DRAINAGE REPORT

FOR PROPOSED

PRELIMINARY & FINAL SITE PLAN

BLOCK 3004, LOT 11

TOWNSHIP OF MORRIS
MORRIS COUNTY, NEW JERSEY

Prepared By:

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PO Box 4619
5 Powder Horn Drive, Unit #4
Warren, New Jersey 07059

July 2020
Project #2100-000

Catherine Mueller, P.E. #GE44252

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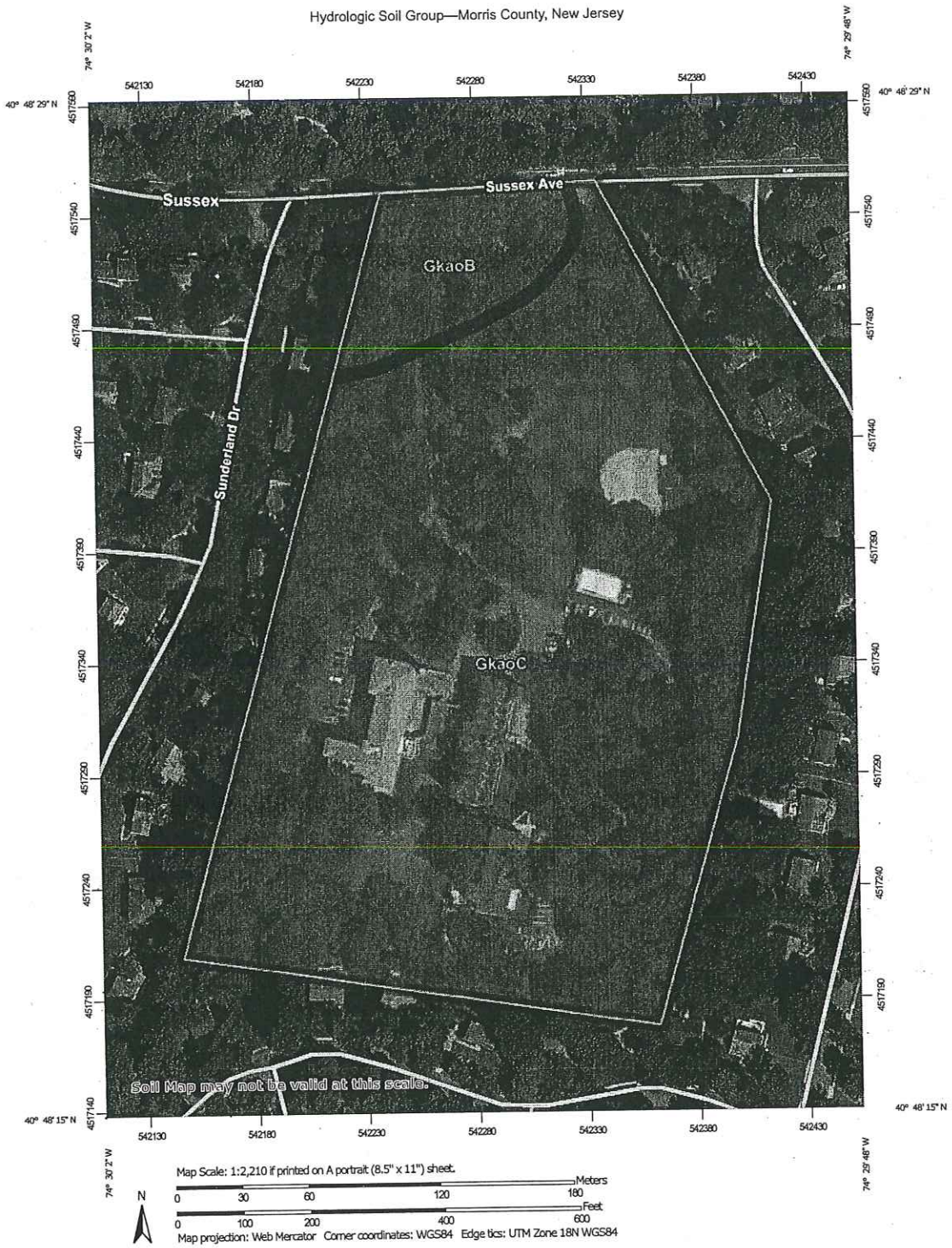
This report addresses the stormwater management issues associated with the proposed site plan for a new multipurpose educational building for The Rabbinical College of America on Lot 21 in Block 3004 in the Township of Morris. The site currently contains several educational buildings, all of which will remain. The lot consists of 15.085 acres and is shown on Morris Township tax map sheet number 30. The property is bordered by Sussex Avenue (Morris County Route 617) to the north, and single-family residences on all other sides. Per the NRCS soil survey, the property contains Gladstone gravelly loam (Class B) soils. The property contains a mixture of woods, lawn, and impervious surface.

The applicant is proposing to construct a new building in a currently undeveloped portion of the site, as well as improve the parking and access drives throughout the southeast portion of the property. The proposed improvements result in more than ¼ acres of additional impervious and greater than 1 acre of disturbance, and therefore must comply with the State stormwater "major project" regulations for water quantity, water quality, and groundwater recharge. Since only a portion of the property is being developed, only the limit of disturbance (2.68 Ac.) was analyzed.

The property generally slopes from south to north, with the majority flowing towards Sussex Avenue. Some of the runoff is captured by inlets, while some flows overland. A portion of the site also flows overland to Sunderland Drive. The site was analyzed as three drainage areas: overland to Sunderland, overland to Sussex, and piped to Sussex.

The following pages contain all the calculations and information regarding the storm water management design for this project.

Hydrologic Soil Group—Morris County, New Jersey



Map Scale: 1:2,210 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

7/6/2020
Page 1 of 4

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GkaoB	Gladstone gravelly loam, 3 to 8 percent slopes	B	1.5	8.5%
GkaoC	Gladstone gravelly loam, 8 to 15 percent slopes	B	16.0	91.5%
Totals for Area of Interest			17.5	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:

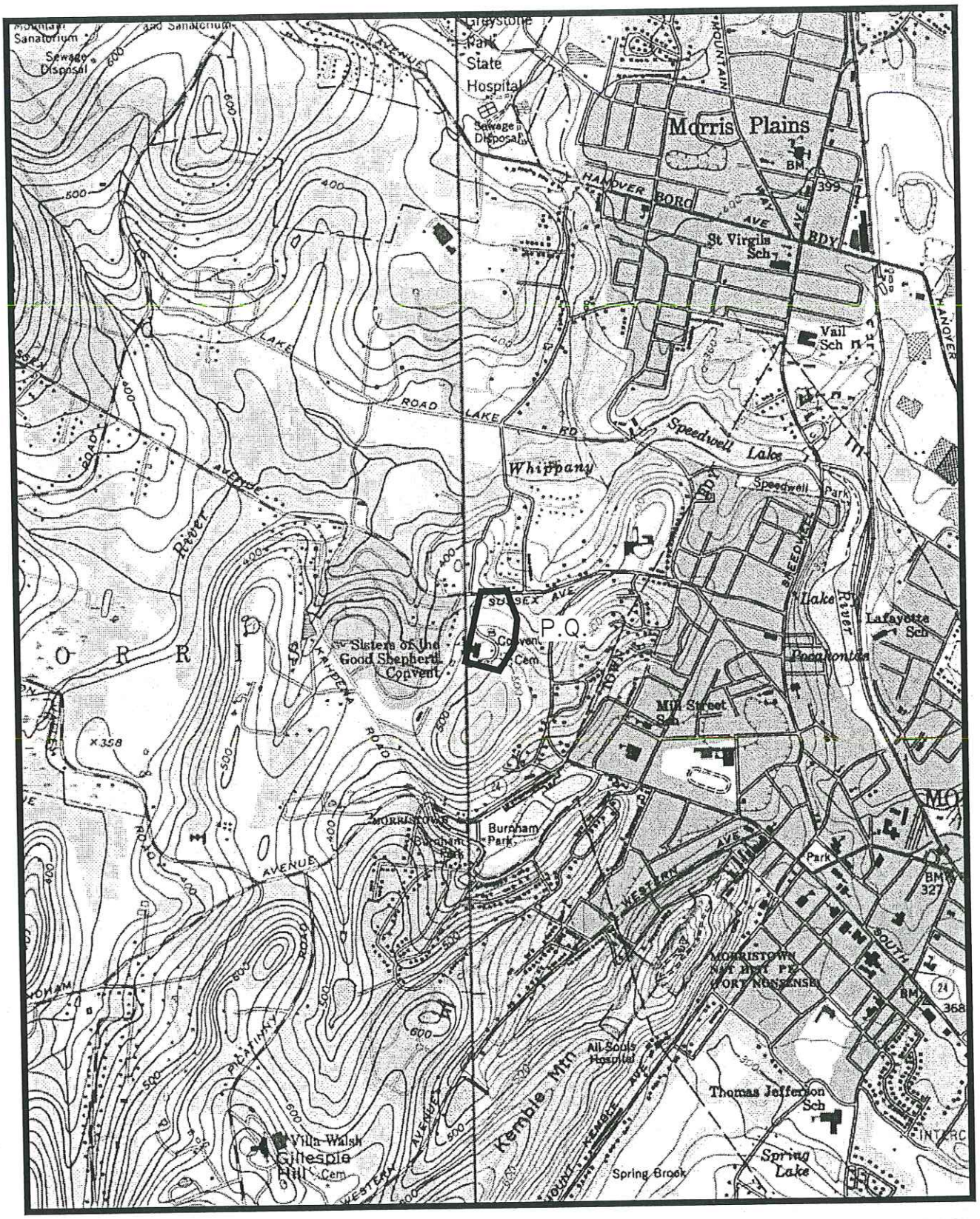
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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.



PME 2100-000
RABBINICAL COLLEGE OF AMERICA
BLOCK 3004, LOT 21
TOWNSHIP OF MORRIS
COUNTY OF MORRIS
STATE OF NEW JERSEY

U.S.G.S. QUADRANGLE MAP

MENDHAM & MORRISTOWN QUADRANGLES
1955, Photorevised 1981
Scale: 1"=2,000'±

DETENTION BASIN DESIGN

II. DESCRIPTION AND SUMMARY

Existing Conditions

The existing property was analyzed as three separate drainage areas: overland to Sunderland, overland to Sussex, and piped to Sussex.

A portion of the area that is ultimately piped to Sussex flows into a depression about 4.7 feet deep, with a capacity of 29,500 cubic feet. The area remains mostly dry, suggesting that infiltration normally occurs. However, for modelling purposes, the depression is assumed to overflow.

The site was modeled as a mixture of woods, lawn, and impervious (both on-site and off-site). Portions of each drainage area outside the limit of disturbance are segregated into separate nodes, with no peak reduction required for these areas.

Proposed Conditions

The same points of analysis were utilized for proposed conditions. Two of the drainage areas (overland to Sunderland and overland to Sussex) will be reduced in size, resulting in a natural reduction of *peak flow and volume* of runoff for these drainage areas.

For the area which is piped to Sussex, a grass-bottom detention basin is proposed for peak reductions. The grass-bottom basin will also meet the groundwater recharge requirement; the lowest outlet is 8" above the proposed basin bottom, allowing the water below to infiltrate. There will also be a bioretention facility for water quality, which will overflow into the grass-bottom basin. The bioretention basin is sized to capture and treat an area equivalent to the proposed increase in paved vehicle surface for 80% TSS removal.

BASIN & STORM SUMMARY REPORTS

PAGE - MUELLER ENGINEERING CONSULTANTS, P.C.
PO BOX 4619 • WARREN, NJ 07059

PEAK FLOW REDUCTION SUMMARY

Project: Rabbinical
Location: Morris Township

Computed By: TBB
7/14/2020

To Sunderland

STORM EVENT	24 HOUR RAINFALL-MORRIS COUNTY	Qpeak EXISTING CONDITIONS (CFS)	Vol EXISTING CONDITIONS (CF)	Qpeak PROPOSED CONDITIONS (CFS)	Vol PROPOSED CONDITIONS (CF)
1	2.9	0.51	2,492	0.55	2,485
2	3.5	0.75	3,401	**0.73**	**3,227**
5	4.5	1.17	5,004	1.05	4,483
10	5.2	1.56	6,471	**1.34**	**5,599**
25	6.4	2.18	8,797	1.78	7,333
50	7.3	2.73	10,877	2.17	8,859
100	8.4	3.35	13,232	**2.61**	**10,569**

To Sussex Overland

STORM EVENT	24 HOUR RAINFALL-MORRIS COUNTY	Qpeak EXISTING CONDITIONS (CFS)	Vol EXISTING CONDITIONS (CF)	Qpeak PROPOSED CONDITIONS (CFS)	Vol PROPOSED CONDITIONS (CF)
1	2.9	0.02	117	0.02	91
2	3.5	0.04	198	**0.03**	**154**
5	4.5	0.09	351	0.07	272
10	5.2	0.13	496	**0.10**	**385**
25	6.4	0.20	733	0.15	569
50	7.3	0.26	949	0.20	737
100	8.4	0.32	1,196	**0.25**	**929**

To Sussex Piped

		A	B	C	D	
STORM EVENT	24 HOUR RAINFALL-MORRIS COUNTY	Qpeak TOTAL PIPED TO SUSSEX (CFS)	Qpeak OFF-SITE-NO REDUCTION REQUIRED (CFS)	REQUIRED % REDUCTION	Qpeak ALLOWABLE (CFS)	Qpeak PROPOSED CONDITIONS (CFS)
1	2.9	1.77	-	N/A	N/A	
2	3.5	2.35	0.88	50.0%	**1.62**	**1.61**
5	4.5	3.38	-	N/A	N/A	
10	5.2	4.32	2.37	25.0%	**3.83**	**3.77**
25	6.4	5.77	-	N/A	N/A	
50	7.3	7.05	-	N/A	N/A	
100	8.4	8.48	5.85	20.0%	**7.95**	**7.83**

Allowable (D) = (Existing (A)-Off-Site (B)) * Reduction (C) + Off-Site to Basin (B)

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DETENTION BASIN SUMMARY SHEET

Project: Rabbinical
Location: Morris Township

Computed By: TBB
Date: 7/15/20

PROPOSED BIORETENTION BASIN

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Elevation (ft)
1	0.33	0.14	486.86
2	0.43	0.23	486.97
5	0.61	0.32	487.14
10	0.76	0.41	487.26
25	1.00	0.84	487.31
50	1.20	1.15	487.33
100	1.43	1.39	487.35

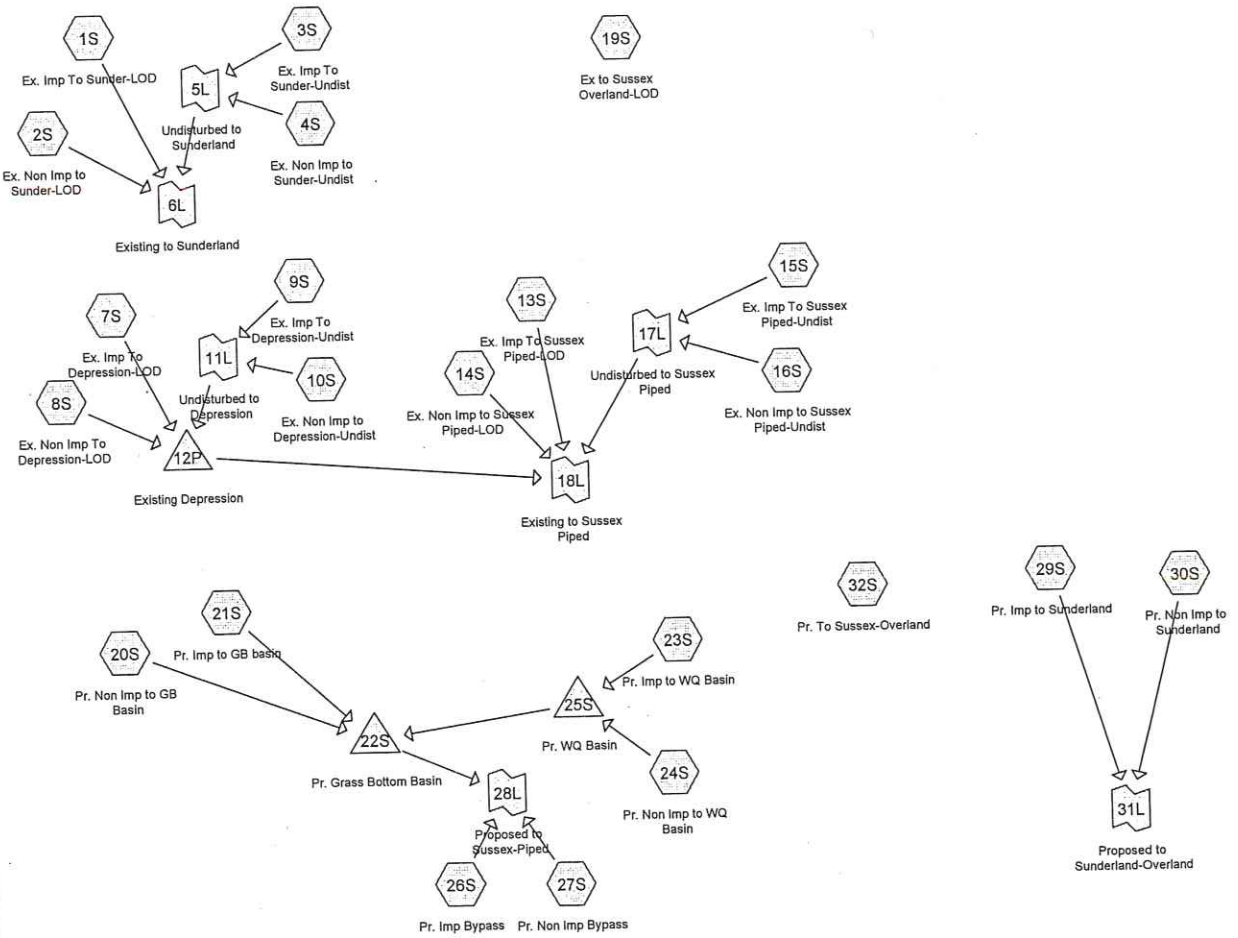
Outlet Configuration:
4"W x 4"H @ 486.60
2.5' x 2.5' Grate @ 487.25

PROPOSED GRASS BOTTOM BASIN

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Elevation (ft)
1	2.86	0.59	465.62
2	4.08	0.85	465.96
5	6.17	2.04	466.30
10	8.01	3.05	466.62
25	11.15	4.24	467.24
50	14.07	5.08	467.81
100	17.19	6.84	468.42

Outlet Configuration:
5"W x 4"H @ 464.67
15"W x 6"H @ 465.85
4' x 4' Grate @ 468.35

HYDROGRAPH SUMMARIES-ALL STORM EVENTS



Routing Diagram for 2100 Drainage
Prepared by Page-Mueller Engineering Consultants, Printed 7/15/2020
HydroCAD® 10.00-25 s/n 02658 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.24 cfs 1,011 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=0.34"
Tc=10.0 min CN=61 Runoff=0.02 cfs 142 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.20 cfs 840 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=412' Tc=10.0 min CN=59 Runoff=0.06 cfs 499 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.36 cfs 1,480 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=0.28"
Tc=10.0 min CN=59 Runoff=0.15 cfs 1,325 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.14 cfs 598 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=0.23"
Flow Length=648' Tc=10.0 min CN=57 Runoff=0.05 cfs 586 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=1.38 cfs 5,719 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=0.34"
Tc=10.0 min CN=61 Runoff=0.07 cfs 446 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=2.71"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.30 cfs 1,255 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=0.23"
Flow Length=807' Tc=10.0 min CN=57 Runoff=0.05 cfs 611 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=0.37"
Tc=10.0 min CN=62 Runoff=0.02 cfs 117 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=0.28"
Tc=10.0 min CN=59 Runoff=0.29 cfs 2,544 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=2.58 cfs 10,690 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.31 cfs 1,265 cf

Subcatchment 24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=0.34"
Tc=10.0 min CN=61 Runoff=0.03 cfs 188 cf

Subcatchment 26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.88 cfs 3,637 cf

Subcatchment 27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=0.34"
Tc=10.0 min CN=61 Runoff=0.01 cfs 79 cf

Subcatchment 29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=98 Runoff=0.52 cfs 2,150 cf

Subcatchment 30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=0.28"
Tc=10.0 min CN=59 Runoff=0.04 cfs 335 cf

Subcatchment 32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=0.37"
Tc=10.0 min CN=62 Runoff=0.02 cfs 91 cf

Pond 12P: Existing Depression Peak Elev=465.53' Storage=3,988 cf Inflow=0.66 cfs 3,990 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=467.13' Storage=13,566 cf Inflow=2.80 cfs 13,566 cf
Outflow=0.00 cfs 0 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.36' Storage=1,127 cf Inflow=0.33 cfs 1,454 cf
Outflow=0.02 cfs 332 cf

Link 5L: Undisturbed to Sunderland Inflow=0.25 cfs 1,339 cf
Primary=0.25 cfs 1,339 cf

Link 6L: Existing to Sunderland Inflow=0.51 cfs 2,492 cf
Primary=0.51 cfs 2,492 cf

Link 11L: Undisturbed to Depression Inflow=0.17 cfs 1,184 cf
Primary=0.17 cfs 1,184 cf

Link 17L: Undisturbed to Sussex Piped Inflow=0.33 cfs 1,866 cf
Primary=0.33 cfs 1,866 cf

Link 18L: Existing to Sussex Piped Inflow=1.77 cfs 8,032 cf
Primary=1.77 cfs 8,032 cf

Link 28L: Proposed to Sussex-Piped Inflow=0.89 cfs 3,716 cf
Primary=0.89 cfs 3,716 cf

Link 31L: Proposed to Sunderland-Overland Inflow=0.55 cfs 2,485 cf
Primary=0.55 cfs 2,485 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.29 cfs 1,234 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=0.59"
Tc=10.0 min CN=61 Runoff=0.05 cfs 245 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.25 cfs 1,025 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=0.51"
Flow Length=412' Tc=10.0 min CN=59 Runoff=0.17 cfs 897 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.43 cfs 1,807 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=0.51"
Tc=10.0 min CN=59 Runoff=0.45 cfs 2,382 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.17 cfs 730 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=0.43"
Flow Length=648' Tc=10.0 min CN=57 Runoff=0.18 cfs 1,107 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=1.67 cfs 6,982 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=0.59"
Tc=10.0 min CN=61 Runoff=0.16 cfs 770 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=3.31"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.37 cfs 1,532 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=0.43"
Flow Length=807' Tc=10.0 min CN=57 Runoff=0.19 cfs 1,154 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=0.63"
Tc=10.0 min CN=62 Runoff=0.04 cfs 198 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=0.51"
Tc=10.0 min CN=59 Runoff=0.86 cfs 4,571 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=3.12 cfs 13,050 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.37 cfs 1,544 cf

Subcatchment 24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=0.59"
Tc=10.0 min CN=61 Runoff=0.07 cfs 325 cf

Subcatchment 26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=1.06 cfs 4,440 cf

Subcatchment 27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=0.59"
Tc=10.0 min CN=61 Runoff=0.03 cfs 136 cf

Subcatchment 29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=98 Runoff=0.63 cfs 2,624 cf

Subcatchment 30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=0.51"
Tc=10.0 min CN=59 Runoff=0.11 cfs 603 cf

Subcatchment 32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=0.63"
Tc=10.0 min CN=62 Runoff=0.03 cfs 154 cf

Pond 12P: Existing Depression Peak Elev=465.91' Storage=6,025 cf Inflow=1.20 cfs 6,025 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=468.03' Storage=18,369 cf Inflow=3.91 cfs 18,370 cf
Outflow=0.00 cfs 0 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.37' Storage=1,143 cf Inflow=0.43 cfs 1,869 cf
Outflow=0.07 cfs 748 cf

Link 5L: Undisturbed to Sunderland Inflow=0.41 cfs 1,922 cf
Primary=0.41 cfs 1,922 cf

Link 6L: Existing to Sunderland Inflow=0.75 cfs 3,401 cf
Primary=0.75 cfs 3,401 cf

Link 11L: Undisturbed to Depression Inflow=0.34 cfs 1,837 cf
Primary=0.34 cfs 1,837 cf

Link 17L: Undisturbed to Sussex Piped Inflow=0.54 cfs 2,686 cf
Primary=0.54 cfs 2,686 cf

Link 18L: Existing to Sussex Piped Inflow=2.35 cfs 10,438 cf
Primary=2.35 cfs 10,438 cf

Link 28L: Proposed to Sussex-Piped Inflow=1.09 cfs 4,576 cf
Primary=1.09 cfs 4,576 cf

Link 31L: Proposed to Sunderland-Overland Inflow=0.73 cfs 3,227 cf
Primary=0.73 cfs 3,227 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.37 cfs 1,580 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=1.06"
Tc=10.0 min CN=61 Runoff=0.11 cfs 441 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.31 cfs 1,313 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=0.95"
Flow Length=412' Tc=10.0 min CN=59 Runoff=0.39 cfs 1,670 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.55 cfs 2,314 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=0.95"
Tc=10.0 min CN=59 Runoff=1.04 cfs 4,434 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.22 cfs 935 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=0.83"
Flow Length=648' Tc=10.0 min CN=57 Runoff=0.48 cfs 2,145 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=2.11 cfs 8,941 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=1.06"
Tc=10.0 min CN=61 Runoff=0.34 cfs 1,384 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=4.23"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.46 cfs 1,961 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=0.83"
Flow Length=807' Tc=10.0 min CN=57 Runoff=0.50 cfs 2,236 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=1.12"
Tc=10.0 min CN=62 Runoff=0.09 cfs 351 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=0.95"
Tc=10.0 min CN=59 Runoff=1.99 cfs 8,511 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=3.95 cfs 16,712 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.47 cfs 1,978 cf

Subcatchment 24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=1.06"
Tc=10.0 min CN=61 Runoff=0.14 cfs 584 cf

Subcatchment 26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=1.34 cfs 5,686 cf

Subcatchment 27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=1.06"
Tc=10.0 min CN=61 Runoff=0.06 cfs 245 cf

Subcatchment 29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=4.23"
Tc=10.0 min CN=98 Runoff=0.79 cfs 3,360 cf

Subcatchment 30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=0.95"
Tc=10.0 min CN=59 Runoff=0.26 cfs 1,122 cf

Subcatchment 32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=1.12"
Tc=10.0 min CN=62 Runoff=0.07 cfs 272 cf

Pond 12P: Existing Depression Peak Elev=466.49' Storage=9,827 cf Inflow=2.27 cfs 9,828 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=468.79' Storage=22,433 cf Inflow=5.87 cfs 26,667 cf
Outflow=0.22 cfs 4,432 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.41' Storage=1,189 cf Inflow=0.61 cfs 2,562 cf
Outflow=0.37 cfs 1,444 cf

Link 5L: Undisturbed to Sunderland Inflow=0.70 cfs 2,983 cf
Primary=0.70 cfs 2,983 cf

Link 6L: Existing to Sunderland Inflow=1.17 cfs 5,004 cf
Primary=1.17 cfs 5,004 cf

Link 11L: Undisturbed to Depression Inflow=0.69 cfs 3,080 cf
Primary=0.69 cfs 3,080 cf

Link 17L: Undisturbed to Sussex Piped Inflow=0.95 cfs 4,198 cf
Primary=0.95 cfs 4,198 cf

Link 18L: Existing to Sussex Piped Inflow=3.38 cfs 14,523 cf
Primary=3.38 cfs 14,523 cf

Link 28L: Proposed to Sussex-Piped Inflow=1.40 cfs 10,363 cf
Primary=1.40 cfs 10,363 cf

Link 31L: Proposed to Sunderland-Overland Inflow=1.05 cfs 4,483 cf
Primary=1.05 cfs 4,483 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.44 cfs 1,867 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=1.52"
Tc=10.0 min CN=61 Runoff=0.16 cfs 629 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.36 cfs 1,551 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=1.37"
Flow Length=412' Tc=10.0 min CN=59 Runoff=0.61 cfs 2,424 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.64 cfs 2,734 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=1.37"
Tc=10.0 min CN=59 Runoff=1.61 cfs 6,435 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.26 cfs 1,104 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=1.23"
Flow Length=648' Tc=10.0 min CN=57 Runoff=0.77 cfs 3,173 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=2.48 cfs 10,564 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=1.52"
Tc=10.0 min CN=61 Runoff=0.51 cfs 1,974 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=5.00"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.54 cfs 2,318 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=1.23"
Flow Length=807' Tc=10.0 min CN=57 Runoff=0.80 cfs 3,308 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=62 Runoff=0.13 cfs 496 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=1.37"
Tc=10.0 min CN=59 Runoff=3.10 cfs 12,351 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=4.64 cfs 19,746 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.55 cfs 2,337 cf

Subcatchment 24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=1.52"
Tc=10.0 min CN=61 Runoff=0.21 cfs 833 cf

Subcatchment 26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=1.58 cfs 6,718 cf

Subcatchment 27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=1.52"
Tc=10.0 min CN=61 Runoff=0.09 cfs 349 cf

Subcatchment 29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=98 Runoff=0.93 cfs 3,971 cf

Subcatchment 30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=1.37"
Tc=10.0 min CN=59 Runoff=0.41 cfs 1,629 cf

Subcatchment 32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=62 Runoff=0.10 cfs 385 cf

Pond 12P: Existing Depression Peak Elev=466.97' Storage=13,445 cf Inflow=3.27 cfs 13,445 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=468.83' Storage=22,658 cf Inflow=8.29 cfs 34,148 cf
Outflow=0.69 cfs 11,913 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.45' Storage=1,226 cf Inflow=0.76 cfs 3,170 cf
Outflow=0.70 cfs 2,052 cf

Link 5L: Undisturbed to Sunderland Inflow=0.97 cfs 3,975 cf
Primary=0.97 cfs 3,975 cf

Link 6L: Existing to Sunderland Inflow=1.56 cfs 6,471 cf
Primary=1.56 cfs 6,471 cf

Link 11L: Undisturbed to Depression Inflow=1.03 cfs 4,277 cf
Primary=1.03 cfs 4,277 cf

Link 17L: Undisturbed to Sussex Piped Inflow=1.34 cfs 5,626 cf
Primary=1.34 cfs 5,626 cf

Link 18L: Existing to Sussex Piped Inflow=4.32 cfs 18,164 cf
Primary=4.32 cfs 18,164 cf

Link 28L: Proposed to Sussex-Piped Inflow=1.67 cfs 18,980 cf
Primary=1.67 cfs 18,980 cf

Link 31L: Proposed to Sunderland-Overland Inflow=1.34 cfs 5,599 cf
Primary=1.34 cfs 5,599 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=0.53 cfs 2,288 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=2.26"
Tc=10.0 min CN=61 Runoff=0.25 cfs 936 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=0.44 cfs 1,901 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=2.08"
Flow Length=412' Tc=10.0 min CN=59 Runoff=0.96 cfs 3,671 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=0.78 cfs 3,350 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=2.08"
Tc=10.0 min CN=59 Runoff=2.56 cfs 9,746 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=0.32 cfs 1,354 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=1.90"
Flow Length=648' Tc=10.0 min CN=57 Runoff=1.26 cfs 4,895 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=3.02 cfs 12,948 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=2.26"
Tc=10.0 min CN=61 Runoff=0.78 cfs 2,940 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=6.13"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.66 cfs 2,840 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=1.90"
Flow Length=807' Tc=10.0 min CN=57 Runoff=1.32 cfs 5,104 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=2.35"
Tc=10.0 min CN=62 Runoff=0.20 cfs 733 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=2.08"
Tc=10.0 min CN=59 Runoff=4.91 cfs 18,707 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=5.65 cfs 24,200 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=0.67 cfs 2,864 cf

Subcatchment24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=2.26"
Tc=10.0 min CN=61 Runoff=0.33 cfs 1,241 cf

Subcatchment26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=1.92 cfs 8,234 cf

Subcatchment27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=2.26"
Tc=10.0 min CN=61 Runoff=0.14 cfs 520 cf

Subcatchment29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=6.13"
Tc=10.0 min CN=98 Runoff=1.14 cfs 4,866 cf

Subcatchment30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=2.08"
Tc=10.0 min CN=59 Runoff=0.65 cfs 2,467 cf

Subcatchment32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=2.35"
Tc=10.0 min CN=62 Runoff=0.15 cfs 569 cf

Pond 12P: Existing Depression Peak Elev=467.67' Storage=19,344 cf Inflow=4.91 cfs 19,345 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=468.96' Storage=23,378 cf Inflow=11.45 cfs 45,889 cf
Outflow=2.98 cfs 23,654 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.47' Storage=1,250 cf Inflow=1.00 cfs 4,105 cf
Outflow=0.96 cfs 2,982 cf

Link 5L: Undisturbed to Sunderland Inflow=1.40 cfs 5,572 cf
Primary=1.40 cfs 5,572 cf

Link 6L: Existing to Sunderland Inflow=2.18 cfs 8,797 cf
Primary=2.18 cfs 8,797 cf

Link 11L: Undisturbed to Depression Inflow=1.58 cfs 6,248 cf
Primary=1.58 cfs 6,248 cf

Link 17L: Undisturbed to Sussex Piped Inflow=1.97 cfs 7,944 cf
Primary=1.97 cfs 7,944 cf

Link 18L: Existing to Sussex Piped Inflow=5.77 cfs 23,832 cf
Primary=5.77 cfs 23,832 cf

Link 28L: Proposed to Sussex-Piped Inflow=3.45 cfs 32,408 cf
Primary=3.45 cfs 32,408 cf

Link 31L: Proposed to Sunderland-Overland Inflow=1.78 cfs 7,333 cf
Primary=1.78 cfs 7,333 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=0.61 cfs 2,642 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=2.94"
Tc=10.0 min CN=61 Runoff=0.33 cfs 1,218 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=0.51 cfs 2,196 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=2.73"
Flow Length=412' Tc=10.0 min CN=59 Runoff=1.29 cfs 4,821 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=0.90 cfs 3,869 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=2.73"
Tc=10.0 min CN=59 Runoff=3.42 cfs 12,800 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=0.36 cfs 1,563 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=648' Tc=10.0 min CN=57 Runoff=1.72 cfs 6,497 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=3.48 cfs 14,952 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=2.94"
Tc=10.0 min CN=61 Runoff=1.03 cfs 3,823 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=7.08"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.76 cfs 3,280 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=807' Tc=10.0 min CN=57 Runoff=1.79 cfs 6,775 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=3.04"
Tc=10.0 min CN=62 Runoff=0.26 cfs 949 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=2.73"
Tc=10.0 min CN=59 Runoff=6.56 cfs 24,568 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=6.50 cfs 27,947 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=0.77 cfs 3,307 cf

Subcatchment24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=2.94"
Tc=10.0 min CN=61 Runoff=0.43 cfs 1,614 cf

Subcatchment26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=2.21 cfs 9,508 cf

Subcatchment27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=2.94"
Tc=10.0 min CN=61 Runoff=0.18 cfs 676 cf

Subcatchment29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=7.08"
Tc=10.0 min CN=98 Runoff=1.31 cfs 5,620 cf

Subcatchment30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=2.73"
Tc=10.0 min CN=59 Runoff=0.87 cfs 3,240 cf

Subcatchment32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=3.04"
Tc=10.0 min CN=62 Runoff=0.20 cfs 737 cf

Pond 12P: Existing Depression Peak Elev=468.24' Storage=24,729 cf Inflow=6.39 cfs 24,729 cf
Outflow=0.00 cfs 0 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=469.13' Storage=24,295 cf Inflow=14.15 cfs 56,314 cf
Outflow=7.54 cfs 34,079 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.48' Storage=1,269 cf Inflow=1.20 cfs 4,921 cf
Outflow=1.16 cfs 3,799 cf

Link 5L: Undisturbed to Sunderland Inflow=1.79 cfs 7,017 cf
Primary=1.79 cfs 7,017 cf

Link 6L: Existing to Sunderland Inflow=2.73 cfs 10,877 cf
Primary=2.73 cfs 10,877 cf

Link 11L: Undisturbed to Depression Inflow=2.08 cfs 8,060 cf
Primary=2.08 cfs 8,060 cf

Link 17L: Undisturbed to Sussex Piped Inflow=2.55 cfs 10,055 cf
Primary=2.55 cfs 10,055 cf

Link 18L: Existing to Sussex Piped Inflow=7.05 cfs 28,830 cf
Primary=7.05 cfs 28,830 cf

Link 28L: Proposed to Sussex-Piped Inflow=8.66 cfs 44,263 cf
Primary=8.66 cfs 44,263 cf

Link 31L: Proposed to Sunderland-Overland Inflow=2.17 cfs 8,859 cf
Primary=2.17 cfs 8,859 cf

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. Imp To Sunder-LOD Runoff Area=4,478 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=0.70 cfs 3,026 cf

Subcatchment2S: Ex. Non Imp to Runoff Area=4,979 sf 0.00% Impervious Runoff Depth=3.71"
Tc=10.0 min CN=61 Runoff=0.42 cfs 1,541 cf

Subcatchment3S: Ex. Imp To Runoff Area=3,721 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=0.58 cfs 2,515 cf

Subcatchment4S: Ex. Non Imp to Runoff Area=21,188 sf 0.00% Impervious Runoff Depth=3.48"
Flow Length=412' Tc=10.0 min CN=59 Runoff=1.66 cfs 6,150 cf

Subcatchment7S: Ex. Imp To Runoff Area=6,557 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=1.03 cfs 4,431 cf

Subcatchment8S: Ex. Non Imp To Runoff Area=56,253 sf 0.00% Impervious Runoff Depth=3.48"
Tc=10.0 min CN=59 Runoff=4.41 cfs 16,327 cf

Subcatchment9S: Ex. Imp To Runoff Area=2,649 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=0.42 cfs 1,790 cf

Subcatchment10S: Ex. Non Imp to Runoff Area=30,834 sf 0.00% Impervious Runoff Depth=3.25"
Flow Length=648' Tc=10.0 min CN=57 Runoff=2.24 cfs 8,360 cf

Subcatchment13S: Ex. Imp To Sussex Runoff Area=25,340 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=3.97 cfs 17,126 cf

Subcatchment14S: Ex. Non Imp to Sussex Runoff Area=15,631 sf 0.00% Impervious Runoff Depth=3.71"
Tc=10.0 min CN=61 Runoff=1.31 cfs 4,837 cf

Subcatchment15S: Ex. Imp To Sussex Runoff Area=5,559 sf 100.00% Impervious Runoff Depth=8.11"
Flow Length=585' Tc=10.0 min CN=98 Runoff=0.87 cfs 3,757 cf

Subcatchment16S: Ex. Non Imp to Sussex Runoff Area=32,150 sf 0.00% Impervious Runoff Depth=3.25"
Flow Length=807' Tc=10.0 min CN=57 Runoff=2.34 cfs 8,717 cf

Subcatchment19S: Ex to Sussex Runoff Area=3,747 sf 1.63% Impervious Runoff Depth=3.83"
Tc=10.0 min CN=62 Runoff=0.32 cfs 1,196 cf

Subcatchment20S: Pr. Non Imp to GB Runoff Area=107,970 sf 0.00% Impervious Runoff Depth=3.48"
Tc=10.0 min CN=59 Runoff=8.46 cfs 31,337 cf

Subcatchment21S: Pr. Imp to GB basin Runoff Area=47,363 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=7.42 cfs 32,009 cf

Subcatchment23S: Pr. Imp to WQ Basin Runoff Area=5,605 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=0.88 cfs 3,788 cf

Subcatchment 24S: Pr. Non Imp to WQ Basin Runoff Area=6,598 sf 0.00% Impervious Runoff Depth=3.71"
Tc=10.0 min CN=61 Runoff=0.55 cfs 2,042 cf

Subcatchment 26S: Pr. Imp Bypass Runoff Area=16,114 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=2.52 cfs 10,890 cf

Subcatchment 27S: Pr. Non Imp Bypass Runoff Area=2,763 sf 0.00% Impervious Runoff Depth=3.71"
Tc=10.0 min CN=61 Runoff=0.23 cfs 855 cf

Subcatchment 29S: Pr. Imp to Sunderland Runoff Area=9,524 sf 100.00% Impervious Runoff Depth=8.11"
Tc=10.0 min CN=98 Runoff=1.49 cfs 6,437 cf

Subcatchment 30S: Pr. Non Imp to Runoff Area=14,238 sf 0.00% Impervious Runoff Depth=3.48"
Tc=10.0 min CN=59 Runoff=1.12 cfs 4,132 cf

Subcatchment 32S: Pr. To Sussex-Overland Runoff Area=2,911 sf 2.10% Impervious Runoff Depth=3.83"
Tc=10.0 min CN=62 Runoff=0.25 cfs 929 cf

Pond 12P: Existing Depression Peak Elev=468.71' Storage=29,564 cf Inflow=8.08 cfs 30,908 cf
Outflow=0.18 cfs 1,485 cf

Pond 22S: Pr. Grass Bottom Basin Peak Elev=469.31' Storage=25,294 cf Inflow=17.19 cfs 68,054 cf
Outflow=14.51 cfs 45,820 cf

Pond 25S: Pr. WQ Basin Peak Elev=487.50' Storage=1,288 cf Inflow=1.43 cfs 5,830 cf
Outflow=1.38 cfs 4,708 cf

Link 5L: Undisturbed to Sunderland Inflow=2.24 cfs 8,664 cf
Primary=2.24 cfs 8,664 cf

Link 6L: Existing to Sunderland Inflow=3.35 cfs 13,232 cf
Primary=3.35 cfs 13,232 cf

Link 11L: Undisturbed to Depression Inflow=2.65 cfs 10,150 cf
Primary=2.65 cfs 10,150 cf

Link 17L: Undisturbed to Sussex Piped Inflow=3.20 cfs 12,474 cf
Primary=3.20 cfs 12,474 cf

Link 18L: Existing to Sussex Piped Inflow=8.48 cfs 35,922 cf
Primary=8.48 cfs 35,922 cf

Link 28L: Proposed to Sussex-Piped Inflow=16.56 cfs 57,565 cf
Primary=16.56 cfs 57,565 cf

Link 31L: Proposed to Sunderland-Overland Inflow=2.61 cfs 10,569 cf
Primary=2.61 cfs 10,569 cf

2-YEAR STORM EVENT

Summary for Subcatchment 1S: Ex. Imp To Sunder-LOD

Runoff = 0.29 cfs @ 12.17 hrs, Volume= 1,234 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
4,478	98	Paved parking, HSG B
4,478		100.00% Impervious Area

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

Summary for Subcatchment 2S: Ex. Non Imp to Sunder-LOD

Runoff = 0.05 cfs @ 12.20 hrs, Volume= 245 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
4,979	61	>75% Grass cover, Good, HSG B
4,979		100.00% Pervious Area

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

Summary for Subcatchment 3S: Ex. Imp To Sunder-Undist

Runoff = 0.25 cfs @ 12.17 hrs, Volume= 1,025 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
3,721	98	Paved parking, HSG B
3,721		100.00% Impervious Area

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

Summary for Subcatchment 4S: Ex. Non Imp to Sunder-Undist

Runoff = 0.17 cfs @ 12.21 hrs, Volume= 897 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
12,640	61	>75% Grass cover, Good, HSG B
8,548	55	Woods, Good, HSG B
21,188	59	Weighted Average
21,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	43	0.1160	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	33	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.8	98	0.1580	1.99		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	49	0.2550	8.13		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	162	0.0620	5.05		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	412	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 7S: Ex. Imp To Depression-LOD

Runoff = 0.43 cfs @ 12.17 hrs, Volume= 1,807 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
6,557	98	Paved parking, HSG B
6,557		100.00% Impervious Area

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

Summary for Subcatchment 8S: Ex. Non Imp To Depression-LOD

Runoff = 0.45 cfs @ 12.21 hrs, Volume= 2,382 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
41,736	61	>75% Grass cover, Good, HSG B
14,517	55	Woods, Good, HSG B
56,253	59	Weighted Average
56,253		100.00% Pervious Area

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

Summary for Subcatchment 9S: Ex. Imp To Depression-Undist

Runoff = 0.17 cfs @ 12.17 hrs, Volume= 730 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
2,649	98	Paved parking, HSG B
2,649		100.00% Impervious Area

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

Summary for Subcatchment 10S: Ex. Non Imp to Depression-Undist

Runoff = 0.18 cfs @ 12.22 hrs, Volume= 1,107 cf, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
10,313	61	>75% Grass cover, Good, HSG B
20,521	55	Woods, Good, HSG B
30,834	57	Weighted Average
30,834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.5	271	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	31	0.0650	5.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	141	0.0850	4.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	60	0.2250	2.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	32	0.0780	4.50		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	648	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 13S: Ex. Imp To Sussex Piped-LOD

Runoff = 1.67 cfs @ 12.17 hrs, Volume= 6,982 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
25,340	98	Paved parking, HSG B
25,340		100.00% Impervious Area

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

Summary for Subcatchment 14S: Ex. Non Imp to Sussex Piped-LOD

Runoff = 0.16 cfs @ 12.20 hrs, Volume= 770 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
15,631	61	>75% Grass cover, Good, HSG B
15,631		100.00% Pervious Area

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

Summary for Subcatchment 15S: Ex. Imp To Sussex Piped-Undist

Runoff = 0.37 cfs @ 12.17 hrs, Volume= 1,532 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
5,559	98	Paved parking, HSG B
5,559		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	50	0.1600	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.1	129	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	157	0.0830	5.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	222	0.0740	4.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0370	3.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	585	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 16S: Ex. Non Imp to Sussex Piped-Undist

Runoff = 0.19 cfs @ 12.22 hrs, Volume= 1,154 cf, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
13,221	61	>75% Grass cover, Good, HSG B
18,929	55	Woods, Good, HSG B
32,150	57	Weighted Average
32,150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	32	0.0940	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.3	80	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.3	222	0.1010	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	109	0.0640	4.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	35	0.2290	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	144	0.0690	5.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	185	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.7	807	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 19S: Ex to Sussex Overland-LOD

Runoff = 0.04 cfs @ 12.20 hrs, Volume= 198 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
3,686	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
3,747	62	Weighted Average
3,686		98.37% Pervious Area
61		1.63% Impervious Area

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

Summary for Subcatchment 20S: Pr. Non Imp to GB Basin

Runoff = 0.86 cfs @ 12.21 hrs, Volume= 4,571 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
63,603	61	>75% Grass cover, Good, HSG B
44,367	55	Woods, Good, HSG B
107,970	59	Weighted Average
107,970		100.00% Pervious Area

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

Summary for Subcatchment 21S: Pr. Imp to GB basin

Runoff = 3.12 cfs @ 12.17 hrs, Volume= 13,050 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

	Area (sf)	CN	Description
*	16,060	98	Roof
	31,303	98	Paved parking, HSG B
	47,363	98	Weighted Average
	47,363		100.00% Impervious Area

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

Summary for Subcatchment 23S: Pr. Imp to WQ Basin

Runoff = 0.37 cfs @ 12.17 hrs, Volume= 1,544 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

	Area (sf)	CN	Description
*	4,809	98	Pavement
*	796	98	Other imp
	5,605	98	Weighted Average
	5,605		100.00% Impervious Area

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

Summary for Subcatchment 24S: Pr. Non Imp to WQ Basin

Runoff = 0.07 cfs @ 12.20 hrs, Volume= 325 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
6,598	61	>75% Grass cover, Good, HSG B
6,598		100.00% Pervious Area

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

Summary for Subcatchment 26S: Pr. Imp Bypass

Runoff = 1.06 cfs @ 12.17 hrs, Volume= 4,440 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
16,114	98	Paved parking, HSG B
16,114		100.00% Impervious Area

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

Summary for Subcatchment 27S: Pr. Non Imp Bypass

Runoff = 0.03 cfs @ 12.20 hrs, Volume= 136 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
2,763	61	>75% Grass cover, Good, HSG B
2,763		100.00% Pervious Area

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

Summary for Subcatchment 29S: Pr. Imp to Sunderland

Runoff = 0.63 cfs @ 12.17 hrs, Volume= 2,624 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
9,524	98	Paved parking, HSG B
9,524		100.00% Impervious Area

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

Summary for Subcatchment 30S: Pr. Non Imp to Sunderland

Runoff = 0.11 cfs @ 12.21 hrs, Volume= 603 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
4,348	55	Woods, Good, HSG B
9,890	61	>75% Grass cover, Good, HSG B
14,238	59	Weighted Average
14,238		100.00% Pervious Area

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

Summary for Subcatchment 32S: Pr. To Sussex-Overland

Runoff = 0.03 cfs @ 12.20 hrs, Volume= 154 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 yr Morris Rainfall=3.54"

Area (sf)	CN	Description
2,850	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
2,911	62	Weighted Average
2,850		97.90% Pervious Area
61		2.10% Impervious Area

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

Summary for Pond 12P: Existing Depression

Inflow Area = 96,293 sf, 9.56% Impervious, Inflow Depth = 0.75" for 2 yr Morris event
Inflow = 1.20 cfs @ 12.19 hrs, Volume= 6,025 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 465.91' @ 24.60 hrs Surf.Area= 5,983 sf Storage= 6,025 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	44,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	332	0	0
466.00	6,256	6,588	6,588
468.00	9,520	15,776	22,364
470.00	12,744	22,264	44,628

Device	Routing	Invert	Outlet Devices
#1	Primary	468.70'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.00' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 22S: Pr. Grass Bottom Basin

Inflow Area = 167,536 sf, 31.62% Impervious, Inflow Depth = 1.32" for 2 yr Morris event
Inflow = 3.91 cfs @ 12.18 hrs, Volume= 18,370 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 468.03' @ 26.55 hrs Surf.Area= 5,368 sf Storage= 18,369 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	26,339 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	10	0	0
465.00	5,065	2,538	2,538
466.00	5,165	5,115	7,653
468.00	5,365	10,530	18,183
469.00	5,465	5,415	23,598
469.50	5,500	2,741	26,339

Device	Routing	Invert	Outlet Devices
#1	Primary	464.67'	**5.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	465.85'	**15.0" W x 6.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#3	Primary	468.35'	**48.0" x 48.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	468.75'	**13.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65
2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.00' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 25S: Pr. WQ Basin

Inflow Area =	12,203 sf, 45.93% Impervious,	Inflow Depth =	1.84"	for 2 yr Morris event
Inflow =	0.43 cfs @ 12.17 hrs, Volume=	1,869 cf		
Outflow =	0.07 cfs @ 12.89 hrs, Volume=	748 cf,	Atten= 83%,	Lag= 42.8 min
Primary =	0.07 cfs @ 12.89 hrs, Volume=	748 cf		

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 487.37' @ 12.89 hrs Surf.Area= 1,065 sf Storage= 1,143 cf

Plug-Flow detention time= 372.3 min calculated for 748 cf (40% of inflow)
Center-of-Mass det. time= 200.9 min (989.2 - 788.2)

Volume	Invert	Avail.Storage	Storage Description
#1	484.49'	1,941 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.49	395	0.0	0	0
484.50	395	30.0	1	1
485.99	395	30.0	177	178
486.00	395	100.0	4	182
487.00	827	100.0	611	793
488.00	1,470	100.0	1,149	1,941

Device	Routing	Invert	Outlet Devices
#1	Primary	486.60'	**4.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	487.25'	**30.0" x 30.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	487.35'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.07 cfs @ 12.89 hrs HW=487.37' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.33 fps)

Summary for Link 5L: Undisturbed to Sunderland

Inflow Area = 24,909 sf, 14.94% Impervious, Inflow Depth = 0.93" for 2 yr Morris event
Inflow = 0.41 cfs @ 12.19 hrs, Volume= 1,922 cf
Primary = 0.41 cfs @ 12.19 hrs, Volume= 1,922 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 6L: Existing to Sunderland

Inflow Area = 34,366 sf, 23.86% Impervious, Inflow Depth = 1.19" for 2 yr Morris event
Inflow = 0.75 cfs @ 12.18 hrs, Volume= 3,401 cf
Primary = 0.75 cfs @ 12.18 hrs, Volume= 3,401 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 11L: Undisturbed to Depression

Inflow Area = 33,483 sf, 7.91% Impervious, Inflow Depth = 0.66" for 2 yr Morris event
Inflow = 0.34 cfs @ 12.20 hrs, Volume= 1,837 cf
Primary = 0.34 cfs @ 12.20 hrs, Volume= 1,837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 17L: Undisturbed to Sussex Piped

Inflow Area = 37,709 sf, 14.74% Impervious, Inflow Depth = 0.85" for 2 yr Morris event
Inflow = 0.54 cfs @ 12.19 hrs, Volume= 2,686 cf
Primary = 0.54 cfs @ 12.19 hrs, Volume= 2,686 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 18L: Existing to Sussex Piped

Inflow Area = 174,973 sf, 22.92% Impervious, Inflow Depth = 0.72" for 2 yr Morris event
Inflow = 2.35 cfs @ 12.18 hrs, Volume= 10,438 cf
Primary = 2.35 cfs @ 12.18 hrs, Volume= 10,438 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 28L: Proposed to Sussex-Piped

Inflow Area = 186,413 sf, 37.06% Impervious, Inflow Depth = 0.29" for 2 yr Morris event
Inflow = 1.09 cfs @ 12.17 hrs, Volume= 4,576 cf
Primary = 1.09 cfs @ 12.17 hrs, Volume= 4,576 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 31L: Proposed to Sunderland-Overland

Inflow Area = 23,762 sf, 40.08% Impervious, Inflow Depth = 1.63" for 2 yr Morris event
Inflow = 0.73 cfs @ 12.18 hrs, Volume= 3,227 cf
Primary = 0.73 cfs @ 12.18 hrs, Volume= 3,227 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

10-YEAR STORM EVENT

Summary for Subcatchment 1S: Ex. Imp To Sunder-LOD

Runoff = 0.44 cfs @ 12.17 hrs, Volume= 1,867 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
4,478	98	Paved parking, HSG B
4,478		100.00% Impervious Area

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

Summary for Subcatchment 2S: Ex. Non Imp to Sunder-LOD

Runoff = 0.16 cfs @ 12.19 hrs, Volume= 629 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
4,979	61	>75% Grass cover, Good, HSG B
4,979		100.00% Pervious Area

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

Summary for Subcatchment 3S: Ex. Imp To Sunder-Undist

Runoff = 0.36 cfs @ 12.17 hrs, Volume= 1,551 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
3,721	98	Paved parking, HSG B
3,721		100.00% Impervious Area

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

Summary for Subcatchment 4S: Ex. Non Imp to Sunder-Undist

Runoff = 0.61 cfs @ 12.19 hrs, Volume= 2,424 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
12,640	61	>75% Grass cover, Good, HSG B
8,548	55	Woods, Good, HSG B
21,188	59	Weighted Average
21,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	43	0.1160	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	33	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.8	98	0.1580	1.99		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	49	0.2550	8.13		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	162	0.0620	5.05		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	412	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 7S: Ex. Imp To Depression-LOD

Runoff = 0.64 cfs @ 12.17 hrs, Volume= 2,734 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
6,557	98	Paved parking, HSG B
6,557		100.00% Impervious Area

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

Summary for Subcatchment 8S: Ex. Non Imp To Depression-LOD

Runoff = 1.61 cfs @ 12.19 hrs, Volume= 6,435 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
41,736	61	>75% Grass cover, Good, HSG B
14,517	55	Woods, Good, HSG B
56,253	59	Weighted Average
56,253		100.00% Pervious Area

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

Summary for Subcatchment 9S: Ex. Imp To Depression-Undist

Runoff = 0.26 cfs @ 12.17 hrs, Volume= 1,104 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
2,649	98	Paved parking, HSG B
2,649		100.00% Impervious Area

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

Summary for Subcatchment 10S: Ex. Non Imp to Depression-Undist

Runoff = 0.77 cfs @ 12.19 hrs, Volume= 3,173 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
10,313	61	>75% Grass cover, Good, HSG B
20,521	55	Woods, Good, HSG B
30,834	57	Weighted Average
30,834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.5	271	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	31	0.0650	5.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	141	0.0850	4.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	60	0.2250	2.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	32	0.0780	4.50		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	648	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 13S: Ex. Imp To Sussex Piped-LOD

Runoff = 2.48 cfs @ 12.17 hrs, Volume= 10,564 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
25,340	98	Paved parking, HSG B
25,340		100.00% Impervious Area

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

Summary for Subcatchment 14S: Ex. Non Imp to Sussex Piped-LOD

Runoff = 0.51 cfs @ 12.19 hrs, Volume= 1,974 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
15,631	61	>75% Grass cover, Good, HSG B
15,631		100.00% Pervious Area

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

Summary for Subcatchment 15S: Ex. Imp To Sussex Piped-Undist

Runoff = 0.54 cfs @ 12.17 hrs, Volume= 2,318 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
5,559	98	Paved parking, HSG B
5,559		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	50	0.1600	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.1	129	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	157	0.0830	5.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	222	0.0740	4.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0370	3.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	585	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 16S: Ex. Non Imp to Sussex Piped-Undist

Runoff = 0.80 cfs @ 12.19 hrs, Volume= 3,308 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
13,221	61	>75% Grass cover, Good, HSG B
18,929	55	Woods, Good, HSG B
32,150	57	Weighted Average
32,150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	32	0.0940	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.3	80	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.3	222	0.1010	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	109	0.0640	4.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	35	0.2290	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	144	0.0690	5.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	185	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.7	807	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 19S: Ex to Sussex Overland-LOD

Runoff = 0.13 cfs @ 12.19 hrs, Volume= 496 cf, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
3,686	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
3,747	62	Weighted Average
3,686		98.37% Pervious Area
61		1.63% Impervious Area

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

Summary for Subcatchment 20S: Pr. Non Imp to GB Basin

Runoff = 3.10 cfs @ 12.19 hrs, Volume= 12,351 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
63,603	61	>75% Grass cover, Good, HSG B
44,367	55	Woods, Good, HSG B
107,970	59	Weighted Average
107,970		100.00% Pervious Area

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

Summary for Subcatchment 21S: Pr. Imp to GB basin

Runoff = 4.64 cfs @ 12.17 hrs, Volume= 19,746 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

	Area (sf)	CN	Description
*	16,060	98	Roof
	31,303	98	Paved parking, HSG B
	47,363	98	Weighted Average
	47,363		100.00% Impervious Area

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

Summary for Subcatchment 23S: Pr. Imp to WQ Basin

Runoff = 0.55 cfs @ 12.17 hrs, Volume= 2,337 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

	Area (sf)	CN	Description
*	4,809	98	Pavement
*	796	98	Other imp
	5,605	98	Weighted Average
	5,605		100.00% Impervious Area

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

Summary for Subcatchment 24S: Pr. Non Imp to WQ Basin

Runoff = 0.21 cfs @ 12.19 hrs, Volume= 833 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
6,598	61	>75% Grass cover, Good, HSG B
6,598		100.00% Pervious Area

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

Summary for Subcatchment 26S: Pr. Imp Bypass

Runoff = 1.58 cfs @ 12.17 hrs, Volume= 6,718 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
16,114	98	Paved parking, HSG B
16,114		100.00% Impervious Area

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

Summary for Subcatchment 27S: Pr. Non Imp Bypass

Runoff = 0.09 cfs @ 12.19 hrs, Volume= 349 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
2,763	61	>75% Grass cover, Good, HSG B
2,763		100.00% Pervious Area

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

Summary for Subcatchment 29S: Pr. Imp to Sunderland

Runoff = 0.93 cfs @ 12.17 hrs, Volume= 3,971 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
9,524	98	Paved parking, HSG B
9,524		100.00% Impervious Area

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

Summary for Subcatchment 30S: Pr. Non Imp to Sunderland

Runoff = 0.41 cfs @ 12.19 hrs, Volume= 1,629 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
4,348	55	Woods, Good, HSG B
9,890	61	>75% Grass cover, Good, HSG B
14,238	59	Weighted Average
14,238		100.00% Pervious Area

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

Summary for Subcatchment 32S: Pr. To Sussex-Overland

Runoff = 0.10 cfs @ 12.19 hrs, Volume= 385 cf, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 yr Morris Rainfall=5.24"

Area (sf)	CN	Description
2,850	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
2,911	62	Weighted Average
2,850		97.90% Pervious Area
61		2.10% Impervious Area

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

Summary for Pond 12P: Existing Depression

Inflow Area = 96,293 sf, 9.56% Impervious, Inflow Depth = 1.68" for 10 yr Morris event
Inflow = 3.27 cfs @ 12.18 hrs, Volume= 13,445 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 466.97' @ 24.60 hrs Surf.Area= 7,843 sf Storage= 13,445 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	44,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	332	0	0
466.00	6,256	6,588	6,588
468.00	9,520	15,776	22,364
470.00	12,744	22,264	44,628

Device	Routing	Invert	Outlet Devices
#1	Primary	468.70'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 22S: Pr. Grass Bottom Basin

Inflow Area = 167,536 sf, 31.62% Impervious, Inflow Depth = 2.45" for 10 yr Morris event
Inflow = 8.29 cfs @ 12.18 hrs, Volume= 34,148 cf
Outflow = 0.69 cfs @ 13.85 hrs, Volume= 11,913 cf, Atten= 92%, Lag= 99.9 min
Primary = 0.69 cfs @ 13.85 hrs, Volume= 11,913 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 468.83' @ 13.85 hrs Surf.Area= 5,448 sf Storage= 22,658 cf

Plug-Flow detention time= 430.5 min calculated for 11,913 cf (35% of inflow)
Center-of-Mass det. time= 246.0 min (1,057.6 - 811.6)

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	26,339 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	10	0	0
465.00	5,065	2,538	2,538
466.00	5,165	5,115	7,653
468.00	5,365	10,530	18,183
469.00	5,465	5,415	23,598
469.50	5,500	2,741	26,339

Device	Routing	Invert	Outlet Devices
#1	Primary	464.67'	**5.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	465.85'	**15.0" W x 6.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#3	Primary	468.35'	**48.0" x 48.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	468.75'	**13.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65
2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.67 cfs @ 13.85 hrs HW=468.83' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.67 cfs @ 0.66 fps)

Summary for Pond 25S: Pr. WQ Basin

Inflow Area = 12,203 sf, 45.93% Impervious, Inflow Depth = 3.12" for 10 yr Morris event
Inflow = 0.76 cfs @ 12.17 hrs, Volume= 3,170 cf
Outflow = 0.70 cfs @ 12.22 hrs, Volume= 2,052 cf, Atten= 7%, Lag= 2.9 min
Primary = 0.70 cfs @ 12.22 hrs, Volume= 2,052 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 487.45' @ 12.22 hrs Surf.Area= 1,114 sf Storage= 1,226 cf

Plug-Flow detention time= 227.8 min calculated for 2,052 cf (65% of inflow)
Center-of-Mass det. time= 105.8 min (893.3 - 787.5)

Volume	Invert	Avail.Storage	Storage Description
#1	484.49'	1,941 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.49	395	0.0	0	0
484.50	395	30.0	1	1
485.99	395	30.0	177	178
486.00	395	100.0	4	182
487.00	827	100.0	611	793
488.00	1,470	100.0	1,149	1,941

Device	Routing	Invert	Outlet Devices
#1	Primary	486.60'	**4.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	487.25'	**30.0" x 30.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	487.35'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.66 cfs @ 12.22 hrs HW=487.44' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.66 cfs @ 0.71 fps)

Summary for Link 5L: Undisturbed to Sunderland

Inflow Area = 24,909 sf, 14.94% Impervious, Inflow Depth = 1.91" for 10 yr Morris event
Inflow = 0.97 cfs @ 12.18 hrs, Volume= 3,975 cf
Primary = 0.97 cfs @ 12.18 hrs, Volume= 3,975 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 6L: Existing to Sunderland

Inflow Area = 34,366 sf, 23.86% Impervious, Inflow Depth = 2.26" for 10 yr Morris event
Inflow = 1.56 cfs @ 12.18 hrs, Volume= 6,471 cf
Primary = 1.56 cfs @ 12.18 hrs, Volume= 6,471 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 11L: Undisturbed to Depression

Inflow Area = 33,483 sf, 7.91% Impervious, Inflow Depth = 1.53" for 10 yr Morris event
Inflow = 1.03 cfs @ 12.19 hrs, Volume= 4,277 cf
Primary = 1.03 cfs @ 12.19 hrs, Volume= 4,277 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 17L: Undisturbed to Sussex Piped

Inflow Area = 37,709 sf, 14.74% Impervious, Inflow Depth = 1.79" for 10 yr Morris event
Inflow = 1.34 cfs @ 12.18 hrs, Volume= 5,626 cf
Primary = 1.34 cfs @ 12.18 hrs, Volume= 5,626 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 18L: Existing to Sussex Piped

Inflow Area = 174,973 sf, 22.92% Impervious, Inflow Depth = 1.25" for 10 yr Morris event
Inflow = 4.32 cfs @ 12.17 hrs, Volume= 18,164 cf
Primary = 4.32 cfs @ 12.17 hrs, Volume= 18,164 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 28L: Proposed to Sussex-Piped

Inflow Area = 186,413 sf, 37.06% Impervious, Inflow Depth = 1.22" for 10 yr Morris event
Inflow = 1.67 cfs @ 12.17 hrs, Volume= 18,980 cf
Primary = 1.67 cfs @ 12.17 hrs, Volume= 18,980 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 31L: Proposed to Sunderland-Overland

Inflow Area = 23,762 sf, 40.08% Impervious, Inflow Depth = 2.83" for 10 yr Morris event
Inflow = 1.34 cfs @ 12.17 hrs, Volume= 5,599 cf
Primary = 1.34 cfs @ 12.17 hrs, Volume= 5,599 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

100-YEAR STORM EVENT

Summary for Subcatchment 1S: Ex. Imp To Sunder-LOD

Runoff = 0.70 cfs @ 12.17 hrs, Volume= 3,026 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
4,478	98	Paved parking, HSG B
4,478		100.00% Impervious Area

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

Summary for Subcatchment 2S: Ex. Non Imp to Sunder-LOD

Runoff = 0.42 cfs @ 12.18 hrs, Volume= 1,541 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
4,979	61	>75% Grass cover, Good, HSG B
4,979		100.00% Pervious Area

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

Summary for Subcatchment 3S: Ex. Imp To Sunder-Undist

Runoff = 0.58 cfs @ 12.17 hrs, Volume= 2,515 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
3,721	98	Paved parking, HSG B
3,721		100.00% Impervious Area

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

Summary for Subcatchment 4S: Ex. Non Imp to Sunder-Undist

Runoff = 1.66 cfs @ 12.18 hrs, Volume= 6,150 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
12,640	61	>75% Grass cover, Good, HSG B
8,548	55	Woods, Good, HSG B
21,188	59	Weighted Average
21,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	43	0.1160	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.2	33	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.8	98	0.1580	1.99		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	49	0.2550	8.13		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	162	0.0620	5.05		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	412	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 7S: Ex. Imp To Depression-LOD

Runoff = 1.03 cfs @ 12.17 hrs, Volume= 4,431 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
6,557	98	Paved parking, HSG B
6,557		100.00% Impervious Area

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

Summary for Subcatchment 8S: Ex. Non Imp To Depression-LOD

Runoff = 4.41 cfs @ 12.18 hrs, Volume= 16,327 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
41,736	61	>75% Grass cover, Good, HSG B
14,517	55	Woods, Good, HSG B
56,253	59	Weighted Average
56,253		100.00% Pervious Area

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

Summary for Subcatchment 9S: Ex. Imp To Depression-Undist

Runoff = 0.42 cfs @ 12.17 hrs, Volume= 1,790 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
2,649	98	Paved parking, HSG B
2,649		100.00% Impervious Area

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

Summary for Subcatchment 10S: Ex. Non Imp to Depression-Undist

Runoff = 2.24 cfs @ 12.18 hrs, Volume= 8,360 cf, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
10,313	61	>75% Grass cover, Good, HSG B
20,521	55	Woods, Good, HSG B
30,834	57	Weighted Average
30,834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.5	271	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	31	0.0650	5.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	141	0.0850	4.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	60	0.2250	2.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	32	0.0780	4.50		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	648	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 13S: Ex. Imp To Sussex Piped-LOD

Runoff = 3.97 cfs @ 12.17 hrs, Volume= 17,126 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
25,340	98	Paved parking, HSG B
25,340		100.00% Impervious Area

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

Summary for Subcatchment 14S: Ex. Non Imp to Sussex Piped-LOD

Runoff = 1.31 cfs @ 12.18 hrs, Volume= 4,837 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
15,631	61	>75% Grass cover, Good, HSG B
15,631		100.00% Pervious Area

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

Summary for Subcatchment 15S: Ex. Imp To Sussex Piped-Undist

Runoff = 0.87 cfs @ 12.17 hrs, Volume= 3,757 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
5,559	98	Paved parking, HSG B
5,559		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	50	0.1600	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.1	129	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	157	0.0830	5.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	222	0.0740	4.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	27	0.0370	3.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	585	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 16S: Ex. Non Imp to Sussex Piped-Undist

Runoff = 2.34 cfs @ 12.18 hrs, Volume= 8,717 cf, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
13,221	61	>75% Grass cover, Good, HSG B
18,929	55	Woods, Good, HSG B
32,150	57	Weighted Average
32,150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	32	0.0940	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
0.3	80	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.3	222	0.1010	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	109	0.0640	4.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	35	0.2290	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	144	0.0690	5.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	185	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.7	807	Total, Increased to minimum Tc = 10.0 min			

Summary for Subcatchment 19S: Ex to Sussex Overland-LOD

Runoff = 0.32 cfs @ 12.18 hrs, Volume= 1,196 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
3,686	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
3,747	62	Weighted Average
3,686		98.37% Pervious Area
61		1.63% Impervious Area

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

Summary for Subcatchment 20S: Pr. Non Imp to GB Basin

Runoff = 8.46 cfs @ 12.18 hrs, Volume= 31,337 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
63,603	61	>75% Grass cover, Good, HSG B
44,367	55	Woods, Good, HSG B
107,970	59	Weighted Average
107,970		100.00% Pervious Area

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

Summary for Subcatchment 21S: Pr. Imp to GB basin

Runoff = 7.42 cfs @ 12.17 hrs, Volume= 32,009 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

	Area (sf)	CN	Description
*	16,060	98	Roof
	31,303	98	Paved parking, HSG B
	47,363	98	Weighted Average
	47,363		100.00% Impervious Area

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

Summary for Subcatchment 23S: Pr. Imp to WQ Basin

Runoff = 0.88 cfs @ 12.17 hrs, Volume= 3,788 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

	Area (sf)	CN	Description
*	4,809	98	Pavement
*	796	98	Other imp
	5,605	98	Weighted Average
	5,605		100.00% Impervious Area

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

Summary for Subcatchment 24S: Pr. Non Imp to WQ Basin

Runoff = 0.55 cfs @ 12.18 hrs, Volume= 2,042 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
6,598	61	>75% Grass cover, Good, HSG B
6,598		100.00% Pervious Area

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

Summary for Subcatchment 26S: Pr. Imp Bypass

Runoff = 2.52 cfs @ 12.17 hrs, Volume= 10,890 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
16,114	98	Paved parking, HSG B
16,114		100.00% Impervious Area

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

Summary for Subcatchment 27S: Pr. Non Imp Bypass

Runoff = 0.23 cfs @ 12.18 hrs, Volume= 855 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
2,763	61	>75% Grass cover, Good, HSG B
2,763		100.00% Pervious Area

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

Summary for Subcatchment 29S: Pr. Imp to Sunderland

Runoff = 1.49 cfs @ 12.17 hrs, Volume= 6,437 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
9,524	98	Paved parking, HSG B
9,524		100.00% Impervious Area

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

Summary for Subcatchment 30S: Pr. Non Imp to Sunderland

Runoff = 1.12 cfs @ 12.18 hrs, Volume= 4,132 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
4,348	55	Woods, Good, HSG B
9,890	61	>75% Grass cover, Good, HSG B
14,238	59	Weighted Average
14,238		100.00% Pervious Area

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

Summary for Subcatchment 32S: Pr. To Sussex-Overland

Runoff = 0.25 cfs @ 12.18 hrs, Volume= 929 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 yr Morris Rainfall=8.35"

Area (sf)	CN	Description
2,850	61	>75% Grass cover, Good, HSG B
61	98	Paved parking, HSG B
2,911	62	Weighted Average
2,850		97.90% Pervious Area
61		2.10% Impervious Area

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

Summary for Pond 12P: Existing Depression

Inflow Area = 96,293 sf, 9.56% Impervious, Inflow Depth = 3.85" for 100 yr Morris event
Inflow = 8.08 cfs @ 12.18 hrs, Volume= 30,908 cf
Outflow = 0.18 cfs @ 22.68 hrs, Volume= 1,485 cf, Atten= 98%, Lag= 630.2 min
Primary = 0.18 cfs @ 22.68 hrs, Volume= 1,485 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 468.71' @ 22.68 hrs Surf.Area= 10,670 sf Storage= 29,564 cf

Plug-Flow detention time= 922.5 min calculated for 1,484 cf (5% of inflow)
Center-of-Mass det. time= 549.5 min (1,388.7 - 839.2)

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	44,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	332	0	0
466.00	6,256	6,588	6,588
468.00	9,520	15,776	22,364
470.00	12,744	22,264	44,628

Device	Routing	Invert	Outlet Devices
#1	Primary	468.70'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.10 cfs @ 22.68 hrs HW=468.71' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.31 fps)

Summary for Pond 22S: Pr. Grass Bottom Basin

Inflow Area = 167,536 sf, 31.62% Impervious, Inflow Depth = 4.87" for 100 yr Morris event
Inflow = 17.19 cfs @ 12.18 hrs, Volume= 68,054 cf
Outflow = 14.51 cfs @ 12.26 hrs, Volume= 45,820 cf, Atten= 16%, Lag= 4.9 min
Primary = 14.51 cfs @ 12.26 hrs, Volume= 45,820 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 469.31' @ 12.26 hrs Surf.Area= 5,487 sf Storage= 25,294 cf

Plug-Flow detention time= 209.9 min calculated for 45,788 cf (67% of inflow)
Center-of-Mass det. time= 95.1 min (901.2 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	26,339 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	10	0	0
465.00	5,065	2,538	2,538
466.00	5,165	5,115	7,653
468.00	5,365	10,530	18,183
469.00	5,465	5,415	23,598
469.50	5,500	2,741	26,339

Device	Routing	Invert	Outlet Devices
#1	Primary	464.67'	**5.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	465.85'	**15.0" W x 6.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#3	Primary	468.35'	**48.0" x 48.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	468.75'	**13.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65
2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=14.15 cfs @ 12.26 hrs HW=469.30' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 14.15 cfs @ 1.97 fps)

Summary for Pond 25S: Pr. WQ Basin

Inflow Area =	12,203 sf, 45.93% Impervious,	Inflow Depth =	5.73"	for 100 yr Morris event
Inflow =	1.43 cfs @ 12.17 hrs, Volume=	5,830 cf		
Outflow =	1.38 cfs @ 12.20 hrs, Volume=	4,708 cf,	Atten= 4%,	Lag= 1.5 min
Primary =	1.38 cfs @ 12.20 hrs, Volume=	4,708 cf		

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 487.50' @ 12.20 hrs Surf.Area= 1,149 sf Storage= 1,288 cf

Plug-Flow detention time= 154.3 min calculated for 4,704 cf (81% of inflow)
Center-of-Mass det. time= 69.3 min (853.5 - 784.2)

Volume	Invert	Avail.Storage	Storage Description
#1	484.49'	1,941 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.49	395	0.0	0	0
484.50	395	30.0	1	1
485.99	395	30.0	177	178
486.00	395	100.0	4	182
487.00	827	100.0	611	793
488.00	1,470	100.0	1,149	1,941

Device	Routing	Invert	Outlet Devices
#1	Primary	486.60'	**4.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	487.25'	**30.0" x 30.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	487.35'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.37 cfs @ 12.20 hrs HW=487.50' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 1.37 cfs @ 0.91 fps)

Summary for Link 5L: Undisturbed to Sunderland

Inflow Area = 24,909 sf, 14.94% Impervious, Inflow Depth = 4.17" for 100 yr Morris event
Inflow = 2.24 cfs @ 12.18 hrs, Volume= 8,664 cf
Primary = 2.24 cfs @ 12.18 hrs, Volume= 8,664 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 6L: Existing to Sunderland

Inflow Area = 34,366 sf, 23.86% Impervious, Inflow Depth = 4.62" for 100 yr Morris event
Inflow = 3.35 cfs @ 12.18 hrs, Volume= 13,232 cf
Primary = 3.35 cfs @ 12.18 hrs, Volume= 13,232 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 11L: Undisturbed to Depression

Inflow Area = 33,483 sf, 7.91% Impervious, Inflow Depth = 3.64" for 100 yr Morris event
Inflow = 2.65 cfs @ 12.18 hrs, Volume= 10,150 cf
Primary = 2.65 cfs @ 12.18 hrs, Volume= 10,150 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 17L: Undisturbed to Sussex Piped

Inflow Area = 37,709 sf, 14.74% Impervious, Inflow Depth = 3.97" for 100 yr Morris event
Inflow = 3.20 cfs @ 12.18 hrs, Volume= 12,474 cf
Primary = 3.20 cfs @ 12.18 hrs, Volume= 12,474 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 18L: Existing to Sussex Piped

Inflow Area = 174,973 sf, 22.92% Impervious, Inflow Depth = 2.46" for 100 yr Morris event
Inflow = 8.48 cfs @ 12.17 hrs, Volume= 35,922 cf
Primary = 8.48 cfs @ 12.17 hrs, Volume= 35,922 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 28L: Proposed to Sussex-Piped

Inflow Area = 186,413 sf, 37.06% Impervious, Inflow Depth = 3.71" for 100 yr Morris event
Inflow = 16.56 cfs @ 12.25 hrs, Volume= 57,565 cf
Primary = 16.56 cfs @ 12.25 hrs, Volume= 57,565 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 31L: Proposed to Sunderland-Overland

Inflow Area = 23,762 sf, 40.08% Impervious, Inflow Depth = 5.34" for 100 yr Morris event
Inflow = 2.61 cfs @ 12.17 hrs, Volume= 10,569 cf
Primary = 2.61 cfs @ 12.17 hrs, Volume= 10,569 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

WATER QUALITY STORM

Within limit of disturbance:
Existing motor vehicle surface: 34,290 SF
Proposed motor vehicle surface: 38,363 SF (4,073 SF increase)

Motor vehicle surface to be treated in bioretention basin (80% TSS removal): 4,809 SF

Summary for Subcatchment 23S: Pr. Imp to WQ Basin

Runoff = 0.21 cfs @ 1.32 hrs, Volume= 483 cf, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NewJersey 2hr NJ-2hr-1.25Inch Rainfall=1.25"

	Area (sf)	CN	Description
*	4,809	98	Pavement
*	796	98	Other imp
	5,605	98	Weighted Average
	5,605		100.00% Impervious Area

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

Summary for Subcatchment 24S: Pr. Non Imp to WQ Basin

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NewJersey 2hr NJ-2hr-1.25Inch Rainfall=1.25"

Area (sf)	CN	Description
6,598	61	>75% Grass cover, Good, HSG B
6,598		100.00% Pervious Area

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

Summary for Pond 25S: Pr. WQ Basin

Inflow Area = 12,203 sf, 45.93% Impervious, Inflow Depth = 0.48" for NJ-2hr-1.25Inch event
Inflow = 0.21 cfs @ 1.32 hrs, Volume= 483 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 486.58' @ 2.60 hrs Surf.Area= 645 sf Storage= 483 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	484.49'	1,941 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.49	395	0.0	0	0
484.50	395	30.0	1	1
485.99	395	30.0	177	178
486.00	395	100.0	4	182
487.00	827	100.0	611	793
488.00	1,470	100.0	1,149	1,941

Device	Routing	Invert	Outlet Devices
#1	Primary	486.60'	**4.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	487.25'	**30.0" x 30.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	487.35'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

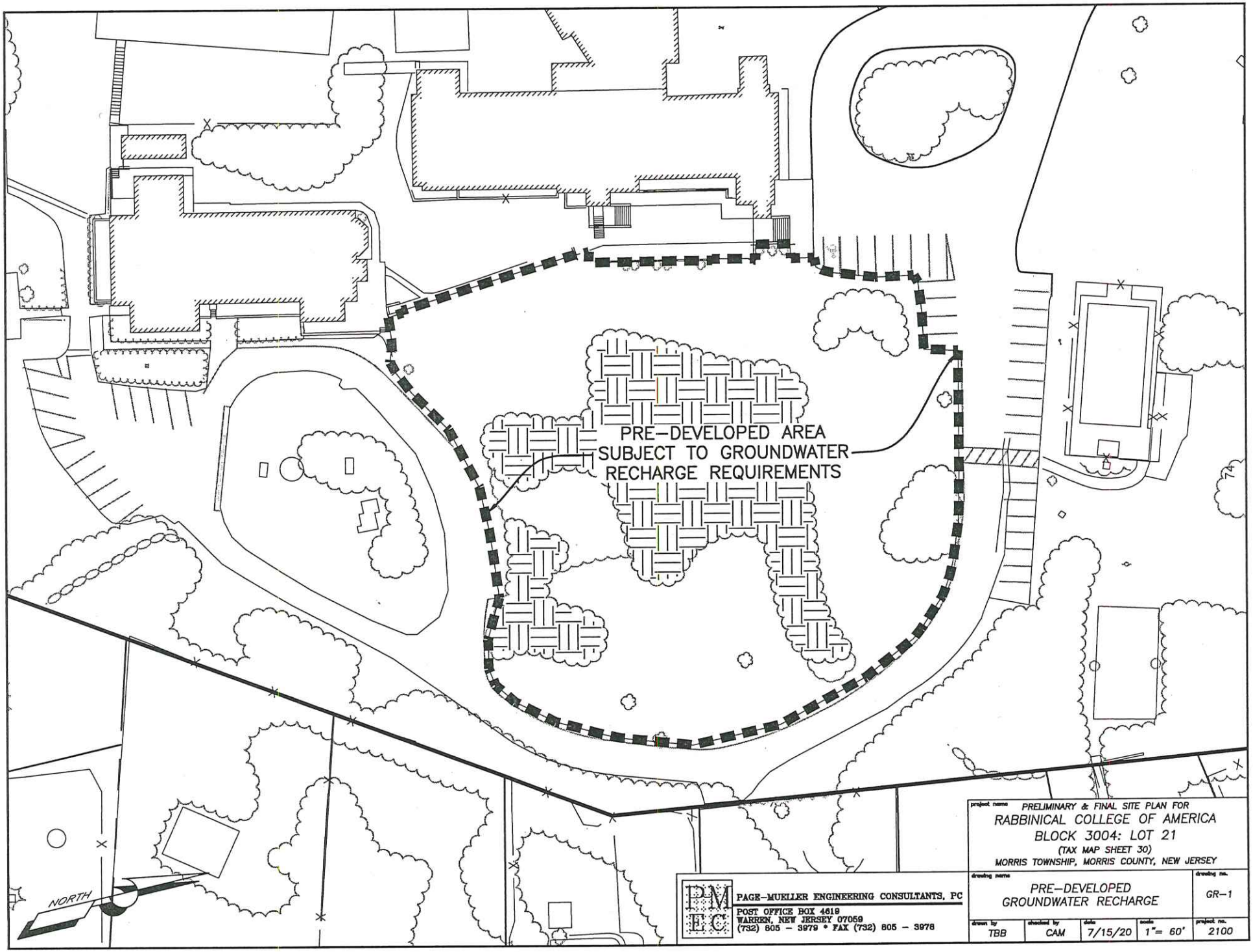
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=484.49' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

GROUNDWATER RECHARGE

This project falls within the PA-1 Metropolitan Planning Area, as delineated on the State Plan Policy Map. Thus, the portions of the site which are previously developed are considered "urban redevelopment area" and are not subject to groundwater recharge requirements. These include areas which currently contain lawn and impervious surface.

The maps on the following pages delineate the pre-development and post-development conditions of the undeveloped portion of the site which is subject to groundwater recharge.

The proposed grass-bottom detention basin will be utilized as a recharge facility. The lowest outlet will be located 8" above the basin bottom, allowing the stormwater runoff below that outlet to be infiltrated and recharged. The following pages contain the recharge calculations for the pre- and post-development conditions.

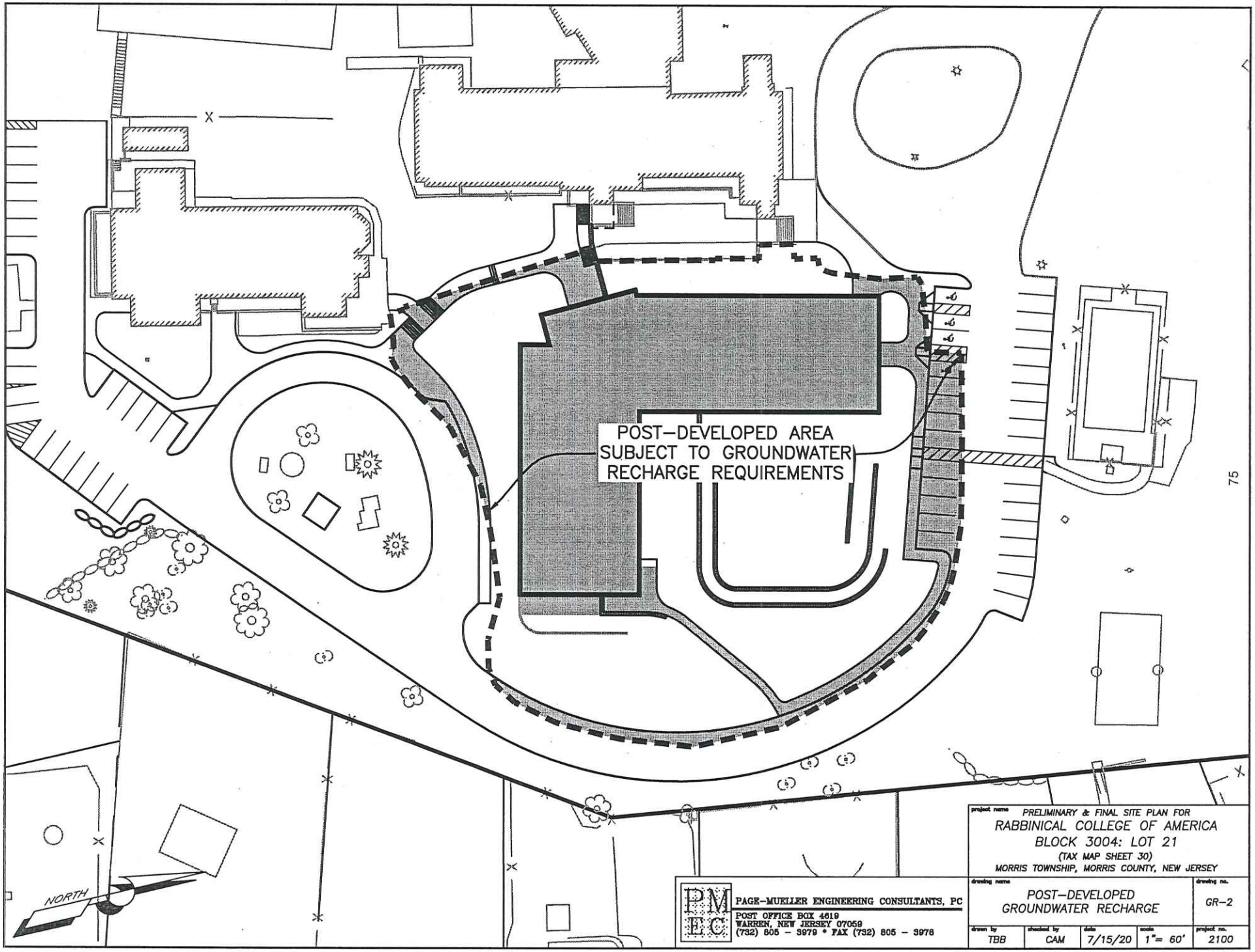


PRELIMINARY & FINAL SITE PLAN FOR
RABBINICAL COLLEGE OF AMERICA
BLOCK 3004: LOT 21
(TAX MAP SHEET 30)
MORRIS TOWNSHIP, MORRIS COUNTY, NEW JERSEY

PAGE-MUELLER ENGINEERING CONSULTANTS, PC
POST OFFICE BOX 4619
WARREN, NEW JERSEY 07059
(732) 805 - 3979 • FAX (732) 805 - 3978

drawing name	drawing no.
PRE-DEVELOPED GROUNDWATER RECHARGE	GR-1

drawn by	checked by	date	scale	project no.
TBB	CAM	7/15/20	1"= 60'	2100



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drawing name	drawing no.
POST-DEVELOPED GROUNDWATER RECHARGE	GR-2

drawn by	checked by	date	scale	project no.
TBB	CAM	7/15/20	1"= 60'	2100

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Project Name:	Rabbinical
Description:	Block 3004, Lot 21, Morris Twp
Analysis Date:	07/15/20

Select Township ↓	Average Annual P (in)	Climatic Factor
MORRIS CO., MORRIS TWP	50.1	1.73

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.33	Woods	Gladstone	19.5	23,301
2	0.93	Open space	Gladstone	18.9	63,732
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
Total =	1.3			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				19.0	87,033

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.68	Open space	Gladstone	18.9	46,599
2	0.58	Impervious areas	Gladstone	0.0	-
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
Total =	1.3			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				10.2	46,599

Annual Recharge Requirements Calculation ↓		Total Impervious Area (sq.ft)	25,265
% of Pre-Developed Annual Recharge to Preserve =	100%		
Post-Development Annual Recharge Deficit=	*40,433*	(cubic feet)	

Recharge Efficiency Parameters Calculations (area averages)

RWC= #N/A	(in)	DRWC= #N/A	(in)
ERWC = #N/A	(in)	EDRWC= #N/A	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
Rabbinical	Block 3004, Lot 21, Morris Twp	07/15/20	Grass Bottom Basin

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	2700.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	4.0	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-4.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	1	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.74	in
ERWC Modified to consider dEXC	EDRWC	0.74	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.58	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	0.21	in
Inches of Rainfall to capture	Pdesign	0.28	in
Recharge Provided Avg. over Imp. Area		11.3	in
Runoff Captured Avg. over imp. Area		13.6	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.05	unitless
BMP Volume	VBMP	900	cu.ft

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	40,433	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	52,968	sq.ft
Root Zone Water Capacity	RWC	5.48	in
RWC Modified to consider dEXC	DRWC	5.48	in
Climatic Factor	C-factor	1.73	no units
Average Annual P	Pavg	50.1	in
Recharge Requirement over Imp. Area	dr	19.2	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		49,794	cu.ft
Avg BMP Recharge Efficiency		82.9%	Represents % Infiltration Recharged
%Rainfall became Runoff		78.7%	%
%Runoff Infiltrated		34.5%	%
%Runoff Recharged		60.0%	%
%Rainfall Recharged		47.2%	%

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check—> OK
dEXC Check—> OK
BMP Location—> OK

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

EMERGENCY SPILLWAY

On-site soils: Gravelly Loam (use allowable velocities for Sandy Loam)
Allowable velocity for grass: 2.0 fps
Allowable velocity for sod: 3.0 fps

Spillway velocity calculations based on 100-year storm event with failure of all other outlets.

Bioretention Basin

Velocity during failure: 0.97 fps

Spillway elevation:	487.35
Top of berm:	488.50
Water surface elevation during failure:	487.50 (1' below top of berm)

Grass Bottom Basin

Velocity during failure: 1.97 fps

Spillway elevation:	468.75
Top of berm:	470.33
Water surface elevation during failure:	469.31 (1' below top of berm)

Summary for Pond 22S: Pr. Grass Bottom Basin

Inflow Area = 167,536 sf, 31.62% Impervious, Inflow Depth = 4.87" for 100 yr Morris event
Inflow = 17.19 cfs @ 12.18 hrs, Volume= 68,054 cf
Outflow = 14.51 cfs @ 12.26 hrs, Volume= 45,820 cf, Atten= 16%, Lag= 4.9 min
Primary = 14.51 cfs @ 12.26 hrs, Volume= 45,820 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 469.31' @ 12.26 hrs Surf.Area= 5,487 sf Storage= 25,294 cf

Plug-Flow detention time= 209.9 min calculated for 45,788 cf (67% of inflow)
Center-of-Mass det. time= 95.1 min (901.2 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	464.00'	26,339 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.00	10	0	0
465.00	5,065	2,538	2,538
466.00	5,165	5,115	7,653
468.00	5,365	10,530	18,183
469.00	5,465	5,415	23,598
469.50	5,500	2,741	26,339

Device	Routing	Invert	Outlet Devices
#1	Primary	464.67'	**5.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	465.85'	**15.0" W x 6.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#3	Primary	468.35'	**48.0" x 48.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	468.75'	**13.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=14.15 cfs @ 12.26 hrs HW=469.30' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 14.15 cfs @ 1.97 fps)

Summary for Pond 25S: Pr. WQ Basin

Inflow Area = 12,203 sf, 45.93% Impervious, Inflow Depth = 5.73" for 100 yr Morris event
Inflow = 1.43 cfs @ 12.17 hrs, Volume= 5,830 cf
Outflow = 1.38 cfs @ 12.20 hrs, Volume= 4,708 cf, Atten= 4%, Lag= 1.5 min
Primary = 1.38 cfs @ 12.20 hrs, Volume= 4,708 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 487.50' @ 12.20 hrs Surf.Area= 1,149 sf Storage= 1,288 cf

Plug-Flow detention time= 154.3 min calculated for 4,704 cf (81% of inflow)
Center-of-Mass det. time= 69.3 min (853.5 - 784.2)

Volume	Invert	Avail.Storage	Storage Description
#1	484.49'	1,941 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.49	395	0.0	0	0
484.50	395	30.0	1	1
485.99	395	30.0	177	178
486.00	395	100.0	4	182
487.00	827	100.0	611	793
488.00	1,470	100.0	1,149	1,941

Device	Routing	Invert	Outlet Devices
#1	Primary	486.60'	**4.0" W x 4.0" H Vert. Orifice/Grate X 0.00** C= 0.600
#2	Primary	487.25'	**30.0" x 30.0" Horiz. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	487.35'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.37 cfs @ 12.20 hrs HW=487.50' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 1.37 cfs @ 0.91 fps)

III. STORM DRAINAGE SYSTEM DESIGN

The proposed stormwater management collection system has been designed for the 25-year storm event. The 25-year storm was used to insure all proposed runoff would be collected and piped to the stormwater management system serving the site. The outlet pipe from the proposed detention basin has been designed to convey the 100-year discharge. Runoff for the collection system was calculated using the Rational Method.

The Rational Method formula is Q = CxIxA; the following defines each variable:

Q = Peak runoff rate in cubic feet per second
C = Weighted coefficient of runoff
I = Rainfall intensity in inches per hour
A = Drainage area in acres

Times of concentration on the site are all less than 10 minutes. Thus, the required minimum of 10 minutes was used for all areas.

All proposed pipe is to be HDPE pipe with a minimum diameter of 15", except for one run of 12" HDPE pipe.

The following pages contain these calculations.

PIPE CALCULATIONS

Project: Rabbinical
Job #: 2100
Location: Morris Twp

Computed By: TBB
Checked By: CAM
Date: 7/15/2020

NOTES:

1) Design method used is Rational Method
2) "EX" denotes existing structure
3) Weighted Runoff Coefficient based on C values of 0.25 for grassed areas and 0.99 for pavement
4) Adjusted C values used to determine equivalent Rational Method peak runoffs for basin outflows
5) Velocity percent (%V) from hydraulic elements table
6) All pipe shall be Class III reinforced concrete pipe unless otherwise noted

STRUCTURE		AREA (Acres)		RUNOFF COEFFICIENT "C"		"A" x "C"		STORM	I	PEAK RUNOFF	TIME OF CONCEN.		PIPING INPUT		PIPING DATA							INVERT ELEVATION		GRATE/RIM ELEVATION		GRATE TO INVERT ELEVATION		GRATE TO TOP OF PIPE CLEARANCE			
FROM	TO	Inc. Area	Total Area	% Imperv-ious	Weighted Incre-mental "C"	Incre-mental	Total A x C	Year	in/hr.	Qa CFS	To Inlet Min.	To Upper End	Dia. (IN)	Length (FT)	Man. "n"	% Slope	Qf Full (CFS)	Vf Full (FPS)	%Q Qa/Qf x100	%V (Va/Vf) x 100	Vactual (FPS)	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	FROM	TO
Inlet 4.1	FES 4.0	0.21	0.21	60%	0.69	0.15	0.15	25	6.47	0.94	10.00	10.00	12	13	0.012	0.54	2.83	3.61	33	89.5	3.23	486.07	486.00	488.00	NA	1.93	NA	0.76	NA	4.1	4
Inlet 3.3	Inlet 3.2	0.94	0.94	16%	0.37	0.35	0.35	25	6.47	2.24	10.00	10.00	15	138	0.012	8.00	19.78	16.13	11	66	10.64	488.82	477.78	491.76	480.88	2.94	3.10	1.50	1.66	3.3	3.2
Inlet 3.2.2	Inlet 3.2	0.13	0.13	0%	0.25	0.03	0.03	25	6.47	0.21	10.00	10.00	15	37	0.012	0.32	3.98	3.25	5	53	1.72	475.73	475.61	478.67	480.88	2.94	5.27	1.50	3.83	3.2.2	3.2
Inlet 3.2.1	Inlet 3.2	0.57	0.57	12%	0.34	0.19	0.19	25	6.47	1.25	10.00	10.00	15	24	0.012	0.50	4.95	4.03	25	83	3.35	477.90	477.78	480.88	480.88	2.98	3.10	1.54	1.66	3.2.1	3.2
Inlet 3.2	Inlet 3.1	0.05	1.69	100%	0.99	0.05	0.62	25	6.39	3.97	10.00	10.36	15	120	0.012	8.50	20.39	16.62	19	77	12.80	475.51	465.31	480.88	470.10	5.37	4.79	3.93	3.35	3.2	3.1
Inlet 3.1.1	Inlet 3.1	0.05	0.05	81%	0.85	0.04	0.04	25	6.47	0.27	10.00	10.00	15	24	0.012	5.00	15.64	12.75	2	38	4.84	466.51	465.31	470.10	470.10	3.59	4.79	2.15	3.35	3.1.1	3.1
Inlet 3.1	HW 3.0	0.04	1.78	100%	0.99	0.04	0.70	25	6.36	4.47	10.00	10.51	15	42	0.012	0.50	4.95	4.03	90	113.5	4.58	465.21	465.00	470.10	NA	4.89	NA	3.45	NA	3.1	3
Inlet 2.8	Inlet 2.7	0.25	0.25	36%	0.52	0.13	0.13	25	6.47	0.84	10.00	10.00	15	44	0.012	3.00	12.11	9.88	7	57	5.63	494.05	492.73	497.18	496.25	3.13	3.52	1.69	2.08	2.8	2.7
Inlet 2.7.1	Inlet 2.7	0.25	0.25	12%	0.34	0.08	0.08	25	6.47	0.55	10.00	10.00	15	65	0.012	0.51	4.98	4.06	11	66	2.68	493.06	492.73	496.00	496.25	2.94	3.52	1.50	2.08	2.7.1	2.7
Inlet 2.7	Inlet 2.6	0.03	0.53	100%	0.99	0.03	0.24	25	6.38	1.55	10.00	10.40	15	114	0.012	7.40	19.03	15.51	8	61	9.46	492.63	484.19	496.25	487.77	3.62	3.58	2.18	2.14	2.7	2.6
Inlet 2.6	MH 2.5	0.20	0.73	50%	0.62	0.12	0.37	25	6.34	2.33	10.00	10.60	15	54	0.012	11.50	23.72	19.34	10	64	12.37	484.09	477.88	487.77	481.00	3.68	3.12	2.24	1.68	2.6	2.5
OCS 2.5.1	MH 2.5	0.33	0.33	* 40%	0.54	0.18	0.18	100	7.78	* 1.39	10.00	10.00	15	28	0.012	11.50	23.72	19.34	6	56	10.83	481.10	477.88	487.50	481.00	6.40	3.12	4.96	1.68	2.5.1	2.5
MH 2.5	Inlet 2.4	0.00	1.06	0%	0.25	0.00	0.55	25	6.32	3.45	10.00	10.68	15	24	0.012	10.00	22.12	18.03	16	73	13.16	477.78	475.38	481.00	479.00	3.22	3.62	1.78	2.18	2.5	2.4
Inlet 2.4.1	Inlet 2.4	0.11	0.11	30%	0.47	0.05	0.05	25	6.47	0.34	10.00	10.00	15	26	0.012	0.50	4.95	4.03	7	57	2.30	475.51	475.38	478.50	479.00	2.99	3.62	1.55	2.18	2.4.1	2.4
Inlet 2.4	Inlet 2.3	0.15	1.32	32%	0.49	0.07	0.67	25	6.32	4.24	10.00	10.71	15	155	0.012	5.00	15.64	12.75	27	85	10.84	473.78	466.03	479.00	468.75	5.22	2.72	3.78	1.28	2.4	2.3
Inlet 2.3	MH 2.2	0.05	1.37	0%	0.25	0.01	0.68	25	6.26	4.28	10.00	10.95	15	36	0.012	0.39	4.36	3.56	98	114	4.05	465.93	465.79	468.75	468.80	2.82	3.01	1.38	1.57	2.3	2.2
MH 2.2	MH 2.1	0.00	1.37	0%	0.25	0.00	0.68	25	6.23	4.26	10.00	11.09	15	62	0.012	0.40	4.44	3.62	96	114	4.13	465.69	465.44	468.80	469.50	3.11	4.06	1.67	2.62	2.2	2.1
MH 2.1	HW 2.0	0.00	1.37	0%	0.25	0.00	0.68	25	6.18	4.23	10.00	11.34	15	27	0.012	0.52	5.04	4.11	84	112.5	4.62	465.14	465.00	469.50	NA	4.36	NA	2.92	NA	2.1	2.0
OCS 1.2	MH 1.1	3.47	3.47	* 0%	0.25	0.87	0.87	100	7.78	* 6.74	10.00	10.00	15	85	0.012	1.00	6.99	5.70	96	114	6.50	463.90	463.05	468.35	468.20	4.45	5.15	3.01	3.71	1.2	1.1
MH	MH																														

PIPE CALCULATIONS

Project: Rabbinical
Job #: 2100
Location: Morris Twp

Computed By: TBB
Checked By: CAM
Date: 7/15/2020

NOTES:

1) Design method used is Rational Method
2) "EX" denotes existing structure
3) Weighted Runoff Coefficient based on C values of 0.25 for grassed areas and 0.99 for pavement
4) Adjusted C values used to determine equivalent Rational Method peak runoffs for basin outflows
5) Velocity percent (%V) from hydraulic elements table
6) All pipe shall be Class III reinforced concrete pipe unless otherwise noted

STRUCTURE		AREA (Acres)		RUNOFF COEFFICIENT "C"		"A" x "C"		STORM	I	PEAK RUNOFF	TIME OF CONCEN.		PIPING INPUT		PIPING DATA						INVERT ELEVATION		GRATE/RIM ELEVATION		GRATE TO INVERT ELEVATION		GRATE TO TOP OF PIPE CLEARANCE			
FROM	TO	Inc. Area	Total Area	% Imperv-ious	Weighted Incre-mental "C"	Incre-mental	Total A x C	Year	in/hr.	Qa CFS	To Inlet Min.	To Upper End	Dia. (IN)	Length (FT)	Man. "n"	% Slope	Qf Full (CFS)	Vf Full (FPS)	%Q Qa/Qf x100	%V (Va/Vf) x 100	Vactual (FPS)	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	FROM	TO
1.1	1.0	0.00	3.47	0%	0.25	0.00	0.87	100	7.73	6.70	10.00	10.22	15	103	0.012	1.00	6.99	5.70	96	114	6.50	462.95	461.92	468.20	NA	5.25	NA	3.81	NA	1.1	1.0

* - Adjust to reflect 100 year flow from basins

SOIL EROSION CALCULATIONS

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CONDUIT OUTLET PROTECTION

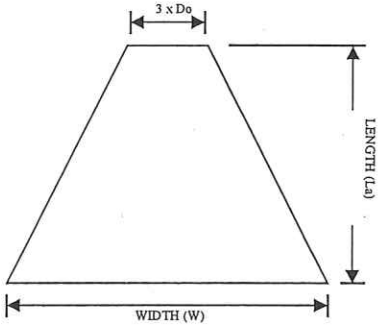
Project: Rabbinical | Computed by: TBB | 7/15/2020
Job#: 2100 | Checked by: CAM

RIP RAP APRON 2.0

Criteria: N.J. Soil Erosion and Sediment Control Standards (Section 12)

INPUT

25 year flow, Q(25) = 4.230 cfs
Pipe size, D(o) = 15 in 1.25
1/2 D(o) = 7.5 in
0.2*D(o) = 0.3 ft
Tailwater, Tw = 1.0 ft (from basin routings-2 YR Stage)
Use Tw = 1.0 ft
Is apron confined? (yes/no) - no



OUTPUT

Since TW>1/2*Do, La = 3Q/Do^(1/2)
= 11.4 ft
Use La = 11 ft

W = 3Do + 0.4La
= 8.3 ft
Use W = 8 ft

d(50) = (0.02/Tw)(Q/Do)^(4/3)
= 1.27 in
Use d(50) = 3 in

Th = 2*d(50) w/filter fabric
Th = 6 in w/filter fabric

Bottom slope = 0.0%

Volume of rip-rap required = 1.6 cy
Area of filter fabric required = 68.7 sf

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CONDUIT OUTLET PROTECTION

Project: Rabbinical
Job#: 2100

Computed by: TBB
Checked by: CAM

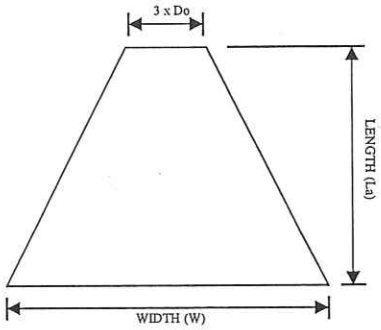
7/15/2020

RIP RAP APRON 3.0

Criteria: N.J. Soil Erosion and Sediment Control Standards (Section 12)

INPUT

25 year flow, Q(25) = 4.470 cfs
Pipe size, D(o) = 15 in 1.25
1/2 D(o) = 7.5 in
0.2*D(o) = 0.3 ft
Tailwater, Tw = 0.9 ft (from basin routings-2 YR Stage)
Use Tw = 0.9 ft
Is apron confined? (yes/no) - no



OUTPUT

Since TW>1/2*Do, La = 3Q/Do^(1/2)
= 12.0 ft

Use La = 12 ft

W = 3Do + 0.4La
= 8.5 ft

Use W = 9 ft

d(50) = (0.02/Tw)(Q/Do)^(4/3)
= 1.53 in

Use d(50) = 3 in

Th = 2*d(50) w/filter fabric

Th = 6 in w/filter fabric

Bottom slope = 0.0%

Volume of rip-rap required = 1.7 cy
Area of filter fabric required = 74.1 sf

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CONDUIT OUTLET PROTECTION

Project: Rabbinical
Job#: 2100

Computed by: TBB
Checked by: CAM

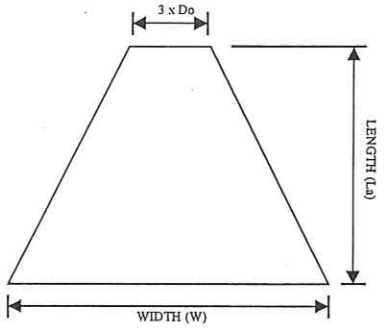
7/15/2020

RIP RAP APRON 4.0

Criteria: N.J. Soil Erosion and Sediment Control Standards (Section 12)

INPUT

25 year flow, Q(25) = 0.940 cfs
Pipe size, D(o) = 12 in 1.00
1/2 D(o) = 6.0 in
0.2*D(o) = 0.2 ft
Tailwater, Tw = 1.0 ft (from basin routings-2 YR Stage)
Use Tw = 1.0 ft
Is apron confined? (yes/no) - no



OUTPUT

Since TW>1/2*Do, La = 3Q/Do^(1/2)
= 2.8 ft
Use La = 3 ft

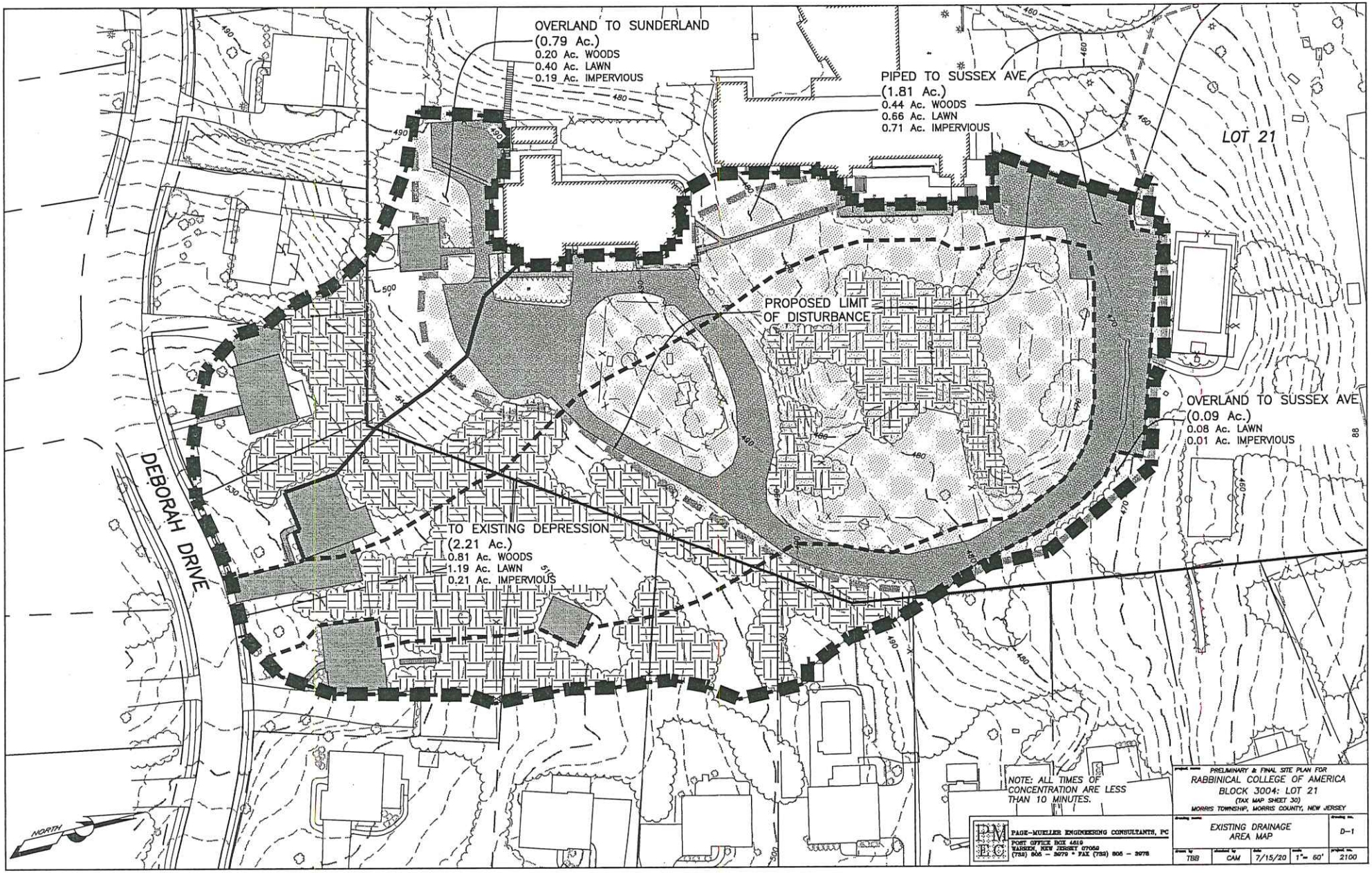
W = 3Do + 0.4La
= 4.1 ft
Use W = 4 ft

d(50) = (0.02/Tw)(Q/Do)^(4/3)
= 0.23 in
Use d(50) = 3 in

Th = 2*d(50) w/filter fabric
Th = 6 in w/filter fabric

Bottom slope = 0.0%

Volume of rip-rap required = 0.3 cy
Area of filter fabric required = 10.4 sf


OVERLAND TO SUNDERLAND
(0.79 Ac.)
0.20 Ac. WOODS
0.40 Ac. LAWN
0.19 Ac. IMPERVIOUS
PIPED TO SUSSEX AVE.
(1.81 Ac.)
0.44 Ac. WOODS
0.66 Ac. LAWN
0.71 Ac. IMPERVIOUS
LOT 21
PROPOSED LIMIT OF DISTURBANCE
OVERLAND TO SUSSEX AVE
(0.09 Ac.)
0.08 Ac. LAWN
0.01 Ac. IMPERVIOUS
DEBORAH DRIVE
TO EXISTING DEPRESSION
(2.21 Ac.)
0.81 Ac. WOODS
1.19 Ac. LAWN
0.21 Ac. IMPERVIOUS
NORTH
NOTE: ALL TIMES OF CONCENTRATION ARE LESS THAN 10 MINUTES.
PRELIMINARY & FINAL SITE PLAN FOR
RABBINICAL COLLEGE OF AMERICA
BLOCK 3004: LOT 21
(TAX MAP SHEET 30)
MORRIS TOWNSHIP, MORRIS COUNTY, NEW JERSEY
EXISTING DRAINAGE AREA MAP
D-1
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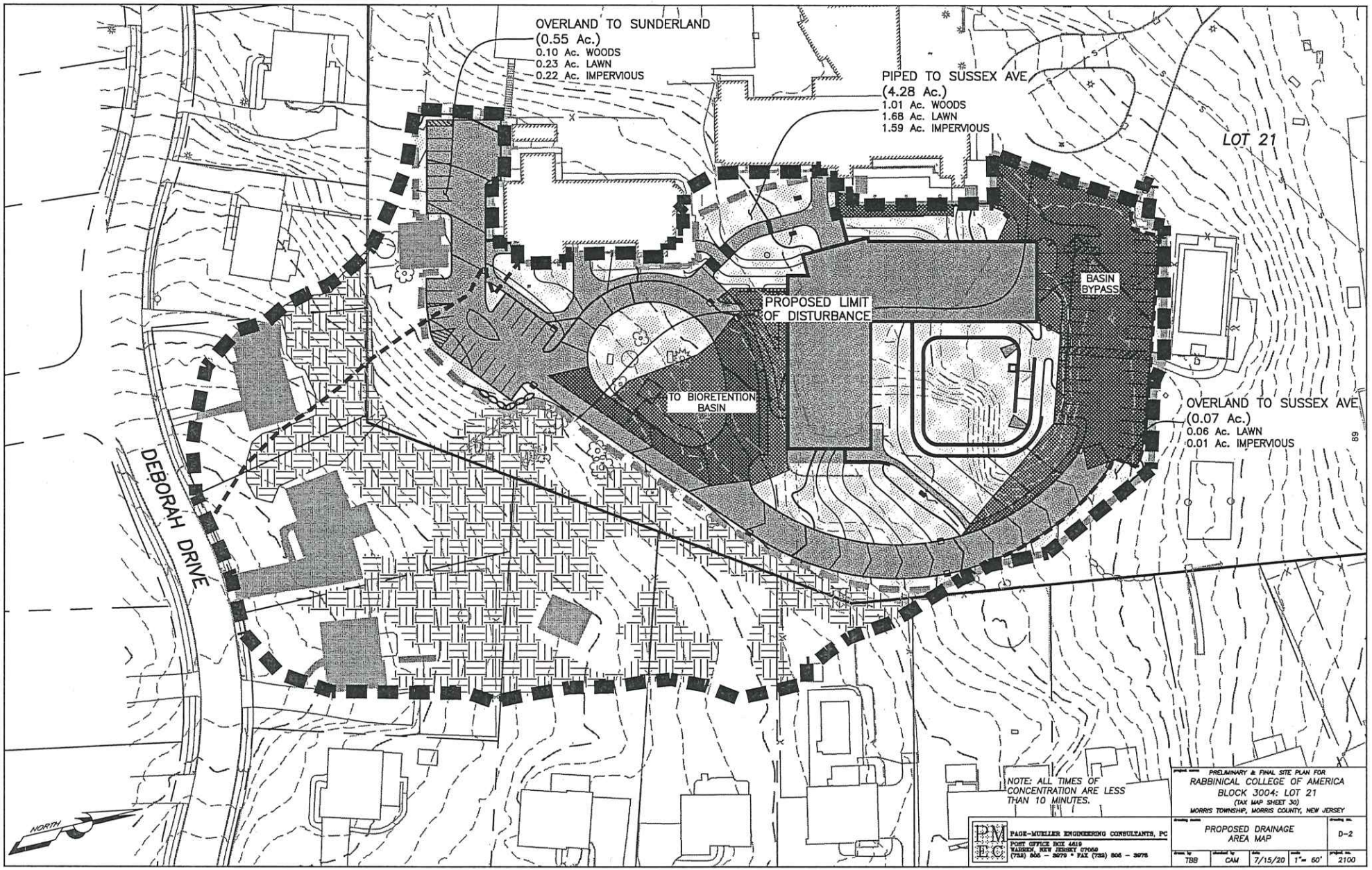
2100


OVERLAND TO SUNDERLAND
(0.55 Ac.)
0.10 Ac. WOODS
0.23 Ac. LAWN
0.22 Ac. IMPERVIOUS
PIPED TO SUSSEX AVE
(4.28 Ac.)
1.01 Ac. WOODS
1.68 Ac. LAWN
1.59 Ac. IMPERVIOUS
LOT 21
BASIN BYPASS
PROPOSED LIMIT OF DISTURBANCE
TO BIORETENTION BASIN
OVERLAND TO SUSSEX AVE
(0.07 Ac.)
0.06 Ac. LAWN
0.01 Ac. IMPERVIOUS
DEBORAH DRIVE
NORTH
NOTE: ALL TIMES OF CONCENTRATION ARE LESS THAN 10 MINUTES.
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PRELIMINARY & FINAL SITE PLAN FOR
RABBINICAL COLLEGE OF AMERICA
BLOCK 3004: LOT 21
(TAX MAP SHEET 30)
MORRIS TOWNSHIP, MORRIS COUNTY, NEW JERSEY
PROPOSED DRAINAGE AREA MAP
D-2
TBB
CAM
7/15/20
1" = 60'
2100