DRAINAGE SUMMARY REPORT

For

12 Walter Lane
Stamford, Connecticut

Prepared For

Chailin Barroso and Juan Antonio Castro

June 9, 2023

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

21JR_DSR_00

D'ANDREA SURVEYING & ENGINEERING, PC
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1. Stormwater Management Standards

1.1. Runoff and Pollution Reduction

Refer to Appendix "A" for Water Quality Volume and retention calculations. The proposed BMPs will provide adequate storage to retain and infiltrate the necessary water quality volume as determined by the Runoff and Pollutant Reduction Requirements Flowchart.

This volume will be retained and infiltrated by the proposed stormwater systems. Refer to Appendix "A" for 72-Hour Drawdown Calculations.

1.2. Peak Flow Control

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

Refer to Appendix "D" for Pipe Conveyance Calculations.

1.3. Construction Erosion and Sediment Control

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

1.4. Operations and Maintenance

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

1.5. Stormwater Management Report

The applicant is proposing to conduct site improvements on the subject property. Currently, the parcel supports a single-family dwelling, asphalt driveway, and various hardscapes. Vegetative cover at the property is primarily lawn with other ornamental plantings. The proposed improvements will include the construction of a dwelling addition and driveway modifications. 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 Walter Lane, Stamford, Connecticut, prepared for Chailin Barroso and Juan Antonio Castro".

The subject parcel is 44,937 square feet in size and is at the southwest corner of the intersection of Walter Lane and Den Road. The proposed redevelopment of the parcel will increase the impervious coverage by approximately 1,049 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
Castro
12 Walter Lane, Stamford, CT
Project ID: 21JR

POC	1 Year Storm				2 Year Storm				5 Year Storm				10 Year Storm				25 Year Storm				50 Year Storm				100 year Storm			
	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)	q_{ex} (ft^3/s)	q_p (ft^3/s)	Δq (ft^3/s)	$\%\Delta q$ (ft^3/s)
A	1.04	1.02	-0.02	-2%	1.50	1.47	-0.03	-2%	2.30	2.25	-0.05	-2%	2.88	2.84	-0.04	-1%	3.47	3.45	-0.02	-1%	4.06	4.06	0.00	0%	4.74	4.75	0.01	0%

Table 1: Comparison of Exising 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_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)	v_{ex} (cf)	v_p (cf)	Δv (cf)	$\%\Delta v$ (cf)
A	4,206	4,143	-63	-1%	5,955	5,908	-47	-1%	9,089	9,061	-28	0%	11,389	11,371	-18	0%	13,750	13,740	-10	0%	16,154	16,152	-2	0%	18,944	18,948	4	0%

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

Exhibits "A & B"

Existing and Proposed Watershed Maps

1 INCH = 60 FEET

SCALE

60 0 60

IN FEET

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EXHIBIT "A"
EXISTING CONDITIONS

21JR_DSR_EX_0.DWG (MMK)

21JR

1 INCH = 60 FEET

SCALE

60 0 60

IN FEET

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EXHIBIT "B"
PROPOSED CONDITIONS

21JR_DSR_PRO_0.DWG (MMK)

21JR

Exhibit "C"

USDA Soil Delineation Map

Hydrologic Soil Group—State of Connecticut

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	D	0.3	24.2%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	C/D	0.9	75.8%
Totals for Area of Interest			**1.2**	**100.0%**

Description

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

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

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

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

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

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

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

Exhibit "D"

Site Vicinity Map

Google Maps 12 Walter Ln

Appendix "A"

Drainage System
Design Calculations

BMP Drawdown Calculations:

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

Retention System #1: Permeable Pavement

$t_{drawdown}$ = DV/kA

Where:

DV =	Design Volume	=	186	ft^3
k =	Infiltration Rate	=	0.06	inches/hr
A =	Bottom Area	=	930	ft^2

$t_{drawdown}$ = **40.0 hours** **Drawdown Requirement Satisfied**

Appendix "B"

HydroCAD Analysis – Existing Conditions

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
40,265	80.0	>75% Grass cover, Good, HSG D (1S)
2,021	98.0	Paved parking, HSG D (1S)
1,400	98.0	Roofs, HSG D (1S)
1,251	98.0	Unconnected pavement, HSG D (1S)
44,937	**81.9**	**TOTAL AREA**

Summary for Subcatchment 1S: Existing Conditions

Runoff = 3.47 cfs @ 12.18 hrs, Volume= 13,750 cf, Depth= 3.67"

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

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Subcatchment 1S: Existing Conditions

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 3.47 cfs @ 12.18 hrs, Volume= 13,750 cf
Primary = 3.47 cfs @ 12.18 hrs, Volume= 13,750 cf, Atten= 0%, Lag= 0.0 min

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

Link 2L: POC A (Lake Claire)

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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=1.12"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=1.04 cfs 4,206 cf

Link 2L: POC A (Lake Claire) Inflow=1.04 cfs 4,206 cf
Primary=1.04 cfs 4,206 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 1.04 cfs @ 12.20 hrs, Volume= 4,206 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	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 1.12" for 1-Year event
Inflow = 1.04 cfs @ 12.20 hrs, Volume= 4,206 cf
Primary = 1.04 cfs @ 12.20 hrs, Volume= 4,206 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=1.59"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=1.50 cfs 5,955 cf

Link 2L: POC A (Lake Claire) Inflow=1.50 cfs 5,955 cf
Primary=1.50 cfs 5,955 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 1.50 cfs @ 12.19 hrs, Volume= 5,955 cf, Depth= 1.59"

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
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 1.59" for 2-Year event
Inflow = 1.50 cfs @ 12.19 hrs, Volume= 5,955 cf
Primary = 1.50 cfs @ 12.19 hrs, Volume= 5,955 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=2.43"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=2.30 cfs 9,089 cf

Link 2L: POC A (Lake Claire) Inflow=2.30 cfs 9,089 cf
Primary=2.30 cfs 9,089 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 2.30 cfs @ 12.19 hrs, Volume= 9,089 cf, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-Year Rainfall=4.30"

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 2.43" for 5-Year event
Inflow = 2.30 cfs @ 12.19 hrs, Volume= 9,089 cf
Primary = 2.30 cfs @ 12.19 hrs, Volume= 9,089 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=3.04"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=2.88 cfs 11,389 cf

Link 2L: POC A (Lake Claire) Inflow=2.88 cfs 11,389 cf
Primary=2.88 cfs 11,389 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 2.88 cfs @ 12.18 hrs, Volume= 11,389 cf, Depth= 3.04"

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 10-Year Rainfall=5.00"

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 3.04" for 10-Year event
Inflow = 2.88 cfs @ 12.18 hrs, Volume= 11,389 cf
Primary = 2.88 cfs @ 12.18 hrs, Volume= 11,389 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=3.67"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=3.47 cfs 13,750 cf

Link 2L: POC A (Lake Claire) Inflow=3.47 cfs 13,750 cf
Primary=3.47 cfs 13,750 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 3.47 cfs @ 12.18 hrs, Volume= 13,750 cf, Depth= 3.67"

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

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 3.47 cfs @ 12.18 hrs, Volume= 13,750 cf
Primary = 3.47 cfs @ 12.18 hrs, Volume= 13,750 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=4.31"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=4.06 cfs 16,154 cf

Link 2L: POC A (Lake Claire) Inflow=4.06 cfs 16,154 cf
Primary=4.06 cfs 16,154 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 4.06 cfs @ 12.18 hrs, Volume= 16,154 cf, Depth= 4.31"

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 50-Year Rainfall=6.40"

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 4.31" for 50-Year event
Inflow = 4.06 cfs @ 12.18 hrs, Volume= 16,154 cf
Primary = 4.06 cfs @ 12.18 hrs, Volume= 16,154 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 Conditions Runoff Area=44,937 sf 10.40% Impervious Runoff Depth=5.06"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.6 Runoff=4.74 cfs 18,944 cf

Link 2L: POC A (Lake Claire) Inflow=4.74 cfs 18,944 cf
Primary=4.74 cfs 18,944 cf

Summary for Subcatchment 1S: Existing Conditions

Runoff = 4.74 cfs @ 12.18 hrs, Volume= 18,944 cf, Depth= 5.06"

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 100-Year Rainfall=7.20"

Area (sf)	CN	Adj	Description
2,021	98.0		Paved parking, HSG D
1,400	98.0		Roofs, HSG D
1,251	98.0		Unconnected pavement, HSG D
40,265	80.0		>75% Grass cover, Good, HSG D
44,937	81.9	81.6	Weighted Average, UI Adjusted
40,265			89.60% Pervious Area
4,672			10.40% Impervious Area
1,251			26.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Link 2L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 10.40% Impervious, Inflow Depth = 5.06" for 100-Year event
Inflow = 4.74 cfs @ 12.18 hrs, Volume= 18,944 cf
Primary = 4.74 cfs @ 12.18 hrs, Volume= 18,944 cf, Atten= 0%, Lag= 0.0 min

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

Appendix "C"

HydroCAD Analysis – Proposed Conditions

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
39,216	80.0	>75% Grass cover, Good, HSG D (3S, 4S)
1,482	98.0	Paved parking, HSG D (3S, 4S)
3,042	98.0	Roofs, HSG D (3S)
1,197	98.0	Unconnected pavement, HSG D (3S, 4S)
44,937	**82.3**	**TOTAL AREA**

Summary for Subcatchment 3S: Existing to Remain

Runoff = 3.39 cfs @ 12.18 hrs, Volume= 13,460 cf, Depth= 3.68"

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 25-Year Rainfall=5.70"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Subcatchment 3S: Existing to Remain

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 467 cf, Depth= 5.25"

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
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Subcatchment 4S: Impervious to Drainage System

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 5.25" for 25-Year event
Inflow = 0.14 cfs @ 12.07 hrs, Volume= 467 cf
Outflow = 0.06 cfs @ 12.23 hrs, Volume= 280 cf, Atten= 56%, Lag= 9.5 min
Primary = 0.06 cfs @ 12.23 hrs, Volume= 280 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.45' @ 12.23 hrs Surf.Area= 930 sf Storage= 240 cf

Plug-Flow detention time= 243.4 min calculated for 280 cf (60% of inflow)
Center-of-Mass det. time= 135.7 min (893.0 - 757.3)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.23 hrs HW=271.45' TW=0.00' (Dynamic Tailwater)
└**1=6" PVC Orifice** (Orifice Controls 0.06 cfs @ 1.30 fps)

Pond 5P: Permeable Driveway

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 3.45 cfs @ 12.18 hrs, Volume= 13,740 cf
Primary = 3.45 cfs @ 12.18 hrs, Volume= 13,740 cf, Atten= 0%, Lag= 0.0 min

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

Link 6L: POC A (Lake Claire)

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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=1.13"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=1.02 cfs 4,128 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=2.28"
Tc=5.00 min CN=96.2 Runoff=0.06 cfs 202 cf

Pond 5P: Permeable Driveway Peak Elev=271.31' Storage=192 cf Inflow=0.06 cfs 202 cf
Outflow=0.00 cfs 15 cf

Link 6L: POC A (Lake Claire) Inflow=1.02 cfs 4,143 cf
Primary=1.02 cfs 4,143 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 1.02 cfs @ 12.20 hrs, Volume= 4,128 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 202 cf, Depth= 2.28"

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 1-Year Rainfall=2.70"

Area (sf)	CN	Description
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 2.28" for 1-Year event
Inflow = 0.06 cfs @ 12.07 hrs, Volume= 202 cf
Outflow = 0.00 cfs @ 21.92 hrs, Volume= 15 cf, Atten= 99%, Lag= 591.2 min
Primary = 0.00 cfs @ 21.92 hrs, Volume= 15 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.31' @ 21.92 hrs Surf.Area= 930 sf Storage= 192 cf

Plug-Flow detention time= 925.2 min calculated for 15 cf (8% of inflow)
Center-of-Mass det. time= 614.5 min (1,391.0 - 776.5)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.00 cfs @ 21.92 hrs HW=271.31' TW=0.00' (Dynamic Tailwater)
↑—**1=6" PVC Orifice** (Orifice Controls 0.00 cfs @ 0.42 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 1.11" for 1-Year event
Inflow = 1.02 cfs @ 12.20 hrs, Volume= 4,143 cf
Primary = 1.02 cfs @ 12.20 hrs, Volume= 4,143 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=1.60"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=1.47 cfs 5,840 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=2.87"
Tc=5.00 min CN=96.2 Runoff=0.08 cfs 255 cf

Pond 5P: Permeable Driveway Peak Elev=271.33' Storage=198 cf Inflow=0.08 cfs 255 cf
Outflow=0.00 cfs 68 cf

Link 6L: POC A (Lake Claire) Inflow=1.47 cfs 5,908 cf
Primary=1.47 cfs 5,908 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 1.47 cfs @ 12.19 hrs, Volume= 5,840 cf, Depth= 1.60"

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
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 255 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 2.87" for 2-Year event
Inflow = 0.08 cfs @ 12.07 hrs, Volume= 255 cf
Outflow = 0.00 cfs @ 14.78 hrs, Volume= 68 cf, Atten= 96%, Lag= 162.5 min
Primary = 0.00 cfs @ 14.78 hrs, Volume= 68 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.33' @ 14.78 hrs Surf.Area= 930 sf Storage= 198 cf

Plug-Flow detention time= 498.3 min calculated for 68 cf (27% of inflow)
Center-of-Mass det. time= 321.2 min (1,092.0 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.00 cfs @ 14.78 hrs HW=271.33' TW=0.00' (Dynamic Tailwater)
↑—**1=6" PVC Orifice** (Orifice Controls 0.00 cfs @ 0.61 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 1.47 cfs @ 12.19 hrs, Volume= 5,908 cf
Primary = 1.47 cfs @ 12.19 hrs, Volume= 5,908 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=2.44"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=2.25 cfs 8,905 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=3.86"
Tc=5.00 min CN=96.2 Runoff=0.10 cfs 343 cf

Pond 5P: Permeable Driveway Peak Elev=271.38' Storage=214 cf Inflow=0.10 cfs 343 cf
Outflow=0.02 cfs 156 cf

Link 6L: POC A (Lake Claire) Inflow=2.25 cfs 9,061 cf
Primary=2.25 cfs 9,061 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 2.25 cfs @ 12.19 hrs, Volume= 8,905 cf, Depth= 2.44"

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 5-Year Rainfall=4.30"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.10 cfs @ 12.07 hrs, Volume= 343 cf, Depth= 3.86"

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
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 3.86" for 5-Year event
Inflow = 0.10 cfs @ 12.07 hrs, Volume= 343 cf
Outflow = 0.02 cfs @ 12.52 hrs, Volume= 156 cf, Atten= 83%, Lag= 26.9 min
Primary = 0.02 cfs @ 12.52 hrs, Volume= 156 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.38' @ 12.52 hrs Surf.Area= 930 sf Storage= 214 cf

Plug-Flow detention time= 318.8 min calculated for 156 cf (45% of inflow)
Center-of-Mass det. time= 189.7 min (953.5 - 763.8)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.02 cfs @ 12.52 hrs HW=271.38' TW=0.00' (Dynamic Tailwater)
└**1=6" PVC Orifice** (Orifice Controls 0.02 cfs @ 0.94 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 2.42" for 5-Year event
Inflow = 2.25 cfs @ 12.19 hrs, Volume= 9,061 cf
Primary = 2.25 cfs @ 12.19 hrs, Volume= 9,061 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=3.05"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=2.82 cfs 11,154 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=4.56"
Tc=5.00 min CN=96.2 Runoff=0.12 cfs 405 cf

Pond 5P: Permeable Driveway Peak Elev=271.41' Storage=228 cf Inflow=0.12 cfs 405 cf
Outflow=0.04 cfs 218 cf

Link 6L: POC A (Lake Claire) Inflow=2.84 cfs 11,371 cf
Primary=2.84 cfs 11,371 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 2.82 cfs @ 12.18 hrs, Volume= 11,154 cf, Depth= 3.05"

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 10-Year Rainfall=5.00"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.12 cfs @ 12.07 hrs, Volume= 405 cf, Depth= 4.56"

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
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 4.56" for 10-Year event
Inflow = 0.12 cfs @ 12.07 hrs, Volume= 405 cf
Outflow = 0.04 cfs @ 12.36 hrs, Volume= 218 cf, Atten= 69%, Lag= 17.4 min
Primary = 0.04 cfs @ 12.36 hrs, Volume= 218 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.41' @ 12.36 hrs Surf.Area= 930 sf Storage= 228 cf

Plug-Flow detention time= 271.0 min calculated for 218 cf (54% of inflow)
Center-of-Mass det. time= 155.3 min (915.5 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.04 cfs @ 12.36 hrs HW=271.41' TW=0.00' (Dynamic Tailwater)
↑—**1=6" PVC Orifice** (Orifice Controls 0.04 cfs @ 1.14 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 3.04" for 10-Year event
Inflow = 2.84 cfs @ 12.19 hrs, Volume= 11,371 cf
Primary = 2.84 cfs @ 12.19 hrs, Volume= 11,371 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=3.68"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=3.39 cfs 13,460 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=5.25"
Tc=5.00 min CN=96.2 Runoff=0.14 cfs 467 cf

Pond 5P: Permeable Driveway Peak Elev=271.45' Storage=240 cf Inflow=0.14 cfs 467 cf
Outflow=0.06 cfs 280 cf

Link 6L: POC A (Lake Claire) Inflow=3.45 cfs 13,740 cf
Primary=3.45 cfs 13,740 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 3.39 cfs @ 12.18 hrs, Volume= 13,460 cf, Depth= 3.68"

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 25-Year Rainfall=5.70"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 467 cf, Depth= 5.25"

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
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 5.25" for 25-Year event
Inflow = 0.14 cfs @ 12.07 hrs, Volume= 467 cf
Outflow = 0.06 cfs @ 12.23 hrs, Volume= 280 cf, Atten= 56%, Lag= 9.5 min
Primary = 0.06 cfs @ 12.23 hrs, Volume= 280 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.45' @ 12.23 hrs Surf.Area= 930 sf Storage= 240 cf

Plug-Flow detention time= 243.4 min calculated for 280 cf (60% of inflow)
Center-of-Mass det. time= 135.7 min (893.0 - 757.3)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.23 hrs HW=271.45' TW=0.00' (Dynamic Tailwater)
└**1=6" PVC Orifice** (Orifice Controls 0.06 cfs @ 1.30 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 3.45 cfs @ 12.18 hrs, Volume= 13,740 cf
Primary = 3.45 cfs @ 12.18 hrs, Volume= 13,740 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=4.32"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=3.97 cfs 15,810 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=5.95"
Tc=5.00 min CN=96.2 Runoff=0.16 cfs 528 cf

Pond 5P: Permeable Driveway Peak Elev=271.48' Storage=253 cf Inflow=0.16 cfs 528 cf
Outflow=0.09 cfs 342 cf

Link 6L: POC A (Lake Claire) Inflow=4.06 cfs 16,152 cf
Primary=4.06 cfs 16,152 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 3.97 cfs @ 12.18 hrs, Volume= 15,810 cf, Depth= 4.32"

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
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 528 cf, Depth= 5.95"

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
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 5.95" for 50-Year event
Inflow = 0.16 cfs @ 12.07 hrs, Volume= 528 cf
Outflow = 0.09 cfs @ 12.17 hrs, Volume= 342 cf, Atten= 42%, Lag= 5.9 min
Primary = 0.09 cfs @ 12.17 hrs, Volume= 342 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.48' @ 12.17 hrs Surf.Area= 930 sf Storage= 253 cf

Plug-Flow detention time= 224.7 min calculated for 342 cf (65% of inflow)
Center-of-Mass det. time= 123.2 min (878.0 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.09 cfs @ 12.17 hrs HW=271.48' TW=0.00' (Dynamic Tailwater)
↑—**1=6" PVC Orifice** (Orifice Controls 0.09 cfs @ 1.44 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 4.31" for 50-Year event
Inflow = 4.06 cfs @ 12.18 hrs, Volume= 16,152 cf
Primary = 4.06 cfs @ 12.18 hrs, Volume= 16,152 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 3S: Existing to Remain Runoff Area=43,871 sf 10.85% Impervious Runoff Depth=5.07"
Flow Length=174' Tc=13.68 min UI Adjusted CN=81.7 Runoff=4.63 cfs 18,536 cf

Subcatchment 4S: Impervious to Drainage Runoff Area=1,066 sf 89.96% Impervious Runoff Depth=6.75"
Tc=5.00 min CN=96.2 Runoff=0.18 cfs 599 cf

Pond 5P: Permeable Driveway Peak Elev=271.51' Storage=264 cf Inflow=0.18 cfs 599 cf
Outflow=0.12 cfs 412 cf

Link 6L: POC A (Lake Claire) Inflow=4.75 cfs 18,948 cf
Primary=4.75 cfs 18,948 cf

Summary for Subcatchment 3S: Existing to Remain

Runoff = 4.63 cfs @ 12.18 hrs, Volume= 18,536 cf, Depth= 5.07"

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 100-Year Rainfall=7.20"

Area (sf)	CN	Adj	Description
552	98.0		Paved parking, HSG D
3,042	98.0		Roofs, HSG D
1,168	98.0		Unconnected pavement, HSG D
39,109	80.0		>75% Grass cover, Good, HSG D
43,871	82.0	81.7	Weighted Average, UI Adjusted
39,109			89.15% Pervious Area
4,762			10.85% Impervious Area
1,168			24.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.28	100	0.0090	0.13		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.30"
0.40	74	0.0419	3.07		**Shallow Concentrated Flow, Lawn** Grassed Waterway Kv= 15.0 fps
13.68	174	Total			

Summary for Subcatchment 4S: Impervious to Drainage System

Runoff = 0.18 cfs @ 12.07 hrs, Volume= 599 cf, Depth= 6.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.20"

Area (sf)	CN	Description
930	98.0	Paved parking, HSG D
0	98.0	Roofs, HSG D
29	98.0	Unconnected pavement, HSG D
107	80.0	>75% Grass cover, Good, HSG D
1,066	96.2	Weighted Average
107		10.04% Pervious Area
959		89.96% Impervious Area
29		3.02% Unconnected

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

Summary for Pond 5P: Permeable Driveway

Inflow Area = 1,066 sf, 89.96% Impervious, Inflow Depth = 6.75" for 100-Year event
Inflow = 0.18 cfs @ 12.07 hrs, Volume= 599 cf
Outflow = 0.12 cfs @ 12.15 hrs, Volume= 412 cf, Atten= 31%, Lag= 4.5 min
Primary = 0.12 cfs @ 12.15 hrs, Volume= 412 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 271.51' @ 12.15 hrs Surf.Area= 930 sf Storage= 264 cf

Plug-Flow detention time= 209.4 min calculated for 412 cf (69% of inflow)
Center-of-Mass det. time= 113.4 min (865.8 - 752.4)

Volume	Invert	Avail.Storage	Storage Description
#1	272.10'	37 cf	**Permeable Surface (Prismatic)** Listed below (Recalc) 372 cf Overall x 10.0% Voids
#2	271.70'	74 cf	**Base Course (No.57 Stone) (Prismatic)** Listed below (Recalc) 372 cf Overall x 20.0% Voids
#3	270.80'	335 cf	**Reservoir Course (No.2 Stone) (Prismatic)** Listed below (Recalc) 837 cf Overall x 40.0% Voids
		446 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.10	930	0	0
272.50	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.70	930	0	0
272.10	930	372	372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.80	930	0	0
271.70	930	837	837

Device	Routing	Invert	Outlet Devices
#1	Primary	271.30'	**6.0" Vert. 6" PVC Orifice** C= 0.600

Primary OutFlow Max=0.12 cfs @ 12.15 hrs HW=271.51' TW=0.00' (Dynamic Tailwater)
↑—**1=6" PVC Orifice** (Orifice Controls 0.12 cfs @ 1.56 fps)

Summary for Link 6L: POC A (Lake Claire)

Inflow Area = 44,937 sf, 12.73% Impervious, Inflow Depth = 5.06" for 100-Year event
Inflow = 4.75 cfs @ 12.18 hrs, Volume= 18,948 cf
Primary = 4.75 cfs @ 12.18 hrs, Volume= 18,948 cf, Atten= 0%, Lag= 0.0 min

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

Stage-Area-Storage for Pond 5P: Permeable Driveway

Elevation (feet)	Storage (cubic-feet)
270.80	0
270.82	7
270.84	15
270.86	22
270.88	30
270.90	37
270.92	45
270.94	52
270.96	60
270.98	67
271.00	74
271.02	82
271.04	89
271.06	97
271.08	104
271.10	112
271.12	119
271.14	126
271.16	134
271.18	141
271.20	149
271.22	156
271.24	164
271.26	171
271.28	179
OUT 271.30	186
271.32	193
271.34	201
271.36	208
271.38	216
271.40	223
271.42	231
271.44	238
271.46	246
271.48	253
271.50	260
271.52	268
271.54	275
271.56	283
271.58	290
271.60	298
271.62	305
271.64	312
271.66	320
271.68	327
271.70	335
271.72	339
271.74	342
271.76	346
271.78	350
271.80	353
271.82	357
271.84	361
271.86	365
271.88	368
271.90	372
271.92	376
271.94	379
271.96	383
271.98	387
272.00	391
272.02	394
272.04	398
272.06	402
272.08	405
272.10	409
272.12	411
272.14	413
272.16	415
272.18	417
272.20	418
272.22	420
272.24	422
272.26	424
272.28	426
272.30	428
272.32	430
272.34	432
272.36	433
272.38	435
272.40	437
272.42	439
272.44	441
272.46	443
272.48	445
272.50	**446**

Appendix "D"

Pipe Conveyance Calculations

Project ID: 21JR_Appendix_D_Conveyance_&_Outlet_Protection_00.xlsx **Date:** 6/9/2023

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 HyrdoCAD 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)
3S	43,871	4,762	82.0	3.39
4S	1,066	959	96.2	0.14
5P	-	-	-	0.06

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*)	Rougness (*n*)	Slope (%)	Contributing Watershed	25-Year Peak Design Flow (*cfs*)	Max Capacity (*cfs*)
1	4	0.011	16.0%	5P	0.06	0.90

Appendix "E"

DCIA Worksheet

Directly Connected Impervious Area Tracking Worksheet
City of Stamford Drainage Manual

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

Part 1: General Information

Project Name	Residential Improvements
Project Address	12 Walter Lane
Project Applicant	Chailin Barroso and Juan Antonio Castro
Date of Submittal	6/9/2023
Tax Account Number	002-5455

Part 2: Project Details

1. What type of development is this? (choose from dropdown)	Redevelopment	
2. What is the total area of the project site?	44,937	ft^2
3. What is the total area of land disturbance for this project?	11,000	ft^2
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
5. What is the current ***DCIA*** for the site?	0	ft^2
6. Will the proposed development increase ***DCIA*** (without consideration of proposed stormwater management)? (Yes/No)	No	
7. What is the proposed-development ***total impervious area*** for the site?	5,721	ft^2

Part 3: Water Quality Target Total

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

Part 4: Proposed DCIA Tracking

Pre-development ***total impervious area***	4,672	ft^2
Current ***DCIA***	0	ft^2
Proposed-development ***total impervious area***	5,721	ft^2
Proposed-development ***DCIA*** (after stormwater management)	0	ft^2
Net change in ***DCIA*** from pre-development to proposed-development	0	ft^2

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

Post-development (per as-built) ***total impervious area***		ft^2
Post-development (per as-built) ***DCIA*** (after stormwater management)		ft^2
Net change in ***DCIA*** from pre-development to post-development		ft^2

Certification Statement

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

Engineer's Signature _____ Date 6/9/23 Engineer's Seal _____

STATE OF CONNECTICUT
LEONARD C. D'ANDREA
No. 14869
LICENSED
PROFESSIONAL ENGINEER

Appendix "F"

Soil Results Forms

SOIL EVALUATION TEST RESULTS

Project Name: **Residential Improvements**

Project Address: **12 Walter Lane**

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

Engineer's Name: **Leonard C. D'Andrea**

Test Pit or Soil Boring #: 1 **Ground Elevation:** 272.3

Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
272.3		0
	Topsoil	
271.3		12
	Brown Silty Loam	
269.8		30
	Grey Mottled Silty Soil	
266.3		72

Elevation		Depth in Inches
269.8	Mottling (Seasonally High Groundwater)	30
268.8	Groundwater	42
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

_____ Amoozemeter 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. Kivijarv		6-9-23
Name of Test Conductor	Signature of Test Conductor	Date

Project Name: **Residential Improvements**

Project Address: **12 Walter Lane**

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

Engineer's Name: **Leonard C. D'Andrea**

Test Pit or Soil Boring #: 2 **Ground Elevation: 270.9**

Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
270.9		0
	Topsoil	
270.4		6
	Brown Silty Loam	
268.5		29
	Grey Mottled Silty Soil	
265.1		70

Elevation		Depth in Inches
268.5	Mottling (Seasonally High Groundwater)	29
267.6	Groundwater	40
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

_____ Amoozemeter 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. Kivijarv
Name of Test Conductor

Signature of Test Conductor

6-9-23
Date