

# **STORMWATER MANAGEMENT REPORT**

**For**

**RESIDENTIAL**

**4 STORY MULTI-FAMILY**

**61 LIBERTY**

**Block 6303, Lot 2**

**JERSEY CITY**

**HUDSON COUNTY, NJ**

**FEB 25, 2022**

Prepared by

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## Table of contents:

Cover

Page 1 Introduction

Page 3 Summary of Flows

Page 4 **Existing Condition Routing Diagram (SCS) Node Summaries**

Page 5 Existing Condition Water Quality

Page 6 Existing Condition 2 Year Storm

Page 7 Existing Condition 10 Year Storm

Page 8 Existing Condition 100 Year Storm

Page 9 **Existing Condition Routing Diagram (DELMARVA) Node Summaries**

Page 10 Existing Condition Water Quality Storm

Page 11 Existing Condition 2 Year Storm

Page 12 Existing Condition 10 Year Storm

Page 13 Existing Condition 100 Year Storm

Page 14 **Proposed Condition (SCS) Routing Diagram**

Page 15 Proposed Condition Water Quality Storm

Page 17 Proposed Condition 2 yr Storm

Page 19 Proposed Condition 10 yr Storm

Page 21 Proposed Condition 100 yr Storm

Page 23 **Proposed Condition (DELMARVA) Routing Diagram**

Page 24` Proposed Condition Water Quality Storm

Page 26 Proposed Condition 2 yr Storm

Page 28 Proposed Condition 10 yr Storm

Page 30 Proposed Condition 100 yr Storm

## INTRODUCTION

The drainage calculations for this report have been prepared in accordance with the general requirements of JERSEY CITY Land Development Ordinances, the HUDSON COUNTY Land Development Standards, and the NJDEP Storm Water Management Regulations.

The ANY proposed internal drainage systems and/or detention/infiltration systems were designed with the following standards:

1. For water quality, the NJ DEP 2-hr 1.25 NJ WQ STORM wa's used.
2. The 100 yr. storm frequency design storm was used for the internal drainage system.
3. Peak outflows from the basins will be attenuated such that, in the developed condition, the 2 yr. design flow will be a maximum of 50% of the pre-developed condition; the 10 yr. design flow will be a maximum of 75% of the pre-developed condition; and the 100 yr. design flow will be a maximum of 80% of the pre- developed condition, **if the project should increase the impervious surface by more than ¼ ac. The project is 5,000 sf in total therefore attenuation is not required. However runoff in the proposed condition may not exceed the runoff in the existing condition.**
4. The project consists of 1,515 sf of existing impervious surfaces & 811 sf of existing pervious surfaces for a total of 2,326 sf.

The proposed condition of the site consists of 1,714 sf of impervious surface. The net increase of 512 sf of regulated impervious surface is below the limits of regulation.

Since the total area of the site, 2,326 sf of disturbance will be made, a net increase of regulated impervious surface is being made of 299 sf, no motor surface is being created, and the project fits the criteria for minor site plan. Therefore detention of 0.6 gal /sf of impervious surface increase is required.  $0.6 \text{ gal} \times 299 \text{ sf of impervious} = 179 \text{ GAL storage required} = 30 \text{ cf storage}$ . Provided is 101 cf of storage.

We are using LID methods, permeable Pavers and sub surface water quality basin to stem the proposed runoff flow and improve TSS retention through subsurface sand filter basin.

5. See sheet 1 & 2 of site plans for summary of flows and runoff area plan

We are available to discuss any questions concerning this report.



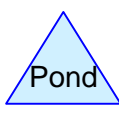
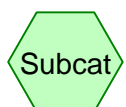
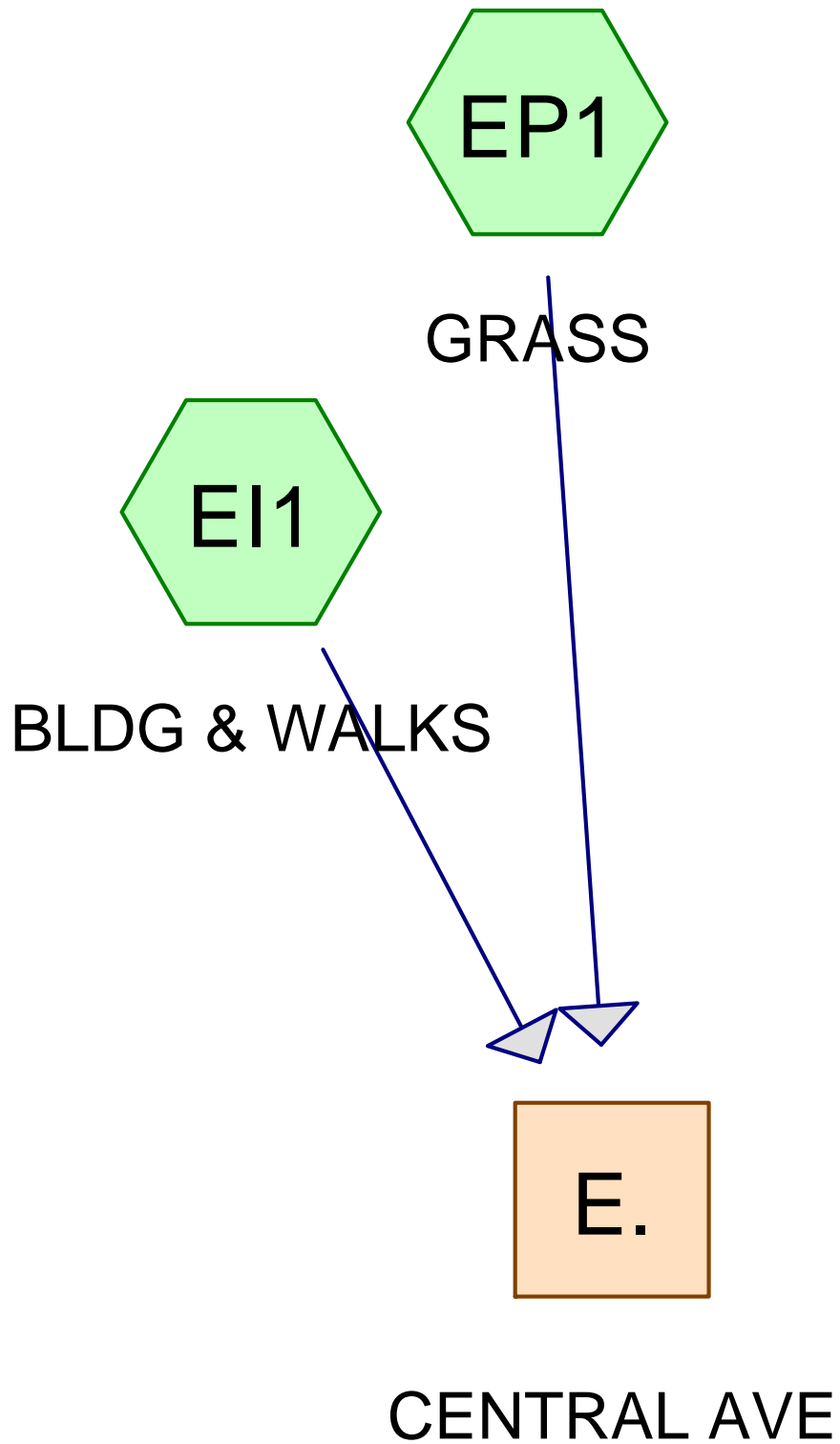
A handwritten signature in black ink, appearing to read "D. Pelikan", written over a horizontal line.

Douglas C. Pelikan, PE: NJ PE# GE27632

# SUMMARY OF FLOWS

	EXISTING CONDITION		PROPOSED CONDITION	
EVENT	PEAK RUNOFF		PEAK RUNOFF	
	SCS (CFS)	DELMARVA (CFS)	SCS (CFS)	DELMARVA (CFS)
WTR QUAL	0.11	0.11	0.11	0.11
2 YR	0.14	0.13	0.13	0.12
10 YR	0.24	0.22	0.23	0.23
100 YR	0.39	0.37	0.39	0.37





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EXISTING CONDITION (SCS)  
NJ DEP 2-hr 1 WQ Rainfall=1.25"

Page 5

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 0.67" for 1 WQ event

Inflow = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af

Outflow = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (SCS)  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 6

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.13 cfs @ 12.01 hrs, Volume= 0.009 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.01 cfs @ 12.12 hrs, Volume= 0.001 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 2.17" for 2 YR HUD event

Inflow = 0.14 cfs @ 12.01 hrs, Volume= 0.010 af

Outflow = 0.14 cfs @ 12.01 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (SCS)  
Type III 24-hr 10YR HUD Rainfall=5.30"

Page 7

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.22 cfs @ 12.01 hrs, Volume= 0.015 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 3.84" for 10YR HUD event

Inflow = 0.23 cfs @ 12.01 hrs, Volume= 0.017 af

Outflow = 0.23 cfs @ 12.01 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (SCS)  
Type III 24-hr 100 YR HUD Rainfall=8.30"

Page 8

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.34 cfs @ 12.01 hrs, Volume= 0.023 af, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

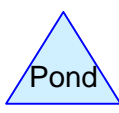
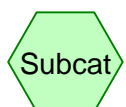
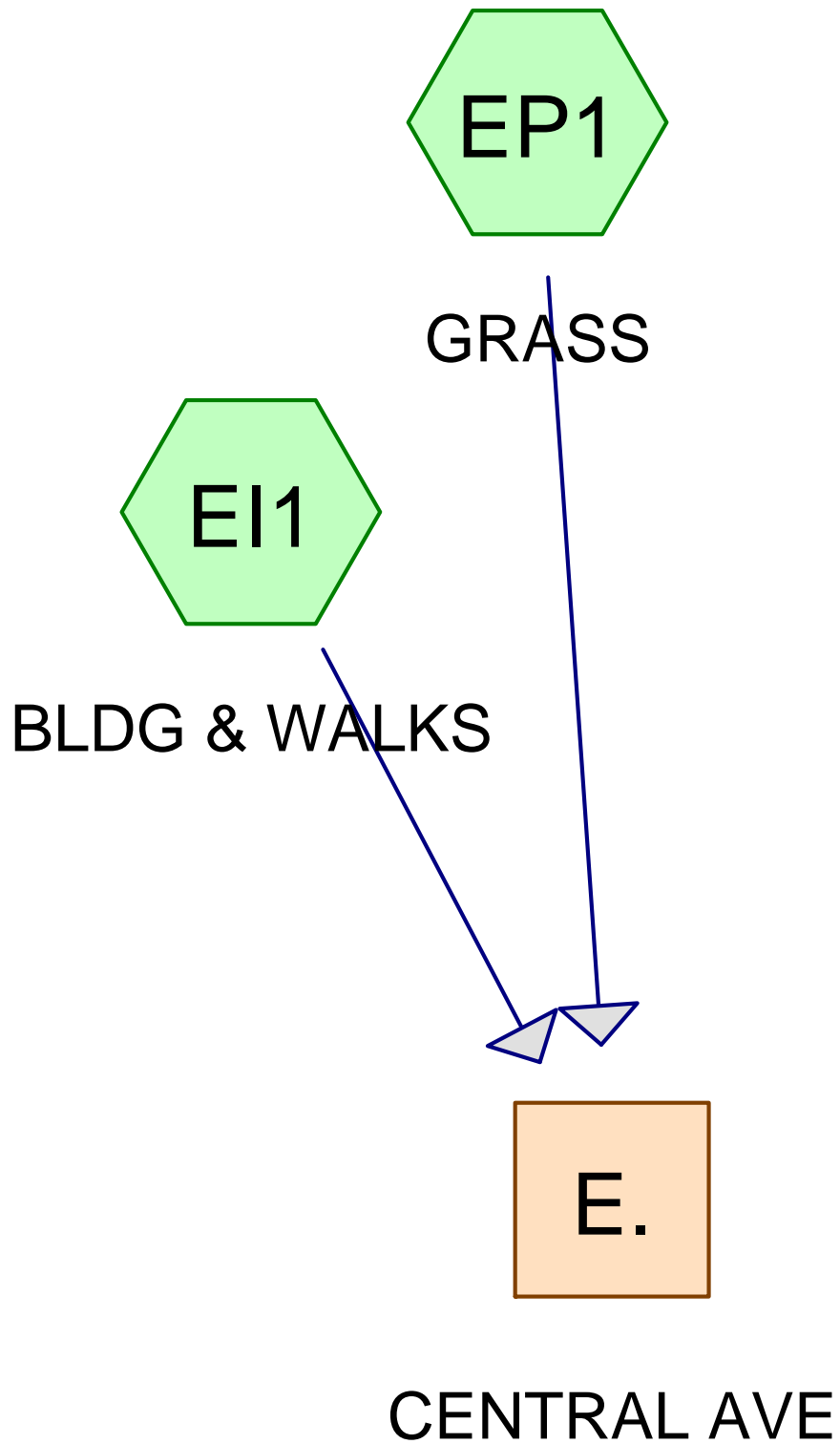
**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 6.53" for 100 YR HUD event

Inflow = 0.39 cfs @ 12.01 hrs, Volume= 0.029 af

Outflow = 0.39 cfs @ 12.01 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



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EXISTING CONDITION (DELMARVA)

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Page 10

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 0.67" for 1 WQ event

Inflow = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af

Outflow = 0.11 cfs @ 1.08 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (DELMARVA)  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 11

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.13 cfs @ 12.02 hrs, Volume= 0.009 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.01 cfs @ 12.21 hrs, Volume= 0.001 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 2.17" for 2 YR HUD event

Inflow = 0.13 cfs @ 12.02 hrs, Volume= 0.010 af

Outflow = 0.13 cfs @ 12.02 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (DELMARVA)  
Type III 24-hr 10YR HUD Rainfall=5.30"

Page 12

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.21 cfs @ 12.02 hrs, Volume= 0.015 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 3.84" for 10YR HUD event

Inflow = 0.22 cfs @ 12.02 hrs, Volume= 0.017 af

Outflow = 0.22 cfs @ 12.02 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

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EXISTING CONDITION (DELMARVA)  
Type III 24-hr 100 YR HUD Rainfall=8.30"

Page 13

**Summary for Subcatchment EI1: BLDG & WALKS**

Runoff = 0.33 cfs @ 12.02 hrs, Volume= 0.023 af, Depth= 8.06"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
1,515	98	Paved parking & roofs
1,515		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0200	1.26		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"

**Summary for Subcatchment EP1: GRASS**

Runoff = 0.06 cfs @ 12.12 hrs, Volume= 0.006 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
811	61	>75% Grass cover, Good, HSG B
811		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	47	0.0150	0.13		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.5	56	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.3	103	Total			

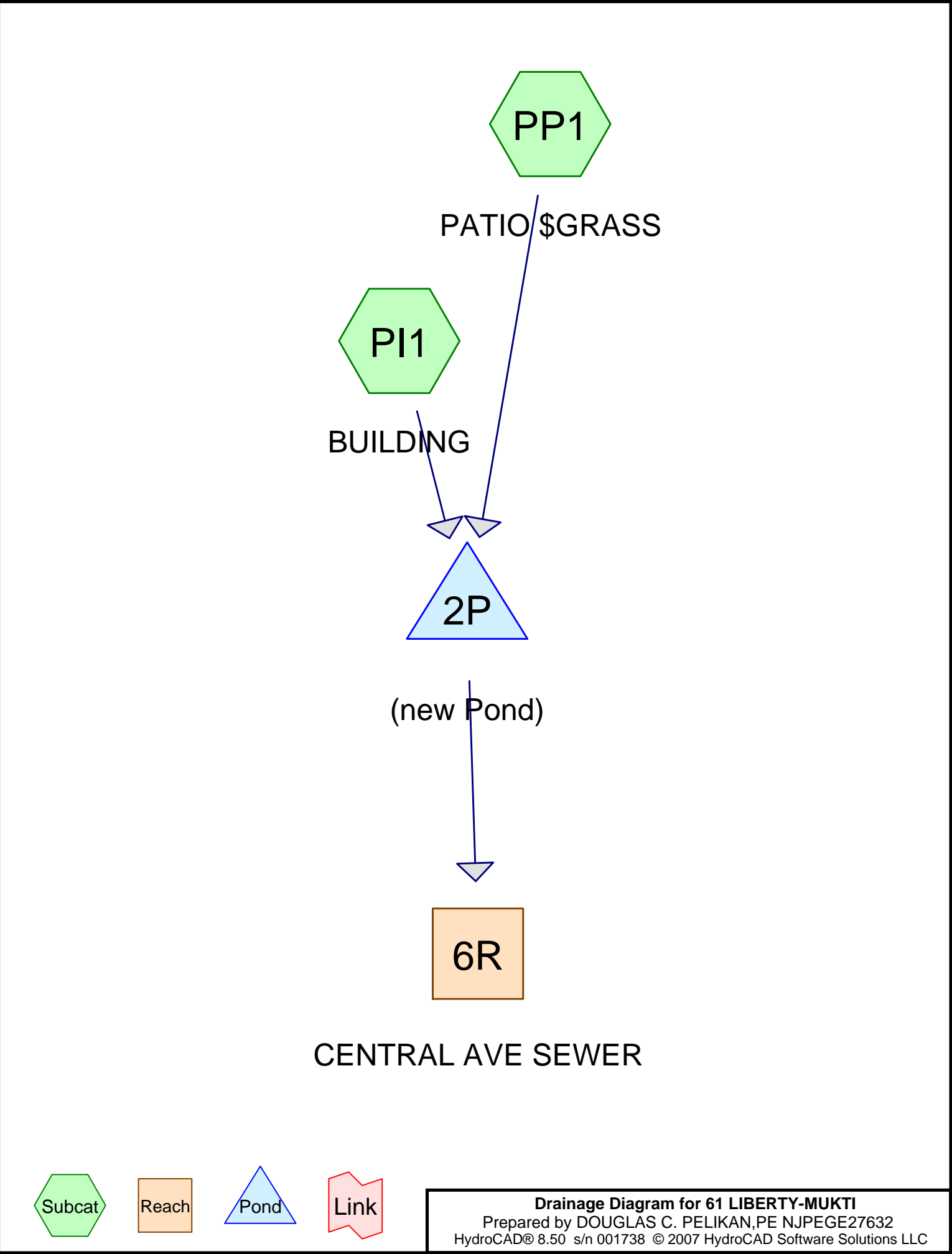
**Summary for Reach E.: CENTRAL AVE**

Inflow Area = 0.053 ac, 65.13% Impervious, Inflow Depth = 6.53" for 100 YR HUD event

Inflow = 0.37 cfs @ 12.02 hrs, Volume= 0.029 af

Outflow = 0.37 cfs @ 12.02 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



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PROPOSED CONDITION (SCS)  
NJ DEP 2-hr 1 WQ Rainfall=1.25"

Page 15

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.12 cfs @ 1.08 hrs, Volume= 0.003 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 0.79" for 1 WQ event

Inflow = 0.11 cfs @ 1.09 hrs, Volume= 0.003 af

Outflow = 0.11 cfs @ 1.09 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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Page 16

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 0.80" for 1 WQ event  
 Inflow = 0.12 cfs @ 1.08 hrs, Volume= 0.003 af  
 Outflow = 0.11 cfs @ 1.09 hrs, Volume= 0.003 af, Atten= 7%, Lag= 0.6 min  
 Discarded = 0.00 cfs @ 0.52 hrs, Volume= 0.000 af  
 Primary = 0.11 cfs @ 1.09 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 62.98' @ 1.09 hrs Surf.Area= 25 sf Storage= 25 cf

Plug-Flow detention time= 3.3 min calculated for 0.003 af (100% of inflow)  
 Center-of-Mass det. time= 3.3 min ( 69.2 - 65.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 0.52 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.11 cfs @ 1.09 hrs HW=62.98' (Free Discharge)

↑ **2=Culvert** (Passes 0.11 cfs of 0.81 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.56 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.96 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (SCS)  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 17

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.15 cfs @ 12.02 hrs, Volume= 0.010 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.01 cfs @ 12.07 hrs, Volume= 0.000 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 2.44" for 2 YR HUD event

Inflow = 0.13 cfs @ 12.05 hrs, Volume= 0.010 af

Outflow = 0.13 cfs @ 12.05 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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PROPOSED CONDITION (SCS)  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 18

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 2.47" for 2 YR HUD event  
 Inflow = 0.15 cfs @ 12.02 hrs, Volume= 0.011 af  
 Outflow = 0.13 cfs @ 12.05 hrs, Volume= 0.011 af, Atten= 14%, Lag= 2.0 min  
 Discarded = 0.00 cfs @ 8.04 hrs, Volume= 0.000 af  
 Primary = 0.13 cfs @ 12.05 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 63.02' @ 12.05 hrs Surf.Area= 25 sf Storage= 26 cf

Plug-Flow detention time= 3.8 min calculated for 0.011 af (100% of inflow)  
 Center-of-Mass det. time= 3.8 min ( 762.3 - 758.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 8.04 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.13 cfs @ 12.05 hrs HW=63.02' (Free Discharge)

↑ **2=Culvert** (Passes 0.13 cfs of 0.83 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.66 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.18 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (SCS)  
Type III 24-hr 10YR HUD Rainfall=5.30"

Page 19

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.24 cfs @ 12.02 hrs, Volume= 0.017 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.02 cfs @ 12.05 hrs, Volume= 0.002 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 4.21" for 10YR HUD event

Inflow = 0.24 cfs @ 12.04 hrs, Volume= 0.018 af

Outflow = 0.24 cfs @ 12.04 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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PROPOSED CONDITION (SCS)  
Type III 24-hr 10YR HUD Rainfall=5.30"

Page 20

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 4.26" for 10YR HUD event  
 Inflow = 0.26 cfs @ 12.02 hrs, Volume= 0.018 af  
 Outflow = 0.24 cfs @ 12.04 hrs, Volume= 0.018 af, Atten= 6%, Lag= 1.1 min  
 Discarded = 0.00 cfs @ 6.04 hrs, Volume= 0.000 af  
 Primary = 0.24 cfs @ 12.04 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 63.32' @ 12.04 hrs Surf.Area= 25 sf Storage= 33 cf

Plug-Flow detention time= 3.5 min calculated for 0.018 af (100% of inflow)  
 Center-of-Mass det. time= 3.5 min ( 756.4 - 753.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinder x 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 6.04 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.24 cfs @ 12.04 hrs HW=63.32' (Free Discharge)

↑ **2=Culvert** (Passes 0.24 cfs of 0.98 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.35 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.13 cfs @ 2.60 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (SCS)  
Type III 24-hr 100 YR HUD Rainfall=8.30"

Page 21

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.38 cfs @ 12.02 hrs, Volume= 0.026 af, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.06 cfs @ 12.04 hrs, Volume= 0.004 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 7.00" for 100 YR HUD event

Inflow = 0.39 cfs @ 12.05 hrs, Volume= 0.030 af

Outflow = 0.39 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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PROPOSED CONDITION (SCS)  
Type III 24-hr 100 YR HUD Rainfall=8.30"

Page 22

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 7.05" for 100 YR HUD event  
 Inflow = 0.43 cfs @ 12.02 hrs, Volume= 0.030 af  
 Outflow = 0.39 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 9%, Lag= 1.7 min  
 Discarded = 0.00 cfs @ 3.09 hrs, Volume= 0.000 af  
 Primary = 0.39 cfs @ 12.05 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 64.01' @ 12.05 hrs Surf.Area= 25 sf Storage= 51 cf

Plug-Flow detention time= 3.0 min calculated for 0.030 af (100% of inflow)  
 Center-of-Mass det. time= 3.0 min ( 751.7 - 748.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 3.09 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

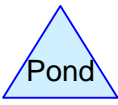
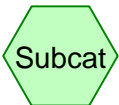
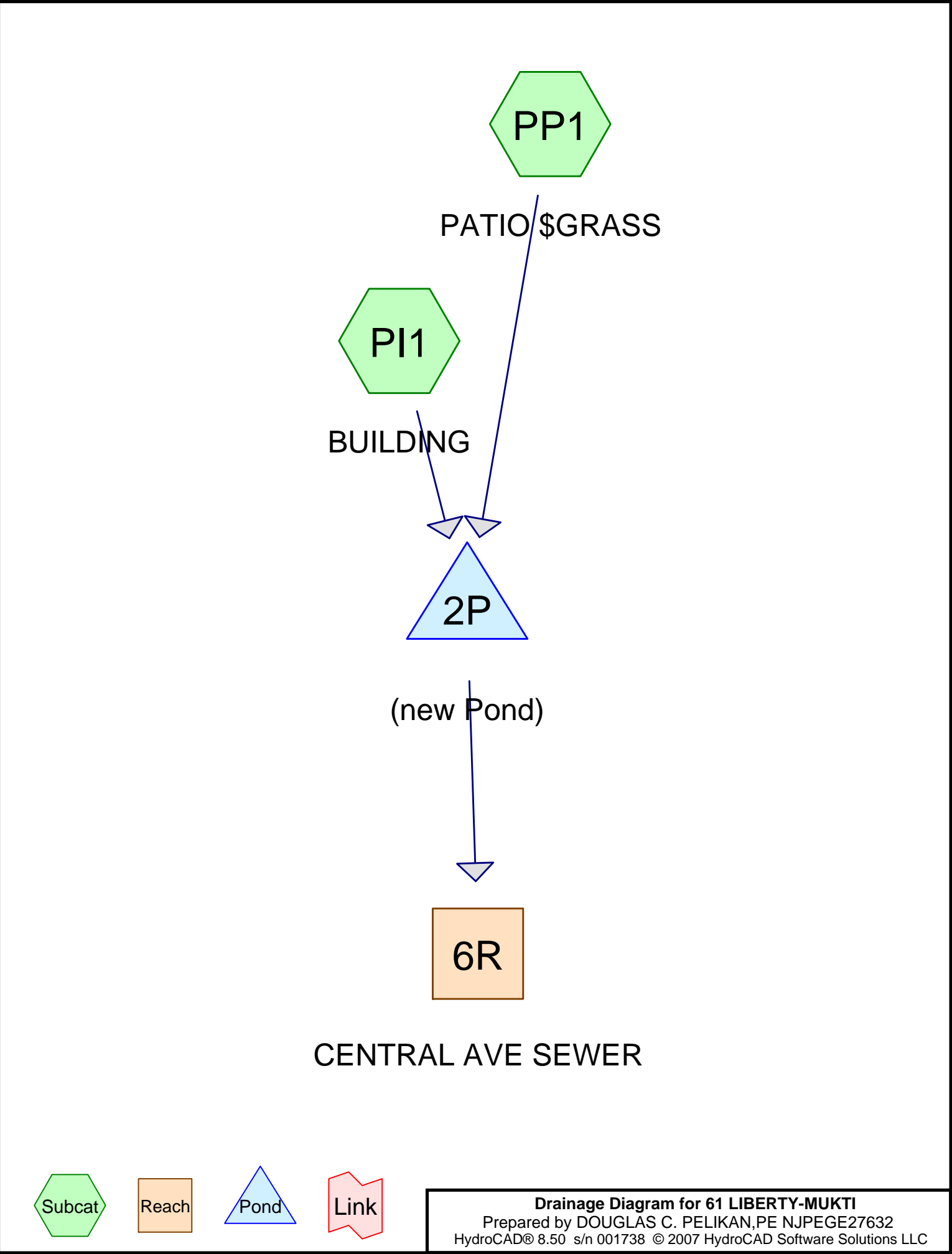
**Primary OutFlow** Max=0.39 cfs @ 12.05 hrs HW=64.01' (Free Discharge)

↑ **2=Culvert** (Passes 0.39 cfs of 1.20 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 6.68 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.23 cfs @ 4.78 fps)

↑ **5=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.32 fps)



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PROPOSED CONDITION (DELMARVA

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Page 24

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.12 cfs @ 1.08 hrs, Volume= 0.003 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

NJ DEP 2-hr 1 WQ Rainfall=1.25"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 0.79" for 1 WQ event

Inflow = 0.11 cfs @ 1.10 hrs, Volume= 0.003 af

Outflow = 0.11 cfs @ 1.10 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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Page 25

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 0.80" for 1 WQ event  
 Inflow = 0.12 cfs @ 1.08 hrs, Volume= 0.003 af  
 Outflow = 0.11 cfs @ 1.10 hrs, Volume= 0.003 af, Atten= 12%, Lag= 1.3 min  
 Discarded = 0.00 cfs @ 0.53 hrs, Volume= 0.000 af  
 Primary = 0.11 cfs @ 1.10 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 62.96' @ 1.10 hrs Surf.Area= 25 sf Storage= 24 cf

Plug-Flow detention time= 3.3 min calculated for 0.003 af (100% of inflow)  
 Center-of-Mass det. time= 3.3 min ( 70.0 - 66.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 0.53 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.11 cfs @ 1.10 hrs HW=62.96' (Free Discharge)

↑ **2=Culvert** (Passes 0.11 cfs of 0.80 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.51 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.83 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (DELMARVA  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 26

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.14 cfs @ 12.03 hrs, Volume= 0.010 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 YR HUD Rainfall=3.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 2.44" for 2 YR HUD event

Inflow = 0.12 cfs @ 12.07 hrs, Volume= 0.010 af

Outflow = 0.12 cfs @ 12.07 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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PROPOSED CONDITION (DELMARVA  
Type III 24-hr 2 YR HUD Rainfall=3.30"

Page 27

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 2.47" for 2 YR HUD event  
 Inflow = 0.14 cfs @ 12.03 hrs, Volume= 0.011 af  
 Outflow = 0.12 cfs @ 12.07 hrs, Volume= 0.011 af, Atten= 14%, Lag= 2.5 min  
 Discarded = 0.00 cfs @ 8.05 hrs, Volume= 0.000 af  
 Primary = 0.12 cfs @ 12.07 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
 Peak Elev= 63.01' @ 12.07 hrs Surf.Area= 25 sf Storage= 25 cf

Plug-Flow detention time= 3.8 min calculated for 0.011 af (100% of inflow)  
 Center-of-Mass det. time= 3.8 min ( 763.1 - 759.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 8.05 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.12 cfs @ 12.07 hrs HW=63.01' (Free Discharge)

↑ **2=Culvert** (Passes 0.12 cfs of 0.82 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.63 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.02 cfs @ 1.12 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (DELMARVA  
Type III 24-hr 10YR HUD Rainfall=5.30"

Page 28

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.23 cfs @ 12.03 hrs, Volume= 0.017 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.02 cfs @ 12.07 hrs, Volume= 0.002 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 10YR HUD Rainfall=5.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 4.21" for 10YR HUD event

Inflow = 0.23 cfs @ 12.05 hrs, Volume= 0.018 af

Outflow = 0.23 cfs @ 12.05 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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Page 29

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 4.26" for 10YR HUD event  
Inflow = 0.24 cfs @ 12.03 hrs, Volume= 0.018 af  
Outflow = 0.23 cfs @ 12.05 hrs, Volume= 0.018 af, Atten= 4%, Lag= 1.3 min  
Discarded = 0.00 cfs @ 6.05 hrs, Volume= 0.000 af  
Primary = 0.23 cfs @ 12.05 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
Peak Elev= 63.28' @ 12.05 hrs Surf.Area= 25 sf Storage= 32 cf

Plug-Flow detention time= 3.5 min calculated for 0.018 af (100% of inflow)  
Center-of-Mass det. time= 3.5 min ( 757.3 - 753.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 6.05 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.23 cfs @ 12.05 hrs HW=63.28' (Free Discharge)

↑ **2=Culvert** (Passes 0.23 cfs of 0.96 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.11 cfs @ 5.26 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.12 cfs @ 2.42 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)

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PROPOSED CONDITION (DELMARVA  
Type III 24-hr 100 YR HUD Rainfall=8.30"

Page 30

**Summary for Subcatchment PI1: BUILDING**

Runoff = 0.36 cfs @ 12.03 hrs, Volume= 0.026 af, Depth= 8.06"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
1,714	98	Paved parking & roofs
1,714		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	85	0.0200	1.37		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.3	175	Total			

**Summary for Subcatchment PP1: PATIO \$GRASS**

Runoff = 0.05 cfs @ 12.06 hrs, Volume= 0.004 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=Delmarva, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 YR HUD Rainfall=8.30"

Area (sf)	CN	Description
512	61	>75% Grass cover, Good, HSG B
512		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.40"
0.3	90	0.0200	5.25	1.03	<b>Circular Channel (pipe),</b> Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.6	107	Total			

**Summary for Reach 6R: CENTRAL AVE SEWER**

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 7.00" for 100 YR HUD event

Inflow = 0.37 cfs @ 12.06 hrs, Volume= 0.030 af

Outflow = 0.37 cfs @ 12.06 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

**Summary for Pond 2P: (new Pond)**

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Page 31

Inflow Area = 0.051 ac, 77.00% Impervious, Inflow Depth = 7.05" for 100 YR HUD event  
Inflow = 0.40 cfs @ 12.03 hrs, Volume= 0.030 af  
Outflow = 0.37 cfs @ 12.06 hrs, Volume= 0.030 af, Atten= 9%, Lag= 1.9 min  
Discarded = 0.00 cfs @ 3.10 hrs, Volume= 0.000 af  
Primary = 0.37 cfs @ 12.06 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs  
Peak Elev= 63.93' @ 12.06 hrs Surf.Area= 25 sf Storage= 48 cf

Plug-Flow detention time= 3.0 min calculated for 0.030 af (100% of inflow)  
Center-of-Mass det. time= 3.0 min ( 752.6 - 749.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	101 cf	<b>4.00'D x 4.00'H Vertical Cone/Cylinderx 2</b>

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	<b>0.200 in/hr Exfiltration over Surface area</b>
#2	Primary	62.00'	<b>6.0" x 90.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 60.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Device 2	62.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	62.90'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#5	Device 2	64.00'	<b>6.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 3.10 hrs HW=62.04' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.37 cfs @ 12.06 hrs HW=63.93' (Free Discharge)

↑ **2=Culvert** (Passes 0.37 cfs of 1.18 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.54 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.22 cfs @ 4.57 fps)

↑ **5=Orifice/Grate** ( Controls 0.00 cfs)