

STORMWATER DESIGN CALCULATIONS

FOR

Hwy 12 & Little Marrowbone Residential
Hwy 12
Ashland City, TN

December 14, 2021



Prepared By

KLOBER ENGINEERING SERVICES
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Springfield, Tennessee 37172
(615) 382-2000



STORM WATER CALCULATIONS

NOTE: Storm water runoff is calculated using the TR-55 Method. All flow calculations are based on methods established in the Nashville / Davidson County Stormwater Management Manual.

The following pages contain calculations for the storm water drainage system. The following table illustrates storm water runoff data for pre and post developed conditions for the above referenced property.

Table 1

Storm Event	Pre-Developed Runoff (1S) (cfs)	Post-Developed to Pond (4S) (cfs)	Pond Bypass (5P) (cfs)	Total Post Developed Discharge (1R) (cfs)	Peak Pond Elev: TOP: 430.00
2 yr.	3.25	9.37	1.39	2.97	426.75
5 yr.	4.84	11.95	2.04	3.83	427.38
10 yr.	6.18	14.01	2.59	4.79	427.79
25 yr.	8.17	16.93	3.41	6.70	428.30
50 yr.	9.83	19.29	4.09	8.67	428.65
100yr.	11.57	21.70	4.80	11.43	428.96

Table 1: Total West Drainage Basin Calculation Results

Table 2

Storm Event	Pre-Developed Runoff (2S) (cfs)	Post-Developed Runoff (6S) (cfs)
2 yr.	1.06	0.12
5 yr.	1.64	0.16
10 yr.	2.13	0.20
25 yr.	2.87	0.25
50 yr.	3.49	0.29
100yr.	4.14	0.34

Table 2: Total North Drainage Basin Calculation Results

Table 3

Storm Event	Pre-Developed Runoff (3S) (cfs)	Post-Developed Runoff (7S) (cfs)
2 yr.	0.45	0.76
5 yr.	1.14	1.31
10 yr.	1.79	1.79
25 yr.	2.84	2.54
50 yr.	3.77	3.19
100yr.	4.79	3.88

Table 3: Total East Drainage Basin Calculation Results

Water Quantity:

The proposed detention pond on this site has been sized to handle the additional stormwater runoff generated by the site development and to reduce the peak discharge at or below predeveloped conditions. Storm events will be controlled by a weir structure built into the pond wall.

PRE-DEVELOPED

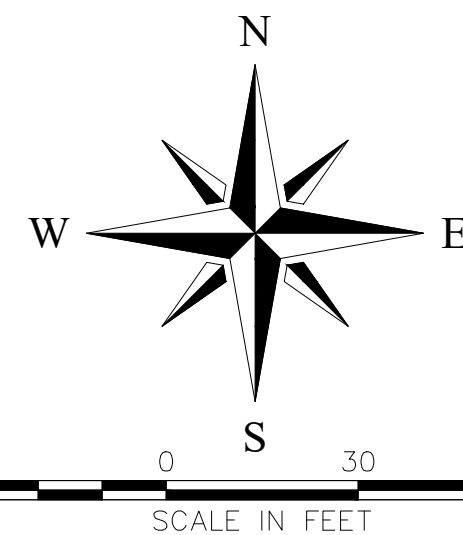
CALL BEFORE YOU DIG



CALL 811 NATIONWIDE

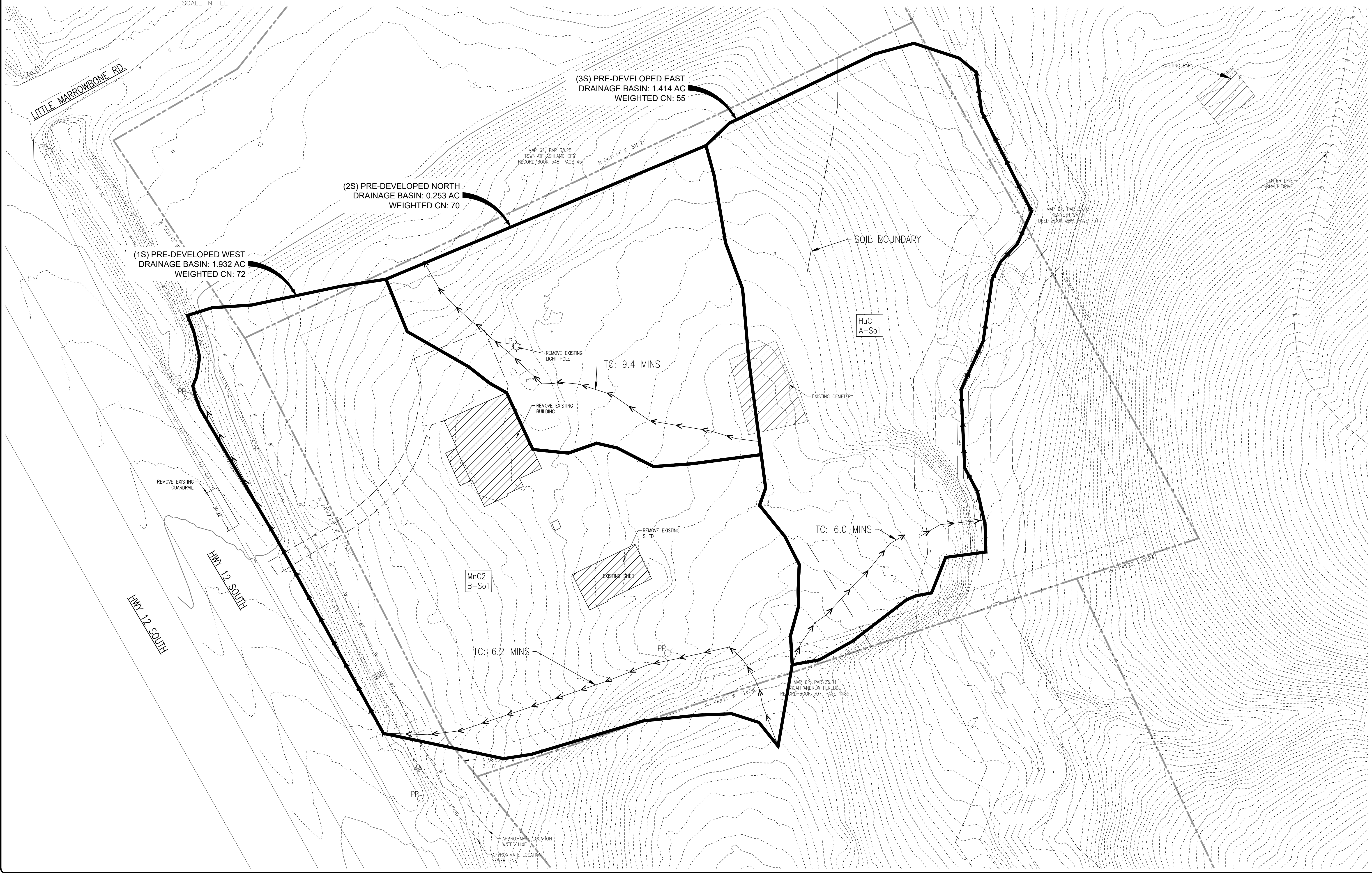
Know what's below. Call before you dig.

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LEGEND:

- PROPERTY LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- OVERHEAD ELECTRIC LINE
- FENCE
- NEW CURB
- SILT FENCE
- EXISTING 3" CONTOUR
- EXISTING 1" CONTOUR
- NEW 1" CONTOUR
- DEMO LINE
- MANHOLE
- C/O CLEAN OUT
- PP/C POWER POLE
- WATER METER
- FIRE HYDRANT
- IRON ROD OLD
- IRON ROD NEW
- PIPE INVERT
- SPOT ELEVATION
- SLOPE DIRECTION



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NO.	BY	DATE	DESCRIPTION

OSHA & LAYTON
REGISTERED PROFESSIONAL ENGINEER
STATE OF TENNESSEE
JOSHUA M. LYON, P.E. TN#112331

NOT FOR CONSTRUCTION

HIGHWAY 12 & LITTLE MARROWBONE

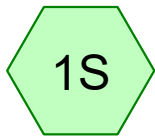
HIGHWAY 12 SOUTH
ASHLAND CITY, TN
CHEATHAM COUNTY

DRAWN BY: JML
CHECKED BY: JML
PROJECT NO.: C01821

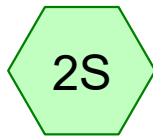
PRE DEVELOPED DRAINAGE MAP

SHEET NUMBER
DM-1

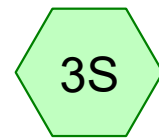
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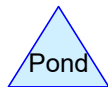
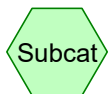
West Pre-Developed
Basin



North Pre-Developed
Basin



East Pre-Developed
Basin



Routing Diagram for Drainage

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Drainage

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NOAA 24-hr B 2-Year Rainfall=3.60"

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Page 2

Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 3.25 cfs @ 12.14 hrs, Volume= 0.176 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 1.06 cfs @ 12.18 hrs, Volume= 0.067 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

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NOAA 24-hr B 2-Year Rainfall=3.60"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 0.45 cfs @ 12.17 hrs, Volume= 0.039 af, Depth> 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

Drainage

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NOAA 24-hr B 5-Year Rainfall=4.39"

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Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 4.84 cfs @ 12.14 hrs, Volume= 0.259 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 1.64 cfs @ 12.17 hrs, Volume= 0.100 af, Depth> 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

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NOAA 24-hr B 5-Year Rainfall=4.39"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 1.14 cfs @ 12.15 hrs, Volume= 0.073 af, Depth> 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

Drainage

NOAA 24-hr B 10-Year Rainfall=5.02"

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Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 6.18 cfs @ 12.14 hrs, Volume= 0.331 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 2.13 cfs @ 12.17 hrs, Volume= 0.130 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

NOAA 24-hr B 10-Year Rainfall=5.02"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 1.79 cfs @ 12.15 hrs, Volume= 0.105 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

Drainage

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NOAA 24-hr B 25-Year Rainfall=5.92"

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Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 8.17 cfs @ 12.14 hrs, Volume= 0.440 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 2.87 cfs @ 12.17 hrs, Volume= 0.174 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

NOAA 24-hr B 25-Year Rainfall=5.92"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 2.84 cfs @ 12.14 hrs, Volume= 0.157 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

Drainage

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NOAA 24-hr B 50-Year Rainfall=6.65"

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Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 9.83 cfs @ 12.14 hrs, Volume= 0.532 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 3.49 cfs @ 12.17 hrs, Volume= 0.212 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

NOAA 24-hr B 50-Year Rainfall=6.65"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 3.77 cfs @ 12.14 hrs, Volume= 0.205 af, Depth> 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

Drainage

NOAA 24-hr B 100-Year Rainfall=7.40"

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Summary for Subcatchment 1S: West Pre-Developed Basin

Runoff = 11.57 cfs @ 12.13 hrs, Volume= 0.630 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Description
0.076	98	Paved parking, HSG B
0.102	98	Roofs, HSG B
1.754	69	50-75% Grass cover, Fair, HSG B
1.932	72	Weighted Average
1.754		90.79% Pervious Area
0.178		9.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	80	0.1250	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.9	250	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.6	275	0.0364	2.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	605	Total			

Summary for Subcatchment 2S: North Pre-Developed Basin

Runoff = 4.14 cfs @ 12.17 hrs, Volume= 0.253 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Description
0.800	69	50-75% Grass cover, Fair, HSG B
0.020	98	Paved parking, HSG B
0.820	70	Weighted Average
0.800		97.56% Pervious Area
0.020		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.5	125	0.0720	4.02		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.4	275	Total			

Drainage

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NOAA 24-hr B 100-Year Rainfall=7.40"

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Summary for Subcatchment 3S: East Pre-Developed Basin

Runoff = 4.79 cfs @ 12.14 hrs, Volume= 0.258 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Description
0.397	69	50-75% Grass cover, Fair, HSG B
1.017	49	50-75% Grass cover, Fair, HSG A
1.414	55	Weighted Average
1.414		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	60	0.0843	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
0.3	100	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.2	330	0.0270	2.46		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.0	490	Total			

POST-DEVELOPED

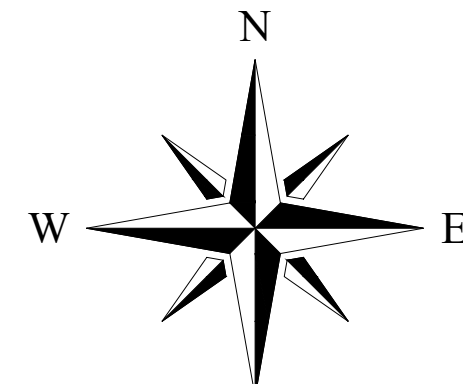
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SCALE IN FEET

LEGEND:

- PROPERTY LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- OVERHEAD ELECTRIC LINE
- FENCE
- NEW CURB
- SET FENCE
- EXISTING 5' CONTOUR
- EXISTING 1' CONTOUR
- NEW 1' CONTOUR
- DEMO LINE
- MANHOLE
- C/O CLEAN OUT
- PP POWER POLE
- WATER METER
- FIRE HYDRANT
- IRON ROD OLD
- IRON ROD NEW
- PIPE INVERT
- SPOT ELEVATION
- SLOPE DIRECTION



(5S) POST-DEVELOPED WEST BYPASS: 0.759 AC WEIGHTED CN: 73

(6S) POST-DEVELOPED NORTH RUNOFF: 0.046 AC WEIGHTED CN: 80

(7S) POST-DEVELOPED EAST RUNOFF: 0.816 AC WEIGHTED CN: 63

(4S) POST-DEVELOPED DRAINAGE BASIN TO DETENTION POND: 2.564 AC WEIGHTED CN: 90

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3568 TOM AUSTIN HWY. SUITE 1, SPRINGFIELD, TN 37172
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NO.	BY	DATE	DESCRIPTION

JOSHUA M. LYON, P.E.

NOT FOR CONSTRUCTION

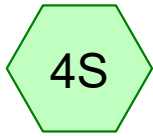
HIGHWAY 12 & LITTLE MARROWBONE

HIGHWAY 12 SOUTH
ASHLAND CITY, TN
CHEATHAM COUNTY

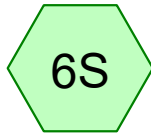
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CHECKED BY: JML
PROJECT NO.: C01821

POST DEVELOPED DRAINAGE MAP
SHEET NUMBER
DM-2

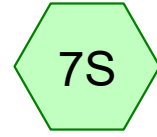
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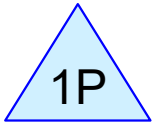
West Post-Developed
To Pond



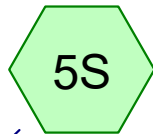
North Runoff



East Runoff



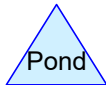
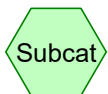
Detention Pond



Pond Bypass



Total West



Routing Diagram for Drainage

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Drainage

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NOAA 24-hr B 2-Year Rainfall=3.60"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 9.37 cfs @ 12.11 hrs, Volume= 0.514 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 1.39 cfs @ 12.12 hrs, Volume= 0.073 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.12 cfs @ 12.12 hrs, Volume= 0.006 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Drainage

NOAA 24-hr B 2-Year Rainfall=3.60"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 0.76 cfs @ 12.13 hrs, Volume= 0.043 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.60"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total WestInflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 2.12" for 2-Year event
Inflow = 2.97 cfs @ 12.14 hrs, Volume= 0.586 af
Outflow = 2.97 cfs @ 12.14 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention PondInflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 2.40" for 2-Year event
Inflow = 9.37 cfs @ 12.11 hrs, Volume= 0.514 af
Outflow = 1.85 cfs @ 12.49 hrs, Volume= 0.514 af, Atten= 80%, Lag= 22.7 min
Primary = 1.85 cfs @ 12.49 hrs, Volume= 0.514 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

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NOAA 24-hr B 2-Year Rainfall=3.60"

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Peak Elev= 426.75' @ 12.49 hrs Surf.Area= 3,849 sf Storage= 7,581 cf

Plug-Flow detention time= 35.1 min calculated for 0.514 af (100% of inflow)

Center-of-Mass det. time= 34.9 min (801.2 - 766.3)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.85 cfs @ 12.49 hrs HW=426.75' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 1.77 cfs @ 9.01 fps)
- 2=Sharp-Crested Vee/Trap Weir (Weir Controls 0.08 cfs @ 1.91 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Drainage

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NOAA 24-hr B 5-Year Rainfall=4.39"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 11.95 cfs @ 12.11 hrs, Volume= 0.667 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 2.04 cfs @ 12.12 hrs, Volume= 0.106 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.16 cfs @ 12.12 hrs, Volume= 0.009 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Drainage

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NOAA 24-hr B 5-Year Rainfall=4.39"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 1.31 cfs @ 12.13 hrs, Volume= 0.070 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.39"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total West

Inflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 2.79" for 5-Year event

Inflow = 3.83 cfs @ 12.14 hrs, Volume= 0.773 af

Outflow = 3.83 cfs @ 12.14 hrs, Volume= 0.773 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention Pond

Inflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 3.12" for 5-Year event

Inflow = 11.95 cfs @ 12.11 hrs, Volume= 0.667 af

Outflow = 2.57 cfs @ 12.42 hrs, Volume= 0.666 af, Atten= 79%, Lag= 18.5 min

Primary = 2.57 cfs @ 12.42 hrs, Volume= 0.666 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

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NOAA 24-hr B 5-Year Rainfall=4.39"

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Peak Elev= 427.38' @ 12.42 hrs Surf.Area= 4,319 sf Storage= 10,143 cf

Plug-Flow detention time= 40.3 min calculated for 0.664 af (100% of inflow)

Center-of-Mass det. time= 40.0 min (800.9 - 760.9)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.56 cfs @ 12.42 hrs HW=427.38' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 1.92 cfs @ 9.78 fps)
- 2=Sharp-Crested Vee/Trap Weir (Weir Controls 0.64 cfs @ 2.86 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Drainage

NOAA 24-hr B 10-Year Rainfall=5.02"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 14.01 cfs @ 12.11 hrs, Volume= 0.790 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 2.59 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.20 cfs @ 12.12 hrs, Volume= 0.010 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Drainage

NOAA 24-hr B 10-Year Rainfall=5.02"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 1.79 cfs @ 12.13 hrs, Volume= 0.095 af, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=5.02"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total West

Inflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 3.34" for 10-Year event

Inflow = 4.79 cfs @ 12.15 hrs, Volume= 0.925 af

Outflow = 4.79 cfs @ 12.15 hrs, Volume= 0.925 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention Pond

Inflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 3.70" for 10-Year event

Inflow = 14.01 cfs @ 12.11 hrs, Volume= 0.790 af

Outflow = 3.41 cfs @ 12.37 hrs, Volume= 0.790 af, Atten= 76%, Lag= 15.6 min

Primary = 3.41 cfs @ 12.37 hrs, Volume= 0.790 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

NOAA 24-hr B 10-Year Rainfall=5.02"

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Peak Elev= 427.79' @ 12.37 hrs Surf.Area= 4,628 sf Storage= 11,983 cf

Plug-Flow detention time= 41.2 min calculated for 0.790 af (100% of inflow)

Center-of-Mass det. time= 41.0 min (798.5 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.40 cfs @ 12.37 hrs HW=427.79' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.01 cfs @ 10.26 fps)
- 2=Sharp-Crested Vee/Trap Weir (Weir Controls 1.39 cfs @ 3.34 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Drainage

NOAA 24-hr B 25-Year Rainfall=5.92"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 16.93 cfs @ 12.11 hrs, Volume= 0.968 af, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 3.41 cfs @ 12.12 hrs, Volume= 0.179 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.25 cfs @ 12.12 hrs, Volume= 0.013 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Drainage

NOAA 24-hr B 25-Year Rainfall=5.92"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 2.54 cfs @ 12.12 hrs, Volume= 0.133 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.92"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total West

Inflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 4.14" for 25-Year event

Inflow = 6.70 cfs @ 12.16 hrs, Volume= 1.146 af

Outflow = 6.70 cfs @ 12.16 hrs, Volume= 1.146 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention Pond

Inflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 4.53" for 25-Year event

Inflow = 16.93 cfs @ 12.11 hrs, Volume= 0.968 af

Outflow = 4.97 cfs @ 12.32 hrs, Volume= 0.967 af, Atten= 71%, Lag= 12.3 min

Primary = 4.97 cfs @ 12.32 hrs, Volume= 0.967 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

NOAA 24-hr B 25-Year Rainfall=5.92"

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Peak Elev= 428.30' @ 12.32 hrs Surf.Area= 4,897 sf Storage= 14,405 cf

Plug-Flow detention time= 40.9 min calculated for 0.967 af (100% of inflow)

Center-of-Mass det. time= 40.6 min (794.3 - 753.6)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.95 cfs @ 12.32 hrs HW=428.29' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.12 cfs @ 10.81 fps)
- 2=Sharp-Crested Vee/Trap Weir (Weir Controls 2.83 cfs @ 3.84 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Drainage

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NOAA 24-hr B 50-Year Rainfall=6.65"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 19.29 cfs @ 12.11 hrs, Volume= 1.112 af, Depth> 5.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 4.09 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.29 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Drainage

NOAA 24-hr B 50-Year Rainfall=6.65"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 3.19 cfs @ 12.12 hrs, Volume= 0.166 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.65"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total West

Inflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 4.79" for 50-Year event

Inflow = 8.67 cfs @ 12.17 hrs, Volume= 1.327 af

Outflow = 8.67 cfs @ 12.17 hrs, Volume= 1.327 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention Pond

Inflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 5.20" for 50-Year event

Inflow = 19.29 cfs @ 12.11 hrs, Volume= 1.112 af

Outflow = 6.67 cfs @ 12.28 hrs, Volume= 1.112 af, Atten= 65%, Lag= 9.9 min

Primary = 6.67 cfs @ 12.28 hrs, Volume= 1.112 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

NOAA 24-hr B 50-Year Rainfall=6.65"

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Peak Elev= 428.65' @ 12.28 hrs Surf.Area= 5,028 sf Storage= 16,174 cf

Plug-Flow detention time= 40.1 min calculated for 1.108 af (100% of inflow)

Center-of-Mass det. time= 39.7 min (790.9 - 751.2)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.63 cfs @ 12.28 hrs HW=428.65' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.20 cfs @ 11.19 fps)
- 2=Sharp-Crested Vee/Trap Weir (Orifice Controls 4.07 cfs @ 4.56 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 0.37 cfs @ 1.26 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Drainage

NOAA 24-hr B 100-Year Rainfall=7.40"

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Summary for Subcatchment 4S: West Post-Developed To Pond

Runoff = 21.70 cfs @ 12.11 hrs, Volume= 1.261 af, Depth> 5.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Description
0.454	98	Unconnected pavement, HSG B
0.466	98	Paved parking, HSG B
0.975	98	Roofs, HSG B
0.669	69	50-75% Grass cover, Fair, HSG B
2.564	90	Weighted Average
0.669		26.09% Pervious Area
1.895		73.91% Impervious Area
0.454		23.96% Unconnected

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

Summary for Subcatchment 5S: Pond Bypass

Runoff = 4.80 cfs @ 12.12 hrs, Volume= 0.254 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Description
0.047	98	Paved parking, HSG B
* 0.056	98	Misc IA
0.656	69	50-75% Grass cover, Fair, HSG B
0.759	73	Weighted Average
0.656		86.43% Pervious Area
0.103		13.57% Impervious Area

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

Summary for Subcatchment 6S: North Runoff

Runoff = 0.34 cfs @ 12.11 hrs, Volume= 0.018 af, Depth> 4.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Drainage

NOAA 24-hr B 100-Year Rainfall=7.40"

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Area (ac)	CN	Description
0.018	98	Unconnected pavement, HSG B
0.028	69	50-75% Grass cover, Fair, HSG B
0.046	80	Weighted Average
0.028		60.87% Pervious Area
0.018		39.13% Impervious Area
0.018		100.00% Unconnected

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

Summary for Subcatchment 7S: East Runoff

Runoff = 3.88 cfs @ 12.12 hrs, Volume= 0.202 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.40"

Area (ac)	CN	Adj	Description
0.059	98		Unconnected pavement, HSG B
0.049	98		Paved parking, HSG A
0.129	98		Roofs, HSG A
0.528	49		50-75% Grass cover, Fair, HSG A
0.051	69		50-75% Grass cover, Fair, HSG B
0.816	64	63	Weighted Average, UI Adjusted
0.579			70.96% Pervious Area
0.237			29.04% Impervious Area
0.059			24.89% Unconnected

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

Summary for Reach 1R: Total WestInflow Area = 3.323 ac, 60.13% Impervious, Inflow Depth > 5.47" for 100-Year event
Inflow = 11.43 cfs @ 12.20 hrs, Volume= 1.515 af
Outflow = 11.43 cfs @ 12.20 hrs, Volume= 1.515 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Detention PondInflow Area = 2.564 ac, 73.91% Impervious, Inflow Depth > 5.90" for 100-Year event
Inflow = 21.70 cfs @ 12.11 hrs, Volume= 1.261 af
Outflow = 9.07 cfs @ 12.25 hrs, Volume= 1.260 af, Atten= 58%, Lag= 8.2 min
Primary = 9.07 cfs @ 12.25 hrs, Volume= 1.260 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Drainage

NOAA 24-hr B 100-Year Rainfall=7.40"

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Peak Elev= 428.96' @ 12.25 hrs Surf.Area= 5,144 sf Storage= 17,749 cf

Plug-Flow detention time= 38.9 min calculated for 1.256 af (100% of inflow)

Center-of-Mass det. time= 38.5 min (787.6 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1	423.00'	23,494 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
423.00	16	16.0	0	0	16
424.00	1,313	156.0	491	491	1,934
425.00	2,146	191.0	1,713	2,204	2,916
426.00	3,285	235.0	2,695	4,899	4,423
427.00	4,044	256.0	3,658	8,557	5,279
428.00	4,789	276.0	4,411	12,968	6,167
429.00	5,158	286.0	4,972	17,941	6,695
430.00	5,959	306.0	5,554	23,494	7,683

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	6.0" Vert. Orifice/Grate C= 0.600
#2	Primary	426.25'	20.0 deg x 2.25' rise Sharp-Crested Vee/Trap Weir Cv= 2.69 (C= 3.36)
#3	Primary	428.50'	2.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Primary	429.50'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=9.05 cfs @ 12.25 hrs HW=428.96' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.26 cfs @ 11.51 fps)
- 2=Sharp-Crested Vee/Trap Weir (Orifice Controls 4.84 cfs @ 5.42 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 1.95 cfs @ 2.22 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

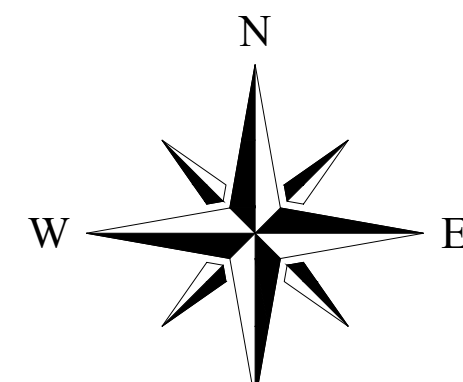
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LEGEND:

- PROPERTY LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- OVERHEAD ELECTRIC LINE
- FENCE
- NEW CURB
- SIT FENCE
- EXISTING 5' CONTOUR
- EXISTING 1' CONTOUR
- NEW 1' CONTOUR
- DEMO LINE
- MANHOLE
- C/O CLEAN OUT
- PP/PO POWER POLE
- W/M WATER METER
- FIRE HYDRANT
- IRON ROD OLD
- IRON ROD NEW
- PIPE INVERT
- SPOT ELEVATION
- SLOPE DIRECTION



DRAIN PIPE DATA										
DESIGN INFORMATION										
PIPE NUMBER	FROM STRUCTURE	INVERT	TO STRUCTURE	INVERT	PIPE LENGTH (FEET)	PIPE DIAMETER (INCHES)	PIPE MATERIAL	SLOPE (%)	Q ₁ (CFS)	25 YR Q ₂ (CFS)
1	A-11	437.80	A-10	436.70	60	15	HDPE	1.83%	10.48	1.04
2	A-10	436.70	A-9	435.35	135	18	HDPE	1.00%	12.59	1.88
3	A-9	435.35	A-8	434.70	65	18	HDPE	1.00%	12.59	2.63
4	A-8	434.70	A-7	433.30	74	18	HDPE	1.89%	17.31	4.86
5	A-7	433.30	A-6	432.00	52	18	HDPE	2.50%	19.90	5.98
6	A-6	432.00	A-3	431.40	20	18	HDPE	3.00%	21.80	7.67
7	A-5	430.00	A-4	429.50	100	15	HDPE	0.50%	5.47	1.91
8	A-4	429.50	A-3	428.40	215	18	HDPE	0.51%	9.00	3.10
9	A-3	428.40	A-2	425.20	80	18	HDPE	4.00%	25.17	12.95
10	A-2	425.20	A-1	425.00	19	24	HDPE	1.05%	27.81	14.52
25	B-4	416.80	B-3	416.75	5	24	RCP	1.00%	25.02	-
26	B-3	416.75	B-2	416.55	20	24	RCP	1.00%	25.02	-
27	B-2	416.55	B-1	416.50	5	24	RCP	1.00%	25.02	-

Table 1: Drainage Pipe Table

DRAINAGE STRUCTURE DATA					
DESIGN INFORMATION					
STRUCTURE NUMBER	STRUCTURE TYPE	GRATE	RIM ELEV.	INVERT	PIPE COVERAGE (IN.)
A-11	DOUBLE CATCH BASIN		4315	441.30	437.80
A-10	SINGLE CATCH BASIN		4315	444.00	436.70
A-9	SINGLE CATCH BASIN		4315	443.00	435.35
A-8	SINGLE CATCH BASIN		4315	444.00	434.70
A-7	SINGLE CATCH BASIN		4315	437.63	433.30
A-6	SINGLE CATCH BASIN		4315	435.70	432.00
A-5	SINGLE CATCH BASIN		4315	433.00	431.40
A-4	SINGLE CATCH BASIN		4315	436.51	429.50
A-3	SINGLE CATCH BASIN		4315	435.46	428.40
A-2	SINGLE CATCH BASIN		4315	429.00	425.20
A-1	6' HEADWALL W/ ED		-	425.00	-
B-4	TDOT HW - DPE24A	DSEW1A	-	416.80	-
B-3	DOUBLE CURB INLET		3305	421.20	416.75
B-2	DOUBLE CURB INLET		3305	421.20	416.55
B-1	TDOT HW - DPE24A	DSEW1A	-	416.50	-

Table 2: Drainage Structure Table

SUBCATCHMENT AREA										
SUBCATCHMENT AREA	DRAINAGE AREA (AC)	DRAINAGE AREA (S.F.)	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (AC)	PERVIOUS AREA (S.F.)	PERVIOUS AREA (AC)	RAINFALL INTENSITY (IN/HR)	RUNOFF COEFF.	RUNOFF 25-YR (CFS)	
S-1	0.191	8,304	4,212	0.0967	4,092	0.0939	8.00	0.68	1.04	
S-2	0.131	5,707	4,207	0.0966	1,500	0.0344	8.00	0.81	0.84	
S-3	0.107	4,656	4,076	0.0936	580	0.0133	8.00	0.88	0.75	
S-4	0.314	13,660	12,130	0.278	1,530	0.035	8.00	0.89	2.23	
S-5	0.163	7,120	5,935	0.136	1,185	0.027	8.00	0.86	1.12	
S-6	0.291	12,670	7,464	0.171	5,206	0.130	8.00	0.72	1.68	
S-7	0.297	12,927	9,547	0.219	3,380	0.078	8.00	0.81	1.91	
S-8	0.187	8,125	5,815	0.133	2,310	0.053	8.00	0.79	1.18	
S-9	0.307	13,383	11,876	0.273	1,507	0.035	8.00	0.89	2.18	
S-10	0.214	9,312	8,742	0.201	570	0.013	8.00	0.92	1.57	
S-11	0.056	2,434	1,270	0.029	1,164	0.027	8.00	0.69	0.31	
S-12	0.034	1,477	1,087	0.025	390	0.009	8.00	0.80	0.22	

Table 3: Subcatchment Area Table

Spread & Head Calculation (Design)										
Inlet	Flow, Q (cfs)	Manning's n	Side Slope, Sx (ft/ft)	Street Grade, S _L (ft/ft)	Spread, T (ft)	Tc (min)	Ku	Sump Condition Head (ft)	Open Area of Grate (ft ²)	
A-11	1.04	0.014	0.02	NA	5.4	5	0.56	0.02	5.16	
A-10	0.84	0.014	0.02	0.027	5.4	5	0.56	0.06	2.58	
A-9	0.75	0.014	0.02	0.050	4.6	5	0.56	0.04	2.58	
A-8	2.23	0.014	0.02	0.043	7.1	5	0.56	0.39	2.58	
A-7	1.12	0.014	0.02	0.035	5.7	5	0.56	0.10	2.58	
A-6	1.68	0.014	0.02	0.035	6.6	5	0.56	0.22	2.58	
A-5	1.91	0.014	0.02	0.032	7.1	5	0.56	0.07	5.16	
A-4	1.18	0.014	0.02	0.023	6.3	5	0.56	0.11	2.58	
A-3	2.18	0.014	0.02	0.024	7.8	5	0.56	0.37	2.58	
A-2	1.57	0.014	0.021	0.095	5.2	5	0.56	0.19	2.58	
B-3	0.31	0.014	0.016	0.096	3.3	5	0.56	0.00	4.7	
B-2	0.22	0.014	0.016	0.096	2.9	5	0.56	0.00	4.7	

Table 4: Spread & Head Calculation (Design)

Equations
 $T = \frac{0.000148 Q^{0.78}}{(K_u S_x)^{0.04}} + 0.375$
 $Head = \left(\frac{Q}{C_u A} \right)^{0.58} / (2 \times 32.2)$

RAINFALL INTENSITY							
Duration (minutes)	3-Month (in/hr)	2-Year (in/hr)	5-Year (in/hr)	10-Year (in/hr)	25-Year (in/hr)	50-Year (in/hr)	100-Year (in/hr)
5	2.45	4.75	6.25	6.97	8	8.9	9.72
10	2.45	3.81	4.99	5.71	6.6	7.35	8.08
15	2.45	3.2	4.2	4.84	5.5	6.08	6.88
20	2.45	2.75	3.65	4.21	4.82	5.34	6.02
25	2.45	2.44	3.28	3.78	4.35	4.83	5.45
30	2.45	2.22	3	3.46	4	4.45	4.99
35	2.45	2.04	2.73	3.15	3.65	4.06	4.52
40	2.45	1.89	2.52	2.9	3.38	3.75	4.16
45	2.45	1.77	2.35	2.7	3.15	3.49	3.85
60	2.45	1.51	1.97	2.27	2.66	2.94	3.21

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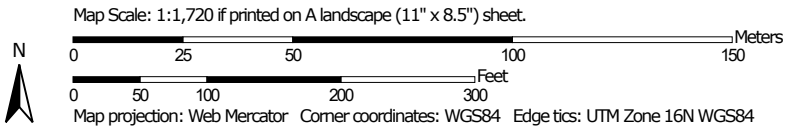
HIGHWAY 12 & LITTLE MARROWBONE
 HIGHWAY 12 SOUTH
 ASHLAND CITY, TN
 CHEATHAM COUNTY

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 PROJECT NO.: C01821

SUBCATCHMENT MAP
 SHEET NUMBER
DM-3


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Soil Map—Cheatham County, Tennessee
(MP-2)



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Cheatham County, Tennessee

Survey Area Data: Version 15, Sep 10, 2021

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

Date(s) aerial images were photographed: Sep 21, 2019—Apr 10, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HsF	Hawthorne-Sulphura association, 20 to 60 percent slopes	1.2	16.9%
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes	1.7	23.3%
MnC2	Minvale gravelly silt loam, 5 to 12 percent slopes, eroded	4.3	59.8%
Totals for Area of Interest		7.3	100.0%