Stormwater Impact Analysis

Scooter's Rolesville
306 South Main St.

Rolesville, North Carolina
KHA Project ID No. 016485000

Prepared for:
S&S Java Enterprises
Submitted: February 2024
Revised: August 2024

STORMWATER IMPACT ANALYSIS

SCOOTER'S ROLESVILLE
306 SOUTH MAIN STREET
ROLESVILLE, NORTH CAROLINA 27571

PREPARED FOR:

S&S JAVA ENTERPRISES
13 LAFOY DRIVE
CLAYTON, NORTH CAROLINA 27527

PREPARED BY:

KIMLEY-HORN AND ASSOCIATES, INC.
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RALEIGH, NORTH CAROLINA 27601
NC CERT. OF AUTH: F-0102

KHA #016485000

Disclosure Statement:

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

TABLE OF CONTENTS

OVERVIEW

This report contains the approach and results of a stormwater impact analysis conducted for the proposed Scooter's Rolesville project. The project site consists of the parcel located at 306 South Main Street in Rolesville, North Carolina. The parcel is currently vacant. The stormwater study area encompasses approximately 0.70 acres.

From the NRCS Soil Survey, the near surface soils are classified as 100% Urban Land. Ground cover was assumed to be in good condition for both the pre- and post-development calculations.

The property is not within a defined floodplain area and is not identified under a special flood hazard per FEMA FIRM presented within Appendix A. Per the USGS Quadrangle Map (Appendix B) there is not a "blue line" stream present. There are no streams and wetlands onsite.

Proposed Development

This project proposes the development of a coffee shop and associated infrastructure. The proposed development increases the existing impervious coverage in the study area from 0.00 acres to 0.43 acres. Due to the increase in impervious area, detention and water quality treatment are required.

Stormwater Analysis

Stormwater management measures shall be designed in accordance with the Town of Rolesville, Wake County, and NCDEQ Stormwater Guidelines. Per the Town of Rolesville stormwater quantity requirements, the post-development stormwater runoff rate leaving the site shall not exceed pre-development conditions for the local 1-year, 24-hour storm events.

Per the Town of Rolesville stormwater quality requirements, all development projects required to manage storm water shall provide permanent on-site BMPs to lower the nitrogen export amounts. The code further states the measures shall control and treat runoff from the first inch of rain with a runoff volume drawdown time between 48 and 120 hours.

Water Quantity

A single point of analysis (POA-1) encompasses the impacted site area. The flow rate at the point of analysis was evaluated using the SCS Method. The calculations for POA-1 indicate that the post-development peak runoff rates will exceed pre-development rates for the 1-year 24-hour storm event, therefore detention is required. The time of concentration was assumed to be 5 minutes for the pre-development condition due to the small site area. Post-development areas were assumed to have a time of concentration of 5 minutes. See below for flow summary to POA-1.

Pre-Development 1 year flow- 1.27 cfs Post Development 1 year flow- 1.20 cfs

Pre-Development 10 year flow- 3.20 cfs Post Development 10 year flow- 3.78 cfs

Pre-Development 25 year flow – 4.10 cfs Post Development 25 year flow- 4.61 cfs

Pre-Development 100-year flow- 5.59 cfs Post Development 100 year flow- 5.91 cfs

Downstream Impact Analysis

Per the Town of Rolesville LDO, a downstream impact analysis was performed for the 1-year 24-hour and 10-year storm events. The pre- and post-development peak flow rates calculated were substantially similar and therefore in compliance with Town of Rolesville requirements. Refer to Appendix I for downstream impact analysis calculations.

Pre-Development 10 year flow- 142.75 cfs Post Development 10 year flow- 144.26 cfs

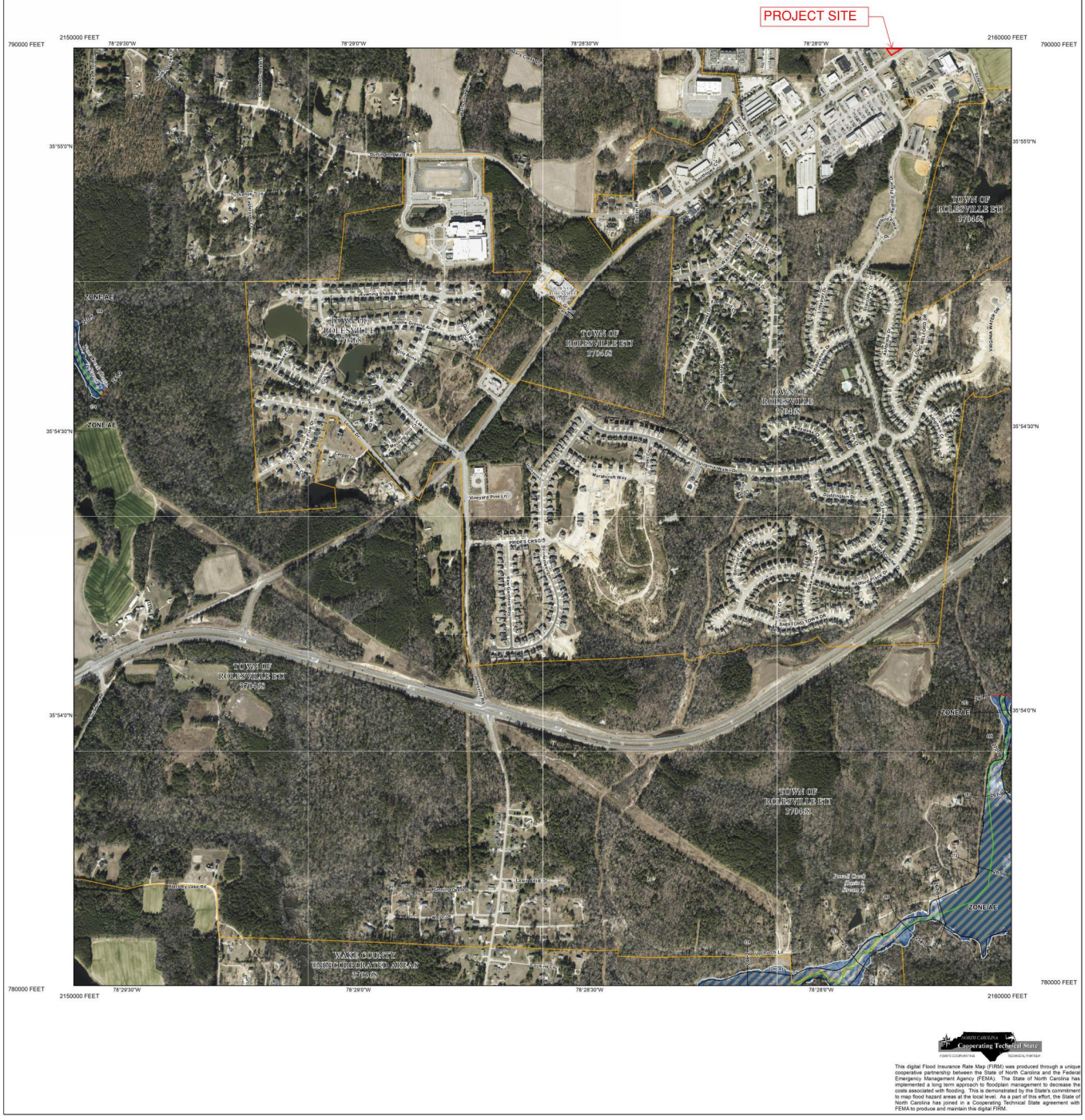
Water Quality

The one (1) proposed wet detention basin will be used as a water quality BMP, treating the 1-inch storm. The proposed BMP is in accordance with the NCDEQ Design Manual. Refer to Appendix E for stormwater quality calculations.

Conclusion

The calculations indicate that the proposed development will comply with local and state stormwater requirements. To meet Town of Rolesville stormwater quantity requirements, this site will incorporate one wet pond for detention. The proposed wet pond will also be utilized as a water quality BMP. Water quality regulation measures are required based on the increase in impervious area to the proposed development.

APPENDIX A



This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://FRIS.NC.GOV/FRIS

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS

- Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall
- 012 — 18.2 — Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

OTHER FEATURES

- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at https://msc.fema.gov. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at https://flood.nc.gov/ncflood, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Flood Insurance Study (FIS) means an examination, evaluation, and determination of flood hazards, corresponding water surface elevations, flood hazard risk zones, and other flood data in a community issued by the North Carolina Floodplain Mapping Program (NCFMP). The Flood Insurance Study (FIS) is comprised of the following products used together: the Digital Flood Hazard Database, the Water Surface Elevation Rasters, the digitally derived, autogenerated Flood Insurance Rate Map and the Flood Insurance Survey Report. A Flood Insurance Survey is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. This report contains detailed flood elevation data, data tables and FIRM indices. When a flood study is completed for the NFIP, the digital information, reports and maps are assembled into an FIS. Information shown on this FIRM is provided in digital format by the NCFMP. Base map information shown on this FIRM was provided in digital format by the NCFMP. The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at https://www.fema.gov/national-flood-insurance-program.

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LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LiMWA)

SCALE

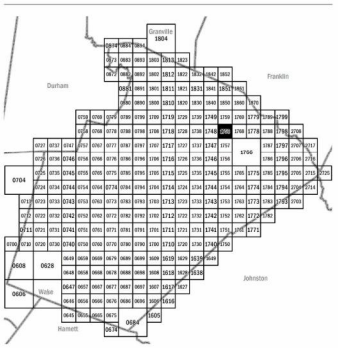
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1758

FEMA

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
ROLESVILLE, TOWN OF	370468	1758	K
WAKE COUNTY	370368	1758	K

VERSION NUMBER
2.3.3.2

MAP NUMBER
3720175800K

MAP REVISED
July 19, 2022

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Limit of Moderate Wave Action (LiMWA)

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Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

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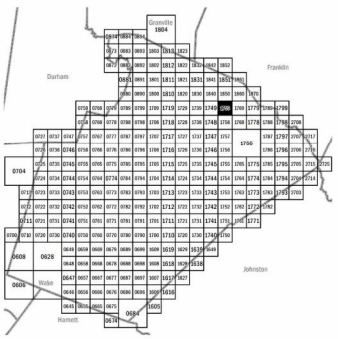
0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1759

FEMA

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
ROLESVILLE, TOWN OF	370468	1759	K
WAKE COUNTY	370368	1759	K
WAKE FOREST, TOWN OF	370244	1759	K

VERSION NUMBER
2.3.3.2

MAP NUMBER
3720175900K

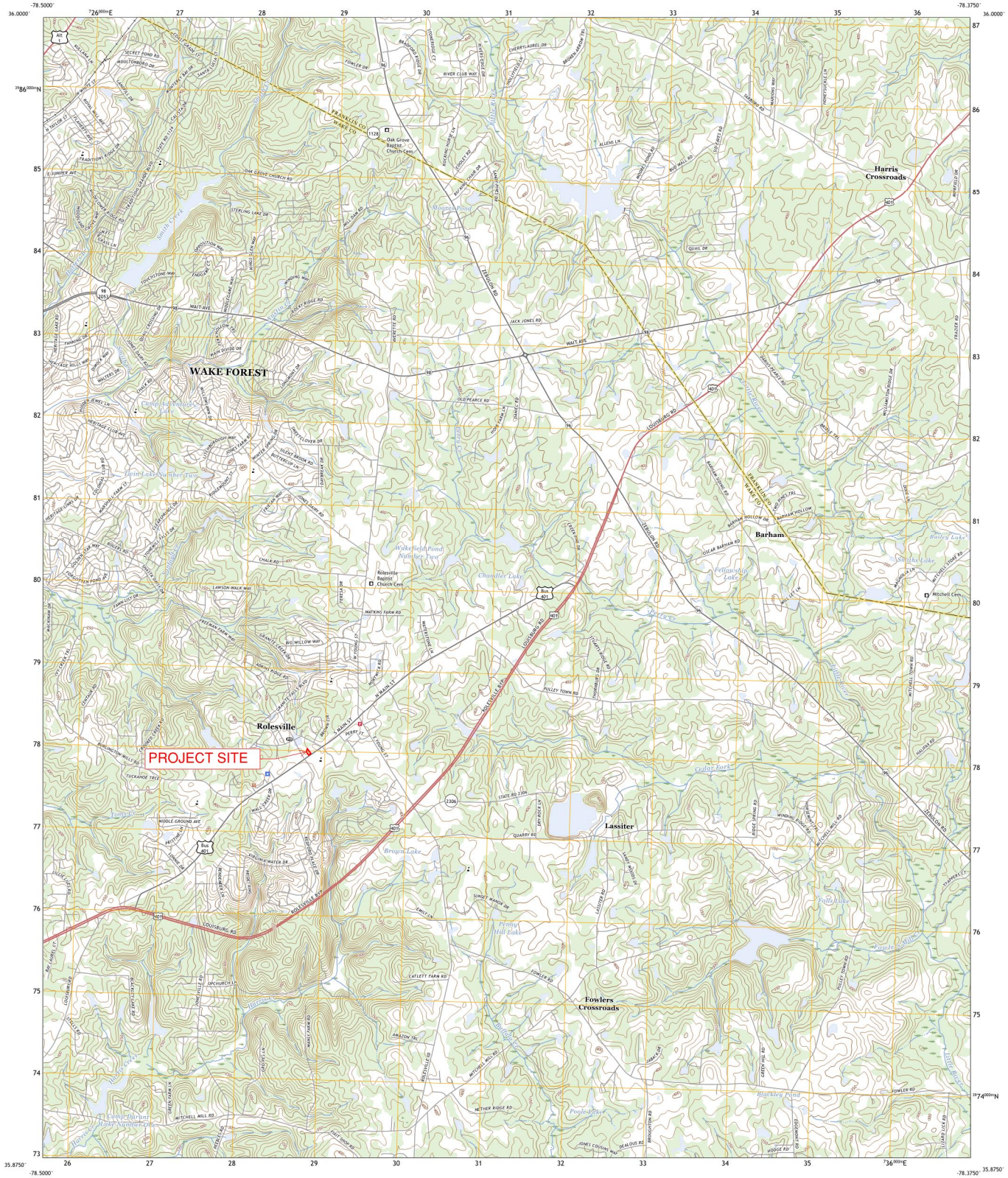
MAP REVISED
July 19, 2022

APPENDIX B

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

ROLESVILLE QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 17S
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAIP, July 2020 - July 2020
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1980 - 2022
Hydrography.....National Hydrography Dataset, 2001 - 2021
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

UTM GRID AND 2019 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
QV
Grid Zone Designation
17S

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard.

NORTH CAROLINA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Grissom
2 Franklinton
3 Louisburg
4 Wake Forest
5 Bunn West
6 Raleigh East
7 Knightdale
8 Zebulon

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ROLESVILLE, NC
2022

NSN
NGA REF NO. USGS24K8145

APPENDIX C

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 22

22

N

Scale 1:15840

1 Mile

5000 Feet

PROJECT SITE

Walkers Crossroads

Rolesville

Rolesville Church

(Joins sheet 15)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 31)

Map Scale: 1:528 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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: Wake County, North Carolina
Survey Area Data: Version 25, Oct 2, 2023

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

Date(s) aerial images were photographed: Apr 24, 2022—May 9, 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.

Map Unit Legend

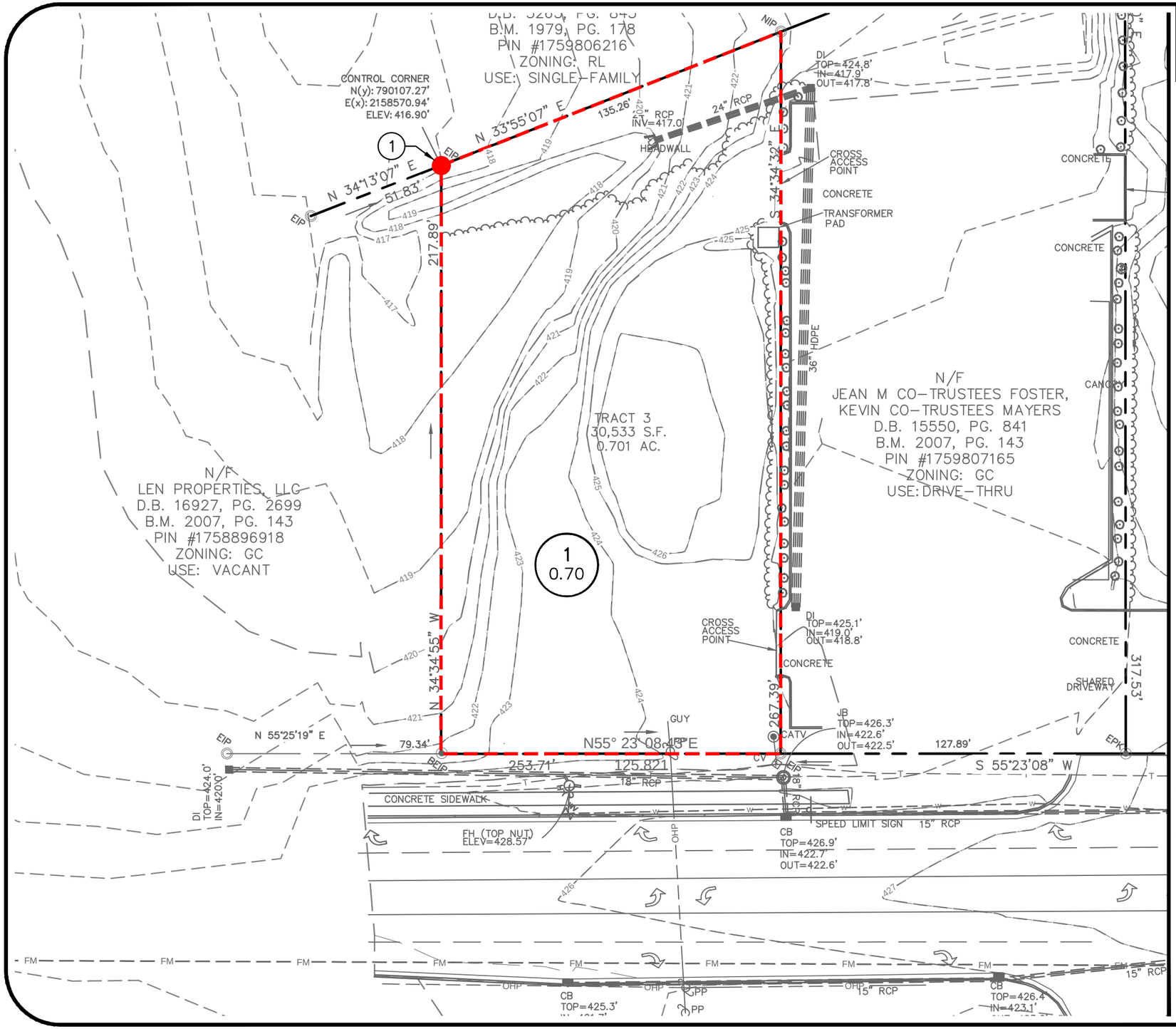
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ur	Urban land	0.7	100.0%
Totals for Area of Interest		**0.7**	**100.0%**

APPENDIX D

SCOOTERS ROLESVILLE

DRAINAGE AREA TABLE					
DRAINAGE AREA	PERVIOUS (AC)	IMPERVIOUS (AC)	TOTAL (AC)	T_c (MIN)	OUTFALL NOTES
1	0.70	0.00	0.70	5.0	–
TOTAL	0.70	0.00	0.70		

NOTES
1. ASSUMED MINIMUM TIME OF CONCENTRATION = 5 MINUTES



GRAPHIC SCALE IN FEET
0 20 40 80

LEGEND

- DRAINAGE AREA OUTLINE
- PROPERTY LINE
- 3 — POINT OF ANALYSIS
- X AC — SUBAREA ID, SUBAREA SIZE

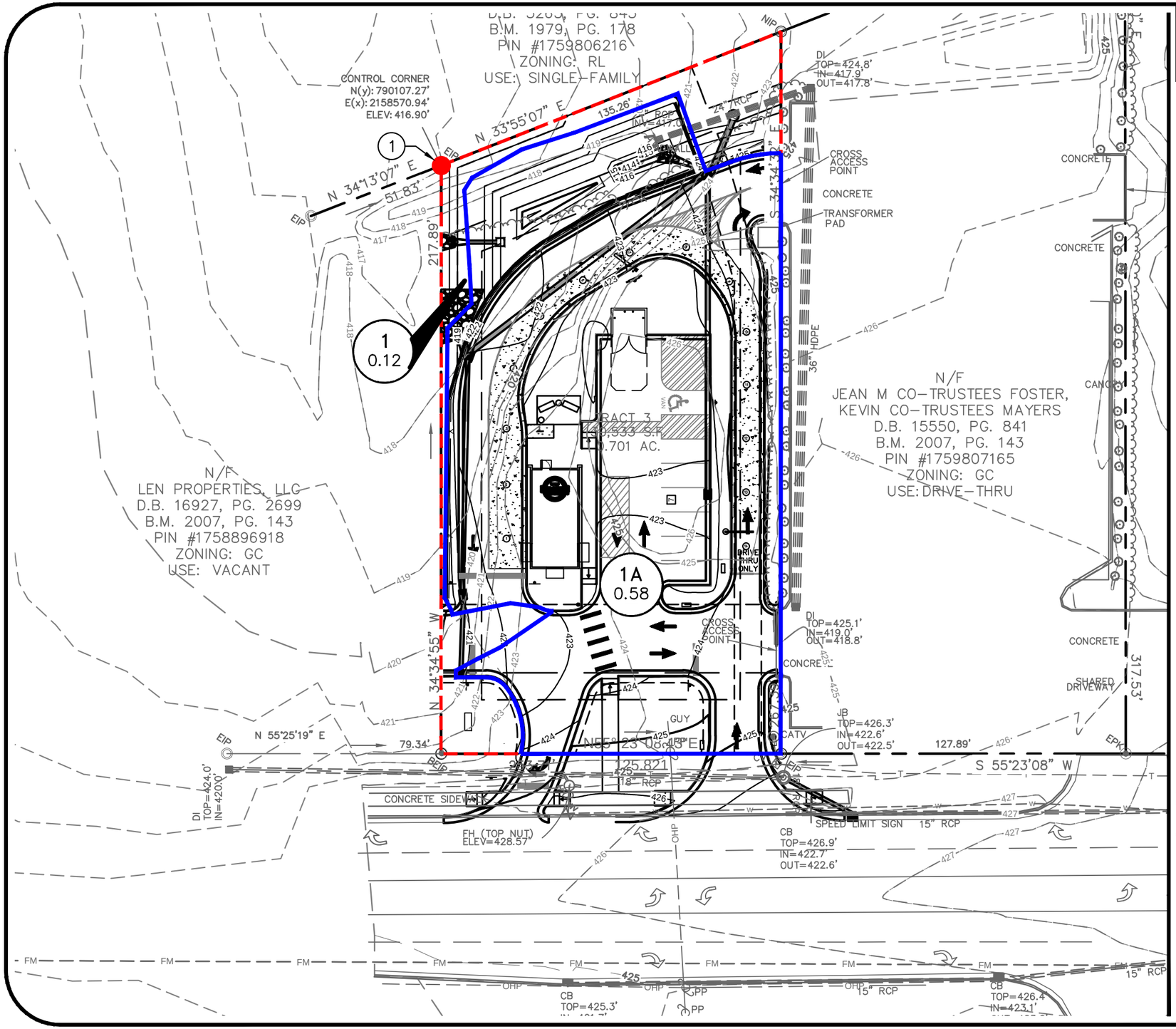
PRE-DEVELOPMENT DRAINAGE AREA MAP

KHA PROJECT NO: 016485000

DATE: 02/26/2024

421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
PHONE: 919-677-2000 FAX: 919-677-2050
WWW.KIMLEY-HORN.COM

SCOOTERS ROLESVILLE



DRAINAGE AREA TABLE					
DRAINAGE AREA	PERVIOUS (AC)	IMPERVIOUS (AC)	TOTAL (AC)	T_c (MIN)	OUTFALL NOTES
1	0.10	0.02	0.12	5.0	–
1A	0.17	0.41	0.58	5.0	
TOTAL	0.27	0.43	0.70		

NOTES
1. ASSUMED MINIMUM TIME OF CONCENTRATION = 5 MINUTES

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

LEGEND

- DRAINAGE AREA OUTLINE
- PROPERTY LINE
- 3 — POINT OF ANALYSIS
- X / AC — SUBAREA ID / SUBAREA SIZE

POST-DEVELOPMENT DRAINAGE AREA MAP

KHA PROJECT NO: 016485000

DATE: 02/26/2024

Kimley»Horn

421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
PHONE: 919-677-2000 FAX: 919-677-2050
WWW.KIMLEY-HORN.COM

APPENDIX E

Table of Contents

Table of Contents

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE-POA 1 DA	1-year 24-hour	1	0.070	11.950	1.27
PRE-POA 1 DA	10 Year	10	0.176	11.900	3.20
PRE-POA 1 DA	25 Year	25	0.226	11.900	4.10
PRE-POA 1 DA	100 Year	100	0.310	11.900	5.59
POST-POA 1 BYPASS DA	1-year 24-hour	1	0.013	11.950	0.24
POST-POA 1 BYPASS DA	10 Year	10	0.032	11.900	0.58
POST-POA 1 BYPASS DA	25 Year	25	0.041	11.900	0.74
POST-POA 1 BYPASS DA	100 Year	100	0.056	11.900	0.99
POST-POA 1 DA	1-year 24-hour	1	0.102	11.900	1.83
POST-POA 1 DA	10 Year	10	0.205	11.900	3.53
POST-POA 1 DA	25 Year	25	0.250	11.900	4.27
POST-POA 1 DA	100 Year	100	0.325	11.900	5.47

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE- POA 1	1-year 24-hour	1	0.070	11.950	1.27
PRE- POA 1	10 Year	10	0.176	11.900	3.20
PRE- POA 1	25 Year	25	0.226	11.900	4.10
PRE- POA 1	100 Year	100	0.310	11.900	5.59
POST-POA 1	1-year 24-hour	1	0.078	12.050	1.20
POST-POA 1	10 Year	10	0.199	11.950	3.78
POST-POA 1	25 Year	25	0.253	11.950	4.61
POST-POA 1	100 Year	100	0.342	11.950	5.91

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
WET POND (IN)	1-year 24-hour	1	0.102	11.900	1.83	(N/A)	(N/A)
WET POND (OUT)	1-year 24-hour	1	0.064	12.050	1.05	418.16	0.048
WET POND (IN)	10 Year	10	0.205	11.900	3.53	(N/A)	(N/A)
WET POND (OUT)	10 Year	10	0.166	11.950	3.22	418.36	0.057

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
WET POND (IN)	25 Year	25	0.250	11.900	4.27	(N/A)	(N/A)
WET POND (OUT)	25 Year	25	0.212	11.950	3.90	418.41	0.060
WET POND (IN)	100 Year	100	0.325	11.900	5.47	(N/A)	(N/A)
WET POND (OUT)	100 Year	100	0.287	11.950	4.96	418.51	0.064

Time-Depth Curve: 10 Year	
Label	10 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.6	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.7	0.8	0.8	0.8	0.8
9.500	0.8	0.8	0.9	0.9	0.9
10.000	0.9	0.9	1.0	1.0	1.0
10.500	1.0	1.1	1.1	1.1	1.1
11.000	1.2	1.2	1.3	1.3	1.4
11.500	1.4	1.5	1.8	2.2	2.9
12.000	3.3	3.4	3.5	3.6	3.7
12.500	3.7	3.7	3.8	3.8	3.9
13.000	3.9	3.9	3.9	4.0	4.0
13.500	4.0	4.1	4.1	4.1	4.1
14.000	4.1	4.2	4.2	4.2	4.2
14.500	4.2	4.2	4.3	4.3	4.3
15.000	4.3	4.3	4.3	4.3	4.4
15.500	4.4	4.4	4.4	4.4	4.4
16.000	4.4	4.4	4.5	4.5	4.5
16.500	4.5	4.5	4.5	4.5	4.5
17.000	4.5	4.6	4.6	4.6	4.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	4.6	4.6	4.6	4.6	4.6
18.000	4.6	4.7	4.7	4.7	4.7
18.500	4.7	4.7	4.7	4.7	4.7
19.000	4.7	4.7	4.7	4.7	4.8
19.500	4.8	4.8	4.8	4.8	4.8
20.000	4.8	4.8	4.8	4.8	4.8
20.500	4.8	4.8	4.8	4.8	4.9
21.000	4.9	4.9	4.9	4.9	4.9
21.500	4.9	4.9	4.9	4.9	4.9
22.000	4.9	4.9	4.9	4.9	4.9
22.500	5.0	5.0	5.0	5.0	5.0
23.000	5.0	5.0	5.0	5.0	5.0
23.500	5.0	5.0	5.0	5.0	5.0
24.000	5.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time-Depth Curve: 100 Year	
Label	100 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.5	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.6	0.6	0.7
6.500	0.7	0.7	0.7	0.7	0.7
7.000	0.7	0.8	0.8	0.8	0.8
7.500	0.8	0.8	0.9	0.9	0.9
8.000	0.9	0.9	0.9	1.0	1.0
8.500	1.0	1.0	1.0	1.1	1.1
9.000	1.1	1.1	1.2	1.2	1.2
9.500	1.2	1.3	1.3	1.3	1.3
10.000	1.4	1.4	1.4	1.5	1.5
10.500	1.5	1.6	1.6	1.7	1.7
11.000	1.8	1.8	1.9	2.0	2.1
11.500	2.1	2.3	2.7	3.3	4.3
12.000	5.0	5.2	5.3	5.4	5.5
12.500	5.6	5.6	5.7	5.7	5.8
13.000	5.8	5.9	5.9	6.0	6.0
13.500	6.0	6.1	6.1	6.1	6.2
14.000	6.2	6.2	6.3	6.3	6.3
14.500	6.3	6.4	6.4	6.4	6.4
15.000	6.5	6.5	6.5	6.5	6.5
15.500	6.6	6.6	6.6	6.6	6.6
16.000	6.7	6.7	6.7	6.7	6.7
16.500	6.7	6.8	6.8	6.8	6.8
17.000	6.8	6.8	6.8	6.9	6.9

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	6.9	6.9	6.9	6.9	6.9
18.000	7.0	7.0	7.0	7.0	7.0
18.500	7.0	7.0	7.1	7.1	7.1
19.000	7.1	7.1	7.1	7.1	7.1
19.500	7.1	7.2	7.2	7.2	7.2
20.000	7.2	7.2	7.2	7.2	7.2
20.500	7.2	7.3	7.3	7.3	7.3
21.000	7.3	7.3	7.3	7.3	7.3
21.500	7.3	7.3	7.4	7.4	7.4
22.000	7.4	7.4	7.4	7.4	7.4
22.500	7.4	7.4	7.4	7.5	7.5
23.000	7.5	7.5	7.5	7.5	7.5
23.500	7.5	7.5	7.5	7.5	7.6
24.000	7.6	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time-Depth Curve: 1-year 24- Hour	
Label	1-year 24- Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.6	0.6
10.500	0.6	0.6	0.6	0.6	0.7
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	2.0	2.0	2.0	2.1
12.500	2.1	2.1	2.1	2.2	2.2
13.000	2.2	2.2	2.2	2.3	2.3
13.500	2.3	2.3	2.3	2.3	2.3
14.000	2.3	2.4	2.4	2.4	2.4
14.500	2.4	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.5	2.5	2.5
15.500	2.5	2.5	2.5	2.5	2.5
16.000	2.5	2.5	2.5	2.5	2.5
16.500	2.5	2.6	2.6	2.6	2.6
17.000	2.6	2.6	2.6	2.6	2.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.6	2.6	2.6	2.6	2.7
18.500	2.7	2.7	2.7	2.7	2.7
19.000	2.7	2.7	2.7	2.7	2.7
19.500	2.7	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.7	2.7
20.500	2.7	2.7	2.7	2.8	2.8
21.000	2.8	2.8	2.8	2.8	2.8
21.500	2.8	2.8	2.8	2.8	2.8
22.000	2.8	2.8	2.8	2.8	2.8
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.8	2.8	2.8	2.8
23.500	2.8	2.8	2.9	2.9	2.9
24.000	2.9	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Time-Depth Curve: 25 Year	
Label	25 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.4	0.4	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.5	0.5	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.6	0.6
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.7	0.7	0.7	0.8	0.8
8.500	0.8	0.8	0.8	0.8	0.9
9.000	0.9	0.9	0.9	0.9	1.0
9.500	1.0	1.0	1.0	1.0	1.1
10.000	1.1	1.1	1.1	1.2	1.2
10.500	1.2	1.3	1.3	1.3	1.4
11.000	1.4	1.5	1.5	1.6	1.6
11.500	1.7	1.8	2.1	2.6	3.4
12.000	4.0	4.1	4.2	4.3	4.4
12.500	4.4	4.5	4.5	4.6	4.6
13.000	4.6	4.7	4.7	4.7	4.8
13.500	4.8	4.8	4.8	4.9	4.9
14.000	4.9	4.9	5.0	5.0	5.0
14.500	5.0	5.0	5.1	5.1	5.1
15.000	5.1	5.1	5.2	5.2	5.2
15.500	5.2	5.2	5.2	5.3	5.3
16.000	5.3	5.3	5.3	5.3	5.3
16.500	5.3	5.4	5.4	5.4	5.4
17.000	5.4	5.4	5.4	5.4	5.5

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	5.5	5.5	5.5	5.5	5.5
18.000	5.5	5.5	5.5	5.6	5.6
18.500	5.6	5.6	5.6	5.6	5.6
19.000	5.6	5.6	5.6	5.7	5.7
19.500	5.7	5.7	5.7	5.7	5.7
20.000	5.7	5.7	5.7	5.7	5.7
20.500	5.8	5.8	5.8	5.8	5.8
21.000	5.8	5.8	5.8	5.8	5.8
21.500	5.8	5.8	5.8	5.8	5.9
22.000	5.9	5.9	5.9	5.9	5.9
22.500	5.9	5.9	5.9	5.9	5.9
23.000	5.9	5.9	5.9	6.0	6.0
23.500	6.0	6.0	6.0	6.0	6.0
24.000	6.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time of Concentration Calculations
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Runoff CN-Area
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	871.200	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	4,356.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	5,227.200	(N/A)	(N/A)	83.000

Subsection: Runoff CN-Area
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	17,859.600	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	7,405.200	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	25,264.800	(N/A)	(N/A)	92.724

Subsection: Runoff CN-Area
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	27,486.360	0.0	0.0	80.000
Woods - grass combination - poor - Soil D	86.000	3,005.640	0.0	0.0	86.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	30,492.000	(N/A)	(N/A)	80.591

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,227.200 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	0.25 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.950 hours
Flow (Peak Interpolated Output)	0.24 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	5,227.200 ft²
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	0.013 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.013 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.63 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	25,264.800 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	1.88 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.900 hours
Flow (Peak Interpolated Output)	1.83 ft³/s

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	25,264.800 ft²
Maximum Retention (Pervious)	0.8 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	0.102 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.102 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	7.89 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	30,492.000 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	1.32 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.950 hours
Flow (Peak Interpolated Output)	1.27 ft³/s

Drainage Area	
SCS CN (Composite)	81.000
Area (User Defined)	30,492.000 ft²
Maximum Retention (Pervious)	2.3 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	0.070 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.070 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	9.52 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Time vs. Elevation
Label: WET POND (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	417.00	417.00	417.00	417.00	417.00
0.250	417.00	417.00	417.00	417.00	417.00
0.500	417.00	417.00	417.00	417.00	417.00
0.750	417.00	417.00	417.00	417.00	417.00
1.000	417.00	417.00	417.00	417.00	417.00
1.250	417.00	417.00	417.00	417.00	417.00
1.500	417.00	417.00	417.00	417.00	417.00
1.750	417.00	417.00	417.00	417.00	417.00
2.000	417.00	417.00	417.00	417.00	417.00
2.250	417.00	417.00	417.00	417.00	417.00
2.500	417.00	417.00	417.00	417.00	417.00
2.750	417.00	417.00	417.00	417.00	417.00
3.000	417.00	417.00	417.00	417.00	417.00
3.250	417.00	417.00	417.00	417.00	417.00
3.500	417.00	417.00	417.00	417.00	417.00
3.750	417.00	417.00	417.00	417.00	417.00
4.000	417.00	417.00	417.00	417.00	417.00
4.250	417.00	417.00	417.00	417.00	417.00
4.500	417.00	417.00	417.00	417.00	417.00
4.750	417.00	417.00	417.00	417.00	417.00
5.000	417.00	417.00	417.00	417.00	417.00
5.250	417.00	417.00	417.00	417.00	417.00
5.500	417.00	417.00	417.00	417.01	417.01
5.750	417.01	417.01	417.01	417.01	417.01
6.000	417.01	417.01	417.01	417.01	417.01
6.250	417.01	417.01	417.01	417.01	417.01
6.500	417.02	417.02	417.02	417.02	417.02
6.750	417.02	417.02	417.02	417.02	417.02
7.000	417.02	417.03	417.03	417.03	417.03
7.250	417.03	417.03	417.03	417.03	417.03
7.500	417.04	417.04	417.04	417.04	417.04
7.750	417.04	417.04	417.04	417.05	417.05
8.000	417.05	417.05	417.05	417.05	417.06
8.250	417.06	417.06	417.06	417.06	417.06
8.500	417.07	417.07	417.07	417.07	417.07
8.750	417.08	417.08	417.08	417.08	417.09
9.000	417.09	417.09	417.09	417.10	417.10
9.250	417.10	417.11	417.11	417.11	417.11
9.500	417.12	417.12	417.12	417.12	417.13
9.750	417.13	417.13	417.14	417.14	417.14
10.000	417.15	417.15	417.16	417.16	417.16
10.250	417.17	417.17	417.18	417.18	417.19

Subsection: Time vs. Elevation
Label: WET POND (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.500	417.19	417.20	417.20	417.21	417.21
10.750	417.22	417.23	417.23	417.24	417.25
11.000	417.26	417.26	417.27	417.28	417.29
11.250	417.30	417.31	417.32	417.34	417.35
11.500	417.36	417.38	417.40	417.44	417.49
11.750	417.55	417.64	417.75	417.91	418.05
12.000	418.13	418.16	418.13	418.09	418.06
12.250	418.04	418.02	418.01	418.00	417.99
12.500	417.98	417.98	417.97	417.97	417.97
12.750	417.97	417.97	417.96	417.96	417.96
13.000	417.96	417.96	417.96	417.96	417.96
13.250	417.96	417.96	417.96	417.96	417.96
13.500	417.96	417.96	417.95	417.95	417.95
13.750	417.95	417.95	417.95	417.95	417.95
14.000	417.95	417.95	417.95	417.95	417.95
14.250	417.95	417.95	417.95	417.95	417.95
14.500	417.95	417.95	417.95	417.95	417.95
14.750	417.95	417.95	417.95	417.95	417.95
15.000	417.95	417.95	417.95	417.95	417.95
15.250	417.95	417.95	417.95	417.95	417.95
15.500	417.95	417.95	417.95	417.95	417.95
15.750	417.95	417.95	417.95	417.95	417.95
16.000	417.95	417.95	417.95	417.95	417.95
16.250	417.95	417.95	417.95	417.95	417.95
16.500	417.95	417.95	417.95	417.95	417.95
16.750	417.95	417.95	417.95	417.95	417.95
17.000	417.95	417.95	417.95	417.95	417.95
17.250	417.95	417.95	417.95	417.95	417.95
17.500	417.95	417.95	417.95	417.95	417.95
17.750	417.95	417.95	417.95	417.95	417.94
18.000	417.94	417.94	417.94	417.94	417.94
18.250	417.94	417.94	417.94	417.94	417.94
18.500	417.94	417.94	417.94	417.94	417.94
18.750	417.94	417.94	417.94	417.94	417.94
19.000	417.94	417.94	417.94	417.94	417.94
19.250	417.94	417.94	417.94	417.94	417.94
19.500	417.94	417.94	417.94	417.94	417.94
19.750	417.94	417.94	417.94	417.94	417.94
20.000	417.94	417.94	417.94	417.94	417.94
20.250	417.94	417.94	417.94	417.94	417.94
20.500	417.94	417.94	417.94	417.94	417.94
20.750	417.94	417.94	417.94	417.94	417.94

Subsection: Time vs. Elevation
Label: WET POND (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
21.000	417.94	417.94	417.94	417.94	417.94
21.250	417.94	417.94	417.94	417.94	417.94
21.500	417.94	417.94	417.94	417.94	417.94
21.750	417.94	417.94	417.94	417.94	417.94
22.000	417.94	417.94	417.94	417.94	417.94
22.250	417.94	417.94	417.94	417.94	417.94
22.500	417.94	417.94	417.94	417.94	417.94
22.750	417.94	417.94	417.94	417.94	417.94
23.000	417.94	417.94	417.94	417.94	417.94
23.250	417.94	417.94	417.94	417.94	417.94
23.500	417.94	417.94	417.94	417.94	417.94
23.750	417.94	417.94	417.94	417.94	417.94
24.000	417.94	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: WET POND
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	0.000	0.000	0.000
0.750	0.000	0.000	0.000	0.000	0.000
1.000	0.000	0.000	0.000	0.000	0.000
1.250	0.000	0.000	0.000	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.000	0.000	0.000
4.250	0.000	0.000	0.000	0.000	0.000
4.500	0.000	0.000	0.000	0.000	0.000
4.750	0.000	0.000	0.000	0.000	0.000
5.000	0.000	0.000	0.000	0.000	0.000
5.250	0.000	0.000	0.000	0.000	0.000
5.500	0.000	0.000	0.000	0.000	0.000
5.750	0.000	0.000	0.000	0.000	0.000
6.000	0.000	0.000	0.000	0.000	0.000
6.250	0.000	0.000	0.000	0.001	0.001
6.500	0.001	0.001	0.001	0.001	0.001
6.750	0.001	0.001	0.001	0.001	0.001
7.000	0.001	0.001	0.001	0.001	0.001
7.250	0.001	0.001	0.001	0.001	0.001
7.500	0.001	0.001	0.001	0.001	0.002
7.750	0.002	0.002	0.002	0.002	0.002
8.000	0.002	0.002	0.002	0.002	0.002
8.250	0.002	0.002	0.002	0.002	0.002
8.500	0.002	0.003	0.003	0.003	0.003
8.750	0.003	0.003	0.003	0.003	0.003
9.000	0.003	0.003	0.004	0.004	0.004
9.250	0.004	0.004	0.004	0.004	0.004
9.500	0.004	0.004	0.005	0.005	0.005
9.750	0.005	0.005	0.005	0.005	0.005
10.000	0.006	0.006	0.006	0.006	0.006
10.250	0.006	0.006	0.007	0.007	0.007

Subsection: Time vs. Volume
Label: WET POND
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.007	0.007	0.008	0.008	0.008
10.750	0.008	0.009	0.009	0.009	0.009
11.000	0.010	0.010	0.010	0.011	0.011
11.250	0.011	0.012	0.012	0.013	0.013
11.500	0.014	0.014	0.015	0.017	0.019
11.750	0.021	0.025	0.030	0.036	0.043
12.000	0.046	0.048	0.047	0.045	0.043
12.250	0.042	0.041	0.041	0.040	0.040
12.500	0.040	0.040	0.039	0.039	0.039
12.750	0.039	0.039	0.039	0.039	0.039
13.000	0.039	0.039	0.039	0.039	0.039
13.250	0.039	0.039	0.039	0.039	0.039
13.500	0.039	0.039	0.039	0.039	0.039
13.750	0.039	0.038	0.038	0.038	0.038
14.000	0.038	0.038	0.038	0.038	0.038
14.250	0.038	0.038	0.038	0.038	0.038
14.500	0.038	0.038	0.038	0.038	0.038
14.750	0.038	0.038	0.038	0.038	0.038
15.000	0.038	0.038	0.038	0.038	0.038
15.250	0.038	0.038	0.038	0.038	0.038
15.500	0.038	0.038	0.038	0.038	0.038
15.750	0.038	0.038	0.038	0.038	0.038
16.000	0.038	0.038	0.038	0.038	0.038
16.250	0.038	0.038	0.038	0.038	0.038
16.500	0.038	0.038	0.038	0.038	0.038
16.750	0.038	0.038	0.038	0.038	0.038
17.000	0.038	0.038	0.038	0.038	0.038
17.250	0.038	0.038	0.038	0.038	0.038
17.500	0.038	0.038	0.038	0.038	0.038
17.750	0.038	0.038	0.038	0.038	0.038
18.000	0.038	0.038	0.038	0.038	0.038
18.250	0.038	0.038	0.038	0.038	0.038
18.500	0.038	0.038	0.038	0.038	0.038
18.750	0.038	0.038	0.038	0.038	0.038
19.000	0.038	0.038	0.038	0.038	0.038
19.250	0.038	0.038	0.038	0.038	0.038
19.500	0.038	0.038	0.038	0.038	0.038
19.750	0.038	0.038	0.038	0.038	0.038
20.000	0.038	0.038	0.038	0.038	0.038
20.250	0.038	0.038	0.038	0.038	0.038
20.500	0.038	0.038	0.038	0.038	0.038
20.750	0.038	0.038	0.038	0.038	0.038

Subsection: Time vs. Volume
Label: WET POND
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.038	0.038	0.038	0.038	0.038
21.250	0.038	0.038	0.038	0.038	0.038
21.500	0.038	0.038	0.038	0.038	0.038
21.750	0.038	0.038	0.038	0.038	0.038
22.000	0.038	0.038	0.038	0.038	0.038
22.250	0.038	0.038	0.038	0.038	0.038
22.500	0.038	0.038	0.038	0.038	0.038
22.750	0.038	0.038	0.038	0.038	0.038
23.000	0.038	0.038	0.038	0.038	0.038
23.250	0.038	0.038	0.038	0.038	0.038
23.500	0.038	0.038	0.038	0.038	0.038
23.750	0.038	0.038	0.038	0.038	0.038
24.000	0.038	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Elevation-Area Volume Curve
Label: WET POND
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
417.00	0.0	1,602.000	0.000	0.000	0.000
418.00	0.0	1,937.000	5,300.554	0.041	0.041
419.00	0.0	2,296.000	6,341.875	0.049	0.089

Requested Pond Water Surface Elevations	
Minimum (Headwater)	417.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	419.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 2	Forward	Culvert - 1	417.94	419.00
Inlet Box	Riser - 1	Forward	Culvert - 1	418.19	419.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	417.09	419.00
Culvert-Circular	Culvert - 1	Forward	TW	417.09	419.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	17.00 ft
Length (Computed Barrel)	17.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.093
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	418.46 ft	T1 Flow	4.80 ft³/s
T2 Elevation	418.58 ft	T2 Flow	5.49 ft³/s

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	418.19 ft
Orifice Area	6.0 ft²
Orifice Coefficient	0.600
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	417.09 ft
Orifice Diameter	0.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	417.94 ft
Orifice Area	0.5 ft²
Top Elevation	418.19 ft
Datum Elevation	417.94 ft
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

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	417.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	419.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 2	Forward	Culvert - 1	417.94	419.00
Inlet Box	Riser - 1	Forward	Culvert - 1	418.19	419.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	417.09	419.00
Culvert-Circular	Culvert - 1	Forward	TW	417.09	419.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	17.00 ft
Length (Computed Barrel)	17.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.093
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	418.46 ft	T1 Flow	4.80 ft³/s
T2 Elevation	418.58 ft	T2 Flow	5.49 ft³/s

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	418.19 ft
Orifice Area	6.0 ft²
Orifice Coefficient	0.600
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	417.09 ft
Orifice Diameter	0.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	417.94 ft
Orifice Area	0.5 ft²
Top Elevation	418.19 ft
Datum Elevation	417.94 ft
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

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	417.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	419.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 2	Forward	Culvert - 1	417.94	419.00
Inlet Box	Riser - 1	Forward	Culvert - 1	418.19	419.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	417.09	419.00
Culvert-Circular	Culvert - 1	Forward	TW	417.09	419.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	17.00 ft
Length (Computed Barrel)	17.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.093
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	418.46 ft	T1 Flow	4.80 ft³/s
T2 Elevation	418.58 ft	T2 Flow	5.49 ft³/s

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	418.19 ft
Orifice Area	6.0 ft²
Orifice Coefficient	0.600
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	417.09 ft
Orifice Diameter	0.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	417.94 ft
Orifice Area	0.5 ft²
Top Elevation	418.19 ft
Datum Elevation	417.94 ft
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

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	417.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	419.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 2	Forward	Culvert - 1	417.94	419.00
Inlet Box	Riser - 1	Forward	Culvert - 1	418.19	419.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	417.09	419.00
Culvert-Circular	Culvert - 1	Forward	TW	417.09	419.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	17.00 ft
Length (Computed Barrel)	17.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.093
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	418.46 ft	T1 Flow	4.80 ft³/s
T2 Elevation	418.58 ft	T2 Flow	5.49 ft³/s

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	418.19 ft
Orifice Area	6.0 ft²
Orifice Coefficient	0.600
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	417.09 ft
Orifice Diameter	0.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	417.94 ft
Orifice Area	0.5 ft²
Top Elevation	418.19 ft
Datum Elevation	417.94 ft
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

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Elevation-Volume-Flow Table (Pond)
Label: WET POND
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	417.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
417.00	0.00	0.000	1,602.000	0.00	0.00	0.00
417.09	0.00	0.003	1,630.849	0.00	0.00	1.62
417.50	0.00	0.019	1,765.527	0.00	0.00	9.35
417.94	0.01	0.038	1,916.004	0.00	0.01	18.35
418.00	0.29	0.041	1,937.000	0.00	0.29	19.93
418.19	1.21	0.049	2,002.863	0.00	1.21	25.00
418.50	4.93	0.064	2,112.687	0.00	4.93	35.81
419.00	7.06	0.089	2,296.000	0.00	7.06	50.18

Subsection: Elevation-Volume-Flow Table (Pond)
Label: WET POND
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	417.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
417.00	0.00	0.000	1,602.000	0.00	0.00	0.00
417.09	0.00	0.003	1,630.849	0.00	0.00	1.62
417.50	0.00	0.019	1,765.527	0.00	0.00	9.35
417.94	0.01	0.038	1,916.004	0.00	0.01	18.35
418.00	0.29	0.041	1,937.000	0.00	0.29	19.93
418.19	1.21	0.049	2,002.863	0.00	1.21	25.00
418.50	4.93	0.064	2,112.687	0.00	4.93	35.81
419.00	7.06	0.089	2,296.000	0.00	7.06	50.18

Subsection: Elevation-Volume-Flow Table (Pond)
Label: WET POND
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	417.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
417.00	0.00	0.000	1,602.000	0.00	0.00	0.00
417.09	0.00	0.003	1,630.849	0.00	0.00	1.62
417.50	0.00	0.019	1,765.527	0.00	0.00	9.35
417.94	0.01	0.038	1,916.004	0.00	0.01	18.35
418.00	0.29	0.041	1,937.000	0.00	0.29	19.93
418.19	1.21	0.049	2,002.863	0.00	1.21	25.00
418.50	4.93	0.064	2,112.687	0.00	4.93	35.81
419.00	7.06	0.089	2,296.000	0.00	7.06	50.18

Subsection: Elevation-Volume-Flow Table (Pond)
Label: WET POND
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	417.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
417.00	0.00	0.000	1,602.000	0.00	0.00	0.00
417.09	0.00	0.003	1,630.849	0.00	0.00	1.62
417.50	0.00	0.019	1,765.527	0.00	0.00	9.35
417.94	0.01	0.038	1,916.004	0.00	0.01	18.35
418.00	0.29	0.041	1,937.000	0.00	0.29	19.93
418.19	1.21	0.049	2,002.863	0.00	1.21	25.00
418.50	4.93	0.064	2,112.687	0.00	4.93	35.81
419.00	7.06	0.089	2,296.000	0.00	7.06	50.18

Subsection: Pond Inflow Summary
Label: WET POND (IN)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Summary for Hydrograph Addition at 'WET POND'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-POA 1 DA

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	POST-POA 1 DA	0.102	11.900	1.83
Flow (In)	WET POND	0.102	11.900	1.83

Subsection: Pond Inflow Summary
Label: WET POND (IN)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Summary for Hydrograph Addition at 'WET POND'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-POA 1 DA

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	POST-POA 1 DA	0.205	11.900	3.53
Flow (In)	WET POND	0.205	11.900	3.53

Subsection: Pond Inflow Summary
Label: WET POND (IN)
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Summary for Hydrograph Addition at 'WET POND'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-POA 1 DA

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	POST-POA 1 DA	0.250	11.900	4.27
Flow (In)	WET POND	0.250	11.900	4.27

Subsection: Pond Inflow Summary
Label: WET POND (IN)
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Summary for Hydrograph Addition at 'WET POND'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-POA 1 DA

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	POST-POA 1 DA	0.325	11.900	5.47
Flow (In)	WET POND	0.325	11.900	5.47

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Water Quality Calculations

Wet Detention Pond

Project Information

Project Name:	Scooters Rolesville		
KHA Project #:	016485000		
Designed by:	MDB	Date:	2/28/2024
Revised by:	MDB	Date:	9/3/2024
Checked by:	COB	Date:	9/3/2024

Design Resource: NCDENR - Stormwater Best Management Practices (Revision 4-18-17)

Site Information

County:	Wake		
Region:	Mtn. & Piedmont		
Sub Area Location:	Drainage Area to Pond		
Drainage Area (DA) =	0.58	Acres	
Impervious Area (IA) with FS =	0.41	Acres	actual
Percent Impervious (I) =	70.69	%	

Main Pool Average Depth (d_{av}):

d_{av} Option 1 (when shelf is not submerged) =	0.98	ft
d_{av} Option 2 (when shelf is submerged) =	3.18	ft

Option 1

$d_{av} = V_{perm\_pool} / A_{perm\_pool}$

Option 2

$$D_{avg} = \frac{VPP - Vshelf}{Abottomofshelf}$$

Where:

- D_{avg} = Average depth in feet
- V_{PP} = Total volume of permanent pool (feet^3)
- V_{shelf} = Volume over the shelf only (feet^3) = 0.5 * $Depth_{max\ over\ shelf}$ * $Perimeter_{perm\ pool}$ * $Width_{submerged\ portion\ of\ shelf}$
- $A_{bottom\ of\ shelf}$ = Area of permanent pool (feet^2)

Required Surface Area (85% TSS): (Taken from Chapter C-3 of NCDEQ Stormwater BMP Manual)

SA/DA for dav = 3 and 70% Impervious =	2.51	Average depth rounded down to nearest 0.5'
SA/DA for dav = 3 and 80% Impervious =	2.92	Average depth rounded down to nearest 0.5'
Surface Area to DA Ratio (SA/DA) =	2.54	
Req'd Main Pool Surface Area at Perm. Pool =	641 sf	****THIS IS ONLY THE MAIN POOL SURFACE AREA****
Req'd Total Pond Surface Area at Perm. Pool =	Range from 737 sf to 770 sf	This includes minimum 20% forbay surface area

Required Storage Volume (Water Quality):

Design Storm =	1.0	inch	
Determine Rv Value =	0.05 + .009 (I) =	0.69	in/in
Design Storm Storage Volume =	1,445	cf	
Storage Volume Required =	1,445	cf	

Summary of Proposed BMP

Bottom of Pond Elevation =	414.00	ft	
Sediment Cleanout Elevation =	415.00	ft	
Permanent Pool Elevation =	417.09	ft	
Temporary Pool Elevation =	417.94	ft	
Top of Berm Elevation =	419.00	ft	
Main Pool Surface Area at Permanent Pool =	1,262	sf	(Required Surface Area = 641 sf)
Forebay Volume (FV1) =	249	cf	(20.1% of Main Pool Volume)
Permanent Pool Volume (PPV) =	1,243	cf	(Main Pool Only)
Temporary Pool Volume (TPV) =	1,454	cf	(Required Volume = 1445 cf)
Total Storage Volume (TSV) =	3,671	cf	
Total Pond Volume (PV) =	5,210	cf	

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Proposed Water Quality Volumes

Water Quality Volume - Wet Detention Pond

Water Quality Volume Required =	**1,445**
Water Quality Volume Provided =	**1,454**

POND

Elevation	Contour Area	Incremental Volume	Accumulated Volume, S	Stage, Z	
	sf ft	cu ft	cu ft	ft	
414.00	17	0	0	0.00	(Bottom of Pond)
414.50	148	41	41	0.50	
415.00	169	79	121	1.00	
416.00	454	312	432	2.00	(Bottom of Shelf)
417.09	1,576	1,106	1,538	3.09	(Permanent Pool Elevation)
417.09	1,576	0	0	3.09	(Top of Shelf)
417.94	1,846	1,454	1,454	3.94	(Temporary Pool Elevation)
418.00	1,870	111	1,566	4.00	
419.00	2,341	2,106	3,671	5.00	(Top of Berm)

MAIN POOL

Elevation	Contour Area	Incremental Volume	Accumulated Volume, S	Stage, Z
	sf ft	cu ft	cu ft	ft
414.00	13	0	0	0.00
414.50	55	17	17	0.50
415.00	154	52	69	1.00
416.00	391	273	342	2.00
417.09	1,262	901	1,243	3.09
417.09	1,262	0	1,243	3.09

FOREBAY

Elevation	Contour Area	Incremental Volume	Accumulated Volume, S	Stage, Z
	sq ft	cu ft	cu ft	ft
414.50	4	0	0	0.00
415.00	15	5	5	0.50
416.00	63	39	44	1.50
417.09	314	205	249	2.59
417.09	314	0	249	2.59

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Wet Detention Basin

INCREMENTAL DRAWDOWN METHOD

Wet Detention Pond

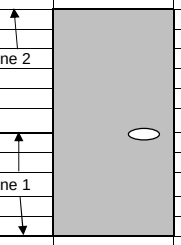
Project Information

Project Name:	Scooters Rolesville		
KHA Project #:	016485000		
Designed by:	MDB	Date:	2/28/2024
Revised by:	MDB	Date:	9/3/2024
Checked by:	COB	Date:	9/3/2024

Design Resource: NCDENR - Stormwater BMP Manual (June 2009)

Water Quality Orifice

Incremental Determination of Water Quality Volume Drawdown Time



$Q_2 = C_D * A * (2gH_0)^{\wedge(1/2)}$

$Q_1 = 0$

Orifice Diameter (D) =	0.50	in		
Cd =	0.6			
Area =	0.00136	sf		
Ei =	417.09	Orifice Inv.		
Zone 1 Range =	417.09	to	417.1108333	
Zone 2 Range =	417.1108333	to	417.94	

Incremental Drawdown Method

Countour	Contour Area	Incremental Volume	Stage, Z	Zone	Q	Drawdown Time
	sq ft	cu ft	ft		cfs	min
417.09	1,576.00	0	0.00	1	0.0000	--
417.14	1,592	79	0.05	2	0.0011	1,177
417.19	1,608	80	0.10	2	0.0018	722
417.111	1,583	-126	0.02	1	0.0000	--
417.24	1,624	81	0.15	2	0.0024	571
417.29	1,641	289	0.20	2	0.0028	1,732
417.34	1,657	82	0.25	2	0.0031	437
417.39	1,673	83	0.30	2	0.0035	400
417.44	1,689	84	0.35	2	0.0038	372
417.49	1,705	85	0.40	2	0.0040	350
417.54	1,721	86	0.45	2	0.0043	332
418.00	1,870.00	826	0.91	NOT IN RANGE	0.0000	--
418.05	1,890	94	0.96	NOT IN RANGE	0.0000	--
418.10	1,910	95	1.01	NOT IN RANGE	0.0000	--
418.15	1,930	96	1.06	NOT IN RANGE	0.0000	--
418.20	1,950	97	1.11	NOT IN RANGE	0.0000	--
418.25	1,970	98	1.16	NOT IN RANGE	0.0000	--
418.30	1,990	99	1.21	NOT IN RANGE	0.0000	--
417.94	1,846.00	-690	0.85	2	0.0060	-1,925
Total (402)	**--**	**1,537**	**--**	**--**	**--**	**4,168**

(Minimum Required Treatment Volume Elev.) Drawdown Time = Incremental Volume / Q / 60sec/min

Summary

Total Volume =	**1,537**	**cf**
Total Time =	**4,168**	**min**
Total Time =	**2.89**	**days***
Max Q =	**0.006**	**cfs**

*Drawdown time calculated based on minimum required treatment volume and corresponding elevation

WAKE COUNTY
NORTH CAROLINA

Project Name: Scooters Rolesville

DRAINAGE AREA 1
BMP CALCULATIONS

DRAINAGE AREA 1 - BMP DEVICES AND ADJUSTMENTS				
DA1 Site Acreage=	0.70			
DA1 Off-Site Acreage=				
Total Required Storage Volume for Site TCN Requirement (ft^3)=	N/A			
Total Required Storage Volume for DA1 1" Rainfall for High Density (ft^3)=	1,532			
Will site use underground detention/cistern?	No	Enter % of the year water will be reused=	0%	Note: Supporting information/details should be submitted to demonstrate water usage.

ENTER ACREAGE FOR ALL SUB-DRAINAGE AREAS IN DA

HSG	Sub-DA1(a) (Ac)		Sub-DA1(b) (Ac)		Sub-DA1(c) (Ac)		Sub-DA1(d) (Ac)		Sub-DA1(e) (Ac)	
	Site	Off-site	Site	Off-site	Site	Off-site	Site	Off-site	Site	Off-site
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Woods, Poor Condition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Woods, Fair Condition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Woods, Good Condition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space, Poor Condition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space, Fair Condition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space, Good Condition	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reforestation (in dedicated OS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Impervious	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sub-DA1(a) BMP(s)

Device Name (As Shown on Plan)	Device Type	Water Quality Volume for Sub-DA (ft^3)	Provided Volume that will drawdown 2-5 days (ft^3)	Nitrogen Removal Efficiency	Sub-DA Nitrogen (lbs)	Nitrogen Removed (lbs)	Drawdown Time (hours)
Proposed Storm Water Pond	Wet Detention Basin	1,445	1,482	25%	8.79	2.20	69
				0%	6.60	0.00	
				0%	6.60	0.00	
				0%	6.60	0.00	
				0%	6.60	0.00	
Total Nitrogen remaining leaving the subbasin (lbs):		**6.60**					

Sub-DA1(b) BMP(s)

If Sub-DA1(b) is connected to upstream subbasin(s), enter the nitrogen leaving the most upstream subbasin(lbs):

Device Name (As Shown on Plan)	Device Type	Water Quality Volume for Sub-DA (ft^3)	Provided Volume that will drawdown 2-5 days (ft^3)	Nitrogen Removal Efficiency	Sub-DA Nitrogen (lbs)	Nitrogen Removed (lbs)	Drawdown Time (hours)
			0	0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
Total Nitrogen remaining leaving the subbasin (lbs):							

Sub-DA1 (c) BMP(s)

If Sub-DA1(c) is connected to upstream subbasin(s), enter the nitrogen leaving the most upstream subbasin(lbs):

Device Name (As Shown on Plan)	Device Type	Water Quality Volume for Sub-DA (ft^3)	Provided Volume that will drawdown 2-5 days (ft^3)	Nitrogen Removal Efficiency	Sub-DA Nitrogen (lbs)	Nitrogen Removed (lbs)	Drawdown Time (hours)
			0	0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
Total Nitrogen remaining leaving the subbasin (lbs):							

WAKE COUNTY
NORTH CAROLINA

Project Name: Scooters Rolesville

DRAINAGE AREA 1
BMP CALCULATIONS

Sub-DA1(d) BMP(s)							
If Sub-DA1(d) is connected to upstream subbasin(s), enter the nitrogen leaving the most upstream subbasin(lbs):							
Device Name (As Shown on Plan)	Device Type	Water Quality Volume for Sub-DA (ft^3)	Provided Volume that will drawdown 2-5 days (ft^3)	Nitrogen Removal Efficiency	Sub-DA Nitrogen (lbs)	Nitrogen Removed (lbs)	Drawdown Time (hours)
			0	0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
Total Nitrogen remaining leaving the subbasin (lbs):							

Sub-DA1(e) BMP(s)							
If Sub-DA1(e) is connected to upstream subbasin(s), enter the nitrogen leaving the most upstream subbasin(lbs):							
Device Name (As Shown on Plan)	Device Type	Water Quality Volume for Sub-DA (ft^3)	Provided Volume that will drawdown 2-5 days (ft^3)	Nitrogen Removal Efficiency	Sub-DA Nitrogen (lbs)	Nitrogen Removed (lbs)	Drawdown Time (hours)
			0	0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
				0%	0.00	0.00	
Total Nitrogen remaining leaving the subbasin (lbs):							

DA1 BMP SUMMARY	
Total Volume Treated (ft^3)=	1,482
Nitrogen Mitigated(lbs)=	2.20
1-year, 24-hour storm	
Post BMP Volume of Runoff (ft^3)$_{(1\text{-}year)}$=	3,464
Post BMP Runoff (inches) = $Q^*_{(1\text{-}year)}$=	1.36
Post BMP $CN_{(1\text{-}year)}$=	83
Post BMP Peak Discharge (cfs)= $Q_{1\text{-}year}$=	
2-year, 24-hour storm (LID)	
Post BMP Volume of Runoff (ft3)$_{(2\text{-}year)}$=	4,869
Post BMP Runoff (inches) = $Q^*_{(2\text{-}year)}$=	1.92
Post BMP $CN_{(2\text{-}year)}$=	84
Post BMP Peak Discharge (cfs)= $Q_{(2\text{-}year)}$=	
10-year, 24-hour storm (DIA)	
Post BMP Volume of Runoff (ft^3)$_{(10\text{-}year)}$=	8,751
Post BMP Runoff (inches) = $Q^*_{(10\text{-}year)}$=	3.44
Post BMP $CN_{(10\text{-}year)}$=	98
Post BMP Peak Discharge (cfs)= $Q_{(10\text{-}year)}$=	

Project Name: Scooters Rolesville

DA SITE SUMMARY
BMP CALCULATIONS

BMP SUMMARY										
DRAINAGE AREA SUMMARIES										
DRAINAGE AREA:	DA1	DA2	DA3	DA4	DA5	DA6	DA7	DA8	DA9	DA10
Pre-Development (1-year, 24-hour storm)										
Runoff (in)=$Q^*_{1\text{-year}}$ =	1.15									
Peak Flow (cfs)=$Q_{1\text{-year}}$ =	1.552									
Post-Development (1-year, 24-hour storm)										
Target Curve Number (TCN) =	NA									
Post BMP Runoff (inches) = $Q^*_{(1\text{-year})}$=	1.36									
Post BMP Peak Discharge (cfs)= $Q_{1\text{-year}}$=										
Post BMP $CN_{(1\text{-year})}$=	83									
Post-BMP Nitrogen Loading										
TOTAL SITE NITROGEN MITIGATED (lbs)=	2.20									
SITE NITROGEN LOADING RATE (lbs/ac/yr)=	10.11									
TOTAL SITE NITROGEN LEFT TO MITIGATE_Wendell Only (lbs)=	**4.56**									

Project Name:	Scooters Rolesville

LOW IMPACT DEVELOPMENT SUMMARY

DRAINAGE AREA SUMMARIES										
DRAINAGE AREA:	DA1	DA2	DA3	DA4	DA5	DA6	DA7	DA8	DA9	DA10
Pre-Development										
Runoff (in) = $Q_{pre\_2\text{-}year}$ =	1.60									
Total Runoff Volume (ft^3)=	4,057									
Peak Flow (cfs)=$Q_{2\text{-}year}$ =	2.163									
Post-Development										
2-year, 24-hour storm (LID)										
Post BMP Runoff (inches) = $Q^*_{(2\text{-}year)}$=	1.92									
Post BMP Peak Discharge (cfs)= $Q_{(2\text{-}year)}$=										
Post BMP Volume of Runoff (ft3)$_{(2\text{-}year)}$=	4,869									
Does Runoff meet LID requirements?	No									
Does Peak Flow meet LID requirements?	No									
Does Runoff Volume meet LID requirements?	No									

SITE SUMMARY	
Site Data	
Target CN =	N/A
Post-Development CN =	84
Does CN meet LID requirements?	

LID CHECKLIST
Complete the below checklist if all requirements have been met above:

LID Narrative (limit to 600 characters - attach additional pages with submittal if necessary):
Describe in detail how the proposed development has utilized "Natural Site Design". Narrative should include the location of site buildings, roads and other land disturbances in the least environmentally-sensitive areas, preservation of steep slopes, and preservation of naturally well draining soils and other hydrologically valuable features.

LID Techniques (check all that apply)
At least **one** of the following techniques must be used to achieve LID classification:

☐	Bioretention
☐	On-site infiltration

Additional LID Techniques (check all that apply)
At least **two** (**one for Wendell**) of the following techniques must be used to achieve LID classification:

☐	Retention of 50% of vegetated area, including open space, landscaping or forests
☐	Use of permeable pavement for all private driveways, private roads, sidewalks and parking areas
☐	Installation of one rain cistern per lot or three rain barrels per lot
☐	Installation of vegetative roofs
☐	Increasing all buffers in the Riparian buffer zone or the Flood Protection Zone, whichever is greater, by 50 feet
☐	Use of reclaimed water for all buildings
☐	Use of innovative LID techniques subject to approval

Project Name:	Scooters Rolesville

DOWNSTREAM IMPACT ANALYSIS SITE SUMMARY

DRAINAGE AREA SUMMARIES										
DRAINAGE AREA:	DA1	DA2	DA3	DA4	DA5	DA6	DA7	DA8	DA9	DA10
Pre-Development										
Peak Discharge (cfs)=$Q_{10\text{-year}}$ =	3.97									
Volume of Runoff (ft^3)$_{(10\text{-year})}$ =	7,439									
Post-Development										
10-year, 24-hour storm (DIA)										
Post BMP Peak Discharge (cfs)= $Q_{(10\text{-year})}$=										
Post BMP Volume of Runoff (ft^3)$_{(10\text{-year})}$=	8,751									

Kimley»Horn

RIP-RAP CALCULATIONS

Project Information

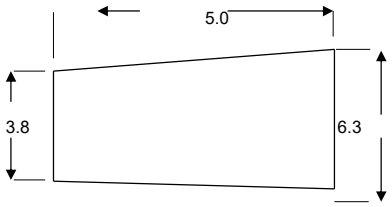
Project Name:	Scooters Rolesville		
KHA Project #:	16485000		
Designed by:	JAA	Date:	2/28/2024
Revised by:		Date:	
Checked by:	COB	Date:	2/28/2024

FES-1

Storm System Outlet Into Pond

Pipe Diameter	d=	15	in	
Number of Pipes	#=	1	total	
Pipe Slope	s=	0.50	%	
Manning's number	n=	0.013		
Flow	Q=	4.58	cfs	Assumes Full Flow
Velocity	V=	3.73	ft/s	Velocity of flow entering rip rap apror

Dissipator Dimensions *	Zone =	1	
	Stone Filling Class =	A	
	D_0 =	1.25	ft
	Entry Width (3 X D_0) =	3.8	ft
	Length (4 X D0) =	5.0	ft
	Width (La + D_0) =	6.3	ft
	Min. Thickness =	12	inches
	Min. Stone Diameter=	3	inches



* All units are in feet

** Dissipator pad designed for full flow of pipe

Kimley»Horn

RIP-RAP CALCULATIONS

Project Information

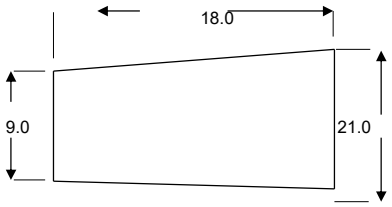
Project Name:	Scooters Rolesville		
KHA Project #:	16485000		
Designed by:	MDB	Date:	2/29/2024
Revised by:		Date:	
Checked by:	COB	Date:	2/29/2024

FES-2

Outfall From Splitter Box

Pipe Diameter	d=	36	in	
Number of Pipes	#=	1	total	
Pipe Slope	s=	0.50	%	
Manning's number	n=	0.013		
Flow	Q=	47.29	cfs	Assumes Full Flow
Velocity	V=	6.69	ft/s	Velocity of flow entering rip rap apror

Dissipator Dimensions *			
	Zone =	2	
	Stone Filling Class =	B	
	D_0 =	3.00	ft
	Entry Width (3 X D_0) =	9.0	ft
	Length (6 X D0) =	18.0	ft
	Width (La + D_0) =	21.0	ft
	Min. Thickness =	22	inches
	Min. Stone Diameter=	6	inches



* All units are in feet

** Dissipator pad designed for full flow of pipe

Kimley»Horn

RIP-RAP CALCULATIONS

Project Information

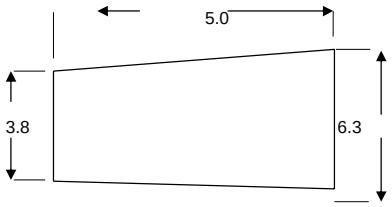
Project Name:	Scooters Rolesville		
KHA Project #:	16485000		
Designed by:	MDB	Date:	2/29/2024
Revised by:	JAA	Date:	8/23/2024
Checked by:	COB	Date:	2/29/2024

FES-3

Outfall From Riser

Pipe Diameter	d=	15	in	
Number of Pipes	#=	1	total	
Pipe Slope	s=	0.52	%	
Manning's number	n=	0.013		
Flow	Q=	4.67	cfs	Assumes Full Flow
Velocity	V=	3.81	ft/s	Velocity of flow entering rip rap apror

Dissipator Dimensions *	Zone =	1	
	Stone Filling Class =	A	
	D_0 =	1.25	ft
	Entry Width (3 X D_0) =	3.8	ft
	Length (4 X D0) =	5.0	ft
	Width (La + D_0) =	6.3	ft
	Min. Thickness =	12	inches
	Min. Stone Diameter=	3	inches

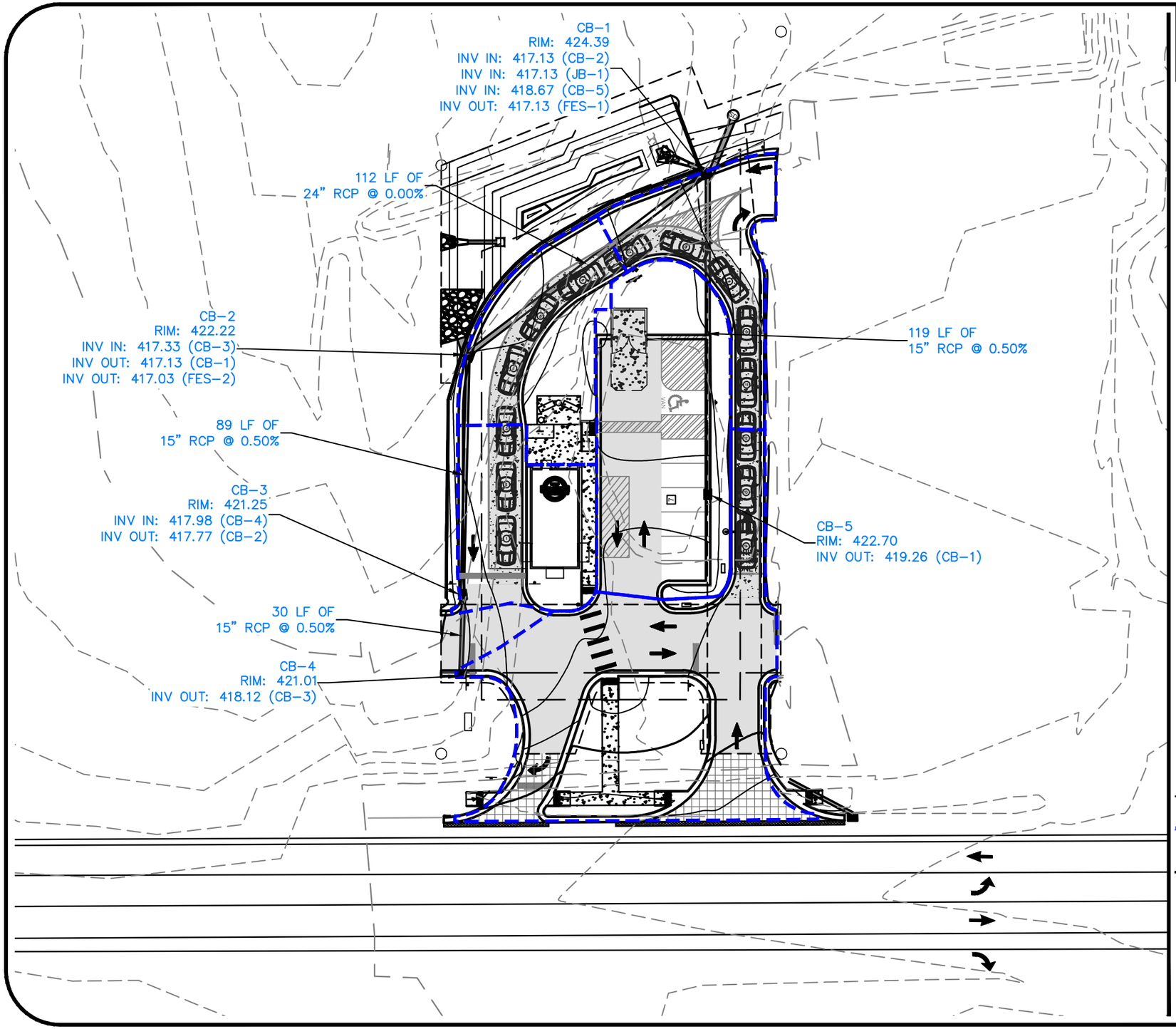


* All units are in feet

** Dissipator pad designed for full flow of pipe

APPENDIX F

SCOOTERS ROLESVILLE



INLET DRAINAGE AREA	
INLET ID	**AREA (AC)**
CB-1	0.064
CB-2	0.081
CB-3	0.071
CB-4	0.205
CB-5	0.134

LEGEND

DRAINAGE AREA OUTLINE

PROPERTY LINE

GRAPHIC SCALE IN FEET
0 20 40 80

NORTH

INLET DRAINAGE AREA MAP

KHA PROJECT NO: 016485000

DATE: 08/23/2024

421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
PHONE: 919–677–2000 FAX: 919–677–2050
WWW.KIMLEY–HORN.COM

2-Year

FlexTable: Catch Basin Table

Label	Inlet	Inlet Location	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet C	Inlet Drainage Area (acres)	External CA (acres)	Local CA (acres)	Local Intensity (in/h)	Local Flow Time (min)	Bypassed Rational Flow (cfs)	Flow (Captured) (cfs)	Flow (Total Out) (cfs)	Capture Efficiency (Calculated) (%)	Spread / Top Width (ft)	Hydraulic Grade Line (In) (ft)	Clogging Factor (%)
CB-1	NCDOT-combination inlet	On Grade	424.39	417.13	0.95	0.064	0.000	0.061	5.620	5.0	0.04	0.31	1.75	89.0	3.6	417.66	50.0
CB-2	NCDOT-combination inlet	In Sag	422.23	417.13	0.75	0.081	0.000	0.061	5.620	5.0	0.00	0.34	1.30	100.0	3.4	417.78	50.0
CB-4	NCDOT-combination inlet	In Sag	421.01	418.12	0.85	0.205	0.000	0.174	5.620	5.0	0.00	0.99	0.99	100.0	6.6	418.51	50.0
CB-5	NCDOT-combination inlet	In Sag	422.70	419.26	0.75	0.134	0.000	0.101	5.620	5.0	0.00	0.57	0.57	100.0	4.7	419.56	50.0
CB-3	NCDOT-combination inlet	In Sag	421.25	417.78	0.00	0.071	0.000	0.000	5.620	5.0	0.00	0.00	0.98	100.0	0.0	418.17	50.0

10-Year

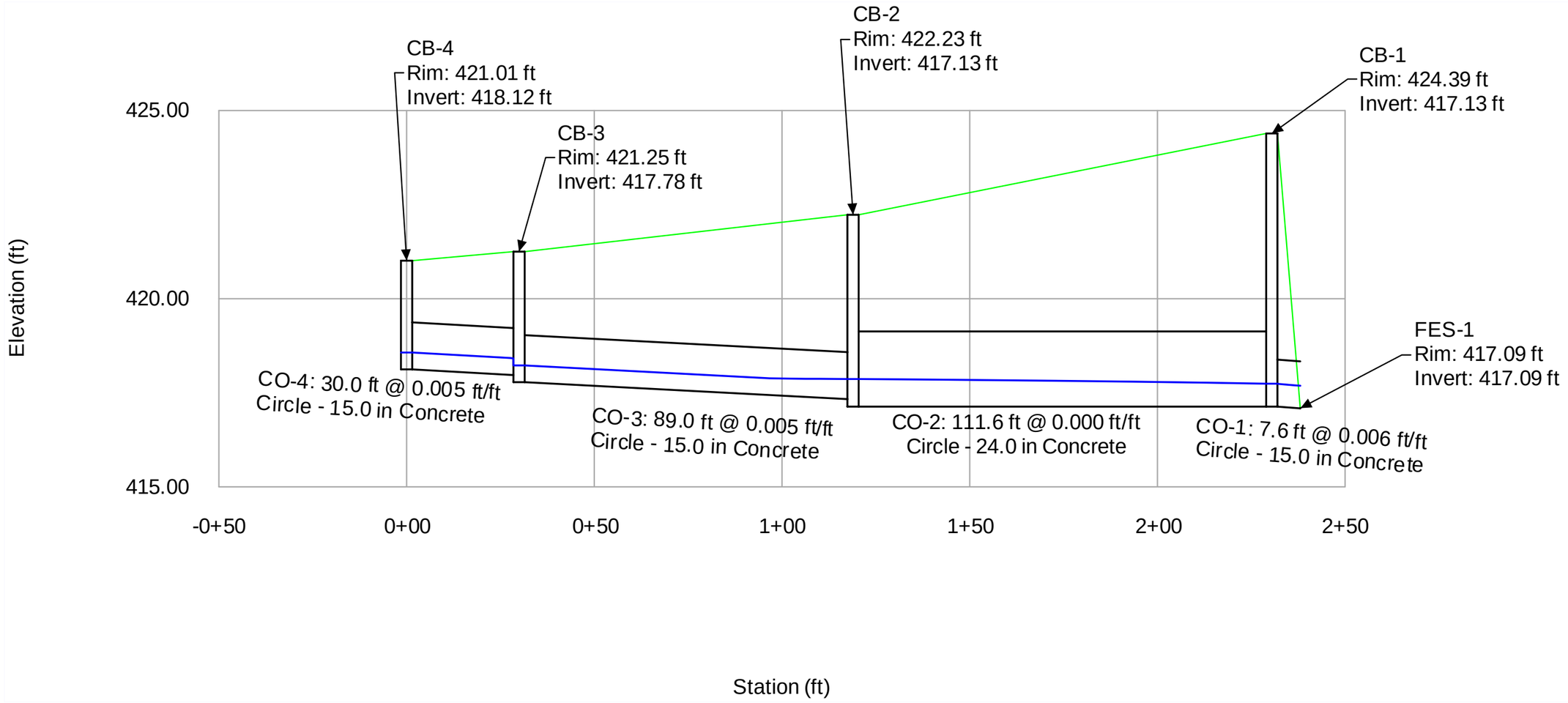
FlexTable: Conduit Table

Label	Start Node	Stop Node	Upstream Inlet C	Upstream Inlet Area (acres)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Flow (cfs)	System Intensity (in/h)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Material
CO-1	CB-1	FES-1	0.95	0.064	4.00	4.98	2.34	5.998	417.13	417.09	417.74	417.69	7.6	0.006	15.0	0.013	Concrete
CO-2	CB-2	CB-1	0.75	0.081	0.53	0.23	1.66	7.011	417.13	417.13	417.87	417.74	111.6	0.000	24.0	0.013	Concrete
CO-3	CB-3	CB-2	0.00	0.071	3.19	4.59	1.25	7.145	417.78	417.33	418.23	417.87	89.0	0.005	15.0	0.013	Concrete
CO-4	CB-4	CB-3	0.85	0.205	3.18	4.57	1.26	7.190	418.12	417.97	418.57	418.41	30.0	0.005	15.0	0.013	Concrete
CO-5	CB-5	CB-1	0.75	0.134	2.71	4.54	0.73	7.190	419.26	418.67	419.60	419.00	119.3	0.005	15.0	0.013	Concrete

10-Year

Profile Report

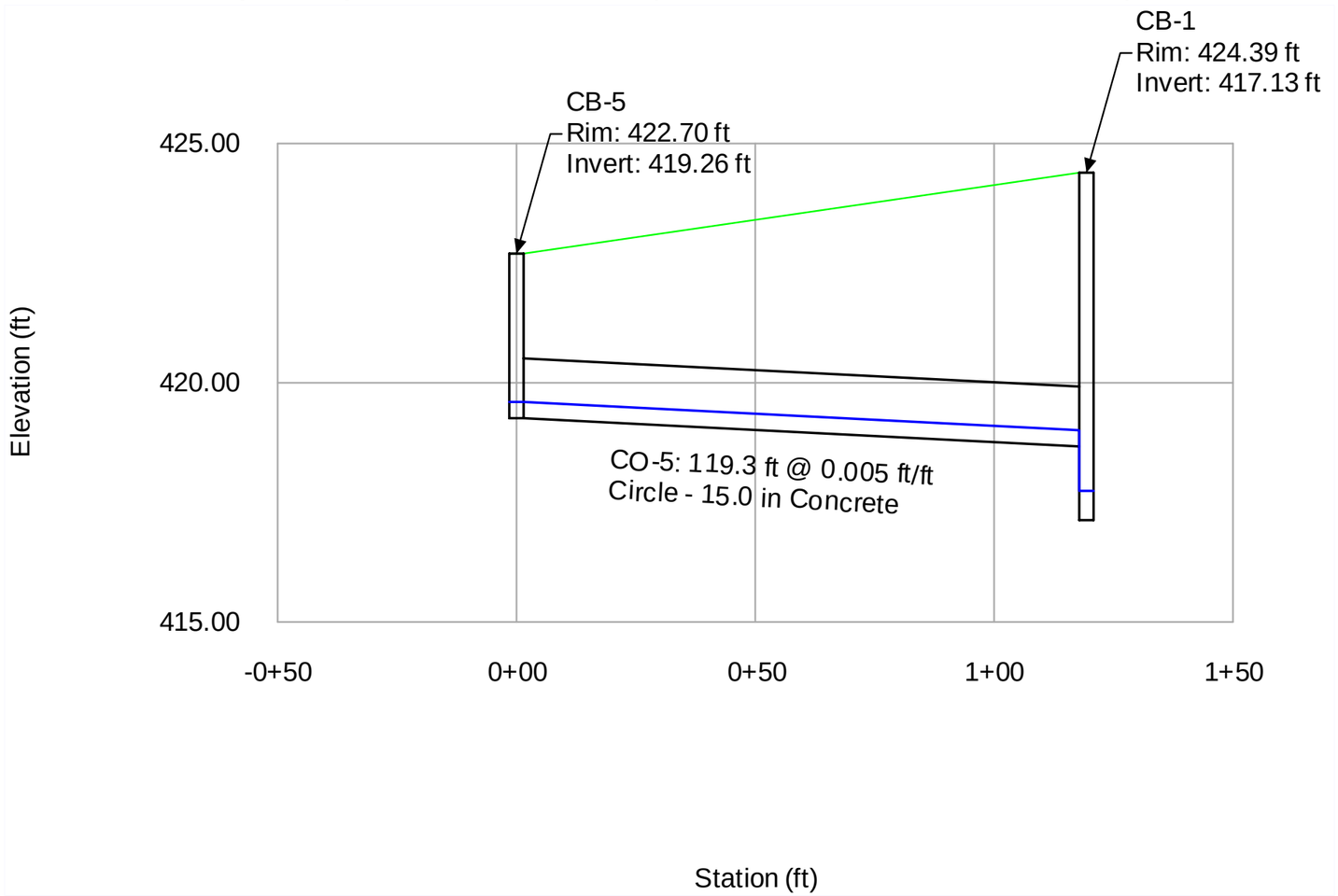
Engineering Profile - CB-4 to FES-1 (2024-08-29 Scooters Rolesville.stsw)



10-Year

Profile Report

Engineering Profile - CB-5 to CB-1 (2024-08-29 Scooters Rolesville.stsw)



Sonic Parcel Peak Discharge:
Runoff Coefficient = 0.85
Intensity (10-yr, 5-min) = 7.19 in/h
Area = 0.86 ac
Q = (0.85)(7.19 in/h)(0.86 ac) = 5.87 cfs

CB-2 Broad Crested Weir

Project Description	
Solve For	Headwater Elevation

Input Data		
Discharge	5.87	cfs
Crest Elevation	417.94	ft
Tailwater Elevation	417.03	ft
Crest Surface Type	Paved	
Crest Breadth	0.50	ft
Crest Length	4.0	ft

Results		
Headwater Elevation	418.55	ft
Headwater Height Above Crest	0.61	ft
Tailwater Height Above Crest	-0.91	ft
Weir Coefficient	3.09	ft^(1/2)/s
Submergence Factor	1.000	
Adjusted Weir Coefficient	3.09	ft^(1/2)/s
Flow Area	2.4	ft²
Velocity	2.41	ft/s
Wetted Perimeter	5.2	ft
Top Width	4.00	ft

Top of Structure Elevation is 422.22 ft, therefore the weir has sufficient capacity

APPENDIX G

NOAA Atlas 14, Volume 2, Version 3
Location name: Rolesville, North Carolina, USA*
Latitude: 35.9246°, Longitude: -78.4558°
Elevation: 432 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.84 (4.43-5.29)	5.62 (5.15-6.13)	6.40 (5.87-6.98)	7.19 (6.58-7.85)	7.98 (7.27-8.70)	8.62 (7.81-9.38)	9.18 (8.27-10.0)	9.67 (8.66-10.6)	10.2 (9.08-11.2)	10.7 (9.44-11.7)
10-min	3.86 (3.54-4.22)	4.49 (4.12-4.91)	5.12 (4.70-5.59)	5.75 (5.26-6.27)	6.36 (5.80-6.94)	6.86 (6.22-7.48)	7.29 (6.57-7.94)	7.67 (6.87-8.36)	8.09 (7.19-8.83)	8.44 (7.44-9.24)
15-min	3.22 (2.95-3.52)	3.77 (3.45-4.11)	4.32 (3.96-4.72)	4.85 (4.44-5.29)	5.38 (4.90-5.86)	5.79 (5.25-6.31)	6.14 (5.54-6.69)	6.45 (5.78-7.04)	6.78 (6.03-7.41)	7.06 (6.22-7.73)
30-min	2.21 (2.02-2.41)	2.60 (2.38-2.84)	3.07 (2.81-3.35)	3.51 (3.21-3.83)	3.98 (3.63-4.34)	4.36 (3.95-4.75)	4.70 (4.24-5.12)	5.02 (4.50-5.48)	5.40 (4.80-5.90)	5.72 (5.04-6.26)
60-min	1.38 (1.26-1.50)	1.63 (1.50-1.78)	1.97 (1.80-2.15)	2.29 (2.09-2.50)	2.65 (2.41-2.89)	2.95 (2.68-3.22)	3.24 (2.92-3.53)	3.52 (3.15-3.84)	3.87 (3.44-4.23)	4.18 (3.68-4.57)
2-hr	0.805 (0.732-0.887)	0.957 (0.874-1.05)	1.17 (1.06-1.28)	1.37 (1.24-1.50)	1.61 (1.46-1.76)	1.83 (1.64-2.00)	2.03 (1.81-2.22)	2.24 (1.98-2.45)	2.51 (2.20-2.74)	2.75 (2.40-3.02)
3-hr	0.568 (0.516-0.629)	0.676 (0.617-0.746)	0.827 (0.753-0.913)	0.979 (0.888-1.08)	1.16 (1.05-1.28)	1.33 (1.19-1.46)	1.49 (1.32-1.64)	1.66 (1.47-1.82)	1.89 (1.65-2.07)	2.10 (1.81-2.31)
6-hr	0.341 (0.311-0.377)	0.406 (0.372-0.448)	0.498 (0.454-0.548)	0.590 (0.537-0.648)	0.704 (0.636-0.771)	0.808 (0.725-0.883)	0.911 (0.810-0.995)	1.02 (0.898-1.11)	1.17 (1.02-1.27)	1.30 (1.12-1.42)
12-hr	0.200 (0.183-0.220)	0.238 (0.219-0.261)	0.293 (0.268-0.321)	0.349 (0.319-0.383)	0.420 (0.380-0.458)	0.485 (0.436-0.527)	0.550 (0.489-0.598)	0.621 (0.546-0.674)	0.718 (0.622-0.779)	0.808 (0.689-0.878)
24-hr	0.119 (0.110-0.128)	0.143 (0.134-0.155)	0.180 (0.168-0.194)	0.210 (0.195-0.226)	0.250 (0.231-0.269)	0.282 (0.260-0.303)	0.314 (0.289-0.339)	0.349 (0.319-0.376)	0.396 (0.360-0.427)	0.433 (0.393-0.468)
2-day	0.069 (0.064-0.074)	0.083 (0.077-0.089)	0.103 (0.096-0.111)	0.119 (0.111-0.129)	0.141 (0.131-0.152)	0.159 (0.147-0.171)	0.177 (0.163-0.191)	0.195 (0.179-0.211)	0.221 (0.201-0.239)	0.241 (0.219-0.261)
3-day	0.048 (0.045-0.052)	0.058 (0.054-0.062)	0.072 (0.067-0.078)	0.084 (0.078-0.090)	0.099 (0.092-0.106)	0.111 (0.103-0.119)	0.123 (0.114-0.132)	0.136 (0.125-0.146)	0.154 (0.140-0.166)	0.168 (0.152-0.181)
4-day	0.038 (0.036-0.041)	0.046 (0.043-0.049)	0.057 (0.053-0.061)	0.066 (0.061-0.070)	0.077 (0.072-0.083)	0.087 (0.080-0.093)	0.097 (0.089-0.103)	0.107 (0.098-0.114)	0.120 (0.110-0.129)	0.131 (0.119-0.141)
7-day	0.025 (0.024-0.027)	0.030 (0.028-0.032)	0.037 (0.034-0.039)	0.042 (0.039-0.045)	0.050 (0.046-0.053)	0.055 (0.051-0.059)	0.061 (0.057-0.066)	0.068 (0.062-0.072)	0.076 (0.070-0.082)	0.083 (0.076-0.089)
10-day	0.020 (0.019-0.021)	0.024 (0.022-0.025)	0.029 (0.027-0.031)	0.033 (0.031-0.035)	0.038 (0.035-0.041)	0.042 (0.039-0.045)	0.046 (0.043-0.050)	0.051 (0.047-0.054)	0.056 (0.052-0.061)	0.061 (0.056-0.066)
20-day	0.013 (0.012-0.014)	0.016 (0.015-0.017)	0.019 (0.018-0.020)	0.021 (0.020-0.022)	0.024 (0.023-0.026)	0.027 (0.025-0.029)	0.029 (0.027-0.031)	0.032 (0.030-0.034)	0.035 (0.033-0.038)	0.038 (0.035-0.041)
30-day	0.011 (0.010-0.012)	0.013 (0.012-0.014)	0.015 (0.014-0.016)	0.017 (0.016-0.018)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.023 (0.021-0.024)	0.024 (0.023-0.026)	0.027 (0.025-0.028)	0.028 (0.026-0.030)
45-day	0.009 (0.009-0.010)	0.011 (0.010-0.011)	0.012 (0.012-0.013)	0.014 (0.013-0.015)	0.015 (0.015-0.016)	0.017 (0.016-0.018)	0.018 (0.017-0.019)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.022 (0.020-0.023)
60-day	0.008 (0.008-0.009)	0.010 (0.009-0.010)	0.011 (0.010-0.012)	0.012 (0.011-0.013)	0.013 (0.013-0.014)	0.014 (0.014-0.015)	0.015 (0.014-0.016)	0.016 (0.015-0.017)	0.018 (0.016-0.019)	0.018 (0.017-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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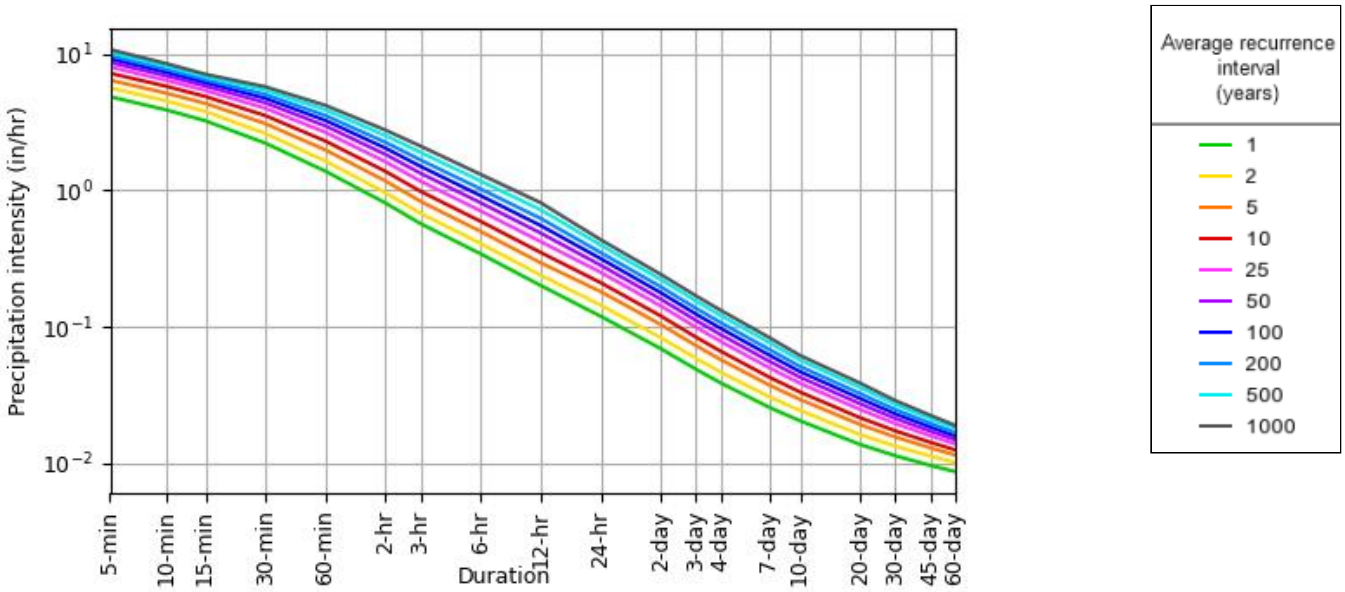
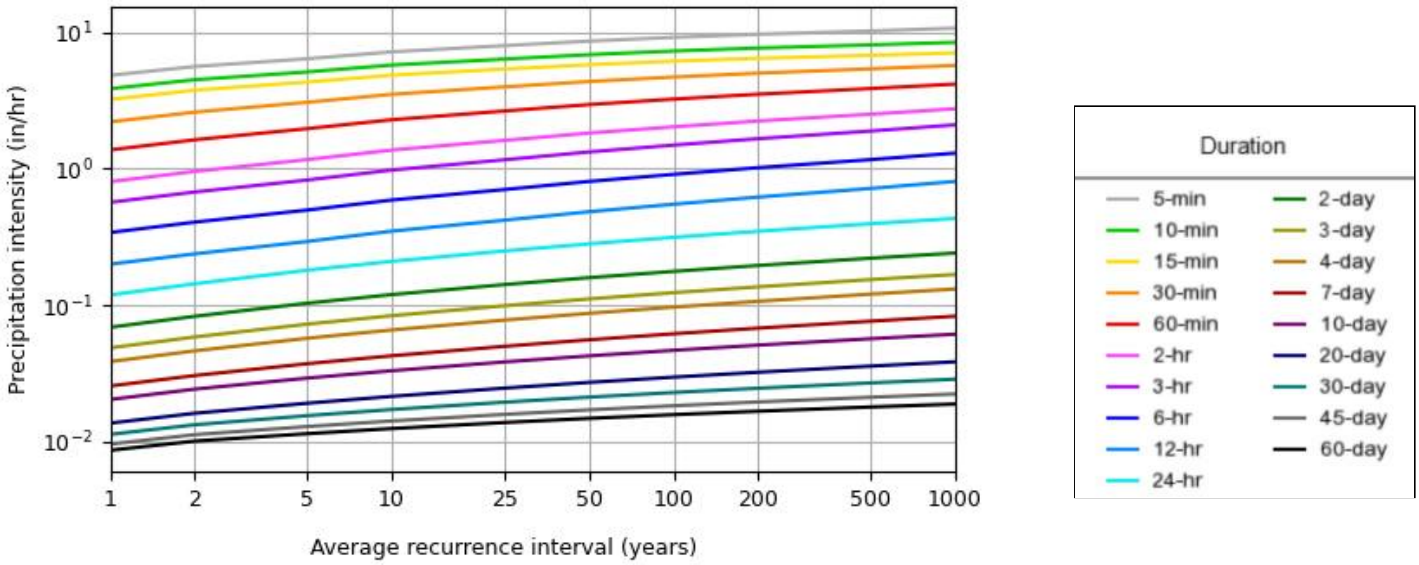
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 35.9246°, Longitude: -78.4558°





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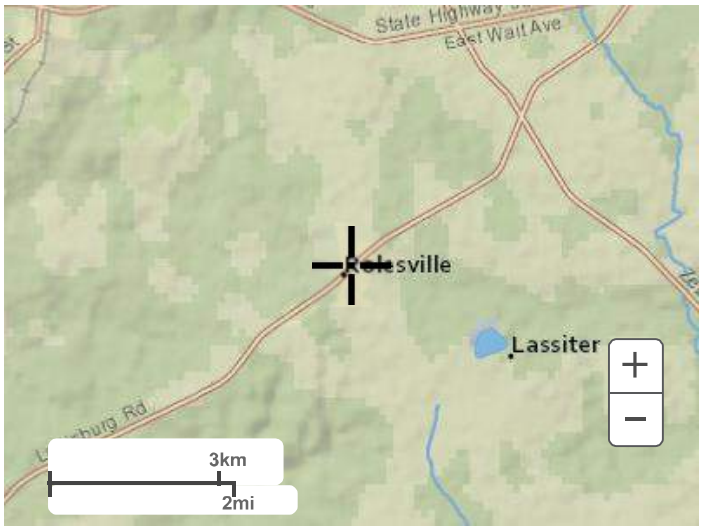
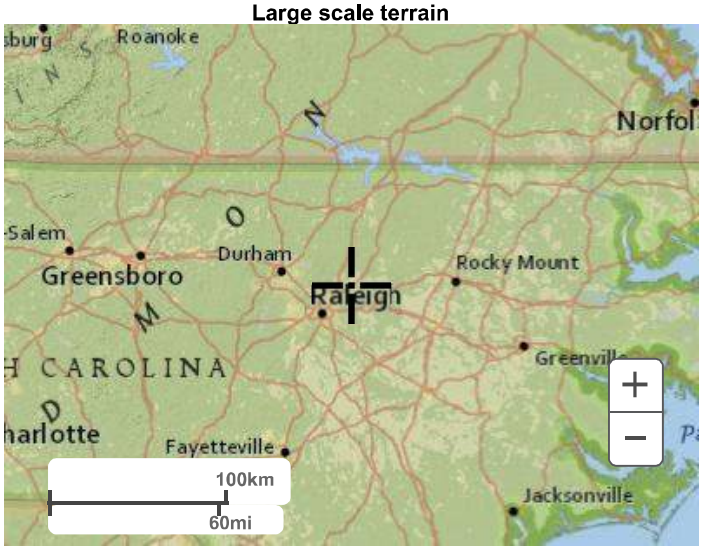
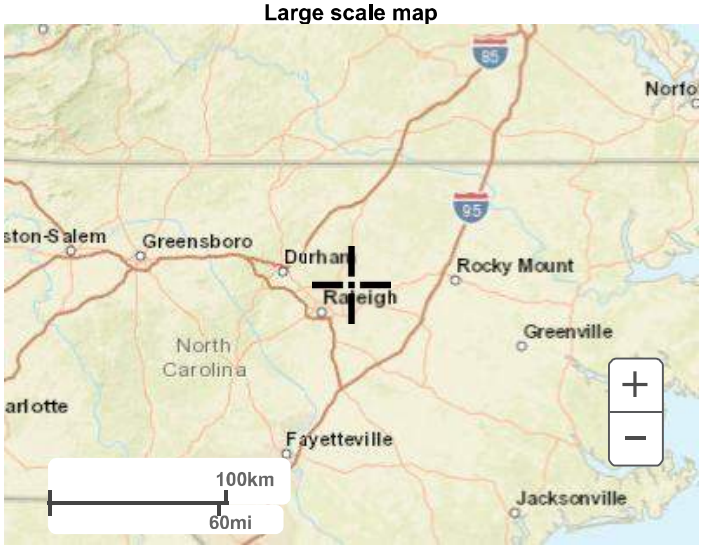
Small scale terrain



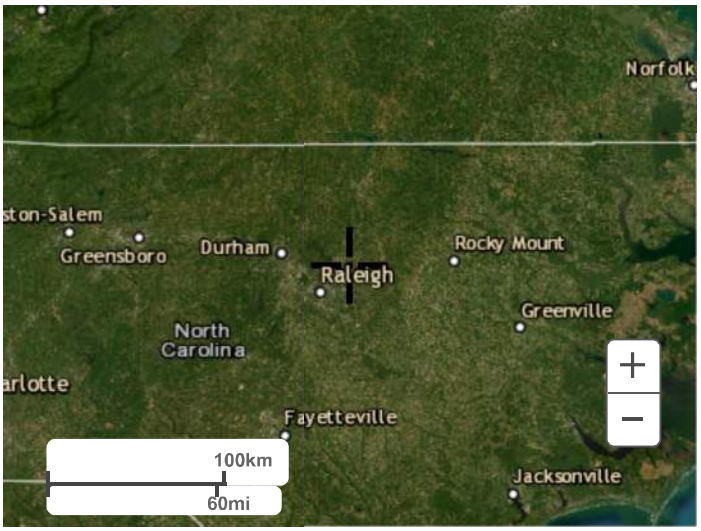
Large scale terrain



Large scale map



Large scale aerial



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National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

NOAA Atlas 14, Volume 2, Version 3
Location name: Rolesville, North Carolina, USA*
Latitude: 35.9246°, Longitude: -78.4558°
Elevation: 432 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.403 (0.369-0.441)	0.468 (0.429-0.511)	0.533 (0.489-0.582)	0.599 (0.548-0.654)	0.665 (0.606-0.725)	0.718 (0.651-0.782)	0.765 (0.689-0.833)	0.806 (0.722-0.880)	0.852 (0.757-0.931)	0.893 (0.787-0.978)
10-min	0.644 (0.590-0.704)	0.749 (0.687-0.818)	0.854 (0.783-0.932)	0.959 (0.877-1.04)	1.06 (0.966-1.16)	1.14 (1.04-1.25)	1.22 (1.10-1.32)	1.28 (1.14-1.39)	1.35 (1.20-1.47)	1.41 (1.24-1.54)
15-min	0.805 (0.738-0.880)	0.942 (0.863-1.03)	1.08 (0.990-1.18)	1.21 (1.11-1.32)	1.34 (1.22-1.46)	1.45 (1.31-1.58)	1.54 (1.38-1.67)	1.61 (1.44-1.76)	1.70 (1.51-1.85)	1.77 (1.56-1.93)
30-min	1.10 (1.01-1.21)	1.30 (1.19-1.42)	1.54 (1.41-1.68)	1.76 (1.61-1.92)	1.99 (1.81-2.17)	2.18 (1.98-2.38)	2.35 (2.12-2.56)	2.51 (2.25-2.74)	2.70 (2.40-2.95)	2.86 (2.52-3.13)
60-min	1.38 (1.26-1.50)	1.63 (1.50-1.78)	1.97 (1.80-2.15)	2.29 (2.09-2.50)	2.65 (2.41-2.89)	2.95 (2.68-3.22)	3.24 (2.92-3.53)	3.52 (3.15-3.84)	3.87 (3.44-4.23)	4.18 (3.68-4.57)
2-hr	1.61 (1.46-1.78)	1.91 (1.75-2.10)	2.34 (2.13-2.56)	2.74 (2.49-3.01)	3.23 (2.91-3.53)	3.65 (3.28-3.99)	4.06 (3.62-4.44)	4.48 (3.97-4.90)	5.03 (4.41-5.49)	5.51 (4.79-6.04)
3-hr	1.71 (1.55-1.89)	2.03 (1.85-2.24)	2.48 (2.26-2.74)	2.94 (2.67-3.24)	3.50 (3.15-3.84)	3.99 (3.57-4.38)	4.48 (3.98-4.91)	4.99 (4.40-5.47)	5.68 (4.95-6.22)	6.31 (5.44-6.93)
6-hr	2.05 (1.87-2.26)	2.44 (2.23-2.68)	2.99 (2.72-3.28)	3.54 (3.22-3.88)	4.22 (3.81-4.62)	4.84 (4.34-5.29)	5.46 (4.86-5.96)	6.11 (5.38-6.66)	6.99 (6.08-7.62)	7.81 (6.70-8.53)
12-hr	2.41 (2.21-2.66)	2.87 (2.64-3.15)	3.54 (3.24-3.88)	4.21 (3.84-4.62)	5.06 (4.59-5.53)	5.84 (5.25-6.36)	6.63 (5.90-7.21)	7.48 (6.58-8.12)	8.65 (7.49-9.40)	9.74 (8.31-10.6)
24-hr	2.86 (2.66-3.08)	3.45 (3.22-3.72)	4.34 (4.04-4.68)	5.04 (4.68-5.43)	6.00 (5.56-6.46)	6.77 (6.24-7.28)	7.56 (6.95-8.14)	8.38 (7.67-9.02)	9.50 (8.66-10.3)	10.4 (9.43-11.2)
2-day	3.32 (3.09-3.57)	3.99 (3.72-4.30)	4.98 (4.64-5.36)	5.76 (5.35-6.20)	6.81 (6.31-7.34)	7.65 (7.07-8.24)	8.52 (7.84-9.17)	9.41 (8.62-10.1)	10.6 (9.69-11.5)	11.6 (10.5-12.6)
3-day	3.52 (3.28-3.77)	4.23 (3.95-4.53)	5.24 (4.89-5.62)	6.05 (5.63-6.48)	7.15 (6.63-7.67)	8.02 (7.42-8.60)	8.92 (8.22-9.57)	9.84 (9.04-10.6)	11.1 (10.1-12.0)	12.1 (11.0-13.1)
4-day	3.72 (3.48-3.98)	4.46 (4.17-4.77)	5.51 (5.15-5.89)	6.34 (5.91-6.77)	7.48 (6.95-8.00)	8.39 (7.77-8.97)	9.32 (8.60-9.98)	10.3 (9.45-11.0)	11.6 (10.6-12.5)	12.7 (11.5-13.6)
7-day	4.31 (4.04-4.60)	5.15 (4.82-5.50)	6.28 (5.88-6.70)	7.18 (6.71-7.66)	8.41 (7.84-8.98)	9.40 (8.72-10.0)	10.4 (9.63-11.1)	11.4 (10.6-12.3)	12.9 (11.8-13.8)	14.0 (12.8-15.0)
10-day	4.91 (4.60-5.24)	5.84 (5.48-6.23)	7.04 (6.59-7.50)	7.97 (7.46-8.49)	9.24 (8.62-9.84)	10.2 (9.53-10.9)	11.2 (10.4-12.0)	12.3 (11.4-13.1)	13.7 (12.6-14.6)	14.8 (13.6-15.8)
20-day	6.59 (6.20-7.01)	7.78 (7.32-8.28)	9.21 (8.66-9.80)	10.3 (9.71-11.0)	11.9 (11.1-12.6)	13.1 (12.2-13.9)	14.3 (13.3-15.2)	15.5 (14.4-16.6)	17.2 (15.9-18.4)	18.5 (17.1-19.9)
30-day	8.18 (7.72-8.68)	9.62 (9.08-10.2)	11.2 (10.6-11.9)	12.4 (11.7-13.2)	14.1 (13.2-15.0)	15.3 (14.4-16.3)	16.6 (15.5-17.6)	17.8 (16.6-19.0)	19.5 (18.1-20.8)	20.8 (19.2-22.2)
45-day	10.4 (9.89-11.0)	12.2 (11.6-12.9)	14.0 (13.3-14.8)	15.4 (14.6-16.2)	17.2 (16.2-18.1)	18.5 (17.5-19.6)	19.9 (18.7-21.0)	21.2 (19.9-22.4)	22.9 (21.4-24.3)	24.2 (22.6-25.7)
60-day	12.5 (11.9-13.1)	14.6 (13.9-15.3)	16.5 (15.7-17.4)	18.0 (17.1-19.0)	20.0 (18.9-21.0)	21.4 (20.3-22.5)	22.8 (21.5-24.0)	24.2 (22.8-25.5)	25.9 (24.4-27.4)	27.3 (25.6-28.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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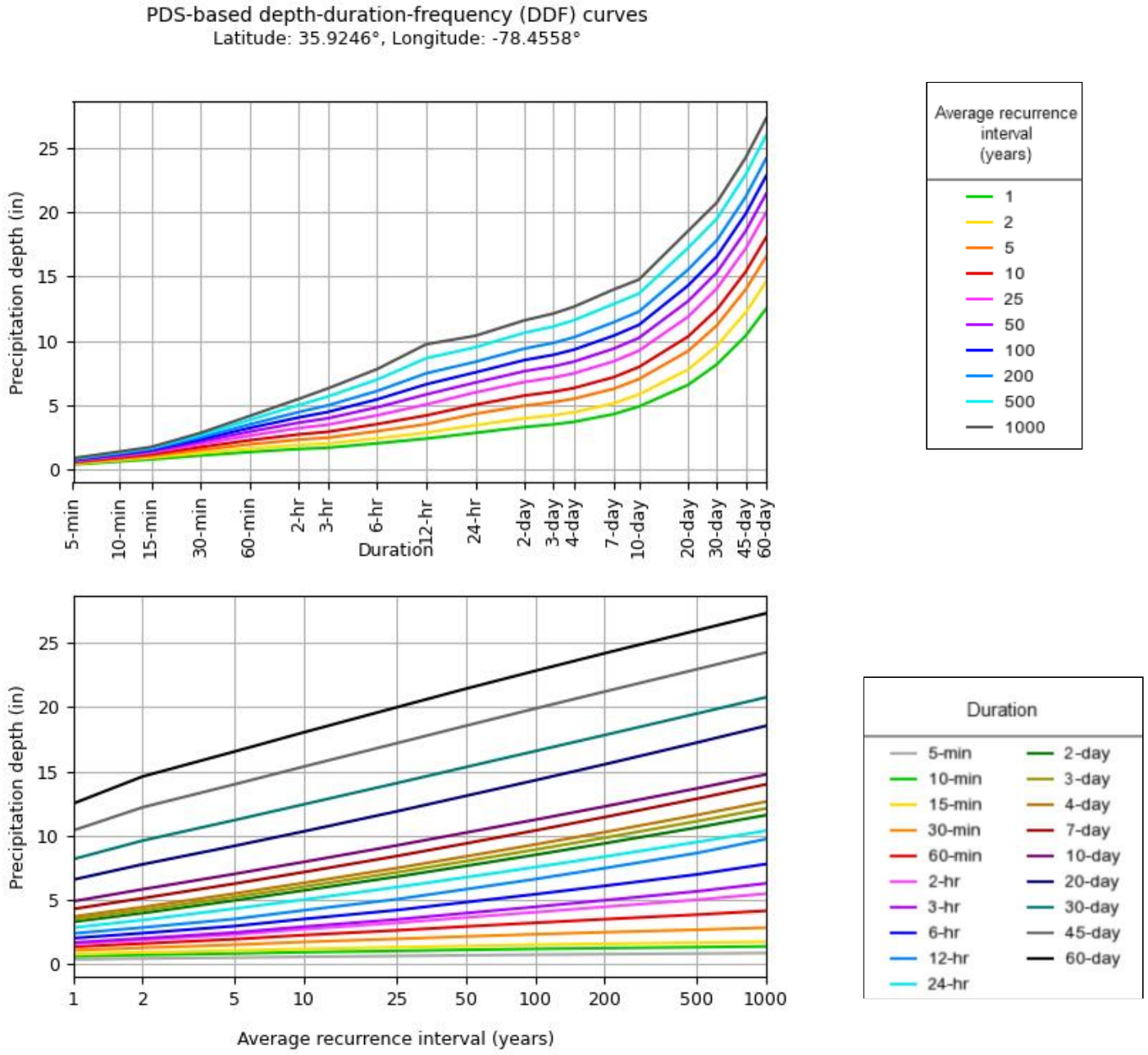
PF graphical



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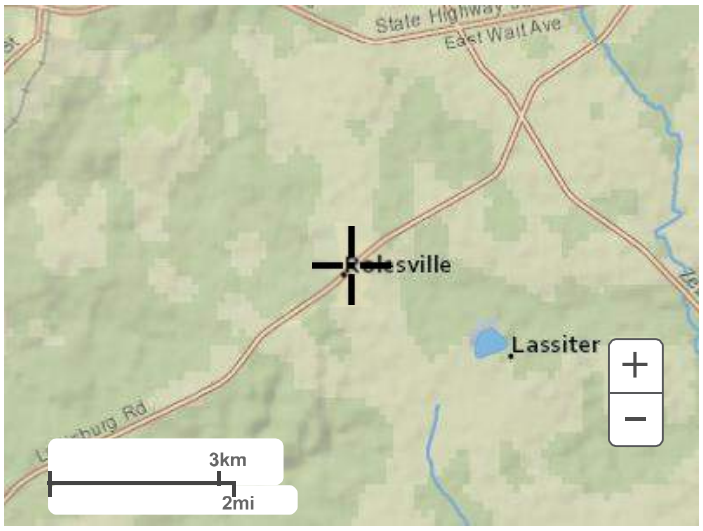
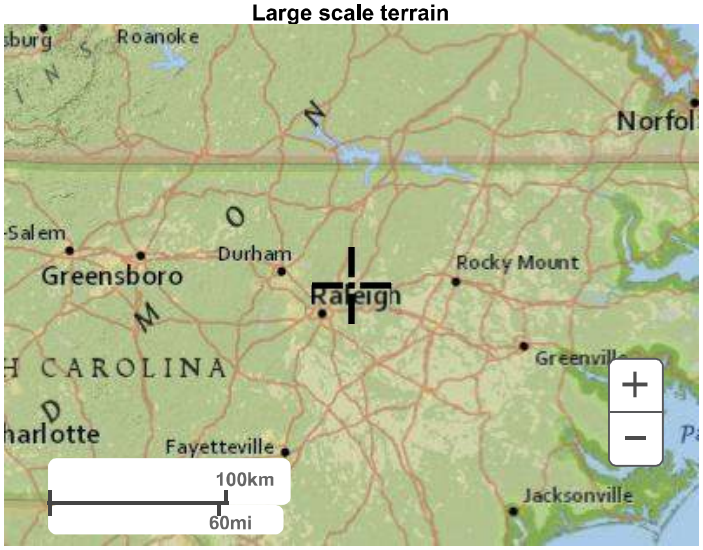
Maps & aerials

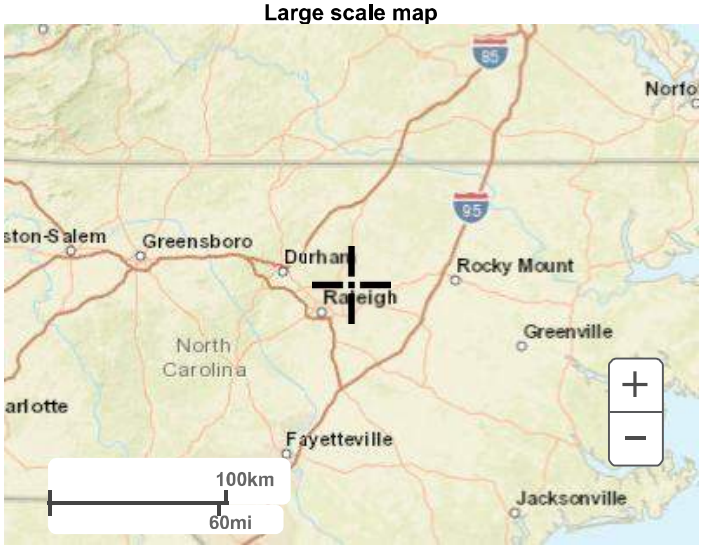
Small scale terrain



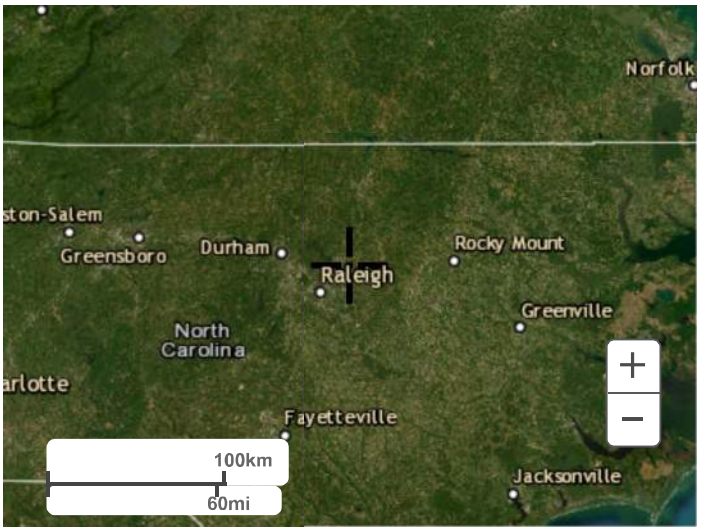
Large scale terrain



Large scale map



Large scale aerial



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National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

APPENDIX H

Skimmer Basin 1

0.70	Total Drainage Area, ACRES		
0.70	Disturbed Area, ACRES	**Q10**	**=C*I*A (Rational Method)**
1.97	10 Year Peak Flow, CFS	**Q10**	**= 0.35 * 8.06 * 0.7**

1,260.0	Required Volume, CUFT	**1800**	CUFT / ACRE disturbed area (NC E&SC Manual)
641.8	Required Surface Area, S(	**325**	SQFT / CFS of peak flow
20.0	Suggested Width, FT		Min length to width ratio: 2:1
40.0	Suggested Length, FT		

Basin Feature	Contour	Contour Area	Incremental Volume	Accumulated Volume, S	Stage, Z
		sq ft	cu ft	cu ft	ft
Bottom of Basin:	417.00	1,008	0	0	0.00
Primary Spillway Elevation:	419.00	2,277	3,285	3,285	2.00
Top of Dam:	420.50	3,412	4,267	7,552	3.50

3.00	Trial Side Slope Ratio Z:1	
2.00	Trial Depth, FT	(2 to 3.5 feet above grade)
418.00	Sediment Storage Elevation	
1,008.0	Bottom Area, SQFT	
3,285.0	Actual Volume, CUFT	**Okay**
2,277.0	Actual Surface Area, SQFT	**Okay**

Weir Design

4	Trial Weir Length, FT (4' min.)	
6.0	Trial Depth of Flow, IN (6" max.)	
2.1	Spillway Capacity, CFS	**Okay**
10.0	Embankment Width, FT	
1.0	Freeboard, FT (1' min.)	

Skimmer Design

2	Skimmer Size, IN	
0.167	Head on Skimmer, FT	
1.00	Orifice Size, IN (1/4 inch increments)	
3.48	Dewatering Time, DAYS	**Okay**
	Suggest about 3 DAYS	**Okay**
417.0	Skimmer Outlet Elevation, FT	

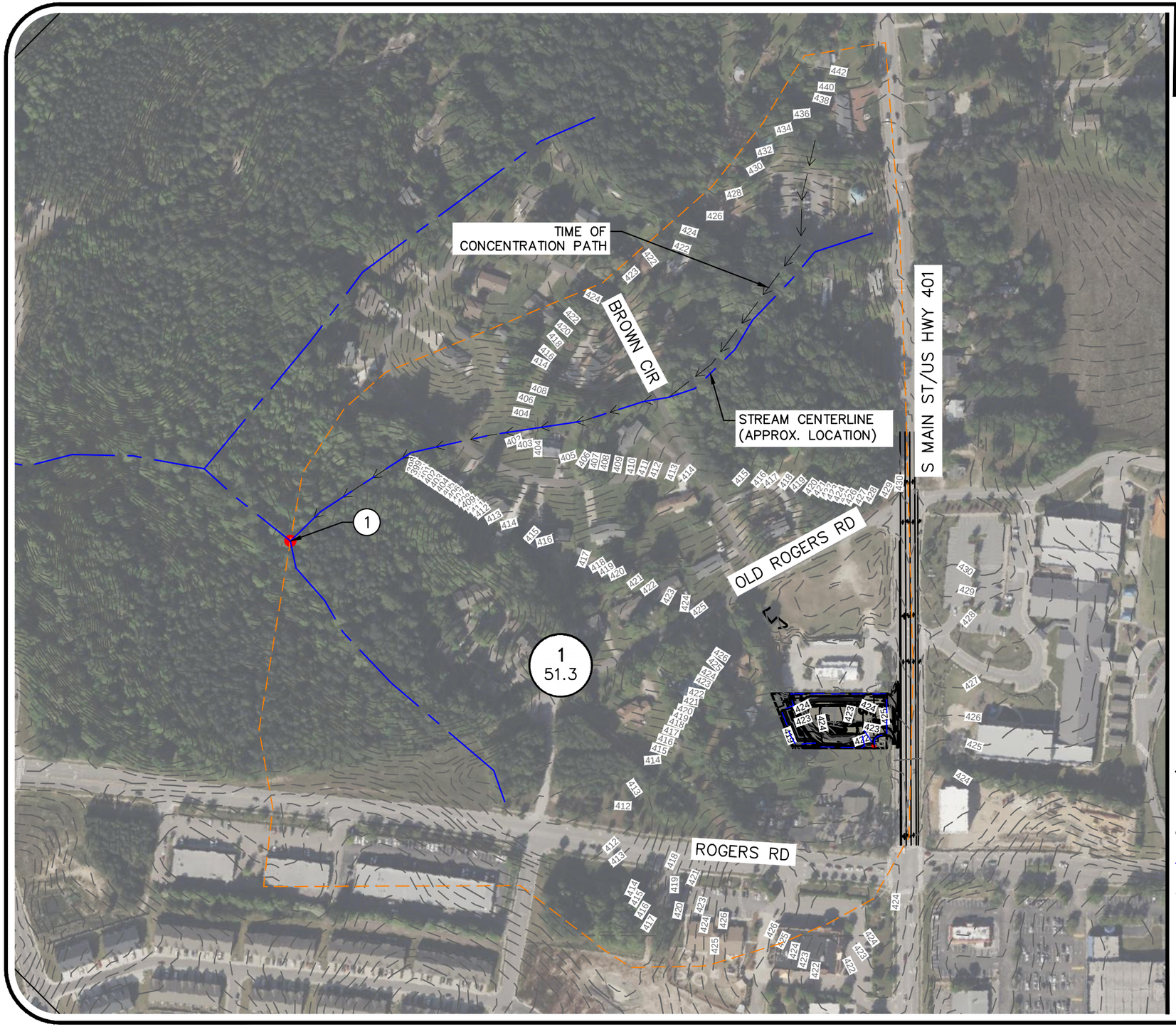
Skimmer Size (Inches)	Head on Skimmer (Feet)
1.5	0.125
2	0.167
2.5	0.208
3	0.250
4	0.333
5	0.417
6	0.500
8	0.667

NOTES:

APPENDIX I

SCOOTER'S ROLESVILLE

DRAINAGE AREA TABLE	
AREA	AREA (AC)
POA–1 (TREATED ONSITE)	0.58
POA–1 (BYPASS)	50.72
TOTAL	51.30



GRAPHIC SCALE IN FEET
0 125 250 500

LEGEND

- DRAINAGE AREA OUTLINE
- PROPERTY LINE
- STREAM CENTERLINE
- TIME OF CONCENTRATION PATH
- 3 — POINT OF ANALYSIS
- X AC — SUBAREA ID, SUBAREA SIZE

10% RULE DRAINAGE AREA MAP

KHA PROJECT NO: 016485000

DATE: 08/07/2024

Kimley»Horn

421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
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WWW.KIMLEY–HORN.COM

Table of Contents

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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE-POA 1 DA	1-year 24-hour	1	2.716	12.050	39.48
PRE-POA 1 DA	10 Year	10	8.805	12.000	142.75
PRE-POA 1 DA	25 Year	25	11.957	12.000	194.97
PRE-POA 1 DA	100 Year	100	17.431	12.000	283.95
POST-POA 1 BYPASS DA	1-year 24-hour	1	2.685	12.050	39.03
POST-POA 1 BYPASS DA	10 Year	10	8.705	12.000	141.13
POST-POA 1 BYPASS DA	25 Year	25	11.822	12.000	192.77
POST-POA 1 BYPASS DA	100 Year	100	17.234	12.000	280.74
POST-POA 1 DA	1-year 24-hour	1	0.102	11.900	1.83
POST-POA 1 DA	10 Year	10	0.205	11.900	3.53
POST-POA 1 DA	25 Year	25	0.250	11.900	4.27
POST-POA 1 DA	100 Year	100	0.325	11.900	5.47

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE- POA 1	1-year 24-hour	1	2.716	12.050	39.48
PRE- POA 1	10 Year	10	8.805	12.000	142.75
PRE- POA 1	25 Year	25	11.957	12.000	194.97
PRE- POA 1	100 Year	100	17.431	12.000	283.95
POST-POA 1	1-year 24-hour	1	2.750	12.050	40.08
POST-POA 1	10 Year	10	8.872	12.000	144.26
POST-POA 1	25 Year	25	12.034	12.000	196.55
POST-POA 1	100 Year	100	17.521	12.000	285.59

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
WET POND (IN)	1-year 24-hour	1	0.102	11.900	1.83	(N/A)	(N/A)
WET POND (OUT)	1-year 24-hour	1	0.064	12.050	1.05	418.16	0.048
WET POND (IN)	10 Year	10	0.205	11.900	3.53	(N/A)	(N/A)
WET POND (OUT)	10 Year	10	0.166	11.950	3.22	418.36	0.057

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
WET POND (IN)	25 Year	25	0.250	11.900	4.27	(N/A)	(N/A)
WET POND (OUT)	25 Year	25	0.212	11.950	3.90	418.41	0.060
WET POND (IN)	100 Year	100	0.325	11.900	5.47	(N/A)	(N/A)
WET POND (OUT)	100 Year	100	0.287	11.950	4.96	418.51	0.064

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time-Depth Curve: 10 Year	
Label	10 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.6	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.7	0.8	0.8	0.8	0.8
9.500	0.8	0.8	0.9	0.9	0.9
10.000	0.9	0.9	1.0	1.0	1.0
10.500	1.0	1.1	1.1	1.1	1.1
11.000	1.2	1.2	1.3	1.3	1.4
11.500	1.4	1.5	1.8	2.2	2.9
12.000	3.3	3.4	3.5	3.6	3.7
12.500	3.7	3.7	3.8	3.8	3.9
13.000	3.9	3.9	3.9	4.0	4.0
13.500	4.0	4.1	4.1	4.1	4.1
14.000	4.1	4.2	4.2	4.2	4.2
14.500	4.2	4.2	4.3	4.3	4.3
15.000	4.3	4.3	4.3	4.3	4.4
15.500	4.4	4.4	4.4	4.4	4.4
16.000	4.4	4.4	4.5	4.5	4.5
16.500	4.5	4.5	4.5	4.5	4.5
17.000	4.5	4.6	4.6	4.6	4.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	4.6	4.6	4.6	4.6	4.6
18.000	4.6	4.7	4.7	4.7	4.7
18.500	4.7	4.7	4.7	4.7	4.7
19.000	4.7	4.7	4.7	4.7	4.8
19.500	4.8	4.8	4.8	4.8	4.8
20.000	4.8	4.8	4.8	4.8	4.8
20.500	4.8	4.8	4.8	4.8	4.9
21.000	4.9	4.9	4.9	4.9	4.9
21.500	4.9	4.9	4.9	4.9	4.9
22.000	4.9	4.9	4.9	4.9	4.9
22.500	5.0	5.0	5.0	5.0	5.0
23.000	5.0	5.0	5.0	5.0	5.0
23.500	5.0	5.0	5.0	5.0	5.0
24.000	5.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time-Depth Curve: 100 Year	
Label	100 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.5	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.6	0.6	0.7
6.500	0.7	0.7	0.7	0.7	0.7
7.000	0.7	0.8	0.8	0.8	0.8
7.500	0.8	0.8	0.9	0.9	0.9
8.000	0.9	0.9	0.9	1.0	1.0
8.500	1.0	1.0	1.0	1.1	1.1
9.000	1.1	1.1	1.2	1.2	1.2
9.500	1.2	1.3	1.3	1.3	1.3
10.000	1.4	1.4	1.4	1.5	1.5
10.500	1.5	1.6	1.6	1.7	1.7
11.000	1.8	1.8	1.9	2.0	2.1
11.500	2.1	2.3	2.7	3.3	4.3
12.000	5.0	5.2	5.3	5.4	5.5
12.500	5.6	5.6	5.7	5.7	5.8
13.000	5.8	5.9	5.9	6.0	6.0
13.500	6.0	6.1	6.1	6.1	6.2
14.000	6.2	6.2	6.3	6.3	6.3
14.500	6.3	6.4	6.4	6.4	6.4
15.000	6.5	6.5	6.5	6.5	6.5
15.500	6.6	6.6	6.6	6.6	6.6
16.000	6.7	6.7	6.7	6.7	6.7
16.500	6.7	6.8	6.8	6.8	6.8
17.000	6.8	6.8	6.8	6.9	6.9

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	6.9	6.9	6.9	6.9	6.9
18.000	7.0	7.0	7.0	7.0	7.0
18.500	7.0	7.0	7.1	7.1	7.1
19.000	7.1	7.1	7.1	7.1	7.1
19.500	7.1	7.2	7.2	7.2	7.2
20.000	7.2	7.2	7.2	7.2	7.2
20.500	7.2	7.3	7.3	7.3	7.3
21.000	7.3	7.3	7.3	7.3	7.3
21.500	7.3	7.3	7.4	7.4	7.4
22.000	7.4	7.4	7.4	7.4	7.4
22.500	7.4	7.4	7.4	7.5	7.5
23.000	7.5	7.5	7.5	7.5	7.5
23.500	7.5	7.5	7.5	7.5	7.6
24.000	7.6	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time-Depth Curve: 1-year 24- Hour	
Label	1-year 24- Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.6	0.6
10.500	0.6	0.6	0.6	0.6	0.7
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	2.0	2.0	2.0	2.1
12.500	2.1	2.1	2.1	2.2	2.2
13.000	2.2	2.2	2.2	2.3	2.3
13.500	2.3	2.3	2.3	2.3	2.3
14.000	2.3	2.4	2.4	2.4	2.4
14.500	2.4	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.5	2.5	2.5
15.500	2.5	2.5	2.5	2.5	2.5
16.000	2.5	2.5	2.5	2.5	2.5
16.500	2.5	2.6	2.6	2.6	2.6
17.000	2.6	2.6	2.6	2.6	2.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.6	2.6	2.6	2.6	2.7
18.500	2.7	2.7	2.7	2.7	2.7
19.000	2.7	2.7	2.7	2.7	2.7
19.500	2.7	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.7	2.7
20.500	2.7	2.7	2.7	2.8	2.8
21.000	2.8	2.8	2.8	2.8	2.8
21.500	2.8	2.8	2.8	2.8	2.8
22.000	2.8	2.8	2.8	2.8	2.8
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.8	2.8	2.8	2.8
23.500	2.8	2.8	2.9	2.9	2.9
24.000	2.9	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: 25 Year	
Label	25 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.4	0.4	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.5	0.5	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.6	0.6
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.7	0.7	0.7	0.8	0.8
8.500	0.8	0.8	0.8	0.8	0.9
9.000	0.9	0.9	0.9	0.9	1.0
9.500	1.0	1.0	1.0	1.0	1.1
10.000	1.1	1.1	1.1	1.2	1.2
10.500	1.2	1.3	1.3	1.3	1.4
11.000	1.4	1.5	1.5	1.6	1.6
11.500	1.7	1.8	2.1	2.6	3.4
12.000	4.0	4.1	4.2	4.3	4.4
12.500	4.4	4.5	4.5	4.6	4.6
13.000	4.6	4.7	4.7	4.7	4.8
13.500	4.8	4.8	4.8	4.9	4.9
14.000	4.9	4.9	5.0	5.0	5.0
14.500	5.0	5.0	5.1	5.1	5.1
15.000	5.1	5.1	5.2	5.2	5.2
15.500	5.2	5.2	5.2	5.3	5.3
16.000	5.3	5.3	5.3	5.3	5.3
16.500	5.3	5.4	5.4	5.4	5.4
17.000	5.4	5.4	5.4	5.4	5.5

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	5.5	5.5	5.5	5.5	5.5
18.000	5.5	5.5	5.5	5.6	5.6
18.500	5.6	5.6	5.6	5.6	5.6
19.000	5.6	5.6	5.6	5.7	5.7
19.500	5.7	5.7	5.7	5.7	5.7
20.000	5.7	5.7	5.7	5.7	5.7
20.500	5.8	5.8	5.8	5.8	5.8
21.000	5.8	5.8	5.8	5.8	5.8
21.500	5.8	5.8	5.8	5.8	5.9
22.000	5.9	5.9	5.9	5.9	5.9
22.500	5.9	5.9	5.9	5.9	5.9
23.000	5.9	5.9	5.9	6.0	6.0
23.500	6.0	6.0	6.0	6.0	6.0
24.000	6.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time of Concentration Calculations
Label: POST-POA 1 BYPASS DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	200.00 ft
Manning's n	0.025
Slope	0.045 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	1.19 ft/s
Segment Time of Concentration	0.047 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	718.00 ft
Is Paved?	False
Slope	0.030 ft/ft
Average Velocity	2.79 ft/s
Segment Time of Concentration	0.071 hours

Segment #3: TR-55 Channel Flow	
Flow Area	2.0 ft²
Hydraulic Length	959.00 ft
Manning's n	0.025
Slope	0.020 ft/ft
Wetted Perimeter	4.47 ft
Average Velocity	4.93 ft/s
Segment Time of Concentration	0.054 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.172 hours

= = = = SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

= = = = SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

= = = = SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
Label: POST-POA 1 DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 1 DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

==== User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 1 DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	200.00 ft
Manning's n	0.025
Slope	0.045 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	1.19 ft/s
Segment Time of Concentration	0.047 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	718.00 ft
Is Paved?	False
Slope	0.030 ft/ft
Average Velocity	2.79 ft/s
Segment Time of Concentration	0.071 hours

Segment #3: TR-55 Channel Flow	
Flow Area	2.0 ft²
Hydraulic Length	959.00 ft
Manning's n	0.025
Slope	0.020 ft/ft
Wetted Perimeter	4.47 ft
Average Velocity	4.93 ft/s
Segment Time of Concentration	0.054 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.172 hours

= = = = SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

= = = = SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

= = = = SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Runoff CN-Area
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	0.020	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	0.100	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	15.000	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil B	61.000	15.360	0.0	0.0	61.000
Woods - good - Soil B	55.000	20.240	0.0	0.0	55.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	50.720	(N/A)	(N/A)	69.600

Subsection: Runoff CN-Area
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	0.410	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	0.170	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	0.580	(N/A)	(N/A)	92.724

Subsection: Runoff CN-Area
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	0.700	0.0	0.0	80.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil B	98.000	15.000	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil B	61.000	15.360	0.0	0.0	61.000
Woods - good - Soil B	55.000	20.240	0.0	0.0	55.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	51.300	(N/A)	(N/A)	69.711

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	50.720 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	12.036 hours
Flow (Peak, Computed)	40.01 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.050 hours
Flow (Peak Interpolated Output)	39.03 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	50.720 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	2.696 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.685 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	333.59 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 BYPASS DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	10 Year
Return Event	10 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	50.720 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	12.013 hours
Flow (Peak, Computed)	141.50 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	141.13 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	50.720 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	8.733 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	8.705 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	333.59 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 BYPASS DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	25 Year
Return Event	25 years
Duration	24.000 hours
Depth	6.0 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	50.720 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	11.990 hours
Flow (Peak, Computed)	192.89 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	192.77 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	50.720 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.8 in
Runoff Volume (Pervious)	11.857 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	11.822 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	333.59 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 BYPASS DA
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	100 Year
Return Event	100 years
Duration	24.000 hours
Depth	7.6 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	50.720 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	11.990 hours
Flow (Peak, Computed)	281.68 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	280.74 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	50.720 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	17.282 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	17.234 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	333.59 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 BYPASS DA
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.580 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	1.88 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.900 hours
Flow (Peak Interpolated Output)	1.83 ft³/s

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	0.580 acres
Maximum Retention (Pervious)	0.8 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	0.102 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.102 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	7.89 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	10 Year
Return Event	10 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.580 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	3.60 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.900 hours
Flow (Peak Interpolated Output)	3.53 ft³/s

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	0.580 acres
Maximum Retention (Pervious)	0.8 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	0.205 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.205 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	7.89 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	25 Year
Return Event	25 years
Duration	24.000 hours
Depth	6.0 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.580 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	4.36 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.900 hours
Flow (Peak Interpolated Output)	4.27 ft³/s

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	0.580 acres
Maximum Retention (Pervious)	0.8 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	0.250 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.250 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	7.89 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 DA
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	100 Year
Return Event	100 years
Duration	24.000 hours
Depth	7.6 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.580 acres

Computational Time Increment	0.011 hours
Time to Peak (Computed)	11.922 hours
Flow (Peak, Computed)	5.57 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	11.900 hours
Flow (Peak Interpolated Output)	5.47 ft³/s

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	0.580 acres
Maximum Retention (Pervious)	0.8 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.7 in
Runoff Volume (Pervious)	0.325 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.325 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	7.89 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-POA 1 DA
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Storm Event	1-year 24- Hour
Return Event	1 years
Duration	24.000 hours
Depth	2.9 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	51.300 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	12.036 hours
Flow (Peak, Computed)	40.47 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.050 hours
Flow (Peak Interpolated Output)	39.48 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	51.300 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	2.727 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.716 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	337.40 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	10 Year
Return Event	10 years
Duration	24.000 hours
Depth	5.0 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	51.300 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	12.013 hours
Flow (Peak, Computed)	143.12 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	142.75 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	51.300 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	8.832 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	8.805 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	337.40 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-POA 1 DA
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	25 Year
Return Event	25 years
Duration	24.000 hours
Depth	6.0 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	51.300 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	11.990 hours
Flow (Peak, Computed)	195.10 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	194.97 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	51.300 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.8 in
Runoff Volume (Pervious)	11.992 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	11.957 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	337.40 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-POA 1 DA
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Storm Event	100 Year
Return Event	100 years
Duration	24.000 hours
Depth	7.6 in
Time of Concentration (Composite)	0.172 hours
Area (User Defined)	51.300 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	11.990 hours
Flow (Peak, Computed)	284.91 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.000 hours
Flow (Peak Interpolated Output)	283.95 ft³/s

Drainage Area	
SCS CN (Composite)	70.000
Area (User Defined)	51.300 acres
Maximum Retention (Pervious)	4.3 in
Maximum Retention (Pervious, 20 percent)	0.9 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	17.479 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	17.431 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.172 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	337.40 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-POA 1 DA
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.115 hours
Unit receding limb, Tr	0.459 hours
Total unit time, Tb	0.574 hours

Subsection: Time vs. Volume
Label: WET POND
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	0.000	0.000	0.000
0.750	0.000	0.000	0.000	0.000	0.000
1.000	0.000	0.000	0.000	0.000	0.000
1.250	0.000	0.000	0.000	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.001	0.001	0.001
4.250	0.001	0.001	0.001	0.001	0.001
4.500	0.001	0.001	0.001	0.001	0.001
4.750	0.001	0.001	0.001	0.001	0.001
5.000	0.001	0.001	0.001	0.002	0.002
5.250	0.002	0.002	0.002	0.002	0.002
5.500	0.002	0.002	0.002	0.002	0.002
5.750	0.002	0.003	0.003	0.003	0.003
6.000	0.003	0.003	0.003	0.003	0.003
6.250	0.003	0.004	0.004	0.004	0.004
6.500	0.004	0.004	0.004	0.004	0.004
6.750	0.004	0.005	0.005	0.005	0.005
7.000	0.005	0.005	0.005	0.005	0.006
7.250	0.006	0.006	0.006	0.006	0.006
7.500	0.006	0.007	0.007	0.007	0.007
7.750	0.007	0.007	0.007	0.008	0.008
8.000	0.008	0.008	0.008	0.008	0.008
8.250	0.009	0.009	0.009	0.009	0.009
8.500	0.010	0.010	0.010	0.010	0.010
8.750	0.011	0.011	0.011	0.011	0.012
9.000	0.012	0.012	0.012	0.013	0.013
9.250	0.013	0.013	0.014	0.014	0.014
9.500	0.015	0.015	0.015	0.015	0.016
9.750	0.016	0.016	0.017	0.017	0.017
10.000	0.018	0.018	0.018	0.019	0.019
10.250	0.019	0.020	0.020	0.021	0.021

Subsection: Time vs. Volume
Label: WET POND
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.022	0.022	0.022	0.023	0.024
10.750	0.024	0.025	0.025	0.026	0.026
11.000	0.027	0.028	0.029	0.029	0.030
11.250	0.031	0.032	0.033	0.034	0.035
11.500	0.036	0.038	0.039	0.041	0.043
11.750	0.046	0.049	0.052	0.055	0.057
12.000	0.057	0.055	0.051	0.048	0.046
12.250	0.045	0.044	0.043	0.042	0.042
12.500	0.041	0.041	0.041	0.041	0.040
12.750	0.040	0.040	0.040	0.040	0.040
13.000	0.040	0.040	0.040	0.040	0.039
13.250	0.039	0.039	0.039	0.039	0.039
13.500	0.039	0.039	0.039	0.039	0.039
13.750	0.039	0.039	0.039	0.039	0.039
14.000	0.039	0.039	0.039	0.039	0.039
14.250	0.039	0.039	0.039	0.039	0.039
14.500	0.039	0.039	0.039	0.039	0.039
14.750	0.039	0.039	0.039	0.039	0.039
15.000	0.039	0.039	0.039	0.039	0.039
15.250	0.039	0.039	0.039	0.039	0.039
15.500	0.039	0.039	0.039	0.039	0.039
15.750	0.039	0.039	0.039	0.039	0.038
16.000	0.038	0.038	0.038	0.038	0.038
16.250	0.038	0.038	0.038	0.038	0.038
16.500	0.038	0.038	0.038	0.038	0.038
16.750	0.038	0.038	0.038	0.038	0.038
17.000	0.038	0.038	0.038	0.038	0.038
17.250	0.038	0.038	0.038	0.038	0.038
17.500	0.038	0.038	0.038	0.038	0.038
17.750	0.038	0.038	0.038	0.038	0.038
18.000	0.038	0.038	0.038	0.038	0.038
18.250	0.038	0.038	0.038	0.038	0.038
18.500	0.038	0.038	0.038	0.038	0.038
18.750	0.038	0.038	0.038	0.038	0.038
19.000	0.038	0.038	0.038	0.038	0.038
19.250	0.038	0.038	0.038	0.038	0.038
19.500	0.038	0.038	0.038	0.038	0.038
19.750	0.038	0.038	0.038	0.038	0.038
20.000	0.038	0.038	0.038	0.038	0.038
20.250	0.038	0.038	0.038	0.038	0.038
20.500	0.038	0.038	0.038	0.038	0.038
20.750	0.038	0.038	0.038	0.038	0.038

Subsection: Time vs. Volume
Label: WET POND
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.038	0.038	0.038	0.038	0.038
21.250	0.038	0.038	0.038	0.038	0.038
21.500	0.038	0.038	0.038	0.038	0.038
21.750	0.038	0.038	0.038	0.038	0.038
22.000	0.038	0.038	0.038	0.038	0.038
22.250	0.038	0.038	0.038	0.038	0.038
22.500	0.038	0.038	0.038	0.038	0.038
22.750	0.038	0.038	0.038	0.038	0.038
23.000	0.038	0.038	0.038	0.038	0.038
23.250	0.038	0.038	0.038	0.038	0.038
23.500	0.038	0.038	0.038	0.038	0.038
23.750	0.038	0.038	0.038	0.038	0.038
24.000	0.038	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Elevation-Area Volume Curve
Label: WET POND
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Elevation (ft)	Planimeter (ft²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
417.00	0.0	0.037	0.000	0.000	0.000
418.00	0.0	0.044	0.122	0.041	0.041
419.00	0.0	0.053	0.146	0.049	0.089

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	417.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	419.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 2	Forward	Culvert - 1	417.94	419.00
Inlet Box	Riser - 1	Forward	Culvert - 1	418.19	419.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	417.09	419.00
Culvert-Circular	Culvert - 1	Forward	TW	417.09	419.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	17.00 ft
Length (Computed Barrel)	17.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	0.000
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	417.09 ft	T1 Flow	4.80 ft³/s
T2 Elevation	418.58 ft	T2 Flow	5.49 ft³/s

Structure ID: Riser - 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	418.19 ft
Orifice Area	6.0 ft²
Orifice Coefficient	0.600
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	417.09 ft
Orifice Diameter	0.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	417.94 ft
Orifice Area	0.5 ft²
Top Elevation	418.19 ft
Datum Elevation	417.94 ft
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

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Pond Inflow Summary
Label: WET POND (IN)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Summary for Hydrograph Addition at 'WET POND'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-POA 1 DA

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Flow (From)	POST-POA 1 DA	0.205	11.900	3.53
Flow (In)	WET POND	0.205	11.900	3.53

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