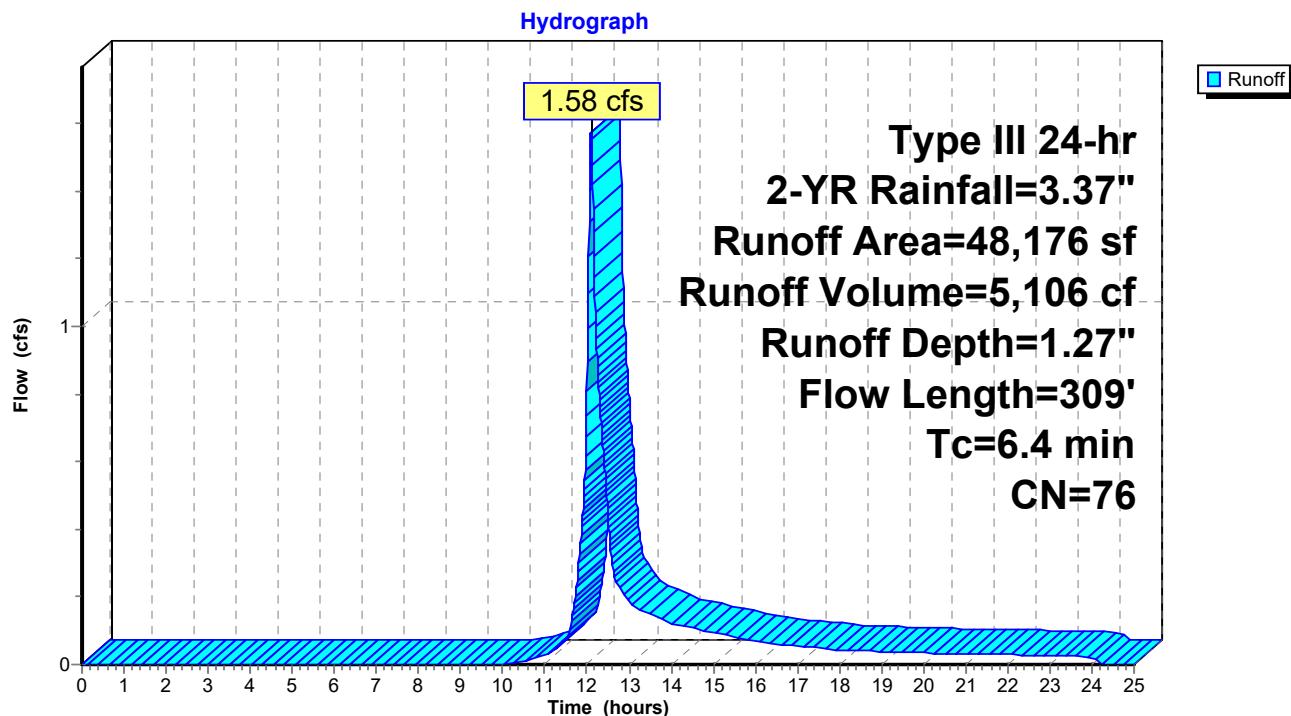
Summary for Subcatchment X-2: Northerly Flows

Runoff = 1.58 cfs @ 12.10 hrs, Volume= 5,106 cf, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
683	98	Paved parking, HSG C
4,065	87	Dirt roads, HSG C
1,105	98	Roofs, HSG C
36,861	74	>75% Grass cover, Good, HSG C
5,462	70	Woods, Good, HSG C
48,176	76	Weighted Average
46,388		96.29% Pervious Area
1,788		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.37"
1.6	21	0.0760	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.37"
0.6	52	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	49	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	66	0.1400	2.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	20	0.0960	2.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	15	0.5200	5.05		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	45	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	309	Total			

Subcatchment X-2: Northerly Flows

Summary for Subcatchment X-3: Westerly Flows

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 1,502 cf, Depth= 1.15"

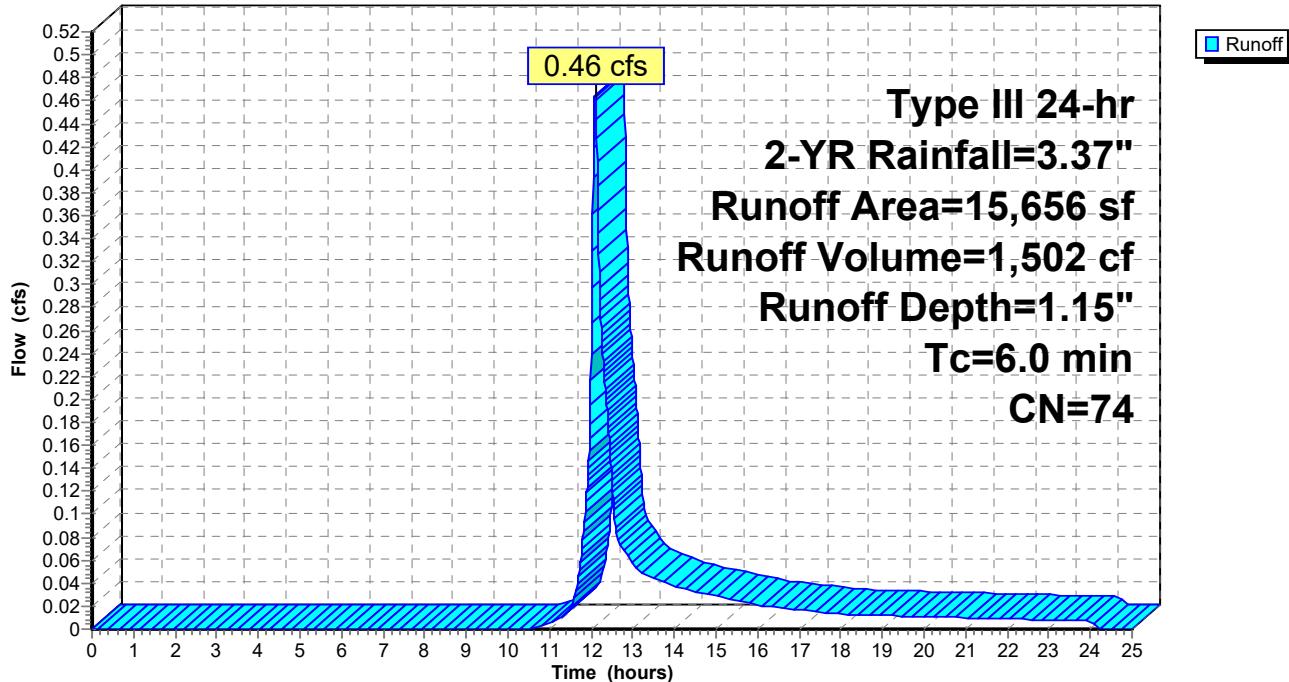
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	87	Dirt roads, HSG C
1,092	98	Roofs, HSG C
7,359	74	>75% Grass cover, Good, HSG C
7,205	70	Woods, Good, HSG C
15,656	74	Weighted Average
14,564		93.03% Pervious Area
1,092		6.97% Impervious Area

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

Subcatchment X-3: Westerly Flows

Hydrograph



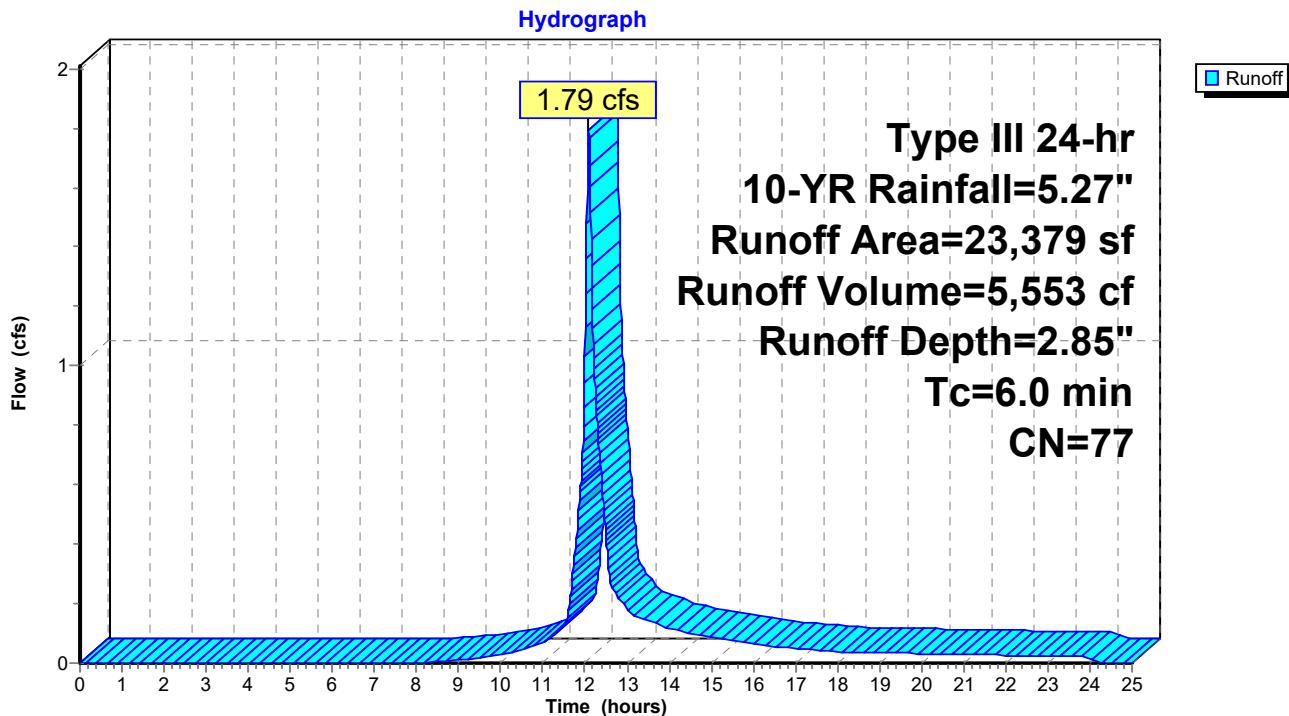
Summary for Subcatchment X-1: Easterly Flows

Runoff = 1.79 cfs @ 12.09 hrs, Volume= 5,553 cf, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
2,838	98	Paved parking, HSG C
3,615	87	Dirt roads, HSG C
0	98	Roofs, HSG C
6,371	74	>75% Grass cover, Good, HSG C
10,555	70	Woods, Good, HSG C
23,379	77	Weighted Average
20,541		87.86% Pervious Area
2,838		12.14% Impervious Area

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

Subcatchment X-1: Easterly Flows

34 Milton Hill Rd - Drainage Chambers

Prepared by Decelle-Burke-Sala & Associates, Inc.

HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-YR Rainfall=5.27"

Printed 5/24/2022

Page 8

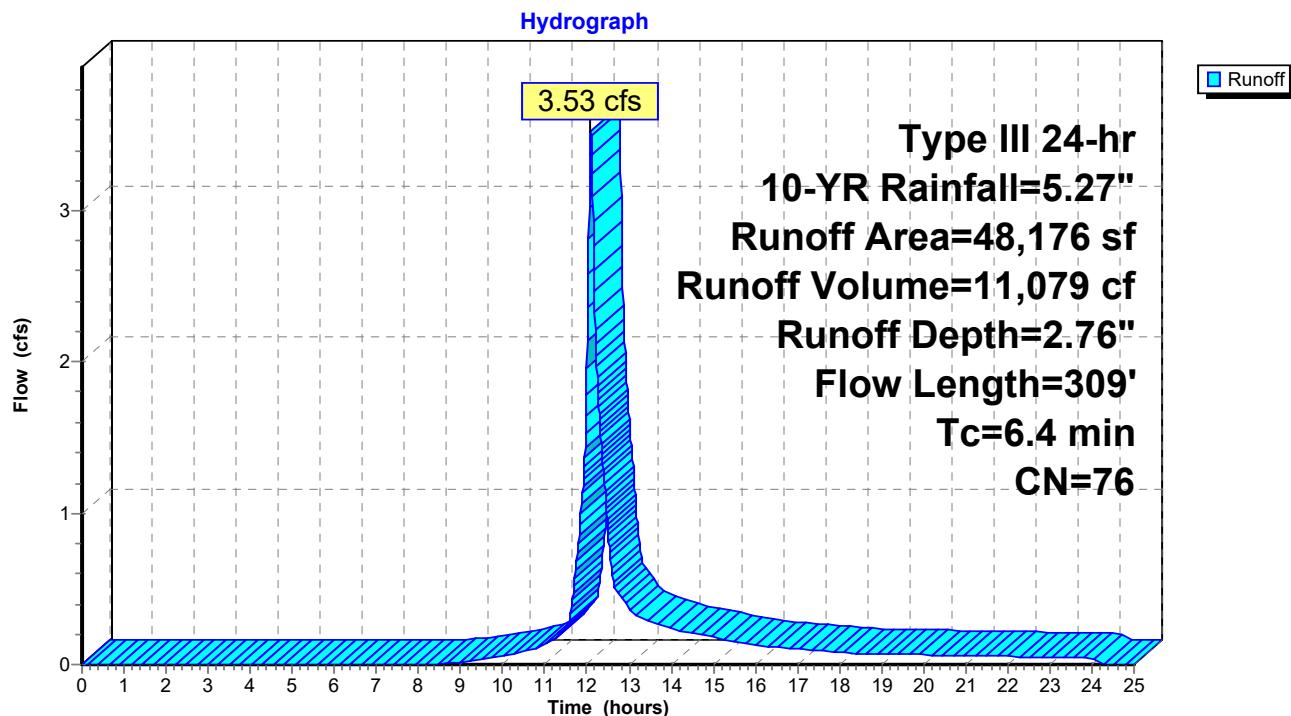
Summary for Subcatchment X-2: Northerly Flows

Runoff = 3.53 cfs @ 12.09 hrs, Volume= 11,079 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
683	98	Paved parking, HSG C
4,065	87	Dirt roads, HSG C
1,105	98	Roofs, HSG C
36,861	74	>75% Grass cover, Good, HSG C
5,462	70	Woods, Good, HSG C
48,176	76	Weighted Average
46,388		96.29% Pervious Area
1,788		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.37"
1.6	21	0.0760	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.37"
0.6	52	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	49	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	66	0.1400	2.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	20	0.0960	2.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	15	0.5200	5.05		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	45	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	309	Total			

Subcatchment X-2: Northerly Flows

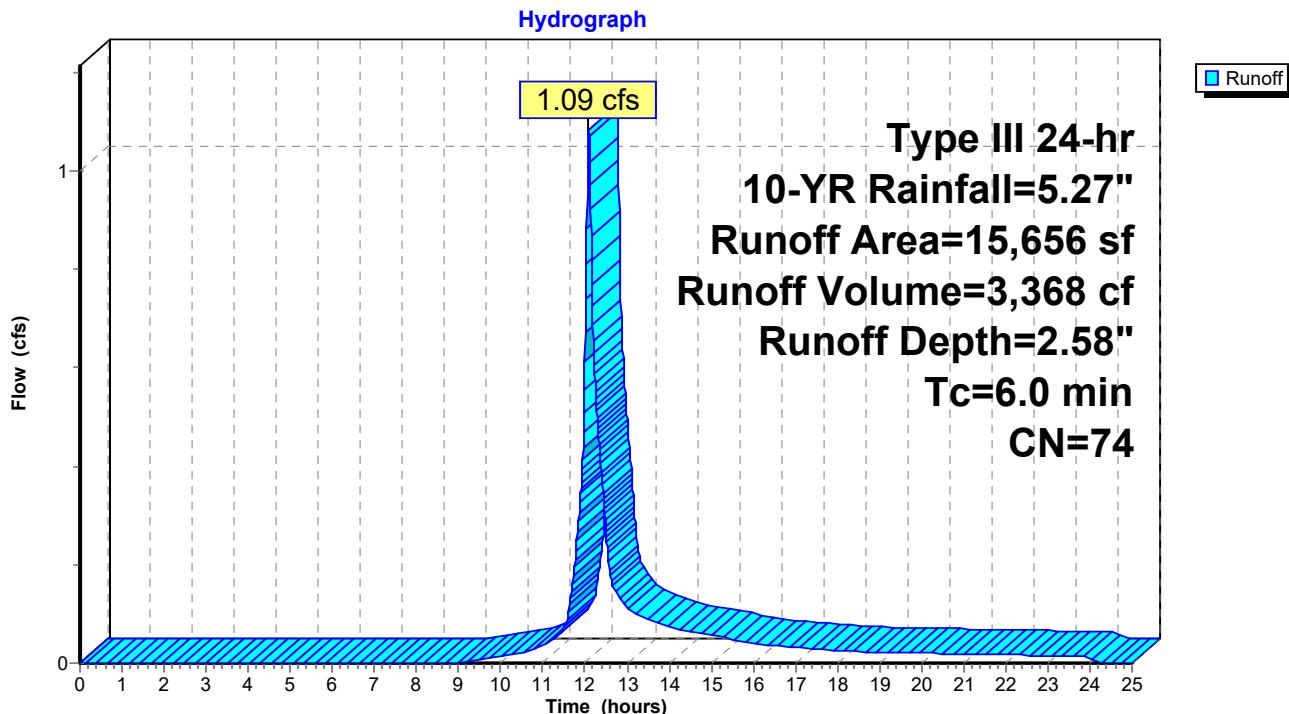
Summary for Subcatchment X-3: Westerly Flows

Runoff = 1.09 cfs @ 12.09 hrs, Volume= 3,368 cf, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	87	Dirt roads, HSG C
1,092	98	Roofs, HSG C
7,359	74	>75% Grass cover, Good, HSG C
7,205	70	Woods, Good, HSG C
15,656	74	Weighted Average
14,564		93.03% Pervious Area
1,092		6.97% Impervious Area

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

Subcatchment X-3: Westerly Flows

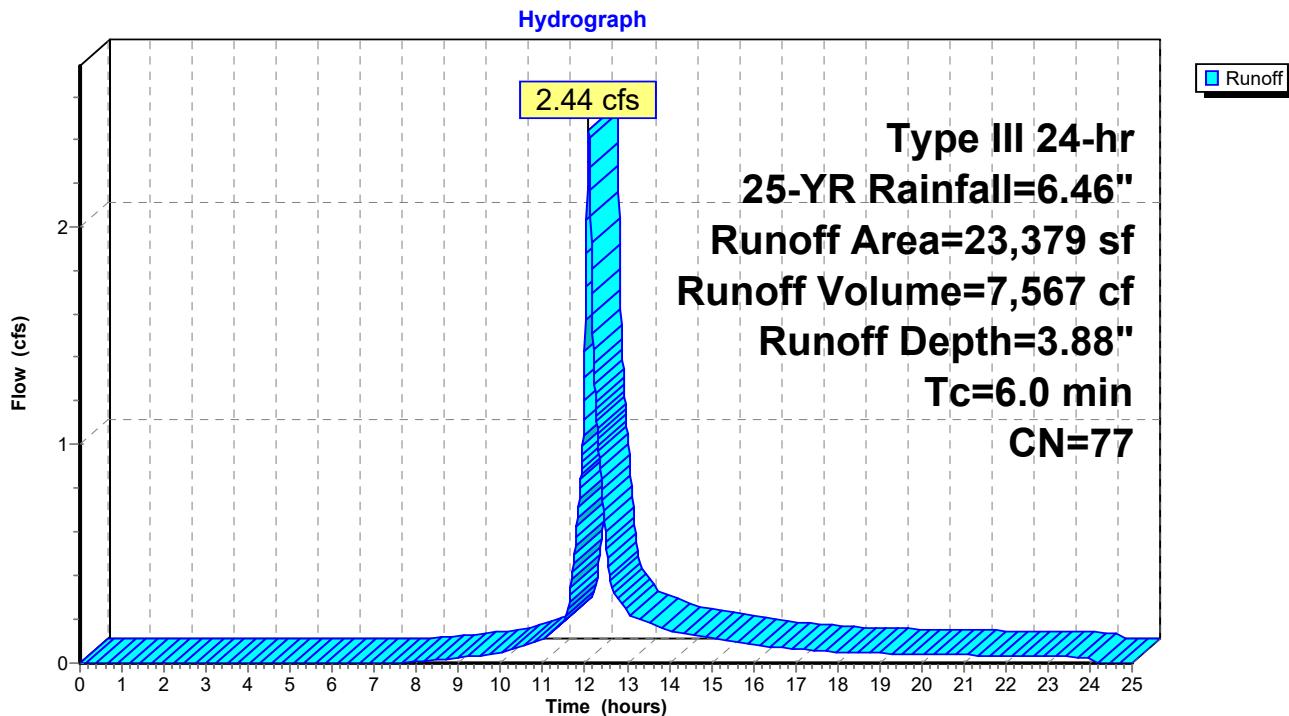
Summary for Subcatchment X-1: Easterly Flows

Runoff = 2.44 cfs @ 12.09 hrs, Volume= 7,567 cf, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
2,838	98	Paved parking, HSG C
3,615	87	Dirt roads, HSG C
0	98	Roofs, HSG C
6,371	74	>75% Grass cover, Good, HSG C
10,555	70	Woods, Good, HSG C
23,379	77	Weighted Average
20,541		87.86% Pervious Area
2,838		12.14% Impervious Area

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

Subcatchment X-1: Easterly Flows

34 Milton Hill Rd - Drainage Chambers

Prepared by Decelle-Burke-Sala & Associates, Inc.

HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-YR Rainfall=6.46"

Printed 5/24/2022

Page 12

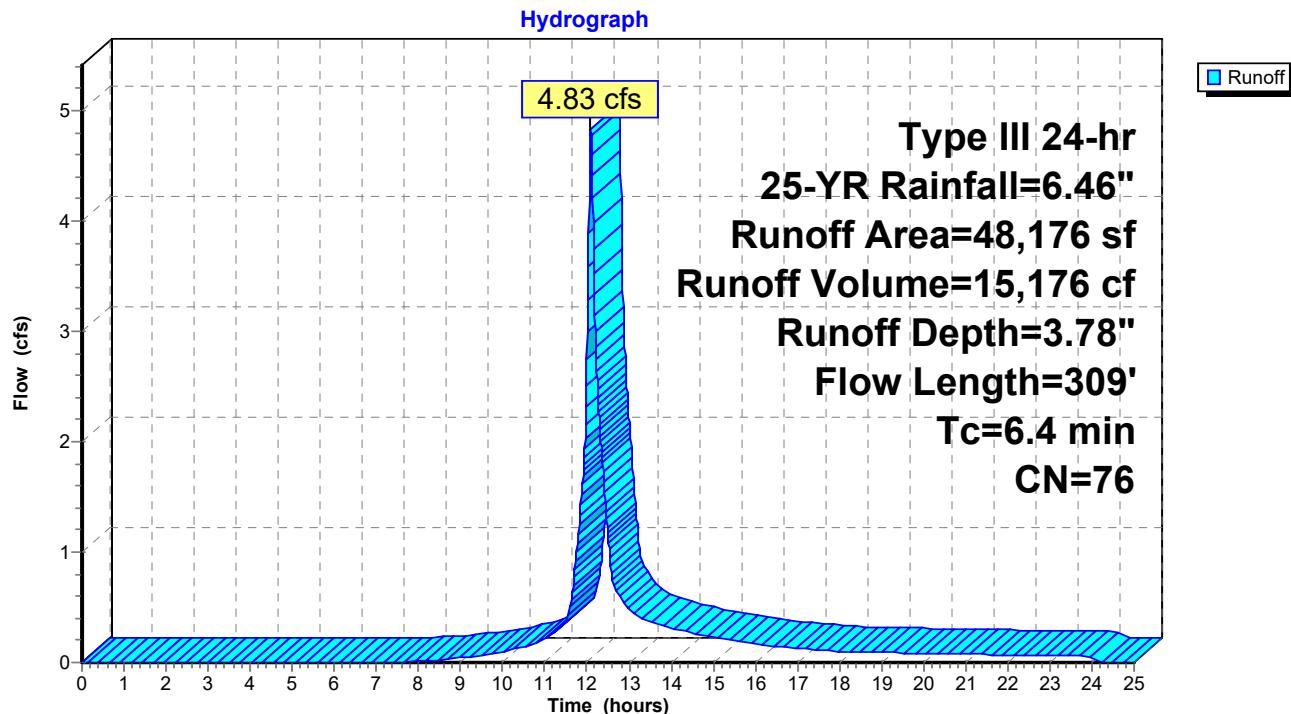
Summary for Subcatchment X-2: Northerly Flows

Runoff = 4.83 cfs @ 12.09 hrs, Volume= 15,176 cf, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
683	98	Paved parking, HSG C
4,065	87	Dirt roads, HSG C
1,105	98	Roofs, HSG C
36,861	74	>75% Grass cover, Good, HSG C
5,462	70	Woods, Good, HSG C
48,176	76	Weighted Average
46,388		96.29% Pervious Area
1,788		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.37"
1.6	21	0.0760	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.37"
0.6	52	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	49	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	66	0.1400	2.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	20	0.0960	2.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	15	0.5200	5.05		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	45	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	309	Total			

Subcatchment X-2: Northerly Flows

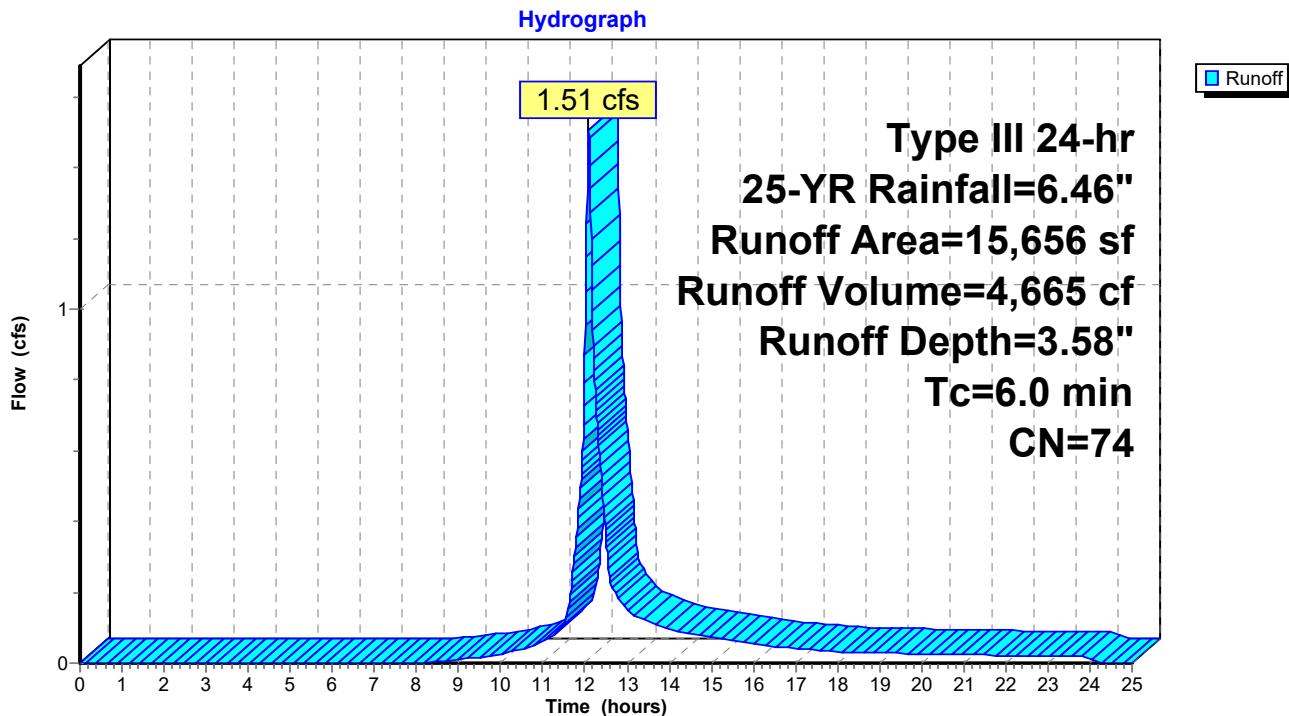
Summary for Subcatchment X-3: Westerly Flows

Runoff = 1.51 cfs @ 12.09 hrs, Volume= 4,665 cf, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	87	Dirt roads, HSG C
1,092	98	Roofs, HSG C
7,359	74	>75% Grass cover, Good, HSG C
7,205	70	Woods, Good, HSG C
15,656	74	Weighted Average
14,564		93.03% Pervious Area
1,092		6.97% Impervious Area

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

Subcatchment X-3: Westerly Flows

Summary for Subcatchment X-1: Easterly Flows

Runoff = 3.45 cfs @ 12.09 hrs, Volume= 10,795 cf, Depth= 5.54"

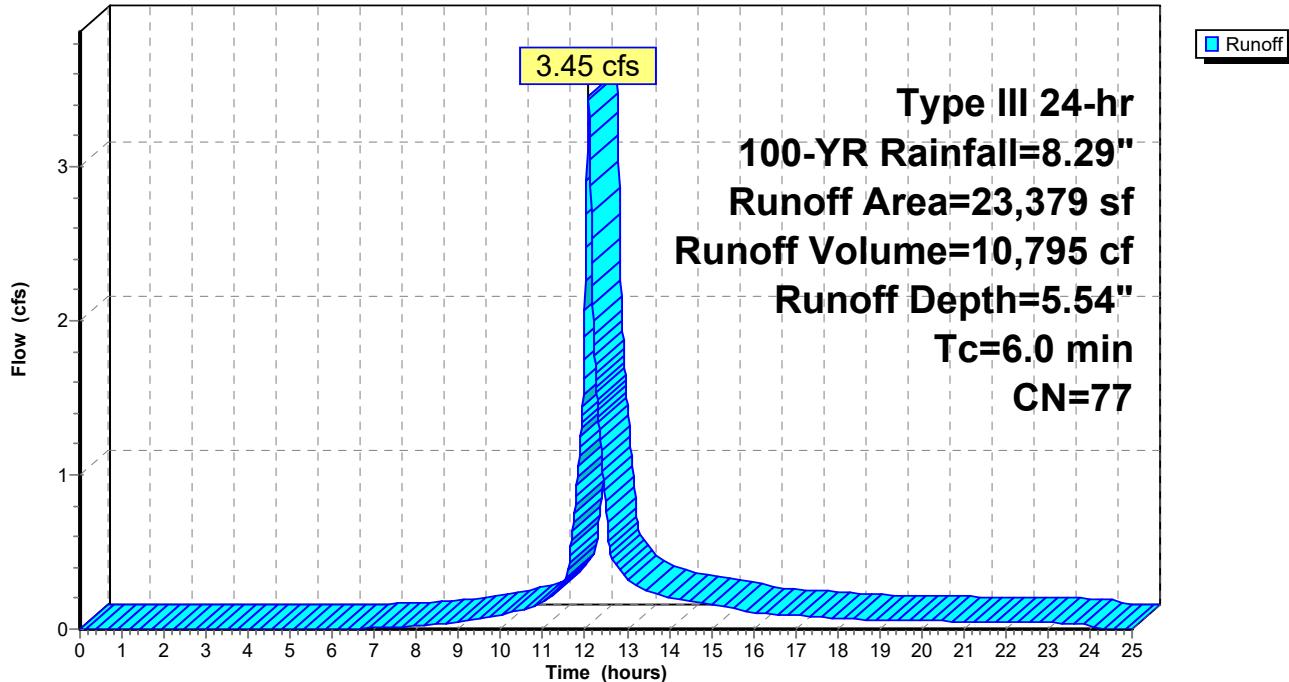
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
2,838	98	Paved parking, HSG C
3,615	87	Dirt roads, HSG C
0	98	Roofs, HSG C
6,371	74	>75% Grass cover, Good, HSG C
10,555	70	Woods, Good, HSG C
23,379	77	Weighted Average
20,541		87.86% Pervious Area
2,838		12.14% Impervious Area

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

Subcatchment X-1: Easterly Flows

Hydrograph



34 Milton Hill Rd - Drainage ChambersPrepared by Decelle-Burke-Sala & Associates, Inc.
HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-YR Rainfall=8.29"

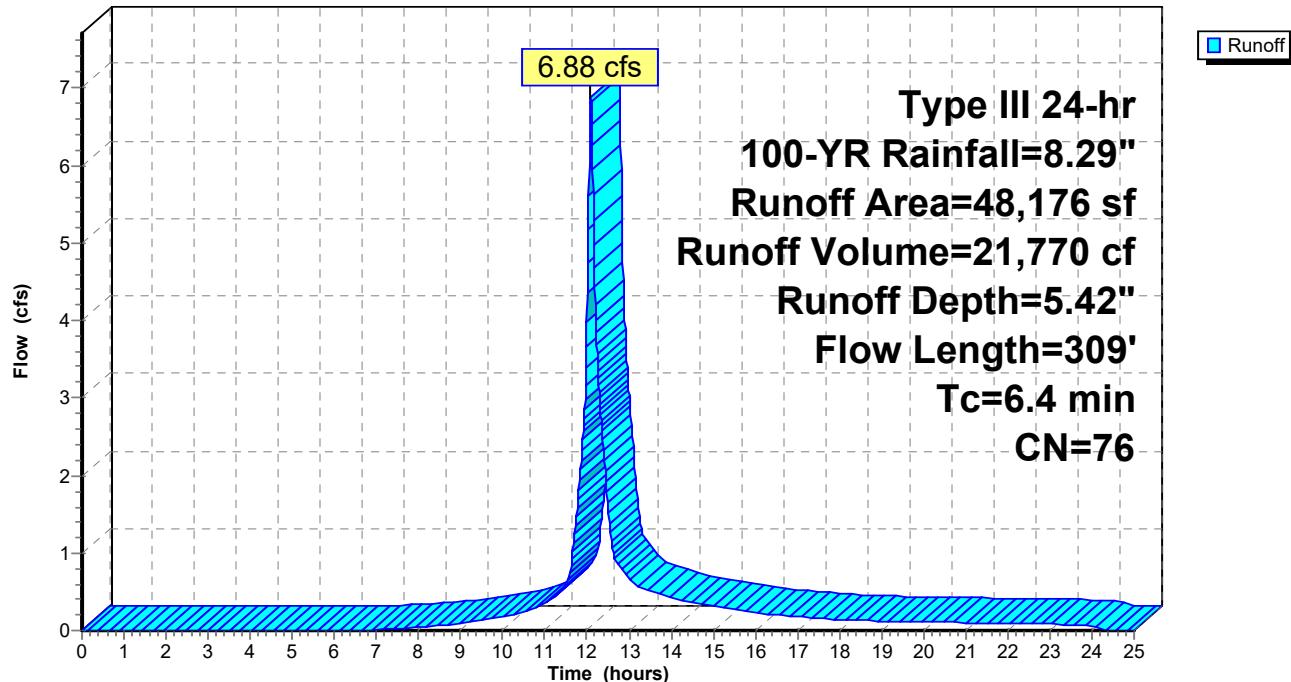
Printed 5/24/2022
Page 16**Summary for Subcatchment X-2: Northerly Flows**

Runoff = 6.88 cfs @ 12.09 hrs, Volume= 21,770 cf, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
683	98	Paved parking, HSG C
4,065	87	Dirt roads, HSG C
1,105	98	Roofs, HSG C
36,861	74	>75% Grass cover, Good, HSG C
5,462	70	Woods, Good, HSG C
48,176	76	Weighted Average
46,388		96.29% Pervious Area
1,788		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.37"
1.6	21	0.0760	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.37"
0.6	52	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	49	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	66	0.1400	2.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	20	0.0960	2.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	15	0.5200	5.05		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	45	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	309	Total			

Subcatchment X-2: Northerly Flows**Hydrograph**

Summary for Subcatchment X-3: Westerly Flows

Runoff = 2.18 cfs @ 12.09 hrs, Volume= 6,766 cf, Depth= 5.19"

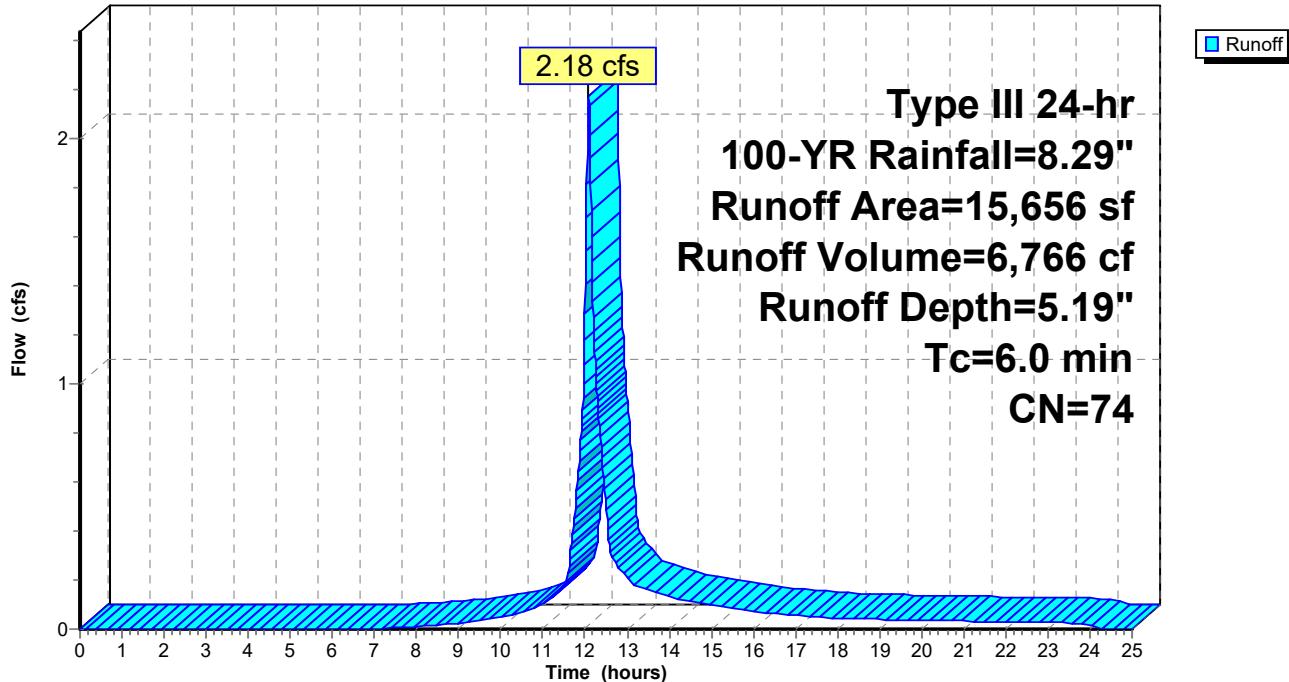
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

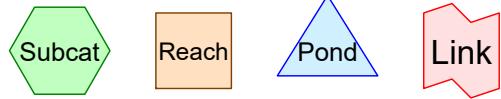
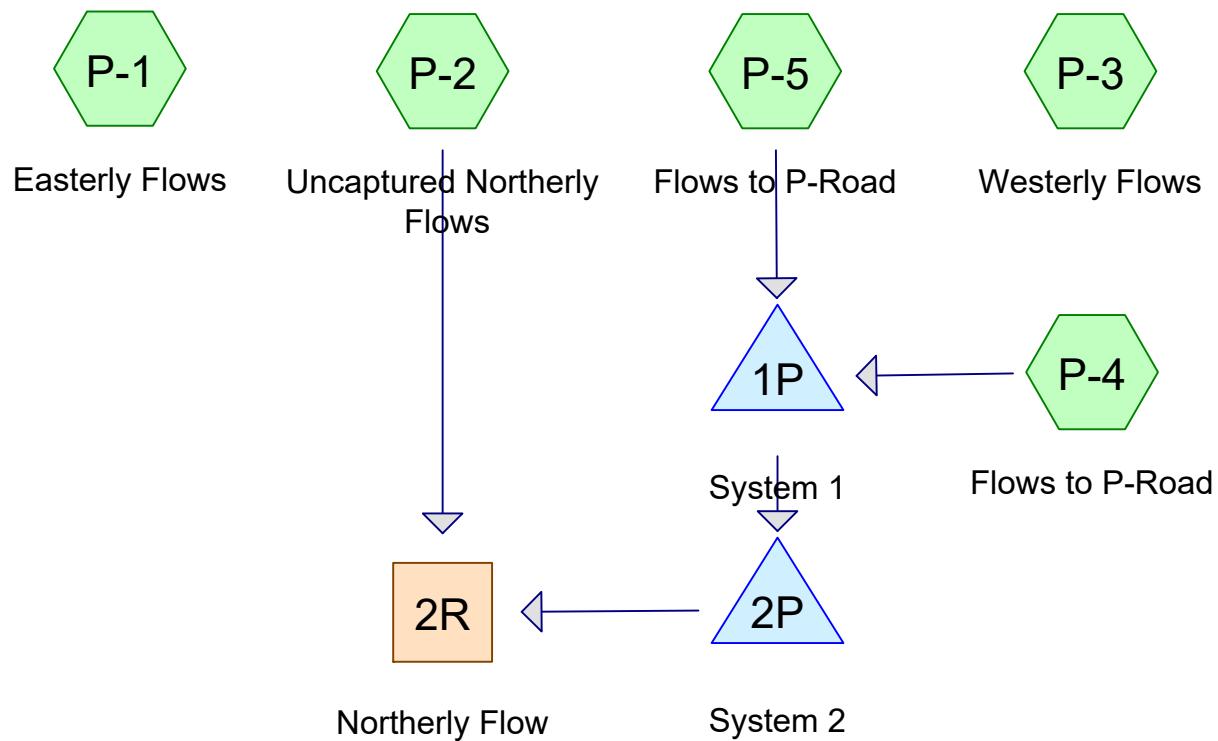
Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	87	Dirt roads, HSG C
1,092	98	Roofs, HSG C
7,359	74	>75% Grass cover, Good, HSG C
7,205	70	Woods, Good, HSG C
15,656	74	Weighted Average
14,564		93.03% Pervious Area
1,092		6.97% Impervious Area

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

Subcatchment X-3: Westerly Flows

Hydrograph





Routing Diagram for 34 Milton Hill Rd - Drainage Chambers
 Prepared by Decelle-Burke-Sala & Associates, Inc., Printed 5/24/2022
 HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

34 Milton Hill Rd - Drainage Chambers

Prepared by Decelle-Burke-Sala & Associates, Inc.

HydroCAD® 10.00-25 s/n 07920 © 2019 HydroCAD Software Solutions LLC

Printed 5/24/2022

Page 2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
52,363	74	>75% Grass cover, Good, HSG C (P-1, P-2, P-3, P-4, P-5)
9,920	98	Paved parking, HSG C (P-4, P-5)
6,192	98	Roofs, HSG C (P-2, P-3, P-4, P-5)
18,736	70	Woods, Good, HSG C (P-1, P-2, P-3, P-4)
87,211	78	TOTAL AREA

Summary for Subcatchment P-1: Easterly Flows

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 677 cf, Depth= 0.98"

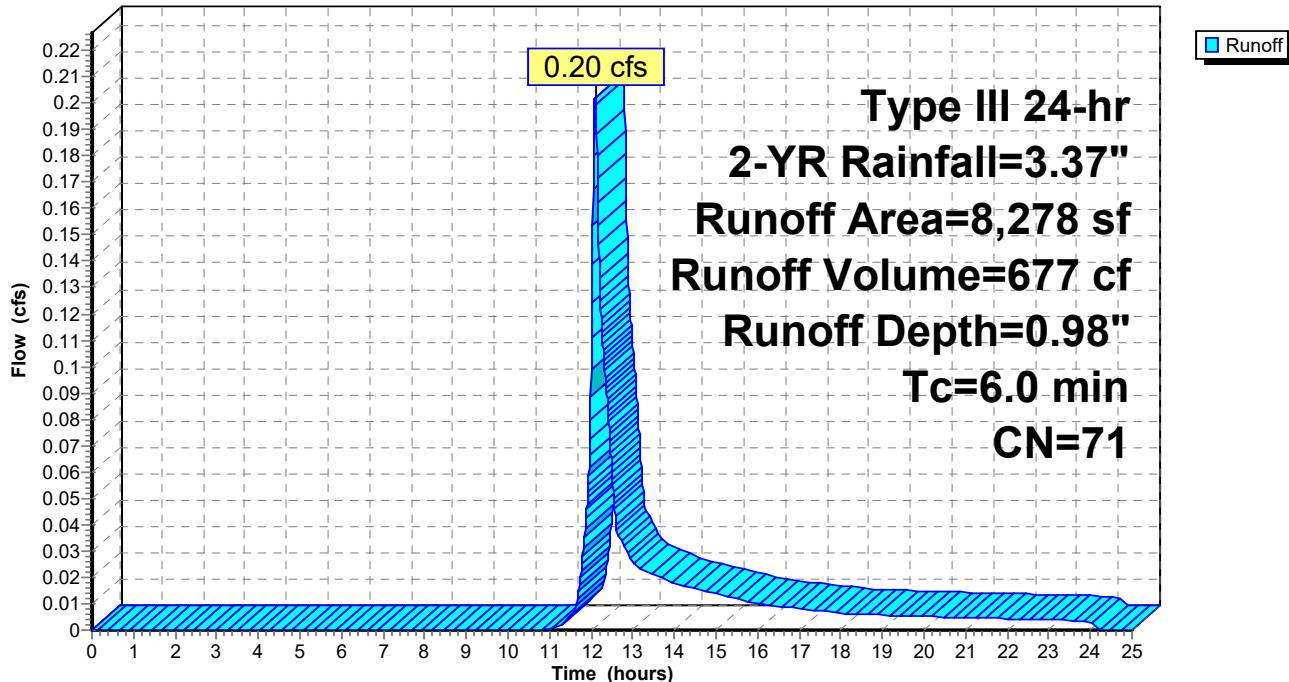
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	98	Roofs, HSG C
2,208	74	>75% Grass cover, Good, HSG C
6,070	70	Woods, Good, HSG C
8,278	71	Weighted Average
8,278		100.00% Pervious Area

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

Subcatchment P-1: Easterly Flows

Hydrograph



Summary for Subcatchment P-2: Uncaptured Northerly Flows

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 2,493 cf, Depth= 1.21"

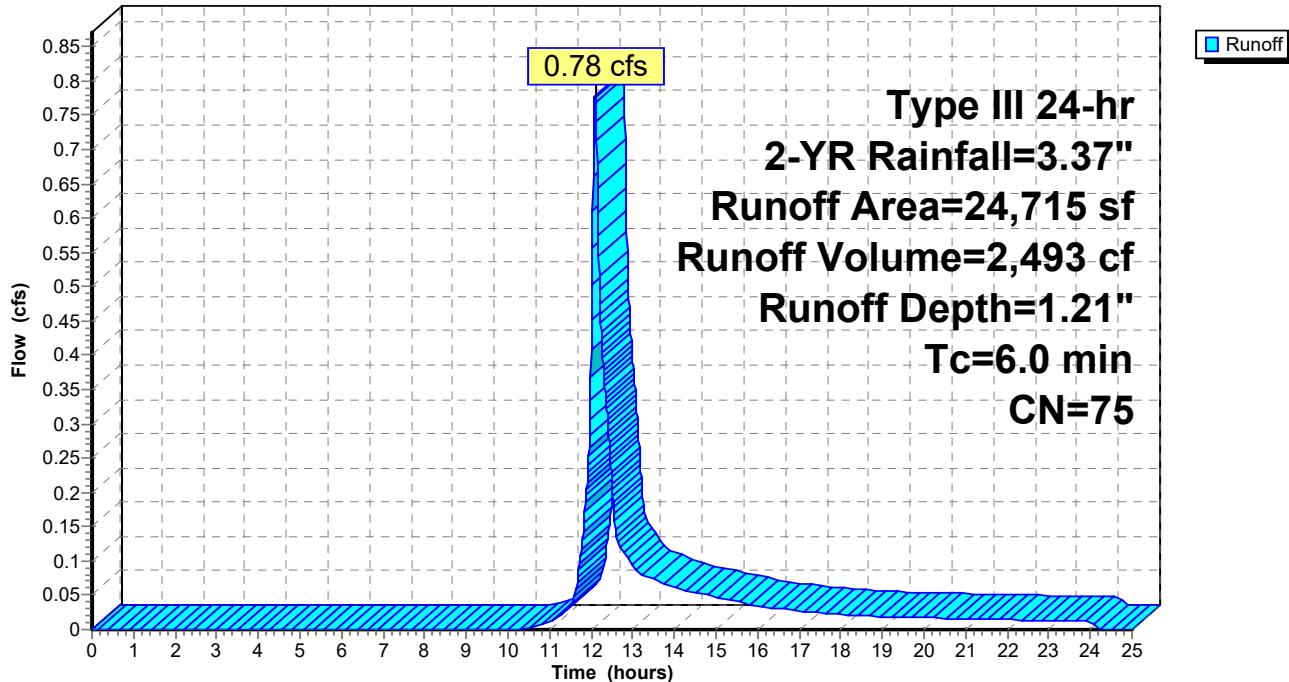
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,548	98	Roofs, HSG C
21,227	74	>75% Grass cover, Good, HSG C
1,940	70	Woods, Good, HSG C
24,715	75	Weighted Average
23,167		93.74% Pervious Area
1,548		6.26% Impervious Area

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

Subcatchment P-2: Uncaptured Northerly Flows

Hydrograph



Summary for Subcatchment P-3: Westerly Flows

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 1,479 cf, Depth= 1.15"

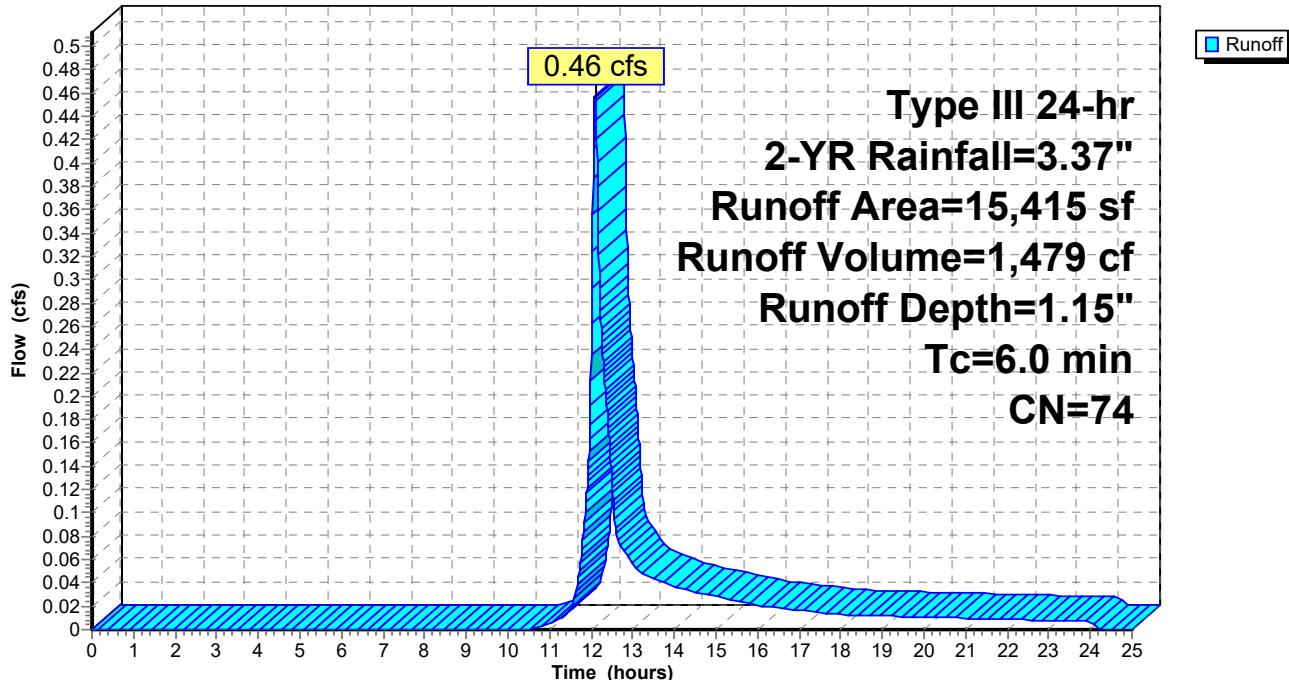
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,307	98	Roofs, HSG C
7,349	74	>75% Grass cover, Good, HSG C
6,759	70	Woods, Good, HSG C
15,415	74	Weighted Average
14,108		91.52% Pervious Area
1,307		8.48% Impervious Area

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

Subcatchment P-3: Westerly Flows

Hydrograph



Summary for Subcatchment P-4: Flows to P-Road

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,143 cf, Depth= 1.53"

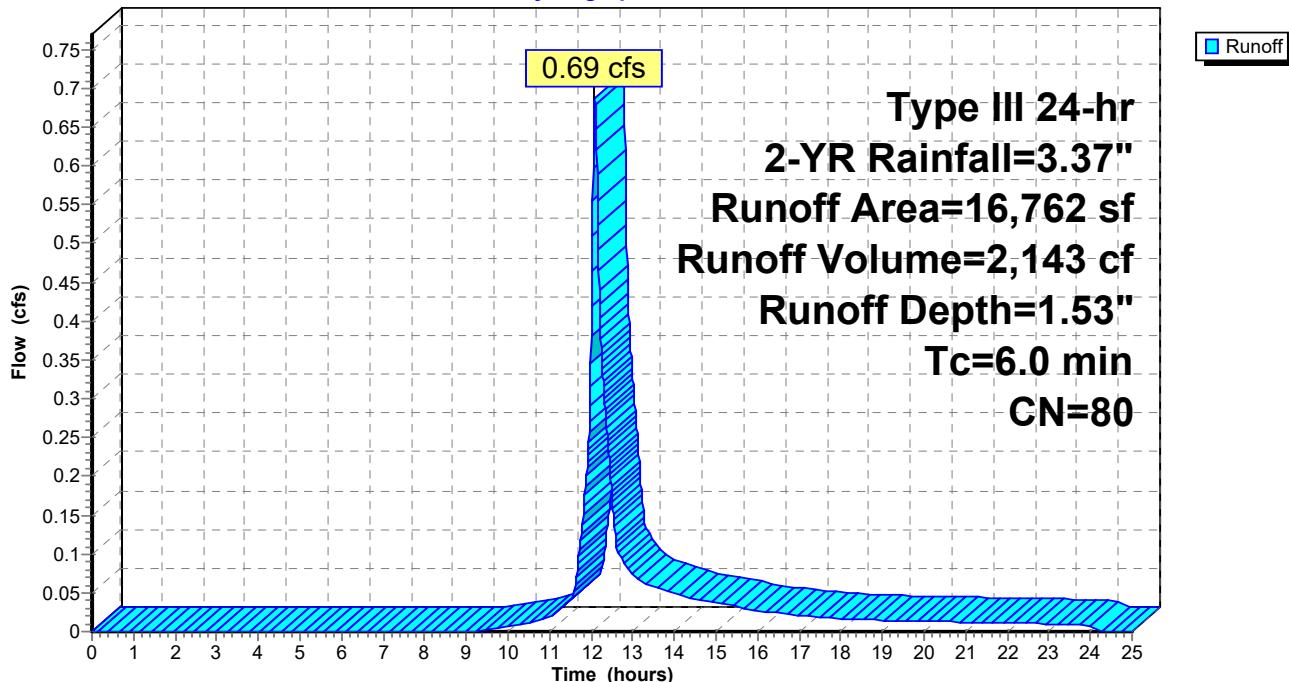
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
4,548	98	Paved parking, HSG C
351	98	Roofs, HSG C
7,896	74	>75% Grass cover, Good, HSG C
3,967	70	Woods, Good, HSG C
16,762	80	Weighted Average
11,863		70.77% Pervious Area
4,899		29.23% Impervious Area

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

Subcatchment P-4: Flows to P-Road

Hydrograph



Summary for Subcatchment P-5: Flows to P-Road

Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,214 cf, Depth= 1.75"

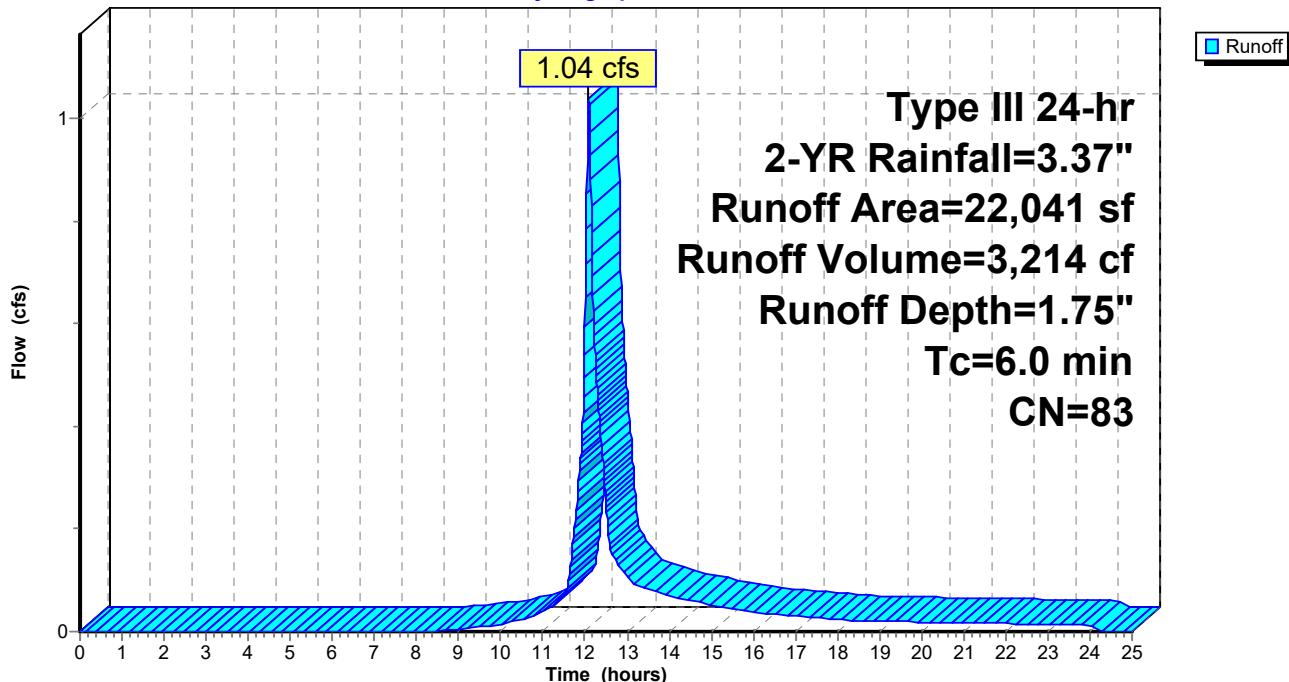
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.37"

Area (sf)	CN	Description
5,372	98	Paved parking, HSG C
2,986	98	Roofs, HSG C
13,683	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
22,041	83	Weighted Average
13,683		62.08% Pervious Area
8,358		37.92% Impervious Area

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

Subcatchment P-5: Flows to P-Road

Hydrograph



Summary for Reach 2R: Northerly Flow

Inflow Area = 63,518 sf, 23.31% Impervious, Inflow Depth = 1.14" for 2-YR event

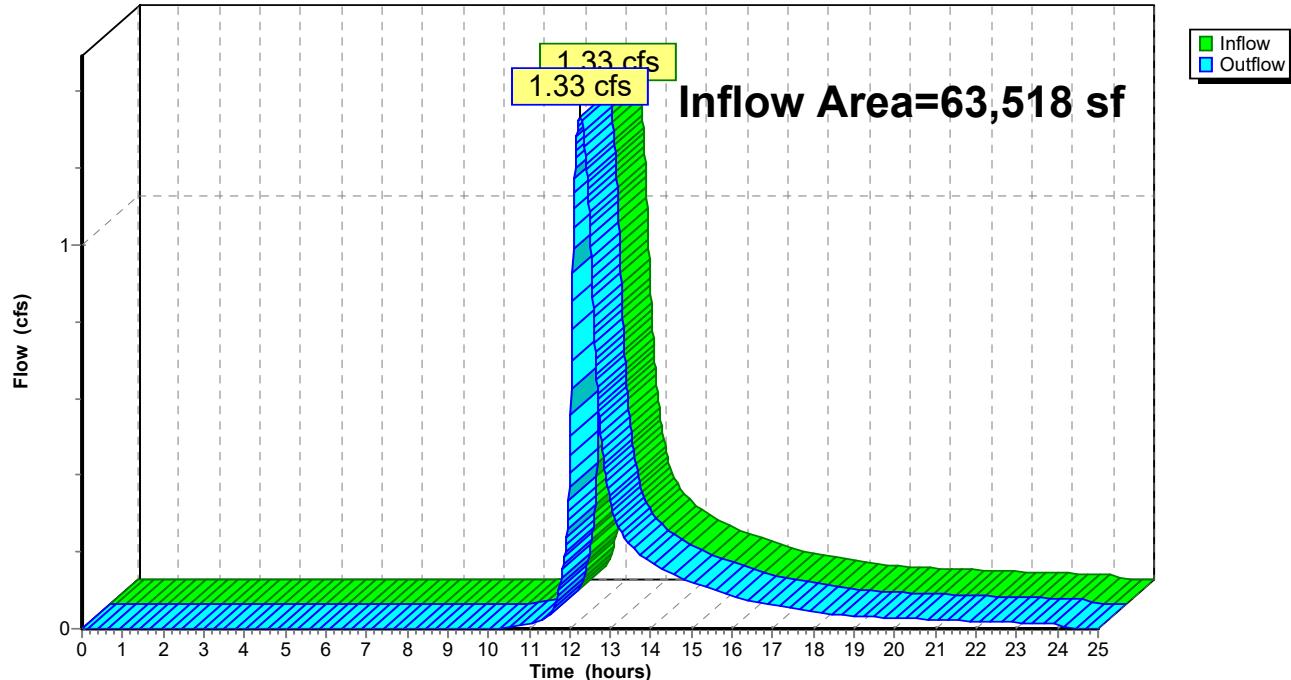
Inflow = 1.33 cfs @ 12.26 hrs, Volume= 6,059 cf

Outflow = 1.33 cfs @ 12.26 hrs, Volume= 6,059 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 2R: Northerly Flow

Hydrograph



Summary for Pond 1P: System 1

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 1.66" for 2-YR event
 Inflow = 1.73 cfs @ 12.09 hrs, Volume= 5,356 cf
 Outflow = 1.25 cfs @ 12.17 hrs, Volume= 5,190 cf, Atten= 27%, Lag= 4.6 min
 Discarded = 0.01 cfs @ 10.20 hrs, Volume= 685 cf
 Primary = 1.24 cfs @ 12.17 hrs, Volume= 4,505 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 65.44' @ 12.17 hrs Surf.Area= 995 sf Storage= 805 cf

Plug-Flow detention time= 39.1 min calculated for 5,190 cf (97% of inflow)
 Center-of-Mass det. time= 21.4 min (855.8 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.95'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	64.45'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	65.80'	11 cf	8.0" Round Pipe Storage-Impervious L= 30.5' S= 0.0050 '/'
#4	66.00'	4 cf	4.00'D x 0.30'H Vertical Cone/Cylinder-Impervious
#5	66.30'	8 cf	8.0" Round Pipe Storage-Impervious L= 23.1' S= 0.0050 '/'
2,685 cf			Total Available Storage

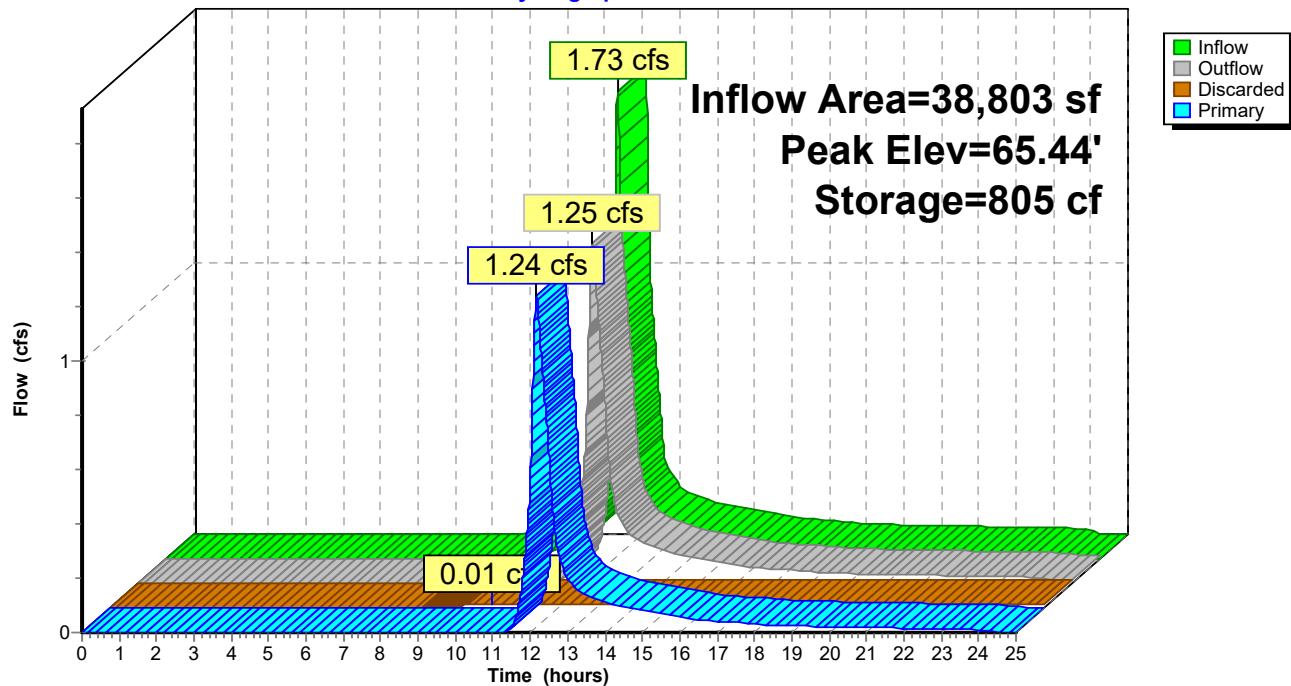
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.95'	0.520 in/hr Exfiltration over Surface area
#2	Primary	64.50'	8.0" Round Culvert L= 46.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 63.00' S= 0.0325 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	64.50'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	65.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	67.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 10.20 hrs HW=64.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.24 cfs @ 12.17 hrs HW=65.44' TW=44.66' (Dynamic Tailwater)

- ↑ 2=Culvert (Inlet Controls 1.03 cfs @ 2.96 fps)
- 3=Orifice/Grate (Orifice Controls 0.10 cfs @ 4.45 fps)
- 4=Orifice/Grate (Orifice Controls 0.11 cfs @ 1.66 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 1P: System 1**Hydrograph**

Summary for Pond 2P: System 2

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 1.39" for 2-YR event
 Inflow = 1.24 cfs @ 12.17 hrs, Volume= 4,505 cf
 Outflow = 0.96 cfs @ 12.33 hrs, Volume= 4,150 cf, Atten= 23%, Lag= 9.6 min
 Discarded = 0.01 cfs @ 11.72 hrs, Volume= 584 cf
 Primary = 0.95 cfs @ 12.33 hrs, Volume= 3,566 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 44.85' @ 12.33 hrs Surf.Area= 995 sf Storage= 882 cf

Plug-Flow detention time= 64.9 min calculated for 4,148 cf (92% of inflow)
 Center-of-Mass det. time= 28.5 min (858.8 - 830.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.25'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	43.75'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	46.50'	34 cf	8.0" Round Pipe Storage-Impervious L= 98.4' S= 0.0800 '/'
2,697 cf			Total Available Storage

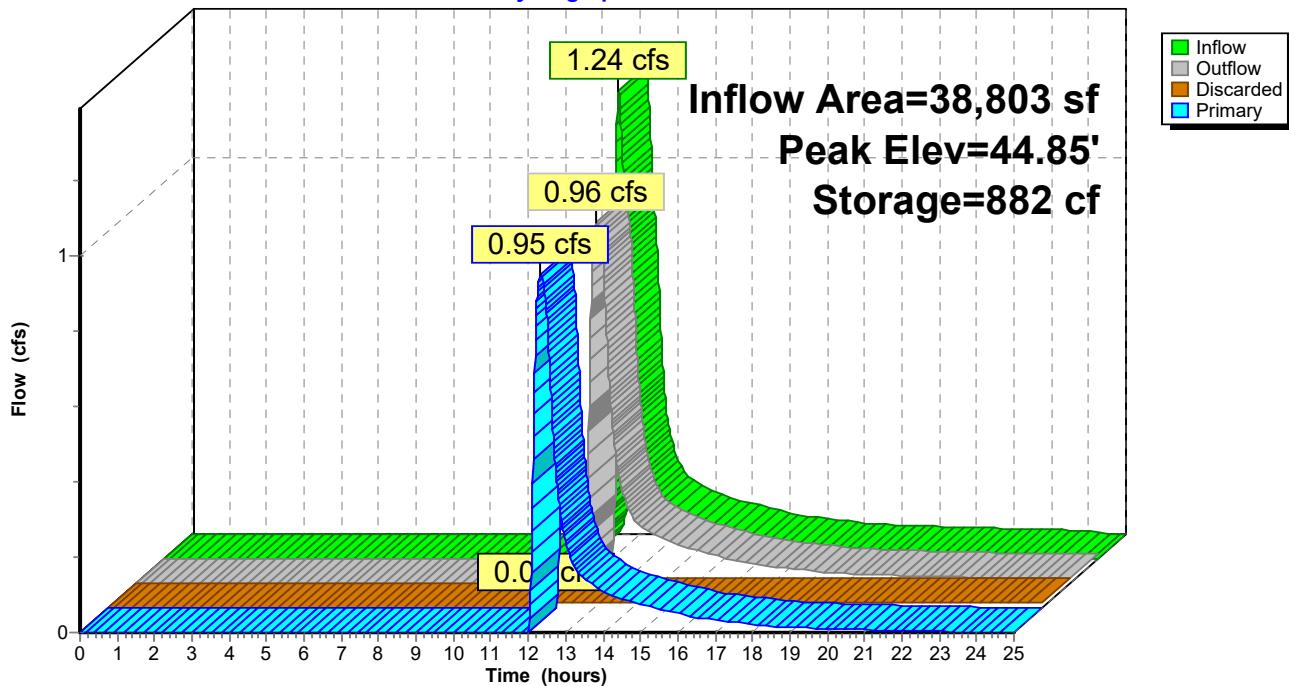
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.25'	0.520 in/hr Exfiltration over Surface area
#2	Primary	44.10'	8.0" Round Culvert L= 69.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 44.10' / 43.70' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	44.10'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	45.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	46.70'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 11.72 hrs HW=43.37' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.95 cfs @ 12.33 hrs HW=44.85' TW=0.00' (Dynamic Tailwater)

- ↑ 2=Culvert (Inlet Controls 0.86 cfs @ 2.47 fps)
- 3=Orifice/Grate (Orifice Controls 0.09 cfs @ 3.95 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: System 2**Hydrograph**

Summary for Subcatchment P-1: Easterly Flows

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 1,602 cf, Depth= 2.32"

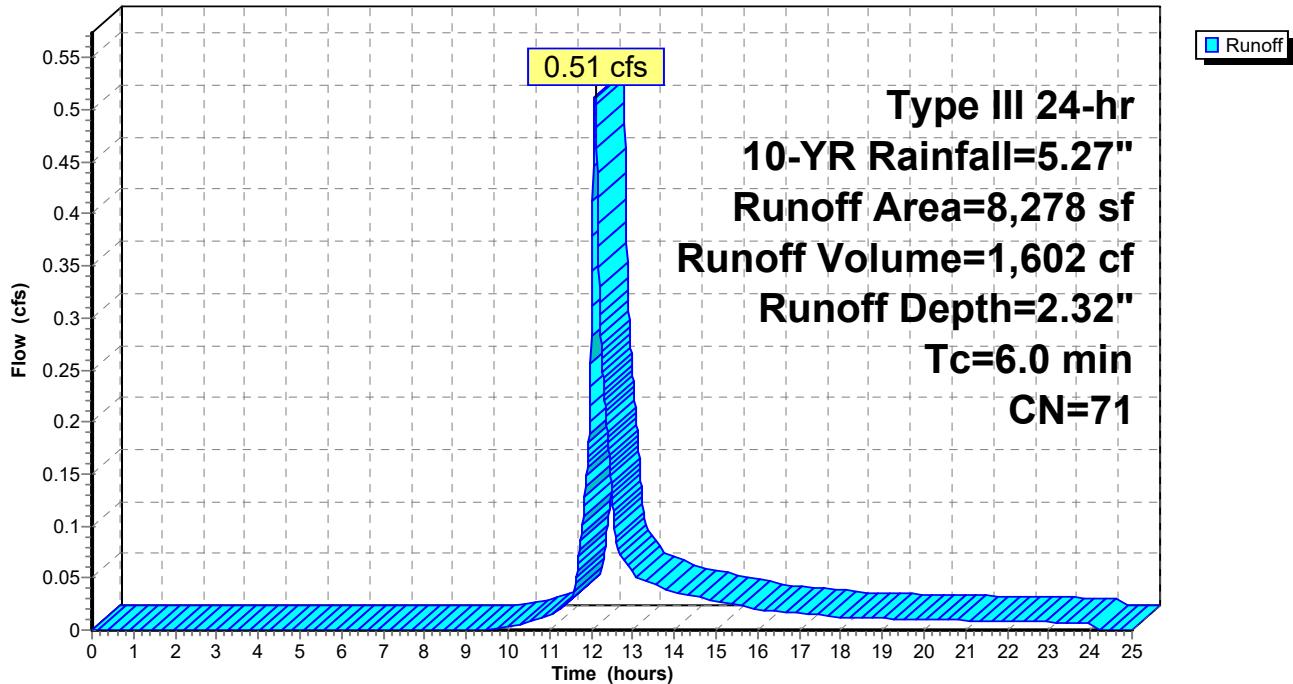
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	98	Roofs, HSG C
2,208	74	>75% Grass cover, Good, HSG C
6,070	70	Woods, Good, HSG C
8,278	71	Weighted Average
8,278		100.00% Pervious Area

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

Subcatchment P-1: Easterly Flows

Hydrograph



Summary for Subcatchment P-2: Uncaptured Northerly Flows

Runoff = 1.77 cfs @ 12.09 hrs, Volume= 5,499 cf, Depth= 2.67"

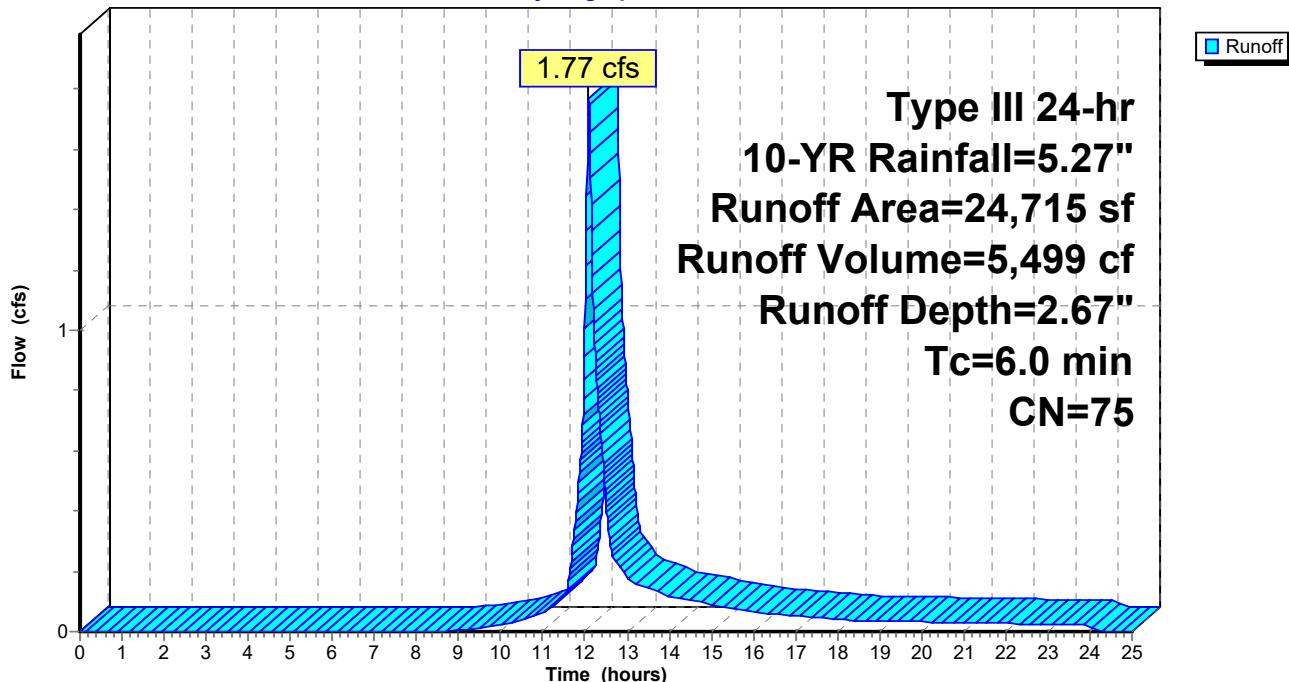
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,548	98	Roofs, HSG C
21,227	74	>75% Grass cover, Good, HSG C
1,940	70	Woods, Good, HSG C
24,715	75	Weighted Average
23,167		93.74% Pervious Area
1,548		6.26% Impervious Area

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

Subcatchment P-2: Uncaptured Northerly Flows

Hydrograph



Summary for Subcatchment P-3: Westerly Flows

Runoff = 1.07 cfs @ 12.09 hrs, Volume= 3,316 cf, Depth= 2.58"

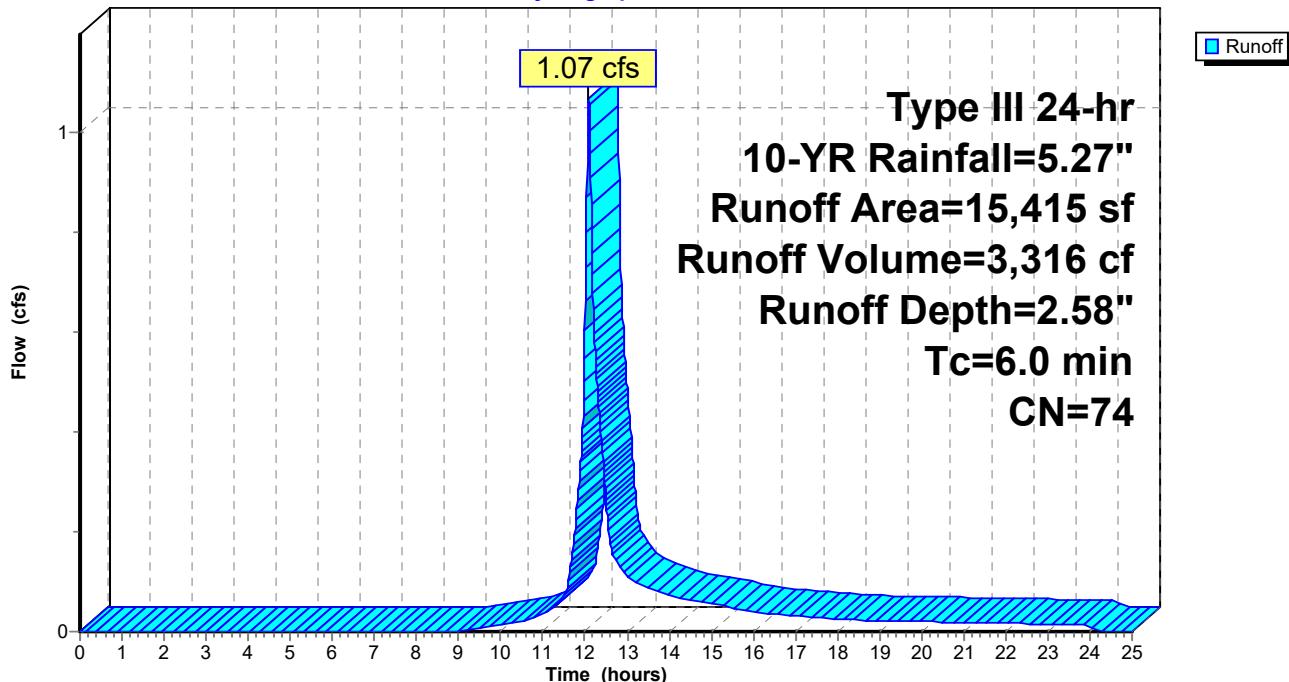
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,307	98	Roofs, HSG C
7,349	74	>75% Grass cover, Good, HSG C
6,759	70	Woods, Good, HSG C
15,415	74	Weighted Average
14,108		91.52% Pervious Area
1,307		8.48% Impervious Area

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

Subcatchment P-3: Westerly Flows

Hydrograph



Summary for Subcatchment P-4: Flows to P-Road

Runoff = 1.41 cfs @ 12.09 hrs, Volume= 4,372 cf, Depth= 3.13"

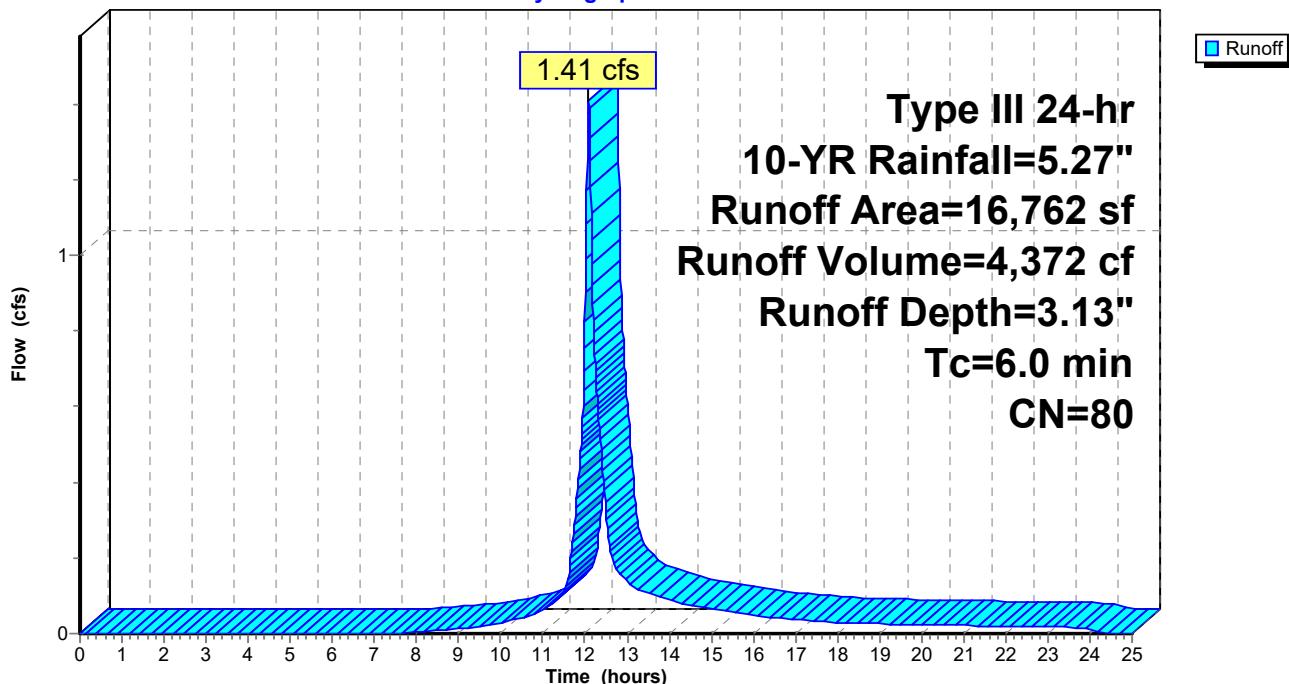
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
4,548	98	Paved parking, HSG C
351	98	Roofs, HSG C
7,896	74	>75% Grass cover, Good, HSG C
3,967	70	Woods, Good, HSG C
16,762	80	Weighted Average
11,863		70.77% Pervious Area
4,899		29.23% Impervious Area

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

Subcatchment P-4: Flows to P-Road

Hydrograph



Summary for Subcatchment P-5: Flows to P-Road

Runoff = 2.02 cfs @ 12.09 hrs, Volume= 6,281 cf, Depth= 3.42"

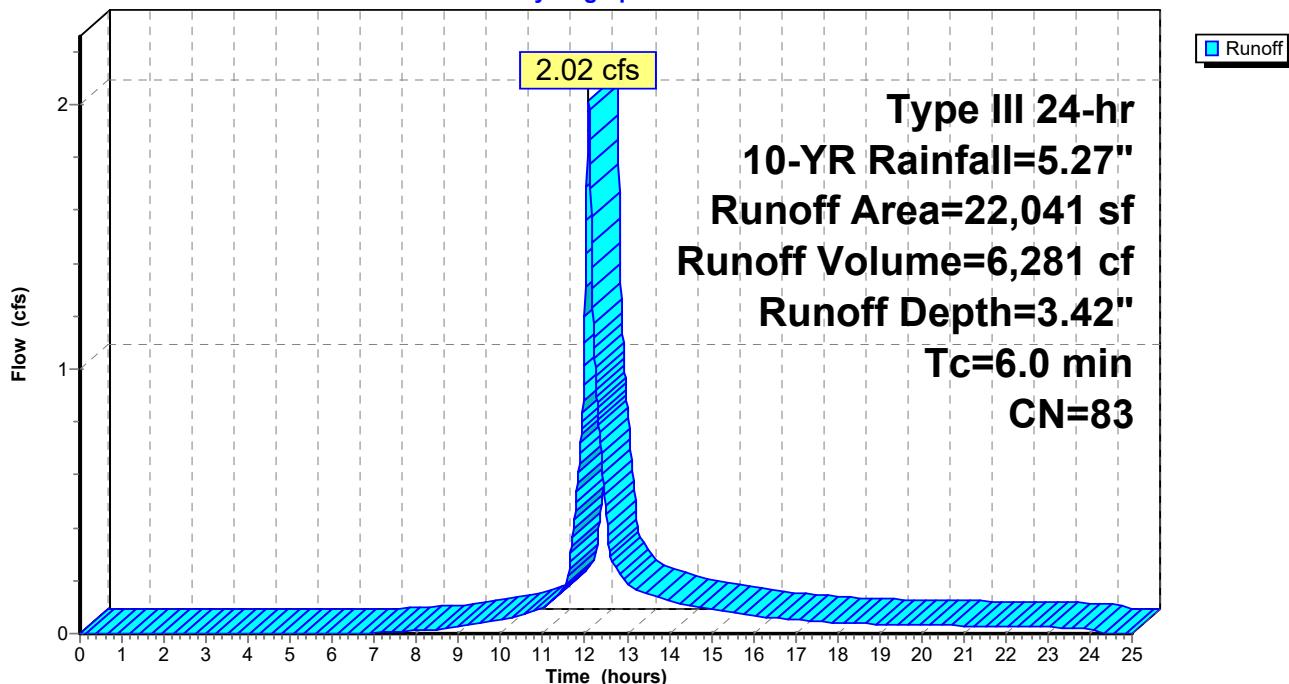
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.27"

Area (sf)	CN	Description
5,372	98	Paved parking, HSG C
2,986	98	Roofs, HSG C
13,683	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
22,041	83	Weighted Average
13,683		62.08% Pervious Area
8,358		37.92% Impervious Area

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

Subcatchment P-5: Flows to P-Road

Hydrograph



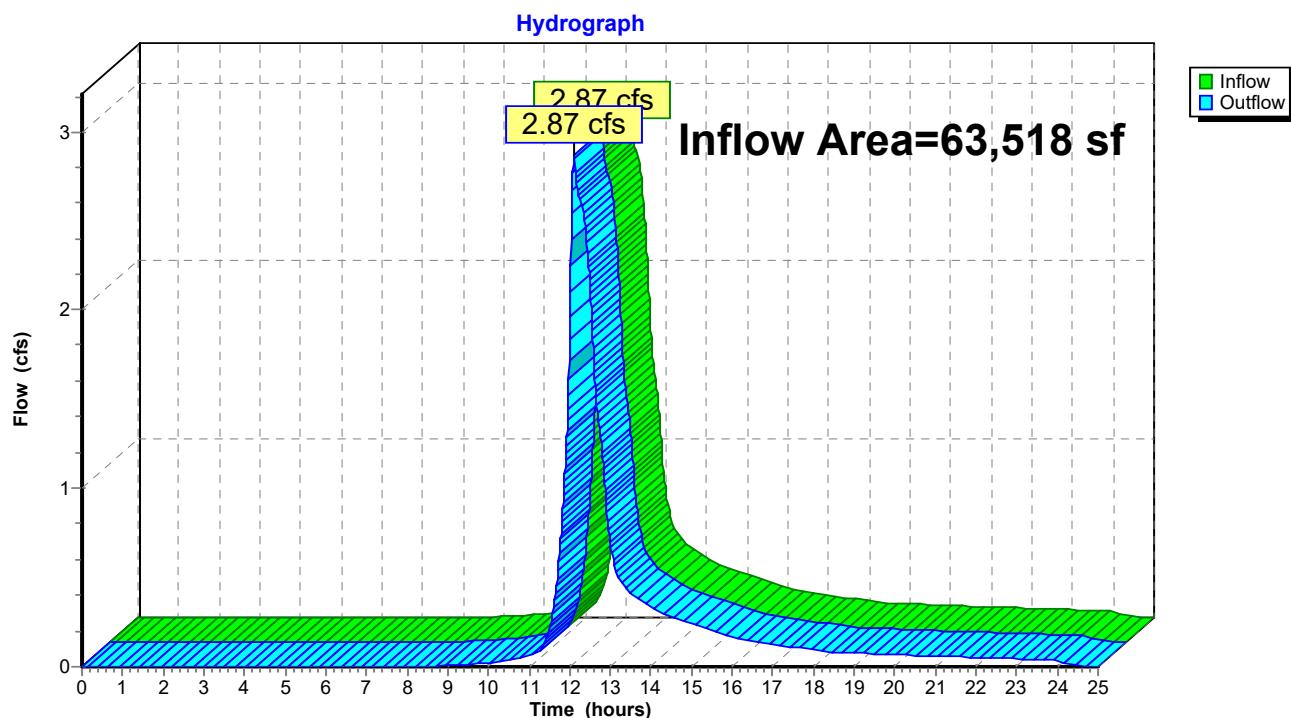
Summary for Reach 2R: Northerly Flow

Inflow Area = 63,518 sf, 23.31% Impervious, Inflow Depth = 2.68" for 10-YR event

Inflow = 2.87 cfs @ 12.10 hrs, Volume= 14,186 cf

Outflow = 2.87 cfs @ 12.10 hrs, Volume= 14,186 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 2R: Northerly Flow

Summary for Pond 1P: System 1

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 3.29" for 10-YR event
 Inflow = 3.43 cfs @ 12.09 hrs, Volume= 10,652 cf
 Outflow = 2.25 cfs @ 12.18 hrs, Volume= 10,477 cf, Atten= 34%, Lag= 5.5 min
 Discarded = 0.01 cfs @ 8.53 hrs, Volume= 763 cf
 Primary = 2.23 cfs @ 12.18 hrs, Volume= 9,715 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 66.41' @ 12.18 hrs Surf.Area= 995 sf Storage= 1,456 cf

Plug-Flow detention time= 26.6 min calculated for 10,477 cf (98% of inflow)
 Center-of-Mass det. time= 16.7 min (831.4 - 814.7)

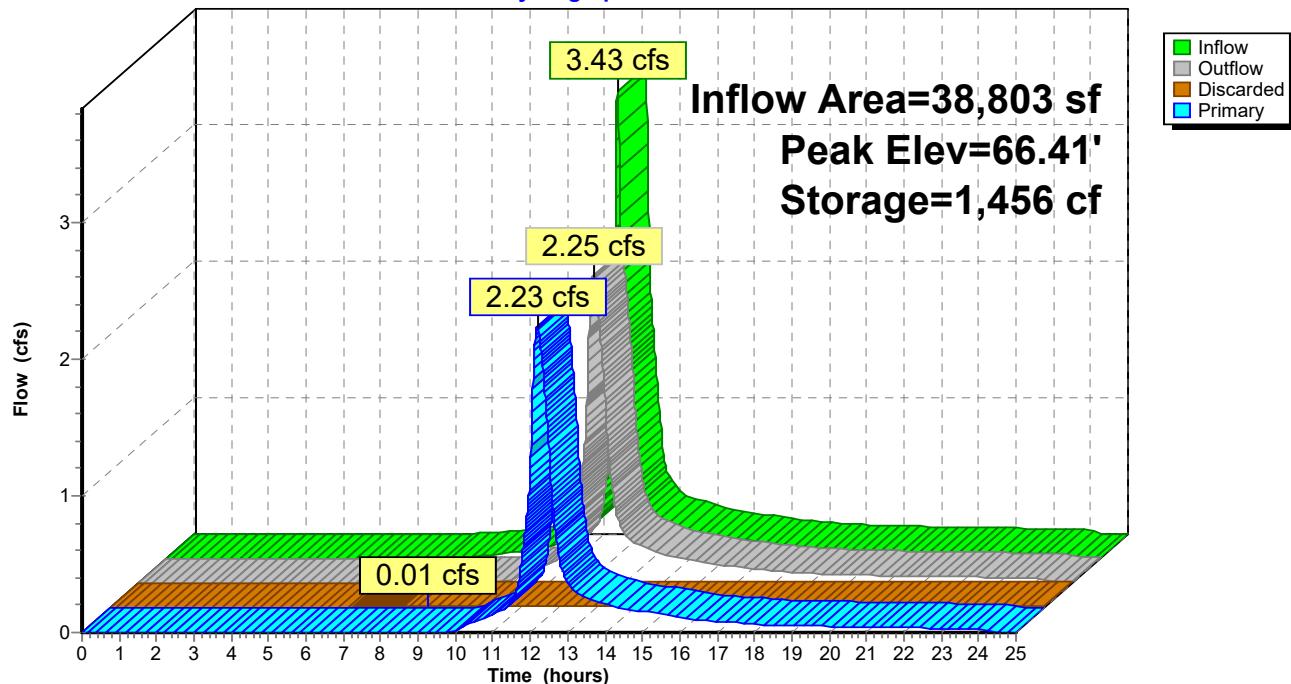
Volume	Invert	Avail.Storage	Storage Description
#1A	63.95'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	64.45'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	65.80'	11 cf	8.0" Round Pipe Storage-Impervious L= 30.5' S= 0.0050 '/'
#4	66.00'	4 cf	4.00'D x 0.30'H Vertical Cone/Cylinder-Impervious
#5	66.30'	8 cf	8.0" Round Pipe Storage-Impervious L= 23.1' S= 0.0050 '/'
			2,685 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.95'	0.520 in/hr Exfiltration over Surface area
#2	Primary	64.50'	8.0" Round Culvert L= 46.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 63.00' S= 0.0325 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	64.50'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	65.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	67.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.53 hrs HW=64.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.23 cfs @ 12.18 hrs HW=66.41' TW=45.47' (Dynamic Tailwater)
 ↑ 2=Culvert (Inlet Controls 1.66 cfs @ 4.77 fps)
 3=Orifice/Grate (Orifice Controls 0.14 cfs @ 6.50 fps)
 4=Orifice/Grate (Orifice Controls 0.43 cfs @ 4.91 fps)
 5=Orifice/Grate (Controls 0.00 cfs)

Pond 1P: System 1**Hydrograph**

Summary for Pond 2P: System 2

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 3.00" for 10-YR event
 Inflow = 2.23 cfs @ 12.18 hrs, Volume= 9,715 cf
 Outflow = 1.84 cfs @ 12.36 hrs, Volume= 9,335 cf, Atten= 18%, Lag= 11.1 min
 Discarded = 0.01 cfs @ 10.38 hrs, Volume= 648 cf
 Primary = 1.83 cfs @ 12.36 hrs, Volume= 8,687 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 45.81' @ 12.36 hrs Surf.Area= 995 sf Storage= 1,513 cf

Plug-Flow detention time= 41.1 min calculated for 9,335 cf (96% of inflow)
 Center-of-Mass det. time= 19.5 min (840.1 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.25'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	43.75'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2" W x 45.0" H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0" W x 51.0" H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	46.50'	34 cf	8.0" Round Pipe Storage-Impervious L= 98.4' S= 0.0800 '/'
2,697 cf			Total Available Storage

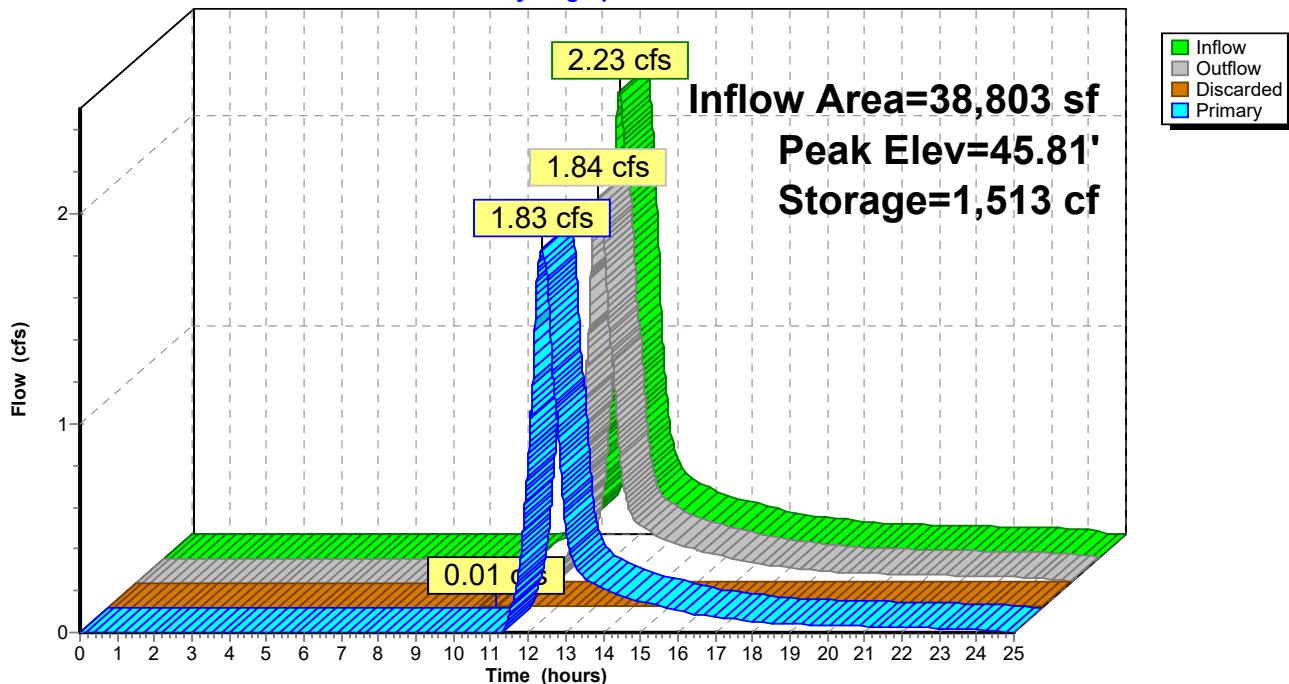
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.25'	0.520 in/hr Exfiltration over Surface area
#2	Primary	44.10'	8.0" Round Culvert L= 69.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 44.10' / 43.70' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	44.10'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	45.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	46.70'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 10.38 hrs HW=43.37' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.83 cfs @ 12.36 hrs HW=45.81' TW=0.00' (Dynamic Tailwater)

- ↑ 2=Culvert (Barrel Controls 1.42 cfs @ 4.06 fps)
- 3=Orifice/Grate (Orifice Controls 0.13 cfs @ 6.15 fps)
- 4=Orifice/Grate (Orifice Controls 0.28 cfs @ 3.21 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: System 2**Hydrograph**

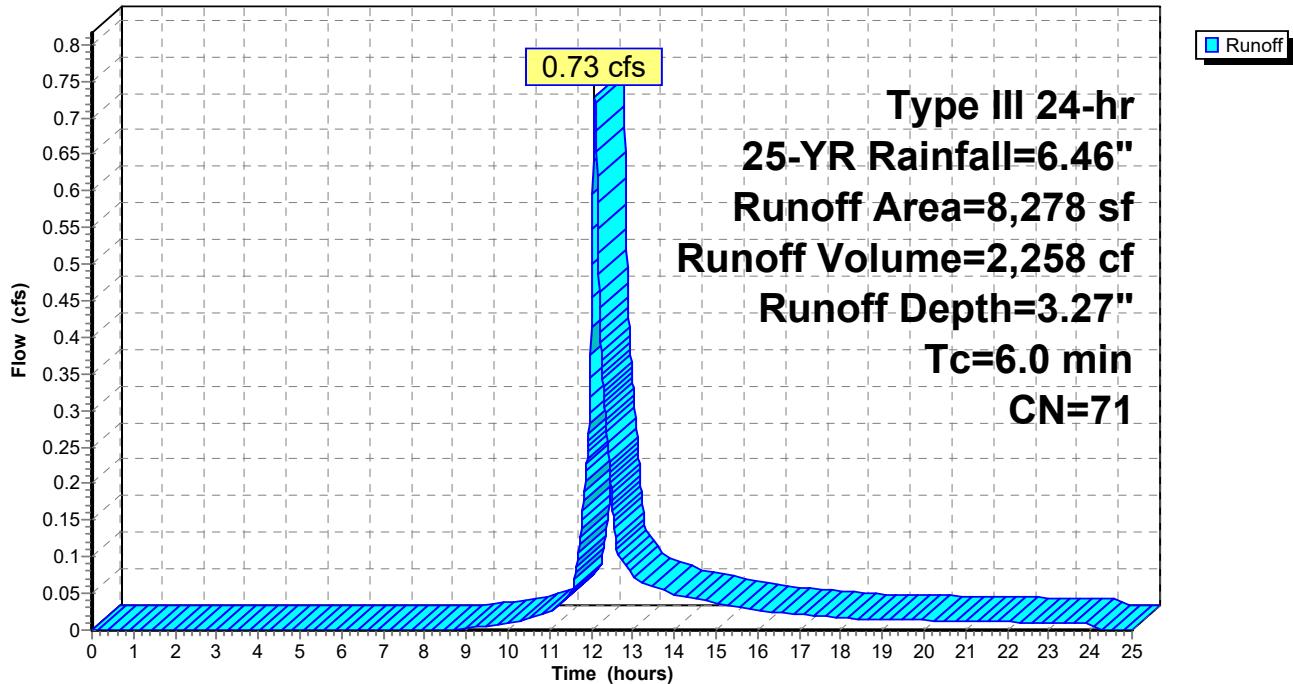
Summary for Subcatchment P-1: Easterly Flows

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 2,258 cf, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	98	Roofs, HSG C
2,208	74	>75% Grass cover, Good, HSG C
6,070	70	Woods, Good, HSG C
8,278	71	Weighted Average
8,278		100.00% Pervious Area

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

Subcatchment P-1: Easterly Flows**Hydrograph**

Summary for Subcatchment P-2: Uncaptured Northerly Flows

Runoff = 2.45 cfs @ 12.09 hrs, Volume= 7,574 cf, Depth= 3.68"

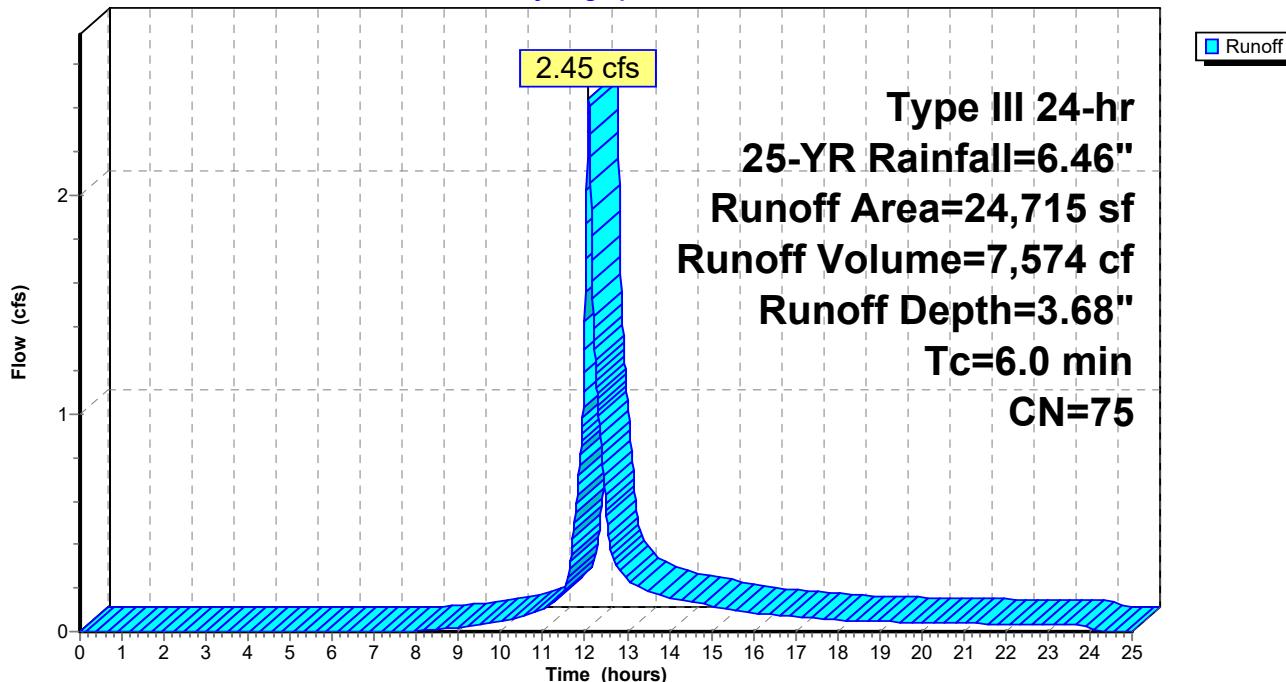
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,548	98	Roofs, HSG C
21,227	74	>75% Grass cover, Good, HSG C
1,940	70	Woods, Good, HSG C
24,715	75	Weighted Average
23,167		93.74% Pervious Area
1,548		6.26% Impervious Area

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

Subcatchment P-2: Uncaptured Northerly Flows

Hydrograph



Summary for Subcatchment P-3: Westerly Flows

Runoff = 1.48 cfs @ 12.09 hrs, Volume= 4,593 cf, Depth= 3.58"

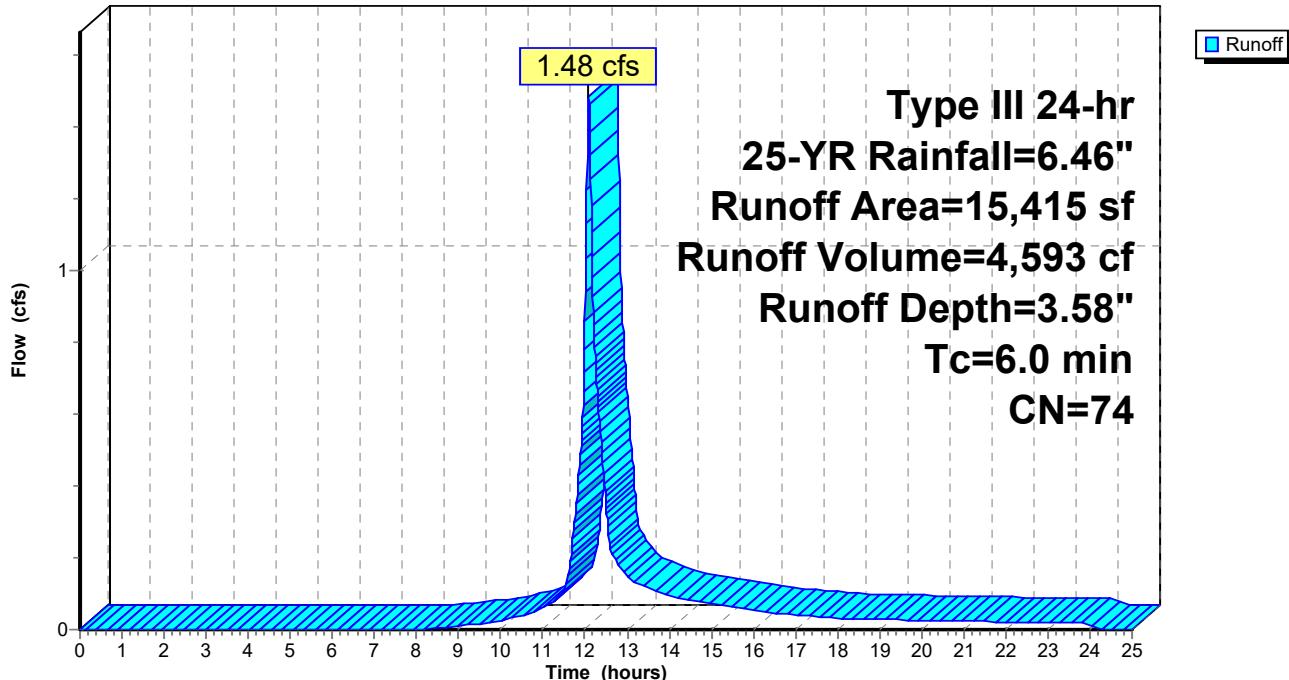
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,307	98	Roofs, HSG C
7,349	74	>75% Grass cover, Good, HSG C
6,759	70	Woods, Good, HSG C
15,415	74	Weighted Average
14,108		91.52% Pervious Area
1,307		8.48% Impervious Area

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

Subcatchment P-3: Westerly Flows

Hydrograph



Summary for Subcatchment P-4: Flows to P-Road

Runoff = 1.88 cfs @ 12.09 hrs, Volume= 5,865 cf, Depth= 4.20"

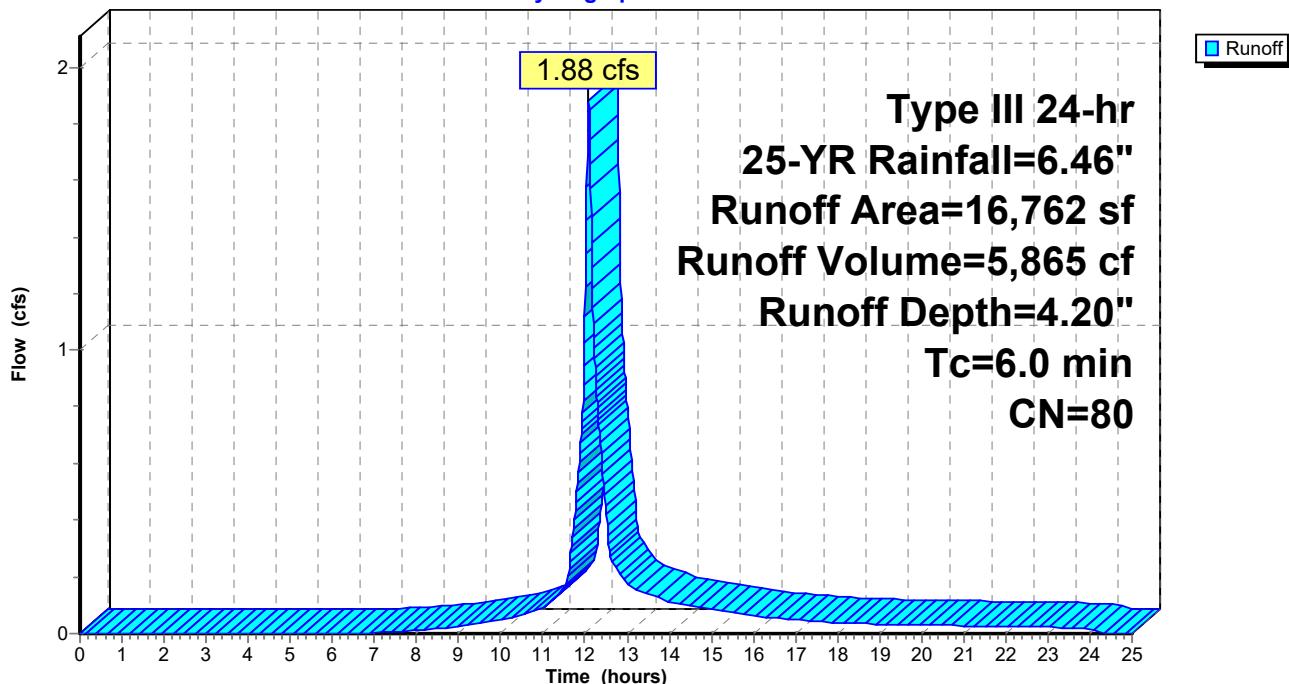
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
4,548	98	Paved parking, HSG C
351	98	Roofs, HSG C
7,896	74	>75% Grass cover, Good, HSG C
3,967	70	Woods, Good, HSG C
16,762	80	Weighted Average
11,863		70.77% Pervious Area
4,899		29.23% Impervious Area

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

Subcatchment P-4: Flows to P-Road

Hydrograph



Summary for Subcatchment P-5: Flows to P-Road

Runoff = 2.64 cfs @ 12.09 hrs, Volume= 8,302 cf, Depth= 4.52"

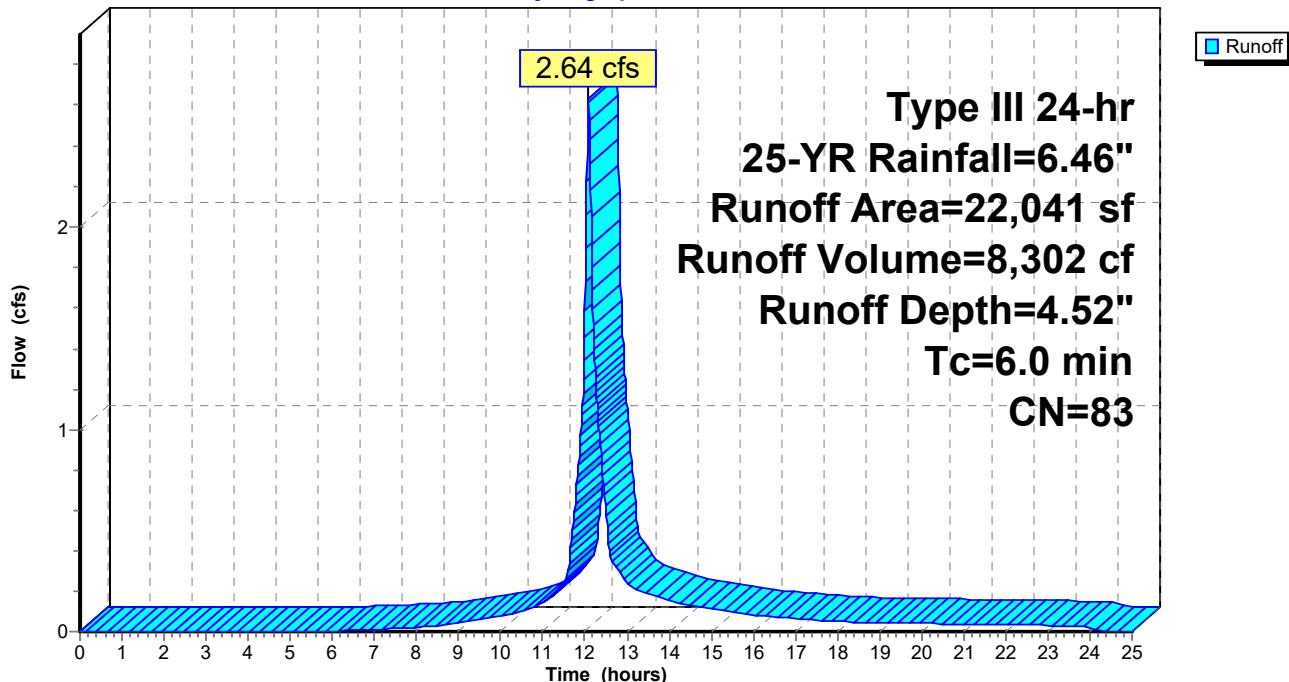
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=6.46"

Area (sf)	CN	Description
5,372	98	Paved parking, HSG C
2,986	98	Roofs, HSG C
13,683	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
22,041	83	Weighted Average
13,683		62.08% Pervious Area
8,358		37.92% Impervious Area

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

Subcatchment P-5: Flows to P-Road

Hydrograph



Summary for Reach 2R: Northerly Flow

Inflow Area = 63,518 sf, 23.31% Impervious, Inflow Depth > 3.72" for 25-YR event

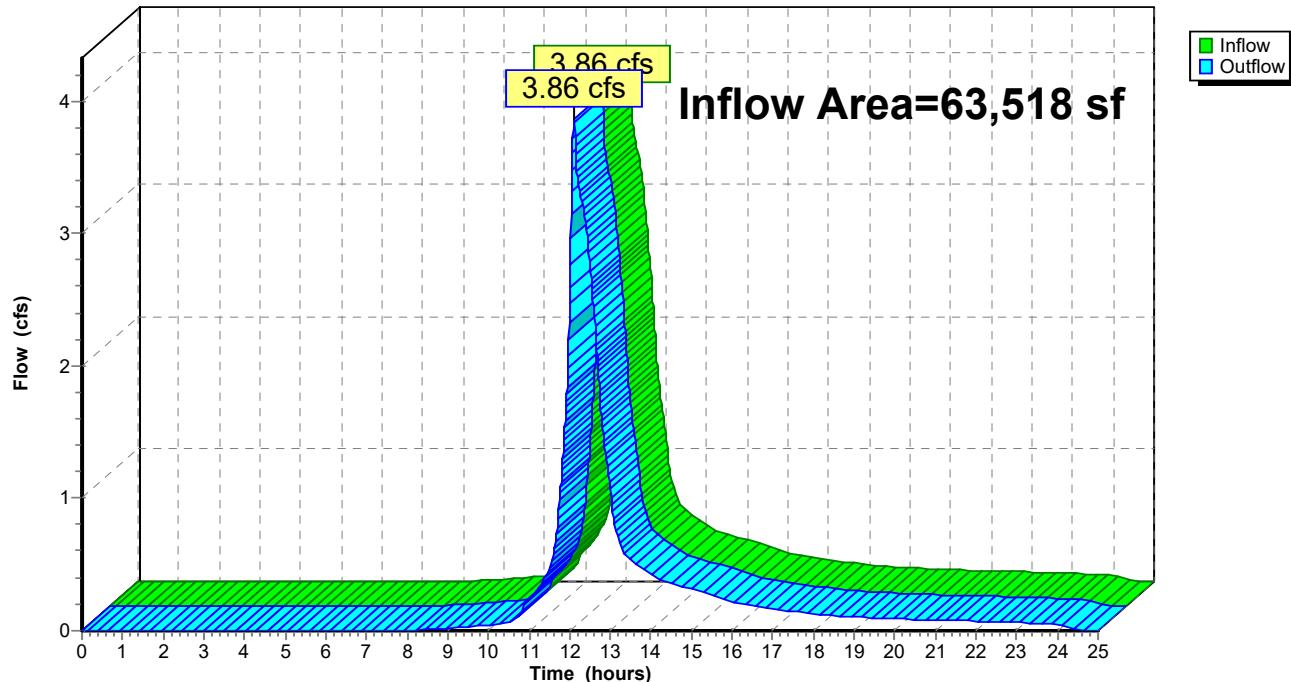
Inflow = 3.86 cfs @ 12.11 hrs, Volume= 19,697 cf

Outflow = 3.86 cfs @ 12.11 hrs, Volume= 19,697 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 2R: Northerly Flow

Hydrograph



Summary for Pond 1P: System 1

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 4.38" for 25-YR event
 Inflow = 4.52 cfs @ 12.09 hrs, Volume= 14,167 cf
 Outflow = 2.78 cfs @ 12.19 hrs, Volume= 13,990 cf, Atten= 39%, Lag= 6.1 min
 Discarded = 0.01 cfs @ 7.67 hrs, Volume= 801 cf
 Primary = 2.76 cfs @ 12.19 hrs, Volume= 13,189 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 67.17' @ 12.19 hrs Surf.Area= 995 sf Storage= 1,967 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 15.6 min (822.3 - 806.6)

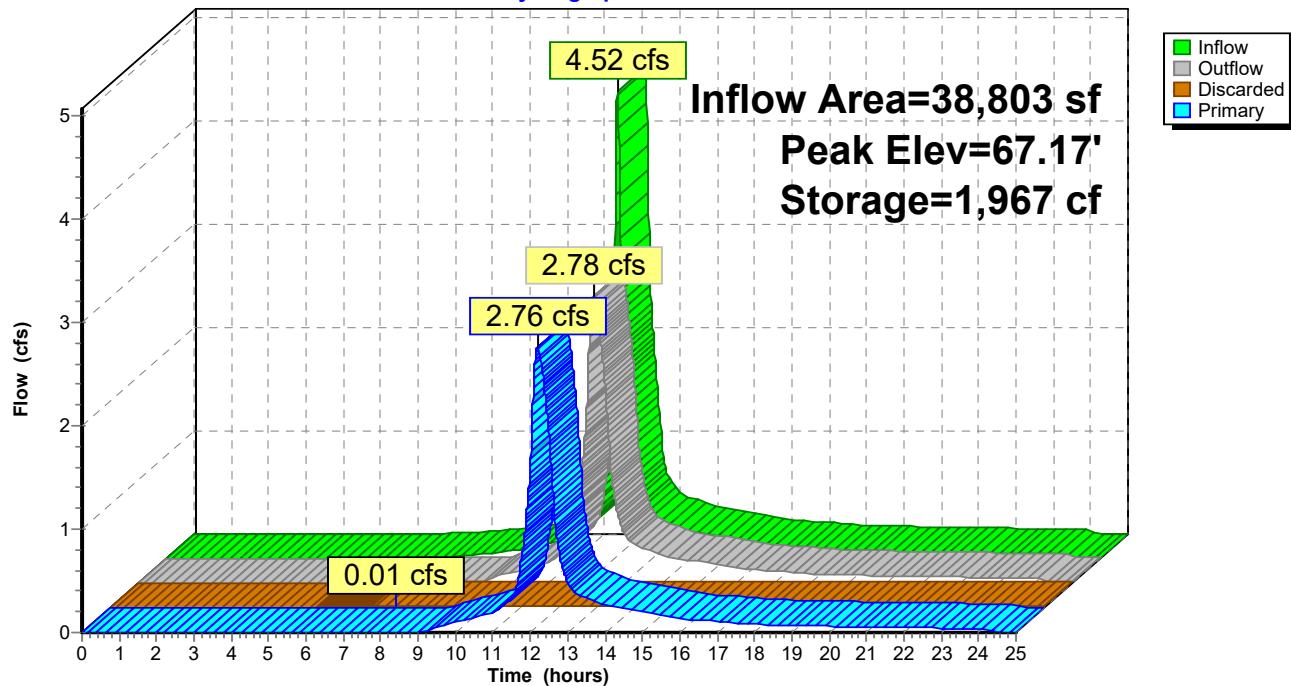
Volume	Invert	Avail.Storage	Storage Description
#1A	63.95'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	64.45'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	65.80'	11 cf	8.0" Round Pipe Storage-Impervious L= 30.5' S= 0.0050 '/'
#4	66.00'	4 cf	4.00'D x 0.30'H Vertical Cone/Cylinder-Impervious
#5	66.30'	8 cf	8.0" Round Pipe Storage-Impervious L= 23.1' S= 0.0050 '/'
2,685 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.95'	0.520 in/hr Exfiltration over Surface area
#2	Primary	64.50'	8.0" Round Culvert L= 46.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 63.00' S= 0.0325 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	64.50'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	65.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	67.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.67 hrs HW=64.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.76 cfs @ 12.19 hrs HW=67.17' TW=45.89' (Dynamic Tailwater)
 ↑ 2=Culvert (Inlet Controls 2.03 cfs @ 5.81 fps)
 3=Orifice/Grate (Orifice Controls 0.17 cfs @ 7.75 fps)
 4=Orifice/Grate (Orifice Controls 0.56 cfs @ 6.47 fps)
 5=Orifice/Grate (Controls 0.00 cfs)

Pond 1P: System 1**Hydrograph**

Summary for Pond 2P: System 2

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 4.08" for 25-YR event
 Inflow = 2.76 cfs @ 12.19 hrs, Volume= 13,189 cf
 Outflow = 2.27 cfs @ 12.41 hrs, Volume= 12,804 cf, Atten= 18%, Lag= 13.0 min
 Discarded = 0.01 cfs @ 9.62 hrs, Volume= 681 cf
 Primary = 2.25 cfs @ 12.41 hrs, Volume= 12,123 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 46.39' @ 12.41 hrs Surf.Area= 995 sf Storage= 1,887 cf

Plug-Flow detention time= 35.0 min calculated for 12,804 cf (97% of inflow)
 Center-of-Mass det. time= 18.2 min (833.1 - 814.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.25'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	43.75'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	46.50'	34 cf	8.0" Round Pipe Storage-Impervious L= 98.4' S= 0.0800 '/'
2,697 cf			Total Available Storage

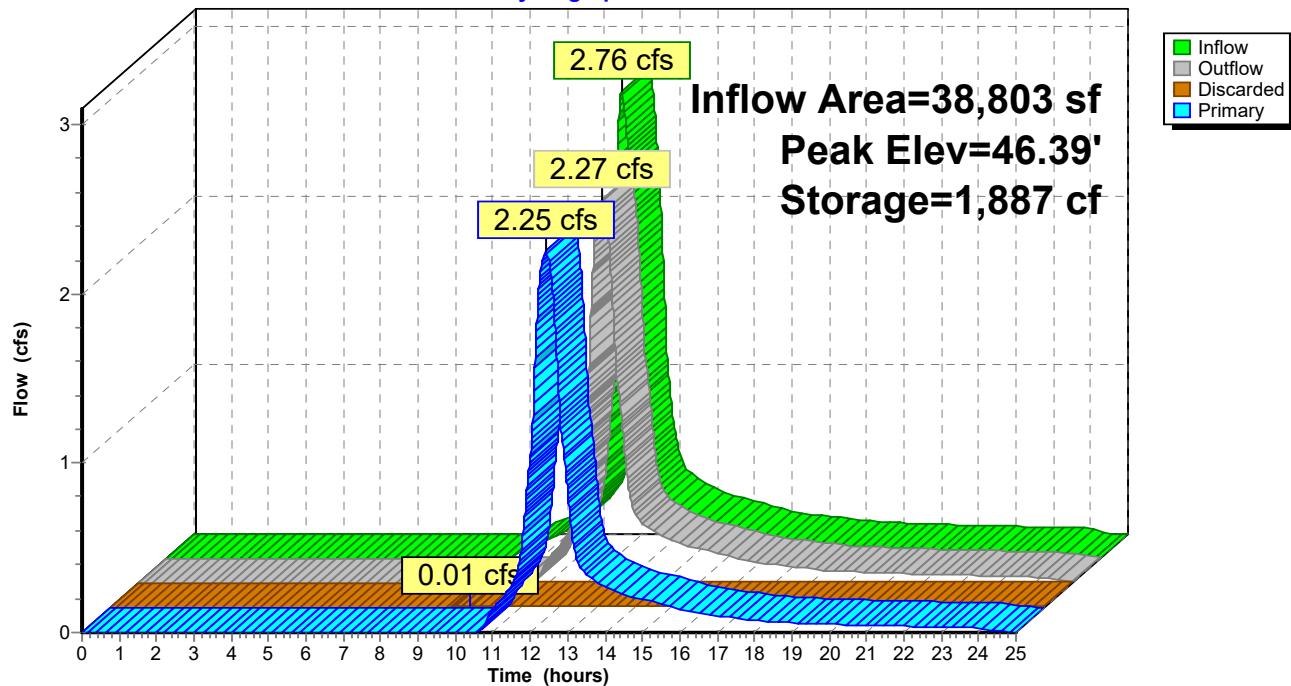
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.25'	0.520 in/hr Exfiltration over Surface area
#2	Primary	44.10'	8.0" Round Culvert L= 69.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 44.10' / 43.70' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	44.10'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	45.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	46.70'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 9.62 hrs HW=43.37' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.25 cfs @ 12.41 hrs HW=46.38' TW=0.00' (Dynamic Tailwater)

- ↑ 2=Culvert (Barrel Controls 1.67 cfs @ 4.79 fps)
- 3=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.14 fps)
- 4=Orifice/Grate (Orifice Controls 0.42 cfs @ 4.86 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: System 2**Hydrograph**

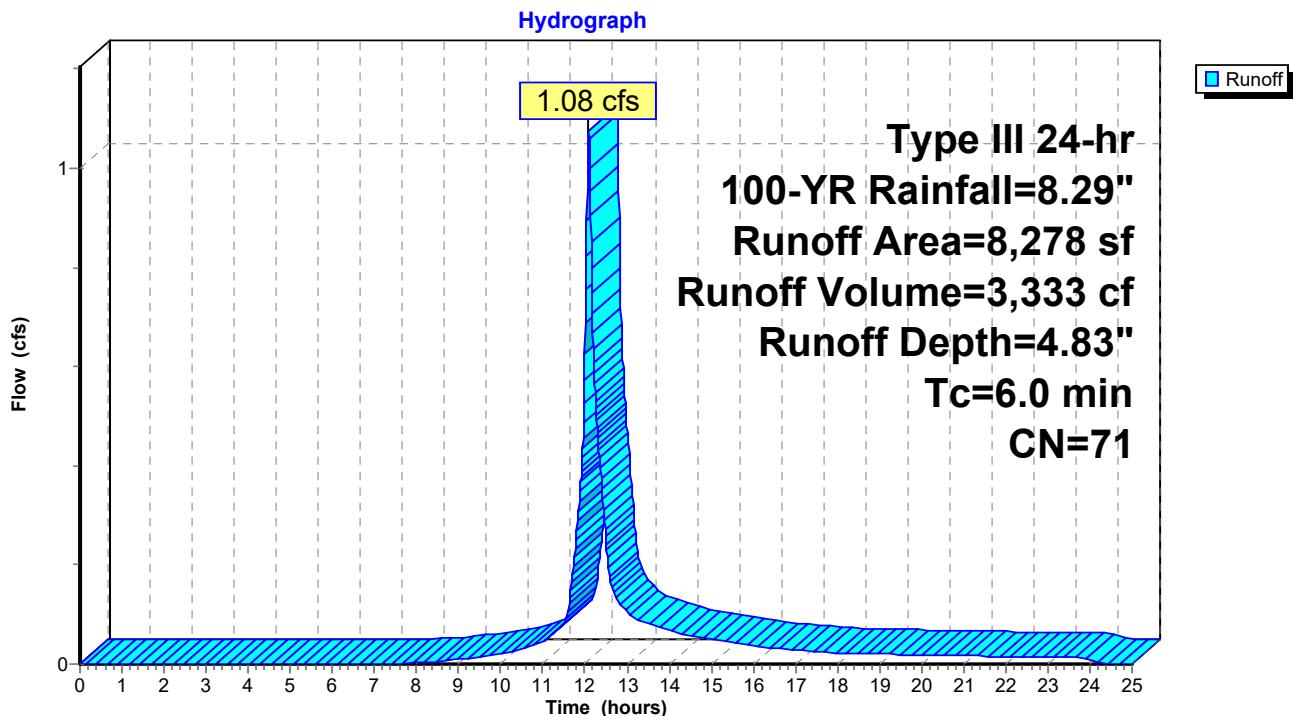
Summary for Subcatchment P-1: Easterly Flows

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 3,333 cf, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	98	Roofs, HSG C
2,208	74	>75% Grass cover, Good, HSG C
6,070	70	Woods, Good, HSG C
8,278	71	Weighted Average
8,278		100.00% Pervious Area

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

Subcatchment P-1: Easterly Flows

Summary for Subcatchment P-2: Uncaptured Northerly Flows

Runoff = 3.51 cfs @ 12.09 hrs, Volume= 10,924 cf, Depth= 5.30"

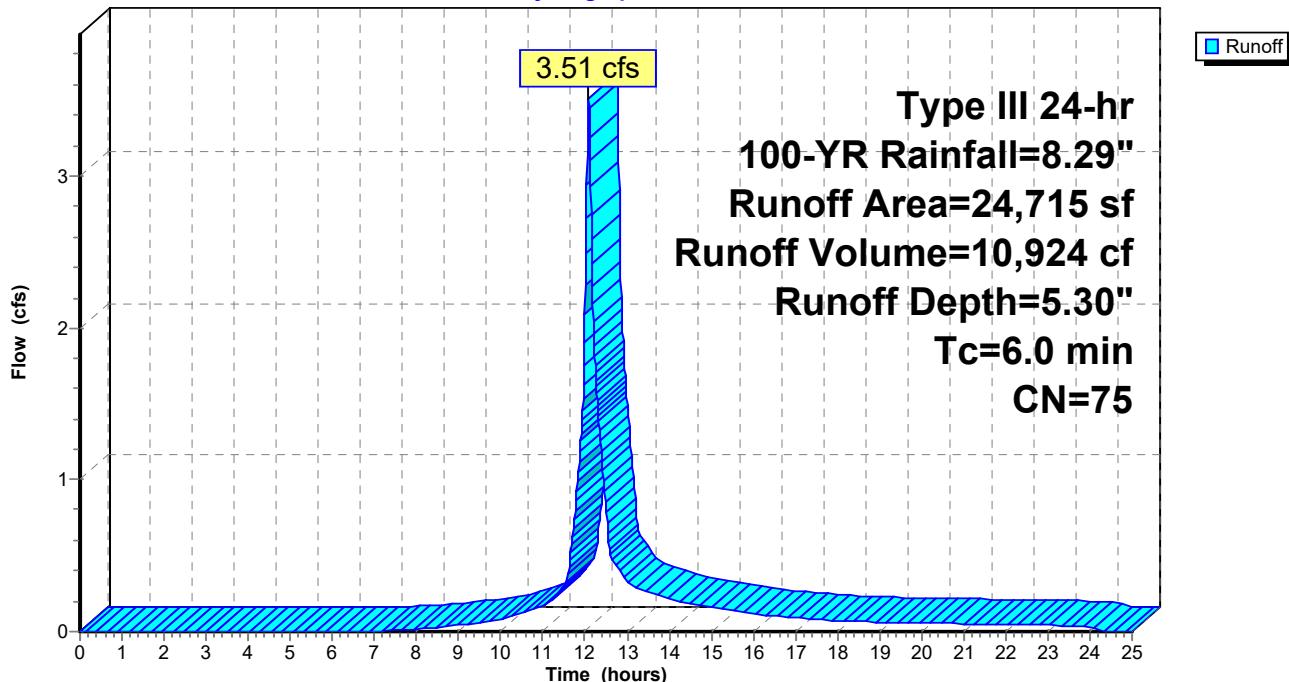
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,548	98	Roofs, HSG C
21,227	74	>75% Grass cover, Good, HSG C
1,940	70	Woods, Good, HSG C
24,715	75	Weighted Average
23,167		93.74% Pervious Area
1,548		6.26% Impervious Area

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

Subcatchment P-2: Uncaptured Northerly Flows

Hydrograph



Summary for Subcatchment P-3: Westerly Flows

Runoff = 2.14 cfs @ 12.09 hrs, Volume= 6,662 cf, Depth= 5.19"

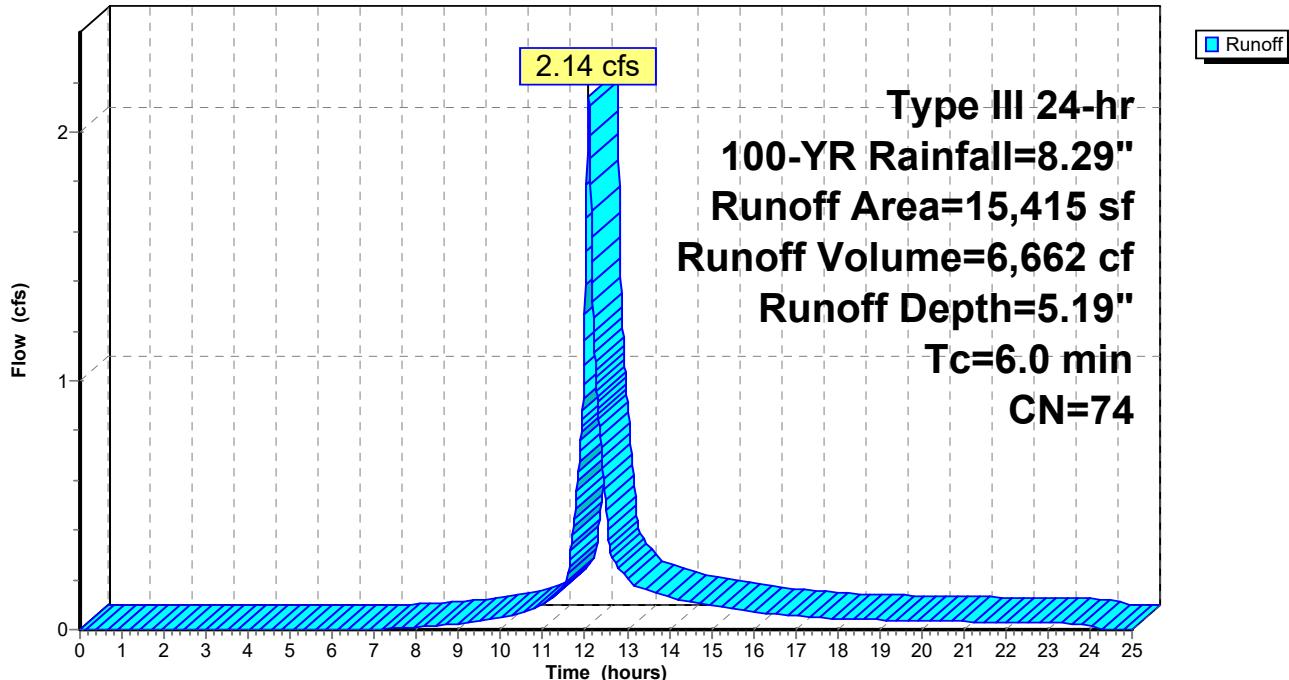
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
1,307	98	Roofs, HSG C
7,349	74	>75% Grass cover, Good, HSG C
6,759	70	Woods, Good, HSG C
15,415	74	Weighted Average
14,108		91.52% Pervious Area
1,307		8.48% Impervious Area

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

Subcatchment P-3: Westerly Flows

Hydrograph



Summary for Subcatchment P-4: Flows to P-Road

Runoff = 2.61 cfs @ 12.09 hrs, Volume= 8,238 cf, Depth= 5.90"

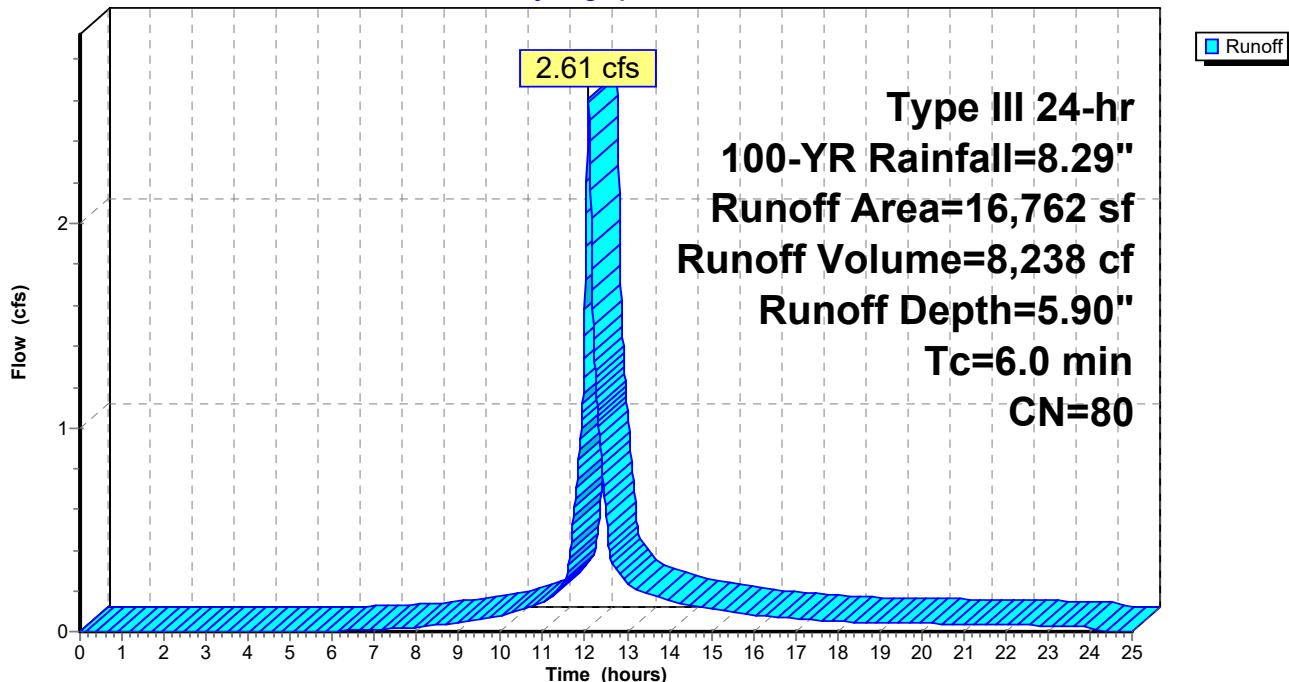
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
4,548	98	Paved parking, HSG C
351	98	Roofs, HSG C
7,896	74	>75% Grass cover, Good, HSG C
3,967	70	Woods, Good, HSG C
16,762	80	Weighted Average
11,863		70.77% Pervious Area
4,899		29.23% Impervious Area

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

Subcatchment P-4: Flows to P-Road

Hydrograph



Summary for Subcatchment P-5: Flows to P-Road

Runoff = 3.60 cfs @ 12.09 hrs, Volume= 11,488 cf, Depth= 6.25"

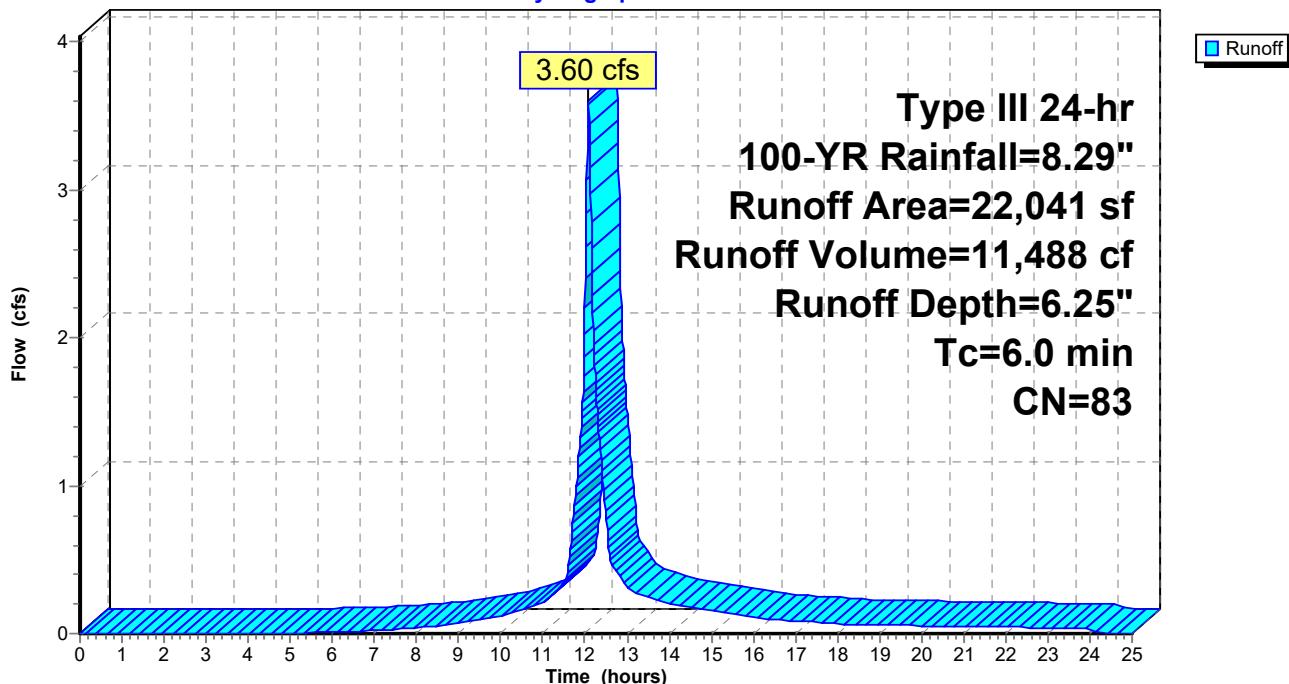
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-YR Rainfall=8.29"

Area (sf)	CN	Description
5,372	98	Paved parking, HSG C
2,986	98	Roofs, HSG C
13,683	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
22,041	83	Weighted Average
13,683		62.08% Pervious Area
8,358		37.92% Impervious Area

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

Subcatchment P-5: Flows to P-Road

Hydrograph



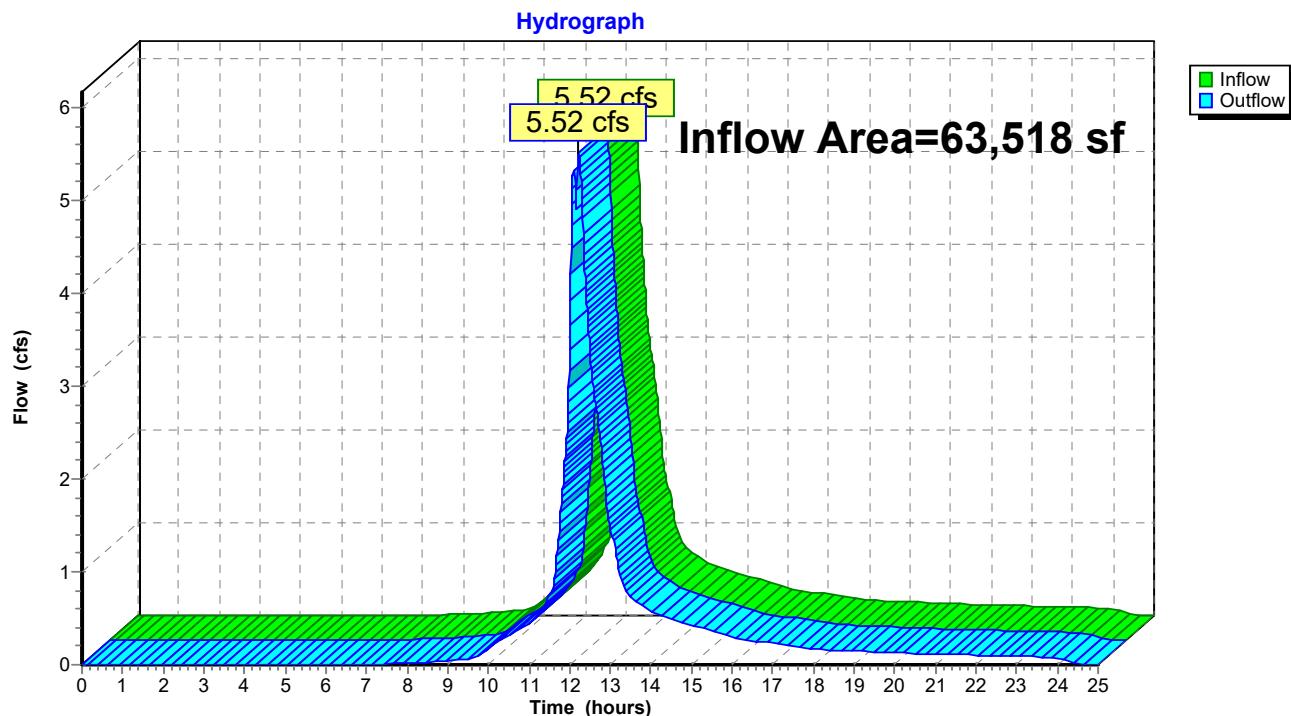
Summary for Reach 2R: Northerly Flow

Inflow Area = 63,518 sf, 23.31% Impervious, Inflow Depth > 5.39" for 100-YR event

Inflow = 5.52 cfs @ 12.21 hrs, Volume= 28,509 cf

Outflow = 5.52 cfs @ 12.21 hrs, Volume= 28,509 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 2R: Northerly Flow

Summary for Pond 1P: System 1

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 6.10" for 100-YR event
 Inflow = 6.22 cfs @ 12.09 hrs, Volume= 19,726 cf
 Outflow = 4.55 cfs @ 12.16 hrs, Volume= 19,546 cf, Atten= 27%, Lag= 4.4 min
 Discarded = 0.01 cfs @ 6.61 hrs, Volume= 848 cf
 Primary = 4.54 cfs @ 12.16 hrs, Volume= 18,698 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 68.07' @ 12.16 hrs Surf.Area= 995 sf Storage= 2,547 cf

Plug-Flow detention time= 20.0 min calculated for 19,546 cf (99% of inflow)
 Center-of-Mass det. time= 14.3 min (811.7 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.95'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	64.45'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	65.80'	11 cf	8.0" Round Pipe Storage-Impervious L= 30.5' S= 0.0050 '/'
#4	66.00'	4 cf	4.00'D x 0.30'H Vertical Cone/Cylinder-Impervious
#5	66.30'	8 cf	8.0" Round Pipe Storage-Impervious L= 23.1' S= 0.0050 '/'
			2,685 cf Total Available Storage

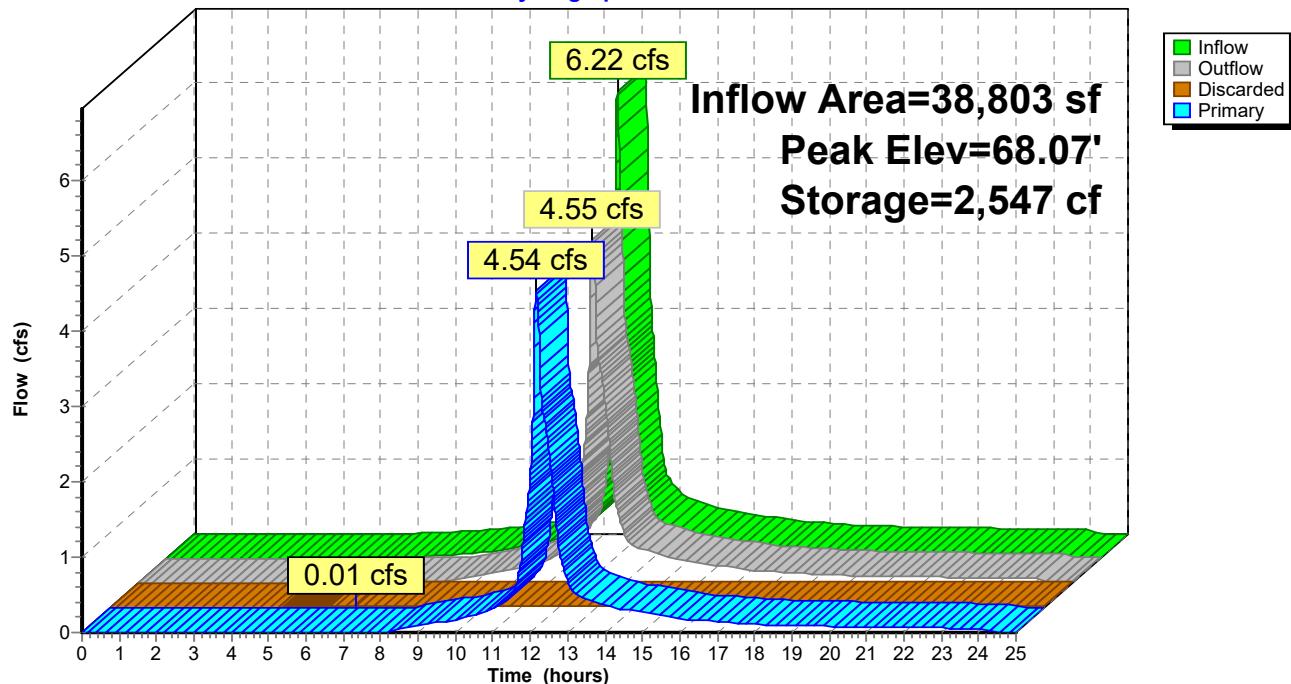
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.95'	0.520 in/hr Exfiltration over Surface area
#2	Primary	64.50'	8.0" Round Culvert L= 46.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 63.00' S= 0.0325 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	64.50'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	65.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	67.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 6.61 hrs HW=64.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=4.54 cfs @ 12.16 hrs HW=68.07' TW=46.60' (Dynamic Tailwater)

- ↑ 2=Culvert (Inlet Controls 2.39 cfs @ 6.84 fps)
- 3=Orifice/Grate (Orifice Controls 0.20 cfs @ 8.99 fps)
- 4=Orifice/Grate (Orifice Controls 0.69 cfs @ 7.91 fps)
- 5=Orifice/Grate (Orifice Controls 1.27 cfs @ 3.63 fps)

Pond 1P: System 1**Hydrograph**

Summary for Pond 2P: System 2

Inflow Area = 38,803 sf, 34.16% Impervious, Inflow Depth = 5.78" for 100-YR event
 Inflow = 4.54 cfs @ 12.16 hrs, Volume= 18,698 cf
 Outflow = 3.73 cfs @ 12.25 hrs, Volume= 18,308 cf, Atten= 18%, Lag= 5.5 min
 Discarded = 0.01 cfs @ 8.66 hrs, Volume= 723 cf
 Primary = 3.72 cfs @ 12.25 hrs, Volume= 17,584 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 47.09' @ 12.25 hrs Surf.Area= 995 sf Storage= 2,345 cf

Plug-Flow detention time= 29.1 min calculated for 18,300 cf (98% of inflow)
 Center-of-Mass det. time= 16.6 min (823.8 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.25'	576 cf	25.50'W x 39.00'L x 4.75'H Field A 4,724 cf Overall - 2,805 cf Embedded = 1,919 cf x 30.0% Voids
#2A	43.75'	2,087 cf	Shea Leaching Chamber 4x4x4 x 45 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 45 Chambers in 5 Rows
#3	46.50'	34 cf	8.0" Round Pipe Storage-Impervious L= 98.4' S= 0.0800 '/'
2,697 cf			Total Available Storage

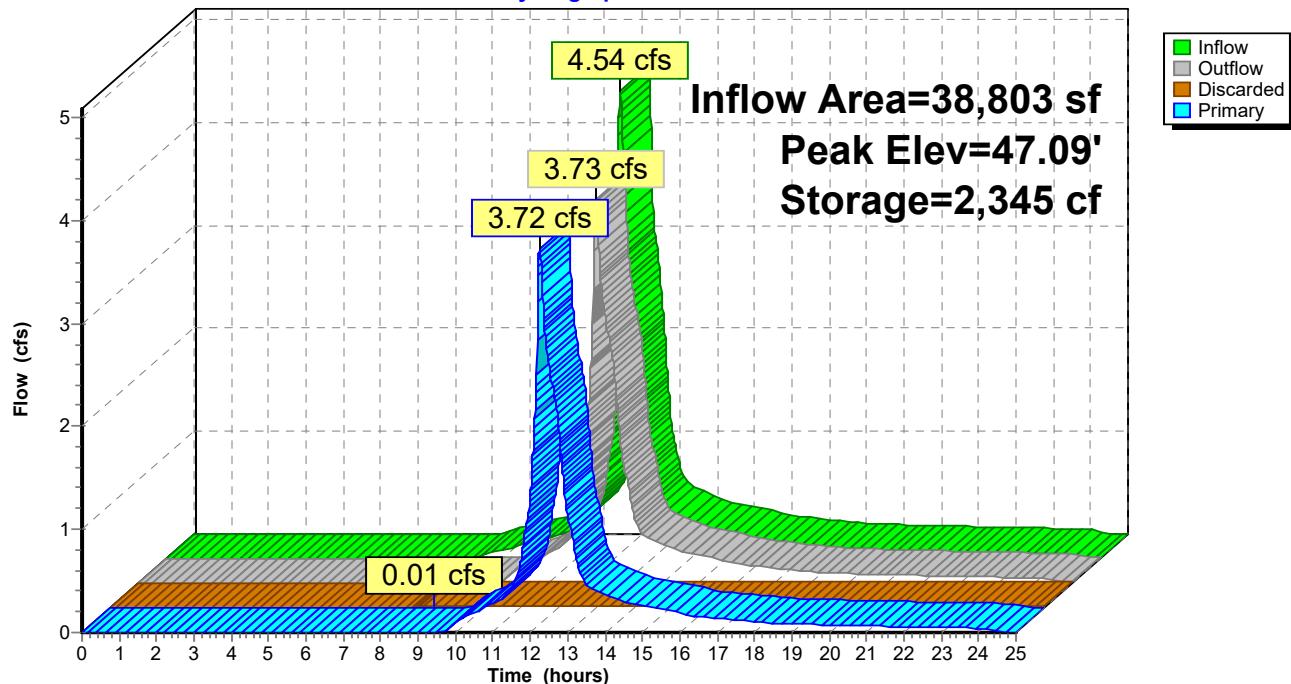
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.25'	0.520 in/hr Exfiltration over Surface area
#2	Primary	44.10'	8.0" Round Culvert L= 69.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 44.10' / 43.70' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Primary	44.10'	2.0" Vert. Orifice/Grate C= 0.600
#4	Primary	45.20'	4.0" Vert. Orifice/Grate C= 0.600
#5	Primary	46.70'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.66 hrs HW=43.37' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.72 cfs @ 12.25 hrs HW=47.09' TW=0.00' (Dynamic Tailwater)

- ↑ 2=Culvert (Barrel Controls 1.94 cfs @ 5.57 fps)
- 3=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.21 fps)
- 4=Orifice/Grate (Orifice Controls 0.55 cfs @ 6.32 fps)
- 5=Orifice/Grate (Orifice Controls 1.05 cfs @ 3.00 fps)

Pond 2P: System 2**Hydrograph**

JAMES W. BURKE, P.E. DATE

GENERAL NOTES:

1. LOCUS: ASSESSORS MAP F BLOCK 8 LOT 9
 RECORD OWNER: JOSEPH P. & DIANE E. GROGAN
 DEED REFERENCE: BOOK 39906 PAGE 540
 PLAN REFERENCE: PLAN 301 OF 1946 (LOT A & 3)

2. THIS PLAN IS THE RESULT OF AN ON THE GROUND SURVEY PERFORMED BY THIS OFFICE DURING JANUARY 2022.

3. EXISTING UTILITIES WHERE SHOWN IN THE DRAWINGS ARE FROM SURFACE OBSERVATION AND RECORD INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY LOCATING AND COORDINATING THE PROPOSED CONSTRUCTION ACTIVITY WITH DIG-SAFE AND THE APPLICABLE UTILITY COMPANIES AND MAINTAINING THE EXISTING UTILITY SYSTEM IN SERVICE.

DIG-SAFE SHALL BE NOTIFIED PER THE STATE OF MASSACHUSETTS STATUTE CHAPTER 82, SECTION 409 AT TEL. 1-888-344-7233. THE ENGINEER DOES NOT GUARANTEE THEIR ACCURACY OR THAT ALL UTILITIES AND SUBSURFACE STRUCTURES ARE SHOWN. LOCATIONS AND ELEVATIONS OF UNDERGROUND UTILITIES WERE TAKEN FROM RECORD PLANS. THE CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND INVERTS OF UTILITIES AND STRUCTURES AS REQUIRED PRIOR TO THE START OF CONSTRUCTION.

4. THE LOT SHOWN LIES WITHIN SPECIAL FLOOD HAZARD ZONE AE (EL 11) AS DELINEATED ON FIRM 25021C0068F, DATED JUNE 9, 2014.

5. WETLANDS SHOWN DELINEATED BY ECOTEC, INC. ON JANUARY 27, 2022.

6. PARCEL IS ZONED RESIDENCE A.

MIN. LOT AREA = 40,000 S.F.
 MIN. FRONTAGE = 150 FT.
 MIN. FRONT YARD = 30 FT.
 MIN. SIDE YARD = 15 FT.
 MIN. REAR YARD = 30 FT.

PROJECT TITLE & LOCATION:
 MILTON HILL DEVELOPMENT
 PROPOSED PRELIMINARY SUBDIVISION
 34 MILTON HILL ROAD
 MILTON, MASS.

PLAN TITLE:
 EXISTING WATERSHED
 DELINEATION PLAN

PREPARED FOR:
 JOSHUA D WILD
 174 DORCHESTER STREET
 BOSTON, MA 02127

DATE: MAY 28, 2022

REVISED:

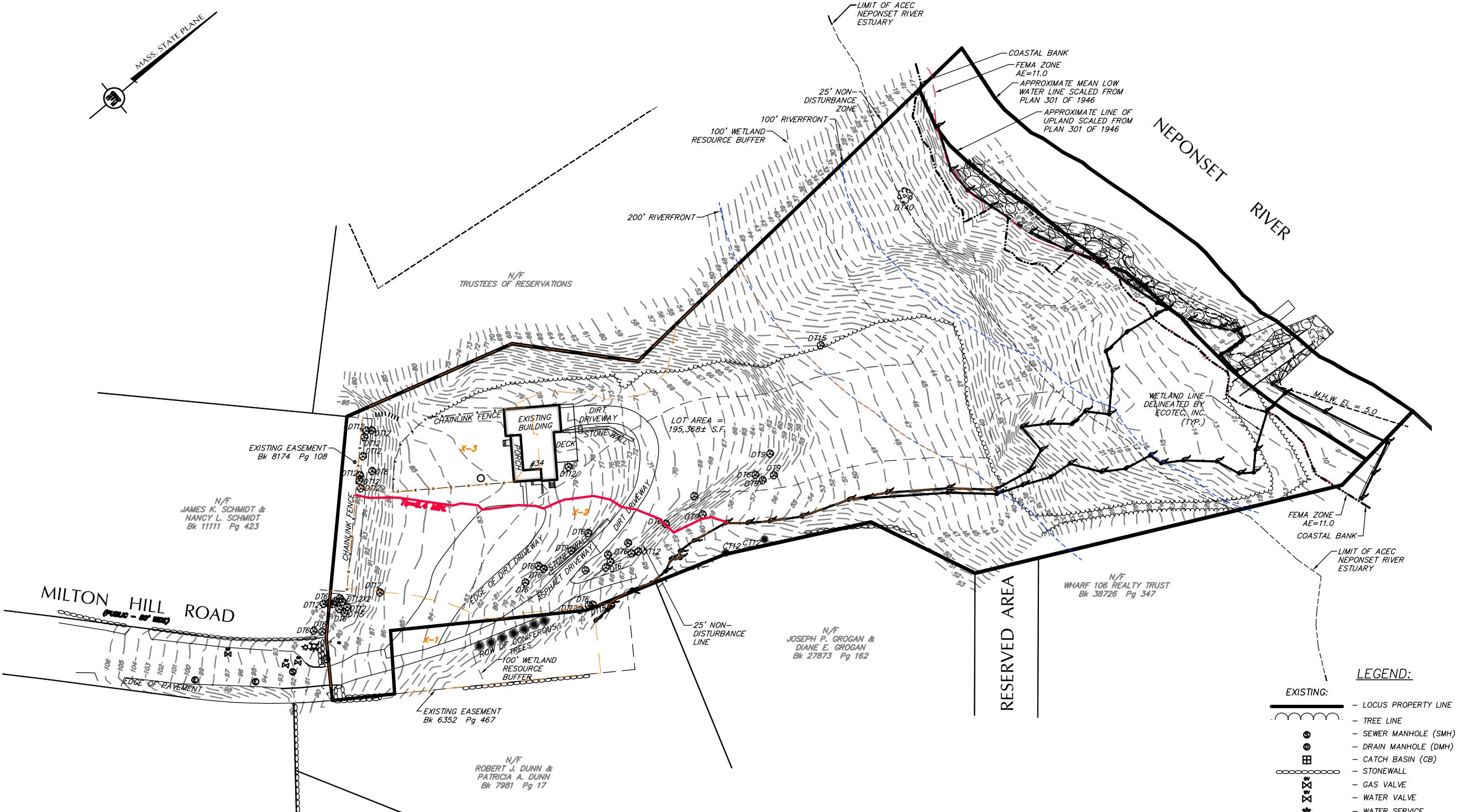
REVISED:

REVISED:

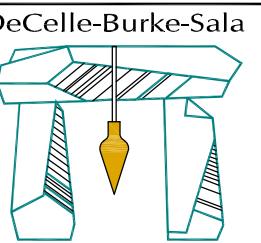
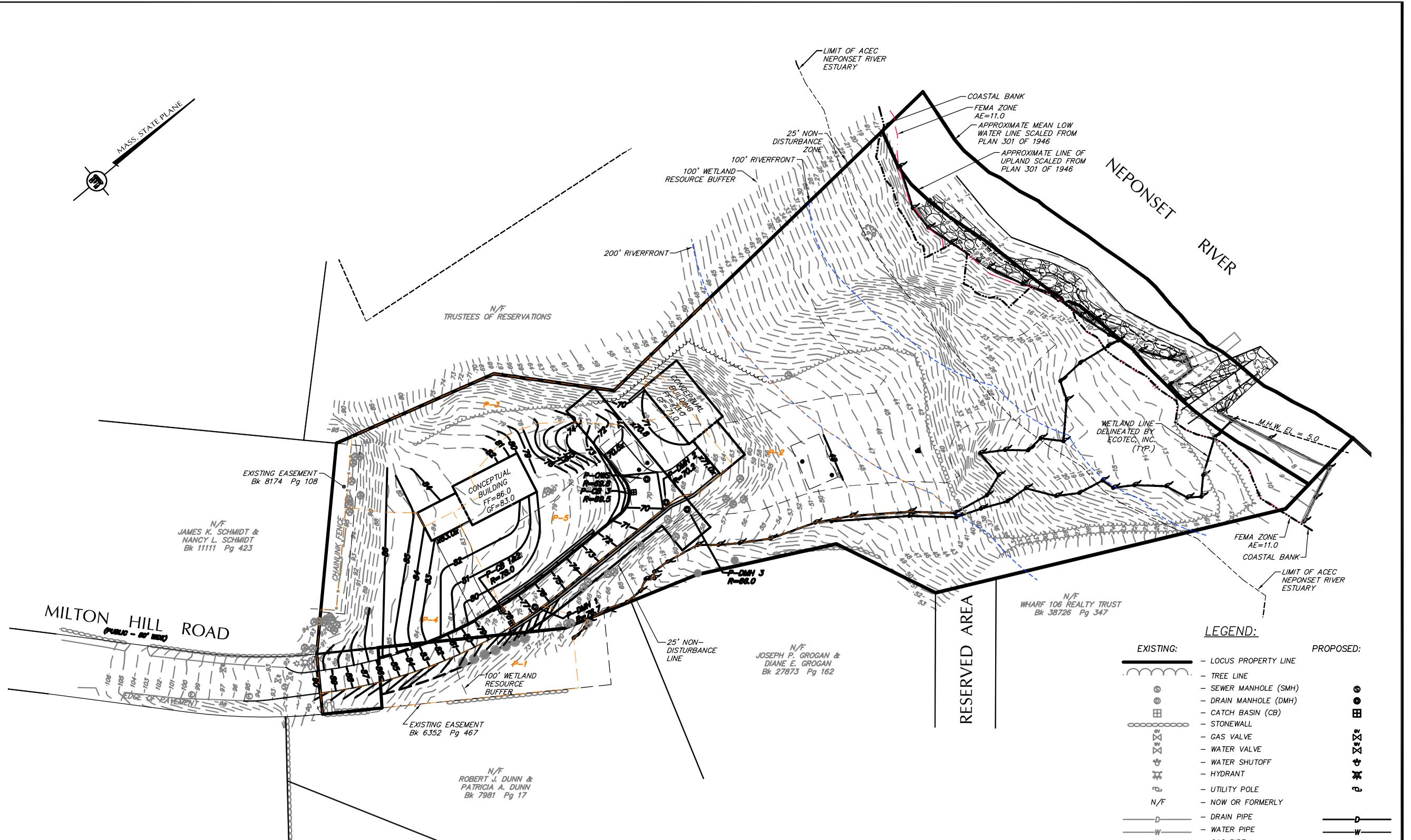
JOB NUMBER: 2022.002 SHEET 1 OF 2

40 20 0 40 80

SCALE: 1" - 40'



DESCRIPTION	X-1	X-2	X-3	TOTAL
PAVEMENT	1,890 S.F.	1,631 S.F.	0 S.F.	3,521 S.F.
DIRT DRIVE	1,398 S.F.	6,282 S.F.	0 S.F.	7,680 S.F.
ROOF	0 S.F.	1,105 S.F.	1,092 S.F.	2,197 S.F.
LAWN	2,436 S.F.	40,796 S.F.	7,359 S.F.	50,591 S.F.
WOODS	8,290 S.F.	7,727 S.F.	7,205 S.F.	23,222 S.F.
TOTAL	14,014 S.F.	57,541 S.F.	15,656 S.F.	87,211 S.F.



& Associates, Inc.
66 Furnace Brook Parkway #401
Quincy, MA 02169
7-405-5100 (o) 617-405-5101 (f)
www.decelle-burke-sala.com

AMES W. BURKE, P.E. DATE

GENERAL NOTES:

LOCUS: ASSESSORS MAP F BLOCK 8 LOT 9
RECORD OWNER: JOSEPH P. & DIANE E. GROGAN
DEED REFERENCE: BOOK 39906 PAGE 540
PLAN REFERENCE: PLAN 301 OF 1946 (LOT A & 3)

THIS PLAN IS THE RESULT OF AN ON THE GROUND SURVEY PERFORMED BY THIS OFFICE DURING JANUARY 2022.

EXISTING UTILITIES WHERE SHOWN IN THE DRAWINGS ARE
ON SURFACE OBSERVATION AND RECORD INFORMATION
D SHOULD BE CONSIDERED APPROXIMATE. THE
TRACTOR SHALL BE RESPONSIBLE FOR PROPERLY
CATING AND COORDINATING THE PROPOSED CONSTRUCTION
TIVITY WITH DIG-SAFE AND THE APPLICABLE UTILITY
MPANIES AND MAINTAINING THE EXISTING UTILITY SYSTEM
SERVICE

S-SAFE SHALL BE NOTIFIED PER THE STATE OF MASSACHUSETTS STATUTE CHAPTER 82, SECTION 409 AT TEL. 888-344-7233. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OR THAT ALL UTILITIES AND SUBSURFACE STRUCTURES ARE SHOWN. LOCATIONS AND ELEVATIONS OF UNDERGROUND UTILITIES WERE TAKEN FROM RECORD PLANS. THE CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND DERTS OF UTILITIES AND STRUCTURES AS REQUIRED PRIOR TO THE START OF CONSTRUCTION.

THE LOT SHOWN LIES WITHIN SPECIAL FLOOD HAZARD
ZONE AE (EL 11) AS DELINEATED ON FIRM 25021C0068F,
DATED JUNE 9, 2014.

WETLANDS SHOWN DELINEATED BY ECOTEC, INC. ON
JANUARY 27, 2022.

PARCEL IS ZONED RESIDENCE A.
N. LOT AREA = 40,000 S.F.
N. FRONTAGE = 150 FT.
N. FRONT YARD = 30 FT.
N. SIDE YARD = 15 FT.

LEGEND:

PROPOSED:

EXISTING:	PROPOSED:
	- LOCUS PROPERTY LINE
	- TREE LINE
	- SEWER MANHOLE (SMH)
	- DRAIN MANHOLE (DMH)
	- CATCH BASIN (CB)
	- STONEWALL
	- GAS VALVE
	- WATER VALVE
	- WATER SHUTOFF
	- HYDRANT
	- UTILITY POLE
N/F	- NOW OR FORMERLY
	- DRAIN PIPE
	- WATER PIPE
	- GAS PIPE
	- UNDERGROUND ELECTRIC
	- OVERHEAD WIRES
	- SEWER PIPE
LSA	- LANDSCAPED AREA
	- GRADE
	- SPOT GRADE
	- CHAIN LINK FENCE
	- STOCKADE FENCE
	- HAND HOLES FOR UTILITIES
	- LIGHT POLE
CCB	- CAPE COD BERM
VGC	- VERTICAL GRANITE CURB
SGC	- SLOPED GRANITE CURB
FF	- FIRST FLOOR
BF	- BASEMENT FLOOR
TOF	- TOP OF FOUNDATION
GF	- GARAGE FLOOR
	- EROSION CONTROL

JECT TITLE & LOCATION:
MILTON HILL DEVELOPMENT
PROPOSED PRELIMINARY SUBDIVISION
34 MILTON HILL ROAD

AN TITLE:
**PROPOSED WATERSHED
DELINEATION PLAN**

DEPARTMENT OF
PREPARED FOR:

DATE: MAY 28, 2022
VISED:
VISED:
VISED:
VISED:
VISED:
OB NUMBER: 2022.002 SHEET 6 OF XXX
40 20 0 40 80

DESCRIPTION	P-1	P-2	P-3	P-4	P-5	TOTAL
PAVEMENT	0 S.F.	0 S.F.	0 S.F.	4,548 S.F.	5,372 S.F.	9,920 S.F.
ROOF	0 S.F.	1,548 S.F.	1,307 S.F.	351 S.F.	2,986 S.F.	6,192 S.F.
LAWN	2,208 S.F.	21,227 S.F.	7,349 S.F.	7,896 S.F.	13,683 S.F.	52,363 S.F.
WOODS	6,070 S.F.	1,940 S.F.	6,759 S.F.	3,967 S.F.	0 S.F.	18,736 S.F.
TOTAL	8,278 S.F.	24,715 S.F.	15,415 S.F.	16,762 S.F.	22,041 S.F.	87,211 S.F.