

STORMWATER MANAGEMENT SUMMARY

for:

The Pointe At Hills Farms
Shrewsbury, Massachusetts

Project Proponent:

Smart Growth Design LLC
625 South Street
Shrewsbury, MA 01550

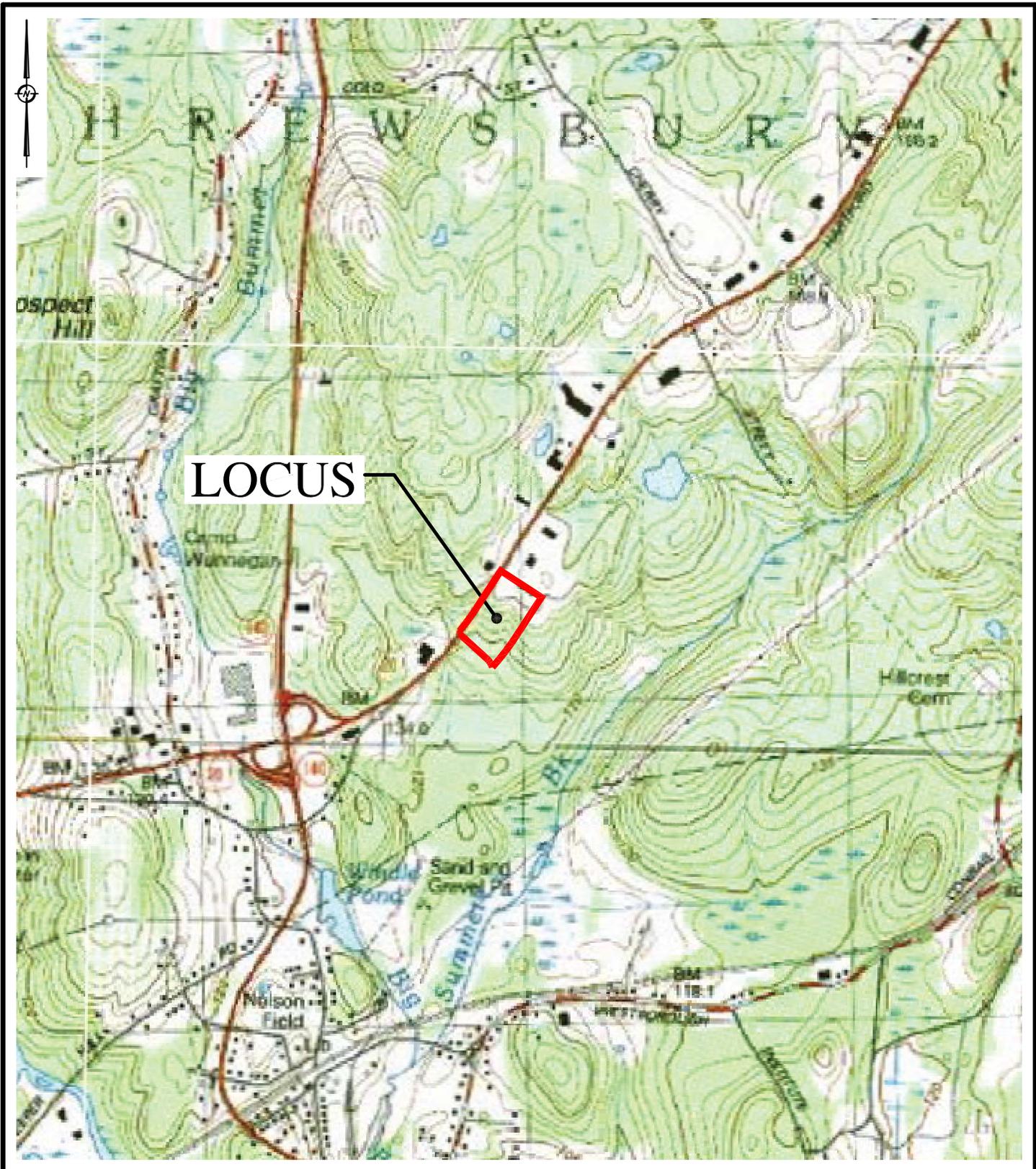
November 2015



WATERMAN DESIGN ASSOCIATES, INC.

31 East Main Street • Westborough, MA 01581

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PREPARED BY:



WATERMAN DESIGN ASSOCIATES, INC.

31 East Main Street
Westborough, MA 01581

508.366.6552
(fax) 508.366.6506
watermandesign.com wda@wdassoc.com

TITLE:

USGS LOCUS PHASE 1
440 Hartford Turnpike
Shrewsbury, MA

OWNER/APPLICANT:

Smart Growth Design, LLC
625 South Street
Shrewsbury, MA

SOURCE:

USGS Topographic Map
440 Hartford Turnpike
Shrewsbury, MA

DATE:

09/01/15

FILE NO.:

0927600

SCALE:

1" = 1500'

JOB NO.:

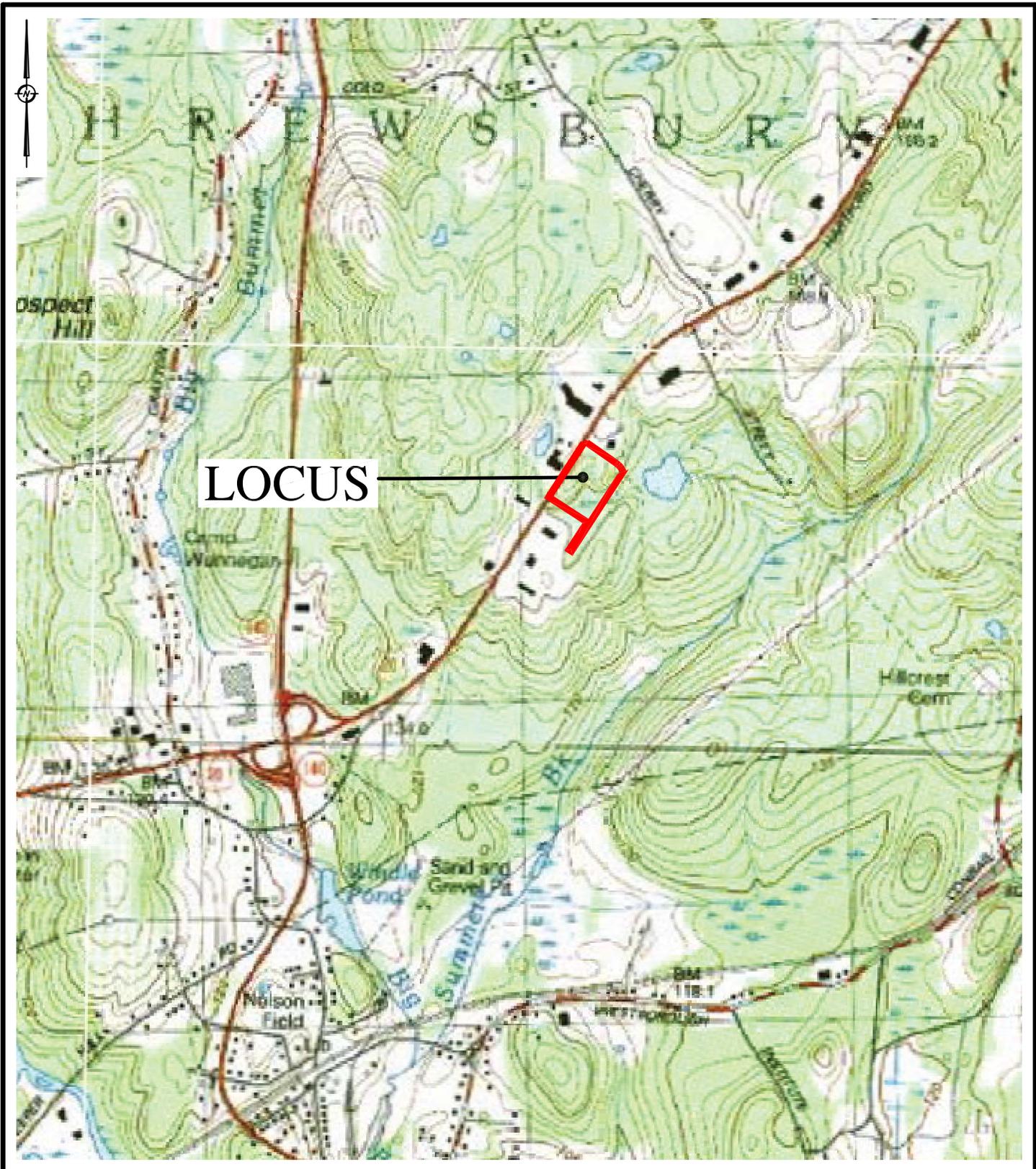
0927.01

DWG NO.:

0927602A

DRAWN BY:

HKV



PREPARED BY:



WATERMAN DESIGN ASSOCIATES, INC.
 31 East Main Street
 Westborough, MA 01581
 508.366.6552
 (fax) 508.366.6506
 watermandesign.com wda@wdassoc.com

TITLE:	USGS LOCUS PHASE 2 440 Hartford Turnpike Shrewsbury, MA		
OWNER/APPLICANT:	Smart Growth Design, LLC 625 South Street Shrewsbury, MA		
SOURCE:	USGS Topographic Map 440 Hartford Turnpike Shrewsbury, MA		
DATE:	09/01/15	FILE NO.:	0927600
JOB NO.:	0927.01	DWG NO.:	0927603A
		SCALE:	1" = 1500'
		DRAWN BY:	HKV

PURPOSE

Hydrologic calculations have been performed as part of the Comprehensive Permit Application for the Pointe at Hills Farm, a proposed two-phase multi-family residential development located in Shrewsbury, MA. The calculations were performed to verify size and location of stormwater collection and attenuation facilities for the sites and to demonstrate that the project will meet the standards of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Regulations.

This report describes the existing project site, the proposed project, and analyses performed to develop a stormwater management system that will protect public safety and convenience and minimize environmental impacts.

PROJECT SITES

Phase 1 – The existing lot consists of approximately 10.5 acres, is located at 440 Hartford Pike (Route 20) at the intersection with Stoney Hill Road, and is shown on the Town of Shrewsbury Assessor's Map 54, Parcel 15 and is located in the Limited Industrial Zone District. The lot configuration is generally of a rectangular nature (a corner lot) with approximately 813 feet of frontage along Hartford Pike and 530 feet of frontage along Stoney Hill Road. The lot depth measures approximately 530 feet. There are no existing building structures on the property.

Topography on site ranges from an elevation of about 414 in the southernmost corner of the site ascending northerly to an elevation 494 located in the northernmost corner of the site adjacent to Route 20 and land of now or formerly South Willow Realty Trust (elevations refer to NGVD 1929). The slope transitions across the property and can be best described as gentle to moderate in the southern portion of the site and moderate to steep in the north central portion of the property. The site drains north to south, with stormwater runoff eventually reaching two small ponding areas in the southern portion of the site.

There are two significant sources of stormwater "run-on" to the site. Roughly an acre of the Hartford Turnpike ROW and roughly an acre and a half of the abutting land to the north of the site presently drain onto the site through breaks in existing curbing associated with Route 20 and the neighboring parking lot, respectively. There are no record drainage easements and there are no dedicated pretreatment or conveyance systems for these stormwater discharges from the abutting land.

Several small areas of isolated pooling were observed (dry at the time) on the site. These areas do not support wetland or potential vernal pool species or characteristics and do not qualify as resource areas under the State or local wetland regulations. The site overall is dominated primarily by hickory, maple, oak and pine. Numerous stones and boulders can be observed at the ground surface, especially in the southern portion of the site. Two small wetland areas exist in the southeasterly portion of the site. These wetland areas represent the two distinct points of stormwater runoff from the site, with one draining to Stoney Hill Road and the other draining behind (north of) the existing homes along Stoney Hill Road. Although there is a minor flow channel within the limits of one of these wetland areas, neither qualify as isolated land subject to flooding (ISLF) and neither may qualify as any other State protected wetland resource.

No portion of the site contains a Special Flood Hazard Area (aka 100-year flood zone). Refer to the NFIP Flood Insurance Rate Map for the Town of Shrewsbury, Map Number 25027C0639F, dated

November 2015

July 16, 2014. The property does not contain a designated area of estimated/priority habitat of rare species, wildlife or vernal pools, according to the Natural Heritage Atlas, valid from October 1, 2008.

Soils on-site are mapped by the SCS/NRCS as predominately Canton fine sandy loam (map units 421B and 422B). Canton fine, sandy loam is classified as Hydrologic Soils Group (HSG) B. A smaller area of Chatfield-Hollis-Rock Outcrop complex (map unit 102D) also is indicated toward the north central portion of the property. Chatfield-Hollis-Rock outcrop complex is HSG of B (Chatfield component), while the Hollis component is HSG D. For purposes of hydrologic calculations, the soils have been modeled as HSG C due to the rocky nature of the site. WDA performed preliminary soils tests in August 2015 to verify the NRCS mapping.

Phase 2 – The existing lot consists of approximately 8.9 acres and is located at 526 Hartford Pike (Route 20) at the intersection of Hartford Turnpike and Stoney Hill Road. The property is shown on the Town of Shrewsbury Assessor's Map 48, Parcel 9 and is located in the Limited Industrial Zone District. The lot configuration is generally of a rectangular nature (a corner lot) with approximately 700 feet of frontage along Hartford Pike and 522 feet of frontage along Stoney Hill Road. The lot depth measures approximately 530 feet. There are no existing building structures on the property, though a public sewer main traverses the property southwest to northeast.

Topography on site ranges from an elevation of about 524 in the northern corner of the site descending southerly to an elevation 484 located in the southern portion of the property. A ridge runs parallel to Route 20 and is located on the west side of the property. The slope transitions across the property and can be best described as inconsistent with a pronounced swale running north/south in the central part of the parcel. Adjacent to the wetland resource that covers the southern portion of the site, the slope is steep, but becomes a gentle slope within the wetland area. Slopes within the swale and ridge are moderate.

The upland area is dominated primarily by black birch, red maple, shagbark hickory, oak, pine, hay scented fern, and Canada mayflower, mountain laurel, and witch hazel. Ledge outcrops can be observed at the ground surface.

A pipe culvert exists at the western part of the property conveying an intermittent stream from the Liberty Assembly of God Church property (#495 Hartford Turnpike) into the intermittent stream and wetland system on the property. An 8-inch PVC gravity sewer main is located along the southern edge of the upland area and is covered with a 12 foot wide compacted gravel access drive. The entire sewer infrastructure and access drive are located within a 25-foot wide record sewer easement.

No portion of the site contains a Special Flood Hazard Area (aka 100-year flood zone). Refer to the NFIP Flood Insurance Rate Map for the Town of Shrewsbury, Map Number 25027C0639F, dated July 16, 2014. The property does not contain a designated area of estimated/priority habitat of rare species, wildlife or vernal pools, according to the Natural Heritage Atlas, valid from October 1, 2008.

Soils on-site are mapped by the SCS/NRCS as predominately Paxton fine sandy loam (map unit 306B). Paxton fine, sandy loam is classified as Hydrologic Soils Group (HSG) C. WDA performed preliminary soils tests in July 2015 to verify the NRCS mapping.

The attached Existing Hydrology Plans show the project design points, contributing drainage area(s) and existing cover types.

PROPOSED PROJECT

Phase 1 – The project proponent, Smart Growth Design LLC, proposes to construct five three-story multi-family residential apartment buildings, a free standing club house building, associated green spaces and parking lots, as well as appurtenances such as walkways, dumpster areas and free standing garage buildings.

Stormwater runoff will be collected in either drop inlets or deep-sump, hooded catch basins and conveyed to stormwater treatment units, and eventually either the surface detention basin or one of several subsurface infiltration systems located throughout the site. Controlled outflow will be discharged to upland areas at a rates equal to or less than existing conditions for the 2, 10, and 100-year, 24-hour design storms.

Phase 2 – The project proponent proposes to construct three four-story multi-family residential apartment buildings, associated green spaces and parking lots, as well as appurtenances such as walkways and dumpster areas.

Stormwater runoff will be collected in either drop inlets or deep-sump, hooded catch basins and conveyed to stormwater treatment units, and eventually to one of the surface detention basins or one of two subsurface infiltration systems. Controlled outflow will be discharged to upland areas at a rates equal to or less than existing conditions for the 2, 10, and 100-year, 24-hour design storms.

STORMWATER MANAGEMENT STANDARDS

STANDARD #1 – NO NEW UNTREATED DISCHARGES

The stormwater collection systems have been designed so that stormwater runoff from the parking areas are treated through a treatment train consisting of deep-sump, hooded catch basins, stormwater treatment units, a detention basin or a stormwater infiltration system. Additionally, all outlets have been designed so that there will be no erosion or scour to the wetlands of the Commonwealth.

STANDARD #2 – PEAK RATE ATTENUATION

METHODOLOGY

United States Soil Conservation Service, “Urban Hydrology for Small Watersheds, Technical Release Number 55” (TR-55) methods (HydroCAD 10.00) were utilized to develop runoff hydrographs for watershed areas affected by the proposed development. Existing and proposed runoff hydrographs were developed for the 2, 10, and 100-year, 24-hour rainfall events for the purpose of developing a stormwater management system that will limit post-development peak runoff rates to pre-development levels.

The proposed stormwater management system has been designed to meet the requirements of the Town of Shrewsbury and the MassDEP Stormwater Management Standards. The project will limit peak rates of runoff from the site and will infiltrate runoff to approximate existing groundwater recharge.

ANALYSIS SUMMARY

In order to assess the impact of the proposed development on peak runoff rates onto down-gradient properties, hydrologic calculations were performed for each of three design storms at the design point(s). The calculations refer to runoff quantities at the final design points, being Stoney Hill Road and behind the homes along the north side of Stoney Hill Road for Phase 1. For Phase 2 the design points are the large wetland system on the southern portion of the site, Hartford Turnpike and Stoney Hill Road to the north.

Calculations of peak runoff rates for existing and proposed site conditions are included and summarized in Table I for comparison of peak runoff rates for the design point for the three design storms. A proposed hydrology plan is provided showing the various sub-watersheds draining to the proposed stormwater management facilities. Stormwater “run-on” from Hartford Turnpike and the abutting lot to the north are also collected, treated, detained/retained, such that flow rates and water quality impacts are mitigated. Stormwater runoff from the overland areas not tributary to the stormwater management facilities will drain by sheet flow or shallow concentrated flow along the existing flow patterns to the design points.

Tables IA and IB demonstrate that the proposed stormwater management system will be effective in limiting peak rates of runoff from the subject property to approximate pre-development levels. Facilities for both phases have been oversized due to rocky subsurface conditions. The systems will be refined when the Notice of Intent is filed with the Conservation Commission.

TABLE IA: EXISTING AND PROPOSED PEAK RUNOFF / PHASE 1

DRAINAGE AREA	DESIGN STORM EVENT / PEAK RUNOFF' (cfs)		
	2-Year	10-Year	100-Year
E1L	1.3	4.9	12.4
P1L	1.1	2.5	9.5
E2L	1.4	4.3	10.0
P2L	1.0	2.1	6.1

TABLE IB: EXISTING AND PROPOSED PEAK RUNOFF / PHASE 2

DRAINAGE AREA	DESIGN STORM EVENT / PEAK RUNOFF' (cfs)		
	2-Year	10-Year	100-Year
E3S	3.7	9.0	17.3
P3L	3.4	6.0	17.3
E4S	1.0	2.5	4.9
P4S	0.0	0.1	0.6
E5S	0.4	0.9	1.7
P5S	0.2	0.5	0.9

TABLE IIA: EXISTING AND PROPOSED RUNOFF VOLUMES / PHASE 1

DRAINAGE AREA	DESIGN STORM EVENT / RUNOFF VOLUME (cf)		
	2-Year	10-Year	100-Year
E1L	16,372	40,593	83,121
P1L	4,308	26,228	79,368
E2L	18,160	38,658	72,105
P2L	3,921	12,699	39,767

TABLE IIB: EXISTING AND PROPOSED PEAK RUNOFF / PHASE 2

DRAINAGE AREA	DESIGN STORM EVENT / RUNOFF VOLUME (cf)		
	2-Year	10-Year	100-Year
E3S	12,881	28,854	54,640
P3L	22,571	41,513	79,249
E4S	3,573	8,155	15,621
P4S	412	941	1,803
E5L	1,233	2,761	5,229
P5S	722	1,562	2,894

STANDARD #3 – STORMWATER RECHARGE

Groundwater recharge is provided within the subsurface infiltration systems and within the proposed detention basin. Test pits have been performed throughout the site and in areas where infiltration is proposed. In Phase 1, the soils across the site and within areas of proposed infiltration facilities were found to be reasonably well drained, loamy sand with the characteristics of HSG B. In some instances the soil is less well drained. All of Phase 2 was found to be rocky and shallow to bedrock with relatively high seasonal ground water. Rawls Rates for Sandy Loam (1.02 inches/hour) or Silt Loam (0.27 inches/hour) were used in the hydrologic models for the infiltration systems. Full recharge calculations will be provided when the Notice of Intent application is filed with the Conservation Commission.

STANDARD #4 – WATER QUALITY

Water quality measures will be designed to provide a minimum of 80% Total Suspended Solids (TSS) removal, and to treat 0.5 of runoff prior to discharging to the upland areas of the sites. Over 80% TSS removal will be provided through the use of two basic treatment trains 1) deep-sump, hooded catch basin, stormwater treatment unit and/or sediment forebay, and detention basin, or 2) deep-sump, hooded catch basins, stormwater treatment units and subsurface infiltration systems. Full water quality calculations will be provided when the Notice of Intent application is filed with the Conservation Commission.

STANDARD #5 – LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPLS)

Phase 1 of the proposed project may be considered a land use with (LUHPPLS). Phase 2 may not be considered a LUHPPLS.

STANDARD #6 – CRITICAL AREAS

Neither phase of the proposed project discharges near or to a Critical Area therefore, Standard #6 is not applicable.

STANDARD #7 – REDEVELOPMENT PROJECT

The proposed project may not be considered a redevelopment project therefore, Standard #7 is not applicable.

STANDARD #8 – CONSTRUCTION POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL

As the proposed area of disturbance for each phase is over one acre, a Notice of Intent (NOI) must be filed with the US EPA and a Stormwater Pollution Prevention Plan (SWPPP) shall be retained on-site during construction. A draft SWPPP will be provided when the Notice of Intent application is filed with the Conservation Commission.

STANDARD #9 – OPERATION AND MAINTENANCE PLAN

The requisite Operation and Maintenance Plan and Long Term Pollution Prevention Plan will be provided when the Notice of Intent application is filed with the Conservation Commission.

STANDARD #10 – PROHIBITION OF ILLICIT DISCHARGES

An Illicit Discharge Compliance Statement will be provided when the Notice of Intent application is filed with the Conservation Commission.

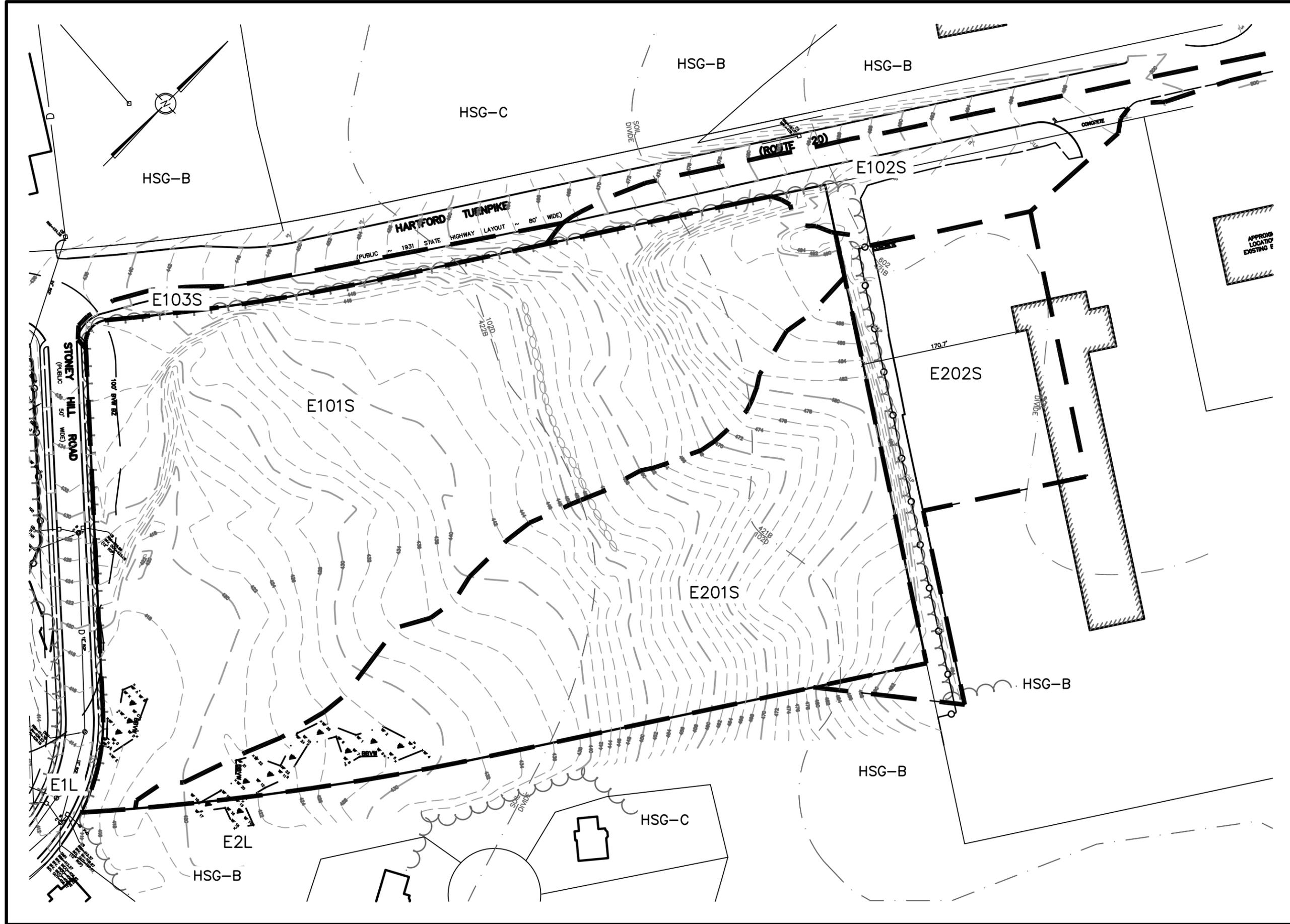
MASSACHUSETTS STORMWATER REPORT CHECKLIST

Though not a numbered standard, the Stormwater Report Checklist will be provided when the Notice of Intent application is filed with the Conservation Commission.

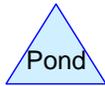
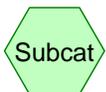
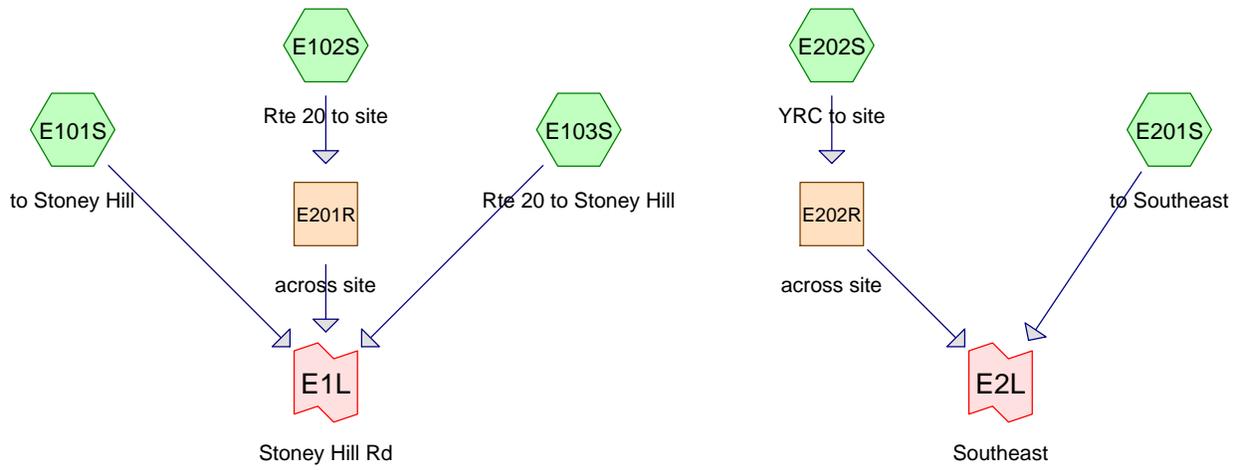
HYDRAULIC ANALYSIS

A full hydraulic analysis and calculations will be provided when the Notice of Intent is filed with the Conservation Commission.

EXISTING HYDROLOGY



WATERMAN DESIGN ASSOCIATES, INC. 31 East Main Street Westborough, MA 01581 508.366.6552 (fax) 508.366.6506 watermandesign.com wda@wdassoc.com	PHASE 1 - EXISTING HYDROLOGY PLAN THE POINTE AT HILLS FARM
	HARTFORD REALTY TRUST OF SHREWSBURY 291 Grafton Street Shrewsbury, MA 01545 PREPARED FOR: SMART GROWTH DESIGN, LLC 625 South Street Shrewsbury, MA 01545
PREPARED BY: WATERMAN DESIGN ASSOCIATES, INC. CIVIL ENGINEERS SURVEYORS LANDSCAPE ARCHITECTS PLANNERS	DATE: 10/28/15 JOB NO.: 0927.01 FILE NO.: 0927350 DWG NO.: 0927351A SCALE: 1" = 100' DRAWN BY: MIS REV. DATE:



927.01 Existing Phase 1

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
39,660	61	>75% Grass cover, Good, HSG B (E102S, E202S)
4,790	74	>75% Grass cover, Good, HSG C (E102S)
52,284	98	Paved parking, HSG B (E202S)
35,129	98	Paved roads w/curbs & sewers, HSG B (E102S, E103S)
1,741	98	Paved roads w/curbs & sewers, HSG C (E102S)
7,405	98	WETLAND, HSG B (E101S, E201S)
324,181	55	Woods, Good, HSG B (E101S, E102S, E201S, E202S)
125,850	70	Woods, Good, HSG C (E101S, E201S)
591,040	66	TOTAL AREA

927.01 Existing Phase 1

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
458,659	HSG B	E101S, E102S, E103S, E201S, E202S
132,381	HSG C	E101S, E102S, E201S
0	HSG D	
0	Other	
591,040		TOTAL AREA

927.01 Existing Phase 1

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E101S: to Stoney Hill	Runoff Area=284,623 sf 0.63% Impervious Runoff Depth>0.34" Flow Length=1,060' Slope=0.0870 '/' Tc=20.6 min CN=58 Runoff=1.0 cfs 8,025 cf
Subcatchment E102S: Rte 20 to site	Runoff Area=62,667 sf 56.86% Impervious Runoff Depth>1.61" Tc=6.0 min CN=83 Runoff=2.7 cfs 8,396 cf
Subcatchment E103S: Rte 20 to Stoney Hill	Runoff Area=1,239 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=0.1 cfs 306 cf
Subcatchment E201S: to Southeast	Runoff Area=170,824 sf 3.28% Impervious Runoff Depth>0.48" Flow Length=880' Slope=0.0940 '/' Tc=15.4 min CN=62 Runoff=1.1 cfs 6,811 cf
Subcatchment E202S: YRC to site	Runoff Area=71,687 sf 72.93% Impervious Runoff Depth>2.00" Tc=6.0 min CN=88 Runoff=3.8 cfs 11,920 cf
Reach E201R: across site	Avg. Flow Depth=0.33' Max Vel=0.28 fps Inflow=2.7 cfs 8,396 cf n=0.400 L=800.0' S=0.0625 '/' Capacity=111.4 cfs Outflow=0.9 cfs 8,041 cf
Reach E202R: across site	Avg. Flow Depth=0.27' Max Vel=0.26 fps Inflow=3.8 cfs 11,920 cf n=0.400 L=930.0' S=0.0720 '/' Capacity=111.1 cfs Outflow=1.2 cfs 11,349 cf
Link E1L: Stoney Hill Rd	Inflow=1.3 cfs 16,372 cf Primary=1.3 cfs 16,372 cf
Link E2L: Southeast	Inflow=1.4 cfs 18,160 cf Primary=1.4 cfs 18,160 cf

Total Runoff Area = 591,040 sf Runoff Volume = 35,458 cf Average Runoff Depth = 0.72"
83.66% Pervious = 494,481 sf 16.34% Impervious = 96,559 sf

927.01 Existing Phase 1

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment E101S: to Stoney Hill

Runoff = 1.0 cfs @ 12.48 hrs, Volume= 8,025 cf, Depth> 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
221,698	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
61,128	70	Woods, Good, HSG C
284,623	58	Weighted Average
282,826		99.37% Pervious Area
1,797		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	1,060	0.0870	0.86		Lag/CN Method,

Summary for Subcatchment E102S: Rte 20 to site

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 8,396 cf, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
33,890	98	Paved roads w/curbs & sewers, HSG B
20,392	61	>75% Grass cover, Good, HSG B
1,741	98	Paved roads w/curbs & sewers, HSG C
4,790	74	>75% Grass cover, Good, HSG C
1,854	55	Woods, Good, HSG B
62,667	83	Weighted Average
27,036		43.14% Pervious Area
35,631		56.86% Impervious Area

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

Summary for Subcatchment E103S: Rte 20 to Stoney Hill

Runoff = 0.1 cfs @ 12.09 hrs, Volume= 306 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
1,239	98	Paved roads w/curbs & sewers, HSG B
1,239		100.00% Impervious Area

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

927.01 Existing Phase 1

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment E201S: to Southeast

Runoff = 1.1 cfs @ 12.30 hrs, Volume= 6,811 cf, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
100,494	55	Woods, Good, HSG B
* 5,608	98	WETLAND, HSG B
64,722	70	Woods, Good, HSG C
170,824	62	Weighted Average
165,216		96.72% Pervious Area
5,608		3.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	880	0.0940	0.95		Lag/CN Method,

Summary for Subcatchment E202S: YRC to site

Runoff = 3.8 cfs @ 12.09 hrs, Volume= 11,920 cf, Depth> 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
* 52,284	98	Paved parking, HSG B
19,268	61	>75% Grass cover, Good, HSG B
135	55	Woods, Good, HSG B
71,687	88	Weighted Average
19,403		27.07% Pervious Area
52,284		72.93% Impervious Area

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

Summary for Reach E201R: across site

Inflow Area = 62,667 sf, 56.86% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 2.7 cfs @ 12.09 hrs, Volume= 8,396 cf
Outflow = 0.9 cfs @ 13.21 hrs, Volume= 8,041 cf, Atten= 66%, Lag= 66.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.28 fps, Min. Travel Time= 47.7 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 86.4 min

Peak Storage= 2,612 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 2.00' Flow Area= 120.0 sf, Capacity= 111.4 cfs

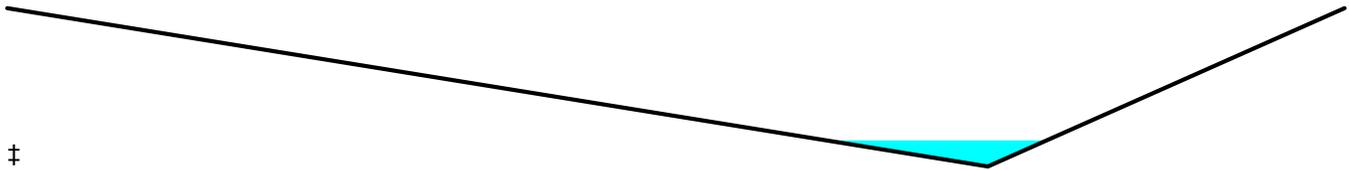
Custom cross-section, Length= 800.0' Slope= 0.0625 '/
Constant n= 0.400 Sheet flow: Woods+light brush
Inlet Invert= 464.00', Outlet Invert= 414.00'

927.01 Existing Phase 1

Type III 24-hr 2-year Rainfall=3.20"

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‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	426.00	0.00
88.00	424.00	2.00
120.00	426.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
2.00	120.0	120.1	96,000	111.4

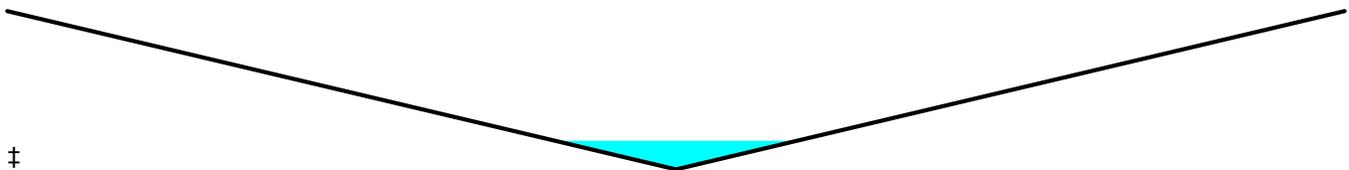
Summary for Reach E202R: across site

Inflow Area = 71,687 sf, 72.93% Impervious, Inflow Depth > 2.00" for 2-year event
 Inflow = 3.8 cfs @ 12.09 hrs, Volume= 11,920 cf
 Outflow = 1.2 cfs @ 13.40 hrs, Volume= 11,349 cf, Atten= 69%, Lag= 78.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.26 fps, Min. Travel Time= 58.8 min
 Avg. Velocity = 0.14 fps, Avg. Travel Time= 108.6 min

Peak Storage= 4,129 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.27'
 Bank-Full Depth= 1.50' Flow Area= 135.0 sf, Capacity= 111.1 cfs

Custom cross-section, Length= 930.0' Slope= 0.0720 '/'
 Constant n= 0.400 Sheet flow: Woods+light brush
 Inlet Invert= 488.00', Outlet Invert= 421.00'



‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	436.00	0.00
90.00	434.50	1.50
180.00	436.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
1.50	135.0	180.0	125,550	111.1

Summary for Link E1L: Stoney Hill Rd

Inflow Area = 348,529 sf, 11.09% Impervious, Inflow Depth > 0.56" for 2-year event
 Inflow = 1.3 cfs @ 13.13 hrs, Volume= 16,372 cf
 Primary = 1.3 cfs @ 13.13 hrs, Volume= 16,372 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

927.01 Existing Phase 1

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Link E2L: Southeast

Inflow Area = 242,511 sf, 23.87% Impervious, Inflow Depth > 0.90" for 2-year event
Inflow = 1.4 cfs @ 13.39 hrs, Volume= 18,160 cf
Primary = 1.4 cfs @ 13.39 hrs, Volume= 18,160 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

927.01 Existing Phase 1

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E101S: to Stoney Hill	Runoff Area=284,623 sf 0.63% Impervious Runoff Depth>1.05" Flow Length=1,060' Slope=0.0870 '/' Tc=20.6 min CN=58 Runoff=4.5 cfs 24,999 cf
Subcatchment E102S: Rte 20 to site	Runoff Area=62,667 sf 56.86% Impervious Runoff Depth>2.99" Tc=6.0 min CN=83 Runoff=4.9 cfs 15,621 cf
Subcatchment E103S: Rte 20 to Stoney Hill	Runoff Area=1,239 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=0.1 cfs 471 cf
Subcatchment E201S: to Southeast	Runoff Area=170,824 sf 3.28% Impervious Runoff Depth>1.31" Flow Length=880' Slope=0.0940 '/' Tc=15.4 min CN=62 Runoff=4.1 cfs 18,666 cf
Subcatchment E202S: YRC to site	Runoff Area=71,687 sf 72.93% Impervious Runoff Depth>3.48" Tc=6.0 min CN=88 Runoff=6.4 cfs 20,769 cf
Reach E201R: across site	Avg. Flow Depth=0.44' Max Vel=0.34 fps Inflow=4.9 cfs 15,621 cf n=0.400 L=800.0' S=0.0625 '/' Capacity=111.4 cfs Outflow=1.9 cfs 15,124 cf
Reach E202R: across site	Avg. Flow Depth=0.35' Max Vel=0.31 fps Inflow=6.4 cfs 20,769 cf n=0.400 L=930.0' S=0.0720 '/' Capacity=111.1 cfs Outflow=2.2 cfs 19,992 cf
Link E1L: Stoney Hill Rd	Inflow=4.9 cfs 40,593 cf Primary=4.9 cfs 40,593 cf
Link E2L: Southeast	Inflow=4.3 cfs 38,658 cf Primary=4.3 cfs 38,658 cf

Total Runoff Area = 591,040 sf Runoff Volume = 80,526 cf Average Runoff Depth = 1.63"
83.66% Pervious = 494,481 sf 16.34% Impervious = 96,559 sf

927.01 Existing Phase 1

Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment E101S: to Stoney Hill

Runoff = 4.5 cfs @ 12.34 hrs, Volume= 24,999 cf, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
221,698	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
61,128	70	Woods, Good, HSG C
284,623	58	Weighted Average
282,826		99.37% Pervious Area
1,797		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	1,060	0.0870	0.86		Lag/CN Method,

Summary for Subcatchment E102S: Rte 20 to site

Runoff = 4.9 cfs @ 12.09 hrs, Volume= 15,621 cf, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
33,890	98	Paved roads w/curbs & sewers, HSG B
20,392	61	>75% Grass cover, Good, HSG B
1,741	98	Paved roads w/curbs & sewers, HSG C
4,790	74	>75% Grass cover, Good, HSG C
1,854	55	Woods, Good, HSG B
62,667	83	Weighted Average
27,036		43.14% Pervious Area
35,631		56.86% Impervious Area

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

Summary for Subcatchment E103S: Rte 20 to Stoney Hill

Runoff = 0.1 cfs @ 12.09 hrs, Volume= 471 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
1,239	98	Paved roads w/curbs & sewers, HSG B
1,239		100.00% Impervious Area

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

927.01 Existing Phase 1

Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment E201S: to Southeast

Runoff = 4.1 cfs @ 12.24 hrs, Volume= 18,666 cf, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
100,494	55	Woods, Good, HSG B
* 5,608	98	WETLAND, HSG B
64,722	70	Woods, Good, HSG C
170,824	62	Weighted Average
165,216		96.72% Pervious Area
5,608		3.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	880	0.0940	0.95		Lag/CN Method,

Summary for Subcatchment E202S: YRC to site

Runoff = 6.4 cfs @ 12.09 hrs, Volume= 20,769 cf, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
* 52,284	98	Paved parking, HSG B
19,268	61	>75% Grass cover, Good, HSG B
135	55	Woods, Good, HSG B
71,687	88	Weighted Average
19,403		27.07% Pervious Area
52,284		72.93% Impervious Area

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

Summary for Reach E201R: across site

Inflow Area = 62,667 sf, 56.86% Impervious, Inflow Depth > 2.99" for 10-year event

Inflow = 4.9 cfs @ 12.09 hrs, Volume= 15,621 cf

Outflow = 1.9 cfs @ 13.01 hrs, Volume= 15,124 cf, Atten= 61%, Lag= 54.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.34 fps, Min. Travel Time= 39.6 min

Avg. Velocity = 0.17 fps, Avg. Travel Time= 77.7 min

Peak Storage= 4,569 cf @ 12.35 hrs

Average Depth at Peak Storage= 0.44'

Bank-Full Depth= 2.00' Flow Area= 120.0 sf, Capacity= 111.4 cfs

Custom cross-section, Length= 800.0' Slope= 0.0625 '/'

Constant n= 0.400 Sheet flow: Woods+light brush

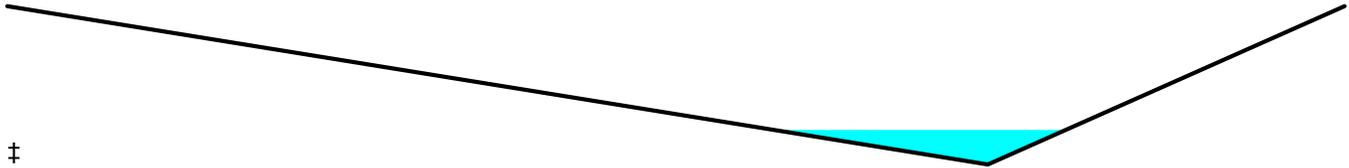
Inlet Invert= 464.00', Outlet Invert= 414.00'

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Type III 24-hr 10-year Rainfall=4.80"

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Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	426.00	0.00
88.00	424.00	2.00
120.00	426.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
2.00	120.0	120.1	96,000	111.4

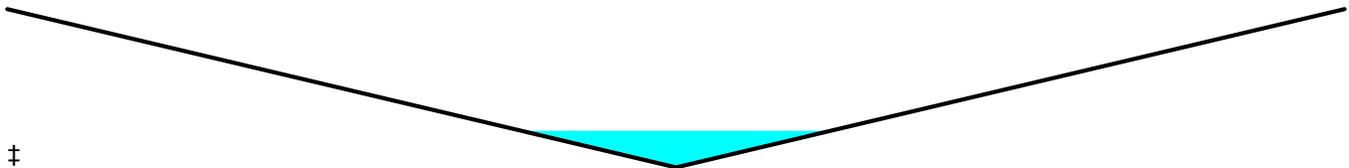
Summary for Reach E202R: across site

Inflow Area = 71,687 sf, 72.93% Impervious, Inflow Depth > 3.48" for 10-year event
 Inflow = 6.4 cfs @ 12.09 hrs, Volume= 20,769 cf
 Outflow = 2.2 cfs @ 13.20 hrs, Volume= 19,992 cf, Atten= 65%, Lag= 66.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.31 fps, Min. Travel Time= 49.9 min
 Avg. Velocity= 0.16 fps, Avg. Travel Time= 98.5 min

Peak Storage= 6,738 cf @ 12.37 hrs
 Average Depth at Peak Storage= 0.35'
 Bank-Full Depth= 1.50' Flow Area= 135.0 sf, Capacity= 111.1 cfs

Custom cross-section, Length= 930.0' Slope= 0.0720 '/'
 Constant n= 0.400 Sheet flow: Woods+light brush
 Inlet Invert= 488.00', Outlet Invert= 421.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	436.00	0.00
90.00	434.50	1.50
180.00	436.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
1.50	135.0	180.0	125,550	111.1

Summary for Link E1L: Stoney Hill Rd

Inflow Area = 348,529 sf, 11.09% Impervious, Inflow Depth > 1.40" for 10-year event
 Inflow = 4.9 cfs @ 12.35 hrs, Volume= 40,593 cf
 Primary = 4.9 cfs @ 12.35 hrs, Volume= 40,593 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link E2L: Southeast

Inflow Area = 242,511 sf, 23.87% Impervious, Inflow Depth > 1.91" for 10-year event
Inflow = 4.3 cfs @ 12.24 hrs, Volume= 38,658 cf
Primary = 4.3 cfs @ 12.24 hrs, Volume= 38,658 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E101S: to Stoney Hill	Runoff Area=284,623 sf 0.63% Impervious Runoff Depth>2.40" Flow Length=1,060' Slope=0.0870 '/ Tc=20.6 min CN=58 Runoff=11.7 cfs 56,856 cf
Subcatchment E102S: Rte 20 to site	Runoff Area=62,667 sf 56.86% Impervious Runoff Depth>5.02" Tc=6.0 min CN=83 Runoff=8.1 cfs 26,236 cf
Subcatchment E103S: Rte 20 to Stoney Hill	Runoff Area=1,239 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=0.2 cfs 698 cf
Subcatchment E201S: to Southeast	Runoff Area=170,824 sf 3.28% Impervious Runoff Depth>2.79" Flow Length=880' Slope=0.0940 '/ Tc=15.4 min CN=62 Runoff=9.4 cfs 39,739 cf
Subcatchment E202S: YRC to site	Runoff Area=71,687 sf 72.93% Impervious Runoff Depth>5.59" Tc=6.0 min CN=88 Runoff=10.1 cfs 33,391 cf
Reach E201R: across site	Avg. Flow Depth=0.55' Max Vel=0.39 fps Inflow=8.1 cfs 26,236 cf n=0.400 L=800.0' S=0.0625 '/ Capacity=111.4 cfs Outflow=3.5 cfs 25,568 cf
Reach E202R: across site	Avg. Flow Depth=0.43' Max Vel=0.36 fps Inflow=10.1 cfs 33,391 cf n=0.400 L=930.0' S=0.0720 '/ Capacity=111.1 cfs Outflow=3.8 cfs 32,366 cf
Link E1L: Stoney Hill Rd	Inflow=12.4 cfs 83,121 cf Primary=12.4 cfs 83,121 cf
Link E2L: Southeast	Inflow=10.0 cfs 72,105 cf Primary=10.0 cfs 72,105 cf

Total Runoff Area = 591,040 sf Runoff Volume = 156,920 cf Average Runoff Depth = 3.19"
83.66% Pervious = 494,481 sf 16.34% Impervious = 96,559 sf

927.01 Existing Phase 1

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Summary for Subcatchment E101S: to Stoney Hill

Runoff = 11.7 cfs @ 12.31 hrs, Volume= 56,856 cf, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
221,698	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
61,128	70	Woods, Good, HSG C
284,623	58	Weighted Average
282,826		99.37% Pervious Area
1,797		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	1,060	0.0870	0.86		Lag/CN Method,

Summary for Subcatchment E102S: Rte 20 to site

Runoff = 8.1 cfs @ 12.09 hrs, Volume= 26,236 cf, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
33,890	98	Paved roads w/curbs & sewers, HSG B
20,392	61	>75% Grass cover, Good, HSG B
1,741	98	Paved roads w/curbs & sewers, HSG C
4,790	74	>75% Grass cover, Good, HSG C
1,854	55	Woods, Good, HSG B
62,667	83	Weighted Average
27,036		43.14% Pervious Area
35,631		56.86% Impervious Area

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

Summary for Subcatchment E103S: Rte 20 to Stoney Hill

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 698 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
1,239	98	Paved roads w/curbs & sewers, HSG B
1,239		100.00% Impervious Area

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

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Summary for Subcatchment E201S: to Southeast

Runoff = 9.4 cfs @ 12.22 hrs, Volume= 39,739 cf, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
100,494	55	Woods, Good, HSG B
* 5,608	98	WETLAND, HSG B
64,722	70	Woods, Good, HSG C
170,824	62	Weighted Average
165,216		96.72% Pervious Area
5,608		3.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	880	0.0940	0.95		Lag/CN Method,

Summary for Subcatchment E202S: YRC to site

Runoff = 10.1 cfs @ 12.09 hrs, Volume= 33,391 cf, Depth> 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
* 52,284	98	Paved parking, HSG B
19,268	61	>75% Grass cover, Good, HSG B
135	55	Woods, Good, HSG B
71,687	88	Weighted Average
19,403		27.07% Pervious Area
52,284		72.93% Impervious Area

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

Summary for Reach E201R: across site

Inflow Area = 62,667 sf, 56.86% Impervious, Inflow Depth > 5.02" for 100-year event
Inflow = 8.1 cfs @ 12.09 hrs, Volume= 26,236 cf
Outflow = 3.5 cfs @ 12.87 hrs, Volume= 25,568 cf, Atten= 57%, Lag= 46.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.39 fps, Min. Travel Time= 34.1 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 70.8 min

Peak Storage= 7,141 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 120.0 sf, Capacity= 111.4 cfs

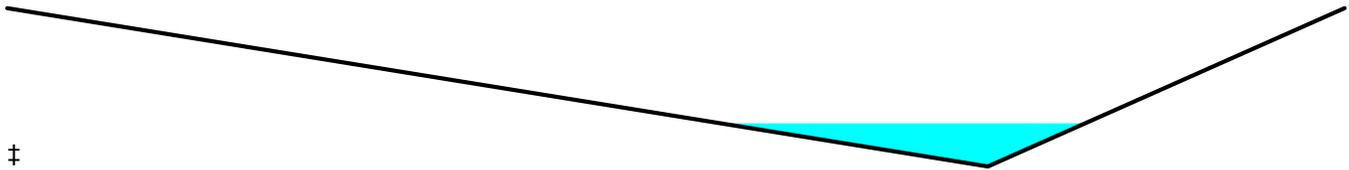
Custom cross-section, Length= 800.0' Slope= 0.0625 '/'
Constant n= 0.400 Sheet flow: Woods+light brush
Inlet Invert= 464.00', Outlet Invert= 414.00'

927.01 Existing Phase 1

Type III 24-hr 100-year Rainfall=7.00"

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Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	426.00	0.00
88.00	424.00	2.00
120.00	426.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
2.00	120.0	120.1	96,000	111.4

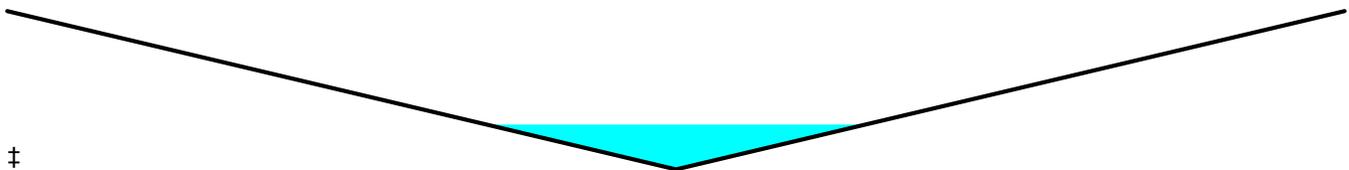
Summary for Reach E202R: across site

Inflow Area = 71,687 sf, 72.93% Impervious, Inflow Depth > 5.59" for 100-year event
 Inflow = 10.1 cfs @ 12.09 hrs, Volume= 33,391 cf
 Outflow = 3.8 cfs @ 13.06 hrs, Volume= 32,366 cf, Atten= 62%, Lag= 58.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.36 fps, Min. Travel Time= 43.6 min
 Avg. Velocity = 0.17 fps, Avg. Travel Time= 89.2 min

Peak Storage= 10,088 cf @ 12.33 hrs
 Average Depth at Peak Storage= 0.43'
 Bank-Full Depth= 1.50' Flow Area= 135.0 sf, Capacity= 111.1 cfs

Custom cross-section, Length= 930.0' Slope= 0.0720 '/'
 Constant n= 0.400 Sheet flow: Woods+light brush
 Inlet Invert= 488.00', Outlet Invert= 421.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	436.00	0.00
90.00	434.50	1.50
180.00	436.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.0
1.50	135.0	180.0	125,550	111.1

Summary for Link E1L: Stoney Hill Rd

Inflow Area = 348,529 sf, 11.09% Impervious, Inflow Depth > 2.86" for 100-year event
 Inflow = 12.4 cfs @ 12.31 hrs, Volume= 83,121 cf
 Primary = 12.4 cfs @ 12.31 hrs, Volume= 83,121 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

927.01 Existing Phase 1

Type III 24-hr 100-year Rainfall=7.00"

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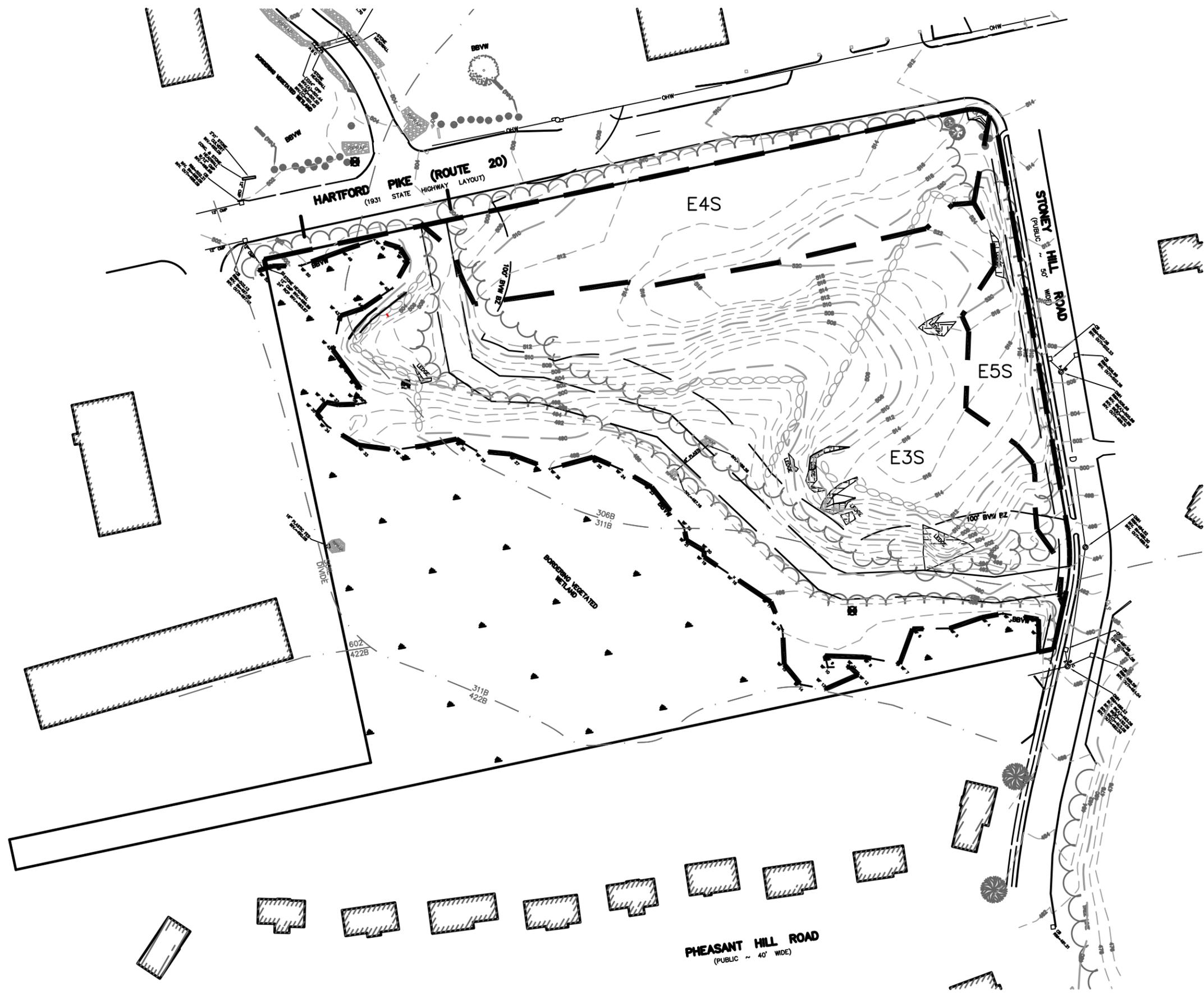
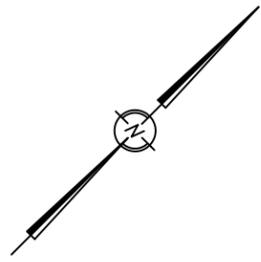
Summary for Link E2L: Southeast

Inflow Area = 242,511 sf, 23.87% Impervious, Inflow Depth > 3.57" for 100-year event

Inflow = 10.0 cfs @ 12.22 hrs, Volume= 72,105 cf

Primary = 10.0 cfs @ 12.22 hrs, Volume= 72,105 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



WATERMAN DESIGN ASSOCIATES, INC.
 31 East Main Street
 Westborough, MA 01581
 508.366.6552
 (fax) 508.366.6506
 watermandesign.com wda@wdassoc.com

TITLE: PHASE 2 - EXISTING HYDROLOGY PLAN
 THE POINTE AT HILLS FARM

OWNER: HARTFORD REALTY TRUST OF SHREWSBURY
 291 Grafton Street
 Shrewsbury, MA 01545

PREPARED FOR: SMART GROWTH DESIGN, LLC
 625 South Street
 Shrewsbury, MA 01545

DATE: 10/28/15
JOB NO.: 0927.02
FILE NO.: 0927350
DWG NO.: 0927354A
SCALE: 1" = 100'
REV. NO.: MIS
REV. DATE: MIS



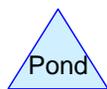
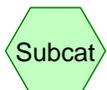
to Rte 20



central portion of site



to Stoney Hill



927.02 Existing Phase 2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
57,784	74	>75% Grass cover, Good, HSG C (E3S, E4S, E5S)
629	98	Unconnected pavement, HSG C (E3S)
184,530	70	Woods, Good, HSG C (E3S, E4S, E5S)
1,959	98	ledge, HSG C (E3S)
76	89	rip rap, HSG C (E3S)
244,978	71	TOTAL AREA

927.02 Existing Phase 2

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
244,978	HSG C	E3S, E4S, E5S
0	HSG D	
0	Other	
244,978		TOTAL AREA

927.02 Existing Phase 2

Prepared by Waterman Design Associates, Inc.

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E3S: central portion of site

Runoff Area=176,259 sf 1.47% Impervious Runoff Depth>0.88"
Flow Length=420' Slope=0.1100 '/' Tc=6.0 min UI Adjusted CN=71 Runoff=3.7 cfs 12,881 cf

Subcatchment E4S: to Rte 20

Runoff Area=51,852 sf 0.00% Impervious Runoff Depth>0.83"
Tc=6.0 min CN=70 Runoff=1.0 cfs 3,573 cf

Subcatchment E5S: to Stoney Hill

Runoff Area=16,867 sf 0.00% Impervious Runoff Depth>0.88"
Tc=6.0 min CN=71 Runoff=0.4 cfs 1,233 cf

Total Runoff Area = 244,978 sf Runoff Volume = 17,687 cf Average Runoff Depth = 0.87"
98.94% Pervious = 242,390 sf 1.06% Impervious = 2,588 sf

927.02 Existing Phase 2

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment E3S: central portion of site

Runoff = 3.7 cfs @ 12.10 hrs, Volume= 12,881 cf, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Adj	Description
29,232	74		>75% Grass cover, Good, HSG C
* 76	89		rip rap, HSG C
* 1,959	98		ledge, HSG C
55,968	70		Woods, Good, HSG C
12,961	70		Woods, Good, HSG C
19,305	74		>75% Grass cover, Good, HSG C
271	74		>75% Grass cover, Good, HSG C
55,858	70		Woods, Good, HSG C
629	98		Unconnected pavement, HSG C
176,259	72	71	Weighted Average, UI Adjusted
173,671			98.53% Pervious Area
2,588			1.47% Impervious Area
629			24.30% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	420	0.1100	1.16		Lag/CN Method,

Summary for Subcatchment E4S: to Rte 20

Runoff = 1.0 cfs @ 12.10 hrs, Volume= 3,573 cf, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
4,447	74	>75% Grass cover, Good, HSG C
47,405	70	Woods, Good, HSG C
51,852	70	Weighted Average
51,852		100.00% Pervious Area

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

Summary for Subcatchment E5S: to Stoney Hill

Runoff = 0.4 cfs @ 12.10 hrs, Volume= 1,233 cf, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
4,529	74	>75% Grass cover, Good, HSG C
12,338	70	Woods, Good, HSG C
16,867	71	Weighted Average
16,867		100.00% Pervious Area

927.02 Existing Phase 2

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

927.02 Existing Phase 2

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Type III 24-hr 10-year Rainfall=4.80"

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E3S: central portion of site Runoff Area=176,259 sf 1.47% Impervious Runoff Depth>1.96"
Flow Length=420' Slope=0.1100 '/' Tc=6.0 min UI Adjusted CN=71 Runoff=9.0 cfs 28,854 cf

Subcatchment E4S: to Rte 20 Runoff Area=51,852 sf 0.00% Impervious Runoff Depth>1.89"
Tc=6.0 min CN=70 Runoff=2.5 cfs 8,155 cf

Subcatchment E5S: to Stoney Hill Runoff Area=16,867 sf 0.00% Impervious Runoff Depth>1.96"
Tc=6.0 min CN=71 Runoff=0.9 cfs 2,761 cf

Total Runoff Area = 244,978 sf Runoff Volume = 39,770 cf Average Runoff Depth = 1.95"
98.94% Pervious = 242,390 sf 1.06% Impervious = 2,588 sf

927.02 Existing Phase 2

Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment E3S: central portion of site

Runoff = 9.0 cfs @ 12.10 hrs, Volume= 28,854 cf, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Adj	Description
29,232	74		>75% Grass cover, Good, HSG C
* 76	89		rip rap, HSG C
* 1,959	98		ledge, HSG C
55,968	70		Woods, Good, HSG C
12,961	70		Woods, Good, HSG C
19,305	74		>75% Grass cover, Good, HSG C
271	74		>75% Grass cover, Good, HSG C
55,858	70		Woods, Good, HSG C
629	98		Unconnected pavement, HSG C
176,259	72	71	Weighted Average, UI Adjusted
173,671			98.53% Pervious Area
2,588			1.47% Impervious Area
629			24.30% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	420	0.1100	1.16		Lag/CN Method,

Summary for Subcatchment E4S: to Rte 20

Runoff = 2.5 cfs @ 12.10 hrs, Volume= 8,155 cf, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
4,447	74	>75% Grass cover, Good, HSG C
47,405	70	Woods, Good, HSG C
51,852	70	Weighted Average
51,852		100.00% Pervious Area

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

Summary for Subcatchment E5S: to Stoney Hill

Runoff = 0.9 cfs @ 12.10 hrs, Volume= 2,761 cf, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
4,529	74	>75% Grass cover, Good, HSG C
12,338	70	Woods, Good, HSG C
16,867	71	Weighted Average
16,867		100.00% Pervious Area

927.02 Existing Phase 2

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

927.02 Existing Phase 2

Type III 24-hr 100-year Rainfall=7.00"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E3S: central portion of site

Runoff Area=176,259 sf 1.47% Impervious Runoff Depth>3.72"
Flow Length=420' Slope=0.1100 '/' Tc=6.0 min UI Adjusted CN=71 Runoff=17.3 cfs 54,640 cf

Subcatchment E4S: to Rte 20

Runoff Area=51,852 sf 0.00% Impervious Runoff Depth>3.62"
Tc=6.0 min CN=70 Runoff=4.9 cfs 15,621 cf

Subcatchment E5S: to Stoney Hill

Runoff Area=16,867 sf 0.00% Impervious Runoff Depth>3.72"
Tc=6.0 min CN=71 Runoff=1.7 cfs 5,229 cf

Total Runoff Area = 244,978 sf Runoff Volume = 75,490 cf Average Runoff Depth = 3.70"
98.94% Pervious = 242,390 sf 1.06% Impervious = 2,588 sf

927.02 Existing Phase 2

Type III 24-hr 100-year Rainfall=7.00"

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Summary for Subcatchment E3S: central portion of site

Runoff = 17.3 cfs @ 12.09 hrs, Volume= 54,640 cf, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Adj	Description
29,232	74		>75% Grass cover, Good, HSG C
* 76	89		rip rap, HSG C
* 1,959	98		ledge, HSG C
55,968	70		Woods, Good, HSG C
12,961	70		Woods, Good, HSG C
19,305	74		>75% Grass cover, Good, HSG C
271	74		>75% Grass cover, Good, HSG C
55,858	70		Woods, Good, HSG C
629	98		Unconnected pavement, HSG C
176,259	72	71	Weighted Average, UI Adjusted
173,671			98.53% Pervious Area
2,588			1.47% Impervious Area
629			24.30% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	420	0.1100	1.16		Lag/CN Method,

Summary for Subcatchment E4S: to Rte 20

Runoff = 4.9 cfs @ 12.09 hrs, Volume= 15,621 cf, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
4,447	74	>75% Grass cover, Good, HSG C
47,405	70	Woods, Good, HSG C
51,852	70	Weighted Average
51,852		100.00% Pervious Area

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

Summary for Subcatchment E5S: to Stoney Hill

Runoff = 1.7 cfs @ 12.09 hrs, Volume= 5,229 cf, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
4,529	74	>75% Grass cover, Good, HSG C
12,338	70	Woods, Good, HSG C
16,867	71	Weighted Average
16,867		100.00% Pervious Area

927.02 Existing Phase 2

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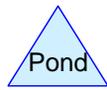
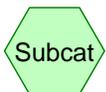
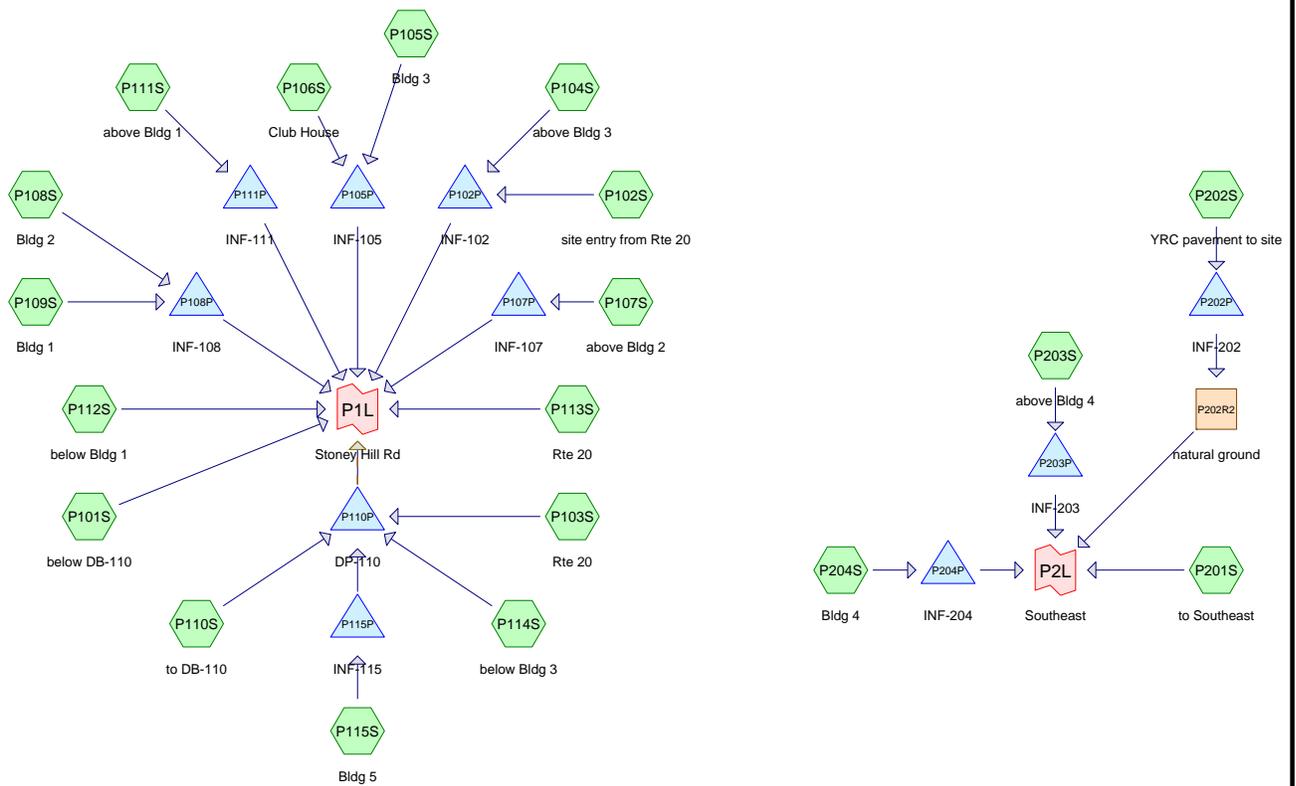
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

PROPOSED HYDROLOGY



TITLE:	PHASE 1 - PROPOSED HYDROLOGY PLAN THE POINTE AT HILLS FARM		
OWNER:	HARTFORD REALTY TRUST OF SHREWSBURY 291 Grafton Street Shrewsbury, MA 01545		
PREPARED FOR:	SMART GROWTH DESIGN, LLC 625 South Street Shrewsbury, MA 01545		
DATE:	10/28/15	FILE NO.:	0927350
JOB NO.:	0927.01	DWG NO.:	0927352A
		REV. NO.:	
		SCALE:	1" = 100'
		DRAWN BY:	MIS
		REV. DATE:	

WATERMAN DESIGN ASSOCIATES, INC.
 31 East Main Street
 Westborough, MA 01581
 508.366.6552
 (fax) 508.366.6506
 watermandesign.com wda@wdassoc.com



Routing Diagram for 927.01 Proposed Phase 1
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927.01 Proposed Phase 1

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
181,746	61	>75% Grass cover, Good, HSG B (P101S, P102S, P103S, P104S, P107S, P110S, P111S, P112S, P114S, P201S, P203S)
53,205	74	>75% Grass cover, Good, HSG C (P102S, P103S, P104S, P107S, P114S, P201S, P203S)
181,315	98	Paved parking, HSG B (P101S, P102S, P103S, P104S, P107S, P110S, P111S, P112S, P114S, P202S, P203S)
43,299	98	Paved parking, HSG C (P102S, P104S, P107S, P114S, P203S)
10,065	98	Paved roads w/curbs & sewers, HSG B (P103S, P113S)
7,253	98	Paved roads w/curbs & sewers, HSG C (P103S, P113S)
53,079	98	Roofs, HSG B (P105S, P106S, P108S, P109S, P115S, P204S)
26,681	98	Roofs, HSG C (P105S, P204S)
1,642	98	Unconnected roofs, HSG B (P201S)
7,405	98	WETLAND, HSG B (P101S, P201S)
23,836	55	Woods, Good, HSG B (P101S, P104S, P201S, P203S)
1,943	70	Woods, Good, HSG C (P104S, P201S, P203S)
591,469	83	TOTAL AREA

927.01 Proposed Phase 1

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
459,088	HSG B	P101S, P102S, P103S, P104S, P105S, P106S, P107S, P108S, P109S, P110S, P111S, P112S, P113S, P114S, P115S, P201S, P202S, P203S, P204S
132,381	HSG C	P102S, P103S, P104S, P105S, P107S, P113S, P114S, P201S, P203S, P204S
0	HSG D	
0	Other	
591,469		TOTAL AREA

927.01 Proposed Phase 1

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Type III 24-hr 2-year Rainfall=3.20"

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP101S: below DB-110	Runoff Area=27,769 sf 27.91% Impervious Runoff Depth>0.83" Tc=6.0 min CN=70 Runoff=0.5 cfs 1,914 cf
SubcatchmentP102S: site entry from Rte 20	Runoff Area=20,647 sf 64.89% Impervious Runoff Depth>2.08" Tc=6.0 min CN=89 Runoff=1.1 cfs 3,579 cf
SubcatchmentP103S: Rte 20	Runoff Area=69,540 sf 70.54% Impervious Runoff Depth>1.91" Tc=6.0 min CN=87 Runoff=3.5 cfs 11,087 cf
SubcatchmentP104S: above Bldg 3	Runoff Area=42,156 sf 46.73% Impervious Runoff Depth>1.40" Tc=6.0 min CN=80 Runoff=1.5 cfs 4,920 cf
SubcatchmentP105S: Bldg 3	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=1.0 cfs 3,504 cf
SubcatchmentP106S: Club House	Runoff Area=4,675 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=0.3 cfs 1,155 cf
SubcatchmentP107S: above Bldg 2	Runoff Area=24,193 sf 72.77% Impervious Runoff Depth>2.00" Flow Length=463' Slope=0.0518 '/ Tc=6.0 min CN=88 Runoff=1.3 cfs 4,023 cf
SubcatchmentP108S: Bldg 2	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=1.0 cfs 3,504 cf
SubcatchmentP109S: Bldg 1	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=1.1 cfs 3,849 cf
SubcatchmentP110S: to DB-110	Runoff Area=54,442 sf 19.00% Impervious Runoff Depth>0.73" Tc=6.0 min CN=68 Runoff=0.9 cfs 3,319 cf
SubcatchmentP111S: above Bldg 1	Runoff Area=25,384 sf 67.70% Impervious Runoff Depth>1.83" Tc=6.0 min CN=86 Runoff=1.2 cfs 3,878 cf
SubcatchmentP112S: below Bldg 1	Runoff Area=20,212 sf 12.33% Impervious Runoff Depth>0.64" Tc=6.0 min CN=66 Runoff=0.3 cfs 1,081 cf
SubcatchmentP113S: Rte 20	Runoff Area=3,348 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=0.2 cfs 827 cf
SubcatchmentP114S: below Bldg 3	Runoff Area=62,968 sf 32.30% Impervious Runoff Depth>1.27" Tc=6.0 min CN=78 Runoff=2.1 cfs 6,675 cf
SubcatchmentP115S: Bldg 5	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=1.1 cfs 3,849 cf
SubcatchmentP201S: to Southeast	Runoff Area=32,709 sf 22.17% Impervious Runoff Depth>0.73" Flow Length=400' Slope=0.0518 '/ Tc=9.2 min UI Adjusted CN=68 Runoff=0.5 cfs 1,992 cf
SubcatchmentP202S: YRC pavement to site	Runoff Area=52,284 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=3.6 cfs 12,921 cf
SubcatchmentP203S: above Bldg 4	Runoff Area=76,057 sf 39.75% Impervious Runoff Depth>1.15" Tc=6.0 min CN=76 Runoff=2.2 cfs 7,293 cf
SubcatchmentP204S: Bldg 4	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=1.1 cfs 3,849 cf
Reach P202R2: natural ground	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.0 cfs 0 cf n=0.400 L=250.0' S=0.0360 '/ Capacity=22.5 cfs Outflow=0.0 cfs 0 cf

927.01 Proposed Phase 1

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Type III 24-hr 2-year Rainfall=3.20"

Pond P102P: INF-102

Peak Elev=448.13' Storage=4,966 cf Inflow=2.7 cfs 8,498 cf
Discarded=0.1 cfs 4,707 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 4,707 cf

Pond P105P: INF-105

Peak Elev=458.69' Storage=3,141 cf Inflow=1.3 cfs 4,660 cf
Discarded=0.0 cfs 1,703 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,703 cf

Pond P107P: INF-107

Peak Elev=443.64' Storage=2,521 cf Inflow=1.3 cfs 4,023 cf
Discarded=0.0 cfs 1,870 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,870 cf

Pond P108P: INF-108

Peak Elev=435.64' Storage=4,275 cf Inflow=2.1 cfs 7,354 cf
Discarded=0.1 cfs 3,936 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,936 cf

Pond P110P: DP-110

Peak Elev=423.42' Storage=12,432 cf Inflow=6.5 cfs 21,081 cf
Discarded=0.2 cfs 10,680 cf Primary=0.0 cfs 485 cf Tertiary=0.0 cfs 0 cf Outflow=0.3 cfs 11,165 cf

Pond P111P: INF-111

Peak Elev=429.92' Storage=2,501 cf Inflow=1.2 cfs 3,878 cf
Discarded=0.0 cfs 1,650 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,650 cf

Pond P115P: INF-115

Peak Elev=434.71' Storage=2,339 cf Inflow=1.1 cfs 3,849 cf
Discarded=0.0 cfs 1,850 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,850 cf

Pond P202P: INF-202

Peak Elev=443.27' Storage=7,242 cf Inflow=3.6 cfs 12,921 cf
Discarded=0.1 cfs 7,453 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 7,453 cf

Pond P203P: INF-203

Peak Elev=438.62' Storage=4,654 cf Inflow=2.2 cfs 7,293 cf
Discarded=0.1 cfs 3,065 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,065 cf

Pond P204P: INF-204

Peak Elev=440.58' Storage=1,457 cf Inflow=1.1 cfs 3,849 cf
Discarded=0.0 cfs 1,011 cf Primary=0.5 cfs 1,929 cf Outflow=0.6 cfs 2,939 cf

Link P1L: Stoney Hill Rd

Inflow=1.1 cfs 4,308 cf
Primary=1.1 cfs 4,308 cf

Link P2L: Southeast

Inflow=1.0 cfs 3,921 cf
Primary=1.0 cfs 3,921 cf

**Total Runoff Area = 591,469 sf Runoff Volume = 83,222 cf Average Runoff Depth = 1.69"
44.08% Pervious = 260,730 sf 55.92% Impervious = 330,739 sf**

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P101S: below DB-110

Runoff = 0.5 cfs @ 12.10 hrs, Volume= 1,914 cf, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
5,953	98	Paved parking, HSG B
14,315	61	>75% Grass cover, Good, HSG B
5,704	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
27,769	70	Weighted Average
20,019		72.09% Pervious Area
7,750		27.91% Impervious Area

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

Summary for Subcatchment P102S: site entry from Rte 20

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 3,579 cf, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
10,300	98	Paved parking, HSG C
6,711	74	>75% Grass cover, Good, HSG C
3,097	98	Paved parking, HSG B
539	61	>75% Grass cover, Good, HSG B
20,647	89	Weighted Average
7,250		35.11% Pervious Area
13,397		64.89% Impervious Area

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

Summary for Subcatchment P103S: Rte 20

Runoff = 3.5 cfs @ 12.09 hrs, Volume= 11,087 cf, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
35,083	98	Paved parking, HSG B
13,373	61	>75% Grass cover, Good, HSG B
9,274	98	Paved roads w/curbs & sewers, HSG B
5,391	61	>75% Grass cover, Good, HSG B
4,696	98	Paved roads w/curbs & sewers, HSG C
1,723	74	>75% Grass cover, Good, HSG C
69,540	87	Weighted Average
20,487		29.46% Pervious Area
49,053		70.54% Impervious Area

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Type III 24-hr 2-year Rainfall=3.20"

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

Summary for Subcatchment P104S: above Bldg 3

Runoff = 1.5 cfs @ 12.10 hrs, Volume= 4,920 cf, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
8,843	98	Paved parking, HSG B
10,926	61	>75% Grass cover, Good, HSG B
2,964	55	Woods, Good, HSG B
10,857	98	Paved parking, HSG C
7,420	74	>75% Grass cover, Good, HSG C
1,146	70	Woods, Good, HSG C
42,156	80	Weighted Average
22,456		53.27% Pervious Area
19,700		46.73% Impervious Area

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

Summary for Subcatchment P105S: Bldg 3

Runoff = 1.0 cfs @ 12.09 hrs, Volume= 3,504 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
2,440	98	Roofs, HSG B
11,740	98	Roofs, HSG C
14,180	98	Weighted Average
14,180		100.00% Impervious Area

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

Summary for Subcatchment P106S: Club House

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,155 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
1,222	98	Roofs, HSG B
3,453	98	Roofs, HSG B
4,675	98	Weighted Average
4,675		100.00% Impervious Area

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

Summary for Subcatchment P107S: above Bldg 2

Runoff = 1.3 cfs @ 12.09 hrs, Volume= 4,023 cf, Depth> 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
1,889	98	Paved parking, HSG C
873	74	>75% Grass cover, Good, HSG C
15,716	98	Paved parking, HSG B
5,715	61	>75% Grass cover, Good, HSG B
24,193	88	Weighted Average
6,588		27.23% Pervious Area
17,605		72.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	463	0.0518	1.35		Lag/CN Method,
5.7	463				Total, Increased to minimum Tc = 6.0 min

Summary for Subcatchment P108S: Bldg 2

Runoff = 1.0 cfs @ 12.09 hrs, Volume= 3,504 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
14,180	98	Roofs, HSG B
14,180		100.00% Impervious Area

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

Summary for Subcatchment P109S: Bldg 1

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 3,849 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P110S: to DB-110

Runoff = 0.9 cfs @ 12.11 hrs, Volume= 3,319 cf, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
10,342	98	Paved parking, HSG B
28,836	61	>75% Grass cover, Good, HSG B
15,264	61	>75% Grass cover, Good, HSG B
54,442	68	Weighted Average
44,100		81.00% Pervious Area
10,342		19.00% Impervious Area

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

Summary for Subcatchment P111S: above Bldg 1

Runoff = 1.2 cfs @ 12.09 hrs, Volume= 3,878 cf, Depth> 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
17,184	98	Paved parking, HSG B
8,200	61	>75% Grass cover, Good, HSG B
25,384	86	Weighted Average
8,200		32.30% Pervious Area
17,184		67.70% Impervious Area

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

Summary for Subcatchment P112S: below Bldg 1

Runoff = 0.3 cfs @ 12.11 hrs, Volume= 1,081 cf, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
2,493	98	Paved parking, HSG B
17,719	61	>75% Grass cover, Good, HSG B
20,212	66	Weighted Average
17,719		87.67% Pervious Area
2,493		12.33% Impervious Area

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

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P113S: Rte 20

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 827 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
791	98	Paved roads w/curbs & sewers, HSG B
2,557	98	Paved roads w/curbs & sewers, HSG C
3,348	98	Weighted Average
3,348		100.00% Impervious Area

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

Summary for Subcatchment P114S: below Bldg 3

Runoff = 2.1 cfs @ 12.10 hrs, Volume= 6,675 cf, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
17,075	98	Paved parking, HSG B
17,014	61	>75% Grass cover, Good, HSG B
3,265	98	Paved parking, HSG C
25,614	74	>75% Grass cover, Good, HSG C
62,968	78	Weighted Average
42,628		67.70% Pervious Area
20,340		32.30% Impervious Area

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

Summary for Subcatchment P115S: Bldg 5

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 3,849 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

Summary for Subcatchment P201S: to Southeast

Runoff = 0.5 cfs @ 12.15 hrs, Volume= 1,992 cf, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

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Type III 24-hr 2-year Rainfall=3.20"

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Area (sf)	CN	Adj	Description
4,555	74		>75% Grass cover, Good, HSG C
662	70		Woods, Good, HSG C
9,142	61		>75% Grass cover, Good, HSG B
11,100	55		Woods, Good, HSG B
* 5,608	98		WETLAND, HSG B
1,642	98		Unconnected roofs, HSG B
32,709	69	68	Weighted Average, UI Adjusted
25,459			77.83% Pervious Area
7,250			22.17% Impervious Area
1,642			22.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	400	0.0518	0.72		Lag/CN Method,

Summary for Subcatchment P202S: YRC pavement to site

Runoff = 3.6 cfs @ 12.09 hrs, Volume= 12,921 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
52,284	98	Paved parking, HSG B
52,284		100.00% Impervious Area

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

Summary for Subcatchment P203S: above Bldg 4

Runoff = 2.2 cfs @ 12.10 hrs, Volume= 7,293 cf, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
13,245	98	Paved parking, HSG B
16,043	61	>75% Grass cover, Good, HSG B
4,068	55	Woods, Good, HSG B
16,988	98	Paved parking, HSG C
6,309	74	>75% Grass cover, Good, HSG C
19,269	61	>75% Grass cover, Good, HSG B
135	70	Woods, Good, HSG C
76,057	76	Weighted Average
45,824		60.25% Pervious Area
30,233		39.75% Impervious Area

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

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P204S: Bldg 4

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 3,849 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
634	98	Roofs, HSG B
14,941	98	Roofs, HSG C
15,575	98	Weighted Average
15,575		100.00% Impervious Area

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

Summary for Reach P202R2: natural ground

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 22.5 cfs

30.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
 Side Slope Z-value= 5.0 ' / ' Top Width= 40.00'
 Length= 250.0' Slope= 0.0360 ' / '
 Inlet Invert= 430.00', Outlet Invert= 421.00'



Summary for Pond P102P: INF-102

Inflow Area = 62,803 sf, 52.70% Impervious, Inflow Depth > 1.62" for 2-year event
 Inflow = 2.7 cfs @ 12.09 hrs, Volume= 8,498 cf
 Outflow = 0.1 cfs @ 11.25 hrs, Volume= 4,707 cf, Atten= 96%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 11.25 hrs, Volume= 4,707 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 448.13' @ 16.14 hrs Surf.Area= 4,000 sf Storage= 4,966 cf

Plug-Flow detention time= 308.6 min calculated for 4,697 cf (55% of inflow)
 Center-of-Mass det. time= 195.3 min (1,024.2 - 828.8)

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Type III 24-hr 2-year Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description
#1	446.25'	6,606 cf	50.00'W x 80.00'L x 6.75'H Prismatic 27,000 cf Overall - 10,486 cf Embedded = 16,514 cf x 40.0% Voids
#2	447.00'	10,486 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 95 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 19 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		17,092 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	446.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	452.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.1 cfs @ 11.25 hrs HW=446.32' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=446.25' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P105P: INF-105

Inflow Area = 18,855 sf, 100.00% Impervious, Inflow Depth > 2.97" for 2-year event
 Inflow = 1.3 cfs @ 12.09 hrs, Volume= 4,660 cf
 Outflow = 0.0 cfs @ 7.95 hrs, Volume= 1,703 cf, Atten= 98%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 7.95 hrs, Volume= 1,703 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 458.69' @ 17.66 hrs Surf.Area= 4,044 sf Storage= 3,141 cf

Plug-Flow detention time= 277.0 min calculated for 1,703 cf (37% of inflow)
 Center-of-Mass det. time= 118.5 min (874.5 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	457.00'	3,649 cf	52.00'W x 60.00'L x 3.50'H Prismatic 10,920 cf Overall - 1,797 cf Embedded = 9,123 cf x 40.0% Voids
#2	457.00'	1,186 cf	22.00'W x 42.00'L x 3.50'H Prismatic 3,234 cf Overall - 269 cf Embedded = 2,965 cf x 40.0% Voids
#3	458.00'	1,797 cf	24.0" Round Pipe Storage x 11 Inside #1 L= 52.0'
#4	458.00'	269 cf	18.0" Round Pipe Storage x 4 Inside #2 L= 38.0'
		6,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	457.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	459.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 7.95 hrs HW=457.04' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=457.00' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.0 cfs)

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Pond P107P: INF-107

Inflow Area = 24,193 sf, 72.77% Impervious, Inflow Depth > 2.00" for 2-year event
 Inflow = 1.3 cfs @ 12.09 hrs, Volume= 4,023 cf
 Outflow = 0.0 cfs @ 10.55 hrs, Volume= 1,870 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 10.55 hrs, Volume= 1,870 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 443.64' @ 16.82 hrs Surf.Area= 1,500 sf Storage= 2,521 cf

Plug-Flow detention time= 300.4 min calculated for 1,866 cf (46% of inflow)
 Center-of-Mass det. time= 185.3 min (999.9 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1	441.25'	2,429 cf	30.00'W x 50.00'L x 6.75'H Prismaoid 10,125 cf Overall - 4,053 cf Embedded = 6,072 cf x 40.0% Voids
#2	442.00'	4,053 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 36 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 12 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		6,482 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	447.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 10.55 hrs HW=441.32' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=441.25' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.0 cfs)

Summary for Pond P108P: INF-108

Inflow Area = 29,755 sf, 100.00% Impervious, Inflow Depth > 2.97" for 2-year event
 Inflow = 2.1 cfs @ 12.09 hrs, Volume= 7,354 cf
 Outflow = 0.1 cfs @ 8.95 hrs, Volume= 3,936 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 8.95 hrs, Volume= 3,936 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 435.64' @ 15.92 hrs Surf.Area= 2,600 sf Storage= 4,275 cf

Plug-Flow detention time= 260.3 min calculated for 3,928 cf (53% of inflow)
 Center-of-Mass det. time= 143.1 min (899.1 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	433.25'	4,347 cf	40.00'W x 65.00'L x 6.75'H Prismaoid 17,550 cf Overall - 6,683 cf Embedded = 10,867 cf x 40.0% Voids
#2	434.00'	6,683 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 60 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 15 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		11,030 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	433.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	439.00'	6.0" Vert. Orifice/Grate C= 0.600

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Type III 24-hr 2-year Rainfall=3.20"

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Discarded OutFlow Max=0.1 cfs @ 8.95 hrs HW=433.32' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=433.25' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P110P: DP-110

Inflow Area = 202,525 sf, 47.06% Impervious, Inflow Depth > 1.25" for 2-year event
 Inflow = 6.5 cfs @ 12.10 hrs, Volume= 21,081 cf
 Outflow = 0.3 cfs @ 15.99 hrs, Volume= 11,165 cf, Atten= 96%, Lag= 233.4 min
 Discarded = 0.2 cfs @ 15.99 hrs, Volume= 10,680 cf
 Primary = 0.0 cfs @ 15.99 hrs, Volume= 485 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 423.42' @ 15.99 hrs Surf.Area= 9,406 sf Storage= 12,432 cf

Plug-Flow detention time= 313.5 min calculated for 11,142 cf (53% of inflow)
 Center-of-Mass det. time= 193.9 min (1,031.8 - 838.0)

Volume	Invert	Avail.Storage	Storage Description
#1	422.00'	41,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
422.00	8,160	0	0
424.00	9,920	18,080	18,080
426.00	13,415	23,335	41,415

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	423.30'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	425.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Tertiary	425.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.2 cfs @ 15.99 hrs HW=423.42' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 15.99 hrs HW=423.42' (Free Discharge)

↑**2=Orifice/Grate** (Orifice Controls 0.0 cfs @ 1.16 fps)
 ↑**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=422.00' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond P111P: INF-111

Inflow Area = 25,384 sf, 67.70% Impervious, Inflow Depth > 1.83" for 2-year event
 Inflow = 1.2 cfs @ 12.09 hrs, Volume= 3,878 cf
 Outflow = 0.0 cfs @ 10.65 hrs, Volume= 1,650 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 10.65 hrs, Volume= 1,650 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2-year Rainfall=3.20"

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Peak Elev= 429.92' @ 17.31 hrs Surf.Area= 1,350 sf Storage= 2,501 cf

Plug-Flow detention time= 306.9 min calculated for 1,650 cf (43% of inflow)
Center-of-Mass det. time= 187.1 min (1,009.1 - 822.0)

Volume	Invert	Avail.Storage	Storage Description
#1	427.25'	2,280 cf	30.00'W x 45.00'L x 6.75'H Prismaoid 9,113 cf Overall - 3,413 cf Embedded = 5,700 cf x 40.0% Voids
#2	428.00'	3,413 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 30 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		5,693 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	433.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 10.65 hrs HW=427.32' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=427.25' (Free Discharge)

↳ **2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P115P: INF-115

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 2.97" for 2-year event
 Inflow = 1.1 cfs @ 12.09 hrs, Volume= 3,849 cf
 Outflow = 0.0 cfs @ 8.65 hrs, Volume= 1,850 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 8.65 hrs, Volume= 1,850 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 434.71' @ 16.36 hrs Surf.Area= 1,200 sf Storage= 2,339 cf

Plug-Flow detention time= 261.4 min calculated for 1,847 cf (48% of inflow)
Center-of-Mass det. time= 133.9 min (889.9 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	432.00'	2,052 cf	40.00'W x 30.00'L x 7.00'H Prismaoid 8,400 cf Overall - 3,271 cf Embedded = 5,129 cf x 40.0% Voids
#2	432.75'	3,271 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 7 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		5,323 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	432.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	438.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 8.65 hrs HW=432.07' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=432.00' (Free Discharge)

↳ **2=Orifice/Grate** (Controls 0.0 cfs)

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Pond P202P: INF-202

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth > 2.97" for 2-year event
 Inflow = 3.6 cfs @ 12.09 hrs, Volume= 12,921 cf
 Outflow = 0.1 cfs @ 9.00 hrs, Volume= 7,453 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 9.00 hrs, Volume= 7,453 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 443.27' @ 15.72 hrs Surf.Area= 4,950 sf Storage= 7,242 cf

Plug-Flow detention time= 256.1 min calculated for 7,438 cf (58% of inflow)
 Center-of-Mass det. time= 145.7 min (901.6 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	441.00'	4,951 cf	45.00'W x 110.00'L x 4.00'H Prismaoid 19,800 cf Overall - 7,422 cf Embedded = 12,378 cf x 40.0% Voids
#2	441.50'	7,422 cf	36.0" Round Pipe Storage x 10 Inside #1 L= 105.0'
		12,373 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	443.80'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.1 cfs @ 9.00 hrs HW=441.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=441.00' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.0 cfs)

Summary for Pond P203P: INF-203

Inflow Area = 76,057 sf, 39.75% Impervious, Inflow Depth > 1.15" for 2-year event
 Inflow = 2.2 cfs @ 12.10 hrs, Volume= 7,293 cf
 Outflow = 0.1 cfs @ 11.55 hrs, Volume= 3,065 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 11.55 hrs, Volume= 3,065 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 438.62' @ 17.78 hrs Surf.Area= 2,800 sf Storage= 4,654 cf

Plug-Flow detention time= 332.0 min calculated for 3,065 cf (42% of inflow)
 Center-of-Mass det. time= 200.0 min (1,054.9 - 854.9)

Volume	Invert	Avail.Storage	Storage Description
#1	436.25'	4,546 cf	40.00'W x 70.00'L x 6.75'H Prismaoid 18,900 cf Overall - 7,536 cf Embedded = 11,364 cf x 40.0% Voids
#2	437.00'	7,536 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 68 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 17 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		12,082 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	436.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	442.00'	8.0" Vert. Orifice/Grate X 2.00 C= 0.600

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Type III 24-hr 2-year Rainfall=3.20"

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Discarded OutFlow Max=0.1 cfs @ 11.55 hrs HW=436.32' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=436.25' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P204P: INF-204

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 2.97" for 2-year event
 Inflow = 1.1 cfs @ 12.09 hrs, Volume= 3,849 cf
 Outflow = 0.6 cfs @ 12.23 hrs, Volume= 2,939 cf, Atten= 49%, Lag= 8.8 min
 Discarded = 0.0 cfs @ 6.70 hrs, Volume= 1,011 cf
 Primary = 0.5 cfs @ 12.23 hrs, Volume= 1,929 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 440.58' @ 12.23 hrs Surf.Area= 2,275 sf Storage= 1,457 cf

Plug-Flow detention time= 143.4 min calculated for 2,939 cf (76% of inflow)
 Center-of-Mass det. time= 60.2 min (816.2 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	439.00'	2,714 cf	35.00'W x 65.00'L x 3.00'H Prismaoid
			6,825 cf Overall - 39 cf Embedded = 6,786 cf x 40.0% Voids
#2	439.50'	39 cf	12.0" Round Pipe Storage Inside #1
			L= 50.0'
		2,754 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	439.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	440.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 6.70 hrs HW=439.03' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.5 cfs @ 12.23 hrs HW=440.57' (Free Discharge)

↑**2=Orifice/Grate** (Orifice Controls 0.5 cfs @ 2.74 fps)

Summary for Link P1L: Stoney Hill Rd

Inflow Area = 414,844 sf, 54.33% Impervious, Inflow Depth > 0.12" for 2-year event
 Inflow = 1.1 cfs @ 12.10 hrs, Volume= 4,308 cf
 Primary = 1.1 cfs @ 12.10 hrs, Volume= 4,308 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link P2L: Southeast

Inflow Area = 176,625 sf, 59.64% Impervious, Inflow Depth > 0.27" for 2-year event
 Inflow = 1.0 cfs @ 12.17 hrs, Volume= 3,921 cf
 Primary = 1.0 cfs @ 12.17 hrs, Volume= 3,921 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-year Rainfall=4.80"

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP101S: below DB-110	Runoff Area=27,769 sf 27.91% Impervious Runoff Depth>1.89" Tc=6.0 min CN=70 Runoff=1.4 cfs 4,367 cf
SubcatchmentP102S: site entry from Rte 20	Runoff Area=20,647 sf 64.89% Impervious Runoff Depth>3.58" Tc=6.0 min CN=89 Runoff=1.9 cfs 6,156 cf
SubcatchmentP103S: Rte 20	Runoff Area=69,540 sf 70.54% Impervious Runoff Depth>3.38" Tc=6.0 min CN=87 Runoff=6.1 cfs 19,568 cf
SubcatchmentP104S: above Bldg 3	Runoff Area=42,156 sf 46.73% Impervious Runoff Depth>2.72" Tc=6.0 min CN=80 Runoff=3.0 cfs 9,544 cf
SubcatchmentP105S: Bldg 3	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=1.5 cfs 5,389 cf
SubcatchmentP106S: Club House	Runoff Area=4,675 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=0.5 cfs 1,777 cf
SubcatchmentP107S: above Bldg 2	Runoff Area=24,193 sf 72.77% Impervious Runoff Depth>3.48" Flow Length=463' Slope=0.0518 '/ Tc=6.0 min CN=88 Runoff=2.2 cfs 7,009 cf
SubcatchmentP108S: Bldg 2	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=1.5 cfs 5,389 cf
SubcatchmentP109S: Bldg 1	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=1.6 cfs 5,919 cf
SubcatchmentP110S: to DB-110	Runoff Area=54,442 sf 19.00% Impervious Runoff Depth>1.74" Tc=6.0 min CN=68 Runoff=2.4 cfs 7,879 cf
SubcatchmentP111S: above Bldg 1	Runoff Area=25,384 sf 67.70% Impervious Runoff Depth>3.28" Tc=6.0 min CN=86 Runoff=2.2 cfs 6,934 cf
SubcatchmentP112S: below Bldg 1	Runoff Area=20,212 sf 12.33% Impervious Runoff Depth>1.59" Tc=6.0 min CN=66 Runoff=0.8 cfs 2,680 cf
SubcatchmentP113S: Rte 20	Runoff Area=3,348 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=0.4 cfs 1,272 cf
SubcatchmentP114S: below Bldg 3	Runoff Area=62,968 sf 32.30% Impervious Runoff Depth>2.54" Tc=6.0 min CN=78 Runoff=4.2 cfs 13,330 cf
SubcatchmentP115S: Bldg 5	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=1.6 cfs 5,919 cf
SubcatchmentP201S: to Southeast	Runoff Area=32,709 sf 22.17% Impervious Runoff Depth>1.74" Flow Length=400' Slope=0.0518 '/ Tc=9.2 min UI Adjusted CN=68 Runoff=1.3 cfs 4,730 cf
SubcatchmentP202S: YRC pavement to site	Runoff Area=52,284 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=5.5 cfs 19,871 cf
SubcatchmentP203S: above Bldg 4	Runoff Area=76,057 sf 39.75% Impervious Runoff Depth>2.37" Tc=6.0 min CN=76 Runoff=4.8 cfs 15,018 cf
SubcatchmentP204S: Bldg 4	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>4.56" Tc=6.0 min CN=98 Runoff=1.6 cfs 5,919 cf
Reach P202R2: natural ground	Avg. Flow Depth=0.09' Max Vel=0.14 fps Inflow=0.6 cfs 3,430 cf n=0.400 L=250.0' S=0.0360 '/ Capacity=22.5 cfs Outflow=0.4 cfs 3,420 cf

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Type III 24-hr 10-year Rainfall=4.80"

Pond P102P: INF-102	Peak Elev=450.04' Storage=10,916 cf Inflow=4.9 cfs 15,700 cf Discarded=0.1 cfs 5,210 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 5,210 cf
Pond P105P: INF-105	Peak Elev=459.19' Storage=4,344 cf Inflow=2.0 cfs 7,166 cf Discarded=0.0 cfs 1,862 cf Primary=0.1 cfs 1,386 cf Outflow=0.1 cfs 3,248 cf
Pond P107P: INF-107	Peak Elev=445.93' Storage=5,057 cf Inflow=2.2 cfs 7,009 cf Discarded=0.0 cfs 2,069 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 2,069 cf
Pond P108P: INF-108	Peak Elev=437.28' Storage=7,462 cf Inflow=3.1 cfs 11,309 cf Discarded=0.1 cfs 4,318 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 4,318 cf
Pond P110P: DP-110	Peak Elev=424.24' Storage=20,510 cf Inflow=12.7 cfs 40,777 cf Discarded=0.2 cfs 12,195 cf Primary=0.8 cfs 16,515 cf Tertiary=0.0 cfs 0 cf Outflow=1.0 cfs 28,710 cf
Pond P111P: INF-111	Peak Elev=433.01' Storage=5,158 cf Inflow=2.2 cfs 6,934 cf Discarded=0.0 cfs 1,827 cf Primary=0.0 cfs 7 cf Outflow=0.0 cfs 1,834 cf
Pond P115P: INF-115	Peak Elev=436.66' Storage=4,052 cf Inflow=1.6 cfs 5,919 cf Discarded=0.0 cfs 2,029 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 2,029 cf
Pond P202P: INF-202	Peak Elev=444.04' Storage=10,036 cf Inflow=5.5 cfs 19,871 cf Discarded=0.1 cfs 8,172 cf Primary=0.6 cfs 3,430 cf Outflow=0.7 cfs 11,601 cf
Pond P203P: INF-203	Peak Elev=442.09' Storage=11,060 cf Inflow=4.8 cfs 15,018 cf Discarded=0.1 cfs 3,392 cf Primary=0.1 cfs 668 cf Outflow=0.1 cfs 4,060 cf
Pond P204P: INF-204	Peak Elev=441.06' Storage=1,895 cf Inflow=1.6 cfs 5,919 cf Discarded=0.0 cfs 1,091 cf Primary=0.8 cfs 3,881 cf Outflow=0.9 cfs 4,972 cf
Link P1L: Stoney Hill Rd	Inflow=2.5 cfs 26,228 cf Primary=2.5 cfs 26,228 cf
Link P2L: Southeast	Inflow=2.1 cfs 12,699 cf Primary=2.1 cfs 12,699 cf

Total Runoff Area = 591,469 sf Runoff Volume = 148,673 cf Average Runoff Depth = 3.02"
44.08% Pervious = 260,730 sf 55.92% Impervious = 330,739 sf

927.01 Proposed Phase 1

Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P101S: below DB-110

Runoff = 1.4 cfs @ 12.10 hrs, Volume= 4,367 cf, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
5,953	98	Paved parking, HSG B
14,315	61	>75% Grass cover, Good, HSG B
5,704	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
27,769	70	Weighted Average
20,019		72.09% Pervious Area
7,750		27.91% Impervious Area

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

Summary for Subcatchment P102S: site entry from Rte 20

Runoff = 1.9 cfs @ 12.09 hrs, Volume= 6,156 cf, Depth> 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
10,300	98	Paved parking, HSG C
6,711	74	>75% Grass cover, Good, HSG C
3,097	98	Paved parking, HSG B
539	61	>75% Grass cover, Good, HSG B
20,647	89	Weighted Average
7,250		35.11% Pervious Area
13,397		64.89% Impervious Area

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

Summary for Subcatchment P103S: Rte 20

Runoff = 6.1 cfs @ 12.09 hrs, Volume= 19,568 cf, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
35,083	98	Paved parking, HSG B
13,373	61	>75% Grass cover, Good, HSG B
9,274	98	Paved roads w/curbs & sewers, HSG B
5,391	61	>75% Grass cover, Good, HSG B
4,696	98	Paved roads w/curbs & sewers, HSG C
1,723	74	>75% Grass cover, Good, HSG C
69,540	87	Weighted Average
20,487		29.46% Pervious Area
49,053		70.54% Impervious Area

927.01 Proposed Phase 1

Type III 24-hr 10-year Rainfall=4.80"

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

Summary for Subcatchment P104S: above Bldg 3

Runoff = 3.0 cfs @ 12.09 hrs, Volume= 9,544 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
8,843	98	Paved parking, HSG B
10,926	61	>75% Grass cover, Good, HSG B
2,964	55	Woods, Good, HSG B
10,857	98	Paved parking, HSG C
7,420	74	>75% Grass cover, Good, HSG C
1,146	70	Woods, Good, HSG C
42,156	80	Weighted Average
22,456		53.27% Pervious Area
19,700		46.73% Impervious Area

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

Summary for Subcatchment P105S: Bldg 3

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,389 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
2,440	98	Roofs, HSG B
11,740	98	Roofs, HSG C
14,180	98	Weighted Average
14,180		100.00% Impervious Area

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

Summary for Subcatchment P106S: Club House

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,777 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
1,222	98	Roofs, HSG B
3,453	98	Roofs, HSG B
4,675	98	Weighted Average
4,675		100.00% Impervious Area

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Type III 24-hr 10-year Rainfall=4.80"

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

Summary for Subcatchment P107S: above Bldg 2

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,009 cf, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
1,889	98	Paved parking, HSG C
873	74	>75% Grass cover, Good, HSG C
15,716	98	Paved parking, HSG B
5,715	61	>75% Grass cover, Good, HSG B
24,193	88	Weighted Average
6,588		27.23% Pervious Area
17,605		72.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	463	0.0518	1.35		Lag/CN Method,
5.7	463				Total, Increased to minimum Tc = 6.0 min

Summary for Subcatchment P108S: Bldg 2

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,389 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
14,180	98	Roofs, HSG B
14,180		100.00% Impervious Area

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

Summary for Subcatchment P109S: Bldg 1

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,919 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P110S: to DB-110

Runoff = 2.4 cfs @ 12.10 hrs, Volume= 7,879 cf, Depth> 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
10,342	98	Paved parking, HSG B
28,836	61	>75% Grass cover, Good, HSG B
15,264	61	>75% Grass cover, Good, HSG B
54,442	68	Weighted Average
44,100		81.00% Pervious Area
10,342		19.00% Impervious Area

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

Summary for Subcatchment P111S: above Bldg 1

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 6,934 cf, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
17,184	98	Paved parking, HSG B
8,200	61	>75% Grass cover, Good, HSG B
25,384	86	Weighted Average
8,200		32.30% Pervious Area
17,184		67.70% Impervious Area

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

Summary for Subcatchment P112S: below Bldg 1

Runoff = 0.8 cfs @ 12.10 hrs, Volume= 2,680 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
2,493	98	Paved parking, HSG B
17,719	61	>75% Grass cover, Good, HSG B
20,212	66	Weighted Average
17,719		87.67% Pervious Area
2,493		12.33% Impervious Area

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

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P113S: Rte 20

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 1,272 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
791	98	Paved roads w/curbs & sewers, HSG B
2,557	98	Paved roads w/curbs & sewers, HSG C
3,348	98	Weighted Average
3,348		100.00% Impervious Area

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

Summary for Subcatchment P114S: below Bldg 3

Runoff = 4.2 cfs @ 12.09 hrs, Volume= 13,330 cf, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
17,075	98	Paved parking, HSG B
17,014	61	>75% Grass cover, Good, HSG B
3,265	98	Paved parking, HSG C
25,614	74	>75% Grass cover, Good, HSG C
62,968	78	Weighted Average
42,628		67.70% Pervious Area
20,340		32.30% Impervious Area

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

Summary for Subcatchment P115S: Bldg 5

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,919 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

Summary for Subcatchment P201S: to Southeast

Runoff = 1.3 cfs @ 12.14 hrs, Volume= 4,730 cf, Depth> 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

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Type III 24-hr 10-year Rainfall=4.80"

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Area (sf)	CN	Adj	Description
4,555	74		>75% Grass cover, Good, HSG C
662	70		Woods, Good, HSG C
9,142	61		>75% Grass cover, Good, HSG B
11,100	55		Woods, Good, HSG B
* 5,608	98		WETLAND, HSG B
1,642	98		Unconnected roofs, HSG B
32,709	69	68	Weighted Average, UI Adjusted
25,459			77.83% Pervious Area
7,250			22.17% Impervious Area
1,642			22.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	400	0.0518	0.72		Lag/CN Method,

Summary for Subcatchment P202S: YRC pavement to site

Runoff = 5.5 cfs @ 12.09 hrs, Volume= 19,871 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
52,284	98	Paved parking, HSG B
52,284		100.00% Impervious Area

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

Summary for Subcatchment P203S: above Bldg 4

Runoff = 4.8 cfs @ 12.09 hrs, Volume= 15,018 cf, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
13,245	98	Paved parking, HSG B
16,043	61	>75% Grass cover, Good, HSG B
4,068	55	Woods, Good, HSG B
16,988	98	Paved parking, HSG C
6,309	74	>75% Grass cover, Good, HSG C
19,269	61	>75% Grass cover, Good, HSG B
135	70	Woods, Good, HSG C
76,057	76	Weighted Average
45,824		60.25% Pervious Area
30,233		39.75% Impervious Area

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

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P204S: Bldg 4

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,919 cf, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
634	98	Roofs, HSG B
14,941	98	Roofs, HSG C
15,575	98	Weighted Average
15,575		100.00% Impervious Area

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

Summary for Reach P202R2: natural ground

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth = 0.79" for 10-year event
 Inflow = 0.6 cfs @ 12.66 hrs, Volume= 3,430 cf
 Outflow = 0.4 cfs @ 13.66 hrs, Volume= 3,420 cf, Atten= 31%, Lag= 60.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.14 fps, Min. Travel Time= 29.7 min
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 66.3 min

Peak Storage= 688 cf @ 13.17 hrs
 Average Depth at Peak Storage= 0.09'
 Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 22.5 cfs

30.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
 Side Slope Z-value= 5.0 ' /' Top Width= 40.00'
 Length= 250.0' Slope= 0.0360 ' /'
 Inlet Invert= 430.00', Outlet Invert= 421.00'



Summary for Pond P102P: INF-102

Inflow Area = 62,803 sf, 52.70% Impervious, Inflow Depth > 3.00" for 10-year event
 Inflow = 4.9 cfs @ 12.09 hrs, Volume= 15,700 cf
 Outflow = 0.1 cfs @ 9.95 hrs, Volume= 5,210 cf, Atten= 98%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 9.95 hrs, Volume= 5,210 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 450.04' @ 18.55 hrs Surf.Area= 4,000 sf Storage= 10,916 cf

Plug-Flow detention time= 298.0 min calculated for 5,210 cf (33% of inflow)
 Center-of-Mass det. time= 167.3 min (979.4 - 812.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	446.25'	6,606 cf	50.00'W x 80.00'L x 6.75'H Prismatic 27,000 cf Overall - 10,486 cf Embedded = 16,514 cf x 40.0% Voids
#2	447.00'	10,486 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 95 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 19 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		17,092 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	446.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	452.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.1 cfs @ 9.95 hrs HW=446.32' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=446.25' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P105P: INF-105

Inflow Area = 18,855 sf, 100.00% Impervious, Inflow Depth > 4.56" for 10-year event
 Inflow = 2.0 cfs @ 12.09 hrs, Volume= 7,166 cf
 Outflow = 0.1 cfs @ 13.63 hrs, Volume= 3,248 cf, Atten= 94%, Lag= 92.6 min
 Discarded = 0.0 cfs @ 6.10 hrs, Volume= 1,862 cf
 Primary = 0.1 cfs @ 13.63 hrs, Volume= 1,386 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 459.19' @ 13.63 hrs Surf.Area= 4,044 sf Storage= 4,344 cf

Plug-Flow detention time= 258.1 min calculated for 3,241 cf (45% of inflow)
 Center-of-Mass det. time= 119.3 min (867.5 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	457.00'	3,649 cf	52.00'W x 60.00'L x 3.50'H Prismatic 10,920 cf Overall - 1,797 cf Embedded = 9,123 cf x 40.0% Voids
#2	457.00'	1,186 cf	22.00'W x 42.00'L x 3.50'H Prismatic 3,234 cf Overall - 269 cf Embedded = 2,965 cf x 40.0% Voids
#3	458.00'	1,797 cf	24.0" Round Pipe Storage x 11 Inside #1 L= 52.0'
#4	458.00'	269 cf	18.0" Round Pipe Storage x 4 Inside #2 L= 38.0'
		6,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	457.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	459.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 6.10 hrs HW=457.04' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 13.63 hrs HW=459.19' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.1 cfs @ 1.48 fps)

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Pond P107P: INF-107

Inflow Area = 24,193 sf, 72.77% Impervious, Inflow Depth > 3.48" for 10-year event
 Inflow = 2.2 cfs @ 12.09 hrs, Volume= 7,009 cf
 Outflow = 0.0 cfs @ 9.10 hrs, Volume= 2,069 cf, Atten= 98%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 9.10 hrs, Volume= 2,069 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 445.93' @ 19.43 hrs Surf.Area= 1,500 sf Storage= 5,057 cf

Plug-Flow detention time= 294.3 min calculated for 2,069 cf (30% of inflow)
 Center-of-Mass det. time= 153.9 min (952.8 - 798.9)

Volume	Invert	Avail.Storage	Storage Description
#1	441.25'	2,429 cf	30.00'W x 50.00'L x 6.75'H Prismaoid 10,125 cf Overall - 4,053 cf Embedded = 6,072 cf x 40.0% Voids
#2	442.00'	4,053 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 36 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 12 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		6,482 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	447.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 9.10 hrs HW=441.32' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=441.25' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.0 cfs)

Summary for Pond P108P: INF-108

Inflow Area = 29,755 sf, 100.00% Impervious, Inflow Depth > 4.56" for 10-year event
 Inflow = 3.1 cfs @ 12.09 hrs, Volume= 11,309 cf
 Outflow = 0.1 cfs @ 7.45 hrs, Volume= 4,318 cf, Atten= 98%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 7.45 hrs, Volume= 4,318 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 437.28' @ 17.57 hrs Surf.Area= 2,600 sf Storage= 7,462 cf

Plug-Flow detention time= 262.1 min calculated for 4,318 cf (38% of inflow)
 Center-of-Mass det. time= 101.1 min (849.4 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	433.25'	4,347 cf	40.00'W x 65.00'L x 6.75'H Prismaoid 17,550 cf Overall - 6,683 cf Embedded = 10,867 cf x 40.0% Voids
#2	434.00'	6,683 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 60 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 15 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		11,030 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	433.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	439.00'	6.0" Vert. Orifice/Grate C= 0.600

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Type III 24-hr 10-year Rainfall=4.80"

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Discarded OutFlow Max=0.1 cfs @ 7.45 hrs HW=433.32' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=433.25' (Free Discharge)

↳ **2=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond P110P: DP-110

Inflow Area = 202,525 sf, 47.06% Impervious, Inflow Depth > 2.42" for 10-year event
 Inflow = 12.7 cfs @ 12.09 hrs, Volume= 40,777 cf
 Outflow = 1.0 cfs @ 13.47 hrs, Volume= 28,710 cf, Atten= 92%, Lag= 82.8 min
 Discarded = 0.2 cfs @ 13.47 hrs, Volume= 12,195 cf
 Primary = 0.8 cfs @ 13.47 hrs, Volume= 16,515 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 424.24' @ 13.47 hrs Surf.Area= 10,339 sf Storage= 20,510 cf

Plug-Flow detention time= 238.5 min calculated for 28,710 cf (70% of inflow)
 Center-of-Mass det. time= 142.6 min (963.5 - 820.9)

Volume	Invert	Avail.Storage	Storage Description
#1	422.00'	41,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
422.00	8,160	0	0
424.00	9,920	18,080	18,080
426.00	13,415	23,335	41,415

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	423.30'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	425.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Tertiary	425.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.2 cfs @ 13.47 hrs HW=424.24' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.8 cfs @ 13.47 hrs HW=424.24' (Free Discharge)

↳ **2=Orifice/Grate** (Orifice Controls 0.8 cfs @ 4.00 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=422.00' (Free Discharge)

↳ **4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond P111P: INF-111

Inflow Area = 25,384 sf, 67.70% Impervious, Inflow Depth > 3.28" for 10-year event
 Inflow = 2.2 cfs @ 12.09 hrs, Volume= 6,934 cf
 Outflow = 0.0 cfs @ 20.26 hrs, Volume= 1,834 cf, Atten= 98%, Lag= 490.2 min
 Discarded = 0.0 cfs @ 9.25 hrs, Volume= 1,827 cf
 Primary = 0.0 cfs @ 20.26 hrs, Volume= 7 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Peak Elev= 433.01' @ 20.26 hrs Surf.Area= 1,350 sf Storage= 5,158 cf

Plug-Flow detention time= 299.7 min calculated for 1,830 cf (26% of inflow)
Center-of-Mass det. time= 157.9 min (963.4 - 805.5)

Volume	Invert	Avail.Storage	Storage Description
#1	427.25'	2,280 cf	30.00'W x 45.00'L x 6.75'H Prismaoid 9,113 cf Overall - 3,413 cf Embedded = 5,700 cf x 40.0% Voids
#2	428.00'	3,413 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 30 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		5,693 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	433.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 9.25 hrs HW=427.32' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 20.26 hrs HW=433.01' (Free Discharge)
↑**2=Orifice/Grate** (Orifice Controls 0.0 cfs @ 0.32 fps)

Summary for Pond P115P: INF-115

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 4.56" for 10-year event
Inflow = 1.6 cfs @ 12.09 hrs, Volume= 5,919 cf
Outflow = 0.0 cfs @ 7.00 hrs, Volume= 2,029 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.0 cfs @ 7.00 hrs, Volume= 2,029 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 436.66' @ 18.01 hrs Surf.Area= 1,200 sf Storage= 4,052 cf

Plug-Flow detention time= 267.2 min calculated for 2,029 cf (34% of inflow)
Center-of-Mass det. time= 91.5 min (839.8 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	432.00'	2,052 cf	40.00'W x 30.00'L x 7.00'H Prismaoid 8,400 cf Overall - 3,271 cf Embedded = 5,129 cf x 40.0% Voids
#2	432.75'	3,271 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 7 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		5,323 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	432.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	438.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 7.00 hrs HW=432.07' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=432.00' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.0 cfs)

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Pond P202P: INF-202

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth > 4.56" for 10-year event
 Inflow = 5.5 cfs @ 12.09 hrs, Volume= 19,871 cf
 Outflow = 0.7 cfs @ 12.66 hrs, Volume= 11,601 cf, Atten= 88%, Lag= 34.4 min
 Discarded = 0.1 cfs @ 7.60 hrs, Volume= 8,172 cf
 Primary = 0.6 cfs @ 12.66 hrs, Volume= 3,430 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 444.04' @ 12.66 hrs Surf.Area= 4,950 sf Storage= 10,036 cf

Plug-Flow detention time= 211.4 min calculated for 11,601 cf (58% of inflow)
 Center-of-Mass det. time= 98.4 min (846.7 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	441.00'	4,951 cf	45.00'W x 110.00'L x 4.00'H Prismaoid 19,800 cf Overall - 7,422 cf Embedded = 12,378 cf x 40.0% Voids
#2	441.50'	7,422 cf	36.0" Round Pipe Storage x 10 Inside #1 L= 105.0'
		12,373 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	443.80'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.1 cfs @ 7.60 hrs HW=441.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.6 cfs @ 12.66 hrs HW=444.04' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 0.6 cfs @ 1.66 fps)

Summary for Pond P203P: INF-203

Inflow Area = 76,057 sf, 39.75% Impervious, Inflow Depth > 2.37" for 10-year event
 Inflow = 4.8 cfs @ 12.09 hrs, Volume= 15,018 cf
 Outflow = 0.1 cfs @ 17.45 hrs, Volume= 4,060 cf, Atten= 97%, Lag= 321.5 min
 Discarded = 0.1 cfs @ 10.40 hrs, Volume= 3,392 cf
 Primary = 0.1 cfs @ 17.45 hrs, Volume= 668 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 442.09' @ 17.45 hrs Surf.Area= 2,800 sf Storage= 11,060 cf

Plug-Flow detention time= 335.3 min calculated for 4,060 cf (27% of inflow)
 Center-of-Mass det. time= 201.5 min (1,035.2 - 833.7)

Volume	Invert	Avail.Storage	Storage Description
#1	436.25'	4,546 cf	40.00'W x 70.00'L x 6.75'H Prismaoid 18,900 cf Overall - 7,536 cf Embedded = 11,364 cf x 40.0% Voids
#2	437.00'	7,536 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 68 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 17 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		12,082 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	436.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	442.00'	8.0" Vert. Orifice/Grate X 2.00 C= 0.600

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Type III 24-hr 10-year Rainfall=4.80"

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Discarded OutFlow Max=0.1 cfs @ 10.40 hrs HW=436.32' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.1 cfs @ 17.45 hrs HW=442.09' (Free Discharge)

↑2=Orifice/Grate (Orifice Controls 0.1 cfs @ 1.01 fps)

Summary for Pond P204P: INF-204

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 4.56" for 10-year event
 Inflow = 1.6 cfs @ 12.09 hrs, Volume= 5,919 cf
 Outflow = 0.9 cfs @ 12.22 hrs, Volume= 4,972 cf, Atten= 47%, Lag= 8.2 min
 Discarded = 0.0 cfs @ 4.30 hrs, Volume= 1,091 cf
 Primary = 0.8 cfs @ 12.22 hrs, Volume= 3,881 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 441.06' @ 12.22 hrs Surf.Area= 2,275 sf Storage= 1,895 cf

Plug-Flow detention time= 120.7 min calculated for 4,972 cf (84% of inflow)
 Center-of-Mass det. time= 53.3 min (801.5 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	439.00'	2,714 cf	35.00'W x 65.00'L x 3.00'H Prismaoid 6,825 cf Overall - 39 cf Embedded = 6,786 cf x 40.0% Voids
#2	439.50'	39 cf	12.0" Round Pipe Storage Inside #1 L= 50.0'
		2,754 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	439.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	440.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 4.30 hrs HW=439.03' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.8 cfs @ 12.22 hrs HW=441.05' (Free Discharge)

↑2=Orifice/Grate (Orifice Controls 0.8 cfs @ 4.30 fps)

Summary for Link P1L: Stoney Hill Rd

Inflow Area = 414,844 sf, 54.33% Impervious, Inflow Depth > 0.76" for 10-year event
 Inflow = 2.5 cfs @ 12.10 hrs, Volume= 26,228 cf
 Primary = 2.5 cfs @ 12.10 hrs, Volume= 26,228 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link P2L: Southeast

Inflow Area = 176,625 sf, 59.64% Impervious, Inflow Depth > 0.86" for 10-year event
 Inflow = 2.1 cfs @ 12.15 hrs, Volume= 12,699 cf
 Primary = 2.1 cfs @ 12.15 hrs, Volume= 12,699 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP101S: below DB-110	Runoff Area=27,769 sf 27.91% Impervious Runoff Depth>3.62" Tc=6.0 min CN=70 Runoff=2.7 cfs 8,365 cf
SubcatchmentP102S: site entry from Rte 20	Runoff Area=20,647 sf 64.89% Impervious Runoff Depth>5.70" Tc=6.0 min CN=89 Runoff=2.9 cfs 9,814 cf
SubcatchmentP103S: Rte 20	Runoff Area=69,540 sf 70.54% Impervious Runoff Depth>5.48" Tc=6.0 min CN=87 Runoff=9.6 cfs 31,730 cf
SubcatchmentP104S: above Bldg 3	Runoff Area=42,156 sf 46.73% Impervious Runoff Depth>4.69" Tc=6.0 min CN=80 Runoff=5.2 cfs 16,478 cf
SubcatchmentP105S: Bldg 3	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=2.2 cfs 7,984 cf
SubcatchmentP106S: Club House	Runoff Area=4,675 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=0.7 cfs 2,632 cf
SubcatchmentP107S: above Bldg 2	Runoff Area=24,193 sf 72.77% Impervious Runoff Depth>5.59" Flow Length=463' Slope=0.0518 '/ Tc=6.0 min CN=88 Runoff=3.4 cfs 11,269 cf
SubcatchmentP108S: Bldg 2	Runoff Area=14,180 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=2.2 cfs 7,984 cf
SubcatchmentP109S: Bldg 1	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=2.4 cfs 8,770 cf
SubcatchmentP110S: to DB-110	Runoff Area=54,442 sf 19.00% Impervious Runoff Depth>3.41" Tc=6.0 min CN=68 Runoff=4.9 cfs 15,456 cf
SubcatchmentP111S: above Bldg 1	Runoff Area=25,384 sf 67.70% Impervious Runoff Depth>5.36" Tc=6.0 min CN=86 Runoff=3.5 cfs 11,342 cf
SubcatchmentP112S: below Bldg 1	Runoff Area=20,212 sf 12.33% Impervious Runoff Depth>3.20" Tc=6.0 min CN=66 Runoff=1.7 cfs 5,392 cf
SubcatchmentP113S: Rte 20	Runoff Area=3,348 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=0.5 cfs 1,885 cf
SubcatchmentP114S: below Bldg 3	Runoff Area=62,968 sf 32.30% Impervious Runoff Depth>4.47" Tc=6.0 min CN=78 Runoff=7.4 cfs 23,462 cf
SubcatchmentP115S: Bldg 5	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=2.4 cfs 8,770 cf
SubcatchmentP201S: to Southeast	Runoff Area=32,709 sf 22.17% Impervious Runoff Depth>3.40" Flow Length=400' Slope=0.0518 '/ Tc=9.2 min UI Adjusted CN=68 Runoff=2.6 cfs 9,280 cf
SubcatchmentP202S: YRC pavement to site	Runoff Area=52,284 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=8.0 cfs 29,440 cf
SubcatchmentP203S: above Bldg 4	Runoff Area=76,057 sf 39.75% Impervious Runoff Depth>4.25" Tc=6.0 min CN=76 Runoff=8.5 cfs 26,960 cf
SubcatchmentP204S: Bldg 4	Runoff Area=15,575 sf 100.00% Impervious Runoff Depth>6.76" Tc=6.0 min CN=98 Runoff=2.4 cfs 8,770 cf
Reach P202R2: natural ground	Avg. Flow Depth=0.29' Max Vel=0.30 fps Inflow=3.8 cfs 11,665 cf n=0.400 L=250.0' S=0.0360 '/ Capacity=22.5 cfs Outflow=2.8 cfs 11,641 cf

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Pond P102P: INF-102	Peak Elev=452.45' Storage=16,220 cf Inflow=8.1 cfs 26,293 cf Discarded=0.1 cfs 5,718 cf Primary=0.4 cfs 5,049 cf Outflow=0.5 cfs 10,768 cf
Pond P105P: INF-105	Peak Elev=459.70' Storage=5,503 cf Inflow=2.9 cfs 10,617 cf Discarded=0.0 cfs 1,980 cf Primary=0.6 cfs 4,634 cf Outflow=0.7 cfs 6,614 cf
Pond P107P: INF-107	Peak Elev=447.50' Storage=6,182 cf Inflow=3.4 cfs 11,269 cf Discarded=0.0 cfs 2,271 cf Primary=0.5 cfs 3,112 cf Outflow=0.5 cfs 5,383 cf
Pond P108P: INF-108	Peak Elev=439.30' Storage=10,300 cf Inflow=4.6 cfs 16,754 cf Discarded=0.1 cfs 4,678 cf Primary=0.2 cfs 2,198 cf Outflow=0.3 cfs 6,876 cf
Pond P110P: DP-110	Peak Elev=425.24' Storage=31,671 cf Inflow=21.9 cfs 72,409 cf Discarded=0.3 cfs 14,212 cf Primary=6.4 cfs 44,568 cf Tertiary=0.0 cfs 0 cf Outflow=6.7 cfs 58,779 cf
Pond P111P: INF-111	Peak Elev=433.99' Storage=5,685 cf Inflow=3.5 cfs 11,342 cf Discarded=0.0 cfs 2,008 cf Primary=0.8 cfs 4,164 cf Outflow=0.8 cfs 6,172 cf
Pond P115P: INF-115	Peak Elev=438.32' Storage=4,996 cf Inflow=2.4 cfs 8,770 cf Discarded=0.0 cfs 2,189 cf Primary=0.3 cfs 1,761 cf Outflow=0.3 cfs 3,949 cf
Pond P202P: INF-202	Peak Elev=444.70' Storage=11,786 cf Inflow=8.0 cfs 29,440 cf Discarded=0.1 cfs 8,864 cf Primary=3.8 cfs 11,665 cf Outflow=3.9 cfs 20,529 cf
Pond P203P: INF-203	Peak Elev=442.97' Storage=12,044 cf Inflow=8.5 cfs 26,960 cf Discarded=0.1 cfs 3,739 cf Primary=2.7 cfs 12,190 cf Outflow=2.7 cfs 15,929 cf
Pond P204P: INF-204	Peak Elev=441.65' Storage=2,437 cf Inflow=2.4 cfs 8,770 cf Discarded=0.0 cfs 1,141 cf Primary=1.1 cfs 6,656 cf Outflow=1.1 cfs 7,797 cf
Link P1L: Stoney Hill Rd	Inflow=9.5 cfs 79,368 cf Primary=9.5 cfs 79,368 cf
Link P2L: Southeast	Inflow=6.1 cfs 39,767 cf Primary=6.1 cfs 39,767 cf

Total Runoff Area = 591,469 sf Runoff Volume = 245,785 cf Average Runoff Depth = 4.99"
44.08% Pervious = 260,730 sf 55.92% Impervious = 330,739 sf

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Summary for Subcatchment P101S: below DB-110

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 8,365 cf, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
5,953	98	Paved parking, HSG B
14,315	61	>75% Grass cover, Good, HSG B
5,704	55	Woods, Good, HSG B
* 1,797	98	WETLAND, HSG B
27,769	70	Weighted Average
20,019		72.09% Pervious Area
7,750		27.91% Impervious Area

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

Summary for Subcatchment P102S: site entry from Rte 20

Runoff = 2.9 cfs @ 12.09 hrs, Volume= 9,814 cf, Depth> 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
10,300	98	Paved parking, HSG C
6,711	74	>75% Grass cover, Good, HSG C
3,097	98	Paved parking, HSG B
539	61	>75% Grass cover, Good, HSG B
20,647	89	Weighted Average
7,250		35.11% Pervious Area
13,397		64.89% Impervious Area

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

Summary for Subcatchment P103S: Rte 20

Runoff = 9.6 cfs @ 12.09 hrs, Volume= 31,730 cf, Depth> 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
35,083	98	Paved parking, HSG B
13,373	61	>75% Grass cover, Good, HSG B
9,274	98	Paved roads w/curbs & sewers, HSG B
5,391	61	>75% Grass cover, Good, HSG B
4,696	98	Paved roads w/curbs & sewers, HSG C
1,723	74	>75% Grass cover, Good, HSG C
69,540	87	Weighted Average
20,487		29.46% Pervious Area
49,053		70.54% Impervious Area

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

Summary for Subcatchment P104S: above Bldg 3

Runoff = 5.2 cfs @ 12.09 hrs, Volume= 16,478 cf, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
8,843	98	Paved parking, HSG B
10,926	61	>75% Grass cover, Good, HSG B
2,964	55	Woods, Good, HSG B
10,857	98	Paved parking, HSG C
7,420	74	>75% Grass cover, Good, HSG C
1,146	70	Woods, Good, HSG C
42,156	80	Weighted Average
22,456		53.27% Pervious Area
19,700		46.73% Impervious Area

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

Summary for Subcatchment P105S: Bldg 3

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,984 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
2,440	98	Roofs, HSG B
11,740	98	Roofs, HSG C
14,180	98	Weighted Average
14,180		100.00% Impervious Area

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

Summary for Subcatchment P106S: Club House

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,632 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
1,222	98	Roofs, HSG B
3,453	98	Roofs, HSG B
4,675	98	Weighted Average
4,675		100.00% Impervious Area

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

Summary for Subcatchment P107S: above Bldg 2

Runoff = 3.4 cfs @ 12.09 hrs, Volume= 11,269 cf, Depth> 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
1,889	98	Paved parking, HSG C
873	74	>75% Grass cover, Good, HSG C
15,716	98	Paved parking, HSG B
5,715	61	>75% Grass cover, Good, HSG B
24,193	88	Weighted Average
6,588		27.23% Pervious Area
17,605		72.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	463	0.0518	1.35		Lag/CN Method,
5.7	463				Total, Increased to minimum Tc = 6.0 min

Summary for Subcatchment P108S: Bldg 2

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,984 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
14,180	98	Roofs, HSG B
14,180		100.00% Impervious Area

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

Summary for Subcatchment P109S: Bldg 1

Runoff = 2.4 cfs @ 12.09 hrs, Volume= 8,770 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

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Type III 24-hr 100-year Rainfall=7.00"

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Summary for Subcatchment P110S: to DB-110

Runoff = 4.9 cfs @ 12.09 hrs, Volume= 15,456 cf, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
10,342	98	Paved parking, HSG B
28,836	61	>75% Grass cover, Good, HSG B
15,264	61	>75% Grass cover, Good, HSG B
54,442	68	Weighted Average
44,100		81.00% Pervious Area
10,342		19.00% Impervious Area

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

Summary for Subcatchment P111S: above Bldg 1

Runoff = 3.5 cfs @ 12.09 hrs, Volume= 11,342 cf, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
17,184	98	Paved parking, HSG B
8,200	61	>75% Grass cover, Good, HSG B
25,384	86	Weighted Average
8,200		32.30% Pervious Area
17,184		67.70% Impervious Area

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

Summary for Subcatchment P112S: below Bldg 1

Runoff = 1.7 cfs @ 12.10 hrs, Volume= 5,392 cf, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
2,493	98	Paved parking, HSG B
17,719	61	>75% Grass cover, Good, HSG B
20,212	66	Weighted Average
17,719		87.67% Pervious Area
2,493		12.33% Impervious Area

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

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Summary for Subcatchment P113S: Rte 20

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,885 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
791	98	Paved roads w/curbs & sewers, HSG B
2,557	98	Paved roads w/curbs & sewers, HSG C
3,348	98	Weighted Average
3,348		100.00% Impervious Area

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

Summary for Subcatchment P114S: below Bldg 3

Runoff = 7.4 cfs @ 12.09 hrs, Volume= 23,462 cf, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
17,075	98	Paved parking, HSG B
17,014	61	>75% Grass cover, Good, HSG B
3,265	98	Paved parking, HSG C
25,614	74	>75% Grass cover, Good, HSG C
62,968	78	Weighted Average
42,628		67.70% Pervious Area
20,340		32.30% Impervious Area

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

Summary for Subcatchment P115S: Bldg 5

Runoff = 2.4 cfs @ 12.09 hrs, Volume= 8,770 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
15,575	98	Roofs, HSG B
15,575		100.00% Impervious Area

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

Summary for Subcatchment P201S: to Southeast

Runoff = 2.6 cfs @ 12.14 hrs, Volume= 9,280 cf, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

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Area (sf)	CN	Adj	Description
4,555	74		>75% Grass cover, Good, HSG C
662	70		Woods, Good, HSG C
9,142	61		>75% Grass cover, Good, HSG B
11,100	55		Woods, Good, HSG B
* 5,608	98		WETLAND, HSG B
1,642	98		Unconnected roofs, HSG B
32,709	69	68	Weighted Average, UI Adjusted
25,459			77.83% Pervious Area
7,250			22.17% Impervious Area
1,642			22.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	400	0.0518	0.72		Lag/CN Method,

Summary for Subcatchment P202S: YRC pavement to site

Runoff = 8.0 cfs @ 12.09 hrs, Volume= 29,440 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
52,284	98	Paved parking, HSG B
52,284		100.00% Impervious Area

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

Summary for Subcatchment P203S: above Bldg 4

Runoff = 8.5 cfs @ 12.09 hrs, Volume= 26,960 cf, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
13,245	98	Paved parking, HSG B
16,043	61	>75% Grass cover, Good, HSG B
4,068	55	Woods, Good, HSG B
16,988	98	Paved parking, HSG C
6,309	74	>75% Grass cover, Good, HSG C
19,269	61	>75% Grass cover, Good, HSG B
135	70	Woods, Good, HSG C
76,057	76	Weighted Average
45,824		60.25% Pervious Area
30,233		39.75% Impervious Area

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

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Type III 24-hr 100-year Rainfall=7.00"

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Summary for Subcatchment P204S: Bldg 4

Runoff = 2.4 cfs @ 12.09 hrs, Volume= 8,770 cf, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
634	98	Roofs, HSG B
14,941	98	Roofs, HSG C
15,575	98	Weighted Average
15,575		100.00% Impervious Area

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

Summary for Reach P202R2: natural ground

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth = 2.68" for 100-year event
 Inflow = 3.8 cfs @ 12.25 hrs, Volume= 11,665 cf
 Outflow = 2.8 cfs @ 12.70 hrs, Volume= 11,641 cf, Atten= 27%, Lag= 27.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.30 fps, Min. Travel Time= 13.8 min
 Avg. Velocity = 0.09 fps, Avg. Travel Time= 46.3 min

Peak Storage= 2,317 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.29'
 Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 22.5 cfs

30.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
 Side Slope Z-value= 5.0 ' / ' Top Width= 40.00'
 Length= 250.0' Slope= 0.0360 ' / '
 Inlet Invert= 430.00', Outlet Invert= 421.00'



Summary for Pond P102P: INF-102

Inflow Area = 62,803 sf, 52.70% Impervious, Inflow Depth > 5.02" for 100-year event
 Inflow = 8.1 cfs @ 12.09 hrs, Volume= 26,293 cf
 Outflow = 0.5 cfs @ 13.79 hrs, Volume= 10,768 cf, Atten= 94%, Lag= 101.9 min
 Discarded = 0.1 cfs @ 8.60 hrs, Volume= 5,718 cf
 Primary = 0.4 cfs @ 13.79 hrs, Volume= 5,049 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 452.45' @ 13.79 hrs Surf.Area= 4,000 sf Storage= 16,220 cf

Plug-Flow detention time= 261.2 min calculated for 10,768 cf (41% of inflow)
 Center-of-Mass det. time= 137.9 min (936.1 - 798.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	446.25'	6,606 cf	50.00'W x 80.00'L x 6.75'H Prismatic 27,000 cf Overall - 10,486 cf Embedded = 16,514 cf x 40.0% Voids
#2	447.00'	10,486 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 95 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 19 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		17,092 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	446.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	452.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.1 cfs @ 8.60 hrs HW=446.32' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.4 cfs @ 13.79 hrs HW=452.45' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 0.4 cfs @ 2.30 fps)

Summary for Pond P105P: INF-105

Inflow Area = 18,855 sf, 100.00% Impervious, Inflow Depth > 6.76" for 100-year event
 Inflow = 2.9 cfs @ 12.09 hrs, Volume= 10,617 cf
 Outflow = 0.7 cfs @ 12.48 hrs, Volume= 6,614 cf, Atten= 77%, Lag= 23.8 min
 Discarded = 0.0 cfs @ 3.80 hrs, Volume= 1,980 cf
 Primary = 0.6 cfs @ 12.48 hrs, Volume= 4,634 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 459.70' @ 12.48 hrs Surf.Area= 4,044 sf Storage= 5,503 cf

Plug-Flow detention time= 203.6 min calculated for 6,614 cf (62% of inflow)
 Center-of-Mass det. time= 95.2 min (837.8 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	457.00'	3,649 cf	52.00'W x 60.00'L x 3.50'H Prismatic 10,920 cf Overall - 1,797 cf Embedded = 9,123 cf x 40.0% Voids
#2	457.00'	1,186 cf	22.00'W x 42.00'L x 3.50'H Prismatic 3,234 cf Overall - 269 cf Embedded = 2,965 cf x 40.0% Voids
#3	458.00'	1,797 cf	24.0" Round Pipe Storage x 11 Inside #1 L= 52.0'
#4	458.00'	269 cf	18.0" Round Pipe Storage x 4 Inside #2 L= 38.0'
		6,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	457.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	459.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 3.80 hrs HW=457.04' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.48 hrs HW=459.70' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 0.6 cfs @ 3.22 fps)

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Type III 24-hr 100-year Rainfall=7.00"

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Summary for Pond P107P: INF-107

Inflow Area = 24,193 sf, 72.77% Impervious, Inflow Depth > 5.59" for 100-year event
 Inflow = 3.4 cfs @ 12.09 hrs, Volume= 11,269 cf
 Outflow = 0.5 cfs @ 12.60 hrs, Volume= 5,383 cf, Atten= 85%, Lag= 30.5 min
 Discarded = 0.0 cfs @ 7.70 hrs, Volume= 2,271 cf
 Primary = 0.5 cfs @ 12.60 hrs, Volume= 3,112 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 447.50' @ 12.60 hrs Surf.Area= 1,500 sf Storage= 6,182 cf

Plug-Flow detention time= 220.6 min calculated for 5,383 cf (48% of inflow)
 Center-of-Mass det. time= 104.1 min (890.0 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	441.25'	2,429 cf	30.00'W x 50.00'L x 6.75'H Prismaoid 10,125 cf Overall - 4,053 cf Embedded = 6,072 cf x 40.0% Voids
#2	442.00'	4,053 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 36 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 12 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		6,482 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	447.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 7.70 hrs HW=441.32' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.5 cfs @ 12.60 hrs HW=447.50' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 0.5 cfs @ 2.41 fps)

Summary for Pond P108P: INF-108

Inflow Area = 29,755 sf, 100.00% Impervious, Inflow Depth > 6.76" for 100-year event
 Inflow = 4.6 cfs @ 12.09 hrs, Volume= 16,754 cf
 Outflow = 0.3 cfs @ 13.63 hrs, Volume= 6,876 cf, Atten= 94%, Lag= 92.6 min
 Discarded = 0.1 cfs @ 5.50 hrs, Volume= 4,678 cf
 Primary = 0.2 cfs @ 13.63 hrs, Volume= 2,198 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 439.30' @ 13.63 hrs Surf.Area= 2,600 sf Storage= 10,300 cf

Plug-Flow detention time= 250.2 min calculated for 6,861 cf (41% of inflow)
 Center-of-Mass det. time= 94.0 min (836.5 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	433.25'	4,347 cf	40.00'W x 65.00'L x 6.75'H Prismaoid 17,550 cf Overall - 6,683 cf Embedded = 10,867 cf x 40.0% Voids
#2	434.00'	6,683 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 60 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 15 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		11,030 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	433.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	439.00'	6.0" Vert. Orifice/Grate C= 0.600

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Discarded OutFlow Max=0.1 cfs @ 5.50 hrs HW=433.32' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.2 cfs @ 13.63 hrs HW=439.30' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 0.2 cfs @ 1.86 fps)

Summary for Pond P110P: DP-110

Inflow Area = 202,525 sf, 47.06% Impervious, Inflow Depth > 4.29" for 100-year event
 Inflow = 21.9 cfs @ 12.09 hrs, Volume= 72,409 cf
 Outflow = 6.7 cfs @ 12.43 hrs, Volume= 58,779 cf, Atten= 70%, Lag= 20.3 min
 Discarded = 0.3 cfs @ 12.43 hrs, Volume= 14,212 cf
 Primary = 6.4 cfs @ 12.43 hrs, Volume= 44,568 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 425.24' @ 12.43 hrs Surf.Area= 12,079 sf Storage= 31,671 cf

Plug-Flow detention time= 208.7 min calculated for 58,779 cf (81% of inflow)
 Center-of-Mass det. time= 135.6 min (943.7 - 808.2)

Volume	Invert	Avail.Storage	Storage Description
#1	422.00'	41,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
422.00	8,160	0	0
424.00	9,920	18,080	18,080
426.00	13,415	23,335	41,415

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	423.30'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	425.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Tertiary	425.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.3 cfs @ 12.43 hrs HW=425.23' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.3 cfs)

Primary OutFlow Max=6.3 cfs @ 12.43 hrs HW=425.23' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 1.2 cfs @ 6.25 fps)
 ↑**3=Broad-Crested Rectangular Weir**(Weir Controls 5.1 cfs @ 1.36 fps)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
 ↑**4=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Summary for Pond P111P: INF-111

Inflow Area = 25,384 sf, 67.70% Impervious, Inflow Depth > 5.36" for 100-year event
 Inflow = 3.5 cfs @ 12.09 hrs, Volume= 11,342 cf
 Outflow = 0.8 cfs @ 12.48 hrs, Volume= 6,172 cf, Atten= 76%, Lag= 23.4 min
 Discarded = 0.0 cfs @ 7.85 hrs, Volume= 2,008 cf
 Primary = 0.8 cfs @ 12.48 hrs, Volume= 4,164 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Peak Elev= 433.99' @ 12.48 hrs Surf.Area= 1,350 sf Storage= 5,685 cf

Plug-Flow detention time= 196.7 min calculated for 6,172 cf (54% of inflow)
Center-of-Mass det. time= 88.5 min (880.3 - 791.8)

Volume	Invert	Avail.Storage	Storage Description
#1	427.25'	2,280 cf	30.00'W x 45.00'L x 6.75'H Prismaoid 9,113 cf Overall - 3,413 cf Embedded = 5,700 cf x 40.0% Voids
#2	428.00'	3,413 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 30 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		5,693 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	433.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 7.85 hrs HW=427.32' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.8 cfs @ 12.48 hrs HW=433.98' (Free Discharge)
↑**2=Orifice/Grate** (Orifice Controls 0.8 cfs @ 4.12 fps)

Summary for Pond P115P: INF-115

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 6.76" for 100-year event
Inflow = 2.4 cfs @ 12.09 hrs, Volume= 8,770 cf
Outflow = 0.3 cfs @ 12.69 hrs, Volume= 3,949 cf, Atten= 88%, Lag= 36.2 min
Discarded = 0.0 cfs @ 4.80 hrs, Volume= 2,189 cf
Primary = 0.3 cfs @ 12.69 hrs, Volume= 1,761 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 438.32' @ 12.69 hrs Surf.Area= 1,200 sf Storage= 4,996 cf

Plug-Flow detention time= 229.7 min calculated for 3,941 cf (45% of inflow)
Center-of-Mass det. time= 85.6 min (828.2 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	432.00'	2,052 cf	40.00'W x 30.00'L x 7.00'H Prismaoid 8,400 cf Overall - 3,271 cf Embedded = 5,129 cf x 40.0% Voids
#2	432.75'	3,271 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 7 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		5,323 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	432.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	438.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 4.80 hrs HW=432.07' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.69 hrs HW=438.32' (Free Discharge)
↑**2=Orifice/Grate** (Orifice Controls 0.3 cfs @ 1.92 fps)

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Summary for Pond P202P: INF-202

Inflow Area = 52,284 sf, 100.00% Impervious, Inflow Depth > 6.76" for 100-year event
 Inflow = 8.0 cfs @ 12.09 hrs, Volume= 29,440 cf
 Outflow = 3.9 cfs @ 12.25 hrs, Volume= 20,529 cf, Atten= 51%, Lag= 9.7 min
 Discarded = 0.1 cfs @ 5.95 hrs, Volume= 8,864 cf
 Primary = 3.8 cfs @ 12.25 hrs, Volume= 11,665 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 444.70' @ 12.25 hrs Surf.Area= 4,950 sf Storage= 11,786 cf

Plug-Flow detention time= 155.1 min calculated for 20,486 cf (70% of inflow)
 Center-of-Mass det. time= 59.8 min (802.4 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	441.00'	4,951 cf	45.00'W x 110.00'L x 4.00'H Prismaoid 19,800 cf Overall - 7,422 cf Embedded = 12,378 cf x 40.0% Voids
#2	441.50'	7,422 cf	36.0" Round Pipe Storage x 10 Inside #1 L= 105.0'
		12,373 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	441.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	443.80'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.1 cfs @ 5.95 hrs HW=441.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=3.8 cfs @ 12.25 hrs HW=444.70' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 3.8 cfs @ 3.63 fps)

Summary for Pond P203P: INF-203

Inflow Area = 76,057 sf, 39.75% Impervious, Inflow Depth > 4.25" for 100-year event
 Inflow = 8.5 cfs @ 12.09 hrs, Volume= 26,960 cf
 Outflow = 2.7 cfs @ 12.42 hrs, Volume= 15,929 cf, Atten= 68%, Lag= 19.6 min
 Discarded = 0.1 cfs @ 9.00 hrs, Volume= 3,739 cf
 Primary = 2.7 cfs @ 12.42 hrs, Volume= 12,190 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 442.97' @ 12.42 hrs Surf.Area= 2,800 sf Storage= 12,044 cf

Plug-Flow detention time= 189.1 min calculated for 15,929 cf (59% of inflow)
 Center-of-Mass det. time= 82.5 min (899.4 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1	436.25'	4,546 cf	40.00'W x 70.00'L x 6.75'H Prismaoid 18,900 cf Overall - 7,536 cf Embedded = 11,364 cf x 40.0% Voids
#2	437.00'	7,536 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 68 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 17 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		12,082 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	436.25'	1.020 in/hr Exfiltration over Surface area
#2	Primary	442.00'	8.0" Vert. Orifice/Grate X 2.00 C= 0.600

927.01 Proposed Phase 1

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Discarded OutFlow Max=0.1 cfs @ 9.00 hrs HW=436.32' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=2.7 cfs @ 12.42 hrs HW=442.96' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 2.7 cfs @ 3.80 fps)

Summary for Pond P204P: INF-204

Inflow Area = 15,575 sf, 100.00% Impervious, Inflow Depth > 6.76" for 100-year event
 Inflow = 2.4 cfs @ 12.09 hrs, Volume= 8,770 cf
 Outflow = 1.1 cfs @ 12.25 hrs, Volume= 7,797 cf, Atten= 53%, Lag= 10.0 min
 Discarded = 0.0 cfs @ 2.70 hrs, Volume= 1,141 cf
 Primary = 1.1 cfs @ 12.25 hrs, Volume= 6,656 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 441.65' @ 12.25 hrs Surf.Area= 2,275 sf Storage= 2,437 cf

Plug-Flow detention time= 104.2 min calculated for 7,781 cf (89% of inflow)
 Center-of-Mass det. time= 51.2 min (793.8 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	439.00'	2,714 cf	35.00'W x 65.00'L x 3.00'H Prismatic 6,825 cf Overall - 39 cf Embedded = 6,786 cf x 40.0% Voids
#2	439.50'	39 cf	12.0" Round Pipe Storage Inside #1 L= 50.0'
		2,754 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	439.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	440.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 2.70 hrs HW=439.03' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=1.1 cfs @ 12.25 hrs HW=441.65' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 1.1 cfs @ 5.70 fps)

Summary for Link P1L: Stoney Hill Rd

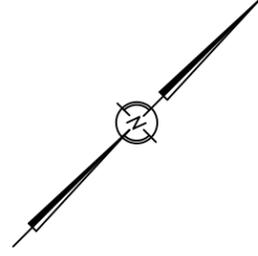
Inflow Area = 414,844 sf, 54.33% Impervious, Inflow Depth > 2.30" for 100-year event
 Inflow = 9.5 cfs @ 12.43 hrs, Volume= 79,368 cf
 Primary = 9.5 cfs @ 12.43 hrs, Volume= 79,368 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link P2L: Southeast

Inflow Area = 176,625 sf, 59.64% Impervious, Inflow Depth > 2.70" for 100-year event
 Inflow = 6.1 cfs @ 12.55 hrs, Volume= 39,767 cf
 Primary = 6.1 cfs @ 12.55 hrs, Volume= 39,767 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



TITLE: PHASE 2 - PROPOSED HYDROLOGY PLAN

THE POINTE AT
HILLS FARM

OWNER: HARTFORD REALTY TRUST OF SHREWSBURY
291 Grafton Street
Shrewsbury, MA 01545

PREPARED FOR: SMART GROWTH DESIGN, LLC
625 South Street
Shrewsbury, MA 01545

DATE: 10/28/15 FILE NO.: 0927350 SCALE: 1" = 100'
JOB NO.: 0927.02 DWG NO.: 0927353A DRAWN BY: MIS
REV. NO.: REV. DATE: REV. DATE:

**WATERMAN DESIGN
ASSOCIATES, INC.**

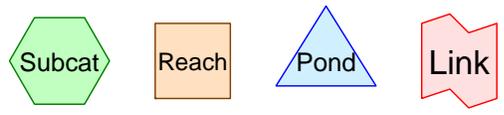
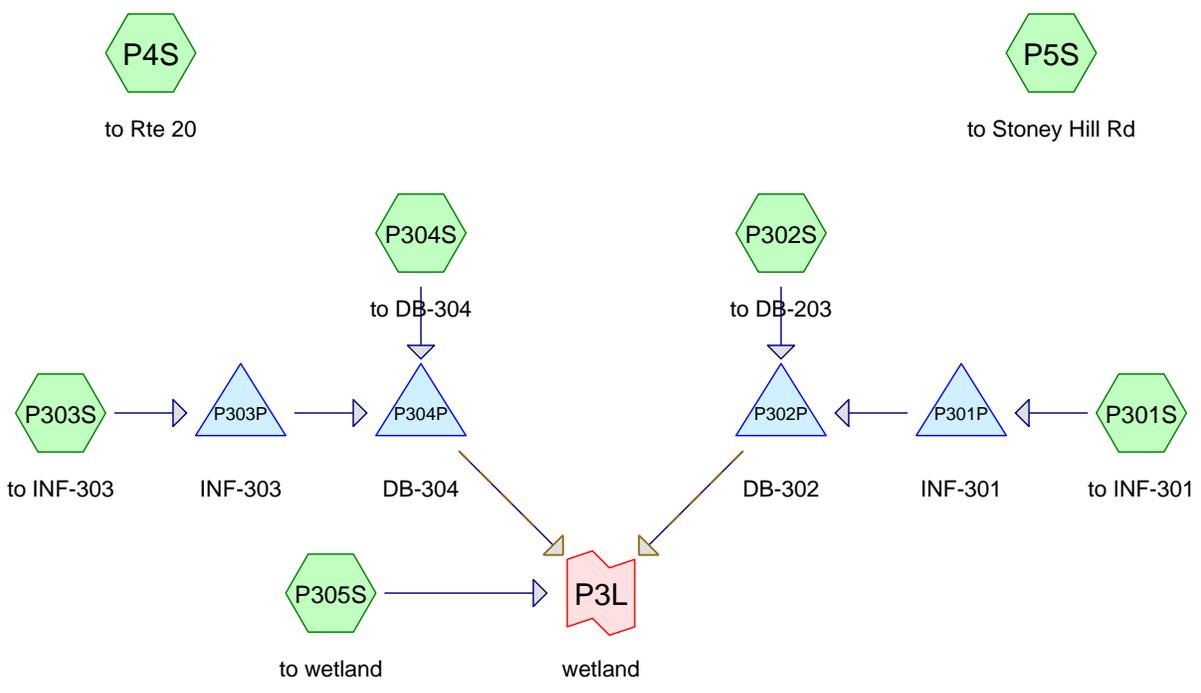
31 East Main Street
Westborough, MA 01581

508.366.6552
(fax) 508.366.6506
watermandesign.com wda@wdassoc.com



PREPARED BY:

PHEASANT HILL ROAD
(PUBLIC ~ 40' WIDE)



Routing Diagram for 927.02 Proposed Phase 2
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927.02 Proposed Phase 2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
15,994	79	50-75% Grass cover, Fair, HSG C (P302S, P305S)
96,963	74	>75% Grass cover, Good, HSG C (P301S, P302S, P303S, P304S, P305S, P5S)
1,267	65	Brush, Good, HSG C (P5S)
73,357	98	Paved parking, HSG C (P301S, P302S, P303S, P304S)
37,912	98	Roofs, HSG C (P301S)
19,485	70	Woods, Good, HSG C (P305S, P4S)
244,978	85	TOTAL AREA

927.02 Proposed Phase 2

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
244,978	HSG C	P301S, P302S, P303S, P304S, P305S, P4S, P5S
0	HSG D	
0	Other	
244,978		TOTAL AREA

927.02 Proposed Phase 2

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP301S: to INF-301	Runoff Area=57,605 sf 68.47% Impervious Runoff Depth>2.17" Tc=6.0 min CN=90 Runoff=3.3 cfs 10,402 cf
SubcatchmentP302S: to DB-203	Runoff Area=57,853 sf 56.18% Impervious Runoff Depth>2.00" Tc=6.0 min CN=88 Runoff=3.0 cfs 9,620 cf
SubcatchmentP303S: to INF-303	Runoff Area=21,071 sf 8.31% Impervious Runoff Depth>1.15" Tc=6.0 min CN=76 Runoff=0.6 cfs 2,021 cf
SubcatchmentP304S: to DB-304	Runoff Area=49,932 sf 75.25% Impervious Runoff Depth>2.35" Tc=6.0 min CN=92 Runoff=3.0 cfs 9,774 cf
SubcatchmentP305S: to wetland	Runoff Area=43,701 sf 0.00% Impervious Runoff Depth>1.04" Tc=6.0 min CN=74 Runoff=1.1 cfs 3,774 cf
SubcatchmentP4S: to Rte 20	Runoff Area=5,984 sf 0.00% Impervious Runoff Depth>0.83" Tc=6.0 min CN=70 Runoff=0.1 cfs 412 cf
SubcatchmentP5S: to Stoney Hill Rd	Runoff Area=8,832 sf 0.00% Impervious Runoff Depth>0.98" Tc=6.0 min CN=73 Runoff=0.2 cfs 722 cf
Pond P301P: INF-301	Peak Elev=509.59' Storage=9,317 cf Inflow=3.3 cfs 10,402 cf Discarded=0.0 cfs 1,084 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,084 cf
Pond P302P: DB-302	Peak Elev=486.05' Storage=1,567 cf Inflow=3.0 cfs 9,620 cf Primary=1.5 cfs 9,531 cf Secondary=0.0 cfs 0 cf Outflow=1.5 cfs 9,531 cf
Pond P303P: INF-303	Peak Elev=505.45' Storage=1,158 cf Inflow=0.6 cfs 2,021 cf Discarded=0.0 cfs 1,163 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,163 cf
Pond P304P: DB-304	Peak Elev=502.70' Storage=3,448 cf Inflow=3.0 cfs 9,774 cf Primary=1.0 cfs 9,265 cf Secondary=0.0 cfs 0 cf Tertiary=0.0 cfs 0 cf Outflow=1.0 cfs 9,265 cf
Link P3L: wetland	Inflow=3.4 cfs 22,571 cf Primary=3.4 cfs 22,571 cf

Total Runoff Area = 244,978 sf Runoff Volume = 36,725 cf Average Runoff Depth = 1.80"
54.58% Pervious = 133,709 sf 45.42% Impervious = 111,269 sf

927.02 Proposed Phase 2

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P301S: to INF-301

Runoff = 3.3 cfs @ 12.09 hrs, Volume= 10,402 cf, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
11,346	98	Roofs, HSG C
13,024	98	Roofs, HSG C
13,542	98	Roofs, HSG C
18,164	74	>75% Grass cover, Good, HSG C
1,529	98	Paved parking, HSG C
57,605	90	Weighted Average
18,164		31.53% Pervious Area
39,441		68.47% Impervious Area

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

Summary for Subcatchment P302S: to DB-203

Runoff = 3.0 cfs @ 12.09 hrs, Volume= 9,620 cf, Depth> 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
21,347	74	>75% Grass cover, Good, HSG C
32,503	98	Paved parking, HSG C
4,003	79	50-75% Grass cover, Fair, HSG C
57,853	88	Weighted Average
25,350		43.82% Pervious Area
32,503		56.18% Impervious Area

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

Summary for Subcatchment P303S: to INF-303

Runoff = 0.6 cfs @ 12.10 hrs, Volume= 2,021 cf, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
19,320	74	>75% Grass cover, Good, HSG C
1,751	98	Paved parking, HSG C
21,071	76	Weighted Average
19,320		91.69% Pervious Area
1,751		8.31% Impervious Area

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

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Type III 24-hr 2-year Rainfall=3.20"

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Summary for Subcatchment P304S: to DB-304

Runoff = 3.0 cfs @ 12.09 hrs, Volume= 9,774 cf, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
12,358	74	>75% Grass cover, Good, HSG C
37,574	98	Paved parking, HSG C
49,932	92	Weighted Average
12,358		24.75% Pervious Area
37,574		75.25% Impervious Area

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

Summary for Subcatchment P305S: to wetland

Runoff = 1.1 cfs @ 12.10 hrs, Volume= 3,774 cf, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
18,209	74	>75% Grass cover, Good, HSG C
1,955	70	Woods, Good, HSG C
11,991	79	50-75% Grass cover, Fair, HSG C
11,546	70	Woods, Good, HSG C
43,701	74	Weighted Average
43,701		100.00% Pervious Area

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

Summary for Subcatchment P4S: to Rte 20

Runoff = 0.1 cfs @ 12.10 hrs, Volume= 412 cf, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
5,984	70	Woods, Good, HSG C
5,984		100.00% Pervious Area

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

Summary for Subcatchment P5S: to Stoney Hill Rd

Runoff = 0.2 cfs @ 12.10 hrs, Volume= 722 cf, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

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Type III 24-hr 2-year Rainfall=3.20"

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Area (sf)	CN	Description
7,565	74	>75% Grass cover, Good, HSG C
1,267	65	Brush, Good, HSG C
8,832	73	Weighted Average
8,832		100.00% Pervious Area

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

Summary for Pond P301P: INF-301

Inflow Area = 57,605 sf, 68.47% Impervious, Inflow Depth > 2.17" for 2-year event
 Inflow = 3.3 cfs @ 12.09 hrs, Volume= 10,402 cf
 Outflow = 0.0 cfs @ 9.05 hrs, Volume= 1,084 cf, Atten= 99%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 9.05 hrs, Volume= 1,084 cf
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 509.59' @ 24.00 hrs Surf.Area= 4,800 sf Storage= 9,317 cf

Plug-Flow detention time= 361.8 min calculated for 1,081 cf (10% of inflow)
 Center-of-Mass det. time= 156.0 min (962.4 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	506.50'	9,800 cf	60.00'W x 80.00'L x 7.00'H Prismatic 33,600 cf Overall - 9,101 cf Embedded = 24,499 cf x 40.0% Voids
#2	507.25'	9,101 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 80 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 8 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 8 rows = 571.2 cf
		18,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	506.50'	0.170 in/hr Exfiltration over Surface area
#2	Primary	511.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 9.05 hrs HW=506.57' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=506.50' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.0 cfs)

Summary for Pond P302P: DB-302

Inflow Area = 115,458 sf, 62.31% Impervious, Inflow Depth > 1.00" for 2-year event
 Inflow = 3.0 cfs @ 12.09 hrs, Volume= 9,620 cf
 Outflow = 1.5 cfs @ 12.25 hrs, Volume= 9,531 cf, Atten= 50%, Lag= 9.7 min
 Primary = 1.5 cfs @ 12.25 hrs, Volume= 9,531 cf
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 486.05' @ 12.25 hrs Surf.Area= 1,853 sf Storage= 1,567 cf

Plug-Flow detention time= 19.7 min calculated for 9,512 cf (99% of inflow)
 Center-of-Mass det. time= 14.2 min (828.7 - 814.5)

927.02 Proposed Phase 2

Type III 24-hr 2-year Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description
#1	485.00'	7,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.00	1,170	0	0
486.00	1,800	1,485	1,485
488.00	4,130	5,930	7,415

Device	Routing	Invert	Outlet Devices
#1	Primary	485.00'	6.0" Round Culvert X 2.00 L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 485.00' / 484.00' S= 0.0370 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#2	Primary	486.10'	6.0" Round Culvert X 2.00 L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 486.10' / 484.00' S= 0.0875 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Secondary	486.90'	30.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.5 cfs @ 12.25 hrs HW=486.04' (Free Discharge)

- ↑1=Culvert (Barrel Controls 1.5 cfs @ 3.90 fps)
- ↓2=Culvert (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=485.00' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Pond P303P: INF-303

Inflow Area =	21,071 sf,	8.31% Impervious,	Inflow Depth > 1.15" for 2-year event
Inflow =	0.6 cfs @ 12.10 hrs,	Volume=	2,021 cf
Outflow =	0.0 cfs @ 11.75 hrs,	Volume=	1,163 cf, Atten= 96%, Lag= 0.0 min
Discarded =	0.0 cfs @ 11.75 hrs,	Volume=	1,163 cf
Primary =	0.0 cfs @ 0.00 hrs,	Volume=	0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 505.45' @ 16.29 hrs Surf.Area= 6,500 sf Storage= 1,158 cf

Plug-Flow detention time= 327.0 min calculated for 1,161 cf (57% of inflow)
Center-of-Mass det. time= 207.3 min (1,062.2 - 854.9)

Volume	Invert	Avail.Storage	Storage Description
#1	505.00'	4,000 cf	50.00'W x 100.00'L x 2.00'H Prismaoid 10,000 cf Overall x 40.0% Voids
#2	505.00'	1,200 cf	50.00'W x 30.00'L x 2.00'H Prismaoid 3,000 cf Overall x 40.0% Voids
		5,200 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	505.00'	0.170 in/hr Exfiltration over Surface area
#2	Primary	506.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 11.75 hrs HW=505.02' (Free Discharge)

- ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=505.00' (Free Discharge)

- ↑2=Orifice/Grate (Controls 0.0 cfs)

927.02 Proposed Phase 2

Type III 24-hr 2-year Rainfall=3.20"

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Summary for Pond P304P: DB-304

Inflow Area = 71,003 sf, 55.38% Impervious, Inflow Depth > 1.65" for 2-year event
 Inflow = 3.0 cfs @ 12.09 hrs, Volume= 9,774 cf
 Outflow = 1.0 cfs @ 12.38 hrs, Volume= 9,265 cf, Atten= 66%, Lag= 17.7 min
 Primary = 1.0 cfs @ 12.38 hrs, Volume= 9,265 cf
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 502.70' @ 12.38 hrs Surf.Area= 4,935 sf Storage= 3,448 cf

Plug-Flow detention time= 92.3 min calculated for 9,265 cf (95% of inflow)
 Center-of-Mass det. time= 63.7 min (860.9 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1	502.00'	12,338 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
502.00	4,935	0	0
504.00	4,935	9,870	9,870
504.50	4,935	2,468	12,338

Device	Routing	Invert	Outlet Devices
#1	Primary	502.00'	8.0" Vert. Orifice/Grate C= 0.600
#2	Primary	503.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Secondary	503.20'	30.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height
#4	Tertiary	504.40'	200.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height

Primary OutFlow Max=1.0 cfs @ 12.38 hrs HW=502.70' (Free Discharge)
 ↑1=Orifice/Grate (Orifice Controls 1.0 cfs @ 2.91 fps)
 ↓2=Orifice/Grate (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=502.00' (Free Discharge)
 ↑3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=502.00' (Free Discharge)
 ↑4=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Link P3L: wetland

Inflow Area = 230,162 sf, 48.34% Impervious, Inflow Depth > 1.18" for 2-year event
 Inflow = 3.4 cfs @ 12.13 hrs, Volume= 22,571 cf
 Primary = 3.4 cfs @ 12.13 hrs, Volume= 22,571 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

927.02 Proposed Phase 2

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Type III 24-hr 10-year Rainfall=4.80"

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP301S: to INF-301	Runoff Area=57,605 sf 68.47% Impervious Runoff Depth>3.68" Tc=6.0 min CN=90 Runoff=5.4 cfs 17,670 cf
SubcatchmentP302S: to DB-203	Runoff Area=57,853 sf 56.18% Impervious Runoff Depth>3.48" Tc=6.0 min CN=88 Runoff=5.2 cfs 16,761 cf
SubcatchmentP303S: to INF-303	Runoff Area=21,071 sf 8.31% Impervious Runoff Depth>2.37" Tc=6.0 min CN=76 Runoff=1.3 cfs 4,161 cf
SubcatchmentP304S: to DB-304	Runoff Area=49,932 sf 75.25% Impervious Runoff Depth>3.89" Tc=6.0 min CN=92 Runoff=4.9 cfs 16,192 cf
SubcatchmentP305S: to wetland	Runoff Area=43,701 sf 0.00% Impervious Runoff Depth>2.20" Tc=6.0 min CN=74 Runoff=2.5 cfs 8,025 cf
SubcatchmentP4S: to Rte 20	Runoff Area=5,984 sf 0.00% Impervious Runoff Depth>1.89" Tc=6.0 min CN=70 Runoff=0.3 cfs 941 cf
SubcatchmentP5S: to Stoney Hill Rd	Runoff Area=8,832 sf 0.00% Impervious Runoff Depth>2.12" Tc=6.0 min CN=73 Runoff=0.5 cfs 1,562 cf
Pond P301P: INF-301	Peak Elev=511.65' Storage=15,243 cf Inflow=5.4 cfs 17,670 cf Discarded=0.0 cfs 1,202 cf Primary=0.1 cfs 1,311 cf Outflow=0.1 cfs 2,513 cf
Pond P302P: DB-302	Peak Elev=486.65' Storage=2,896 cf Inflow=5.2 cfs 18,072 cf Primary=2.7 cfs 17,919 cf Secondary=0.0 cfs 0 cf Outflow=2.7 cfs 17,919 cf
Pond P303P: INF-303	Peak Elev=506.14' Storage=2,957 cf Inflow=1.3 cfs 4,161 cf Discarded=0.0 cfs 1,277 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 1,277 cf
Pond P304P: DB-304	Peak Elev=503.11' Storage=5,479 cf Inflow=4.9 cfs 16,192 cf Primary=1.5 cfs 15,569 cf Secondary=0.0 cfs 0 cf Tertiary=0.0 cfs 0 cf Outflow=1.5 cfs 15,569 cf
Link P3L: wetland	Inflow=6.0 cfs 41,513 cf Primary=6.0 cfs 41,513 cf

Total Runoff Area = 244,978 sf Runoff Volume = 65,313 cf Average Runoff Depth = 3.20"
54.58% Pervious = 133,709 sf 45.42% Impervious = 111,269 sf

927.02 Proposed Phase 2

Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P301S: to INF-301

Runoff = 5.4 cfs @ 12.09 hrs, Volume= 17,670 cf, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
11,346	98	Roofs, HSG C
13,024	98	Roofs, HSG C
13,542	98	Roofs, HSG C
18,164	74	>75% Grass cover, Good, HSG C
1,529	98	Paved parking, HSG C
57,605	90	Weighted Average
18,164		31.53% Pervious Area
39,441		68.47% Impervious Area

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

Summary for Subcatchment P302S: to DB-203

Runoff = 5.2 cfs @ 12.09 hrs, Volume= 16,761 cf, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
21,347	74	>75% Grass cover, Good, HSG C
32,503	98	Paved parking, HSG C
4,003	79	50-75% Grass cover, Fair, HSG C
57,853	88	Weighted Average
25,350		43.82% Pervious Area
32,503		56.18% Impervious Area

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

Summary for Subcatchment P303S: to INF-303

Runoff = 1.3 cfs @ 12.09 hrs, Volume= 4,161 cf, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
19,320	74	>75% Grass cover, Good, HSG C
1,751	98	Paved parking, HSG C
21,071	76	Weighted Average
19,320		91.69% Pervious Area
1,751		8.31% Impervious Area

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

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Subcatchment P304S: to DB-304

Runoff = 4.9 cfs @ 12.09 hrs, Volume= 16,192 cf, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
12,358	74	>75% Grass cover, Good, HSG C
37,574	98	Paved parking, HSG C
49,932	92	Weighted Average
12,358		24.75% Pervious Area
37,574		75.25% Impervious Area

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

Summary for Subcatchment P305S: to wetland

Runoff = 2.5 cfs @ 12.10 hrs, Volume= 8,025 cf, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
18,209	74	>75% Grass cover, Good, HSG C
1,955	70	Woods, Good, HSG C
11,991	79	50-75% Grass cover, Fair, HSG C
11,546	70	Woods, Good, HSG C
43,701	74	Weighted Average
43,701		100.00% Pervious Area

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

Summary for Subcatchment P4S: to Rte 20

Runoff = 0.3 cfs @ 12.10 hrs, Volume= 941 cf, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

Area (sf)	CN	Description
5,984	70	Woods, Good, HSG C
5,984		100.00% Pervious Area

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

Summary for Subcatchment P5S: to Stoney Hill Rd

Runoff = 0.5 cfs @ 12.10 hrs, Volume= 1,562 cf, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.80"

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Type III 24-hr 10-year Rainfall=4.80"

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Area (sf)	CN	Description
7,565	74	>75% Grass cover, Good, HSG C
1,267	65	Brush, Good, HSG C
8,832	73	Weighted Average
8,832		100.00% Pervious Area

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

Summary for Pond P301P: INF-301

Inflow Area = 57,605 sf, 68.47% Impervious, Inflow Depth > 3.68" for 10-year event
 Inflow = 5.4 cfs @ 12.09 hrs, Volume= 17,670 cf
 Outflow = 0.1 cfs @ 19.41 hrs, Volume= 2,513 cf, Atten= 98%, Lag= 439.0 min
 Discarded = 0.0 cfs @ 7.35 hrs, Volume= 1,202 cf
 Primary = 0.1 cfs @ 19.41 hrs, Volume= 1,311 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 511.65' @ 19.41 hrs Surf.Area= 4,800 sf Storage= 15,243 cf

Plug-Flow detention time= 498.2 min calculated for 2,513 cf (14% of inflow)
 Center-of-Mass det. time= 288.8 min (1,080.5 - 791.6)

Volume	Invert	Avail.Storage	Storage Description
#1	506.50'	9,800 cf	60.00'W x 80.00'L x 7.00'H Prismatic 33,600 cf Overall - 9,101 cf Embedded = 24,499 cf x 40.0% Voids
#2	507.25'	9,101 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 80 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 8 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 8 rows = 571.2 cf
		18,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	506.50'	0.170 in/hr Exfiltration over Surface area
#2	Primary	511.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 7.35 hrs HW=506.57' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 19.41 hrs HW=511.65' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 0.1 cfs @ 1.32 fps)

Summary for Pond P302P: DB-302

Inflow Area = 115,458 sf, 62.31% Impervious, Inflow Depth > 1.88" for 10-year event
 Inflow = 5.2 cfs @ 12.09 hrs, Volume= 18,072 cf
 Outflow = 2.7 cfs @ 12.24 hrs, Volume= 17,919 cf, Atten= 48%, Lag= 8.7 min
 Primary = 2.7 cfs @ 12.24 hrs, Volume= 17,919 cf
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 486.65' @ 12.24 hrs Surf.Area= 2,555 sf Storage= 2,896 cf

Plug-Flow detention time= 18.2 min calculated for 17,919 cf (99% of inflow)
 Center-of-Mass det. time= 13.1 min (843.7 - 830.6)

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Type III 24-hr 10-year Rainfall=4.80"

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Volume	Invert	Avail.Storage	Storage Description
#1	485.00'	7,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.00	1,170	0	0
486.00	1,800	1,485	1,485
488.00	4,130	5,930	7,415

Device	Routing	Invert	Outlet Devices
#1	Primary	485.00'	6.0" Round Culvert X 2.00 L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 485.00' / 484.00' S= 0.0370 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#2	Primary	486.10'	6.0" Round Culvert X 2.00 L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 486.10' / 484.00' S= 0.0875 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Secondary	486.90'	30.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.7 cfs @ 12.24 hrs HW=486.64' (Free Discharge)

↑1=Culvert (Barrel Controls 1.8 cfs @ 4.59 fps)

↑2=Culvert (Inlet Controls 0.9 cfs @ 2.31 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=485.00' (Free Discharge)

↑3=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Pond P303P: INF-303

Inflow Area =	21,071 sf,	8.31% Impervious,	Inflow Depth > 2.37" for 10-year event
Inflow =	1.3 cfs @ 12.09 hrs,	Volume=	4,161 cf
Outflow =	0.0 cfs @ 10.90 hrs,	Volume=	1,277 cf, Atten= 98%, Lag= 0.0 min
Discarded =	0.0 cfs @ 10.90 hrs,	Volume=	1,277 cf
Primary =	0.0 cfs @ 0.00 hrs,	Volume=	0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 506.14' @ 19.68 hrs Surf.Area= 6,500 sf Storage= 2,957 cf

Plug-Flow detention time= 321.0 min calculated for 1,274 cf (31% of inflow)
Center-of-Mass det. time= 191.2 min (1,024.9 - 833.7)

Volume	Invert	Avail.Storage	Storage Description
#1	505.00'	4,000 cf	50.00'W x 100.00'L x 2.00'H Prismaoid 10,000 cf Overall x 40.0% Voids
#2	505.00'	1,200 cf	50.00'W x 30.00'L x 2.00'H Prismaoid 3,000 cf Overall x 40.0% Voids
		5,200 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	505.00'	0.170 in/hr Exfiltration over Surface area
#2	Primary	506.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 10.90 hrs HW=505.02' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=505.00' (Free Discharge)

↑2=Orifice/Grate (Controls 0.0 cfs)

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Type III 24-hr 10-year Rainfall=4.80"

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Summary for Pond P304P: DB-304

Inflow Area = 71,003 sf, 55.38% Impervious, Inflow Depth > 2.74" for 10-year event
 Inflow = 4.9 cfs @ 12.09 hrs, Volume= 16,192 cf
 Outflow = 1.5 cfs @ 12.40 hrs, Volume= 15,569 cf, Atten= 69%, Lag= 18.8 min
 Primary = 1.5 cfs @ 12.40 hrs, Volume= 15,569 cf
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 503.11' @ 12.40 hrs Surf.Area= 4,935 sf Storage= 5,479 cf

Plug-Flow detention time= 81.1 min calculated for 15,536 cf (96% of inflow)
 Center-of-Mass det. time= 59.0 min (842.5 - 783.5)

Volume	Invert	Avail.Storage	Storage Description
#1	502.00'	12,338 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
502.00	4,935	0	0
504.00	4,935	9,870	9,870
504.50	4,935	2,468	12,338

Device	Routing	Invert	Outlet Devices
#1	Primary	502.00'	8.0" Vert. Orifice/Grate C= 0.600
#2	Primary	503.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Secondary	503.20'	30.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height
#4	Tertiary	504.40'	200.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height

Primary OutFlow Max=1.5 cfs @ 12.40 hrs HW=503.11' (Free Discharge)

- ↑1=Orifice/Grate (Orifice Controls 1.5 cfs @ 4.24 fps)
- └2=Orifice/Grate (Orifice Controls 0.0 cfs @ 1.13 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=502.00' (Free Discharge)

- ↑3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=502.00' (Free Discharge)

- ↑4=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Link P3L: wetland

Inflow Area = 230,162 sf, 48.34% Impervious, Inflow Depth > 2.16" for 10-year event
 Inflow = 6.0 cfs @ 12.14 hrs, Volume= 41,513 cf
 Primary = 6.0 cfs @ 12.14 hrs, Volume= 41,513 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP301S: to INF-301	Runoff Area=57,605 sf 68.47% Impervious Runoff Depth>5.82" Tc=6.0 min CN=90 Runoff=8.3 cfs 27,935 cf
SubcatchmentP302S: to DB-203	Runoff Area=57,853 sf 56.18% Impervious Runoff Depth>5.59" Tc=6.0 min CN=88 Runoff=8.1 cfs 26,948 cf
SubcatchmentP303S: to INF-303	Runoff Area=21,071 sf 8.31% Impervious Runoff Depth>4.25" Tc=6.0 min CN=76 Runoff=2.4 cfs 7,469 cf
SubcatchmentP304S: to DB-304	Runoff Area=49,932 sf 75.25% Impervious Runoff Depth>6.05" Tc=6.0 min CN=92 Runoff=7.4 cfs 25,177 cf
SubcatchmentP305S: to wetland	Runoff Area=43,701 sf 0.00% Impervious Runoff Depth>4.04" Tc=6.0 min CN=74 Runoff=4.7 cfs 14,707 cf
SubcatchmentP4S: to Rte 20	Runoff Area=5,984 sf 0.00% Impervious Runoff Depth>3.62" Tc=6.0 min CN=70 Runoff=0.6 cfs 1,803 cf
SubcatchmentP5S: to Stoney Hill Rd	Runoff Area=8,832 sf 0.00% Impervious Runoff Depth>3.93" Tc=6.0 min CN=73 Runoff=0.9 cfs 2,894 cf
Pond P301P: INF-301	Peak Elev=512.57' Storage=17,117 cf Inflow=8.3 cfs 27,935 cf Discarded=0.0 cfs 1,309 cf Primary=0.9 cfs 11,380 cf Outflow=0.9 cfs 12,689 cf
Pond P302P: DB-302	Peak Elev=487.04' Storage=3,983 cf Inflow=8.1 cfs 38,327 cf Primary=3.3 cfs 36,419 cf Secondary=4.1 cfs 1,712 cf Outflow=7.5 cfs 38,131 cf
Pond P303P: INF-303	Peak Elev=506.72' Storage=4,463 cf Inflow=2.4 cfs 7,469 cf Discarded=0.0 cfs 1,408 cf Primary=0.1 cfs 2,037 cf Outflow=0.2 cfs 3,445 cf
Pond P304P: DB-304	Peak Elev=503.32' Storage=6,538 cf Inflow=7.4 cfs 27,214 cf Primary=1.9 cfs 23,840 cf Secondary=4.3 cfs 2,572 cf Tertiary=0.0 cfs 0 cf Outflow=6.2 cfs 26,411 cf
Link P3L: wetland	Inflow=17.3 cfs 79,249 cf Primary=17.3 cfs 79,249 cf

Total Runoff Area = 244,978 sf Runoff Volume = 106,932 cf Average Runoff Depth = 5.24"
54.58% Pervious = 133,709 sf 45.42% Impervious = 111,269 sf

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Type III 24-hr 100-year Rainfall=7.00"

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Summary for Subcatchment P301S: to INF-301

Runoff = 8.3 cfs @ 12.09 hrs, Volume= 27,935 cf, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
11,346	98	Roofs, HSG C
13,024	98	Roofs, HSG C
13,542	98	Roofs, HSG C
18,164	74	>75% Grass cover, Good, HSG C
1,529	98	Paved parking, HSG C
57,605	90	Weighted Average
18,164		31.53% Pervious Area
39,441		68.47% Impervious Area

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

Summary for Subcatchment P302S: to DB-203

Runoff = 8.1 cfs @ 12.09 hrs, Volume= 26,948 cf, Depth> 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
21,347	74	>75% Grass cover, Good, HSG C
32,503	98	Paved parking, HSG C
4,003	79	50-75% Grass cover, Fair, HSG C
57,853	88	Weighted Average
25,350		43.82% Pervious Area
32,503		56.18% Impervious Area

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

Summary for Subcatchment P303S: to INF-303

Runoff = 2.4 cfs @ 12.09 hrs, Volume= 7,469 cf, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
19,320	74	>75% Grass cover, Good, HSG C
1,751	98	Paved parking, HSG C
21,071	76	Weighted Average
19,320		91.69% Pervious Area
1,751		8.31% Impervious Area

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

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Type III 24-hr 100-year Rainfall=7.00"

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Summary for Subcatchment P304S: to DB-304

Runoff = 7.4 cfs @ 12.09 hrs, Volume= 25,177 cf, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
12,358	74	>75% Grass cover, Good, HSG C
37,574	98	Paved parking, HSG C
49,932	92	Weighted Average
12,358		24.75% Pervious Area
37,574		75.25% Impervious Area

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

Summary for Subcatchment P305S: to wetland

Runoff = 4.7 cfs @ 12.09 hrs, Volume= 14,707 cf, Depth> 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
18,209	74	>75% Grass cover, Good, HSG C
1,955	70	Woods, Good, HSG C
11,991	79	50-75% Grass cover, Fair, HSG C
11,546	70	Woods, Good, HSG C
43,701	74	Weighted Average
43,701		100.00% Pervious Area

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

Summary for Subcatchment P4S: to Rte 20

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 1,803 cf, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

Area (sf)	CN	Description
5,984	70	Woods, Good, HSG C
5,984		100.00% Pervious Area

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

Summary for Subcatchment P5S: to Stoney Hill Rd

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 2,894 cf, Depth> 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.00"

927.02 Proposed Phase 2

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Area (sf)	CN	Description
7,565	74	>75% Grass cover, Good, HSG C
1,267	65	Brush, Good, HSG C
8,832	73	Weighted Average
8,832		100.00% Pervious Area

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

Summary for Pond P301P: INF-301

Inflow Area = 57,605 sf, 68.47% Impervious, Inflow Depth > 5.82" for 100-year event
 Inflow = 8.3 cfs @ 12.09 hrs, Volume= 27,935 cf
 Outflow = 0.9 cfs @ 12.83 hrs, Volume= 12,689 cf, Atten= 89%, Lag= 44.6 min
 Discarded = 0.0 cfs @ 5.65 hrs, Volume= 1,309 cf
 Primary = 0.9 cfs @ 12.83 hrs, Volume= 11,380 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 512.57' @ 12.83 hrs Surf.Area= 4,800 sf Storage= 17,117 cf

Plug-Flow detention time= 268.3 min calculated for 12,689 cf (45% of inflow)
 Center-of-Mass det. time= 146.5 min (926.0 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	506.50'	9,800 cf	60.00'W x 80.00'L x 7.00'H Prismatic 33,600 cf Overall - 9,101 cf Embedded = 24,499 cf x 40.0% Voids
#2	507.25'	9,101 cf	ADS_StormTech MC-4500 +Cap @ 4.03' Lx 80 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 8 Rows of 10 Chambers Cap Storage= +35.7 cf x 2 x 8 rows = 571.2 cf
		18,901 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	506.50'	0.170 in/hr Exfiltration over Surface area
#2	Primary	511.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 5.65 hrs HW=506.57' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.9 cfs @ 12.83 hrs HW=512.57' (Free Discharge)
 ↑**2=Orifice/Grate** (Orifice Controls 0.9 cfs @ 4.36 fps)

Summary for Pond P302P: DB-302

Inflow Area = 115,458 sf, 62.31% Impervious, Inflow Depth > 3.98" for 100-year event
 Inflow = 8.1 cfs @ 12.09 hrs, Volume= 38,327 cf
 Outflow = 7.5 cfs @ 12.15 hrs, Volume= 38,131 cf, Atten= 8%, Lag= 4.0 min
 Primary = 3.3 cfs @ 12.16 hrs, Volume= 36,419 cf
 Secondary = 4.1 cfs @ 12.15 hrs, Volume= 1,712 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 487.04' @ 12.16 hrs Surf.Area= 3,010 sf Storage= 3,983 cf

Plug-Flow detention time= 15.8 min calculated for 38,131 cf (99% of inflow)
 Center-of-Mass det. time= 12.8 min (842.4 - 829.6)

927.02 Proposed Phase 2

Type III 24-hr 100-year Rainfall=7.00"

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Volume	Invert	Avail.Storage	Storage Description
#1	485.00'	7,415 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.00	1,170	0	0
486.00	1,800	1,485	1,485
488.00	4,130	5,930	7,415

Device	Routing	Invert	Outlet Devices
#1	Primary	485.00'	6.0" Round Culvert X 2.00 L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 485.00' / 484.00' S= 0.0370 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#2	Primary	486.10'	6.0" Round Culvert X 2.00 L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 486.10' / 484.00' S= 0.0875 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Secondary	486.90'	30.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.3 cfs @ 12.16 hrs HW=487.03' (Free Discharge)

- ↑1=Culvert (Barrel Controls 2.0 cfs @ 4.99 fps)
- ↑2=Culvert (Inlet Controls 1.4 cfs @ 3.51 fps)

Secondary OutFlow Max=3.9 cfs @ 12.15 hrs HW=487.03' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir (Weir Controls 3.9 cfs @ 0.98 fps)

Summary for Pond P303P: INF-303

Inflow Area =	21,071 sf,	8.31% Impervious,	Inflow Depth > 4.25" for 100-year event
Inflow =	2.4 cfs @ 12.09 hrs,	Volume=	7,469 cf
Outflow =	0.2 cfs @ 13.91 hrs,	Volume=	3,445 cf, Atten= 93%, Lag= 109.2 min
Discarded =	0.0 cfs @ 9.55 hrs,	Volume=	1,408 cf
Primary =	0.1 cfs @ 13.91 hrs,	Volume=	2,037 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 506.72' @ 13.91 hrs Surf.Area= 6,500 sf Storage= 4,463 cf

Plug-Flow detention time= 270.1 min calculated for 3,438 cf (46% of inflow)
Center-of-Mass det. time= 154.6 min (971.5 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1	505.00'	4,000 cf	50.00'W x 100.00'L x 2.00'H Prismatic 10,000 cf Overall x 40.0% Voids
#2	505.00'	1,200 cf	50.00'W x 30.00'L x 2.00'H Prismatic 3,000 cf Overall x 40.0% Voids
		5,200 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	505.00'	0.170 in/hr Exfiltration over Surface area
#2	Primary	506.50'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.0 cfs @ 9.55 hrs HW=505.02' (Free Discharge)

- ↑1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 13.91 hrs HW=506.72' (Free Discharge)

- ↑2=Orifice/Grate (Orifice Controls 0.1 cfs @ 1.58 fps)

927.02 Proposed Phase 2

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Summary for Pond P304P: DB-304

Inflow Area = 71,003 sf, 55.38% Impervious, Inflow Depth > 4.60" for 100-year event
 Inflow = 7.4 cfs @ 12.09 hrs, Volume= 27,214 cf
 Outflow = 6.2 cfs @ 12.16 hrs, Volume= 26,411 cf, Atten= 16%, Lag= 4.6 min
 Primary = 1.9 cfs @ 12.17 hrs, Volume= 23,840 cf
 Secondary = 4.3 cfs @ 12.16 hrs, Volume= 2,572 cf
 Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 503.32' @ 12.17 hrs Surf.Area= 4,935 sf Storage= 6,538 cf

Plug-Flow detention time= 66.5 min calculated for 26,411 cf (97% of inflow)
 Center-of-Mass det. time= 49.1 min (835.7 - 786.6)

Volume	Invert	Avail.Storage	Storage Description
#1	502.00'	12,338 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
502.00	4,935	0	0
504.00	4,935	9,870	9,870
504.50	4,935	2,468	12,338

Device	Routing	Invert	Outlet Devices
#1	Primary	502.00'	8.0" Vert. Orifice/Grate C= 0.600
#2	Primary	503.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Secondary	503.20'	30.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height
#4	Tertiary	504.40'	200.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height

Primary OutFlow Max=1.9 cfs @ 12.17 hrs HW=503.31' (Free Discharge)

- ↑1=Orifice/Grate (Orifice Controls 1.7 cfs @ 4.77 fps)
- └2=Orifice/Grate (Orifice Controls 0.2 cfs @ 1.91 fps)

Secondary OutFlow Max=3.8 cfs @ 12.16 hrs HW=503.31' (Free Discharge)

- ↑3=Sharp-Crested Rectangular Weir (Weir Controls 3.8 cfs @ 1.11 fps)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=502.00' (Free Discharge)

- ↑4=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Link P3L: wetland

Inflow Area = 230,162 sf, 48.34% Impervious, Inflow Depth > 4.13" for 100-year event
 Inflow = 17.3 cfs @ 12.15 hrs, Volume= 79,249 cf
 Primary = 17.3 cfs @ 12.15 hrs, Volume= 79,249 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDICES



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Worcester County, Massachusetts, Northeastern Part the Pointe at Hills Farm



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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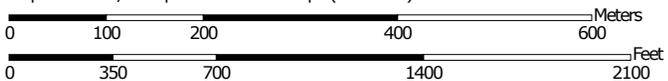
Soil Map

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.

Custom Soil Resource Report Soil Map



Map Scale: 1:7,740 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

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 1:20,000.

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: <http://websoilsurvey.nrcs.usda.gov>
 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: Worcester County, Massachusetts, Northeastern Part
 Survey Area Data: Version 10, Sep 28, 2015

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

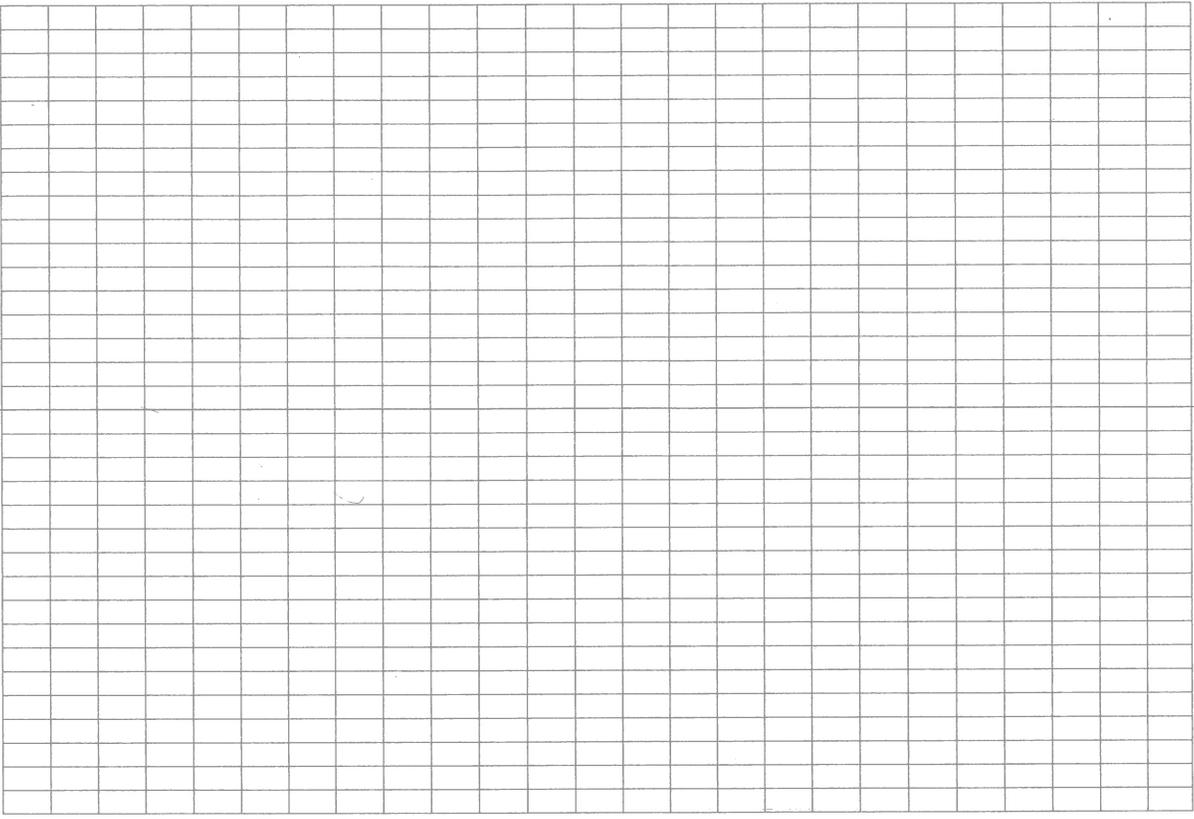
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Worcester County, Massachusetts, Northeastern Part (MA613)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	4.1	1.9%
52A	Freetown muck, 0 to 1 percent slopes	1.3	0.6%
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	1.1	0.5%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	10.3	4.7%
102C	Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes	43.8	19.9%
102D	Chatfield-Hollis-Rock outcrop complex, 15 to 25 percent slopes	35.7	16.2%
245B	Hinckley loamy sand, 3 to 8 percent slopes	1.2	0.5%
245C	Hinckley loamy sand, 8 to 15 percent slopes	1.1	0.5%
306B	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	12.4	5.6%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	13.5	6.1%
421B	Canton fine sandy loam, 3 to 8 percent slopes, very stony	10.1	4.6%
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	57.1	25.9%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	16.4	7.5%
602	Urban land	12.0	5.4%
651	Udorthents, smoothed	0.0	0.0%
Totals for Area of Interest		220.1	100.0%

92701 Sunny 75°
 num of Auk Duplicates / Compsu PC / 58
 8/15-01
 0-8 A SL
 8-33 B SL GREYISH TAN
 33-170 C SL (COBBLES SANDS) SIMILAR
 170-182 C₁ SL (BONEY & GRAVELLY)
 C₂ (Very Oxidized @ Bottom)
 No REF H₂O @ 170
 / Pans Oxides @ 80 Mottles @ 50
 8/15-02
 0-8 A SL
 8-32 B SL
 32-90 C₁ SL (BONEY-COBBLER GREYISH TAN)
 90-150 C₂ SL (same " more TAN)
 IRON OXIDE POCKETS
 Oxides / Mottles @ 50"
 WEEPING @ 140"
 WATER @ 140"
 No REF

8/15-03
 0-6 A SL
 6-30 B SL
 30-148 C SL (TAN & COBBLES)
 VERY LARGE BOULDERS @ 54-148"
 No REF @ 148"
 (Removals w/ Hammer Pan)
 Contractions
 Mottles / oxides @ 50"
 No H₂O
 8/15-04
 0-8 A SL
 8-30 B SL
 30-148 C SL (TAN & BONEY)
 No REF
 No H₂O Mottles @ 50"
 8/15-05
 0-8 A SL
 8-30 B SL
 30-148 C SL (Very Boney - TAN)
 REF @ 50" (mottles) / 30" (mottles)
 Mottles @ 30"
 No H₂O



815-07
0-10 A SL
10-38 B SL
38-132 C SL (Very Boney - Tan)
No RGR
H₂O @ 126"
FOR ~~MONIES~~ DISTINCT OXIDE
BAND @ 70"
MONIES / OXIDES @ 46"

815-08
0-6 A SL
6-76 B SL
76-132 C SL (TANT BONEY)
MONIES @ 43
No H₂O NO RGR

815-06
0 A LS
79 B LS (LEAK)
80 C LS Boney (REDISTAN)
MONIES @ 48
FRAN FANDE
FRAN @ 40

92702

7/31/5 Unwitnessed Soil Test by
W. M. and J. O. HAN (D. P. CATO CONS)
PHASE II 526 HATTING FIVE

715-01
0-5 A FSL
5-28 B FSL
28-70 C FSL TAN (COARSE)
No H₂O, MOTTLES/OXIDES 44"
SOME

REF C 60" (min)
70" (max)

715-02
0-6 A FSL
6-20 B FSL
30-46 C FSL (TAN)

BOREY
REF C 46" (max) / 20" (min)
No Mottles
No H₂O

KOMATSU PC158USLC

40' x 16" MACHINING

715-03
0-6 A FSL
6-24 B FSL
24-48 C FSL (TAN/GREYISH)
Some Mottles
SHAPE 18-24" (EAST SIDE)
REF C 30" (min) / 48" (max)
No H₂O

715-04
0-5 A FSL
5-20 B FSL
20-40 C SL
No Mottles
REF C 28" (min)
REF C 40" (max) / 28" (min)

715-05
0-7 A FSL
7-26 B FSL
26-48 C SL
REF C 48"
No Mottles
No H₂O
Mottles 238"

TP 715-06

0-6 A FSL (NORTH)

6-22 B FSL

REF @ 22" (max) / 16" (min)

South end North end

0-6 A FSL

6-30 B FSL

30-102 C SL (Boney) (30-48 (max))

No tag (48-102 (max))

REF @ 102"

Mark use 48"

TP 517-08

0-8 A FSL

8-30 B FSL

30-56 C SL (LIGHT TAG)

REF @ 56

No marked No tag

TP 517-07

0-6 A FSL

6-20 B FSL

REF @ 20" (max) / 12" (min)

South end / South

20' Long Trench

Another trench 25' south
was attempted & scratched for
20' w/ similar results. 250610
MAY RUN AGAIN RIGGS.

TP-517-09

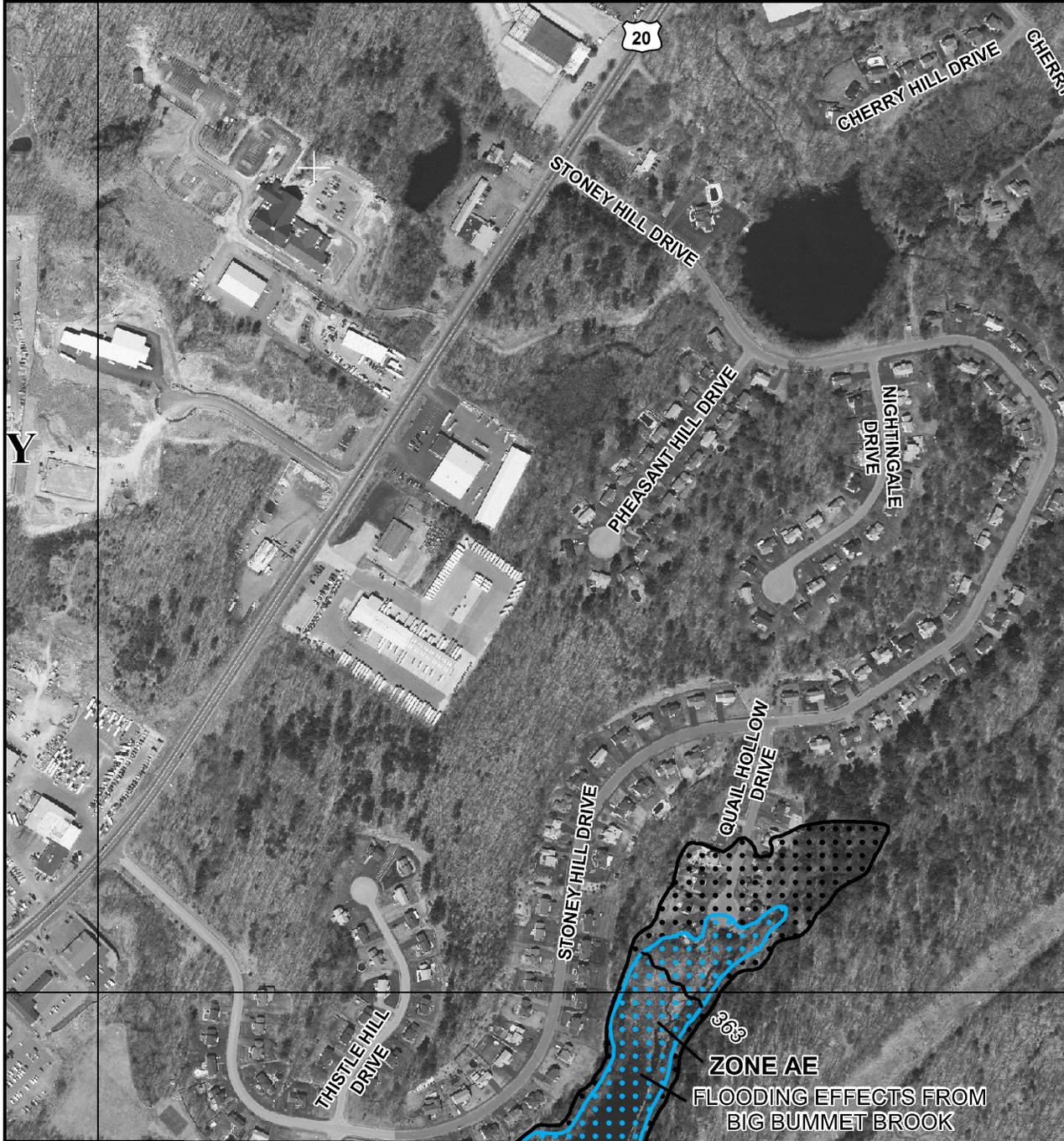
0-6 A FSL

6-24 B FSL

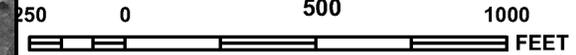
24-122 C SL (Boney)

REF @ 122"

No tag No marked



MAP SCALE 1" = 500'



PANEL 0639F

FIRM

FLOOD INSURANCE RATE MAP
 WORCESTER COUNTY,
 MASSACHUSETTS
 (ALL JURISDICTIONS)

PANEL 639 OF 1075
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAFTON, TOWN OF	250306	0639	F
SHREWSBURY, TOWN OF	250332	0639	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER
 25027C0639F

MAP REVISED
 JULY 16, 2014

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM
 FIRM

JOINS PANEL 0827

250,000m

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov