STORMWATER REPORT

Center & Main – Definitive Plan
1440 Main Street
Concord, Massachusetts

July 17, 2020

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1 | Mitigative Drainage Analysis

1.1 Purpose

The purpose of this analysis is to compare the pre-development watershed condition to the post development watershed condition for the property located along Main Street and Highland Street, Concord, MA. This is accomplished by analyzing the stormwater surface runoff rates to the limit of watershed analysis as shown on the accompanying watershed maps. The results of this analysis are presented below in the Peak Rate of Runoff table.

1.2 Introduction

The site is located in West Concord at the intersection of Main Street and Highland Street, and now consists of three parcels of land with updated street address numbers (146B and 1442 Main Street and 110 Highland Street) due to a recent endorsement of the Approval Not Required (ANR) Plan of land. From this ANR Plan, Lot B & Lot C have been sold resulting in a smaller watershed of analysis. The site lies entirely within the Residence C zoning district and a smaller portion of the northeast corner of the site is also located within the Wetlands Conservancy Overlay District.

The site is bounded to the north by the commuter rail, to the northeast by open space associated with Junction Square, to the east and south by residential dwellings along Highland Street and Main Street and to the west by Center Village Condominium, a previously approved Planned Residential Development and to the northwest by the associated open space from Center Village which has been conveyed to the Town of Concord.

The site is currently occupied by a single-family dwelling (formerly #1450 now #1442) and a two-family dwelling (formerly #1440 now #110 Highland Street) which have access via a paved common driveway originating from Highland Street. The site contains an open lawn area along Main street with mature trees along a sidewalk and steps leading up from Main Street to the dwellings. The dwellings (Lot A & Lot D) are served by town water and town sewer located adjacent to the sidewalk access from Main Street. Overhead electrical service originates from Highland Street. The site is primarily vegetated with a large lawn area along the frontage of Main Street with some deciduous and coniferous tree cover. The rear of the site (Parcel G & Parcel H) is woodland and contains an isolated wetland. Lot E 7 Lot F are ANR frontage lots.

The site varies in elevation from approximately 156 along the frontage of both Main Street and Highland Street to elevation 170 near the dwellings and quickly down to elevation 134 behind the single-family dwelling. The elevation 170 also runs along the westerly boundary with Center Village near its dwellings, with an elevation drop along the fence line to elevation 144 to elevation 130 along the Town of Concord Land. There is a gravel path that begins at elevation 160 at the stonewall near Highland Street which provides access down to the rear of the site to elevation of 136 at the Junction Square open space. All elevations mentioned above drain towards the isolated wetlands on site (Parcel H) at elevation 126 with low areas at elevation 124. Runoff from the drain outlets from the Junction Square catch basins also drains into this isolated wetland from the east along the base of the commuter rail berm.

There is an isolated wetland located on-site which has been reviewed and confirmed by the Natural Resources Commission (See ORAD Dep File #137-1408; dated December 7, 2017). In addition to the edge of wetland confirmation, it has also been confirmed that this depression does not meet the criteria as an isolated land subject to flooding.

This definitive plan is a conventional layout of a subdivision road network to create frontage for sixteen additional lots. Lot E & Lot F area remain unchanged and will become corner lots once Parcel G is approved as a road. The existing structures will be razed and the site regraded with roadway access from Main Street for the subdivision.

This conventional subdivision street with access from Main Street will result in a roadway and sidewalk. Lots will be served by town water and individual private Title V on-site subsurface sewage disposal systems. Utilities will be underground. An above ground sediment forebay prior to a subsurface infiltration system will be provided for each road.

1.3 Existing Condition Soils Analysis

In order to model the excess runoff for both the existing and proposed watershed condition, the parent soils on site were mapped using the Web Soil Survey (WSS) made available on the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) website. The WSS provides vital soil data and information such as Hydrologic Soil Group (HSG), which is then input into a mathematical model to generate runoff curve numbers.

The user inputs the soil cover type as well as the hydrologic soil group to generate a weighted curve number (CN) and also uses the topography of the land to generate a time of concentration (Tc) from which the stormwater runoff rate and volume can be calculated for a given watershed for comparison.

On-site soils are comprised of Merrimac-Urban Land Complex and Hinckley loamy sand which have Hydrologic Soil Group (HSG) ratings of A; while Deerfield loamy sand has a rating of B. Scarboro mucky fine sandy loam within the area of the isolated wetland has a Hydrologic Soil Group (HSG) rating of D.

1.4 Stormwater Modeling Methodology

The mathematical model used in this analysis for post development is computed using the stormwater modeling software HydroCAD, v10.00, developed by HydroCAD Software Solutions LLC. HydroCAD is a program used to model the hydrology and hydraulics of stormwater runoff and is based largely on programs and techniques developed by the NRCS, specifically TR-20 and TR-55 and other hydraulic calculation methods.

HydroCAD allows the user, for a given rainfall event, to generate runoff hydrographs for single or multiple watersheds and is used to determine if a given drainage system is adequate under the desired conditions and to predict flooding or other hydraulic impacts such as erosion at specified locations.

Four design storm events are analyzed and the result is summarized in Tables 1 through 8 below.

1.5 Pre-Development Watershed

The pre-development watershed area is separated into four watersheds resulting from the existing topography and for comparison with the post-development condition.

The selected Comparison Edge 1L represents flow to the isolated wetland (S1). The area tributary to this selected edge of comparison is 247,652 square feet.

The selected Comparison Edge 2L represents flow tributary towards Highland Street (S2). The area tributary to this selected edge of comparison is 13,272 square feet.

The selected Comparison Edge 3L represents flow tributary towards a low point in the southeast lawn area along Main Street behind the sidewalk (S3). The area tributary to this selected edge of comparison is 18,378 square feet.

The selected Comparison Edge 4L represents flow tributary towards a low point located at the southwest property corner along Main Street behind the sidewalk (S4). The area tributary to this selected edge of comparison is 55,943 square feet.

The total watershed area within the limit of watershed analysis is 330,370 square feet.

Using the methods described in the stormwater modeling methodology above, runoff curve numbers and times of concentration are generated for each watershed for the pre-development condition to be used for comparison with the post-development condition described below. A schematic of the mathematical model and the results of the calculations for the 2-year, 10-year, 25-year and 100-year Type III, 24-hour storm events are included in this analysis.

1.6 Post-Development Watershed

The post-development watershed is separated into four distinct watershed groups (H1 - Highland Street; M1 & M2 – to rain gardens in lawn areas along Main Street; R1 thru R12, R16, R-D1, R-E & R-F for each dwelling unit roof area; P1 thru P-9 representing area directed to each respective catch basin. P10 & P11 represent direct flow into sediment forebays and P-12 represents the lower rear yard areas down gradient of street drainage along isolated wetland.

Similar to the pre development watershed Comparison Edge 1L represents flow tributary to the isolated wetland. The area tributary to this selected edge of comparison is 37,103 ft^2, with remainder of site area directed to subsurface recharge areas SWMA 1 & 2, and roof drywell areas mentioned above.

The selected Comparison Edge 2L represents flow tributary towards Highland Street. The area tributary to this selected edge of comparison is 3,241 ft^2 due to removal of existing driveway and dwellings. .

The selected Comparison Edge 3L represents flow tributary towards a low point to remain in the southeast lawn area along Main Street behind the sidewalk on ANR frontage Lot D1. The area tributary to this selected edge of comparison is 2,490 $ft^{2,}$.

The selected Comparison Edge 4L represents flow tributary towards a low point located at the southwest property corner along Main Street behind the sidewalk on Lot E. The area tributary to this selected edge of comparison is 4,423 $ft^{2,}$.

The total watershed area within the limit of watershed analysis is 330,370 square feet.

Post-development design provides for the construction of two primary subsurface infiltration systems, (Road A – SWMA-1 & Road B – SWMA-2). These two systems, which include sediment forebays #1 & #2 are associated with the collection and treatment of roadway runoff. These systems consist of subsurface infiltration chamber systems. Each system (1 & 2) within the culdesac islands provide peak rate of runoff mitigation, water quality and groundwater recharge in the volume provided below the required emergency overflow outlets. Prior to this, the first 1-inch is diverted into an off line sediment basin sized to hold and treat the water quality volume.

Using the methods described in the stormwater modeling methodology above, runoff curve numbers and times of concentration are generated for each watershed for the pre-development condition to be used for comparison with the post-development condition described below. A schematic of the mathematical model and the results of the calculations for the 2-year, 10-year, 25-year and 100-year Type III, 24-hour storm events are included in this analysis.

1.7 Compliance with DEP Stormwater Management Standards

Standard 1

No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Stormwater will be treated prior to any discharge from the two outfalls provided towards the onsite isolated wetland with stone rip rap provided at each outfall location.

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Standard 2

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

References within the handbook guide the designer to BMPs that slow runoff rates through storage and gradual release, such as LID techniques, extended dry detention basins, and wet basins, must be provided to meet Standard 2.

The stormwater handbook also recognizes that subsurface chambers can also be used to control the quantity as well as quality of stormwater runoff, if properly designed and constructed (Structural BMPs – Volume 2 | Chapter 2 page 105). Since adoption of this handbook, the industry advancements in the manufacturing, user-friendly design software and construction guidance are reliable to ensure proper installation, operation & maintenance.

It is our understanding that the subsurface chambers, selected for this site, are a suitable BMP that will meet the requirements of Standard 2, by slowing runoff rates in a decentralized manner across the site through storage and gradual release in an manner equal to an extended dry detention basin as indicated within Table 9.0.

See Tables 1 through 9 below which demonstrate the post-development peak discharge rates and volume of runoff are both less than or equal to the pre-development values towards **1L**, **2L, 3L** & **4L** which respectfully are to the onsite Isolated Wetland, the Highland Street Catch Basins and the southeast and southwest west property corner boundary along Main Street.

Rain Gardens have been incorporated at the low point area in the front lawn on Lot D1 and Lot F to mitigate runoff conversion from woods to lawn.

Standard 3

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The surface runoff rates and runoff volumes for the project site are analyzed using Hydrologic Soil Group A, Group B and a minor area of Group D. Groundwater recharge is provided by subsurface infiltration systems which lie entirely within areas of sand only, as determined by on site soil testing performed by a certified soil evaluator. An exfiltration rate of 8.27 inches per hour (for sand, based upon field confirmation of the absence of loamy sand within the parent material determined to be as sand within onsite soil observations at all proposed locations has been utilized as found in Table 2-1 of the Hydrology Handbook of Conservation Commissioners, March 2002 using Rawls, Brakensiek and Saxton, 1982.

Any unsuitable material encountered during construction of the subsurface infiltration pipe network will be removed and replaced with either on-site parent material or imported granular material. Should refusal/ledge be encountered during construction it shall be removed to a depth of four feet below infiltration system and backfilled with clean blasted rock fragments.

Standard 4

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:
a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

Pretreatment consisting of deep-sump catch basins equipped with a hood/trap and the diversion of pavement runoff to the off line sediment forebay will meet the Pretreatment rate of 44%. Excess runoff following the first 1-inch to the sediment forebay will be sent to the subsurface infiltration chamber rows via a manifold system resulting in greater than 80% TSS removal prior to any discharge.

The project site is not considered a LUHPPL, within a Zone II or Interim Wellhead Protection Area or Critical Area. Given the stormwater management systems lie within an area of rapid infiltration water quality volume is based on a runoff of one inch.

Standard 5

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow melt, and stormwater runoff, the proponent shall use specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This project is not being considered a LUHPPL.

Standard 6

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special

Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2) (a) (1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of public water supply.

Stormwater discharge from this property is not within a Zone II, Interim Wellhead Protection Area of a public water supply or a critical area.

Standard 7

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

This project is not considered a redevelopment.

Standard 8

A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

A Construction Period Pollution Plan (under separate cover) will be prepared in addition to the Stormwater Pollution Prevention Plan (SWPPP) within the plan set.

Standard 9

A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

A Long-Term Operation and Maintenance Plan (O&M) (under separate cover) will be prepared.

Standard 10

All illicit discharges to the stormwater management system are prohibited.

Illicit Discharge Compliance Statement

No connection between the stormwater and wastewater management systems is proposed. Per requirements of Standard 10 it is herein stated that there are no proposed illicit discharges into the Stormwater Management System to be constructed as shown on the site plan.

1.8 Conclusion

Examining the following Peak Rate of Runoff and Basin Performance tables, the proposed stormwater management system is effective for mitigating the peak flow rates and volume of runoff from the limit of the watershed analysis for the 2, 10, 25 and 100-year storm events.

Table 1.0: Peak Rate of Runoff | Comparison Location 1L

Description	**2 Year**	**10 Year**	**25 Year**	**100 Year**
Existing Peak Rate of Runoff (cfs)	0.00	0.01	0.63	1.49
Proposed Peak Rate of Runoff (cfs)	0.01	0.19	0.62	1.06
Difference	**+0.01**	**+0.18**	**-0.01**	**-0.43**

Table 2.0: Peak Rate of Runoff | Comparison Location 2L

Description	**2 Year**	**10 Year**	**25 Year**	**100 Year**
Existing Peak Rate of Runoff (cfs)	0.03	0.16	0.34	0.51
Proposed Peak Rate of Runoff (cfs)	0.03	0.10	0.16	0.22
Difference	**0.00**	**-0.06**	**-0.18**	**-0.29**

Table 3.0: Peak Rate of Runoff | Comparison Location 3L

Description	**2 Year**	**10 Year**	**25 Year**	**100 Year**
Existing Peak Rate of Runoff (cfs)	0.00	0.02	0.10	0.22
Proposed Peak Rate of Runoff (cfs)	0.00	0.00	0.00	0.00
Difference	**0.00**	**-0.02**	**-0.10**	**-0.22**

Table 4.0: Peak Rate of Runoff | Comparison Location 4L

Description	**2 Year**	**10 Year**	**25 Year**	**100 Year**
Existing Peak Rate of Runoff (cfs)	0.00	0.00	0.02	0.10
Proposed Peak Rate of Runoff (cfs)	0.00	0.00	0.00	0.00
Difference	**0.00**	**0.00**	**-0.02**	**-0.10**

Table 5.0: Volume of Runoff | Comparison Location 1L

Description	**2 Year**	**10 Year**	**25 Year**	**100 Year**
Existing Volume of Runoff (cf)	13	2,759	7,771	13,396
Proposed Volume of Runoff (cf)	281	1,410	2,748	4,886
Difference	**+268**	**-1,349**	**-5,023**	**-8,510**

Table 6.0: Volume of Runoff | Comparison Location 2L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Volume of Runoff (cf)	246	821	1,431	2,005	
Proposed Volume of Runoff (cf)	139	342	536	709	
Difference	**-107**	**-479**	**-895**	**-1,296**	

Table 7.0: Volume of Runoff | Comparison Location 3L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Volume of Runoff (cf)	23	347	822	1,326	
Proposed Volume of Runoff (cf)	0	0	0	0	
Difference	**-23**	**-347**	**-822**	**-1,326**	**Rain Garden**

Table 8.0: Volume of Runoff | Comparison Location 4L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Volume of Runoff (cf)	0	89	651	1,450	
Proposed Volume of Runoff (cf)	0	0	0	0	
Difference	**0**	**-89**	**-651**	**-1450**	**Rain Garden**

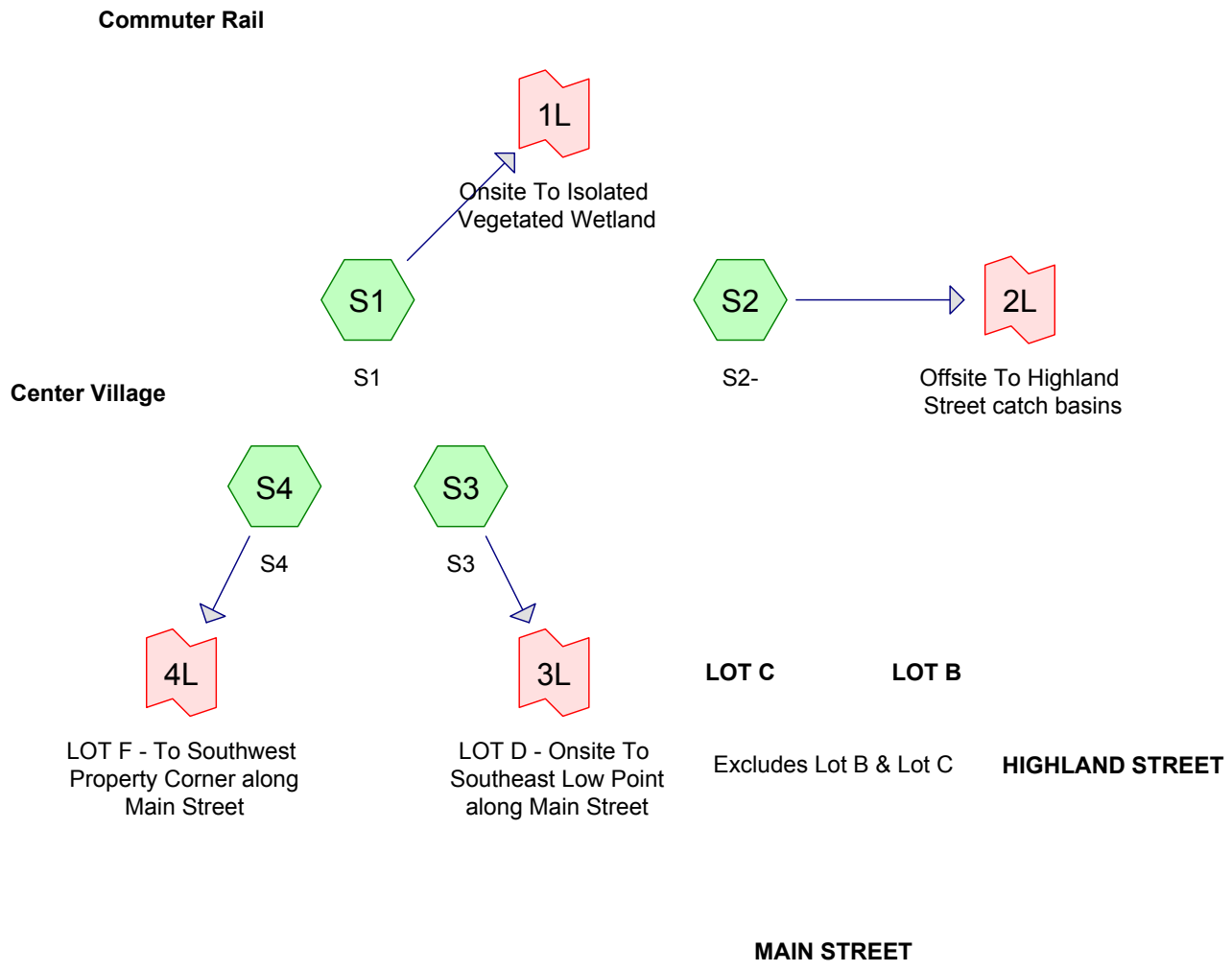
Table 9.0: Infiltration Chambers | SWMA-1P Through SWMA-9P

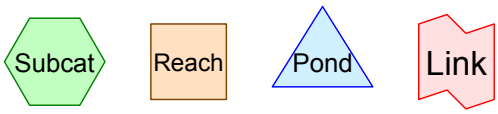
Description	Chamber System Provided	Surface Area Provided (sf)	Total Storage Volume Provided (cf)	100-Year Max Storage Volume (cf)	100 Year Max Elevation (ft)	Proposed Overflow Elevation (ft)
SWMA-1	3500 8R7C	3,176	10,698	2,634	128.02	128.50
SWMA-2	3500 8R7C	3,176	10,698	5,030	129.04	128.75

1.9 HydroCAD Data

1.9.1 Existing Condition

PREDEVELOPMENT - CONVENTIONAL





Routing Diagram for EXISTING CONV
Prepared by HP Inc., Printed 7/14/2020
HydroCAD® 10.00-25 s/n 06611 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
40,946	39	>75% Grass cover, Good, HSG A (S1, S2, S3, S4)
2,420	76	Gravel cart path, HSG A (S1)
1,657	96	Gravel drive & parking area, HSG A (S3)
3,528	98	Impervious, HSG A (S2)
510	98	Impervious, drive apron & sidewalk (S3)
345	98	Impervious, driveway (S4)
3,297	98	Roofs, HSG A (S1, S2)
631	98	Unconnected pavement, HSG A (S1)
665	98	Unconnected roofs, HSG A (S4)
208,602	30	Woods, Good, HSG A (S1, S2, S3, S4)
56,931	55	Woods, Good, HSG B (S1)
10,838	77	Woods, Good, HSG D (S1)
330,370	**39**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
261,746	HSG A	S1, S2, S3, S4
56,931	HSG B	S1
0	HSG C	
10,838	HSG D	S1
855	Other	S3, S4
330,370		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
40,946	0	0	0	0	40,946	>75% Grass cover, Good
2,420	0	0	0	0	2,420	Gravel cart path
1,657	0	0	0	0	1,657	Gravel drive & parking area
3,528	0	0	0	0	3,528	Impervious
0	0	0	0	510	510	Impervious, drive apron & sidewalk
0	0	0	0	345	345	Impervious, driveway
3,297	0	0	0	0	3,297	Roofs
631	0	0	0	0	631	Unconnected pavement
665	0	0	0	0	665	Unconnected roofs
208,602	56,931	0	10,838	0	276,371	Woods, Good
261,746	**56,931**	**0**	**10,838**	**855**	**330,370**	**TOTAL AREA**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S1: S1 Runoff Area=242,777 sf 1.19% Impervious Runoff Depth=0.00"
Flow Length=235' Slope=0.0200 '/' Tc=23.2 min CN=40 Runoff=0.00 cfs 13 cf

Subcatchment S2: S2- Runoff Area=13,272 sf 34.35% Impervious Runoff Depth=0.22"
Flow Length=156' Tc=9.9 min CN=55 Runoff=0.03 cfs 246 cf

Subcatchment S3: S3 Runoff Area=18,378 sf 2.78% Impervious Runoff Depth=0.01"
Flow Length=160' Tc=9.4 min CN=43 Runoff=0.00 cfs 23 cf

Subcatchment S4: S4 Runoff Area=55,943 sf 1.81% Impervious Runoff Depth=0.00"
Flow Length=231' Tc=6.0 min CN=34 Runoff=0.00 cfs 0 cf

Link 1L: Onsite To Isolated Vegetated Wetland delayed by 6.0 min Inflow=0.00 cfs 13 cf
Primary=0.00 cfs 13 cf

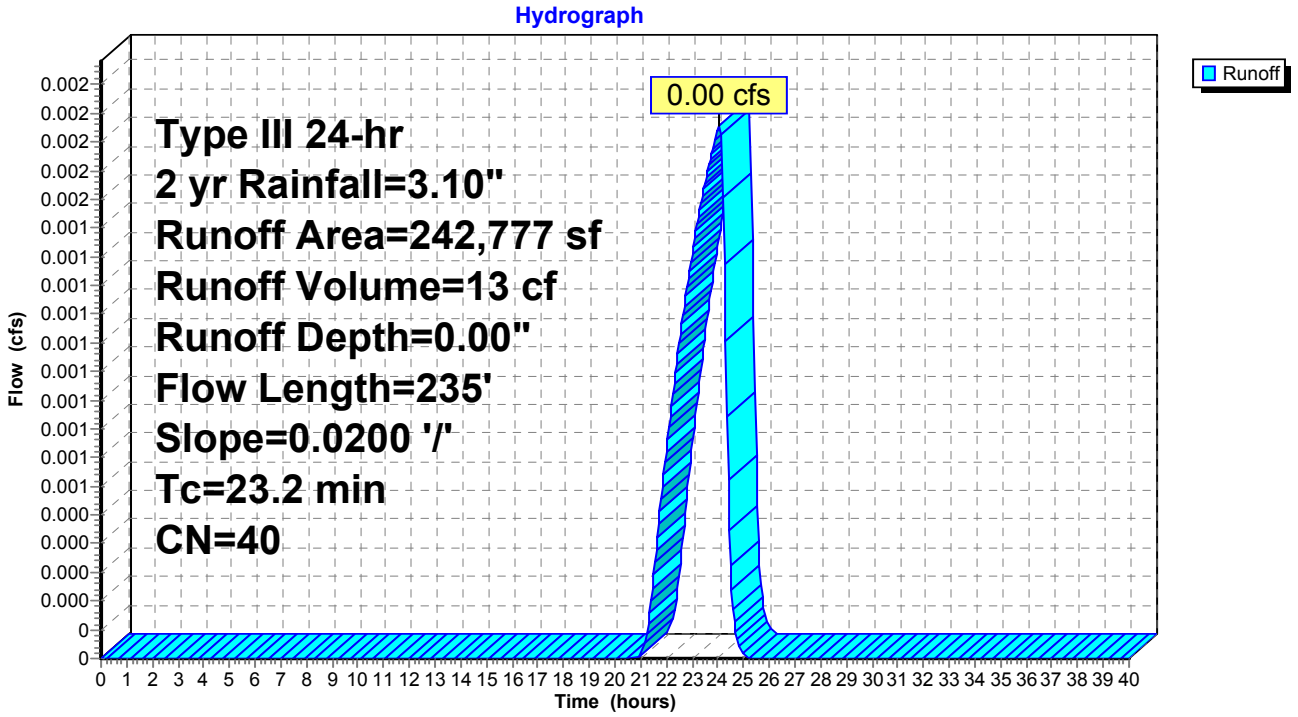
Link 2L: Offsite To Highland Street catch basins Inflow=0.03 cfs 246 cf
Primary=0.03 cfs 246 cf

Link 3L: LOT D - Onsite To Southeast Low Point along Main Street Inflow=0.00 cfs 23 cf
Primary=0.00 cfs 23 cf

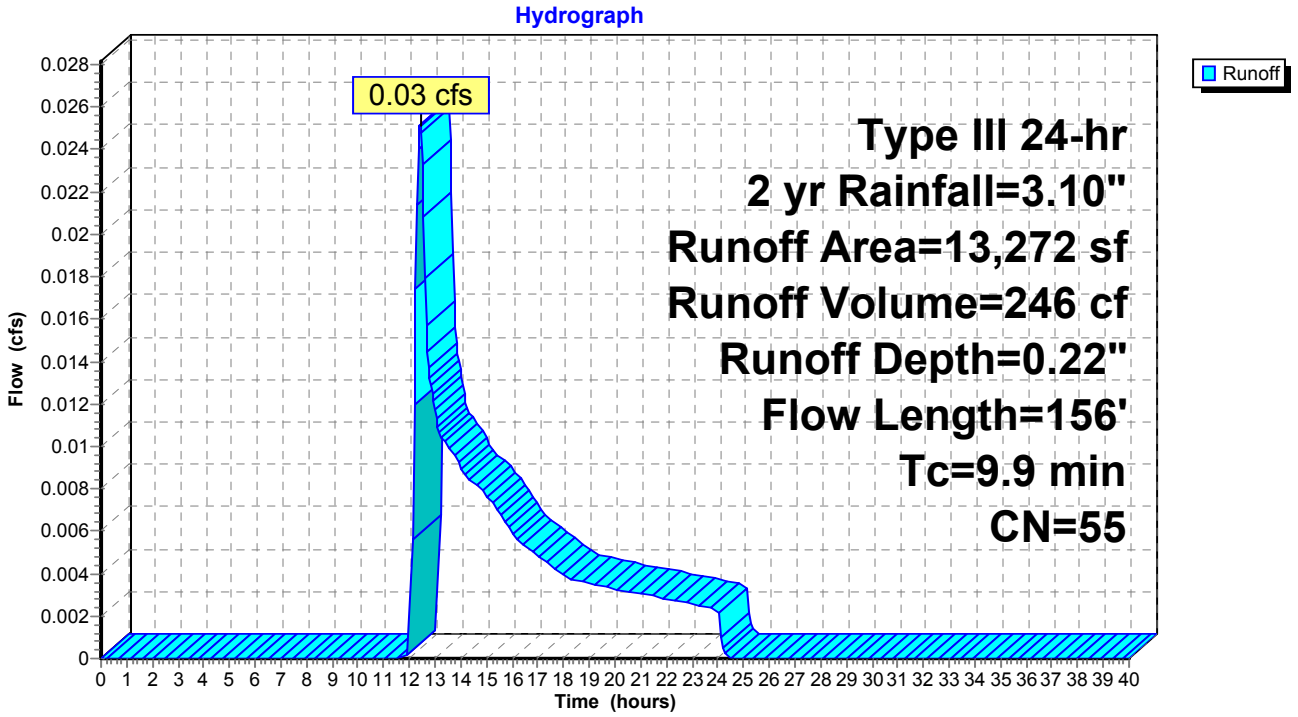
Link 4L: LOT F - To Southwest Property Corner along Main Street Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 330,370 sf Runoff Volume = 282 cf Average Runoff Depth = 0.01"
97.28% Pervious = 321,394 sf 2.72% Impervious = 8,976 sf

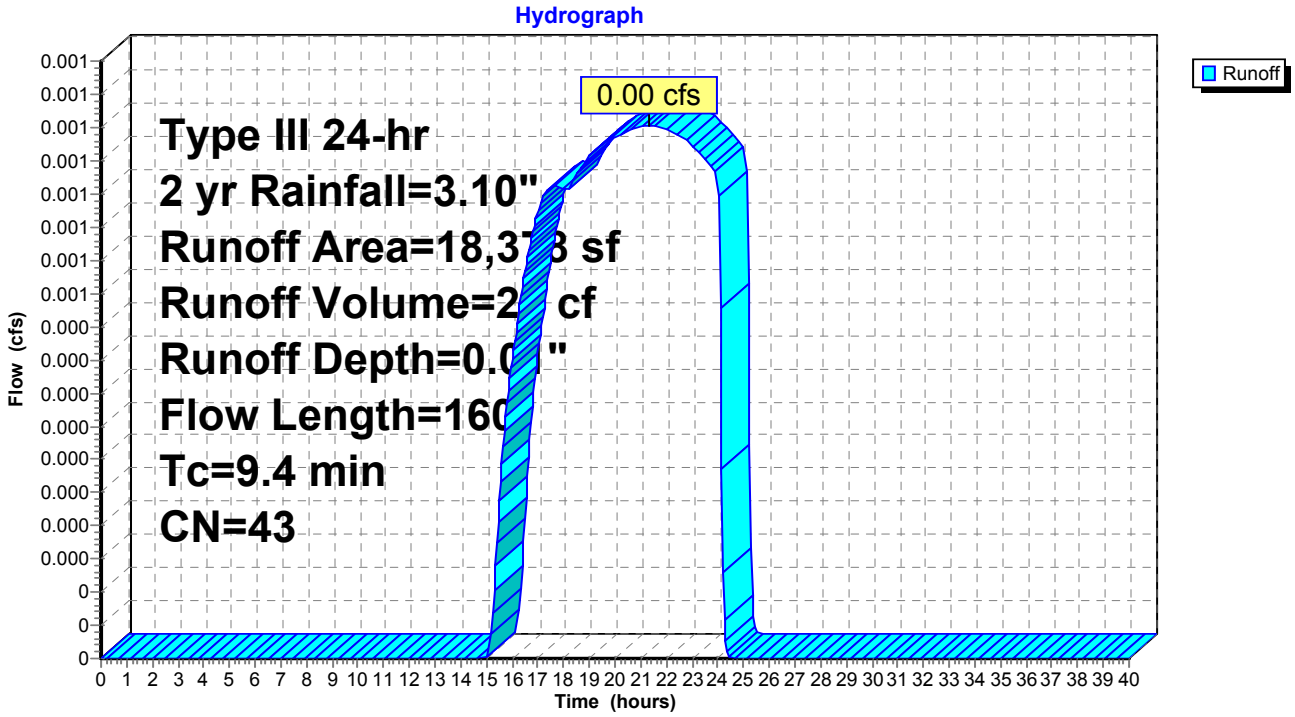
Subcatchment S1: S1



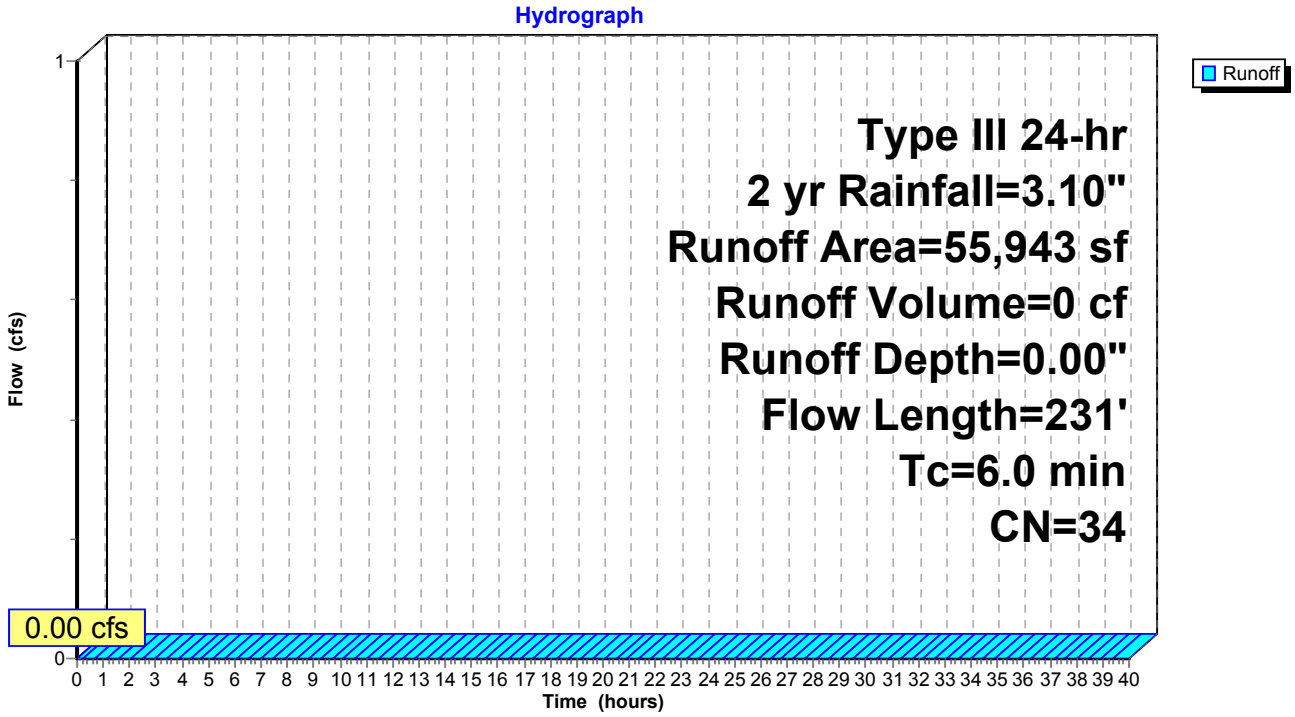
Subcatchment S2: S2-



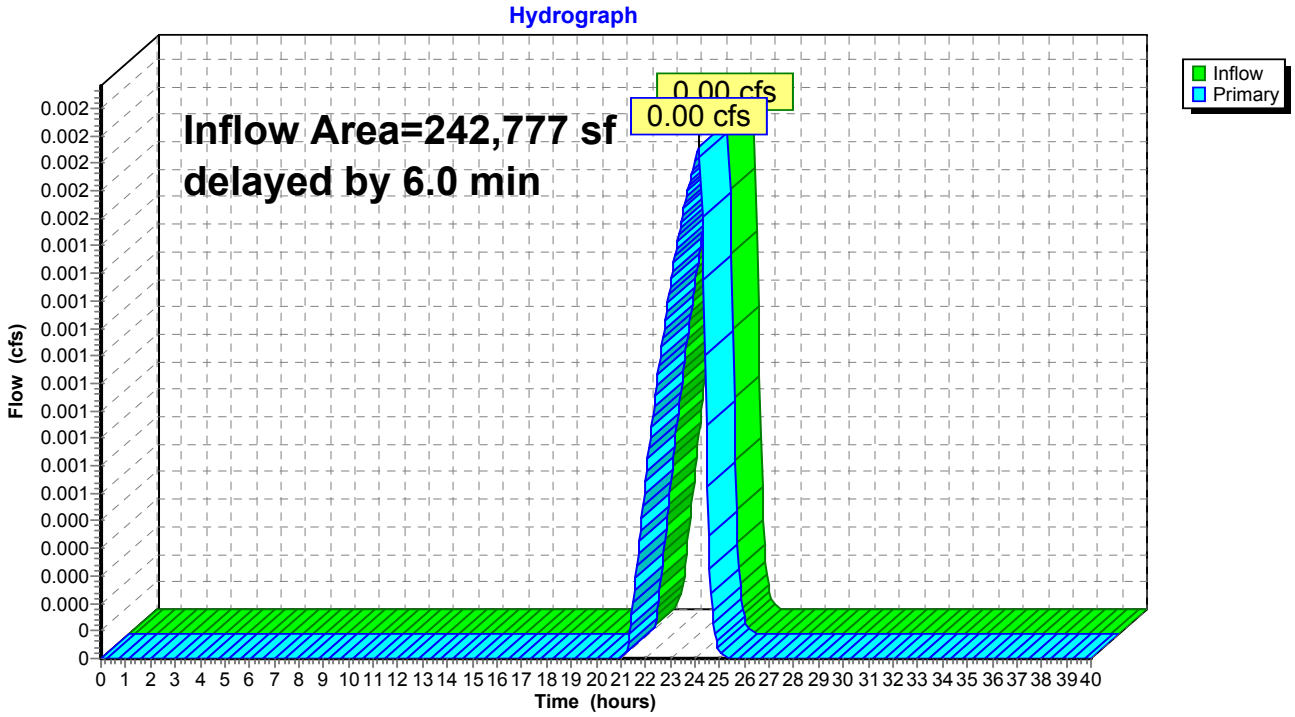
Subcatchment S3: S3



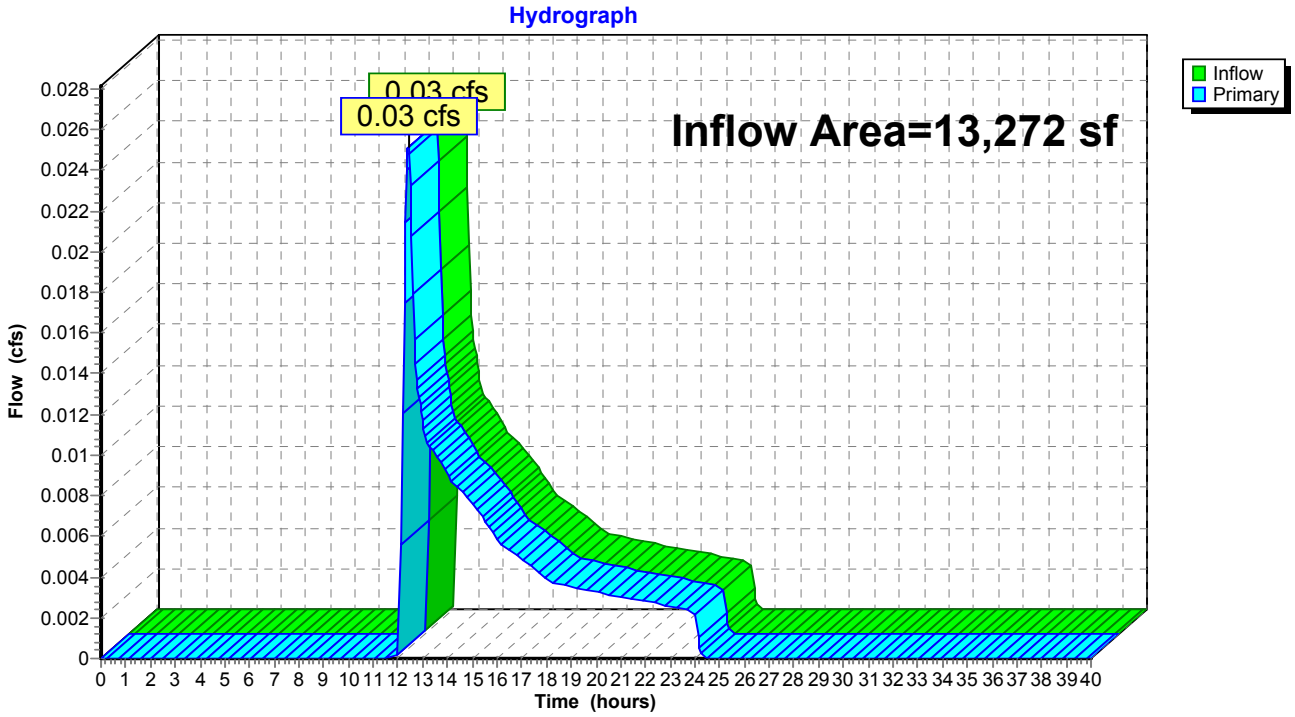
Subcatchment S4: S4



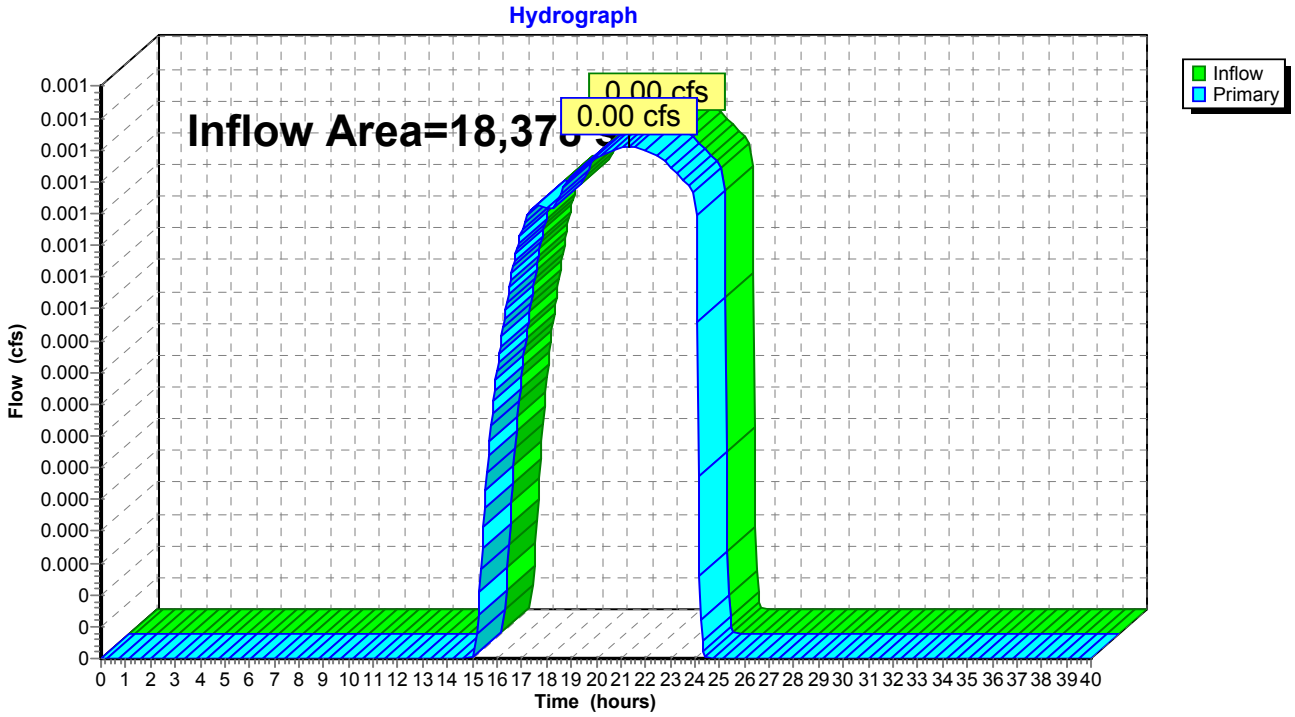
Link 1L: Onsite To Isolated Vegetated Wetland



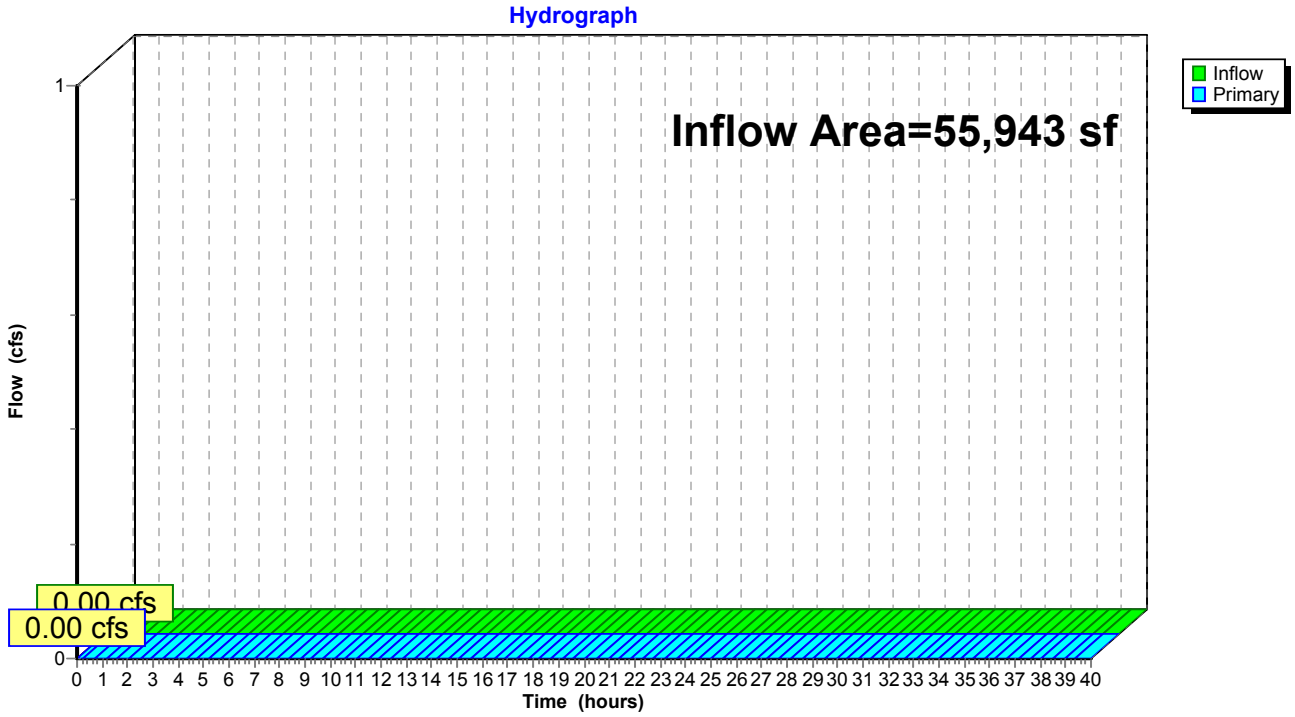
Link 2L: Offsite To Highland Street catch basins



Link 3L: LOT D - Onsite To Southeast Low Point along Main Street



Link 4L: LOT F - To Southwest Property Corner along Main Street



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S1: S1 Runoff Area=242,777 sf 1.19% Impervious Runoff Depth=0.14"
Flow Length=235' Slope=0.0200 '/' Tc=23.2 min CN=40 Runoff=0.10 cfs 2,759 cf

Subcatchment S2: S2- Runoff Area=13,272 sf 34.35% Impervious Runoff Depth=0.74"
Flow Length=156' Tc=9.9 min CN=55 Runoff=0.16 cfs 821 cf

Subcatchment S3: S3 Runoff Area=18,378 sf 2.78% Impervious Runoff Depth=0.23"
Flow Length=160' Tc=9.4 min CN=43 Runoff=0.02 cfs 347 cf

Subcatchment S4: S4 Runoff Area=55,943 sf 1.81% Impervious Runoff Depth=0.02"
Flow Length=231' Tc=6.0 min CN=34 Runoff=0.00 cfs 89 cf

Link 1L: Onsite To Isolated Vegetated Wetland delayed by 6.0 min Inflow=0.10 cfs 2,759 cf
Primary=0.10 cfs 2,759 cf

Link 2L: Offsite To Highland Street catch basins Inflow=0.16 cfs 821 cf
Primary=0.16 cfs 821 cf

Link 3L: LOT D - Onsite To Southeast Low Point along Main Street Inflow=0.02 cfs 347 cf
Primary=0.02 cfs 347 cf

Link 4L: LOT F - To Southwest Property Corner along Main Street Inflow=0.00 cfs 89 cf
Primary=0.00 cfs 89 cf

Total Runoff Area = 330,370 sf Runoff Volume = 4,015 cf Average Runoff Depth = 0.15"
97.28% Pervious = 321,394 sf 2.72% Impervious = 8,976 sf

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S1: S1 Runoff Area=242,777 sf 1.19% Impervious Runoff Depth=0.38"
Flow Length=235' Slope=0.0200 '/' Tc=23.2 min CN=40 Runoff=0.63 cfs 7,771 cf

Subcatchment S2: S2- Runoff Area=13,272 sf 34.35% Impervious Runoff Depth=1.29"
Flow Length=156' Tc=9.9 min CN=55 Runoff=0.34 cfs 1,431 cf

Subcatchment S3: S3 Runoff Area=18,378 sf 2.78% Impervious Runoff Depth=0.54"
Flow Length=160' Tc=9.4 min CN=43 Runoff=0.10 cfs 822 cf

Subcatchment S4: S4 Runoff Area=55,943 sf 1.81% Impervious Runoff Depth=0.14"
Flow Length=231' Tc=6.0 min CN=34 Runoff=0.02 cfs 651 cf

Link 1L: Onsite To Isolated Vegetated Wetland delayed by 6.0 min Inflow=0.63 cfs 7,771 cf
Primary=0.63 cfs 7,771 cf

Link 2L: Offsite To Highland Street catch basins Inflow=0.34 cfs 1,431 cf
Primary=0.34 cfs 1,431 cf

Link 3L: LOT D - Onsite To Southeast Low Point along Main Street Inflow=0.10 cfs 822 cf
Primary=0.10 cfs 822 cf

Link 4L: LOT F - To Southwest Property Corner along Main Street Inflow=0.02 cfs 651 cf
Primary=0.02 cfs 651 cf

Total Runoff Area = 330,370 sf Runoff Volume = 10,674 cf Average Runoff Depth = 0.39"
97.28% Pervious = 321,394 sf 2.72% Impervious = 8,976 sf

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S1: S1 Runoff Area=242,777 sf 1.19% Impervious Runoff Depth=0.66"
Flow Length=235' Slope=0.0200 '/' Tc=23.2 min CN=40 Runoff=1.49 cfs 13,396 cf

Subcatchment S2: S2- Runoff Area=13,272 sf 34.35% Impervious Runoff Depth=1.81"
Flow Length=156' Tc=9.9 min CN=55 Runoff=0.51 cfs 2,005 cf

Subcatchment S3: S3 Runoff Area=18,378 sf 2.78% Impervious Runoff Depth=0.87"
Flow Length=160' Tc=9.4 min CN=43 Runoff=0.22 cfs 1,326 cf

Subcatchment S4: S4 Runoff Area=55,943 sf 1.81% Impervious Runoff Depth=0.31"
Flow Length=231' Tc=6.0 min CN=34 Runoff=0.10 cfs 1,450 cf

Link 1L: Onsite To Isolated Vegetated Wetland delayed by 6.0 min Inflow=1.49 cfs 13,396 cf
Primary=1.49 cfs 13,396 cf

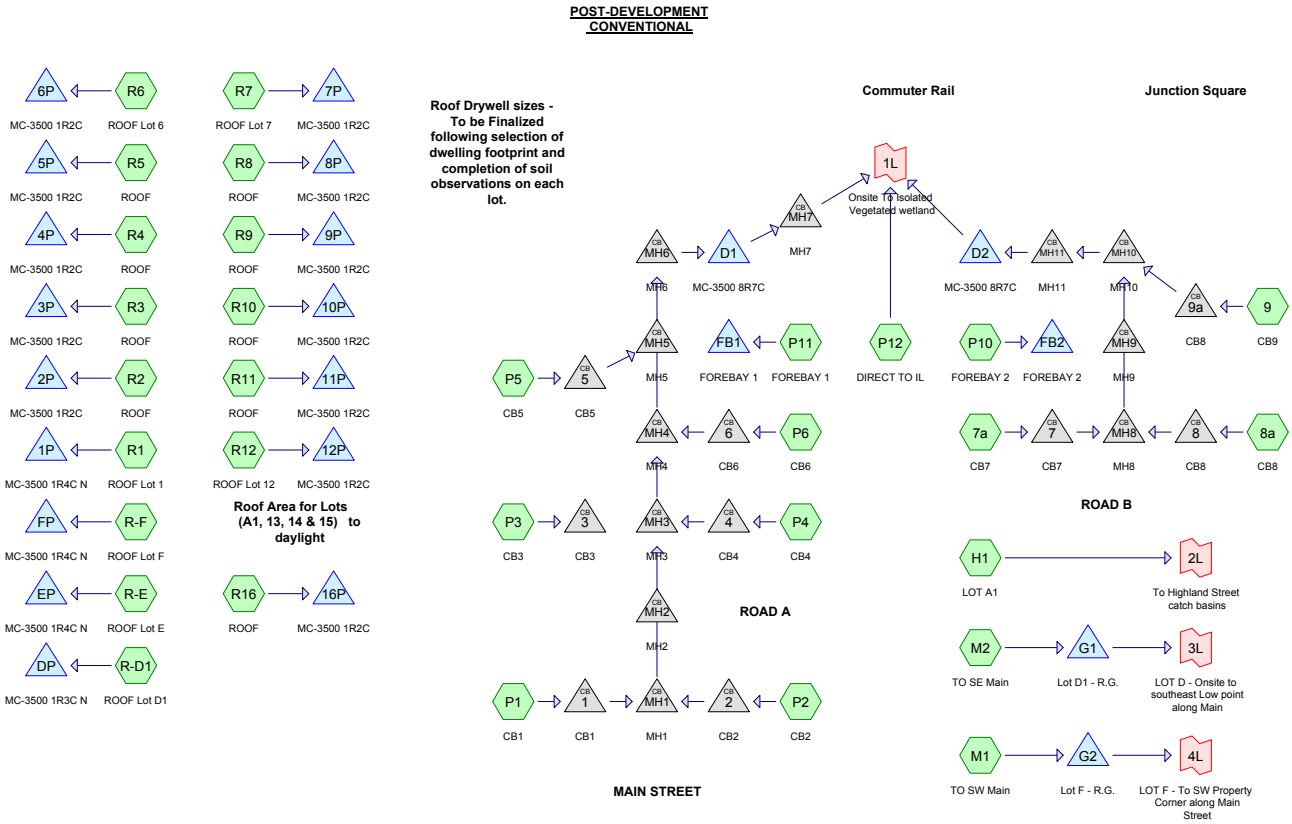
Link 2L: Offsite To Highland Street catch basins Inflow=0.51 cfs 2,005 cf
Primary=0.51 cfs 2,005 cf

Link 3L: LOT D - Onsite To Southeast Low Point along Main Street Inflow=0.22 cfs 1,326 cf
Primary=0.22 cfs 1,326 cf

Link 4L: LOT F - To Southwest Property Corner along Main Street Inflow=0.10 cfs 1,450 cf
Primary=0.10 cfs 1,450 cf

Total Runoff Area = 330,370 sf Runoff Volume = 18,178 cf Average Runoff Depth = 0.66"
97.28% Pervious = 321,394 sf 2.72% Impervious = 8,976 sf

1.9.2 Proposed Condition



Subcat Reach Pond Link

Routing Diagram for Prop DEF Conv
Prepared by HP Inc., Printed 7/17/2020
HydroCAD® 10.00-25 s/n 06611 © 2019 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
142,900	39	>75% Grass cover, Good, HSG A (7a, 8a, 9, H1, M1, M2, P1, P10, P11, P12, P2, P3, P4, P5, P6)
37,118	61	>75% Grass cover, Good, HSG B (7a, P12, P3, P4, P5, P6)
1,745	80	>75% Grass cover, Good, HSG D (P12)
29,667	30	Brush, Good, HSG A (P10, P11, P12, P3, P5)
1,000	48	Brush, Good, HSG B (P12)
9,093	73	Brush, Good, HSG D (P10, P11, P12)
497	98	Paved Driveway Highland, HSG A (H1)
537	98	Paved parking, HSG A (M2)
42,267	98	Paved roads w/curbs & sewers, HSG A (7a, 8a, 9, P1, P2, P3, P4, P5)
11,787	98	Paved roads w/curbs & sewers, HSG B (7a, P3, P4, P5)
43,936	98	Roofs, HSG A (8a, 9, H1, R-D1, R-E, R-F, R1, R10, R11, R12, R16, R2, R3, R4, R6, R7, R8)
7,026	98	Roofs, HSG B (R4, R5, R6, R8, R9)
1,071	98	Unconnected roofs, HSG A (P3, P5)
1,726	30	Woods, Good, HSG A (P12)
330,370	**61**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
262,601	HSG A	7a, 8a, 9, H1, M1, M2, P1, P10, P11, P12, P2, P3, P4, P5, P6, R-D1, R-E, R-F, R1, R10, R11, R12, R16, R2, R3, R4, R6, R7, R8
56,931	HSG B	7a, P12, P3, P4, P5, P6, R4, R5, R6, R8, R9
0	HSG C	
10,838	HSG D	P10, P11, P12
0	Other	
330,370		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
142,900	37,118	0	1,745	0	181,763	>75% Grass cover, Good
29,667	1,000	0	9,093	0	39,760	Brush, Good
497	0	0	0	0	497	Paved Driveway Highland
537	0	0	0	0	537	Paved parking
42,267	11,787	0	0	0	54,054	Paved roads w/curbs & sewers
43,936	7,026	0	0	0	50,962	Roofs
1,071	0	0	0	0	1,071	Unconnected roofs
1,726	0	0	0	0	1,726	Woods, Good
262,601	**56,931**	**0**	**10,838**	**0**	**330,370**	**TOTAL AREA**

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1	141.50	140.00	15.0	0.1000	0.012	12.0	0.0	0.0
2	2	141.50	140.00	15.0	0.1000	0.012	12.0	0.0	0.0
3	3	131.23	131.13	10.0	0.0100	0.012	12.0	0.0	0.0
4	4	131.23	131.13	10.0	0.0100	0.012	12.0	0.0	0.0
5	5	128.39	128.15	7.0	0.0343	0.012	12.0	0.0	0.0
6	6	129.75	128.88	87.0	0.0100	0.012	12.0	0.0	0.0
7	7	133.80	133.60	10.0	0.0200	0.012	12.0	0.0	0.0
8	8	133.80	133.60	10.0	0.0200	0.012	12.0	0.0	0.0
9	9a	128.53	128.17	6.0	0.0600	0.012	12.0	0.0	0.0
10	D1	128.50	126.50	96.0	0.0208	0.011	12.0	0.0	0.0
11	D2	128.75	125.60	84.0	0.0375	0.011	12.0	0.0	0.0
12	MH1	140.00	132.28	110.0	0.0702	0.012	12.0	0.0	0.0
13	MH10	128.12	128.00	12.0	0.0100	0.012	15.0	0.0	0.0
14	MH11	128.10	128.00	10.0	0.0100	0.012	24.0	0.0	0.0
15	MH2	143.90	141.75	46.0	0.0467	0.012	12.0	0.0	0.0
16	MH3	130.88	128.88	100.0	0.0200	0.012	15.0	0.0	0.0
17	MH4	130.88	128.88	100.0	0.0200	0.012	15.0	0.0	0.0
18	MH5	128.10	128.00	10.0	0.0100	0.012	18.0	0.0	0.0
19	MH6	128.00	127.60	10.0	0.0400	0.012	24.0	0.0	0.0
20	MH7	126.50	125.60	90.0	0.0100	0.012	12.0	0.0	0.0
21	MH8	133.60	129.10	92.0	0.0489	0.012	12.0	0.0	0.0
22	MH9	129.10	128.17	64.0	0.0145	0.012	12.0	0.0	0.0

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7a: CB7 Runoff Area=3,472 sf 76.58% Impervious Runoff Depth=1.67"
Tc=6.0 min CN=85 Runoff=0.15 cfs 484 cf

Subcatchment 8a: CB8 Runoff Area=15,335 sf 39.20% Impervious Runoff Depth=0.44"
Tc=6.0 min CN=62 Runoff=0.11 cfs 561 cf

Subcatchment 9: CB9 Runoff Area=73,562 sf 30.35% Impervious Runoff Depth=0.28"
Flow Length=340' Tc=9.5 min CN=57 Runoff=0.21 cfs 1,699 cf

Subcatchment H1: LOT A1 Runoff Area=3,241 sf 42.55% Impervious Runoff Depth=0.51"
Tc=6.0 min CN=64 Runoff=0.03 cfs 139 cf

Subcatchment M1: TO SW Main Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment M2: TO SE Main Runoff Area=2,490 sf 21.57% Impervious Runoff Depth=0.15"
Tc=6.0 min CN=52 Runoff=0.00 cfs 31 cf

Subcatchment P1: CB1 Runoff Area=12,362 sf 37.57% Impervious Runoff Depth=0.40"
Tc=6.0 min CN=61 Runoff=0.08 cfs 416 cf

Subcatchment P10: FOREBAY 2 Runoff Area=4,609 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment P11: FOREBAY 1 Runoff Area=7,767 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=37 Runoff=0.00 cfs 0 cf

Subcatchment P12: DIRECT TO IL Runoff Area=37,103 sf 0.00% Impervious Runoff Depth=0.09"
Tc=6.0 min CN=49 Runoff=0.01 cfs 281 cf

Subcatchment P2: CB2 Runoff Area=10,903 sf 49.32% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=68 Runoff=0.17 cfs 617 cf

Subcatchment P3: CB3 Runoff Area=45,223 sf 12.98% Impervious Runoff Depth=0.03"
Tc=6.0 min CN=45 Runoff=0.00 cfs 126 cf

Subcatchment P4: CB4 Runoff Area=7,404 sf 63.44% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=82 Runoff=0.28 cfs 900 cf

Subcatchment P5: CB5 Runoff Area=45,437 sf 29.90% Impervious Runoff Depth=0.59"
Tc=6.0 min CN=66 Runoff=0.57 cfs 2,246 cf

Subcatchment P6: CB6 Runoff Area=17,005 sf 0.00% Impervious Runoff Depth=0.09"
Tc=6.0 min CN=49 Runoff=0.00 cfs 129 cf

Subcatchment R-D1: ROOF Lot D1 Runoff Area=3,048 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.21 cfs 728 cf

Subcatchment R-E: ROOF Lot E Runoff Area=2,864 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.19 cfs 684 cf

Subcatchment R-F: ROOF Lot F Runoff Area=3,406 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.23 cfs 814 cf

Subcatchment R1: ROOF Lot 1 Runoff Area=3,357 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.23 cfs 802 cf

Subcatchment R10: ROOF Runoff Area=2,512 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.17 cfs 600 cf

Subcatchment R11: ROOF Runoff Area=1,974 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.13 cfs 472 cf

Subcatchment R12: ROOF Lot 12 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.12 cfs 430 cf

Subcatchment R16: ROOF Runoff Area=2,040 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.14 cfs 488 cf

Subcatchment R2: ROOF Runoff Area=2,967 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.20 cfs 709 cf

Subcatchment R3: ROOF Runoff Area=2,200 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.15 cfs 526 cf

Subcatchment R4: ROOF Runoff Area=2,308 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.16 cfs 552 cf

Subcatchment R5: ROOF Runoff Area=2,216 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.15 cfs 530 cf

Subcatchment R6: ROOF Lot 6 Runoff Area=2,440 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.16 cfs 583 cf

Subcatchment R7: ROOF Lot 7 Runoff Area=2,814 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.19 cfs 673 cf

Subcatchment R8: ROOF Runoff Area=2,092 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.14 cfs 500 cf

Subcatchment R9: ROOF Runoff Area=1,996 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.13 cfs 477 cf

Pond 1: CB1 Peak Elev=141.63' Inflow=0.08 cfs 416 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.08 cfs 416 cf

Pond 1P: MC-3500 1R4C N Peak Elev=1.30' Storage=185 cf Inflow=0.23 cfs 802 cf
Outflow=0.05 cfs 802 cf

Pond 2: CB2 Peak Elev=141.70' Inflow=0.17 cfs 617 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.17 cfs 617 cf

Pond 2P: MC-3500 1R2C Peak Elev=1.81' Storage=187 cf Inflow=0.20 cfs 709 cf
Outflow=0.03 cfs 709 cf

Pond 3: CB3 Peak Elev=131.26' Inflow=0.00 cfs 126 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.00 cfs 126 cf

Pond 3P: MC-3500 1R2C Peak Elev=1.29' Storage=117 cf Inflow=0.15 cfs 526 cf
Outflow=0.03 cfs 526 cf

Pond 4: CB4 Peak Elev=131.52' Inflow=0.28 cfs 900 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.28 cfs 900 cf

Pond 4P: MC-3500 1R2C Peak Elev=1.37' Storage=127 cf Inflow=0.16 cfs 552 cf
Outflow=0.03 cfs 552 cf

Pond 5: CB5 Peak Elev=128.77' Inflow=0.57 cfs 2,246 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0343 '/' Outflow=0.57 cfs 2,246 cf

Pond 5P: MC-3500 1R2C Peak Elev=1.30' Storage=119 cf Inflow=0.15 cfs 530 cf
Outflow=0.03 cfs 530 cf

Pond 6: CB6 Peak Elev=129.79' Inflow=0.00 cfs 129 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.00 cfs 129 cf

Pond 6P: MC-3500 1R2C Peak Elev=1.47' Storage=140 cf Inflow=0.16 cfs 583 cf
Outflow=0.03 cfs 583 cf

Pond 7: CB7 Peak Elev=133.99' Inflow=0.15 cfs 484 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.15 cfs 484 cf

Pond 7P: MC-3500 1R2C Peak Elev=1.69' Storage=172 cf Inflow=0.19 cfs 673 cf
Outflow=0.03 cfs 673 cf

Pond 8: CB8 Peak Elev=133.96' Inflow=0.11 cfs 561 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.11 cfs 561 cf

Pond 8P: MC-3500 1R2C Peak Elev=1.20' Storage=107 cf Inflow=0.14 cfs 500 cf
Outflow=0.03 cfs 500 cf

Pond 9a: CB8 Peak Elev=128.75' Inflow=0.21 cfs 1,699 cf
12.0" Round Culvert n=0.012 L=6.0' S=0.0600 '/' Outflow=0.21 cfs 1,699 cf

Pond 9P: MC-3500 1R2C Peak Elev=1.13' Storage=98 cf Inflow=0.13 cfs 477 cf
Outflow=0.03 cfs 477 cf

Pond 10P: MC-3500 1R2C Peak Elev=1.53' Storage=147 cf Inflow=0.17 cfs 600 cf
Outflow=0.03 cfs 600 cf

Pond 11P: MC-3500 1R2C Peak Elev=1.12' Storage=96 cf Inflow=0.13 cfs 472 cf
Outflow=0.03 cfs 472 cf

Pond 12P: MC-3500 1R2C Peak Elev=0.99' Storage=81 cf Inflow=0.12 cfs 430 cf
Outflow=0.03 cfs 430 cf

Pond 16P: MC-3500 1R2C Peak Elev=1.17' Storage=102 cf Inflow=0.14 cfs 488 cf
Outflow=0.03 cfs 488 cf

Pond D1: MC-3500 8R7C Peak Elev=126.79' Storage=56 cf Inflow=0.52 cfs 2,061 cf
Discarded=0.49 cfs 2,061 cf Primary=0.00 cfs 0 cf Outflow=0.49 cfs 2,061 cf

Pond D2: MC-3500 8R7C Peak Elev=126.78' Storage=41 cf Inflow=0.35 cfs 2,744 cf
Discarded=0.35 cfs 2,744 cf Primary=0.00 cfs 0 cf Outflow=0.35 cfs 2,744 cf

Pond DP: MC-3500 1R3C N Peak Elev=1.54' Storage=184 cf Inflow=0.21 cfs 728 cf
Outflow=0.04 cfs 728 cf

Pond EP: MC-3500 1R4C N Peak Elev=1.07' Storage=140 cf Inflow=0.19 cfs 684 cf
Outflow=0.05 cfs 684 cf

Pond FB1: FOREBAY 1 Peak Elev=126.50' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond FB2: FOREBAY 2 Peak Elev=126.75' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond FP: MC-3500 1R4C N Peak Elev=1.32' Storage=190 cf Inflow=0.23 cfs 814 cf
Outflow=0.05 cfs 814 cf

Pond G1: Lot D1 - R.G. Peak Elev=152.25' Storage=0 cf Inflow=0.00 cfs 31 cf
Discarded=0.00 cfs 31 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 31 cf

Pond G2: Lot F - R.G. Peak Elev=152.25' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond MH1: MH1 Peak Elev=140.24' Inflow=0.24 cfs 1,033 cf
12.0" Round Culvert n=0.012 L=110.0' S=0.0702 '/' Outflow=0.24 cfs 1,033 cf

Pond MH10: MH10 Peak Elev=128.42' Inflow=0.35 cfs 2,744 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=0.35 cfs 2,744 cf

Pond MH11: MH11 Peak Elev=128.36' Inflow=0.35 cfs 2,744 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.35 cfs 2,744 cf

Pond MH2: MH2 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=46.0' S=0.0467 '/' Primary=0.00 cfs 0 cf

Pond MH3: MH3 Peak Elev=131.22' Inflow=0.52 cfs 1,932 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=0.52 cfs 1,932 cf

Pond MH4: MH4 Peak Elev=131.22' Inflow=0.52 cfs 2,061 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=0.52 cfs 2,061 cf

Pond MH5: MH5 Peak Elev=128.47' Inflow=0.57 cfs 2,246 cf
18.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.57 cfs 2,246 cf

Pond MH6: MH6 Peak Elev=128.29' Inflow=0.52 cfs 2,061 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0400 '/' Outflow=0.52 cfs 2,061 cf

Pond MH7: MH7 Peak Elev=126.50' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.012 L=90.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Pond MH8: MH8 Peak Elev=133.85' Inflow=0.26 cfs 1,045 cf
12.0" Round Culvert n=0.012 L=92.0' S=0.0489 '/' Outflow=0.26 cfs 1,045 cf

Pond MH9: MH9 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=64.0' S=0.0145 '/' Primary=0.00 cfs 0 cf

Link 1L: Onsite To Isolated Vegetated wetland Inflow=0.01 cfs 281 cf
Primary=0.01 cfs 281 cf

Link 2L: To Highland Street catch basins Inflow=0.03 cfs 139 cf
Primary=0.03 cfs 139 cf

Link 3L: LOT D - Onsite to southeast Low point along Main delayed by 6.0 min Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 4L: LOT F - To SW Property Corner along Main Street Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 330,370 sf Runoff Volume = 17,195 cf Average Runoff Depth = 0.62"
67.58% Pervious = 223,249 sf 32.42% Impervious = 107,121 sf

Summary for Subcatchment 7a: CB7

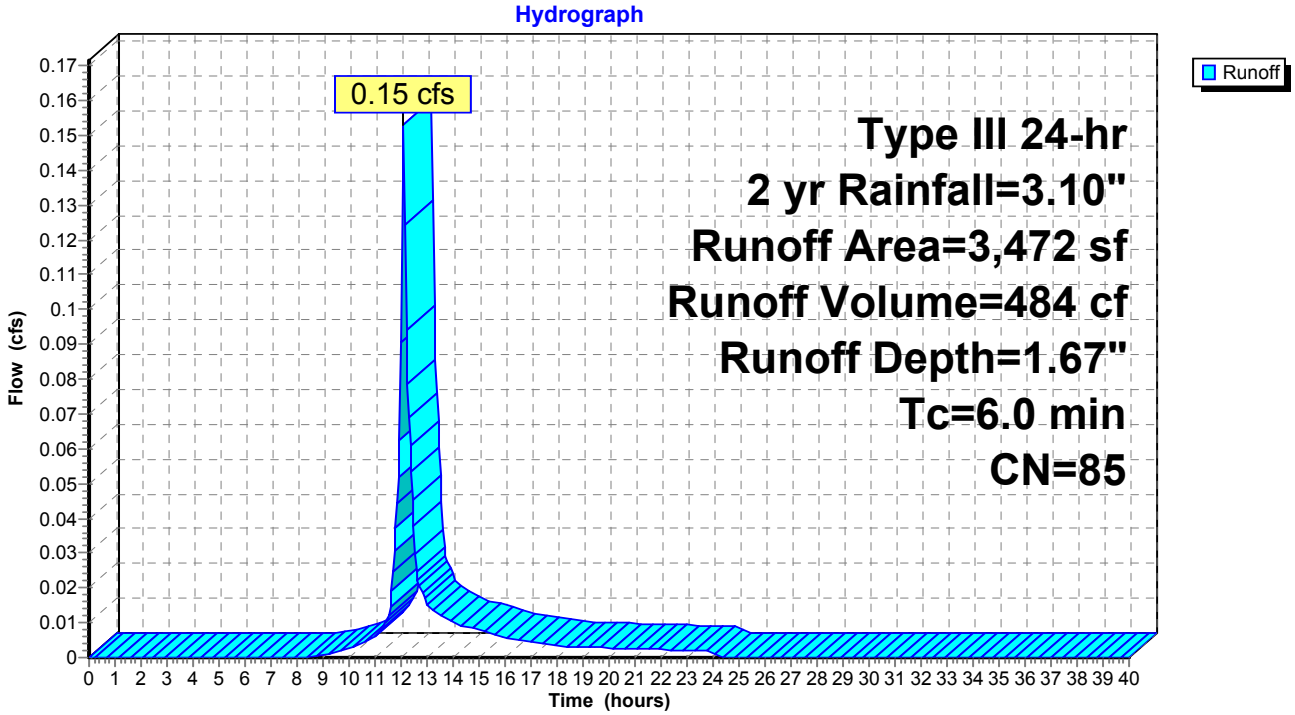
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 484 cf, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,274	98	Paved roads w/curbs & sewers, HSG A
385	98	Paved roads w/curbs & sewers, HSG B
676	39	>75% Grass cover, Good, HSG A
137	61	>75% Grass cover, Good, HSG B
3,472	85	Weighted Average
813		23.42% Pervious Area
2,659		76.58% Impervious Area

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

Subcatchment 7a: CB7



Summary for Subcatchment 8a: CB8

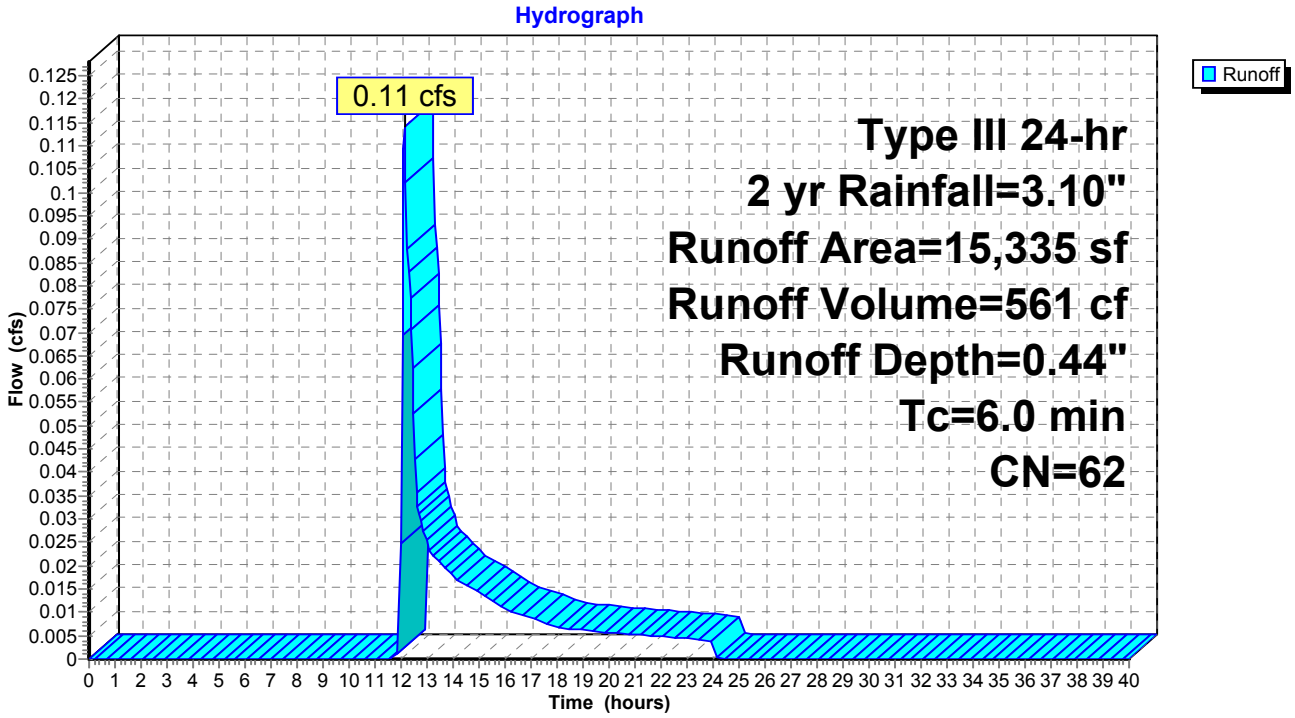
Runoff = 0.11 cfs @ 12.12 hrs, Volume= 561 cf, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
3,845	98	Paved roads w/curbs & sewers, HSG A
9,324	39	>75% Grass cover, Good, HSG A
2,166	98	Roofs, HSG A
15,335	62	Weighted Average
9,324		60.80% Pervious Area
6,011		39.20% Impervious Area

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

Subcatchment 8a: CB8



Summary for Subcatchment 9: CB9

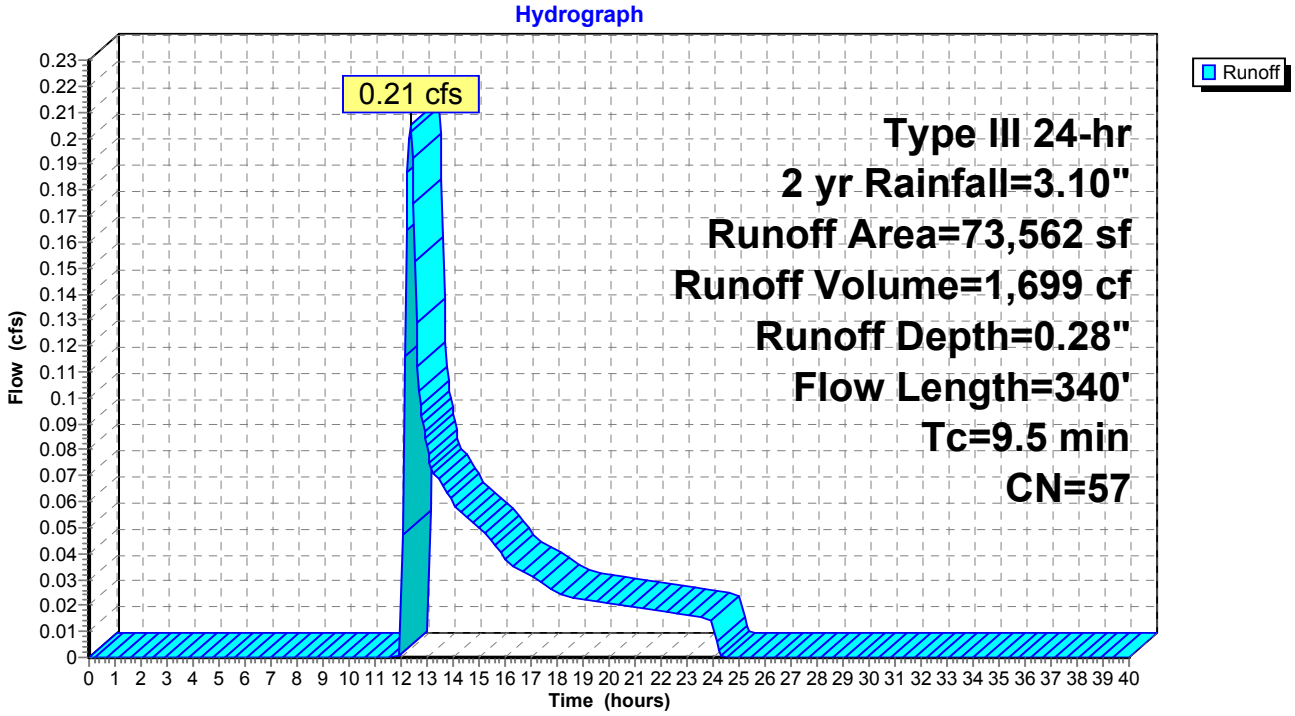
Runoff = 0.21 cfs @ 12.36 hrs, Volume= 1,699 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
14,445	98	Paved roads w/curbs & sewers, HSG A
51,237	39	>75% Grass cover, Good, HSG A
7,880	98	Roofs, HSG A
73,562	57	Weighted Average
51,237		69.65% Pervious Area
22,325		30.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.10"
1.2	290	0.0600	3.94		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
9.5	340	Total			

Subcatchment 9: CB9



Summary for Subcatchment H1: LOT A1

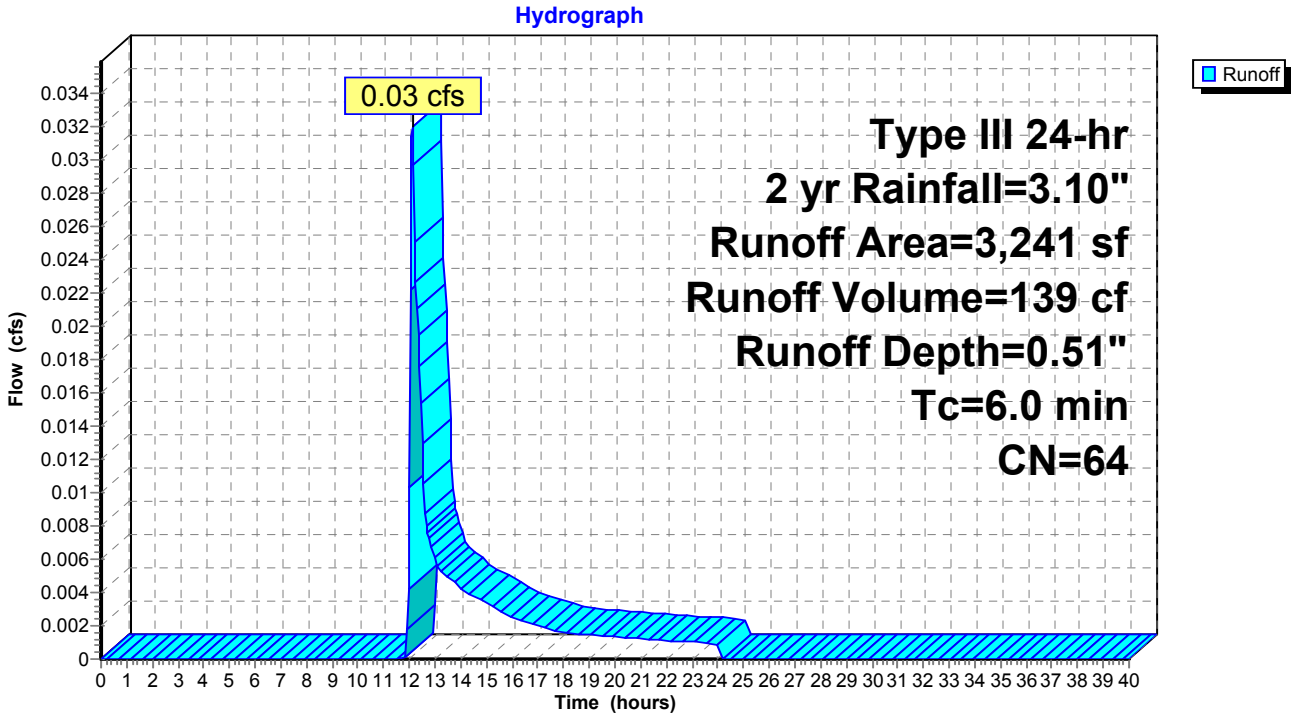
Runoff = 0.03 cfs @ 12.12 hrs, Volume= 139 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	497	98	Paved Driveway Highland, HSG A
	882	98	Roofs, HSG A
	1,862	39	>75% Grass cover, Good, HSG A
	3,241	64	Weighted Average
	1,862		57.45% Pervious Area
	1,379		42.55% Impervious Area

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

Subcatchment H1: LOT A1



Summary for Subcatchment M1: TO SW Main

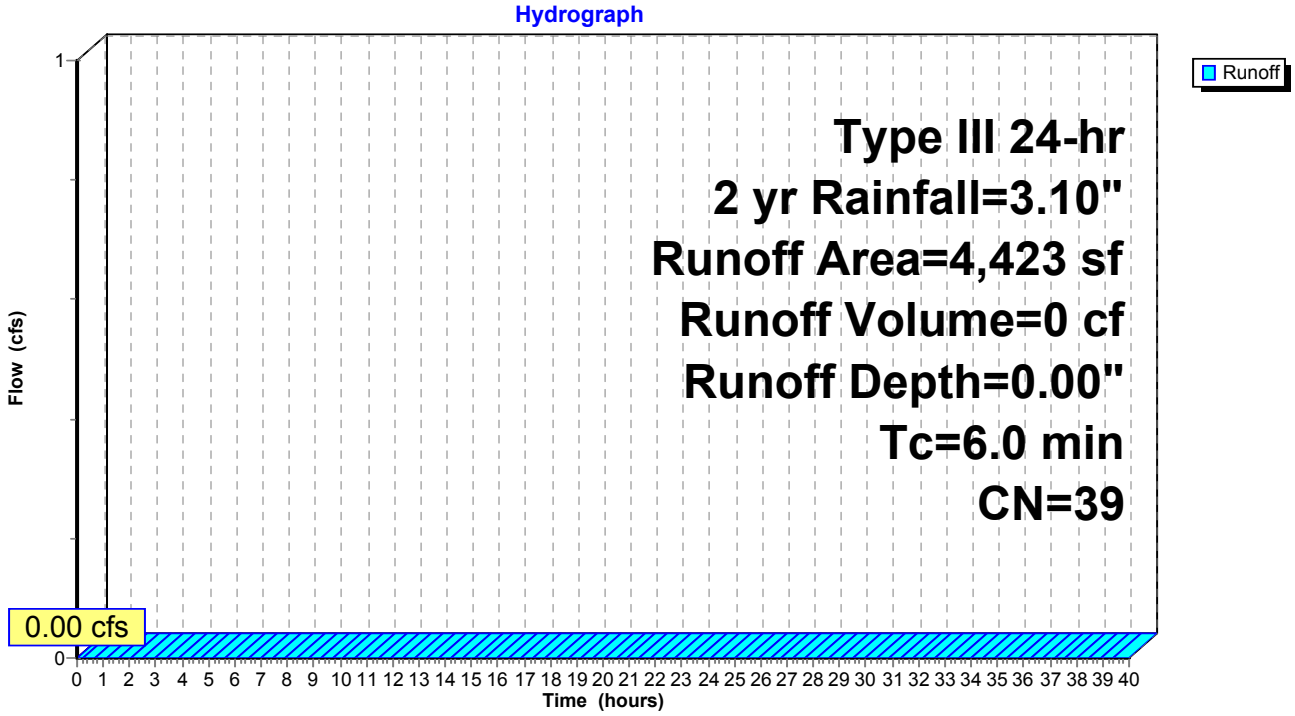
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
4,423	39	>75% Grass cover, Good, HSG A
4,423		100.00% Pervious Area

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

Subcatchment M1: TO SW Main



Summary for Subcatchment M2: TO SE Main

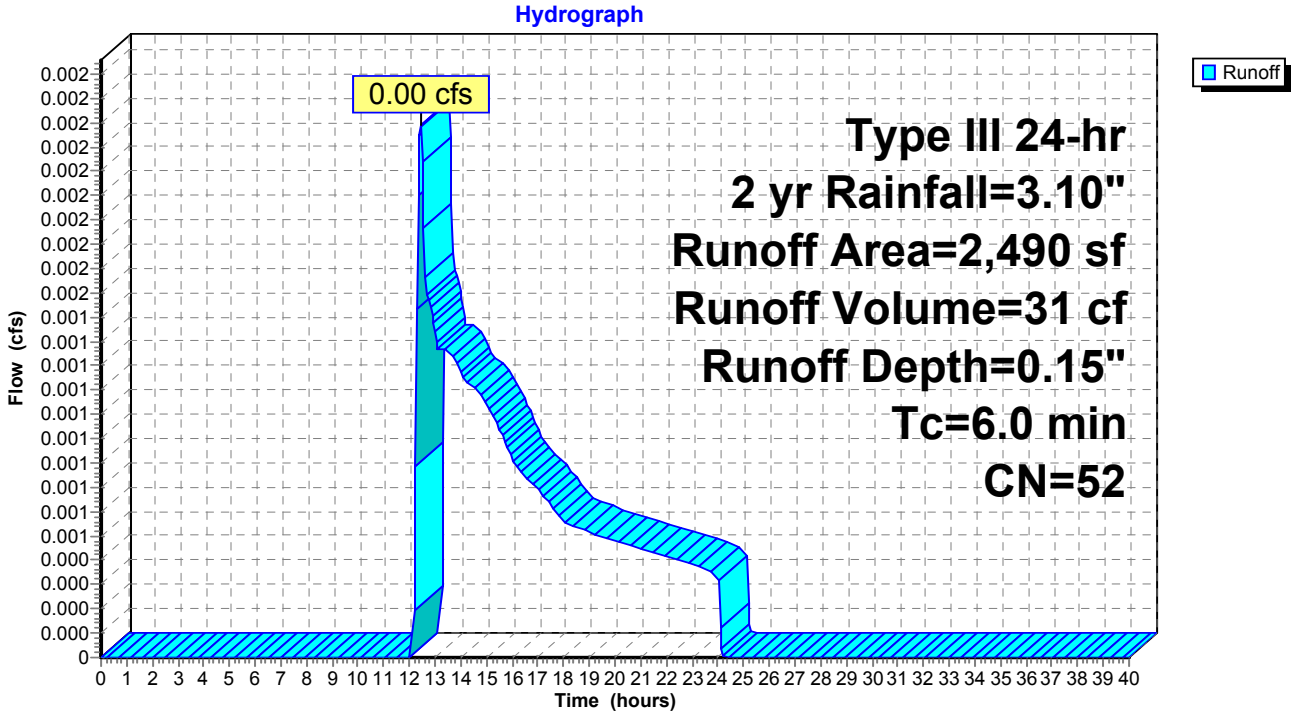
Runoff = 0.00 cfs @ 12.43 hrs, Volume= 31 cf, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,953	39	>75% Grass cover, Good, HSG A
537	98	Paved parking, HSG A
2,490	52	Weighted Average
1,953		78.43% Pervious Area
537		21.57% Impervious Area

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

Subcatchment M2: TO SE Main



Summary for Subcatchment P1: CB1

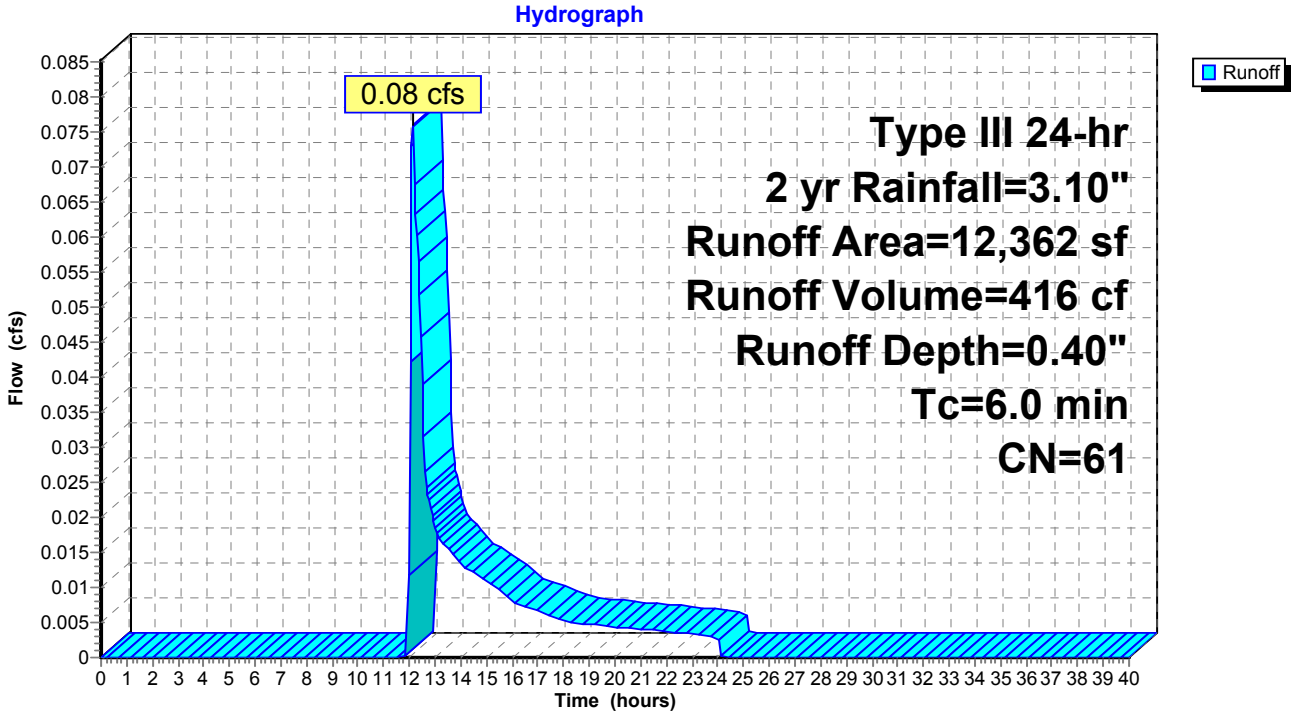
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 416 cf, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
4,645	98	Paved roads w/curbs & sewers, HSG A
7,717	39	>75% Grass cover, Good, HSG A
12,362	61	Weighted Average
7,717		62.43% Pervious Area
4,645		37.57% Impervious Area

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

Subcatchment P1: CB1



Summary for Subcatchment P10: FOREBAY 2

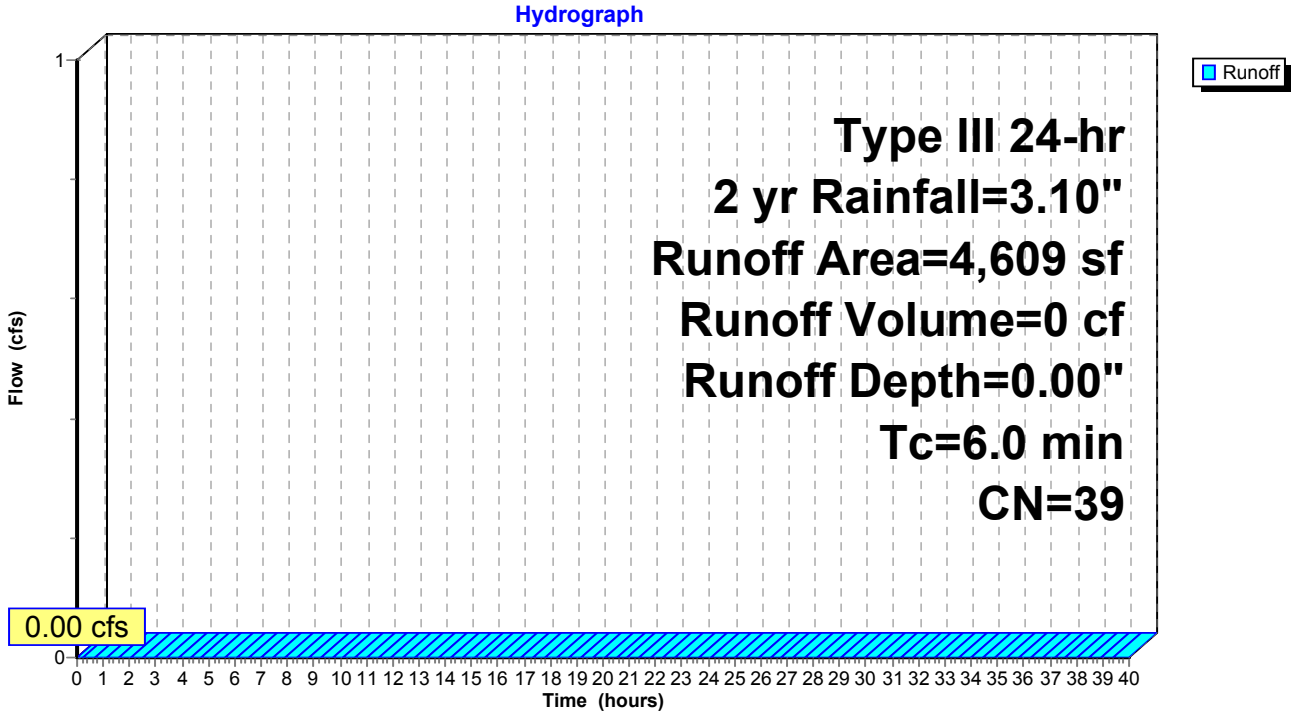
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,073	39	>75% Grass cover, Good, HSG A
2,000	30	Brush, Good, HSG A
536	73	Brush, Good, HSG D
4,609	39	Weighted Average
4,609		100.00% Pervious Area

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

Subcatchment P10: FOREBAY 2



Summary for Subcatchment P11: FOREBAY 1

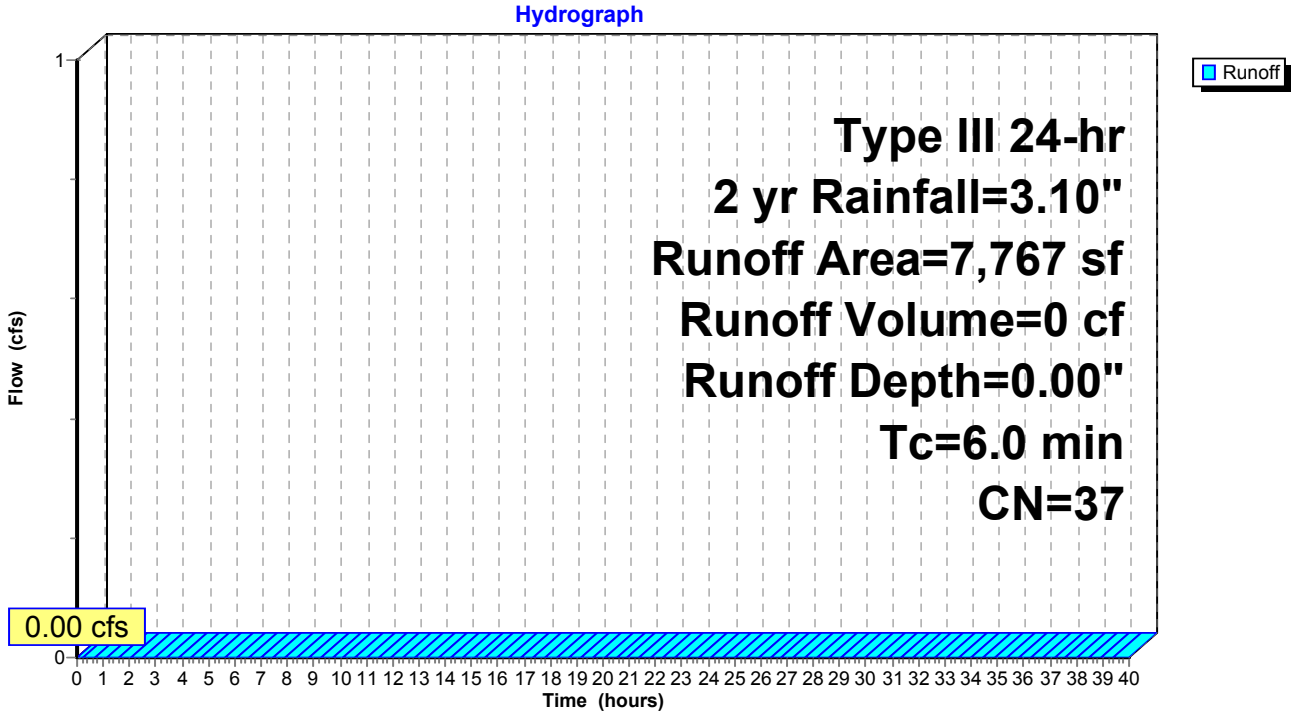
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
4,399	39	>75% Grass cover, Good, HSG A
3,000	30	Brush, Good, HSG A
368	73	Brush, Good, HSG D
7,767	37	Weighted Average
7,767		100.00% Pervious Area

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

Subcatchment P11: FOREBAY 1



Summary for Subcatchment P12: DIRECT TO IL

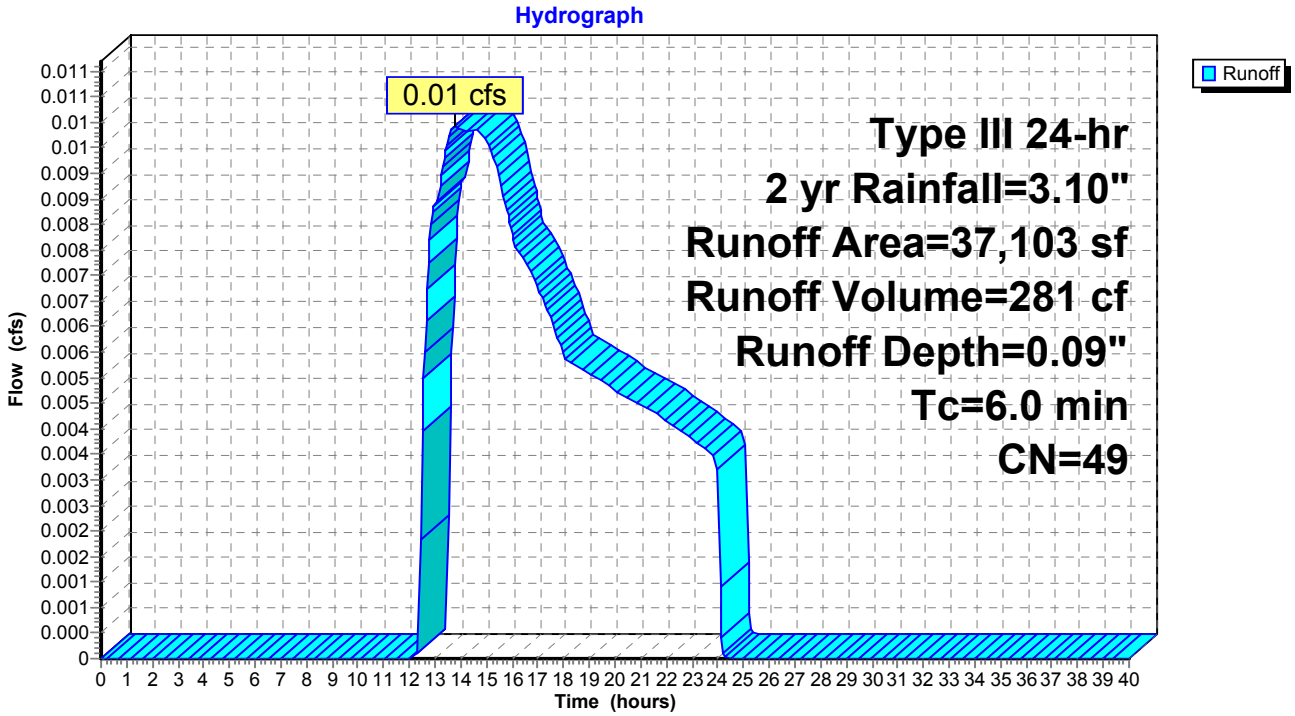
Runoff = 0.01 cfs @ 13.80 hrs, Volume= 281 cf, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
7,475	39	>75% Grass cover, Good, HSG A
5,968	61	>75% Grass cover, Good, HSG B
1,745	80	>75% Grass cover, Good, HSG D
11,000	30	Brush, Good, HSG A
1,000	48	Brush, Good, HSG B
8,189	73	Brush, Good, HSG D
1,726	30	Woods, Good, HSG A
37,103	49	Weighted Average
37,103		100.00% Pervious Area

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

Subcatchment P12: DIRECT TO IL



Summary for Subcatchment P2: CB2

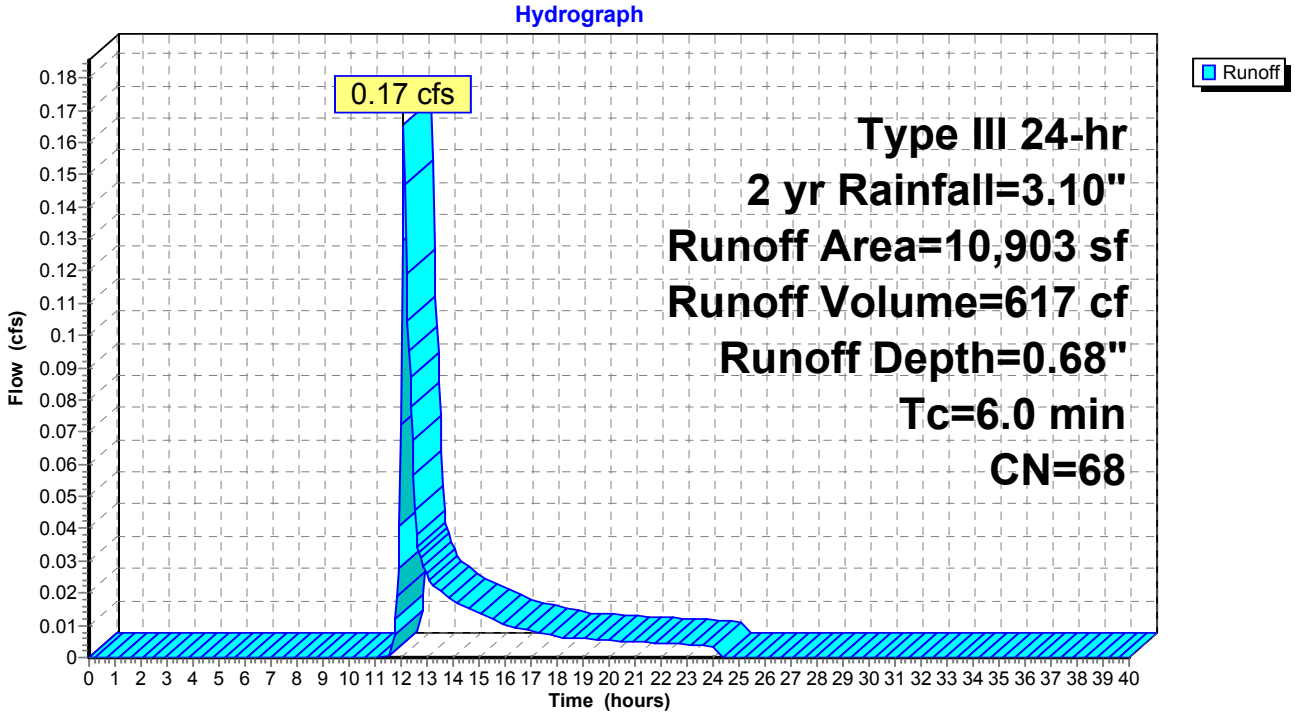
Runoff = 0.17 cfs @ 12.11 hrs, Volume= 617 cf, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
5,377	98	Paved roads w/curbs & sewers, HSG A
5,526	39	>75% Grass cover, Good, HSG A
10,903	68	Weighted Average
5,526		50.68% Pervious Area
5,377		49.32% Impervious Area

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

Subcatchment P2: CB2



Summary for Subcatchment P3: CB3

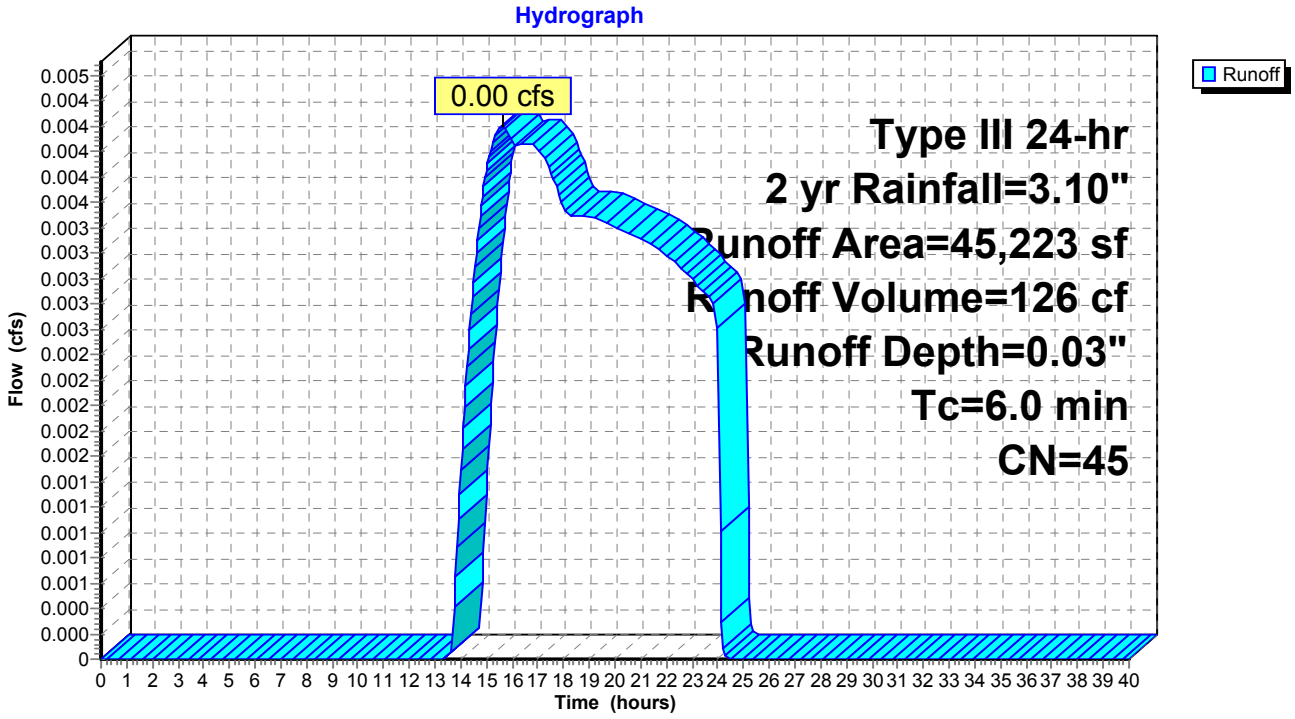
Runoff = 0.00 cfs @ 15.61 hrs, Volume= 126 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
3,616	98	Paved roads w/curbs & sewers, HSG A
1,801	98	Paved roads w/curbs & sewers, HSG B
27,359	39	>75% Grass cover, Good, HSG A
1,185	61	>75% Grass cover, Good, HSG B
455	98	Unconnected roofs, HSG A
10,807	30	Brush, Good, HSG A
45,223	45	Weighted Average
39,351		87.02% Pervious Area
5,872		12.98% Impervious Area
455		7.75% Unconnected

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

Subcatchment P3: CB3



Summary for Subcatchment P4: CB4

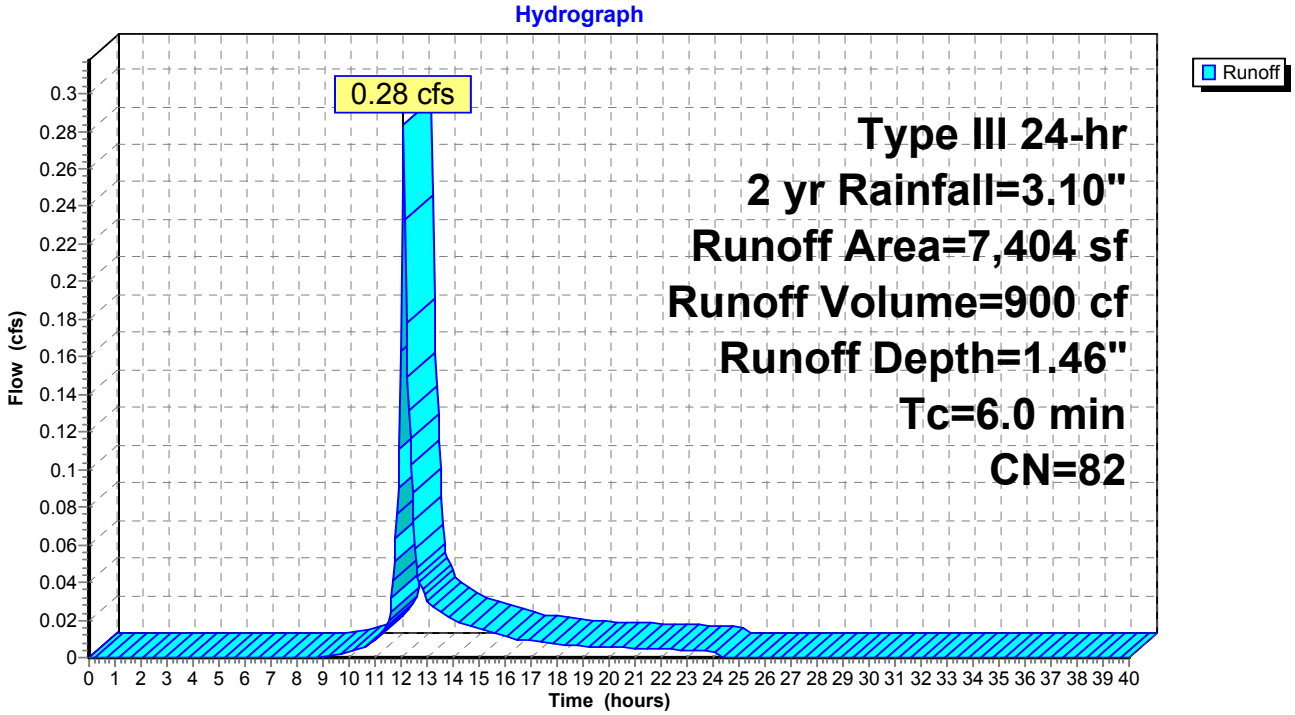
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 900 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,937	98	Paved roads w/curbs & sewers, HSG A
2,760	98	Paved roads w/curbs & sewers, HSG B
687	39	>75% Grass cover, Good, HSG A
2,020	61	>75% Grass cover, Good, HSG B
7,404	82	Weighted Average
2,707		36.56% Pervious Area
4,697		63.44% Impervious Area

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

Subcatchment P4: CB4



Summary for Subcatchment P5: CB5

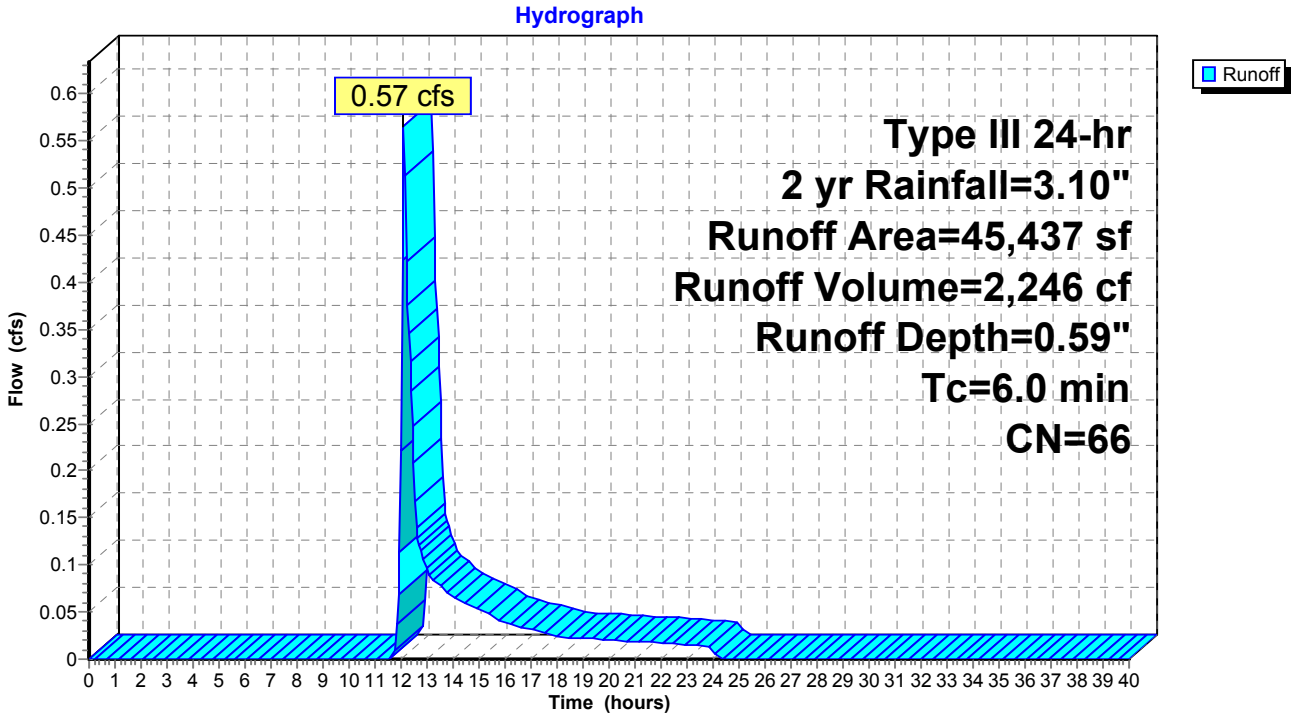
Runoff = 0.57 cfs @ 12.11 hrs, Volume= 2,246 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
6,128	98	Paved roads w/curbs & sewers, HSG A
6,841	98	Paved roads w/curbs & sewers, HSG B
8,825	39	>75% Grass cover, Good, HSG A
20,167	61	>75% Grass cover, Good, HSG B
616	98	Unconnected roofs, HSG A
2,860	30	Brush, Good, HSG A
45,437	66	Weighted Average
31,852		70.10% Pervious Area
13,585		29.90% Impervious Area
616		4.53% Unconnected

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

Subcatchment P5: CB5



Summary for Subcatchment P6: CB6

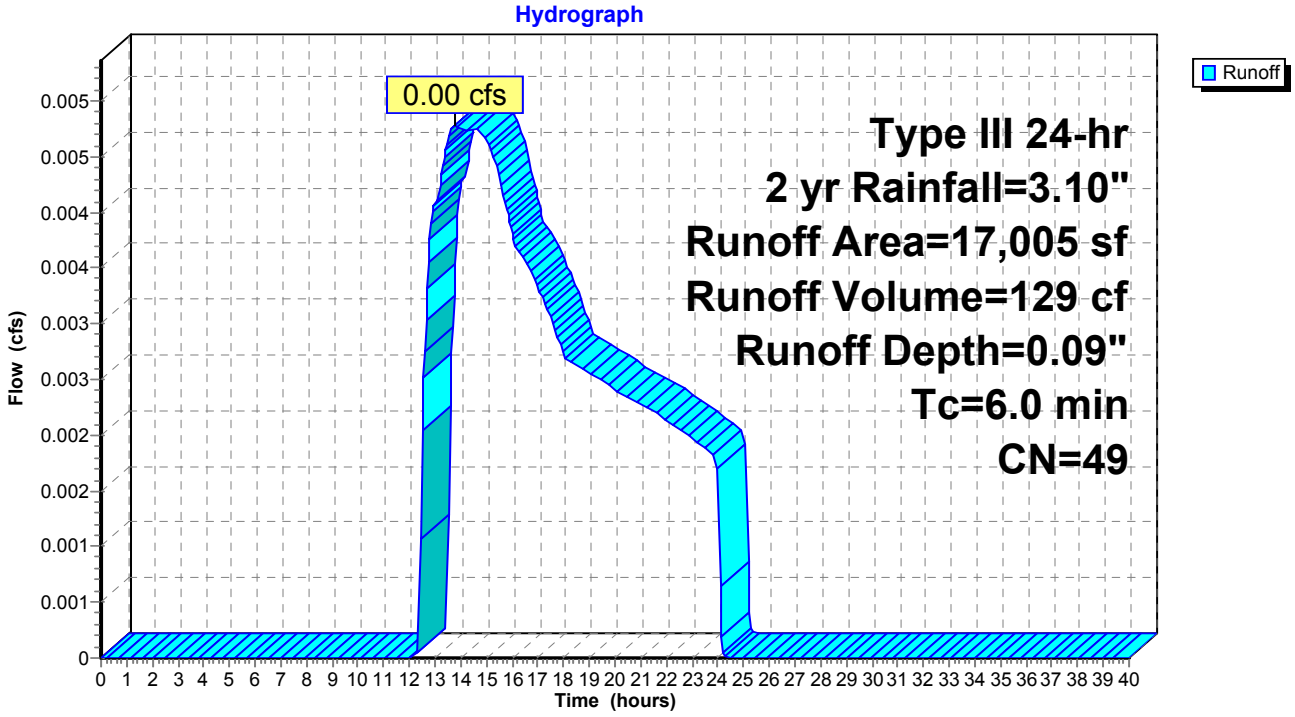
Runoff = 0.00 cfs @ 13.80 hrs, Volume= 129 cf, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
9,364	39	>75% Grass cover, Good, HSG A
7,641	61	>75% Grass cover, Good, HSG B
17,005	49	Weighted Average
17,005		100.00% Pervious Area

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

Subcatchment P6: CB6



Summary for Subcatchment R-D1: ROOF Lot D1

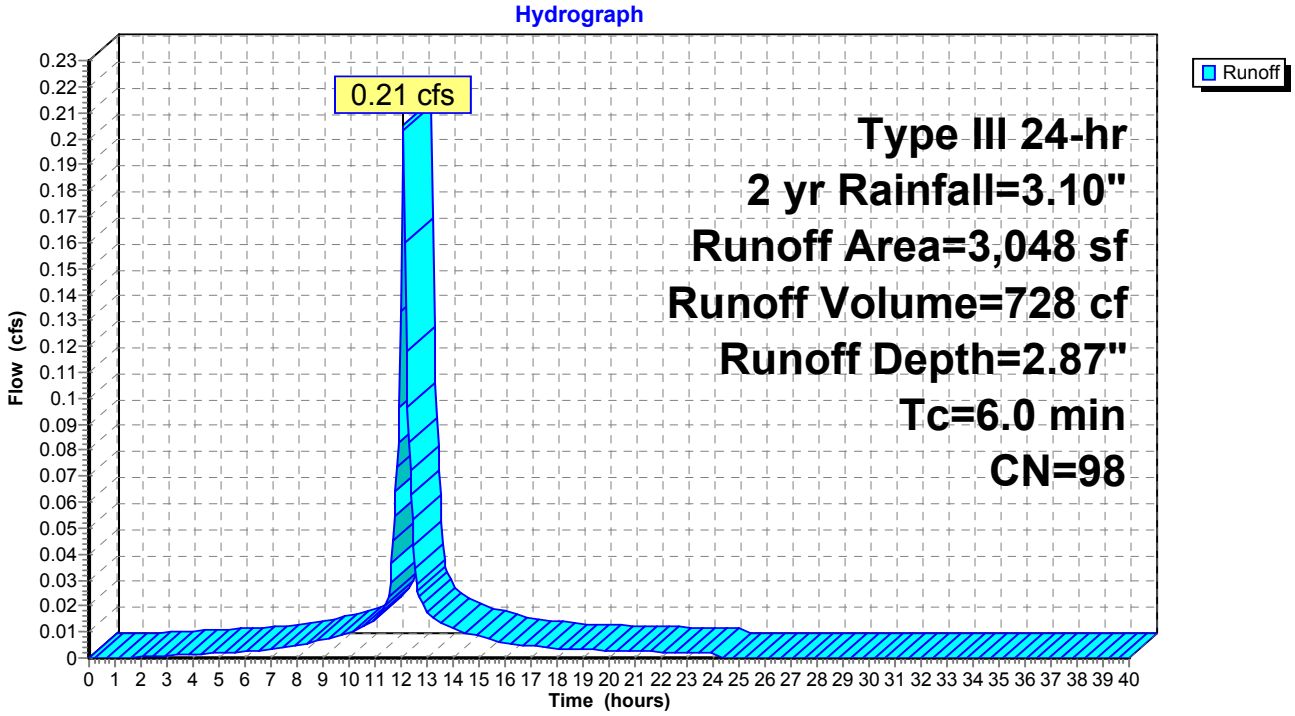
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 728 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
3,048	98	Roofs, HSG A
3,048		100.00% Impervious Area

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

Subcatchment R-D1: ROOF Lot D1



Summary for Subcatchment R-E: ROOF Lot E

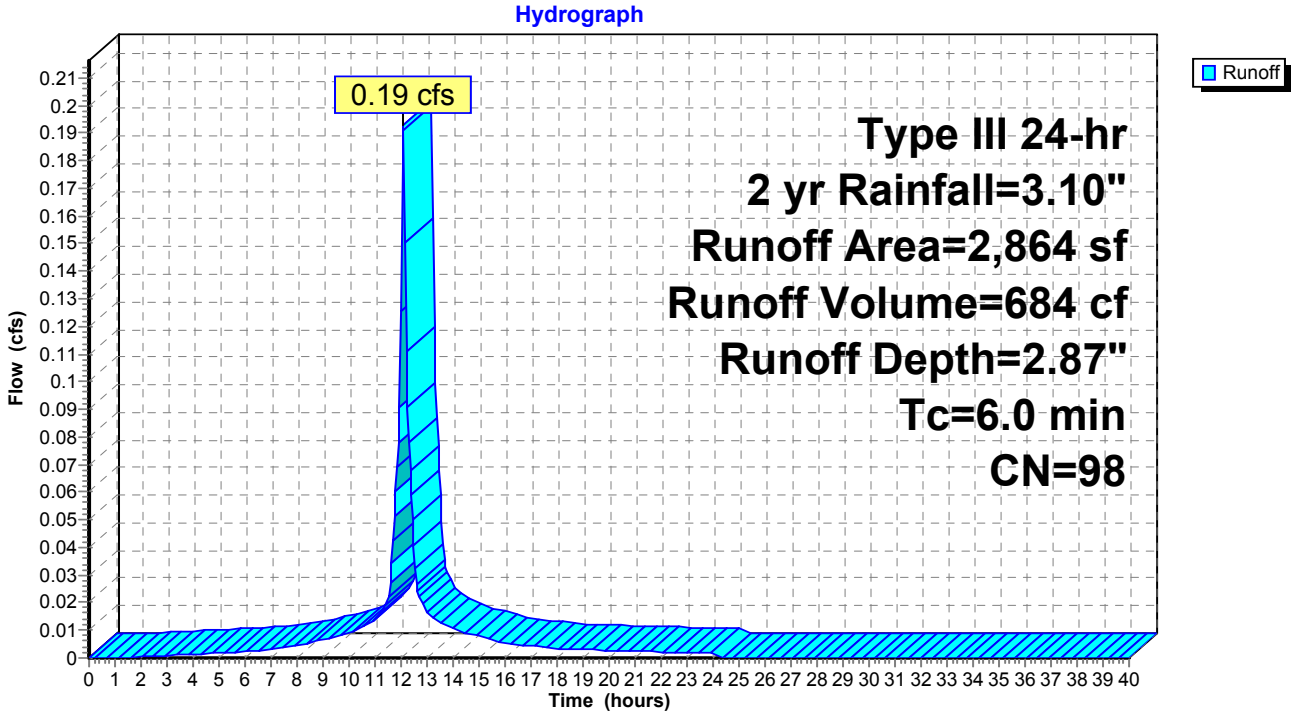
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 684 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,864	98	Roofs, HSG A
2,864		100.00% Impervious Area

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

Subcatchment R-E: ROOF Lot E



Summary for Subcatchment R-F: ROOF Lot F

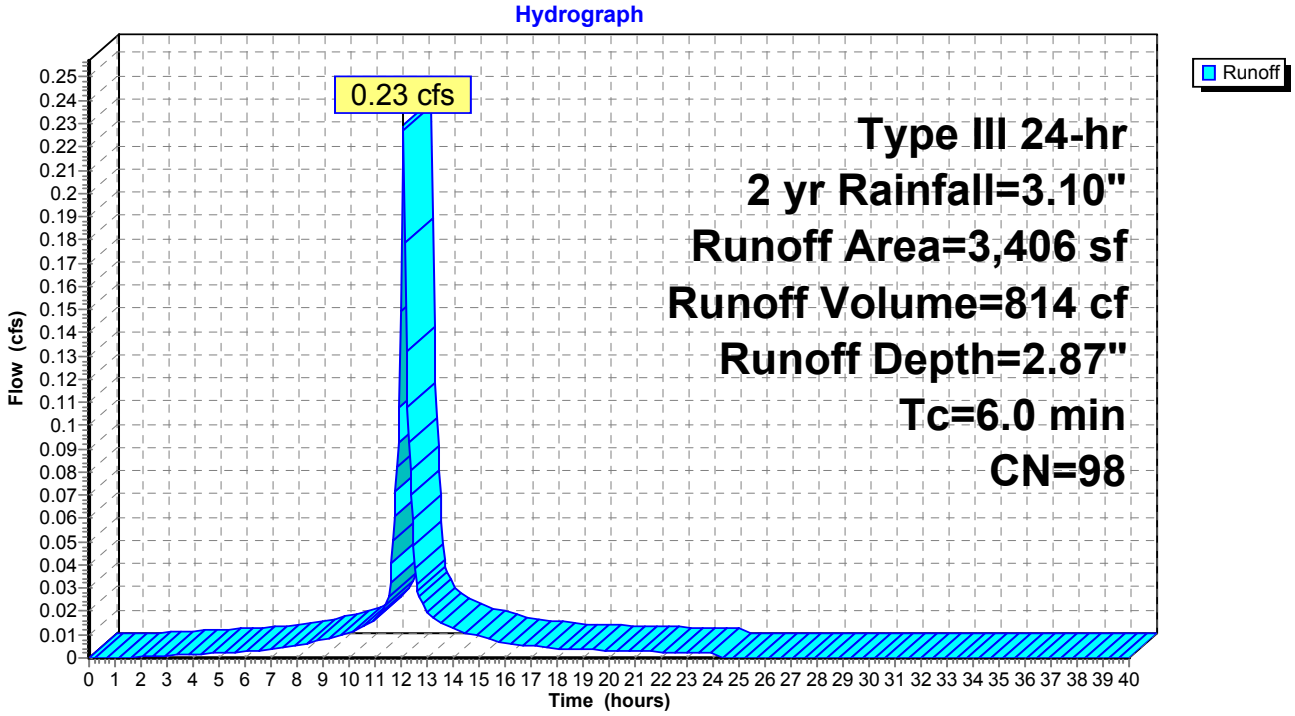
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 814 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
3,406	98	Roofs, HSG A
3,406		100.00% Impervious Area

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

Subcatchment R-F: ROOF Lot F



Summary for Subcatchment R1: ROOF Lot 1

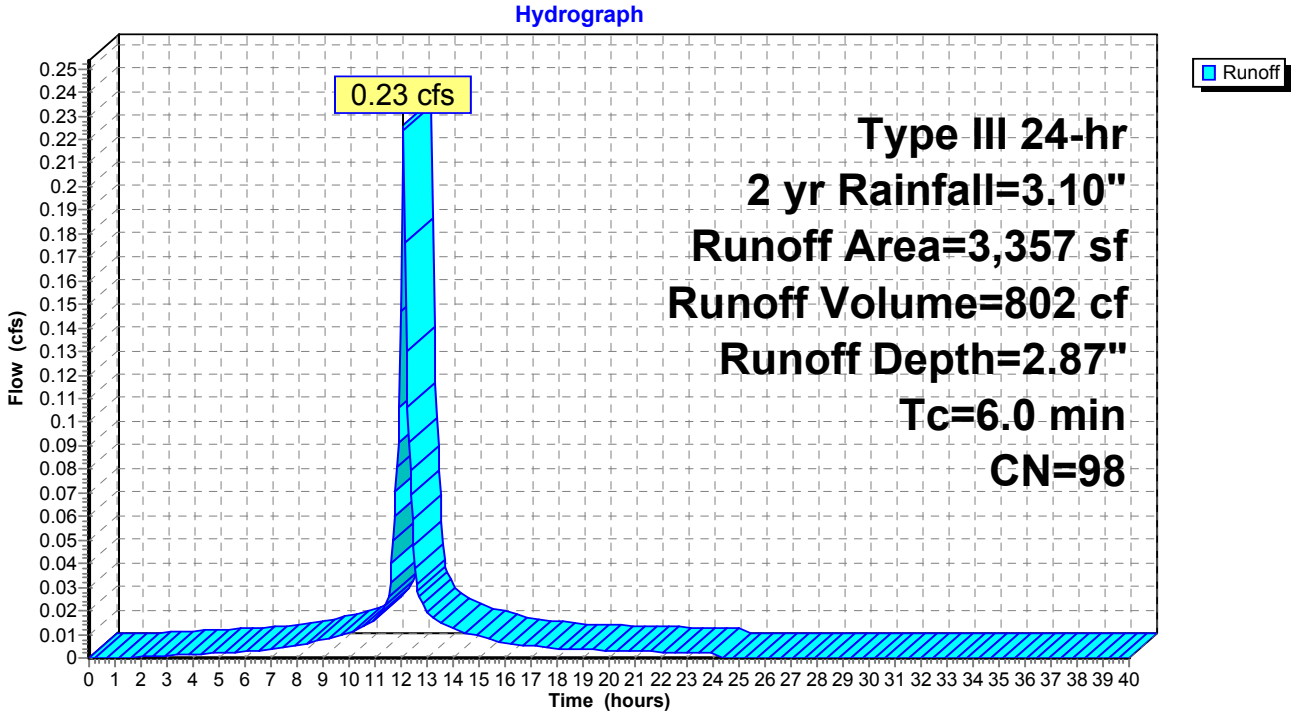
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 802 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
3,357	98	Roofs, HSG A
3,357		100.00% Impervious Area

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

Subcatchment R1: ROOF Lot 1



Summary for Subcatchment R10: ROOF

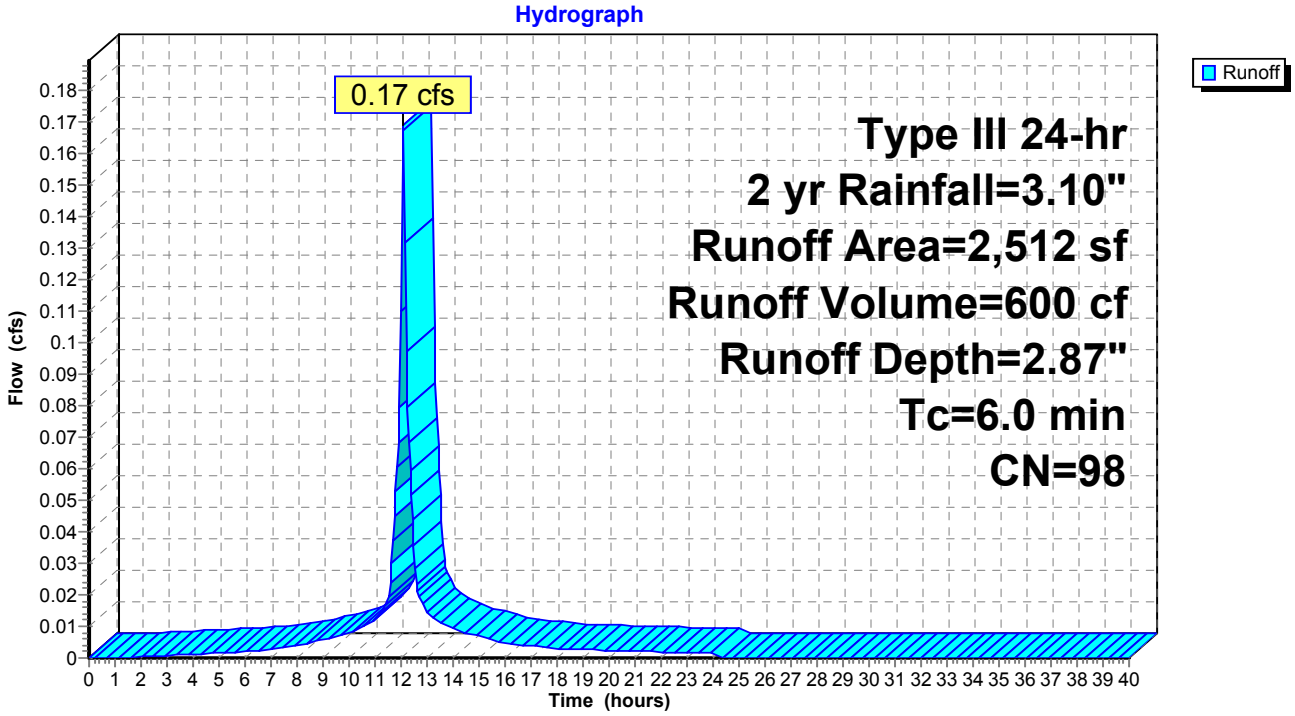
Runoff = 0.17 cfs @ 12.09 hrs, Volume= 600 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,512	98	Roofs, HSG A
2,512		100.00% Impervious Area

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

Subcatchment R10: ROOF



Summary for Subcatchment R11: ROOF

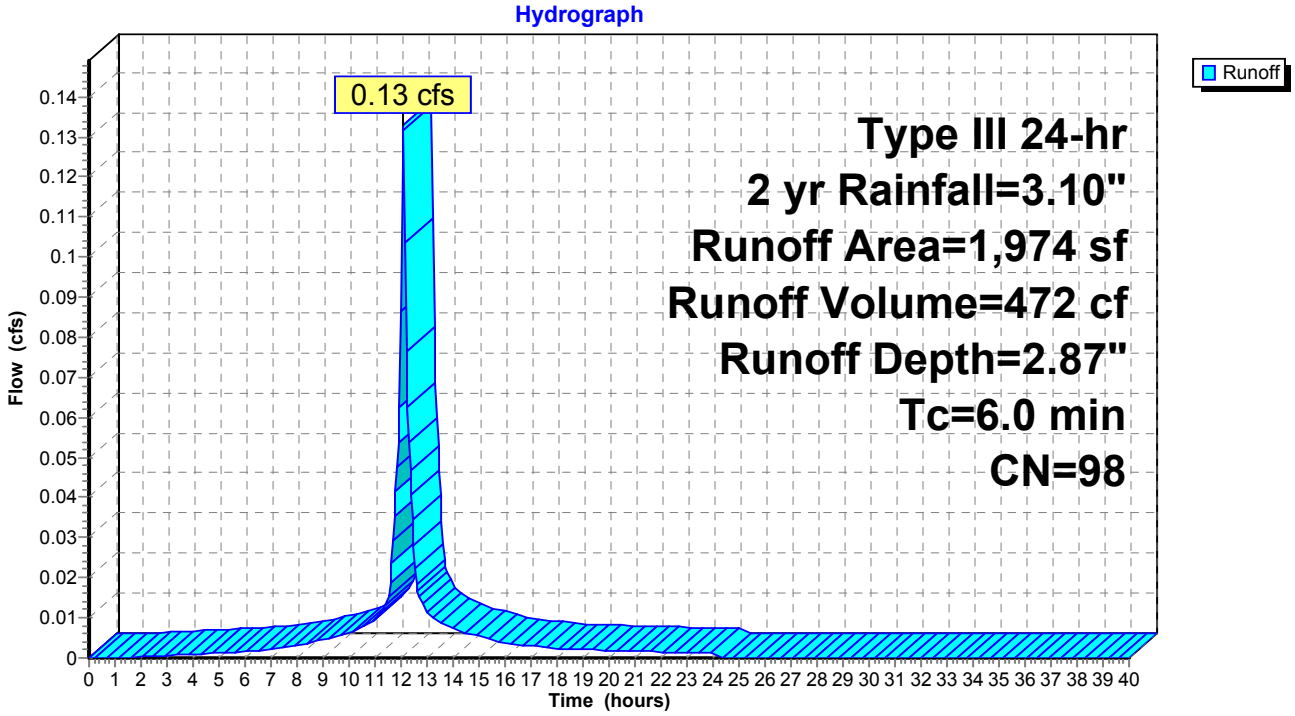
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 472 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,974	98	Roofs, HSG A
1,974		100.00% Impervious Area

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

Subcatchment R11: ROOF



Summary for Subcatchment R12: ROOF Lot 12

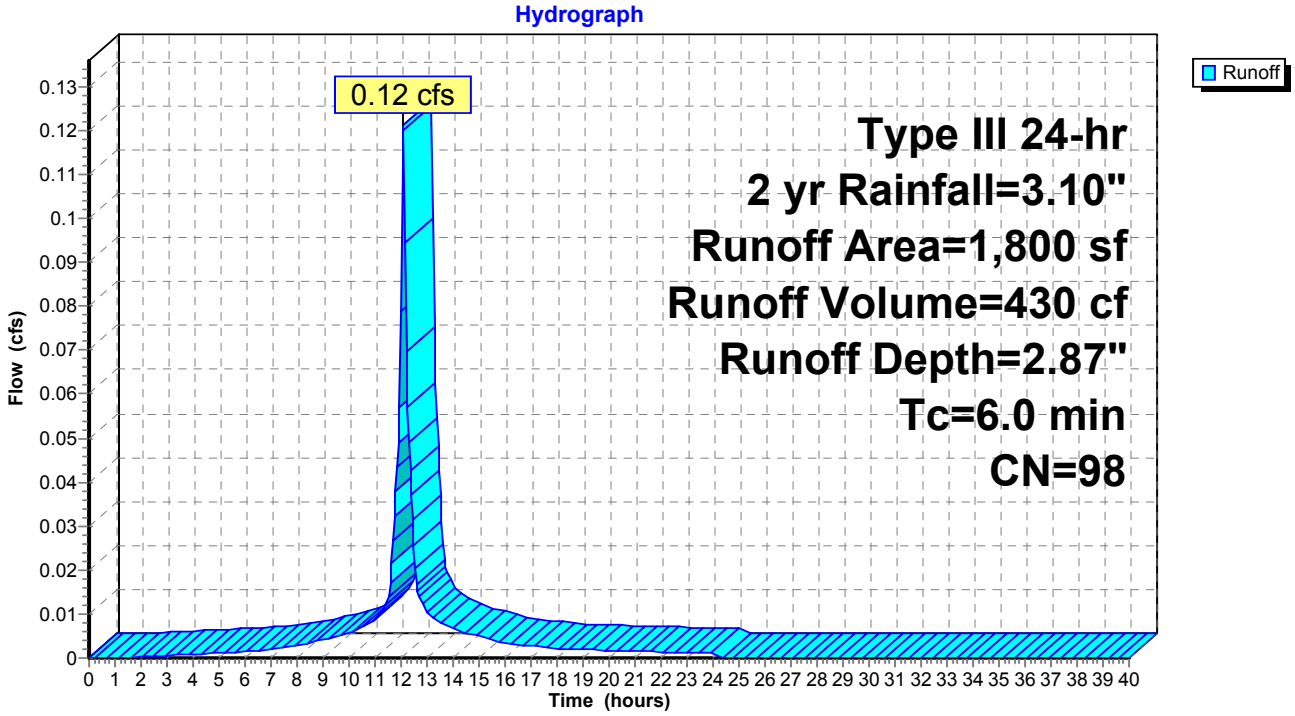
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 430 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,800	98	Roofs, HSG A
1,800		100.00% Impervious Area

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

Subcatchment R12: ROOF Lot 12



Summary for Subcatchment R16: ROOF

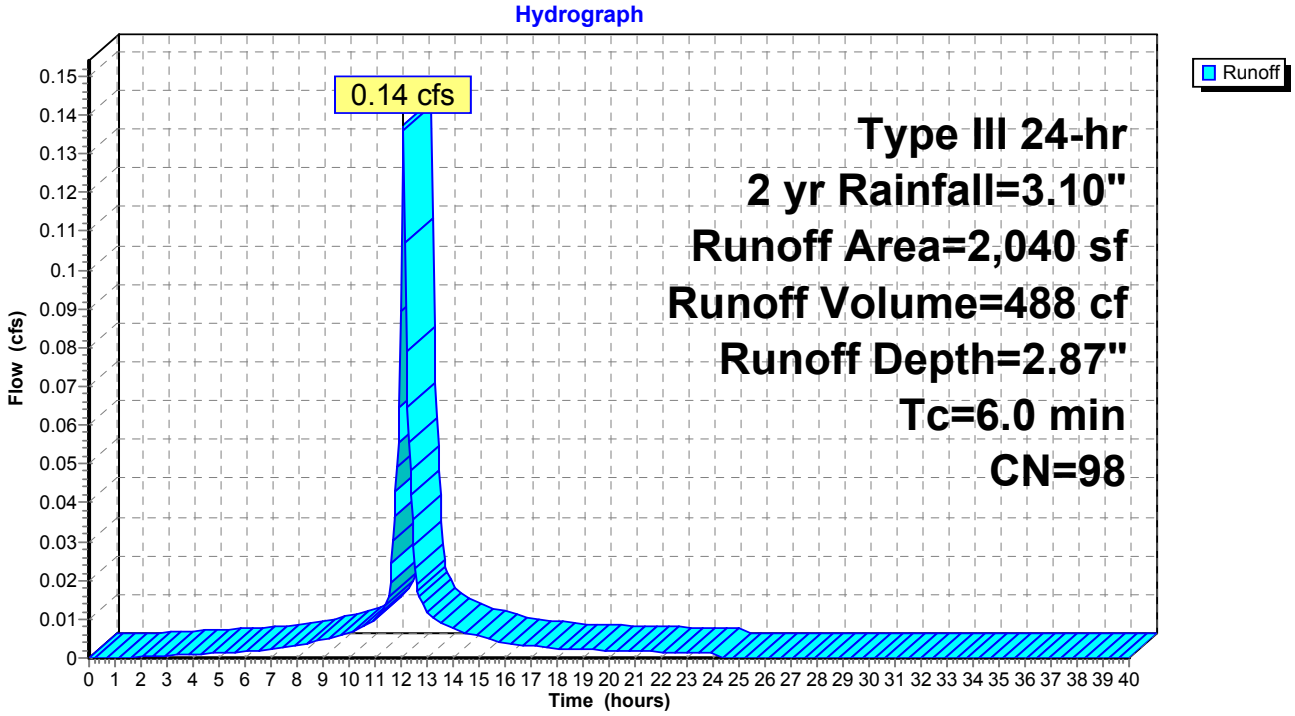
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 488 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,040	98	Roofs, HSG A
2,040		100.00% Impervious Area

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

Subcatchment R16: ROOF



Summary for Subcatchment R2: ROOF

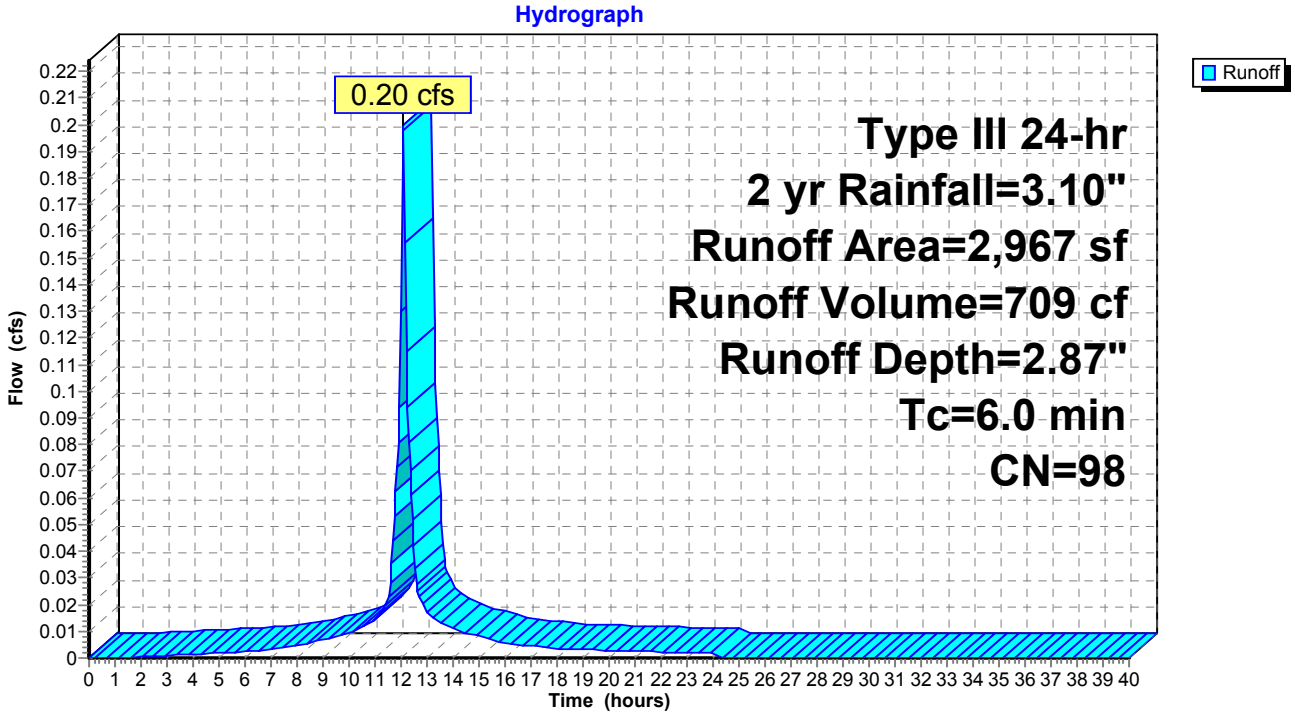
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 709 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,967	98	Roofs, HSG A
2,967		100.00% Impervious Area

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

Subcatchment R2: ROOF



Summary for Subcatchment R3: ROOF

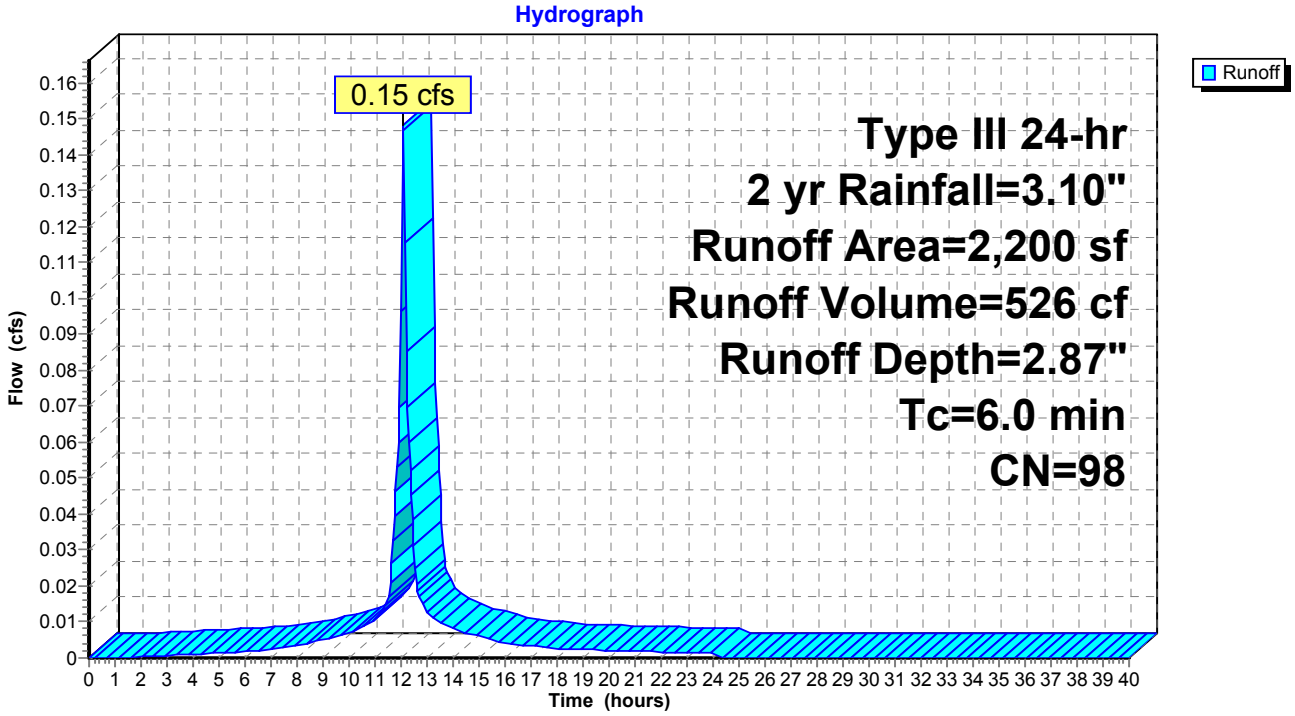
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 526 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,200	98	Roofs, HSG A
2,200		100.00% Impervious Area

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

Subcatchment R3: ROOF



Summary for Subcatchment R4: ROOF

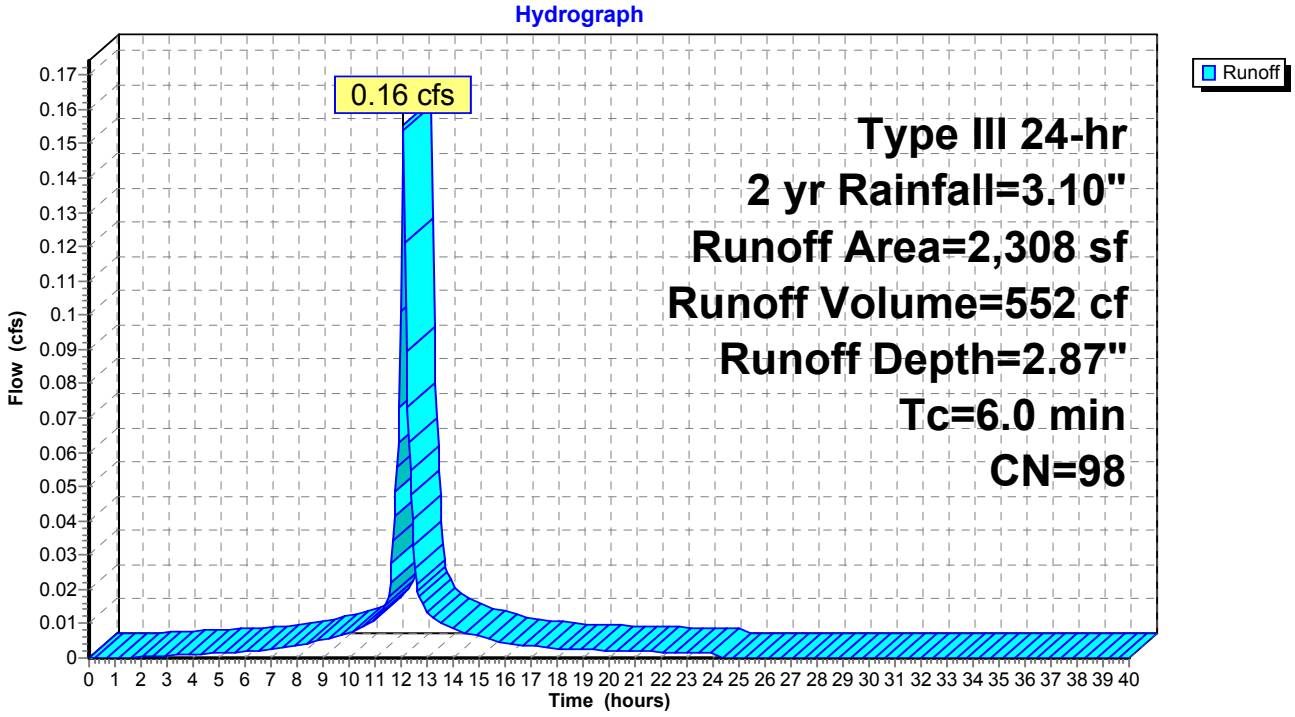
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 552 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,456	98	Roofs, HSG A
852	98	Roofs, HSG B
2,308	98	Weighted Average
2,308		100.00% Impervious Area

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

Subcatchment R4: ROOF



Summary for Subcatchment R5: ROOF

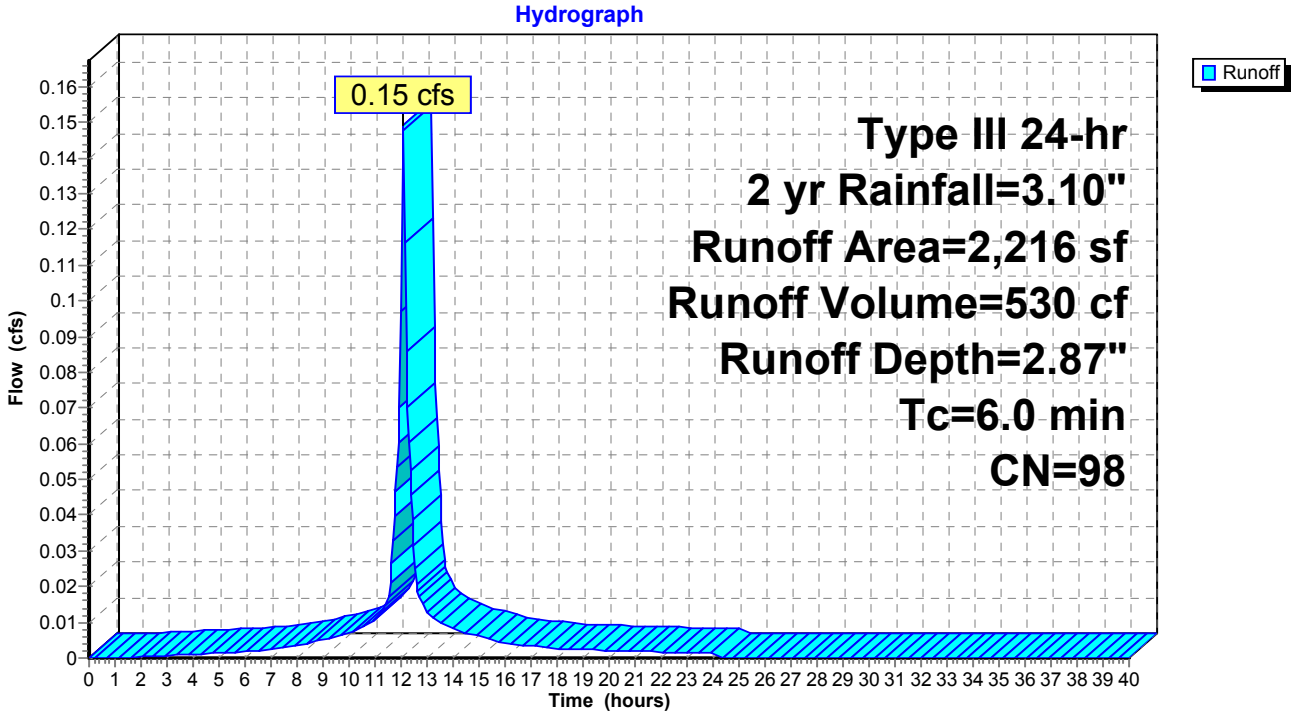
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 530 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
0	98	Roofs, HSG A
2,216	98	Roofs, HSG B
2,216	98	Weighted Average
2,216		100.00% Impervious Area

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

Subcatchment R5: ROOF



Summary for Subcatchment R6: ROOF Lot 6

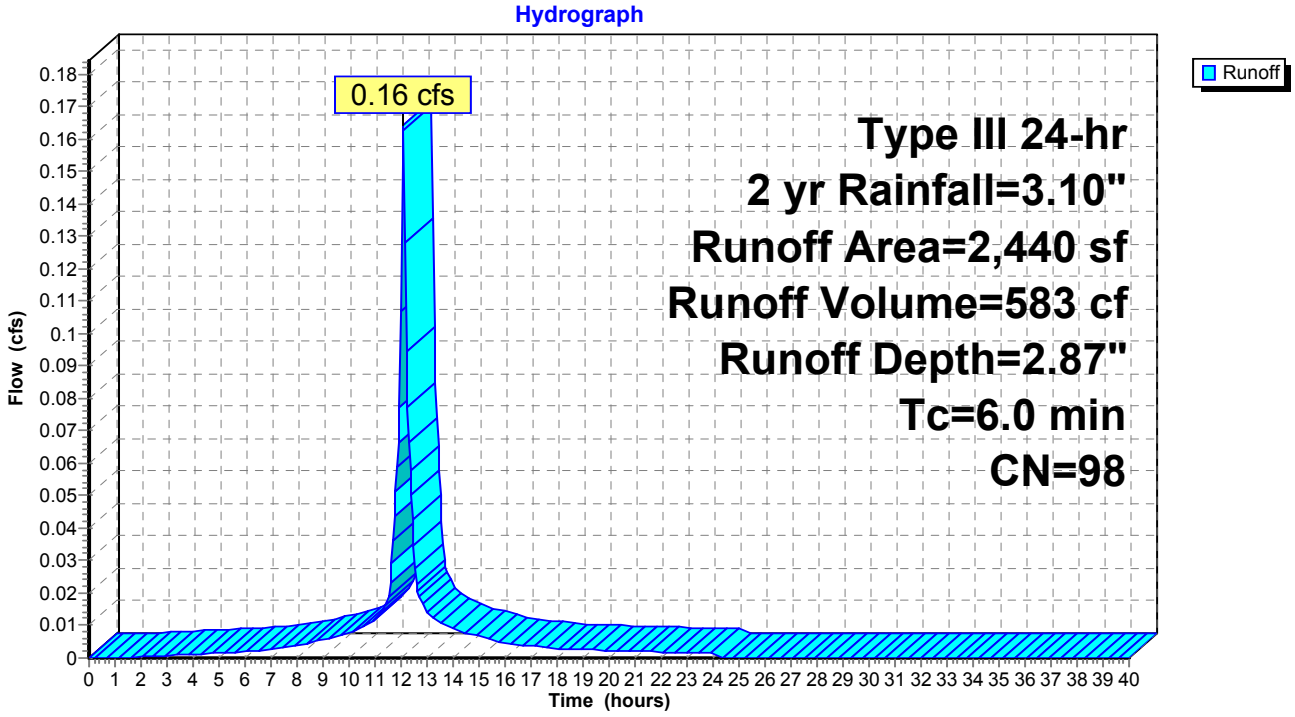
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 583 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,040	98	Roofs, HSG A
1,400	98	Roofs, HSG B
2,440	98	Weighted Average
2,440		100.00% Impervious Area

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

Subcatchment R6: ROOF Lot 6



Summary for Subcatchment R7: ROOF Lot 7

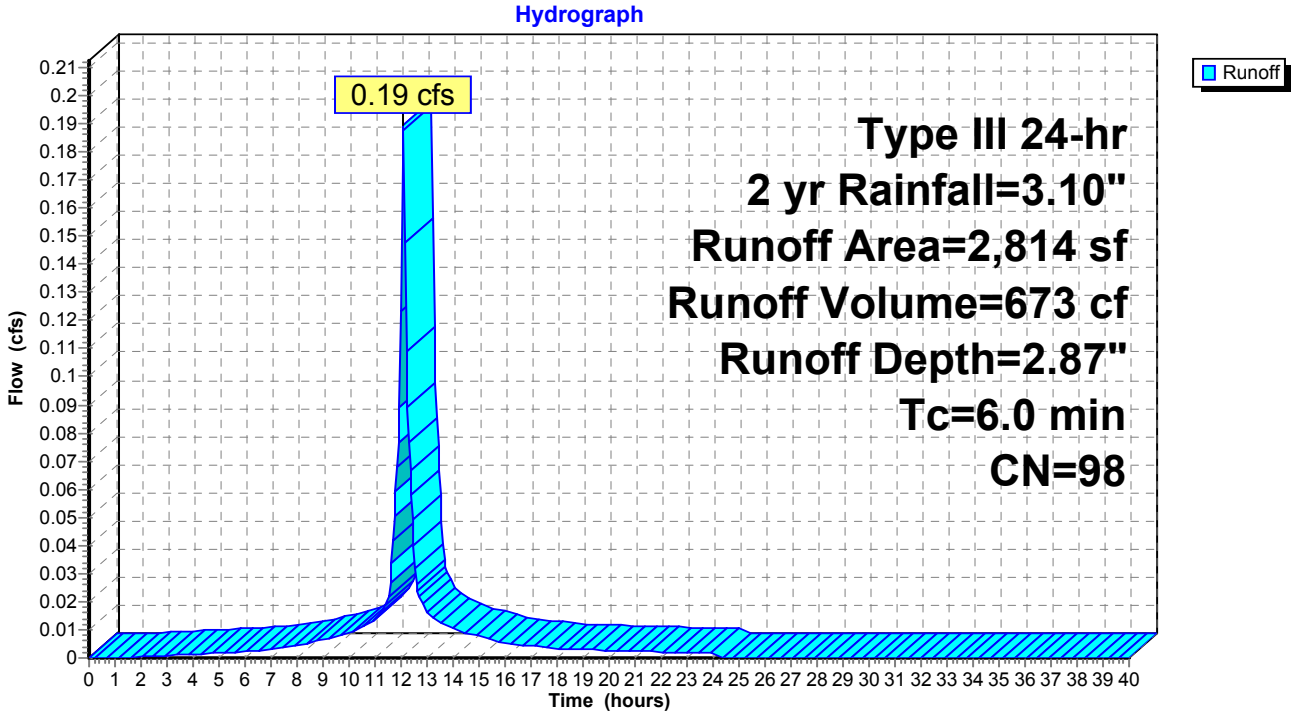
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 673 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
2,814	98	Roofs, HSG A
2,814		100.00% Impervious Area

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

Subcatchment R7: ROOF Lot 7



Summary for Subcatchment R8: ROOF

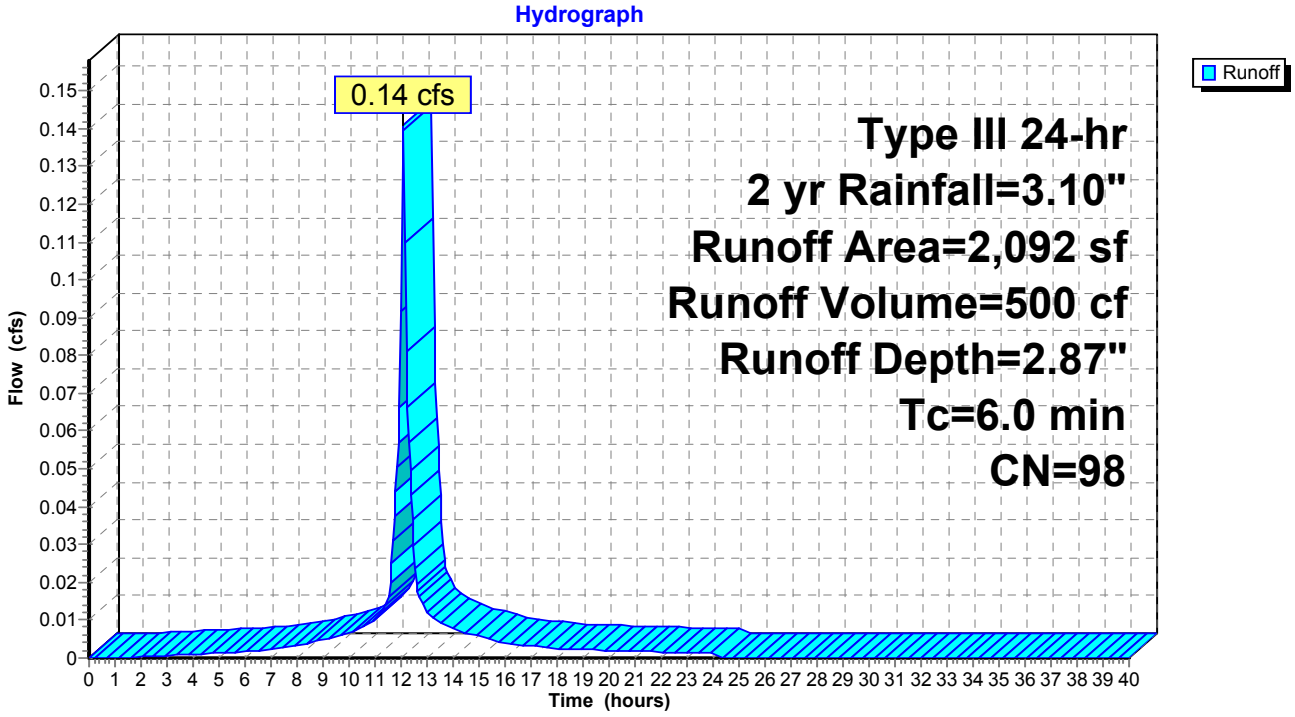
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 500 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,530	98	Roofs, HSG A
562	98	Roofs, HSG B
2,092	98	Weighted Average
2,092		100.00% Impervious Area

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

Subcatchment R8: ROOF



Summary for Subcatchment R9: ROOF

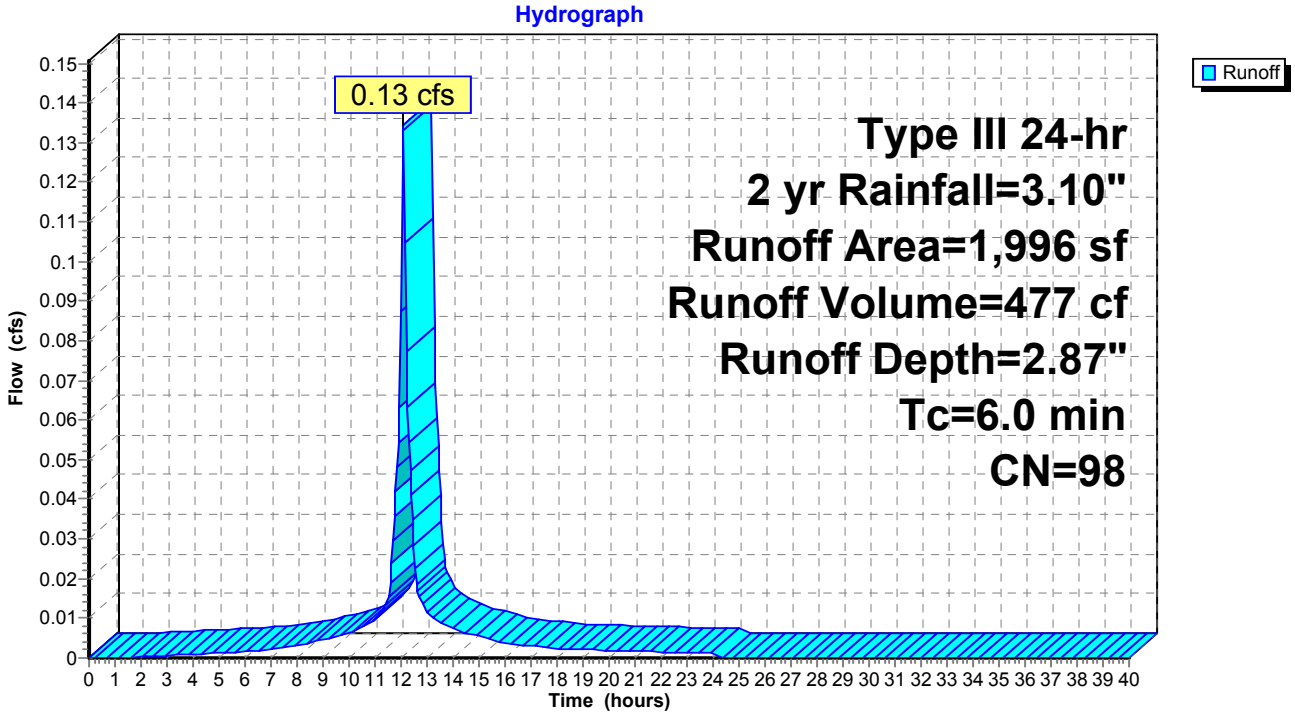
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 477 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.10"

Area (sf)	CN	Description
1,996	98	Roofs, HSG B
1,996		100.00% Impervious Area

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

Subcatchment R9: ROOF



Summary for Pond 1: CB1

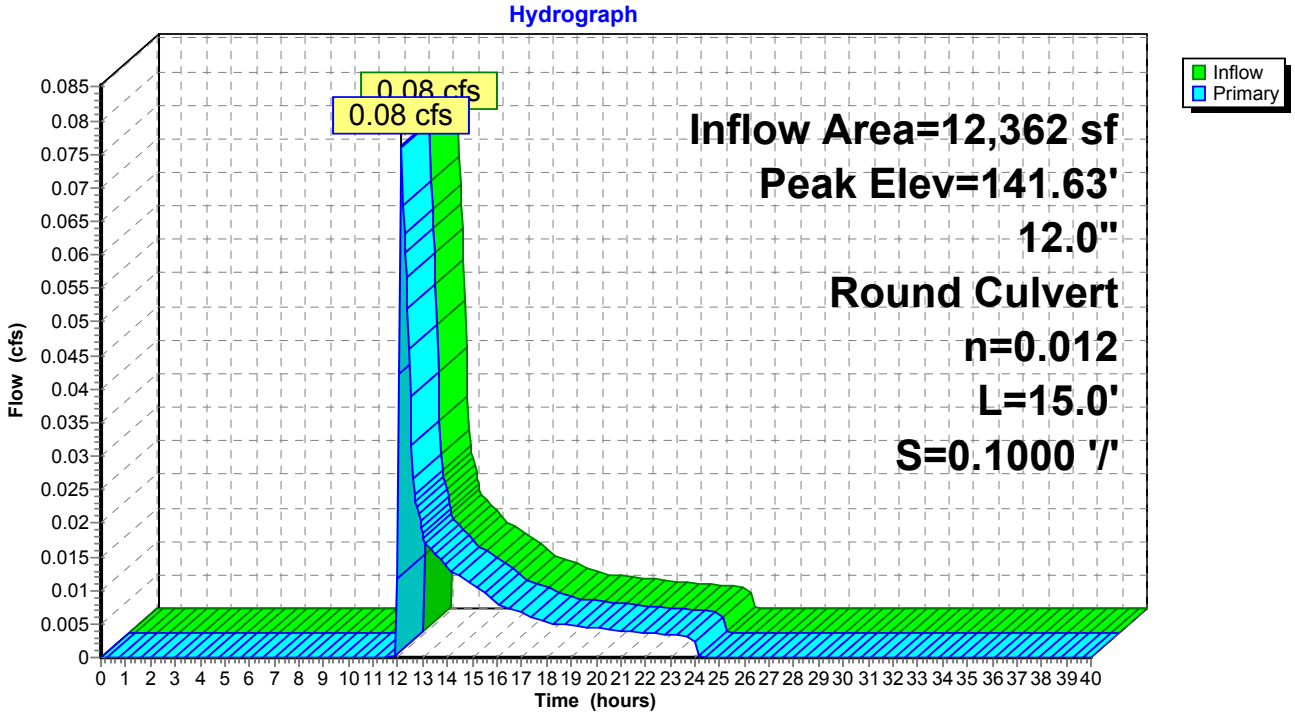
Inflow Area = 12,362 sf, 37.57% Impervious, Inflow Depth = 0.40" for 2 yr event
Inflow = 0.08 cfs @ 12.14 hrs, Volume= 416 cf
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 416 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.08 cfs @ 12.14 hrs, Volume= 416 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 141.63' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	**12.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 140.00' S= 0.1000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.14 hrs HW=141.63' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.08 cfs @ 1.23 fps)

Pond 1: CB1



Summary for Pond 1P: MC-3500 1R4C N

Inflow Area = 3,357 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 802 cf
Outflow = 0.05 cfs @ 11.75 hrs, Volume= 802 cf, Atten= 79%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.75 hrs, Volume= 802 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.30' @ 12.51 hrs Surf.Area= 245 sf Storage= 185 cf

Plug-Flow detention time= 20.5 min calculated for 802 cf (100% of inflow)
Center-of-Mass det. time= 20.5 min (777.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.75 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond 1P: MC-3500 1R4C N - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

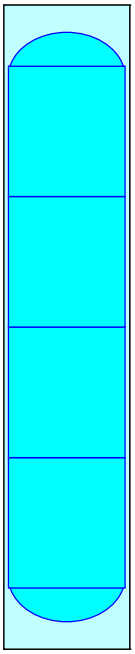
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +18.0" End Stone x 2 = 35.38' Base Length
1 Rows x 77.0" Wide + 3.0" Side Stone x 2 = 6.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

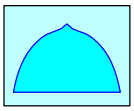
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,345.9 cf Field - 469.6 cf Chambers = 876.3 cf Stone x 40.0% Voids = 350.5 cf Stone Storage

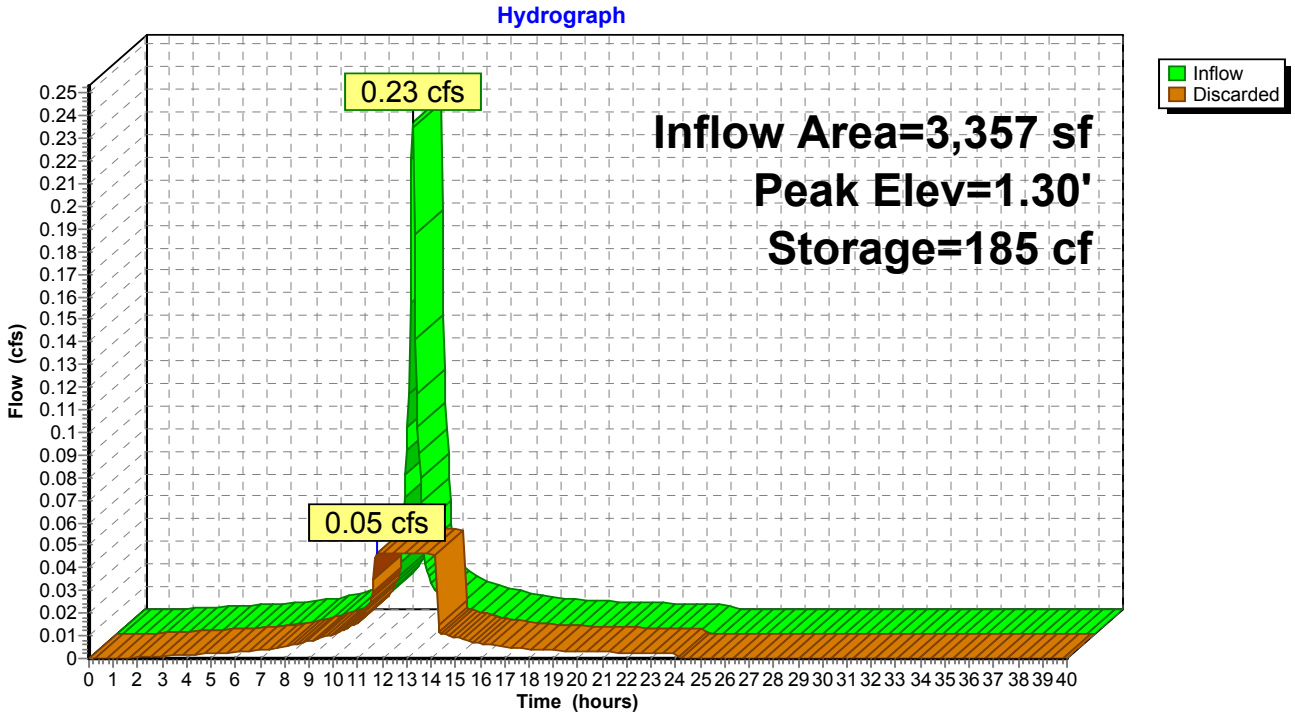
Chamber Storage + Stone Storage = 820.1 cf = 0.019 af
Overall Storage Efficiency = 60.9%
Overall System Size = 35.38' x 6.92' x 5.50'

4 Chambers
49.8 cy Field
32.5 cy Stone





Pond 1P: MC-3500 1R4C N



Summary for Pond 2: CB2

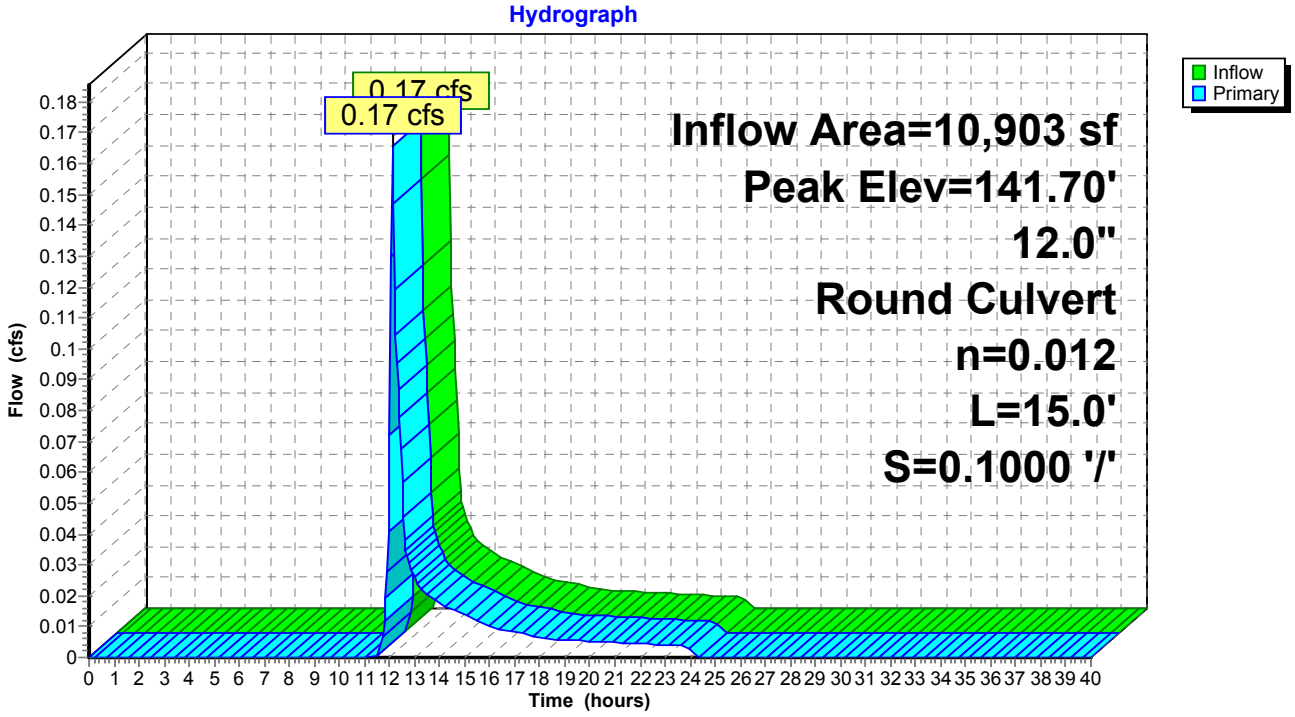
Inflow Area = 10,903 sf, 49.32% Impervious, Inflow Depth = 0.68" for 2 yr event
Inflow = 0.17 cfs @ 12.11 hrs, Volume= 617 cf
Outflow = 0.17 cfs @ 12.11 hrs, Volume= 617 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.11 hrs, Volume= 617 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 141.70' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	**12.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 140.00' S= 0.1000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.16 cfs @ 12.11 hrs HW=141.69' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.16 cfs @ 1.50 fps)

Pond 2: CB2



Summary for Pond 2P: MC-3500 1R2C

Inflow Area = 2,967 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 709 cf
Outflow = 0.03 cfs @ 11.70 hrs, Volume= 709 cf, Atten= 83%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.70 hrs, Volume= 709 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.81' @ 12.55 hrs Surf.Area= 177 sf Storage= 187 cf

Plug-Flow detention time= 30.6 min calculated for 709 cf (100% of inflow)
Center-of-Mass det. time= 30.6 min (787.7 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	325 cf	**8.42'W x 21.04'L x 6.00'H Field A** 1,063 cf Overall - 250 cf Embedded = 813 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		575 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.70 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 2P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

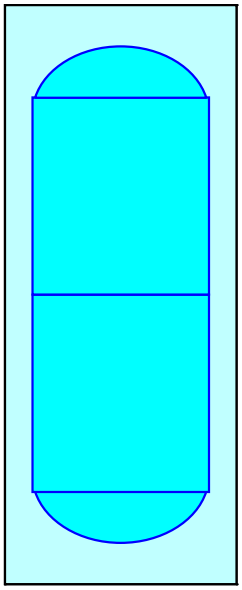
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +18.0" End Stone x 2 = 21.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 18.0" Cover = 6.00' Field Height

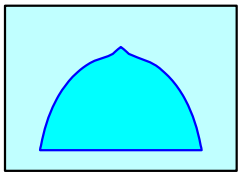
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

1,062.5 cf Field - 249.7 cf Chambers = 812.8 cf Stone x 40.0% Voids = 325.1 cf Stone Storage

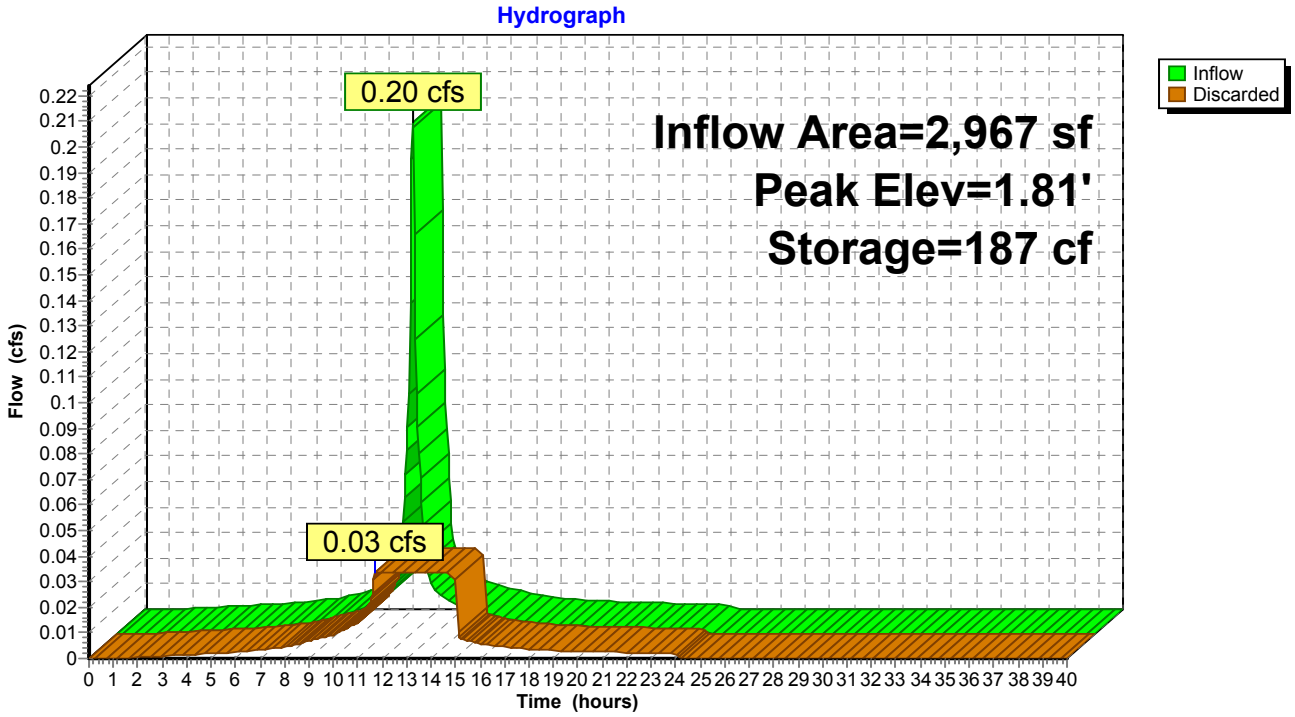
Chamber Storage + Stone Storage = 574.8 cf = 0.013 af
Overall Storage Efficiency = 54.1%
Overall System Size = 21.04' x 8.42' x 6.00'

2 Chambers
39.4 cy Field
30.1 cy Stone





Pond 2P: MC-3500 1R2C



Summary for Pond 3: CB3

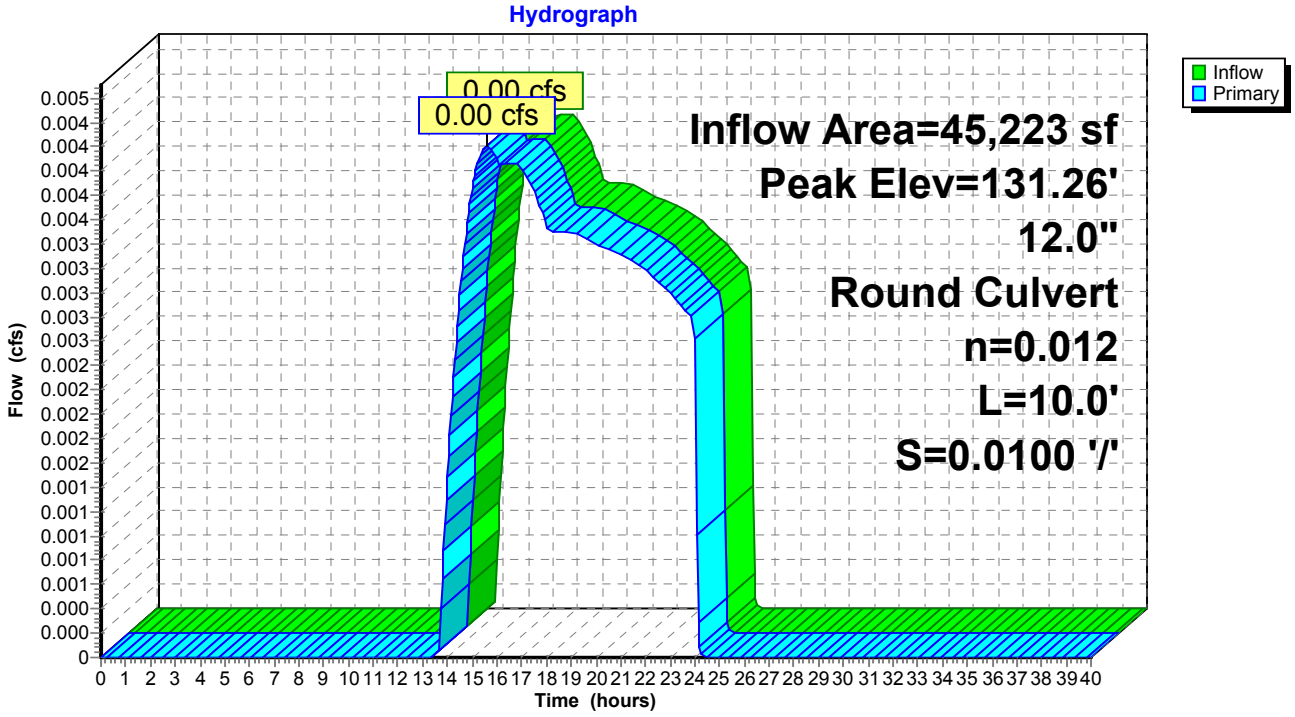
Inflow Area = 45,223 sf, 12.98% Impervious, Inflow Depth = 0.03" for 2 yr event
Inflow = 0.00 cfs @ 15.61 hrs, Volume= 126 cf
Outflow = 0.00 cfs @ 15.61 hrs, Volume= 126 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.61 hrs, Volume= 126 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.26' @ 15.61 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.23'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 131.23' / 131.13' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.61 hrs HW=131.26' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.00 cfs @ 0.78 fps)

Pond 3: CB3



Summary for Pond 3P: MC-3500 1R2C

Inflow Area = 2,200 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 526 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 526 cf, Atten= 78%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 526 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.29' @ 12.49 hrs Surf.Area= 169 sf Storage= 117 cf

Plug-Flow detention time= 18.5 min calculated for 526 cf (100% of inflow)
Center-of-Mass det. time= 18.5 min (775.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 3P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

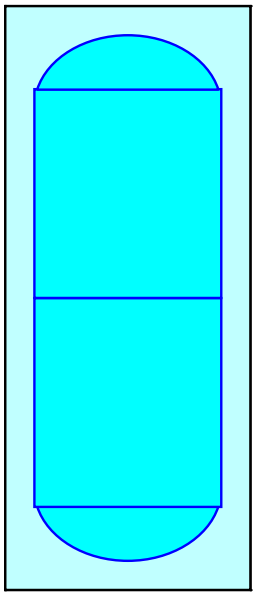
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

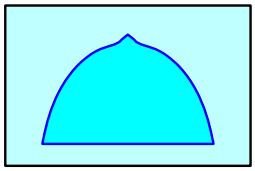
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

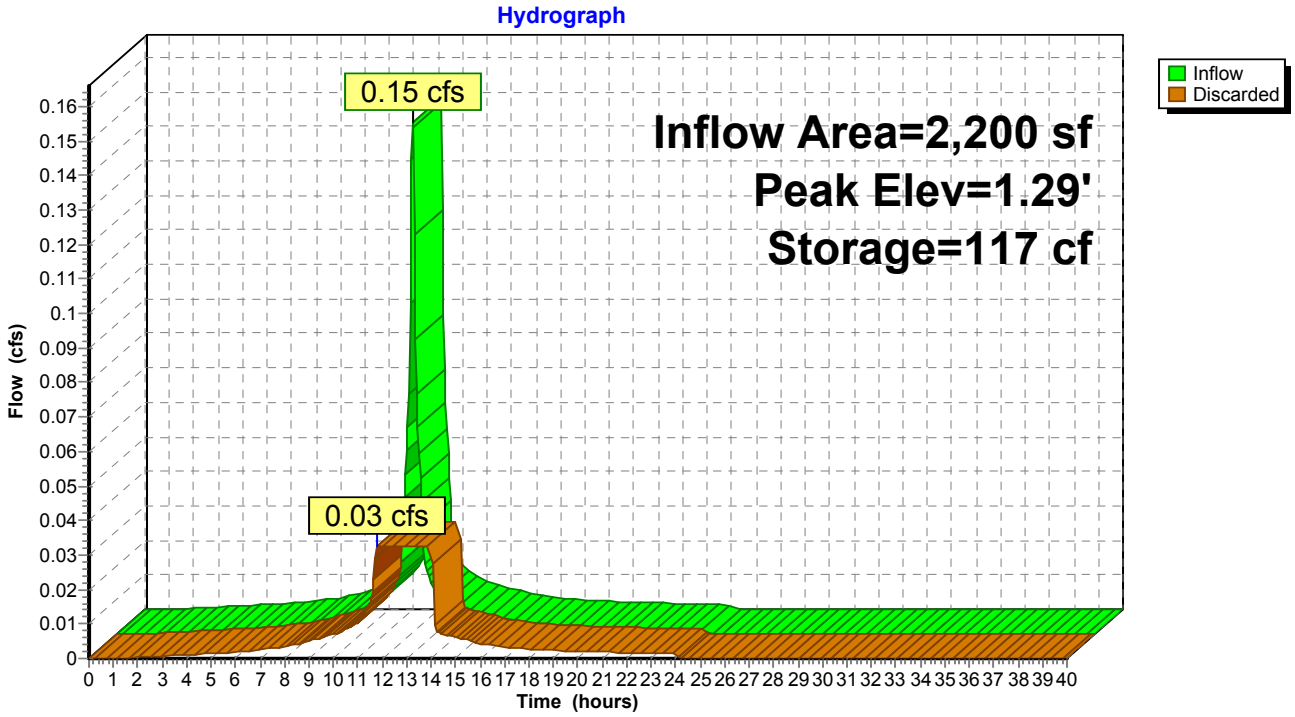
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 3P: MC-3500 1R2C



Summary for Pond 4: CB4

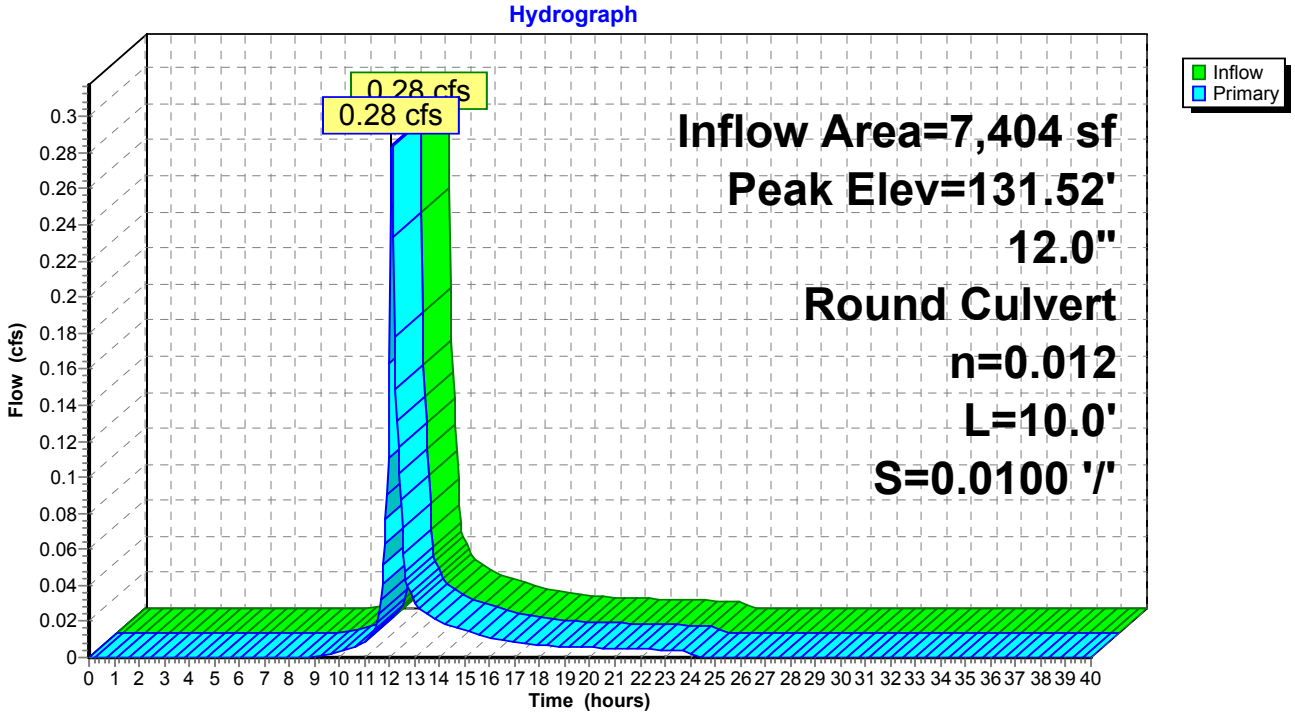
Inflow Area = 7,404 sf, 63.44% Impervious, Inflow Depth = 1.46" for 2 yr event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 900 cf
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 900 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 900 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.52' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.23'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 131.23' / 131.13' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.09 hrs HW=131.52' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.28 cfs @ 2.27 fps)

Pond 4: CB4



Summary for Pond 4P: MC-3500 1R2C

Inflow Area = 2,308 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 552 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 552 cf, Atten= 79%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 552 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.37' @ 12.51 hrs Surf.Area= 169 sf Storage= 127 cf

Plug-Flow detention time= 20.4 min calculated for 552 cf (100% of inflow)
Center-of-Mass det. time= 20.4 min (777.5 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 4P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

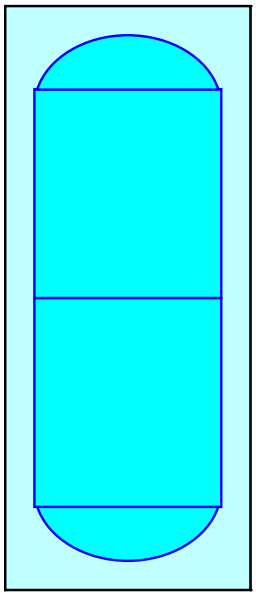
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

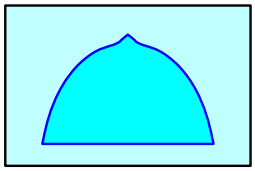
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

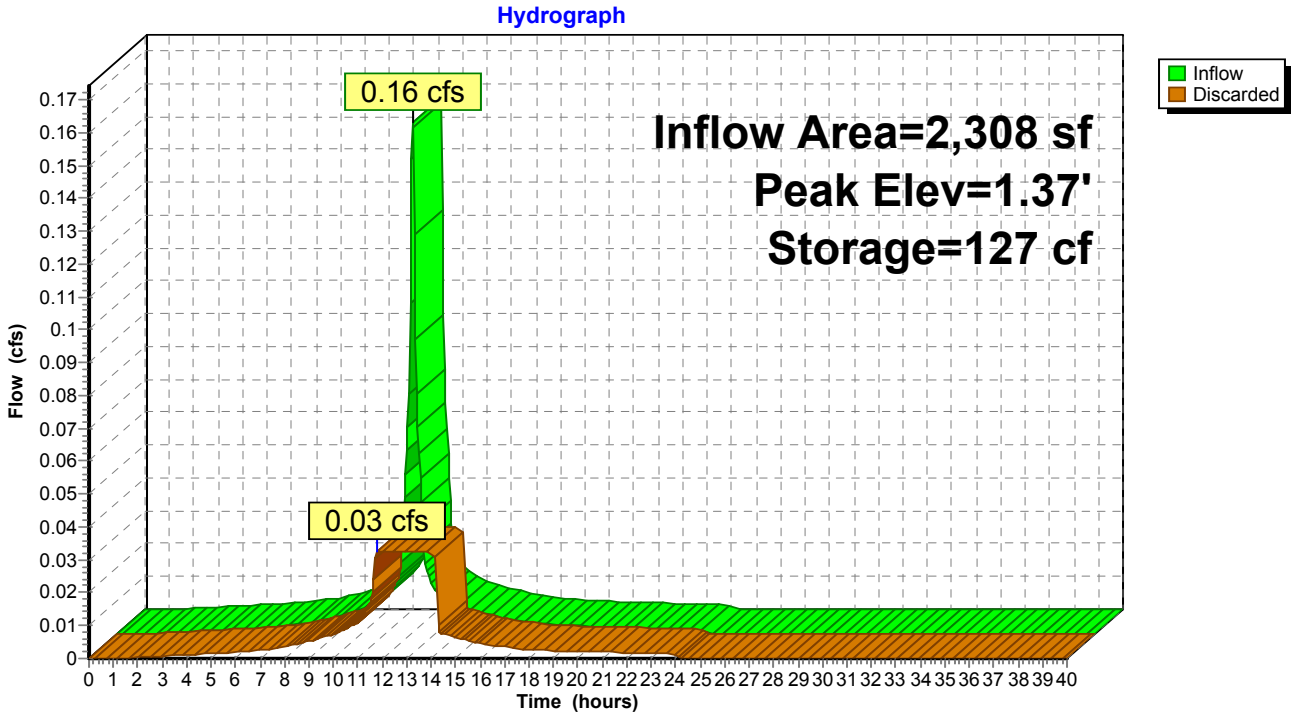
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 4P: MC-3500 1R2C



Summary for Pond 5: CB5

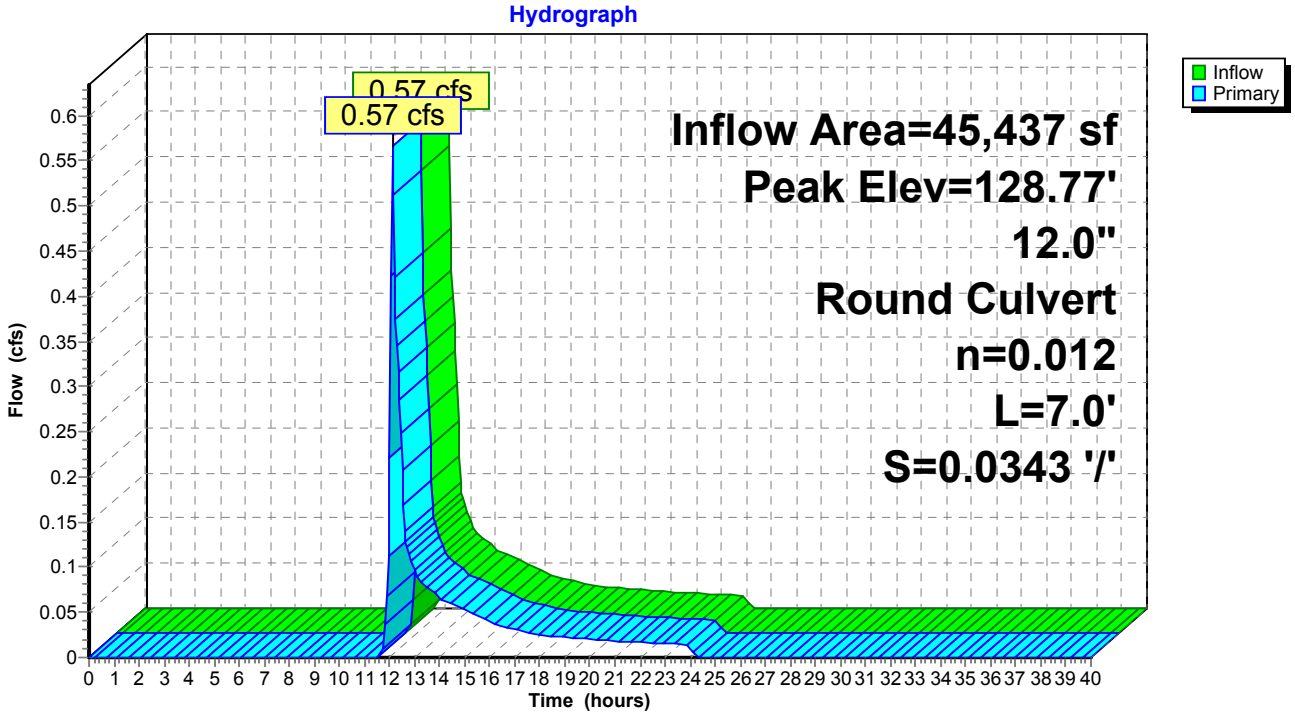
Inflow Area =	45,437 sf, 29.90% Impervious, Inflow Depth = 0.59" for 2 yr event				
Inflow =	0.57 cfs @	12.11 hrs, Volume=	2,246 cf		
Outflow =	0.57 cfs @	12.11 hrs, Volume=	2,246 cf, Atten= 0%, Lag= 0.0 min		
Primary =	0.57 cfs @	12.11 hrs, Volume=	2,246 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.77' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.39'	**12.0" Round Culvert** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.39' / 128.15' S= 0.0343 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.11 hrs HW=128.76' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.55 cfs @ 2.07 fps)

Pond 5: CB5



Summary for Pond 5P: MC-3500 1R2C

Inflow Area = 2,216 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 530 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 530 cf, Atten= 78%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 530 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.30' @ 12.50 hrs Surf.Area= 169 sf Storage= 119 cf

Plug-Flow detention time= 18.8 min calculated for 530 cf (100% of inflow)
Center-of-Mass det. time= 18.8 min (775.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 5P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

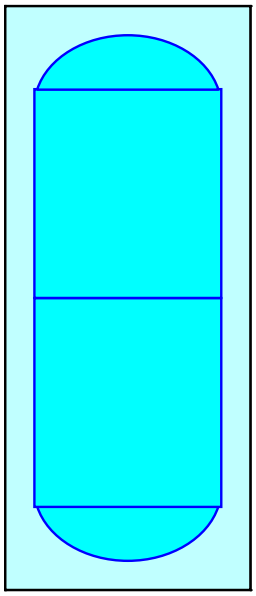
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

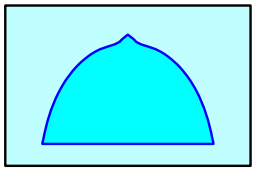
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

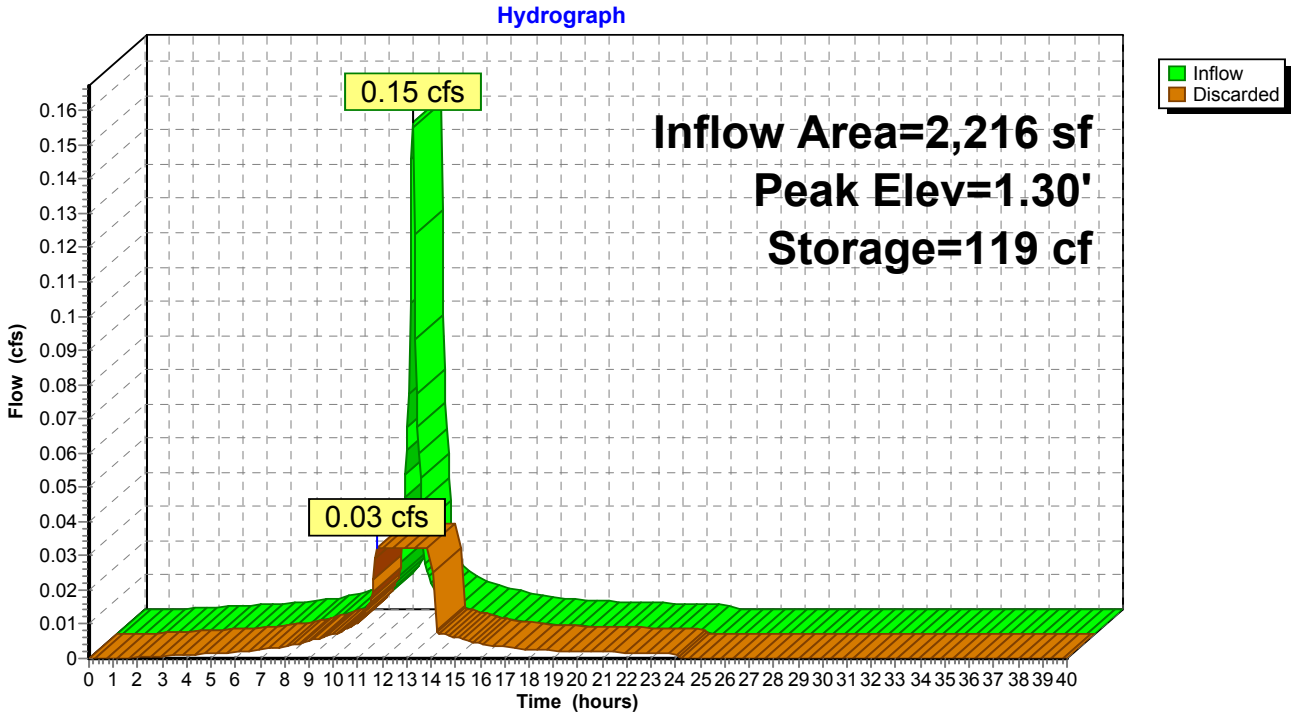
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 5P: MC-3500 1R2C



Summary for Pond 6: CB6

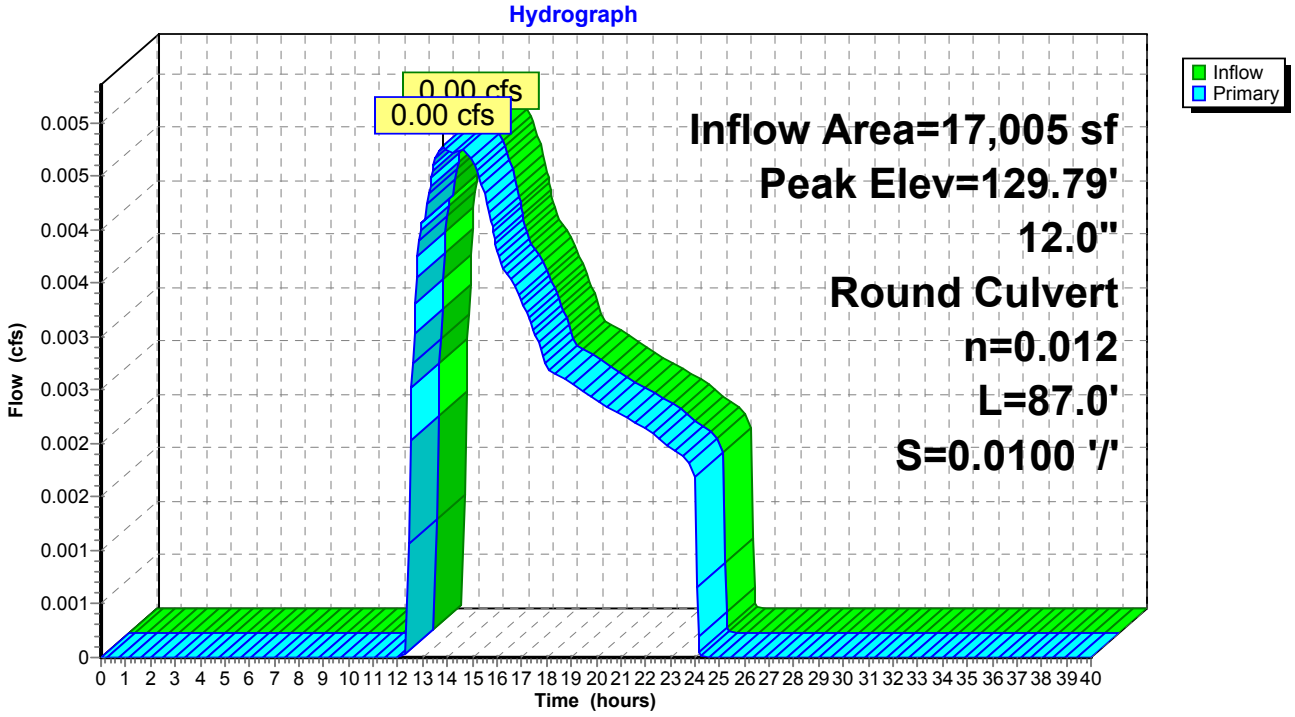
Inflow Area = 17,005 sf, 0.00% Impervious, Inflow Depth = 0.09" for 2 yr event
Inflow = 0.00 cfs @ 13.80 hrs, Volume= 129 cf
Outflow = 0.00 cfs @ 13.80 hrs, Volume= 129 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 13.80 hrs, Volume= 129 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 129.79' @ 13.80 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	129.75'	**12.0" Round Culvert** L= 87.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 129.75' / 128.88' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 13.80 hrs HW=129.79' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.00 cfs @ 0.83 fps)

Pond 6: CB6



Summary for Pond 6P: MC-3500 1R2C

Inflow Area = 2,440 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 583 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 583 cf, Atten= 80%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 583 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.47' @ 12.52 hrs Surf.Area= 169 sf Storage= 140 cf

Plug-Flow detention time= 22.8 min calculated for 583 cf (100% of inflow)
Center-of-Mass det. time= 22.8 min (779.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.08' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 6P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

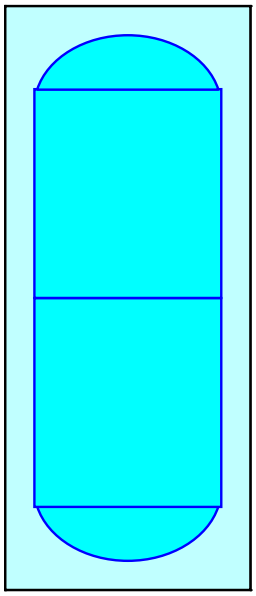
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

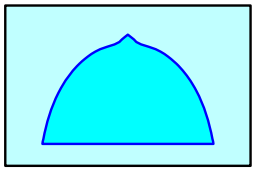
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

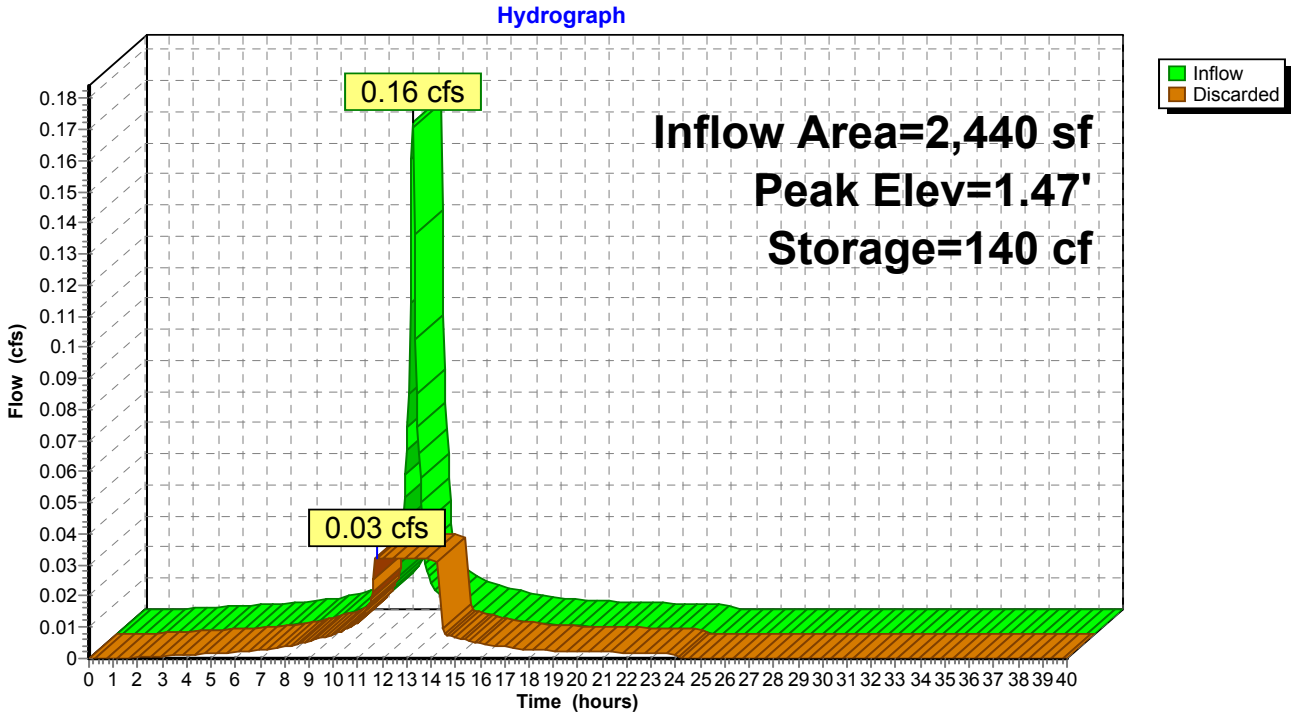
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 6P: MC-3500 1R2C



Summary for Pond 7: CB7

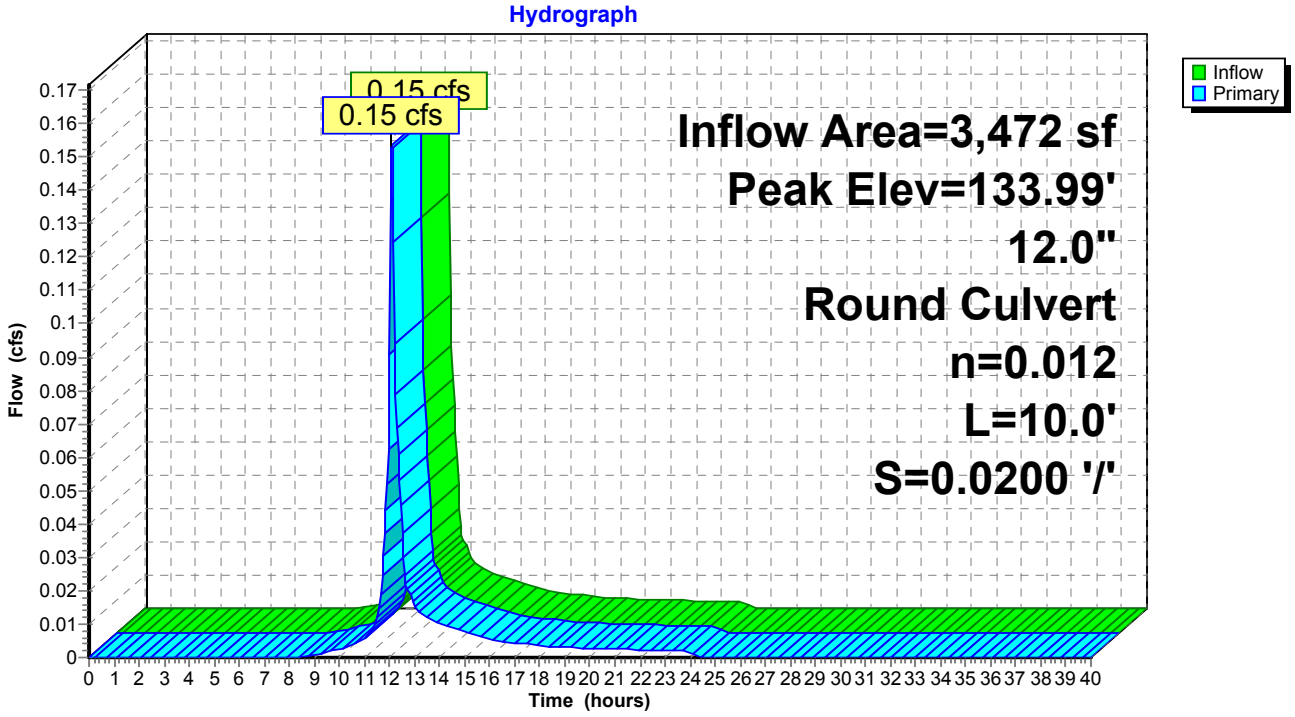
Inflow Area =	3,472 sf, 76.58% Impervious, Inflow Depth = 1.67" for 2 yr event				
Inflow =	0.15 cfs @	12.09 hrs,	Volume=	484 cf	
Outflow =	0.15 cfs @	12.09 hrs,	Volume=	484 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.15 cfs @	12.09 hrs,	Volume=	484 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 133.99' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.80' / 133.60' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=133.99' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.15 cfs @ 1.47 fps)

Pond 7: CB7



Summary for Pond 7P: MC-3500 1R2C

Inflow Area = 2,814 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 673 cf
Outflow = 0.03 cfs @ 11.70 hrs, Volume= 673 cf, Atten= 82%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.70 hrs, Volume= 673 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.69' @ 12.54 hrs Surf.Area= 177 sf Storage= 172 cf

Plug-Flow detention time= 27.7 min calculated for 673 cf (100% of inflow)
Center-of-Mass det. time= 27.6 min (784.7 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	325 cf	**8.42'W x 21.04'L x 6.00'H Field A** 1,063 cf Overall - 250 cf Embedded = 813 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		575 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.70 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 7P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

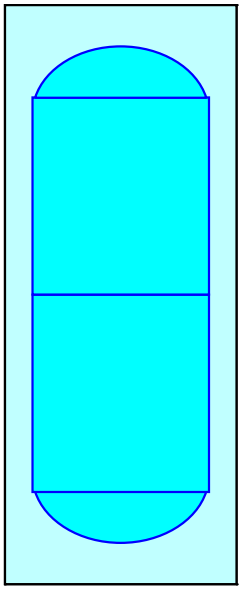
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +18.0" End Stone x 2 = 21.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 18.0" Cover = 6.00' Field Height

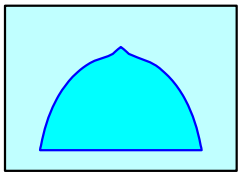
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

1,062.5 cf Field - 249.7 cf Chambers = 812.8 cf Stone x 40.0% Voids = 325.1 cf Stone Storage

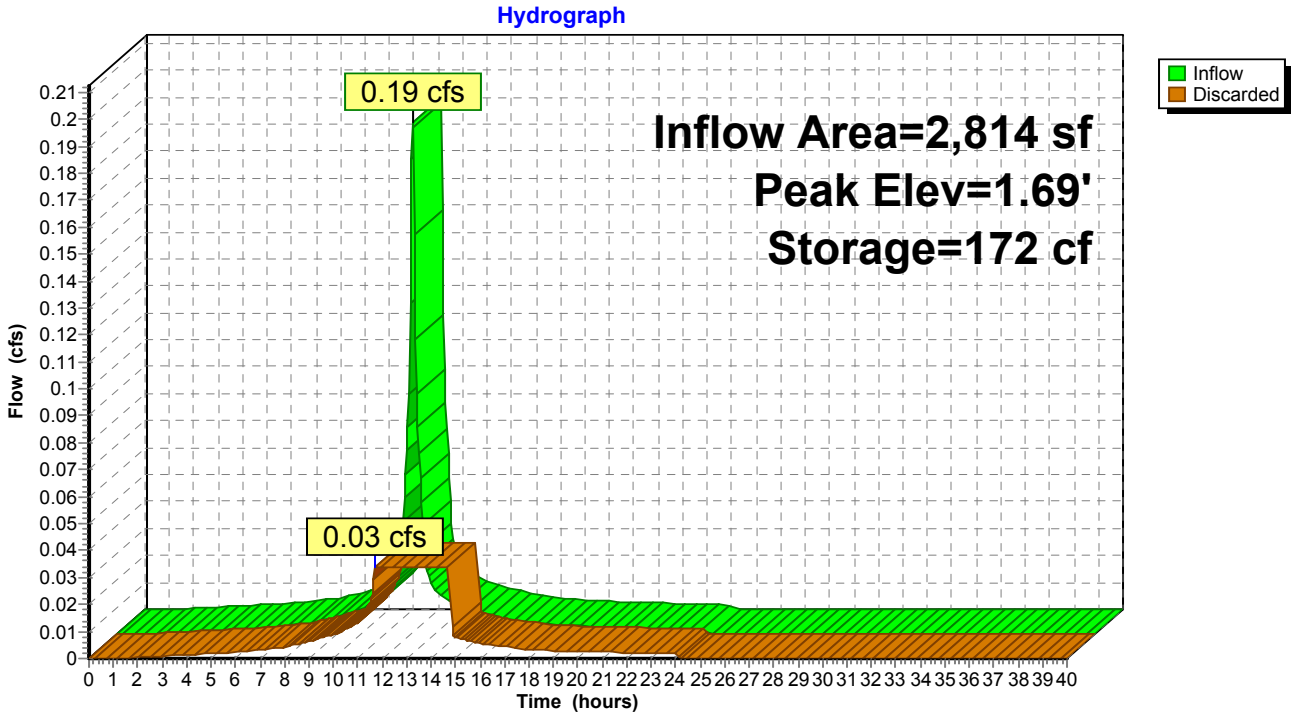
Chamber Storage + Stone Storage = 574.8 cf = 0.013 af
Overall Storage Efficiency = 54.1%
Overall System Size = 21.04' x 8.42' x 6.00'

2 Chambers
39.4 cy Field
30.1 cy Stone





Pond 7P: MC-3500 1R2C



Summary for Pond 8: CB8

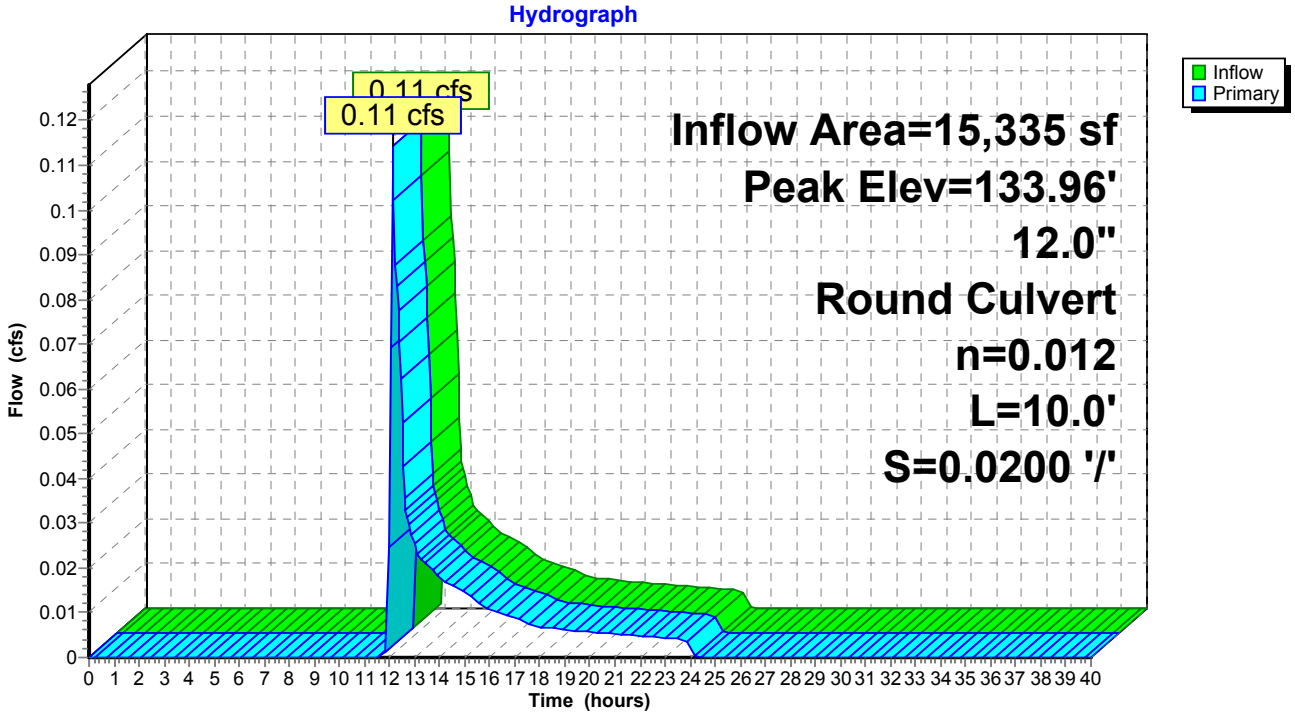
Inflow Area =	15,335 sf, 39.20% Impervious, Inflow Depth = 0.44" for 2 yr event				
Inflow =	0.11 cfs @	12.12 hrs,	Volume=	561 cf	
Outflow =	0.11 cfs @	12.12 hrs,	Volume=	561 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.11 cfs @	12.12 hrs,	Volume=	561 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 133.96' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.80' / 133.60' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.12 hrs HW=133.96' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.11 cfs @ 1.36 fps)

Pond 8: CB8



Summary for Pond 8P: MC-3500 1R2C

Inflow Area = 2,092 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 500 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 500 cf, Atten= 77%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 500 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.20' @ 12.48 hrs Surf.Area= 169 sf Storage= 107 cf

Plug-Flow detention time= 16.7 min calculated for 500 cf (100% of inflow)
Center-of-Mass det. time= 16.7 min (773.8 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 8P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

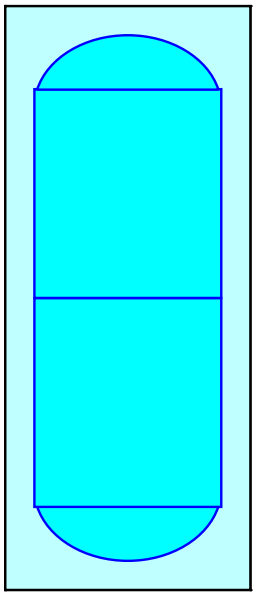
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

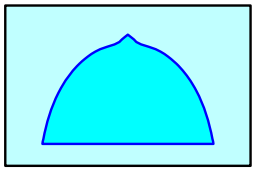
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

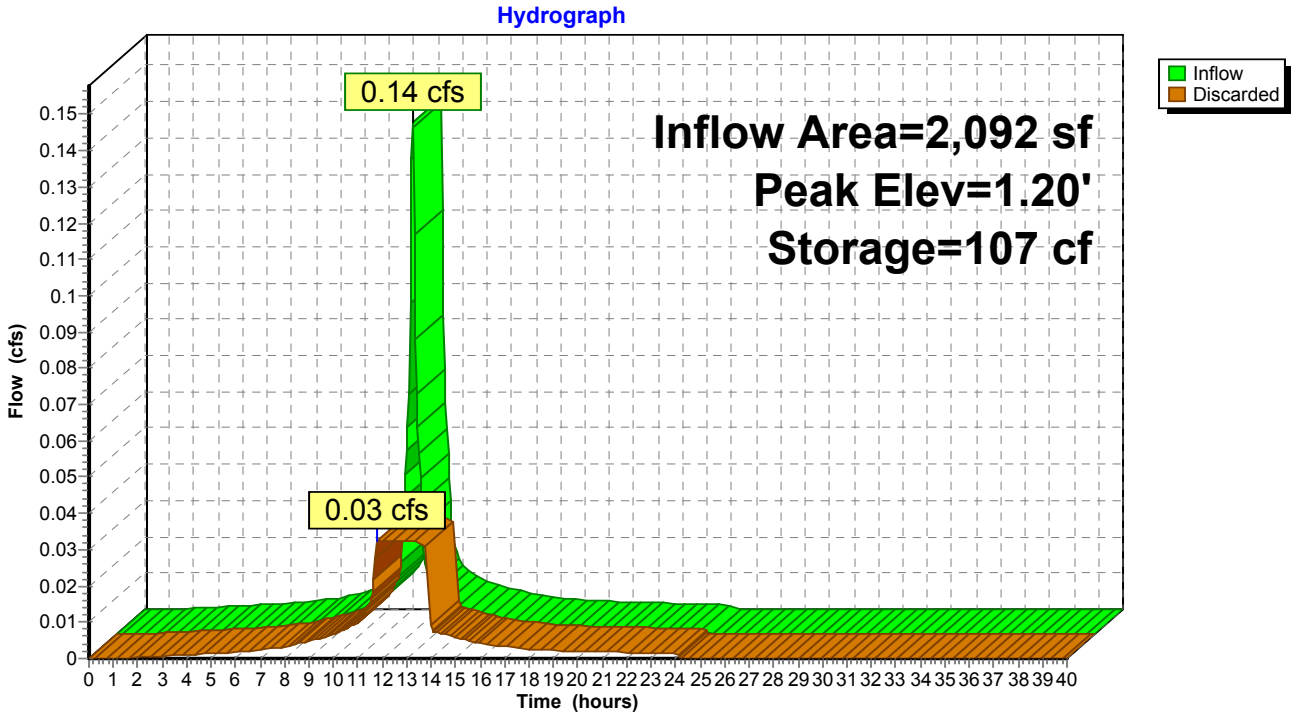
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 8P: MC-3500 1R2C



Summary for Pond 9a: CB8

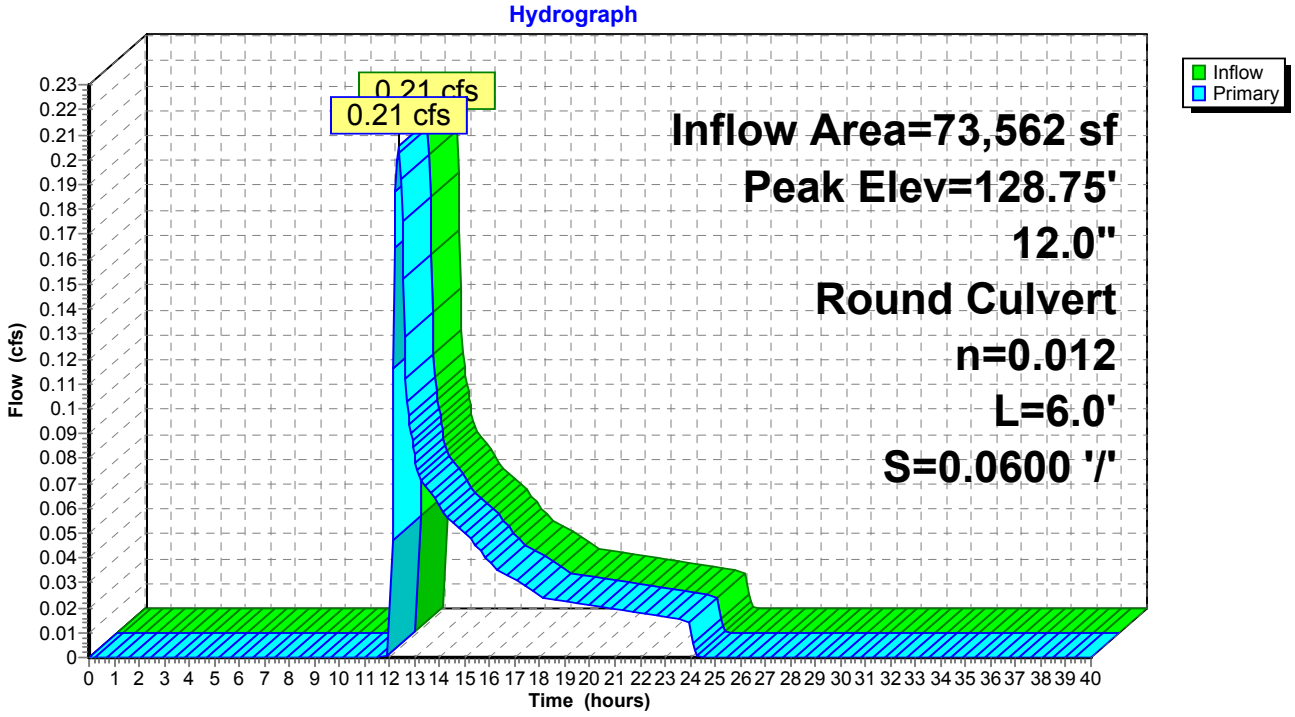
Inflow Area = 73,562 sf, 30.35% Impervious, Inflow Depth = 0.28" for 2 yr event
Inflow = 0.21 cfs @ 12.36 hrs, Volume= 1,699 cf
Outflow = 0.21 cfs @ 12.36 hrs, Volume= 1,699 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.36 hrs, Volume= 1,699 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.75' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.53'	**12.0" Round Culvert** L= 6.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.53' / 128.17' S= 0.0600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.36 hrs HW=128.75' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.20 cfs @ 1.60 fps)

Pond 9a: CB8



Summary for Pond 9P: MC-3500 1R2C

Inflow Area = 1,996 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 477 cf
Outflow = 0.03 cfs @ 11.80 hrs, Volume= 477 cf, Atten= 76%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.80 hrs, Volume= 477 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.13' @ 12.47 hrs Surf.Area= 169 sf Storage= 98 cf

Plug-Flow detention time= 15.2 min calculated for 477 cf (100% of inflow)
Center-of-Mass det. time= 15.2 min (772.2 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 9P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

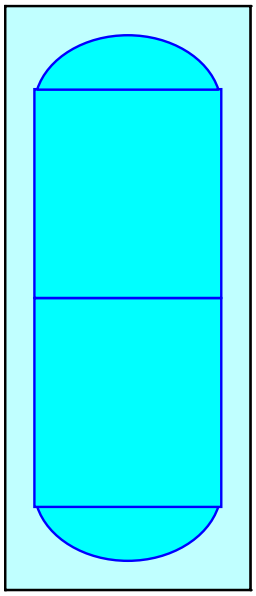
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

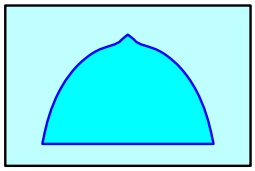
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

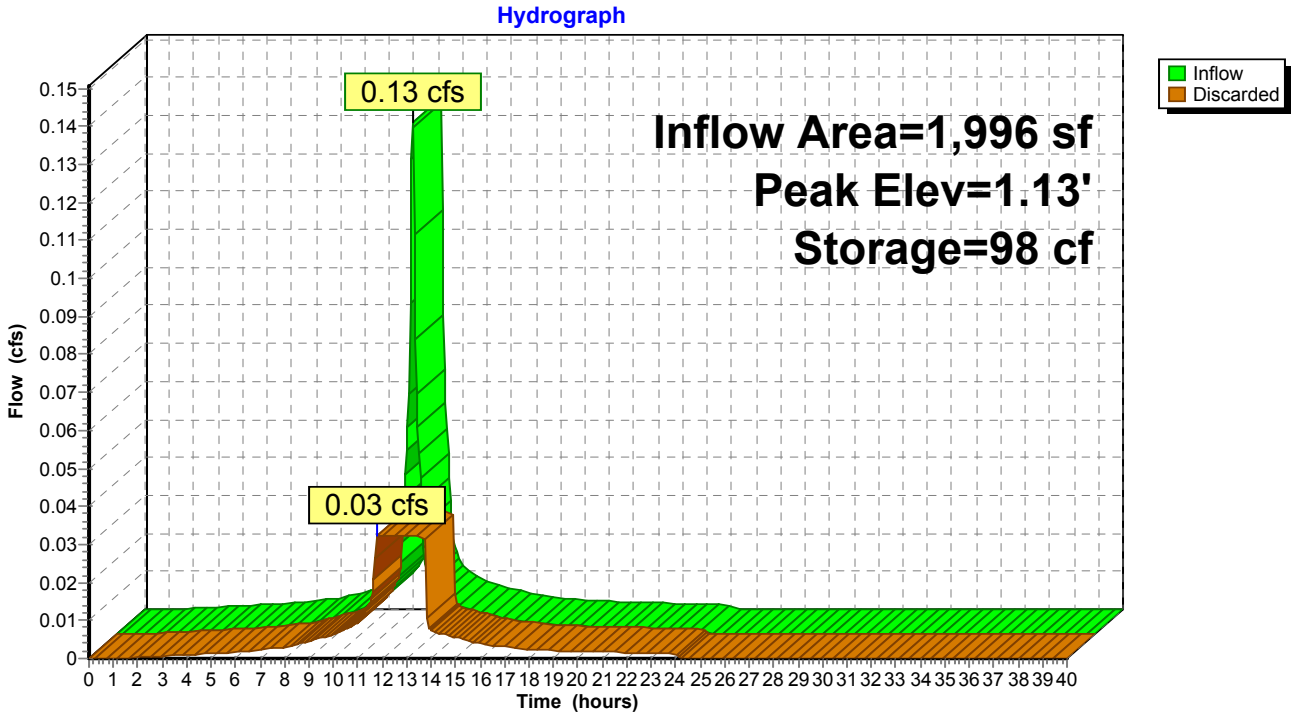
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 9P: MC-3500 1R2C



Summary for Pond 10P: MC-3500 1R2C

Inflow Area = 2,512 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 600 cf
Outflow = 0.03 cfs @ 11.70 hrs, Volume= 600 cf, Atten= 81%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.70 hrs, Volume= 600 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.53' @ 12.52 hrs Surf.Area= 169 sf Storage= 147 cf

Plug-Flow detention time= 24.2 min calculated for 600 cf (100% of inflow)
Center-of-Mass det. time= 24.2 min (781.2 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.70 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 10P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

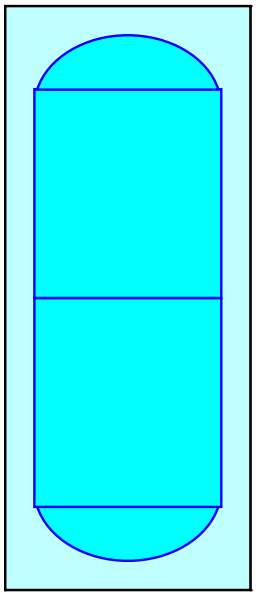
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

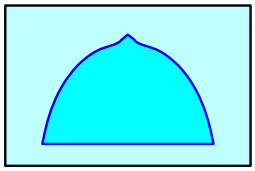
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

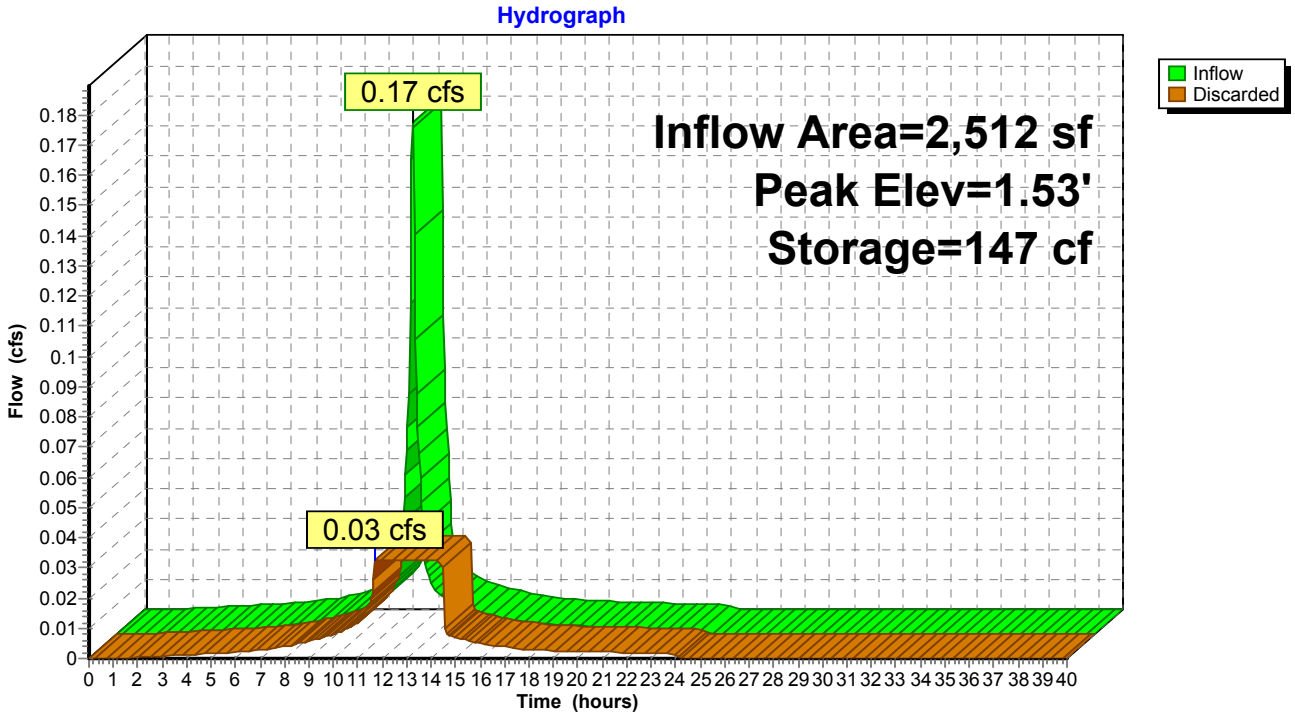
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 10P: MC-3500 1R2C



Summary for Pond 11P: MC-3500 1R2C

Inflow Area = 1,974 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 472 cf
Outflow = 0.03 cfs @ 11.80 hrs, Volume= 472 cf, Atten= 76%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.80 hrs, Volume= 472 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.12' @ 12.47 hrs Surf.Area= 169 sf Storage= 96 cf

Plug-Flow detention time= 14.8 min calculated for 471 cf (100% of inflow)
Center-of-Mass det. time= 14.8 min (771.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 11P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

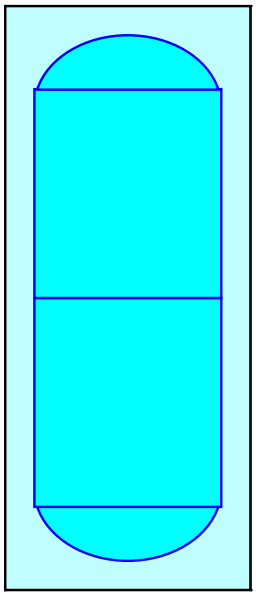
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

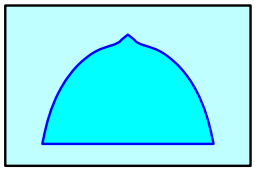
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

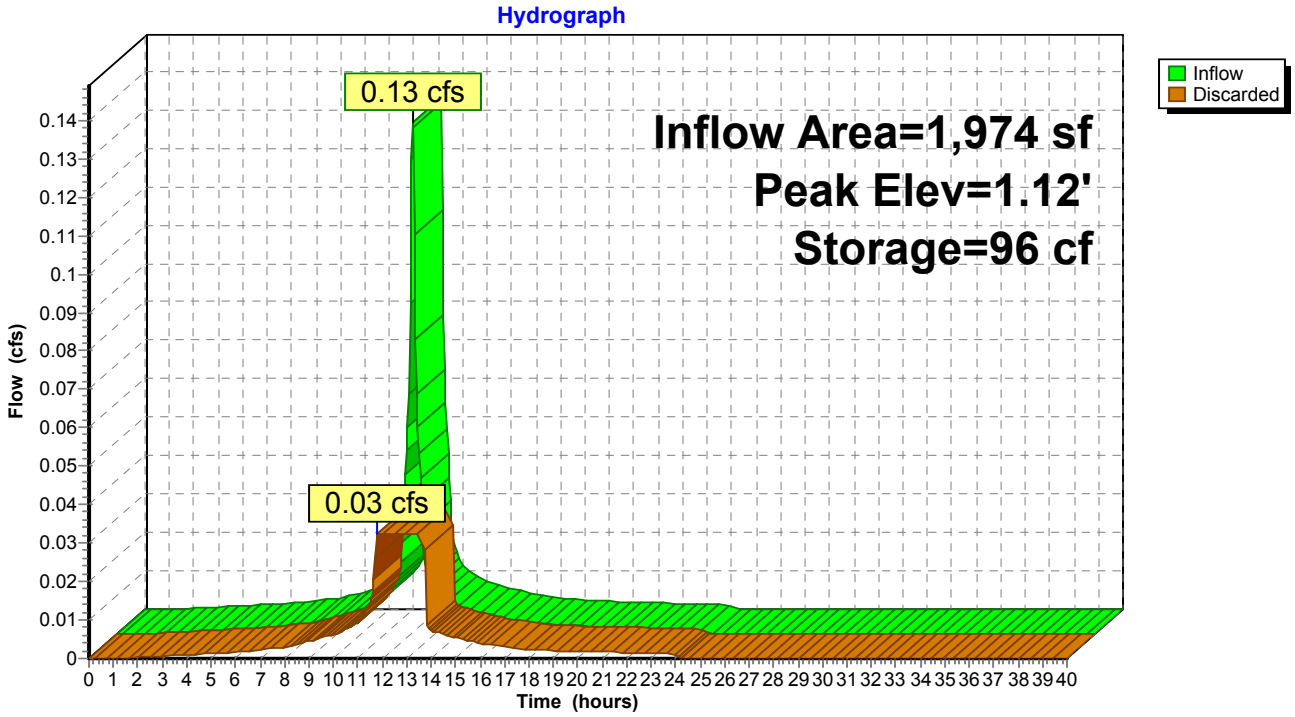
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 11P: MC-3500 1R2C



Summary for Pond 12P: MC-3500 1R2C

Inflow Area = 1,800 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.12 cfs @ 12.09 hrs, Volume= 430 cf
Outflow = 0.03 cfs @ 11.80 hrs, Volume= 430 cf, Atten= 73%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.80 hrs, Volume= 430 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 0.99' @ 12.44 hrs Surf.Area= 169 sf Storage= 81 cf

Plug-Flow detention time= 12.3 min calculated for 430 cf (100% of inflow)
Center-of-Mass det. time= 12.2 min (769.3 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 12P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

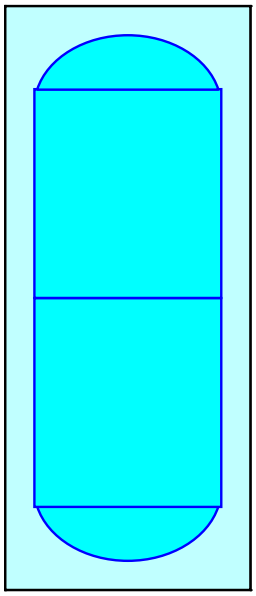
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

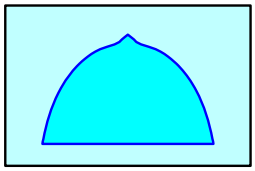
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

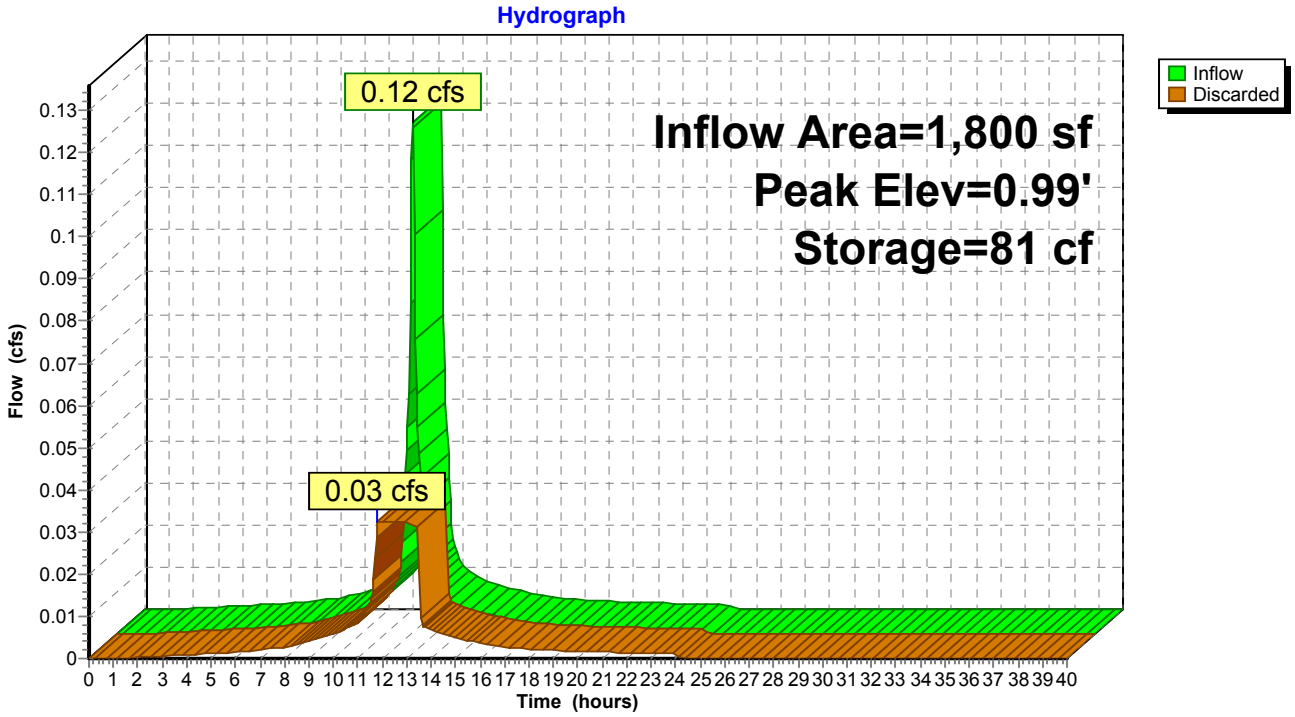
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 12P: MC-3500 1R2C



Summary for Pond 16P: MC-3500 1R2C

Inflow Area = 2,040 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 488 cf
Outflow = 0.03 cfs @ 11.75 hrs, Volume= 488 cf, Atten= 77%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.75 hrs, Volume= 488 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.17' @ 12.48 hrs Surf.Area= 169 sf Storage= 102 cf

Plug-Flow detention time= 15.9 min calculated for 487 cf (100% of inflow)
Center-of-Mass det. time= 15.9 min (772.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 16P: MC-3500 1R2C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

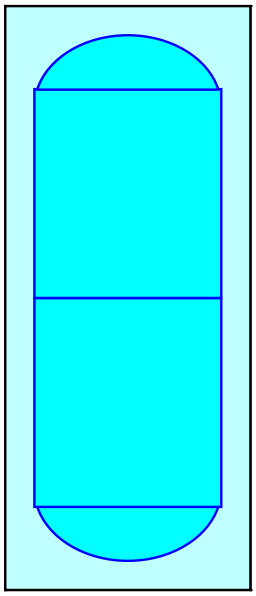
2 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 18.04' Row Length +12.0" End Stone x 2 = 20.04' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

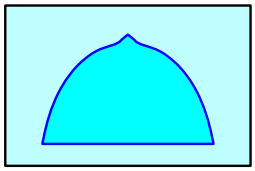
2 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 249.7 cf Chamber Storage

927.7 cf Field - 249.7 cf Chambers = 678.0 cf Stone x 40.0% Voids = 271.2 cf Stone Storage

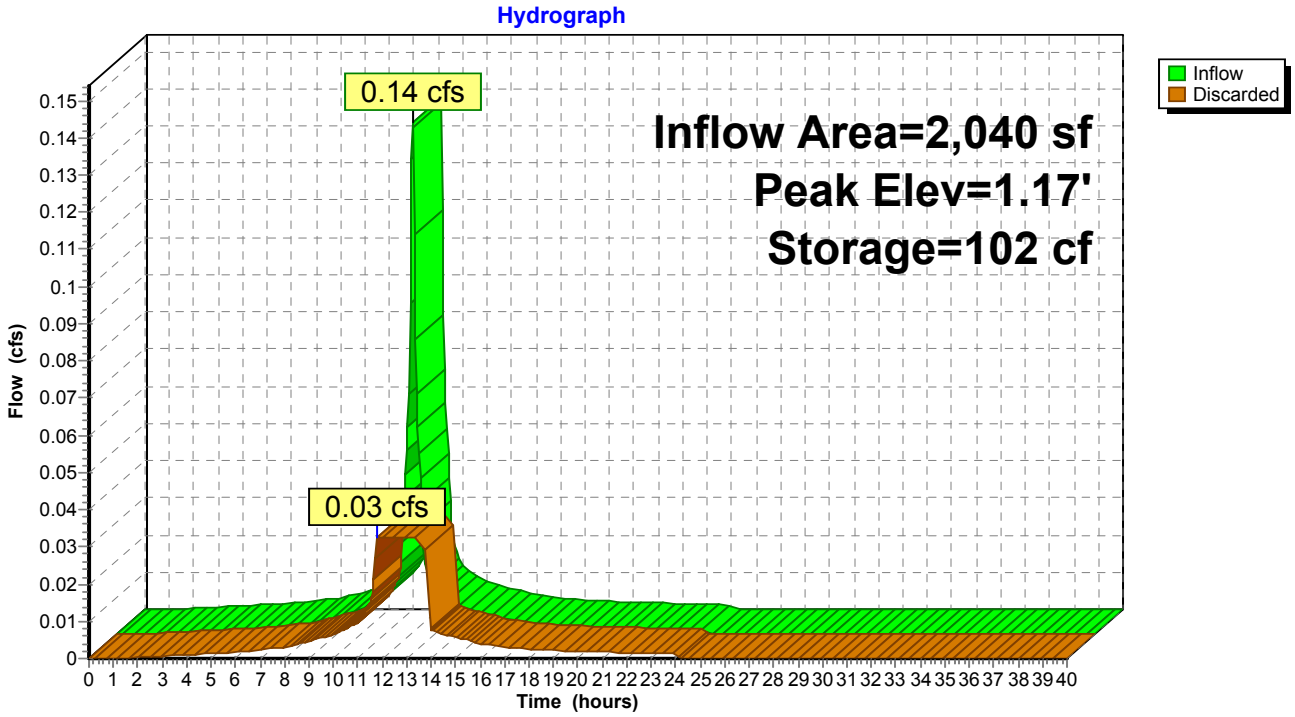
Chamber Storage + Stone Storage = 520.9 cf = 0.012 af
Overall Storage Efficiency = 56.2%
Overall System Size = 20.04' x 8.42' x 5.50'

2 Chambers
34.4 cy Field
25.1 cy Stone





Pond 16P: MC-3500 1R2C



Summary for Pond D1: MC-3500 8R7C

Inflow Area =	47,674 sf, 30.87% Impervious, Inflow Depth = 0.52" for 2 yr event				
Inflow =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf	
Outflow =	0.49 cfs @	12.14 hrs,	Volume=	2,061 cf,	Atten= 7%, Lag= 2.2 min
Discarded =	0.49 cfs @	12.14 hrs,	Volume=	2,061 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.79' @ 12.14 hrs Surf.Area= 3,176 sf Storage= 56 cf

Plug-Flow detention time= 1.9 min calculated for 2,059 cf (100% of inflow)
Center-of-Mass det. time= 1.9 min (883.0 - 881.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.75'	4,430 cf	**56.83'W x 55.89'L x 5.50'H Field A** 17,470 cf Overall - 6,396 cf Embedded = 11,075 cf x 40.0% Voids
#2A	127.50'	6,396 cf	**ADS_StormTech MC-3500 d +Cap** x 56 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 56 Chambers in 8 Rows Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf
		10,826 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	128.50'	**12.0" Round RCP_Round 12"** L= 96.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 128.50' / 126.50' S= 0.0208 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.61 cfs @ 12.14 hrs HW=126.79' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.75' (Free Discharge)
└─**2=RCP_Round 12"** (Controls 0.00 cfs)

Pond D1: MC-3500 8R7C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf

77.0" Wide + 6.0" Spacing = 83.0" C-C Row Spacing

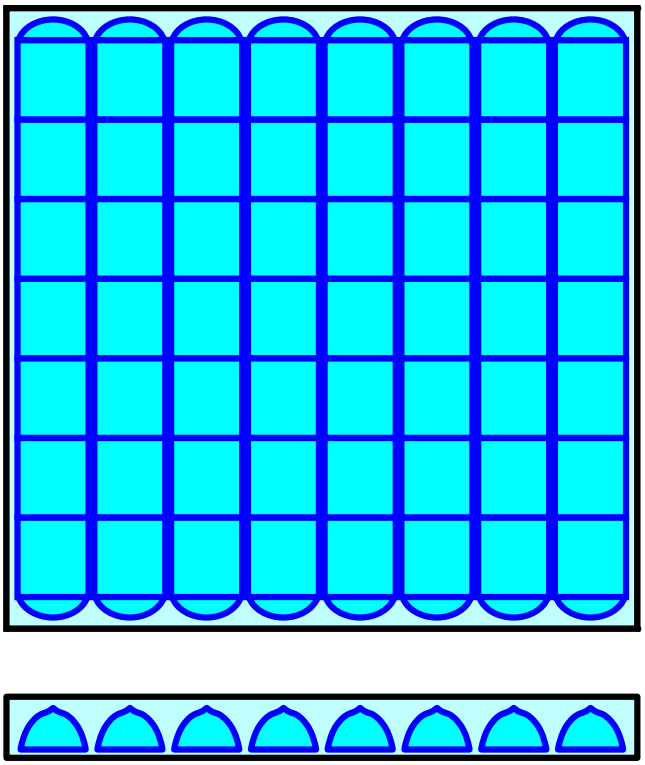
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length
8 Rows x 77.0" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 56.83' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

56 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 8 Rows = 6,395.7 cf Chamber Storage

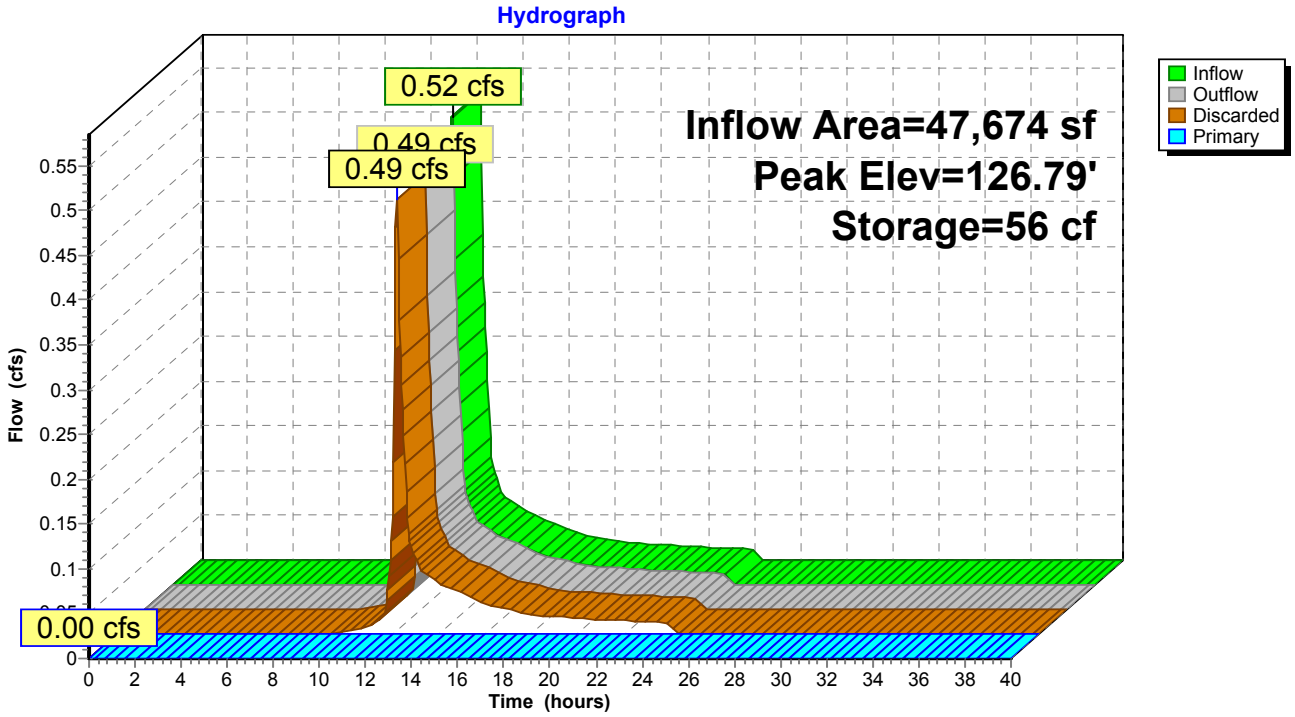
17,470.3 cf Field - 6,395.7 cf Chambers = 11,074.6 cf Stone x 40.0% Voids = 4,429.8 cf Stone Storage

Chamber Storage + Stone Storage = 10,825.5 cf = 0.249 af
Overall Storage Efficiency = 62.0%
Overall System Size = 55.89' x 56.83' x 5.50'

56 Chambers
647.0 cy Field
410.2 cy Stone



Pond D1: MC-3500 8R7C



Summary for Pond D2: MC-3500 8R7C

Inflow Area =	92,369 sf, 33.56% Impervious, Inflow Depth = 0.36" for 2 yr event				
Inflow =	0.35 cfs @	12.20 hrs,	Volume=	2,744 cf	
Outflow =	0.35 cfs @	12.27 hrs,	Volume=	2,744 cf,	Atten= 0%, Lag= 4.4 min
Discarded =	0.35 cfs @	12.27 hrs,	Volume=	2,744 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.78' @ 12.27 hrs Surf.Area= 3,176 sf Storage= 41 cf

Plug-Flow detention time= 1.9 min calculated for 2,741 cf (100% of inflow)
Center-of-Mass det. time= 1.9 min (922.1 - 920.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.75'	4,430 cf	**56.83'W x 55.89'L x 5.50'H Field A** 17,470 cf Overall - 6,396 cf Embedded = 11,075 cf x 40.0% Voids
#2A	127.50'	6,396 cf	**ADS_StormTech MC-3500 d +Cap** x 56 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 56 Chambers in 8 Rows Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf
		10,826 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	128.75'	**12.0" Round RCP_Round 12"** L= 84.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 128.75' / 125.60' S= 0.0375 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.61 cfs @ 12.27 hrs HW=126.78' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.75' (Free Discharge)
└─**2=RCP_Round 12"** (Controls 0.00 cfs)

Pond D2: MC-3500 8R7C - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf

77.0" Wide + 6.0" Spacing = 83.0" C-C Row Spacing

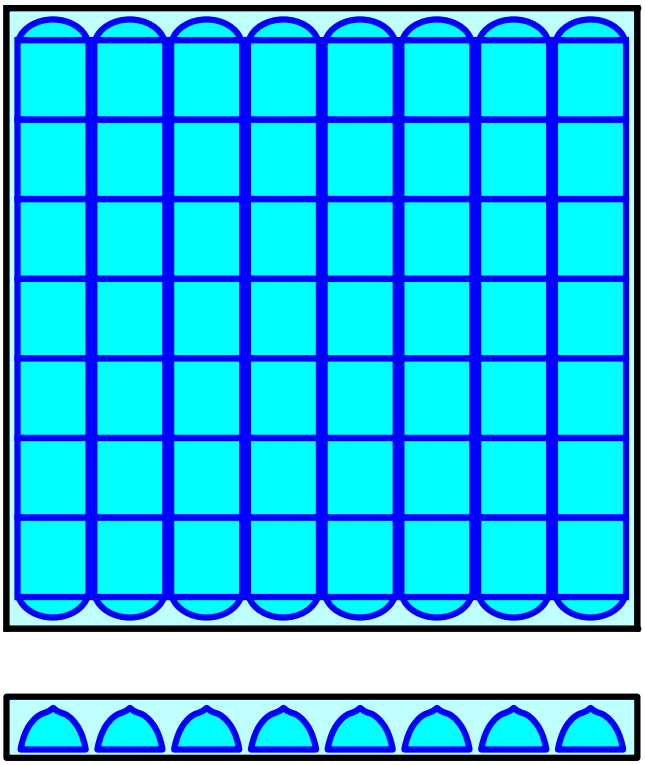
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length
8 Rows x 77.0" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 56.83' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

56 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 8 Rows = 6,395.7 cf Chamber Storage

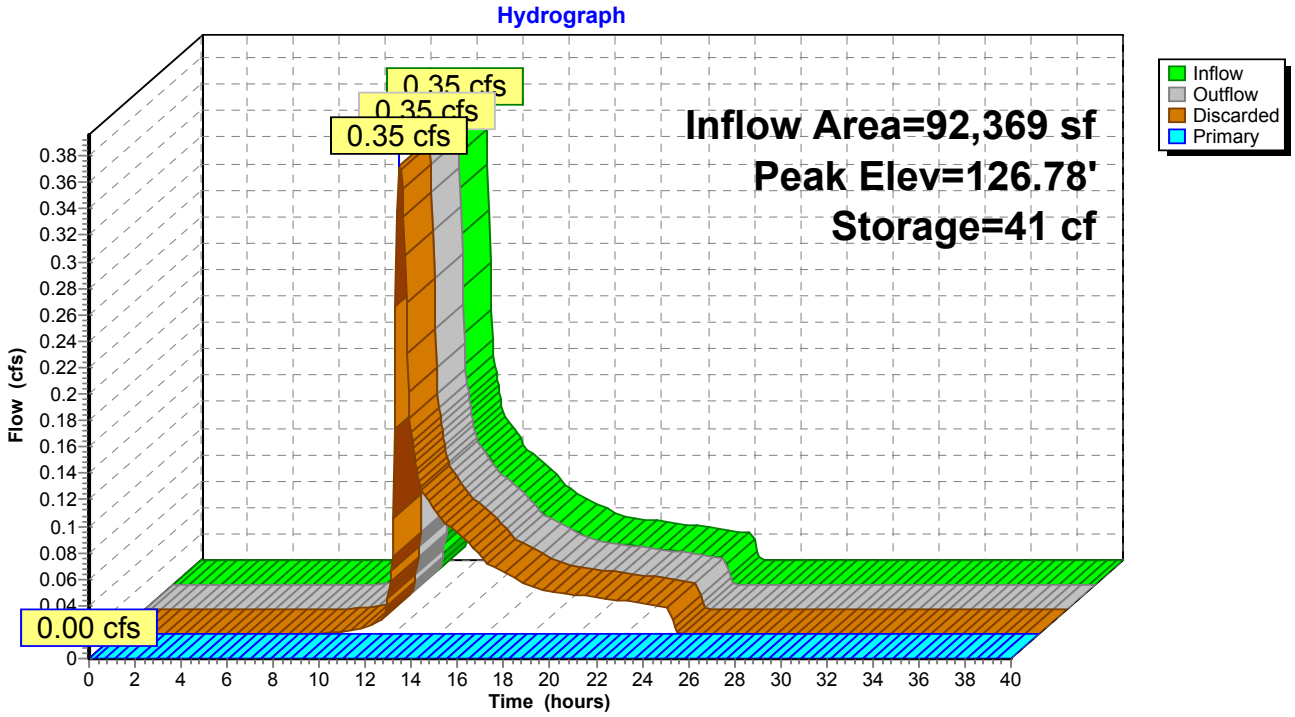
17,470.3 cf Field - 6,395.7 cf Chambers = 11,074.6 cf Stone x 40.0% Voids = 4,429.8 cf Stone Storage

Chamber Storage + Stone Storage = 10,825.5 cf = 0.249 af
Overall Storage Efficiency = 62.0%
Overall System Size = 55.89' x 56.83' x 5.50'

56 Chambers
647.0 cy Field
410.2 cy Stone



Pond D2: MC-3500 8R7C



Summary for Pond DP: MC-3500 1R3C N

Inflow Area = 3,048 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 728 cf
Outflow = 0.04 cfs @ 11.70 hrs, Volume= 728 cf, Atten= 82%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.70 hrs, Volume= 728 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.54' @ 12.54 hrs Surf.Area= 195 sf Storage= 184 cf

Plug-Flow detention time= 26.6 min calculated for 728 cf (100% of inflow)
Center-of-Mass det. time= 26.6 min (783.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	285 cf	**6.92'W x 28.21'L x 5.50'H Field A** 1,073 cf Overall - 360 cf Embedded = 713 cf x 40.0% Voids
#2A	0.75'	360 cf	**ADS_StormTech MC-3500 d +Cap** x 3 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		645 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Pond DP: MC-3500 1R3C N - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

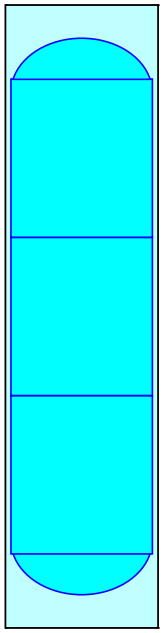
3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +18.0" End Stone x 2 = 28.21' Base Length
1 Rows x 77.0" Wide + 3.0" Side Stone x 2 = 6.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

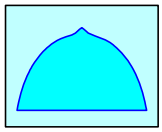
3 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 359.7 cf Chamber Storage

1,073.2 cf Field - 359.7 cf Chambers = 713.5 cf Stone x 40.0% Voids = 285.4 cf Stone Storage

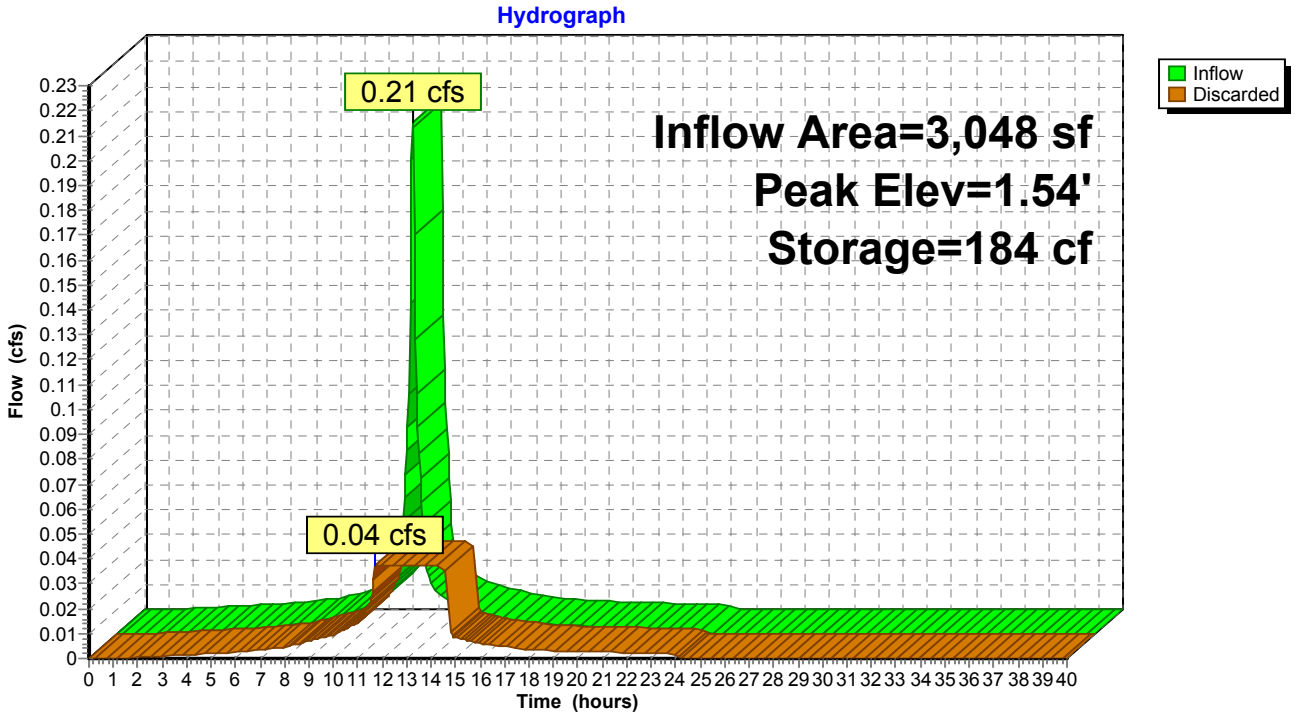
Chamber Storage + Stone Storage = 645.1 cf = 0.015 af
Overall Storage Efficiency = 60.1%
Overall System Size = 28.21' x 6.92' x 5.50'

3 Chambers
39.7 cy Field
26.4 cy Stone





Pond DP: MC-3500 1R3C N



Summary for Pond EP: MC-3500 1R4C N

Inflow Area = 2,864 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 684 cf
Outflow = 0.05 cfs @ 11.80 hrs, Volume= 684 cf, Atten= 76%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.80 hrs, Volume= 684 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.07' @ 12.47 hrs Surf.Area= 245 sf Storage= 140 cf

Plug-Flow detention time= 14.8 min calculated for 684 cf (100% of inflow)
Center-of-Mass det. time= 14.8 min (771.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.80 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond EP: MC-3500 1R4C N - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

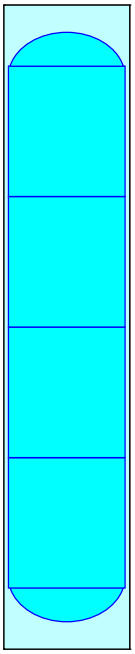
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +18.0" End Stone x 2 = 35.38' Base Length
1 Rows x 77.0" Wide + 3.0" Side Stone x 2 = 6.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

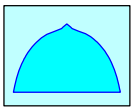
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,345.9 cf Field - 469.6 cf Chambers = 876.3 cf Stone x 40.0% Voids = 350.5 cf Stone Storage

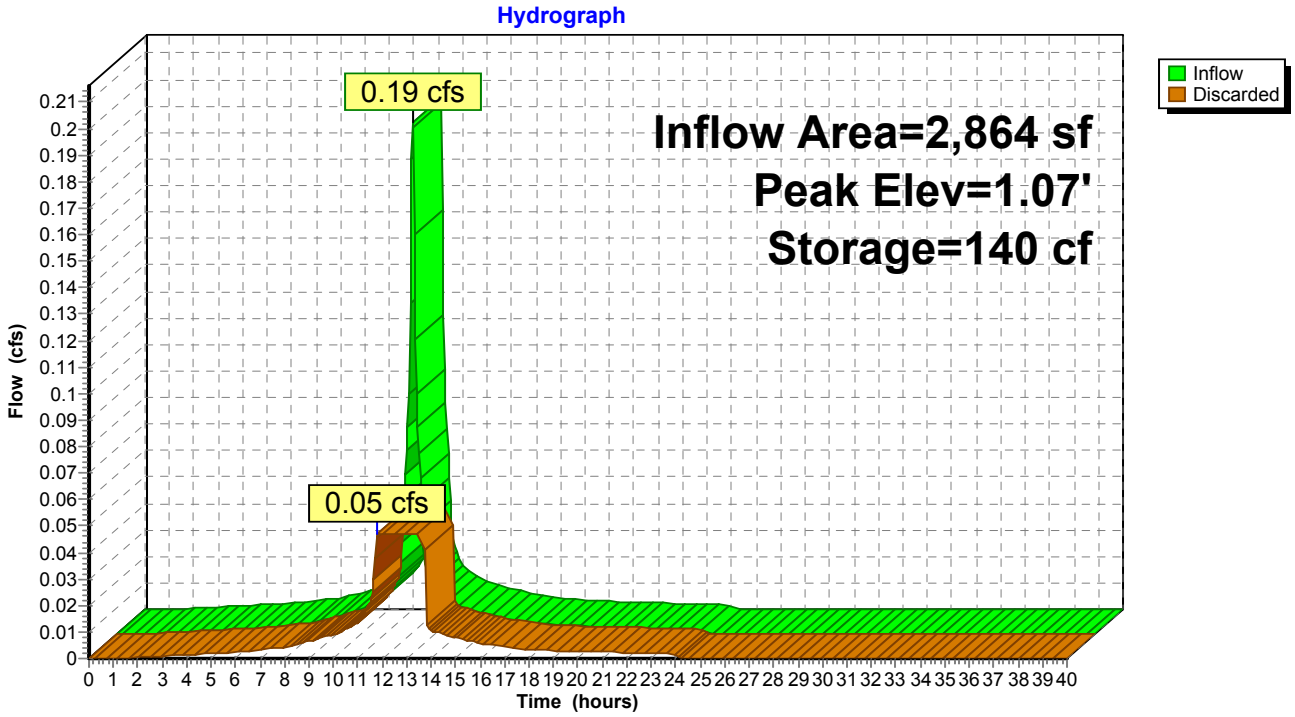
Chamber Storage + Stone Storage = 820.1 cf = 0.019 af
Overall Storage Efficiency = 60.9%
Overall System Size = 35.38' x 6.92' x 5.50'

4 Chambers
49.8 cy Field
32.5 cy Stone





Pond EP: MC-3500 1R4C N



Summary for Pond FB1: FOREBAY 1

Inflow Area = 7,767 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.50' @ 0.00 hrs Surf.Area= 1,370 sf Storage= 0 cf

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

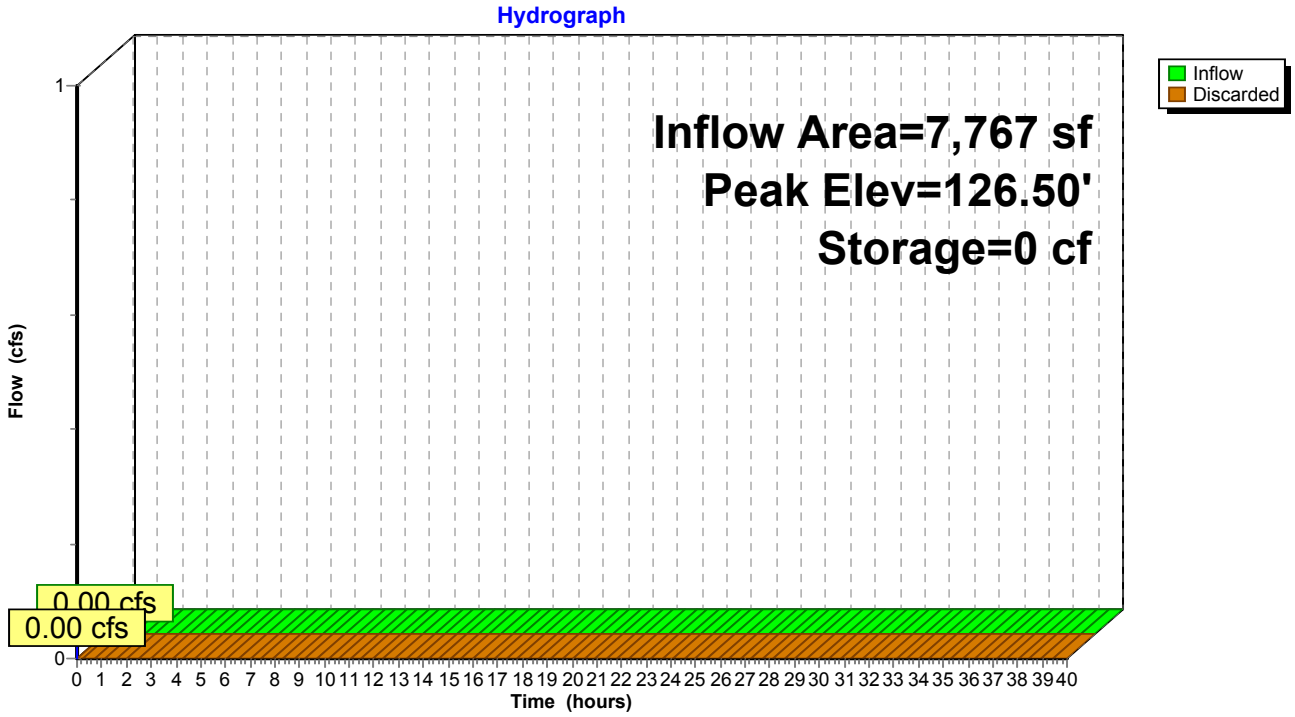
Volume	Invert	Avail.Storage	Storage Description
#1	126.50'	9,136 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
126.50	1,370	0	0
127.00	1,876	812	812
128.00	2,444	2,160	2,972
129.00	3,068	2,756	5,728
130.00	3,748	3,408	9,136

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.50' (Free Discharge)
└─**1=Exfiltration** (Passes 0.00 cfs of 0.26 cfs potential flow)

Pond FB1: FOREBAY 1



Summary for Pond FB2: FOREBAY 2

Inflow Area = 4,609 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.75' @ 0.00 hrs Surf.Area= 738 sf Storage= 0 cf

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

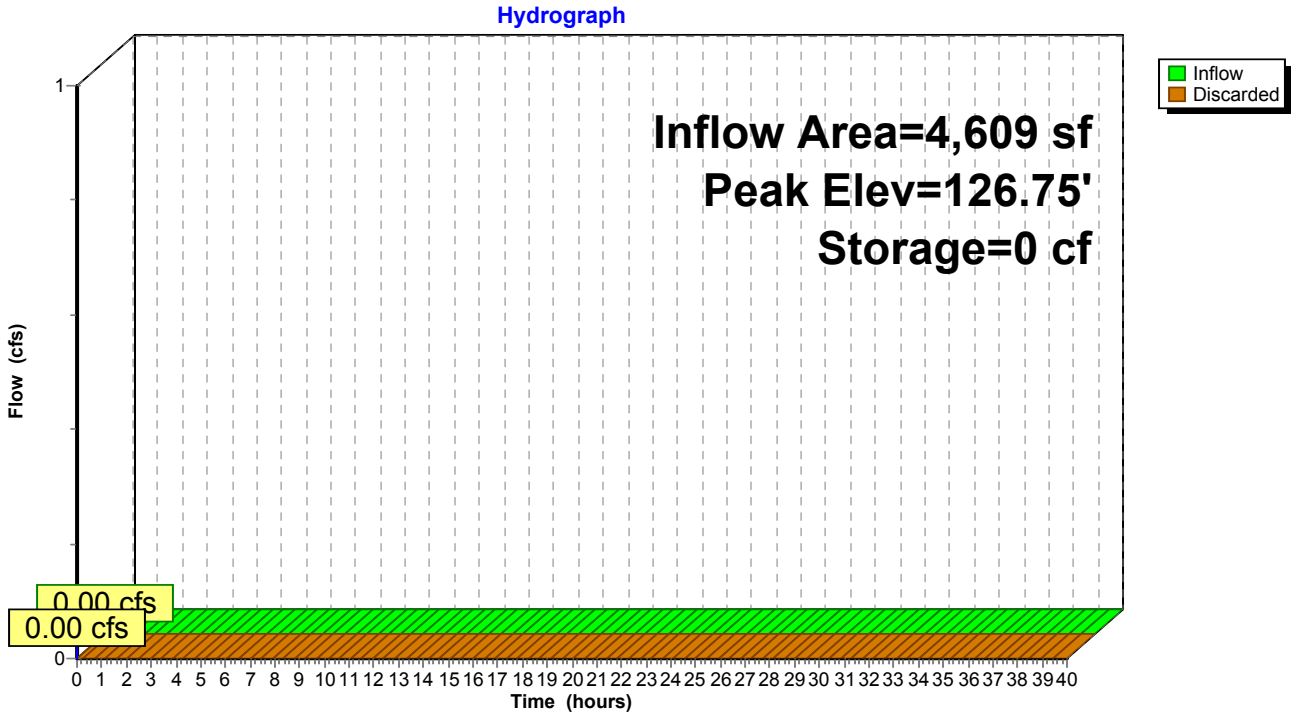
Volume	Invert	Avail.Storage	Storage Description
#1	126.75'	5,254 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
126.75	738	0	0
127.00	886	203	203
128.00	1,444	1,165	1,368
129.00	1,932	1,688	3,056
130.00	2,464	2,198	5,254

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.75' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.14 cfs potential flow)

Pond FB2: FOREBAY 2



Summary for Pond FP: MC-3500 1R4C N

Inflow Area = 3,406 sf,100.00% Impervious, Inflow Depth = 2.87" for 2 yr event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 814 cf
Outflow = 0.05 cfs @ 11.75 hrs, Volume= 814 cf, Atten= 80%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.75 hrs, Volume= 814 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1.32' @ 12.51 hrs Surf.Area= 245 sf Storage= 190 cf

Plug-Flow detention time= 21.1 min calculated for 813 cf (100% of inflow)
Center-of-Mass det. time= 21.1 min (778.2 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.75 hrs HW=0.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond FP: MC-3500 1R4C N - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

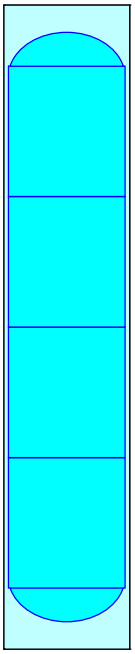
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +18.0" End Stone x 2 = 35.38' Base Length
1 Rows x 77.0" Wide + 3.0" Side Stone x 2 = 6.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

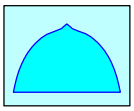
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,345.9 cf Field - 469.6 cf Chambers = 876.3 cf Stone x 40.0% Voids = 350.5 cf Stone Storage

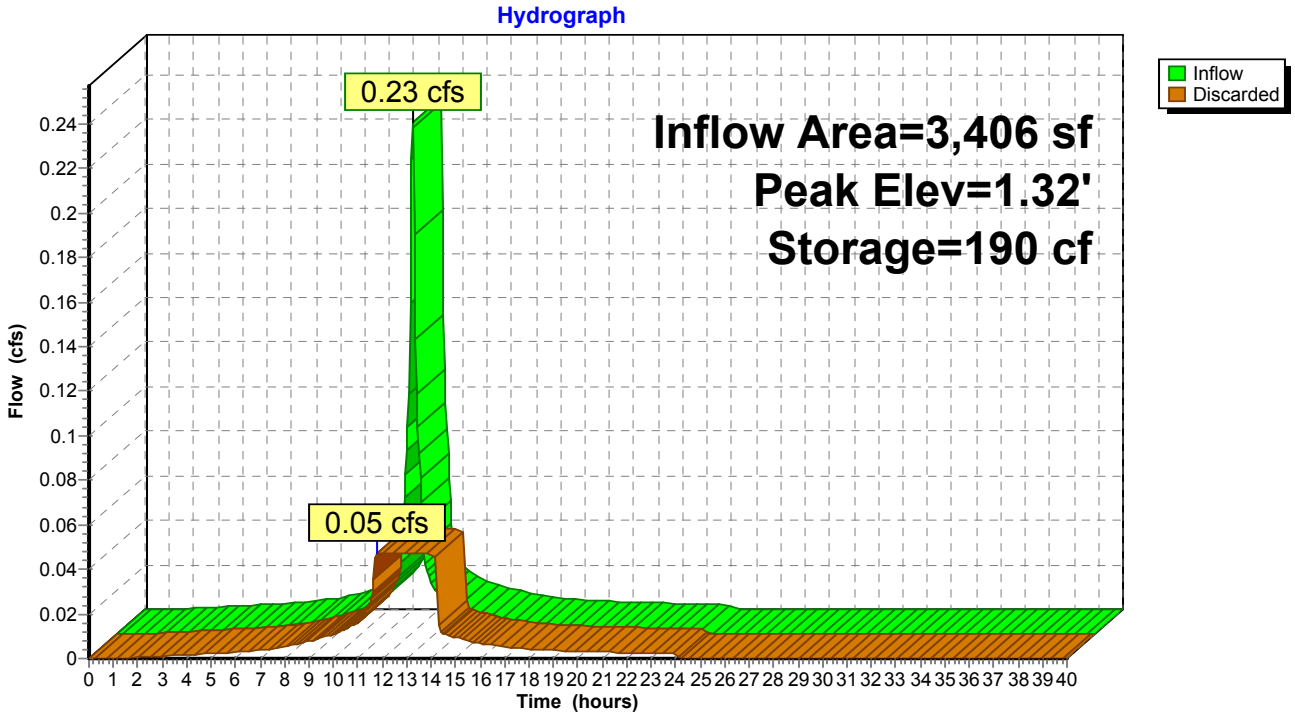
Chamber Storage + Stone Storage = 820.1 cf = 0.019 af
Overall Storage Efficiency = 60.9%
Overall System Size = 35.38' x 6.92' x 5.50'

4 Chambers
49.8 cy Field
32.5 cy Stone





Pond FP: MC-3500 1R4C N



Summary for Pond G1: Lot D1 - R.G.

Inflow Area = 2,490 sf, 21.57% Impervious, Inflow Depth = 0.15" for 2 yr event
Inflow = 0.00 cfs @ 12.43 hrs, Volume= 31 cf
Outflow = 0.00 cfs @ 12.45 hrs, Volume= 31 cf, Atten= 0%, Lag= 1.2 min
Discarded = 0.00 cfs @ 12.45 hrs, Volume= 31 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 152.25' @ 12.45 hrs Surf.Area= 150 sf Storage= 0 cf

Plug-Flow detention time= 1.1 min calculated for 31 cf (100% of inflow)
Center-of-Mass det. time= 1.1 min (995.2 - 994.1)

Volume	Invert	Avail.Storage	Storage Description
#1	152.25'	234 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

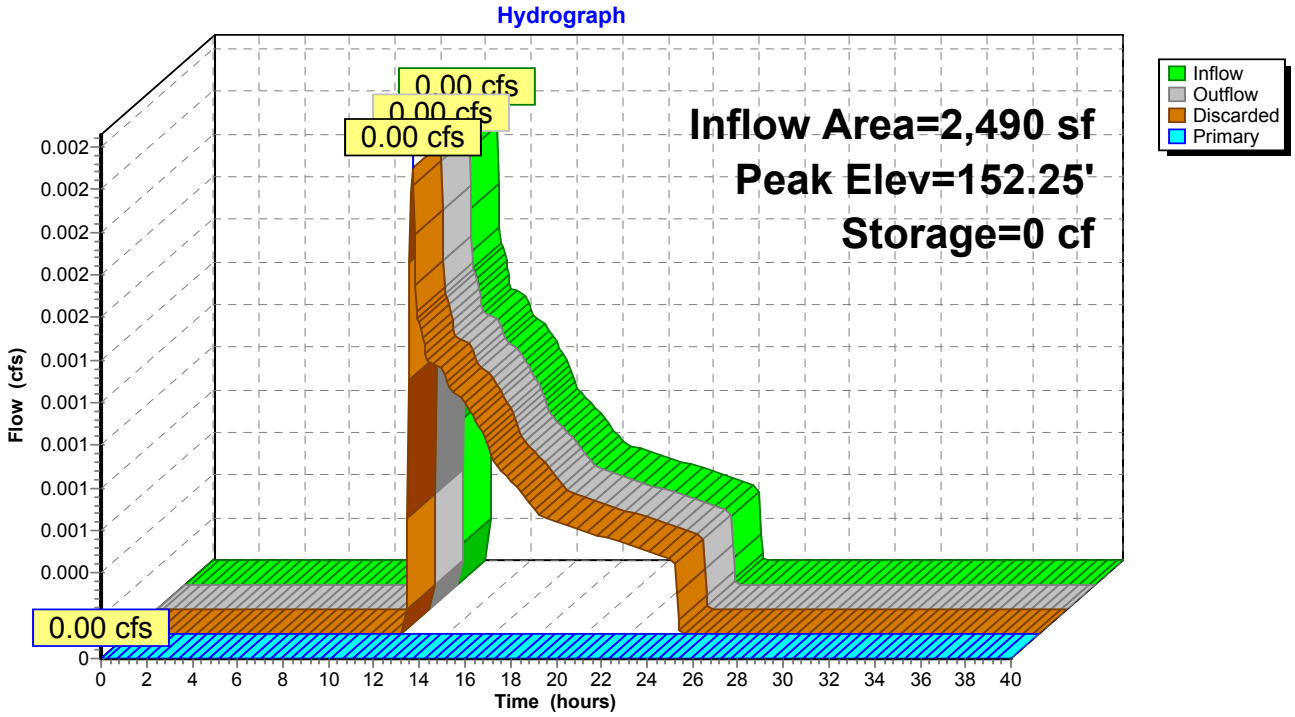
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.25	150	0.0	0	0
155.50	150	30.0	146	146
156.00	200	100.0	88	234

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.03 cfs @ 12.45 hrs HW=152.25' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.25' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond G1: Lot D1 - R.G.



Summary for Pond G2: Lot F - R.G.

Inflow Area = 4,423 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 152.25' @ 0.00 hrs Surf.Area= 300 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	152.25'	468 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

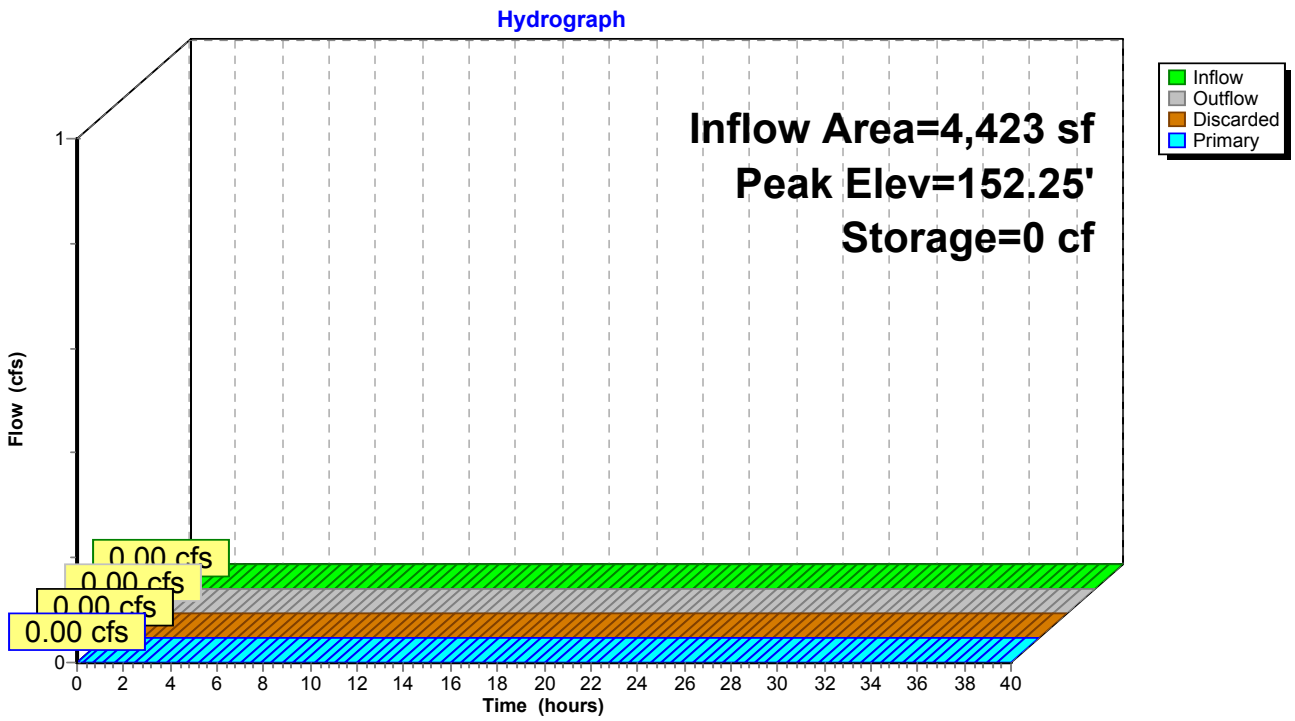
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.25	300	0.0	0	0
155.50	300	30.0	293	293
156.00	400	100.0	175	468

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.25' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.06 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.25' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond G2: Lot F - R.G.



Summary for Pond MH1: MH1

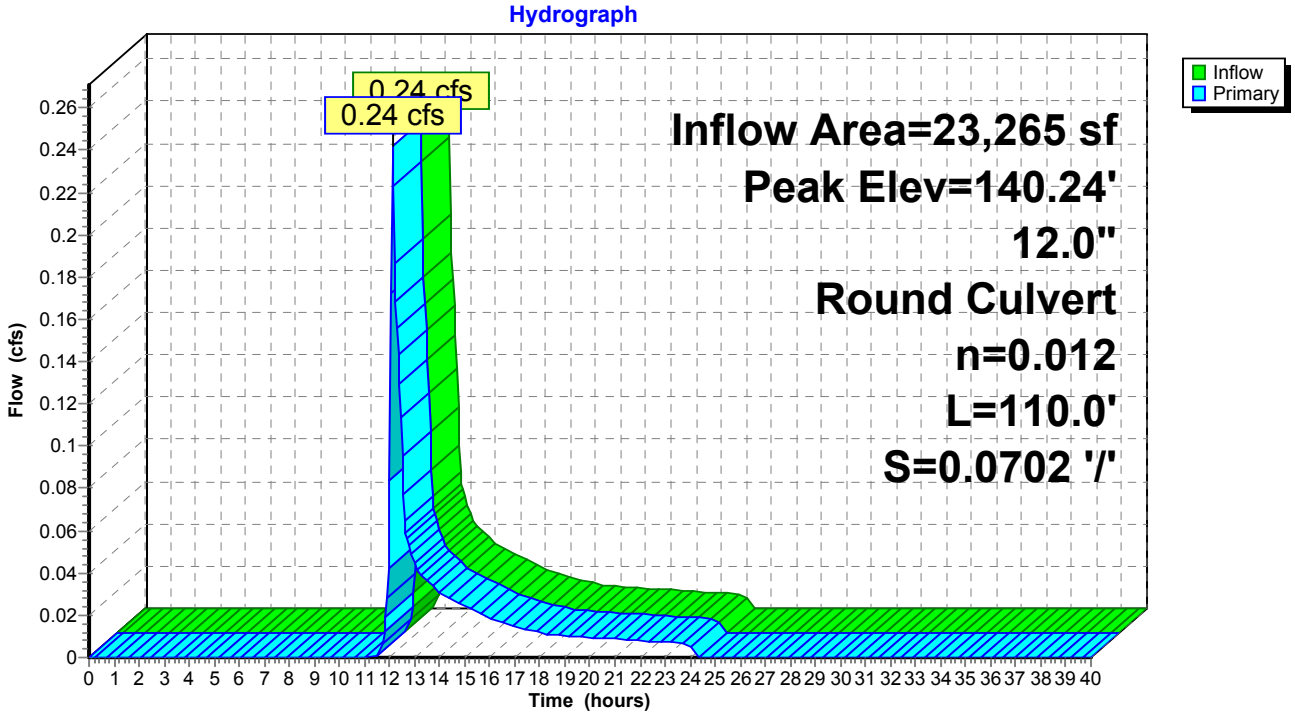
Inflow Area =	23,265 sf, 43.08% Impervious, Inflow Depth = 0.53" for 2 yr event				
Inflow =	0.24 cfs @	12.12 hrs,	Volume=	1,033 cf	
Outflow =	0.24 cfs @	12.12 hrs,	Volume=	1,033 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.24 cfs @	12.12 hrs,	Volume=	1,033 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 140.24' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**12.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 132.28' S= 0.0702 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.12 hrs HW=140.24' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.23 cfs @ 1.65 fps)

Pond MH1: MH1



Summary for Pond MH10: MH10

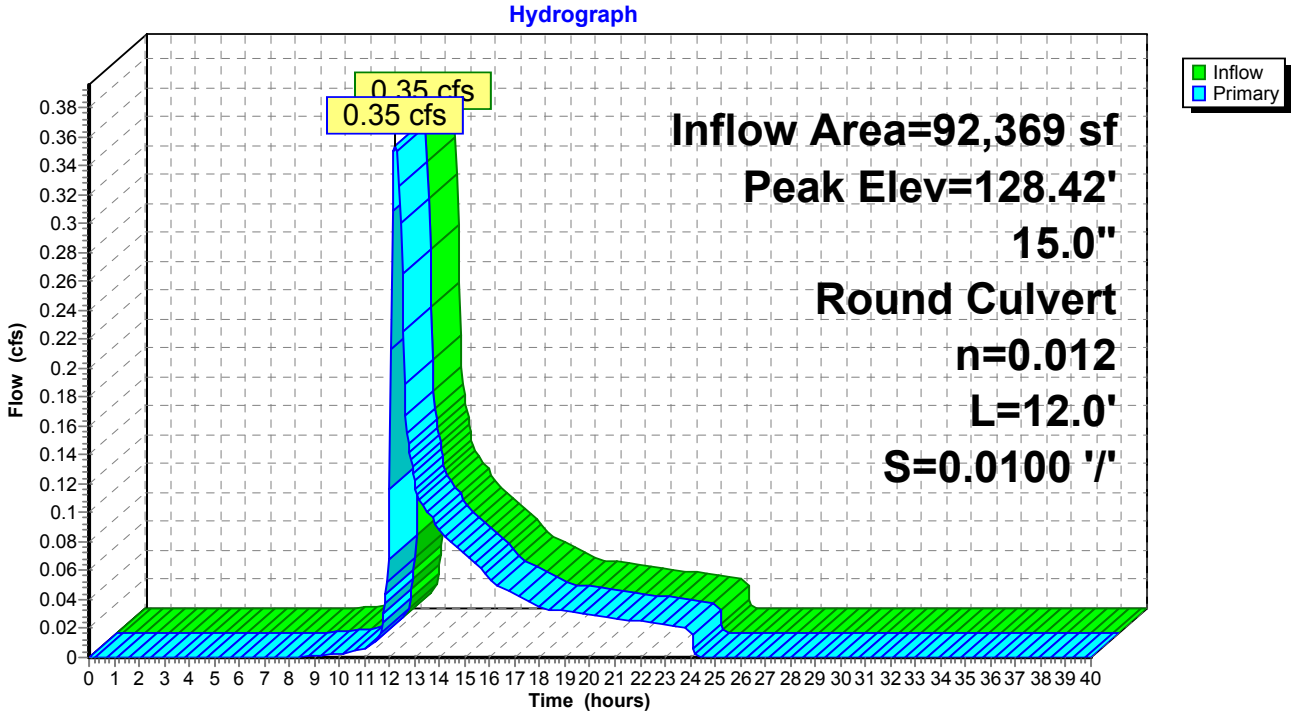
Inflow Area =	92,369 sf, 33.56% Impervious, Inflow Depth = 0.36" for 2 yr event				
Inflow =	0.35 cfs @ 12.20 hrs, Volume=	2,744 cf			
Outflow =	0.35 cfs @ 12.20 hrs, Volume=	2,744 cf, Atten= 0%, Lag= 0.0 min			
Primary =	0.35 cfs @ 12.20 hrs, Volume=	2,744 cf			

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.42' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.12'	**15.0" Round Culvert** L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.12' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.20 hrs HW=128.42' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.35 cfs @ 2.38 fps)

Pond MH10: MH10



Summary for Pond MH11: MH11

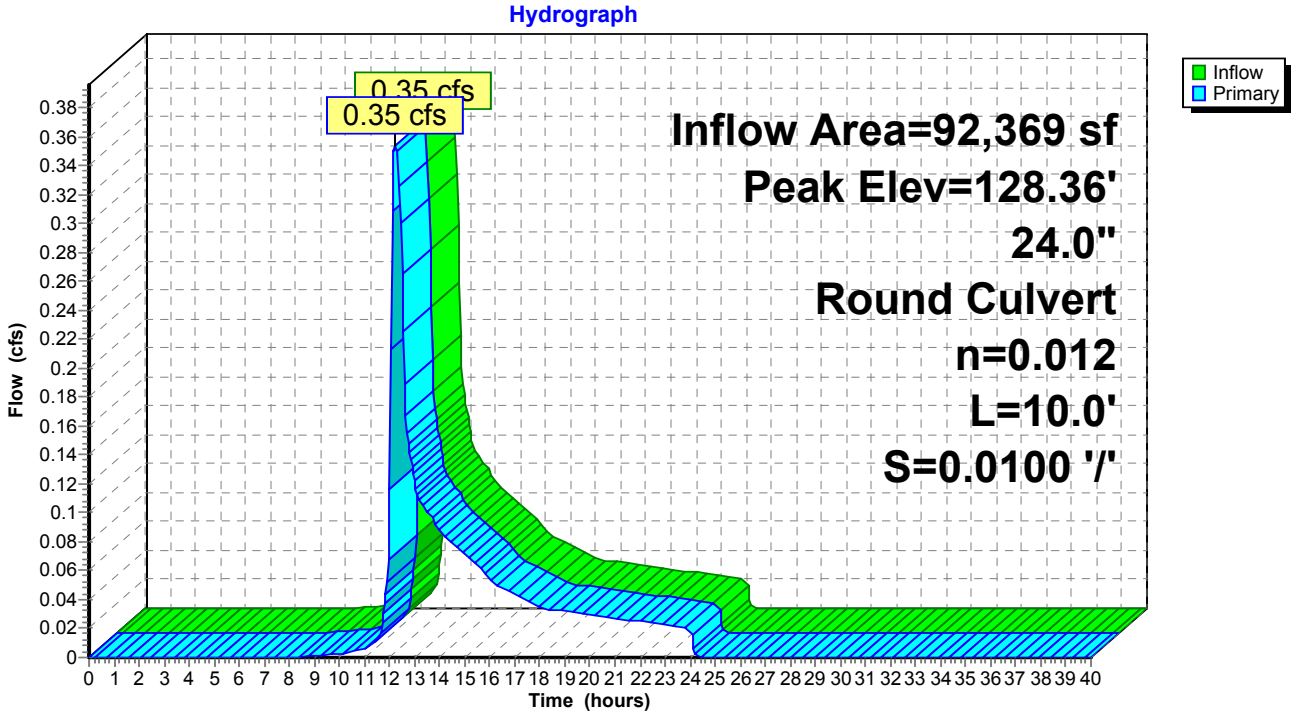
Inflow Area =	92,369 sf, 33.56% Impervious, Inflow Depth = 0.36" for 2 yr event				
Inflow =	0.35 cfs @	12.20 hrs,	Volume=	2,744 cf	
Outflow =	0.35 cfs @	12.20 hrs,	Volume=	2,744 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.35 cfs @	12.20 hrs,	Volume=	2,744 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.36' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.10'	**24.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.10' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=0.35 cfs @ 12.20 hrs HW=128.36' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.35 cfs @ 2.21 fps)

Pond MH11: MH11

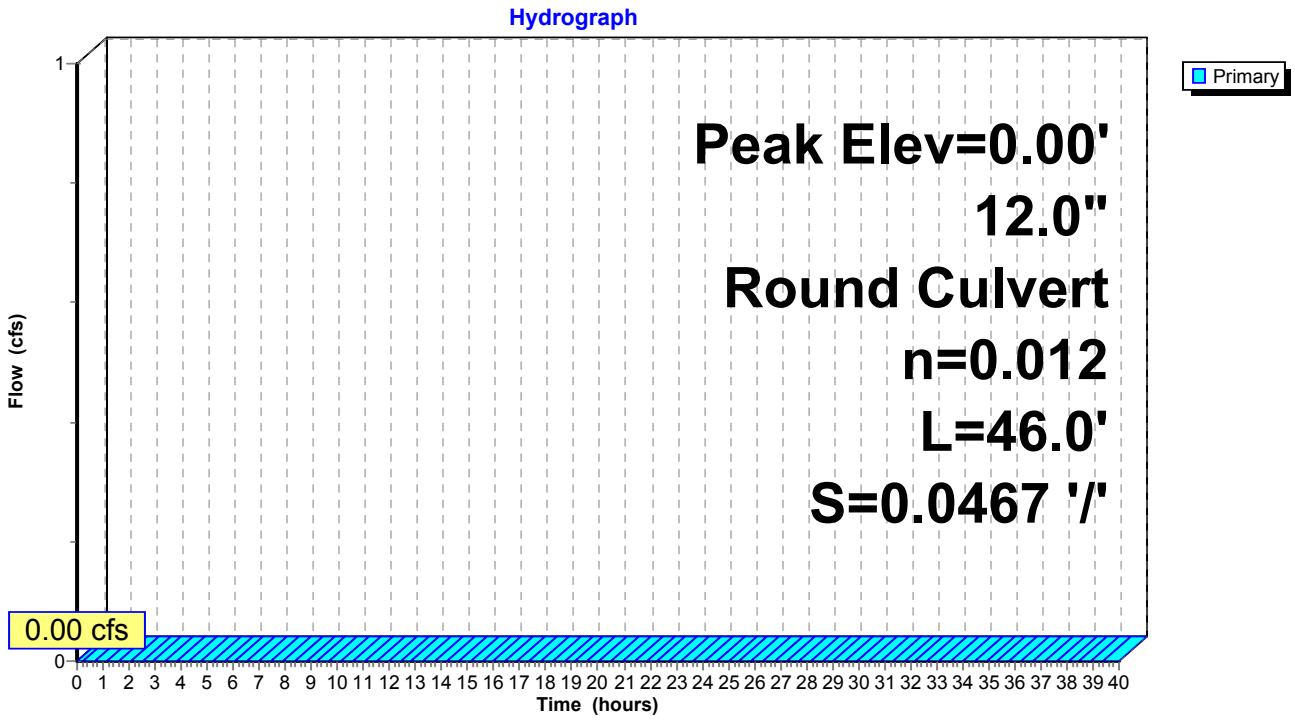


Summary for Pond MH2: MH2

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	**12.0" Round Culvert** L= 46.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 141.75' S= 0.0467 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond MH2: MH2



Summary for Pond MH3: MH3

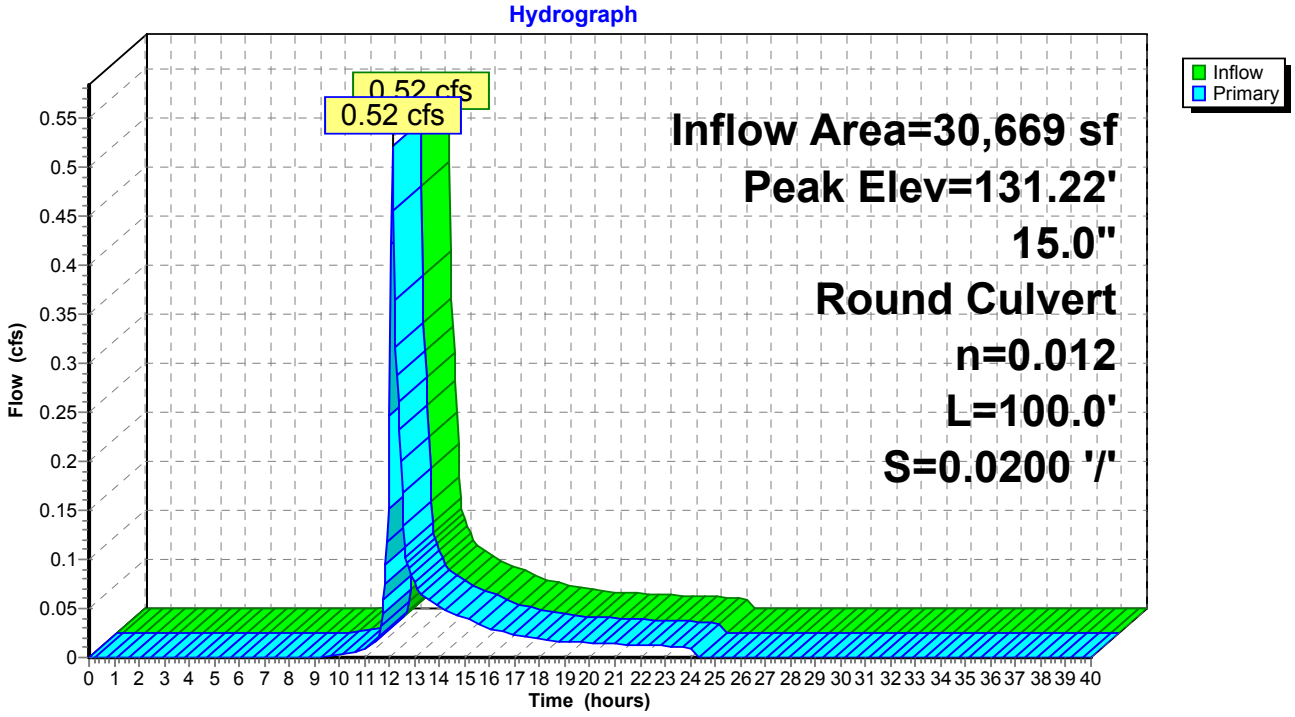
Inflow Area = 30,669 sf, 47.99% Impervious, Inflow Depth = 0.76" for 2 yr event
Inflow = 0.52 cfs @ 12.11 hrs, Volume= 1,932 cf
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 1,932 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.11 hrs, Volume= 1,932 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.22' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	130.88'	**15.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.88' / 128.88' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=0.51 cfs @ 12.11 hrs HW=131.21' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.51 cfs @ 1.96 fps)

Pond MH3: MH3



Summary for Pond MH4: MH4

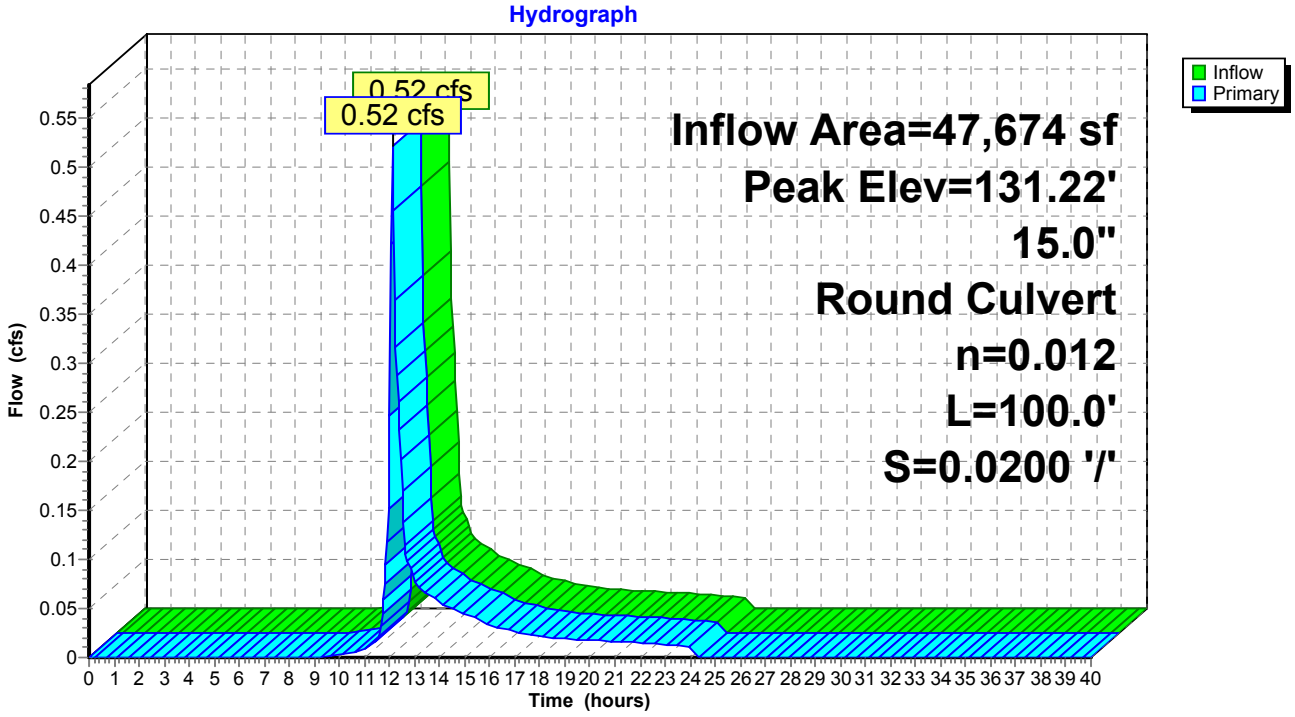
Inflow Area =	47,674 sf, 30.87% Impervious, Inflow Depth = 0.52" for 2 yr event				
Inflow =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf	
Outflow =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.22' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	130.88'	**15.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.88' / 128.88' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=0.51 cfs @ 12.11 hrs HW=131.21' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.51 cfs @ 1.96 fps)

Pond MH4: MH4



Summary for Pond MH5: MH5

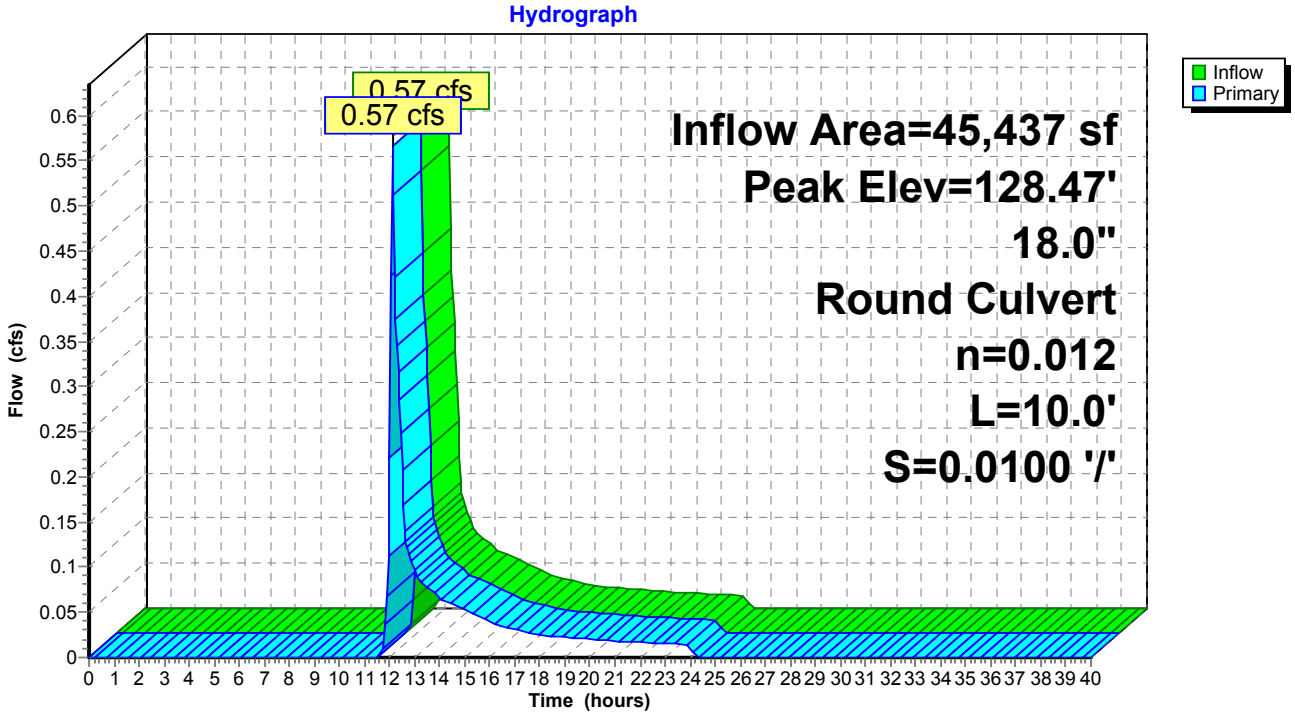
Inflow Area =	45,437 sf, 29.90% Impervious, Inflow Depth = 0.59" for 2 yr event				
Inflow =	0.57 cfs @	12.11 hrs,	Volume=	2,246 cf	
Outflow =	0.57 cfs @	12.11 hrs,	Volume=	2,246 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.57 cfs @	12.11 hrs,	Volume=	2,246 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.47' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.10'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.10' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=0.55 cfs @ 12.11 hrs HW=128.46' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.55 cfs @ 2.50 fps)

Pond MH5: MH5



Summary for Pond MH6: MH6

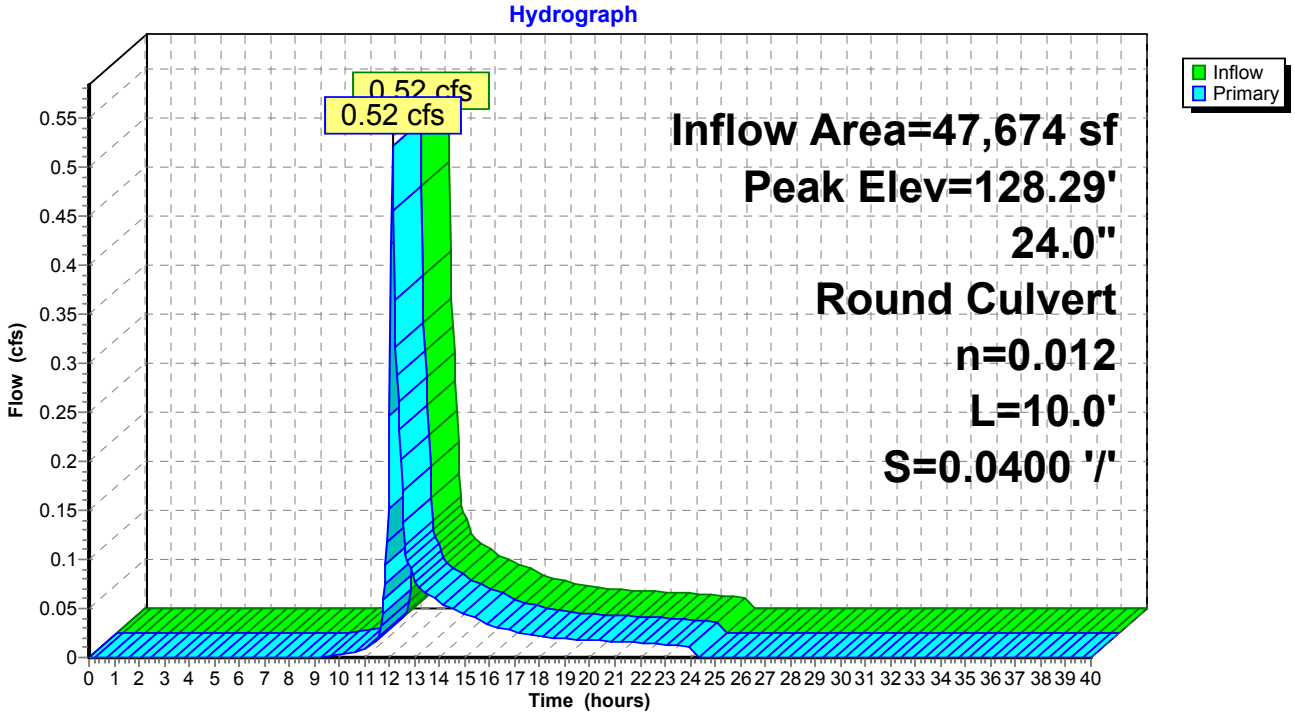
Inflow Area =	47,674 sf, 30.87% Impervious, Inflow Depth = 0.52" for 2 yr event				
Inflow =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf	
Outflow =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.11 hrs,	Volume=	2,061 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.29' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**24.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.60' S= 0.0400 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=0.51 cfs @ 12.11 hrs HW=128.29' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.51 cfs @ 1.83 fps)

Pond MH6: MH6



Summary for Pond MH7: MH7

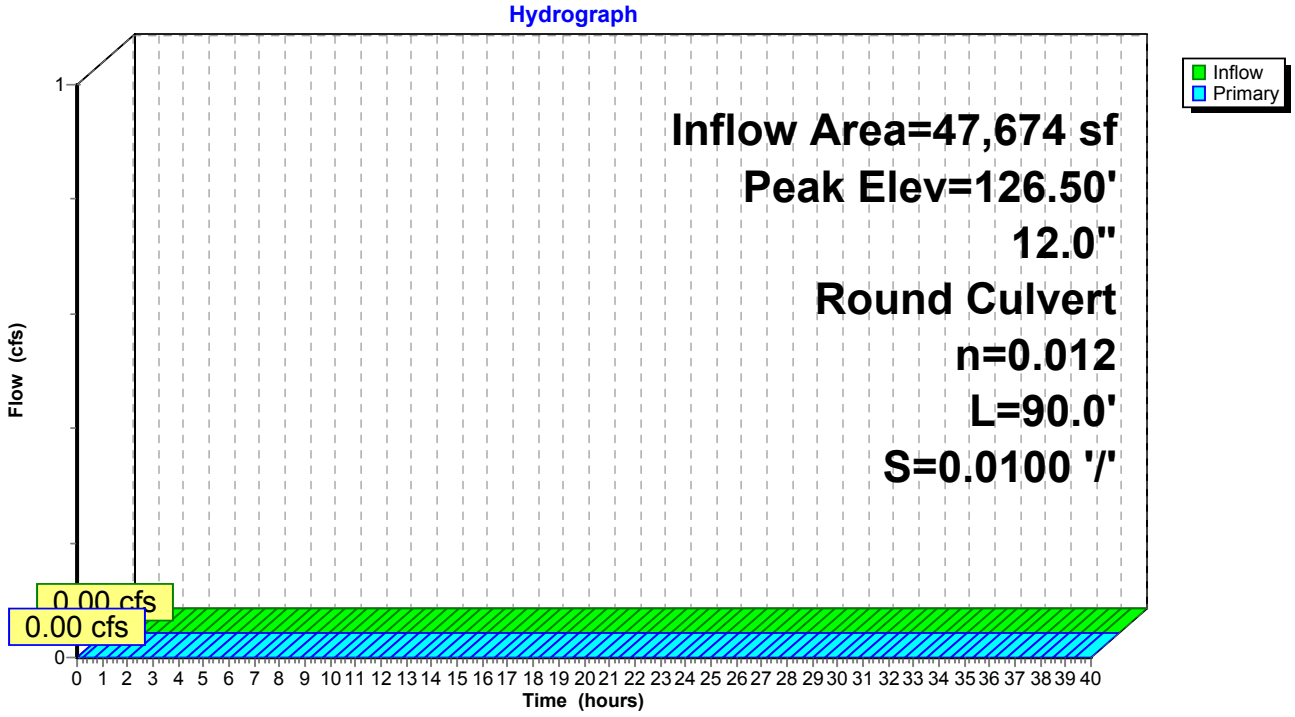
Inflow Area =	47,674 sf,	30.87% Impervious,	Inflow Depth =	0.00"	for 2 yr event
Inflow =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	
Outflow =	0.00 cfs @	0.00 hrs,	Volume=	0 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.50' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.50' / 125.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.50' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond MH7: MH7



Summary for Pond MH8: MH8

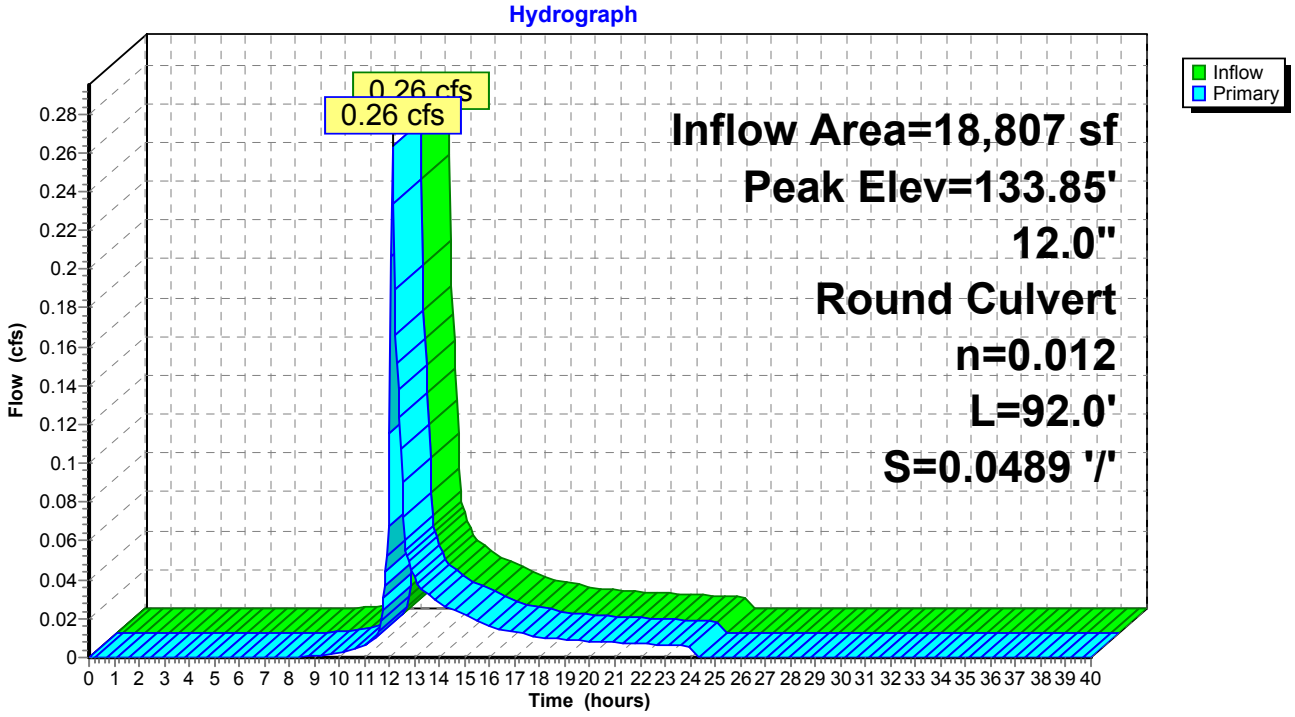
Inflow Area = 18,807 sf, 46.10% Impervious, Inflow Depth = 0.67" for 2 yr event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 1,045 cf
Outflow = 0.26 cfs @ 12.11 hrs, Volume= 1,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.11 hrs, Volume= 1,045 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 133.85' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.60'	**12.0" Round Culvert** L= 92.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.60' / 129.10' S= 0.0489 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.26 cfs @ 12.11 hrs HW=133.85' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.26 cfs @ 1.70 fps)

Pond MH8: MH8

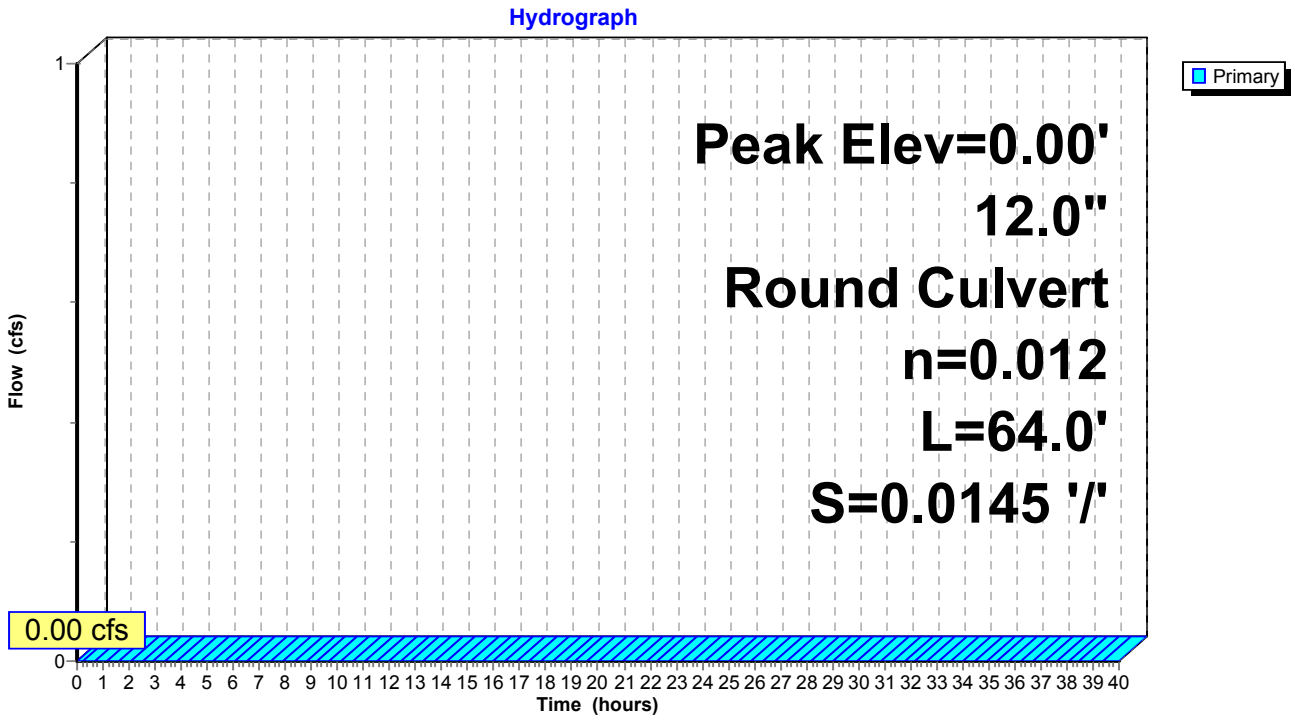


Summary for Pond MH9: MH9

Device	Routing	Invert	Outlet Devices
#1	Primary	129.10'	**12.0" Round Culvert** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 129.10' / 128.17' S= 0.0145 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond MH9: MH9

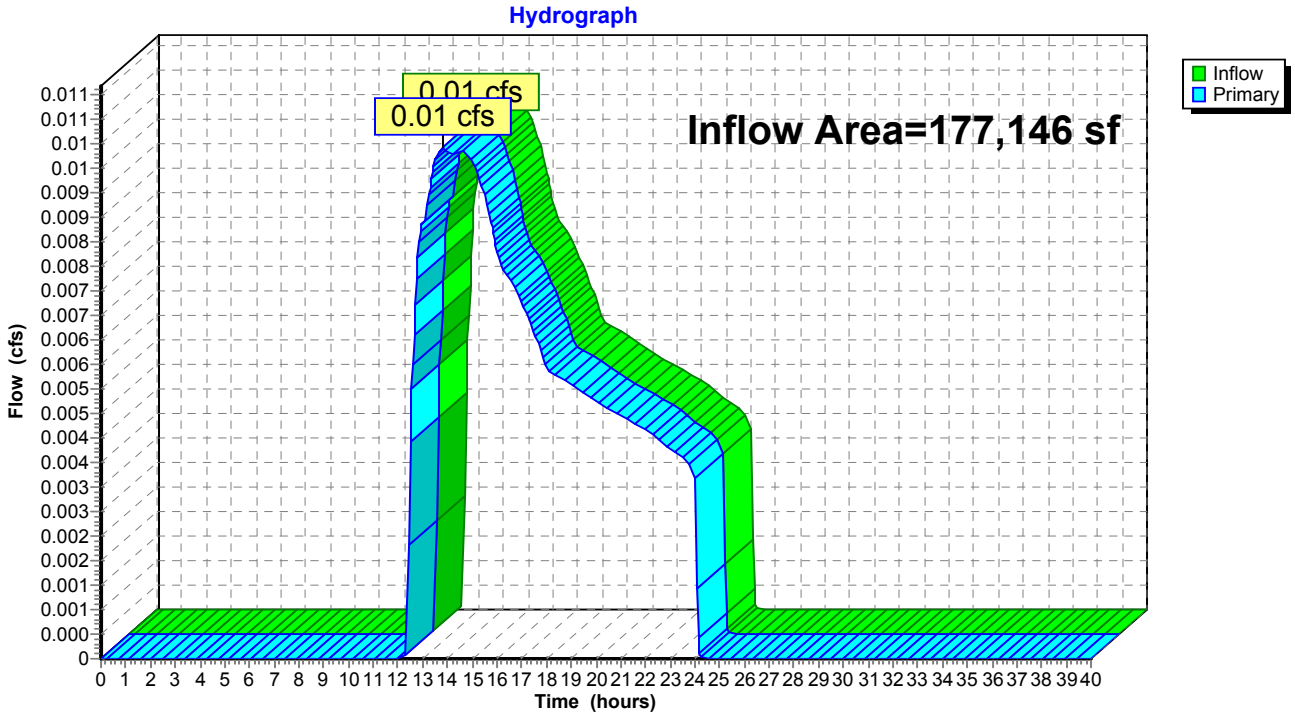


Summary for Link 1L: Onsite To Isolated Vegetated wetland

Inflow Area = 177,146 sf, 25.81% Impervious, Inflow Depth = 0.02" for 2 yr event
Inflow = 0.01 cfs @ 13.80 hrs, Volume= 281 cf
Primary = 0.01 cfs @ 13.80 hrs, Volume= 281 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: Onsite To Isolated Vegetated wetland

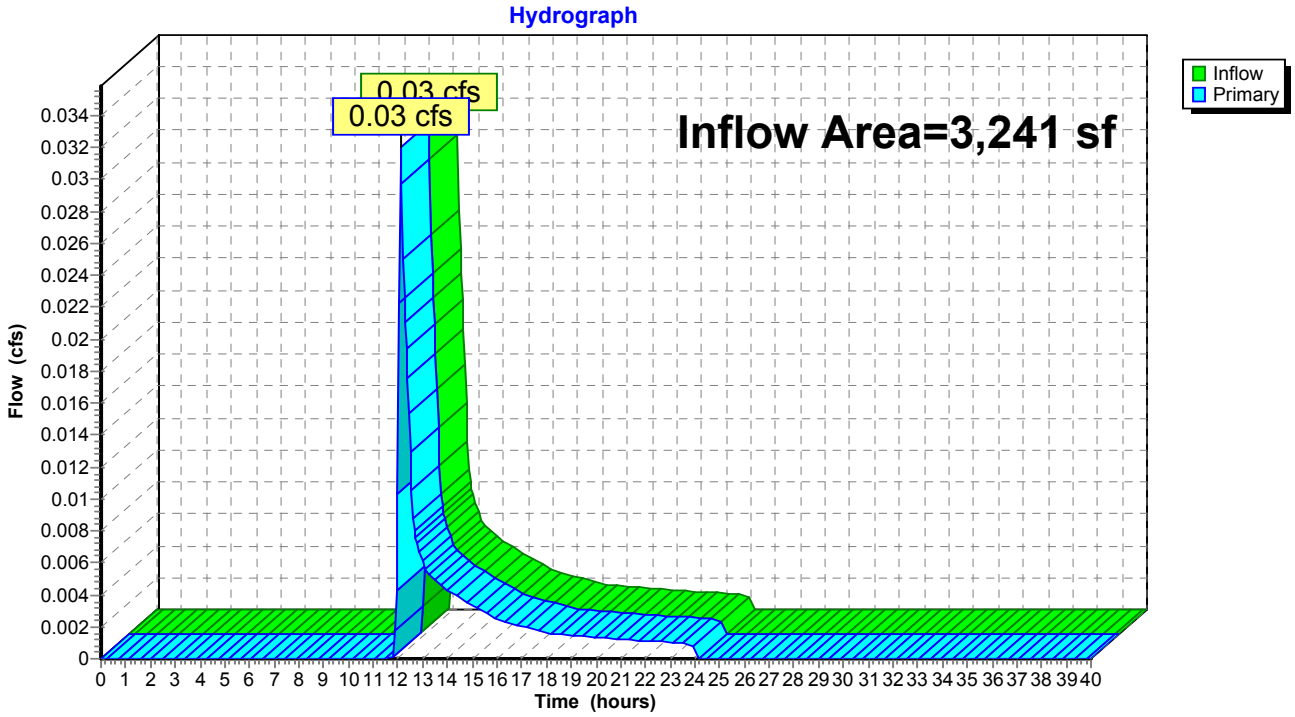


Summary for Link 2L: To Highland Street catch basins

Inflow Area = 3,241 sf, 42.55% Impervious, Inflow Depth = 0.51" for 2 yr event
Inflow = 0.03 cfs @ 12.12 hrs, Volume= 139 cf
Primary = 0.03 cfs @ 12.12 hrs, Volume= 139 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 2L: To Highland Street catch basins

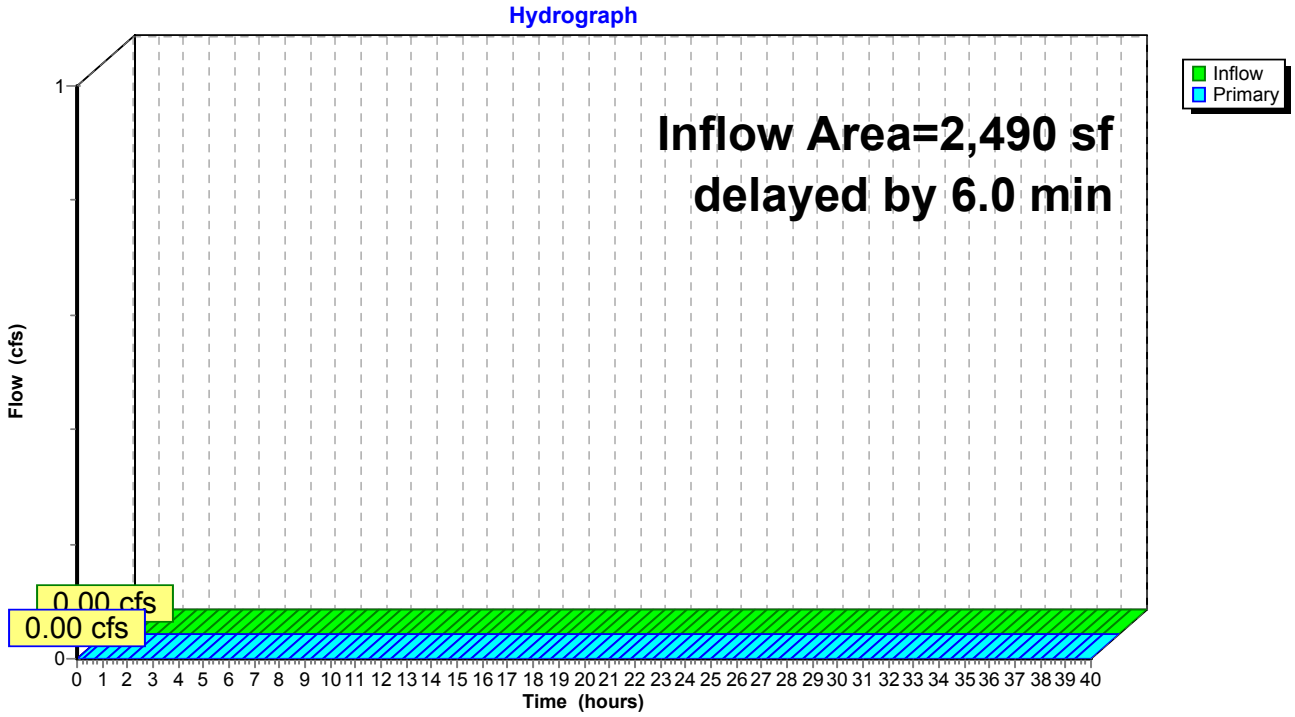


Summary for Link 3L: LOT D - Onsite to southeast Low point along Main

Inflow Area = 2,490 sf, 21.57% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 3L: LOT D - Onsite to southeast Low point along Main

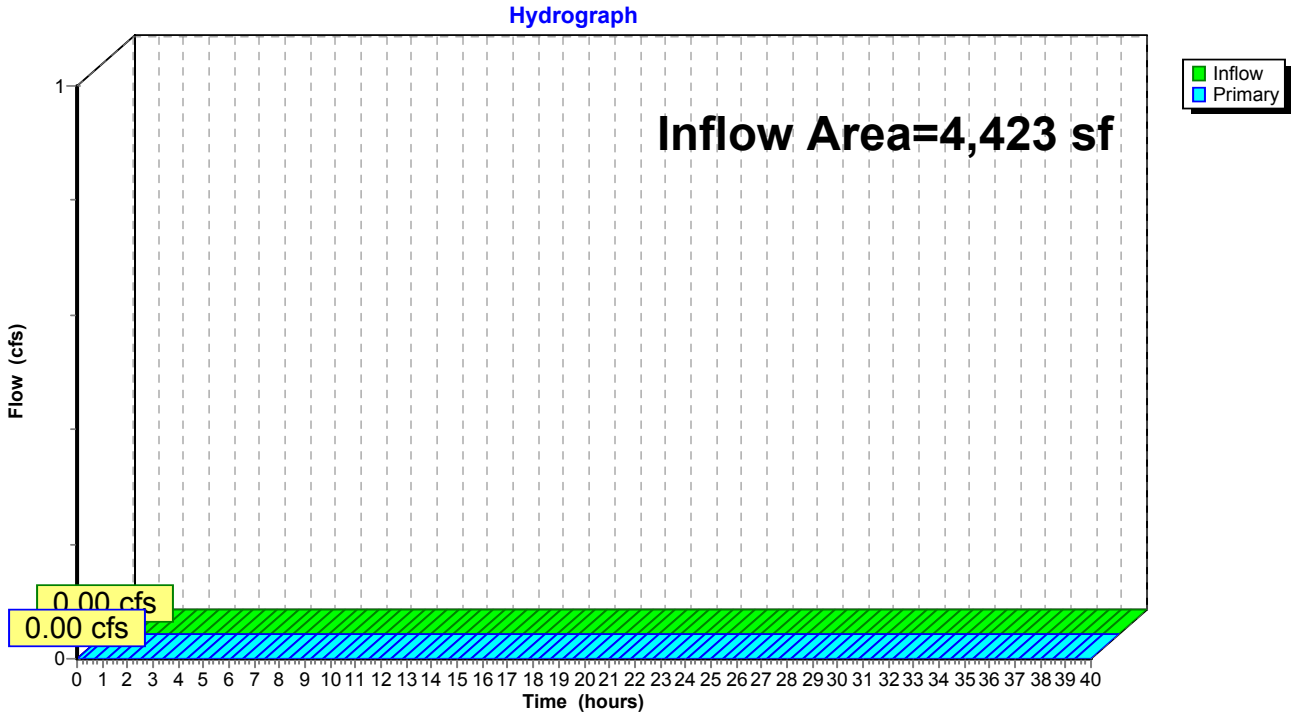


Summary for Link 4L: LOT F - To SW Property Corner along Main Street

Inflow Area = 4,423 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 4L: LOT F - To SW Property Corner along Main Street



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7a: CB7 Runoff Area=3,472 sf 76.58% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=85 Runoff=0.26 cfs 842 cf

Subcatchment 8a: CB8 Runoff Area=15,335 sf 39.20% Impervious Runoff Depth=1.14"
Tc=6.0 min CN=62 Runoff=0.41 cfs 1,457 cf

Subcatchment 9: CB9 Runoff Area=73,562 sf 30.35% Impervious Runoff Depth=0.85"
Flow Length=340' Tc=9.5 min CN=57 Runoff=1.15 cfs 5,206 cf

Subcatchment H1: LOT A1 Runoff Area=3,241 sf 42.55% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=64 Runoff=0.10 cfs 342 cf

Subcatchment M1: TO SW Main Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=39 Runoff=0.00 cfs 41 cf

Subcatchment M2: TO SE Main Runoff Area=2,490 sf 21.57% Impervious Runoff Depth=0.59"
Tc=6.0 min CN=52 Runoff=0.02 cfs 123 cf

Subcatchment P1: CB1 Runoff Area=12,362 sf 37.57% Impervious Runoff Depth=1.08"
Tc=6.0 min CN=61 Runoff=0.31 cfs 1,112 cf

Subcatchment P10: FOREBAY 2 Runoff Area=4,609 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=39 Runoff=0.00 cfs 42 cf

Subcatchment P11: FOREBAY 1 Runoff Area=7,767 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min CN=37 Runoff=0.00 cfs 43 cf

Subcatchment P12: DIRECT TO IL Runoff Area=37,103 sf 0.00% Impervious Runoff Depth=0.46"
Tc=6.0 min CN=49 Runoff=0.19 cfs 1,410 cf

Subcatchment P2: CB2 Runoff Area=10,903 sf 49.32% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=68 Runoff=0.42 cfs 1,392 cf

Subcatchment P3: CB3 Runoff Area=45,223 sf 12.98% Impervious Runoff Depth=0.30"
Tc=6.0 min CN=45 Runoff=0.11 cfs 1,115 cf

Subcatchment P4: CB4 Runoff Area=7,404 sf 63.44% Impervious Runoff Depth=2.64"
Tc=6.0 min CN=82 Runoff=0.51 cfs 1,626 cf

Subcatchment P5: CB5 Runoff Area=45,437 sf 29.90% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=66 Runoff=1.58 cfs 5,287 cf

Subcatchment P6: CB6 Runoff Area=17,005 sf 0.00% Impervious Runoff Depth=0.46"
Tc=6.0 min CN=49 Runoff=0.09 cfs 646 cf

Subcatchment R-D1: ROOF Lot D1 Runoff Area=3,048 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 1,083 cf

Subcatchment R-E: ROOF Lot E Runoff Area=2,864 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.28 cfs 1,018 cf

Subcatchment R-F: ROOF Lot F Runoff Area=3,406 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.34 cfs 1,210 cf

Subcatchment R1: ROOF Lot 1 Runoff Area=3,357 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.33 cfs 1,193 cf

Subcatchment R10: ROOF Runoff Area=2,512 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.25 cfs 893 cf

Subcatchment R11: ROOF Runoff Area=1,974 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.19 cfs 701 cf

Subcatchment R12: ROOF Lot 12 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.18 cfs 640 cf

Subcatchment R16: ROOF Runoff Area=2,040 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.20 cfs 725 cf

Subcatchment R2: ROOF Runoff Area=2,967 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.29 cfs 1,054 cf

Subcatchment R3: ROOF Runoff Area=2,200 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.22 cfs 782 cf

Subcatchment R4: ROOF Runoff Area=2,308 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.23 cfs 820 cf

Subcatchment R5: ROOF Runoff Area=2,216 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.22 cfs 787 cf

Subcatchment R6: ROOF Lot 6 Runoff Area=2,440 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.24 cfs 867 cf

Subcatchment R7: ROOF Lot 7 Runoff Area=2,814 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.28 cfs 1,000 cf

Subcatchment R8: ROOF Runoff Area=2,092 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.21 cfs 743 cf

Subcatchment R9: ROOF Runoff Area=1,996 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=0.20 cfs 709 cf

Pond 1: CB1 Peak Elev=141.77' Inflow=0.31 cfs 1,112 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.31 cfs 1,112 cf

Pond 1P: MC-3500 1R4C N Peak Elev=2.08' Storage=339 cf Inflow=0.33 cfs 1,193 cf
Outflow=0.05 cfs 1,193 cf

Pond 2: CB2 Peak Elev=141.82' Inflow=0.42 cfs 1,392 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.42 cfs 1,392 cf

Pond 2P: MC-3500 1R2C Peak Elev=3.01' Storage=328 cf Inflow=0.29 cfs 1,054 cf
Outflow=0.03 cfs 1,054 cf

Pond 3: CB3 Peak Elev=131.40' Inflow=0.11 cfs 1,115 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.11 cfs 1,115 cf

Pond 3P: MC-3500 1R2C Peak Elev=2.12' Storage=217 cf Inflow=0.22 cfs 782 cf
Outflow=0.03 cfs 782 cf

Pond 4: CB4 Peak Elev=131.63' Inflow=0.51 cfs 1,626 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.51 cfs 1,626 cf

Pond 4P: MC-3500 1R2C Peak Elev=2.26' Storage=233 cf Inflow=0.23 cfs 820 cf
Outflow=0.03 cfs 820 cf

Pond 5: CB5 Peak Elev=129.07' Inflow=1.58 cfs 5,287 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0343 '/' Outflow=1.58 cfs 5,287 cf

Pond 5P: MC-3500 1R2C Peak Elev=2.14' Storage=219 cf Inflow=0.22 cfs 787 cf
Outflow=0.03 cfs 787 cf

Pond 6: CB6 Peak Elev=129.89' Inflow=0.09 cfs 646 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.09 cfs 646 cf

Pond 6P: MC-3500 1R2C Peak Elev=2.43' Storage=253 cf Inflow=0.24 cfs 867 cf
Outflow=0.03 cfs 867 cf

Pond 7: CB7 Peak Elev=134.05' Inflow=0.26 cfs 842 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.26 cfs 842 cf

Pond 7P: MC-3500 1R2C Peak Elev=2.80' Storage=304 cf Inflow=0.28 cfs 1,000 cf
Outflow=0.03 cfs 1,000 cf

Pond 8: CB8 Peak Elev=134.12' Inflow=0.41 cfs 1,457 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.41 cfs 1,457 cf

Pond 8P: MC-3500 1R2C Peak Elev=1.98' Storage=201 cf Inflow=0.21 cfs 743 cf
Outflow=0.03 cfs 743 cf

Pond 9a: CB8 Peak Elev=129.09' Inflow=1.15 cfs 5,206 cf
12.0" Round Culvert n=0.012 L=6.0' S=0.0600 '/' Outflow=1.15 cfs 5,206 cf

Pond 9P: MC-3500 1R2C Peak Elev=1.86' Storage=187 cf Inflow=0.20 cfs 709 cf
Outflow=0.03 cfs 709 cf

Pond 10P: MC-3500 1R2C Peak Elev=2.52' Storage=264 cf Inflow=0.25 cfs 893 cf
Outflow=0.03 cfs 893 cf

Pond 11P: MC-3500 1R2C Peak Elev=1.84' Storage=184 cf Inflow=0.19 cfs 701 cf
Outflow=0.03 cfs 701 cf

Pond 12P: MC-3500 1R2C Peak Elev=1.63' Storage=159 cf Inflow=0.18 cfs 640 cf
Outflow=0.03 cfs 640 cf

Pond 16P: MC-3500 1R2C Peak Elev=1.92' Storage=193 cf Inflow=0.20 cfs 725 cf
Outflow=0.03 cfs 725 cf

Pond D1: MC-3500 8R7C Peak Elev=127.13' Storage=483 cf Inflow=1.31 cfs 4,777 cf
Discarded=0.61 cfs 4,777 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 4,777 cf

Pond D2: MC-3500 8R7C Peak Elev=127.59' Storage=1,207 cf Inflow=1.71 cfs 7,505 cf
Discarded=0.61 cfs 7,505 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 7,505 cf

Pond DP: MC-3500 1R3C N Peak Elev=2.49' Storage=327 cf Inflow=0.30 cfs 1,083 cf
Outflow=0.04 cfs 1,083 cf

Pond EP: MC-3500 1R4C N Peak Elev=1.71' Storage=267 cf Inflow=0.28 cfs 1,018 cf
Outflow=0.05 cfs 1,018 cf

Pond FB1: FOREBAY 1 Peak Elev=126.50' Storage=0 cf Inflow=0.00 cfs 43 cf
Outflow=0.00 cfs 43 cf

Pond FB2: FOREBAY 2 Peak Elev=126.75' Storage=0 cf Inflow=0.00 cfs 42 cf
Outflow=0.00 cfs 42 cf

Pond FP: MC-3500 1R4C N Peak Elev=2.12' Storage=347 cf Inflow=0.34 cfs 1,210 cf
Outflow=0.05 cfs 1,210 cf

Pond G1: Lot D1 - R.G. Peak Elev=152.28' Storage=2 cf Inflow=0.02 cfs 123 cf
Discarded=0.02 cfs 123 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 123 cf

Pond G2: Lot F - R.G. Peak Elev=152.25' Storage=0 cf Inflow=0.00 cfs 41 cf
Discarded=0.00 cfs 41 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 41 cf

Pond MH1: MH1 Peak Elev=140.43' Inflow=0.73 cfs 2,504 cf
12.0" Round Culvert n=0.012 L=110.0' S=0.0702 '/' Outflow=0.73 cfs 2,504 cf

Pond MH10: MH10 Peak Elev=128.85' Inflow=1.71 cfs 7,505 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=1.71 cfs 7,505 cf

Pond MH11: MH11 Peak Elev=128.72' Inflow=1.71 cfs 7,505 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=1.71 cfs 7,505 cf

Pond MH2: MH2 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=46.0' S=0.0467 '/' Primary=0.00 cfs 0 cf

Pond MH3: MH3 Peak Elev=131.41' Inflow=1.24 cfs 4,131 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=1.24 cfs 4,131 cf

Pond MH4: MH4 Peak Elev=131.43' Inflow=1.31 cfs 4,777 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=1.31 cfs 4,777 cf

Pond MH5: MH5 Peak Elev=128.76' Inflow=1.58 cfs 5,287 cf
18.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=1.58 cfs 5,287 cf

Pond MH6: MH6 Peak Elev=128.47' Inflow=1.31 cfs 4,777 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0400 '/' Outflow=1.31 cfs 4,777 cf

Pond MH7: MH7 Peak Elev=126.50' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.012 L=90.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Pond MH8: MH8 Peak Elev=134.01' Inflow=0.68 cfs 2,299 cf
12.0" Round Culvert n=0.012 L=92.0' S=0.0489 '/' Outflow=0.68 cfs 2,299 cf

Pond MH9: MH9 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=64.0' S=0.0145 '/' Primary=0.00 cfs 0 cf

Link 1L: Onsite To Isolated Vegetated wetland Inflow=0.19 cfs 1,410 cf
Primary=0.19 cfs 1,410 cf

Link 2L: To Highland Street catch basins Inflow=0.10 cfs 342 cf
Primary=0.10 cfs 342 cf

Link 3L: LOT D - Onsite to southeast Low point along Main delayed by 6.0 min Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 4L: LOT F - To SW Property Corner along Main Street Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 330,370 sf Runoff Volume = 34,911 cf Average Runoff Depth = 1.27"
67.58% Pervious = 223,249 sf 32.42% Impervious = 107,121 sf

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7a: CB7 Runoff Area=3,472 sf 76.58% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=85 Runoff=0.35 cfs 1,136 cf

Subcatchment 8a: CB8 Runoff Area=15,335 sf 39.20% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=62 Runoff=0.70 cfs 2,328 cf

Subcatchment 9: CB9 Runoff Area=73,562 sf 30.35% Impervious Runoff Depth=1.44"
Flow Length=340' Tc=9.5 min CN=57 Runoff=2.22 cfs 8,819 cf

Subcatchment H1: LOT A1 Runoff Area=3,241 sf 42.55% Impervious Runoff Depth=1.98"
Tc=6.0 min CN=64 Runoff=0.16 cfs 536 cf

Subcatchment M1: TO SW Main Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=39 Runoff=0.01 cfs 124 cf

Subcatchment M2: TO SE Main Runoff Area=2,490 sf 21.57% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=52 Runoff=0.06 cfs 225 cf

Subcatchment P1: CB1 Runoff Area=12,362 sf 37.57% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=61 Runoff=0.54 cfs 1,795 cf

Subcatchment P10: FOREBAY 2 Runoff Area=4,609 sf 0.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=39 Runoff=0.01 cfs 130 cf

Subcatchment P11: FOREBAY 1 Runoff Area=7,767 sf 0.00% Impervious Runoff Depth=0.25"
Tc=6.0 min CN=37 Runoff=0.01 cfs 162 cf

Subcatchment P12: DIRECT TO IL Runoff Area=37,103 sf 0.00% Impervious Runoff Depth=0.89"
Tc=6.0 min CN=49 Runoff=0.62 cfs 2,748 cf

Subcatchment P2: CB2 Runoff Area=10,903 sf 49.32% Impervious Runoff Depth=2.32"
Tc=6.0 min CN=68 Runoff=0.66 cfs 2,106 cf

Subcatchment P3: CB3 Runoff Area=45,223 sf 12.98% Impervious Runoff Depth=0.65"
Tc=6.0 min CN=45 Runoff=0.40 cfs 2,440 cf

Subcatchment P4: CB4 Runoff Area=7,404 sf 63.44% Impervious Runoff Depth=3.62"
Tc=6.0 min CN=82 Runoff=0.70 cfs 2,234 cf

Subcatchment P5: CB5 Runoff Area=45,437 sf 29.90% Impervious Runoff Depth=2.15"
Tc=6.0 min CN=66 Runoff=2.52 cfs 8,134 cf

Subcatchment P6: CB6 Runoff Area=17,005 sf 0.00% Impervious Runoff Depth=0.89"
Tc=6.0 min CN=49 Runoff=0.28 cfs 1,260 cf

Subcatchment R-D1: ROOF Lot D1 Runoff Area=3,048 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.37 cfs 1,362 cf

Subcatchment R-E: ROOF Lot E Runoff Area=2,864 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.35 cfs 1,280 cf

Subcatchment R-F: ROOF Lot F Runoff Area=3,406 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.42 cfs 1,522 cf

Subcatchment R1: ROOF Lot 1 Runoff Area=3,357 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.41 cfs 1,500 cf

Subcatchment R10: ROOF Runoff Area=2,512 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.31 cfs 1,123 cf

Subcatchment R11: ROOF Runoff Area=1,974 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.24 cfs 882 cf

Subcatchment R12: ROOF Lot 12 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.22 cfs 804 cf

Subcatchment R16: ROOF Runoff Area=2,040 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.25 cfs 912 cf

Subcatchment R2: ROOF Runoff Area=2,967 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.36 cfs 1,326 cf

Subcatchment R3: ROOF Runoff Area=2,200 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.27 cfs 983 cf

Subcatchment R4: ROOF Runoff Area=2,308 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.28 cfs 1,031 cf

Subcatchment R5: ROOF Runoff Area=2,216 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.27 cfs 990 cf

Subcatchment R6: ROOF Lot 6 Runoff Area=2,440 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.30 cfs 1,090 cf

Subcatchment R7: ROOF Lot 7 Runoff Area=2,814 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.35 cfs 1,257 cf

Subcatchment R8: ROOF Runoff Area=2,092 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.26 cfs 935 cf

Subcatchment R9: ROOF Runoff Area=1,996 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.25 cfs 892 cf

Pond 1: CB1 Peak Elev=141.87' Inflow=0.54 cfs 1,795 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.54 cfs 1,795 cf

Pond 1P: MC-3500 1R4C N Peak Elev=2.77' Storage=468 cf Inflow=0.41 cfs 1,500 cf
Outflow=0.05 cfs 1,500 cf

Pond 2: CB2 Peak Elev=141.91' Inflow=0.66 cfs 2,106 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.66 cfs 2,106 cf

Pond 2P: MC-3500 1R2C Peak Elev=4.27' Storage=452 cf Inflow=0.36 cfs 1,326 cf
Outflow=0.03 cfs 1,326 cf

Pond 3: CB3 Peak Elev=131.58' Inflow=0.40 cfs 2,440 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.40 cfs 2,440 cf

Pond 3P: MC-3500 1R2C Peak Elev=2.84' Storage=300 cf Inflow=0.27 cfs 983 cf
Outflow=0.03 cfs 983 cf

Pond 4: CB4 Peak Elev=131.71' Inflow=0.70 cfs 2,234 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.70 cfs 2,234 cf

Pond 4P: MC-3500 1R2C Peak Elev=3.04' Storage=321 cf Inflow=0.28 cfs 1,031 cf
Outflow=0.03 cfs 1,031 cf

Pond 5: CB5 Peak Elev=129.33' Inflow=2.52 cfs 8,134 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0343 '/' Outflow=2.52 cfs 8,134 cf

Pond 5P: MC-3500 1R2C Peak Elev=2.87' Storage=303 cf Inflow=0.27 cfs 990 cf
Outflow=0.03 cfs 990 cf

Pond 6: CB6 Peak Elev=130.01' Inflow=0.28 cfs 1,260 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.28 cfs 1,260 cf

Pond 6P: MC-3500 1R2C Peak Elev=3.29' Storage=348 cf Inflow=0.30 cfs 1,090 cf
Outflow=0.03 cfs 1,090 cf

Pond 7: CB7 Peak Elev=134.09' Inflow=0.35 cfs 1,136 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.35 cfs 1,136 cf

Pond 7P: MC-3500 1R2C Peak Elev=3.88' Storage=419 cf Inflow=0.35 cfs 1,257 cf
Outflow=0.03 cfs 1,257 cf

Pond 8: CB8 Peak Elev=134.23' Inflow=0.70 cfs 2,328 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.70 cfs 2,328 cf

Pond 8P: MC-3500 1R2C Peak Elev=2.66' Storage=279 cf Inflow=0.26 cfs 935 cf
Outflow=0.03 cfs 935 cf

Pond 9a: CB8 Peak Elev=129.38' Inflow=2.22 cfs 8,819 cf
12.0" Round Culvert n=0.012 L=6.0' S=0.0600 '/' Outflow=2.22 cfs 8,819 cf

Pond 9P: MC-3500 1R2C Peak Elev=2.49' Storage=261 cf Inflow=0.25 cfs 892 cf
Outflow=0.03 cfs 892 cf

Pond 10P: MC-3500 1R2C Peak Elev=3.44' Storage=363 cf Inflow=0.31 cfs 1,123 cf
Outflow=0.03 cfs 1,123 cf

Pond 11P: MC-3500 1R2C Peak Elev=2.46' Storage=256 cf Inflow=0.24 cfs 882 cf
Outflow=0.03 cfs 882 cf

Pond 12P: MC-3500 1R2C Peak Elev=2.18' Storage=224 cf Inflow=0.22 cfs 804 cf
Outflow=0.03 cfs 804 cf

Pond 16P: MC-3500 1R2C Peak Elev=2.57' Storage=269 cf Inflow=0.25 cfs 912 cf
Outflow=0.03 cfs 912 cf

Pond D1: MC-3500 8R7C Peak Elev=127.66' Storage=1,391 cf Inflow=2.17 cfs 7,395 cf
Discarded=0.61 cfs 7,395 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 7,395 cf

Pond D2: MC-3500 8R7C Peak Elev=128.35' Storage=3,231 cf Inflow=3.12 cfs 12,283 cf
Discarded=0.61 cfs 12,283 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 12,283 cf

Pond DP: MC-3500 1R3C N Peak Elev=3.38' Storage=450 cf Inflow=0.37 cfs 1,362 cf
Outflow=0.04 cfs 1,362 cf

Pond EP: MC-3500 1R4C N Peak Elev=2.25' Storage=372 cf Inflow=0.35 cfs 1,280 cf
Outflow=0.05 cfs 1,280 cf

Pond FB1: FOREBAY 1 Peak Elev=126.50' Storage=2 cf Inflow=0.01 cfs 162 cf
Outflow=0.01 cfs 162 cf

Pond FB2: FOREBAY 2 Peak Elev=126.75' Storage=2 cf Inflow=0.01 cfs 130 cf
Outflow=0.01 cfs 130 cf

Pond FP: MC-3500 1R4C N Peak Elev=2.82' Storage=477 cf Inflow=0.42 cfs 1,522 cf
Outflow=0.05 cfs 1,522 cf

Pond G1: Lot D1 - R.G. Peak Elev=152.67' Storage=19 cf Inflow=0.06 cfs 225 cf
Discarded=0.03 cfs 225 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 225 cf

Pond G2: Lot F - R.G. Peak Elev=152.26' Storage=1 cf Inflow=0.01 cfs 124 cf
Discarded=0.01 cfs 124 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 124 cf

Pond MH1: MH1 Peak Elev=140.57' Inflow=1.19 cfs 3,901 cf
12.0" Round Culvert n=0.012 L=110.0' S=0.0702 '/' Outflow=1.19 cfs 3,901 cf

Pond MH10: MH10 Peak Elev=129.17' Inflow=3.12 cfs 12,283 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=3.12 cfs 12,283 cf

Pond MH11: MH11 Peak Elev=128.97' Inflow=3.12 cfs 12,283 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=3.12 cfs 12,283 cf

Pond MH2: MH2 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=46.0' S=0.0467 '/' Primary=0.00 cfs 0 cf

Pond MH3: MH3 Peak Elev=131.56' Inflow=1.89 cfs 6,135 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=1.89 cfs 6,135 cf

Pond MH4: MH4 Peak Elev=131.61' Inflow=2.17 cfs 7,395 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=2.17 cfs 7,395 cf

Pond MH5: MH5 Peak Elev=128.96' Inflow=2.52 cfs 8,134 cf
18.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=2.52 cfs 8,134 cf

Pond MH6: MH6 Peak Elev=128.61' Inflow=2.17 cfs 7,395 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0400 '/' Outflow=2.17 cfs 7,395 cf

Pond MH7: MH7 Peak Elev=126.50' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.012 L=90.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Pond MH8: MH8 Peak Elev=134.13' Inflow=1.05 cfs 3,464 cf
12.0" Round Culvert n=0.012 L=92.0' S=0.0489 '/' Outflow=1.05 cfs 3,464 cf

Pond MH9: MH9 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=64.0' S=0.0145 '/' Primary=0.00 cfs 0 cf

Link 1L: Onsite To Isolated Vegetated wetland Inflow=0.62 cfs 2,748 cf
Primary=0.62 cfs 2,748 cf

Link 2L: To Highland Street catch basins Inflow=0.16 cfs 536 cf
Primary=0.16 cfs 536 cf

Link 3L: LOT D - Onsite to southeast Low point along Main delayed by 6.0 min Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 4L: LOT F - To SW Property Corner along Main Street Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 330,370 sf Runoff Volume = 52,066 cf Average Runoff Depth = 1.89"
67.58% Pervious = 223,249 sf 32.42% Impervious = 107,121 sf

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7a: CB7 Runoff Area=3,472 sf 76.58% Impervious Runoff Depth=4.78"
Tc=6.0 min CN=85 Runoff=0.43 cfs 1,382 cf

Subcatchment 8a: CB8 Runoff Area=15,335 sf 39.20% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=62 Runoff=0.96 cfs 3,117 cf

Subcatchment 9: CB9 Runoff Area=73,562 sf 30.35% Impervious Runoff Depth=1.99"
Flow Length=340' Tc=9.5 min CN=57 Runoff=3.22 cfs 12,183 cf

Subcatchment H1: LOT A1 Runoff Area=3,241 sf 42.55% Impervious Runoff Depth=2.63"
Tc=6.0 min CN=64 Runoff=0.22 cfs 709 cf

Subcatchment M1: TO SW Main Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.60"
Tc=6.0 min CN=39 Runoff=0.03 cfs 220 cf

Subcatchment M2: TO SE Main Runoff Area=2,490 sf 21.57% Impervious Runoff Depth=1.56"
Tc=6.0 min CN=52 Runoff=0.09 cfs 324 cf

Subcatchment P1: CB1 Runoff Area=12,362 sf 37.57% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=61 Runoff=0.74 cfs 2,418 cf

Subcatchment P10: FOREBAY 2 Runoff Area=4,609 sf 0.00% Impervious Runoff Depth=0.60"
Tc=6.0 min CN=39 Runoff=0.03 cfs 230 cf

Subcatchment P11: FOREBAY 1 Runoff Area=7,767 sf 0.00% Impervious Runoff Depth=0.48"
Tc=6.0 min CN=37 Runoff=0.03 cfs 308 cf

Subcatchment P12: DIRECT TO IL Runoff Area=37,103 sf 0.00% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=49 Runoff=1.06 cfs 4,071 cf

Subcatchment P2: CB2 Runoff Area=10,903 sf 49.32% Impervious Runoff Depth=3.01"
Tc=6.0 min CN=68 Runoff=0.86 cfs 2,735 cf

Subcatchment P3: CB3 Runoff Area=45,223 sf 12.98% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=45 Runoff=0.84 cfs 3,808 cf

Subcatchment P4: CB4 Runoff Area=7,404 sf 63.44% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=82 Runoff=0.86 cfs 2,745 cf

Subcatchment P5: CB5 Runoff Area=45,437 sf 29.90% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=66 Runoff=3.34 cfs 10,665 cf

Subcatchment P6: CB6 Runoff Area=17,005 sf 0.00% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=49 Runoff=0.48 cfs 1,866 cf

Subcatchment R-D1: ROOF Lot D1 Runoff Area=3,048 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.44 cfs 1,590 cf

Subcatchment R-E: ROOF Lot E Runoff Area=2,864 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.41 cfs 1,494 cf

Subcatchment R-F: ROOF Lot F Runoff Area=3,406 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.49 cfs 1,777 cf

Subcatchment R1: ROOF Lot 1 Runoff Area=3,357 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.48 cfs 1,752 cf

Subcatchment R10: ROOF Runoff Area=2,512 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.36 cfs 1,311 cf

Subcatchment R11: ROOF Runoff Area=1,974 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.28 cfs 1,030 cf

Subcatchment R12: ROOF Lot 12 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.26 cfs 939 cf

Subcatchment R16: ROOF Runoff Area=2,040 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.29 cfs 1,064 cf

Subcatchment R2: ROOF Runoff Area=2,967 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.42 cfs 1,548 cf

Subcatchment R3: ROOF Runoff Area=2,200 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.31 cfs 1,148 cf

Subcatchment R4: ROOF Runoff Area=2,308 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.33 cfs 1,204 cf

Subcatchment R5: ROOF Runoff Area=2,216 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.32 cfs 1,156 cf

Subcatchment R6: ROOF Lot 6 Runoff Area=2,440 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.35 cfs 1,273 cf

Subcatchment R7: ROOF Lot 7 Runoff Area=2,814 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 1,468 cf

Subcatchment R8: ROOF Runoff Area=2,092 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 1,092 cf

Subcatchment R9: ROOF Runoff Area=1,996 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.29 cfs 1,041 cf

Pond 1: CB1 Peak Elev=141.94' Inflow=0.74 cfs 2,418 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.74 cfs 2,418 cf

Pond 1P: MC-3500 1R4C N Peak Elev=3.43' Storage=581 cf Inflow=0.48 cfs 1,752 cf
Outflow=0.05 cfs 1,752 cf

Pond 2: CB2 Peak Elev=141.97' Inflow=0.86 cfs 2,735 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.86 cfs 2,735 cf

Pond 2P: MC-3500 1R2C Peak Elev=5.79' Storage=560 cf Inflow=0.42 cfs 1,548 cf
Outflow=0.03 cfs 1,548 cf

Pond 3: CB3 Peak Elev=131.76' Inflow=0.84 cfs 3,808 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.84 cfs 3,808 cf

Pond 3P: MC-3500 1R2C Peak Elev=3.53' Storage=372 cf Inflow=0.31 cfs 1,148 cf
Outflow=0.03 cfs 1,148 cf

Pond 4: CB4 Peak Elev=131.77' Inflow=0.86 cfs 2,745 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.86 cfs 2,745 cf

Pond 4P: MC-3500 1R2C Peak Elev=3.81' Storage=399 cf Inflow=0.33 cfs 1,204 cf
Outflow=0.03 cfs 1,204 cf

Pond 5: CB5 Peak Elev=129.67' Inflow=3.34 cfs 10,665 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0343 '/' Outflow=3.34 cfs 10,665 cf

Pond 5P: MC-3500 1R2C Peak Elev=3.57' Storage=376 cf Inflow=0.32 cfs 1,156 cf
Outflow=0.03 cfs 1,156 cf

Pond 6: CB6 Peak Elev=130.10' Inflow=0.48 cfs 1,866 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.48 cfs 1,866 cf

Pond 6P: MC-3500 1R2C Peak Elev=4.20' Storage=432 cf Inflow=0.35 cfs 1,273 cf
Outflow=0.03 cfs 1,273 cf

Pond 7: CB7 Peak Elev=134.12' Inflow=0.43 cfs 1,382 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.43 cfs 1,382 cf

Pond 7P: MC-3500 1R2C Peak Elev=5.22' Storage=519 cf Inflow=0.40 cfs 1,468 cf
Outflow=0.03 cfs 1,468 cf

Pond 8: CB8 Peak Elev=134.32' Inflow=0.96 cfs 3,117 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.96 cfs 3,117 cf

Pond 8P: MC-3500 1R2C Peak Elev=3.27' Storage=346 cf Inflow=0.30 cfs 1,092 cf
Outflow=0.03 cfs 1,092 cf

Pond 9a: CB8 Peak Elev=129.75' Inflow=3.22 cfs 12,183 cf
12.0" Round Culvert n=0.012 L=6.0' S=0.0600 '/' Outflow=3.22 cfs 12,183 cf

Pond 9P: MC-3500 1R2C Peak Elev=3.06' Storage=324 cf Inflow=0.29 cfs 1,041 cf
Outflow=0.03 cfs 1,041 cf

Pond 10P: MC-3500 1R2C Peak Elev=4.46' Storage=451 cf Inflow=0.36 cfs 1,311 cf
Outflow=0.03 cfs 1,311 cf

Pond 11P: MC-3500 1R2C Peak Elev=3.01' Storage=318 cf Inflow=0.28 cfs 1,030 cf
Outflow=0.03 cfs 1,030 cf

Pond 12P: MC-3500 1R2C Peak Elev=2.66' Storage=279 cf Inflow=0.26 cfs 939 cf
Outflow=0.03 cfs 939 cf

Pond 16P: MC-3500 1R2C Peak Elev=3.16' Storage=334 cf Inflow=0.29 cfs 1,064 cf
Outflow=0.03 cfs 1,064 cf

Pond D1: MC-3500 8R7C Peak Elev=128.02' Storage=2,364 cf Inflow=2.94 cfs 9,764 cf
Discarded=0.61 cfs 9,764 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 9,764 cf

Pond D2: MC-3500 8R7C Peak Elev=129.04' Storage=5,030 cf Inflow=4.41 cfs 16,682 cf
Discarded=0.61 cfs 15,867 cf Primary=0.35 cfs 815 cf Outflow=0.96 cfs 16,682 cf

Pond DP: MC-3500 1R3C N Peak Elev=4.39' Storage=558 cf Inflow=0.44 cfs 1,590 cf
Outflow=0.04 cfs 1,590 cf

Pond EP: MC-3500 1R4C N Peak Elev=2.74' Storage=462 cf Inflow=0.41 cfs 1,494 cf
Outflow=0.05 cfs 1,494 cf

Pond FB1: FOREBAY 1 Peak Elev=126.50' Storage=6 cf Inflow=0.03 cfs 308 cf
Outflow=0.03 cfs 308 cf

Pond FB2: FOREBAY 2 Peak Elev=126.76' Storage=5 cf Inflow=0.03 cfs 230 cf
Outflow=0.03 cfs 230 cf

Pond FP: MC-3500 1R4C N Peak Elev=3.50' Storage=593 cf Inflow=0.49 cfs 1,777 cf
Outflow=0.05 cfs 1,777 cf

Pond G1: Lot D1 - R.G. Peak Elev=153.43' Storage=53 cf Inflow=0.09 cfs 324 cf
Discarded=0.03 cfs 324 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 324 cf

Pond G2: Lot F - R.G. Peak Elev=152.27' Storage=2 cf Inflow=0.03 cfs 220 cf
Discarded=0.03 cfs 220 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 220 cf

Pond MH1: MH1 Peak Elev=140.68' Inflow=1.60 cfs 5,153 cf
12.0" Round Culvert n=0.012 L=110.0' S=0.0702 '/' Outflow=1.60 cfs 5,153 cf

Pond MH10: MH10 Peak Elev=129.46' Inflow=4.41 cfs 16,682 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=4.41 cfs 16,682 cf

Pond MH11: MH11 Peak Elev=129.16' Inflow=4.41 cfs 16,682 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=4.41 cfs 16,682 cf

Pond MH2: MH2 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=46.0' S=0.0467 '/' Primary=0.00 cfs 0 cf

Pond MH3: MH3 Peak Elev=131.67' Inflow=2.46 cfs 7,899 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=2.46 cfs 7,899 cf

Pond MH4: MH4 Peak Elev=131.76' Inflow=2.94 cfs 9,764 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=2.94 cfs 9,764 cf

Pond MH5: MH5 Peak Elev=129.12' Inflow=3.34 cfs 10,665 cf
18.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=3.34 cfs 10,665 cf

Pond MH6: MH6 Peak Elev=128.72' Inflow=2.94 cfs 9,764 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0400 '/' Outflow=2.94 cfs 9,764 cf

Pond MH7: MH7 Peak Elev=126.50' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.012 L=90.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Pond MH8: MH8 Peak Elev=134.22' Inflow=1.39 cfs 4,499 cf
12.0" Round Culvert n=0.012 L=92.0' S=0.0489 '/' Outflow=1.39 cfs 4,499 cf

Pond MH9: MH9 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=64.0' S=0.0145 '/' Primary=0.00 cfs 0 cf

Link 1L: Onsite To Isolated Vegetated wetland Inflow=1.06 cfs 4,886 cf
Primary=1.06 cfs 4,886 cf

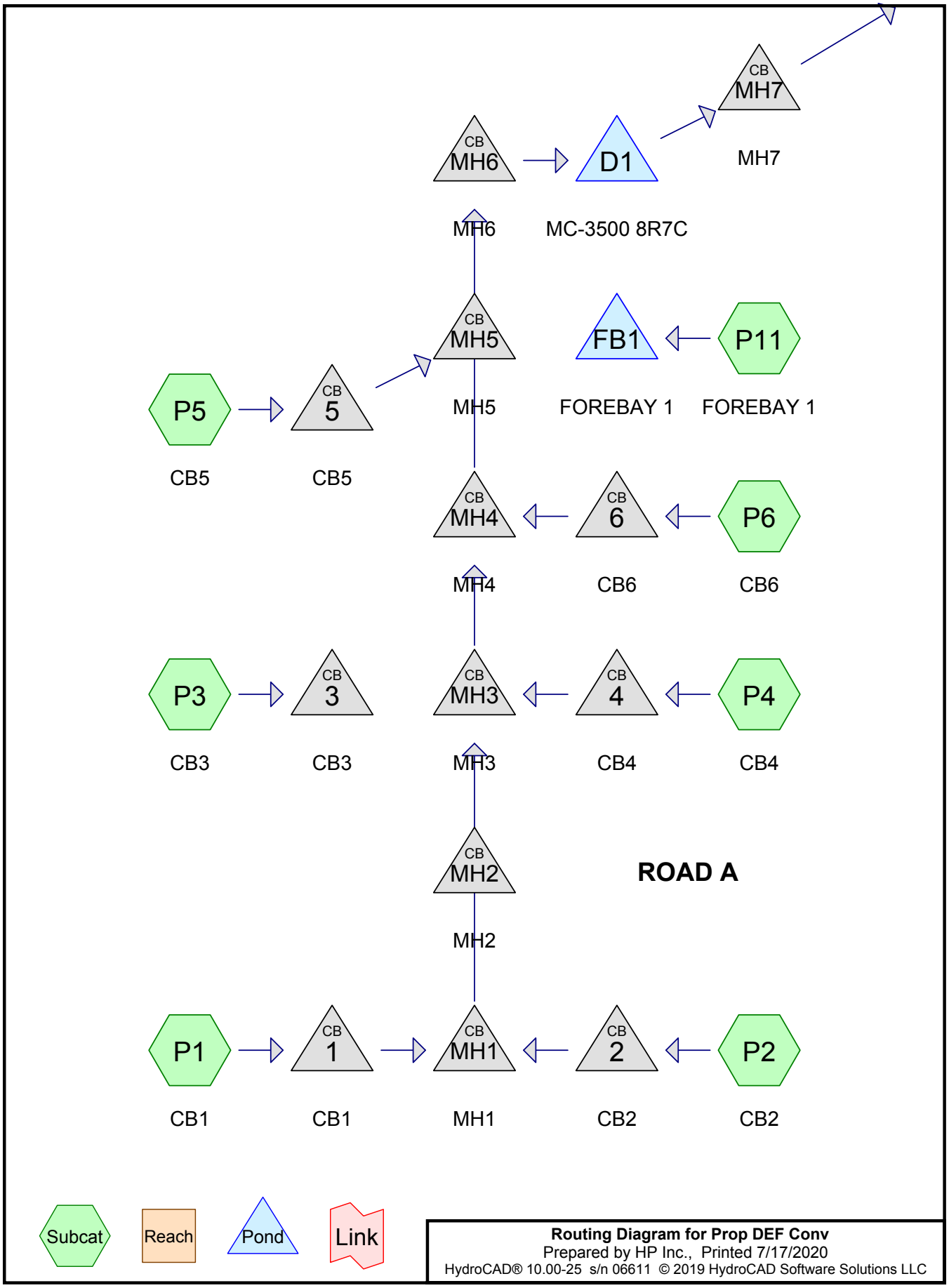
Link 2L: To Highland Street catch basins Inflow=0.22 cfs 709 cf
Primary=0.22 cfs 709 cf

Link 3L: LOT D - Onsite to southeast Low point along Main delayed by 6.0 min Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 4L: LOT F - To SW Property Corner along Main Street Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 330,370 sf Runoff Volume = 67,671 cf Average Runoff Depth = 2.46"
67.58% Pervious = 223,249 sf 32.42% Impervious = 107,121 sf

1.9.2.1 Road A – (100 Year)



Routing Diagram for Prop DEF Conv
Prepared by HP Inc., Printed 7/17/2020
HydroCAD® 10.00-25 s/n 06611 © 2019 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,877	39	>75% Grass cover, Good, HSG A (P1, P11, P2, P3, P4, P5, P6)
31,013	61	>75% Grass cover, Good, HSG B (P3, P4, P5, P6)
16,667	30	Brush, Good, HSG A (P11, P3, P5)
368	73	Brush, Good, HSG D (P11)
21,703	98	Paved roads w/curbs & sewers, HSG A (P1, P2, P3, P4, P5)
11,402	98	Paved roads w/curbs & sewers, HSG B (P3, P4, P5)
1,071	98	Unconnected roofs, HSG A (P3, P5)
146,101	**57**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
103,318	HSG A	P1, P11, P2, P3, P4, P5, P6
42,415	HSG B	P3, P4, P5, P6
0	HSG C	
368	HSG D	P11
0	Other	
146,101		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
63,877	31,013	0	0	0	94,890	>75% Grass cover, Good
16,667	0	0	368	0	17,035	Brush, Good
21,703	11,402	0	0	0	33,105	Paved roads w/curbs & sewers
1,071	0	0	0	0	1,071	Unconnected roofs
103,318	**42,415**	**0**	**368**	**0**	**146,101**	**TOTAL AREA**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: CB1 Runoff Area=12,362 sf 37.57% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=61 Runoff=0.74 cfs 2,418 cf

Subcatchment P11: FOREBAY 1 Runoff Area=7,767 sf 0.00% Impervious Runoff Depth=0.48"
Tc=6.0 min CN=37 Runoff=0.03 cfs 308 cf

Subcatchment P2: CB2 Runoff Area=10,903 sf 49.32% Impervious Runoff Depth=3.01"
Tc=6.0 min CN=68 Runoff=0.86 cfs 2,735 cf

Subcatchment P3: CB3 Runoff Area=45,223 sf 12.98% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=45 Runoff=0.84 cfs 3,808 cf

Subcatchment P4: CB4 Runoff Area=7,404 sf 63.44% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=82 Runoff=0.86 cfs 2,745 cf

Subcatchment P5: CB5 Runoff Area=45,437 sf 29.90% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=66 Runoff=3.34 cfs 10,665 cf

Subcatchment P6: CB6 Runoff Area=17,005 sf 0.00% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=49 Runoff=0.48 cfs 1,866 cf

Pond 1: CB1 Peak Elev=141.94' Inflow=0.74 cfs 2,418 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.74 cfs 2,418 cf

Pond 2: CB2 Peak Elev=141.97' Inflow=0.86 cfs 2,735 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.1000 '/' Outflow=0.86 cfs 2,735 cf

Pond 3: CB3 Peak Elev=131.76' Inflow=0.84 cfs 3,808 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.84 cfs 3,808 cf

Pond 4: CB4 Peak Elev=131.77' Inflow=0.86 cfs 2,745 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.86 cfs 2,745 cf

Pond 5: CB5 Peak Elev=129.67' Inflow=3.34 cfs 10,665 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0343 '/' Outflow=3.34 cfs 10,665 cf

Pond 6: CB6 Peak Elev=130.10' Inflow=0.48 cfs 1,866 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.48 cfs 1,866 cf

Pond D1: MC-3500 8R7C Peak Elev=128.02' Storage=2,364 cf Inflow=2.94 cfs 9,764 cf
Discarded=0.61 cfs 9,764 cf Primary=0.00 cfs 0 cf Outflow=0.61 cfs 9,764 cf

Pond FB1: FOREBAY 1 Peak Elev=126.50' Storage=6 cf Inflow=0.03 cfs 308 cf
Outflow=0.03 cfs 308 cf

Pond MH1: MH1 Peak Elev=140.68' Inflow=1.60 cfs 5,153 cf
12.0" Round Culvert n=0.012 L=110.0' S=0.0702 '/' Outflow=1.60 cfs 5,153 cf

Pond MH2: MH2 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=46.0' S=0.0467 '/' Primary=0.00 cfs 0 cf

Pond MH3: MH3 Peak Elev=131.67' Inflow=2.46 cfs 7,899 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=2.46 cfs 7,899 cf

Pond MH4: MH4 Peak Elev=131.76' Inflow=2.94 cfs 9,764 cf
15.0" Round Culvert n=0.012 L=100.0' S=0.0200 '/' Outflow=2.94 cfs 9,764 cf

Pond MH5: MH5 Peak Elev=129.12' Inflow=3.34 cfs 10,665 cf
18.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=3.34 cfs 10,665 cf

Pond MH6: MH6 Peak Elev=128.72' Inflow=2.94 cfs 9,764 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0400 '/' Outflow=2.94 cfs 9,764 cf

Pond MH7: MH7 Peak Elev=126.50' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.012 L=90.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Total Runoff Area = 146,101 sf Runoff Volume = 24,546 cf Average Runoff Depth = 2.02"
76.61% Pervious = 111,925 sf 23.39% Impervious = 34,176 sf

Summary for Subcatchment P1: CB1

Runoff = 0.74 cfs @ 12.10 hrs, Volume= 2,418 cf, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
4,645	98	Paved roads w/curbs & sewers, HSG A
7,717	39	>75% Grass cover, Good, HSG A
12,362	61	Weighted Average
7,717		62.43% Pervious Area
4,645		37.57% Impervious Area

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

Summary for Subcatchment P11: FOREBAY 1

Runoff = 0.03 cfs @ 12.35 hrs, Volume= 308 cf, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
4,399	39	>75% Grass cover, Good, HSG A
3,000	30	Brush, Good, HSG A
368	73	Brush, Good, HSG D
7,767	37	Weighted Average
7,767		100.00% Pervious Area

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

Summary for Subcatchment P2: CB2

Runoff = 0.86 cfs @ 12.10 hrs, Volume= 2,735 cf, Depth= 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
5,377	98	Paved roads w/curbs & sewers, HSG A
5,526	39	>75% Grass cover, Good, HSG A
10,903	68	Weighted Average
5,526		50.68% Pervious Area
5,377		49.32% Impervious Area

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

Summary for Subcatchment P3: CB3

Runoff = 0.84 cfs @ 12.12 hrs, Volume= 3,808 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
3,616	98	Paved roads w/curbs & sewers, HSG A
1,801	98	Paved roads w/curbs & sewers, HSG B
27,359	39	>75% Grass cover, Good, HSG A
1,185	61	>75% Grass cover, Good, HSG B
455	98	Unconnected roofs, HSG A
10,807	30	Brush, Good, HSG A
45,223	45	Weighted Average
39,351		87.02% Pervious Area
5,872		12.98% Impervious Area
455		7.75% Unconnected

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

Summary for Subcatchment P4: CB4

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 2,745 cf, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,937	98	Paved roads w/curbs & sewers, HSG A
2,760	98	Paved roads w/curbs & sewers, HSG B
687	39	>75% Grass cover, Good, HSG A
2,020	61	>75% Grass cover, Good, HSG B
7,404	82	Weighted Average
2,707		36.56% Pervious Area
4,697		63.44% Impervious Area

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

Summary for Subcatchment P5: CB5

Runoff = 3.34 cfs @ 12.10 hrs, Volume= 10,665 cf, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
6,128	98	Paved roads w/curbs & sewers, HSG A
6,841	98	Paved roads w/curbs & sewers, HSG B
8,825	39	>75% Grass cover, Good, HSG A
20,167	61	>75% Grass cover, Good, HSG B
616	98	Unconnected roofs, HSG A
2,860	30	Brush, Good, HSG A
45,437	66	Weighted Average
31,852		70.10% Pervious Area
13,585		29.90% Impervious Area
616		4.53% Unconnected

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

Summary for Subcatchment P6: CB6

Runoff = 0.48 cfs @ 12.11 hrs, Volume= 1,866 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
9,364	39	>75% Grass cover, Good, HSG A
7,641	61	>75% Grass cover, Good, HSG B
17,005	49	Weighted Average
17,005		100.00% Pervious Area

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

Summary for Pond 1: CB1

Inflow Area = 12,362 sf, 37.57% Impervious, Inflow Depth = 2.35" for 100 yr event
Inflow = 0.74 cfs @ 12.10 hrs, Volume= 2,418 cf
Outflow = 0.74 cfs @ 12.10 hrs, Volume= 2,418 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.10 hrs, Volume= 2,418 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 141.94' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	**12.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 140.00' S= 0.1000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.10 hrs HW=141.94' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.74 cfs @ 2.25 fps)

Summary for Pond 2: CB2

Inflow Area = 10,903 sf, 49.32% Impervious, Inflow Depth = 3.01" for 100 yr event
Inflow = 0.86 cfs @ 12.10 hrs, Volume= 2,735 cf
Outflow = 0.86 cfs @ 12.10 hrs, Volume= 2,735 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.10 hrs, Volume= 2,735 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 141.97' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	**12.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 140.00' S= 0.1000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.10 hrs HW=141.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.85 cfs @ 2.34 fps)

Summary for Pond 3: CB3

Inflow Area = 45,223 sf, 12.98% Impervious, Inflow Depth = 1.01" for 100 yr event
Inflow = 0.84 cfs @ 12.12 hrs, Volume= 3,808 cf
Outflow = 0.84 cfs @ 12.12 hrs, Volume= 3,808 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.12 hrs, Volume= 3,808 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.76' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.23'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 131.23' / 131.13' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.12 hrs HW=131.75' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.81 cfs @ 2.84 fps)

Summary for Pond 4: CB4

Inflow Area = 7,404 sf, 63.44% Impervious, Inflow Depth = 4.45" for 100 yr event
Inflow = 0.86 cfs @ 12.09 hrs, Volume= 2,745 cf
Outflow = 0.86 cfs @ 12.09 hrs, Volume= 2,745 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.09 hrs, Volume= 2,745 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.77' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.23'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 131.23' / 131.13' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.09 hrs HW=131.76' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.84 cfs @ 2.86 fps)

Summary for Pond 5: CB5

Inflow Area = 45,437 sf, 29.90% Impervious, Inflow Depth = 2.82" for 100 yr event
Inflow = 3.34 cfs @ 12.10 hrs, Volume= 10,665 cf
Outflow = 3.34 cfs @ 12.10 hrs, Volume= 10,665 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.34 cfs @ 12.10 hrs, Volume= 10,665 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 129.67' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.39'	**12.0" Round Culvert** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.39' / 128.15' S= 0.0343 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=3.31 cfs @ 12.10 hrs HW=129.66' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.31 cfs @ 4.21 fps)

Summary for Pond 6: CB6

Inflow Area = 17,005 sf, 0.00% Impervious, Inflow Depth = 1.32" for 100 yr event
Inflow = 0.48 cfs @ 12.11 hrs, Volume= 1,866 cf
Outflow = 0.48 cfs @ 12.11 hrs, Volume= 1,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.48 cfs @ 12.11 hrs, Volume= 1,866 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 130.10' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	129.75'	**12.0" Round Culvert** L= 87.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 129.75' / 128.88' S= 0.0100 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.11 hrs HW=130.09' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.47 cfs @ 1.99 fps)

Summary for Pond D1: MC-3500 8R7C

Inflow Area =	47,674 sf,	30.87% Impervious,	Inflow Depth =	2.46"	for 100 yr event
Inflow =	2.94 cfs @	12.10 hrs, Volume=	9,764 cf		
Outflow =	0.61 cfs @	11.85 hrs, Volume=	9,764 cf,	Atten= 79%,	Lag= 0.0 min
Discarded =	0.61 cfs @	11.85 hrs, Volume=	9,764 cf		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.02' @ 12.56 hrs Surf.Area= 3,176 sf Storage= 2,364 cf

Plug-Flow detention time= 23.8 min calculated for 9,752 cf (100% of inflow)
Center-of-Mass det. time= 23.7 min (867.3 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.75'	4,430 cf	**56.83'W x 55.89'L x 5.50'H Field A** 17,470 cf Overall - 6,396 cf Embedded = 11,075 cf x 40.0% Voids
#2A	127.50'	6,396 cf	**ADS_StormTech MC-3500 d +Cap** x 56 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 56 Chambers in 8 Rows Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf
		10,826 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	128.50'	**12.0" Round RCP_Round 12"** L= 96.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 128.50' / 126.50' S= 0.0208 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.61 cfs @ 11.85 hrs HW=126.81' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.75' (Free Discharge)
└**2=RCP_Round 12"** (Controls 0.00 cfs)

Summary for Pond FB1: FOREBAY 1

Inflow Area =	7,767 sf,	0.00% Impervious,	Inflow Depth =	0.48"	for 100 yr event
Inflow =	0.03 cfs @	12.35 hrs, Volume=	308 cf		
Outflow =	0.03 cfs @	12.40 hrs, Volume=	308 cf,	Atten= 3%,	Lag= 3.1 min
Discarded =	0.03 cfs @	12.40 hrs, Volume=	308 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.50' @ 12.40 hrs Surf.Area= 1,374 sf Storage= 6 cf

Plug-Flow detention time= 3.0 min calculated for 308 cf (100% of inflow)
Center-of-Mass det. time= 3.0 min (963.6 - 960.6)

Volume	Invert	Avail.Storage	Storage Description
#1	126.50'	9,136 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
126.50	1,370	0	0
127.00	1,876	812	812
128.00	2,444	2,160	2,972
129.00	3,068	2,756	5,728
130.00	3,748	3,408	9,136

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.26 cfs @ 12.40 hrs HW=126.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Summary for Pond MH1: MH1

Inflow Area = 23,265 sf, 43.08% Impervious, Inflow Depth = 2.66" for 100 yr event
Inflow = 1.60 cfs @ 12.10 hrs, Volume= 5,153 cf
Outflow = 1.60 cfs @ 12.10 hrs, Volume= 5,153 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.60 cfs @ 12.10 hrs, Volume= 5,153 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 140.68' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**12.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 132.28' S= 0.0702 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.10 hrs HW=140.68' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.59 cfs @ 2.80 fps)

Summary for Pond MH2: MH2

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	**12.0" Round Culvert** L= 46.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 141.75' S= 0.0467 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond MH3: MH3

Inflow Area =	30,669 sf, 47.99% Impervious, Inflow Depth = 3.09" for 100 yr event				
Inflow =	2.46 cfs @	12.09 hrs, Volume=	7,899 cf		
Outflow =	2.46 cfs @	12.09 hrs, Volume=	7,899 cf, Atten= 0%, Lag= 0.0 min		
Primary =	2.46 cfs @	12.09 hrs, Volume=	7,899 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.67' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	130.88'	**15.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.88' / 128.88' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=2.42 cfs @ 12.09 hrs HW=131.66' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.42 cfs @ 3.01 fps)

Summary for Pond MH4: MH4

Inflow Area =	47,674 sf, 30.87% Impervious, Inflow Depth = 2.46" for 100 yr event				
Inflow =	2.94 cfs @	12.10 hrs, Volume=	9,764 cf		
Outflow =	2.94 cfs @	12.10 hrs, Volume=	9,764 cf, Atten= 0%, Lag= 0.0 min		
Primary =	2.94 cfs @	12.10 hrs, Volume=	9,764 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 131.76' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	130.88'	**15.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.88' / 128.88' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=2.91 cfs @ 12.10 hrs HW=131.75' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.91 cfs @ 3.18 fps)

Summary for Pond MH5: MH5

Inflow Area =	45,437 sf, 29.90% Impervious, Inflow Depth = 2.82" for 100 yr event				
Inflow =	3.34 cfs @	12.10 hrs, Volume=	10,665 cf		
Outflow =	3.34 cfs @	12.10 hrs, Volume=	10,665 cf, Atten= 0%, Lag= 0.0 min		
Primary =	3.34 cfs @	12.10 hrs, Volume=	10,665 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Peak Elev= 129.12' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.10'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.10' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=3.31 cfs @ 12.10 hrs HW=129.11' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.31 cfs @ 3.70 fps)

Summary for Pond MH6: MH6

Inflow Area = 47,674 sf, 30.87% Impervious, Inflow Depth = 2.46" for 100 yr event
Inflow = 2.94 cfs @ 12.10 hrs, Volume= 9,764 cf
Outflow = 2.94 cfs @ 12.10 hrs, Volume= 9,764 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.94 cfs @ 12.10 hrs, Volume= 9,764 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 128.72' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**24.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.60' S= 0.0400 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=2.91 cfs @ 12.10 hrs HW=128.72' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.91 cfs @ 2.88 fps)

Summary for Pond MH7: MH7

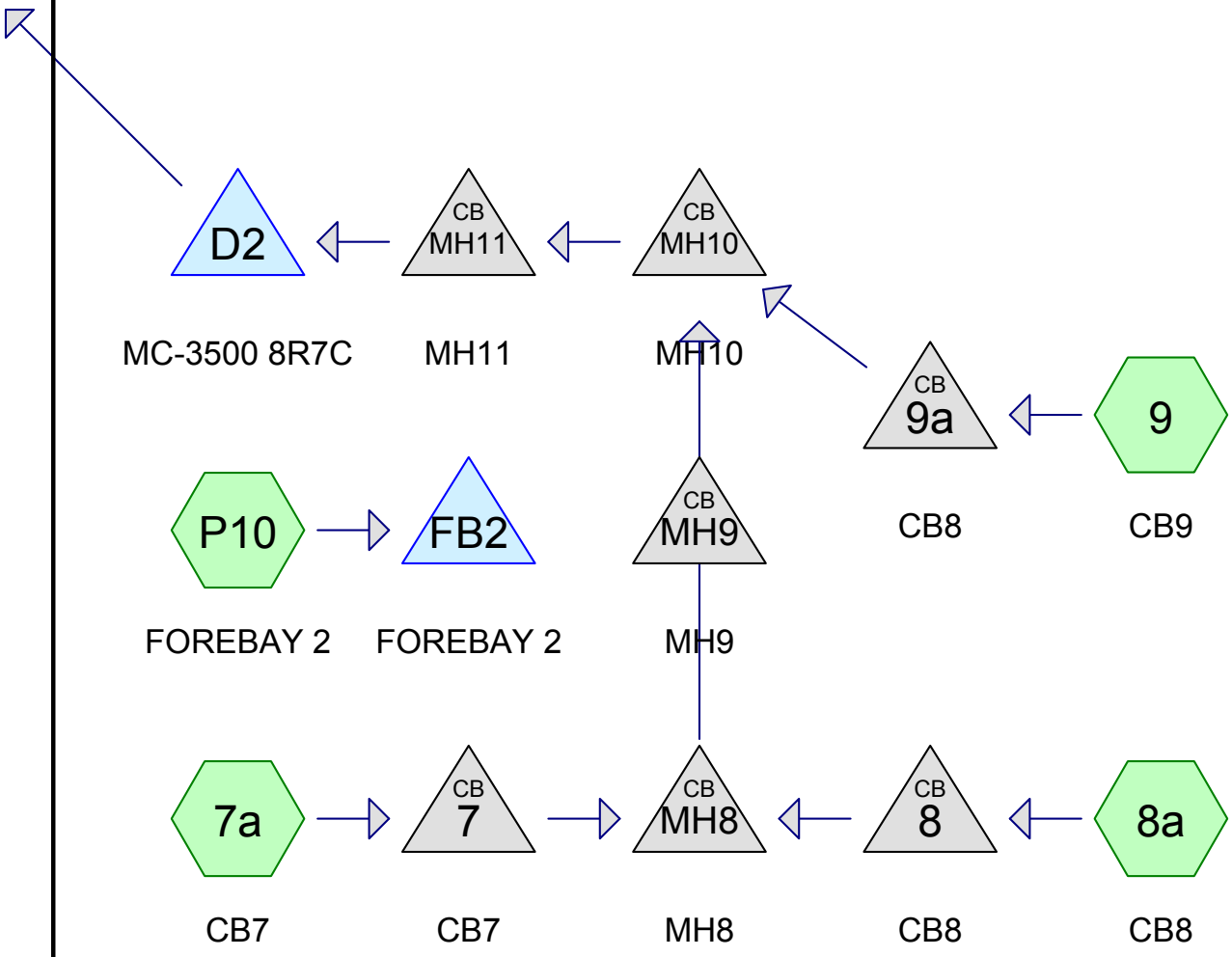
Inflow Area = 47,674 sf, 30.87% Impervious, Inflow Depth = 0.00" for 100 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

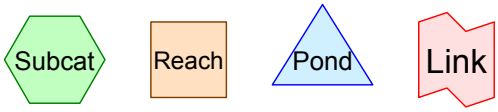
Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.50' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.50' / 125.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.50' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

1.9.2.2 Road B – (100 Year)





Routing Diagram for Prop DEF Conv
Prepared by HP Inc., Printed 7/17/2020
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,310	39	>75% Grass cover, Good, HSG A (7a, 8a, 9, P10)
137	61	>75% Grass cover, Good, HSG B (7a)
2,000	30	Brush, Good, HSG A (P10)
536	73	Brush, Good, HSG D (P10)
20,564	98	Paved roads w/curbs & sewers, HSG A (7a, 8a, 9)
385	98	Paved roads w/curbs & sewers, HSG B (7a)
10,046	98	Roofs, HSG A (8a, 9)
96,978	**58**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
95,920	HSG A	7a, 8a, 9, P10
522	HSG B	7a
0	HSG C	
536	HSG D	P10
0	Other	
96,978		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
63,310	137	0	0	0	63,447	>75% Grass cover, Good
2,000	0	0	536	0	2,536	Brush, Good
20,564	385	0	0	0	20,949	Paved roads w/curbs & sewers
10,046	0	0	0	0	10,046	Roofs
95,920	**522**	**0**	**536**	**0**	**96,978**	**TOTAL AREA**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7a: CB7 Runoff Area=3,472 sf 76.58% Impervious Runoff Depth=4.78"
Tc=6.0 min CN=85 Runoff=0.43 cfs 1,382 cf

Subcatchment 8a: CB8 Runoff Area=15,335 sf 39.20% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=62 Runoff=0.96 cfs 3,117 cf

Subcatchment 9: CB9 Runoff Area=73,562 sf 30.35% Impervious Runoff Depth=1.99"
Flow Length=340' Tc=9.5 min CN=57 Runoff=3.22 cfs 12,183 cf

Subcatchment P10: FOREBAY 2 Runoff Area=4,609 sf 0.00% Impervious Runoff Depth=0.60"
Tc=6.0 min CN=39 Runoff=0.03 cfs 230 cf

Pond 7: CB7 Peak Elev=134.12' Inflow=0.43 cfs 1,382 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.43 cfs 1,382 cf

Pond 8: CB8 Peak Elev=134.32' Inflow=0.96 cfs 3,117 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0200 '/' Outflow=0.96 cfs 3,117 cf

Pond 9a: CB8 Peak Elev=129.75' Inflow=3.22 cfs 12,183 cf
12.0" Round Culvert n=0.012 L=6.0' S=0.0600 '/' Outflow=3.22 cfs 12,183 cf

Pond D2: MC-3500 8R7C Peak Elev=129.04' Storage=5,030 cf Inflow=4.41 cfs 16,682 cf
Discarded=0.61 cfs 15,867 cf Primary=0.35 cfs 815 cf Outflow=0.96 cfs 16,682 cf

Pond FB2: FOREBAY 2 Peak Elev=126.76' Storage=5 cf Inflow=0.03 cfs 230 cf
Outflow=0.03 cfs 230 cf

Pond MH10: MH10 Peak Elev=129.46' Inflow=4.41 cfs 16,682 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=4.41 cfs 16,682 cf

Pond MH11: MH11 Peak Elev=129.16' Inflow=4.41 cfs 16,682 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=4.41 cfs 16,682 cf

Pond MH8: MH8 Peak Elev=134.22' Inflow=1.39 cfs 4,499 cf
12.0" Round Culvert n=0.012 L=92.0' S=0.0489 '/' Outflow=1.39 cfs 4,499 cf

Pond MH9: MH9 Peak Elev=0.00'
12.0" Round Culvert n=0.012 L=64.0' S=0.0145 '/' Primary=0.00 cfs 0 cf

Total Runoff Area = 96,978 sf Runoff Volume = 16,912 cf Average Runoff Depth = 2.09"
68.04% Pervious = 65,983 sf 31.96% Impervious = 30,995 sf

Summary for Subcatchment 7a: CB7

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 1,382 cf, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,274	98	Paved roads w/curbs & sewers, HSG A
385	98	Paved roads w/curbs & sewers, HSG B
676	39	>75% Grass cover, Good, HSG A
137	61	>75% Grass cover, Good, HSG B
3,472	85	Weighted Average
813		23.42% Pervious Area
2,659		76.58% Impervious Area

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

Summary for Subcatchment 8a: CB8

Runoff = 0.96 cfs @ 12.10 hrs, Volume= 3,117 cf, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
3,845	98	Paved roads w/curbs & sewers, HSG A
9,324	39	>75% Grass cover, Good, HSG A
2,166	98	Roofs, HSG A
15,335	62	Weighted Average
9,324		60.80% Pervious Area
6,011		39.20% Impervious Area

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

Summary for Subcatchment 9: CB9

Runoff = 3.22 cfs @ 12.15 hrs, Volume= 12,183 cf, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
14,445	98	Paved roads w/curbs & sewers, HSG A
51,237	39	>75% Grass cover, Good, HSG A
7,880	98	Roofs, HSG A
73,562	57	Weighted Average
51,237		69.65% Pervious Area
22,325		30.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.10"
1.2	290	0.0600	3.94		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
9.5	340	Total			

Summary for Subcatchment P10: FOREBAY 2

Runoff = 0.03 cfs @ 12.29 hrs, Volume= 230 cf, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,073	39	>75% Grass cover, Good, HSG A
2,000	30	Brush, Good, HSG A
536	73	Brush, Good, HSG D
4,609	39	Weighted Average
4,609		100.00% Pervious Area

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

Summary for Pond 7: CB7

Inflow Area = 3,472 sf, 76.58% Impervious, Inflow Depth = 4.78" for 100 yr event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 1,382 cf
Outflow = 0.43 cfs @ 12.09 hrs, Volume= 1,382 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.09 hrs, Volume= 1,382 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 134.12' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.80' / 133.60' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=134.12' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.42 cfs @ 1.92 fps)

Summary for Pond 8: CB8

Inflow Area =	15,335 sf, 39.20% Impervious, Inflow Depth = 2.44" for 100 yr event				
Inflow =	0.96 cfs @	12.10 hrs, Volume=	3,117 cf		
Outflow =	0.96 cfs @	12.10 hrs, Volume=	3,117 cf, Atten= 0%, Lag= 0.0 min		
Primary =	0.96 cfs @	12.10 hrs, Volume=	3,117 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 134.32' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.80' / 133.60' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.10 hrs HW=134.32' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.96 cfs @ 3.40 fps)

Summary for Pond 9a: CB8

Inflow Area =	73,562 sf, 30.35% Impervious, Inflow Depth = 1.99" for 100 yr event				
Inflow =	3.22 cfs @	12.15 hrs, Volume=	12,183 cf		
Outflow =	3.22 cfs @	12.15 hrs, Volume=	12,183 cf, Atten= 0%, Lag= 0.0 min		
Primary =	3.22 cfs @	12.15 hrs, Volume=	12,183 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 129.75' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.53'	**12.0" Round Culvert** L= 6.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.53' / 128.17' S= 0.0600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.22 cfs @ 12.15 hrs HW=129.75' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.22 cfs @ 4.09 fps)

Summary for Pond D2: MC-3500 8R7C

Inflow Area =	92,369 sf, 33.56% Impervious, Inflow Depth = 2.17" for 100 yr event				
Inflow =	4.41 cfs @	12.13 hrs, Volume=	16,682 cf		
Outflow =	0.96 cfs @	12.66 hrs, Volume=	16,682 cf, Atten= 78%, Lag= 31.8 min		
Discarded =	0.61 cfs @	11.80 hrs, Volume=	15,867 cf		
Primary =	0.35 cfs @	12.66 hrs, Volume=	815 cf		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Peak Elev= 129.04' @ 12.66 hrs Surf.Area= 3,176 sf Storage= 5,030 cf

Plug-Flow detention time= 61.6 min calculated for 16,662 cf (100% of inflow)
Center-of-Mass det. time= 61.5 min (921.5 - 860.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.75'	4,430 cf	**56.83'W x 55.89'L x 5.50'H Field A** 17,470 cf Overall - 6,396 cf Embedded = 11,075 cf x 40.0% Voids
#2A	127.50'	6,396 cf	**ADS_StormTech MC-3500 d +Cap** x 56 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 56 Chambers in 8 Rows Cap Storage= +14.9 cf x 2 x 8 rows = 238.4 cf
		10,826 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	128.75'	**12.0" Round RCP_Round 12"** L= 84.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 128.75' / 125.60' S= 0.0375 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.61 cfs @ 11.80 hrs HW=126.81' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=0.35 cfs @ 12.66 hrs HW=129.04' (Free Discharge)
└**2=RCP_Round 12"** (Inlet Controls 0.35 cfs @ 1.84 fps)

Summary for Pond FB2: FOREBAY 2

Inflow Area = 4,609 sf, 0.00% Impervious, Inflow Depth = 0.60" for 100 yr event
Inflow = 0.03 cfs @ 12.29 hrs, Volume= 230 cf
Outflow = 0.03 cfs @ 12.34 hrs, Volume= 230 cf, Atten= 2%, Lag= 2.8 min
Discarded = 0.03 cfs @ 12.34 hrs, Volume= 230 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 126.76' @ 12.34 hrs Surf.Area= 742 sf Storage= 5 cf

Plug-Flow detention time= 2.8 min calculated for 229 cf (100% of inflow)
Center-of-Mass det. time= 2.8 min (946.2 - 943.4)

Volume	Invert	Avail.Storage	Storage Description
#1	126.75'	5,254 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
126.75	738	0	0
127.00	886	203	203
128.00	1,444	1,165	1,368
129.00	1,932	1,688	3,056
130.00	2,464	2,198	5,254

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.75'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 12.34 hrs HW=126.76' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Summary for Pond MH10: MH10

Inflow Area = 92,369 sf, 33.56% Impervious, Inflow Depth = 2.17" for 100 yr event
Inflow = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf
Outflow = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 129.46' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.12'	**15.0" Round Culvert** L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.12' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=4.33 cfs @ 12.13 hrs HW=129.44' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.33 cfs @ 4.15 fps)

Summary for Pond MH11: MH11

Inflow Area = 92,369 sf, 33.56% Impervious, Inflow Depth = 2.17" for 100 yr event
Inflow = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf
Outflow = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.41 cfs @ 12.13 hrs, Volume= 16,682 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 129.16' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.10'	**24.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 128.10' / 128.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=4.33 cfs @ 12.13 hrs HW=129.15' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.33 cfs @ 3.78 fps)

Summary for Pond MH8: MH8

Inflow Area = 18,807 sf, 46.10% Impervious, Inflow Depth = 2.87" for 100 yr event
Inflow = 1.39 cfs @ 12.10 hrs, Volume= 4,499 cf
Outflow = 1.39 cfs @ 12.10 hrs, Volume= 4,499 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.39 cfs @ 12.10 hrs, Volume= 4,499 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 134.22' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.60'	**12.0" Round Culvert** L= 92.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.60' / 129.10' S= 0.0489 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

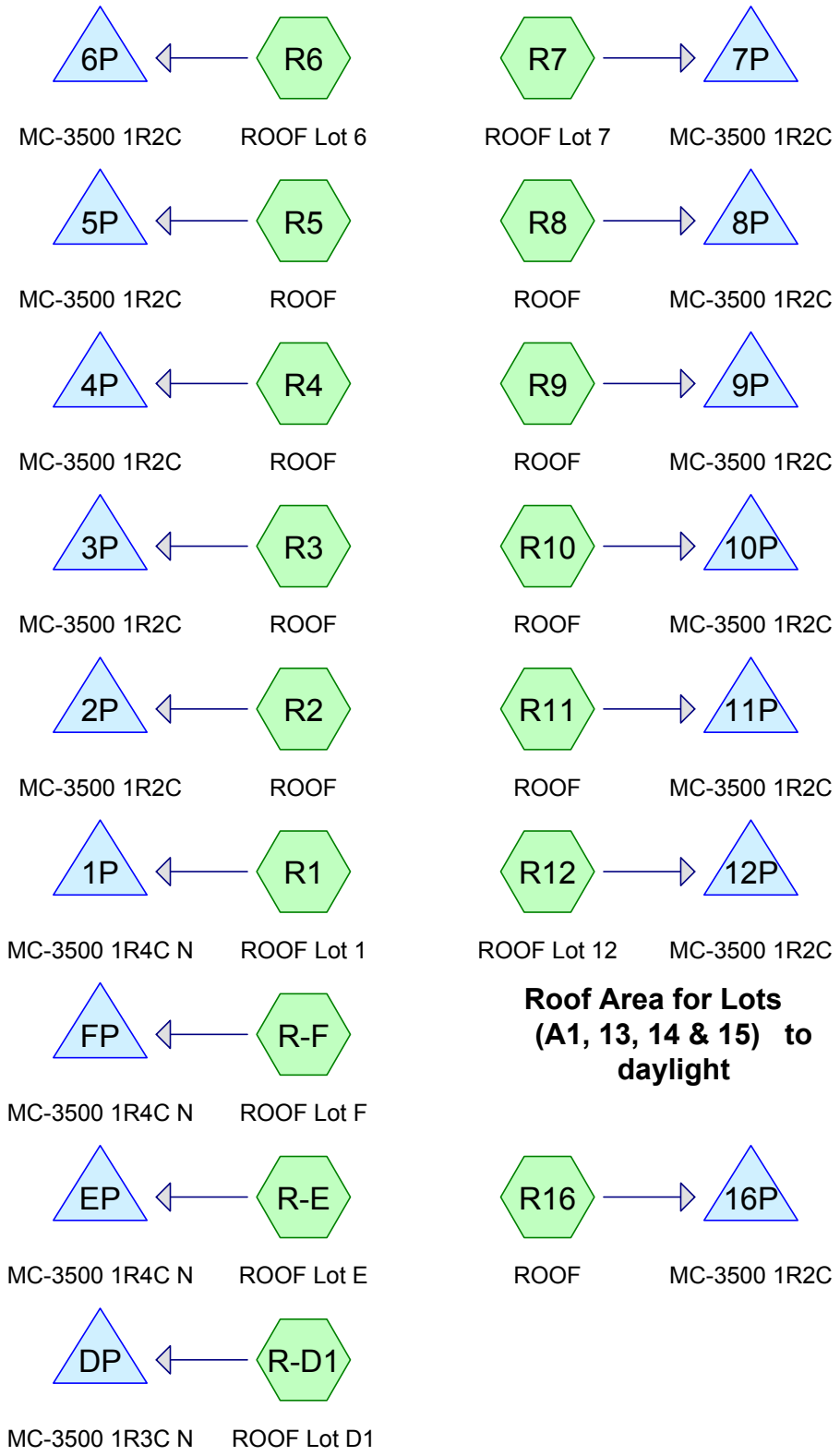
Primary OutFlow Max=1.37 cfs @ 12.10 hrs HW=134.22' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.37 cfs @ 2.68 fps)

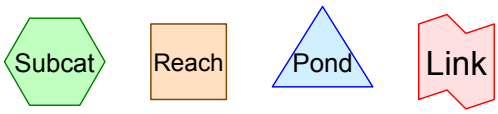
Summary for Pond MH9: MH9

Device	Routing	Invert	Outlet Devices
#1	Primary	129.10'	**12.0" Round Culvert** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 129.10' / 128.17' S= 0.0145 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

1.9.2.3 Roof Drywells – (100 Year)





Routing Diagram for Prop DEF Conv
Prepared by HP Inc., Printed 7/17/2020
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
33,008	98	Roofs, HSG A (R-D1, R-E, R-F, R1, R10, R11, R12, R16, R2, R3, R4, R6, R7, R8)
7,026	98	Roofs, HSG B (R4, R5, R6, R8, R9)
40,034	**98**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
33,008	HSG A	R-D1, R-E, R-F, R1, R10, R11, R12, R16, R2, R3, R4, R6, R7, R8
7,026	HSG B	R4, R5, R6, R8, R9
0	HSG C	
0	HSG D	
0	Other	
40,034		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
33,008	7,026	0	0	0	40,034	Roofs	R-D1, R-E, R-F, R1, R10, R11, R12, R16, R2, R3, R4, R5, R6, R7, R8, R9
33,008	**7,026**	**0**	**0**	**0**	**40,034**	**TOTAL AREA**	

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment R-D1: ROOF Lot D1 Runoff Area=3,048 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.44 cfs 1,590 cf

Subcatchment R-E: ROOF Lot E Runoff Area=2,864 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.41 cfs 1,494 cf

Subcatchment R-F: ROOF Lot F Runoff Area=3,406 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.49 cfs 1,777 cf

Subcatchment R1: ROOF Lot 1 Runoff Area=3,357 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.48 cfs 1,752 cf

Subcatchment R10: ROOF Runoff Area=2,512 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.36 cfs 1,311 cf

Subcatchment R11: ROOF Runoff Area=1,974 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.28 cfs 1,030 cf

Subcatchment R12: ROOF Lot 12 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.26 cfs 939 cf

Subcatchment R16: ROOF Runoff Area=2,040 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.29 cfs 1,064 cf

Subcatchment R2: ROOF Runoff Area=2,967 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.42 cfs 1,548 cf

Subcatchment R3: ROOF Runoff Area=2,200 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.31 cfs 1,148 cf

Subcatchment R4: ROOF Runoff Area=2,308 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.33 cfs 1,204 cf

Subcatchment R5: ROOF Runoff Area=2,216 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.32 cfs 1,156 cf

Subcatchment R6: ROOF Lot 6 Runoff Area=2,440 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.35 cfs 1,273 cf

Subcatchment R7: ROOF Lot 7 Runoff Area=2,814 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 1,468 cf

Subcatchment R8: ROOF Runoff Area=2,092 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 1,092 cf

Subcatchment R9: ROOF Runoff Area=1,996 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98 Runoff=0.29 cfs 1,041 cf

Pond 1P: MC-3500 1R4C N	Peak Elev=3.43'	Storage=581 cf	Inflow=0.48 cfs	1,752 cf
			Outflow=0.05 cfs	1,752 cf
Pond 2P: MC-3500 1R2C	Peak Elev=5.79'	Storage=560 cf	Inflow=0.42 cfs	1,548 cf
			Outflow=0.03 cfs	1,548 cf
Pond 3P: MC-3500 1R2C	Peak Elev=3.53'	Storage=372 cf	Inflow=0.31 cfs	1,148 cf
			Outflow=0.03 cfs	1,148 cf
Pond 4P: MC-3500 1R2C	Peak Elev=3.81'	Storage=399 cf	Inflow=0.33 cfs	1,204 cf
			Outflow=0.03 cfs	1,204 cf
Pond 5P: MC-3500 1R2C	Peak Elev=3.57'	Storage=376 cf	Inflow=0.32 cfs	1,156 cf
			Outflow=0.03 cfs	1,156 cf
Pond 6P: MC-3500 1R2C	Peak Elev=4.20'	Storage=432 cf	Inflow=0.35 cfs	1,273 cf
			Outflow=0.03 cfs	1,273 cf
Pond 7P: MC-3500 1R2C	Peak Elev=5.22'	Storage=519 cf	Inflow=0.40 cfs	1,468 cf
			Outflow=0.03 cfs	1,468 cf
Pond 8P: MC-3500 1R2C	Peak Elev=3.27'	Storage=346 cf	Inflow=0.30 cfs	1,092 cf
			Outflow=0.03 cfs	1,092 cf
Pond 9P: MC-3500 1R2C	Peak Elev=3.06'	Storage=324 cf	Inflow=0.29 cfs	1,041 cf
			Outflow=0.03 cfs	1,041 cf
Pond 10P: MC-3500 1R2C	Peak Elev=4.46'	Storage=451 cf	Inflow=0.36 cfs	1,311 cf
			Outflow=0.03 cfs	1,311 cf
Pond 11P: MC-3500 1R2C	Peak Elev=3.01'	Storage=318 cf	Inflow=0.28 cfs	1,030 cf
			Outflow=0.03 cfs	1,030 cf
Pond 12P: MC-3500 1R2C	Peak Elev=2.66'	Storage=279 cf	Inflow=0.26 cfs	939 cf
			Outflow=0.03 cfs	939 cf
Pond 16P: MC-3500 1R2C	Peak Elev=3.16'	Storage=334 cf	Inflow=0.29 cfs	1,064 cf
			Outflow=0.03 cfs	1,064 cf
Pond DP: MC-3500 1R3C N	Peak Elev=4.39'	Storage=558 cf	Inflow=0.44 cfs	1,590 cf
			Outflow=0.04 cfs	1,590 cf
Pond EP: MC-3500 1R4C N	Peak Elev=2.74'	Storage=462 cf	Inflow=0.41 cfs	1,494 cf
			Outflow=0.05 cfs	1,494 cf
Pond FP: MC-3500 1R4C N	Peak Elev=3.50'	Storage=593 cf	Inflow=0.49 cfs	1,777 cf
			Outflow=0.05 cfs	1,777 cf

Total Runoff Area = 40,034 sf Runoff Volume = 20,889 cf Average Runoff Depth = 6.26"
0.00% Pervious = 0 sf 100.00% Impervious = 40,034 sf

Summary for Subcatchment R-D1: ROOF Lot D1

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,590 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
3,048	98	Roofs, HSG A
3,048		100.00% Impervious Area

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

Summary for Subcatchment R-E: ROOF Lot E

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 1,494 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,864	98	Roofs, HSG A
2,864		100.00% Impervious Area

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

Summary for Subcatchment R-F: ROOF Lot F

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 1,777 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
3,406	98	Roofs, HSG A
3,406		100.00% Impervious Area

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

Summary for Subcatchment R1: ROOF Lot 1

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 1,752 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
3,357	98	Roofs, HSG A
3,357		100.00% Impervious Area

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

Summary for Subcatchment R10: ROOF

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,311 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,512	98	Roofs, HSG A
2,512		100.00% Impervious Area

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

Summary for Subcatchment R11: ROOF

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,030 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,974	98	Roofs, HSG A
1,974		100.00% Impervious Area

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

Summary for Subcatchment R12: ROOF Lot 12

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 939 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,800	98	Roofs, HSG A
1,800		100.00% Impervious Area

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

Summary for Subcatchment R16: ROOF

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 1,064 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,040	98	Roofs, HSG A
2,040		100.00% Impervious Area

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

Summary for Subcatchment R2: ROOF

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,548 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,967	98	Roofs, HSG A
2,967		100.00% Impervious Area

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

Summary for Subcatchment R3: ROOF

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 1,148 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,200	98	Roofs, HSG A
2,200		100.00% Impervious Area

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

Summary for Subcatchment R4: ROOF

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,204 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,456	98	Roofs, HSG A
852	98	Roofs, HSG B
2,308	98	Weighted Average
2,308		100.00% Impervious Area

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

Summary for Subcatchment R5: ROOF

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 1,156 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
0	98	Roofs, HSG A
2,216	98	Roofs, HSG B
2,216	98	Weighted Average
2,216		100.00% Impervious Area

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

Summary for Subcatchment R6: ROOF Lot 6

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,273 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,040	98	Roofs, HSG A
1,400	98	Roofs, HSG B
2,440	98	Weighted Average
2,440		100.00% Impervious Area

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

Summary for Subcatchment R7: ROOF Lot 7

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,468 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
2,814	98	Roofs, HSG A
2,814		100.00% Impervious Area

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

Summary for Subcatchment R8: ROOF

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 1,092 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,530	98	Roofs, HSG A
562	98	Roofs, HSG B
2,092	98	Weighted Average
2,092		100.00% Impervious Area

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

Summary for Subcatchment R9: ROOF

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 1,041 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=6.50"

Area (sf)	CN	Description
1,996	98	Roofs, HSG B
1,996		100.00% Impervious Area

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

Summary for Pond 1P: MC-3500 1R4C N

Inflow Area = 3,357 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 1,752 cf
Outflow = 0.05 cfs @ 11.40 hrs, Volume= 1,752 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.40 hrs, Volume= 1,752 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.43' @ 12.88 hrs Surf.Area= 245 sf Storage= 581 cf

Plug-Flow detention time= 82.2 min calculated for 1,749 cf (100% of inflow)
Center-of-Mass det. time= 82.1 min (826.1 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.40 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Summary for Pond 2P: MC-3500 1R2C

Inflow Area = 2,967 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,548 cf
Outflow = 0.03 cfs @ 11.20 hrs, Volume= 1,548 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.20 hrs, Volume= 1,548 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 5.79' @ 13.07 hrs Surf.Area= 177 sf Storage= 560 cf

Plug-Flow detention time= 117.2 min calculated for 1,548 cf (100% of inflow)
Center-of-Mass det. time= 117.2 min (861.2 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	325 cf	**8.42'W x 21.04'L x 6.00'H Field A** 1,063 cf Overall - 250 cf Embedded = 813 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		575 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.20 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 3P: MC-3500 1R2C

Inflow Area = 2,200 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.31 cfs @ 12.09 hrs, Volume= 1,148 cf
Outflow = 0.03 cfs @ 11.45 hrs, Volume= 1,148 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.45 hrs, Volume= 1,148 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.53' @ 12.82 hrs Surf.Area= 169 sf Storage= 372 cf

Plug-Flow detention time= 75.0 min calculated for 1,148 cf (100% of inflow)
Center-of-Mass det. time= 75.0 min (819.0 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.45 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 4P: MC-3500 1R2C

Inflow Area = 2,308 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,204 cf
Outflow = 0.03 cfs @ 11.40 hrs, Volume= 1,204 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.40 hrs, Volume= 1,204 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.81' @ 12.87 hrs Surf.Area= 169 sf Storage= 399 cf

Plug-Flow detention time= 81.8 min calculated for 1,203 cf (100% of inflow)
Center-of-Mass det. time= 81.7 min (825.7 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.40 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 5P: MC-3500 1R2C

Inflow Area = 2,216 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 1,156 cf
Outflow = 0.03 cfs @ 11.40 hrs, Volume= 1,156 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.40 hrs, Volume= 1,156 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.57' @ 12.83 hrs Surf.Area= 169 sf Storage= 376 cf

Plug-Flow detention time= 76.0 min calculated for 1,156 cf (100% of inflow)
Center-of-Mass det. time= 76.0 min (819.9 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.40 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 6P: MC-3500 1R2C

Inflow Area = 2,440 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 1,273 cf
Outflow = 0.03 cfs @ 11.30 hrs, Volume= 1,273 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.30 hrs, Volume= 1,273 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 4.20' @ 12.93 hrs Surf.Area= 169 sf Storage= 432 cf

Plug-Flow detention time= 90.3 min calculated for 1,273 cf (100% of inflow)
Center-of-Mass det. time= 90.3 min (834.3 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.30 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 7P: MC-3500 1R2C

Inflow Area = 2,814 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 1,468 cf
Outflow = 0.03 cfs @ 11.25 hrs, Volume= 1,468 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.25 hrs, Volume= 1,468 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 5.22' @ 13.02 hrs Surf.Area= 177 sf Storage= 519 cf

Plug-Flow detention time= 106.8 min calculated for 1,468 cf (100% of inflow)
Center-of-Mass det. time= 106.8 min (850.8 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	325 cf	**8.42'W x 21.04'L x 6.00'H Field A** 1,063 cf Overall - 250 cf Embedded = 813 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		575 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.25 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 8P: MC-3500 1R2C

Inflow Area = 2,092 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 1,092 cf
Outflow = 0.03 cfs @ 11.50 hrs, Volume= 1,092 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.50 hrs, Volume= 1,092 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.27' @ 12.77 hrs Surf.Area= 169 sf Storage= 346 cf

Plug-Flow detention time= 68.5 min calculated for 1,092 cf (100% of inflow)
Center-of-Mass det. time= 68.5 min (812.4 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.50 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 9P: MC-3500 1R2C

Inflow Area = 1,996 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 1,041 cf
Outflow = 0.03 cfs @ 11.55 hrs, Volume= 1,041 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.55 hrs, Volume= 1,041 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.06' @ 12.72 hrs Surf.Area= 169 sf Storage= 324 cf

Plug-Flow detention time= 62.9 min calculated for 1,041 cf (100% of inflow)
Center-of-Mass det. time= 62.9 min (806.9 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.55 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 10P: MC-3500 1R2C

Inflow Area = 2,512 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 1,311 cf
Outflow = 0.03 cfs @ 11.30 hrs, Volume= 1,311 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.30 hrs, Volume= 1,311 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 4.46' @ 12.96 hrs Surf.Area= 169 sf Storage= 451 cf

Plug-Flow detention time= 95.2 min calculated for 1,309 cf (100% of inflow)
Center-of-Mass det. time= 95.1 min (839.1 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.30 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 11P: MC-3500 1R2C

Inflow Area = 1,974 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 1,030 cf
Outflow = 0.03 cfs @ 11.55 hrs, Volume= 1,030 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.55 hrs, Volume= 1,030 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.01' @ 12.71 hrs Surf.Area= 169 sf Storage= 318 cf

Plug-Flow detention time= 61.7 min calculated for 1,030 cf (100% of inflow)
Center-of-Mass det. time= 61.6 min (805.6 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.55 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 12P: MC-3500 1R2C

Inflow Area = 1,800 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 939 cf
Outflow = 0.03 cfs @ 11.60 hrs, Volume= 939 cf, Atten= 87%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.60 hrs, Volume= 939 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 2.66' @ 12.65 hrs Surf.Area= 169 sf Storage= 279 cf

Plug-Flow detention time= 52.2 min calculated for 938 cf (100% of inflow)
Center-of-Mass det. time= 52.2 min (796.1 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.60 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 16P: MC-3500 1R2C

Inflow Area = 2,040 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 1,064 cf
Outflow = 0.03 cfs @ 11.50 hrs, Volume= 1,064 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.50 hrs, Volume= 1,064 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.16' @ 12.74 hrs Surf.Area= 169 sf Storage= 334 cf

Plug-Flow detention time= 65.5 min calculated for 1,063 cf (100% of inflow)
Center-of-Mass det. time= 65.4 min (809.4 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	271 cf	**8.42'W x 20.04'L x 5.50'H Field A** 928 cf Overall - 250 cf Embedded = 678 cf x 40.0% Voids
#2A	0.75'	250 cf	**ADS_StormTech MC-3500 d +Cap** x 2 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		521 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.50 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond DP: MC-3500 1R3C N

Inflow Area = 3,048 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 1,590 cf
Outflow = 0.04 cfs @ 11.25 hrs, Volume= 1,590 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.25 hrs, Volume= 1,590 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 4.39' @ 13.00 hrs Surf.Area= 195 sf Storage= 558 cf

Plug-Flow detention time= 103.6 min calculated for 1,588 cf (100% of inflow)
Center-of-Mass det. time= 103.5 min (847.5 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	285 cf	**6.92'W x 28.21'L x 5.50'H Field A** 1,073 cf Overall - 360 cf Embedded = 713 cf x 40.0% Voids
#2A	0.75'	360 cf	**ADS_StormTech MC-3500 d +Cap** x 3 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		645 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 11.25 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Summary for Pond EP: MC-3500 1R4C N

Inflow Area = 2,864 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.41 cfs @ 12.09 hrs, Volume= 1,494 cf
Outflow = 0.05 cfs @ 11.55 hrs, Volume= 1,494 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.55 hrs, Volume= 1,494 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 2.74' @ 12.71 hrs Surf.Area= 245 sf Storage= 462 cf

Plug-Flow detention time= 61.7 min calculated for 1,493 cf (100% of inflow)
Center-of-Mass det. time= 61.6 min (805.6 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.55 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Summary for Pond FP: MC-3500 1R4C N

Inflow Area = 3,406 sf,100.00% Impervious, Inflow Depth = 6.26" for 100 yr event
Inflow = 0.49 cfs @ 12.09 hrs, Volume= 1,777 cf
Outflow = 0.05 cfs @ 11.35 hrs, Volume= 1,777 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.35 hrs, Volume= 1,777 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 3.50' @ 12.89 hrs Surf.Area= 245 sf Storage= 593 cf

Plug-Flow detention time= 84.4 min calculated for 1,775 cf (100% of inflow)
Center-of-Mass det. time= 84.3 min (828.2 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	351 cf	**6.92'W x 35.38'L x 5.50'H Field A** 1,346 cf Overall - 470 cf Embedded = 876 cf x 40.0% Voids
#2A	0.75'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		820 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 11.35 hrs HW=0.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

2 | *Stormwater Report Compliance Calculations*

2.1 Standard 1 | No Untreated Discharges Or Erosion To Wetlands

Untreated Discharges
To document compliance that new discharges are adequately treated refer to calculations for Standards 4 through 6.

Erosion To Wetlands

The project proposes the filling of up to 5,000 square feet of Isolated Wetlands. Use of Erosion controls, erosion mats and implementation of vegetative cover will be utilized to minimize impacts.

2.2 Standard 2 | Peak Rate Attenuation

Refer to Peak Rate of Runoff table below (see Mitigative Drainage Analysis)

Table 1.0: Peak Rate of Runoff | Comparison Location 1L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Peak Rate of Runoff (cfs)	0.00	0.01	0.63	1.49	
Proposed Peak Rate of Runoff (cfs)	0.01	0.19	0.62	1.06	
Difference	**+0.01***	**+0.18***	**-0.01**	**-0.43**	**Remains onsite in IVW**

Table 2.0: Peak Rate of Runoff | Comparison Location 2L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Peak Rate of Runoff (cfs)	0.03	0.16	0.34	0.51	
Proposed Peak Rate of Runoff (cfs)	0.03	0.10	0.16	0.22	
Difference	**0.00**	**-0.06**	**-0.18**	**-0.29**	

Table 3.0: Peak Rate of Runoff | Comparison Location 3L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Peak Rate of Runoff (cfs)	0.00	0.02	0.10	0.22	
Proposed Peak Rate of Runoff (cfs)	0.00	0.00	0.00	0.00	
Difference	**0.00**	**-0.02**	**-0.10**	**-0.22**	

Table 4.0: Peak Rate of Runoff | Comparison Location 4L

Description	2 Year	10 Year	25 Year	100 Year	
Existing Peak Rate of Runoff (cfs)	0.00	0.00	0.02	0.10	
Proposed Peak Rate of Runoff (cfs)	0.00	0.00	0.00	0.00	
Difference	**0.00**	**0.00**	**-0.02**	**-0.10**	

2.3 Standard 3 | Stormwater Recharge

Recharge Volume:

$R_{v\ required}$ = (Impervious Area)(F)

Site consists of Hydrologic Soils Group A: F_A = 0.60 in.; Group B: F_A = 0.35 in.

***Site Impervious Area Draining to Recharge Facilities*:**

Stormwater Management Area 1 (SWMA-1)

$A_{imp\ A\ soils}$ = 21,703 ft
$A_{imp\ B\ soils}$ = 11,402 ft^2
$R_{v\ required}$ = [(21,703)(0.6)/12 + (11,402)(.35)/12] = 1,418 ft^3
Infiltration System Storage below 128.50′ (outlet pipe in MH7)
Storage at 128.50′ = 3,663 cf
$V_{wq\ provided}$ = 3663 cf

3663 ft^3 > 1418 ft^3 ok

Stormwater Management Area 2 (SWMA-2)

$A_{imp\ A\ soils}$ = 30,610 ft
$A_{imp\ B\ soils}$ = 385 ft^2
$R_{v\ required}$ = [(30,610)(0.6)/12 + (385)(.35)/12] = 1542 ft^3
Infiltration System Storage below 128.75′ (outlet pipe in MH12)
Storage at 128.75′ = 4,286 cf
$V_{wq\ provided}$ = 4286 cf

4286 ft^3 > 1542 ft^3 ok

Roof Drywell Areas (Total – 16 lots)

$A_{imp\ A\ soils}$ = 33,008 sf
$A_{imp\ B\ soils}$ = 7,026 sf
$R_{v\ required}$ = [(33,008 (0.6)/12 + (7,026(.35)/12] = 1,856 ft^3
(MC-3500 Chamber storage for 1R2C equals 514 cf of storage per drywell system minimum.
Storage per Cap at 36″= 29.56 cf; Storage per Chamber at 36″ = 81.21 cf [Table 9 & Table 10]
$V_{wq\ provided}$ = 16 drywells x 514 cf = 8,224 cf
$V_{wq\ provided}$ = 8,224 cf

8224 ft^3 > 1856 ft^3 ok

Total Recharge Volume Required

$A_{imp\ total}$ = 105,513 ft^2
$R_{v\ required}$ = [(105513)(0.60)/12] = 5276 ft^3
Adjusted minimum required recharge volume = [(5276)(1.01)] = 5346 ft^3

Total Recharge Volume Provided

$R_{v\ provided}$ = > 7949 ft^3 (within SWMA-1, SWMA-2) + additional volume in roof drywells
***7949+* cf > 5346 cf**

Capture Area Percentage:

Site impervious areas draining to recharge facilities:104134 ft^2
Total impervious area: 105513
Percent Captured: [(104134/105513](100) = 98.6 % > 65%

Drawdown Within 72 Hours:

$T_{drawdown}$ = [$R_{v\ total}$ / (K)(Bottom Area)]

Stormwater Management Area 1 (Road A)

$R_{v\ 1P}$ = 2364 ft^3 (100 year water level)
K = 8.27 in/hr (Rawls Rate for Sand; confirmed via field observation test hole)
Bottom Area = 3176 ft^2 (Bottom Area)
$T_{drawdown}$ = 2364 / [(8.27)(3176)/12] = 1.1 hours < 72 hours

Stormwater Management Area 2 (Road B)

$R_{v\ 1P}$ = 5030 ft^3 (100 year water level)
K = 8.27 in/hr (Rawls Rate for Sand; confirmed via field observation test hole)
Bottom Area = 3176 ft^2 (Bottom Area)
$T_{drawdown}$ = 5030 / [(8.27)(3176)/12] = 2.3 hours < 72 hours

Typical Roof Drywell Area - 4500 1R2C

$R_{v\ 1P}$ = 1548 ft^3 (R2 - 100 year water level)
K = 8.27 in/hr (Rawls Rate for Sand; confirmed via field observation test hole)
Bottom Area = 168 ft^2 (Bottom Area)
$T_{drawdown}$ = / 1548 [(8.27)(168)/12] = 14 hours < 72 hours

Typical Roof Drywell Area - 4500 1R4C

$R_{v\ 1P}$ = 1777 ft^3 (R-E 100 year water level)
K = 8.27 in/hr (Rawls Rate for Sand; confirmed via field observation test hole)
Bottom Area = 245 ft^2 (Bottom Area)
$T_{drawdown}$ = 1777 / [(8.27)(245)/12] = 11.0 hours < 72 hours

Groundwater Mounding

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)

COMPANY: Williams & Sparages LLC

PROJECT: Center & Main Conventional SWMA-1

ANALYST: Richard J. Harrington

DATE: 7/14/2020

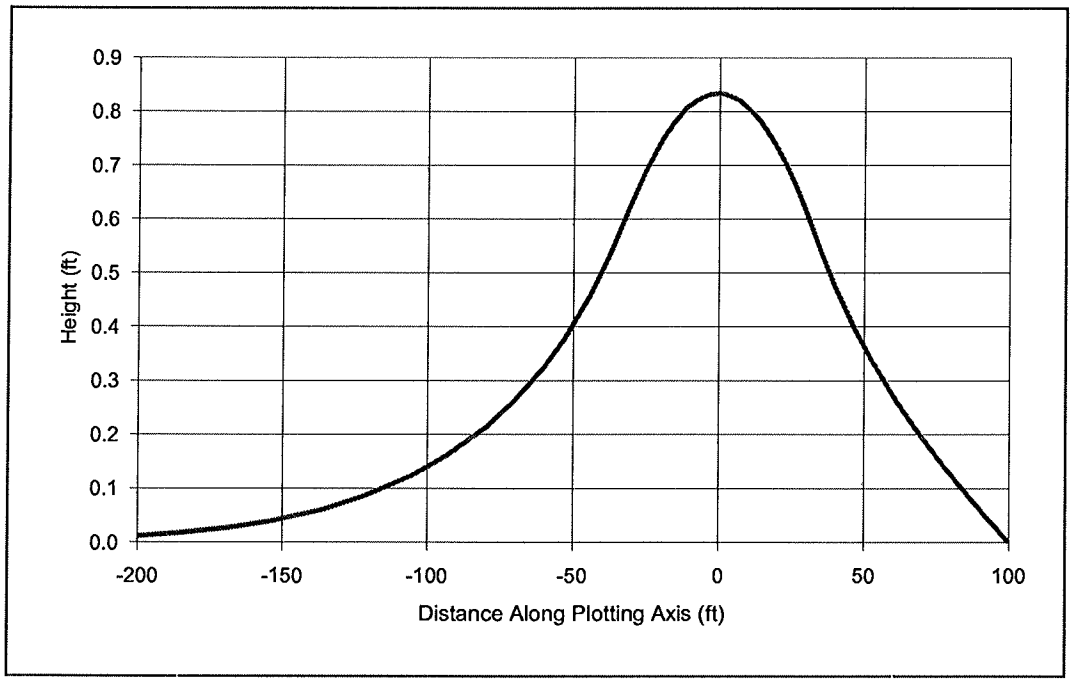
INPUT PARAMETERS

Application rate: 0.85 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.28
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 35 ft
Length of application area: 56.83 ft
Width of application area: 55.89 ft
Constant head boundary used at: 100 ft
Plotting axis from Y-Axis: 60 degrees
Edge of recharge area:
positive X: 27.9 ft
positive Y: 16.1 ft
Total volume applied: 2699.794 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-173.2	-100	-200	0.01
-145.7	-84.1	-168	0.02
-118.1	-68.2	-136	0.04
-90.6	-52.3	-105	0.08
-68.9	-39.8	-80	0.14
-52.1	-30.1	-60	0.2
-38.4	-22.2	-44	0.29
-26.8	-15.5	-31	0.39
-16.8	-9.7	-19	0.47
-10	-5.8	-12	0.51
-5.5	-3.2	-6	0.52
0	0	0	0.52
2.7	1.6	3	0.52
5	2.9	6	0.52
8.4	4.8	10	0.51
13.4	7.7	15	0.48
19.2	11.1	22	0.45
26.1	15.1	30	0.38
34.5	19.9	40	0.3
45.3	26.1	52	0.21
59.1	34.1	68	0.13
72.8	42.1	84	0.06
86.6	50	100	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Williams & Sparages LLC

PROJECT: Center & Main Conventional SWMA-2

ANALYST: Richard J. Harrington

DATE: 7/14/2020

INPUT PARAMETERS

Application rate: 1.35 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.28
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 35 ft
Length of application area: 56.83 ft
Width of application area: 55.89 ft
Constant head boundary used at: 100 ft
Plotting axis from Y-Axis: 60 degrees
Edge of recharge area:
positive X: 27.9 ft
positive Y: 16.1 ft
Total volume applied: 4287.909 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-173.2	-100	-200	0.01
-145.7	-84.1	-168	0.03
-118.1	-68.2	-136	0.06
-90.6	-52.3	-105	0.13
-68.9	-39.8	-80	0.22
-52.1	-30.1	-60	0.32
-38.4	-22.2	-44	0.46
-26.8	-15.5	-31	0.62
-16.8	-9.7	-19	0.75
-10	-5.8	-12	0.81
-5.5	-3.2	-6	0.83
0	0	0	0.83
2.7	1.6	3	0.83
5	2.9	6	0.82
8.4	4.8	10	0.81
13.4	7.7	15	0.77
19.2	11.1	22	0.71
26.1	15.1	30	0.61
34.5	19.9	40	0.48
45.3	26.1	52	0.34
59.1	34.1	68	0.21
72.8	42.1	84	0.1
86.6	50	100	0

2.4 Standard 4 | Water Quality

Water Quality:

Water quality is provided through three structural stormwater best management practices.

1) Deep Sump Catch Basin with Hood/Trap
2) Sediment Forebay
3) Subsurface Infiltration Chambers

Water Quality Volume:

$V_{wq\ required} = (D_{wq})(A_{imp})$

Sediment Forebay Sizing

Sediment Forebay #1 (Road A)

$A_{imp\ A\ soils}$ = 33105 ft^2
$R_{v\ required}$ = [(33105)(1.0)/12] = 2758 ft^3
(Volume provided in Sediment Forebay #1)
Storage Below Elevation (128.00′) = 2972 cf
$V_{wq\ provided}$ = 2972cf

2972 ft^3 > 2758 ft^3 ok

Sediment Forebay #2 (Road B)

$A_{imp\ A\ soils}$ = 30610 sf
$R_{v\ required}$ = [(30610)(1.0)/12] = 2550 ft^3
(Volume provided in Sediment Forebay #2)
Storage Below Elevation (128.75′) outlet to MH11 = 2588 cf
$V_{wq\ provided}$ = 2588 cf

2588 ft^3 > 2550 ft^3 ok

Recharge Facilities:

Water Quality Volume:

$R_{v\ required}$ = (Impervious Area)(1.0-inch)

Stormwater Management Area 1 (SWMA-1)

$R_{v\ required}$ = 2758 ft^3
Infiltration System Storage below 128.50′ (outlet pipe in MH7)
Storage at 128.50′ = 3,663 cf
$V_{wq\ provided}$ = 3663 cf

3663 ft^3 > 2758 ft^3 ok

Stormwater Management Area 2 (SWMA-2)

$R_{v\ required}$ = 2550 ft^3
Infiltration System Storage below 128.75′ (outlet pipe in MH12)
Storage at 128.75′ = 4,286 cf
$V_{wq\ provided}$ = 4286 cf

4286 ft^3 > 2550 ft^3 ok

Roof Drywell Areas (Total – 16 lots)

$A_{imp\ A\ soils}$ = 33,008 sf
$A_{imp\ B\ soils}$ = 7,026 sf
$R_{v\ required}$ = [(33,008 (1.0)/12 + (7,026(1.0)/12] = 3336 ft^3
(MC-3500 Chamber storage for 1R2C equals 514 cf of storage per drywell system minimum.
Storage per Cap at 36″= 29.56 cf; Storage per Chamber at 36″ = 81.21 cf [Table 9 & Table 10]
$V_{wq\ provided}$ = 16 drywells x 514 cf = 8,224 cf
$V_{wq\ provided}$ = 8,224 cf

8224 ft^3 > 3336 ft^3 ok

TSS Removal:

Pretreatment Chain SWMA-1 & SWMA-2

- Deep Sump Catch Bain = 25%
- Sediment Forebay = 25%

Treatment Chain SWMA-1 & SWMA-2

- Deep Sump Catch Bain = 25%
- Subsurface Infiltration System (with Sediment Forebay) = 80%

Location: Subsurface Infiltration System - SWMA 1 (Road A)

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56

Total TSS Removal = 44%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CONC-0020 CONV
Prepared By: RJH
Date: 7/16/2020

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
[1] From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

Location: Subsurface Infiltration System - SWMA 2 (Road B)

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56

Total TSS Removal = 44%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CONC-0020 CONV
Prepared By: RJH
Date: 7/16/2020

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
[1] From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

Location: Subsurface Infiltration System - SWMA 1 (Road A)

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Subsurface Infiltration Structure	0.80	0.75	0.60	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15

Total TSS Removal = 85%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CONC-0020 CONV
Prepared By: RJH
Date: 7/16/2020

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1 From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

Location: Subsurface Infiltration System - SWMA 2 (Road B)

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Subsurface Infiltration Structure	0.80	0.75	0.60	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15

Total TSS Removal = 85%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CONC-0020 CONV
Prepared By: RJH
Date: 7/16/2020

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1 From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

2.5 Standard 5 | Land Uses With Higher Potential Pollutant Loading

This project is not considered a LUHPPL.

2.6 Standard 6 | Critical Areas

Stormwater discharge from this property is not within a Zone II, Interim Wellhead Protection Area of a public water supply or a critical area.

2.7 Standard 7 |Redevelopment

This project is not considered a redevelopment.

2.8 Standard 8 | Construction Period Controls

Prior to construction, a Construction Period Pollution Prevention Plan (CPPP) will be finalized (under separate cover) to compliment the Stormwater Pollution Prevention Plan (SWPPP).

2.9 Standard 9 | Long Term Operation And Maintenance Plan

Provided under Separate Cover.

2.10 Standard 10 |Illicit Discharges To Drainage System

There are no proposed illicit discharges into the Stormwater Management Systems to be constructed as shown on the site plan.

3 | MassDEP Stormwater Checklist

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

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 8[2]
- 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

[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

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.

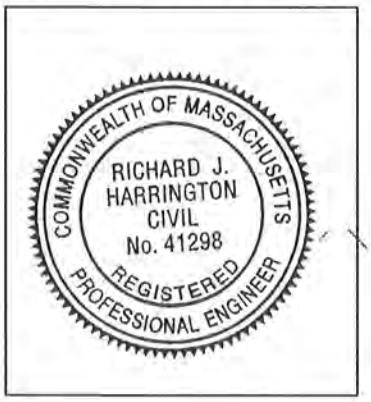
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the 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 7.17.2020

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

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): Roof Drywells

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.

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 Field[1]

☐ 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.

☒ 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.

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

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 provided as a separate document.

☒ 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.

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

- ☒ The ½" 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 propriety 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. (see Massachusetts Stormwater Handbook, Volume 2, Chapter 2, page 86)

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.

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 is provided under separate cover.

☒ 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 provided under separate cover, 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; (See Definitive/SWPPP plan set)

☐ 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; (See section 1.7 of the Mitigative Drainage Analysis)

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

4 | Rational Method Calculations

Closed Drainage System **Center & Main Conventional Plan Set - July 13, 2020**

Date: JULY 13, 2020

Rational Method Calculations

Q=CiA

Q= peak flow rate, (cfs)

i=rainfall intensity (inches/hour)

C= runoff coefficient,

C=	0.9	Impervious
C=	0.2	landscaped/grass
C=	0.15	woods

A = Area (acres)

CB1 to MH1

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	4,645		0.107	0.9	0.096
Landscape	7,717		0.177	0.2	0.035
Woods	0		0.000	0.15	0.000
	12,362	sum =	0.284	sum =	0.131

C = Product / Area = **0.46**

CB2 to MH1

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	5,377		0.123	0.9	0.111
Landscape	5,526		0.127	0.2	0.025
Woods	0		0.000	0.15	0.000
	10,903	sum =	0.250	sum =	0.136

C = Product / Area = **0.55**

MH1 to MH2

	A (Ac.)	C	Product (A*C)
CB1 to MH1	0.284	0.46	0.131
CB2 to MH1	0.250	0.55	0.136
sum =	0.534	sum =	0.268

C = Product / Area = **0.50**

MH2 to MH3

	A (Ac.)	C	Product (A*C)
MH1 to MH2	0.534	0.50	0.268
sum =	0.534	sum =	0.268

C = Product / Area = **0.50**

Closed Drainage System **Center & Main**

Date: JULY 13, 2020

Rational Method Calculations

Q=CiA

Q= peak flow rate, (cfs)	C=	0.9	Impervious
i=rainfall intensity (inches/hour)	C=	0.2	landscaped/grass
C= runoff coefficient,	C=	0.15	woods

CB-3 to MH3

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	5,872		0.135	0.9	0.121
Landscape	28,544		0.655	0.2	0.131
Woods/brush	10,807		0.248	0.15	0.037
	45,223	sum =	1.038	sum =	0.290

C = $\frac{\text{Product}}{\text{Area}}$ = **0.28**

CB-4 to MH3

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	4,697		0.108	0.9	0.097
Landscape	2,707		0.062	0.2	0.012
Woods	0		0.000	0.15	0.000
	7,404	sum =	0.170	sum =	0.109

C = $\frac{\text{Product}}{\text{Area}}$ = **0.64**

MH3 to MH4

	A (Ac.)	C	Product (A*C)
CB-3 to MH3	1.038	0.28	0.290
CB-4 to MH3	0.170	0.64	0.109
MH2 to MH3	0.534	0.50	0.268
sum =	1.742	sum =	0.667

C = $\frac{\text{Product}}{\text{Area}}$ = **0.38**

Rational Method Calculations **Center & Main**
Date: JULY 13, 2020

CB5 to MH5

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	13,585		0.312	0.9	0.281
Landscape	28,992		0.666	0.2	0.133
Woods/Brush	2,860		0.066	0.15	0.010
	45,437	sum =	1.043	sum =	0.424

C = $\frac{\text{Product}}{\text{Area}}$ = **0.41**

CB6 to MH4

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	0		0.000	0.9	0.000
Landscape	17,005		0.390	0.2	0.078
Woods	0		0.000	0.15	0.000
	17,005	sum =	0.390	sum =	0.078

C = $\frac{\text{Product}}{\text{Area}}$ = **0.20**

MH4 to MH5

	A (Ac.)	C	Product (A*C)
CB6 to MH4	0.390	0.20	0.078
MH3 to MH4	1.742	0.38	0.667
sum =	2.133	sum =	0.745

C = $\frac{\text{Product}}{\text{Area}}$ = **0.35**

MH5 to MH6

	A (Ac.)	C	Product (A*C)
CB5 to MH5	1.043	0.41	0.424
MH4 to MH5	2.133	0.35	0.745
sum =	3.176	sum =	1.169

C = $\frac{\text{Product}}{\text{Area}}$ = **0.37**

Closed Drainage System **Center & Main**

Date: JULY 13, 2020

Rational Method Calculations

Q=CiA

Q= peak flow rate, (cfs)

i=rainfall intensity (inches/hour)

C= runoff coefficient,

CB7 to MH8

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	2,659		0.061	0.9	0.055
Landscape	813		0.019	0.2	0.004
Woods	0		0.000	0.15	0.000
	3,472	sum =	0.080	sum =	0.059

C = $\frac{\text{Product}}{\text{Area}}$ = **0.74**

CB-8 to MH8

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	6,011		0.138	0.9	0.124
Landscape	9,324		0.214	0.2	0.043
Woods	0		0.000	0.15	0.000
	15,335	sum =	0.352	sum =	0.167

C = $\frac{\text{Product}}{\text{Area}}$ = **0.47**

MH8 to MH9

	A (Ac.)	C	Product (A*C)
CB7 to MH8	0.080	0.74	0.059
CB-8 to MH8	0.352	0.47	0.167
0 sum =	0.432	sum =	0.226

C = $\frac{\text{Product}}{\text{Area}}$ = **0.52**

MH9 to MH10

	A (Ac.)	C	Product (A*C)
MH8 to MH9	0.432	0.52	0.226
sum =	0.432	sum =	0.226

C = $\frac{\text{Product}}{\text{Area}}$ = **0.52**

Rational Method Calculations **Center & Main**
Date: JULY 13, 2020

CB9 to MH10

Surface Cover	Area (SF)		A (Ac.)	C	Product (A*C)
Impervious	21,765		0.500	0.9	0.450
Landscape	51,797		1.189	0.2	0.238
Woods	0		0.000	0.15	0.000
	73,562	sum =	1.689	sum =	0.688

C = $\frac{\text{Product}}{\text{Area}}$ = **0.41**

MH10 to MH11

	A (Ac.)	C	Product (A*C)
CB9 to MH10	1.689	0.41	0.688
MH8 to MH9	0.432	0.52	0.226
sum =	2.121	sum =	0.913

C = $\frac{\text{Product}}{\text{Area}}$ = **0.43**

Center & Main **Conventional** **Date:** **14-Jul-20** 100-yr Design Storm Event
Storm Sewer Design Table Rational Method_Conv.xlsx

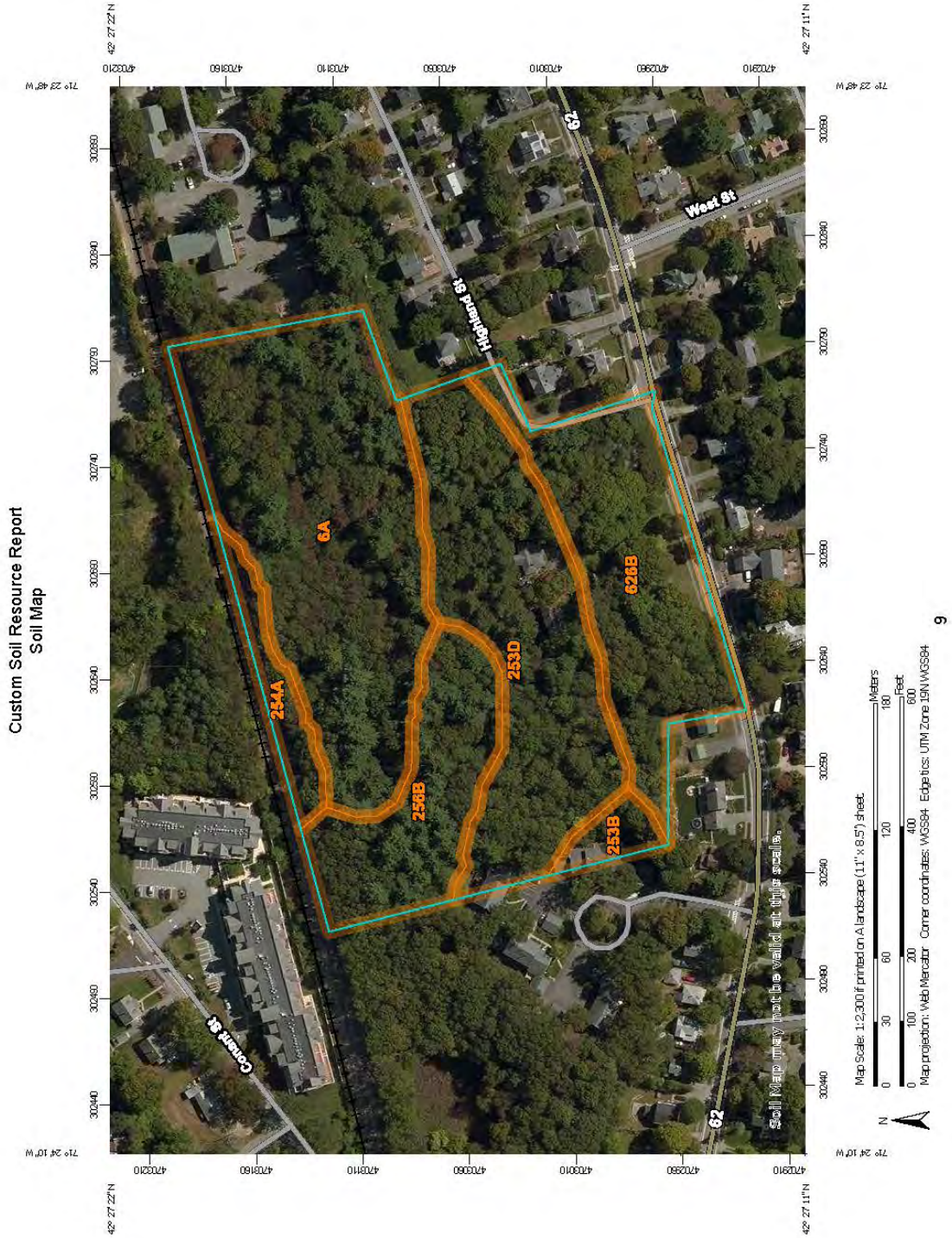
From	To	L (Ft)	TRIBUTARY AREA Incr. (Acres)	TRIBUTARY AREA Total (Acres)	Time To Upper End (Min)	Time Time in Section (Min)	Runoff Coefficient "C"	Rainfall Intensity (Inch/Hr)	"Q" Total Runoff (cfs)	Slope of Pipe (Ft/Ft)	Pipe Dia. (Inch)	Pipe Invert Elevation Upper End (Ft)	Pipe Invert Elevation Lower End (Ft)	Ground Surface Upper End (Ft)	Ground Surface Lower End (Ft)
CB1	MH1	15	0.284	0.284	10		0.46	7.6	1.00	0.100	12	141.50	140.00	146.00	145.24
CB2	MH1	15	0.250	0.250	10		0.55	7.6	1.04	0.100	12	141.50	140.00	146.00	145.24
MH1	MH2	110	----	0.534	10		0.50	7.6	2.04	0.070	12	140.00	132.28	145.24	137.75
MH2	MH3	64	----	0.534	10		0.50	7.6	2.04	0.018	12	132.28	131.13	137.75	135.38
CB3	MH3	10	1.038	1.038	10		0.28	7.6	2.20	0.010	12	131.23	131.13	135.23	135.38
CB4	MH3	10	0.170	0.170	10		0.64	7.6	0.83	0.010	12	131.23	131.13	135.23	135.38
MH3	MH4	100	----	1.742	10		0.38	7.6	5.07	0.020	**15**	130.88	128.88	135.38	133.32
CB6	MH4	87	0.390	0.390	10		0.20	7.6	0.59	0.010	12	129.75	128.88	132.75	133.32
MH4	MH5	50	----	2.133	10		0.35	7.6	5.66	0.003	**18**	128.31	128.15	133.32	132.51
CB5	MH5	7	1.043	1.043			0.41	7.6	3.22	0.034	12	128.39	128.15	132.23	132.51
MH5	FE-1	50	----	3.176	10		0.37	7.6	8.88	0.005	**24**	127.25	127.00	132.51	127.00
MH5	MH6	10	----	3.176	10		0.37	7.6	8.88	0.010	18	128.10	128.00	132.51	132.50
Emergency Overflow Pipe to Daylight															
MH6	MH7	96	----	3.176	10		0.37	7.6	8.88	0.018	15	128.50	126.75	132.50	130.25
MH7	FE-2	90	----	3.176	10		0.37	7.6	8.88	0.014	15	126.75	125.50	130.25	125.60
CB7	MH8	10	0.080	0.080	10		0.74	7.6	0.45	0.020	12	133.80	133.60	138.30	138.28
CB8	MH8	10	0.352	0.352	10		0.47	7.6	1.27	0.020	12	133.80	133.60	138.30	138.28
MH8	MH9	92	----	0.432	10		0.52	7.6	1.72	0.039	12	133.60	130.03	133.53	133.97
MH9	MH10	64	----	0.432	10		0.52	7.6	1.72	0.020	12	130.03	128.75	133.97	132.82
CB9	MH10	6	1.689	1.689	10		0.41	7.6	5.23	0.020	12	128.87	128.75	132.53	132.82
MH10	FE-3	60	----	2.121	10		0.43	7.6	6.94	0.005	24	127.30	127.00	132.82	127.00
MH10	MH11	12	----	2.121	10		0.43	7.6	6.94	0.063	15	128.75	128.00	132.82	
Emergency Overflow Pipe to Daylight															
MH12	FE-4	84	----	2.121	10		0.43	7.6	6.94	0.038	12	128.75	125.60		125.60

5 | NRCS Web Soil Survey

Soil Map

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

8


Custom Soil Resource Report
Soil Map
6A
254A
256B
253D
626B
253B
62
Highland St
West St
Concord St
Soil Map may not be valid at this scale.
Map Scale: 1:2,300 if printed on A landscape (11" x 8.5") sheet.
Meters
Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84
9

Custom Soil Resource Report

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 18, Sep 7, 2018

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	4.4	35.0%
253B	Hinckley loamy sand, 3 to 8 percent slopes	0.3	2.1%
253D	Hinckley loamy sand, 15 to 25 percent slopes	3.3	26.0%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.5	3.7%
256B	Deerfield loamy fine sand, 3 to 8 percent slopes	1.6	13.1%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	2.5	20.1%
Totals for Area of Interest		**12.6**	**100.0%**

Map Unit Descriptions

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

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

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

Soil Map

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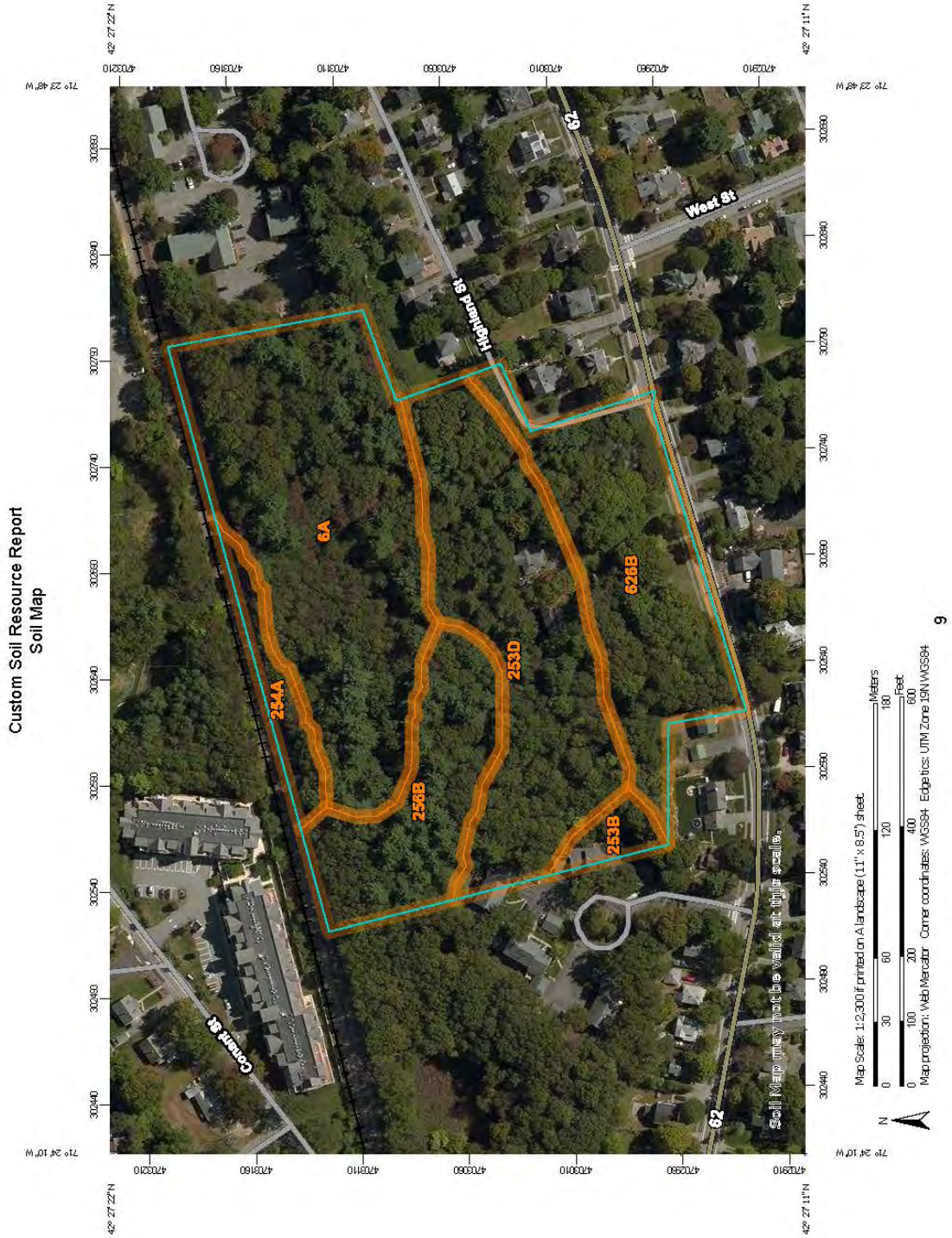
8


Custom Soil Resource Report
Soil Map
6A
254A
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West St
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Custom Soil Resource Report

MAP LEGEND

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- Sandy Spot
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- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
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Water Features
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- Rails
- Interstate Highways
- US Routes
- Major Roads
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- Aerial Photography

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Web Soil Survey URL:
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Custom Soil Resource Report

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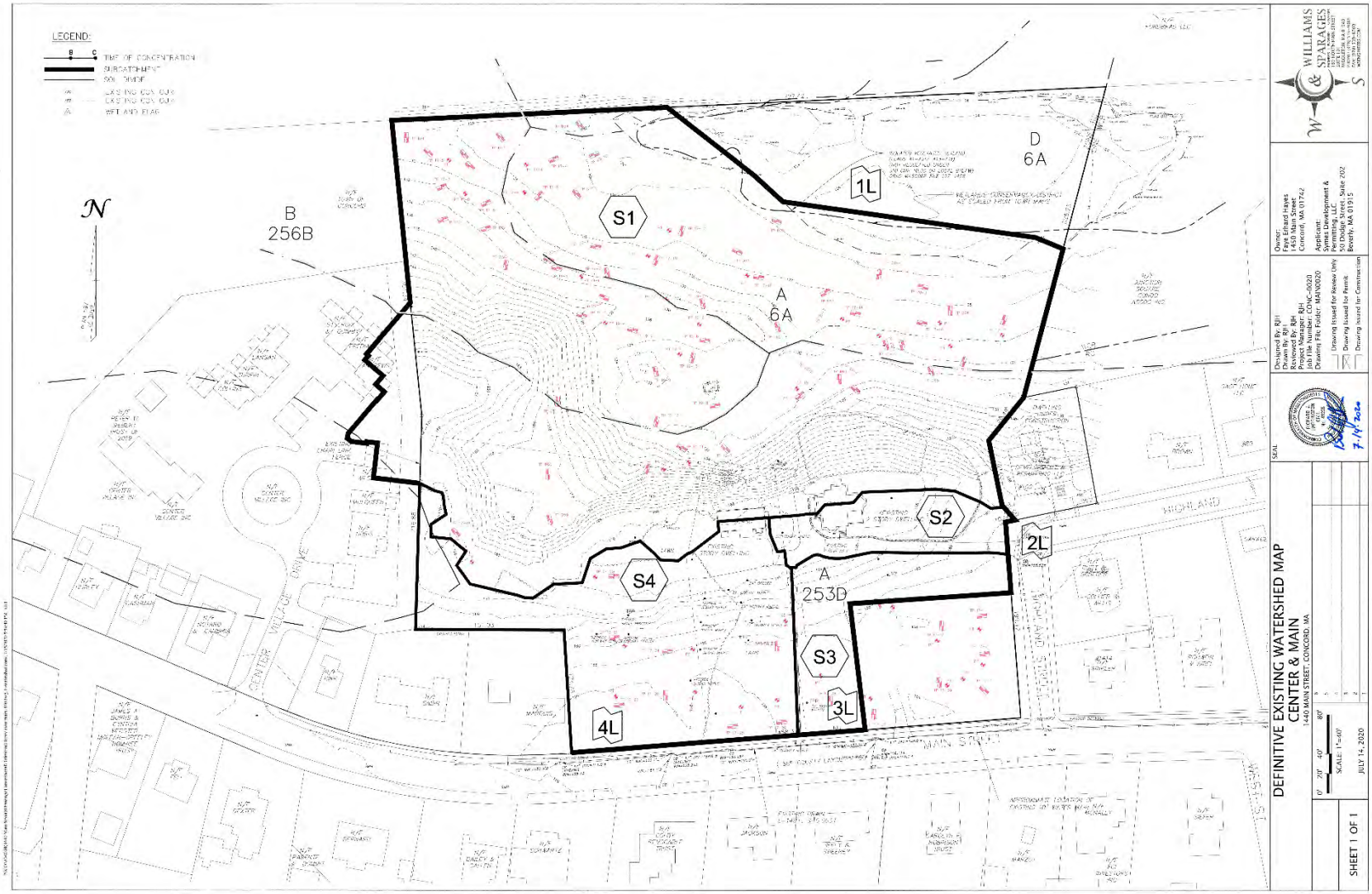
Appendix A – General Location Map

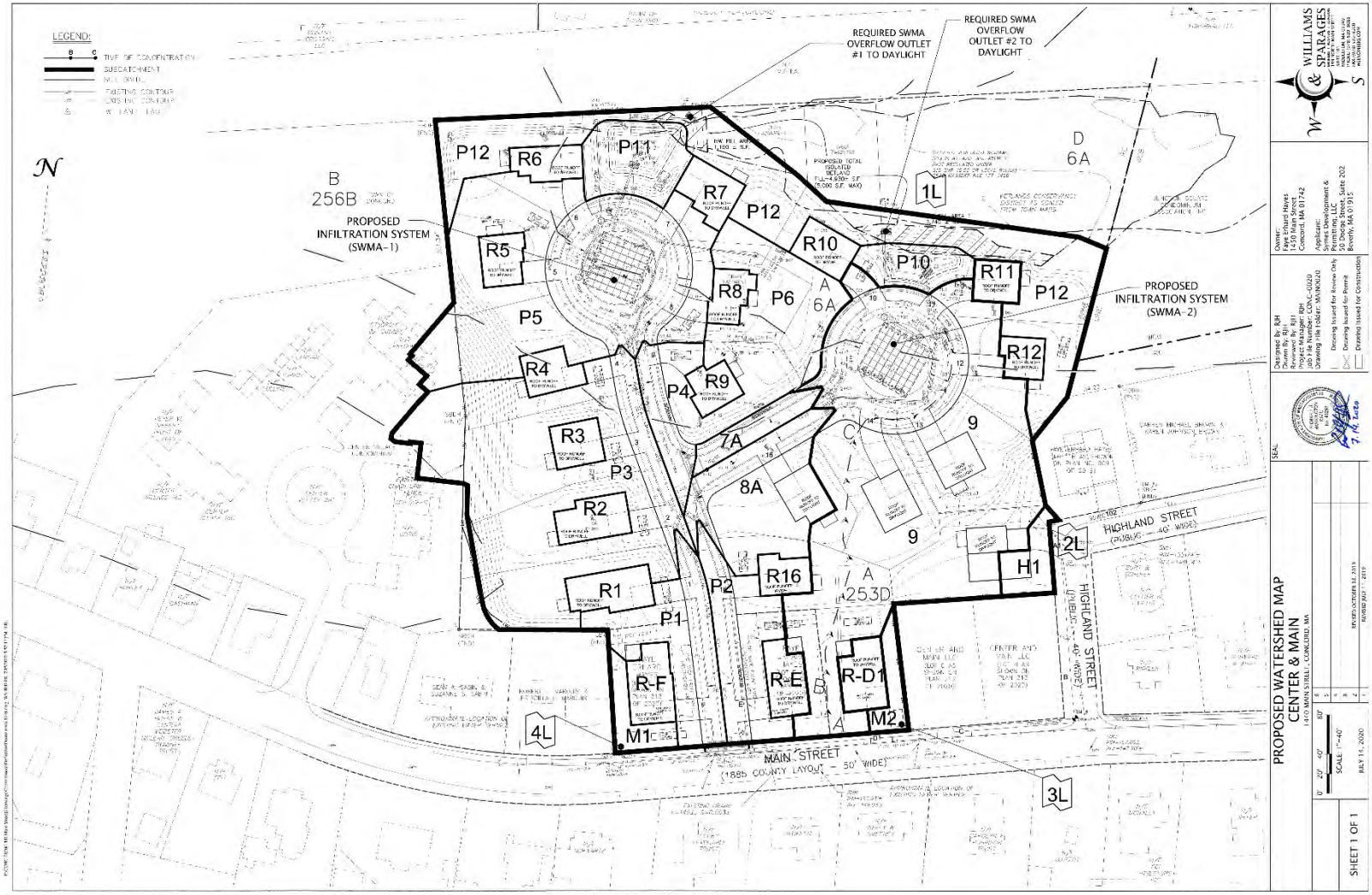
Locus Map
1440 Main Street
Concord, MA

Appendix B – Site Maps

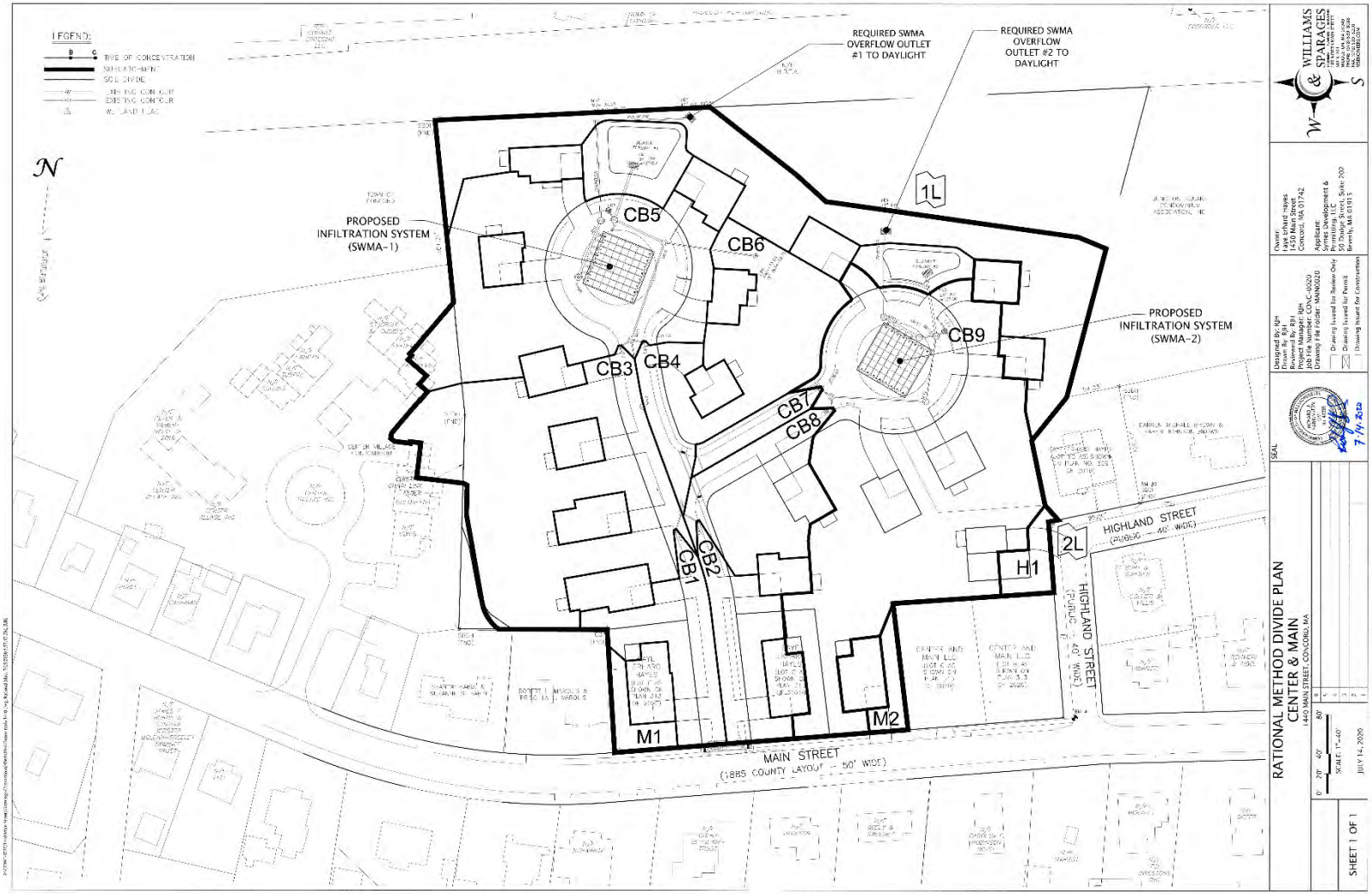
Existing Watershed Map



Proposed Watershed Map



Rational Method Divide Plan



Appendix C – Soil Logs

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Prepared For: Symes Development & Permitting, LLC - Jeffrey Rhuda, Manager CONC-0020 **(TP 20-1 thru TP 20-10) Stormwater Areas**
Owner Name

1440, 1450 & 146B Main Street — Street Address
D10 — Map/Lot #

Concord — City
MA — State
01742 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS WEB SOIL SURVEY — 253B, 253D, 254A, 256B (Soil Map Unit)

   Hinckley, Merrimac, Deerfield — Soil Name
   Soil Limitations

   Soil Parent material
   Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: Year Published/Source — Map Unit

   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): Month/Day/ Year Range: ☐ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: Soil Observations (20-1 thru 20-10); Witnessed by Justin Richardson - Concord Public Works

   Observations conducted within Stormwater Areas associated with proposed subdivision
   .

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-1 (Hole #) | 6/23/2020 (Date) | Time | Sun, 85 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 112 Depth Weeping from Pit 118 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-24	B	LS	10YR 5/6						M	F	
24-130	C	Sand Med.	2.5Y 5/6	85	High Chroma	>10			Sg	Loose	

Additional Notes: Test Pit Elevation El.131.50', Mottles @ El. 124.40'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-2 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 96 Depth Weeping from Pit 100 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-27	B	LS	10YR 5/6						M	F	
27-130	C	Medium Sand	2.5Y 5/6	84	High Chroma	>10			Sg	Loose	

Additional Notes:
Test Pit Elevation El.130.75', Mottles @ El. 123.75'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-3 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 50 Depth Weeping from Pit 70 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	SL	10YR 3/2						M	F	
10-20	B	LS	10YR 5/6						M	F	
20-84	C	Sand	2.5Y 5/6	30	High Chroma	>10			Sg	Loose	

Additional Notes: Test Pit Elevation El.127.00', Mottles @ El. 124.50'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-4 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 56 Depth Weeping from Pit 60 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-11	A	SL	10YR 3/2						M	F	
11-22	B	LS	10YR 5/6						M	F	
22-80	C	Sand	2.5Y 5/6	22	High Chroma	>10			Sg	Loose	

Additional Notes:
Test Pit Elevation El.126.50', Mottles @ El. 124.66'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-5 (Hole #) | 6/23/2020 (Date) | Time | Sun, 85 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 132 Depth Weeping from Pit -- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	SL	10YR 3/2						M	F	
10-23	B	LS	10YR 5/6						M	F	
23-135	C	Sand	2.5Y 5/6	132	High Chroma	>10			Sg	Loose	

Additional Notes: Test Pit Elevation El.133.70', Mottles @ El. 122.70'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-6 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-26	B	LS	10YR 5/6						M	F	
26-144	C	Medium Sand	2.5Y 5/6						Sg	Loose	

Additional Notes:
Test Pit Elevation El.139.00', Test Pit Bottom El. 127.00'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-7 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 66 Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	SL	10YR 3/2						M	F	
10-22	B	LS	10YR 5/6						M	F	
22-100	C	Sand	2.5Y 5/6	44	High Chroma	>10			Sg	Loose	

Additional Notes:
Test Pit Elevation El.128.40', Mottles @ El. 124.73'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-8 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-12	B	LS	10YR 5/6						M	F	
12-148	C	Sand	2.5Y 5/6	----	----	---			Sg	Loose	

Additional Notes:
Test Pit Elevation El.136.40', Test Pit Bottom El. 124.10'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-9 (Hole #) | 6/23/2020 (Date) | Time | Sun, 85 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 108 Depth Weeping from Pit 114 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-21	B	LS	10YR 5/6						M	F	
21-120	C	Sand	2.5Y 5/6	94	High Chroma	>10			Sg	Loose	

Additional Notes:
Test Pit Elevation El.131.80', Mottles @ El. 124.00'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 20-10 (Hole #) | 6/23/2020 (Date) | _____ (Time) | Sun, 85 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | % (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 36 Depth Weeping from Pit -- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-16	B	LS	10YR 5/6						M	F	
16-72	C	Sand	2.5Y 5/6	18	High Chroma	>10			Sg	Loose	

Additional Notes:
Test Pit Elevation El.126.00', Mottles @ El. 124.50'

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

6/23/2020
Date

Richard J. Harrington / #1012
Typed or Printed Name of Soil Evaluator / License #

6/30/2022
Expiration Date of License

Justin Richardson – Concord Public Works
Name of Approving Authority Witness

Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Prepared For: Symes Development & Permitting, LLC - Jeffrey Rhuda, Manager CONC-0020 **(TP D50 thru TP D66) Stormwater Ares**
Owner Name

1440, 1450 & 146B Main Street — D/
Street Address — Map/Lot #

Concord — MA — 01742
City — State — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS WEB SOIL SURVEY — 253B, 253D, 254A, 256B (Soil Map Unit)

   Hinckley, Merrimac, Deerfield (Soil Name) — Soil Limitations

   Soil Parent material — Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: Year Published/Source — Map Unit

   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): Month/Day/ Year Range: ☐ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: D50 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: >136 Depth Weeping from Pit >136 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-26	B	LS	10YR 5/6						M	F	
26-136	C	Sand	2.5Y 5/6	104	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D51 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 48 Depth Weeping from Pit 54 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	SL	10YR 3/2						M	F	
10-24	B	LS	10YR 5/6						M	F	
24-80 Collapse	C	Sand	2.5Y 5/6	46	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D50	Obs. Hole #D51
☒ Depth observed standing water in observation hole	>136 inches	48 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	>136 inches	46 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 24 inches Lower boundary: 136 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D52 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 110 Depth Weeping from Pit 100 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-26	B	LS	10YR 5/6						M	F	
26-120	C	Sand	2.5Y 5/6	102	High Chroma	>10	15		Sg	Loose	

Additional Notes: _____

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D53 (Hole #) | 4/17/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 34 Depth Weeping from Pit 52- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-18	B	LS	10YR 5/6						M	F	
18-72 Collapse	C	Sand	2.5Y 6/3	26	High Chroma	>10			Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D52	Obs. Hole # D53
☒ Depth observed standing water in observation hole	110 inches	34 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	102 inches	26 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 18 inches Lower boundary: 120 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D54 (Hole #) | 4/17/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 23 Depth Weeping from Pit 36 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-16	B	LS	10YR 5/6						M	F	
16-72	C	Sand	2.5Y 5/6	16	High Chroma	>15	15		Sg	Loose	
Collapse											

Additional Notes: _____

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D55 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 36 Depth Weeping from Pit -49 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-16	B	LS	10YR 5/6						M	F	
16-72	C	Sand	2.5Y 6/3	30	High Chroma	>10-	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D54	Obs. Hole # D55
☒ Depth observed standing water in observation hole	23 inches	36 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	16 inches	-30 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 30 inches Lower boundary: 156 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D56 (Hole #) | 4/17/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ---- Depth Weeping from Pit --- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-28	B	LS	10YR 5/6						M	F	
28-132	C	Sand	2.5Y 5/6	--	--	---	15		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D57 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 38 Depth Weeping from Pit 66 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL									
8-24	B	LS	10YR 3/2								
24-72+	C	Sand	2.5Y 5/6	33	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D56	Obs. Hole # D57
☒ Depth observed standing water in observation hole	>132 inches	38 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	>132 inches	33 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 28 inches Lower boundary: 72+ inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D58 (Hole #) | 4/17/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 20 Depth Weeping from Pit 42 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	A	SL	10YR 3/2						M	F	
9-12	B	LS	10YR 5/6						M	F	
12-72	C	Med Sand	2.5Y 5/6	16	High Chroma	>10	10		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D59 (Hole #) | 4/17/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-60	FILL									FILL	
60-68	A	SL	10YR 3/2						M	F	
68-90	B	LS	10YR 5/6						M	F	
90-264	C	Coarse Sand	2.5Y 5/6	----	----	----	15		Sg	Loose	
[22'-0"]											

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D58	Obs. Hole # D59
☒ Depth observed standing water in observation hole	16 inches	>264 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	20 inches	->264 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 72 inches Lower boundary: 180 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D60 (Hole #) | 4/17/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
No	A or B										
0-264	C	Coarse Sand	2.5Y 6/3	----	----	----	15		Sg	Loose	
(22'-0)'											

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D61 (Hole #) | 4/17/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: 120 Depth Weeping from Pit 120 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-26	B	LS	10YR 5/6						M	F	
26-252	C	Coarse Sand	2.5Y 5/6	----	----	---	20		Sg	Loose	
(21'-0")											

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D60	Obs. Hole # D61
☒ Depth observed standing water in observation hole	>264 inches	>252 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	>264 inches	>252 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 26 inches Lower boundary: 264+ inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D62 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 96 Depth Weeping from Pit | 100 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-12	B	LS	10YR 5/6						M	F	
12-120	C	Med Sand	2.5Y 5/6	84	High Chroma	>10	10		Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D63 (Hole #) | 4/17/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 54 Depth Weeping from Pit 60 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-21	B	LS	10YR 5/6						M	F	
21-72+	C	Med Sand	2.5Y 5/6	54	High Chroma	>10	10		Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D62	Obs. Hole # D63
☒ Depth observed standing water in observation hole	inches	inches
☐ Depth weeping from side of observation hole	96 inches	54 inches
☒ Depth to soil redoximorphic features (mottles)	84 inches	54 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number _____ Reading Date _____

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 60 inches Lower boundary: 132 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D64 (Hole #) | 4/17/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 50 Depth Weeping from Pit 56 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-23	B	LS	10YR 5/6						M	F	
23-72+	C	Med Sand	2.5Y 5/6	50	High Chroma	>10	10		Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D65 (Hole #) | 4/17/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform _____ | Position on Landscape (SU, SH, BS, , TS) _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 114 Depth Weeping from Pit 120 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	A	SL	10YR 3/2						M	F	
9-27	B	LS	10YR 5/6						M	F	
27-132	C	Med Sand	2.5Y 5/6	110	High Chroma	>10	10		Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D64	Obs. Hole # D65
☒ Depth observed standing water in observation hole	inches	inches
☐ Depth weeping from side of observation hole	50 inches	114 inches
☒ Depth to soil redoximorphic features (mottles)	50 inches	110 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number _____ Reading Date _____

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 60 inches Lower boundary: 132 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: D66 (Hole #) | 4/17/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ------Depth Weeping from Pit --- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-26	B	LS	10YR 5/6						M	F	
26-174	C	Sand	2.5Y 5/6	----					Sg	Loose	
14'-6"											

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # D66	Obs. Hole #
☒ Depth observed standing water in observation hole	inches	inches
☐ Depth weeping from side of observation hole	>174 inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	>174 inches	inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 26 inches Lower boundary: 174 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator	4/17/19 (TP D50 thru TP D66) – Stormwater Areas Only Date
Richard J. Harrington / #1012 Typed or Printed Name of Soil Evaluator / License #	6/30/2019 Expiration Date of License
Stormwater Management Areas – Not Witnessed Name of Approving Authority Witness	---------- Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Prepared For: Symes Development & Permitting, LLC - Jeffrey Rhuda, Manager CONC-0020 **(TP 19-1 thru 19-13)**
Owner Name

1440, 1450 & 146B Main Street — D/
Street Address — Map/Lot #

Concord — MA — 01742
City — State — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS WEB SOIL SURVEY — 253B, 253D, 254A, 256B (Soil Map Unit)

   Hinckley, Merrimac, Deerfield (Soil Name) — Soil Limitations

   Soil Parent material — Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: Year Published/Source — Map Unit

   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): Month/Day/ Year Range: ☐ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 19-1 (Hole #) | 4/16/19 (Date) | (Time) | Sun, 60 (Weather) | (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ Landform: _____ Position on Landscape (SU, SH, BS, , TS): _____

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 110 Depth Weeping from Pit 120 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-30	B	LS	10YR 5/6						M	F	
30-104	C1	Sand	2.5Y 5/6						Sg	Loose	
104-132	C2	Sand	2.5Y 6/3	104	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-2 (Hole #) | 4/16/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 104 Depth Weeping from Pit 110 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-26	B	LS	10YR 5/6						M	F	
26-130	C1	Medium Sand	2.5Y 5/6	100	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-1	Obs. Hole # 19-2
☒ Depth observed standing water in observation hole	110 inches	104 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	104" inches	100" inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number _____ Reading Date _____

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 30 inches Lower boundary: 132 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-3 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 100 Depth Weeping from Pit 100 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-28	B	LS	10YR 5/6						M	F	
28-130	C	Medium Sand	2.5Y 5/6	96	High Chroma	>10	15		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-4 (Hole #) | 4/16/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2						M	F	
8-30	B	LS	10YR 5/6						M	F	
30-180	C	Medium Sand	2.5Y 6/3	----	----	----	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-3	Obs. Hole # 19-4
☒ Depth observed standing water in observation hole	100 inches	>180 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	96" inches	->180" inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 30 inches Lower boundary: 180 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-5 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 104 Depth Weeping from Pit 106 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-7	A	SL	10YR 3/2						M	F	
7-30	B	LS	10YR 5/6						M	F	
30-150	C	Medium Sand	2.5Y 5/6	104	High Chroma	>15	15		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-6 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4	A	SL	10YR 3/2						M	F	
4-18	B	LS	10YR 5/6						M	F	
18-156	C	Medium Sand	2.5Y 6/3	----	----	----	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-5	Obs. Hole # 19-6
☒ Depth observed standing water in observation hole	104 inches	>156 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	104" inches	->156" inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 30 inches Lower boundary: 156 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-7 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 132 Depth Weeping from Pit 140 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-106	FILL	FILL									
106-116	A	SL	10YR 3/2						M	F	
116-130	B	LS	10YR 5/6						M	F	
130-190	C	Med Sand	2.5Y 5/6	132	High Chroma	>10	15		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-8 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 144 Depth Weeping from Pit 150 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-108	FILL, A & B	FILL									
108-132	A & B	SL & LS	10YR 3/2								
132-192	C	Med Sand	2.5Y 5/6	144	High Chroma	>10	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-7	Obs. Hole # 19-8
☒ Depth observed standing water in observation hole	132 inches	144 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	132 inches	144 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 132 inches Lower boundary: 192 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-9 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 106 Depth Weeping from Pit 130 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-48	FILL	FILL									
48-54	A	SL	10YR 3/2						M	F	
54-72	B	LS	10YR 5/6						M	F	
72-150	C	Med Sand	2.5Y 5/6	106	High Chroma	>10	10		Sg	Loose	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-10 (Hole #) | 4/16/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	SL	10YR 3/2						M	F	
6-30	B	LS	10YR 5/6						M	F	
30-180	C	Coarse Sand	2.5Y 5/6	----	----	----	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-9	Obs. Hole # 19-10
☒ Depth observed standing water in observation hole	106 inches	>180 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	106" inches	->180 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 72 inches Lower boundary: 180 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-11 (Hole #) | 4/16/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: --- Depth Weeping from Pit ---- Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 3/2						M	F	
12-36	B	LS	10YR 5/6						M	F	
36-144	C	Coarse Sand	2.5Y 6/3	----	----	----	15		Sg	Loose	

Additional Notes:
Williams & Sparages LLC – CONC-0020

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-12 (Hole #) | 4/16/19 (Date) | _____ (Time) | Sun, 60 (Weather) | _____ (Latitude) | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

   Description of Location: _____

2. Soil Parent Material: _____ | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, , TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 120 Depth Weeping from Pit | 120 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-96	FILL	FILL									
96-106	A	SL	10YR 3/2						M	F	
106-120	B	LS	10YR 5/6						M	F	
120-180	C	Med Sand	2.5Y 5/6	120	High Chroma	>10			Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-11	Obs. Hole # 19-12
☒ Depth observed standing water in observation hole	>144 inches	120 inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	>144 inches	-120 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 36-120 inches Lower boundary: 180 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 19-13 (Hole #) | 4/16/19 (Date) | Time | Sun, 60 (Weather) | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Pine/deciduous (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | Position on Landscape (SU, SH, BS, , TS)

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 106 Depth Weeping from Pit 120 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-42	FILL	FILL									
42-50	A	SL	10YR 3/2						M	F	
50-60	B	LS	10YR 5/6						M	F	
60-132	C	Med Sand	2.5Y 5/6	96	High Chroma	>10	10		Sg	Loose	

Commonwealth of Massachusetts
City/Town of Concord

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 19-13	Obs. Hole #
☒ Depth observed standing water in observation hole	106 inches	inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☒ Depth to soil redoximorphic features (mottles)	96 inches	inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 60 inches Lower boundary: 132 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

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Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Richard J. Harrington	4/16/19 (TP 19-1 thru TP 19-13)
Signature of Soil Evaluator	Date
Richard J. Harrington / #1012	6/30/2019
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Stanley Sosnicki	Concord Health Department
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

STAMSKI AND McNARY, INC.
1000 Main Street
ACTON, MA 01720
Engineering • Planning • Surveying

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

DEP has provided this form for use by on-site professionals and local Boards of Health. Other forms may be used, but the information must be substantially the same as provided here. Before using this form, check with your local Board of Health to determine the form they use.

A. Facility Information

1. Facility Information

Owner Name: FAYE HAYES

Street Address: 1440 & 1450 MAIN STREET Map/Lot: _____

City/Town: CONCORD State: MA Zip Code: _____

B. Site Information

1. (Check one) New Construction ☒ Upgrade ☐ Repair ☐

2. Published Soil Survey available? Yes ☒ No ☐ If yes: Year Published _____ Publication Scale _____ Soil Map Unit _____

   Soil Name _____ Soil limitations: RAPID PERMEABILITY

3. Surficial Geological Report available? Yes ☐ No ☐ If yes: Year Published _____ Publication Scale _____ Map Unit _____

   Geologic Material _____ Landform _____

4. Flood Rate Insurance Map:

   Above the 500 year flood boundary? Yes ☒ No ☐ Within the 100 year flood boundary? Yes ☐ No ☒

   Within the 500 year flood boundary? Yes ☐ No ☒ Within a Velocity Zone? Yes ☐ No ☒

5. Wetland Area: National Wetland Inventory Map — Map Unit: ISOLATED WETLAND Name: DELINEATED ON-SITE

   Wetlands Conservancy Program Map — Map Unit: _____ Name: _____

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STAMSKI AND McNARY, INC.
1000 Main Street
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C. On-Site Review

(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-1 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 157.5

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line 25 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Pedgl acial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: 168

Deep Observation Hole Number: TP 17-1

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles) Depth	Color	Percent	Soil Texture (USDA)	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
12	A_p	10YR 2/2	—	—	—	SL	—	—	M	F	
40	B	10YR 3/6	—	—	—	LS	—	—	M	F	
168	C	2.5Y 6/3	—	—	—	COARSE TO MEDIUM SAND	TRACE GRAVEL		SG	LOOSE	

Additional Notes _____

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C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: TP 17-2 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 157.1

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line 20 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Propland Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: BELOW 156

Deep Observation Hole Number: TP 17-2

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles) Depth	Color	Percent	Soil Texture (USDA)	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
12	Ap	10YR 2/2	—	—	—	SL	—	—	M	F	
30	BW	10YR 3/4	—	—	—	LS	—	—	M	F	
156	C	10YR 6/3	—	—	—	COARSE TO MEDIUM SAND	THREE GRAVEL <2%	—	SG	LOOSE	

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-3 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

Ground Elevation at Surface of Hole 156.7

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV- feet

Property Line 30 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☑

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: Below 156

Deep Observation Hole Number: TP 17-3

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	Ap	10YR	—	—	—	SL	—	—	M		
14	B	10YR	—	—	—	LS	—	—	M		
156	C	2.5Y	—	—	—	COARSE SAND	4	—	SG	LOOSE	

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-4 Date 12/18/2017 Time 1-3 Weather RAIN 40°

1. Location

Ground Elevation at Surface of Hole 126.8

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (~~e.g. woodland, agricultural field~~, vacant lot, etc.) Surface Stones — Slope (%) _____

Vegetation GRASS BRUSH TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Pwg/Glcwt Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

If Yes: Depth Weeping from Pit 60 Depth Standing Water in Hole 100

Estimated Depth to High Groundwater: 28 124.47'

Deep Observation Hole Number: TP 17-4

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 3/2	—	—	—	SL	—	—	M	F	
20	B	10YR 4/4	—	—	—	LS	—	—	M	F	
120	C	2.5Y 4/4	28	High	>10	SANDY	—	—	M	VERY FRIABLE	
				CATLOWN		MEDIUM					

Additional Notes _____

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C. On-Site Review
(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-5 Date: 12/12/2017 Time: 13 Weather: ~~RAIN~~ 40° SM 3"

1. Location

Ground Elevation at Surface of Hole 129.0

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

Property Line 30 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: PROGLACIAL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

If Yes: Depth Weeping from Pit 75 Depth Standing Water in Hole 90

Estimated Depth to High Groundwater: ~~48~~ 62 123.80

Deep Observation Hole Number: TP 17-5

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles) Depth	Color	Percent	Soil Texture (USDA)	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
6	A	10YR 3/2	—			SL	—	—	M	F	
15	F_2	10YR 4/4	—			LS	—		M		
170	C	2.5Y 4/1	62			SMS	—			VERY	

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-6 Date: 12/18/2017 Time: 13 Weather: ~~RAIN~~ 40° SUN 30

1. Location

Ground Elevation at Surface of Hole 128.8

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Glacial Till Unsuitable Materials Present: Yes ☐ No ☑

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☑ No ☐

If Yes: Depth Weeping from Pit 50 Depth Standing Water in Hole 54

Estimated Depth to High Groundwater: 50 124.03

17-4

Deep Observation Hole Number: TP 17-6

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 3/2	—	—	—	SL	—	—	M	F	
20	B	10YR 4/4	—	—	—	LS	—	—	M	F	
170	C	2.5Y 4/4	—	[illegible]	[illegible]	SAND MEDIUM	—	—	M	VERY [illegible]	

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-7 Date 12/18/2017 Time _____ Weather RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 132.3 13

   Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) LAWN LANDSCAPE Surface Stones — Slope (%) _____

   GRASS BRUSH TREES Vegetation Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: BOULDERS Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 92 124.63

Deep Observation Hole Number: TP 17-7

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 2/2	—	—	—	SL	—	—	M	F	
20	B	10YR 4/4	—	—	—	LS	—	—	M	F	
120	C	2.5Y 4/4	—		—	SANDY MEDIUM	TRACE	—	M	VERY FRIABLE	
						VARIABLE					

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-8 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 130.9

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Presglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

   If Yes: Depth Weeping from Pit 120 Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: 78 124.40

Deep Observation Hole Number: TP 17-8

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A		—			SL			M		
20	B					LS			M		
13-L	C		78			SAND MEDIUM			P		

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-9 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

Ground Elevation at Surface of Hole 128.0

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW feet

Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: [illegible] Unsuitable Materials Present: Yes ☐ No ☐

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

If Yes: Depth Weeping from Pit [illegible] Depth Standing Water in Hole [illegible]

Estimated Depth to High Groundwater: 60 123.00'

Deep Observation Hole Number: TP 17-9

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
	A	[illegible]	—	—	—	[illegible]	—		[illegible]		
	B	[illegible]	—	—		[illegible]			[illegible]		
	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	
				CHANNEL							

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-10 Date 12/12/2017 Time _____ Weather RAIN 40°

1. Location

Ground Elevation at Surface of Hole 128.8 13

Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) LAWN LANDSCAPE Surface Stones — Slope (%) _____

Vegetation GRASS BRUSH TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: PM Unsuitable Materials Present: Yes ☐ No ☐

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

If Yes: Depth Weeping from Pit 88 Depth Standing Water in Hole 94

Estimated Depth to High Groundwater: 4 122.63

Deep Observation Hole Number: TP 17-10

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10	—	—	—	SL	—	—	M	F	
22	B	10	—	—		LS	—	—	M	F	
120	C	2.5	74		>50	SAND MOD	—	—	M	VF	

Additional Notes _____

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C. On-Site Review
(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-11 Date 12/18/2017 Time _____ Weather RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 128.8 13

   Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) LAWN LANDSCAPE Surface Stones — Slope (%) _____

   Vegetation GRASS BRUSH TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Till Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

   If Yes: Depth Weeping from Pit 90 Depth Standing Water in Hole 120

   Estimated Depth to High Groundwater: 60 123.8'

Deep Observation Hole Number: TP 17-11

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles) Depth	Color	Percent	Soil Texture (USDA)	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
10	A	10YR 2/2	—	—	—	SL	—	—	M	F	
21	B	10YR 4/4	—	—	—	LS	—	—	M	F	
120	C	10YR 4/4	60	10YR 6/2	35	MED SAND	—	—	M	VF	

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-12 Date 12/18/2017 Time _____ Weather RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 132.8

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation GRASS BRUSH TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV — feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☒ No ☐

   If Yes: Depth Weeping from Pit 132 Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: 125 122.38'

12 ⊕ 13
⊕
11 ⊕ 10

Deep Observation Hole Number: TP 17-12

Depth (in:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR 3/2	—	—	—	SL	—	—	M	F	
23	B	10YR 4/4	—	—	—	LS	—	—	M	F	
144	C	2.5Y 4/4		High Chroma		SAND medium	—	—	M	V F	

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-13 Date 12/18/2017 Time _____ Weather RAIN 40°

1. Location

Ground Elevation at Surface of Hole 131.9'

Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

Vegetation GRASS BRUSH TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: PRO Unsuitable Materials Present: Yes ☐ No ☐

If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☐

If Yes: Depth Weeping from Pit 90 IN Depth Standing Water in Hole 101

Estimated Depth to High Groundwater: 90 124.40'

Deep Observation Hole Number: TP 17-13

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
9	A		—	—	—	SL	—	—	M	F	
20	B		L		—	LS	—	—	M	F	
120	C		90		75	SAND MOIST			M	VF	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.
1000 Main Street
ACTON, MA 01720
Engineering • Planning • Surveying

C. On-Site Review

(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-14 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 129.0

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: _____ Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☐

   If Yes: Depth Weeping from Pit 90 Depth Standing Water in Hole 96

   Estimated Depth to High Groundwater: 70 123.20'

Deep Observation Hole Number: TP 17-14

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A					SL			M		
22	B					LS			M		
120	C		70		5%	SAND			M		
						water					

Additional Notes _____

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Deep Observation Hole Number: TP 17-15 | Date: 12/12/2017 | Time: | Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 133.8'

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) | Surface Stones: — | Slope (%): _____

   Vegetation: GRASS BRUSH TREES | Landform: _____ | Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet | Drainage Way _____ feet | Possible Wet Area IVW- feet

   Property Line _____ feet | Drinking Water Well _____ feet | Other: ISOLATED VEGETATED WETLAND

4. Parent Material: _____ Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒ NO.

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: — 121.8' OR LOW BEL MSL 114'

Deep Observation Hole Number: TP 17-15

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles) Depth	Color	Percent	Soil Texture (USDA)	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
30	FILL	—	—	—	—	LS FILL	—	—	FILL	L	—
36	A	3/2	—	—	—	SL	—	—	M	F	
52	B	4/4	—	—		LS	—	—	M	F	
62	C1	2.5Y 6/4	—		—	SAND COARSE	5		M	V	
144	C2	2.5Y 4/2	—	—		SAND SAND			M	VF	
						MOTTLED					

Additional Notes _____

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Deep Observation Hole Number: TP 17-16 Date: 12/18/2017 Time: _____ Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 128.4

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: GRASS BRUSH TREES Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Protolaurite Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☐

   If Yes: Depth Weeping from Pit 80 Depth Standing Water in Hole 80

   Estimated Depth to High Groundwater: 60 123.40

Deep Observation Hole Number: TP 17-16

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR	—			SL	—	—	M	F	
40	B	10YR				LS			M	F	
120	C	2.5Y	60	High Chroma	Y	SFLS MSS			M	F	

Additional Notes _____

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Deep Observation Hole Number: TP 17-17 | Date: 12/12/2017 | Time: | Weather: RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 127.60

   Location (Identify on Plan)

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) | Surface Stones: – | Slope (%):

   Vegetation: GRASS BRUSH TREES | Landform: | Position on landscape (attach sheet):

3. Distances from: Open Water Body – feet | Drainage Way feet | Possible Wet Area Two feet

   Property Line feet | Drinking Water Well feet | Other ISOLATED VEGETATED WETLAND

4. Parent Material: Postglacial | Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☒ No ☐

   If Yes: Depth Weeping from Pit | Depth Standing Water in Hole

   Estimated Depth to High Groundwater: | 123.00

Deep Observation Hole Number: TP 17-17

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR	–	–	–	SL	–	–	M	F	
28	B	[illegible]	–	–	–	LS	–	–	M	F	
12+	C	[illegible]	[illegible]	[illegible]	[illegible]	SAND	–	–	M	F	

Additional Notes

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Deep Observation Hole Number: TP 17-18 Date 12/18/2017 Time _____ Weather RAIN 40°

1. Location

   Ground Elevation at Surface of Hole 129.0

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   GRASS BRUSH TREES Vegetation Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Glaciofluvial Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐

   If Yes: Depth Weeping from Pit 104 Depth Standing Water in Hole 108

   Estimated Depth to High Groundwater: 84 122.00

Deep Observation Hole Number: TP 17-18

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR			—	SL	—	—	M	F	
26	B	10YR			—	LS	—		M	F	
120	C	2.5Y	84		75	SAND	—	—	M	VF	

Additional Notes _____

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Deep Observation Hole Number: TP 17- 19 Date 12/ 1/ 2017 Time _____ Weather PM Sun

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation TREE Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line 50 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: PROBABLE Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: BELOW 13'

Deep Observation Hole Number: TP 17- 19

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4	A	10YR 3/2	—	—	—	LS	—	—	—	—	
14	B	10YR 5/6			—	LS	—				
16	C	2.5Y 4/1	—	—	—	SAND	5	—	—	—	

Additional Notes _____

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Deep Observation Hole Number: TP 17-20 Date 12/14/2017 Time _____ Weather CLEAR 25°

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: BELOW 132

Deep Observation Hole Number: TP 17-20

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2	—	—	—	LS	—	—	M	F	
12	B	10YR 5/6	—	—	—	LS	—	—	M	F	
132	C	2.5Y 4/4	—	—	—	SAND	5	—	SG	loose	
						COARSE					

Additional Notes _____

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Deep Observation Hole Number: TP 17-22 | 12 | 14 | 2017 (Date) _____ (Time) PM Sun (Weather)

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) — (Surface Stones) _____ (Slope (%))

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV- feet

   Property Line 4.0ft feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☑

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: BELOW 144

Deep Observation Hole Number: TP 17-22

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
24	FILL	—	—	—	—	FILL	SANDY	COBBLES	—	—	—
36	A	[illegible]	—	—	—	SL	—	—	M	F	
48	B	[illegible]	—	—	—	LS	—	—	M	F	
56 144	C_1	[illegible]	—	—	—	SANDY MODIUM	—	—	M	VF	
144	C_2	[illegible]	—	—		SAND COARSE	10	2	SG	LOOSE	

Additional Notes _____

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Deep Observation Hole Number: TP 17-23 Date 12 / 2017 Time _____ Weather RM

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: Known 144

Deep Observation Hole Number: TP 17-23

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
24	Fill	—	—	—	—	—	SANDY FILL		—	—	
30	A	10YR 3/2	—	—	—	SL	—	—	M	F	
36	B	10YR 5/6	—	—	—	LS	—	—	M	F	
46	C1	2.5Y 6/6	—	—	—	SAND VFGR	—	—	M	F	
144	C2	2.5Y 6/4	—	—	—	SAND COARSE	10	2	SG	loose	

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Deep Observation Hole Number: TP 17-24 Date 12/14/2017 Time _____ Weather RM

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Morainal Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: BELOW 144

Deep Observation Hole Number: TP 17-24

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
16	A	10YR 3/2	—	—	—	SL	—	—	M	F	
26	B	10YR 5/6	—	—	—	LS	—	—	M	F	
54	C1	2.5Y 6/6	—	—	—	SAND MED	—	—	M	F	
108	C2	2.5Y 6/4	—	—	—	SAND FINE	2	—	SG	Loose	
144	C3	2.5Y 6/3	—	—	—	SAND VERY FINE	—	—	M	F	

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Deep Observation Hole Number: TP 17-25 Date 12/14/2017 Time _____ Weather RM Sun 25

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: _____ _____

Deep Observation Hole Number: TP 17-25

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
24	FW	—	—	—	—	—	—	—	M	F	
30	B	[illegible]	—	—	—	SL	—	—	M	F	
36	B2	[illegible]	—	—	—	LS	—	—	M	F	
72	C1	[illegible]	—	—	—	Sand Gravel	15	5	SG	loose	
144	C2	2.5Y 6/4			—	Sand med	—		M	VF	

Additional Notes _____

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Deep Observation Hole Number: TP 17-26 Date 12/14/2017 Time _____ Weather RM

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line 15 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Proglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: BELOW 144

Deep Observation Hole Number: TP 17-26

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
20	FILL	—	—	—	—	—	—	—	SANDY FILL		
27	A	10YR 3/2	—	—	—	SL	—	—	M	F	
40	B	10YR 5/6	—	—	—	LS	—	—	M	F	
100	C1	2.5Y 6/4	—	—	—	FINE COARSE	10	3	SG	loose	
144	C2	2.5Y 6/4	—	—	—	SAND MEDIUM	—	—	SG	loose	

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Deep Observation Hole Number: TP 17-27 Date 12/14/2017 Time _____ Weather RM

1. Location

   Ground Elevation at Surface of Hole 157.5

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Glacial Till Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☐

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: 144.0' or lower

Deep Observation Hole Number: TP 17-27

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR 3/2	—	—	—	SL	—		M	F	
74	B1	10YR 5/6	—	—	—	LS			M	V F	
36	C1	7.5YR 6/6	—	—	—	SANDY LOAM	—		M	V F	
74	C2	7.5YR 6/4	—	—	—	SANDY LOAM	—		M	V F	
142	C3	2.5Y 6/4	—	—	—	SAND	—		M	V F	

Additional Notes _____

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(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-28 | Date: 12/14/2017 | Time: | Weather: RM

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) | Surface Stones: — | Slope (%):

   Vegetation: | Landform: | Position on landscape (attach sheet):

3. Distances from: Open Water Body — feet | Drainage Way ____ feet | Possible Wet Area IVW- feet

   Property Line 30 feet | Drinking Water Well ____ feet | Other ISOLATED VEGETATED WETLAND

4. Parent Material: Probable till | Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — | Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: Below 150

Deep Observation Hole Number: TP 17-28

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
1-20	A	10YR 3/2	—			SL	—		M	F	
20-	[illegible]	10YR [illegible]	—			LS	—		M	[illegible]	
30-	C	[illegible]	—			SAND COARSE	—	—	SG	[illegible]	
120-	C	[illegible]	—			SAND MEDIUM	—		M	VERY FRIABLE	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.
1000 Main Street
ACTON, MA 01720
Engineering • Planning • Surveying

C. On-Site Review
(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17- 29 Date: 12/14/2017 Time: _____ Weather: RAT

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones: — Slope (%): _____

   Vegetation: Green Landform: _____ Position on landscape (attach sheet): _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area IVW- feet

   Property Line 15 feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Probable Till Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: Probable 150

Deep Observation Hole Number: TP 17- 29

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
16	A	10YR 2/1	—	—	—	SL	—	—	M	F	
26	B	10YR 3/6	—	—		LS	—	—	M	—	
[illegible]	C1	2.5Y 6/4	—		—	Fine Sand	10	3	SG	Loose	
[illegible]	C2	7.5Y 6/4				Sand	—	—	M	[illegible]	

Additional Notes _____

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C. On-Site Review
(minimum of two holes required at every proposed disposal area)

Deep Observation Hole Number: TP 17-30 Date 12/14/2017 Time _____ Weather RM

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INV- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: Postglacial Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: BELOW 150

Deep Observation Hole Number: TP 17-30

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR 3/2	—	—	—	SL	—	—	M	F	
24	B	10YR 5/6	—	—	—	LS	—	—	M	F	
150	C	2.5Y 6/4	—	—		SAND GRAVEL	10	—	SG	loose	

Additional Notes _____

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Deep Observation Hole Number: TP 17- 31 Date 12/11/2017 Time _____ Weather PM 75

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND LAWN LANDSCAPE (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones — Slope (%) _____

   Vegetation TREES Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way _____ feet Possible Wet Area INW- feet

   Property Line _____ feet Drinking Water Well _____ feet Other ISOLATED VEGETATED WETLAND

4. Parent Material: _____ Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☐

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: _____

Deep Observation Hole Number: TP 17- 31

Depth (In:)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
12	A	10YR [illegible]	—	—		SL	—	—	M	F	
24	B	10YR [illegible]	—			LS	—	—	M	F	
154	C	[illegible]			—	Sand [illegible]	10	[illegible]	[illegible]	[illegible]	

Additional Notes _____

City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.
1000 Main Street
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C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: 17-32 Date 12/14/2017 Time _____ Weather CLEAR

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND, VACANT LOT (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones _____ Slope (%) _____

   Vegetation GRASS Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area — feet

   Property Line — feet Drinking Water Well — feet Other _____

4. Parent Material: Pondicon Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil☐ Fill Material☐ Impervious Layer(s) ☐ Weathered/Fractured Rock☐ Bedrock☐

5. Groundwater Observed: Yes ☐ No ☑

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: Below 150

Deep Observation Hole Number: 17-37

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
16	A					SL			M		
34	B					LS			M		
84	C1					Sand Coarse			SG		
150	C2					Sand Medium			M		

Additional Notes _____

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D. Determination of High Groundwater Elevation

1. Method used:
   - ☐ Depth observed standing water in observation hole A. _____ inches B. _____ inches
   - ☐ Depth weeping from side of observation hole A. _____ inches B. _____ inches
   - ☐ Depth to soil redoximorphic features (mottles) A. _____ inches B. _____ inches
   - ☐ Groundwater adjustment (USGS methodology) A. _____ inches B. _____ inches

   SEE INDIVIDUAL SOIL LOGS

2. Index Well Number _____ Reading Date _____ Index Well Level _____

   Adjustment Factor _____ Adjusted Groundwater Level _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes ☒ No ☐

   b. If yes, at what depth was it observed? Upper boundary: SEE LOGS inches Lower boundary: SEE LOGS inches

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator — Date: 12/14/2017

RICHARD J. HARRINGTON SE1012
Typed or Printed Name of Soil Evaluator/License Number — *Date of Soil Evaluator Exam: 10/25/1994

STAN SOSNICKI
Name of Board of Health Witness — Board of Health: CONCORD

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Appendix D – ADS