

DRAINAGE SUMMARY REPORT

For

**65 Stanton Lane
Stamford, Connecticut**

Prepared For

Jessica Domiziano

November 9, 2023

Revised:

March 11, 2024



A handwritten signature in blue ink, appearing to read "Leonard C. D'Andrea", written over a horizontal line.

Leonard C. D'Andrea, P.E.
CT License No. 14869

23BL_DSR_Lite_03

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1. Stormwater Management Standards

1.1. Runoff and Pollution Reduction

Standard 1: Runoff and Pollutant Reduction is not applicable to this project as determined by the Runoff and Pollutant Reduction Requirements Flowchart. Refer to Appendix "A" for the Directly Connected Impervious Area Tracking Worksheet.

1.2. Peak Flow Control

The proposed development will decrease peak runoff flow rates to less than pre-construction conditions to all points of concern. Refer to Appendices "B" and "C" for Existing and Proposed HydroCAD results, and to the HydroCAD Summary Table at the end of this introduction. The decrease in peak runoff flow rates meets the standard of reduction for all storms up to the 50-year storm. Refer to Appendix "D" for Pipe Conveyance Calculations.

1.3. Construction Erosion and Sediment Control

During the construction phase of the project, treatment of storm water runoff will be provided by temporary sedimentation and other erosion control measures as outlined within the Final Site Plan Review Set. This includes the installation of silt fencing, an anti-tracking pad, and hay bales around catch basins. Periodic on-site inspections will be performed to ensure that these measures are maintained in effective working order. Once construction is complete and all disturbed areas are properly graded, seeded and stabilized, the proposed sedimentation and erosion control measures will be removed.

1.4. Operations and Maintenance

Refer to Appendix "G" of the City of Stamford Stormwater Drainage Manual for a Standard City of Stamford Drainage Maintenance Agreement.

1.5. Stormwater Management Report

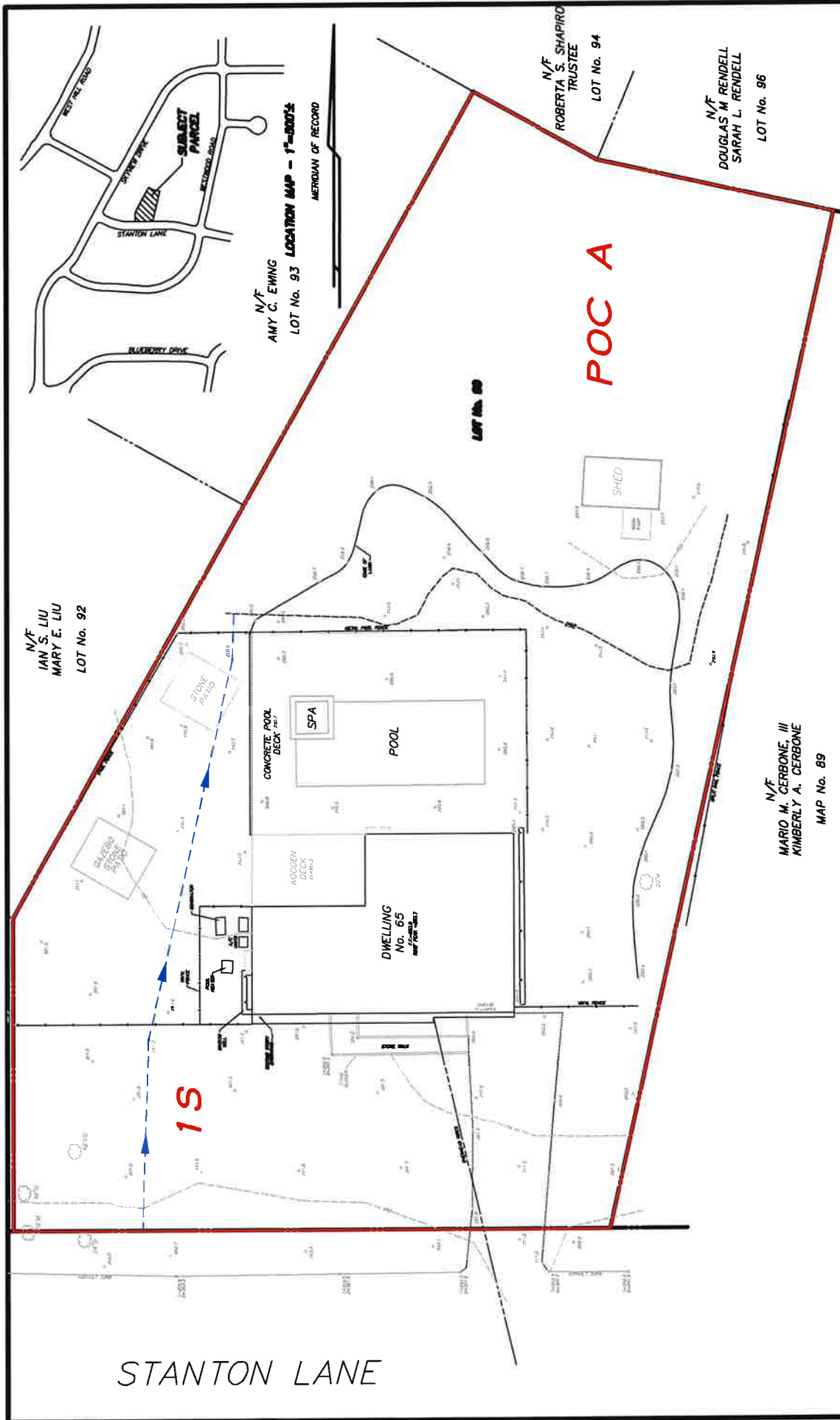
The applicant is proposing to conduct site improvements on the subject property. Currently, the parcel supports a dwelling, garage, pool, deck, and a driveway. There are several impervious surfaces that have been built within the last 10 years without mitigation. These surfaces have been treated as new impervious. Vegetative cover at the property is primarily lawn with other ornamental plantings. There is a wooded area of approximately 8,000 S.F. along the Northern side of the property. There are also wetlands located on the northern side of the property, refer to "Soil Report" dated 4/3/17 by Steven Danzer, PhD & Associates LLC for more information. The proposed improvements will include the construction of various dwelling additions, a concrete slab, an expansion to the driveway, and a front patio. Improvements also include the installation of a storm drainage system, site grading, and associated landscaping. For a depiction of existing and proposed conditions, refer to a plan set prepared by D'Andrea Surveying and Engineering, P.C.

The subject parcel is 26,958 square feet in size and is located approximately 325 feet east of the intersection of Stanton Lane and Skyview Drive. The proposed redevelopment of the parcel will increase the impervious coverage by approximately 3,115 square feet. Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.

		Peak Flows (q)				Runoff Volume (V)			
		q _{ex} (ft ³ /s)	q _p (ft ³ /s)	Δq (ft ³ /s)	%Δq (ft ³ /s)	v _{ex} (ft ³ /s)	v _p (ft ³ /s)	ΔV (ft ³ /s)	%ΔV (ft ³ /s)
POC A	1 Year Storm	0.75	0.75	0.00	0%	3,086	3,317	231	7%
	2 Year Storm	1.04	1.04	0.00	0%	4,231	4,501	270	6%
	5 Year Storm	1.52	1.47	-0.05	-3%	6,178	6,495	317	5%
	10 Year Storm	1.94	1.85	-0.09	-5%	7,885	8,233	348	4%
	25 Year Storm	2.04	1.93	-0.11	-5%	8,294	8,647	353	4%
	50 Year Storm	2.94	2.87	-0.07	-2%	12,091	12,488	397	3%
	100 Year Storm	3.40	3.30	-0.10	-3%	14,072	14,485	413	3%

Table 1: Comparison of Existing and Proposed Peak Flow Rates and Volumes for all Point of Concerns.

Exhibits “A & B”
Existing and Proposed
Watershed Maps



STANTON LANE

ROCCO V. D'ANDREA, INC.

• LAND PLANNERS
• ENGINEERS

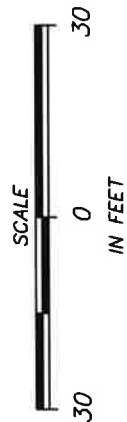
P.O. BOX 549
RIVERSIDE, CT 06878
• SURVEYORS
6 NEIL LANE
TEL. 637-1779

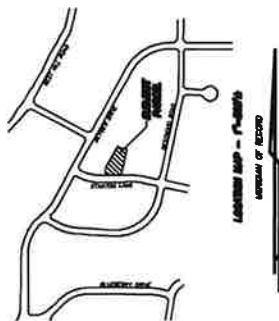
EXHIBIT "A"

EXISTING CONDITIONS

CONTOUR INTERVAL = ONE FOOT

1 INCH = 30 FEET





N/F
AMY C. EWING
LOT No. 93

N/F
IAN S. LIU
MARY E. LIU
LOT No. 92

ROBERTA S. SHAPIRO
TRUSTEE
LOT No. 94

N/F
DOUGLAS M. RENDELL
SARAH L. RENDELL
LOT No. 96

N/F
MARIO M. CERBONE, III
KIMBERLY A. CERBONE
MAP No. 89

LOT No. 88
POC A

1S

2S

DWELLING
No. 65

3S

PROPOSED
GARAGE ADDITION

PROPOSED
ADDITION

ROCCO V. D'ANDREA, INC.

• LAND PLANNERS
• ENGINEERS
• SURVEYORS

6 NEIL LANE
TEL. 637-1779

P.O. BOX 549
RIVERSIDE, CT 06878

EXHIBIT "B"
PROPOSED CONDITIONS

CONTOUR INTERVAL = ONE FOOT
1 INCH = 30 FEET

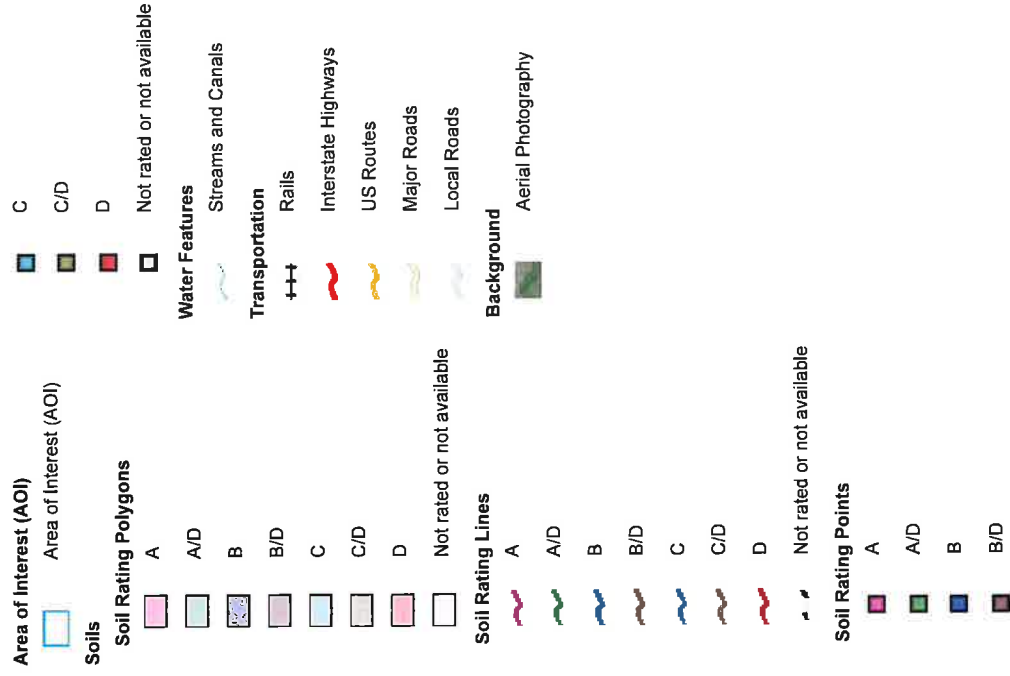


Exhibit “C”
NRCS Web Soil Survey

Hydrologic Soil Group—State of Connecticut, Western Part



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
 Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	0.1	6.5%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	0.9	93.5%
Totals for Area of Interest			1.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

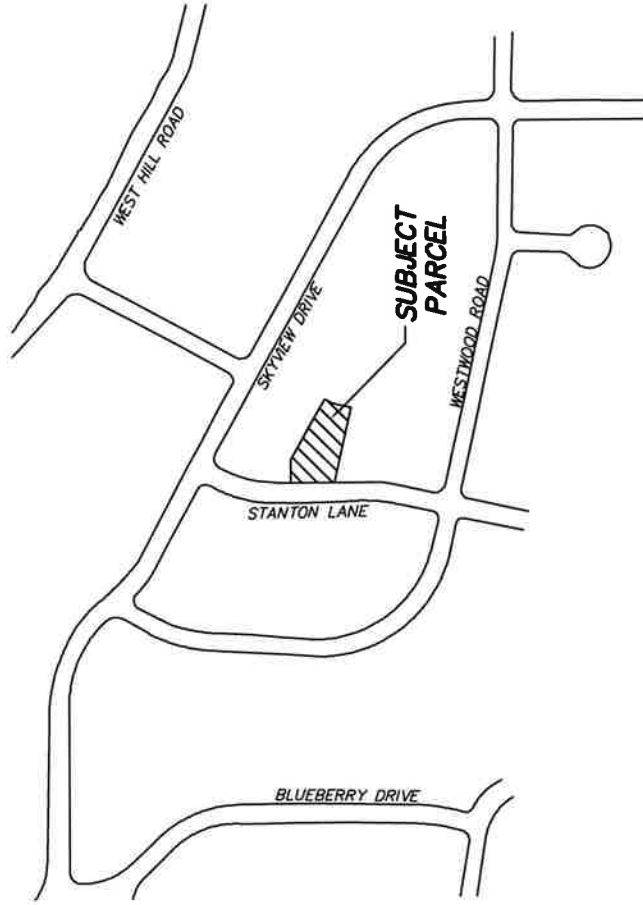
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

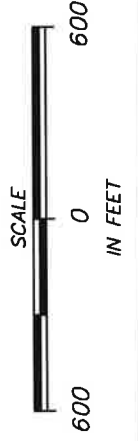
Exhibit “D”
Site Vicinity Map

MERIDIAN OF RECORD

AREA = 26,958 S.F. OR 0.6189 ACRES
REFER TO MAP No. 6101 S.L.R.
LAND LIES IN "R-20" ZONE



1 INCH = 600 FEET



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EXHIBIT "D"
VICINITY MAP

Appendix “A”
DCIA Tracking Sheet



Note to user: complete all cells of this color only

Part 1: General Information

Project Name Proposed Additions
Project Address 65 Stanton Lane
Project Applicant Jessica Domiziano
Date of Submittal 2/15/2024
Tax Account Number 002-3687

Part 2: Project Details

1. What type of development is this? (choose from dropdown) Redevelopment
2. What is the total area of the project site? 26,958 ft²
3. What is the total area of land disturbance for this project? 15,750 ft²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No) No
5. What is the current DCIA for the site? 0 ft²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No) No
7. What is the proposed-development total impervious area for the site? 7,130 ft²

Part 3: Water Quality Target Total

Does Standard 1 apply based on information above? No, Skip to Part 4
Water Quality Volume (WQV) N/A ft³
Standard 1 requirement N/A
Required treatment/retention volume N/A ft³
Provided treatment/retention volume for proposed development N/A ft³

Part 4: Proposed DCIA Tracking

Pre-development total impervious area 4,015 ft²
Current DCIA 0 ft²
Proposed-development total impervious area 7,130 ft²
Proposed-development DCIA (after stormwater management) 0 ft²
Net change in DCIA from pre-development to proposed-development 0 ft²

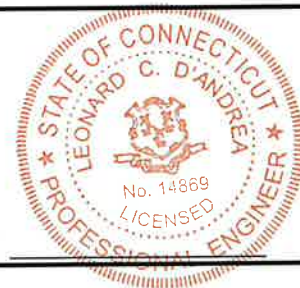
Part 5: Post-Development (As-Built Certified) DCIA Tracking

Post-development (per as-built) total impervious area ft²
Post-development (per as-built) DCIA (after stormwater management) ft²
Net change in DCIA from pre-development to post-development ft²

Certification Statement

I hereby certify that the information contained in this worksheet is true and correct.

Engineer's Signature Leonard C. D'Andrea Date 2/20/24 Engineer's Seal



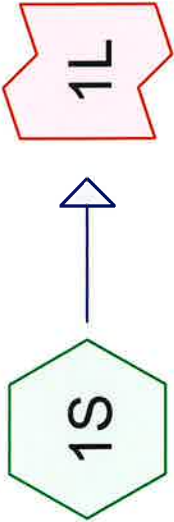
Appendix “B”

**HydroCAD Analysis –
Existing Conditions**

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
14,943	80.0	>75% Grass cover, Good, HSG D (1S)
364	98.0	Deck, HSG D (1S)
785	98.0	Driveway, HSG D (1S)
1,834	98.0	Dwelling, HSG D (1S)
110	98.0	Front Walk, HSG D (1S)
732	98.0	Pool, HSG D (1S)
167	98.0	Shed, HSG D (1S)
23	98.0	Utilities, HSG D (1S)
8,000	77.0	Woods, Good, HSG D (1S)
26,958	81.8	TOTAL AREA

Stamford



65 Stanton Lane POC A

Subcat

Reach

Pond

Link

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf, Depth= 3.69"

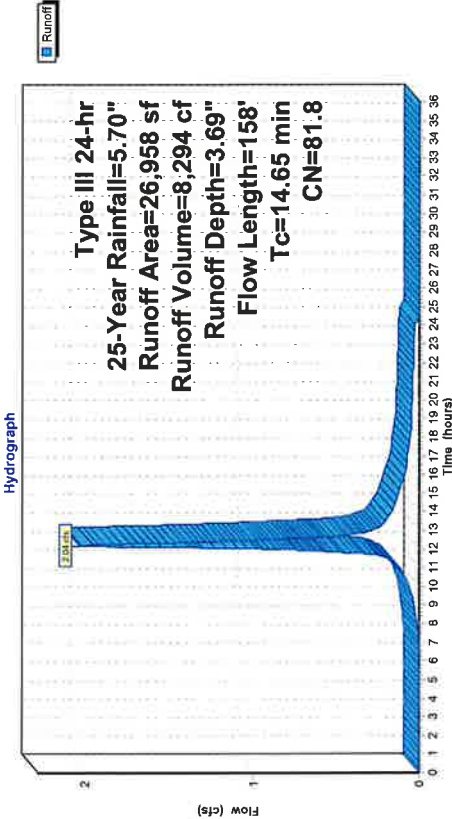
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943	85.11%	Pervious Area
4,015	14.89%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30"
					Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

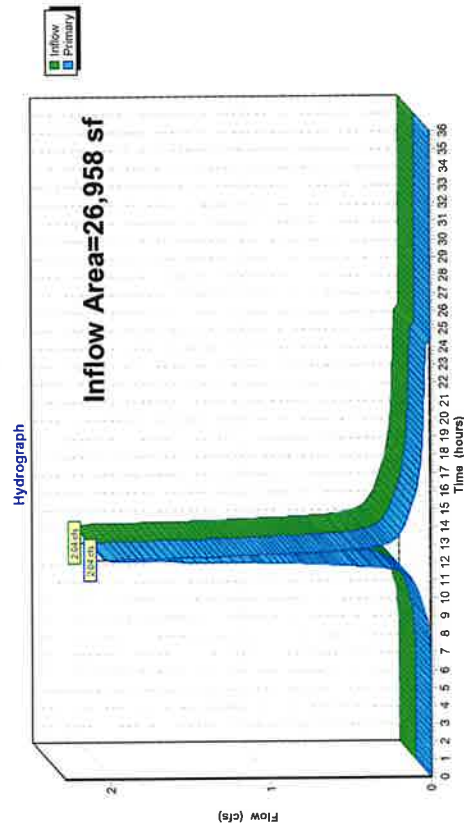
Subcatchment 1S: 65 Stanton Lane



Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 3.69" for 25-Year event
Inflow = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf
Primary = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 1L: POC A



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=1.37"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=0.75 cfs 3,086 cf

Inflow=0.75 cfs 3,086 cf
Primary=0.75 cfs 3,086 cf

Link 1L: POC A

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 0.75 cfs @ 12.21 hrs, Volume= 3,086 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=3.01"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30"
					Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 1.37" for 1-Year event
Inflow = 0.75 cfs @ 12.21 hrs, Volume= 3,086 cf
Primary = 0.75 cfs @ 12.21 hrs, Volume= 3,086 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=1.88"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=1.04 cfs 4,231 cf

Inflow=1.04 cfs 4,231 cf
Primary=1.04 cfs 4,231 cf

Link 1L: POC A

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 1.04 cfs @ 12.20 hrs, Volume= 4,231 cf, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.64"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30"
					Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 1.88" for 2-Year event
Inflow = 1.04 cfs @ 12.20 hrs, Volume= 4,231 cf
Primary = 1.04 cfs @ 12.20 hrs, Volume= 4,231 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method
Subcatchment 1S: 65 Stanton Lane Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=2.75"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=1.52 cfs 6,178 cf
Inflow=1.52 cfs 6,178 cf
Primary=1.52 cfs 6,178 cf

Link 1L: POC A

Summary for Subcatchment 1S: 65 Stanton Lane
Runoff = 1.52 cfs @ 12.20 hrs, Volume= 6,178 cf, Depth= 2.75"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-Year Rainfall=4.65"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 2.75" for 5-Year event
Inflow = 1.52 cfs @ 12.20 hrs, Volume= 6,178 cf
Primary = 1.52 cfs @ 12.20 hrs, Volume= 6,178 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 1.94 cfs @ 12.20 hrs, Volume= 7,885 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D

26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30"
					Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 3.51" for 10-Year event
Inflow = 1.94 cfs @ 12.20 hrs, Volume= 7,885 cf
Primary = 1.94 cfs @ 12.20 hrs, Volume= 7,885 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane
Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=3.51"
Flow Length=158 Tc=14.65 min CN=81.8 Runoff=1.94 cfs 7,885 cf

Link 1L: POC A

Inflow=1.94 cfs 7,885 cf
Primary=1.94 cfs 7,885 cf

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=3.69"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=2.04 cfs 8,294 cf

Inflow=2.04 cfs 8,294 cf
Primary=2.04 cfs 8,294 cf

Link 1L: POC A

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D

26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 3.69" for 25-Year event
Inflow = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf
Primary = 2.04 cfs @ 12.20 hrs, Volume= 8,294 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 2.94 cfs @ 12.19 hrs, Volume= 12,091 cf, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.52"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943	85.11%	Pervious Area
4,015	14.89%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn
0.31	58	0.0431	3.11		Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 5.38" for 50-Year event
Inflow = 2.94 cfs @ 12.19 hrs, Volume= 12,091 cf
Primary = 2.94 cfs @ 12.19 hrs, Volume= 12,091 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane
Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=5.38"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=2.94 cfs 12,091 cf

Link 1L: POC A
Inflow=2.94 cfs 12,091 cf
Primary=2.94 cfs 12,091 cf

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 65 Stanton Lane Runoff Area=26,958 sf 14.89% Impervious Runoff Depth=6.26"
Flow Length=158' Tc=14.65 min CN=81.8 Runoff=3.40 cfs 14,072 cf

Inflow=3.40 cfs 14,072 cf
Primary=3.40 cfs 14,072 cf

Link 1L: POC A

Summary for Subcatchment 1S: 65 Stanton Lane

Runoff = 3.40 cfs @ 12.19 hrs, Volume= 14,072 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.45"

Area (sf)	CN	Description
785	98.0	Driveway, HSG D
1,834	98.0	Dwelling, HSG D
732	98.0	Pool, HSG D
110	98.0	Front Walk, HSG D
364	98.0	Deck, HSG D
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
14,943	80.0	>75% Grass cover, Good, HSG D
8,000	77.0	Woods, Good, HSG D
26,958	81.8	Weighted Average
22,943		85.11% Pervious Area
4,015		14.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.30"
0.31	58	0.0431	3.11		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 14.89% Impervious, Inflow Depth = 6.26" for 100-Year event
Inflow = 3.40 cfs @ 12.19 hrs, Volume= 14,072 cf
Primary = 3.40 cfs @ 12.19 hrs, Volume= 14,072 cf, Atten= 0%, Lag= 0.0 min

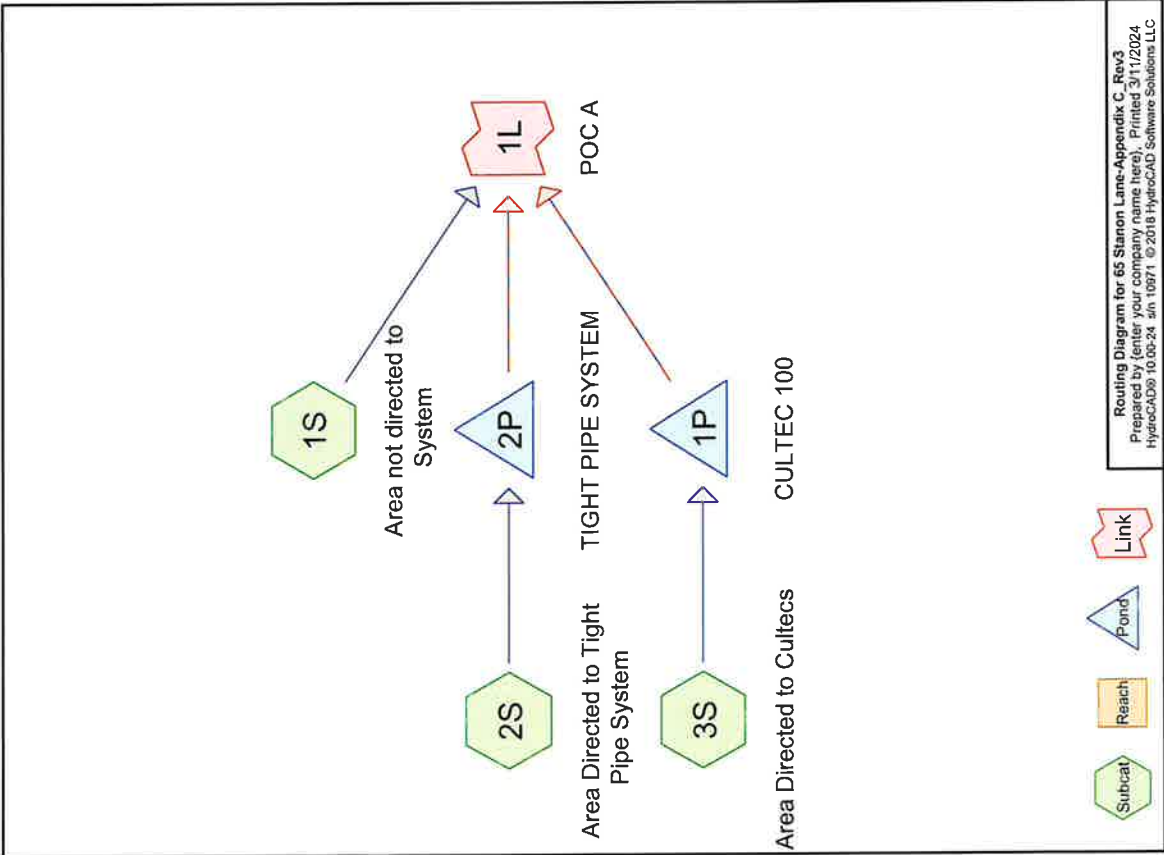
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Appendix “C”

**HydroCAD Analysis –
Proposed Conditions**

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
59	98.0	13 x 4.5 S.F. Stepping Stones, HSG D (2S)
94	98.0	21 x 4.5 S.F. Stepping Stones, HSG D (1S)
11,828	80.0	>75% Grass cover, Good, HSG D (1S, 2S)
188	98.0	Concrete Slab, HSG D (1S)
1,113	98.0	Driveway, HSG D (2S)
1,802	98.0	Dwelling, HSG D (2S)
43	98.0	Front Patio, HSG D (2S)
168	98.0	Gazebo Stone Patio, HSG D (1S)
1,728	98.0	Pool Deck, HSG D (1S)
732	98.0	Pool, HSG D (1S)
842	98.0	Roofs, HSG D (3S)
167	98.0	Shed, HSG D (1S)
15	98.0	Steps (1S)
156	98.0	Stone Patio, HSG D (1S)
23	98.0	Utilities, HSG D (1S)
8,000	77.0	Woods, Good, HSG D (1S)
26,958	83.9	TOTAL AREA



Summary for Subcatchment 15: Area not directed to System

Runoff = 1.61 cfs @ 12.20 hrs, Volume= 6,544 cf, Depth= 3.67"

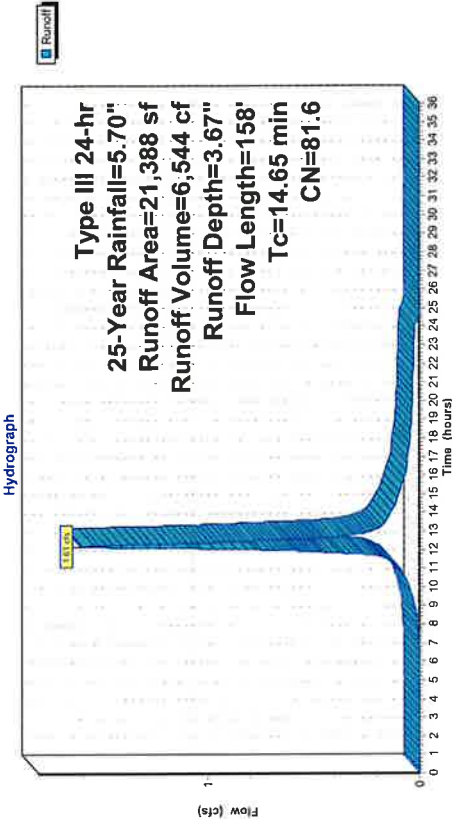
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D
732	98.0	Pool, HSG D
1,728	98.0	Pool Deck, HSG D
168	98.0	Gazebo Stone Patio, HSG D
156	98.0	Stone Patio, HSG D
188	98.0	Concrete Slab, HSG D
8,000	77.0	Woods, Good, HSG D
10,117	80.0	>75% Grass cover, Good, HSG D
15	98.0	Steps
21,388	81.6	Weighted Average
18,117		84.71% Pervious Area
3,271		15.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow,
					Grass: Dense n= 0.240 P2= 3.30"
0.31	58	0.0431	3.11		Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Subcatchment 15: Area not directed to System



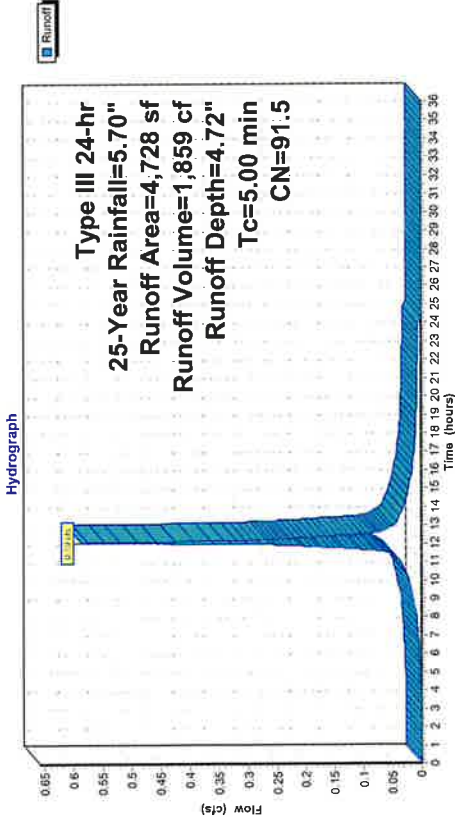
Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.59 cfs @ 12.07 hrs, Volume= 1,859 cf, Depth= 4.72"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Stepping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711		36.19% Pervious Area
3,017		63.81% Impervious Area

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

Subcatchment 2S: Area Directed to Tight Pipe System



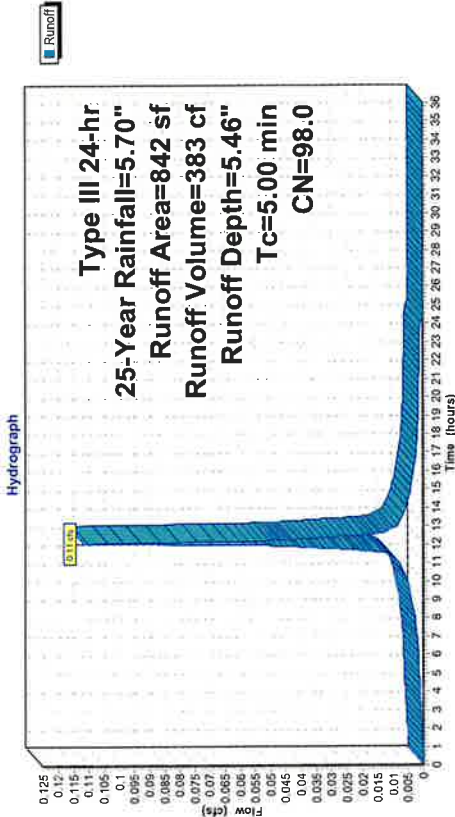
Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 383 cf, Depth= 5.46"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
842	98.0	Roofs, HSG D
842		100.00% Impervious Area

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

Subcatchment 3S: Area Directed to Cultecs



Summary for Pond 1P: CULTEC 100

[42] Hint: Gap in defined storage above volume #4 at 260.20'

Inflow Area = 842 sf/100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
Inflow = 0.11 cfs @ 12.07 hrs, Volume= 383 cf
Outflow = 0.11 cfs @ 12.07 hrs, Volume= 287 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.11 cfs @ 12.07 hrs, Volume= 287 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.91' @ 12.07 hrs Surf.Area= 113 sf Storage= 119 cf

Plug-Flow detention time= 183.6 min calculated for 267 cf (70% of inflow)
Center-of-Mass det. time= 87.5 min (832.5 - 745.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overail - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows
#3	260.40'	2 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#4	258.30'	48 cf	4.00'D x 1.90'H pop-up emitter x 2
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation	Surf.Area	Inc.Store	Cum.Store
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600
#2	Secondary	259.80'	Limited to weir flow at low heads 6.0" Vert. Level Spreader Pop-up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1-pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.11 cfs @ 12.07 hrs HW=259.91' TW=0.00' (Dynamic Tailwater)
2-Level Spreader Pop-up Emitters (Office Controls 0.11 cfs @ 1.14 fps)

Pond 1P: CULTEC 100 - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 1 rows

2 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'
Base Length

1 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 5.00' Base Width
2.4" Base + 12.5" Chamber Height + 6.0" Cover = 1.74' Field Height

2 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 1 Rows = 28.9 cf Chamber Storage

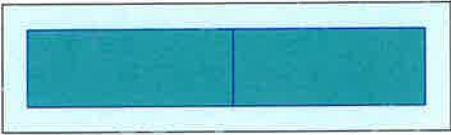
152.4 cf Field - 28.9 cf Chambers = 123.5 cf Stone x 40.0% Voids = 49.4 cf Stone Storage

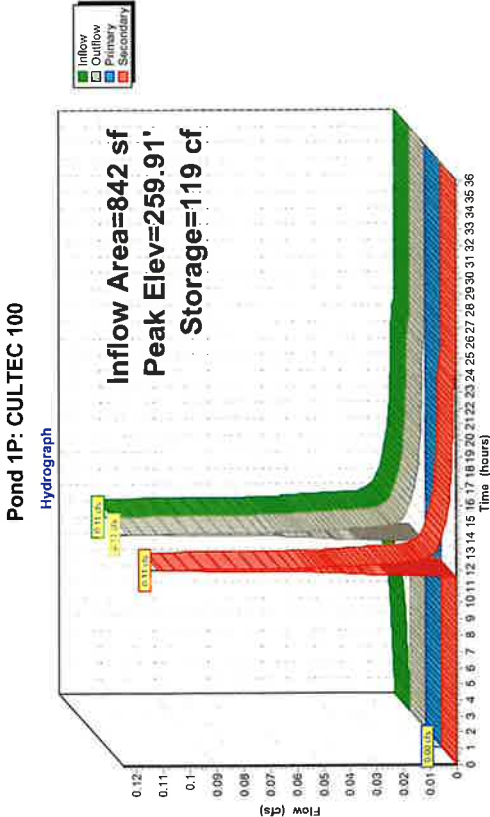
Chamber Storage + Stone Storage = 78.3 cf = 0.002 af

Overall Storage Efficiency = 51.4%

Overall System Size = 17.50' x 5.00' x 1.74'

2 Chambers
5.6 cy Field
4.6 cy Stone





Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area =	4,728 sf	63.81% Impervious, Inflow Depth = 4.72" for 25-Year event
Inflow =	0.59 cfs @ 12.07 hrs, Volume= 1,859 cf	
Outflow =	0.27 cfs @ 12.22 hrs, Volume= 1,836 cf	Atten= 54%, Lag= 9.1 min
Primary =	0.27 cfs @ 12.22 hrs, Volume= 1,836 cf	
Secondary =	0.00 cfs @ 0.00 hrs, Volume= 0 cf	
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs		
Peak Elev= 259.42' @ 12.22 hrs	Surf.Area= 475 sf	Storage= 330 cf
Plug-Flow detention time= 28.7 min calculated for 1,835 cf (99% of inflow)		
Center-of-Mass det. time= 20.7 min (800.5 - 779.8)		
Volume	Invert	Avail.Storage
#1A	257.10'	0 cf
#2A	257.60'	372 cf
Storage Description		
#1A		21.58'W x 22.00'L x 3.33'H Field A
#2A		1.583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
		Inside= 23.8'W x 23.8'H => 3.10 sf x 20.00'L = 62.0 cf
		Outside= 28.0'W x 28.0'H => 3.92 sf x 20.00'L = 78.4 cf
		6 Chambers in 6 Rows
		372 cf Total Available Storage

Storage Group A created with Chamber Wizard

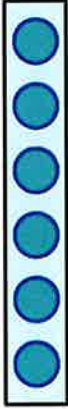
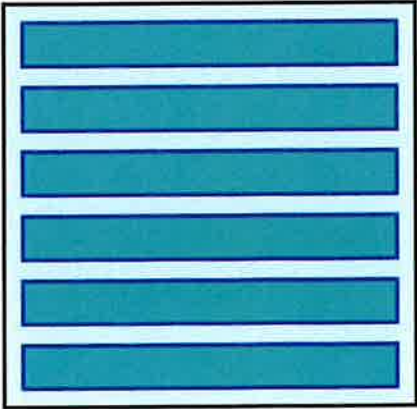
Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500
			Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600
			n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
			Primary Outflow Max=0.27 cfs @ 12.22 hrs HW=259.42' TW=0.00' (Dynamic Tailwater)
			3=8" pvc (Passes 0.27 cfs of 1.79 cfs potential flow)
			1=3" Orifice (Orifice Controls 0.27 cfs @ 5.48 fps)
			2=6" H.O. (Controls 0.00 cfs)

Secondary Outflow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)

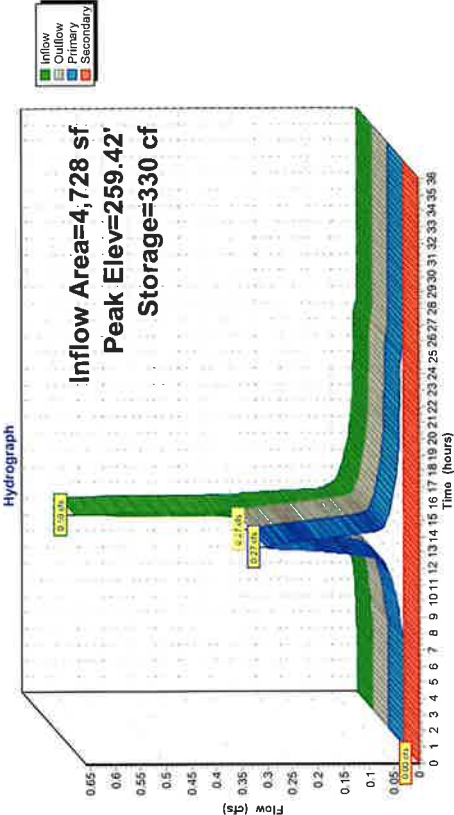
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Pond 2P: TIGHT PIPE SYSTEM - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12@ Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf
28.0" Wide + 13.4" Spacing = 41.4" C-C Row Spacing
1 Chambers/Row x 20.00' Long = 20.00' Row Length +12.0" End Stone x 2 = 22.00' Base Length
6 Rows x 28.0" Wide + 13.4" Spacing x 5 + 12.0" Side Stone x 2 = 21.58' Base Width
6.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.33' Field Height
6 Chambers x 62.0 cf = 372.0 cf Chamber Storage
6 Chambers x 78.4 cf = 470.6 cf Displacement
1,582.8 cf Field - 470.6 cf Chambers = 1,112.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage
Chamber Storage = 372.0 cf = 0.009 af
Overall Storage Efficiency = 23.5%
Overall System Size = 22.00' x 21.58' x 3.33'
6 Chambers
58.6 cy Field
41.2 cy Stone

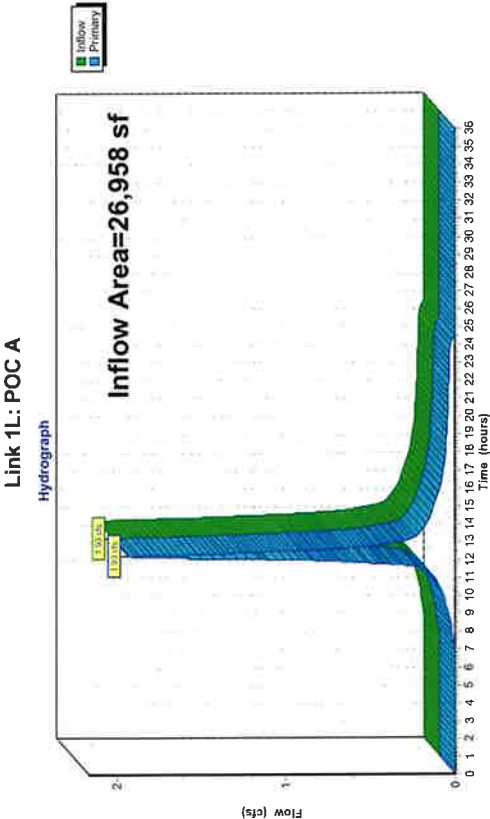


Pond 2P: TIGHT PIPE SYSTEM



Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 3.85" for 25-Year event
Inflow = 1.93 cfs @ 12.19 hrs, Volume= 8,647 cf
Primary = 1.93 cfs @ 12.19 hrs, Volume= 8,647 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to
Flow Length=158' Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=1.36"
Tc=14.65 min CN=81.6 Runoff=0.59 cfs 2,425 cf

Subcatchment 2S: Area Directed to Tight
Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=2.13"
Tc=5.00 min CN=91.5 Runoff=0.28 cfs 837 cf

Subcatchment 3S: Area Directed to Cultecs
Runoff Area=842 sf 100.00% Impervious Runoff Depth=2.78"
Tc=5.00 min CN=98.0 Runoff=0.06 cfs 195 cf

Pond 1P: CULTEC 100
Peak Elev=259.85' Storage=117 cf Inflow=0.06 cfs 195 cf
Primary=0.00 cfs 0 cf Secondary=0.02 cfs 79 cf Outflow=0.02 cfs 79 cf

Pond 2P: TIGHT PIPE SYSTEM
Peak Elev=258.56' Storage=138 cf Inflow=0.28 cfs 837 cf
Primary=0.16 cfs 814 cf Secondary=0.00 cfs 0 cf Outflow=0.16 cfs 814 cf

Link 1L: POC A
Inflow=0.75 cfs 3,317 cf
Primary=0.75 cfs 3,317 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 0.59 cfs @ 12.21 hrs, Volume= 2,425 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=3.01"

Area (sf)	CN	Description
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D
732	98.0	Pool, HSG D
1,728	98.0	Pool Deck, HSG D
168	98.0	Gazebo Stone Patio, HSG D
156	98.0	Stone Patio, HSG D
188	98.0	Concrete Slab, HSG D
8,000	77.0	Woods, Good, HSG D
10,117	80.0	>75% Grass cover, Good, HSG D
15	98.0	Steps
21,388	81.6	Weighted Average
18,117	84.71%	Pervious Area
3,271	15.29%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		
0.31	58	0.0431	3.11		
14.65	158	Total			

Sheet Flow,
Grass: Dense n= 0.240 P2= 3.30"
Shallow Concentrated Flow,
Grassed Waterway Kv= 15.0 fps

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 837 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=3.01"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711	36.19%	Pervious Area
3,017	63.81%	Impervious Area

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

Summary for Subcatchment 3S: Area Directed to Cultees

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 195 cf, Depth= 2.78"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=3.01"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842		100.00% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 2.78" for 1-Year event
Inflow = 0.06 cfs @ 12.07 hrs, Volume= 195 cf
Outflow = 0.02 cfs @ 12.31 hrs, Volume= 79 cf, Atten= 65%, Lag= 14.6 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.02 cfs @ 12.31 hrs, Volume= 79 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.85' @ 12.31 hrs Surf.Area= 113 sf Storage= 117 cf

Plug-Flow detention time= 307.9 min calculated for 79 cf (41% of inflow)
Center-of-Mass det. time= 162.3 min (919.1 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows #3 260.40' 2 cf Custom Stage Data (Prismatic) Listed below (Recalc) x 2 #4 258.30' 48 cf 4.00'D x 1.90'H pop-up emitter x 2 128 cf Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.02 cfs @ 12.31 hrs HW=259.85' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.02 cfs @ 0.74 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 2.13" for 1-Year event
Inflow = 0.28 cfs @ 12.07 hrs, Volume= 837 cf
Outflow = 0.16 cfs @ 12.18 hrs, Volume= 814 cf, Atten= 43%, Lag= 6.3 min
Primary = 0.16 cfs @ 12.18 hrs, Volume= 814 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 258.56' @ 12.18 hrs Surf.Area= 475 sf Storage= 138 cf

Plug-Flow detention time= 40.9 min calculated for 814 cf (97% of inflow)
Center-of-Mass det. time= 24.1 min (825.6 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows 372 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary Outflow Max=0.16 cfs @ 12.18 hrs HW=258.56' TW=0.00' (Dynamic Tailwater)
3-8" pvc (Passes 0.16 cfs of 1.20 cfs potential flow)
1-3" Orifice (Orifice Controls 0.16 cfs @ 3.19 fps)
2-6" H.O. (Controls 0.00 cfs)

Secondary Outflow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4-Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 1.48" for 1-Year event
Inflow = 0.75 cfs @ 12.20 hrs, Volume= 3,317 cf
Primary = 0.75 cfs @ 12.20 hrs, Volume= 3,317 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=1.87"
Flow Length=158' Tc=14.65 min CN=81.6 Runoff=0.82 cfs 3,330 cf

Subcatchment 2S: Area Directed to Tight Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=2.72"
Tc=5.00 min CN=91.5 Runoff=0.35 cfs 1,073 cf

Subcatchment 3S: Area Directed to Culverts Runoff Area=842 sf 100.00% Impervious Runoff Depth=3.41"
Tc=5.00 min CN=98.0 Runoff=0.07 cfs 239 cf

Pond 1P: CULTEC 100 Peak Elev=259.88' Storage=118 cf Inflow=0.07 cfs 239 cf
Primary=0.00 cfs 0 cf Secondary=0.07 cfs 123 cf Outflow=0.07 cfs 123 cf

Pond 2P: TIGHT PIPE SYSTEM Peak Elev=258.73' Storage=178 cf Inflow=0.35 cfs 1,073 cf
Primary=0.18 cfs 1,049 cf Secondary=0.00 cfs 0 cf Outflow=0.18 cfs 1,049 cf

Link 1L: POC A

Inflow=1.04 cfs 4,501 cf
Primary=1.04 cfs 4,501 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 0.82 cfs @ 12.20 hrs, Volume= 3,330 cf, Depth= 1.87"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.64"

Area (sf)	CN	Description			
23	98.0	Utilities, HSG D			
167	98.0	Shed, HSG D			
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D			
732	98.0	Pool, HSG D			
1,728	98.0	Pool Deck, HSG D			
168	98.0	Gazebo Stone Patio, HSG D			
156	98.0	Stone Patio, HSG D			
188	98.0	Concrete Slab, HSG D			
8,000	77.0	Woods, Good, HSG D			
10,117	80.0	>75% Grass cover, Good, HSG D			
15	98.0	Steps			
21,388	81.6	Weighted Average			
18,117	84.71%	Pervious Area			
3,271	15.29%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.31	58	0.0431	3.11		
14.65	158	Total			

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 1,073 cf, Depth= 2.72"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.64"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711	36.19%	Pervious Area
3,017	63.81%	Impervious Area

Direct Entry,

Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.07 cfs @ 12.07 hrs, Volume= 239 cf, Depth= 3.41"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.64"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842	100.00%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 3.41" for 2-Year event
Inflow = 0.07 cfs @ 12.07 hrs, Volume= 239 cf
Outflow = 0.07 cfs @ 12.11 hrs, Volume= 123 cf, Atten= 7%, Lag= 2.7 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.07 cfs @ 12.11 hrs, Volume= 123 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.88' @ 12.11 hrs Surf.Area= 113 sf Storage= 118 cf

Plug-Flow detention time= 247.5 min calculated for 123 cf (51% of inflow)
Center-of-Mass det. time= 124.1 min (876.9 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#3	260.40'	2 cf	
#4	258.30'	48 cf	4.00'D x 1.90'H pop-up emitter x 2
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C=0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C=0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
4=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.06 cfs @ 12.11 hrs HW=259.88' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.06 cfs @ 0.98 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 2.72" for 2-Year event
Inflow = 0.35 cfs @ 12.07 hrs, Volume= 1,073 cf
Outflow = 0.18 cfs @ 12.19 hrs, Volume= 1,049 cf, Atten= 47%, Lag= 7.1 min
Primary = 0.18 cfs @ 12.19 hrs, Volume= 1,049 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 258.73' @ 12.19 hrs Surf.Area= 475 sf Storage= 178 cf

Plug-Flow detention time= 36.1 min calculated for 1,049 cf (98% of inflow)
Center-of-Mass det. time= 22.7 min (817.2 - 794.6)

Volume	Invert	Avail. Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8'W x 23.8'H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0'W x 28.0'H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C=0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C=0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C=0.600

Primary OutFlow Max=0.18 cfs @ 12.19 hrs HW=258.73' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.18 cfs of 1.34 cfs potential flow)
1=3" Orifice (Orifice Controls 0.18 cfs @ 3.76 fps)
2=6" H.O. (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 2.00" for 2-Year event
Inflow = 1.04 cfs @ 12.20 hrs, Volume= 4,501 cf
Primary = 1.04 cfs @ 12.20 hrs, Volume= 4,501 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to
 Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=2.73"
 Flow Length=158' Tc=14.65 min CN=81.6 Runoff=1.20 cfs 4,869 cf

Subcatchment 2S: Area Directed to Tight
 Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=3.70"
 Tc=5.00 min CN=91.5 Runoff=0.47 cfs 1,456 cf

Subcatchment 3S: Area Directed to Culverts
 Runoff Area=642 sf 100.00% Impervious Runoff Depth=4.41"
 Tc=5.00 min CN=98.0 Runoff=0.09 cfs 310 cf

Pond 1P: CULTREC 100
 Peak Elev=259.90' Storage=118 cf Inflow=0.09 cfs 310 cf
 Primary=0.00 cfs 0 cf Secondary=0.09 cfs 194 cf Outflow=0.09 cfs 194 cf

Pond 2P: TIGHT PIPE SYSTEM
 Peak Elev=259.04' Storage=250 cf Inflow=0.47 cfs 1,456 cf
 Primary=0.23 cfs 1,432 cf Secondary=0.00 cfs 0 cf Outflow=0.23 cfs 1,432 cf

Link 1L: POC A
 Inflow=1.47 cfs 6,495 cf
 Primary=1.47 cfs 6,495 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 1.20 cfs @ 12.20 hrs, Volume= 4,869 cf, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Type III 24-hr 5-Year Rainfall=4.65"

Area (sf)	CN	Description
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D
732	98.0	Pool, HSG D
1,728	98.0	Pool Deck, HSG D
168	98.0	Gazebo Stone Patio, HSG D
156	98.0	Stone Patio, HSG D
188	98.0	Concrete Slab, HSG D
8,000	77.0	Woods, Good, HSG D
10,117	80.0	>75% Grass cover, Good, HSG D
15	98.0	Steps
21,388	81.6	Weighted Average
18,117		84.71% Pervious Area
3,271		15.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		
0.31	58	0.0431	3.11		
14.65	158	Total			

Sheet Flow,
 Grass: Dense n= 0.240 P2= 3.30"
Shallow Concentrated Flow,
 Grassed Waterway Kv= 15.0 fps

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.47 cfs @ 12.07 hrs, Volume= 1,456 cf, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Type III 24-hr 5-Year Rainfall=4.65"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711		36.19% Pervious Area
3,017		63.81% Impervious Area

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

Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.09 cfs @ 12.07 hrs, Volume= 310 cf, Depth= 4.41"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-Year Rainfall=4.65"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842	100.00%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 4.41" for 5-Year event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 310 cf
Outflow = 0.09 cfs @ 12.07 hrs, Volume= 194 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.09 cfs @ 12.07 hrs, Volume= 194 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.90' @ 12.07 hrs Surf.Area= 113 sf Storage= 118 cf

Plug-Flow detention time= 205.5 min calculated for 194 cf (63% of inflow)
Center-of-Mass det. time= 99.4 min (847.7 - 748.3)

Volume	Invert	Avail. Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.5"H x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#3	260.40'	2 cf	4.90'D x 1.90'H pop-up emitter x 2
#4	258.30'	48 cf	128 cf Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc. Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.09 cfs @ 12.07 hrs HW=259.90' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.09 cfs @ 1.08 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 3.70" for 5-Year event
Inflow = 0.47 cfs @ 12.07 hrs, Volume= 1,456 cf
Outflow = 0.23 cfs @ 12.21 hrs, Volume= 1,432 cf, Atten= 52%, Lag= 8.2 min
Primary = 0.23 cfs @ 12.21 hrs, Volume= 1,432 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.04' @ 12.21 hrs Surf.Area= 475 sf Storage= 250 cf

Plug-Flow detention time= 31.4 min calculated for 1,432 cf (98% of inflow)
Center-of-Mass det. time= 21.4 min (807.6 - 786.2)

Volume	Invert	Avail. Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.23 cfs @ 12.21 hrs HW=259.04' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.23 cfs of 1.55 cfs potential flow)
1=3" Orifice (Orifice Controls 0.23 cfs @ 4.60 fps)
2=6" H.O. (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 2.89" for 5-Year event
Inflow = 1.47 cfs @ 12.19 hrs, Volume= 6,495 cf
Primary = 1.47 cfs @ 12.19 hrs, Volume= 6,495 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=3.49"
Flow Length=158' Tc=14.65 min CN=81.6 Runoff=1.53 cfs 6,221 cf

Subcatchment 2S: Area Directed to Tight Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=4.52"
Tc=5.00 min CN=91.5 Runoff=0.56 cfs 1,782 cf

Subcatchment 3S: Area Directed to Cultecs Runoff Area=842 sf 100.00% Impervious Runoff Depth=5.26"
Tc=5.00 min CN=98.0 Runoff=0.11 cfs 369 cf

Pond 1P: CULTEC 100 Peak Elev=259.91' Storage=119 cf Inflow=0.11 cfs 369 cf
Primary=0.00 cfs 0 cf Secondary=0.11 cfs 253 cf Outflow=0.11 cfs 253 cf

Pond 2P: TIGHT PIPE SYSTEM Peak Elev=259.34' Storage=315 cf Inflow=0.56 cfs 1,782 cf
Primary=0.26 cfs 1,759 cf Secondary=0.00 cfs 0 cf Outflow=0.26 cfs 1,759 cf

Link 1L: POC A

Inflow=1.85 cfs 8,233 cf
Primary=1.85 cfs 8,233 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 1.53 cfs @ 12.20 hrs, Volume= 6,221 cf, Depth= 3.49"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description			
23	98.0	Utilities, HSG D			
167	98.0	Shed, HSG D			
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D			
732	98.0	Pool, HSG D			
1,728	98.0	Pool Deck, HSG D			
168	98.0	Gazebo Stone Patio, HSG D			
156	98.0	Stone Patio, HSG D			
188	98.0	Concrete Slab, HSG D			
8,000	77.0	Woods, Good, HSG D			
10,117	80.0	>75% Grass cover, Good, HSG D			
15	98.0	Steps			
21,388	81.6	Weighted Average			
18,117	84.71%	Pervious Area			
3,271	15.29%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.31	58	0.0431	3.11		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.56 cfs @ 12.07 hrs, Volume= 1,782 cf, Depth= 4.52"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711	36.19%	Pervious Area
3,017	63.81%	Impervious Area

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

Summary for Subcatchment 3S: Area Directed to Cultees

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 369 cf, Depth= 5.26"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842	100.00%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 5.26" for 10-Year event
Inflow = 0.11 cfs @ 12.07 hrs, Volume= 369 cf
Outflow = 0.11 cfs @ 12.07 hrs, Volume= 253 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.11 cfs @ 12.07 hrs, Volume= 253 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.91' @ 12.07 hrs Surf.Area= 113 sf Storage= 119 cf

Plug-Flow detention time= 186.8 min calculated for 253 cf (69% of inflow)
Center-of-Mass det. time= 89.3 min (834.8 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.66 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#3	260.40'	2 cf	
#4	258.30'	48 cf	4.00'D x 1.90'H pop-up emitter x 2
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.11 cfs @ 12.07 hrs HW=259.91' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.11 cfs @ 1.13 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 4.52" for 10-Year event
Inflow = 0.56 cfs @ 12.07 hrs, Volume= 1,782 cf
Outflow = 0.26 cfs @ 12.22 hrs, Volume= 1,759 cf, Atten= 54%, Lag= 9.0 min
Primary = 0.26 cfs @ 12.22 hrs, Volume= 1,759 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.34' @ 12.22 hrs Surf Area= 475 sf Storage= 315 cf

Plug-Flow detention time= 29.1 min calculated for 1,758 cf (99% of inflow)
Center-of-Mass det. time= 20.8 min (801.7 - 780.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 ' /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.26 cfs @ 12.22 hrs HW=259.34' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.26 cfs of 1.74 cfs potential flow)
1=3" Orifice (Orifice Controls 0.26 cfs @ 5.31 fps)
2=6" H.O. (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 3.66" for 10-Year event
Inflow = 1.85 cfs @ 12.19 hrs, Volume= 8,233 cf
Primary = 1.85 cfs @ 12.19 hrs, Volume= 8,233 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to
Flow Length=158' Tc=14.65 min CN=81.6 Runoff=1.61 cfs 6,544 cf
Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=3.67"

Subcatchment 2S: Area Directed to Tight
Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=4.72"
Tc=5.00 min CN=91.5 Runoff=0.59 cfs 1,859 cf

Subcatchment 3S: Area Directed to Cultecs
Runoff Area=842 sf 100.00% Impervious Runoff Depth=5.46"
Tc=5.00 min CN=98.0 Runoff=0.11 cfs 383 cf

Pond 1P: CULTEC 100
Peak Elev=259.91' Storage=119 cf Inflow=0.11 cfs 383 cf
Primary=0.00 cfs 0 cf Secondary=0.11 cfs 267 cf Outflow=0.11 cfs 267 cf

Pond 2P: TIGHT PIPE SYSTEM
Peak Elev=259.42' Storage=330 cf Inflow=0.59 cfs 1,859 cf
Primary=0.27 cfs 1,836 cf Secondary=0.00 cfs 0 cf Outflow=0.27 cfs 1,836 cf

Link 1L: POC A
Inflow=1.93 cfs 8,647 cf
Primary=1.93 cfs 8,647 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 1.61 cfs @ 12.20 hrs, Volume= 6,544 cf, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D
732	98.0	Pool, HSG D
1,728	98.0	Pool Deck, HSG D
168	98.0	Gazebo Stone Patio, HSG D
156	98.0	Stone Patio, HSG D
188	98.0	Concrete Slab, HSG D
8,000	77.0	Woods, Good, HSG D
10,117	80.0	>75% Grass cover, Good, HSG D
15	98.0	Steps
21,388	81.6	Weighted Average
18,117		84.71% Pervious Area
3,271		15.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.31	58	0.0431	3.11		
14.65	158	Total			

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.59 cfs @ 12.07 hrs, Volume= 1,859 cf, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711		36.19% Pervious Area
3,017		63.81% Impervious Area

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

Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 383 cf, Depth= 5.46"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
842	98.0	Roofs, HSG D
842		100.00% Impervious Area

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

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
Inflow = 0.11 cfs @ 12.07 hrs, Volume= 383 cf
Outflow = 0.11 cfs @ 12.07 hrs, Volume= 267 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.11 cfs @ 12.07 hrs, Volume= 267 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.91' @ 12.07 hrs Surf.Area= 113 sf Storage= 119 cf

Plug-Flow detention time= 183.6 min calculated for 267 cf (70% of inflow)
Center-of-Mass det. time= 87.5 min (832.5 - 745.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#3	260.40'	2 cf	4.00'D x 1.90'H pop-up emitter x 2
#4	258.30'	48 cf	
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.11 cfs @ 12.07 hrs HW=259.91' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.11 cfs @ 1.14 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 4.72" for 25-Year event
Inflow = 0.59 cfs @ 12.07 hrs, Volume= 1,859 cf
Outflow = 0.27 cfs @ 12.22 hrs, Volume= 1,836 cf, Atten= 54%, Lag= 9.1 min
Primary = 0.27 cfs @ 12.22 hrs, Volume= 1,836 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.42' @ 12.22 hrs Surf.Area= 475 sf Storage= 330 cf

Plug-Flow detention time= 28.7 min calculated for 1,835 cf (99% of inflow)
Center-of-Mass det. time= 20.7 min (800.5 - 779.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 1' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary Outflow Max=0.27 cfs @ 12.22 hrs HW=259.42' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.27 cfs of 1.79 cfs potential flow)
1=3" Orifice (Orifice Controls 0.27 cfs @ 5.48 fps)
2=6" H.O. (Controls 0.00 cfs)

Secondary Outflow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 3.85" for 25-Year event
Inflow = 1.93 cfs @ 12.19 hrs, Volume= 8,647 cf
Primary = 1.93 cfs @ 12.19 hrs, Volume= 8,647 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=5.36"
Flow Length=158' Tc=14.65 min CN=81.6 Runoff=2.32 cfs 9,552 cf

Subcatchment 2S: Area Directed to Tight Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=6.51"
Tc=5.00 min CN=91.5 Runoff=0.80 cfs 2,565 cf

Subcatchment 3S: Area Directed to Cultecs Runoff Area=842 sf 100.00% Impervious Runoff Depth=7.28"
Tc=5.00 min CN=98.0 Runoff=0.15 cfs 511 cf

Pond 1P: CULTREC 100 Peak Elev=259.93' Storage=119 cf Inflow=0.15 cfs 511 cf
Primary=0.00 cfs 0 cf Secondary=0.15 cfs 395 cf Outflow=0.15 cfs 395 cf

Pond 2P: TIGHT PIPE SYSTEM Peak Elev=259.66' Storage=365 cf Inflow=0.80 cfs 2,565 cf
Primary=0.75 cfs 2,541 cf Secondary=0.00 cfs 0 cf Outflow=0.75 cfs 2,541 cf

Link 1L: POC A

Inflow=2.87 cfs 12,488 cf
Primary=2.87 cfs 12,488 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 2.32 cfs @ 12.19 hrs, Volume= 9.552 cf, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.52"

Area (sf)	CN	Description			
23	98.0	Utilities, HSG D			
167	98.0	Shed, HSG D			
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D			
732	98.0	Pool, HSG D			
1,728	98.0	Pool Deck, HSG D			
168	98.0	Gazebo Stone Patio, HSG D			
156	98.0	Stone Patio, HSG D			
188	98.0	Concrete Slab, HSG D			
8,000	77.0	Woods, Good, HSG D			
10,117	80.0	>75% Grass cover, Good, HSG D			
15	98.0	Steps			
21,388	81.6	Weighted Average			
18,117	84.71%	Pervious Area			
3,271	15.29%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		Sheet Flow,
					Grass: Dense n= 0.240 P2= 3.30"
0.31	58	0.0431	3.11		Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.65	158	Total			

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.80 cfs @ 12.07 hrs, Volume= 2.565 cf, Depth= 6.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.52"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711	36.19%	Pervious Area
3,017	63.81%	Impervious Area

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

Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.15 cfs @ 12.07 hrs, Volume= 511 cf, Depth= 7.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=7.52"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842	100.00%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Pond 1P: CULTEC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 7.28" for 50-Year event
Inflow = 0.15 cfs @ 12.07 hrs, Volume= 511 cf
Outflow = 0.15 cfs @ 12.07 hrs, Volume= 395 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.15 cfs @ 12.07 hrs, Volume= 395 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.93' @ 12.07 hrs Surf.Area= 113 sf Storage= 119 cf

Plug-Flow detention time= 159.4 min calculated for 395 cf (77% of inflow)
Center-of-Mass del. time= 76.1 min (817.1 - 741.1)

Volume	Invert	Avail. Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows
#3	260.40'	2 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#4	258.30'	48 cf	4.00'D x 1.90'H pop-up emitter x 2
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf. Area (sq-ft)	Inc. Store (cubic-feet)	Cum. Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.15 cfs @ 12.07 hrs HW=259.93' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.15 cfs @ 1.22 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 6.51" for 50-Year event
Inflow = 0.80 cfs @ 12.07 hrs, Volume= 2,565 cf
Outflow = 0.75 cfs @ 12.10 hrs, Volume= 2,541 cf, Atten= 6%, Lag= 1.9 min
Primary = 0.75 cfs @ 12.10 hrs, Volume= 2,541 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.66' @ 12.10 hrs Surf.Area= 475 sf Storage= 365 cf

Plug-Flow detention time= 24.2 min calculated for 2,540 cf (99% of inflow)
Center-of-Mass det. time= 18.3 min (790.0 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	257.10'	0 cf	21.58"W x 22.00"L x 3.33"H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.74 cfs @ 12.10 hrs HW=259.66' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.74 cfs of 1.92 cfs potential flow)
1=3" Orifice (Orifice Controls 0.29 cfs @ 5.97 fps)
2=6" H.O. (Weir Controls 0.45 cfs @ 1.31 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area = 26,958 sf, 26.45% Impervious, Inflow Depth = 5.56" for 50-Year event
Inflow = 2.87 cfs @ 12.16 hrs, Volume= 12,488 cf
Primary = 2.87 cfs @ 12.16 hrs, Volume= 12,488 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area not directed to
Runoff Area=21,388 sf 15.29% Impervious Runoff Depth=6.24"
Flow Length=158' Tc=14.65 min CN=81.6 Runoff=2.69 cfs 11,122 cf

Subcatchment 2S: Area Directed to Tight
Runoff Area=4,728 sf 63.81% Impervious Runoff Depth=7.43"
Tc=5.00 min CN=91.5 Runoff=0.90 cfs 2,927 cf

Subcatchment 3S: Area Directed to Cultecs
Runoff Area=842 sf 100.00% Impervious Runoff Depth=8.21"
Tc=5.00 min CN=98.0 Runoff=0.17 cfs 576 cf

Pond 1P: CULTEC 100
Peak Elev=259.94' Storage=119 cf Inflow=0.17 cfs 576 cf
Primary=0.00 cfs 0 cf Secondary=0.17 cfs 460 cf Outflow=0.17 cfs 460 cf

Pond 2P: TIGHT PIPE SYSTEM
Peak Elev=259.70' Storage=369 cf Inflow=0.90 cfs 2,927 cf
Primary=0.90 cfs 2,903 cf Secondary=0.00 cfs 0 cf Outflow=0.90 cfs 2,903 cf

Link 1L: POC A
Inflow=3.30 cfs 14,485 cf
Primary=3.30 cfs 14,485 cf

Summary for Subcatchment 1S: Area not directed to System

Runoff = 2.69 cfs @ 12.19 hrs, Volume= 11,122 cf, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.45"

Area (sf)	CN	Description
23	98.0	Utilities, HSG D
167	98.0	Shed, HSG D
94	98.0	21 x 4.5 S.F. Steeping Stones, HSG D
732	98.0	Pool, HSG D
1,728	98.0	Pool Deck, HSG D
168	98.0	Gazebo Stone Patio, HSG D
156	98.0	Stone Patio, HSG D
188	98.0	Concrete Slab, HSG D
8,000	77.0	Woods, Good, HSG D
10,117	80.0	>75% Grass cover, Good, HSG D
15	98.0	Steps
21,388	81.6	Weighted Average
18,117	84.71%	Pervious Area
3,271	15.29%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.34	100	0.0190	0.12		
0.31	58	0.0431	3.11		
14.65	158	Total			

Sheet Flow,
Grass: Dense n= 0.240 P2= 3.30"
Shallow Concentrated Flow,
Grassed Waterway Kv= 15.0 fps

Summary for Subcatchment 2S: Area Directed to Tight Pipe System

Runoff = 0.90 cfs @ 12.07 hrs, Volume= 2,927 cf, Depth= 7.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.45"

Area (sf)	CN	Description
1,113	98.0	Driveway, HSG D
59	98.0	13 x 4.5 S.F. Steeping Stones, HSG D
1,711	80.0	>75% Grass cover, Good, HSG D
1,802	98.0	Dwelling, HSG D
43	98.0	Front Patio, HSG D
4,728	91.5	Weighted Average
1,711	36.19%	Pervious Area
3,017	63.81%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					

Direct Entry,

Summary for Subcatchment 3S: Area Directed to Cultecs

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 576 cf, Depth= 8.21"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.45"

Area (sf)	CN	Description			
842	98.0	Roofs, HSG D			
842	100.00% Impervious Area				
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Direct Entry,

Summary for Pond 1P: CULTREC 100

Inflow Area = 842 sf, 100.00% Impervious, Inflow Depth = 8.21" for 100-Year event
Inflow = 0.17 cfs @ 12.07 hrs, Volume= 576 cf
Outflow = 0.17 cfs @ 12.07 hrs, Volume= 460 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.17 cfs @ 12.07 hrs, Volume= 460 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.94' @ 12.07 hrs Surf.Area= 113 sf Storage= 119 cf

Plug-Flow detention time= 149.8 min calculated for 460 cf (80% of inflow)
Center-of-Mass det. time= 71.7 min (811.3 - 739.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	256.80'	49 cf	5.00'W x 17.50'L x 1.74'H Field A 152 cf Overall - 29 cf Embedded = 124 cf x 40.0% Voids
#2A	257.00'	29 cf	Cultec C-100HD x 2 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 1 rows
#3	260.40'	2 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 2
#4	258.30'	48 cf	4.00'D x 1.90'H pop-up emitter x 2
		128 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
260.40	10	0	0
260.50	10	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	260.10'	4.0" Horiz. pop-up emitter X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.80' TW=0.00' (Dynamic Tailwater)
1=pop-up emitter (Controls 0.00 cfs)

Secondary OutFlow Max=0.17 cfs @ 12.07 hrs HW=259.94' TW=0.00' (Dynamic Tailwater)
2=Level Spreader Pop-Up Emitters (Orifice Controls 0.17 cfs @ 1.26 fps)

Summary for Pond 2P: TIGHT PIPE SYSTEM

Inflow Area = 4,728 sf, 63.81% Impervious, Inflow Depth = 7.43" for 100-Year event
Inflow = 0.90 cfs @ 12.07 hrs, Volume= 2,927 cf
Outflow = 0.90 cfs @ 12.08 hrs, Volume= 2,903 cf, Atten= 0%, Lag= 0.7 min
Primary = 0.90 cfs @ 12.08 hrs, Volume= 2,903 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 259.70' @ 12.08 hrs Surf.Area= 475 sf Storage= 369 cf

Plug-Flow detention time= 22.6 min calculated for 2,903 cf (99% of inflow)
Center-of-Mass det. time= 17.3 min (785.7 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	257.10'	0 cf	21.58'W x 22.00'L x 3.33'H Field A 1,583 cf Overall - 471 cf Embedded = 1,112 cf x 0.0% Voids
#2A	257.60'	372 cf	ADS N-12 24" x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 6 Rows
		372 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	258.00'	3.0" Vert. 3" Orifice C= 0.600
#2	Device 3	259.50'	8.0" Horiz. 6" H.O. C= 0.600 Limited to weir flow at low heads
#3	Primary	257.50'	8.0" Round 8" pvc L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 257.50' / 257.20' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf
#4	Secondary	259.80'	6.0" Vert. Level Spreader Pop-Up Emitters X 3.00 C= 0.600

Primary OutFlow Max=0.90 cfs @ 12.08 hrs HW=259.70' TW=0.00' (Dynamic Tailwater)
3=8" pvc (Passes 0.90 cfs of 1.94 cfs potential flow)
1=3" Orifice (Orifice Controls 0.30 cfs @ 6.04 fps)
2=6" H.O. (Weir Controls 0.60 cfs @ 1.45 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=257.10' TW=0.00' (Dynamic Tailwater)
4=Level Spreader Pop-Up Emitters (Controls 0.00 cfs)

Summary for Link 1L: POC A

Inflow Area =	26,958 sf	26.45% Impervious	Inflow Depth =	6.45"	for 100-Year event
Inflow =	3.30 cfs @	12.16 hrs	Volume=	14,485 cf	
Primary =	3.30 cfs @	12.16 hrs	Volume=	14,485 cf	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Appendix “D”

**Pipe Conveyance
Calculations**

Project ID: 23BL_Appendix_D_Conveyance_&_Outlet_Protection_0.xlsx

Date: 2/15/2024

The following is a summary of the computations performed to design the proposed storm drainage system drain sizes. The proposed watershed flows were taken from the results of the HydroCAD storm drainage analysis performed on the site. Refer to Appendix "C" for HydroCAD model input data, computations, and results. Refer to Exhibit "B" for a depiction of the proposed on-site watershed areas. HydroCAD runoff computations are based on the 25-year design storm frequency event. Culvert conveyance computations are based on the Manning's Equation.

Watershed Analysis Results

Drainage Area	Area (S.F.)	Impervious Area (S.F.)	CN	25-Year Peak Flow Rate (cfs)
1S	21,388	3,271	81.6	1.61
2S	4,728	3,017	91.5	0.59
3S	842	842	98.0	0.11

Culvert Capacity Summary Table

Maximum pipe capacities were calculated using the Manning equation for full flow conditions. The proposed pipe information, 25-year peak design flows, and corresponding maximum capacities are summarized in the following table. Refer to the Development Plan for pipe and structure locations. All pipes have been sized to convey the flow rates for at least the 25-year design storm frequency event.

Pipe #	Diameter	Roughness	Slope (%)	Contributing	25-Year Peak	Max
1	6	0.011	0.5%	2S (80%)	0.44	0.47
2	8	0.011	0.5%	2S,3S	0.70	1.01
3	8	0.011	0.5%	2S,3S	0.70	1.01

Appendix “E”
Soil Results Forms

SOIL EVALUATION TEST RESULTS

Project Name: Proposed Additions Engineering Firm's Name: D'Andrea Surveying & Engineering, P.C.
 Project Address: 65 Stanton Lane Stamford, CT Engineer's Name: Leonard C. D'Andrea

Test Pit or Soil Boring #:	1	Ground Elevation:	260.2
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	0
260.2	Topsoil		10
259.4	Tan Brown Sandy Loam		22
258.4	Dark Brown Loam with Stones		52
255.9	Brown Sandy Loam with Stones		72
254.2			

Elevation	Depth in Inches
255.9	Mottling (Seasonally High Groundwater)
254.5	Groundwater
254.2	Ledge

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

Saturated Hydraulic Conductivity Test Location #: 1

Ground Elevation: 260.2
 Top Elevation of Proposed Infiltration System: 259.0
 Bottom Elevation of Proposed Infiltration System: 257.0
 Elevation of Test*: 258.2
 Test Method (check one of the following acceptable methods**):
☒ Borehole infiltration test (NHDES, 2008)
☐ Guelph permeameter - ASTM D5126-90 Method
☐ Falling head permeameter - ASTM D5126-90 Method
☐ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
☐ Amoozegar or Amoozegar (constant head) permeameter - Amoozegar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: _____

** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Alexander Ruther

Name of Test Conductor



Signature of Test Conductor

10/16/2023

Date

Soil Evaluation

Project Name:	Proposed Additions	Engineering Firm's Name:	D'Andrea Surveying & Engineering, P.C.
Project Address:	65 Stanton Lane Stamford, CT	Engineer's Name:	Leonard C. D'Andrea

[illegible]

Elevation	Depth in Inches
N/A	Mottling (Seasonally High Groundwater)
N/A	Groundwater
258.4	Ledge
	34

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

****A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.**

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Alexander Ruth
Name of Test Conductor

Accepted

Date 10/16/2023

Project Name: **Proposed Additions**
 Project Address: **65 Stanton Lane Stamford, CT**
 Engineering Firm's Name: **D'Andrea Surveying & Engineering, P.C.**
 Engineer's Name: **Leonard C. D'Andrea**

[illegible]

Elevation	Depth in Inches
N/A	Mottling (Seasonally High Groundwater)
N/A	Groundwater
259.5	Ledge

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

****A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.**

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Signature of Test Conductor

Saturated Hydraulic Conductivity Test Location #:	
Ground Elevation:	_____
Top Elevation of Proposed Infiltration System:	_____
Bottom Elevation of Proposed Infiltration System:	_____
Elevation of Test*:	_____
Test Method (check one of the following acceptable methods**):	
_____	Borehole infiltration test (NHDES, 2008)
_____	Guelph permeameter - ASTM D5126-90 Method
_____	Falling head permeameter – ASTM D5126-90 Method
_____	Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
_____	Amoozegar or Amoozegar (constant head) permeameter – Amoozegar 1992
Attach field data forms for the respective infiltration test method.	
Calculated Saturated Hydraulic Conductivity Rate: _____	

Soil Evaluation

2/15/2024

Project Name: Proposed Additions
Project Address: 65 Stanton Lane Stamford, CT

Engineering Firm's Name: D'Andrea Surveying & Engineering, P.C.
Engineer's Name: Leonard C. D'Andrea

Test Pit or Soil Boring:		A	Ground Elevation:	260.1
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches		
260.1				0
258.8	Fill			16
256.6	Tan Brown Sandy Loam with Boulders			42
255.1	Grey Clay			60
253.6	Sandy Loam			78

Elevation		Depth in Inches
255.6	Mottling (Seasonally High Groundwater)	54
255.6	Groundwater	54
N/A	Ledge	N/A

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Alexander Ruthier
Name of Test Conductor



2/8/2024
Date

Saturated Hydraulic Conductivity Test Location #:

Ground Elevation: _____

Top Elevation of Proposed Infiltration System: _____

Bottom Elevation of Proposed Infiltration System: _____

Elevation of Test*: _____

Test Method (check one of the following acceptable methods**):

☐ Borehole infiltration test (NHIDES, 2008)

☐ Guelph permeameter - ASTM D5126-90 Method

☐ Falling head permeameter - ASTM D5126-90 Method

☐ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods

☐ Amoozegar or Amoozegar (constant head) permeameter - Amoozegar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: _____

Soil Evaluation

2/15/2024

Page 1

Project Name: **Proposed Additions**
 Project Address: **65 Stanton Lane Stamford, CT**

Engineering Firm's Name: **D'Andrea Surveying & Engineering, P.C.**
 Engineer's Name: **Leonard C. D'Andrea**

Test Pit or Soil Boring: B		Ground Elevation:	Depth Range in Inches	261.7
Elevation	Soil Texture (Percent Sand, Silt and Clay)			
261.7	Fill			0
261.2				6
259.4	Gray Clay			28
257.9	Dark Brown Loam			46

Elevation	Depth in Inches	
N/A	Mottling (Seasonally High Groundwater)	N/A
257.9	Groundwater	46
N/A	Ledge	N/A

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

Saturated Hydraulic Conductivity Test Location #:

Ground Elevation: _____

Top Elevation of Proposed Infiltration System: _____

Bottom Elevation of Proposed Infiltration System: _____

Elevation of Test*: _____

Test Method (check one of the following acceptable methods**):

_____ Borehole infiltration test (NHDES, 2008)

_____ Guelph permeameter - ASTM D5126-90 Method

_____ Falling head permeameter - ASTM D5126-90 Method

_____ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods

_____ Amoozegar or Amoozegar (constant head) permeameter - Amoozegar 1992

Attach field data forms for the respective infiltration test method. _____

Calculated Saturated Hydraulic Conductivity Rate: _____

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION
 I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Alexander Ruthen
 Name of Test Conductor



Signature of Test Conductor

2/8/2024

Date