

# **DRAINAGE SUMMARY REPORT**

**For**

**12 & 18 Taylor Street  
Stamford, Connecticut**

**Prepared For**

**G&T Taylor Street LLC**

**May 2, 2023**



**Leonard C. D'Andrea, P.E.**

**CT License No. 14869**

20PA\_DSR\_00

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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 "E" for 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 and refer to Appendix "A" for 72-Hour Drawdown 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 two multi-family dwellings, two asphalt driveways, and various hardscapes. Vegetative cover at the property is primarily lawn with other ornamental plantings. The proposed improvements will include the construction of three multi-family buildings totaling 13 units. 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., entitled "Residential Development depicting property at 12 & 18 Taylor Street, Stamford, Connecticut, prepared for G&T Taylor Street LLC".

The subject parcel is 24,492 square feet in size and is located approximately 140 feet south of the intersection of Taylor Street and Richmond Hill Avenue. The proposed redevelopment of the parcel will increase the impervious coverage by approximately 10,444 square feet. Refer to Appendix "A" for a depiction of the proposed stormwater BMPs and drainage calculations.

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.

HydroCAD Summary  
 G&T Taylor Street LLC  
 Tylor Street, Stamford, CT  
 Project ID: 20PA

POC	1 Year Storm				2 Year Storm				5 Year Storm				10 Year Storm				25 Year Storm				50 Year Storm				100 Year Storm			
	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)	q <sub>ex</sub> (ft <sup>3</sup> /s)	q <sub>p</sub> (ft <sup>3</sup> /s)	Δq (ft <sup>3</sup> /s)	%Δq (ft <sup>3</sup> /s)
A	0.85	0.61	-0.24	-28%	1.14	1.14	0.00	0%	1.63	1.56	-0.07	-4%	1.98	1.85	-0.13	-7%	2.33	2.12	-0.21	-9%	2.67	2.39	-0.28	-10%	3.06	2.69	-0.37	-12%
B	0.12	0.03	-0.09	-75%	0.17	0.04	-0.13	-76%	0.27	0.06	-0.21	-78%	0.33	0.08	-0.25	-76%	0.40	0.22	-0.18	-45%	0.47	0.37	-0.10	-21%	0.55	0.56	0.01	2%

Table 1: Comparison of Existing and Proposed Peak Flow Rates for all Points of Concern.

POC	1 Year Storm				2 Year Storm				5 Year Storm				10 Year Storm				25 Year Storm				50 Year Storm				100 Year Storm			
	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)	v <sub>ex</sub> (cf)	v <sub>p</sub> (cf)	Δv (cf)	%Δv (cf)
A	2,531	2,424	-107	-4%	3,413	3,372	-41	-1%	4,941	4,977	36	1%	6,038	6,112	74	1%	7,149	7,254	105	1%	8,271	8,401	130	2%	9,563	9,716	153	2%
B	416	86	-330	-79%	590	121	-469	-79%	901	427	-474	-53%	1,129	680	-449	-40%	1,364	934	-430	-32%	1,603	1,188	-415	-26%	1,880	1,480	-400	-21%

Table 2: Comparison of Existing and Proposed Runoff Volumes for all Points of Concern.

**Exhibits “A & B”**

**Existing and Proposed  
Watershed Maps**

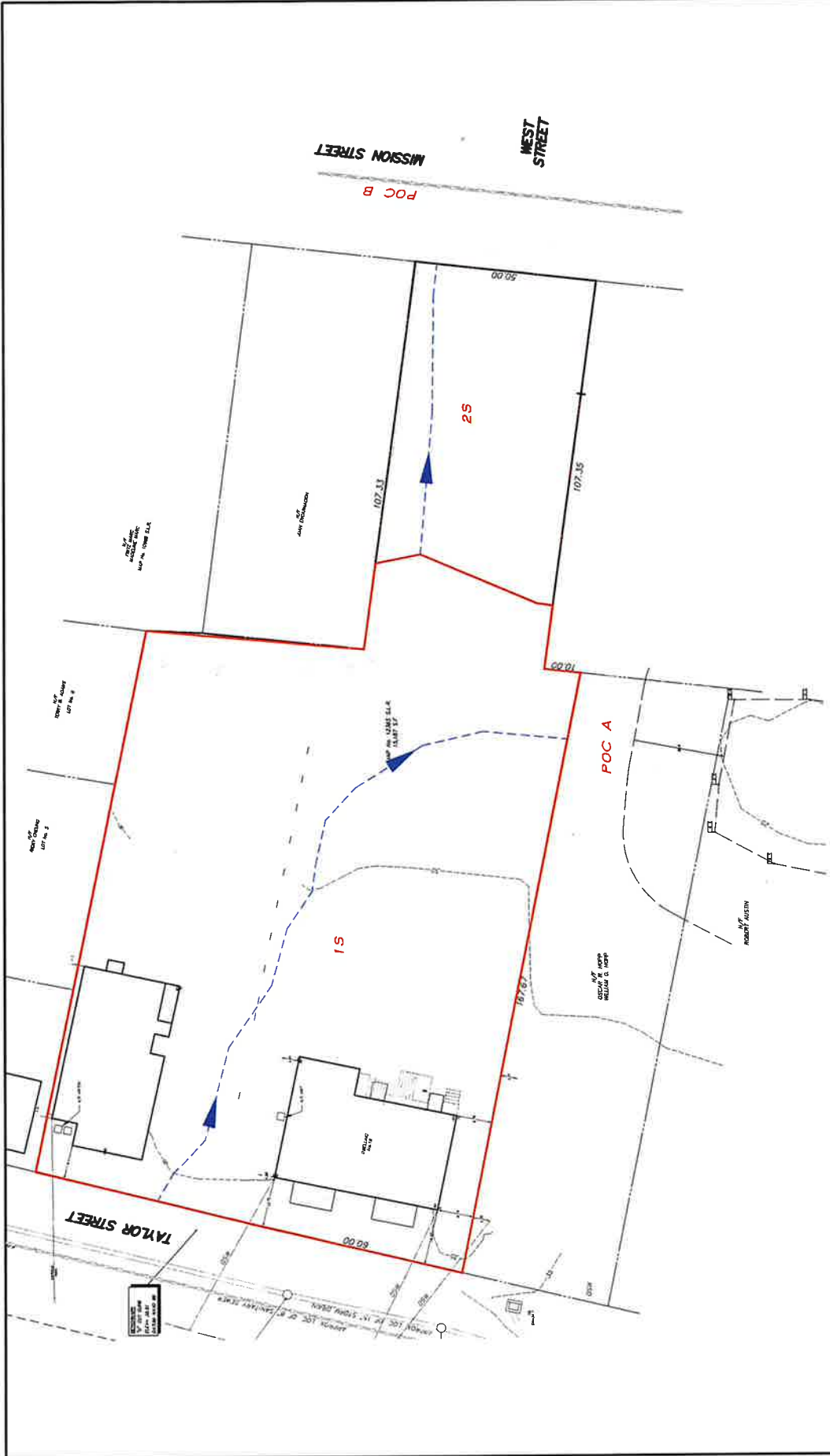
**D'ANDREA SURVEYING & ENGINEERING, P.C.**  
 • LAND PLANNERS  
 • ENGINEERS  
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P.O. BOX 549  
 RIVERSIDE, CT 06878

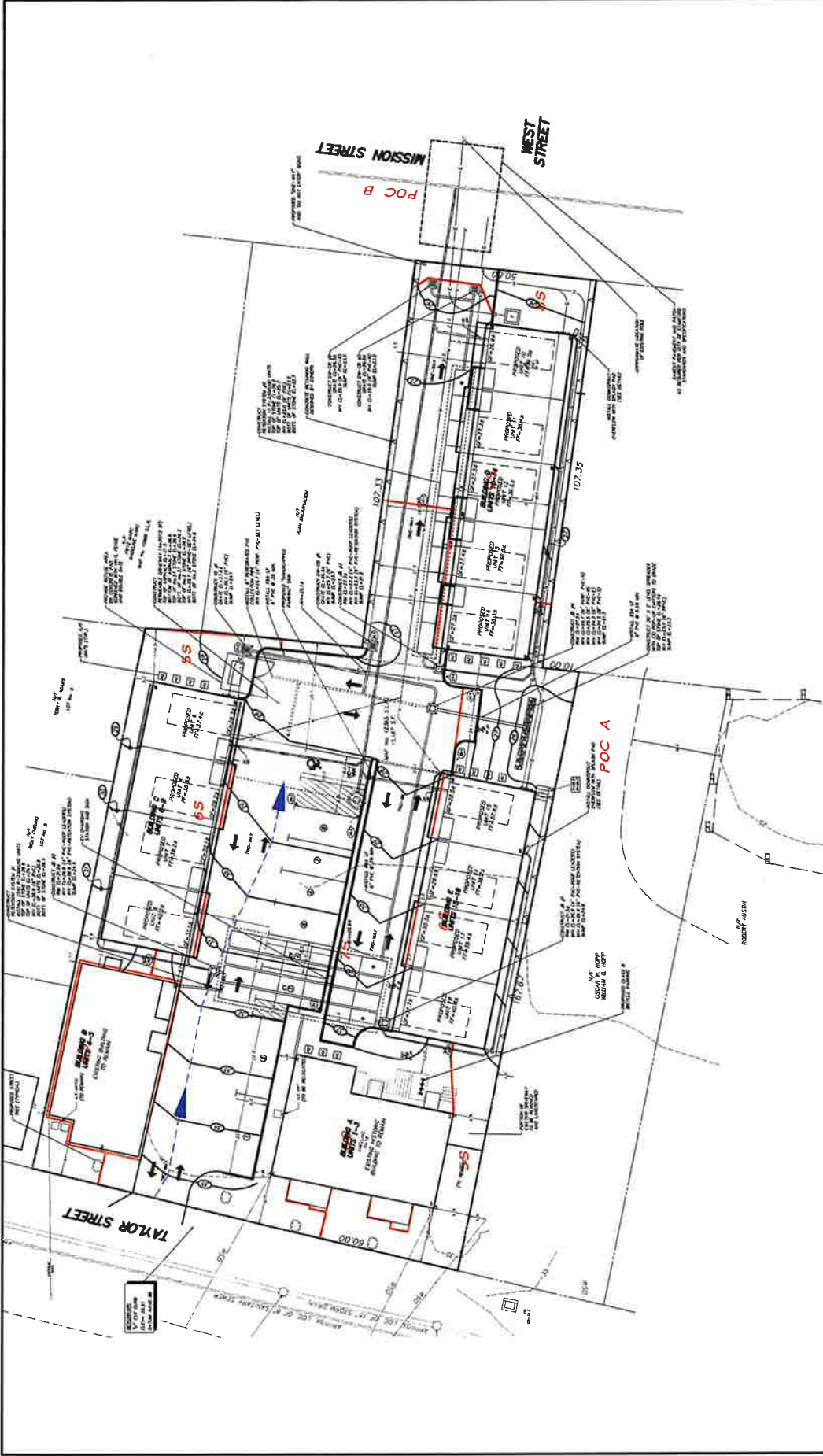
6 NEIL LANE  
 TEL. 637-1779

**EXHIBIT "A"**  
**EXISTING CONDITIONS**

1 INCH = 40 FEET





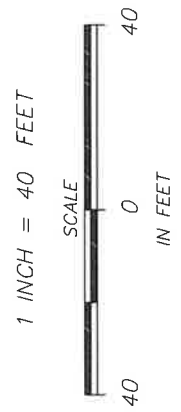


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**EXHIBIT "B"**  
**PROPOSED CONDITIONS**

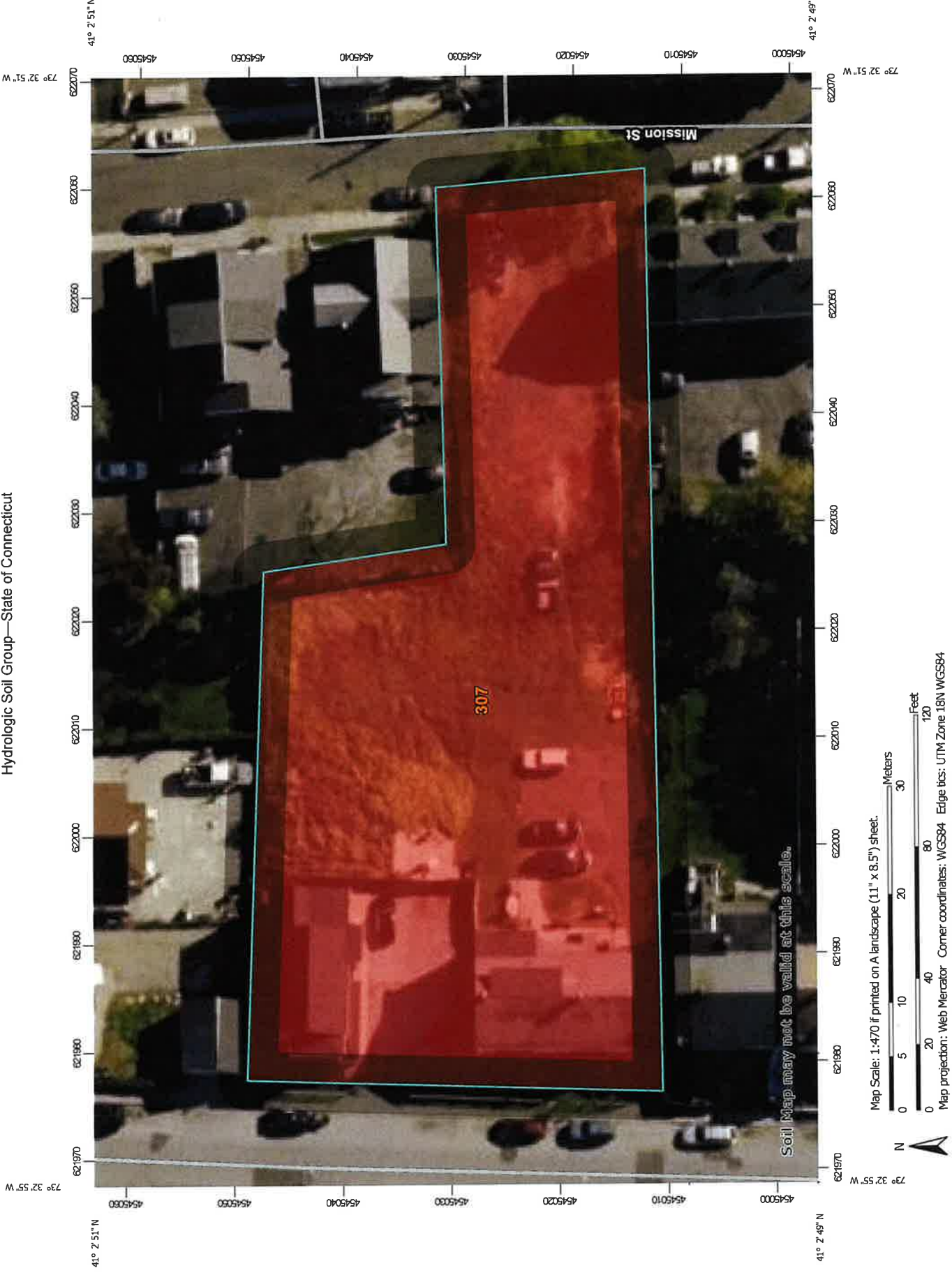




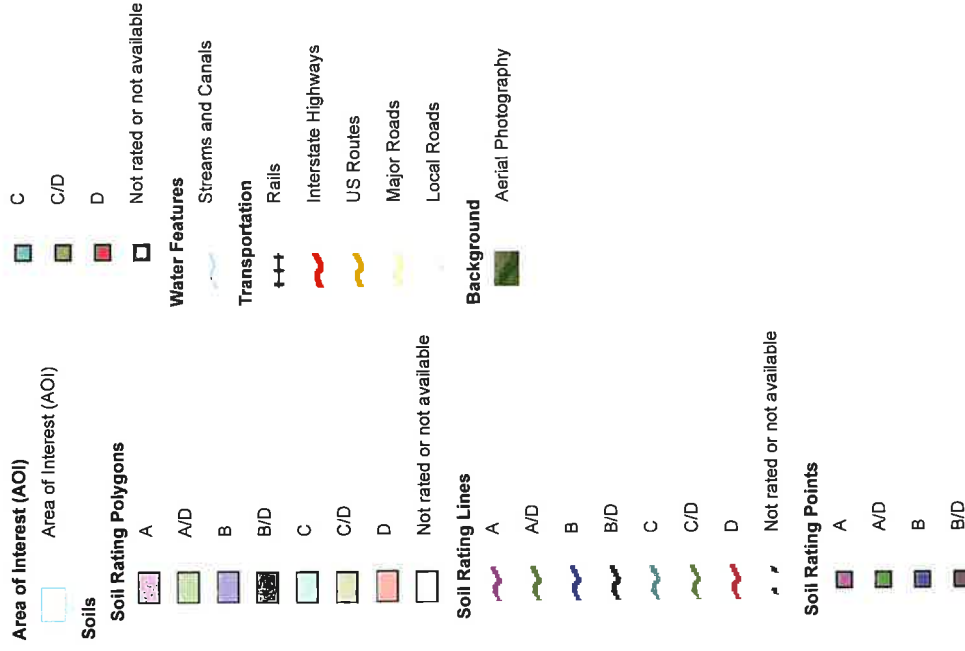
**Exhibit “C”**

**USDA Soil Delineation Map**

Hydrologic Soil Group—State of Connecticut



## 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  
 Survey Area Data: Version 22, Sep 12, 2022

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
307	Urban land	D	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### 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.

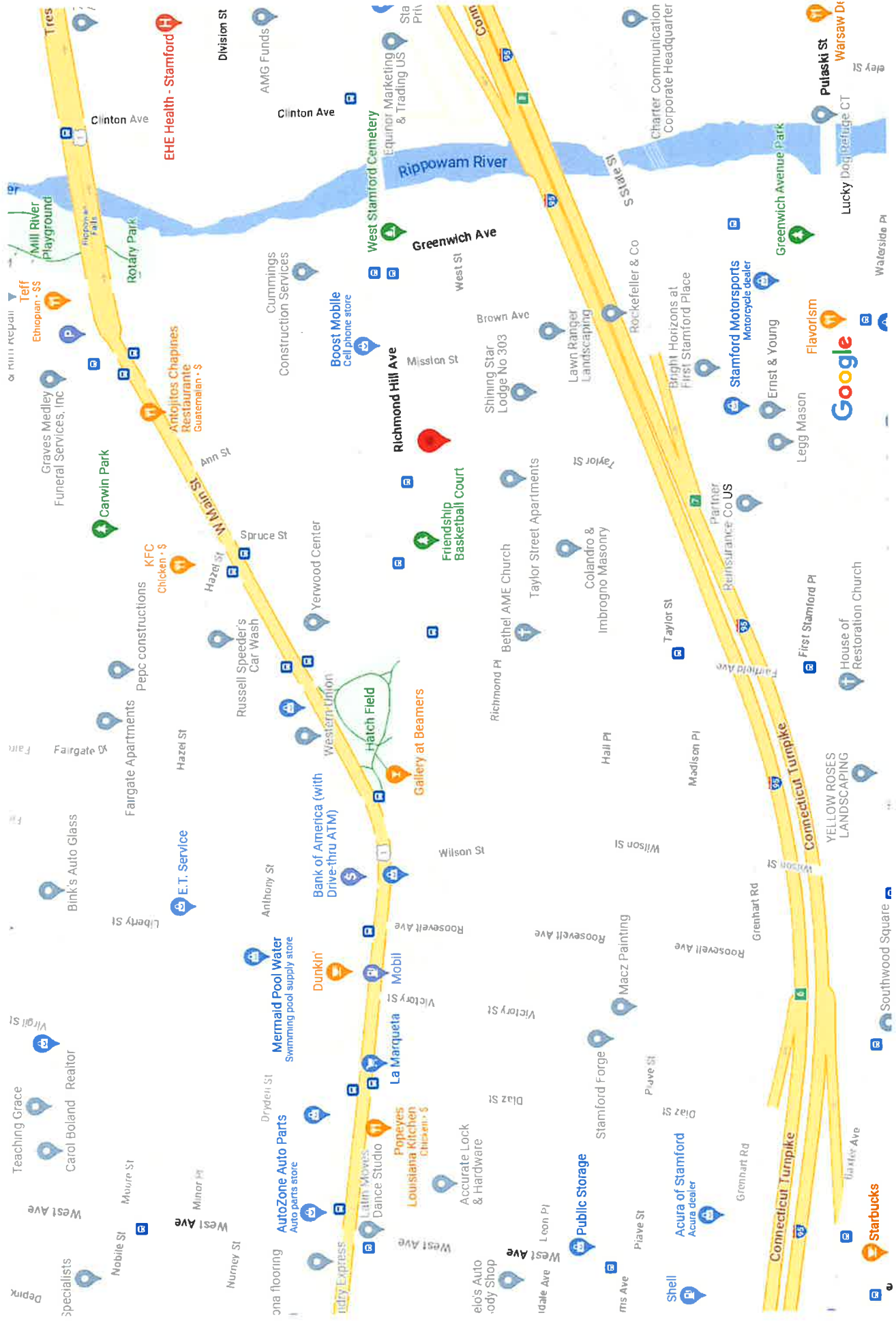
### Rating Options

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

**Exhibit "D"**  
**Site Vicinity Map**

# Google Maps 12 Taylor St



**Appendix "A"**

**Drainage System  
Design Calculations**



**BMP Drawdown Calculations:**

*Infiltration structures must be able to drain fully within 72 hours.*

**Retention System #1: Cultec Drywells #1**

$$t_{\text{drawdown}} = DV/kA$$

Where:

DV = Design Volume	=	190 ft <sup>3</sup>	
k = Infiltration Rate	=	0.09 inches/hr	Silty Loam
A = Bottom Area	=	948 ft <sup>2</sup>	

$$t_{\text{drawdown}} = 26.7 \text{ hours} \quad \text{Drawdown Requirement Satisfied}$$

**Retention System #2: Cultec Drywells #2**

$$t_{\text{drawdown}} = DV/kA$$

Where:

DV = Design Volume	=	963 ft <sup>3</sup>	
k = Infiltration Rate	=	0.52 inches/hr	Tan Fines
A = Bottom Area	=	510 ft <sup>2</sup>	

$$t_{\text{drawdown}} = 43.6 \text{ hours} \quad \text{Drawdown Requirement Satisfied}$$

**Retention System #3: Permeable Pavement**

$$t_{\text{drawdown}} = DV/kA$$

Where:

DV = Design Volume	=	912 ft <sup>3</sup>	
k = Infiltration Rate	=	0.09 inches/hr	Silty Loam
A = Bottom Area	=	2073 ft <sup>2</sup>	

$$t_{\text{drawdown}} = 58.7 \text{ hours} \quad \text{Drawdown Requirement Satisfied}$$

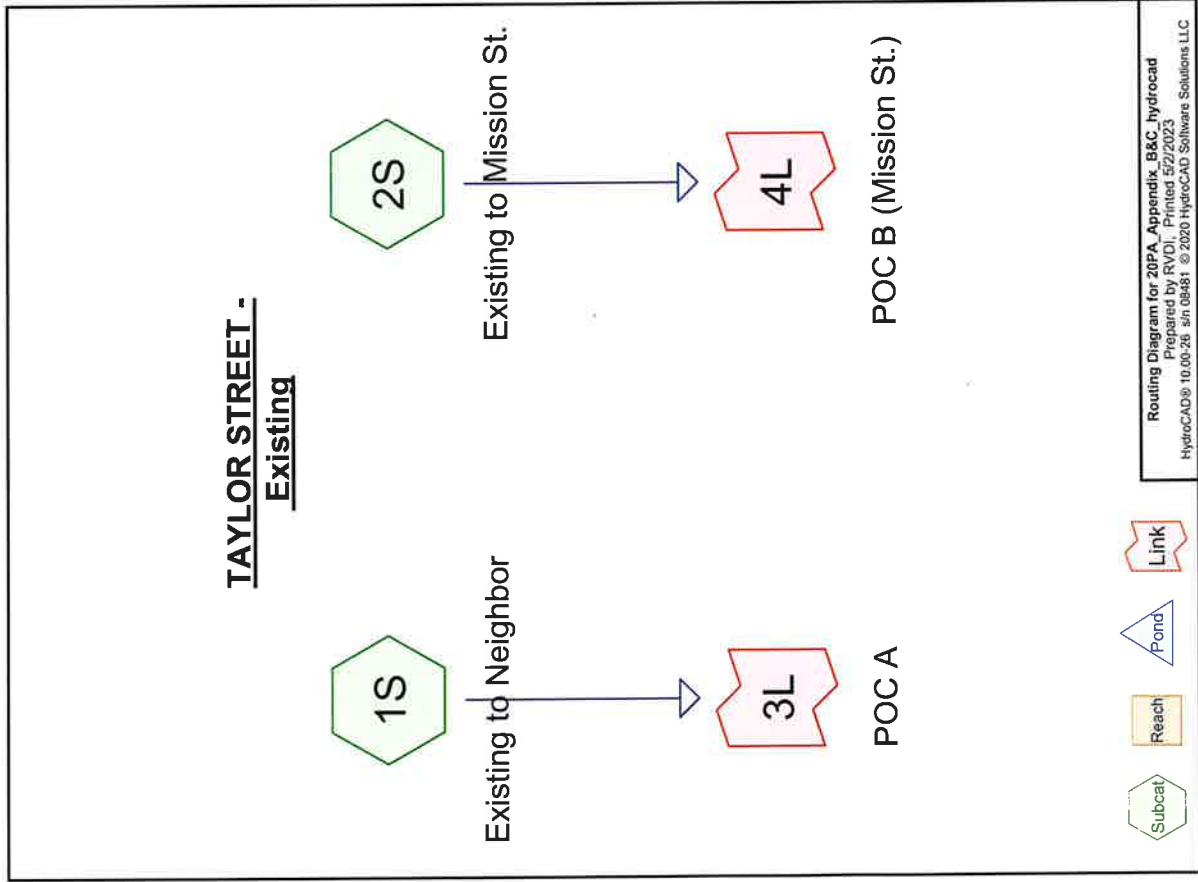
**Appendix “B”**

**HydroCAD Analysis –  
Existing Conditions**

**20PA Appendix B&C\_hydrocad**

**Area Listing (selected nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
15,790	80.0	>75% Grass cover, Good, HSG D (1S, 2S)
4,514	98.0	Paved parking, HSG D (1S, 2S)
3,256	98.0	Roofs, HSG D (1S)
935	98.0	Unconnected pavement, HSG D (1S)
<b>24,495</b>	<b>86.4</b>	<b>TOTAL AREA</b>



**Summary for Subcatchment 1S: Existing to Neighbor**

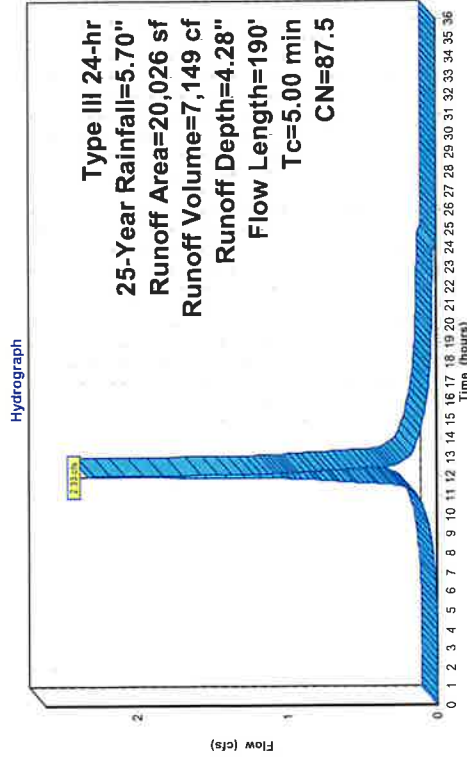
Runoff = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf, Depth= 4.28"

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 25-Year Rainfall=5.70"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683	58.34%	Pervious Area
8,343	41.66%	Impervious Area
935	11.21%	Unconnected

Tc (min)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34	Sheet Flow, Driveway
				Smooth surfaces n= 0.011 P2= 3.30"
1.71	30	0.1367	0.29	Sheet Flow, Lawn
				Grass: Short n= 0.150 P2= 3.30"
0.56	90	0.0322	2.69	Shallow Concentrated Flow, Lawn
				Grassed Waterway Kv= 15.0 fps
2.77	190	Total, Increased to minimum	Tc = 5.00 min	

**Subcatchment 1S: Existing to Neighbor**



**Summary for Subcatchment 2S: Existing to Mission St.**

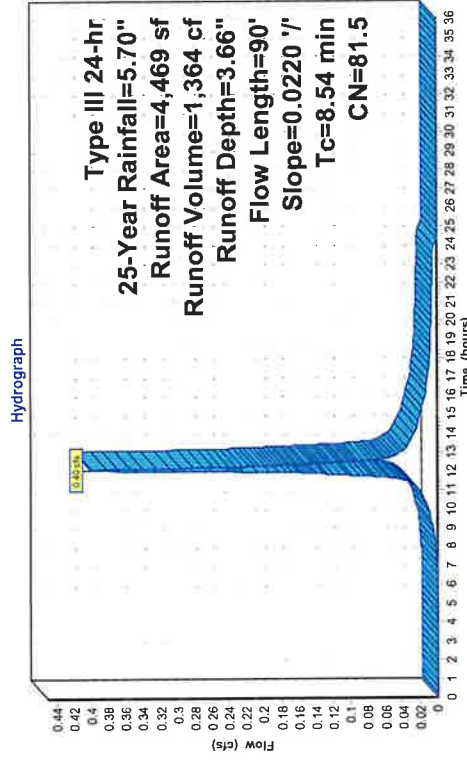
Runoff = 0.40 cfs @ 12.12 hrs, Volume= 1,364 cf, Depth= 3.66"

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
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107	91.90%	Pervious Area
362	8.10%	Impervious Area

Tc (min)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18	Sheet Flow, Sheet Flow
				Grass: Short n= 0.150 P2= 3.30"

**Subcatchment 2S: Existing to Mission St.**



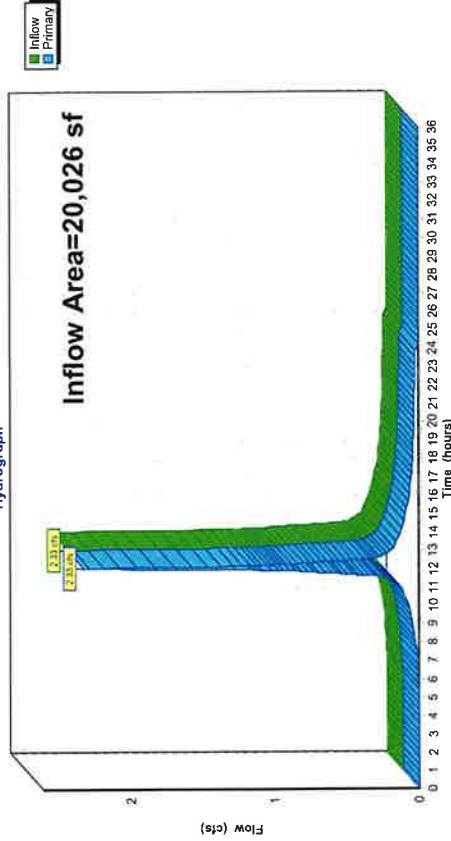
**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 4.28" for 25-Year event  
 Inflow = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf  
 Primary = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf, Atten= 0%, Lag= 0.0 min

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

**Link 3L: POC A**

Hydrograph



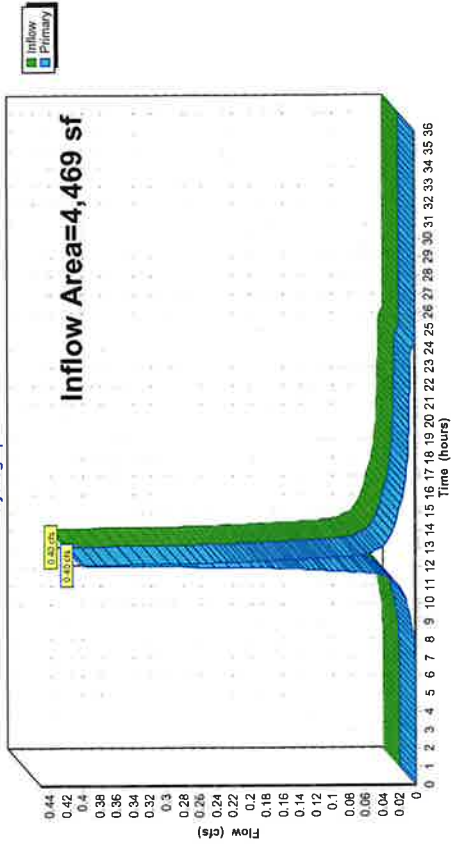
**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 3.66" for 25-Year event  
 Inflow = 0.40 cfs @ 12.12 hrs, Volume= 1,364 cf  
 Primary = 0.40 cfs @ 12.12 hrs, Volume= 1,364 cf, Atten= 0%, Lag= 0.0 min

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

**Link 4L: POC B (Mission St.)**

Hydrograph



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: Existing to Neighbor**  
Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=1.52"  
Flow Length=190' Tc=5.00 min CN=87.5 Runoff=0.85 cfs 2,531 cf

**Subcatchment 2S: Existing to Mission St.**  
Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=1.12"  
Flow Length=90' Slope=0.0220 Tc=8.54 min CN=81.5 Runoff=0.12 cfs 416 cf

**Link 3L: POC A**

Inflow=0.85 cfs 2,531 cf  
Primary=0.85 cfs 2,531 cf

**Link 4L: POC B (Mission St.)**

Inflow=0.12 cfs 416 cf  
Primary=0.12 cfs 416 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 0.85 cfs @ 12.07 hrs, Volume= 2,531 cf, Depth= 1.52"

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 1-Year Rainfall=2.70"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D

Area (sf)	Weighted Average
20,026	58.34% Pervious Area
11,683	41.66% Impervious Area
8,343	11.21% Unconnected
935	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		
1.71	30	0.1367	0.29		
0.56	90	0.0322	2.69		
2.77	190	Total, increased to minimum	Tc = 5.00 min		

Area (sf)	CN	Description
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107		91.90% Pervious Area
362		8.10% Impervious Area

Tc (min) 8.54 Length (feet) 90 Slope (ft/ft) 0.0220 Velocity (ft/sec) 0.18 Capacity (cfs) 0.18 Description Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.12 cfs @ 12.13 hrs, Volume= 416 cf, Depth= 1.12"

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=2.70"

Area (sf)	CN	Description
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107		91.90% Pervious Area
362		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		
2.77	190	Total, increased to minimum	Tc = 5.00 min		

Tc (min) 8.54 Length (feet) 90 Slope (ft/ft) 0.0220 Velocity (ft/sec) 0.18 Capacity (cfs) 0.18 Description Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 1.52" for 1-Year event  
 Inflow = 0.85 cfs @ 12.07 hrs, Volume= 2,531 cf  
 Primary = 0.85 cfs @ 12.07 hrs, Volume= 2,531 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 1.12" for 1-Year event  
 Inflow = 0.12 cfs @ 12.13 hrs, Volume= 416 cf  
 Primary = 0.12 cfs @ 12.13 hrs, Volume= 416 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: Existing to Neighbor**  
 Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=2.05"  
 Flow Length=190' Tc=5.00 min CN=87.5 Runoff=1.14 cfs 3,413 cf

**Subcatchment 2S: Existing to Mission St.**  
 Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=1.58"  
 Flow Length=90' Slope=0.0220'/' Tc=8.54 min CN=81.5 Runoff=0.17 cfs 590 cf

**Link 3L: POC A**  
 Inflow=1.14 cfs 3,413 cf  
 Primary=1.14 cfs 3,413 cf

**Link 4L: POC B (Mission St.)**  
 Inflow=0.17 cfs 590 cf  
 Primary=0.17 cfs 590 cf



**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 1.14 cfs @ 12.07 hrs, Volume= 3,413 cf, Depth= 2.05"  
 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=3.30"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683		58.34% Pervious Area
8,343		41.66% Impervious Area
935		11.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		<b>Sheet Flow, Driveway</b> Smooth surfaces n=0.011 P2= 3.30"
1.71	30	0.1367	0.29		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30"
0.56	90	0.0322	2.69		<b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway Kv= 15.0 fps
2.77	190				Total, Increased to minimum Tc = 5.00 min

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.17 cfs @ 12.12 hrs, Volume= 590 cf, Depth= 1.58"  
 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=3.30"

Area (sf)	CN	Description			
362	98.0	Paved parking, HSG D			
4,107	80.0	>75% Grass cover, Good, HSG D			
4,469	81.5	Weighted Average			
4,107		91.90% Pervious Area			
362		8.10% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 2.05" for 2-Year event  
 Inflow = 1.14 cfs @ 12.07 hrs, Volume= 3,413 cf  
 Primary = 1.14 cfs @ 12.07 hrs, Volume= 3,413 cf, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 1.58" for 2-Year event  
 Inflow = 0.17 cfs @ 12.12 hrs, Volume= 590 cf  
 Primary = 0.17 cfs @ 12.12 hrs, Volume= 590 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: Existing to Neighbor**  
Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=2.96"  
Flow Length=190' Tc=5.00 min CN=87.5 Runoff=1.63 cfs 4,941 cf

**Subcatchment 2S: Existing to Mission St.**  
Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=2.42"  
Flow Length=90' Slope=0.0220 Tc=8.54 min CN=81.5 Runoff=0.27 cfs 901 cf

Link 3L: POC A

Link 4L: POC B (Mission St.)

Inflow=1.63 cfs 4,941 cf  
Primary=1.63 cfs 4,941 cf  
  
Inflow=0.27 cfs 901 cf  
Primary=0.27 cfs 901 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 1.63 cfs @ 12.07 hrs, Volume= 4,941 cf, Depth= 2.96"

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=4.30"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683	58.34%	Pervious Area
8,343	41.66%	Impervious Area
935	11.21%	Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		
1.71	30	0.1367	0.29		<b>Sheet Flow, Driveway</b> Smooth surfaces n=0.011 P2= 3.30"
0.56	90	0.0322	2.69		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30" <b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway Kv= 15.0 fps
2.77	190	Total	Increased to minimum	Tc = 5.00 min	

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.27 cfs @ 12.12 hrs, Volume= 901 cf, Depth= 2.42"

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=4.30"

Area (sf)	CN	Description
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107	91.90%	Pervious Area
362	8.10%	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		
					<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 2.96" for 5-Year event  
Inflow = 1.63 cfs @ 12.07 hrs, Volume= 4,941 cf  
Primary = 1.63 cfs @ 12.07 hrs, Volume= 4,941 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 2.42" for 5-Year event  
Inflow = 0.27 cfs @ 12.12 hrs, Volume= 901 cf  
Primary = 0.27 cfs @ 12.12 hrs, Volume= 901 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: Existing to Neighbor** Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=3.62"  
Flow Length=190' Tc=5.00 min CN=87.5 Runoff=1.98 cfs 6,038 cf

**Subcatchment 2S: Existing to Mission St.** Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=3.03"  
Flow Length=90' Slope=0.0220 1/100' Tc=8.54 min CN=81.5 Runoff=0.33 cfs 1,129 cf

**Link 3L: POC A**  
Inflow=1.98 cfs 6,038 cf  
Primary=1.98 cfs 6,038 cf

**Link 4L: POC B (Mission St.)**  
Inflow=0.33 cfs 1,129 cf  
Primary=0.33 cfs 1,129 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 1.98 cfs @ 12.07 hrs, Volume= 6,038 cf, Depth= 3.62"  
 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=5.00"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683	58.34%	Pervious Area
8,343	41.66%	Impervious Area
935	11.21%	Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		<b>Sheet Flow, Driveway</b> Smooth surfaces n= 0.011 P2= 3.30"
1.71	30	0.1367	0.29		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30"
0.56	90	0.0322	2.69		<b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway Kv= 15.0 fbs
2.77	190	Total	Increased to minimum	Tc = 5.00 min	

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.33 cfs @ 12.12 hrs, Volume= 1,129 cf, Depth= 3.03"  
 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=5.00"

Area (sf)	CN	Description			
362	98.0	Paved parking, HSG D			
4,107	80.0	>75% Grass cover, Good, HSG D			
4,469	81.5	Weighted Average			
4,107	91.90%	Pervious Area			
362	8.10%	Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 3.62" for 10-Year event  
 Inflow = 1.98 cfs @ 12.07 hrs, Volume= 6,038 cf  
 Primary = 1.98 cfs @ 12.07 hrs, Volume= 6,038 cf, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 3.03" for 10-Year event  
 Inflow = 0.33 cfs @ 12.12 hrs, Volume= 1,129 cf  
 Primary = 0.33 cfs @ 12.12 hrs, Volume= 1,129 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: Existing to Neighbor**  
Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=4.28"  
Flow Length=190' Tc=5.00 min CN=87.5 Runoff=2.33 cfs 7,149 cf

**Subcatchment 2S: Existing to Mission St.**  
Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=3.66"  
Flow Length=90' Slope=0.0220 Tc=8.54 min CN=81.5 Runoff=0.40 cfs 1,364 cf

Link 3L: POC A

Inflow=2.33 cfs 7,149 cf  
Primary=2.33 cfs 7,149 cf

Link 4L: POC B (Mission St.)

Inflow=0.40 cfs 1,364 cf  
Primary=0.40 cfs 1,364 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf, Depth= 4.28"

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 25-Year Rainfall=5.70"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683		58.34% Pervious Area
8,343		41.66% Impervious Area
935		11.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		
1.71	30	0.1367	0.29		<b>Sheet Flow, Driveway</b> Smooth surfaces n=0.011 P2= 3.30"
0.56	90	0.0322	2.69		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30"
2.77	190	Total, Increased to minimum Tc = 5.00 min			<b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway KV= 15.0 fps

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.40 cfs @ 12.12 hrs, Volume= 1,364 cf, Depth= 3.66"

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
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107		91.90% Pervious Area
362		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		
					<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

Summary for Link 3L: POC A

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 4.28" for 25-Year event  
Inflow = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf  
Primary = 2.33 cfs @ 12.07 hrs, Volume= 7,149 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link 4L: POC B (Mission St.)

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 3.66" for 25-Year event  
Inflow = 0.40 cfs @ 12.12 hrs, Volume= 1,364 cf  
Primary = 0.40 cfs @ 12.12 hrs, Volume= 1,364 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: Existing to Neighbor Runoff Area=20,026 sf 41.66% Impervious Runoff Depth=4.96"  
Flow Length=190' Tc=5.00 min CN=87.5 Runoff=2.67 cfs 8,271 cf

Subcatchment 2S: Existing to Mission St. Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=4.30"  
Flow Length=90' Slope=0.0220 1/ Slope=8.54 min CN=81.5 Runoff=0.47 cfs 1,603 cf

Link 3L: POC A Inflow=2.67 cfs 8,271 cf  
Primary=2.67 cfs 8,271 cf

Link 4L: POC B (Mission St.) Inflow=0.47 cfs 1,603 cf  
Primary=0.47 cfs 1,603 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 2.67 cfs @ 12.07 hrs, Volume= 8,271 cf, Depth= 4.96"

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=6.40"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683		58.34% Pervious Area
8,343		41.66% Impervious Area
935		11.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		<b>Sheet Flow, Driveway</b> Smooth surfaces n=0.011 P2= 3.30"
1.71	30	0.1367	0.29		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30"
0.56	90	0.0322	2.69		<b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway Kv= 15.0 fps
2.77	190	Total	Increased to minimum	Tc = 5.00 min	

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.47 cfs @ 12.12 hrs, Volume= 1,603 cf, Depth= 4.30"

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=6.40"

Area (sf)	CN	Description
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107		91.90% Pervious Area
362		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 4.96" for 50-Year event  
 Inflow = 2.67 cfs @ 12.07 hrs, Volume= 8,271 cf  
 Primary = 2.67 cfs @ 12.07 hrs, Volume= 8,271 cf, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 4.30" for 50-Year event  
 Inflow = 0.47 cfs @ 12.12 hrs, Volume= 1,603 cf  
 Primary = 0.47 cfs @ 12.12 hrs, Volume= 1,603 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: Existing to Neighbor** Runoff Area=20,026 sf 41.86% Impervious Runoff Depth=5.73"  
 Flow Length=190' Tc=5.00 min CN=87.5 Runoff=3.06 cfs 9,563 cf

**Subcatchment 2S: Existing to Mission St.** Runoff Area=4,469 sf 8.10% Impervious Runoff Depth=5.05"  
 Flow Length=90' Slope=0.0220/ft Tc=8.54 min CN=81.5 Runoff=0.55 cfs 1,880 cf

**Link 3L: POC A**  
 Inflow=3.06 cfs 9,563 cf  
 Primary=3.06 cfs 9,563 cf

**Link 4L: POC B (Mission St.)**  
 Inflow=0.55 cfs 1,880 cf  
 Primary=0.55 cfs 1,880 cf

**Summary for Subcatchment 1S: Existing to Neighbor**

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 9,563 cf, Depth= 5.73"

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 100-Year Rainfall=7.20"

Area (sf)	CN	Description
4,152	98.0	Paved parking, HSG D
3,256	98.0	Roofs, HSG D
935	98.0	Unconnected pavement, HSG D
11,683	80.0	>75% Grass cover, Good, HSG D
20,026	87.5	Weighted Average
11,683		58.34% Pervious Area
8,343		41.66% Impervious Area
935		11.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.50	70	0.0871	2.34		<b>Sheet Flow, Driveway</b> Smooth surfaces n= 0.011 P2= 3.30"
1.71	30	0.1367	0.29		<b>Sheet Flow, Lawn</b> Grass: Short n= 0.150 P2= 3.30"
0.56	90	0.0322	2.69		<b>Shallow Concentrated Flow, Lawn</b> Grassed Waterway Kv= 15.0 fps
2.77	190	Total	Increased to minimum	Tc = 5.00 min	

**Summary for Subcatchment 2S: Existing to Mission St.**

Runoff = 0.55 cfs @ 12.12 hrs, Volume= 1,880 cf, Depth= 5.05"

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=7.20"

Area (sf)	CN	Description
362	98.0	Paved parking, HSG D
4,107	80.0	>75% Grass cover, Good, HSG D
4,469	81.5	Weighted Average
4,107		91.90% Pervious Area
362		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.54	90	0.0220	0.18		<b>Sheet Flow, Sheet Flow</b> Grass: Short n= 0.150 P2= 3.30"

**Summary for Link 3L: POC A**

Inflow Area = 20,026 sf, 41.66% Impervious, Inflow Depth = 5.73" for 100-Year event  
Inflow = 3.06 cfs @ 12.07 hrs, Volume= 9,563 cf  
Primary = 3.06 cfs @ 12.07 hrs, Volume= 9,563 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 4L: POC B (Mission St.)**

Inflow Area = 4,469 sf, 8.10% Impervious, Inflow Depth = 5.05" for 100-Year event  
Inflow = 0.55 cfs @ 12.12 hrs, Volume= 1,880 cf  
Primary = 0.55 cfs @ 12.12 hrs, Volume= 1,880 cf, Atten= 0%, Lag= 0.0 min

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

**Appendix “C”**

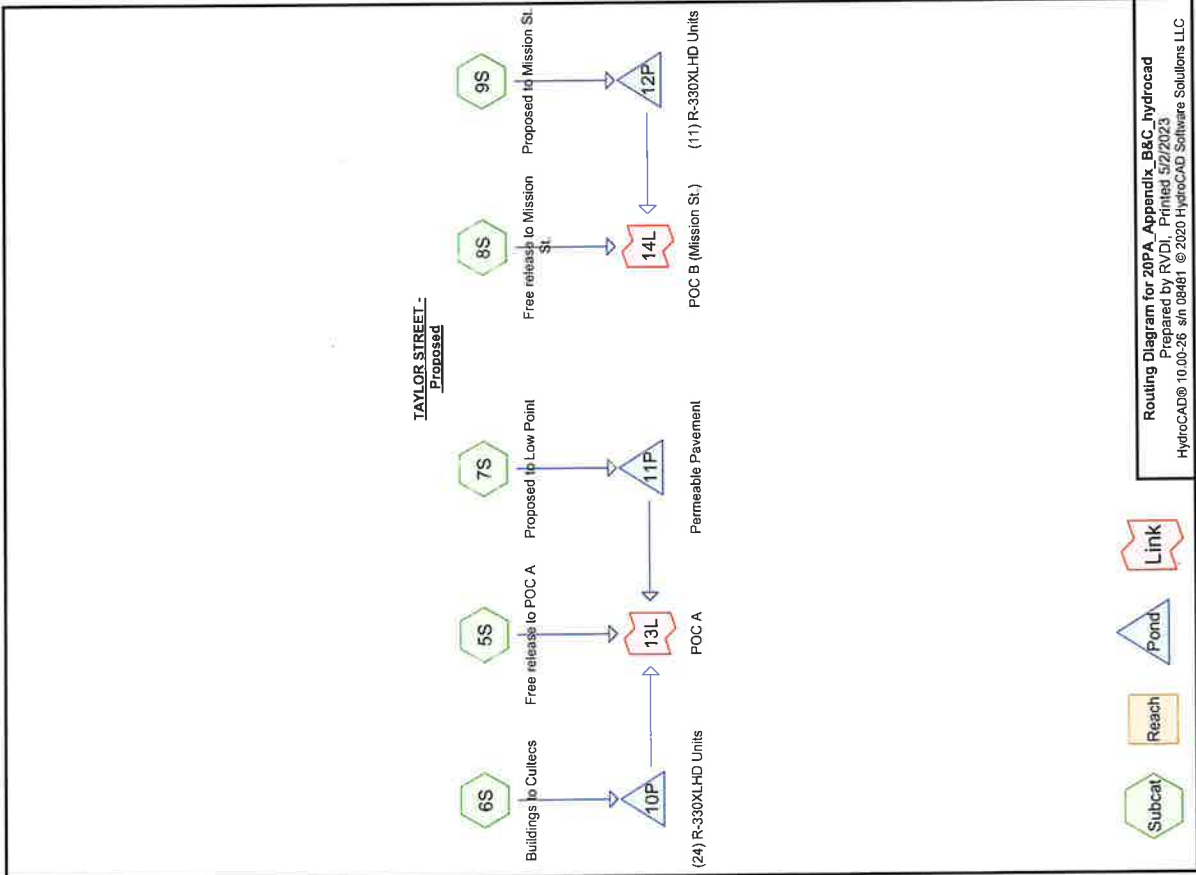
**HydroCAD Analysis –  
Proposed Conditions**

**20PA\_Appendix\_B&C\_hydrocad**

Prepared by RVDI  
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**Area Listing (selected nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
5,344	80.0	>75% Grass cover, Good, HSG D (5S, 7S, 8S)
10,022	98.0	Paved parking, HSG D (7S, 8S, 9S)
8,883	98.0	Roofs, HSG D (6S, 9S)
244	98.0	Unconnected pavement, HSG D (5S, 7S)
<b>24,493</b>	<b>94.1</b>	<b>TOTAL AREA</b>



Routing Diagram for 20PA\_Appendix\_B&C\_hydrocad  
 Prepared by RVDI, Printed 5/2/2023  
 HydroCAD® 10.00-26 s/n 08481 © 2020 HydroCAD Software Solutions LLC

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.87 cfs @ 12.07 hrs, Volume= 2,985 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"

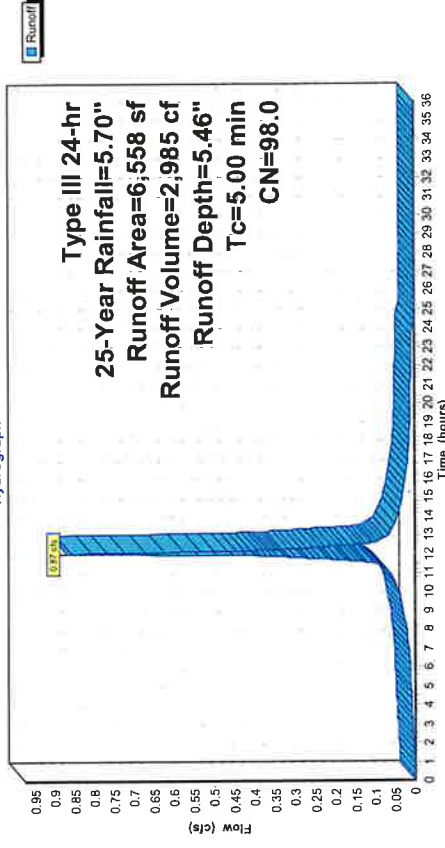
Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558	100.00%	Impervious Area

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

**Subcatchment 6S: Buildings to Cultecs**

Hydrograph



**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.37 cfs @ 12.07 hrs, Volume= 1,118 cf, Depth= 3.53"

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"

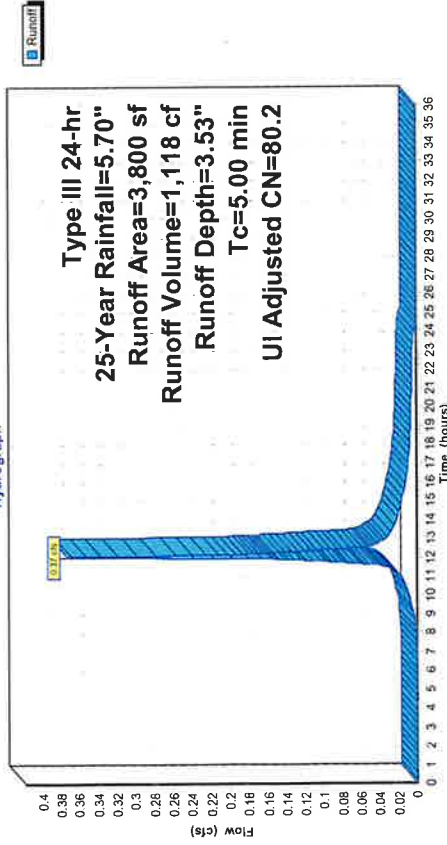
Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UI Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Subcatchment 5S: Free release to POC A**

Hydrograph



**Summary for Subcatchment 7S: Proposed to Low Point**

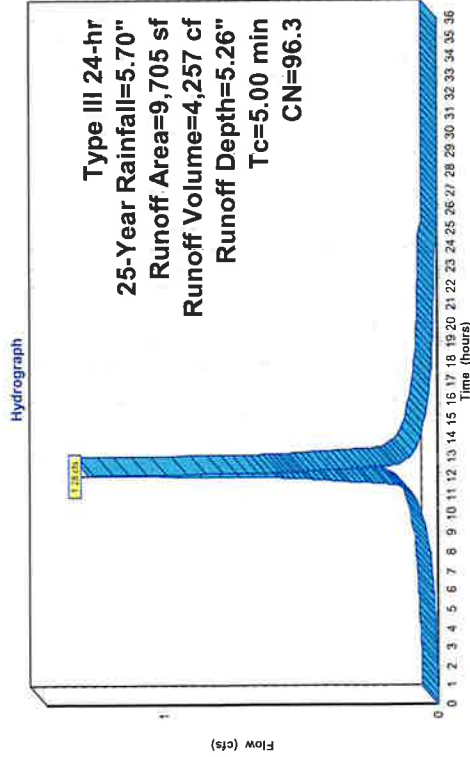
Runoff = 1.28 cfs @ 12.07 hrs, Volume= 4,257 cf, Depth= 5.26"

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 25-Year Rainfall=5.70"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	9.42%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Subcatchment 7S: Proposed to Low Point**



**Summary for Subcatchment 8S: Free release to Mission St.**

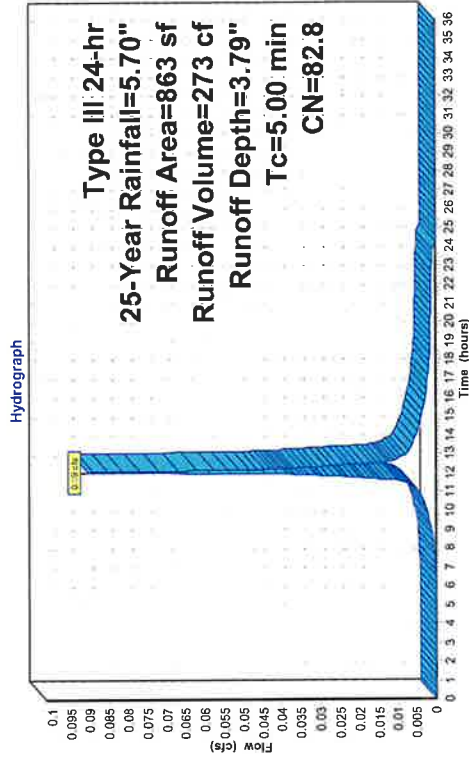
Runoff = 0.09 cfs @ 12.07 hrs, Volume= 273 cf, Depth= 3.79"

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
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Subcatchment 8S: Free release to Mission St.**



**Summary for Subcatchment 9S: Proposed to Mission St.**

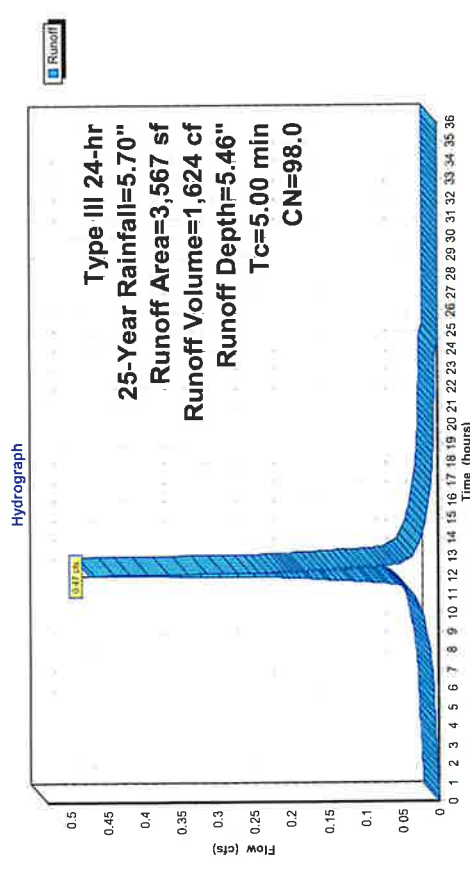
Runoff = 0.47 cfs @ 12.07 hrs, Volume= 1,624 cf, Depth= 5.46"  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Subcatchment 9S: Proposed to Mission St.**



**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event  
 Inflow = 0.87 cfs @ 12.07 hrs, Volume= 2,985 cf  
 Outflow = 0.54 cfs @ 12.16 hrs, Volume= 2,791 cf, Atten= 38%, Lag= 5.3 min  
 Primary = 0.54 cfs @ 12.16 hrs, Volume= 2,791 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.48' @ 12.16 hrs Surf.Area= 948 sf Storage= 644 cf

Plug-Flow detention time= 97.3 min calculated for 2,790 cf (93% of inflow)  
 Center-of-Mass det. time= 61.2 min ( 806.2 - 745.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	26.40'	824 cf	20.83'W x 45.50'L x 3.54'H Field A
#2A	26.90'	1,296 cf	3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
			Cultec R-330XLHD x 24 Inside #1
			Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf
			Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap
			Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		2,121 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
			2.85 3.07 3.20 3.32
#2	Device 1	26.90'	6.0" Round 6" Culvert L= 87.0' Ke= 0.500
			Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310 /' Cc= 0.900
			n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.54 cfs @ 12.16 hrs HW=27.48' TW=0.00' (Dynamic Tailwater)  
 1=Broad-Crested Rectangular Weir (Passes 0.54 cfs of 136.61 cfs potential flow)  
 2=6" Culvert (Inlet Controls 0.54 cfs @ 2.76 fps)

**Pond 10P: (24) R-330XLHD Units - Chamber Wizard Field A**

**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50'

Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,296.5 cf Chamber Storage

3,357.2 cf Field - 1,296.5 cf Chambers = 2,060.7 cf Stone x 40.0% Voids = 824.3 cf Stone Storage

Chamber Storage + Stone Storage = 2,120.8 cf = 0.049 af

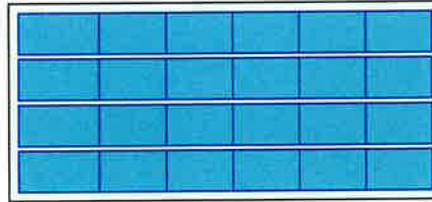
Overall Storage Efficiency = 63.2%

Overall System Size = 45.50' x 20.83' x 3.54'

24 Chambers

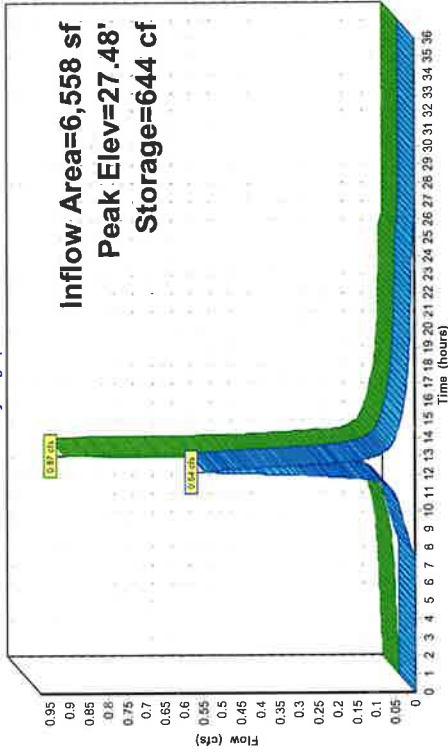
124.3 cy Field

76.3 cy Stone



**Pond 10P: (24) R-330XLHD Units**

Hydrograph





**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 5.26" for 25-Year event  
 Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,257 cf  
 Outflow = 1.26 cfs @ 12.08 hrs, Volume= 3,345 cf, Atten= 1%, Lag= 0.6 min  
 Primary = 1.26 cfs @ 12.08 hrs, Volume= 3,345 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.79' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 983 cf

Plug-Flow detention time= 144.1 min calculated for 3,345 cf (79% of inflow)  
 Center-of-Mass det. time= 64.9 min ( 821.6 - 756.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	<b>No.2 Stone (Prismatic)</b> Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	<b>No.57 Stone (Prismatic)</b> Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
1,493 cf Total Available Storage			

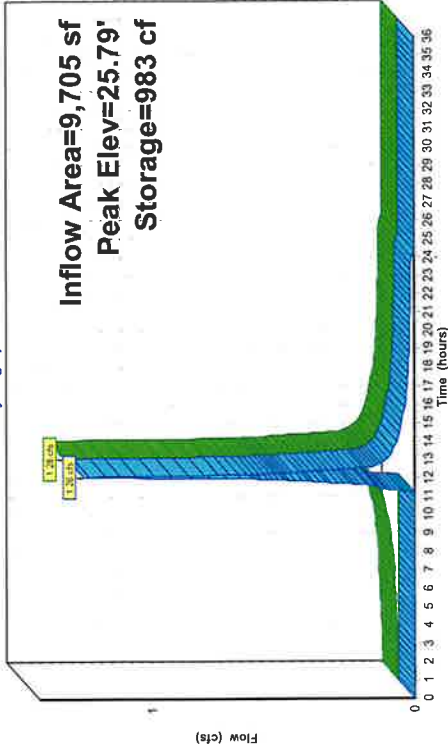
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Primary OutFlow** Max=1.26 cfs @ 12.08 hrs HW=25.79' TW=0.00' (Dynamic Tailwater)  
 #1=**Broad-Crested Rectangular Weir** (Weir Controls 1.26 cfs @ 0.74 fps)

Hydrograph



**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event  
 Inflow = 0.47 cfs @ 12.07 hrs, Volume= 1,624 cf  
 Outflow = 0.18 cfs @ 12.28 hrs, Volume= 661 cf, Atten= 62%, Lag= 12.9 min  
 Primary = 0.18 cfs @ 12.28 hrs, Volume= 661 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.74' @ 12.28 hrs Surf.Area= 510 sf Storage= 970 cf

Plug-Flow detention time= 320.8 min calculated for 661 cf (41% of inflow)  
 Center-of-Mass det. time= 165.2 min ( 910.2 - 745.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	<b>6.33"W x 80.50"L x 3.54"H Field A</b> 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	<b>Cultec R-330XLHD</b> x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		1,073 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00</b> C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	<b>6.0" Round 6" Culvert</b> L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625'/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.18 cfs @ 12.28 hrs HW=25.74' TW=0.00' (Dynamic Tailwater)  
 1-2-2'x2' catch basins (Passes 0.18 cfs @ 0.35 cfs potential flow)  
 2-6" Culvert (Inlet Controls 0.18 cfs @ 0.91' fps)

**Pond 12P: (11) R-330XLHD Units - Chamber Wizard Field A**

**Chamber Model = Cultec R-330XLHD (Cultec Recharge® 330XLHD)**  
 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf  
 Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap  
 Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

11 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 78.50' Row Length +12.0" End Stone x 2 = 80.50' Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width  
 6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

11 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 584.9 cf Chamber Storage

1,805.7 cf Field - 584.9 cf Chambers = 1,220.8 cf Stone x 40.0% Voids = 488.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,073.2 cf = 0.025 af

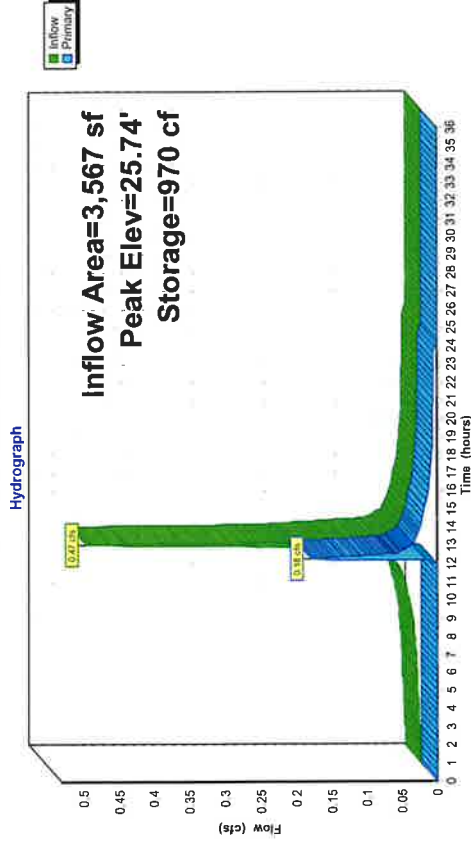
Overall Storage Efficiency = 59.4%

Overall System Size = 80.50' x 6.33' x 3.54'

11 Chambers  
 66.9 cy Field  
 45.2 cy Stone



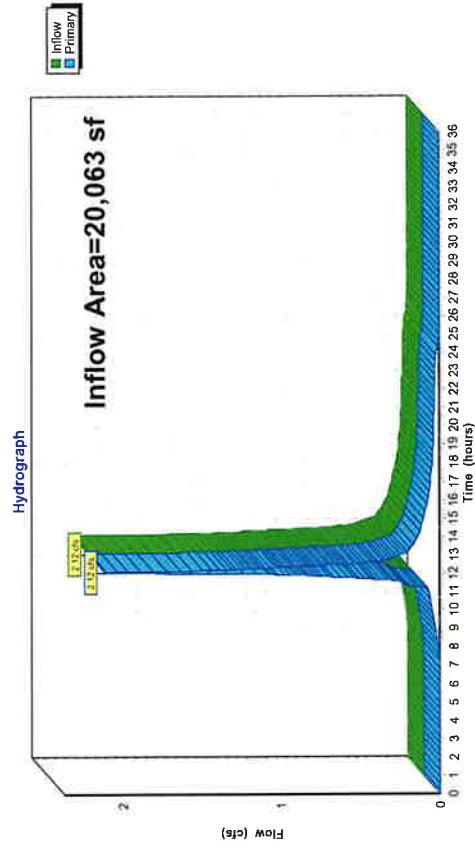
**Pond 12P: (11) R-330XLHD Units**



**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 4.34" for 25-Year event  
 Inflow = 2.12 cfs @ 12.08 hrs, Volume= 7,254 cf  
 Primary = 2.12 cfs @ 12.08 hrs, Volume= 7,254 cf, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

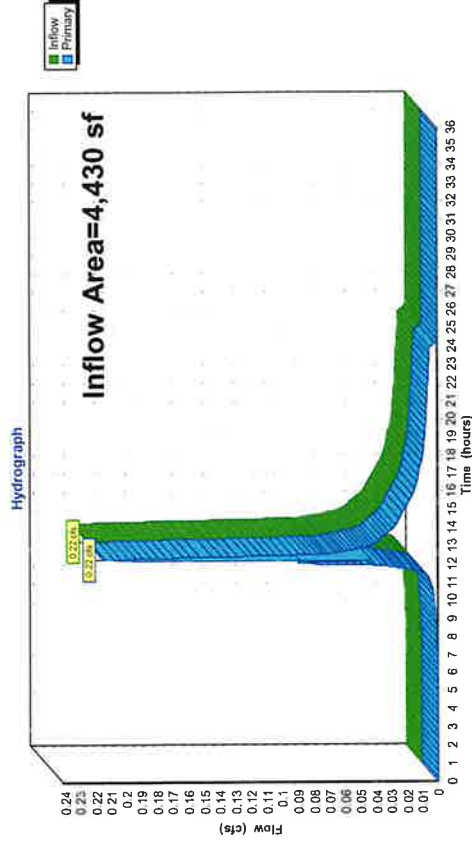
**Link 13L: POC A**



**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 2.53" for 25-Year event  
Inflow = 0.22 cfs @ 12.28 hrs, Volume= 934 cf  
Primary = 0.22 cfs @ 12.28 hrs, Volume= 934 cf, Atten= 0%, Lag= 0.0 min  
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

**Link 14L: POC B (Mission St.)**



Time span=0.00-36.00 hrs, dj=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

Time span=0.00-36.00 hrs, dj=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 5S: Free release to POC A  
 Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=1.04"  
 Tc=5.00 min UI Adjusted CN=80.2 Runoff=0.11 cfs 330 cf

Subcatchment 5S: Free release to POC A  
 Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=1.04"  
 Tc=5.00 min UI Adjusted CN=80.2 Runoff=0.11 cfs 330 cf

Subcatchment 6S: Buildings to Cultecs  
 Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=2.47"  
 Tc=5.00 min CN=98.0 Runoff=0.41 cfs 1,350 cf

Subcatchment 6S: Buildings to Cultecs  
 Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=2.47"  
 Tc=5.00 min CN=98.0 Runoff=0.41 cfs 1,350 cf

Subcatchment 7S: Proposed to Low Point  
 Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=2.29"  
 Tc=5.00 min CN=96.3 Runoff=0.58 cfs 1,850 cf

Subcatchment 7S: Proposed to Low Point  
 Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=2.29"  
 Tc=5.00 min CN=96.3 Runoff=0.58 cfs 1,850 cf

Subcatchment 8S: Free release to Mission St.  
 Runoff Area=863 sf 15.41% Impervious Runoff Depth=1.20"  
 Tc=5.00 min CN=82.8 Runoff=0.03 cfs 86 cf

Subcatchment 8S: Free release to Mission St.  
 Runoff Area=863 sf 15.41% Impervious Runoff Depth=1.20"  
 Tc=5.00 min CN=82.8 Runoff=0.03 cfs 86 cf

Subcatchment 9S: Proposed to Mission St.  
 Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=2.47"  
 Tc=5.00 min CN=98.0 Runoff=0.22 cfs 734 cf

Subcatchment 9S: Proposed to Mission St.  
 Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=2.47"  
 Tc=5.00 min CN=98.0 Runoff=0.22 cfs 734 cf

Pond 10P: (24) R-330XLHD Units  
 Peak Elev=27.22' Storage=443 cf Inflow=0.41 cfs 1,350 cf  
 Outflow=0.26 cfs 1,156 cf

Pond 10P: (24) R-330XLHD Units  
 Peak Elev=27.22' Storage=443 cf Inflow=0.41 cfs 1,350 cf  
 Outflow=0.26 cfs 1,156 cf

Pond 11P: Permeable Pavement  
 Peak Elev=25.73' Storage=939 cf Inflow=0.58 cfs 1,850 cf  
 Outflow=0.30 cfs 938 cf

Pond 11P: Permeable Pavement  
 Peak Elev=25.73' Storage=939 cf Inflow=0.58 cfs 1,850 cf  
 Outflow=0.30 cfs 938 cf

Pond 12P: (11) R-330XLHD Units  
 Peak Elev=24.89' Storage=734 cf Inflow=0.22 cfs 734 cf  
 Outflow=0.00 cfs 0 cf

Pond 12P: (11) R-330XLHD Units  
 Peak Elev=24.89' Storage=734 cf Inflow=0.22 cfs 734 cf  
 Outflow=0.00 cfs 0 cf

Link 13L: POC A  
 Inflow=0.61 cfs 2,424 cf  
 Primary=0.61 cfs 2,424 cf

Link 13L: POC A  
 Inflow=0.61 cfs 2,424 cf  
 Primary=0.61 cfs 2,424 cf

Link 14L: POC B (Mission St.)  
 Inflow=0.03 cfs 86 cf  
 Primary=0.03 cfs 86 cf

Link 14L: POC B (Mission St.)  
 Inflow=0.03 cfs 86 cf  
 Primary=0.03 cfs 86 cf

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.11 cfs @ 12.08 hrs, Volume= 330 cf, Depth= 1.04"

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=2.70"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UI Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.41 cfs @ 12.07 hrs, Volume= 1,350 cf, Depth= 2.47"

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=2.70"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 0.58 cfs @ 12.07 hrs, Volume= 1,850 cf, Depth= 2.29"

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=2.70"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	9.42%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.03 cfs @ 12.08 hrs, Volume= 86 cf, Depth= 1.20"  
 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=2.70"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 734 cf, Depth= 2.47"  
 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=2.70"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 2.47" for 1-Year event  
 Inflow = 0.41 cfs @ 12.07 hrs, Volume= 1,350 cf  
 Outflow = 0.26 cfs @ 12.16 hrs, Volume= 1,156 cf, Atten= 37%, Lag= 5.2 min  
 Primary = 0.26 cfs @ 12.16 hrs, Volume= 1,156 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.22 @ 12.16 hrs Surf.Area= 948 sf Storage= 443 cf  
 Plug-Flow detention time= 151.0 min calculated for 1,156 cf (86% of inflow)  
 Center-of-Mass det. time= 88.3 min ( 847.5 - 759.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	26.40'	824 cf	<b>20.83'W x 45.50'L x 3.54'H Field A</b> 3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
#2A	26.90'	1,296 cf	<b>Cultec R-330XLHD</b> x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		2,121 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Device 1	26.90'	<b>6.0" Round 6" Culvert</b> L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310 /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.26 cfs @ 12.16 hrs HW=27.22' TW=0.00' (Dynamic Tailwater)  
**1-Broad-Crested Rectangular Weir** (Passes 0.26 cfs of 106.71 cfs potential flow)  
**1-2=6" Culvert** (Inlet Controls 0.26 cfs @ 1.93 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 2.29" for 1-Year event  
 Inflow = 0.58 cfs @ 12.07 hrs, Volume= 1,850 cf  
 Outflow = 0.30 cfs @ 12.19 hrs, Volume= 938 cf, Atten= 49%, Lag= 7.4 min  
 Primary = 0.30 cfs @ 12.19 hrs, Volume= 938 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.73' @ 12.19 hrs Surf.Area= 2,073 sf Storage= 939 cf  
 Plug-Flow detention time= 232.8 min calculated for 938 cf (51% of inflow)  
 Center-of-Mass det. time= 117.4 min ( 893.1 - 775.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	No.2 Stone (Prismatic) Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	No.57 Stone (Prismatic) Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.30 cfs @ 12.19 hrs HW=25.73' TW=0.00' (Dynamic Tailwater)  
 1-1=Broad-Crested Rectangular Weir (Weir Controls 0.30 cfs @ 0.46 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 2.47" for 1-Year event  
 Inflow = 0.22 cfs @ 12.07 hrs, Volume= 734 cf  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min  
 Primary = 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= 24.89' @ 24.29 hrs Surf.Area= 510 sf Storage= 734 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	6.33'W x 80.50'L x 3.54'H Field A 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	Cultec R-330XLHD x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 1,073 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	6.0" Round 6" Culvert L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.70' TW=0.00' (Dynamic Tailwater)  
 1-1=2 - 2'x2' catch basins ( Controls 0.00 cfs)  
 1-2=6" Culvert ( Controls 0.00 cfs)

**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth > 1.45" for 1-Year event  
 Inflow = 0.61 cfs @ 12.19 hrs, Volume= 2,424 cf  
 Primary = 0.61 cfs @ 12.19 hrs, Volume= 2,424 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 0.23" for 1-Year event  
 Inflow = 0.03 cfs @ 12.08 hrs, Volume= 86 cf  
 Primary = 0.03 cfs @ 12.08 hrs, Volume= 86 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 473 cf, Depth= 1.49"

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 2-Year Rainfall=3.30"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UI Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 1,676 cf, Depth= 3.07"

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=3.30"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 0.72 cfs @ 12.07 hrs, Volume= 2,329 cf, Depth= 2.88"

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=3.30"

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

**Subcatchment 5S: Free release to POC A**  
 Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=1.49"  
 Tc=5.00 min UI Adjusted CN=80.2 Runoff=0.16 cfs 473 cf

**Subcatchment 6S: Buildings to Cultecs**  
 Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=3.07"  
 Tc=5.00 min CN=98.0 Runoff=0.50 cfs 1,676 cf

**Subcatchment 7S: Proposed to Low Point**  
 Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=2.88"  
 Tc=5.00 min CN=96.3 Runoff=0.72 cfs 2,329 cf

**Subcatchment 8S: Free release to Mission St.** Runoff Area=863 sf 15.41% Impervious Runoff Depth=1.68"  
 Tc=5.00 min CN=82.8 Runoff=0.04 cfs 121 cf

**Subcatchment 9S: Proposed to Mission St.** Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=3.07"  
 Tc=5.00 min CN=98.0 Runoff=0.27 cfs 912 cf

**Pond 10P: (24) R-330XLHD Units**  
 Peak Elev=27.27' Storage=483 cf Inflow=0.50 cfs 1,676 cf  
 Outflow=0.33 cfs 1,482 cf

**Pond 11P: Permeable Pavement**  
 Peak Elev=25.76' Storage=960 cf Inflow=0.72 cfs 2,329 cf  
 Outflow=0.70 cfs 1,417 cf

**Pond 12P: (11) R-330XLHD Units**  
 Peak Elev=25.48' Storage=912 cf Inflow=0.27 cfs 912 cf  
 Outflow=0.00 cfs 0 cf

**Link 13L: POC A**  
 Inflow=1.14 cfs 3,372 cf  
 Primary=1.14 cfs 3,372 cf

**Link 14L: POC B (Mission St.)**  
 Inflow=0.04 cfs 121 cf  
 Primary=0.04 cfs 121 cf



Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	94.2%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.04 cfs @ 12.08 hrs, Volume= 121 cf, Depth= 1.68"  
 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=3.30"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 912 cf, Depth= 3.07"  
 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=3.30"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 3.07" for 2-Year event  
 Inflow = 0.50 cfs @ 12.07 hrs, Volume= 1,676 cf  
 Outflow = 0.33 cfs @ 12.15 hrs, Volume= 1,482 cf, Atten= 35%, Lag= 5.0 min  
 Primary = 0.33 cfs @ 12.15 hrs, Volume= 1,482 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.27' @ 12.15 hrs Surf.Area= 948 sf Storage= 483 cf

Plug-Flow detention time= 134.9 min calculated for 1,482 cf (88% of inflow)  
 Center-of-Mass det. time= 80.1 min ( 835.0 - 754.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	26.40'	824 cf	<b>20.83'W x 45.50'L x 3.54'H Field A</b> 3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.00% Voids
#2A	26.90'	1,296 cf	<b>Cultec R-330XLHD</b> x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows 2,121 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Device 1	26.90'	<b>6.0" Round 6" Culvert</b> L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310' /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.33 cfs @ 12.15 hrs HW=27.27' TW=0.00' (Dynamic Tailwater)  
**1-6" Broad-Crested Rectangular Weir** (Passes 0.33 cfs of 113.26 cfs potential flow)  
**1-2=6" Culvert** (Inlet Controls 0.33 cfs @ 2.08 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 2.88" for 2-Year event  
 Inflow = 0.72 cfs @ 12.07 hrs, Volume= 2,329 cf  
 Outflow = 0.70 cfs @ 12.09 hrs, Volume= 1,417 cf, Atten= 3%, Lag= 1.3 min  
 Primary = 0.70 cfs @ 12.09 hrs, Volume= 1,417 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.76' @ 12.09 hrs Surf.Area= 2,073 sf Storage= 960 cf

Plug-Flow detention time= 195.7 min calculated for 1,417 cf (61% of inflow)  
 Center-of-Mass det. time= 91.9 min ( 861.9 - 770.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	<b>No.2 Stone (Prismatic)</b> Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	<b>No.57 Stone (Prismatic)</b> Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Primary OutFlow** Max=0.70 cfs @ 12.09 hrs HW=25.76' TW=0.00' (Dynamic Tailwater)  
**1-Broad-Crested Rectangular Weir** (Weir Controls 0.70 cfs @ 0.61 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 3.07" for 2-Year event  
 Inflow = 0.27 cfs @ 12.07 hrs, Volume= 912 cf  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min  
 Primary = 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= 25.48' @ 24.29 hrs Surf.Area= 510 sf Storage= 912 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	<b>6.33'W x 80.50'L x 3.54'H Field A</b> 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	<b>Cultec R-330XLHD</b> x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00</b> C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	<b>6.0" Round 6" Culvert</b> L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=22.70' TW=0.00' (Dynamic Tailwater)  
**1-2-2'x2' catch basins** ( Controls 0.00 cfs)  
**1-2=6" Culvert** ( Controls 0.00 cfs)

**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 2.02" for 2-Year event  
 Inflow = 1.14 cfs @ 12.09 hrs, Volume= 3,372 cf  
 Primary = 1.14 cfs @ 12.09 hrs, Volume= 3,372 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 0.33" for 2-Year event  
 Inflow = 0.04 cfs @ 12.08 hrs, Volume= 121 cf  
 Primary = 0.04 cfs @ 12.08 hrs, Volume= 121 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 5S: Free release to POC A** Runoff Area=3,800 sf, 2.63% Impervious, Runoff Depth=2.31"  
 Tc=5.00 min, UJ Adjusted CN=80.2, Runoff=0.24 cfs, 731 cf

**Subcatchment 6S: Buildings to Cultecs** Runoff Area=6,558 sf, 100.00% Impervious, Runoff Depth=4.06"  
 Tc=5.00 min, CN=98.0, Runoff=0.65 cfs, 2,221 cf

**Subcatchment 7S: Proposed to Low Point** Runoff Area=9,705 sf, 90.58% Impervious, Runoff Depth=3.87"  
 Tc=5.00 min, CN=96.3, Runoff=0.95 cfs, 3,131 cf

**Subcatchment 8S: Free release to Mission St.** Runoff Area=863 sf, 15.41% Impervious, Runoff Depth=2.53"  
 Tc=5.00 min, CN=82.8, Runoff=0.06 cfs, 182 cf

**Subcatchment 9S: Proposed to Mission St.** Runoff Area=3,567 sf, 100.00% Impervious, Runoff Depth=4.06"  
 Tc=5.00 min, CN=98.0, Runoff=0.36 cfs, 1,208 cf

**Pond 10P: (24) R-330XLHD Units** Peak Elev=27.35', Storage=547 cf, Inflow=0.65 cfs, 2,221 cf  
 Outflow=0.43 cfs, 2,027 cf

**Pond 11P: Permeable Pavement** Peak Elev=25.77', Storage=970 cf, Inflow=0.95 cfs, 3,131 cf  
 Outflow=0.94 cfs, 2,219 cf

**Pond 12P: (11) R-330XLHD Units** Peak Elev=25.70', Storage=964 cf, Inflow=0.36 cfs, 1,208 cf  
 Outflow=0.02 cfs, 245 cf

**Link 13L: POC A** Inflow=1.56 cfs, 4,977 cf  
 Primary=1.56 cfs, 4,977 cf

**Link 14L: POC B (Mission St.)** Inflow=0.06 cfs, 427 cf  
 Primary=0.06 cfs, 427 cf

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.24 cfs @ 12.08 hrs, Volume= 731 cf, Depth= 2.31"

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=4.30"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UJ Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 2,221 cf, Depth= 4.06"

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=4.30"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 0.95 cfs @ 12.07 hrs, Volume= 3,131 cf, Depth= 3.87"

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 5-Year Rainfall=4.30"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	9.42%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 182 cf, Depth= 2.53"  
 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=4.30"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.36 cfs @ 12.07 hrs, Volume= 1,208 cf, Depth= 4.06"  
 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=4.30"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 4.06" for 5-Year event  
 Inflow = 0.65 cfs @ 12.07 hrs, Volume= 2,221 cf  
 Outflow = 0.43 cfs @ 12.15 hrs, Volume= 2,027 cf, Atten= 34%, Lag= 4.9 min  
 Primary = 0.43 cfs @ 12.15 hrs, Volume= 2,027 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.35' @ 12.15 hrs Surf.Area= 948 sf Storage= 547 cf

Plug-Flow detention time= 115.4 min calculated for 2,027 cf (91% of inflow)  
 Center-of-Mass det. time= 70.4 min ( 820.1 - 749.7 )

Volume	Invert	Avail.Storage	Storage	Description
#1A	26.40'	824 cf	20.83'W x 45.50'L x 3.54'H Field A	3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
#2A	26.90'	1,296 cf	Cultec R-330XLHD x 24 Inside #1	Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Device 1	26.90'	6.0" Round 6" Culvert L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.43 cfs @ 12.15 hrs HW=27.35' TW=0.00' (Dynamic Tailwater)  
 1=Broad-Crested Rectangular Weir (Passes 0.43 cfs of 122.80 cfs potential flow)  
 2=6" Culvert (Inlet Controls 0.43 cfs @ 2.29 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 3.87" for 5-Year event  
 Inflow = 0.95 cfs @ 12.07 hrs, Volume= 3,131 cf  
 Outflow = 0.94 cfs @ 12.08 hrs, Volume= 2,219 cf, Atten= 1%, Lag= 0.7 min  
 Primary = 0.94 cfs @ 12.08 hrs, Volume= 2,219 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.77' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 970 cf  
 Plug-Flow detention time= 166.7 min calculated for 2,219 cf (71% of inflow)  
 Center-of-Mass det. time= 75.1 min ( 838.2 - 763.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	No.2 Stone (Prismatic) Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	No.57 Stone (Prismatic) Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.94 cfs @ 12.08 hrs HW=25.77' TW=0.00' (Dynamic Tailwater)  
 1=Broad-Crested Rectangular Weir (Weir Controls 0.94 cfs @ 0.67 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 4.06" for 5-Year event  
 Inflow = 0.36 cfs @ 12.07 hrs, Volume= 1,208 cf  
 Outflow = 0.02 cfs @ 14.07 hrs, Volume= 245 cf  
 Primary = 0.02 cfs @ 14.07 hrs, Volume= 245 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.70' @ 14.07 hrs Surf.Area= 510 sf Storage= 964 cf

Plug-Flow detention time= 559.9 min calculated for 245 cf (20% of inflow)  
 Center-of-Mass det. time= 305.7 min ( 1,055.4 - 749.7 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	6.33'W x 80.50'L x 3.54'H Field A 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	Cultec R-330XLHD x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 1,073 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	6.0" Round 6" Culvert L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625' /- Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.02 cfs @ 14.07 hrs HW=25.70' TW=0.00' (Dynamic Tailwater)  
 1=2 - 2'x2' catch basins (Weir Controls 0.02 cfs @ 0.23 fps)  
 2=6" Culvert (Passes 0.02 cfs of 0.07 cfs potential flow)

**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 2.98" for 5-Year event  
 Inflow = 1.56 cfs @ 12.09 hrs, Volume= 4,977 cf  
 Primary = 1.56 cfs @ 12.09 hrs, Volume= 4,977 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 1.16" for 5-Year event  
 Inflow = 0.06 cfs @ 12.07 hrs, Volume= 427 cf  
 Primary = 0.06 cfs @ 12.07 hrs, Volume= 427 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 5S: Free release to POC A**  
 Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=2.91"  
 Tc=5.00 min UI Adjusted CN=80.2 Runoff=0.31 cfs 922 cf

**Subcatchment 6S: Buildings to Cultecs**  
 Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=4.76"  
 Tc=5.00 min CN=98.0 Runoff=0.76 cfs 2,603 cf

**Subcatchment 7S: Proposed to Low Point**  
 Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=4.57"  
 Tc=5.00 min CN=96.3 Runoff=1.11 cfs 3,693 cf

**Subcatchment 8S: Free release to Mission St.** Runoff Area=863 sf 15.41% Impervious Runoff Depth=3.15"  
 Tc=5.00 min CN=82.8 Runoff=0.08 cfs 227 cf

**Subcatchment 9S: Proposed to Mission St.** Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=4.76"  
 Tc=5.00 min CN=98.0 Runoff=0.41 cfs 1,416 cf

**Runoff = 0.31 cfs @ 12.07 hrs, Volume= 922 cf, Depth= 2.91"**

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=5.00"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UI Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Pond 10P: (24) R-330XLHD Units**  
 Peak Elev=27.41' Storage=594 cf Inflow=0.76 cfs 2,603 cf  
 Outflow=0.49 cfs 2,409 cf

**Pond 11P: Permeable Pavement**  
 Peak Elev=25.78' Storage=977 cf Inflow=1.11 cfs 3,693 cf  
 Outflow=1.10 cfs 2,781 cf

**Pond 12P: (11) R-330XLHD Units**  
 Peak Elev=25.71' Storage=965 cf Inflow=0.41 cfs 1,416 cf  
 Outflow=0.06 cfs 453 cf

**Link 13L: POC A**  
 Inflow=1.85 cfs 6,112 cf  
 Primary=1.85 cfs 6,112 cf

**Link 14L: POC B (Mission St.)**  
 Inflow=0.08 cfs 680 cf  
 Primary=0.08 cfs 680 cf

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.31 cfs @ 12.07 hrs, Volume= 922 cf, Depth= 2.91"

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=5.00"

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.76 cfs @ 12.07 hrs, Volume= 2,603 cf, Depth= 4.76"

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=5.00"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 1.11 cfs @ 12.07 hrs, Volume= 3,693 cf, Depth= 4.57"

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=5.00"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914		9.42% Pervious Area
8,791		90.58% Impervious Area
144		1.64% Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 227 cf, Depth= 3.15"  
 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=5.00"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730		84.59% Pervious Area
133		15.41% Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.41 cfs @ 12.07 hrs, Volume= 1,416 cf, Depth= 4.76"  
 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=5.00"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567		100.00% Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 4.76" for 10-Year event  
 Inflow = 0.76 cfs @ 12.07 hrs, Volume= 2,603 cf  
 Outflow = 0.49 cfs @ 12.16 hrs, Volume= 2,409 cf, Atten= 36%, Lag= 5.1 min  
 Primary = 0.49 cfs @ 12.16 hrs, Volume= 2,409 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.41' @ 12.16 hrs Surf.Area= 948 sf Storage= 594 cf

Plug-Flow detention time= 105.7 min calculated for 2,409 cf (93% of inflow)  
 Center-of-Mass det. time= 65.3 min ( 812.4 - 747.1 )

Volume	Invert	Avail.Storage	Storage	Description
#1A	26.40'	824 cf	20.83'W x 45.50'L x 3.54'H Field A	3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
#2A	26.90'	1,296 cf	Cultec R-330XLHD x 24 Inside #1	Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		2,121 cf		Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Device 1	26.90'	6.0" Round 6" Culvert L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310 /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.49 cfs @ 12.16 hrs HW=27.41' TW=0.00' (Dynamic Tailwater)  
 J=Broad-Crested Rectangular Weir (Passes 0.49 cfs of 129.46 cfs potential flow)  
 L=2=6" Culvert (inlet Controls 0.49 cfs @ 2.47 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 4.57" for 10-Year event  
 Inflow = 1.11 cfs @ 12.07 hrs, Volume= 3,693 cf  
 Outflow = 1.10 cfs @ 12.08 hrs, Volume= 2,781 cf, Atten= 1%, Lag= 0.7 min  
 Primary = 1.10 cfs @ 12.08 hrs, Volume= 2,781 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.78' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 977 cf  
 Plug-Flow detention time= 154.1 min calculated for 2.781 cf (75% of inflow)  
 Center-of-Mass det. time= 69.2 min ( 628.7 - 759.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	No.2 Stone (Prismatic) Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	No.57 Stone (Prismatic) Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary Outflow Max=1.10 cfs @ 12.08 hrs HW=25.78' TW=0.00' (Dynamic Tailwater)  
 1-Broad-Crested Rectangular Weir (Weir Controls 1.10 cfs @ 0.71 fps)

Summary for Pond 12P: (11) R-330XLHD Units

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 4.76" for 10-Year event  
 Inflow = 0.41 cfs @ 12.07 hrs, Volume= 1,416 cf  
 Outflow = 0.06 cfs @ 12.56 hrs, Volume= 453 cf, Atten= 86%, Lag= 29.1 min  
 Primary = 0.06 cfs @ 12.56 hrs, Volume= 453 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.71' @ 12.56 hrs Surf.Area= 510 sf Storage= 965 cf

Plug-Flow detention time= 396.7 min calculated for 453 cf (32% of inflow)  
 Center-of-Mass det. time= 210.0 min ( 957.1 - 747.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	6.33'W x 80.50'L x 3.54'H Field A 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	Culvert R-330XLHD x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 1,073 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	6.0" Round 6" Culvert L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625'/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary Outflow Max=0.06 cfs @ 12.56 hrs HW=25.71' TW=0.00' (Dynamic Tailwater)  
 1-2 - 2'x2' catch basins (Weir Controls 0.06 cfs @ 0.34 fps)  
 2-6" Culvert (Passes 0.06 cfs of 0.10 cfs potential flow)

Summary for Link 13L: POC A

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 3.66" for 10-Year event  
 Inflow = 1.85 cfs @ 12.09 hrs, Volume= 6,112 cf  
 Primary = 1.85 cfs @ 12.09 hrs, Volume= 6,112 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link 14L: POC B (Mission St.)

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 1.84" for 10-Year event  
 Inflow = 0.08 cfs @ 12.07 hrs, Volume= 680 cf  
 Primary = 0.08 cfs @ 12.07 hrs, Volume= 680 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 5S: Free release to POC A Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=3.53"  
 Tc=5.00 min UJ Adjusted CN=80.2 Runoff=0.37 cfs 1,118 cf
- Subcatchment 6S: Buildings to Cultecs Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=5.46"  
 Tc=5.00 min CN=98.0 Runoff=0.87 cfs 2,985 cf
- Subcatchment 7S: Proposed to Low Point Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=5.26"  
 Tc=5.00 min CN=96.3 Runoff=1.28 cfs 4,257 cf
- Subcatchment 8S: Free release to Mission St. Runoff Area=863 sf 15.41% Impervious Runoff Depth=3.79"  
 Tc=5.00 min CN=82.8 Runoff=0.09 cfs 273 cf
- Subcatchment 9S: Proposed to Mission St. Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=5.46"  
 Tc=5.00 min CN=98.0 Runoff=0.47 cfs 1,624 cf

- Pond 10P: (24) R-330XLHD Units Peak Elev=27.48' Storage=644 cf Inflow=0.87 cfs 2,985 cf  
 Outflow=0.54 cfs 2,791 cf
- Pond 11P: Permeable Pavement Peak Elev=25.79' Storage=983 cf Inflow=1.28 cfs 4,257 cf  
 Outflow=1.26 cfs 3,345 cf
- Pond 12P: (11) R-330XLHD Units Peak Elev=25.74' Storage=970 cf Inflow=0.47 cfs 1,624 cf  
 Outflow=0.18 cfs 661 cf
- Link 13L: POC A Inflow=2.12 cfs 7,254 cf  
 Primary=2.12 cfs 7,254 cf
- Link 14L: POC B (Mission St.) Inflow=0.22 cfs 934 cf  
 Primary=0.22 cfs 934 cf

Summary for Subcatchment 5S: Free release to POC A  
 Runoff = 0.37 cfs @ 12.07 hrs, Volume= 1,118 cf, Depth= 3.53"

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	Adj	Description		
0	98.0		Paved parking, HSG D		
3,700	80.0		>75% Grass cover, Good, HSG D		
0	98.0		Roofs, HSG D		
100	98.0		Unconnected pavement, HSG D		
3,800	80.5	80.2	Weighted Average, UJ Adjusted		
3,700			97.37% Pervious Area		
100			2.63% Impervious Area		
100			100.00% Unconnected		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Subcatchment 6S: Buildings to Cultecs  
 Runoff = 0.87 cfs @ 12.07 hrs, Volume= 2,985 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			
0	98.0	Paved parking, HSG D			
0	80.0	>75% Grass cover, Good, HSG D			
6,558	98.0	Roofs, HSG D			
0	98.0	Unconnected pavement, HSG D			
6,558	98.0	Weighted Average			
6,558		100.00% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.00					Direct Entry,

Summary for Subcatchment 7S: Proposed to Low Point  
 Runoff = 1.28 cfs @ 12.07 hrs, Volume= 4,257 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 25-Year Rainfall=5.70"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	9.42%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.09 cfs @ 12.07 hrs, Volume= 273 cf, Depth= 3.79"  
 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
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.47 cfs @ 12.07 hrs, Volume= 1,624 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
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event  
 Inflow = 0.87 cfs @ 12.07 hrs, Volume= 2,985 cf  
 Outflow = 0.54 cfs @ 12.16 hrs, Volume= 2,791 cf, Atten= 38%, Lag= 5.3 min  
 Primary = 0.54 cfs @ 12.16 hrs, Volume= 2,791 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.48' @ 12.16 hrs Surf.Area= 948 sf Storage= 644 cf

Plug-Flow detention time= 97.3 min calculated for 2,790 cf (93% of inflow)  
 Center-of-Mass det. time= 61.2 min ( 806.2 - 745.0 )

Volume	Invert	Avail. Storage	Storage Description
#1A	26.40'	824 cf	<b>20.83'W x 45.50'L x 3.54'H Field A</b> 3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
#2A	26.90'	1,296 cf	<b>Cultec R-330XLHD</b> x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.61 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32 <b>6.0" Round 6" Culvert</b> L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310' /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#2	Device 1	26.90'	

**Primary OutFlow** Max=0.54 cfs @ 12.16 hrs HW=27.48' TW=0.00' (Dynamic Tailwater)  
**1-Broad-Crested Rectangular Weir** (Passes 0.54 cfs of 136.61 cfs potential flow)  
**1-2-6" Culvert** (Inlet Controls 0.54 cfs @ 2.76 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 5.26" for 25-Year event  
 Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,257 cf  
 Outflow = 1.26 cfs @ 12.08 hrs, Volume= 3,345 cf, Atten= 1%, Lag= 0.6 min  
 Primary = 1.26 cfs @ 12.08 hrs, Volume= 3,345 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.79' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 983 cf  
 Plug-Flow detention time= 144.1 min calculated for 3,345 cf (79% of inflow)  
 Center-of-Mass det. time= 64.9 min ( 821.6 - 756.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	<b>No.2 Stone (Prismatic)</b> Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	<b>No.57 Stone (Prismatic)</b> Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
1,493 cf Total Available Storage			

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Primary Outflow** Max=1.26 cfs @ 12.08 hrs HW=25.79' TW=0.00' (Dynamic Tailwater)  
 ↳=Broad-Crested Rectangular Weir (Weir Controls 1.26 cfs @ 0.74 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event  
 Inflow = 0.47 cfs @ 12.07 hrs, Volume= 1,624 cf  
 Outflow = 0.18 cfs @ 12.28 hrs, Volume= 661 cf, Atten= 62%, Lag= 12.9 min  
 Primary = 0.18 cfs @ 12.28 hrs, Volume= 661 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.74' @ 12.28 hrs Surf.Area= 510 sf Storage= 970 cf

Plug-Flow detention time= 320.8 min calculated for 661 cf (41% of inflow)  
 Center-of-Mass det. time= 165.2 min ( 910.2 - 745.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	<b>6.33'W x 80.50'L x 3.54'H Field A</b> 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	<b>Cultec R-330XLHD</b> x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 1,073 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00</b> C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	<b>6.0" Round 6" Culvert</b> L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625' /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary Outflow** Max=0.18 cfs @ 12.28 hrs HW=25.74' TW=0.00' (Dynamic Tailwater)  
 ↳=2 - 2'x2' catch basins (Passes 0.18 cfs of 0.35 cfs potential flow)  
 ↳=2=6" Culvert (Inlet Controls 0.18 cfs @ 0.91 fps)

**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 4.34" for 25-Year event  
 Inflow = 2.12 cfs @ 12.08 hrs, Volume= 7,254 cf  
 Primary = 2.12 cfs @ 12.08 hrs, Volume= 7,254 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 2.53" for 25-Year event  
 Inflow = 0.22 cfs @ 12.28 hrs, Volume= 934 cf  
 Primary = 0.22 cfs @ 12.28 hrs, Volume= 934 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.44 cfs @ 12.07 hrs, Volume= 1,319 cf, Depth= 4.17"

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=6.40"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UI Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 3,367 cf, Depth= 6.16"

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=6.40"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 1.44 cfs @ 12.07 hrs, Volume= 4,821 cf, Depth= 5.96"

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=6.40"

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 5S: Free release to POC A**  
 Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=4.17"  
 Tc=5.00 min UI Adjusted CN=80.2 Runoff=0.44 cfs 1,319 cf

**Subcatchment 6S: Buildings to Cultecs**  
 Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=6.16"  
 Tc=5.00 min CN=98.0 Runoff=0.98 cfs 3,367 cf

**Subcatchment 7S: Proposed to Low Point**  
 Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=5.96"  
 Tc=5.00 min CN=96.3 Runoff=1.44 cfs 4,821 cf

**Subcatchment 8S: Free release to Mission St.** Runoff Area=863 sf 15.41% Impervious Runoff Depth=4.44"  
 Tc=5.00 min CN=82.8 Runoff=0.11 cfs 319 cf

**Subcatchment 9S: Proposed to Mission St.** Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=6.16"  
 Tc=5.00 min CN=98.0 Runoff=0.53 cfs 1,831 cf

**Pond 10P: (24) R-330XLHD Units**  
 Peak Elev=27.54' Storage=695 cf Inflow=0.98 cfs 3,367 cf  
 Outflow=0.59 cfs 3,173 cf

**Pond 11P: Permeable Pavement**  
 Peak Elev=25.79' Storage=989 cf Inflow=1.44 cfs 4,821 cf  
 Outflow=1.42 cfs 3,909 cf

**Pond 12P: (11) R-330XLHD Units**  
 Peak Elev=25.80' Storage=984 cf Inflow=0.53 cfs 1,831 cf  
 Outflow=0.30 cfs 869 cf

**Link 13L: POC A**  
 Inflow=2.39 cfs 8,401 cf  
 Primary=2.39 cfs 8,401 cf

**Link 14L: POC B (Mission St.)**  
 Inflow=0.37 cfs 1,188 cf  
 Primary=0.37 cfs 1,188 cf

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914		9.42% Pervious Area
8,791		90.58% Impervious Area
144		1.64% Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 319 cf, Depth= 4.44"  
 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=6.40"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730		84.59% Pervious Area
133		15.41% Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 1,831 cf, Depth= 6.16"  
 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=6.40"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567		100.00% Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 6.16" for 50-Year event  
 Inflow = 0.98 cfs @ 12.07 hrs, Volume= 3,367 cf  
 Outflow = 0.59 cfs @ 12.16 hrs, Volume= 3,173 cf, Atten= 39%, Lag= 5.5 min  
 Primary = 0.59 cfs @ 12.16 hrs, Volume= 3,173 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.54' @ 12.16 hrs Surf.Area= 948 sf Storage= 695 cf

Plug-Flow detention time= 90.8 min calculated for 3,173 cf (94% of inflow)  
 Center-of-Mass det. time= 57.7 min ( 801.0 - 743.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A 26.40'		824 cf	20.83'W x 45.50'L x 3.54'H Field A 3,357 cf Overall - 1,296 cf Embedded = 2,061 cf x 40.0% Voids
#2A 26.90'		1,296 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		2,121 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1 Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir	Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.62 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2 Device 1	26.90'	6.0" Round 6" Culvert	L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310' /' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary Outflow Max=0.59 cfs @ 12.16 hrs HW=27.54' TW=0.00' (Dynamic Tailwater)  
 Broad-Crested Rectangular Weir (Passes 0.59 cfs of 143.93 cfs potential flow)  
 L=2=6" Culvert (Inlet Controls 0.59 cfs @ 3.02 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 5.96" for 50-Year event  
 Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,821 cf  
 Outflow = 1.42 cfs @ 12.08 hrs, Volume= 3,909 cf, Atten= 1%, Lag= 0.6 min  
 Primary = 1.42 cfs @ 12.08 hrs, Volume= 3,909 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 25.79' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 989 cf

Plug-Flow detention time= 135.4 min calculated for 3,908 cf (81% of inflow)  
 Center-of-Mass det. time= 61.4 min ( 815.6 - 754.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	No.2 Stone (Prismatic) Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	No.57 Stone (Prismatic) Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.61 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary Outflow Max=1.42 cfs @ 12.08 hrs HW=25.79' TW=0.00' (Dynamic Tailwater)  
 1-1=Broad-Crested Rectangular Weir (Weir Controls 1.42 cfs @ 0.77 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area = 3,567 sf, 100.00% Impervious, Inflow Depth = 6.16" for 50-Year event  
 Inflow = 0.53 cfs @ 12.07 hrs, Volume= 1,831 cf  
 Outflow = 0.30 cfs @ 12.17 hrs, Volume= 869 cf, Atten= 43%, Lag= 6.1 min  
 Primary = 0.30 cfs @ 12.17 hrs, Volume= 869 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.80' @ 12.17 hrs Surf.Area= 510 sf Storage= 984 cf

Plug-Flow detention time= 278.7 min calculated for 869 cf (47% of inflow)  
 Center-of-Mass det. time= 140.9 min ( 884.2 - 743.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	6.33'W x 80.50'L x 3.54'H Field A 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	Cultec R-330XLHD x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 1,073 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	6.0" Round 6" Culvert L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625' /' Co= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Primary Outflow Max=0.30 cfs @ 12.17 hrs HW=25.80' TW=0.00' (Dynamic Tailwater)  
 1-1=2 - 2'x2' catch basins (Passes 0.30 cfs of 1.73 cfs potential flow)  
 1-2=6" Culvert (Inlet Controls 0.30 cfs @ 1.54 fps)

**Summary for Link 13L: POC A**

Inflow Area = 20,063 sf, 77.00% Impervious, Inflow Depth = 5.02" for 50-Year event  
 Inflow = 2.39 cfs @ 12.08 hrs, Volume= 8,401 cf  
 Primary = 2.39 cfs @ 12.08 hrs, Volume= 8,401 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area = 4,430 sf, 83.52% Impervious, Inflow Depth = 3.22" for 50-Year event  
 Inflow = 0.37 cfs @ 12.16 hrs, Volume= 1,188 cf  
 Primary = 0.37 cfs @ 12.16 hrs, Volume= 1,188 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 5S: Free release to POC A** Runoff Area=3,800 sf 2.63% Impervious Runoff Depth=4.90"  
 Tc=5.00 min UJ Adjusted CN=80.2 Runoff=0.51 cfs 1,552 cf

**Subcatchment 6S: Buildings to Cultecs** Runoff Area=6,558 sf 100.00% Impervious Runoff Depth=6.96"  
 Tc=5.00 min CN=98.0 Runoff=1.10 cfs 3,804 cf

**Subcatchment 7S: Proposed to Low Point** Runoff Area=9,705 sf 90.58% Impervious Runoff Depth=6.76"  
 Tc=5.00 min CN=96.3 Runoff=1.62 cfs 5,466 cf

**Subcatchment 8S: Free release to Mission St.** Runoff Area=863 sf 15.41% Impervious Runoff Depth=5.19"  
 Tc=5.00 min CN=82.8 Runoff=0.12 cfs 374 cf

**Subcatchment 9S: Proposed to Mission St.** Runoff Area=3,567 sf 100.00% Impervious Runoff Depth=6.96"  
 Tc=5.00 min CN=98.0 Runoff=0.60 cfs 2,069 cf

**Pond 10P: (24) R-330XLHD Units** Peak Elev=27.62' Storage=756 cf Inflow=1.10 cfs 3,804 cf  
 Outflow=0.65 cfs 3,610 cf

**Pond 11P: Permeable Pavement** Peak Elev=25.80' Storage=995 cf Inflow=1.62 cfs 5,466 cf  
 Outflow=1.61 cfs 4,554 cf

**Pond 12P: (11) R-330XLHD Units** Peak Elev=25.94' Storage=1,011 cf Inflow=0.60 cfs 2,069 cf  
 Outflow=0.46 cfs 1,106 cf

**Link 13L: POC A** Inflow=2.69 cfs 9,716 cf  
 Primary=2.69 cfs 9,716 cf

**Link 14L: POC B (Mission St.)** Inflow=0.56 cfs 1,480 cf  
 Primary=0.56 cfs 1,480 cf

**Summary for Subcatchment 5S: Free release to POC A**

Runoff = 0.51 cfs @ 12.07 hrs, Volume= 1,552 cf, Depth= 4.90"

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=7.20"

Area (sf)	CN	Adj	Description
0	98.0		Paved parking, HSG D
3,700	80.0		>75% Grass cover, Good, HSG D
0	98.0		Roofs, HSG D
100	98.0		Unconnected pavement, HSG D
3,800	80.5	80.2	Weighted Average, UJ Adjusted
3,700			97.37% Pervious Area
100			2.63% Impervious Area
100			100.00% Unconnected

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

**Summary for Subcatchment 6S: Buildings to Cultecs**

Runoff = 1.10 cfs @ 12.07 hrs, Volume= 3,804 cf, Depth= 6.96"

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=7.20"

Area (sf)	CN	Description
0	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
6,558	98.0	Roofs, HSG D
0	98.0	Unconnected pavement, HSG D
6,558	98.0	Weighted Average
6,558		100.00% Impervious Area

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

**Summary for Subcatchment 7S: Proposed to Low Point**

Runoff = 1.62 cfs @ 12.07 hrs, Volume= 5,466 cf, Depth= 6.76"

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=7.20"

Area (sf)	CN	Description
8,647	98.0	Paved parking, HSG D
914	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
144	98.0	Unconnected pavement, HSG D
9,705	96.3	Weighted Average
914	9.42%	Pervious Area
8,791	90.58%	Impervious Area
144	1.64%	Unconnected

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

**Summary for Subcatchment 8S: Free release to Mission St.**

Runoff = 0.12 cfs @ 12.07 hrs, Volume= 374 cf, Depth= 5.19"  
 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=7.20"

Area (sf)	CN	Description
133	98.0	Paved parking, HSG D
730	80.0	>75% Grass cover, Good, HSG D
0	98.0	Roofs, HSG D
863	82.8	Weighted Average
730	84.59%	Pervious Area
133	15.41%	Impervious Area

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

**Summary for Subcatchment 9S: Proposed to Mission St.**

Runoff = 0.60 cfs @ 12.07 hrs, Volume= 2,069 cf, Depth= 6.96"  
 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=7.20"

Area (sf)	CN	Description
1,242	98.0	Paved parking, HSG D
0	80.0	>75% Grass cover, Good, HSG D
2,325	98.0	Roofs, HSG D
3,567	98.0	Weighted Average
3,567	100.00%	Impervious Area

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

**Summary for Pond 10P: (24) R-330XLHD Units**

Inflow Area = 6,558 sf, 100.00% Impervious, Inflow Depth = 6.96" for 100-Year event  
 Inflow = 1.10 cfs @ 12.07 hrs, Volume= 3,804 cf  
 Outflow = 0.65 cfs @ 12.17 hrs, Volume= 3,610 cf, Atten= 41%, Lag= 5.8 min  
 Primary = 0.65 cfs @ 12.17 hrs, Volume= 3,610 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.62' @ 12.17 hrs Surf.Area= 948 sf Storage= 756 cf

Plug-Flow detention time= 84.2 min calculated for 3,609 cf (95% of inflow)  
 Center-of-Mass det. time= 54.4 min ( 796.0 - 741.6 )

Volume	Invert	Avail. Storage	Storage Description
#1A	26.40'	824 cf	<b>20.83'W x 45.50'L x 3.54'H Field A</b> 3,357 cf Overall - 1,296 cf Embodied = 2,061 cf x 40.0% Voids
#2A	26.90'	1,296 cf	<b>Cultec R-330XLHD</b> x 24 inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32 <b>6.0" Round 6" Culvert</b> L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 26.90' / 24.20' S= 0.0310 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#2	Device 1	26.90'	

**Primary OutFlow** Max=0.65 cfs @ 12.17 hrs HW=27.62' TW=0.00' (Dynamic Tailwater)  
**1-2-6" Culvert** (Inlet Controls 0.65 cfs @ 3.31 fps)

**Summary for Pond 11P: Permeable Pavement**

Inflow Area = 9,705 sf, 90.58% Impervious, Inflow Depth = 6.76" for 100-Year event  
 Inflow = 1.62 cfs @ 12.07 hrs, Volume= 5,466 cf  
 Outflow = 1.61 cfs @ 12.08 hrs, Volume= 4,554 cf, Atten= 1%, Lag= 0.6 min  
 Primary = 1.61 cfs @ 12.08 hrs, Volume= 4,554 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs



Peak Elev= 25.80' @ 12.08 hrs Surf.Area= 2,073 sf Storage= 995 cf

Plug-Flow detention time= 126.9 min calculated for 4,553 cf (83% of inflow)  
 Center-of-Mass det. time= 58.0 min ( 809.8 - 751.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	24.60'	1,327 cf	<b>No.2 Stone (Prismatic)</b> Listed below (Recalc) 3,317 cf Overall x 40.0% Voids
#2	26.20'	166 cf	<b>No.57 Stone (Prismatic)</b> Listed below (Recalc) 1,658 cf Overall x 10.0% Voids
			1,493 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
24.60	2,073	0	0
26.20	2,073	3,317	3,317

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.20	2,073	0	0
27.00	2,073	1,658	1,658

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Primary OutFlow** Max=1.61 cfs @ 12.08 hrs HW=25.80' TW=0.00' (Dynamic Tailwater)  
**1-1=Broad-Crested Rectangular Weir** (Weir Controls 1.61 cfs @ 0.80 fps)

**Summary for Pond 12P: (11) R-330XLHD Units**

Inflow Area =	3,567 sf, 100.00% impervious, Inflow Depth = 6.96" for 100-Year event
Inflow =	0.60 cfs @ 12.07 hrs, Volume= 2,069 cf
Outflow =	0.46 cfs @ 12.13 hrs, Volume= 1,106 cf, Atten= 23%, Lag= 3.7 min
Primary =	0.46 cfs @ 12.13 hrs, Volume= 1,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
 Peak Elev= 25.94' @ 12.13 hrs Surf.Area= 510 sf Storage= 1,011 cf

Plug-Flow detention time= 249.5 min calculated for 1,106 cf (53% of inflow)  
 Center-of-Mass det. time= 124.3 min ( 865.9 - 741.6 )

Volume	Invert	Avail.Storage	Storage Description
#1A	22.70'	488 cf	<b>6.33'W x 80.50'L x 3.54'H Field A</b> 1,806 cf Overall - 585 cf Embedded = 1,221 cf x 40.0% Voids
#2A	23.20'	585 cf	<b>Cultec R-330XLHD</b> x 11 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows  
 Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.70'	<b>24.0" x 24.0" Horiz. 2 - 2'x2' catch basins X 2.00</b> C= 0.600 Limited to weir flow at low heads
#2	Device 1	23.50'	<b>6.0" Round 6" Culvert</b> L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 23.50' / 23.00' S= 0.0625 1' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.46 cfs @ 12.13 hrs HW=25.94' TW=0.00' (Dynamic Tailwater)  
**1-1=2 - 2'x2' catch basins** (Passes 0.46 cfs of 6.00 cfs potential flow)  
**1-2=6" Culvert** (Inlet Controls 0.46 cfs @ 2.34 fps)

**Summary for Link 13L: POC A**

Inflow Area =	20,063 sf, 77.00% Impervious, Inflow Depth = 5.81" for 100-Year event
Inflow =	2.69 cfs @ 12.08 hrs, Volume= 9,716 cf
Primary =	2.69 cfs @ 12.08 hrs, Volume= 9,716 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 14L: POC B (Mission St.)**

Inflow Area =	4,430 sf, 83.52% Impervious, Inflow Depth = 4.01" for 100-Year event
Inflow =	0.56 cfs @ 12.12 hrs, Volume= 1,480 cf
Primary =	0.56 cfs @ 12.12 hrs, Volume= 1,480 cf, Atten= 0%, Lag= 0.0 min

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

**20PA\_Appendix\_B&C\_hydrocad**

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

Prepared by RVDI

Printed 5/2/2023

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**Stage-Area-Storage for Pond 10P: (24) R-330XLHD Units**

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
26.40	0	29.00	1,723
26.45	19	29.05	1,751
26.50	38	29.10	1,778
26.55	57	29.15	1,804
26.60	76	29.20	1,829
26.65	95	29.25	1,853
26.70	114	29.30	1,875
26.75	133	29.35	1,896
26.80	152	29.40	1,915
26.85	171	29.45	1,934
26.90	190	29.50	1,953
26.95	229	29.55	1,972
27.00	269	29.60	1,991
27.05	308	29.65	2,010
27.10	348	29.70	2,029
27.15	387	29.75	2,048
27.20	426	29.80	2,067
27.25	466	29.85	2,086
27.30	505	29.90	2,105
27.35	544		
27.40	583		
27.45	622		
27.50	661		
27.55	699		
27.60	738		
27.65	776		
27.70	814		
27.75	852		
27.80	890		
27.85	928		
27.90	966		
27.95	1,003		
28.00	1,041		
28.05	1,078		
28.10	1,116		
28.15	1,153		
28.20	1,190		
28.25	1,226		
28.30	1,262		
28.35	1,298		
28.40	1,333		
28.45	1,368		
28.50	1,403		
28.55	1,437		
28.60	1,471		
28.65	1,504		
28.70	1,537		
28.75	1,570		
28.80	1,601		
28.85	1,633		
28.90	1,663		
28.95	1,693		

**Stage-Area-Storage for Pond 11P: Permeable Pavement**

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
24.60	0	25.64	862	26.68	1,426
24.62	17	25.66	879	26.70	1,430
24.64	33	25.68	896	26.72	1,435
24.66	50	25.70	912	26.74	1,439
24.68	66	25.72	929	26.76	1,443
24.70	83	25.74	945	26.78	1,447
24.72	100	25.76	962	26.80	1,451
24.74	116	25.78	978	26.82	1,455
24.76	133	25.80	995	26.84	1,459
24.78	149	25.82	1,012	26.86	1,464
24.80	166	25.84	1,028	26.88	1,468
24.82	182	25.86	1,045	26.90	1,472
24.84	199	25.88	1,061	26.92	1,476
24.86	216	25.90	1,078	26.94	1,480
24.88	232	25.92	1,095	26.96	1,484
24.90	249	25.94	1,111	26.98	1,488
24.92	265	25.96	1,128	27.00	1,493
24.94	282	25.98	1,144		
24.96	299	26.00	1,161		
24.98	315	26.02	1,177		
25.00	332	26.04	1,194		
25.02	348	26.06	1,211		
25.04	365	26.08	1,227		
25.06	381	26.10	1,244		
25.08	398	26.12	1,260		
25.10	415	26.14	1,277		
25.12	431	26.16	1,294		
25.14	448	26.18	1,310		
25.16	464	26.20	1,327		
25.18	481	26.22	1,331		
25.20	498	26.24	1,335		
25.22	514	26.26	1,339		
25.24	531	26.28	1,343		
25.26	547	26.30	1,347		
25.28	564	26.32	1,352		
25.30	580	26.34	1,356		
25.32	597	26.36	1,360		
25.34	614	26.38	1,364		
25.36	630	26.40	1,368		
25.38	647	26.42	1,372		
25.40	663	26.44	1,376		
25.42	680	26.46	1,381		
25.44	697	26.48	1,385		
25.46	713	26.50	1,389		
25.48	730	26.52	1,393		
25.50	746	26.54	1,397		
25.52	763	26.56	1,401		
25.54	779	26.58	1,405		
25.56	796	26.60	1,410		
25.58	813	26.62	1,414		
25.60	829	26.64	1,418		
25.62	846	26.66	1,422		

**Stage-Area-Storage for Pond 12P: (11) R-330XLHD Units**

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
22.70	0	25.30	863
22.75	10	25.35	877
22.80	20	25.40	891
22.85	31	25.45	904
22.90	41	25.50	917
22.95	51	25.55	929
23.00	61	25.60	941
23.05	71	25.65	952
23.10	82	<u>25.70</u>	<u>963</u> <i>1005</i>
23.15	92	25.75	973
23.20	102	25.80	983
23.25	122	25.85	993
23.30	141	25.90	1,004
23.35	160	25.95	1,014
23.40	180	26.00	1,024
23.45	199	26.05	1,034
23.50	219	26.10	1,044
23.55	238	26.15	1,055
23.60	257	26.20	<b>1,065</b>
23.65	277		
23.70	296		
23.75	315		
23.80	334		
23.85	353		
23.90	372		
23.95	391		
24.00	410		
24.05	429		
24.10	447		
24.15	466		
24.20	485		
24.25	504		
24.30	522		
24.35	541		
24.40	559		
24.45	578		
24.50	596		
24.55	614		
24.60	632		
24.65	650		
24.70	667		
24.75	685		
24.80	702		
24.85	719		
24.90	736		
24.95	753		
25.00	769		
25.05	785		
25.10	801		
25.15	817		
25.20	833		
25.25	848		

## **Appendix “D”**

### **Pipe Conveyance Calculations**

Project ID: 20PA Appendix\_D Conveyance &amp; Outlet Protection\_00.xlsx

Date: 5/2/2023

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)
5S	3,800	100	80.5	0.37
6S	6,558	6,558	98.0	0.87
7S	9,705	8,791	96.3	1.28
8S	863	133	82.8	0.09
9S	3,567	3,567	98.0	0.47
10P	-	-	-	0.54
11P	-	-	-	1.26
12P	-	-	-	0.18

### 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 (inches)	Roughness (n)	Slope (%)	Contributing Watershed	25-Year Peak Design Flow (cfs)	Max Capacity (cfs)
1	6	0.011	2.0%	10P	0.18	0.94
2	6	0.011	3.0%	5S	0.37	1.15
3	8	0.011	2.5%	5S+10P+11P	2.17	2.26

**Appendix “E”**

**DCIA Worksheet**



Note to user: complete all cells of this color *only*

<b>Part 1: General Information</b>	
Project Name	Residential Development
Project Address	12, 16 & 18 Taylor Street
Project Applicant	G&T Taylor Street LLC
Date of Submittal	5/2/2023
Tax Account Number	001-9860

<b>Part 2: Project Details</b>	
1. What type of development is this? (choose from dropdown)	Redevelopment
2. What is the total area of the project site?	24,492 ft <sup>2</sup>
3. What is the total area of land disturbance for this project?	20,600 ft <sup>2</sup>
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 <u>current DCIA</u> for the site?	0 ft <sup>2</sup>
6. Will the proposed development increase <b>DCIA</b> (without consideration of proposed stormwater management)? (Yes/No)	No
7. What is the <u>proposed-development total impervious area</u> for the site?	19,149 ft <sup>2</sup>


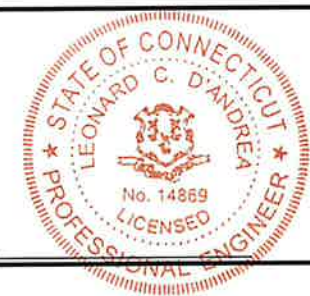
<b>Part 3: Water Quality Target Total</b>	
Does Standard 1 apply based on information above?	No, Skip to Part 4
Water Quality Volume (WQV)	N/A ft <sup>3</sup>
Standard 1 requirement	N/A
Required treatment/retention volume	N/A ft <sup>3</sup>
Provided treatment/retention volume for proposed development	N/A ft <sup>3</sup>

<b>Part 4: Proposed DCIA Tracking</b>	
<u>Pre-development total impervious area</u>	8,705 ft <sup>2</sup>
<u>Current DCIA</u>	0 ft <sup>2</sup>
<u>Proposed-development total impervious area</u>	19,149 ft <sup>2</sup>
<u>Proposed-development DCIA</u> (after stormwater management)	0 ft <sup>2</sup>
Net change in <b>DCIA</b> from <u>pre-development</u> to <u>proposed-development</u>	0 ft <sup>2</sup>

<b>Part 5: Post-Development (As-Built Certified) DCIA Tracking</b>	
<u>Post-development</u> (per as-built) <b>total impervious area</b>	ft <sup>2</sup>
<u>Post-development</u> (per as-built) <b>DCIA</b> (after stormwater management)	ft <sup>2</sup>
Net change in <b>DCIA</b> from <u>pre-development</u> to <u>post-development</u>	ft <sup>2</sup>

**Certification Statement**

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

Engineer's Signature:  Date: 5/2/23 Engineer's Seal: 



**Appendix “F”**  
**Soil Results Forms**

SOIL EVALUATION TEST RESULTS

Project Name: **Residential Development** Engineering Firm's Name: **D'Andrea Surveying & Engineering, P.C.**  
 Project Address: **12, 16 & 18 Taylor Street** Engineer's Name: **Leonard C. D'Andrea**

Test Pit or Soil Boring #:	1	Ground Elevation:	31.5
Elevation		Depth Range in Inches	0
31.5	Soil Texture (Percent Sand, Silt and Clay)		
	Topsoil		6
31.0	Light Brown Silty Loam		
28.5	Light Brown Silty Clay		36
23.4			97

Elevation	Depth in Inches
28.2	Mottling (Seasonally High Groundwater)
24.0	Groundwater
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.

Matthew M. Kivijarvi  
 Name of Test Conductor

  
 Signature of Test Conductor

5-2-2023  
 Date

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

Project Name: Residential Development Engineering Firm's Name: D'Andrea Surveying & Engineering, P.C.  
 Project Address: 12, 16 & 18 Taylor Street Engineer's Name: Leonard C. D'Andrea

Test Pit or Soil Boring #:	2	Ground Elevation:	25.6
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	
25.6	Topsoil		0
25.1	Light Brown Silty Loam		6
23.6	Light Brown Silt with Grey Clay		24
18.8			82

**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: \_\_\_\_\_

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

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

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 Name of Test Conductor

 \_\_\_\_\_  
 Signature of Test Conductor

5-2-2023 \_\_\_\_\_  
 Date

Project Name: Residential Development Engineering Firm's Name: D'Andrea Surveying & Engineering, P.C.  
 Project Address: 12, 16 & 18 Taylor Street Engineer's Name: Leonard C. D'Andrea

Test Pit or Soil Boring #:	3	Ground Elevation:	26.3
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	
26.3	Millings	0	
23.8	Light Brown Fine Loam	30	
22.3	Tan Fine Sand with Clay	48	
21.0	Sandy Gravel	64	
18.6		92	

**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: \_\_\_\_\_

Elevation	Depth in Inches
22.3	48
22.0	52
N/A	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.

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Matthew M. Kivijarvi  
 Name of Test Conductor

  
 Signature of Test Conductor

5-2-2023  
 Date

**Soil Evaluation**

5/2/2023

Project Name: Residential Development  
 Project Address: 12, 16 & 18 Taylor Street

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

Test Pit or Soil Boring #:	4	Ground Elevation:	32.8
Elevation		Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
32.8			0
32.2		Topsoil	7
30.8		Clean Fill; Brown Silty Sand	24
29.7		Light Brown Natural Loam	37
26.8		Tan Silty Fine Soil	72

**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: \_\_\_\_\_

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

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

**TEST CERTIFICATION**

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Matthew M. Kivijarvi  
 Name of Test Conductor

  
 Signature of Test Conductor  
 Date 5-2-2023