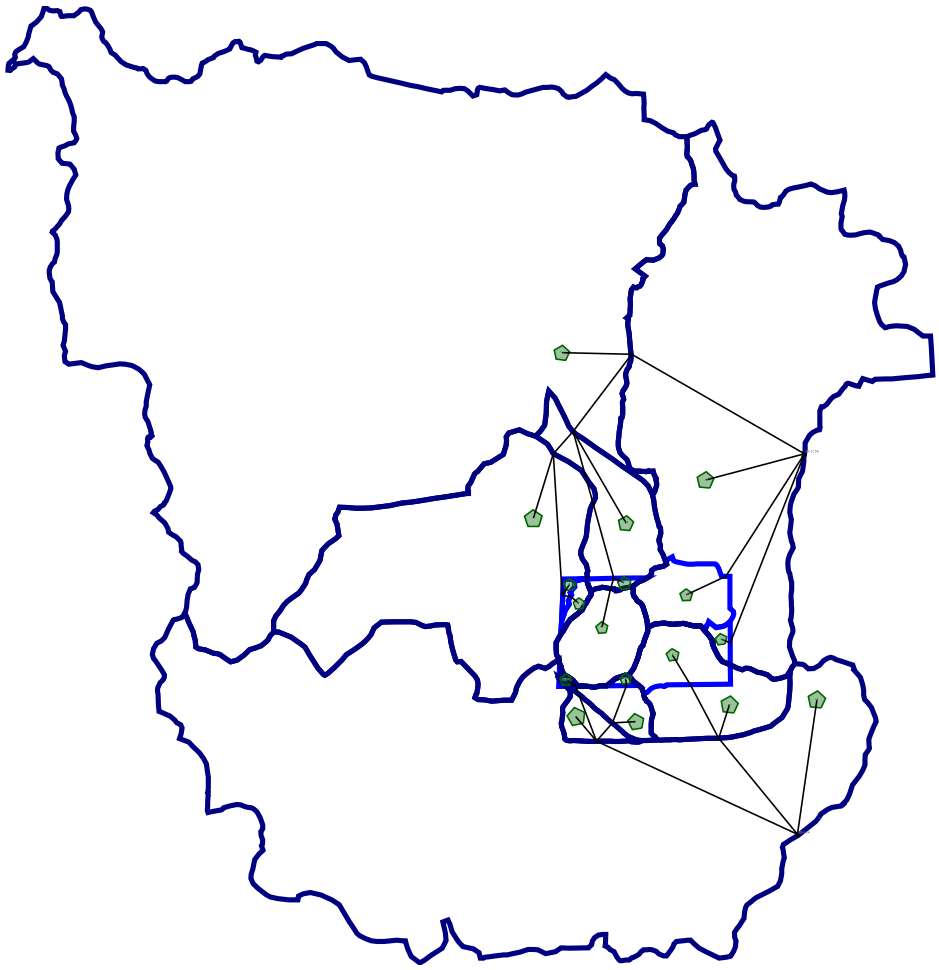
MCADAMS

Scenario: Pre-Development 1-year



MCADAMS

FlexTable: Catchment Table (DRH22004 DIA.ppc)

Current Time: 0.000 min

Label	Outflow Node	Area (ft²)	SCS CN	Time of Concentration (min)	Notes
1 BYPASS DIA	POA 1	164,493.00	60.000	15.900	PRE
1A DIA	1A DIA	2,171,065.00	74.000	20.530	PRE
1B DIA	1B DIA	3,145,838.00	73.000	28.440	PRE
1C DIA	POA 1 DIA	81,646,098.00	86.000	83.000	PRE
2-3 DIA	POA 2-3 DIA	27,602,895.00	75.000	46.950	PRE
4A DIA	4A DIA	2,468,795.00	84.000	17.500	PRE
4B DIA	POA 4 DIA	50,301,621.00	80.000	97.300	PRE
5 DIA	POA 5 DIA	860,024.00	83.000	20.570	PRE
6 DIA	POA 6 DIA	662,787.00	81.000	21.320	PRE
7 DIA	POA 7 DIA	15,215,700.00	81.000	47.990	PRE
SUB 2	POA 2	1,701,747.00	68.000	30.500	PRE
SUB 3	POA 3	213,337.00	66.000	11.820	PRE
SUB 4	POA 4	1,592,289.00	76.000	28.330	PRE
SUB 5	POA 5	64,322.00	74.000	16.080	PRE
SUB 6	POA 6	59,890.00	75.000	13.310	PRE
SUB 7A	J-11	224,893.00	64.000	21.950	PRE
SUB 7B	POA 7	89,904.00	71.000	13.070	PRE

Catchments Summary

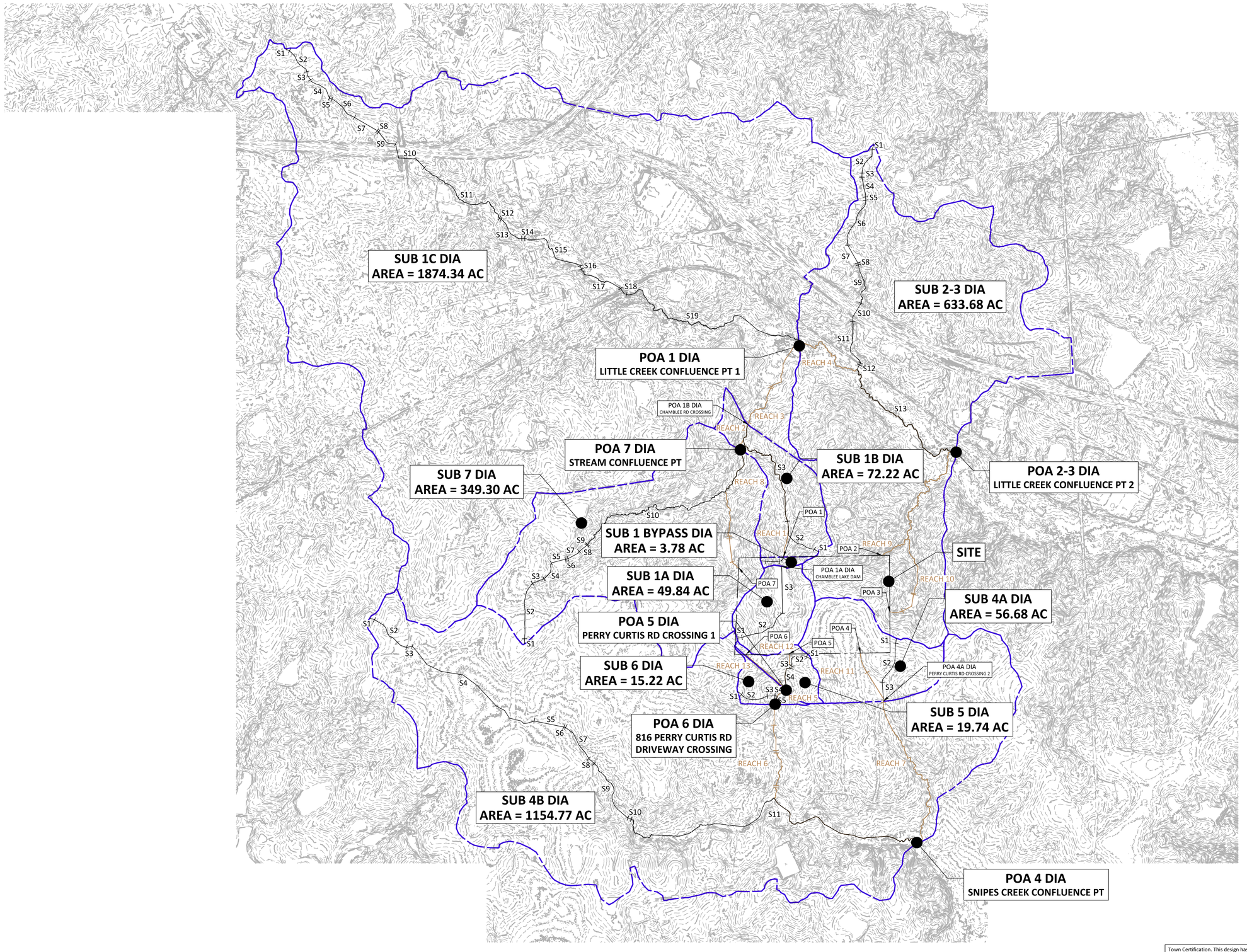
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
1A DIA	Pre-Development 10-year	10	10.328	731.000	108.15
1B DIA	Pre-Development 10-year	10	14.415	736.000	125.51
1C DIA	Pre-Development 10-year	10	554.792	775.000	2,675.81
2-3 DIA	Pre-Development 10-year	10	134.811	751.000	905.66
4A DIA	Pre-Development 10-year	10	16.118	730.000	183.27
4B DIA	Pre-Development 10-year	10	284.824	779.000	1,246.71
5 DIA	Pre-Development 10-year	10	5.450	732.000	57.33
6 DIA	Pre-Development 10-year	10	3.956	731.000	40.96
7 DIA	Pre-Development 10-year	10	90.155	749.000	602.12
1 BYPASS DIA	Pre-Development 10-year	10	0.438	729.000	4.61
SUB 2	Pre-Development 10-year	10	6.454	740.000	52.61
SUB 3	Pre-Development 10-year	10	0.750	727.000	9.65
SUB 4	Pre-Development 10-year	10	8.091	737.000	71.75
SUB 5	Pre-Development 10-year	10	0.306	729.000	3.63
SUB 6	Pre-Development 10-year	10	0.295	727.000	3.80
SUB 7A	Pre-Development 10-year	10	0.723	734.000	6.76
SUB 7B	Pre-Development 10-year	10	0.385	727.000	4.93

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
1A DIA	Pre-Development 10-year	10	10.328	731.000	108.15
1B DIA	Pre-Development 10-year	10	116.297	746.000	793.59
4A DIA	Pre-Development 10-year	10	24.203	731.000	238.94

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
J-11	Pre-Development 10-year	10	0.723	734.000	6.76
POA 1	Pre-Development 10-year	10	10.764	732.000	112.58
POA 1 DIA	Pre-Development 10-year	10	670.611	769.000	3,385.21
POA 2	Pre-Development 10-year	10	6.454	740.000	52.61
POA 2-3 DIA	Pre-Development 10-year	10	805.927	793.000	3,777.21
POA 3	Pre-Development 10-year	10	0.750	727.000	9.65
POA 4	Pre-Development 10-year	10	8.091	737.000	71.75
POA 4 DIA	Pre-Development 10-year	10	318.880	778.000	1,361.69
POA 5	Pre-Development 10-year	10	0.306	729.000	3.63
POA 5 DIA	Pre-Development 10-year	10	5.756	732.000	60.91
POA 6	Pre-Development 10-year	10	0.295	727.000	3.80
POA 6 DIA	Pre-Development 10-year	10	10.006	733.000	105.43
POA 7	Pre-Development 10-year	10	1.107	730.000	10.73
POA 7 DIA	Pre-Development 10-year	10	91.259	749.000	609.99



GRAPHIC SCALE
0 450 900 1800
1 inch = 900 ft.

McADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
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RALEIGH, NC 27615
PHONE: 919. 809. 4207

D·R·HORTON America's Builder

CHAMBLEE LAKE
CONSTRUCTION DRAWINGS
1509 CHAMBLEE ROAD
ZEBULON, NORTH CAROLINA

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	DRH-22004
FILENAME	DRH22004 DIA-PRE
CHECKED BY	JKW
DRAWN BY	MMJ
SCALE	1"= 900'
DATE	02. 20. 2024

SHEET

PRE-DEVELOPMENT HYDROLOGY MAP

PRE

Town Certification. This design has been reviewed by the Engineer for the Town of Zebulon, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Zebulon.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Zebulon and serve as construction plans for this project.
By: _____ Date: _____
Administrator

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

M:\Projects\DRH\DRH22004\04-Production\Water Resources\Downstream Impact Analysis\Current Drawings\DRH22004 DIA-PRE.dwg, 2/20/2024 9:48:22 AM, Mirabelle Jawillana

POST-DEVELOPMENT HYDROLOGIC CALCULATIONS

Chamblee Lake
DRH-22004

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY

Summary of Results

M. Javellana, EI
2/20/2024

HYDROLOGY INPUT SUMMARY

Sub-basin ID	Total Area [acres]	SCS CN	Tc [min]
1 Bypass	1.93	64	6.27
1 to Culvert 1	1.63	78	15.37
1 to Lake	14.72	88	5.00
1 to SCM B	19.20	90	5.00
1 to SCM H	6.02	90	5.00
1 to SCM I	6.90	92	5.00
2 Bypass 1	6.33	73	9.13
2 Bypass 2	10.95	67	12.01
2 to SCM E	10.65	90	5.00
2 to SCM F	10.65	91	5.00
2 to SCM G	7.69	89	5.00
3 Bypass	3.47	78	11.79
4 Bypass	13.42	78	30.04
4 to SCM C	11.57	93	5.00
4 to SCM J	8.57	91	5.00
5 Bypass	0.22	78	5.00
6 Bypass	1.22	86	11.84
7 Bypass 1	0.86	70	5.00
7 Bypass 2	2.06	71	13.07
7 to SCM A	6.17	89	5.00
1B DIA	72.23	73	28.44
1C DIA	1874.34	86	83.00
2-3 DIA	633.67	75	46.95
4A DIA	56.68	84	17.50
4B DIA	1154.77	80	97.30
5 DIA	19.74	83	20.57
6 DIA	15.22	81	21.32
7 DIA	349.30	81	47.99
Totals =	**4320.15**		

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	62.2%
HSG 'C' =	9.9%
HSG 'D' =	27.9%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	68	Assume good condition
Wooded	63	Assume good condition
1/8 Acre Residential	87	-
1/4 Acre Residential	79	-
1/2 Acre Residential	75	-
1 Acre Residential	74	-
2 Acre Residential	71	-
Farmstead	78	-
Industrial	90	-
Commercial	93	-
Paved; open ditches	90	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	68	0	0.00	Assume good condition
Wooded	63	1,142,496	26.23	Assume good condition
1/8 Acre Residential	87	0	0.00	-
1/4 Acre Residential	79	0	0.00	-
1/2 Acre Residential	75	0	0.00	-
1 Acre Residential	74	50,446	1.16	-
2 Acre Residential	71	134,762	3.09	-
Farmstead	78	1,711,268	39.29	-
Industrial	90	0	0.00	-
Commercial	93	0	0.00	-
Paved; open ditches	90	107,192	2.46	-
Pond	100	0	0.00	-

Total Area =	72.23	acres
	3,146,164	sf
Composite SCS CN =	73	
% Impervious =	54.4%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	328.00	ft
Bot Elev =	324.00	ft
Height =	4	ft
Slope =	0.0400	ft/ft
Manning's n =	0.40	wooded
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***15.65***	***minutes***

Segment 2: Concentrated Flow

Length =	888	ft
Top Elev =	324.00	ft
Bot Elev =	284.00	ft
Height =	40	ft
Slope =	0.0450	ft/ft
Paved ? =	No	
Velocity =	3.42	ft/sec
Segment Time =	***4.32***	***minutes***

Segment 3: Channel Flow

Length =	2592	ft
Top Elev =	284.00	ft
Bot Elev =	254.00	ft
Height =	30	ft
Slope =	0.0116	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	5.10	ft/sec
Segment Time =	***8.47***	***minutes***

Time of Concentration =	28.44	minutes
SCS Lag Time =	17.06	minutes (SCS Lag = 0.6* Tc)
Time Increment =	4.95	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 1C DIA

M. Javellana, EI
2/20/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	33.8%
HSG 'C' =	12.8%
HSG 'D' =	53.4%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	73	Assume good condition
Wooded	69	Assume good condition
1/8 Acre Residential	89	-
1/4 Acre Residential	82	-
1/2 Acre Residential	79	-
1 Acre Residential	78	-
2 Acre Residential	76	-
Farmstead	81	-
Industrial	91	-
Commercial	94	-
Paved; open ditches	92	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	73	0	0.00	Assume good condition
Wooded	69	6,042,678	138.72	Assume good condition
1/8 Acre Residential	89	8,001,967	183.70	-
1/4 Acre Residential	82	563,848	12.94	-
1/2 Acre Residential	79	362,359	8.32	-
1 Acre Residential	78	1,102,722	25.32	-
2 Acre Residential	76	130,199	2.99	-
Farmstead	81	28,344,856	650.71	-
Industrial	91	5,500,822	126.28	-
Commercial	94	24,830,587	570.03	-
Paved; open ditches	92	6,766,060	155.33	-
Pond	100	0	0.00	-

Total Area =	1874.34	acres
	81,646,098	sf
Composite SCS CN =	86	
% Impervious =	34.7%	

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 1C DIA

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	350.00	ft
Bot Elev =	348.00	ft
Height =	2	ft
Slope =	0.0200	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***13.72***	***minutes***

Segment 2: Concentrated Flow

Length =	555	ft
Top Elev =	348.00	ft
Bot Elev =	333.50	ft
Height =	15	ft
Slope =	0.0261	ft/ft
Paved ? =	No	
Velocity =	2.61	ft/sec
Segment Time =	***3.55***	***minutes***

Segment 3: Concentrated Flow

Length =	183	ft
Top Elev =	333.50	ft
Bot Elev =	328.50	ft
Height =	5	ft
Slope =	0.0273	ft/ft
Paved ? =	Yes	
Velocity =	3.36	ft/sec
Segment Time =	***0.91***	***minutes***

Segment 4: Concentrated Flow

Length =	557	ft
Top Elev =	328.50	ft
Bot Elev =	324.00	ft
Height =	5	ft
Slope =	0.0081	ft/ft
Paved ? =	No	
Velocity =	1.45	ft/sec
Segment Time =	***6.40***	***minutes***

Segment 5: Pipe Flow

Length =	58	ft
Top Elev =	324.00	ft
Bot Elev =	322.00	ft
Height =	2	ft
Slope =	0.0345	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	17.57	ft/sec
Segment Time =	***0.06***	***minutes***

Segment 6: Channel Flow

Length =	591	ft
Top Elev =	322.00	ft
Bot Elev =	314.00	ft
Height =	8	ft
Slope =	0.0135	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5'w x 3'h channel)
Channel Velocity =	4.74	ft/sec
Segment Time =	***2.08***	***minutes***

Segment 7: Surface Water Flow

Length =	527	ft
Segment Time =	***0.00***	***minutes***

Segment 8: Pipe Flow

Length =	38	ft
Top Elev =	311.00	ft
Bot Elev =	310.00	ft
Height =	1	ft
Slope =	0.0263	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	15.35	ft/sec
Segment Time =	***0.04***	***minutes***

Segment 9: Concentrated Flow

Length =	446	ft
Top Elev =	310.00	ft
Bot Elev =	306.00	ft
Height =	4	ft
Slope =	0.0090	ft/ft
Paved ? =	No	
Velocity =	1.53	ft/sec
Segment Time =	***4.86***	***minutes***

Segment 10: Pipe Flow

Length =	878	ft
Top Elev =	306.00	ft
Bot Elev =	294.00	ft
Height =	12	ft
Slope =	0.0137	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	13.40	ft/sec
Segment Time =	***1.09***	***minutes***

Segment 11: Channel Flow

Length =	2065	ft
Top Elev =	294.00	ft
Bot Elev =	274.50	ft
Height =	19.5	ft
Slope =	0.0094	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	4.61	ft/sec
Segment Time =	***7.47***	***minutes***

Segment 12: Pipe Flow

Length =	38	ft
Top Elev =	274.50	ft
Bot Elev =	274.00	ft
Height =	0.5	ft
Slope =	0.0132	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	13.15	ft/sec
Segment Time =	***0.05***	***minutes***

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY

Subbasin 1C DIA

Segment 13: Concentrated Flow

Length =	604	ft
Top Elev =	274.00	ft
Bot Elev =	272.50	ft
Height =	2	ft
Slope =	0.0025	ft/ft
Paved ? =	No	
Velocity =	0.80	ft/sec
Segment Time =	***12.52***	***minutes***

Segment 14: Pipe Flow

Length =	62	ft
Top Elev =	272.50	ft
Bot Elev =	272.00	ft
Height =	0.5	ft
Slope =	0.0081	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	10.29	ft/sec
Segment Time =	***0.10***	***minutes***

Segment 15: Channel Flow

Length =	1416	ft
Top Elev =	272.00	ft
Bot Elev =	264.00	ft
Height =	8	ft
Slope =	0.0056	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	45.00	sf (assume 15'w x 3'h channel)
Wetted Perimeter =	21.00	lf (assume 15'w x 3'h channel)
Channel Velocity =	4.14	ft/sec
Segment Time =	***5.71***	***minutes***

Segment 16: Pipe Flow

Length =	71	ft
Top Elev =	264.00	ft
Bot Elev =	263.00	ft
Height =	1	ft
Slope =	0.0141	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	13.60	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 17: Channel Flow

Length =	957	ft
Top Elev =	263.00	ft
Bot Elev =	260.00	ft
Height =	3	ft
Slope =	0.0031	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	45.00	sf (assume 15'w x 3'h channel)
Wetted Perimeter =	21.00	lf (assume 15'w x 3'h channel)
Channel Velocity =	3.08	ft/sec
Segment Time =	***5.18***	***minutes***

Segment 18: Pipe Flow

Length =	175	ft
Top Elev =	260.00	ft
Bot Elev =	258.50	ft
Height =	1.5	ft
Slope =	0.0086	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	10.61	ft/sec
Segment Time =	***0.27***	***minutes***

Segment 19: Channel Flow

Length =	4452	ft
Top Elev =	258.50	ft
Bot Elev =	238.00	ft
Height =	20.5	ft
Slope =	0.0046	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	60.00	sf (assume 20'w x 3'h channel)
Wetted Perimeter =	26.00	lf (assume 20'w x 3'h channel)
Channel Velocity =	3.92	ft/sec
Segment Time =	***18.91***	***minutes***

Time of Concentration =	83.00	minutes
SCS Lag Time =	49.80	minutes (SCS Lag = 0.6* Tc)
Time Increment =	14.44	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	66.8%
HSG 'C' =	11.1%
HSG 'D' =	22.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	67	Assume good condition
Wooded	62	Assume good condition
1/8 Acre Residential	87	-
1/4 Acre Residential	79	-
1/2 Acre Residential	74	-
1 Acre Residential	73	-
2 Acre Residential	70	-
Farmstead	78	-
Industrial	89	-
Commercial	93	-
Paved; open ditches	90	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	67	0	0.00	Assume good condition
Wooded	62	7,572,330	173.84	Assume good condition
1/8 Acre Residential	87	437,629	10.05	-
1/4 Acre Residential	79	0	0.00	-
1/2 Acre Residential	74	764,016	17.54	-
1 Acre Residential	73	367,282	8.43	-
2 Acre Residential	70	47,579	1.09	-
Farmstead	78	13,971,433	320.74	-
Industrial	89	1,841,245	42.27	-
Commercial	93	0	0.00	-
Paved; open ditches	90	2,601,360	59.72	-
Pond	100	0	0.00	-

Total Area =	633.67	acres
	27,602,874	sf
Composite SCS CN =	75	
% Impervious =	50.6%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	328.00	ft
Bot Elev =	325.00	ft
Height =	3	ft
Slope =	0.0300	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***11.67***	***minutes***

Segment 2: Concentrated Flow

Length =	545	ft
Top Elev =	325.00	ft
Bot Elev =	314.00	ft
Height =	11	ft
Slope =	0.0202	ft/ft
Paved ? =	No	
Velocity =	2.29	ft/sec
Segment Time =	***3.96***	***minutes***

Segment 3: Pipe Flow

Length =	79	ft
Top Elev =	314.00	ft
Bot Elev =	312.00	ft
Height =	2	ft
Slope =	0.0253	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	15.05	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 4: Concentrated Flow

Length =	406	ft
Top Elev =	312.00	ft
Bot Elev =	304.00	ft
Height =	8	ft
Slope =	0.0197	ft/ft
Paved ? =	No	
Velocity =	2.26	ft/sec
Segment Time =	***2.99***	***minutes***

Segment 5: Pipe Flow

Length =	67	ft
Top Elev =	304.00	ft
Bot Elev =	302.00	ft
Height =	2	ft
Slope =	0.0299	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	16.35	ft/sec
Segment Time =	***0.07***	***minutes***

Segment 6: Channel Flow

Length =	1006	ft
Top Elev =	302.00	ft
Bot Elev =	280.00	ft
Height =	22	ft
Slope =	0.0219	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5'w x 3'h channel)
Channel Velocity =	5.23	ft/sec
Segment Time =	***3.20***	***minutes***

Segment 7: Surface Water Flow

Length =	406	ft
Segment Time =	***0.00***	***minutes***

Segment 8: Pipe Flow

Length =	43	ft
Top Elev =	271.00	ft
Bot Elev =	270.00	ft
Height =	1	ft
Slope =	0.0233	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	6.94	ft/sec
Segment Time =	***0.10***	***minutes***

Segment 9: Channel Flow

Length =	864	ft
Top Elev =	270.00	ft
Bot Elev =	250.00	ft
Height =	20	ft
Slope =	0.0231	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5'h x 3'h channel)
Channel Velocity =	5.39	ft/sec
Segment Time =	***2.67***	***minutes***

Segment 10: Pipe Flow

Length =	408	ft
Top Elev =	250.00	ft
Bot Elev =	244.00	ft
Height =	6	ft
Slope =	0.0147	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	13.90	ft/sec
Segment Time =	***0.49***	***minutes***

Segment 11: Channel Flow

Length =	933	ft
Top Elev =	244.00	ft
Bot Elev =	236.00	ft
Height =	8	ft
Slope =	0.0086	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	4.39	ft/sec
Segment Time =	***3.54***	***minutes***

Segment 12: Pipe Flow

Length =	50	ft
Top Elev =	236.00	ft
Bot Elev =	235.50	ft
Height =	0.5	ft
Slope =	0.0100	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	9.46	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 13: Channel Flow

Length =	3402	ft
Top Elev =	235.50	ft
Bot Elev =	226.00	ft
Height =	9.5	ft
Slope =	0.0028	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	72.00	sf (assume 24'w x 3'h channel)
Wetted Perimeter =	30.00	lf (assume 24'w x 3'h channel)
Channel Velocity =	3.14	ft/sec
Segment Time =	***18.08***	***minutes***

Time of Concentration =	46.95	minutes
SCS Lag Time =	28.17	minutes (SCS Lag = 0.6* Tc)
Time Increment =	8.17	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 4A DIA

M. Javellana, EI
2/20/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	50.3%
HSG 'D' =	49.7%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	77	Assume good condition
Wooded	73	Assume good condition
1/8 Acre Residential	91	-
1/4 Acre Residential	85	-
1/2 Acre Residential	82	-
1 Acre Residential	81	-
2 Acre Residential	79	-
Farmstead	84	-
Industrial	92	-
Commercial	94	-
Paved; open ditches	92	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	77	0	0.00	Assume good condition
Wooded	73	0	0.00	Assume good condition
1/8 Acre Residential	91	0	0.00	-
1/4 Acre Residential	85	0	0.00	-
1/2 Acre Residential	82	0	0.00	-
1 Acre Residential	81	227,470	5.22	-
2 Acre Residential	79	0	0.00	-
Farmstead	84	2,090,035	47.98	-
Industrial	92	0	0.00	-
Commercial	94	0	0.00	-
Paved; open ditches	92	151,290	3.47	-
Pond	100	0	0.00	-

Total Area =	56.68	acres
	2,468,795	sf
Composite SCS CN =	84	
% Impervious =	84.7%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	325.00	ft
Bot Elev =	322.00	ft
Height =	3	ft
Slope =	0.0300	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***11.67***	***minutes***

Segment 2: Concentrated Flow

Length =	861	ft
Top Elev =	322.00	ft
Bot Elev =	302.00	ft
Height =	20	ft
Slope =	0.0232	ft/ft
Paved ? =	No	
Velocity =	2.46	ft/sec
Segment Time =	***5.84***	***minutes***

Segment 3: Surface Water Flow

Length =	329	ft
Segment Time =	***0.00***	***minutes***

Time of Concentration =	17.50	minutes
SCS Lag Time =	10.50	minutes (SCS Lag = 0.6* Tc)
Time Increment =	3.05	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	3.1%
HSG 'B' =	23.5%
HSG 'C' =	31.3%
HSG 'D' =	42.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	72	Assume good condition
Wooded	68	Assume good condition
1/8 Acre Residential	89	-
1/4 Acre Residential	82	-
1/2 Acre Residential	79	-
1 Acre Residential	78	-
2 Acre Residential	75	-
Farmstead	81	-
Industrial	91	-
Commercial	94	-
Paved; open ditches	91	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	72	0	0.00	Assume good condition
Wooded	68	2,256,428	51.80	Assume good condition
1/8 Acre Residential	89	569,906	13.08	-
1/4 Acre Residential	82	2,645	0.06	-
1/2 Acre Residential	79	71,883	1.65	-
1 Acre Residential	78	7,490,920	171.97	-
2 Acre Residential	75	0	0.00	-
Farmstead	81	38,254,237	878.20	-
Industrial	91	0	0.00	-
Commercial	94	0	0.00	-
Paved; open ditches	91	1,655,548	38.01	-
Pond	100	0	0.00	-

Total Area =	1154.77	acres
	50,301,567	sf
Composite SCS CN =	80	
% Impervious =	76.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	361.00	ft
Bot Elev =	360.00	ft
Height =	1.00	ft
Slope =	0.0100	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***18.11***	***minutes***

Segment 2: Concentrated Flow

Length =	884	ft
Top Elev =	360.00	ft
Bot Elev =	348.00	ft
Height =	12	ft
Slope =	0.0136	ft/ft
Paved ? =	No	
Velocity =	1.88	ft/sec
Segment Time =	***7.84***	***minutes***

Segment 3: Pipe Flow

Length =	118	ft
Top Elev =	348.00	ft
Bot Elev =	346.00	ft
Height =	2	ft
Slope =	0.0169	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	12.32	ft/sec
Segment Time =	***0.16***	***minutes***

Segment 4: Concentrated Flow

Length =	3039	ft
Top Elev =	346.00	ft
Bot Elev =	326.00	ft
Height =	20	ft
Slope =	0.0066	ft/ft
Paved ? =	No	
Velocity =	1.31	ft/sec
Segment Time =	***38.70***	***minutes***

Segment 5: Surface Water Flow

Length =	600	ft
Segment Time =	***0.00***	***minutes***

Segment 6: Pipe Flow

Length =	39	ft
Top Elev =	324.50	ft
Bot Elev =	324.00	ft
Height =	0.5	ft
Slope =	0.0128	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	10.71	ft/sec
Segment Time =	***0.06***	***minutes***

Segment 7: Surface Water Flow

Length =	789	ft
Segment Time =	***0.00***	***minutes***

Segment 8: Pipe Flow

Length =	144	ft
Top Elev =	318.00	ft
Bot Elev =	316.00	ft
Height =	2	ft
Slope =	0.0139	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	11.15	ft/sec
Segment Time =	***0.22***	***minutes***

Segment 9: Channel Flow

Length =	1391	ft
Top Elev =	316.00	ft
Bot Elev =	304.00	ft
Height =	12	ft
Slope =	0.0086	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	4.41	ft/sec
Segment Time =	***5.26***	***minutes***

Segment 10: Pipe Flow

Length =	71	ft
Top Elev =	304.00	ft
Bot Elev =	302.00	ft
Height =	2	ft
Slope =	0.0282	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	15.88	ft/sec
Segment Time =	***0.07***	***minutes***

Segment 11: Channel Flow

Length =	7025	ft
Top Elev =	302.00	ft
Bot Elev =	258.00	ft
Height =	44	ft
Slope =	0.0063	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	45.00	sf (assume 15'w x 3'h channel)
Wetted Perimeter =	21.00	lf (assume 15'w x 3'h channel)
Channel Velocity =	4.36	ft/sec
Segment Time =	***26.88***	***minutes***

Time of Concentration =	97.30	minutes
SCS Lag Time =	58.38	minutes (SCS Lag = 0.6* Tc)
Time Increment =	16.93	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 5 DIA

M. Javellana, EI
2/20/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	5.2%
HSG 'C' =	53.8%
HSG 'D' =	41.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	76	Assume good condition
Wooded	72	Assume good condition
1/8 Acre Residential	91	-
1/4 Acre Residential	84	-
1/2 Acre Residential	82	-
1 Acre Residential	80	-
2 Acre Residential	78	-
Farmstead	83	-
Industrial	92	-
Commercial	94	-
Paved; open ditches	92	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	76	0	0.00	Assume good condition
Wooded	72	0	0.00	Assume good condition
1/8 Acre Residential	91	0	0.00	-
1/4 Acre Residential	84	0	0.00	-
1/2 Acre Residential	82	0	0.00	-
1 Acre Residential	80	457,325	10.50	-
2 Acre Residential	78	0	0.00	-
Farmstead	83	259,365	5.95	-
Industrial	92	0	0.00	-
Commercial	94	0	0.00	-
Paved; open ditches	92	143,331	3.29	-
Pond	100	0	0.00	-

Total Area =	19.74	acres
	860,021	sf
Composite SCS CN =	83	
% Impervious =	30.2%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	328.00	ft
Bot Elev =	326.50	ft
Height =	1.5	ft
Slope =	0.0150	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***15.40***	***minutes***

Segment 2: Concentrated Flow

Length =	462	ft
Top Elev =	326.50	ft
Bot Elev =	318.00	ft
Height =	9	ft
Slope =	0.0184	ft/ft
Paved ? =	No	
Velocity =	2.19	ft/sec
Segment Time =	***3.52***	***minutes***

Segment 3: Pipe Flow

Length =	53	ft
Top Elev =	318.00	ft
Bot Elev =	317.00	ft
Height =	1	ft
Slope =	0.0189	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	2.00	ft
Flow Area =	3.14	sf
Wetted Perimeter =	6.28	lf (2 ft ID pipe)
Channel Velocity =	9.92	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 4: Channel Flow

Length =	479	ft
Top Elev =	318.00	ft
Bot Elev =	308.00	ft
Height =	10	ft
Slope =	0.0209	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5'w x 3'h channel)
Channel Velocity =	5.11	ft/sec
Segment Time =	***1.56***	***minutes***

Time of Concentration =	20.57	minutes
SCS Lag Time =	12.34	minutes (SCS Lag = 0.6* Tc)
Time Increment =	3.58	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 6 DIA

M. Javellana, EI
2/20/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	35.1%
HSG 'C' =	30.7%
HSG 'D' =	34.2%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	71	Assume good condition
Wooded	67	Assume good condition
1/8 Acre Residential	89	-
1/4 Acre Residential	82	-
1/2 Acre Residential	78	-
1 Acre Residential	77	-
2 Acre Residential	74	-
Farmstead	81	-
Industrial	91	-
Commercial	94	-
Paved; open ditches	91	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	71	0	0.00	Assume good condition
Wooded	67	0	0.00	Assume good condition
1/8 Acre Residential	89	0	0.00	-
1/4 Acre Residential	82	0	0.00	-
1/2 Acre Residential	78	0	0.00	-
1 Acre Residential	77	278,386	6.39	-
2 Acre Residential	74	0	0.00	-
Farmstead	81	282,504	6.49	-
Industrial	91	0	0.00	-
Commercial	94	0	0.00	-
Paved; open ditches	91	101,896	2.34	-
Pond	100	0	0.00	-

Total Area =	15.22	acres
	662,786	sf
Composite SCS CN =	81	
% Impervious =	42.6%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	335.00	ft
Bot Elev =	334.00	ft
Height =	1	ft
Slope =	0.0100	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***18.09***	***minutes***

Segment 2: Concentrated Flow

Length =	563	ft
Top Elev =	334.00	ft
Bot Elev =	304.00	ft
Height =	30	ft
Slope =	0.0533	ft/ft
Paved ? =	No	
Velocity =	3.72	ft/sec
Segment Time =	***2.52***	***minutes***

Segment 3: Surface Water Flow

Length =	140	ft
Segment Time =	***0.00***	***minutes***

Segment 4: Pipe Flow

Length =	27	ft
Top Elev =	302.50	ft
Bot Elev =	302.00	ft
Height =	0.5	ft
Slope =	0.0185	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	2.00	ft
Flow Area =	3.14	sf
Wetted Perimeter =	6.28	lf (2 ft ID pipe)
Channel Velocity =	9.83	ft/sec
Segment Time =	***0.05***	***minutes***

Segment 5: Channel Flow

Length =	175	ft
Top Elev =	302.00	ft
Bot Elev =	300.00	ft
Height =	2	ft
Slope =	0.0114	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5'x x 3'h channel)
Channel Velocity =	4.35	ft/sec
Segment Time =	***0.67***	***minutes***

Time of Concentration =	21.32	minutes
SCS Lag Time =	12.79	minutes (SCS Lag = 0.6* Tc)
Time Increment =	3.71	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

DOWNSTREAM IMPACT ANALYSIS POST-DEVELOPMENT HYDROLOGY
Subbasin 7 DIA

M. Javellana, EI
2/20/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded	1/8 Acre Residential	1/4 Acre Residential	1/2 Acre Residential
A	98	39	30	77	61	54
B	98	61	55	85	75	70
C	98	74	70	90	83	80
D	98	80	77	92	87	85

HSG	1 Acre Residential	2 Acre Residential	Farmstead	Industrial	Commercial	Paved; open ditches
A	51	46	59	81	89	83
B	68	65	74	88	92	89
C	79	77	82	91	94	92
D	84	82	86	93	95	93

Assume:

HSG 'A' =	0.0%
HSG 'B' =	20.0%
HSG 'C' =	55.9%
HSG 'D' =	24.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	73	Assume good condition
Wooded	69	Assume good condition
1/8 Acre Residential	89	-
1/4 Acre Residential	82	-
1/2 Acre Residential	79	-
1 Acre Residential	78	-
2 Acre Residential	76	-
Farmstead	81	-
Industrial	91	-
Commercial	94	-
Paved; open ditches	92	-
Pond	100	-

II. PRE-DEVELOPMENT

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Impervious	98	0	0.00	-
Open	73	0	0.00	Assume good condition
Wooded	69	403,270	9.26	Assume good condition
1/8 Acre Residential	89	0	0.00	-
1/4 Acre Residential	82	0	0.00	-
1/2 Acre Residential	79	0	0.00	-
1 Acre Residential	78	0	0.00	-
2 Acre Residential	76	0	0.00	-
Farmstead	81	14,296,173	328.19	-
Industrial	91	0	0.00	-
Commercial	94	0	0.00	-
Paved; open ditches	92	515,928	11.84	-
Pond	100	0	0.00	-

Total Area =	349.30	acres
	15,215,371	sf
Composite SCS CN =	81	
% Impervious =	94.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	357.00	ft
Bot Elev =	356.00	ft
Height =	1	ft
Slope =	0.0100	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***18.11***	***minutes***

Segment 2: Concentrated Flow

Length =	1152	ft
Top Elev =	356.00	ft
Bot Elev =	334.00	ft
Height =	22	ft
Slope =	0.0191	ft/ft
Paved ? =	No	
Velocity =	2.23	ft/sec
Segment Time =	***8.61***	***minutes***

Segment 3: Pipe Flow

Length =	247	ft
Top Elev =	334.00	ft
Bot Elev =	328.00	ft
Height =	6	ft
Slope =	0.0243	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	14.75	ft/sec
Segment Time =	***0.28***	***minutes***

Segment 4: Concentrated Flow

Length =	376	ft
Top Elev =	328.00	ft
Bot Elev =	324.00	ft
Height =	4	ft
Slope =	0.0106	ft/ft
Paved ? =	No	
Velocity =	1.66	ft/sec
Segment Time =	***3.77***	***minutes***

Segment 5: Surface Water Flow

Length =	294	ft
Segment Time =	***0.00***	***minutes***

Segment 6: Pipe Flow

Length =	51	ft
Top Elev =	319.00	ft
Bot Elev =	318.00	ft
Height =	1	ft
Slope =	0.0196	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	6.37	ft/sec
Segment Time =	***0.13***	***minutes***

Segment 7: Concentrated Flow

Length =	274	ft
Top Elev =	318.00	ft
Bot Elev =	312.00	ft
Height =	6	ft
Slope =	0.0219	ft/ft
Paved ? =	No	
Velocity =	2.39	ft/sec
Segment Time =	***1.91***	***minutes***

Segment 8: Surface Water Flow

Length =	195	ft
Segment Time =	***0.00***	***minutes***

Segment 9: Pipe Flow

Length =	24	ft
Top Elev =	312.00	ft
Bot Elev =	311.50	ft
Height =	0.5	ft
Slope =	0.0208	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	6.57	ft/sec
Segment Time =	***0.06***	***minutes***

Segment 10: Channel Flow

Length =	4683	ft
Top Elev =	311.50	ft
Bot Elev =	256.00	ft
Height =	55.5	ft
Slope =	0.0119	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	5.16	ft/sec
Segment Time =	***15.12***	***minutes***

Time of Concentration =	47.99	minutes
SCS Lag Time =	28.79	minutes (SCS Lag = 0.6* Tc)
Time Increment =	8.35	minutes (= 0.29*SCS Lag)

REACH DATA

REACH #1 DIA: *POA 1 to POA 1B*

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	3322	ft
Top Elev =	294.00	ft
Bot Elev =	254.00	ft
Height =	40	ft
Slope =	0.0120	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	5.20	ft/sec
Segment Time =	***10.64***	***minutes***

Segment Length =	10.64	minutes
SCS Lag Time =	6.38	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.85	minutes (= 0.29*SCS Lag)

REACH #2 DIA: *POA 7 DIA to POA 1B*

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	537	ft
Top Elev =	256.00	ft
Bot Elev =	254.00	ft
Height =	2	ft
Slope =	0.0037	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	2.89	ft/sec
Segment Time =	***3.09***	***minutes***

Segment Length =	3.09	minutes
SCS Lag Time =	1.86	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.54	minutes (= 0.29*SCS Lag)

REACH #3 DIA: *POA 1B to POA 1 DIA*

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Pipe Flow

Length =	79	ft
Top Elev =	254.00	ft
Bot Elev =	253.50	ft
Height =	0.5	ft
Slope =	0.0063	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	9.12	ft/sec
Segment Time =	***0.14***	***minutes***

Segment 2: Channel Flow

Length =	937	ft
Top Elev =	253.50	ft
Bot Elev =	244.50	ft
Height =	9	ft
Slope =	0.0096	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	3.00	sf (assume 3'w x 1'h channel)
Wetted Perimeter =	5.00	lf (assume 3'w x 1'h channel)
Channel Velocity =	2.31	ft/sec
Segment Time =	***6.76***	***minutes***

Segment 3: Pipe Flow

Length =	33	ft
Top Elev =	244.50	ft
Bot Elev =	244.00	ft
Height =	0.5	ft
Slope =	0.0152	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	14.11	ft/sec
Segment Time =	***0.04***	***minutes***

Segment 4: Channel Flow

Length =	1122	ft
Top Elev =	244.00	ft
Bot Elev =	238.00	ft
Height =	6	ft
Slope =	0.0053	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	60.00	sf (assume 20'w x 3'h channel)
Wetted Perimeter =	26.00	lf (assume 20'w x 3'h channel)
Channel Velocity =	4.23	ft/sec
Segment Time =	***4.42***	***minutes***

Segment Length =	11.37	minutes
SCS Lag Time =	6.82	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.98	minutes (= 0.29*SCS Lag)

REACH #4 DIA: *POA 1 DIA to POA 2-3 DIA*

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	5049	ft
Top Elev =	238.00	ft
Bot Elev =	226.00	ft
Height =	12	ft
Slope =	0.0024	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	72.00	sf (assume 24'w x 3'h channel)
Wetted Perimeter =	30.00	lf (assume 24'w x 3'h channel)
Channel Velocity =	2.89	ft/sec
Segment Time =	***29.08***	***minutes***

Segment Length =	29.08	minutes
SCS Lag Time =	17.45	minutes (SCS Lag = 0.6* Tc)
Time Increment =	5.06	minutes (= 0.29*SCS Lag)

REACH #5 DIA: *POA 5 DIA to POA 6 DIA*
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Pipe Flow

Length =	49	ft
Top Elev =	308.00	ft
Bot Elev =	306.00	ft
Height =	2	ft
Slope =	0.0408	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	23.16	ft/sec
Segment Time =	***0.04***	***minutes***

Segment 2: Channel Flow

Length =	343	ft
Top Elev =	306.00	ft
Bot Elev =	300.00	ft
Height =	6	ft
Slope =	0.0175	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5'x x 3'h channel)
Channel Velocity =	5.39	ft/sec
Segment Time =	***1.06***	***minutes***

Segment Length =	1.10	minutes
SCS Lag Time =	0.66	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.19	minutes (= 0.29*SCS Lag)

REACH #6 DIA: *POA 6 DIA to POA 4 DIA*
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Pipe Flow

Length =	39	ft
Top Elev =	300.00	ft
Bot Elev =	299.50	ft
Height =	0.5	ft
Slope =	0.0128	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	5.15	ft/sec
Segment Time =	***0.13***	***minutes***

Segment 2: Channel Flow

Length =	397	ft
Top Elev =	299.50	ft
Bot Elev =	292.00	ft
Height =	7.5	ft
Slope =	0.0189	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5'x x 3'h channel)
Channel Velocity =	5.60	ft/sec
Segment Time =	***1.18***	***minutes***

Segment 3: Surface Water Flow

Length =	517	ft
Segment Time =	***0.00***	***minutes***

Segment 4: Pipe Flow

Length =	49	ft
Top Elev =	286.50	ft
Bot Elev =	286.00	ft
Height =	0.5	ft
Slope =	0.0102	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	4.59	ft/sec
Segment Time =	***0.18***	***minutes***

Segment 5: Channel Flow

Length =	756	ft
Top Elev =	286.00	ft
Bot Elev =	258.00	ft
Height =	28	ft
Slope =	0.0370	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	3.00	sf (assume 3'w x 1'h channel)
Wetted Perimeter =	5.00	lf (assume 3'x x 1'h channel)
Channel Velocity =	4.53	ft/sec
Segment Time =	***2.78***	***minutes***

Segment 6: Pipe Flow

Length =	48	ft
Top Elev =	278.50	ft
Bot Elev =	278.00	ft
Height =	0.5	ft
Slope =	0.0104	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	4.64	ft/sec
Segment Time =	***0.17***	***minutes***

Segment 7: Channel Flow

Length =	3742	ft
Top Elev =	278.00	ft
Bot Elev =	258.00	ft
Height =	20	ft
Slope =	0.0053	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	45.00	sf (assume 15'w x 3'h channel)
Wetted Perimeter =	21.00	lf (assume 15'x x 3'h channel)
Channel Velocity =	4.02	ft/sec
Segment Time =	***15.50***	***minutes***

Segment Length =	19.94	minutes
SCS Lag Time =	11.96	minutes (SCS Lag = 0.6* Tc)
Time Increment =	3.47	minutes (= 0.29*SCS Lag)

REACH #7 DIA: *POA 4A to POA 4 DIA*
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Pipe Flow

Length =	72	ft
Top Elev =	302.00	ft
Bot Elev =	300.00	ft
Height =	2	ft
Slope =	0.0278	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	7.58	ft/sec
Segment Time =	***0.16***	***minutes***

Segment 2: Channel Flow

Length =	3621	ft
Top Elev =	300.00	ft
Bot Elev =	258.00	ft
Height =	42	ft
Slope =	0.0116	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	30.00	sf (assume 10'w x 3'h channel)
Wetted Perimeter =	16.00	lf (assume 10'x x 3'h channel)
Channel Velocity =	5.42	ft/sec
Segment Time =	***11.13***	***minutes***

Segment Length =	11.29	minutes
SCS Lag Time =	6.77	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.96	minutes (= 0.29*SCS Lag)

REACH #8 DIA: POA 7 to POA 7 DIA
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	184	ft
Top Elev =	300.00	ft
Bot Elev =	296.00	ft
Height =	4	ft
Slope =	0.0217	ft/ft
Paved ? =	no	
Velocity =	2.38	ft/sec
Segment Time =	***1.29***	***minutes***

Segment 2: Surface Water Flow

Length =	463	ft
Segment Time =	***0.00***	***minutes***

Segment 3: Pipe Flow

Length =	55	ft
Top Elev =	296.00	ft
Bot Elev =	282.00	ft
Height =	14	ft
Slope =	0.2545	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	22.95	ft/sec
Segment Time =	***0.04***	***minutes***

Segment 4: Channel Flow

Length =	1998	ft
Top Elev =	282.00	ft
Bot Elev =	256.00	ft
Height =	26	ft
Slope =	0.0130	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	24.00	sf (assume 8'w x 3'h channel)
Wetted Perimeter =	14.00	lf (assume 8'w x 3'h channel)
Channel Velocity =	5.41	ft/sec
Segment Time =	***6.15***	***minutes***

Segment Length =	7.48	minutes
SCS Lag Time =	4.49	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.30	minutes (= 0.29*SCS Lag)

REACH #9 DIA: POA 2 to POA 2-3 DIA
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	3618	ft
Top Elev =	264.00	ft
Bot Elev =	226.00	ft
Height =	38	ft
Slope =	0.0105	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	32.00	sf (assume 16'w x 2'h channel)
Wetted Perimeter =	20.00	lf (assume 16'w x 2'h channel)
Channel Velocity =	4.64	ft/sec
Segment Time =	***12.99***	***minutes***

Segment Length =	12.99	minutes
SCS Lag Time =	7.79	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.26	minutes (= 0.29*SCS Lag)

REACH #10 DIA: POA 3 to POA 2-3 DIA
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	258	ft
Top Elev =	305.00	ft
Bot Elev =	290.00	ft
Height =	15	ft
Slope =	0.0581	ft/ft
Paved ? =	no	
Velocity =	3.89	ft/sec
Segment Time =	***1.11***	***minutes***

Segment 2: Surface Water Flow

Length =	445	ft
Segment Time =	***0.00***	***minutes***

Segment 3: Pipe Flow

Length =	21	ft
Top Elev =	288.00	ft
Bot Elev =	276.00	ft
Height =	12	ft
Slope =	0.5714	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	1.00	ft
Flow Area =	0.79	sf
Wetted Perimeter =	3.14	lf (2 ft ID pipe)
Channel Velocity =	34.38	ft/sec
Segment Time =	***0.01***	***minutes***

Segment 4: Channel Flow

Length =	4121	ft
Top Elev =	276.00	ft
Bot Elev =	226.00	ft
Height =	50	ft
Slope =	0.0121	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	32.00	sf (assume 16'w x 2'h channel)
Wetted Perimeter =	20.00	lf (assume 16'w x 2'h channel)
Channel Velocity =	4.99	ft/sec
Segment Time =	***13.77***	***minutes***

Segment Length =	14.88	minutes
SCS Lag Time =	8.93	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.59	minutes (= 0.29*SCS Lag)

REACH #11 DIA: POA 4 TO POA 4A
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	416	ft
Top Elev =	308.00	ft
Bot Elev =	302.00	ft
Height =	6	ft
Slope =	0.0144	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5' x 3' channel)
Channel Velocity =	4.25	ft/sec
Segment Time =	***1.63***	***minutes***

Segment 2: Surface Water Flow

Length =	620	ft
Segment Time =	***0.00***	***minutes***

Segment Length =	1.63	minutes
SCS Lag Time =	0.98	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.28	minutes (= 0.29*SCS Lag)

REACH #12 DIA: POA 5 to POA 5 DIA
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	245	ft
Top Elev =	322.00	ft
Bot Elev =	318.00	ft
Height =	4	ft
Slope =	0.0163	ft/ft
Paved ? =	no	
Velocity =	2.06	ft/sec
Segment Time =	***1.98***	***minutes***

Segment 2: Pipe Flow

Length =	53	ft
Top Elev =	318.00	ft
Bot Elev =	317.00	ft
Height =	1	ft
Slope =	0.0189	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	2.00	ft
Flow Area =	3.14	sf
Wetted Perimeter =	6.28	lf (2 ft ID pipe)
Channel Velocity =	9.92	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 3: Channel Flow

Length =	479	ft
Top Elev =	317.00	ft
Bot Elev =	308.00	ft
Height =	9	ft
Slope =	0.0188	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5'w x 3'h channel)
Channel Velocity =	4.85	ft/sec
Segment Time =	***1.65***	***minutes***

Segment Length =	3.72	minutes
SCS Lag Time =	2.23	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.65	minutes (= 0.29*SCS Lag)

REACH #13 DIA: POA 6 to POA 6 DIA
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	881	ft
Top Elev =	340.00	ft
Bot Elev =	310.00	ft
Height =	30	ft
Slope =	0.0341	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	10.50	sf (assume 3.5'w x 3'h channel)
Wetted Perimeter =	9.50	lf (assume 3.5'w x 3'h channel)
Channel Velocity =	6.53	ft/sec
Segment Time =	***2.25***	***minutes***

Segment 2: Concentrated Flow

Length =	156	ft
Top Elev =	310.00	ft
Bot Elev =	308.00	ft
Height =	2	ft
Slope =	0.0128	ft/ft
Paved ? =	no	
Velocity =	1.83	ft/sec
Segment Time =	***1.42***	***minutes***

Segment 3: Pipe Flow

Length =	49	ft
Top Elev =	308.00	ft
Bot Elev =	306.00	ft
Height =	2	ft
Slope =	0.0408	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	4.00	ft
Flow Area =	12.57	sf
Wetted Perimeter =	12.57	lf (2 ft ID pipe)
Channel Velocity =	23.16	ft/sec
Segment Time =	***0.04***	***minutes***

Segment 4: Channel Flow

Length =	343	ft
Top Elev =	306.00	ft
Bot Elev =	300.00	ft
Height =	6	ft
Slope =	0.0175	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	15.00	sf (assume 5'w x 3'h channel)
Wetted Perimeter =	11.00	lf (assume 5'x x 3'h channel)
Channel Velocity =	5.39	ft/sec
Segment Time =	***1.06***	***minutes***

Segment Length =	4.77	minutes
SCS Lag Time =	2.86	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.83	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 Bypass

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	76.8%
HSG 'C' =	0.0%
HSG 'D' =	23.2%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	65	Assume good condition
Wooded	60	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	65	55,395	1.27	Assume good condition
Onsite wooded	60	28,701	0.66	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	65	0	0.00	Assume good condition
Offsite wooded	60	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	1.93	acres
	84,096	sf
Composite SCS CN =	64	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	329.00	ft
Bot Elev =	306.00	ft
Height =	23	ft
Slope =	0.2300	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***5.17***	***minutes***

Segment 2: Concentrated Flow

Length =	118	ft
Top Elev =	306.00	ft
Bot Elev =	298.00	ft
Height =	8	ft
Slope =	0.0678	ft/ft
Paved ? =	No	
Velocity =	4.20	ft/sec
Segment Time =	***0.47***	***minutes***

Segment 3: Channel Flow

Length =	123	ft
Top Elev =	298.00	ft
Bot Elev =	294.00	ft
Height =	4	ft
Slope =	0.0325	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	2.00	sf (assume 4'w x 0.5'h channel)
Wetted Perimeter =	5.00	lf (assume 4'w x 0.5'h channel)
Channel Velocity =	3.24	ft/sec
Segment Time =	***0.63***	***minutes***

Time of Concentration =	6.27	minutes
SCS Lag Time =	3.76	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.09	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to Culvert 1

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	3.9%
HSG 'D' =	96.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	80	39,240	0.90	Assume good condition
Onsite wooded	77	31,937	0.73	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	1.63	acres
	71,177	sf
Composite SCS CN =	78	
% Impervious =	0.0%	

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to Culvert 1

M. Javellana, EI
2/8/2024

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow			***Segment 2: Concentrated Flow***		
Length =	87	ft	Length =	235	ft
Top Elev =	318.75	ft	Top Elev =	317.50	ft
Bot Elev =	317.50	ft	Bot Elev =	310.00	ft
Height =	1.25	ft	Height =	8	ft
Slope =	0.0144	ft/ft	Slope =	0.0319	ft/ft
Manning's n =	0.24	dense grasses	Paved ? =	No	
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)	Velocity =	2.88	ft/sec
Segment Time =	***14.01***	***minutes***	***Segment Time =***	***1.36***	***minutes***

Time of Concentration =	15.37	minutes
SCS Lag Time =	9.22	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.67	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to Lake

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	15.7%
HSG 'C' =	0.1%
HSG 'D' =	84.2%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	77	Assume good condition
Wooded	74	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	28,403	0.65
Other	0	0.00
Totals	28,403	0.65

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	28,403	0.65	-
Onsite open	77	258,322	5.93	Assume good condition
Onsite wooded	74	74,496	1.71	Assume good condition
Onsite pond	100	279,984	6.43	-
Offsite impervious	98	0	0.00	-
Offsite open	77	0	0.00	Assume good condition
Offsite wooded	74	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	14.72	acres
	641,205	sf
Composite SCS CN =	88	
% Impervious =	4.4%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to SCM B

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	4.8%
HSG 'C' =	48.1%
HSG 'D' =	47.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	76	Assume good condition
Wooded	73	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	219,801	5.05
Roadway Area	109,900	2.52
Driveway / Parking Lot	88,967	2.04
Sidewalk / Patio	104,667	2.40
Other	0	0.00
Totals	523,335	12.01

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	523,335	12.01	-
Onsite open	76	258,818	5.94	Assume good condition
Onsite wooded	73	0	0.00	Assume good condition
Onsite pond	100	22,978	0.53	-
Offsite impervious	98	0	0.00	-
Offsite open	76	31,021	0.71	Assume good condition
Offsite wooded	73	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	19.20	acres
	836,152	sf
Composite SCS CN =	90	
% Impervious =	62.6%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 1 to SCM H

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	39.5%
HSG 'C' =	36.1%
HSG 'D' =	24.5%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	70	Assume good condition
Wooded	66	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	71,567	1.64
Roadway Area	35,783	0.82
Driveway / Parking Lot	28,967	0.67
Sidewalk / Patio	34,079	0.78
Other	0	0.00
Totals	170,397	3.91

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	170,397	3.91	-
Onsite open	70	77,972	1.79	Assume good condition
Onsite wooded	66	0	0.00	Assume good condition
Onsite pond	100	13,780	0.32	-
Offsite impervious	98	0	0.00	-
Offsite open	70	0	0.00	Assume good condition
Offsite wooded	66	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.02	acres
	262,149	sf
Composite SCS CN =	90	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 1 to SCM I

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	42.3%
HSG 'D' =	57.7%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	77	Assume good condition
Wooded	74	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	82,050	1.88
Roadway Area	41,025	0.94
Driveway / Parking Lot	33,211	0.76
Sidewalk / Patio	39,072	0.90
Other	0	0.00
Totals	195,358	4.48

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	195,358	4.48	-
Onsite open	77	95,566	2.19	Assume good condition
Onsite wooded	74	0	0.00	Assume good condition
Onsite pond	100	9,627	0.22	-
Offsite impervious	98	0	0.00	-
Offsite open	77	0	0.00	Assume good condition
Offsite wooded	74	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.90	acres
	300,551	sf
Composite SCS CN =	92	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 Bypass 1

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	59.5%
HSG 'C' =	1.1%
HSG 'D' =	39.4%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	69	Assume good condition
Wooded	64	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	43,899	1.01
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	43,899	1.01

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	43,899	1.01	-
Onsite open	69	110,223	2.53	Assume good condition
Onsite wooded	64	25,660	0.59	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	9,965	0.23	-
Offsite open	69	60,105	1.38	Assume good condition
Offsite wooded	64	25,683	0.59	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.33	acres
	275,535	sf
Composite SCS CN =	73	
% Impervious =	19.5%	

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 Bypass 1

M. Javellana, EI
2/8/2024

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	324.75	ft
Bot Elev =	318.00	ft
Height =	6.75	ft
Slope =	0.0675	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***8.44***	***minutes***

Segment 2: Concentrated Flow

Length =	46	ft
Top Elev =	318.00	ft
Bot Elev =	310.00	ft
Height =	8	ft
Slope =	0.1739	ft/ft
Paved ? =	No	
Velocity =	6.73	ft/sec
Segment Time =	***0.11***	***minutes***

Segment 2: Concentrated Flow

Length =	130	ft
Top Elev =	310.00	ft
Bot Elev =	304.00	ft
Height =	6	ft
Slope =	0.0462	ft/ft
Paved ? =	yes	
Velocity =	4.37	ft/sec
Segment Time =	***0.50***	***minutes***

Segment 4: Pipe Flow

Length =	194	ft
Top Elev =	304.00	ft
Bot Elev =	266.00	ft
Height =	38	ft
Slope =	0.1959	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	2.50	ft
Flow Area =	4.91	sf
Wetted Perimeter =	7.85	lf (2 ft ID pipe)
Channel Velocity =	37.08	ft/sec
Segment Time =	***0.09***	***minutes***

Time of Concentration =	9.13	minutes
SCS Lag Time =	5.48	minutes (SCS Lag = 0.6* Tc)
Time Increment =	1.59	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 Bypass 2

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	88.0%
HSG 'C' =	0.0%
HSG 'D' =	12.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	63	Assume good condition
Wooded	58	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	46,440	1.07
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	46,440	1.07

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	46,440	1.07	-
Onsite open	63	167,294	3.84	Assume good condition
Onsite wooded	58	63,577	1.46	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	30,503	0.70	-
Offsite open	63	95,084	2.18	Assume good condition
Offsite wooded	58	73,916	1.70	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	10.95	acres
	476,814	sf
Composite SCS CN =	67	
% Impervious =	16.1%	

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 Bypass 2

M. Javellana, EI
2/8/2024

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	314.00	ft
Bot Elev =	306.00	ft
Height =	8	ft
Slope =	0.0800	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***7.88***	***minutes***

Segment 2: Concentrated Flow

Length =	310	ft
Top Elev =	306.00	ft
Bot Elev =	282.00	ft
Height =	24	ft
Slope =	0.0774	ft/ft
Paved ? =	No	
Velocity =	4.49	ft/sec
Segment Time =	***1.15***	***minutes***

Segment 3: Channel Flow

Length =	746	ft
Top Elev =	282.00	ft
Bot Elev =	266.00	ft
Height =	16	ft
Slope =	0.0214	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	8.00	sf (assume 8' x 1' channel)
Wetted Perimeter =	10.00	lf (assume 8' x 1' channel)
Channel Velocity =	4.18	ft/sec
Segment Time =	***2.98***	***minutes***

Time of Concentration =	12.01	minutes
SCS Lag Time =	7.20	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.09	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 2 to SCM E

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	64.3%
HSG 'C' =	0.0%
HSG 'D' =	35.7%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	68	Assume good condition
Wooded	63	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	133,597	3.07
Roadway Area	66,799	1.53
Driveway / Parking Lot	54,075	1.24
Sidewalk / Patio	63,618	1.46
Other	0	0.00
Totals	318,089	7.30

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	318,089	7.30	-
Onsite open	68	118,435	2.72	Assume good condition
Onsite wooded	63	0	0.00	Assume good condition
Onsite pond	100	17,889	0.41	-
Offsite impervious	98	0	0.00	-
Offsite open	68	0	0.00	Assume good condition
Offsite wooded	63	9,703	0.22	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	10.65	acres
	464,116	sf
Composite SCS CN =	90	
% Impervious =	68.5%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 to SCM F

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	65.9%
HSG 'D' =	34.1%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	76	Assume good condition
Wooded	72	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	126,601	2.91
Roadway Area	63,300	1.45
Driveway / Parking Lot	51,243	1.18
Sidewalk / Patio	60,286	1.38
Other	0	0.00
Totals	301,430	6.92

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	301,430	6.92	-
Onsite open	76	145,119	3.33	Assume good condition
Onsite wooded	72	0	0.00	Assume good condition
Onsite pond	100	17,190	0.39	-
Offsite impervious	98	0	0.00	-
Offsite open	76	0	0.00	Assume good condition
Offsite wooded	72	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	10.65	acres
	463,739	sf
Composite SCS CN =	91	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 2 to SCM G

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	34.5%
HSG 'C' =	52.8%
HSG 'D' =	12.8%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	70	Assume good condition
Wooded	66	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	91,397	2.10
Roadway Area	45,698	1.05
Driveway / Parking Lot	36,994	0.85
Sidewalk / Patio	43,522	1.00
Other	0	0.00
Totals	217,611	5.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	217,611	5.00	-
Onsite open	70	106,291	2.44	Assume good condition
Onsite wooded	66	0	0.00	Assume good condition
Onsite pond	100	10,884	0.25	-
Offsite impervious	98	0	0.00	-
Offsite open	70	0	0.00	Assume good condition
Offsite wooded	66	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	7.69	acres
	334,786	sf
Composite SCS CN =	89	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 3 Bypass

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	76.5%
HSG 'C' =	23.5%
HSG 'D' =	0.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	64	Assume good condition
Wooded	59	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	61,186	1.40
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	61,186	1.40

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	61,186	1.40	-
Onsite open	64	81,447	1.87	Assume good condition
Onsite wooded	59	8,329	0.19	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	64	0	0.00	Assume good condition
Offsite wooded	59	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	3.47	acres
	150,962	sf
Composite SCS CN =	78	
% Impervious =	40.5%	

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 3 Bypass

M. Javellana, EI
2/8/2024

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	95	ft
Top Elev =	324.00	ft
Bot Elev =	321.00	ft
Height =	3	ft
Slope =	0.0316	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***10.97***	***minutes***

Segment 2: Concentrated Flow

Length =	78	ft
Top Elev =	321.00	ft
Bot Elev =	317.00	ft
Height =	4	ft
Slope =	0.0513	ft/ft
Paved ? =	yes	
Velocity =	4.60	ft/sec
Segment Time =	***0.28***	***minutes***

Segment 3: Pipe Flow

Length =	102	ft
Top Elev =	317.00	ft
Bot Elev =	313.00	ft
Height =	4	ft
Slope =	0.0392	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	3.00	ft
Flow Area =	7.07	sf
Wetted Perimeter =	9.42	lf (2 ft ID pipe)
Channel Velocity =	18.74	ft/sec
Segment Time =	***0.09***	***minutes***

Segment 4: Concentrated Flow

Length =	97	ft
Top Elev =	313.00	ft
Bot Elev =	308.00	ft
Height =	5	ft
Slope =	0.0515	ft/ft
Paved ? =	no	
Velocity =	3.66	ft/sec
Segment Time =	***0.44***	***minutes***

Time of Concentration =	11.79	minutes
SCS Lag Time =	7.07	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.05	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 4 Bypass

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	8.5%
HSG 'D' =	91.5%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	79	Assume good condition
Wooded	76	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	79	166,806	3.83	Assume good condition
Onsite wooded	76	390,475	8.96	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	3,902	0.09	-
Offsite open	79	21,264	0.49	Assume good condition
Offsite wooded	76	2,038	0.05	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	13.42	acres
	584,485	sf
Composite SCS CN =	78	
% Impervious =	0.7%	

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 4 Bypass

M. Javellana, EI
2/8/2024

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow			***Segment 2: Concentrated Flow***		
Length =	100	ft	Length =	824	ft
Top Elev =	318.50	ft	Top Elev =	316.75	ft
Bot Elev =	316.75	ft	Bot Elev =	308.00	ft
Height =	1.75	ft	Height =	9	ft
Slope =	0.0175	ft/ft	Slope =	0.0106	ft/ft
Manning's n =	0.40	wooded-dense underbrush	Paved ? =	No	
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)	Velocity =	1.66	ft/sec
Segment Time =	***21.78***	***minutes***	***Segment Time =***	***8.26***	***minutes***

Time of Concentration =	30.04	minutes
SCS Lag Time =	18.03	minutes (SCS Lag = 0.6* Tc)
Time Increment =	5.23	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 4 to SCM C

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	64.6%
HSG 'D' =	35.4%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	76	Assume good condition
Wooded	72	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	148,116	3.40
Roadway Area	74,058	1.70
Driveway / Parking Lot	59,952	1.38
Sidewalk / Patio	70,531	1.62
Other	0	0.00
Totals	352,657	8.10

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	352,657	8.10	-
Onsite open	76	125,967	2.89	Assume good condition
Onsite wooded	72	0	0.00	Assume good condition
Onsite pond	100	25,172	0.58	-
Offsite impervious	98	0	0.00	-
Offsite open	76	0	0.00	Assume good condition
Offsite wooded	72	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	11.57	acres
	503,796	sf
Composite SCS CN =	93	
% Impervious =	70.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 4 to SCM J

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	51.6%
HSG 'D' =	48.4%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	77	Assume good condition
Wooded	73	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	101,927	2.34
Roadway Area	50,964	1.17
Driveway / Parking Lot	41,256	0.95
Sidewalk / Patio	48,537	1.11
Other	0	0.00
Totals	242,684	5.57

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	242,684	5.57	-
Onsite open	77	119,556	2.74	Assume good condition
Onsite wooded	73	0	0.00	Assume good condition
Onsite pond	100	11,120	0.26	-
Offsite impervious	98	0	0.00	-
Offsite open	77	0	0.00	Assume good condition
Offsite wooded	73	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	8.57	acres
	373,360	sf
Composite SCS CN =	91	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 5 Bypass

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	100.0%
HSG 'D' =	0.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	74	Assume good condition
Wooded	70	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	1,712	0.04
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	1,712	0.04

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	1,712	0.04	-
Onsite open	74	7,882	0.18	Assume good condition
Onsite wooded	70	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	74	0	0.00	Assume good condition
Offsite wooded	70	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	0.22	acres
	9,594	sf
Composite SCS CN =	78	
% Impervious =	17.8%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 6 Bypass

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	88.1%
HSG 'D' =	11.9%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	75	Assume good condition
Wooded	71	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	26,693	0.61
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	26,693	0.61

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	26,693	0.61	-
Onsite open	75	19,207	0.44	Assume good condition
Onsite wooded	71	7,411	0.17	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	75	0	0.00	Assume good condition
Offsite wooded	71	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	1.22	acres
	53,311	sf
Composite SCS CN =	86	
% Impervious =	50.1%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	60	ft
Top Elev =	348.00	ft
Bot Elev =	347.00	ft
Height =	1	ft
Slope =	0.0167	ft/ft
Manning's n =	0.24	wooded-dense underbrush
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***9.81***	***minutes***

Segment 2: Concentrated Flow

Length =	314	ft
Top Elev =	347.00	ft
Bot Elev =	339.00	ft
Height =	8	ft
Slope =	0.0255	ft/ft
Paved ? =	No	
Velocity =	2.58	ft/sec
Segment Time =	***2.03***	***minutes***

Time of Concentration =	11.84	minutes
SCS Lag Time =	7.11	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.06	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 7 Bypass 1

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	33.1%
HSG 'C' =	66.9%
HSG 'D' =	0.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	70	Assume good condition
Wooded	65	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	70	37,663	0.86	Assume good condition
Onsite wooded	65	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	70	0	0.00	Assume good condition
Offsite wooded	65	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	0.86	acres
	37,663	sf
Composite SCS CN =	70	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY
Subbasin 7 Bypass 2

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	19.3%
HSG 'C' =	65.2%
HSG 'D' =	15.5%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	72	Assume good condition
Wooded	68	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	0	0.00
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	72	53,356	1.22	Assume good condition
Onsite wooded	68	36,548	0.84	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	72	0	0.00	Assume good condition
Offsite wooded	68	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	2.06	acres
	89,904	sf
Composite SCS CN =	71	
% Impervious =	0.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	316.00	ft
Bot Elev =	309.00	ft
Height =	7	ft
Slope =	0.0700	ft/ft
Manning's n =	0.40	wooded
P (2-year/24-hour) =	3.46	inches (Zebulon, NC)
Segment Time =	***12.51***	***minutes***

Segment 2: Concentrated Flow

Length =	138	ft
Top Elev =	309.00	ft
Bot Elev =	300.00	ft
Height =	9	ft
Slope =	0.0652	ft/ft
Paved ? =	No	
Velocity =	4.12	ft/sec
Segment Time =	***0.56***	***minutes***

Time of Concentration =	13.07	minutes
SCS Lag Time =	7.84	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.27	minutes (= 0.29*SCS Lag)

Chamblee Lake
DRH 22004

POST-DEVELOPMENT HYDROLOGY

Subbasin 7 to SCM A

M. Javellana, EI
2/8/2024

I. SCS CURVE NUMBERS

Soils from WebSoilSurvey are only inclusive of indirectly connected areas

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	68.1%
HSG 'C' =	31.9%
HSG 'D' =	0.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	65	Assume good condition
Wooded	60	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roof	73,323	1.68
Roadway Area	36,661	0.84
Driveway / Parking Lot	29,678	0.68
Sidewalk / Patio	34,916	0.80
Other	0	0.00
Totals	174,578	4.01

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	174,578	4.01	-
Onsite open	65	75,730	1.74	Assume good condition
Onsite wooded	60	0	0.00	Assume good condition
Onsite pond	100	18,273	0.42	-
Offsite impervious	98	0	0.00	-
Offsite open	65	0	0.00	Assume good condition
Offsite wooded	60	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	6.17	acres
	268,581	sf
Composite SCS CN =	89	
% Impervious =	65.0%	

III. TIME OF CONCENTRATION INFORMATION

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

REACH DATA

REACH #1: J-4 to POA 7

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	194	ft
Top Elev =	307.00	ft
Bot Elev =	300.00	ft
Height =	7	ft
Slope =	0.0361	ft/ft
Paved ? =	No	
Velocity =	3.06	ft/sec
Segment Time =	***1.05***	***minutes***

Segment Length =	1.05	minutes
SCS Lag Time =	0.63	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.18	minutes (= 0.29*SCS Lag)

REACH #2: *J-2 to POA 1*

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	159	ft
Top Elev =	298.00	ft
Bot Elev =	294.00	ft
Height =	4	ft
Slope =	0.0252	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	2.00	sf (assume 4'w x 0.5'h channel)
Wetted Perimeter =	5.00	lf (assume 4'w x 0.5'h channel)
Channel Velocity =	2.85	ft/sec
Segment Time =	***0.93***	***minutes***

Segment Length =	0.93	minutes
SCS Lag Time =	0.56	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.16	minutes (= 0.29*SCS Lag)

REACH #3: *J-9 to J-3*
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	80	ft
Top Elev =	298.00	ft
Bot Elev =	292.00	ft
Height =	6	ft
Slope =	0.0750	ft/ft
Paved ? =	No	
Velocity =	4.42	ft/sec
Segment Time =	***0.30***	***minutes***

Segment 2: Channel Flow

Length =	100	ft
Top Elev =	292.00	ft
Bot Elev =	288.77	ft
Height =	3.23	ft
Slope =	0.0323	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	4.00	sf (assume 4'w x 1'h channel)
Wetted Perimeter =	6.00	lf (assume 4'w x 1'h channel)
Channel Velocity =	4.54	ft/sec
Segment Time =	***0.37***	***minutes***

Segment 3: Pipe Flow

Length =	73	ft
Top Elev =	288.77	ft
Bot Elev =	286.39	ft
Height =	2.38	ft
Slope =	0.0326	ft/ft
Manning's n =	0.013	concrete pipe
Pipe Diameter=	2.50	ft
Flow Area =	4.91	sf
Wetted Perimeter =	7.85	lf (2 ft ID pipe)
Channel Velocity =	15.13	ft/sec
Segment Time =	***0.08***	***minutes***

Segment Length =	0.75	minutes
SCS Lag Time =	0.45	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.13	minutes (= 0.29*SCS Lag)

REACH #4: J-3 to POA 2
Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Channel Flow

Length =	858	ft
Top Elev =	286.39	ft
Bot Elev =	266.00	ft
Height =	20.39	ft
Slope =	0.0238	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	8.00	sf (assume 4'w x 2'h channel)
Wetted Perimeter =	10.00	lf (assume 4'w x 2'h channel)
Channel Velocity =	4.40	ft/sec
Segment Time =	***3.25***	***minutes***

Segment Length =	3.25	minutes
SCS Lag Time =	1.95	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.57	minutes (= 0.29*SCS Lag)

REACH #5: J-5 to POA 2

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	83	ft
Top Elev =	275.00	ft
Bot Elev =	266.50	ft
Height =	9	ft
Slope =	0.1024	ft/ft
Paved ? =	No	
Velocity =	5.16	ft/sec
Segment Time =	***0.27***	***minutes***

Segment 2: Channel Flow

Length =	23	ft
Top Elev =	266.50	ft
Bot Elev =	266.00	ft
Height =	0.5	ft
Slope =	0.0217	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	8.00	sf (assume 4'w x 2'h channel)
Wetted Perimeter =	10.00	lf (assume 4'w x 2'h channel)
Channel Velocity =	4.21	ft/sec
Segment Time =	***0.09***	***minutes***

Segment Length =	0.36	minutes
SCS Lag Time =	0.22	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.06	minutes (= 0.29*SCS Lag)

REACH #6: J-7 to POA 4

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	153	ft
Top Elev =	311.00	ft
Bot Elev =	308.00	ft
Height =	3	ft
Slope =	0.0196	ft/ft
Paved ? =	No	
Velocity =	2.26	ft/sec
Segment Time =	***1.13***	***minutes***

Segment Length =	1.13	minutes
SCS Lag Time =	0.68	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.20	minutes (= 0.29*SCS Lag)

REACH #7 J-8 to POA 4

Calculated using the SCS Segmental Approach (TR-55).

Segment 1: Concentrated Flow

Length =	288	ft
Top Elev =	312.00	ft
Bot Elev =	308.00	ft
Height =	4	ft
Slope =	0.0139	ft/ft
Paved ? =	No	
Velocity =	1.90	ft/sec
Segment Time =	***2.52***	***minutes***

Segment Length =	2.52	minutes
SCS Lag Time =	1.51	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.44	minutes (= 0.29*SCS Lag)

REACH #8 Culvert 1 to O-11

Calculated using the SCS Segmental Approach (TR-55).

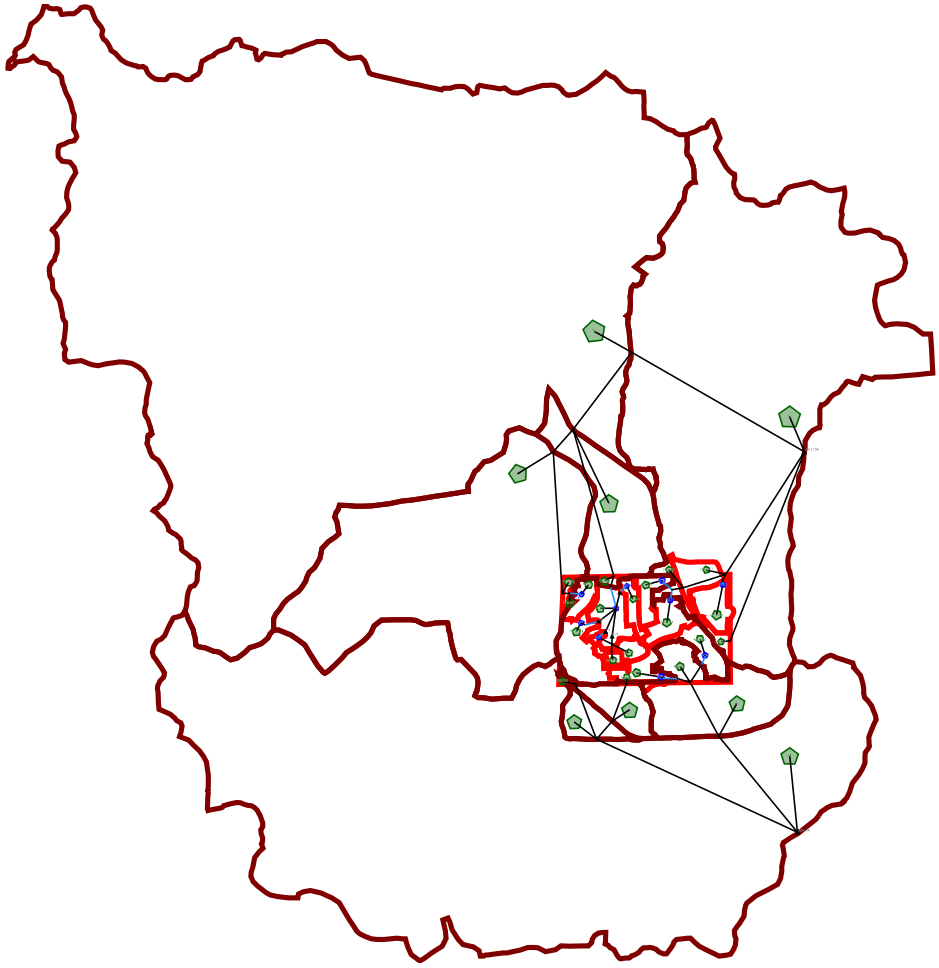
Segment 1: Concentrated Flow

Length =	63	ft
Top Elev =	310.00	ft
Bot Elev =	307.00	ft
Height =	3	ft
Slope =	0.0476	ft/ft
Paved ? =	no	
Velocity =	3.52	ft/sec
Segment Time =	***0.30***	***minutes***

Segment Length =	0.30	minutes
SCS Lag Time =	0.18	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.05	minutes (= 0.29*SCS Lag)

MCADAMS

Scenario: Post-Development 1-year



MCADAMS

FlexTable: Catchment Table (DRH22004 DIA.ppc)

Current Time: 0.000 min

Label	Outflow Node	Area (ft²)	SCS CN	Time of Concentration (min)	Notes
1 Bypass	POA 1	84,096.00	64.000	6.270	POST
1 to Culvert 1	Culvert 1	71,177.00	78.000	15.370	POST
1 to Lake	Lake	641,205.00	88.000	5.000	POST
1 to SCM B	SCM B	836,152.00	90.000	5.000	POST
1 to SCM H	SCM H	262,149.00	90.000	5.000	POST
1 to SCM I	SCM I	300,551.00	92.000	5.000	POST
1B DIA	1B DIA	3,146,164.00	73.000	28.440	POST
1C DIA	POA 1 DIA	81,646,098.00	86.000	83.000	POST
2 Bypass 1	Chamblee Rd Culvert	275,535.00	73.000	9.130	POST
2 Bypass 2	POA 2	476,814.00	67.000	12.010	POST
2 to SCM E	SCM E	464,116.00	90.000	5.000	POST
2 to SCM F	SCM F	463,739.00	91.000	5.000	POST
2 to SCM G	SCM G	334,786.00	89.000	5.000	POST
2-3 DIA	POA 2-3 DIA	27,602,874.00	75.000	46.950	POST
3 Bypass	POA 3	150,962.00	78.000	11.790	POST
4 Bypass	POA 4	584,485.00	78.000	30.040	POST
4 to SCM C	SCM C	503,796.00	93.000	5.000	POST
4 to SCM J	SCM J	373,360.00	91.000	5.000	POST
4A DIA	4A DIA	2,468,795.00	84.000	17.500	POST
4B DIA	POA 4 DIA	50,301,567.00	80.000	97.300	POST
5 Bypass	POA 5	9,594.00	78.000	5.000	POST
5 DIA	POA 5 DIA	860,021.00	83.000	20.570	POST
6 Bypass	POA 6	53,311.00	86.000	11.840	POST
6 DIA	POA 6 DIA	662,786.00	81.000	21.320	POST
7 Bypass 1	J-4	37,663.00	70.000	5.000	POST
7 Bypass 2	POA 7	89,904.00	71.000	13.070	POST
7 DIA	POA 7 DIA	15,215,371.00	81.000	47.990	POST
7 to SCM A	SCM A	268,581.00	89.000	5.000	POST

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
1 Bypass	Post-Development 10-year	10	0.271	722.000	4.24
1 to Culvert 1	Post-Development 10-year	10	0.387	728.000	4.70
1 to Lake	Post-Development 10-year	10	4.687	721.000	82.69
1 to SCM B	Post-Development 10-year	10	6.448	721.000	112.47
1 to SCM H	Post-Development 10-year	10	2.021	721.000	35.26
1 to SCM I	Post-Development 10-year	10	2.441	721.000	41.95
1B DIA	Post-Development 10-year	10	14.416	736.000	125.52
1C DIA	Post-Development 10-year	10	554.792	775.000	2,675.81
2 Bypass 1	Post-Development 10-year	10	1.268	724.000	18.69
2 Bypass 2	Post-Development 10-year	10	1.746	727.000	22.59
2 to SCM E	Post-Development 10-year	10	3.579	721.000	62.43
2 to SCM F	Post-Development 10-year	10	3.671	721.000	63.59
2 to SCM G	Post-Development 10-year	10	2.514	721.000	44.12
2-3 DIA	Post-Development 10-year	10	134.811	751.000	905.66
3 Bypass	Post-Development 10-year	10	0.822	726.000	11.21
4 Bypass	Post-Development 10-year	10	3.169	737.000	27.37
4 to SCM C	Post-Development 10-year	10	4.197	721.000	71.48
4 to SCM J	Post-Development 10-year	10	2.955	721.000	51.19
4A DIA	Post-Development 10-year	10	16.118	730.000	183.27
4B DIA	Post-Development 10-year	10	284.824	779.000	1,246.71
5 DIA	Post-Development 10-year	10	5.450	732.000	57.33
5 Bypass	Post-Development 10-year	10	0.052	721.000	0.94
6 DIA	Post-Development 10-year	10	3.956	731.000	40.96
6 Bypass	Post-Development 10-year	10	0.369	726.000	4.98

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
7 DIA	Post-Development 10-year	10	90.153	749.000	602.10
7 Bypass 1	Post-Development 10-year	10	0.155	721.000	2.71
7 Bypass 2	Post-Development 10-year	10	0.385	727.000	4.93
7 to SCM A	Post-Development 10-year	10	2.017	721.000	35.40

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
1A DIA	Post-Development 10-year	10	12.803	764.000	42.91
1B DIA	Post-Development 10-year	10	119.139	752.000	735.96
4A DIA	Post-Development 10-year	10	24.339	730.000	228.03
Chamblee Rd Culvert	Post-Development 10-year	10	4.908	728.000	26.58
Culvert 1	Post-Development 10-year	10	0.387	728.000	4.70
J-4	Post-Development 10-year	10	1.278	751.000	6.56
J-5	Post-Development 10-year	10	2.575	756.000	6.18
J-7	Post-Development 10-year	10	2.992	783.000	3.87
J-8	Post-Development 10-year	10	2.073	728.000	23.02
J-9	Post-Development 10-year	10	3.642	753.000	16.71
POA 1	Post-Development 10-year	10	13.069	764.000	43.42
POA 1 DIA	Post-Development 10-year	10	673.439	773.000	3,358.84
POA 2	Post-Development 10-year	10	9.222	731.000	50.30
POA 2-3 DIA	Post-Development 10-year	10	811.541	793.000	3,736.45
POA 3	Post-Development 10-year	10	0.822	726.000	11.21
POA 4	Post-Development 10-year	10	8.230	733.000	51.91

Node Summary

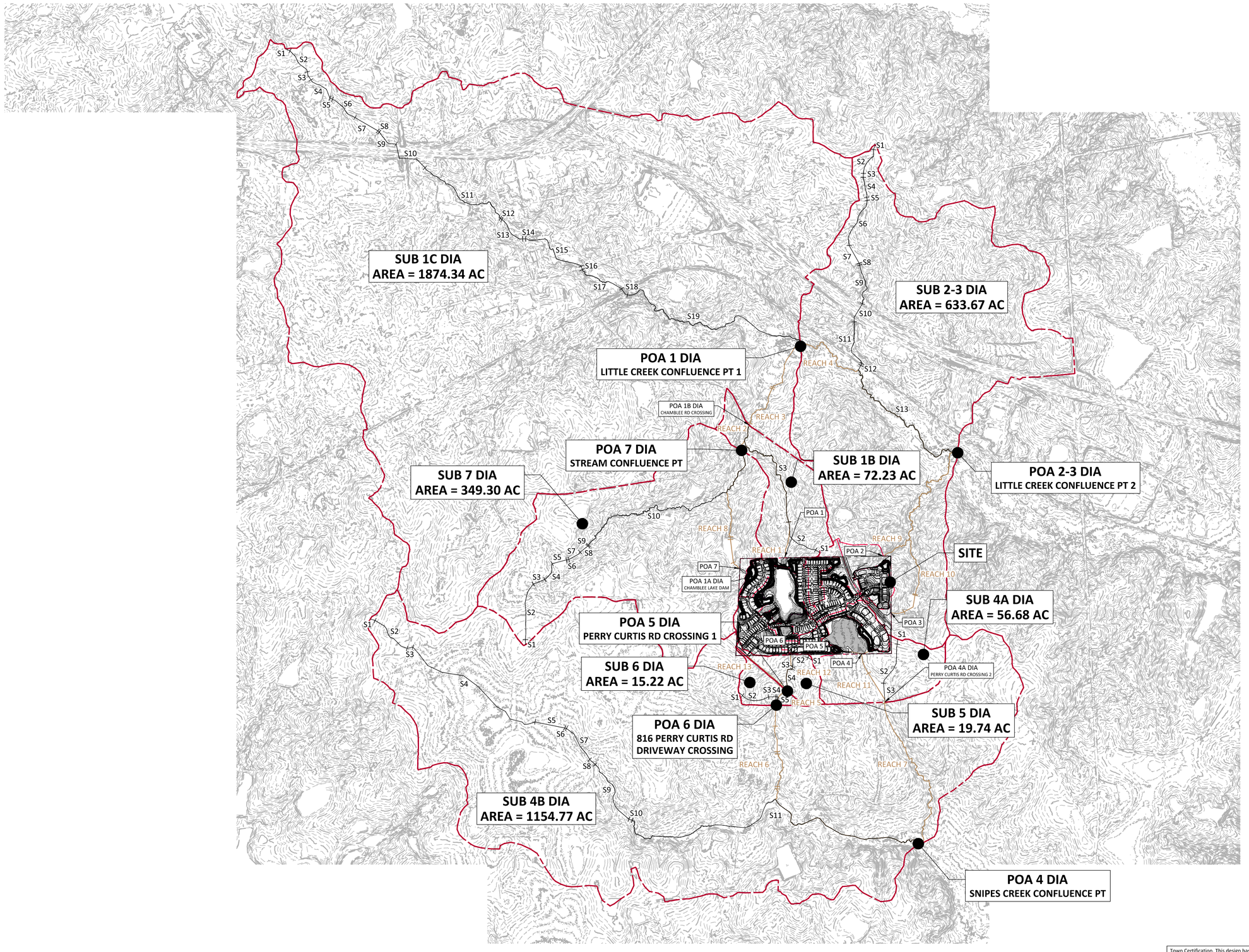
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
POA 4 DIA	Post-Development 10-year	10	318.825	778.000	1,352.12
POA 5	Post-Development 10-year	10	0.052	721.000	0.94
POA 5 DIA	Post-Development 10-year	10	5.502	732.000	57.81
POA 6	Post-Development 10-year	10	0.369	726.000	4.98
POA 6 DIA	Post-Development 10-year	10	9.826	731.000	103.60
POA 7	Post-Development 10-year	10	1.662	752.000	8.49
POA 7 DIA	Post-Development 10-year	10	91.810	749.000	608.97

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Lake (IN)	Post-Development 10-year	10	13.806	722.000	160.53	(N/A)	(N/A)
Lake (OUT)	Post-Development 10-year	10	12.803	764.000	42.91	307.80	5.572
SCM A (IN)	Post-Development 10-year	10	2.017	721.000	35.40	(N/A)	(N/A)
SCM A (OUT)	Post-Development 10-year	10	1.122	753.000	5.84	316.34	1.153
SCM B (IN)	Post-Development 10-year	10	6.448	721.000	112.47	(N/A)	(N/A)
SCM B (OUT)	Post-Development 10-year	10	5.219	728.000	50.81	313.70	2.366
SCM C (IN)	Post-Development 10-year	10	4.197	721.000	71.48	(N/A)	(N/A)
SCM C (OUT)	Post-Development 10-year	10	2.992	783.000	3.87	315.57	2.660

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
SCM E (IN)	Post-Development 10-year	10	3.579	721.000	62.43	(N/A)	(N/A)
SCM E (OUT)	Post-Development 10-year	10	2.575	756.000	6.18	280.07	2.075
SCM F (IN)	Post-Development 10-year	10	3.671	721.000	63.59	(N/A)	(N/A)
SCM F (OUT)	Post-Development 10-year	10	2.151	753.000	11.60	302.87	1.976
SCM G (IN)	Post-Development 10-year	10	2.514	721.000	44.12	(N/A)	(N/A)
SCM G (OUT)	Post-Development 10-year	10	1.491	755.000	5.16	302.30	1.431
SCM H (IN)	Post-Development 10-year	10	2.021	721.000	35.26	(N/A)	(N/A)
SCM H (OUT)	Post-Development 10-year	10	1.514	732.000	9.56	312.21	0.903
SCM I (IN)	Post-Development 10-year	10	2.441	721.000	41.95	(N/A)	(N/A)
SCM I (OUT)	Post-Development 10-year	10	1.998	725.000	28.77	312.61	0.714
SCM J (IN)	Post-Development 10-year	10	2.955	721.000	51.19	(N/A)	(N/A)
SCM J (OUT)	Post-Development 10-year	10	2.073	728.000	23.02	316.88	1.287



GRAPHIC SCALE
0 450 900 1800
1 inch = 900 ft.

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CHAMBLEE LAKE
CONSTRUCTION DRAWINGS
1509 CHAMBLEE ROAD
ZEBULON, NORTH CAROLINA

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	DRH-22004
FILENAME	DRH22004 DIA-PRE
CHECKED BY	JKW
DRAWN BY	MMJ
SCALE	1"= 900'
DATE	02. 20. 2024

SHEET

POST-DEVELOPMENT HYDROLOGY MAP

POST

Town Certification. This design has been reviewed by the Engineer for the Town of Zebulon, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Zebulon.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Zebulon and serve as construction plans for this project.
By: _____ Date: _____
Administrator

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

M:\Projects\DRH\DRH22004\04-Production\Water Resources\Downstream Impact Analysis\Current Drawing\DRH22004 DIA-POST.dwg, 2/20/2024 10:06:03 AM, Mirabelle Javellana