Hydrology Study for:

CUMMING UTILITIES

Dated:

August 9, 2023

Prepared By:

Land Development Professionals

130 Prominence Court

Dawsonville, Georgia 30534

Table of Contents

Narrative

The Site is located at Mountain Road, Cumming, Forsyth Georgia. It is an undeveloped 10.95 acre tract. The proposed land use is a laydown yard for the City of Cumming Utilities. The laydown yard will be graveled with a heavy duty paved access drive. The offsite drainage areas are minimal as shown on the pre and post development maps. There is one drainage basin containing offsite and on site run off.

Stormwater modeling was performed with the "HydroCAD" modeling software package, a variable tailwater hydrograph routing software that combines elements of TR-20 with fundamental reach routing and pond routing principles. A copy of the software inputs and outputs are included in **Appendix D**.

24-hour rainfall totals for the model were taken from the NOAA Precipitation Frequency Data Server for the site location

The overall Total Suspended Solid (TSS) load percentage for the project site was calculated using accepted spreadsheet tools developed by the Atlanta Regional Commission. This analysis provides credit based on better site design methods and on the effect of treatment trains. A copy of the TSS load rate calculation is provided in **Appendix B**.

Water Quality of 100% of the first 1.0 inch of rainfall is provided by the proposed storm water pond.

Vicinity Map

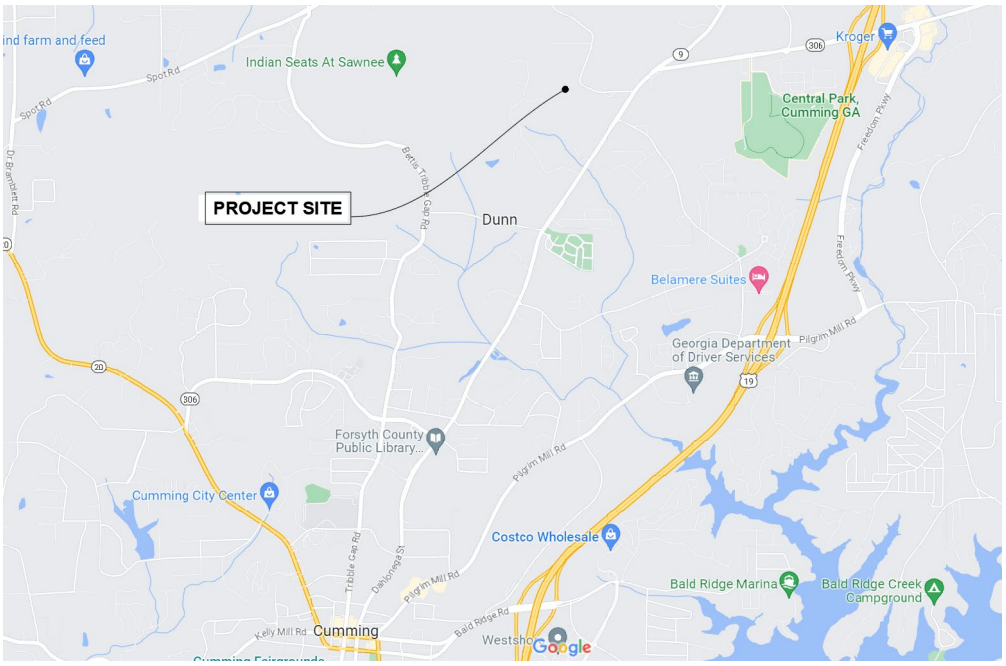


Figure 1 Vicinity Map

Discharge Summary

Discharge Summary

	Return Frequency (YR)	1	2	5	10	25	50	100
	Rainfall (in)	3.38	3.84	4.6	5.23	6.11	6.79	7.48
Study Point A	Predevelopment (cfs)	2.17	3.93	7.68	11.39	17.22	22.13	27.46
Study Point A	Post-Development Flow (cfs)	0.69	1.09	1.55	2.37	3.37	3.69	3.98

Proposed Project Scope:

The proposed project is a pipe laydown yard. The proposed infrastructure is a detention pond, OCS, and riprap apron.

BMPS's

In order to protect and enhance downstream environmental quality, temporary best management practices (BMPs) will be employed both during construction (temporary) and after construction is complete (permanent). Temporary BMPs will be identified and designed as part of the construction plan set's Erosion, Pollution, and Sedimentation Control Plan. A permanent Stormwater Pond is proposed for this project.

The Permanent provides all four methods of environmental protection as required by the Georgia Stormwater Management Manual; water quality treatment, downstream channel protection, overbank flood protection, and extreme flood protection.

Water Quality

Stormwater runoff from all the existing and proposed impervious surfaces in the project area will be directed to the detention pond, which provides water quality in a permanent wet pool of water equal to the water quality volume. Stormwater runoff displaces the water already present in the pool.

The stormwater detention pond provides a 80% reduction in TSS, meeting the regulatory threshold. Calculations for this TSS reduction were performed utilizing the Georgia Stormwater Management Manual Stormwater Quality Site Development Review Tool, version 2.2, and are appended for reference.

The water quality volume has been calculated as follows:

WATER QUALITY CALCULATIONS

WATER QUALITY STORAGE CALC

WQ	**2480.0**	**CF**	
Rv	0.150		
Impervious surface percentage	0.112		
On-Impervious Drainage Area	0.569	24800	SF
Total onsite Drainage Area A	5.100		

WQ=
1.2"* impervious surface

Using the proposed pond storage volume, the permanent pool elevation (Water Quality Storage) will be 1158.50.

Channel Protection

To prevent an increase in downstream channel scour from the development, the runoff volume of the 1 year storm has been captured and drawn down over a period of 24 hours in the existing detention pond, in accordance with guidelines set by the GSMM. The channel protection volume for the 1-Year rainfall @ 3.38" is 0.219 AF. The required 6" channel protection orifice would be at 1260.9

Overbank Flood Protection and Extreme Flood Protection

A downstream hydrologic assessment for the overbank and extreme flood protection includes an unnamed tributary to Baldridge Creek. Overbank flood and Extreme Flood Protection are provided by the proposed stormwater management pond.

Stormwater Management Design Methodology

Stormwater modeling was performed with the "HydroCAD" modeling software package, a variable tailwater hydrograph routing software that combines elements of TR-20 with fundamental reach routing and pond routing principles. A copy of the software inputs and outputs are included in **Appendix D**.

24-hour rainfall totals for the model were taken from the NOAA Precipitation Frequency Data Server for the site location

The overall Total Suspended Solid (TSS) load percentage for the project site was calculated using accepted spreadsheet tools developed by the Atlanta Regional Commission. This analysis provides credit based on better site design methods and on the effect of treatment trains. A copy of the TSS load rate calculation is provided in **Appendix B**.

Water Quality Volume was calculated from the equation provided in the GSMM., and *Channel Protection* volume was calculated by methodologies within the GSMM. Copies of these spreadsheets for each pond are included in **Appendix B**.

Peak discharge calculations were performed using methodology from the Natural Resource Conservation Service's Technical Release 20, (NRCS TR-20) typically referred to as "the SCS

Method." Watersheds were delineated on field run survey where available, and on USGS Quadrangle Maps where not available.
Stormwater modeling was performed with the "HydroCAD" modeling software package, a variable tailwater hydrograph routing software that combines elements of TR-20 with fundamental reach routing and pond routing principles. A copy of the software inputs and outputs are included in **Appendix D**.

24-hour rainfall totals for the model were taken from the NOAA Precipitation Frequency Data Server for the site location.

Proposed Pond Stage Storage

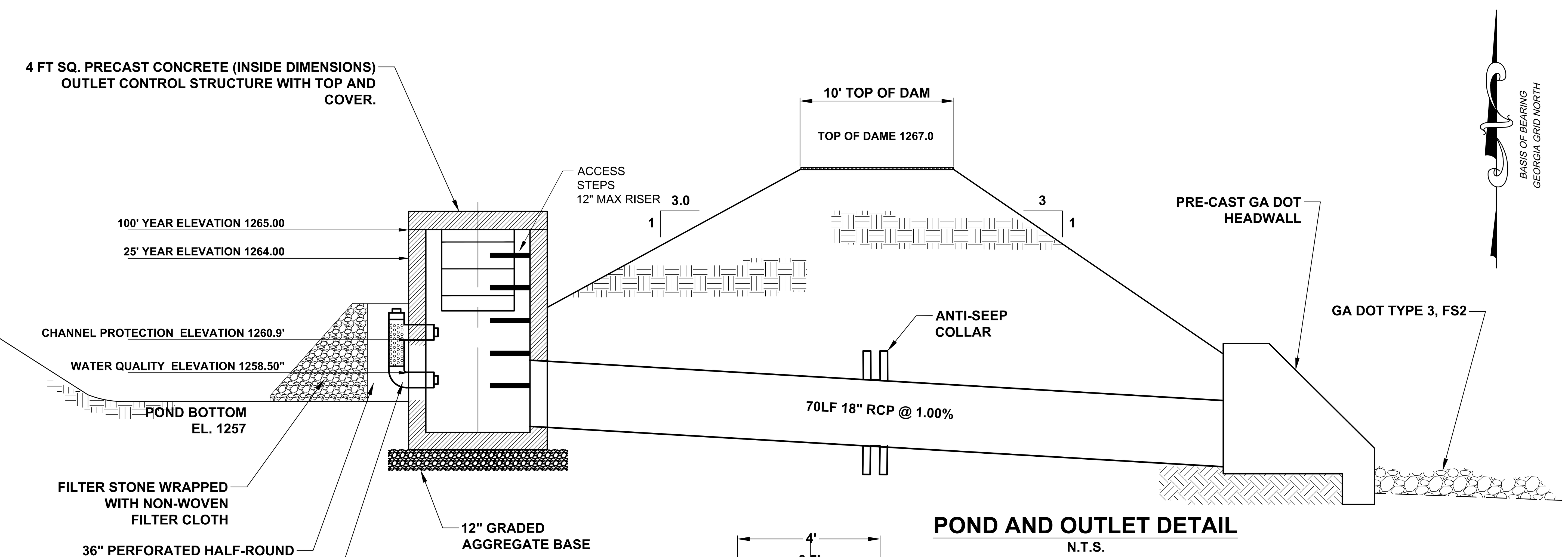
Elevation (feet)	Cum.Store (acre-feet)
1,257.00	0.000
1,258.00	0.090
1,259.00	0.167
1,260.00	0.250
1,261.00	0.375
1,262.00	0.514
1,263.00	0.689
1,264.00	0.874
1,265.00	1.359
1,266.00	1.712
1,267.00	2.498

All stormwater management requirements have been satisfied with the existing wet detention pond. Water quality and Channel Protection are adequately designed to meet GSMM requirements.

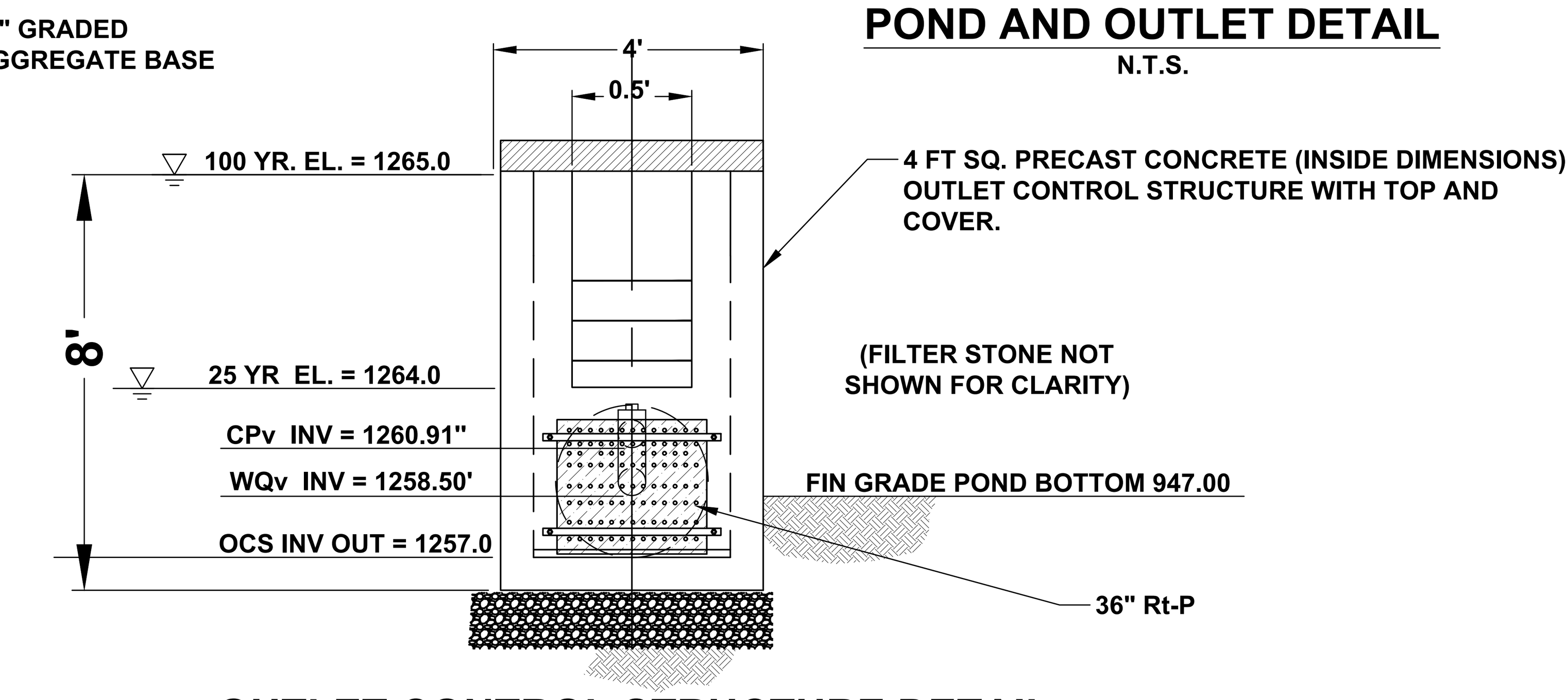
Stormwater Detention Pond

	3Do	La	W	Do
St	4.5'	11'	15.5'	.2'

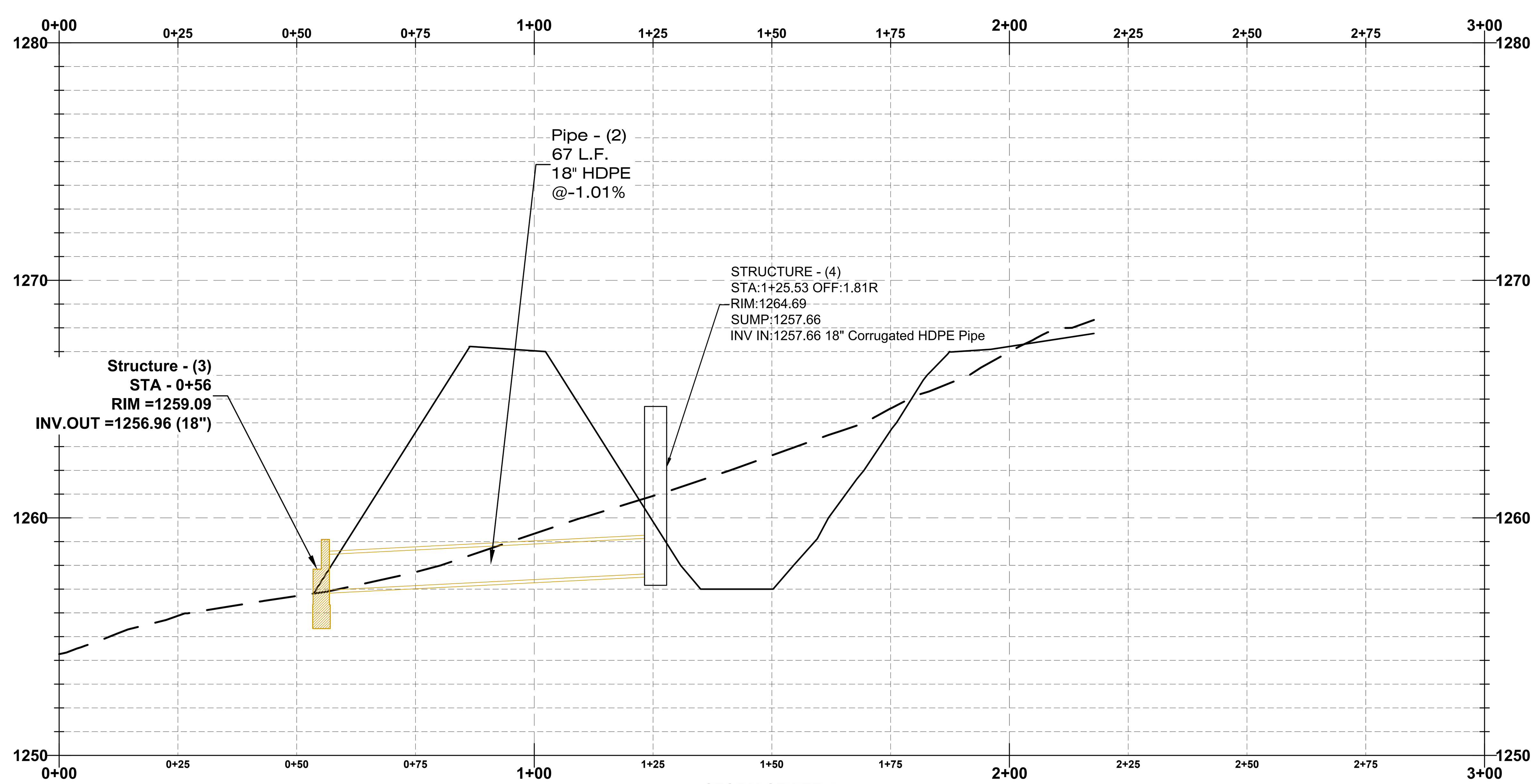
SCALE IN FEET
0 20' 40'
SCALE: 1" = 20'-0"



POND AND OUTLET DETAIL
N.T.S.



OUTLET CONTROL STRUCTURE DETAIL
N.T.S.



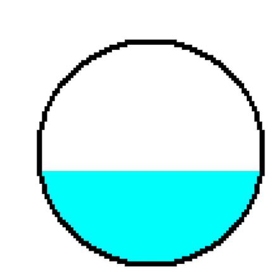
STORM SEWER A
STAT 0+00 - 3+00
SCALE: VERT 1"=8
HORZ 1"=40

Inflow Area = 11.800 ac, 5.08% Impervious, Inflow Depth > 2.19" for 100-yr event
Inflow = 3.98 cfs @ 13.83 hrs, Volume= 2.156 af
Outflow = 3.98 cfs @ 13.82 hrs, Volume= 2.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.87 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.51 fps, Avg. Travel Time= 0.2 min

Peak Storage= 47 cf @ 13.82 hrs
Average Depth at Peak Storage= 0.61', Surface Width= 1.47'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.38 cfs

18.0" Round Pipe
n= 0.012 Corrugated PP, smooth interior
Length= 70.0' Slope= 0.0100 '/'
Inlet Invert= 1,257.66', Outlet Invert= 1,256.96'



BASIS OF BEARING
GEORGIA GRID NORTH

LAND SURVEYING AND PLANNING
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LDP
LAND DEVELOPMENT PROFESSIONALS

June 27, 2023
FIELD CREW: LDP
DRAWN BY: DRS
Job Number: 5151.001
DRWG FILE: 5151
FIELD DATE: 6/13/2023
Checked By: LDP

Rev. No. | Date: | Description:

NOT FOR CONSTRUCTION

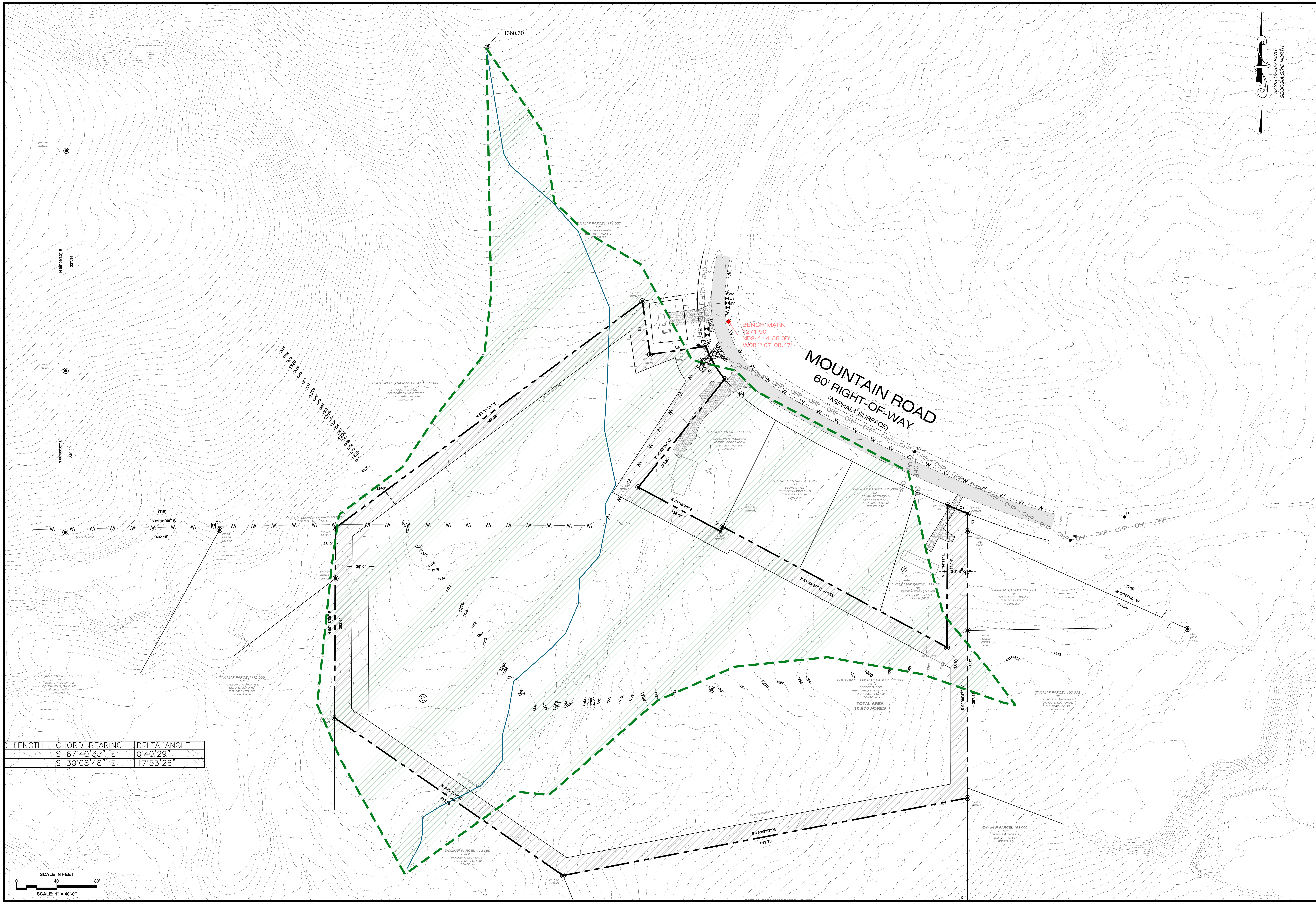
GEORGIA REGISTERED PROFESSIONAL SURVEYOR
DOUGLAS R. SHERRILL

CITY OF CUMMING:
DETENTION POND DETAILS
Located in: Land Lots 833 & 896 - 3rd District - 1st Section, Forsyth County, Georgia

Sheet No.
1-C-3

Drainage Basin Exhibits

Predevelopment Drainage Basin



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CUMMING UTILITIES

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6/13/2023
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Rev. No.	Date:	Description:

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CITY OF CUMMING:

PREDEVELOPED DRAINAGE PLAN

Located in:
Land Lots 833 & 896 - 3rd District - 1st Section
Forsyth County, Georgia

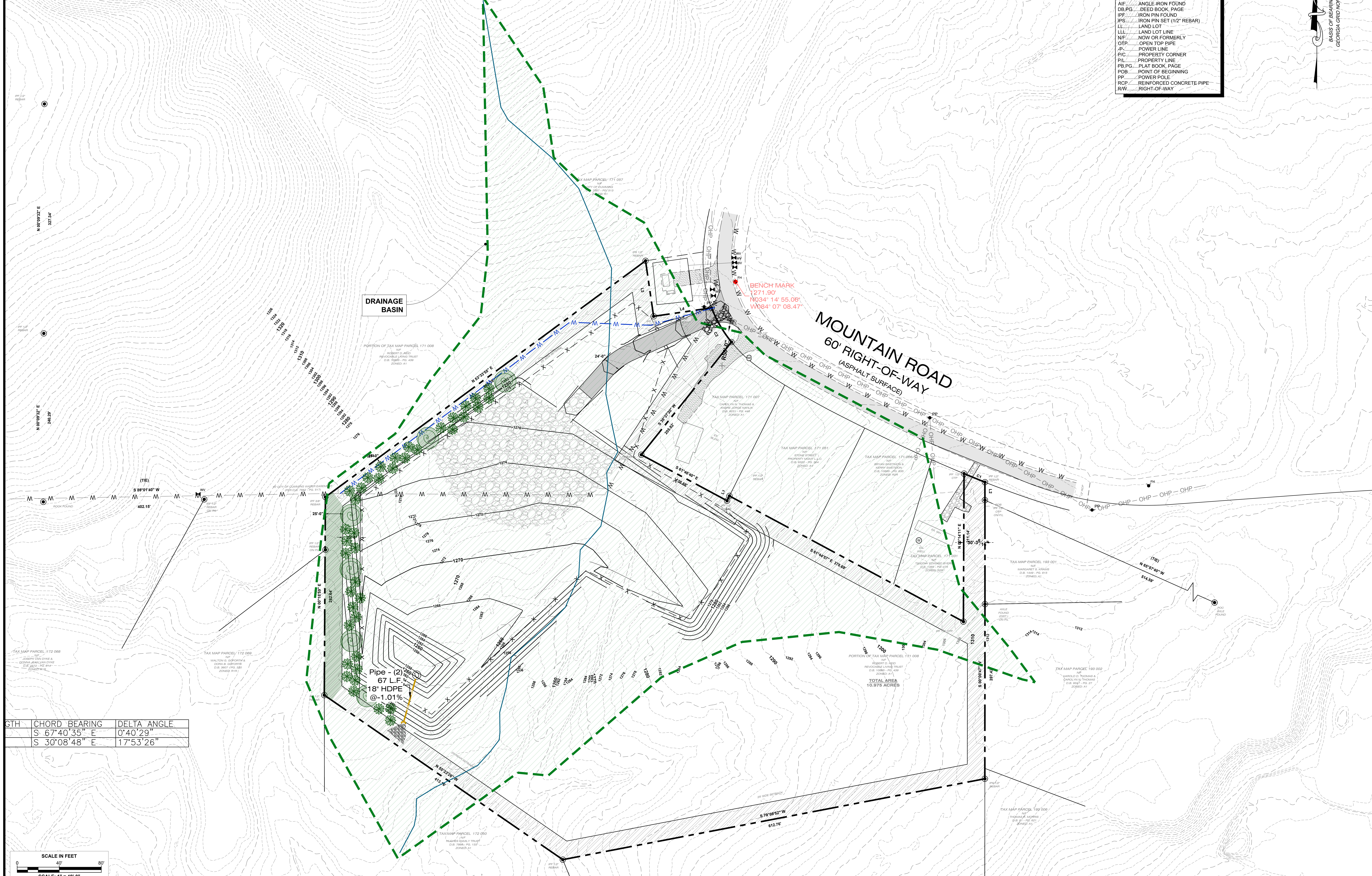
Sheet No.

1-C-2

Post-Development Drainage Basin Exhibit

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
volumes	**1.000**	1.150	172329.23 Sq. Ft.	11868.79 Cu. Yd.	11906.01 Cu. Yd.	37.21 Cu. Yd.<Fill>
Totals			172329.23 Sq. Ft.	11868.79 Cu. Yd.	11906.01 Cu. Yd.	37.21 Cu. Yd.<Fill>



LEGEND

AIF..........ANGLE IRON FOUND
DB,PG......DEED BOOK, PAGE
IPF..........IRON PIN FOUND
IPS..........IRON PIN SET (1/2" REBAR)
LL............LAND LOT
LLL..........LAND LOT LINE
N/F..........NOW OR FORMERLY
OTP.........OPEN TOP PIPE
-P-...........POWER LINE
P/C..........PROPERTY CORNER
P/L..........PROPERTY LINE
PB,PG.....PLAT BOOK, PAGE
POB........POINT OF BEGINNING
PP...........POWER POLE
RCP........REINFORCED CONCRETE PIPE
R/W.........RIGHT-OF-WAY

GTH	CHORD BEARING	DELTA ANGLE
	S 67°40'35" E	0°40'29"
	S 30°08'48" E	17°53'26"

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GEORGIA REGISTERED No. 2995 Professional SURVEYOR DOUGLAS R. SHERRILL

CITY OF CUMMING:
POST DEVELOPED DRAINAGE BASIN

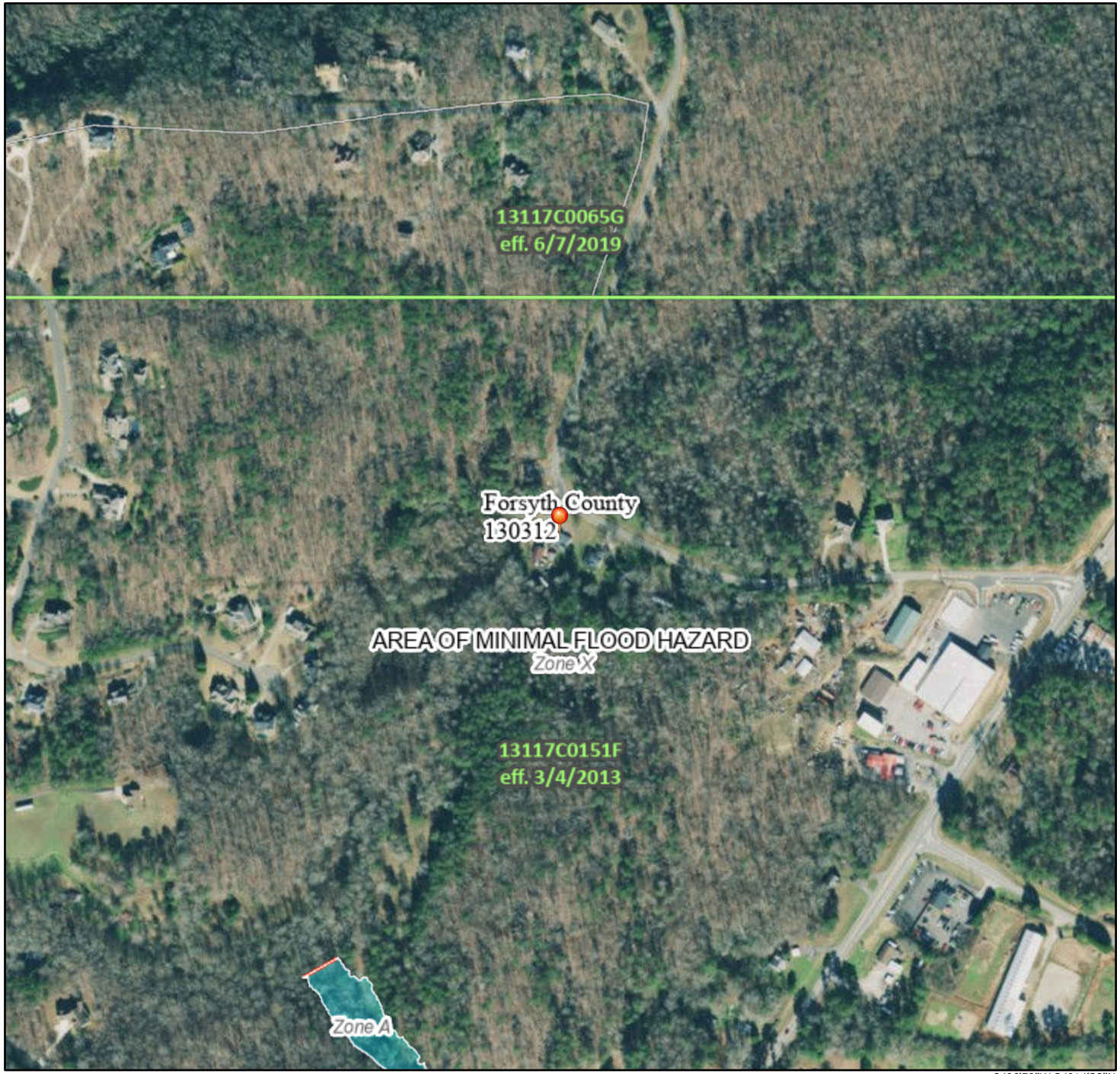
Located In:
Land Lots 833 & 896 - 3rd District - 1st Section
Forsyth County, Georgia

Sheet No.
1-C-2

Firmette

National Flood Hazard Layer FIRMette

84°7'27"W 34°15'8"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

84°6'50"W 34°14'38"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

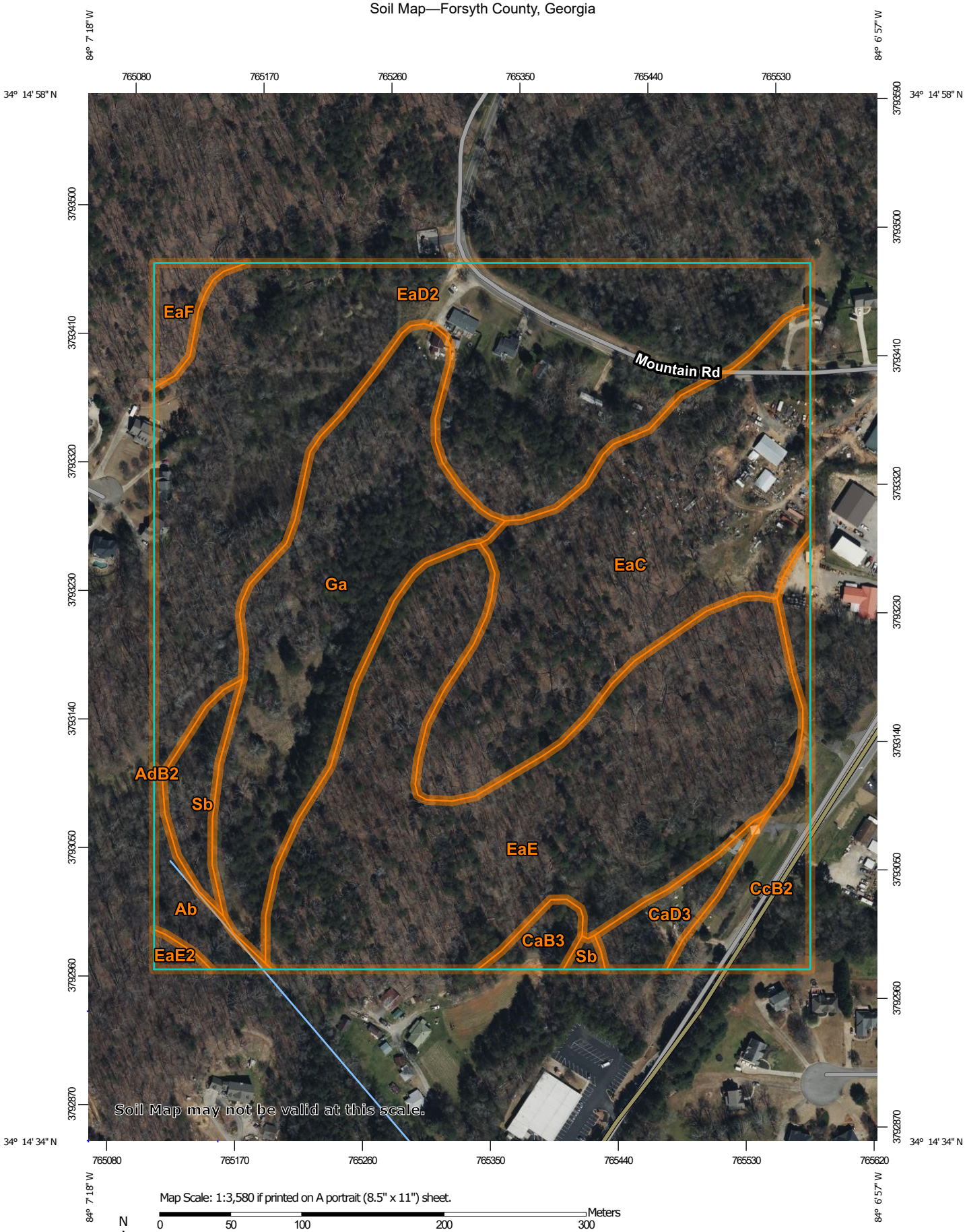
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/28/2023 at 8:01 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soils Information



Map Scale: 1:3,580 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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 1:20,000.

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: Forsyth County, Georgia
Survey Area Data: Version 15, Sep 13, 2022

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

Date(s) aerial images were photographed: Mar 14, 2022—Jun 21, 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
Ab	Toccoa and Chewacla soils, 0 to 2 percent slopes, occasionally flooded	0.9	1.6%
AdB2	Appling sandy clay loam, eroded very gently sloping phase	0.0	0.0%
CaB3	Cecil clay loam, severely eroded very gently sloping phase	0.5	0.9%
CaD3	Cecil clay loam, severely eroded sloping phase	1.0	1.7%
CcB2	Cecil sandy loam, 2 to 6 percent slopes, moderately eroded	2.4	4.3%
EaC	Edgemont stony sandy loam, gently sloping phase	10.4	18.4%
EaD2	Edgemont stony sandy loam, eroded sloping phase	16.1	28.4%
EaE	Edgemont stony sandy loam, moderately steep phase	15.0	26.6%
EaE2	Edgemont stony sandy loam, eroded moderately steep phase	0.2	0.3%
EaF	Edgemont stony sandy loam, steep phase	0.6	1.1%
Ga	Gullied land, acid materials	8.3	14.7%
Sb	Severely gullied land	1.1	2.0%
Totals for Area of Interest		**56.6**	**100.0%**

Site Development Tool

IDF Curve

5/20/2020 Precipitation Frequency Data Server

NOAA Atlas 14, Volume 9, Version 2
Location name: Cumming, Georgia, USA*
Latitude: 34.2042°, Longitude: -84.1396°
Elevation: 1203.23 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

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	0.416 (0.333-0.520)	0.477 (0.382-0.596)	0.578 (0.462-0.724)	0.665 (0.528-0.835)	0.788 (0.615-1.01)	0.886 (0.680-1.14)	0.988 (0.738-1.29)	1.09 (0.794-1.45)	1.23 (0.873-1.66)	1.34 (0.933-1.82)
10-min	0.609 (0.488-0.761)	0.698 (0.559-0.873)	0.847 (0.677-1.06)	0.974 (0.775-1.22)	1.15 (0.900-1.48)	1.30 (0.995-1.67)	1.44 (1.08-1.89)	1.60 (1.16-2.12)	1.80 (1.28-2.43)	1.96 (1.37-2.67)
15-min	0.743 (0.595-0.928)	0.851 (0.681-1.06)	1.03 (0.825-1.29)	1.19 (0.945-1.49)	1.41 (1.10-1.80)	1.58 (1.21-2.04)	1.76 (1.32-2.30)	1.95 (1.42-2.58)	2.20 (1.56-2.96)	2.39 (1.67-3.25)
30-min	1.04 (0.834-1.30)	1.20 (0.957-1.50)	1.45 (1.16-1.82)	1.67 (1.33-2.10)	1.98 (1.54-2.53)	2.22 (1.70-2.86)	2.46 (1.85-3.22)	2.72 (1.98-3.61)	3.06 (2.17-4.13)	3.33 (2.32-4.52)
60-min	1.33 (1.07-1.67)	1.52 (1.22-1.90)	1.84 (1.47-2.30)	2.11 (1.68-2.65)	2.50 (1.96-3.21)	2.82 (2.16-3.64)	3.14 (2.36-4.11)	3.48 (2.54-4.62)	3.94 (2.80-5.32)	4.31 (3.00-5.85)
2-hr	1.63 (1.32-2.01)	1.85 (1.50-2.28)	2.23 (1.80-2.75)	2.56 (2.06-3.17)	3.03 (2.40-3.85)	3.42 (2.66-4.36)	3.82 (2.91-4.94)	4.24 (3.14-5.57)	4.82 (3.48-6.43)	5.29 (3.74-7.09)
3-hr	1.82 (1.49-2.23)	2.06 (1.68-2.52)	2.47 (2.01-3.03)	2.83 (2.29-3.48)	3.36 (2.68-4.23)	3.79 (2.97-4.80)	4.24 (3.26-5.45)	4.72 (3.53-6.16)	5.39 (3.93-7.14)	5.92 (4.22-7.88)
6-hr	2.24 (1.85-2.71)	2.52 (2.08-3.05)	3.01 (2.48-3.65)	3.44 (2.82-4.18)	4.06 (3.29-5.06)	4.58 (3.64-5.72)	5.11 (3.98-6.48)	5.68 (4.31-7.30)	6.47 (4.78-8.44)	7.09 (5.14-9.31)
12-hr	2.78 (2.33-3.32)	3.15 (2.63-3.76)	3.76 (3.14-4.49)	4.28 (3.56-5.13)	5.02 (4.11-6.15)	5.61 (4.52-6.91)	6.22 (4.90-7.76)	6.85 (5.27-8.58)	7.72 (5.78-9.92)	8.39 (6.17-10.9)
24-hr	3.38 (2.87-3.98)	3.84 (3.25-4.53)	4.60 (3.88-5.43)	5.23 (4.41-6.19)	6.11 (5.05-7.35)	6.79 (5.53-8.23)	7.48 (5.97-9.19)	8.19 (6.38-10.2)	9.13 (6.94-11.6)	9.85 (7.37-12.6)
2-day	3.97 (3.41-4.62)	4.51 (3.87-5.25)	5.40 (4.62-6.29)	6.14 (5.24-7.17)	7.17 (6.01-8.52)	7.98 (6.59-9.54)	8.79 (7.12-10.6)	9.62 (7.61-11.8)	10.7 (8.29-13.4)	11.6 (8.80-14.6)
3-day	4.37 (3.78-5.04)	4.93 (4.26-5.69)	5.87 (5.06-6.78)	6.66 (5.73-7.72)	7.79 (6.59-9.19)	8.68 (7.24-10.3)	9.59 (7.84-11.5)	10.5 (8.41-12.9)	11.8 (9.22-14.6)	12.8 (9.83-16.0)
4-day	4.72 (4.10-5.41)	5.28 (4.59-6.06)	6.25 (5.42-7.18)	7.08 (6.12-8.15)	8.27 (7.05-9.72)	9.23 (7.75-10.9)	10.2 (8.41-12.2)	11.2 (9.05-13.7)	12.7 (9.96-15.6)	13.8 (10.7-17.1)
7-day	5.61 (4.93-6.36)	6.21 (5.46-7.05)	7.25 (6.38-8.24)	8.17 (7.14-9.30)	9.50 (8.21-11.1)	10.6 (9.01-12.4)	11.7 (9.80-13.9)	12.9 (10.6-15.6)	14.6 (11.7-17.9)	16.0 (12.5-19.6)
10-day	6.37 (5.64-7.18)	7.03 (6.22-7.92)	8.16 (7.21-9.21)	9.16 (8.06-10.4)	10.6 (9.23-12.3)	11.8 (10.1-13.7)	13.1 (11.0-15.4)	14.4 (11.8-17.2)	16.2 (13.1-19.6)	17.7 (14.0-21.5)
20-day	8.52 (7.64-9.47)	9.39 (8.41-10.4)	10.8 (9.70-12.1)	12.1 (10.8-13.5)	13.9 (12.2-15.7)	15.3 (13.3-17.4)	16.7 (14.3-19.3)	18.2 (15.2-21.4)	20.3 (16.8-24.2)	21.9 (17.6-26.3)
30-day	10.5 (9.46-11.5)	11.5 (10.4-12.7)	13.2 (11.9-14.6)	14.6 (13.2-16.2)	16.6 (14.7-18.6)	18.1 (15.8-20.4)	19.6 (16.8-22.4)	21.1 (17.8-24.5)	23.2 (19.1-27.3)	24.7 (20.1-29.4)
45-day	13.1 (12.0-14.3)	14.4 (13.1-15.7)	16.4 (14.9-17.9)	17.9 (16.3-19.7)	20.0 (17.8-22.2)	21.6 (19.0-24.1)	23.1 (20.0-26.1)	24.5 (20.8-28.1)	26.4 (21.9-30.7)	27.7 (22.7-32.6)
60-day	15.6 (14.3-16.9)	17.0 (15.6-18.5)	19.2 (17.5-20.9)	20.9 (19.0-22.7)	23.0 (20.5-25.3)	24.5 (21.7-27.2)	25.9 (22.5-29.1)	27.2 (23.2-31.0)	28.8 (24.0-33.2)	29.8 (24.6-34.9)

[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.

Please refer to NOAA Atlas 14 document for more information.

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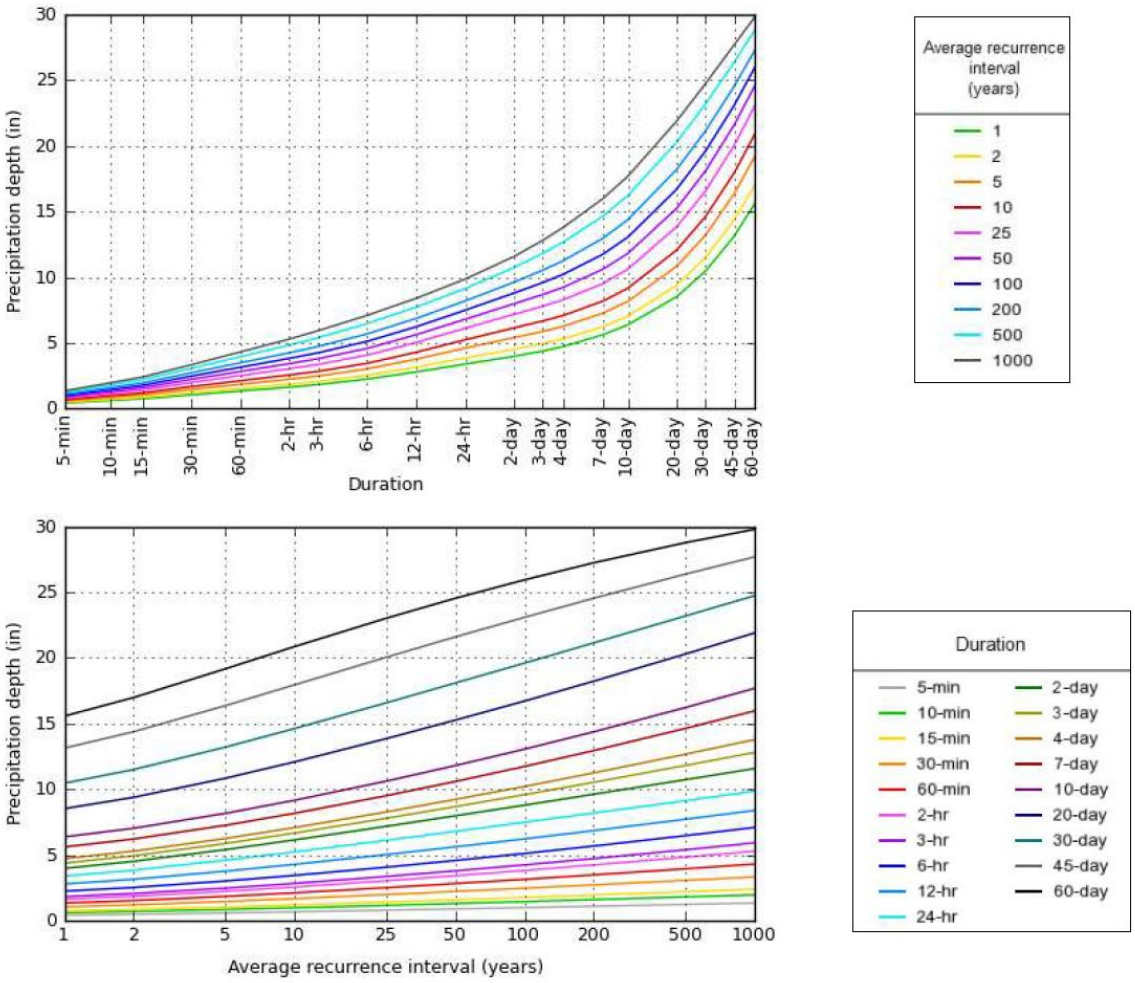
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.2042°, Longitude: -84.1396°



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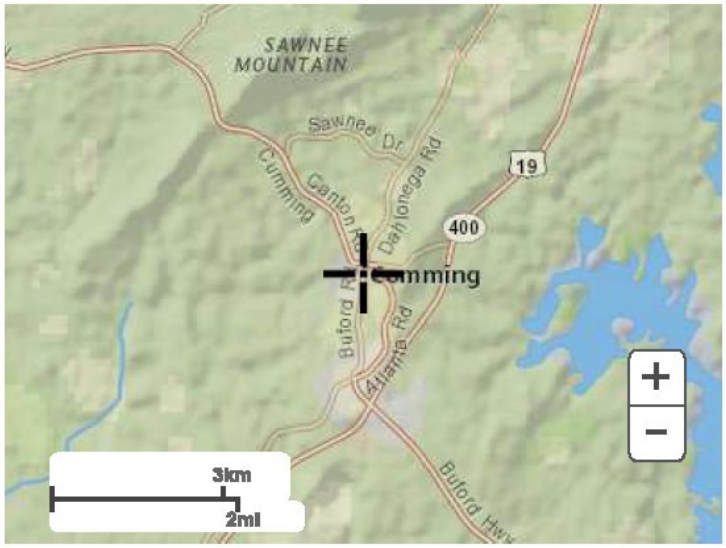
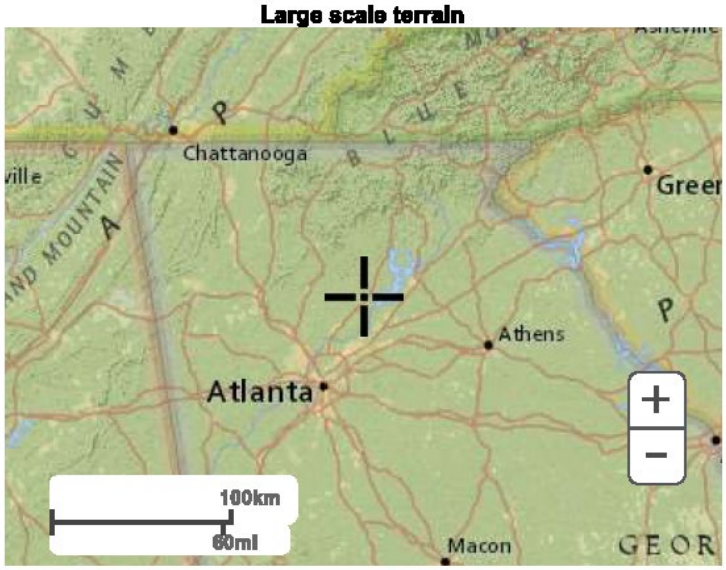
Maps & aerials

Small scale terrain

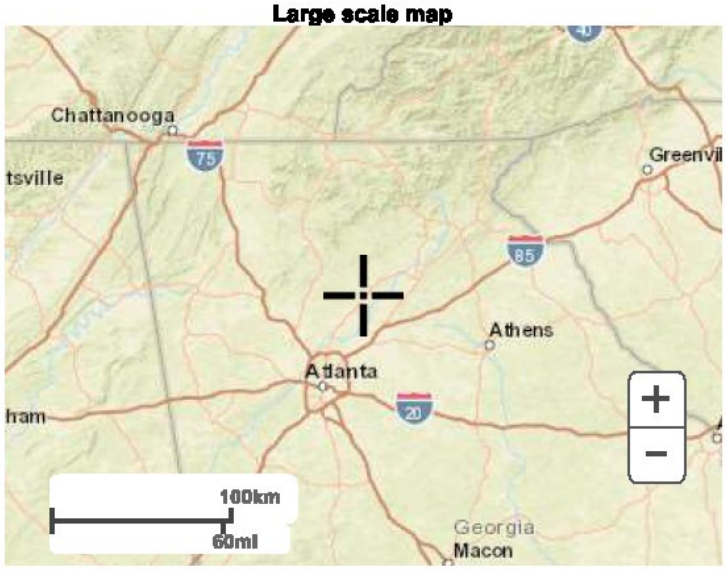
5/20/2020 Precipitation Frequency Data Server



Large scale terrain

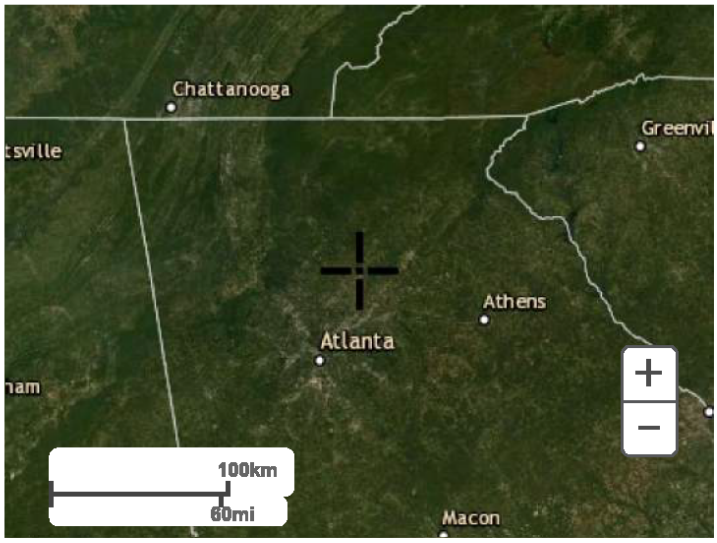


Large scale map



Large scale aerial

5/20/2020 Precipitation Frequency Data Server



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

BMP Tracking Forms:

Stormwater Pond					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
General Inspection					
Access to the site is adequately maintained for inspection and maintenance.					
Area is clean (trash, debris, grass clippings, etc. removed).					
Inlet Structure					
Drainage ways (overland flow or pipes) to the practice are free of trash, debris, large branches, etc.					
Area around the inlet structure is mowed and grass clippings are removed.					
No evidence of gullies, rills, or excessive erosion around the inlet structure.					
Inlet pipe is in good condition, and water is going through the structure (i.e. no evidence of water going around the structure).					
Diversion structure (high flow bypass structure or other) is free of trash, debris, or sediment. Comment on overall condition of diversion structure and list type.					
Pretreatment (choose one)					
Forebay – area is free of trash, debris, and sediment.					
Filter Strip or Grass Channels – area is free of trash debris and sediment. Area has been mowed and grass clippings are removed. No evidence of erosion.					
Rock Lined Plunge Pools – area is free of trash debris and sediment. Rock thickness in pool is adequate.					
Main Treatment					
Main treatment area is free of trash, debris, and sediment.					
Erosion protection is present on site (i.e. turf reinforcement mats). Comment on types of erosion protection and evaluate condition.					
No algal growth along or within the pond.					
Native plants were used in the practice according to the planting plan. No undesirable vegetation.					
Practice seems to be working properly. No settling around the stormwater pond.					

Stormwater Pond					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
Comment on overall condition of stormwater pond.					
Vegetation within and around practice is maintained per landscaping plan. Grass clippings are removed.					
No significant sediment accumulation within the practice.					
No evidence of use of fertilizer on plants (fertilizer crusting on the surface of the soil, tips of leaves turning brown or yellow, blackened roots, etc.).					
Plants seem to be healthy and in good condition. Comment on condition of plants.					
Emergency Overflow					
Emergency overflow is free of trash, debris, and sediment.					
No evidence of erosion, scour, flooding, or animal activity around the structure.					
No evidence of erosion, scour, or flooding around the structure.					
Outlet Structure					
Outlet structure is free of trash, debris, and sediment.					
No evidence of erosion, scour, or flooding around the structure.					
Outlet structure does not appear to be blocked.					
No evidence of animal activity.					
No evidence of seepage on the downstream face.					
Results					
Overall condition of Stormwater Pond:					
Additional Comments					
Notes: * If a specific maintenance item was not checked, please check N/A and explain why in the appropriate comment box.					

Project Notes

Rainfall events imported from "Detention Pond Assessment 2021.hcp"

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	3.38	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.84	2
3	5-yr	Type II 24-hr		Default	24.00	1	4.60	2
4	10-yr	Type II 24-hr		Default	24.00	1	5.23	2
5	25-yr	Type II 24-hr		Default	24.00	1	6.11	2
6	50-yr	Type II 24-hr		Default	24.00	1	6.79	2
7	100-yr	Type II 24-hr		Default	24.00	1	7.48	2

Summary for Subcatchment 1S: PRE-DEVELOPMENT

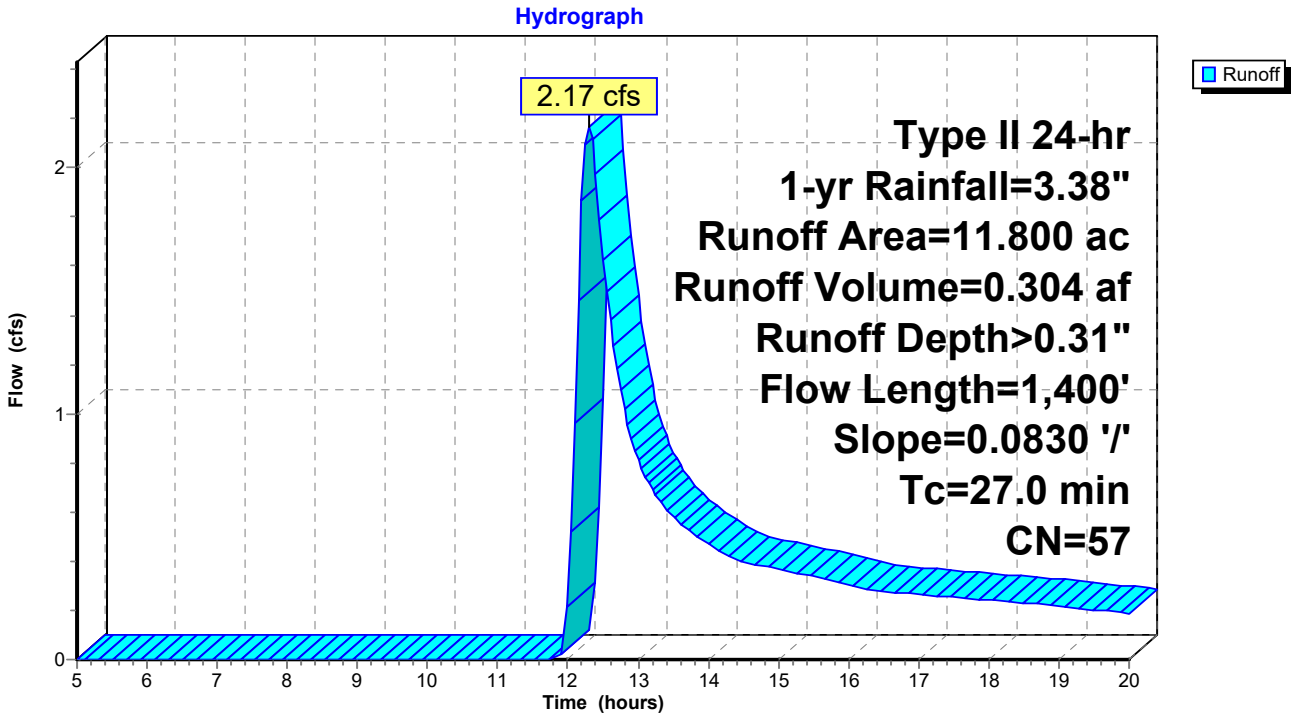
Runoff = 2.17 cfs @ 12.30 hrs, Volume= 0.304 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=3.38"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

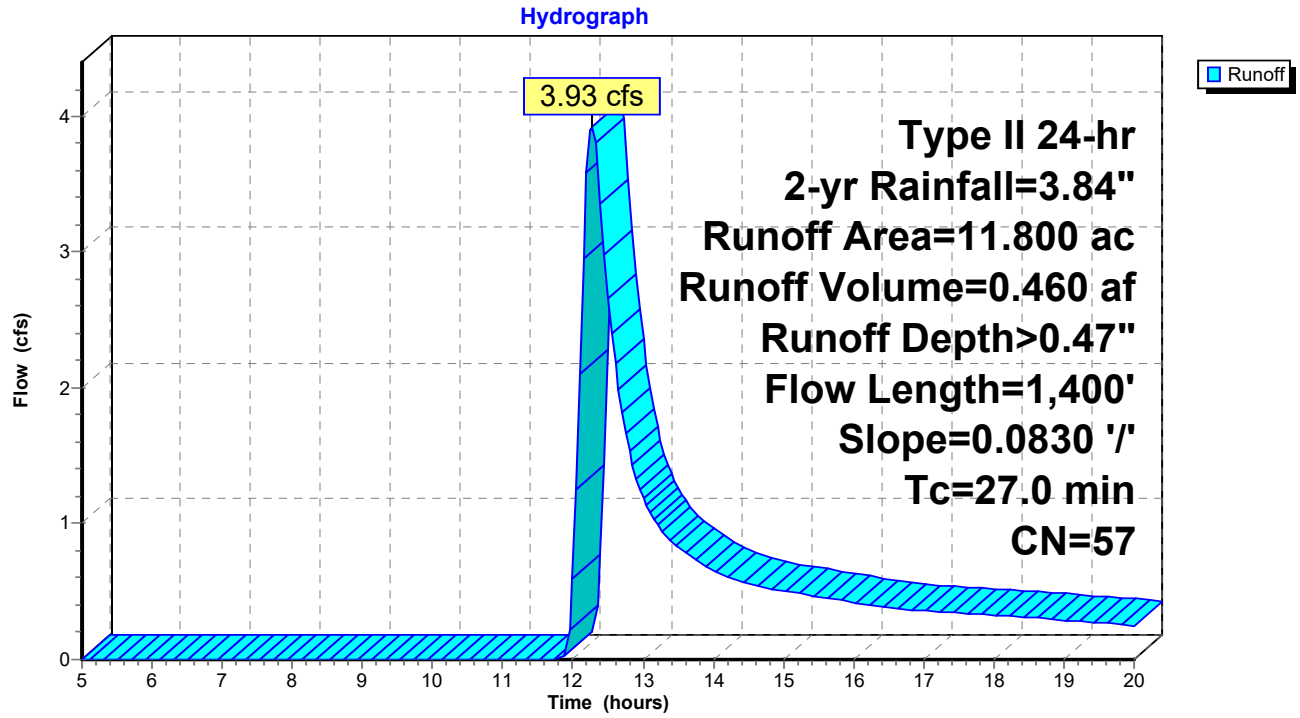
Runoff = 3.93 cfs @ 12.28 hrs, Volume= 0.460 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.84"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

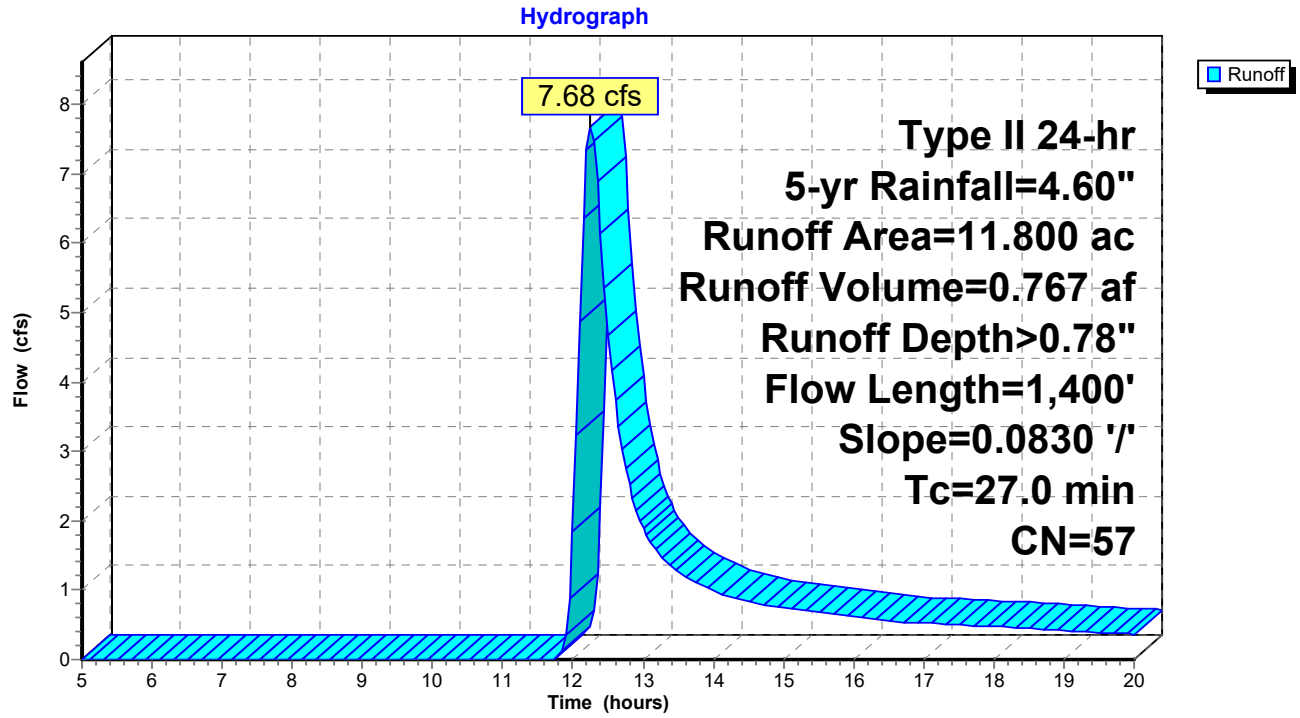
Runoff = 7.68 cfs @ 12.26 hrs, Volume= 0.767 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-yr Rainfall=4.60"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

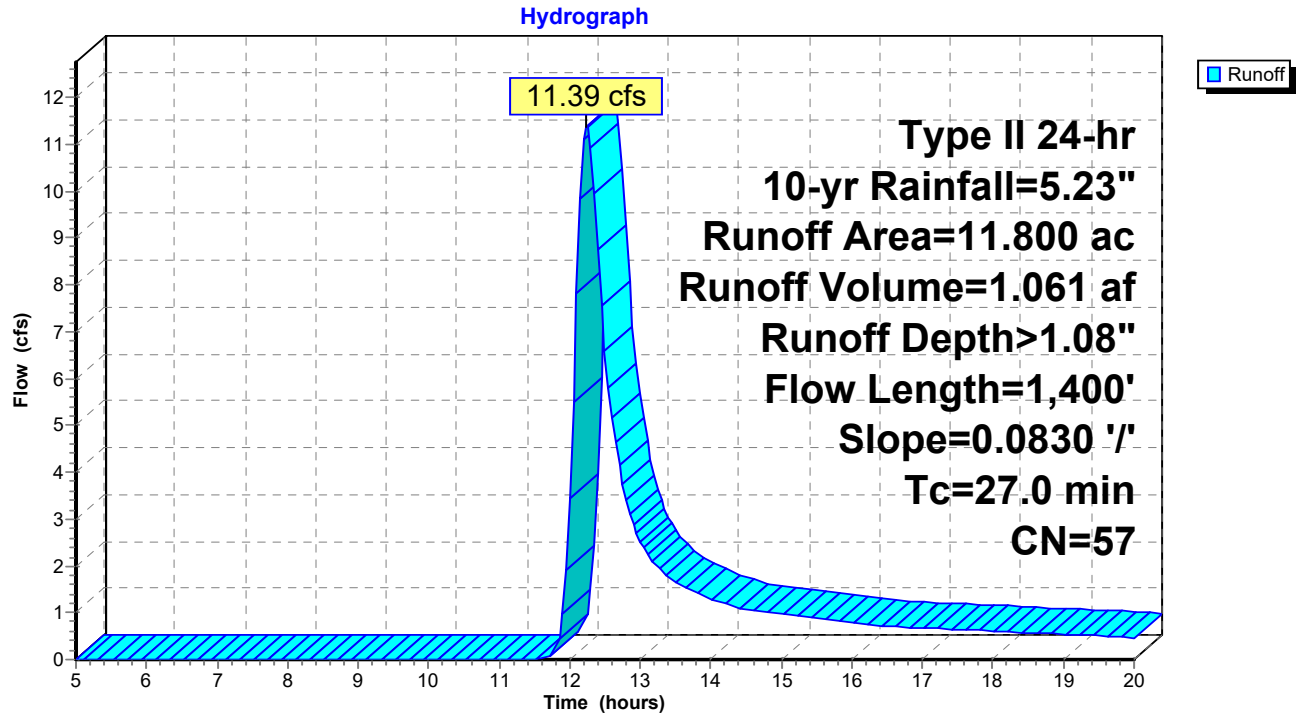
Runoff = 11.39 cfs @ 12.24 hrs, Volume= 1.061 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=5.23"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

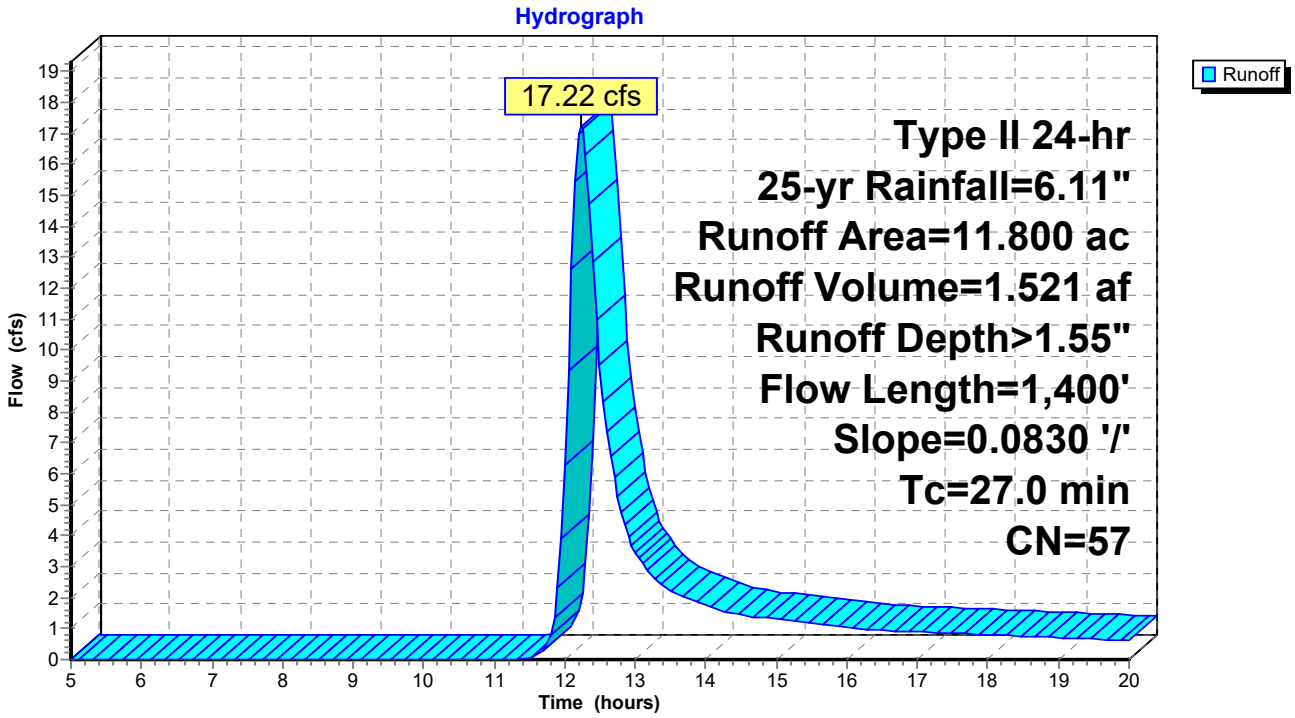
Runoff = 17.22 cfs @ 12.23 hrs, Volume= 1.521 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=6.11"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

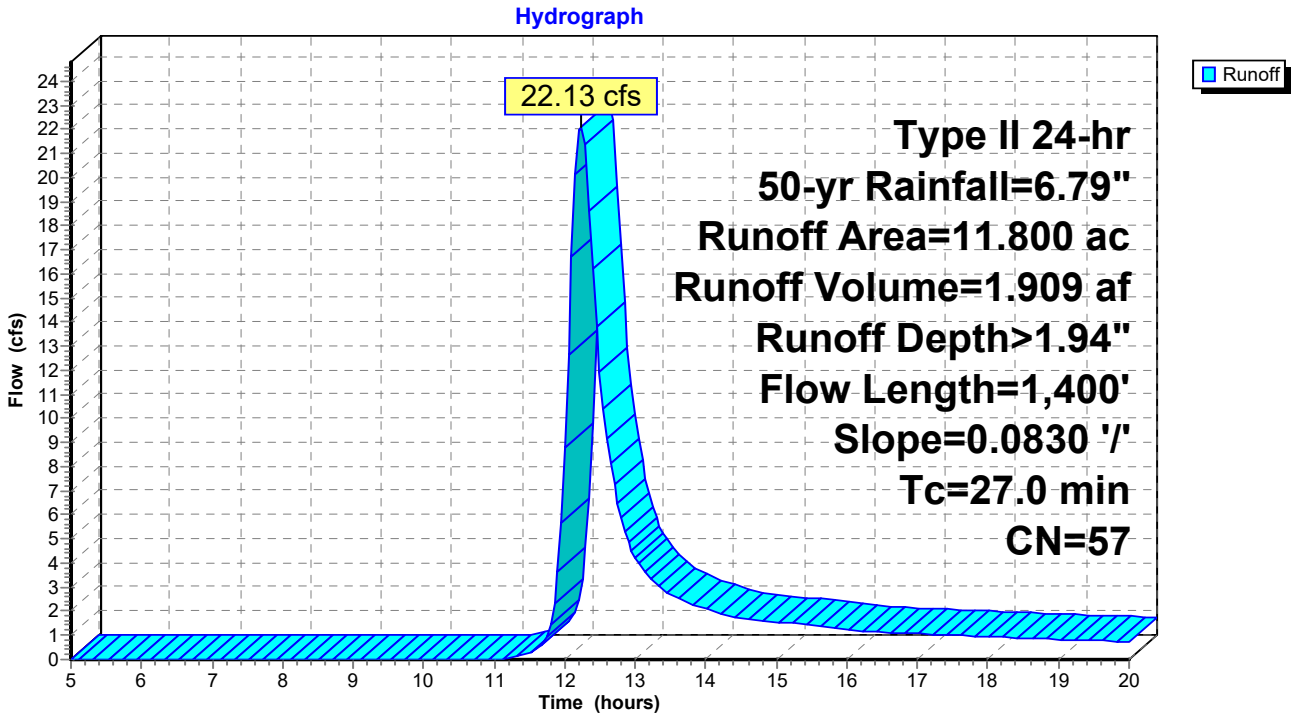
Runoff = 22.13 cfs @ 12.23 hrs, Volume= 1.909 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=6.79"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT



Summary for Subcatchment 1S: PRE-DEVELOPMENT

Runoff = 27.46 cfs @ 12.22 hrs, Volume= 2.328 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=7.48"

Area (ac)	CN	Description
11.200	55	Woods, Good, HSG B
0.600	89	Paved roads w/open ditches, 50% imp, HSG B
11.800	57	Weighted Average
11.500		97.46% Pervious Area
0.300		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	1,400	0.0830	0.87		**Lag/CN Method, TC**

Subcatchment 1S: PRE-DEVELOPMENT