FRENCH & PARRELLO ASSOCIATES

ENGINEERING AND CONSULTING **SINCE 1974**

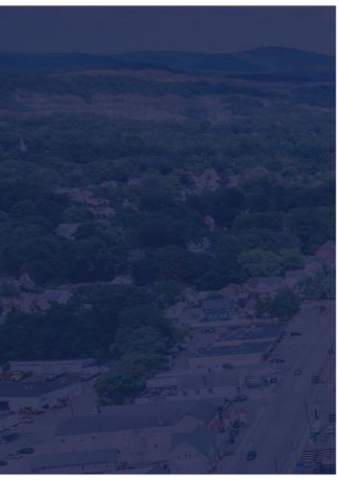
STORMWATER MANAGEMENT REPORT

For

Penn Medicine Princeton Health

Cancer Center and Imaging Center

Block 1701, Lot 3.01
Township of Plainsboro
Middlesex County, New Jersey



Prepared For:

Princeton HealthCare System
A New Jersey Nonprofit Corporation
d/b/a Penn Medicine Princeton Health
1 Plainsboro Road
Plainsboro, NJ 08536

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Andrew L. French
Professional Engineer, NJ License No # 42894

July 31, 2024| FPA No. 06C028T.003
1800 Route 34, Suite 101, Wall Township, NJ 07719

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FPA

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1.0 INTRODUCTION

The applicant/owner Princeton Healthcare System, a New Jersey nonprofit corporation, d/b/a Penn Medicine Princeton Health, is proposing to construct a new Cancer Center and Imaging Center (CCIC) on the hospital site known as Block 1701, Lot 3.01 in Plainsboro, New Jersey. The project proposes the construction of a new four (4) story CCIC and other site improvements, such as sidewalks, landscaping, lighting, and stormwater management facilities.

This report contains the stormwater management calculations demonstrating compliance with the requirements of the Stormwater Management Rules at N.J.A.C. 7:8 for the proposed CCIC on Lot 3.01 in the Township of Plainsboro, Middlesex County, New Jersey.

2.0 BASIS OF ENGINEERING ANALYSIS

The stormwater management systems, including collection and conveyance structures, groundwater recharge, water quality, and detention measures (BMP'S) have been designed in accordance with the provisions outlined in N.J.A.C. 7:8 New Jersey Stormwater Management Rules and the Plainsboro Township Stormwater Management Ordinance. The New Jersey Best Management Practices Manual dated April 2004 and last updated March 2021 was used for technical guidance to comply with the above regulations.

The soils map located in Appendix A, published by Natural Resources Conservation Service Web Soil Survey, National Cooperative Soil Survey, was used to obtain the required soil information for the project, including soil types and hydrologic soil groups. A subsurface soil assessment was performed to obtain site specific information to determine the seasonal high water table and on-site soil permeability conditions; see Appendix A for supporting documentation.

The calculation of the stormwater runoff rates and volumes were performed utilizing the procedures outlined in the New Jersey Best Management Practices Manual. The PondPack Connect Edition Update 2 Computer Program developed by the Haested Methods was used to generate the runoff hydrographs and hydrologic model for project site. Peak discharges, run-off volumes, and hydrographs were computed for the current 2, 10, 25, and 100-year storm events, and projected year 2100 2, 10, and 100-year storm events utilizing the USDA Natural Resources Conservation Service (NRCS) methodology, as found in the NRCS National Engineering Handbook, Part 630-Hydrology. The NOAA Type D, 24-hour rainfall distribution, and 24-hour rainfall frequency data for Middlesex County, New Jersey published in August 2012 by NRCS were used in the computations. Runoff calculations and precipitation losses were calculated using the NRCS Curve Numbers (CNs), based upon the present and proposed watershed conditions. Times of Concentration (TC) were based upon estimates of overland, shallow concentrated, and open channel flow utilizing methods presented in Chapter 15 of the NEH, Part 630-Hydrology.

The rainfall distribution for the NJDEP Water Quality Design Storm (1.25 inches of rain falling nonuniformly in a 2-hour storm event), as shown on Table 5-2 of the New Jersey Stormwater Best Management Practices Manual was used to compute the peak runoff rate and runoff volume for this storm.

3.0 EXISTING CONDITIONS

The subject property consists of 49.42 acres and is located in the Township of Plainsboro, Middlesex County, New Jersey. The property is known as Block 1701, Lot 3.01. The site currently contains a hospital and parking lots. The property fronts on Plainsboro Rd to the south. Existing parking lots are adjacent to the property across Hospital Drive to the north. Stormwater currently drains to an existing wet pond to the south of the site. The wetpond was designed under the previous stormwater rules to manage the stormwater runoff quantity reductions for the maximum development of the hospital property. Stormwater drains from the proposed CCIC through a pipe network to the wet pond.

The existing conditions were previously approved for reductions in peak runoff rates in accordance with N.J.A.C. 7:8 New Jersey Stormwater Management Rules. The proposed development increases the impervious area. The required peak runoff reductions were applied for the increase in impervious area. The total existing peak runoff is presented in Table 3.1 Column B. The portion of peak runoff to be reduced is the existing peak runoff from the proposed building footprint and presented in Table 3.1 Column C. The Reduction required (Column D) is only applied to the portion of peak runoff from the area of the proposed building (Column C).

The following table summarizes the existing conditions, peak runoff rates and establishes the allowable proposed conditions peak runoff rates in accordance with N.J.A.C. 7:8 New Jersey Stormwater Management Rules. The formula describes how the allowable peak runoff rates were calculated to incorporate areas with and without required reductions. Detailed calculations are presented in Appendix B of this report.

Allowable Proposed Conditions Runoff	=	Portion of Existing Peak Runoff with no Required Reduction	+	Portion of Existing Peak Runoff with Required Reduction	*	Required Reduction per Storm event
F	=	E	+	C	*	D

Table 3.1

Summary of Present Conditions Peak Runoff Rates Present Rainfall					
A	**B**	**C**	**D**	**E**	**F**
Storm Frequency	**Total Existing Peak Runoff (cfs)**	**Portion of Peak Runoff to be Reduced**	**Required Reduction**	**Portion of Peak runoff with no required reduction**	**Allowable Proposed Conditions Runoff (cfs)**
2-Year	13.37	0.27	50%	13.37-0.27=13.10	13.10+(0.5*0.27) =**13.24**
10-Year	21.78	0.61	75%	21.78-0.61=21.17	21.78+(0.75*0.61) =**21.63**
25-year	27.08	--	--	--	**27.08**
100-Year	39.43	1.35	80%	39.43-1.35=38.08	38.08+(0.8*1.35) =**38.63**

Table 3.2

Summary of Present Conditions Peak Runoff Rates 2100 Rainfall					
A	**B**	**C**	**D**	**E**	**F**
Storm Frequency	**Total Existing Peak Runoff (cfs)**	**Portion of Peak Runoff to be Reduced**	**Required Reduction**	**Portion of Peak runoff with no required reduction**	**Allowable Proposed Conditions Runoff (cfs)**
2-Year	15.70	0.36	0.50	15.70-0.36=15.34	15.34+(0.5*0.36) =**15.52**
10-Year	25.45	0.76	0.75	25.45-0.76=25.26	25.26+(0.75*0.76) **=25.26**
100-Year	53.00	1.93	0.80	53.00-1.93=51.07	51.07+(0.8*1.93) = **52.61**

4.0 PROPOSED CONDITIONS

The applicant is proposing to construct a new CCIC and Parking Garage. Both the new CCIC and Parking Garage are located on Block 1701, Lot 3.01 in Plainsboro, New Jersey. The CCIC project proposes the construction of a new four (4) story building with other site improvements, such as sidewalks, landscaping, lighting, and stormwater management facilities. The CCIC results in an increased demand for parking; therefore, both the CCIC and Parking Garage are considered as one project. Two reports

have been provided to simplify the design and calculations. Please see the approved "Stormwater Management Report for Penn Medicine Princeton Health Cancer Center Parking Garage" prepared by French and Parello Associates, dated April 14, 2023, last revised December 2023 for more information regarding the Parking Garage portion of the project.

The existing impervious cover on the Hospital (HMOC) site is 56.21% or 27.78 acres. The proposed CCIC and parking garage project will result in a total impervious cover of 57.36% or 28.35 acres. There is an increase of 0.561 acres in impervious cover. This increase consists of 0.461 acres of impervious for the garage and 0.100 acres of impervious for the CCIC.

However, for the overall project there is a decrease in motor vehicle surfaces, which are generating total suspended solids, because much of the existing parking lot will be converted to building. The CCIC project results in an increase of impervious surface of 4,347 sf, which includes the built out condition for the land bank parking spaces. The decrease in motor vehicle surface for the CCIC project is 26,973 sf. The proposed CCIC and Parking Garage shall result in an increase of total impervious of 24,455 sf. However, there will be a decrease in motor vehicle surface of 7,393 sf for the overall project.

The proposed stormwater management facilities for the CCIC consist of a bioretention system to manage the water quantity aspect of the rules. Although there is only an increase of 0.100 acres of impervious for the CCIC, the calculations for required reductions and the system was designed for an assumed increase of 0.22 acres of impervious to account for any changes that may take place based on township comments and/or during the resolution compliance process.

5.0 COMPLIANCE

5.1 Groundwater Recharge

N.J.A.C. 7:8 New Jersey Stormwater Management Rules requires that the proposed project maintain the present conditions average annual groundwater recharge volume for the project site. The property is currently used as a grassed area and a parking lot.

The results of the soil logs were consistent with the subsurface soil conditions at the Parking Garage and the surrounding properties within the Redevelopment area, which included mostly silty clay loam. Based on the soil logs, the seasonal high water table was not encountered in any of the soil excavations, which is consistent with the findings of the subsurface soil conditions performed for the Parking Garage located at the north side of the property. Also, on-site percolation testing was performed at locations as shown in Appendix A. Testing was performed at depths from 6" to 14" below the surface and all percolation testing failed during the pre-soak where the water elevation either did not drop at all or insignificantly after 1 hour. The on-site percolation testing results indicated that the existing surface soil conditions do not provide any infiltration of stormwater runoff into the groundwater. Therefore, the annual pre-construction groundwater recharge is zero and the requirement for post-construction

recharge would be the same. Since there is no groundwater recharge under the existing conditions, the project meets the recharge requirements of N.J.A.C. 7:8 New Jersey Stormwater Management Rules or a waiver is hereby requested. Soil Logs and on-site percolation testing results are included in Appendix A of this report.

5.2 Water Quality

Since there is a decrease in motor vehicle surface area, water quality treatment is not required as per NJAC 7:8-5.5(a):

This section contains the minimum design and performance standards to control stormwater runoff quality impacts of major development. Stormwater runoff quality standards are applicable when the major development results in an increase of one quarter acre or more of regulated motor vehicle surface.

5.3 Water Quantity

The governing regulations require that the proposed peak runoff rates for the 2-year, 10-year, and 100-year storm events from the proposed development be reduced to 50, 75, and 80 percent, respectively, of the projects present conditions peak runoff rates for the same storms. The proposed stormwater management facilities consist of a rain garden which takes roof runoff from the proposed cancer center.

The proposed small-scale bioretention system (rain gardens) are approved Green Infrastructure BMPs that have been designed to meet the peak runoff reductions of N.J.A.C. 7:8 New Jersey Stormwater Management Rules. The basin routing summary and the overall peak runoff rate reductions for the site are shown in the following tables:

Table 5.1

Rain Garden Routing Summary Present Rainfall			
Storm Frequency	**Peak Inflow (cfs)**	**Peak Outflow (cfs)**	**Maximum Water Surface Elevation (ft)**
2-Year Storm	2.15	1.15	82.09
10-Year Storm	3.47	1.78	82.58
25-Year Storm	4.30	2.35	82.81
100-Year Storm	6.20	3.67	83.25

Table 5.2

Comparison of Present Conditions vs. Proposed Conditions Peak Runoff Rates POA-A Present Rainfall			
Storm Frequency	**Maximum Allowable Proposed Conditions Peak Runoff Rate (From Table 3.1) (cfs)**	**Estimated Proposed Conditions Peak Runoff Rate (cfs)**	
2-Year Storm	13.24	13.07	OK
10-Year Storm	21.26	21.26	OK
25-Year Storm	27.08	26.60	OK
100-Year Storm	39.16	39.16	OK

Table 5.3

Underground Storage Routing Summary 2100 Rainfall			
Storm Frequency	**Peak Inflow (cfs)**	**Peak Outflow (cfs)**	**Maximum Water Surface Elevation (ft)**
2-Year Storm	2.53	1.29	82.24
10-Year Storm	4.05	2.16	82.75
100-Year Storm	8.27	4.90	83.65

Table 5.4

Comparison of Present Conditions vs. Proposed Conditions Peak Runoff Rates POA-A 2100 Rainfall			
Storm Frequency	**Maximum Allowable Proposed Conditions Peak Runoff Rate (From Table 3.1) (cfs)**	**Estimated Proposed Conditions Peak Runoff Rate (cfs)**	
2-Year Storm	15.52	15.30	OK
10-Year Storm	25.26	24.94	OK
100-Year Storm	52.61	52.44	OK

Detailed computations are presented in Appendix D of this report.

5.4 Delaware and Raritan Canal Commission

This project is located within the Delaware and Raritan Canal Commission (DRCC) jurisdiction area. It is located in Review Zone B. The DRCC regulations, NJAC 7:45-8.5, have the same requirements as N.J.A.C. 7:8 for water quantity and recharge. For water quality, N.J.A.C. 7:45-8.5 requires that the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm be reduced by 80% of the anticipated load from the developed site, expressed as an annual average. This requirement differs from N.J.A.C. 7:8 in that the 80% TSS reduction is applicable to the impervious for the development, not just the increase in motor vehicle surfaces. The increase in total impervious area for the Cancer Center is 0.100 ac. However, the DRCC regulations allow the use of the wet pond for stormwater management for both the volume and water quality. The wet pond was designed to treat and reduce the runoff from the maximum site development of 60%. The proposed impervious with both the Cancer Center and Parking Garage is 57.36%. Therefore, water quantity reductions and water quality treatment requirements are met by the existing wet pond.

The DRCC requires that the nonstructural stormwater management strategies be incorporated into the site design. A Nonstructural Stormwater Strategies Point System (NSPS) worksheet can be provided to demonstrate compliance. The NSPS worksheet can be found in Appendix D.

5.5 Soil Erosion and Sediment Control

The discharge pipe to the interconnected, bioretention basins was designed with a scour hole. The bottom of both basins will be lined with Delaware River rock to address erosion for the two interconnected pipes. The basin will discharge through an outlet control structure and connect to the existing stormwater system with a pipe. Ultimately the project area will discharge into the existing wet

pond to the south. The existing system discharges to the wet pond via a pipes that outfall into a riprap apron. Therefore, per The Standards for Soil Erosion and Sediment Control in New Jersey, 7th Edition, January 2014, Revised July 2017; Chapter 21: Standard for Off-Site Stability, off-site stability conditions are stable due to the stormwater discharging into a stable conveyance pipe.

6.0 CONCLUSION

The proposed CCIC on Lot 3.01 has been designed with a rain garden to comply with the Township Stormwater Management requirements, which for this project include stormwater quantity reductions only using Green Infrastructure (GI) elements.

Based upon the calculations present in this report, the proposed stormwater management system meets the requirements of the N.J.A.C. 7:8 - New Jersey Stormwater Management Rules, the Plainsboro Township Stormwater Management Ordinance and the DRCC.

Appendix A
Supporting Documents

Hydrologic Soil Group—Middlesex County, New Jersey
(CancerCenterLOD)

Map Scale: 1:1,550 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, New Jersey
Survey Area Data: Version 19, Aug 29, 2023

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

Date(s) aerial images were photographed: Jun 4, 2022—Jul 22, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NknB	Nixon loam, 2 to 5 percent slopes	B	3.3	69.0%
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	C	1.5	31.0%
Totals for Area of Interest			**4.7**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NEW JERSEY 24 HOUR RAINFALL FREQUENCY DATA

Rainfall amounts in Inches

County	1 year	2 year	5 year	10 year	25 year	50 year	100 year
Atlantic	2.72	3.31	4.30	5.16	6.46	7.61	8.90
Bergen	2.75	3.34	4.27	5.07	6.28	7.32	8.47
Burlington	2.77	3.36	4.34	5.18	6.45	7.56	8.81
Camden	2.73	3.31	4.25	5.06	6.28	7.34	8.52
Cape May	2.67	3.25	4.22	5.07	6.34	7.47	8.73
Cumberland	2.69	3.27	4.25	5.09	6.37	7.49	8.76
Essex	2.85	3.44	4.40	5.22	6.44	7.49	8.66
Gloucester	2.71	3.29	4.24	5.05	6.29	7.36	8.55
Hudson	2.73	3.31	4.23	5.02	6.19	7.20	8.31
Hunterdon	2.80	3.38	4.26	5.00	6.09	7.02	8.03
Mercer	2.74	3.31	4.23	5.01	6.19	7.20	8.33
Middlesex	2.76	3.35	4.30	5.12	6.36	7.43	8.63
Monmouth	2.79	3.38	4.38	5.23	6.53	7.66	8.94
Morris	2.94	3.54	4.47	5.24	6.37	7.32	8.35
Ocean	2.81	3.42	4.45	5.33	6.68	7.87	9.20
Passaic	2.87	3.47	4.42	5.23	6.43	7.47	8.62
Salem	2.69	3.26	4.20	5.00	6.22	7.28	8.45
Somerset	2.76	3.34	4.25	5.01	6.15	7.13	8.21
Sussex	2.68	3.22	4.02	4.70	5.72	6.60	7.58
Union	2.80	3.39	4.35	5.17	6.42	7.49	8.69
Warren	2.78	3.34	4.18	4.89	5.93	6.83	7.82

Notes: The average point rainfall amounts listed above were developed from data contained in NOAA Atlas 14 Volume 2.

Point rainfall estimates for specific locations may be obtained from the Precipitation Frequency Data Server located at http://www.nws.noaa.gov/ohd/hdsc/

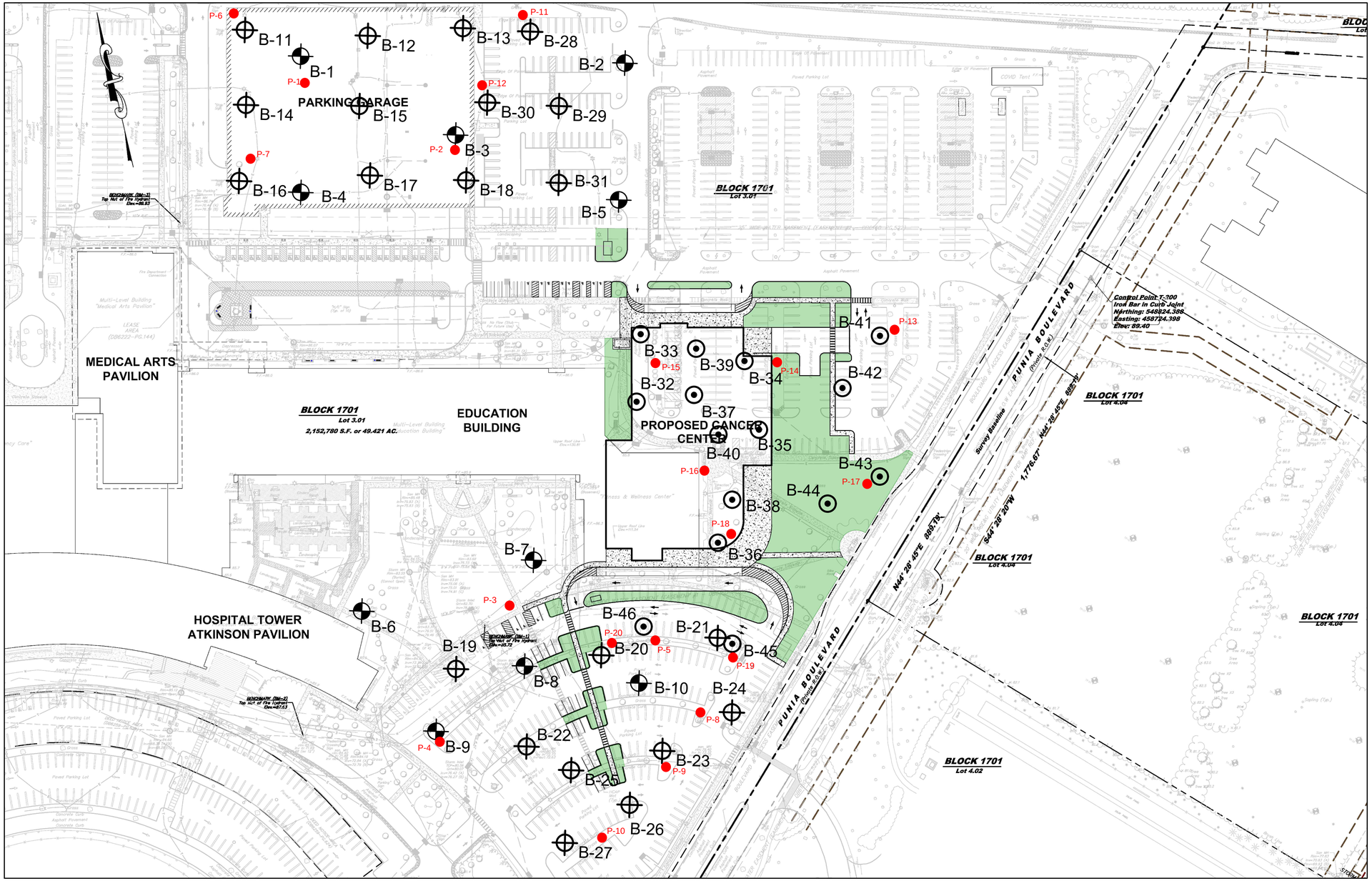
For most hydrologic design procedures, the rainfall amounts listed above may be rounded to the nearest tenth of an inch.

Present Rainfall Factors
2 year= 1.00
10 year = 1.01
100 year = 1.03

2100 Rainfall Factors
2 year = 1.19
10 year = 1.21
100 year = 1.33

Present Rainfall Totals Used
2 year= 1.00*3.35 = 3.35
10 year = 1.01*5.12= 5.17
100 year = 1.03*8.63=8.89

2100 Rainfall Factors
2 year = 1.19*3.35= 3.99
10 year = 1.21*5.12= 6.20
100 year = 1.33*8.63=11.48



LEGEND:

- 2021 TEST BORING LOCATION
- 2022 TEST BORING LOCATION
- 2024 TEST BORING LOCATION

No.	Date	Revision	Revised By	Checked By

60 0 60 120
SCALE IN FEET

FPA RENCH & PARRELLO ASSOCIATES
New Jersey ▲ New York ▲ Pennsylvania ▲ Georgia

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732.312.9800

FPAengineers.com

BORING LOCATION PLAN

FOR

PENN MEDICINE - CANCER CENTER

PLAINSBORO TOWNSHIP
MIDDLESEX COUNTY NEW JERSEY

DATE:	DESIGNED BY:	SCALE:	PROJECT NUMBER:
APRIL 2024	–	APPROX. 1"=60'	06C028T.003
DRAWN BY:	CHECKED BY:	FIELD BOOK	DRAWING NO.:
MTM	RDK	–	2

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TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-33
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +87'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1	X – 9 – 6 – 3		S-1 TOP 6": **Asphalt**.
	0-2'			MID 4": Grey cmf **GRAVEL**, little mf Sand, little Silt.
	S-2	11 – 8 – 9 – 9		
	2-4'			BOT 14": Dark Grey **Clayey SILT**, little mf^{+} Sand,
--- 5'---	S-3	3 – 4 – 6 – 8		trace f Gravel.
	4-6'			S-2 Red-Brown **Clayey SILT**, trace f Sand.
	S-4	9 – 9 – 45 – 50/3"		S-3 TOP 5": Dark Grey cm^{+}f **SAND**, little Silt, trace
	6-8'			cmf Gravel.
	S-5	11 – 27 – 100/4" – X		BOT 19": Red-Brown **Clayey SILT**, little f Gravel,
---10'---	8-10'			trace f Sand.
				S-4 Red-Brown **Clayey SILT**, little cmf Gravel, trace f Sand.
				S-5 Yellow-Brown f^{+} **SAND**, little cmf Gravel, trace
	RUN-1	REC.: 53%		Clayey Silt. (completely weathered Sandstone)
---15'---	10-15'	RQD: 20%		RUN-1 Yellow-Brown moderately weathered **SANDSTONE**.
				END OF BORING @ 15'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-34
SHEET 1 OF 1

DATE STARTED: 4/15/2024
DATE FINISHED: 4/15/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +87.5'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 14 – 6 – 8		S-1 TOP 6": **Asphalt**. BOT 18": Brown cm+f **SAND**, little Silt, trace mf Gravel.
	S-2 2-4'	12 – 7 – 8 – 9		S-2 Tan-brown mf **SAND**, little Silt.
--- 5'---	S-3 4-6'	4 – 5 – 6 – 6		S-3 Same as **S-2**.
	S-4 6-8'	8 – 6 – 12 – 18		S-4 Same as **S-2**.
	S-5 8-10'	6 – 9 – 16 – 18		S-5 Tan-Brown mf **SAND**, trace Clayey Silt.
---10'---	S-6 10-12'	24 – 30 – 22 – 25		S-6 Brown cmf **SAND**, little Silt, trace mf Gravel.
---15'---	S-7 15-17'	31 – 50 – 46 – 60		S-7 Red-Brown **Clayey SILT**, little f Sand, trace f Gravel. (completely weathered Shale)
---20'---	S-8 20-22'	17 – 30 – 34 – 45		S-8 Same as **S-7**.
				END OF BORING @ 22'
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-35
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +85'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL	
	S-1	X – 9 – 9 – 7		S-1	TOP 6": **Asphalt**.
	0-2'				MID 4": Grey cmf **GRAVEL**, little mf Sand, little Silt.
	S-2	9 – 7 – 13 – 169			
	2-4'				BOT 14": Red-Brown **Clayey SILT**, little f Sand, trace f Gravel.
--- 5'---	S-3	7 – 24 – 38 – 25		S-2	Same a **S-1, BOT 14**".
	4-6'			S-3	Red-Brown **Clayey SILT**, some mf Gravel, trace f Sand.
	S-4	50 – 95 – 50/3" – X		S-4	Same as **S-3**.
	6-8'			S-5	Red-Brown **Clayey SILT**, and cmf+ **GRAVEL**, trace f Sand. (completely weathered Shale)
	S-5	82 – 50/3" – X – X		S-6	Same as **S-5**.
---10'---	8-10'				
	S-6	150/3" – X – X – X			
	10-12'				
---15'---	RUN-1	REC.: 67%		RUN-1	Red-Brown moderately weathered **SHALE**.
	11-16'	RQD: 40%			
					END OF BORING @ 16'
---20'---					
---25'---					
---30'---					
---35'---					

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-36
SHEET 1 OF 1

DATE STARTED: 4/15/2024
DATE FINISHED: 4/15/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +85'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	2 – 8 – 10 – 18		S-1 Red-Brown & Tan-Brown mf+ **SAND**, little Clayey Silt, trace f Gavel.
	S-2 2-4'	10 – 18 – 44 – 50		S-2 Brown mf+ **SAND**, little cmf Gravel, trace Clayey Silt.
--- 5'---	S-3 4-6'	14 – 9 – 5 – 8		S-3 Brown mf+ **SAND**, little Clayey Silt, trace cmf Gravel.
	S-4 6-8'	8 – 6 – 8 – 19		S-4 Same as **S-3**.
---10'---	S-5 8-10'	25 – 100 – X – X		S-5 Brown mf+ **SAND**, little+ Clayey Silt, trace f Gravel.
---15'---	RUN-1 9-14'	REC.: 70% RQD: 17%		RUN-1 Yellow-Brown moderately weathered **SANDSTONE**. (w/ veins of Red-Brown Shale)
				END OF BORING @ 14'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-37
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +86'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 8 – 7 – 6		S-1 TOP 6": **Asphalt**. MID 4": Grey cmf **GRAVEL**, little mf Sand, little Silt.
	S-2 2-4'	3 – 3 – 5 – 6		BOT 14": Tan mf **SAND**, little Silt.
--- 5'---	S-3 4-6'	3 – 6 – 6 – 6		S-2 Tan mf **SAND**, little Silt. S-3 Same as **S-2**.
	S-4 6-8'	8 – 15 – 16 – 22		S-4 Same as **S-2**.
	S-5	13 – 12 – 10 – 10		S-5 TOP 20": Same as **S-2**.
---10'---	8-10'			BOT 4": Red-Brown **Clayey SILT**, trace f Sand.
	S-6 10-12'	9 – 12 – 12 – 13		S-6 Same as **S-5, BOT 4"**.
---15'---				
	S-7 15-17'	16 – 30 – 49 – 50		S-7 Red-Brown **Clayey SILT**, little mf Gravel, trace f Sand. (completely weathered Shale)
---20'---				
	S-8 20-22'	12 – 13 – 50/4" – X		S-8 Same as **S-7**.
				END OF BORING @ 21.3'
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-38
SHEET 1 OF 1

DATE STARTED: 4/15/2024
DATE FINISHED: 4/15/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +85'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	2 – 10 – 20 – 63		S-1 TOP 12": Red-Brown f+ **SAND**, some Clayey Silt, trace f Gravel.
	S-2 2-4'	42 – 82 – 95 – 50/3"		BOT 12": Brown mf+ **SAND**, little Silt, trace f Gravel.
--- 5'---	S-3 4-6'	37 – 40 – 30 – 16		S-2 Light Grey mf+ **SAND**, some cmf Gravel, little Silt.
	S-4 6-8'	14 – 17 – 85 – 100/2"		S-3 Tan-Brown m+f **SAND**, little Silt, trace f Gravel.
	S-5	80/2" – X – X – X		S-4 Same as **S-3**.
---10'---	8-10'			S-5 Brown cm+f **SAND**, little Silt, trace f Gravel. (completely weathered Sandstone)
	RUN-1 8-13.2'	REC.: 100% RQD: 66%		RUN-1 Red-Brown highly weathered **SANDSTONE**.
---15'---				END OF BORING @ 13.2'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-39
SHEET 1 OF 1

DATE STARTED: 4/15/2024
DATE FINISHED: 4/15/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +87.5'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 4 – 2 – 2		S-1 TOP 6": **Asphalt**. BOT 18": Red-Brown mf+ **SAND**, some Clayey Silt, trace f Gravel.
	S-2 2-4'	7 – 5 – 7 – 8		S-2 Red-Brown **Clayey SILT**, little f Sand, trace Silt.
--- 5'---	S-3 4-6'	6 – 7 – 7 – 10		S-3 Red-Brown mf+ **SAND**, little Clayey Silt, trace f Gravel.
	S-4 6-8'	15 – 29 – 45 – 13		S-4 Light Tan mf+ **SAND**, little Silt.
---10'---	S-5 8-10'	15 – 37 – 26 – 49		S-5 Tan-Brown mf+ **SAND**, little Silt.
---15'---	S-6 10-12'	60 – 130 – 50/2" – X Drilled Directly to 15' through weathered Sandstone.		S-6 Tan-Brown & Red-Brown m+f **SAND**, little Silt, little f Gravel. (completely weathered Sandstone)
---20'---	RUN-1 15-20'	REC.: 78% RQD: 56%		RUN-1 Yellow-Brown moderately weathered **SANDSTONE**.
				END OF BORING @ 20'
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-40
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +85'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 7 – 6 – 6		S-1 TOP 6": **Asphalt**. MID 4": Grey cmf **GRAVEL**, little mf Sand, little Silt. BOT 14": Red-Brown **Clayey SILT**, trace f Gravel.
--- 5'---	S-2 2-4' S-3 4-6'	7 – 6 – 10 – 13 10 – 13 – 12 – 16		S-2 Red-Brown **Clayey SILT**, little mf Gravel, trace f Sand.
	S-4 6-8'	13 – 12 – 13 – 15		S-3 Same as **S-2**. S-4 Same as **S-2**.
---10'---	S-5 8-10'	14 – 25 – 51 – 92		S-5 Same as **S-2**.
	S-6 10-12'	17 – 31 – 105 – 70/3"		S-6 Red-Brown **Clayey SILT**, some mf Gravel, trace f Sand. (completely weathered Shale)
---15'---	S-7 15-17'	80 – 120/5" – X – X		S-7 Same as **S-6**.
				END OF BORING @ 17'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-41
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +88'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2' S-2 2-4'	X – 7 – 8 – 14 14 – 7 – 7 – 8		S-1 TOP 6": **Asphalt**. MID 12": Brown mf^{+} **SAND**, little Silt, trace f Gravel. BOT 6": Brown **Clayey SILT**, trace f Sand.
--- 5'---	S-3 4-6' S-4 6-8' S-5	11 – 11 – 15 – 13 8 – 5 – 8 – 9 9 – 7 – 9 – 12		S-2 Tan-Brown **Clayey SILT**, little^{-} f Sand, trace mf Gravel. S-3 Light Red-Brown m^{+}f **SAND**, little cmf Gravel, trace Silt. S-4 TOP 20": Tan-Brown mf^{+} **SAND**, little Clayey Silt, trace f Gravel.
---10'---	8-10' S-6 10-12'	 18 – 16 – 17 – 17		BOT 4": Red-Brown **Clayey SILT**, trace f Sand. S-5 Same as **S-4, BOT 4"**. S-6 Same as **S-4, BOT 4"**.
---15'---				END OF BORING @ 12'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-42
SHEET 1 OF 1

DATE STARTED: 4/12/2024
DATE FINISHED: 4/12/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +86'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 8 – 6 – 11		S-1 TOP 6": **Asphalt.** BOT 18": Brown f+ **SAND**, some Clayey Silt, trace f Gravel.
	S-2 2-4'	14 – 9 – 10 – 12		S-2 Same as **S-1, BOT 18"**.
--- 5'---	S-3 4-6'	10 – 7 – 10 – 19		S-3 Red-Brown **Clayey SILT**, little f Sand, trace f Gravel.
	S-4 6-8'	27 – 19 – 24 – 70		S-4 Red-Brown **Clayey SILT**, little f Gravel, trace f Sand.
---10'---	S-5 8-10'	45 – 50/3" – X – X		S-5 Red-Brown cmf **GRAVEL**, little Clayey Silt, trace f Sand. (completely weathered Shale)
				END OF BORING @ 10'
---15'---				
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

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TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-43
SHEET 1 OF 1

DATE STARTED: 4/16/2024
DATE FINISHED: 4/16/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +84'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	1 – 2 – 3 – 4		S-1 Brown **Clayey SILT**, little f+ Sand, trace f Gravel.
	S-2 2-4'	4 – 4 – 5 – 10		S-2 Tan-Brown mf+ **SAND**, some Clayey Silt, trace f Gravel.
--- 5'---	S-3 4-6'	10 – 10 – 14 – 13		S-3 Tan-Brown mf+ **SAND**, little Silt.
	S-4 6-8'	23 – 30 – 45 – 70		S-4 Light Tan mf+ **SAND**, little Silt.
	S-5 8-10'	50 – 50 – 40 – 40		S-5 BTan-Brown cmf+ **SAND**, little Silt.
---10'---	S-6 10-12'	95/3" – X – X – X		S-6 Same as **S-5**.
				END OF BORING @ 12'
---15'---				
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-44
SHEET 1 OF 1

DATE STARTED: 4/16/2024
DATE FINISHED: 4/16/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +85'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	1 – 9 – 3 – 4		S-1 Brown f+ **SAND**, some Clayey Silt, trace f Gravel.
	S-2 2-4'	3 – 4 – 7 – 8		S-2 TOP 12": Same as **S-1**. BOT 12": Yellow-Brown m⁺f **SAND**, little Silt, trace f Gravel.
--- 5'---	S-3 4-6'	10 – 7 – 11 – 14		S-3 TOP 12": Same as **S-2, BOT 12"**. MID 6": Red-Brown **Clayey SILT**, little f Sand, trace Gravel. BOT 6": Yellow-Brown m⁺f **SAND**, little Silt, trace f Gravel.
	S-4 6-8'	11 – 11 – 15 – 15		S-4 Red-Brown **Clayey SILT**, little⁻ f Sand, trace f Gravel.
---10'---	S-5 8-10'	16 – 17 – 18 – 37		S-5 TOP 12": Same as **S-4**. BOT 12": Red-Brown & Tan cmf **SAND**, little cmf Gravel, trace Silt.
	S-6 10-12'	38 – 30 – 70 – 50/3"		S-6 Tan-Brown cmf **SAND**, little Silt.
---15'---				END OF BORING @ 12'
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-45
SHEET 1 OF 1

DATE STARTED: 4/16/2024
DATE FINISHED: 4/16/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +83'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	X – 5 – 3 – 10		S-1 TOP 6": **Asphalt**. BOT 18": Brown mf+ **SAND**, little Clayey Silt, trace f Gravel.
	S-2 2-4'	10 – 10 – 11 – 9		S-2 Brown f+ **SAND**, some Clayey Silt, trace f Gravel.
--- 5'---	S-3 4-6'	10 – 10 – 7 – 9		S-3 Same as **S-2**.
	S-4 6-8'	11 – 9 – 10 – 7		S-4 Red-Brown m+f **SAND**, little Silt.
	S-5 8-10'	12 – 12 – 13 – 16		S-5 Tan m+f **SAND**, little Silt.
---10'---	S-6 10-12'	20 – 26 – 40 – 60		S-6 Same as **S-5**.
				END OF BORING @ 12'
---15'---				
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

TEST BORING LOG

PENN MEDICINE CANCER CENTER PROJECT
TOWNSHIP OF PLAINSBORO, MIDDLESEX COUNTY, NEW JERSEY
FPA NO. 06C028T.003

BORING NO.: B-46
SHEET 1 OF 1

DATE STARTED: 4/16/2024
DATE FINISHED: 4/16/2024
DEPTH OF WATER: Dry
LOCATION: See Plan
GROUND ELEVATION: +84'±
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	8 – 9 – 6 – 5		S-1 TOP 6": **Asphalt**. BOT 18": Red-Brown **Clayey SILT**, some f Sand, little f Gravel.
	S-2 2-4'	6 – 7 – 14 – 10		S-2 Same as **S-1, BOT 18"**.
--- 5'---	S-3 4-6'	8 – 9 – 8 – 9		S-3 TOP 12": Brown mf+ **SAND**, some cmf Gravel, little Clayey Silt. BOT 12": Brown mf+ **SAND**, little Silt, trace f Gravel.
	S-4 6-8'	7 – 8 – 11 – 20		S-4 Tan mf **SAND**, little Silt, trace f Gravel.
---10'---	S-5 8-10'	19 – 17 – 12 – 24		S-5 Same as **S-4**.
	S-6 10-12'	21 – 28 – 21 – 30		S-6 Same as **S-4**.
				END OF BORING @ 12'
---15'---				
---20'---				
---25'---				
---30'---				
---35'---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: S. SAINTILMA

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-13 (B-41)** Date Tested **7/9/2024**

2. Depth **10" below grade**

3. Pre-soak:
   _____ Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____ Four Hour Pre-soak completed - Indicate result:
   _____ Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

7. I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-14 (B-34)** Date Tested **7/9/2024**

2. Depth **6" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   __X__Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

7. I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-15 (B-33)** Date Tested **7/9/2024**

2. Depth **7" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

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Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-16 (B-40)** Date Tested **7/9/2024**

2. Depth **8" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   __X__Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

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Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-17 (B-43)** Date Tested **7/9/2024**

2. Depth **10" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

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Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-18 (B-36)** Date Tested **7/9/2024**

2. Depth **8" below grade**

3. Pre-soak:
   ____ Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   ____ Four Hour Pre-soak completed - Indicate result:
   ____ Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

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Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-19 (B-45)** Date Tested **7/9/2024**

2. Depth **10" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

7. I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

COUNTY/MUNICIPALITY PLAINSBORO / TOWNSHIP OF PLAINSBORO

Percolation Test Data: Block **1701** Lot **3.01**

1. Test Number **P-20 (B-20)** Date Tested **7/9/2024**

2. Depth **10" below grade**

3. Pre-soak:
   _____Sandy Textured Soil Only, Shortened Pre-soak - Indicate Time Required for 12 in. of Water to Drain after Second Filling, Minutes
   _____Four Hour Pre-soak completed - Indicate result:
   _____Test Hole Drained within 15 to 24 hours after Pre-soak
   X Test Hole did not Drain within 24 hours after Pre-soak

   Pre-Soak water elevation dropped 1/8" after 1 hour. Due to insignificant fall in water elevation, Percolation Test has failed, and soil is determined to be unsuitable for water infiltration.

4. Rate of Fall Data:
   a. Time Interval Selected, Minutes
   b. Record the Drop in Water Level during each time Interval to the nearest 1/10th-inch on the line below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)
7"		
7"		
7"		

5. Percolation Rate:
   a. Time, minutes, Required for a Six-inch Drop in the Water level
   b. Percolation Rate = a/6 = / 6=

6. Per NJ Stormwater Best Management Practices Manual, Appendix E Section B1(e.)

   K = a/pm (in/hr) where a = 20 for a bottom width of 6 inches
   K = 20/ min/in. = in/ hr /2 = **in/hr** Therefore, Use

7. I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____
Robert Skinner

Date _____

Signature of Professional Engineer _____
Mark Kalusz, PE

License No. 24GE05937000

Appendix B

Present Conditions and Runoff Calculations

FRENCH & PARRELLO ASSOCIATES
TELEPHONE : (732) 312-9800
FAX : (732) 312-9801
1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER:	06C028T.003		
PROJECT NAME:	Cancer Center		
CALCULATED BY:	KAN	DATE:	2/28/2024
CHECKED BY:		DATE:	
REVISED BY:		DATE:	

TIME OF CONCENTRATION CALCULATOR

DRAINAGE AREA NAME:	Impervious Existing	DRAINAGE AREA NOTATION:	

Sheet Flow: Segment 1

Surface Type:	Smooth surface (concrete, asphalt, gravel, or bare soil)	
Slope of land surface, S:	0.016	ft/ft
n-value (from Table 15-1):	0.011	---
Limiting Length of flow, *l* : (Eq 15-9)	100.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	1.3	minutes

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(n l)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad \text{(Eq 15-8)}$$

$$l = \frac{100(S)^{0.5}}{n} \quad \text{(Eq 15-9)}$$

Shallow Concentrated Flow: Segment 2

Surface Type:	Pavement and small upland gullies	
Flow length, l:	68	ft
Slope of land surface, S:	0.016	ft/ft
n-value (from Table 15-3):	0.025	---
Average velocity, V:	2.571	ft/s
Travel time, T_t: (Eq 15-1)	0.4	minutes

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3{,}600V} \quad \text{(Eq 15-1)}$$

Open Channel Flow:

Hydraulic Length:	40	ft	136	ft
Slope:	0.010	ft/ft	0.009	ft/ft
Manning's n:	0.013	---	0.013	---
Flow Area:	1.2265625	ft^2	7.065	ft^2
Wetted Perimeter:	3.93	ft	9.42	ft
Velocity:	5.34	fps	8.81	fps
Travel time, T_t:	0.1	minutes	0.3	0

	Segment 5		Segment 6	
Hydraulic Length:	70	ft	80	ft
Slope:	0.006	ft/ft	0.010	ft/ft
Manning's n:	0.013	---	0.013	---
Flow Area:	7.065	ft^2	7.065	ft^2
Wetted Perimeter:	9.42	ft	9.42	ft
Velocity:	7.42	fps	9.52	fps
Travel time, T_t:	0.2	minutes	0.1	0

Continued on next sheet

FRENCH & PARRELLO ASSOCIATES
TELEPHONE : (732) 312-9800
FAX : (732) 312-9801
1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER:	06C028T.003		
PROJECT NAME:	Cancer Center		
CALCULATED BY:	KAN	DATE:	2/28/2024
CHECKED BY:		DATE:	
REVISED BY:		DATE:	

TIME OF CONCENTRATION CALCULATOR

DRAINAGE AREA NAME:	Impervious Existing	DRAINAGE AREA NOTATION:	0

	Segment 7		Segment 8	
Hydraulic Length:	37	ft		
Slope:	0.007	ft/ft		ft
Manning's n:	0.013	---		ft/ft
Flow Area:	7.065	ft^2	0	---
Wetted Perimeter:	9.42	ft	0.000	ft/s
Velocity:	7.92	fps	0.0	minutes
Travel time, T_t:	0.1	minutes		

Total Time of Concentration:	2	minutes	user input

FRENCH & PARRELLO ASSOCIATES

TELEPHONE : (732) 312-9800
FAX : (732) 312-9801

1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER:	06C028T.003		
PROJECT NAME:	Cancer Center		
CALCULATED BY:	KAN	DATE:	2/28/2024
CHECKED BY:		DATE:	
REVISED BY:		DATE:	

TIME OF CONCENTRATION CALCULATOR

DRAINAGE AREA NAME:	Pervious Existing	DRAINAGE AREA NOTATION:	

Sheet Flow: Segment 1

Surface Type:	Grass: Short-grass prairie	
Slope of land surface, S:	0.025	ft/ft
n-value (from Table 15-1):	0.15	---
Limiting Length of flow, *l* : (Eq 15-9)	100.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	8.8	minutes

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(n l)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad \text{(Eq 15-8)}$$

$$l = \frac{100(S)^{0.5}}{n} \quad \text{(Eq 15-9)}$$

Shallow Concentrated Flow: Segment 2

Surface Type:	Short-grass pasture	
Flow length, l:	58.0	ft
Slope of land surface, S:	0.025	ft/ft
n-value (from Table 15-3):	0.073	---
Average velocity, V:	1.101	ft/s
Travel time, T_t: (Eq 15-1)	0.9	minutes

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3{,}600V} \quad \text{(Eq 15-1)}$$

Shallow Concentrated Flow: Segment 3 Segment 4

Surface Type:	Pavement and small upland gullies			
Flow length, l:	48.0	ft		ft
Slope of land surface, S:	0.008	ft/ft		ft/ft
n-value (from Table 15-3):	0.025	---	0	---
Average velocity, V:	1.856	ft/s	0.000	ft/s
Travel time, T_t: (Eq 15-1)	0.4	minutes	0.0	minutes

Open Channel Flow:

Hydraulic Length:	130	ft
Slope:	0.005	ft/ft
Manning's n:	0.013	---
Flow Area:	7.065	ft^2
Wetted Perimeter:	9.42	ft
Velocity:	6.86	fps
Travel time, T_t:	0.3	minutes

Total Time of Concentration:	10	minutes	user input

FRENCH & PARRELLO ASSOCIATES

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1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER:	06C028T.003		
PROJECT NAME:	Cancer Center		
CALCULATED BY:	KAN	DATE:	2/28/2024
CHECKED BY:		DATE:	
REVISED BY:		DATE:	

TIME OF CONCENTRATION CALCULATOR

DRAINAGE AREA NAME:	Pervious Proposed	DRAINAGE AREA NOTATION:	

Sheet Flow: Segment 1

Surface Type:	Grass: Short-grass prairie	
Slope of land surface, S:	0.034	ft/ft
n-value (from Table 15-1):	0.15	---
Limiting Length of flow, *l* : (Eq 15-9)	82.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	6.6	minutes

Sheet Flow: Segment 2

Surface Type:	Smooth surface (concrete,	
Slope of land surface, S:	0.020	ft/ft
n-value (from Table 15-1):	0.011	---
Limiting Length of flow, *l* : (Eq 15-9)	6.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	0.1	minutes

Sheet Flow: Segment 3

Surface Type:	Grass: Short-grass prairie	
Slope of land surface, S:	0.050	ft/ft
n-value (from Table 15-1):	0.15	---
Limiting Length of flow, *l* : (Eq 15-9)	12.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	1.2	minutes

Shallow Concentrated Flow: Segment 4

Surface Type:	Short-grass pasture	
Flow length, l:	12.0	ft
Slope of land surface, S:	0.050	ft/ft
n-value (from Table 15-3):	0.073	---
Average velocity, V:	1.557	ft/s
Travel time, T_t: (Eq 15-1)	0.1	minutes

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(n l)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad \text{(Eq 15-8)}$$

$$l = \frac{100(S)^{0.5}}{n} \quad \text{(Eq 15-9)}$$

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of

$$T_t = \frac{l}{3{,}600V} \quad \text{(Eq 15-1)}$$

Shallow Concentrated Flow: Segment 5

Surface Type:	Pavement and small upland gullies	
Flow length, l:	85.0	ft
Slope of land surface, S:	0.010	ft/ft
n-value (from Table 15-3):	0.025	---
Average velocity, V:	2.033	ft/s
Travel time, T_t: (Eq 15-1)	0.7	minutes

Open Channel Flow: Segment 6

Hydraulic Length:	133	ft
Slope:	0.005	ft/ft
Manning's n:	0.013	---
Flow Area:	7.065	ft^2
Wetted Perimeter:	9.42	ft
Velocity:	6.86	fps
Travel time, T_t:	0.3	minutes

Total Time of Concentration:	7	minutes	user input

FRENCH & PARRELLO ASSOCIATES

TELEPHONE : (732) 312-9800
FAX : (732) 312-9801

1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER:	06C028T.003		
PROJECT NAME:	Cancer Center		
CALCULATED BY:	KAN	DATE:	2/28/2024
CHECKED BY:		DATE:	
REVISED BY:		DATE:	

TIME OF CONCENTRATION CALCULATOR

DRAINAGE AREA NAME:	Impervious Proposed	DRAINAGE AREA NOTATION:	

Sheet Flow: Segment 1

Surface Type:	Smooth surface (concrete, asphalt, gravel, or bare soil)	
Slope of land surface, S:	0.030	ft/ft
n-value (from Table 15-1):	0.011	---
Limiting Length of flow, *l* : (Eq 15-9)	100.0	ft
2-year, 24 hours rainfall, P_2:	3.350	in
Travel time, T_t: (Eq 15-8)	1.0	minutes

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(n/\ )^{0.8}}{(P_2)^{0.5}\, S^{0.4}} \quad \text{(Eq 15-8)}$$

$$l = \frac{100(S)^{0.5}}{n} \quad \text{(Eq 15-9)}$$

Shallow Concentrated Flow: Segment 2

Surface Type:	Pavement and small upland gullies	
Flow length, l:	70	ft
Slope of land surface, S:	0.030	ft/ft
n-value (from Table 15-3):	0.025	---
Average velocity, V:	3.521	ft/s
Travel time, T_t: (Eq 15-1)	0.3	minutes

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3{,}600V} \quad \text{(Eq 15-1)}$$

Open Channel Flow: Segment 3

Hydraulic Length:	307	ft
Slope:	0.005	ft/ft
Manning's n:	0.013	---
Flow Area:	7.069	ft^2
Wetted Perimeter:	9.42	ft
Velocity:	6.69	fps
Travel time, T_t:	0.8	minutes

Total Time of Concentration:	2	minutes	user input

Project Summary	
Title	Penn Medicine Cancer Center
Engineer	Kiera Nissen
Company	French and Parrello Associates
Date	7/17/2024

Notes	Existing Conditions

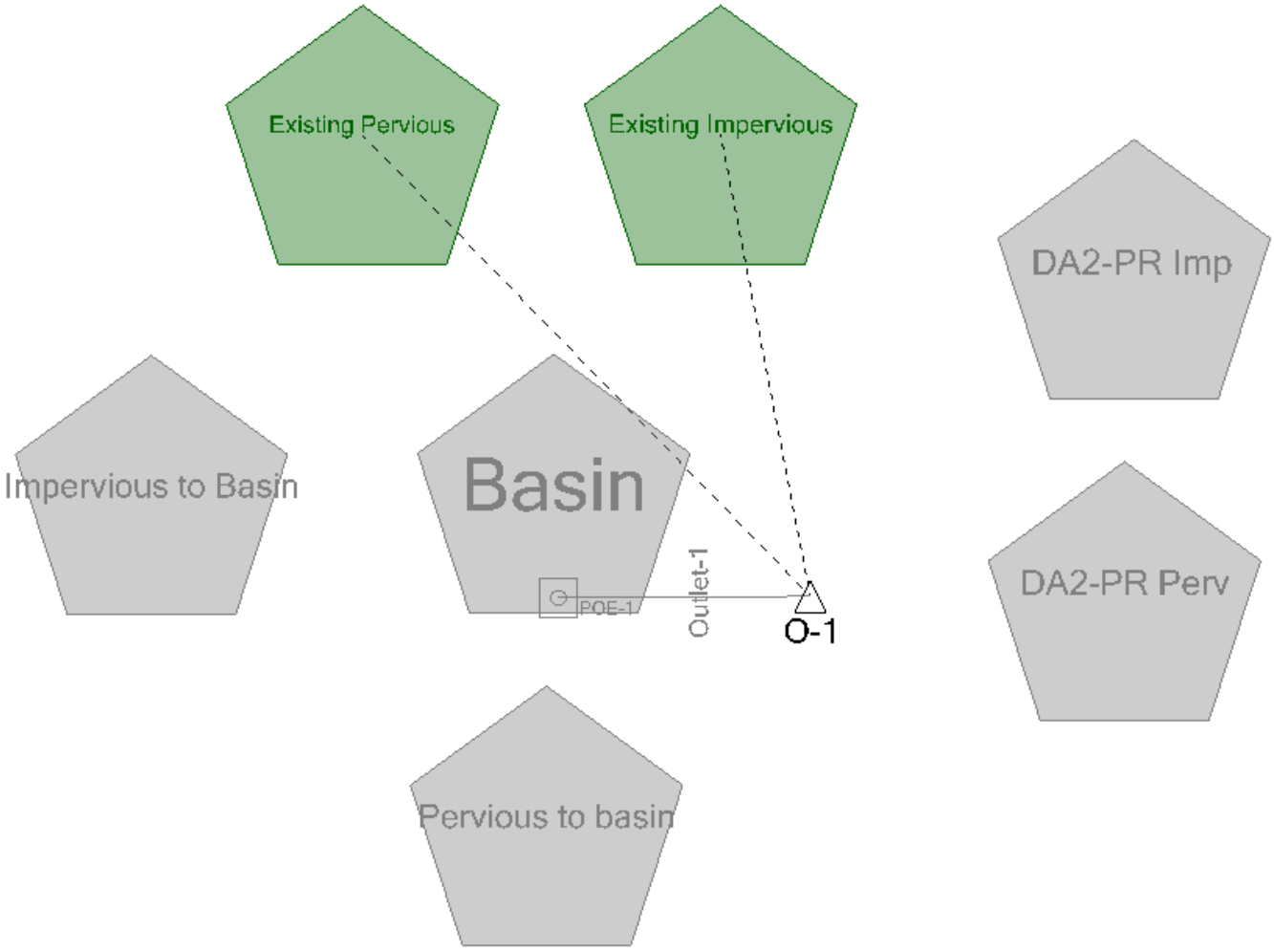

Table of Contents

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Existing Pervious	Pre-Development 2 year	2	3,567.000	730.000	0.94
Existing Pervious	Pre-Development 2 year, Year 2100	2	4,992.000	730.000	1.40
Existing Pervious	Pre-Development 10 year	10	9,206.000	729.000	2.77
Existing Pervious	Pre-Development 10 year, Year 2100	10	11,995.000	729.000	3.67
Existing Pervious	Pre-Development 25 year	25	12,737.000	729.000	3.91
Existing Pervious	Pre-Development 100 year	100	23,650.000	729.000	7.35
Existing Pervious	Pre-Development 100 year, Year 2100	100	35,861.000	729.000	11.10
Existing Impervious	Pre-Development 2 year	2	36,866.000	726.000	12.69
Existing Impervious	Pre-Development 2 year, Year 2100	2	42,781.000	725.000	14.62
Existing Impervious	Pre-Development 10 year	10	57,821.000	725.000	19.53
Existing Impervious	Pre-Development 10 year, Year 2100	10	66,709.000	725.000	22.42
Existing Impervious	Pre-Development 25 year	25	70,253.000	725.000	23.57
Existing Impervious	Pre-Development 100 year	100	99,907.000	725.000	33.20
Existing Impervious	Pre-Development 100 year, Year 2100	100	131,575.000	725.000	43.46

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
O-1	Pre-Development 2 year	2	40,432.000	726.000	13.37
O-1	Pre-Development 2 year, Year 2100	2	47,773.000	726.000	15.70
O-1	Pre-Development 10 year	10	67,027.000	726.000	21.78
O-1	Pre-Development 10 year, Year 2100	10	78,704.000	726.000	25.45
O-1	Pre-Development 25 year	25	82,990.000	726.000	26.81
O-1	Pre-Development 100 year	100	123,556.000	726.000	39.43

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft^3)	Time to Peak (min)	Peak Flow (ft^3/s)
O-1	Pre-Development 100 year, Year 2100	100	167,436.000	726.000	53.00

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	14.66 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	14.62 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.61 in
Runoff Volume (Pervious)	42,797.695 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	42,781.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Impervious
Scenario: Pre-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	12.72 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	12.69 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.11 in
Runoff Volume (Pervious)	36,880.273 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	36,866.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	22.46 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	22.42 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.62 in
Runoff Volume (Pervious)	66,733.894 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	66,709.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Impervious
Scenario: Pre-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	19.57 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	19.53 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.87 in
Runoff Volume (Pervious)	57,842.984 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	57,821.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	23.61 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	23.57 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.95 in
Runoff Volume (Pervious)	70,279.490 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	70,253.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	110.57 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	43.54 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	43.46 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.09 in
Runoff Volume (Pervious)	131,624.284 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	131,575.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Impervious
Scenario: Pre-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	3.270 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	33.26 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	33.20 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3.270 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.42 in
Runoff Volume (Pervious)	99,944.131 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	99,907.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	111.15 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Impervious
Scenario: Pre-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	1.41 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	730.000 min
Flow (Peak Interpolated Output)	1.40 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.94 in
Runoff Volume (Pervious)	5,010.265 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4,992.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	730.667 min
Flow (Peak, Computed)	0.94 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	730.000 min
Flow (Peak Interpolated Output)	0.94 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.67 in
Runoff Volume (Pervious)	3,580.780 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,567.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	3.70 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	3.67 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.25 in
Runoff Volume (Pervious)	12,030.999 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	11,995.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	2.80 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	2.77 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.73 in
Runoff Volume (Pervious)	9,235.021 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	9,206.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	3.95 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	3.91 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.49 in
Runoff Volume (Pervious)	12,773.785 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	12,737.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	9.61 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	11.16 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	11.10 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.72 in
Runoff Volume (Pervious)	35,945.551 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	35,861.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.473 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	7.40 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	7.35 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.473 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.43 in
Runoff Volume (Pervious)	23,710.330 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	23,650.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.01 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	42,781.086	725.000	14.62
Flow (From)	Existing Pervious	4,991.943	730.000	1.40
Flow (In)	O-1	47,773.029	726.000	15.70

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	36,865.830	726.000	12.69
Flow (From)	Existing Pervious	3,566.518	730.000	0.94
Flow (In)	O-1	40,432.348	726.000	13.37

Subsection: Addition Summary
Label: O-1
Scenario: Pre-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	66,708.529	725.000	22.42
Flow (From)	Existing Pervious	11,995.246	729.000	3.67
Flow (In)	O-1	78,703.775	726.000	25.45

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	57,820.873	725.000	19.53
Flow (From)	Existing Pervious	9,205.864	729.000	2.77
Flow (In)	O-1	67,026.737	726.000	21.78

Subsection: Addition Summary
Label: O-1
Scenario: Pre-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	70,252.833	725.000	23.57
Flow (From)	Existing Pervious	12,736.679	729.000	3.91
Flow (In)	O-1	82,989.512	726.000	26.81

Subsection: Addition Summary
Label: O-1
Scenario: Pre-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	131,575.226	725.000	43.46
Flow (From)	Existing Pervious	35,860.788	729.000	11.10
Flow (In)	O-1	167,436.013	726.000	53.00

Subsection: Addition Summary
Label: O-1
Scenario: Pre-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Existing Impervious
<Catchment to Outflow Node>	Existing Pervious

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Existing Impervious	99,906.637	725.000	33.20
Flow (From)	Existing Pervious	23,649.521	729.000	7.35
Flow (In)	O-1	123,556.158	726.000	39.43

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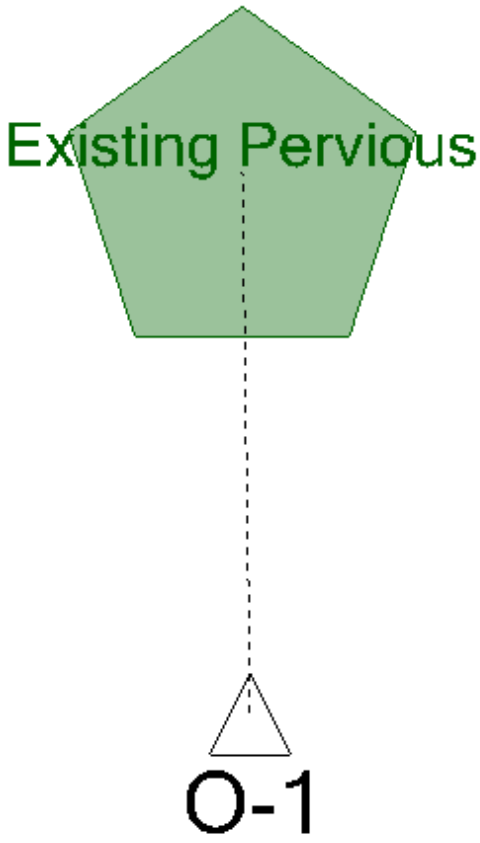
Project Summary	
Title	Penn Medicine Cancer and Imaging Center Reduction Areas
Engineer	Kiera Nissen
Company	French and Parrello Associates
Date	7/17/2024

Notes



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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Existing Pervious	Pre-Development 2 year, Year 2100	2	1,178.000	729.000	0.36
Existing Pervious	Pre-Development 2 year	2	900.000	729.000	0.27
Existing Pervious	Pre-Development 10 year, Year 2100	10	2,443.000	729.000	0.76
Existing Pervious	Pre-Development 10 year	10	1,953.000	729.000	0.61
Existing Pervious	Pre-Development 100 year, Year 2100	100	6,365.000	729.000	1.93
Existing Pervious	Pre-Development 100 year	100	4,398.000	729.000	1.35

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
O-1	Pre-Development 2 year, Year 2100	2	1,178.000	729.000	0.36
O-1	Pre-Development 2 year	2	900.000	729.000	0.27
O-1	Pre-Development 10 year, Year 2100	10	2,443.000	729.000	0.76
O-1	Pre-Development 10 year	10	1,953.000	729.000	0.61
O-1	Pre-Development 100 year, Year 2100	100	6,365.000	729.000	1.93
O-1	Pre-Development 100 year	100	4,398.000	729.000	1.35

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	0.36 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	0.36 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.48 in
Runoff Volume (Pervious)	1,181.860 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,178.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	0.27 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	0.27 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.13 in
Runoff Volume (Pervious)	903.057 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	900.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	0.76 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	0.76 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.07 in
Runoff Volume (Pervious)	2,449.706 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,443.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	0.61 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	0.61 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.45 in
Runoff Volume (Pervious)	1,958.413 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,953.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 10 year

Return Event: 10 years
Storm Event: NOAA-C (5.11 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	1.94 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	1.93 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.99 in
Runoff Volume (Pervious)	6,378.237 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	6,365.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	0.220 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	1.36 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	1.35 ft³/s

Drainage Area	
SCS CN (Composite)	74.000
Area (User Defined)	0.220 acres
Maximum Retention (Pervious)	3.51 in
Maximum Retention (Pervious, 20 percent)	0.70 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.52 in
Runoff Volume (Pervious)	4,408.251 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4,398.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.50 ft³/s

Subsection: Unit Hydrograph Summary
Label: Existing Pervious
Scenario: Pre-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	26.667 min
Total unit time, Tb	33.333 min

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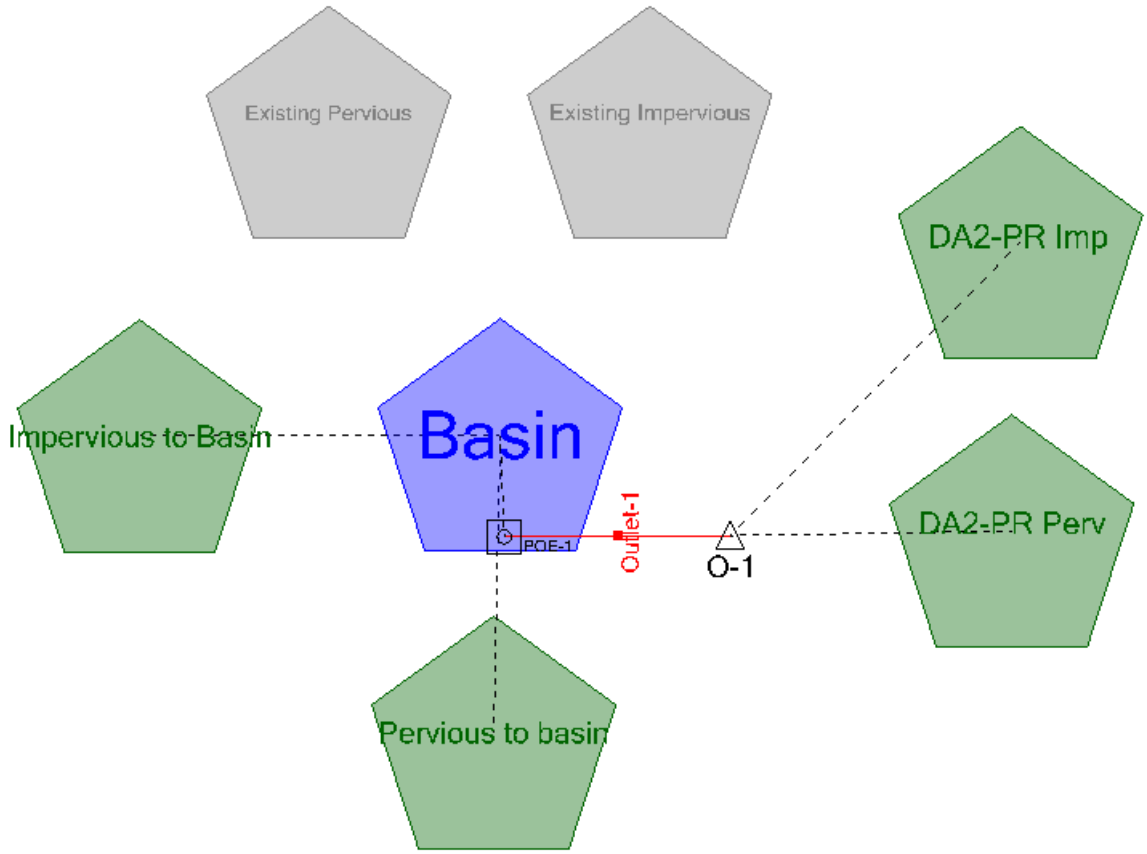
Appendix C

Proposed Conditions Calculations

Project Summary	
Title	Penn Medicine Cancer Center
Engineer	Kiera Nissen
Company	French and Parrello Associates
Date	7/17/2024

Notes	Proposed Conditions



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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
DA2-PR Imp	Post-Development 2 year, Year 2100	2	37,666.000	725.000	12.88
DA2-PR Imp	Post-Development 2 year	2	32,458.000	726.000	11.17
DA2-PR Imp	Post-Development 10 year, Year 2100	10	58,732.000	725.000	19.74
DA2-PR Imp	Post-Development 10 year	10	50,907.000	725.000	17.19
DA2-PR Imp	Post-Development 25 year	25	62,176.000	725.000	20.86
DA2-PR Imp	Post-Development 100 year, Year 2100	100	115,843.000	725.000	38.27
DA2-PR Imp	Post-Development 100 year	100	87,961.000	725.000	29.23
DA2-PR Perv	Post-Development 2 year, Year 2100	2	4,106.000	728.000	1.33
DA2-PR Perv	Post-Development 2 year	2	2,934.000	728.000	0.89
DA2-PR Perv	Post-Development 10 year, Year 2100	10	9,864.000	728.000	3.44
DA2-PR Perv	Post-Development 10 year	10	7,571.000	728.000	2.61
DA2-PR Perv	Post-Development 25 year	25	10,919.000	728.000	3.82
DA2-PR Perv	Post-Development 100 year, Year 2100	100	29,485.000	728.000	10.25
DA2-PR Perv	Post-Development 100 year	100	19,446.000	728.000	6.82
Impervious to Basin	Post-Development 2 year, Year 2100	2	6,418.000	726.000	2.20
Impervious to Basin	Post-Development 2 year	2	5,531.000	726.000	1.91
Impervious to Basin	Post-Development 10 year, Year 2100	10	10,008.000	726.000	3.37
Impervious to Basin	Post-Development 10 year	10	8,675.000	726.000	2.94
Impervious to Basin	Post-Development 25 year	25	10,595.000	726.000	3.56
Impervious to Basin	Post-Development 100 year, Year 2100	100	19,740.000	726.000	6.53
Impervious to Basin	Post-Development 100 year	100	14,989.000	726.000	4.99
Pervious to basin	Post-Development 2 year, Year 2100	2	815.000	727.000	0.32
Pervious to basin	Post-Development 2 year	2	617.000	727.000	0.24
Pervious to basin	Post-Development 10 year, Year 2100	10	1,728.000	726.000	0.68

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Pervious to basin	Post-Development 10 year	10	1,373.000	726.000	0.54
Pervious to basin	Post-Development 25 year	25	1,889.000	726.000	0.74
Pervious to basin	Post-Development 100 year, Year 2100	100	4,596.000	726.000	1.74
Pervious to basin	Post-Development 100 year	100	3,153.000	726.000	1.21

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
O-1	Post-Development 2 year, Year 2100	2	48,955.000	726.000	15.30
O-1	Post-Development 2 year	2	41,496.000	726.000	13.07
O-1	Post-Development 10 year, Year 2100	10	80,270.000	726.000	24.94
O-1	Post-Development 10 year	10	68,468.000	726.000	21.26
O-1	Post-Development 25 year	25	85,514.000	726.000	26.60
O-1	Post-Development 100 year, Year 2100	100	169,570.000	726.000	52.44
O-1	Post-Development 100 year	100	125,471.000	726.000	39.16

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
Basin (IN)	Post-Development 2 year, Year 2100	2	7,234.000	726.000	2.52	(N/A)	(N/A)
Basin (OUT)	Post-Development 2 year, Year 2100	2	7,184.000	727.000	1.29	82.24	1,049.000
Basin (IN)	Post-Development 2 year	2	6,148.000	726.000	2.15	(N/A)	(N/A)

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
Basin (OUT)	Post-Development 2 year	2	6,105.000	727.000	1.15	82.09	870.000
Basin (IN)	Post-Development 10 year, Year 2100	10	11,736.000	726.000	4.05	(N/A)	(N/A)
Basin (OUT)	Post-Development 10 year, Year 2100	10	11,674.000	727.000	2.16	82.75	1,800.000
Basin (IN)	Post-Development 10 year	10	10,048.000	726.000	3.47	(N/A)	(N/A)
Basin (OUT)	Post-Development 10 year	10	9,990.000	728.000	1.78	82.58	1,523.000
Basin (IN)	Post-Development 25 year	25	12,484.000	726.000	4.30	(N/A)	(N/A)
Basin (OUT)	Post-Development 25 year	25	12,420.000	727.000	2.35	82.81	1,920.000
Basin (IN)	Post-Development 100 year, Year 2100	100	24,336.000	726.000	8.27	(N/A)	(N/A)
Basin (OUT)	Post-Development 100 year, Year 2100	100	24,242.000	727.000	4.90	83.65	3,740.000
Basin (IN)	Post-Development 100 year	100	18,142.000	726.000	6.20	(N/A)	(N/A)
Basin (OUT)	Post-Development 100 year	100	18,064.000	727.000	3.67	83.25	2,776.000

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	12.90 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	12.88 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.61 in
Runoff Volume (Pervious)	37,680.295 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	37,666.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	11.20 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	11.17 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.11 in
Runoff Volume (Pervious)	32,470.430 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	32,458.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	19.78 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	19.74 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.62 in
Runoff Volume (Pervious)	58,754.398 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	58,732.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Imp
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	17.23 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	17.19 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.87 in
Runoff Volume (Pervious)	50,926.591 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	50,907.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Imp
Scenario: Post-Development 10 year

Return Event: 10 years
Storm Event: NOAA-C (5.11 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	20.90 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	20.86 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.95 in
Runoff Volume (Pervious)	62,199.401 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	62,176.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	38.34 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	38.27 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.09 in
Runoff Volume (Pervious)	115,885.723 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	115,843.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Imp
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	2.000 min
Area (User Defined)	2.879 acres

Computational Time Increment	0.267 min
Time to Peak (Computed)	725.867 min
Flow (Peak, Computed)	29.28 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	725.000 min
Flow (Peak Interpolated Output)	29.23 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2.879 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.42 in
Runoff Volume (Pervious)	87,993.625 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	87,961.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.000 min
Computational Time Increment	0.267 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	97.86 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Imp
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	1.333 min
Unit receding limb, Tr	5.333 min
Total unit time, Tb	6.667 min

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	1.33 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	1.33 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.94 in
Runoff Volume (Pervious)	4,115.695 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4,106.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	0.89 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	0.89 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.67 in
Runoff Volume (Pervious)	2,941.442 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,934.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	3.44 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	3.44 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.25 in
Runoff Volume (Pervious)	9,882.898 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	9,864.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	2.61 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	2.61 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.73 in
Runoff Volume (Pervious)	7,586.134 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	7,571.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 10 year

Return Event: 10 years
Storm Event: NOAA-C (5.11 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	3.82 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	3.82 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.49 in
Runoff Volume (Pervious)	10,938.627 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	10,919.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	10.25 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	10.25 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.72 in
Runoff Volume (Pervious)	29,527.574 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	29,485.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	7.000 min
Area (User Defined)	1.210 acres

Computational Time Increment	0.933 min
Time to Peak (Computed)	728.000 min
Flow (Peak, Computed)	6.82 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	728.000 min
Flow (Peak Interpolated Output)	6.82 ft³/s

Drainage Area	
SCS CN (Composite)	65.000
Area (User Defined)	1.210 acres
Maximum Retention (Pervious)	5.38 in
Maximum Retention (Pervious, 20 percent)	1.08 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.43 in
Runoff Volume (Pervious)	19,476.917 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	19,446.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	7.000 min
Computational Time Increment	0.933 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	11.75 ft³/s

Subsection: Unit Hydrograph Summary
Label: DA2-PR Perv
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	4.667 min
Unit receding limb, Tr	18.667 min
Total unit time, Tb	23.333 min

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	2.20 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	2.20 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.61 in
Runoff Volume (Pervious)	6,419.648 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	6,418.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	1.91 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	1.91 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.11 in
Runoff Volume (Pervious)	5,532.031 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	5,531.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	3.37 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	3.37 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.62 in
Runoff Volume (Pervious)	10,010.080 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	10,008.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	2.94 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	2.94 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.87 in
Runoff Volume (Pervious)	8,676.445 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	8,675.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	3.56 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	3.56 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.95 in
Runoff Volume (Pervious)	10,597.011 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	10,595.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	6.53 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	6.53 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.09 in
Runoff Volume (Pervious)	19,743.642 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	19,740.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	1.000 min
Area (User Defined)	0.491 acres

Computational Time Increment	0.133 min
Time to Peak (Computed)	726.000 min
Flow (Peak, Computed)	4.99 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	4.99 ft³/s

Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	0.491 acres
Maximum Retention (Pervious)	0.20 in
Maximum Retention (Pervious, 20 percent)	0.04 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.42 in
Runoff Volume (Pervious)	14,991.619 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	14,989.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.000 min
Computational Time Increment	0.133 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	33.35 ft³/s

Subsection: Unit Hydrograph Summary
Label: Impervious to Basin
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.667 min
Unit receding limb, Tr	2.667 min
Total unit time, Tb	3.333 min

Storm Event	NOAA-C 2100 (3.84)
Return Event	2 years
Duration	1,440.000 min
Depth	3.84 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	0.32 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	727.000 min
Flow (Peak Interpolated Output)	0.32 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.38 in
Runoff Volume (Pervious)	816.412 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	815.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C (3.34 in)
Return Event	2 years
Duration	1,440.000 min
Depth	3.34 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	0.24 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	727.000 min
Flow (Peak Interpolated Output)	0.24 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.04 in
Runoff Volume (Pervious)	617.866 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	617.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C 2100 (5.86)
Return Event	10 years
Duration	1,440.000 min
Depth	5.86 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	0.68 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	0.68 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.93 in
Runoff Volume (Pervious)	1,729.684 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,728.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C (5.11 in)
Return Event	10 years
Duration	1,440.000 min
Depth	5.11 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	0.54 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	0.54 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.32 in
Runoff Volume (Pervious)	1,374.320 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,373.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 10 year

Return Event: 10 years
Storm Event: NOAA-C (5.11 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C (6.19 in)
Return Event	25 years
Duration	1,440.000 min
Depth	6.19 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	0.74 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	0.74 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.20 in
Runoff Volume (Pervious)	1,890.584 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,889.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C 2100 (11.33)
Return Event	100 years
Duration	1,440.000 min
Depth	11.33 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	1.74 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	1.74 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.78 in
Runoff Volume (Pervious)	4,599.779 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4,596.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Storm Event	NOAA-C (8.66 in)
Return Event	100 years
Duration	1,440.000 min
Depth	8.66 in
Time of Concentration (Composite)	4.000 min
Area (User Defined)	0.163 acres

Computational Time Increment	0.533 min
Time to Peak (Computed)	726.400 min
Flow (Peak, Computed)	1.22 ft³/s
Output Increment	1.002 min
Time to Flow (Peak Interpolated Output)	726.000 min
Flow (Peak Interpolated Output)	1.21 ft³/s

Drainage Area	
SCS CN (Composite)	72.492
Area (User Defined)	0.163 acres
Maximum Retention (Pervious)	3.79 in
Maximum Retention (Pervious, 20 percent)	0.76 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.34 in
Runoff Volume (Pervious)	3,156.247 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,153.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	4.000 min
Computational Time Increment	0.533 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	2.77 ft³/s

Subsection: Unit Hydrograph Summary
Label: Pervious to basin
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	2.667 min
Unit receding limb, Tr	10.667 min
Total unit time, Tb	13.333 min

Subsection: Addition Summary
Label: O-1
Scenario: Post-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Outlet-1	7,183.743	727.000	1.29
Flow (From)	DA2-PR Imp	37,665.672	725.000	12.88
Flow (From)	DA2-PR Perv	4,105.957	728.000	1.33
Flow (In)	O-1	48,955.371	726.000	15.30

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet-1	6,104.693	727.000	1.15
Flow (From)	DA2-PR Imp	32,457.714	726.000	11.17
Flow (From)	DA2-PR Perv	2,933.763	728.000	0.89
Flow (In)	O-1	41,496.171	726.000	13.07

Subsection: Addition Summary
Label: O-1
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Outlet-1	11,673.822	727.000	2.16
Flow (From)	DA2-PR Imp	58,732.066	725.000	19.74
Flow (From)	DA2-PR Perv	9,864.463	728.000	3.44
Flow (In)	O-1	80,270.351	726.000	24.94

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet-1	9,989.677	728.000	1.78
Flow (From)	DA2-PR Imp	50,907.123	725.000	17.19
Flow (From)	DA2-PR Perv	7,570.969	728.000	2.61
Flow (In)	O-1	68,467.769	726.000	21.26

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet-1	12,419.512	727.000	2.35
Flow (From)	DA2-PR Imp	62,175.808	725.000	20.86
Flow (From)	DA2-PR Perv	10,918.747	728.000	3.82
Flow (In)	O-1	85,514.067	726.000	26.60

Subsection: Addition Summary
Label: O-1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet-1	24,242.111	727.000	4.90
Flow (From)	DA2-PR Imp	115,842.530	725.000	38.27
Flow (From)	DA2-PR Perv	29,485.239	728.000	10.25
Flow (In)	O-1	169,569.880	726.000	52.44

Subsection: Addition Summary
Label: O-1
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
Outlet-1	Basin
<Catchment to Outflow Node>	DA2-PR Imp
<Catchment to Outflow Node>	DA2-PR Perv

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Outlet-1	18,063.793	727.000	3.67
Flow (From)	DA2-PR Imp	87,960.614	725.000	29.23
Flow (From)	DA2-PR Perv	19,446.205	728.000	6.82
Flow (In)	O-1	125,470.612	726.000	39.16

Subsection: Elevation-Area Volume Curve
Return Event: 100 years
Label: Basin
Storm Event: NOAA-C 2100 (11.33)
Scenario: Post-Development 100 year, Year 2100

Elevation (ft)	Planimeter (ft^2)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ft^3)	Volume (Total) (ft^3)
81.00	0.0	0.011	0.000	0.000	0.000
82.00	0.0	0.025	0.053	764.000	764.000
83.00	0.0	0.045	0.104	1,503.000	2,267.000
84.00	0.0	0.067	0.167	2,424.000	4,690.000

Pond Volume Equations
*** Incremental volume computed by the Conic Method for Reservoir Volumes.**

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	81.00 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	84.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	81.00	84.00
Orifice-Circular	Orifice - 2	Forward	TW	82.10	84.00
Orifice-Circular	Orifice - 3	Forward	TW	82.40	84.00
Rectangular Weir	Weir - 1	Forward	TW	83.55	84.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	81.00 ft
Orifice Diameter	7.0 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	83.55 ft
Weir Length	3.50 ft
Weir Coefficient	3.50 (ft^0.5)/s

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	82.10 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: Orifice - 3 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	82.40 ft
Orifice Diameter	9.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 1 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
81.00	0.00	(N/A)	0.00
81.10	0.03	(N/A)	0.00
81.20	0.10	(N/A)	0.00
81.30	0.21	(N/A)	0.00
81.40	0.35	(N/A)	0.00
81.50	0.52	(N/A)	0.00
81.60	0.71	(N/A)	0.00
81.70	0.82	(N/A)	0.00
81.80	0.92	(N/A)	0.00
81.90	1.00	(N/A)	0.00
82.00	1.08	(N/A)	0.00
82.10	1.16	(N/A)	0.00
82.20	1.23	(N/A)	0.00
82.30	1.29	(N/A)	0.00
82.40	1.35	(N/A)	0.00
82.50	1.41	(N/A)	0.00
82.60	1.47	(N/A)	0.00
82.70	1.53	(N/A)	0.00
82.80	1.58	(N/A)	0.00
82.90	1.63	(N/A)	0.00
83.00	1.68	(N/A)	0.00
83.10	1.73	(N/A)	0.00
83.20	1.78	(N/A)	0.00
83.30	1.82	(N/A)	0.00
83.40	1.87	(N/A)	0.00
83.50	1.91	(N/A)	0.00
83.55	1.93	(N/A)	0.00
83.60	1.95	(N/A)	0.00
83.70	2.00	(N/A)	0.00
83.80	2.04	(N/A)	0.00
83.90	2.08	(N/A)	0.00
84.00	2.12	(N/A)	0.00

Computation Messages

Upstream HW &
DNstream TW < Inv.El
CRIT.DEPTH CONTROL
Vh= .025ft Dcr= .075ft
CRIT.DEPTH Hev= .00ft

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 1 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages
CRIT.DEPTH CONTROL
Vh= .052ft Dcr= .148ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL
Vh= .081ft Dcr= .219ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL
Vh= .112ft Dcr= .288ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL
Vh= .148ft Dcr= .352ft
CRIT.DEPTH Hev= .00ft
H =.31
H =.41
H =.51
H =.61
H =.71
H =.81
H =.91
H =1.01
H =1.11
H =1.21
H =1.31
H =1.41
H =1.51
H =1.61
H =1.71
H =1.81
H =1.91
H =2.01
H =2.11
H =2.21
H =2.26
H =2.31
H =2.41
H =2.51
H =2.61
H =2.71

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir - 1 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
81.00	0.00	(N/A)	0.00
81.10	0.00	(N/A)	0.00
81.20	0.00	(N/A)	0.00
81.30	0.00	(N/A)	0.00
81.40	0.00	(N/A)	0.00
81.50	0.00	(N/A)	0.00
81.60	0.00	(N/A)	0.00
81.70	0.00	(N/A)	0.00
81.80	0.00	(N/A)	0.00
81.90	0.00	(N/A)	0.00
82.00	0.00	(N/A)	0.00
82.10	0.00	(N/A)	0.00
82.20	0.00	(N/A)	0.00
82.30	0.00	(N/A)	0.00
82.40	0.00	(N/A)	0.00
82.50	0.00	(N/A)	0.00
82.60	0.00	(N/A)	0.00
82.70	0.00	(N/A)	0.00
82.80	0.00	(N/A)	0.00
82.90	0.00	(N/A)	0.00
83.00	0.00	(N/A)	0.00
83.10	0.00	(N/A)	0.00
83.20	0.00	(N/A)	0.00
83.30	0.00	(N/A)	0.00
83.40	0.00	(N/A)	0.00
83.50	0.00	(N/A)	0.00
83.55	0.00	(N/A)	0.00
83.60	0.14	(N/A)	0.00
83.70	0.71	(N/A)	0.00
83.80	1.53	(N/A)	0.00
83.90	2.54	(N/A)	0.00
84.00	3.70	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir - 1 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir - 1 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages
HW & TW below Inv.El.=83.550
HW & TW below Inv.El.=83.550
H=.00; Htw=.00; Qfree=.00;
H=.05; Htw=.00; Qfree=.14;
H=.15; Htw=.00; Qfree=.71;
H=.25; Htw=.00; Qfree=1.53;
H=.35; Htw=.00; Qfree=2.54;
H=.45; Htw=.00; Qfree=3.70;

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 2 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
81.00	0.00	(N/A)	0.00
81.10	0.00	(N/A)	0.00
81.20	0.00	(N/A)	0.00
81.30	0.00	(N/A)	0.00
81.40	0.00	(N/A)	0.00
81.50	0.00	(N/A)	0.00
81.60	0.00	(N/A)	0.00
81.70	0.00	(N/A)	0.00
81.80	0.00	(N/A)	0.00
81.90	0.00	(N/A)	0.00
82.00	0.00	(N/A)	0.00
82.10	0.00	(N/A)	0.00
82.20	0.02	(N/A)	0.00
82.30	0.07	(N/A)	0.00
82.40	0.14	(N/A)	0.00
82.50	0.20	(N/A)	0.00
82.60	0.24	(N/A)	0.00
82.70	0.28	(N/A)	0.00
82.80	0.31	(N/A)	0.00
82.90	0.33	(N/A)	0.00
83.00	0.36	(N/A)	0.00
83.10	0.38	(N/A)	0.00
83.20	0.41	(N/A)	0.00
83.30	0.43	(N/A)	0.00
83.40	0.45	(N/A)	0.00
83.50	0.47	(N/A)	0.00
83.55	0.48	(N/A)	0.00
83.60	0.48	(N/A)	0.00
83.70	0.50	(N/A)	0.00
83.80	0.52	(N/A)	0.00
83.90	0.54	(N/A)	0.00
84.00	0.55	(N/A)	0.00

Computation Messages
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 2 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .027ft Dcr= .073ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .054ft Dcr= .146ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .090ft Dcr= .210ft
CRIT.DEPTH Hev= .00ft
H =.23
H =.33
H =.43
H =.53
H =.63
H =.73
H =.83
H =.93
H =1.03
H =1.13
H =1.23
H =1.28
H =1.33
H =1.43
H =1.53
H =1.63
H =1.73

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 3 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
81.00	0.00	(N/A)	0.00
81.10	0.00	(N/A)	0.00
81.20	0.00	(N/A)	0.00
81.30	0.00	(N/A)	0.00
81.40	0.00	(N/A)	0.00
81.50	0.00	(N/A)	0.00
81.60	0.00	(N/A)	0.00
81.70	0.00	(N/A)	0.00
81.80	0.00	(N/A)	0.00
81.90	0.00	(N/A)	0.00
82.00	0.00	(N/A)	0.00
82.10	0.00	(N/A)	0.00
82.20	0.00	(N/A)	0.00
82.30	0.00	(N/A)	0.00
82.40	0.00	(N/A)	0.00
82.50	0.03	(N/A)	0.00
82.60	0.11	(N/A)	0.00
82.70	0.24	(N/A)	0.00
82.80	0.42	(N/A)	0.00
82.90	0.63	(N/A)	0.00
83.00	0.86	(N/A)	0.00
83.10	1.12	(N/A)	0.00
83.20	1.39	(N/A)	0.00
83.30	1.54	(N/A)	0.00
83.40	1.68	(N/A)	0.00
83.50	1.81	(N/A)	0.00
83.55	1.87	(N/A)	0.00
83.60	1.93	(N/A)	0.00
83.70	2.05	(N/A)	0.00
83.80	2.15	(N/A)	0.00
83.90	2.26	(N/A)	0.00
84.00	2.35	(N/A)	0.00

Computation Messages
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 3 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .025ft Dcr= .075ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .051ft Dcr= .148ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .079ft Dcr= .220ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .109ft Dcr= .291ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .140ft Dcr= .361ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .174ft Dcr= .425ft
CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .212ft Dcr= .488ft
CRIT.DEPTH Hev= .00ft
H =.43
H =.53
H =.63
H =.73
H =.78
H =.83
H =.93
H =1.03
H =1.13
H =1.23

Subsection: Composite Rating Curve
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
81.00	0.00	(N/A)	0.00
81.10	0.03	(N/A)	0.00
81.20	0.10	(N/A)	0.00
81.30	0.21	(N/A)	0.00
81.40	0.35	(N/A)	0.00
81.50	0.52	(N/A)	0.00
81.60	0.71	(N/A)	0.00
81.70	0.82	(N/A)	0.00
81.80	0.92	(N/A)	0.00
81.90	1.00	(N/A)	0.00
82.00	1.08	(N/A)	0.00
82.10	1.16	(N/A)	0.00
82.20	1.24	(N/A)	0.00
82.30	1.36	(N/A)	0.00
82.40	1.49	(N/A)	0.00
82.50	1.65	(N/A)	0.00
82.60	1.83	(N/A)	0.00
82.70	2.05	(N/A)	0.00
82.80	2.31	(N/A)	0.00
82.90	2.60	(N/A)	0.00
83.00	2.91	(N/A)	0.00
83.10	3.24	(N/A)	0.00
83.20	3.57	(N/A)	0.00
83.30	3.79	(N/A)	0.00
83.40	4.00	(N/A)	0.00
83.50	4.19	(N/A)	0.00
83.55	4.28	(N/A)	0.00
83.60	4.51	(N/A)	0.00
83.70	5.26	(N/A)	0.00
83.80	6.24	(N/A)	0.00
83.90	7.41	(N/A)	0.00
84.00	8.72	(N/A)	0.00

Contributing Structures

None Contributing
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1
Orifice - 1

Subsection: Composite Rating Curve
Label: Composite Outlet Structure - 1
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Composite Outflow Summary

Contributing Structures
Orifice - 1
Orifice - 1 + Orifice - 2
Orifice - 1 + Orifice - 2
Orifice - 1 + Orifice - 2
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1
Orifice - 1 + Orifice - 2 + Orifice - 3 + Weir - 1

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 2 year, Year 2100

Return Event: 2 years
Storm Event: NOAA-C 2100 (3.84)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	2.52 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	1.29 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	82.24 ft
Volume (Peak)	1,049.115 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	7,234.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	7,184.000 ft³
Volume (Retained)	48.000 ft³
Volume (Unrouted)	-2.000 ft³
Error (Mass Balance)	0.022 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 2 year

Return Event: 2 years
Storm Event: NOAA-C (3.34 in)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	2.15 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	1.15 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	82.09 ft
Volume (Peak)	869.569 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	6,148.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	6,105.000 ft³
Volume (Retained)	42.000 ft³
Volume (Unrouted)	-2.000 ft³
Error (Mass Balance)	0.027 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 10 year, Year 2100

Return Event: 10 years
Storm Event: NOAA-C 2100 (5.86)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	4.05 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	2.16 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	82.75 ft
Volume (Peak)	1,799.704 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	11,736.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	11,674.000 ft³
Volume (Retained)	60.000 ft³
Volume (Unrouted)	-3.000 ft³
Error (Mass Balance)	0.023 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 10 year

Return Event: 10 years
Storm Event: NOAA-C (5.11 in)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	3.47 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	1.78 ft³/s	Time to Peak (Flow, Outlet)	728.000 min

Elevation (Water Surface, Peak)	82.58 ft
Volume (Peak)	1,522.645 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	10,048.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	9,990.000 ft³
Volume (Retained)	56.000 ft³
Volume (Unrouted)	-2.000 ft³
Error (Mass Balance)	0.023 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 25 year

Return Event: 25 years
Storm Event: NOAA-C (6.19 in)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	4.30 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	2.35 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	82.81 ft
Volume (Peak)	1,919.786 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	12,484.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	12,420.000 ft³
Volume (Retained)	61.000 ft³
Volume (Unrouted)	-3.000 ft³
Error (Mass Balance)	0.024 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 100 year, Year 2100

Return Event: 100 years
Storm Event: NOAA-C 2100 (11.33)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	8.27 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	4.90 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	83.65 ft
Volume (Peak)	3,739.577 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	24,336.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	24,242.000 ft³
Volume (Retained)	88.000 ft³
Volume (Unrouted)	-5.000 ft³
Error (Mass Balance)	0.022 %

Subsection: Level Pool Pond Routing Summary
Label: Basin (IN)
Scenario: Post-Development 100 year

Return Event: 100 years
Storm Event: NOAA-C (8.66 in)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	81.00 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	6.20 ft³/s	Time to Peak (Flow, In)	726.000 min
Flow (Peak Outlet)	3.67 ft³/s	Time to Peak (Flow, Outlet)	727.000 min

Elevation (Water Surface, Peak)	83.25 ft
Volume (Peak)	2,775.642 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	18,142.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	18,064.000 ft³
Volume (Retained)	74.000 ft³
Volume (Unrouted)	-4.000 ft³
Error (Mass Balance)	0.023 %

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STORM SEWER DESIGN WORK SHEET

LOCATION		RUNOFF DATA									SEWER DESIGN DATA						
STRUCTURE NUMBER		INCREMENTAL AREA				TIME OF CONCENTRATION					PIPE MATERIAL : RCP MANNINGS 'n' = 0.013						
UPSTREAM	DOWNSTREAM	AREA	WEIGHTED RUNOFF COEFFICIENT	SUBAREA Ac x C	TOTAL AREA	OVERLAND THROUGH AREA, Ta	THROUGH PIPE, Tp	TOTAL Tc OR LONGEST ACCUMULATED Tc	RAINFALL INTENSITY, I	RUNOFF PEAK, Q	DIAMETER	LENGTH	SLOPE	CAPACITY AT FULL FLOW, Qf	VELOCITY AT FULL FLOW, Vf	VELOCITY ACTUAL, Va	FLOW TIME THROUGH PIPE
		Ac	C		Ac X C	MIN.	MIN.	MIN.	IN/HR	CFS	INCHES	FEET	%	CFS	FPS	FPS	MIN.
GA 1	GA 3	0.02	0.20	0.00	0.00	5.0		5.0	7.20	0.02	12	56	0.50	2.5	3.2	0.8	1.2
GA 2	GA 3	0.15	0.99	0.14	0.14	5.0	1.2	5.0	7.20	1.04	15	46	0.37	3.9	3.2	2.7	0.3
GA 3	GA 4	0.09	0.25	0.02	0.17	5.0	1.4	5.0	7.20	1.22	15	83	1.80	8.7	7.1	4.9	0.3
GA 4	GA 5	0.05	0.31	0.01	0.18	5.0	1.7	5.0	7.20	1.32	15	18	0.50	4.6	3.7	3.2	0.1
GA 5	GA 6	0.30	0.99	0.30	0.48	5.0	1.8	5.0	7.20	3.47	18	7	0.50	7.4	4.2	4.1	0.0
GA 7	GA 6	0.22	0.99	0.22	0.22	5.0	1.8	5.0	7.20	1.57	15	46	0.71	5.4	4.4	3.8	0.2
G 1	A 1	0.09	0.48	0.04	0.74	5.0	2.0	5.0	7.20	5.35	18	83	1.42	12.5	7.1	6.7	0.2
of Leaders	A 1	0.71	0.99	0.70	1.45	5.0		5.0	7.20	10.41	18	133	1.50	12.9	7.3	8.0	0.3
h 1	h 2	0.07	0.37	0.03	0.03	5.0		5.0	7.20	0.18	12	71	1.00	3.6	4.5	2.2	0.5
h 2	a 1	0.01	0.46	0.00	0.03	5.0	0.5	5.0	7.20	0.22	12	33	1.00	3.6	4.5	2.5	0.2
A 1	A 2	0.07	0.70	0.05	1.53	5.0	2.0	5.0	7.20	10.98	36	29	0.50	47.2	6.7	5.5	0.1
A 2	A 3	0.02	0.78	0.02	1.54	5.0	2.1	5.0	7.20	11.11	36	42	0.50	47.2	6.7	5.5	0.1
B 1	B 2	0.11	0.99	0.11	0.11	5.0		5.0	7.20	0.78	18	52	1.00	10.5	5.9	5.1	0.2
B 2	B 3	0.21	0.94	0.20	0.31	5.0	0.2	5.0	7.20	2.21	18	17	1.00	10.5	5.9	5.6	0.1
Z 4	B 3	0.96	0.42	0.40	0.40	5.0	0.2	5.0	7.20	2.90	15	87	1.80	8.7	7.1	6.3	0.2
B 3	B 4	0.04	0.50	0.02	0.73	5.0	0.4	5.0	7.20	5.24	18	13	1.00	10.5	5.9	6.4	0.0
B 4	A 4	0.85	0.93	0.79	1.51	5.0	0.5	5.0	7.20	10.90	24	67	1.00	22.6	7.2	7.4	0.2
A 3	A 4	0.04	0.90	0.03	3.09	5.0	2.1	5.0	7.20	22.26	36	87	0.50	47.2	6.7	6.7	0.2
A 4	A 5	0.25	0.84	0.21	4.82	5.0	2.3	5.0	7.20	34.68	36	50	0.50	47.2	6.7	7.5	0.1
F 2	A 5	0.29	0.99	0.29	0.29	5.0		5.0	7.20	2.06	18	13	1.00	10.5	5.9	5.2	0.0
A 5	A 6	0.00	0.00	0.00	5.10	5.0	2.3	5.0	7.20	36.74	36	45	0.50	47.2	6.7	7.5	0.1
A 6A	A 6	0.11	0.48	0.05	0.05	5.0		5.0	7.20	0.36	15	25	1.00	6.5	5.3	2.8	0.1
a 6	a 7	0.00	0.00	0.00	5.15	5.0	2.3	5.0	7.20	37.10	36	83	0.50	47.2	6.7	7.6	0.2
a 7	a 8	0.01	0.76	0.00	5.16	5.0	2.5	5.0	7.20	37.13	36	48	0.50	47.2	6.7	7.5	0.1
nch Drain	A 8C	0.07	0.99	0.07	0.07	5.0		5.0	7.20	0.52	12	8	1.00	3.6	4.5	3.2	0.0
Canopy Roof Drains	A 8C	0.02	0.99	0.02	0.02	5.0		5.0	7.20	0.17	12	35	1.00	3.6	4.5	2.3	0.3
Canopy Roof Drains	A 8C	0.03	0.99	0.03	0.03	5.0		5.0	7.20	0.22	12	38	1.00	3.6	4.5	2.5	0.3
a 8C	a 8D	0.11	0.32	0.04	0.11	5.0	0.0	5.0	7.20	0.77	15	55	1.00	6.5	5.3	3.5	0.3
a 8D	a 8	0.04	0.74	0.03	0.14	5.0	0.3	5.0	7.20	0.99	15	49	1.00	6.5	5.3	3.6	0.2
A 8	a 9	0.00	0.00	0.00	5.29	5.0	2.5	5.0	7.20	38.12	36	82	0.50	47.2	6.7	7.6	0.2
a 9	a 10	0.19	0.86	0.16	5.46	5.0	2.7	5.0	7.20	39.30	36	47	0.50	47.2	6.7	7.6	0.1
R 1	R 2	0.48	0.99	0.47	0.47	5.0	0.0	5.0	7.20	3.41	15	49	0.50	4.6	3.7	4.0	0.2
R 2	Basin	0.00	0.00	0.00	0.47	5.0	0.2	5.0	7.20	3.41	15	37	0.50	4.6	3.7	4.0	0.2
OCS	E 2									1.9	15	11	1.00	6.5	5.3	4.5	0.0
E 1	E 2	0.10	0.49	0.05	0.05	5.0	0.0	5.0	7.20	0.34	18	95	1.00	10.5	5.9	2.6	0.6
E 2	A 10	0.00	0.00	0.00	0.05	5.0	0.6	5.0	7.20	2.28	18	34	1.00	10.5	5.9	4.7	0.1
A 10	x 4	0.47	0.97	0.46	5.96	5.0	2.7	5.0	7.20	44.86	36	36	1.64	85.4	12.1	12.7	0.0
c 1	c 2	0.43	0.88	0.38	0.85	5.0	0.0	5.0	7.20	6.13	18	138	1.00	10.5	5.9	6.1	0.4
c 2	c 3	0.14	0.89	0.12	0.97	5.0	0.4	5.0	7.20	7.00	18	122	1.00	10.5	5.9	6.3	0.3
y 6	c 3	0.38	0.89	0.34	0.34	5.0	0.7	5.0	7.20	2.43	15	41	0.73	5.5	4.5	4.8	0.1
c 3	x 2	0.46	0.92	0.43	1.74	5.0	0.8	5.0	7.20	12.49	24	59	1.02	22.8	7.3	7.4	0.1
d 4	d 5	0.26	0.99	0.26	0.26	5.0	0.0	5.0	7.20	1.87	12	106	1.00	3.6	4.5	4.5	0.4
d 5	x 6	0.12	0.99	0.12	0.38	5.0	0.4	5.0	7.20	2.73	18	42	1.00	10.5	5.9	4.9	0.1
Roof Leaders	G 1	0.19	0.99	0.19	0.19	5.0	0.0	5.0	7.20	1.37	12	22	1.00	3.6	4.5	4.2	0.1
Roof Leaders	G 1	0.08	0.99	0.08	0.08	5.0	0.1	5.0	7.20	0.57	6	53	1.00	0.6	2.9	3.2	0.3
G 1	EXISTING MH				0.27	5.0	0.4	5.0	7.20	1.94	12	52	2.56	5.7	7.3	6.4	0.1

1. SEE CONSTRUCTION PLANS FOR

2.. SEE PLANS FOR PIPE PROFILE

INFORMATION.

PROJECT NAME : Penn Medicine Parking Garage

PROJECT NO. : 06C028T.003

STORM FREQUENCY 25 YEAR

COMPUTED BY : KAN DATE : 7-17-2024

CHECKED BY : DATE :

REVISED BY : DATE :

FRENCH & PARRELLO ASSOCIATES

1800 ROUTE 34, SUITE 101 TELEPHONE : (732)-312-9800

WALL, NEW JERSEY NJ 07719 FAX : (732)-312-9801

Hydraulic Grade Line analysis for the year 2100 100-year storm

Line No.	Line ID	Invert Dn	Grnd/ Rim Elev Dn	HGL Dn	Invert Up	Grnd/ Rim Elev Up	HGL Up
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
1	X4 TO X6	74.21	0.00	76.77	74.28	84.46	77.06
2	X3 TO X4	80.13	84.46	81.60	81.07	88.32	82.55
3	X2 TO X3	83.92	88.32	85.08	84.76	88.31	86.31
4	C3 TO X2	84.92	88.31	86.31	85.51	90.76	86.73 j
5	Y6 TO C3	87.91	90.76	88.53	88.21	91.95	88.90
6	Y5 TO Y6	88.21	91.95	88.90	88.56	92.14	89.30
7	Y3 TO Y5	88.56	92.14	89.56	88.65	92.50	89.72
8	Y2 TO Y3	88.70	92.50	89.77	90.39	92.84	90.82 j
9	Y1 TO Y2	90.39	92.84	90.82	91.50	95.35	91.79 j
10	A10 TO X4	74.28	84.46	79.08	74.87	83.67	79.20
11	A9 TO A10	74.87	83.67	79.84	75.34	85.42	79.95
12	A8 TO A9	75.39	85.42	80.11	75.79	87.99	80.28
13	A7 TO A8	75.79	87.99	80.55	76.03	89.66	80.64
14	A6 TO A7	76.03	89.66	81.02	76.45	88.41	81.16
15	A5 TO A6	76.45	88.41	81.42	76.67	86.07	81.50
16	A4 TO A5	76.67	86.07	81.76	76.92	86.10	81.83
17	B4 TO A4	81.61	86.10	82.72	82.28	89.91	83.60
18	B3 TO B4	82.78	89.91	83.67	82.91	89.48	83.93
19	A4 TO B2	84.23	89.48	84.62	85.79	91.09	86.32
20	Z3 TO Z4	88.34	91.09	88.55	90.05	92.85	90.39
21	Z2 TO Z3	90.05	92.85	90.39	90.86	93.46	91.18 j
22	Y4 TO Y5	89.74	92.14	89.93	91.99	95.19	92.28
23	C2 TO C3	85.59	90.76	86.73	86.80	91.62	87.58 j
24	C1 TO C2	86.80	91.62	87.58	88.18	91.43	88.86 j
25	Z1 TO Z4	85.94	91.09	86.32	88.54	91.54	88.91 j
26	X1 TO X2	84.96	88.31	86.31	85.21	88.71	86.39
27	8B TO 8	83.88	87.99	84.23	84.37	87.50	84.78
28	B2 TO B3	82.91	89.48	83.93	83.08	88.90	83.96 j
29	B1 TO B2	83.08	88.90	83.96	83.60	87.10	84.32 j
30	A8A TO A8B	82.37	87.50	84.78	82.92	85.28	84.79
31	TRENCH DRAIN TO A8A	82.92	85.28	84.80	83.00	85.21	84.80
32	A3 TO A4	76.92	86.10	82.01	77.36	86.60	82.03
33	A2 TO A3	77.36	86.60	82.06	77.57	86.57	82.07
34	A1 TO A2	77.57	86.57	82.10	77.72	84.17	82.10
35	h2 to a1	82.28	84.17	82.42	82.64	87.00	82.80
36	h1 to h2	82.65	87.00	82.80	83.34	85.55	83.48 j
37	A6A TO 6A	82.15	88.41	82.35	82.40	85.90	82.64
38	F2 TO A5	81.17	86.07	81.77	81.30	87.03	82.01
39	F1 TO F2	81.30	87.03	82.01	81.92	86.75	82.24
40	ROOF TO F2	81.30	87.03	82.13	81.43	87.50	82.33
41	E3 TO A10	79.18	83.67	79.84	79.52	84.17	80.16 j
42	OCS TO E-3	80.85	84.17	81.32	81.00	84.50	81.59
43	X5 TO X6	80.23	84.46	80.88	80.54	83.54	81.19
44	e1 to e2	79.52	84.17	80.16	80.47	84.90	80.71 j
45	X8 TO EX1	69.59	73.92	70.64	71.67	78.32	72.81
46	X6 TO X8	71.77	78.32	72.81	72.47	80.80	73.46 j
47	D5 TO X6	77.12	80.80	77.51	77.54	82.13	78.03
48	D4 TO D5	78.62	82.13	78.93	79.73	84.97	80.09
49	d3 to d4	81.80	84.97	82.10	81.84	84.93	82.20

Line No.	Line ID	Invert Dn	Grnd/ Rim Elev Dn	HGL Dn	Invert Up	Grnd/ Rim Elev Up	HGL Up
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
50	D2 TO D3	81.84	84.93	82.20	82.15	84.97	82.51
51	D1 TO D2	82.15	84.97	82.51	82.47	85.44	82.83
52	X7 TO X6	76.92	80.80	77.33	77.57	81.90	78.09
53	L2 TO A13	75.88	78.32	76.62	76.30	79.55	77.13
54	L1 TO L2	76.70	79.55	77.13	77.70	81.25	78.20
55	Pipe (57)	80.62	83.97	81.22	82.02	85.03	82.67
56	TO X6	82.02	85.42	82.67	82.07	86.00	82.52
57	Pipe (56)	82.02	85.42	82.67	82.26	86.00	82.71 j
58	r2 to fes	81.00	82.65	81.74	81.22	85.89	81.98
59	r1 to r2	81.36	85.89	82.08	81.60	85.38	82.36
	Notes: j-Line contains hyd. jump						

FRENCH & PARRELLO ASSOCIATES

TELEPHONE : (732) 312-9800
FAX : (732) 312-9801

1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

PROJECT NUMBER :	06C028T.003		
PROJECT NAME :	Penn Medicine Cancer and Imaging Center		
CALCULATED BY :	KAN	DATE:	7/18/2024
CHECKED BY :		DATE:	
REVISED BY :		DATE:	

CONDUIT OUTLET PROTECTION WORKSHEET

STRUCTURE NUMBER	Q25 (CFS)	Do (INCH)	q=Q/Do	TW OR 0.2 D0 (Ft)*	FOR Y = 1/2 Do	FOR Y = Do	U S E : Y = 1/2 Do					
					D50=(0.0125/Tw) * q^1.33	D50=(0.0082/Tw) * q^1.33	Y, In.	d50, IN.	THICKNESS		L, FT.	W, FT.
A1 SCOUR HOLE	3.47	18	2.31	0.30	1.5	1.0	9.0	2.0	4.0	With Filter Fabric	9.00	7.50

Calculated 2" d50 minimum, 3-4" Delaware River Rock to be used.

	FOR Y=0.5*Do	FOR Y=Do	D= 3 * d50 WITHOUT FILTER FABRIC D= 2 * d50 WITH FILTER FABRIC	
	d50=(0.0125/Tw) * q^1.33	d50=(0.0082/Tw) * q^1.33		

Appendix D

Delaware and Raritan Canal Commission

NJDEP Nonstructural Strategies Points System (NSPS)

Version: January 31, 2006

Note: Input Values in Yellow Cells Only

Project:	Cancer Center and Imaging Center
Date:	July 8, 2024
User:	FPA
Notes:	

Step 1 - Provide Basic Major Development Site Information

A. Specify Total Area in Acres of Development Site Described in Steps 2 and 3 = 4.7 **Acres**

B. Specify by Percent the Various Planning Areas Located within the Development Site:

State Plan Planning Area:	PA-1	PA-2	PA-3	PA-4	PA-4B	PA-5	Total % Area
Percent of Each Planning Area within Site:		100.0%					100.0%

Note: See User's Guide for Equivalent Zones within Designated Centers and the NJ Meadowlands, Pinelands, and Highlands Districts

Step 2 - Describe Existing or Pre-Developed Site Conditions

A. Specify Existing Land Use/Land Cover Descriptions and Areas:

Site Segment	Land Use/Land Cover Description	Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover Subtotals	Points
		HSG A	HSG B	HSG C	HSG D		
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space		1.0	0.4		1.4	90
3	Brush and Shrub					0.0	0
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0
7	Woods - Indigenous					0.0	0
8	Woods - Planted					0.0	0
9	Woods and Grass Combination					0.0	0
10	Ponds, Lakes, and Other Open Water					0.0	0
11	Gravel and Dirt					0.0	0
12	Porous and Permeable Paving					0.0	0
13	Directly Connected Impervious		2.3	1.1		3.3	0
14	Unconnected Impervious with Small D/S Pervious					0.0	0
15	Unconnected Impervious with Large D/S Pervious					0.0	0
	HSG Subtotals (Acres):	0.0	3.3	1.5	0.0	**Total Area:**	4.7
	HSG Subtotals (%):	0.0%	69.1%	30.9%	0.0%	**Total % Area:**	100.0%

Points Subtotal: **90**

Total Existing Site Points: **90**

Step 3 - Describe Proposed or Post-Developed Site Conditions

A. Specify Proposed Land Use/Land Cover Descriptions and Areas:

Site Segment	Land Use/Land Cover Description	Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover Subtotals	Points
		HSG A	HSG B	HSG C	HSG D		
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space		0.8	0.6		1.4	83
3	Brush and Shrub			0.1		0.1	3
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0
7	Woods - Indigenous					0.0	0
8	Woods - Planted					0.0	0
9	Woods and Grass Combination					0.0	0
10	Ponds, Lakes, and Other Open Water					0.0	0
11	Gravel and Dirt					0.0	0
12	Porous and Permeable Paving					0.0	0
13	Directly Connected Impervious		2.5	0.9		3.3	0
14	Unconnected Impervious with Small D/S Pervious					0.0	0
15	Unconnected Impervious with Large D/S Pervious					0.0	0
	HSG Subtotals (Acres):	0.0	3.3	1.5	0.0	**Total Area:**	4.7
	HSG Subtotals (%):	0.0%	69.1%	30.9%	0.0%	**Total % Area:**	100.0%

Points Subtotal: **86**

B. Compare Proposed Impervious Coverage with Maximum Allowable Impervious Coverage:

Total Directly Connected Impervious Coverage =	70%	% of Site
Total Unconnected Impervious Coverage with Small D/S Pervious =	0%	% of Site
Total Unconnected Impervious Coverage with Large D/S Pervious =	0%	% of Site
Total Site Impervious Coverage =	70%	% of Site
Effective Site Impervious Coverage =	70%	% of Site
Specify Source of Maximum Allowable Impervious Coverage:	None	(None or Table)

Points Subtotal: 0

C. Compare Proposed Site Disturbance with Maximum Allowable Site Disturbance:

Total Proposed Site Disturbance =	100%	% of Site
Maximum Allowable Site Disturbance by Municipal Ordinance =	100%	% of Site

Points Subtotal: 0

D. Describe Proposed Runoff Conveyance System:

Total Length of Runoff Conveyance System =		Feet
Length of Vegetated Runoff Conveyance System =		Feet
% of Total Runoff Conveyance System That is Vegetated =	0%	

Points Subtotal: 0

E. Residential Lot Clustering:

Percent of Total Site Area that will be Clustered =		% of Site
Minimum Standard Lot Size as Per Zoning (Note: 1/2 Acre or Greater) =		Acres
Maximum Proposed Cluster Lot Size (Note:1/4 Acre or Less) =		Acres
Percent of Clustered Portion of Site to be Preserved as Vegetated Open Space =		% of Clustered Site Portion

Points Subtotal: 0

F. Will the Following be Utilized to Minimize Soil Compaction?

Proposed Lawn Areas will be Graded with Lightweight Construction Equipment:	No	(Yes or No)
Percent of Proposed Lawn Areas to be Graded with Such Equipment:	0%	% of Lawn Areas

Points Subtotal: 0

G. Are Any of the Following Stormwater Management Standards Met Using Only Nonstructural Strategies and Measures?

Groundwater Recharge Standards (NJAC 7:8-5.4-a-2):	No	(Yes or No)
Stormwater Runoff Quality Standards (NJAC 7:8-5.5):	No	(Yes or No)
Stormwater Runoff Quantity Standards (NJAC 7:8-5.4-a-3):	No	(Yes or No)

Points Subtotal: 0

Note: If the Answers to All Three Questions at G Above are "Yes", Adequate Nonstructural Measures have been Utilized

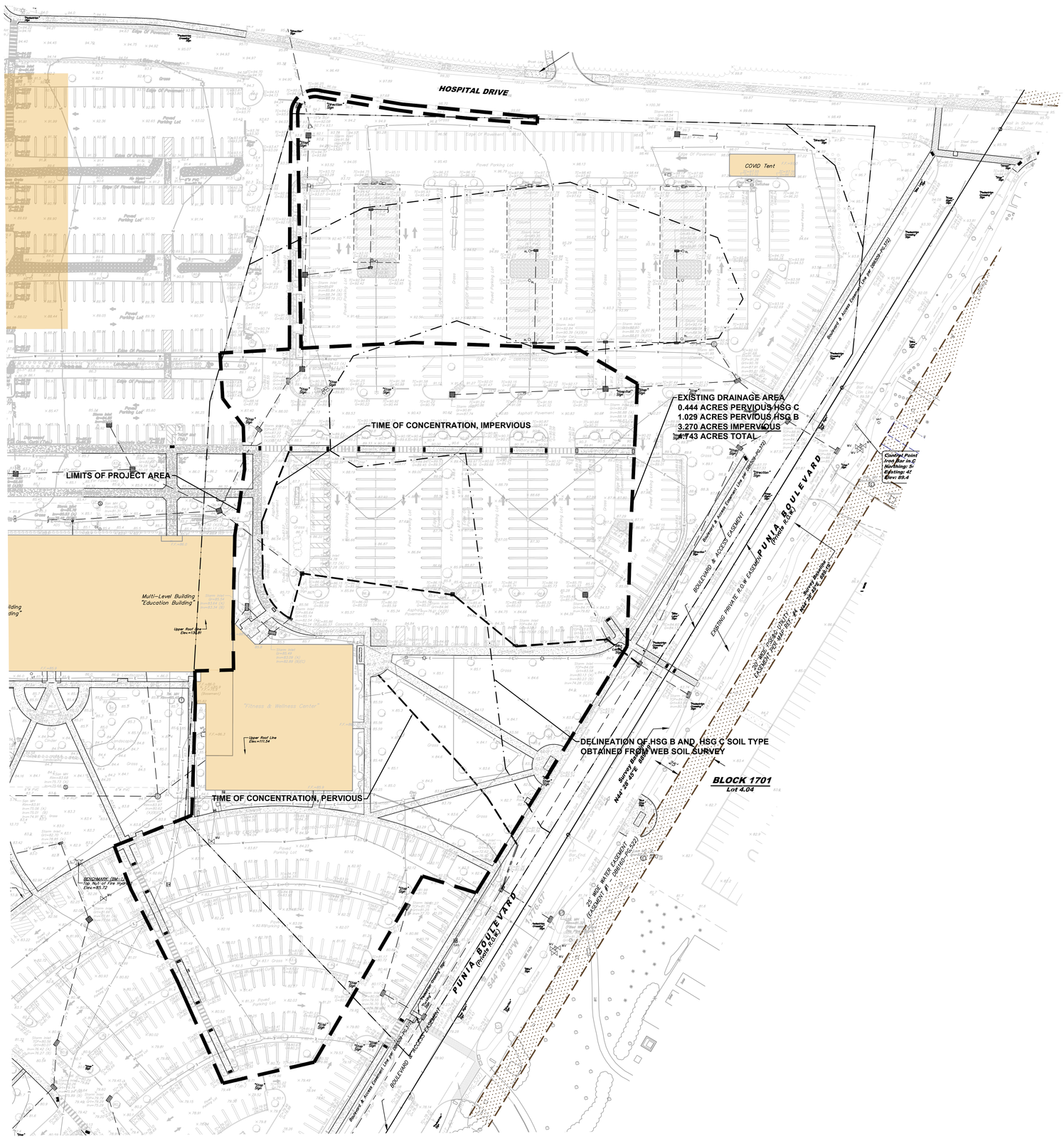
Total Proposed Site Points: 86

Ratio of Proposed to Existing Site Points: 96%

Required Site Points Ratio: 88%

Nonstructural Point System Results: Proposed Nonstructural Measures are Adequate

Appendix E
Drainage Area Maps



NOTES:
LIMITS OF DRAINAGE AREA ANALYZED (4.7 AC) WERE USED FOR DRCC SPREADSHEET CALCULATIONS

40 0 40 80
SCALE : 1" = 40'

OWNER

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ANDREW L. FRENCH, P.E.
PROFESSIONAL ENGINEER, N.J. LIC. No. 42894

STAMP

ISSUANCES

NO.	DATE	DESCRIPTION

KEY PLAN

PROJECT INFORMATION

PENN MEDICINE PRINCETON HEALTH CCIC

1 Plainsboro Road
Plainsboro, NJ 08536
JOB NO: 5267.003

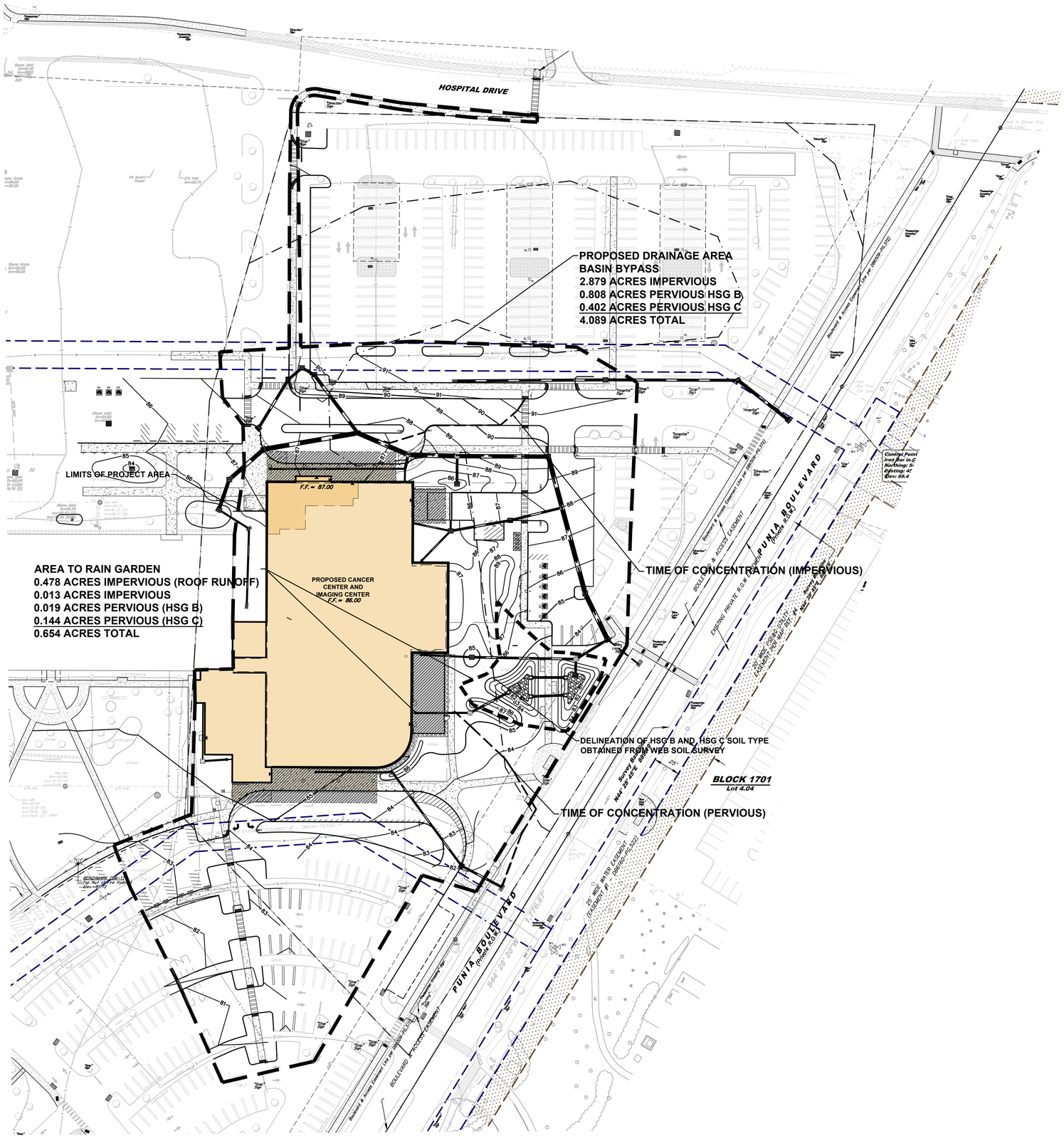
DRAWING INFORMATION

EXISTING DRAINAGE AREA MAP

07/31/2024 PACKAGE 0

C. SHEPLEY BULFINCH

PENN MEDICINE PRINCETON HEALTH CANCER CENTER
G:\CE\2006\0602287 – Cancer Center\0602287.003 – Penn Medical Cancer Center\CAD\DWG\0602287 – Cancer Center V2\0602287.003 – DA CC.dwg Existing



NOTES:
LIMITS OF DRAINAGE AREA ANALYZED (4.7 AC) WERE USED FOR DRCC SPREADSHEET CALCULATIONS

40 0 40 80
SCALE : 1" = 40'

C: SHEPLEY BULFINCH

PENN MEDICINE PRINCETON HEALTH CANCER CENTER
G:\CE\2008\V8602281 – Cancer Center\V8602281.003 – Penn Medical Cancer Center\CADD\DWG\V8602281 – Cancer Center V21V8602281.003 – DA CC.dwg Proposed

THE ORIGINAL OF THIS DRAWING IS 36" X 48". IF THIS COPY IS ANY OTHER SIZE, IT HAS EITHER BEEN REDUCED OR ENLARGED. TAKE APPROPRIATE PRECAUTIONS ACCORDINGLY.

OWNER

Princeton Forward

Penn Medicine
Princeton Health

1 Plainsboro Road
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New Jersey ▲ New York ▲ Pennsylvania ▲ Georgia

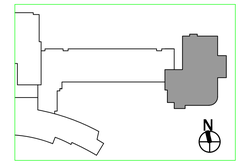
ANDREW L. FRENCH, P.E.
PROFESSIONAL ENGINEER, N.J. LIC. No. 42894

STAMP

ISSUANCES

NO.	DATE	DESCRIPTION

KEY PLAN



PROJECT INFORMATION

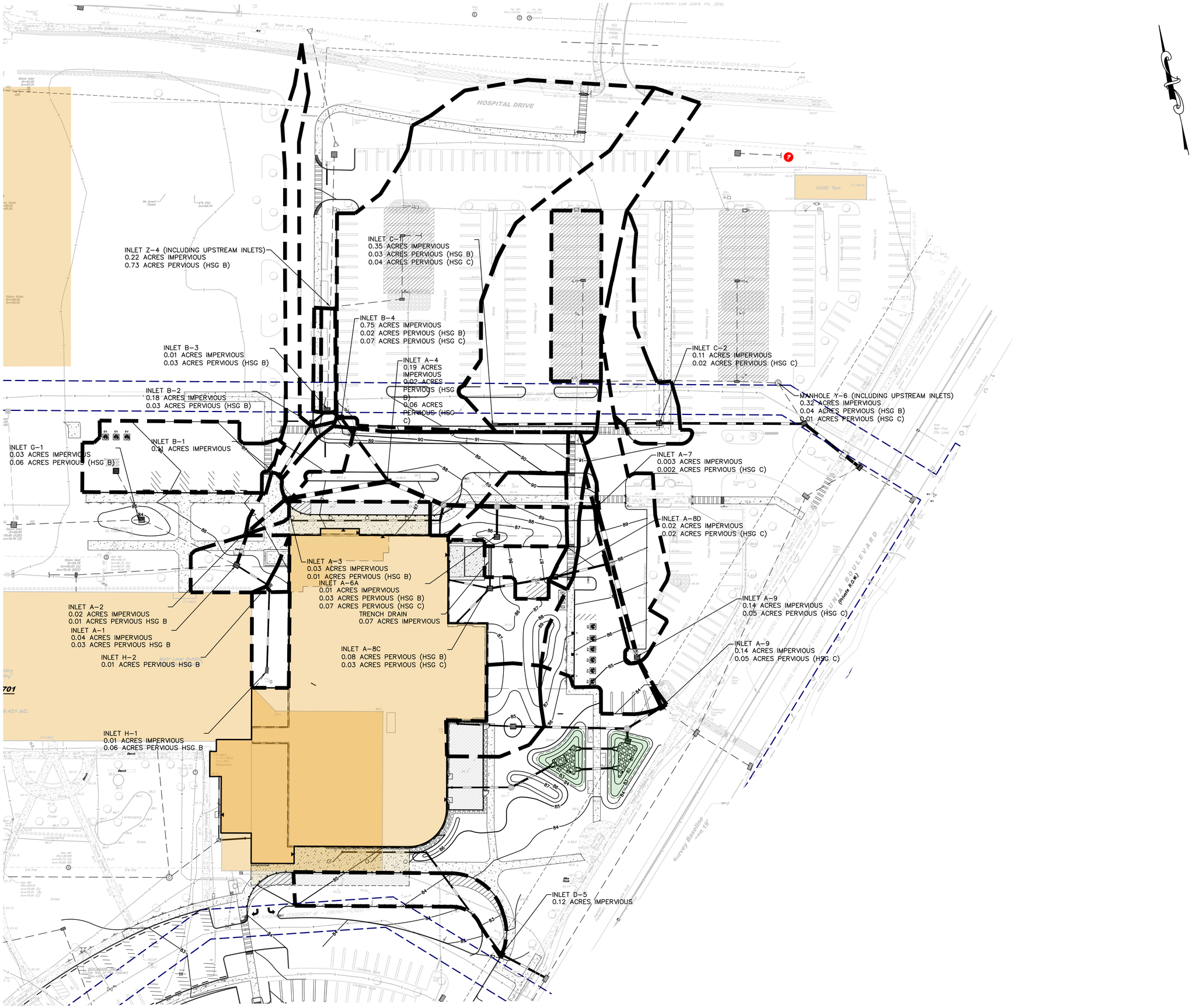
PENN MEDICINE PRINCETON HEALTH CCIC

1 Plainsboro Road
Plainsboro, NJ 08536
JOB NO: 5267.003

DRAWING INFORMATION

PROPOSED DRAINAGE AREA MAP

07/31/2024 PACKAGE 0



30 0 30 60

SCALE : 1" = 30'

PENN MEDICINE PRINCETON HEALTH CANCER CENTER
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C. SHEPLEY BULFINCH

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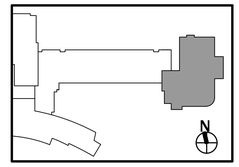

PROJECT INFORMATION

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DRAWING INFORMATION

INLET DRAINAGE AREA MAP

07/31/2024 PACKAGE 0
08/02/2024 PACKAGE 1