STORMWATER DESIGN CALCULATIONS

FOR

Ace Mini Storage

Hwy 12
Ashland City, TN

August 25, 2023

Prepared By

KLOBER ENGINEERING SERVICES
3556 Tom Austin Hwy, Suite 1
Springfield, Tennessee 37172
(615) 382-2000

KLOBER
ENGINEERING SERVICES

Serving clients with Civil and Environmental Engineering Services

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(615) 382-2000 Office
(888) 373-4485 Fax

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.

Storm Event	Total Pre-Developed Runoff (1R)	Post-Developed to Pond (3S)	Post-Developed Pond Bypass (4S)	Total Post Developed Discharge (2R)	Pond Elevation: TOB: 405.50
2 yr.	13.38	15.58	1.11	12.64	403.11
5 yr.	16.98	19.40	1.53	15.58	403.40
10 yr.	19.82	22.43	1.87	17.91	403.61
25 yr.	23.81	26.73	2.37	21.14	403.92
50 yr.	27.00	30.21	2.78	23.68	404.17
100yr.	30.24	33.77	3.19	26.20	404.43

Water Quantity:

The existing 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. The pond and outlet structure had been designed for the complete build out of the site for all phases. Storm events are controlled by a weir structure built into the pond wall.

PRE-DEVELOPED

PRESENT OWNER:
MARK & TONYA YARBROUGH
400 WARIOTO WAY #708
ASHLAND CITY, TN 37105

DEED REFERENCE:
MAP 55, PARCEL 36
LEE BATSON COMMERCIAL LOTS – LOT 1

PROPERTY INFORMATION:
AREA: 226,164 S.F. = 5.19 ACRES

ZONING:
COMMERCIAL C–2

SITE USE:
EXISTING USE: MINI STORAGE
PROPOSED USE: MINI STORAGE

SIGN NOTE:
ALL SIGNS SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE ASHLAND CITY ZONING ORDINANCE. SEPARATE PERMIT REQUIRED.

LOT COVERAGE:
EXISTING BUILDING AREA = 22,225 S.F.
NEW BUILDING AREA = 24,090 S.F.
BUILDING COVERAGE = 20.5%
MAX BUILDING HEIGHT: 40'–0"
EXISTING CONCRETE SURFACE: ±350 S.F.
EXISTING ASPHALT SURFACE: ±41,782 S.F.
EXISTING IMPERVIOUS AREA: ±64,357 S.F. = 28.46%
PROPOSED ASPHALT SURFACE: ±18,144 S.F.
PROPOSED IMPERVIOUS AREA: ±106,591 S.F. = 47.13%

PARKING INFORMATION:
REQUIRED PARKING:
EXISTING: 3 SPACES, INCLUDING 1 HANDICAP SPACES

PROVIDED: 2 SPACES

TOTAL PARKING: 5 SPACES, INCLUDING 1 HANDICAP SPACES

UTILITY NOTE:
COORDINATE ALL UTILITY INSTALLATIONS WITH GOVERNING ENTITIES.

SECURITY GATE:
SECURITY GATES OR BARRIERS SHALL BE EQUIPPED WITH A RADIO OPERATED RECEIVER/CONTROLLER CAPABLE OF RECEIVING SIGNALS FROM A POLICE DEPARTMENT, SHERIFF'S DEPARTMENT (IF THE GATED FACILITY OR COMMUNITY IS IN THE COUNTY), FIRE DEPARTMENT, UTILITY AND EMERGENCY MEDICAL SERVICES' RADIO TRANSCEIVERS SERVING THE GATED FACILITY OR COMMUNITY WHICH ALLOW EMERGENCY RESPONDERS AND OTHER NECESSARY ON–DUTY EMPLOYEES TO OPEN THE SECURITY GATE OR BARRIER BY USE OF SUCH EQUIPMENT. ALL SECURITY GATES OR BARRIERS MUST MEET POLICIES DEEMED NECESSARY BY THE AUTHORITY HAVING JURISDICTION OVER THE GATED FACILITY OR COMMUNITY FOR RAPID, RELIABLE, AND MUTUAL AID ACCESS. SUCH EQUIPMENT SHALL BE FURNISHED, INSTALLED AND MAINTAINED BY THE GATED FACILITY OR COMMUNITY THAT IS SERVED BY SUCH EQUIPMENT.

GENERAL NOTES:
1. PRIOR TO BEGINNING CONSTRUCTION ON THIS SITE THE LOCATION OF UTILITIES MUST BE IDENTIFIED BY CALLING THE TOLL–FREE TENNESSEE ONE CALL REFERENCE NUMBER 1–800–351–1111.
2. ALL CONSTRUCTION ON THIS SITE SHALL COMPLY WITH APPLICABLE REGULATIONS AS SPECIFIED BY THE CITY OF MILLERSVILLE AND THE STATE OF TENNESSEE.
3. TOPSOIL SHALL BE PLACED ON EXCAVATED AREAS WHICH REQUIRE NEW VEGETATION. GROUND COVER SHALL BE REESTABLISHED WITH KENTUCKY 31 FESCUE SEEDED AT A MINIMUM OF 250 LBS. PER ACRE. SLOPES 3:1 OR GREATER SHALL BE LINED WITH NORTH AMERICAN GREEN S150 GRASS MATTING OR EQUAL.
4. SILT FENCE SHALL BE INSTALLED IN ALL EROSION AREAS WHICH COULD ALLOW UNTREATED STORMWATER RUNOFF TO BE DISCHARGED FROM THE PROPERTY. ALL EROSION CONTROL MEASURES SHALL BE CONSISTENT WITH THE PROVISIONS DESCRIBED IN THE MOST CURRENT EDITION OF THE TENNESSEE EROSION & SEDIMENT CONTROL HANDBOOK.
5. THE STORMWATER RUNOFF CALCULATIONS ON THIS SITE HAVE BEEN PERFORMED USING THE U.S. SOIL CONSERVATION SERVICE TR–55 METHOD. STORMWATER POND HAS BEEN SIZED TO HANDLE A 25 AND 100 YEAR STORM EVENT.
6. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS TAKEN FROM A SURVEY BY STEVEN E ARTZ SURVEYING OF SPRINGFIELD, TN.
7. CONSTRUCTION WILL BEGIN FOLLOWING PLAN APPROVAL BY THE CITY OF ASHLAND CITY.
8. THE BUILDING SHOULD FRONT TED DORRIS ROAD, AND BE SERVICED BY UNDERGROUND UTILITY LINES.
9. ANY DUMPSTER SHALL BE FULLY ENCLOSED, MATCHING THE FACADE OF THE BUILDING, AND A WOODEN PRIVACY FENCE GATE THAT IS 8 FEET HIGH ON ALL SIDES AND ALL SERVICE BOXES AND MECHANICALS TO BE IN THE REAR OF THE BUILDING.
10. ALL ADDITIONS IN THE FUTURE MUST BE BUILT TO THESE STANDARDS.
11. THIS PROPERTY IN LOCATED IN ZONE "A" AND ZONE "X" (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON NFIP FIRM MAP ACCORDING TO THE FEMA MAP PANEL NUMBER 47021C0170D, DATED 9/10/2010,

NPDES PERMIT NOTE:
THE MAXIMUM DISTURBED AREA FOR THIS PROJECT IS OVER 1 ACRE. THIS SITE IS CURRENTLY COVERED UNDER PERMIT NUMBER TNR245326.

JOSHUA M. LYON, P.E.
PROJECT MANAGER

EP&SC NOTES:
1. AN EROSION PREVENTION SILTATION CONTROL PLAN (EP&SC) AND LAND DISTURBANCE PERMIT (IF REQUIRED) SHALL BE IN PLACE PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY. EROSION CONTROL DEVICES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD; GENERALLY CONSIDERED TO BE THROUGH THE COMPLETION OF RESTORATION. IF REQUIRED, THE EP&SC PLAN ALONG WITH AN INSPECTION CHECKLIST AND STORMWATER PERMIT MUST BE AT THE PROJECT SITE AT ALL TIMES. THE INSPECTION CHECKLIST SHALL HAVE A RECORD OF DATES EP&SC DEVICES ARE INSPECTED AND ANY CORRECTION ACTION TAKEN OR MAJOR OBSERVATIONS. BMP'S MUST BE INSPECTED BY A QUALIFIED PERSON WHO HAS TAKEN AN APPROVED EROSION AND SEDIMENTATION COURSE.
2. ALL EP&SC DEVICES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND A GOOD STAND OF GRASS HAS BEEN ESTABLISHED.
3. EROSION PREVENTION AND SEDIMENT CONTROLS MUST BE INSPECTED AT LEAST TWICE EVERY CALENDAR WEEK AT LEAST 72 HOURS APART. INSPECTIONS ARE TO BE DOCUMENTED AND KEPT WITH THE SWPPP (IF REQUIRED).
4. SILT FENCE, OR OTHER SEDIMENT BARRIERS ARE TO BE INSTALLED PROPERLY ALONG TOPOGRAPHICAL CONTOURS DOWN SLOPE OF THE AREA TO BE DISTURBED PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY.
5. EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING.
6. THIS SITE SHALL CONTAIN A TEMPORARY STONE CONSTRUCTION ENTRANCE THAT CONFORMS TO REQUIRED SPECIFICATIONS PRIOR TO GRADING COMMENCEMENT. THE STONE SHALL BE 2 TO 3 INCH IN DIAMETER AND SHALL BE KEPT CLEAN BY ADDING STONE AS NEEDED. IT SHALL BE AT LEAST 8 INCHES DEEP UNDERLAIN WITH FILTER FABRIC AND 20 FEET WIDE.
7. APPROVED INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS MUST BE INSTALLED WITHIN 24 HOURS OF GRADING COMMENCEMENT.
8. VEGETATIVE BUFFERS OR OTHER PROTECTION MUST BE PROVIDED ALONG STREAMS, RIVERS, AND PONDS TO AVOID EROSION OF BANKS.
9. STABILIZATION MEASURES MUST BE PERFORMED WITHIN SEVEN (7) DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND WITHIN FIFTEEN (15) DAYS AFTER FINAL GRADING.
10. ALL TREES DESIGNATED TO REMAIN, MUST BE PROTECTED. HEAVY EQUIPMENT SHOULD NOT BE OPERATED OR STORED, NOR MATERIALS HANDLED OR STORED, WITHIN THE DRIP LINES OF TREES.
11. SEDIMENT MUST BE REMOVED FROM SEDIMENT BARRIERS, PONDS, AND OTHER SEDIMENT CONTROLS WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 33%
12. SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
13. BUILDING AND WASTE MATERIALS, AND NON STORM WATER DISCHARGES, SUCH AS CONCRETE, PAINT WASH WATER, OR MACHINERY LEAKAGE, OR SPILLAGE MUST BE MANAGED TO PREVENT THEM FROM ENTERING THE STORM WATER SYSTEM, GROUND WATER, OR NEARBY WATER BODY.
14. THE PROJECT IS SUBJECT TO INSPECTION BY THE CITY AT ANY TIME AND ITEMS FOUND DEFICIENT SHALL BE IMMEDIATELY CORRECTED. THE CITY MAY STOP CONSTRUCTION OR PROPERTIES, OR ADMINISTER OTHER ENFORCEMENT ACTIONS AS DEFINED BY THE CITY

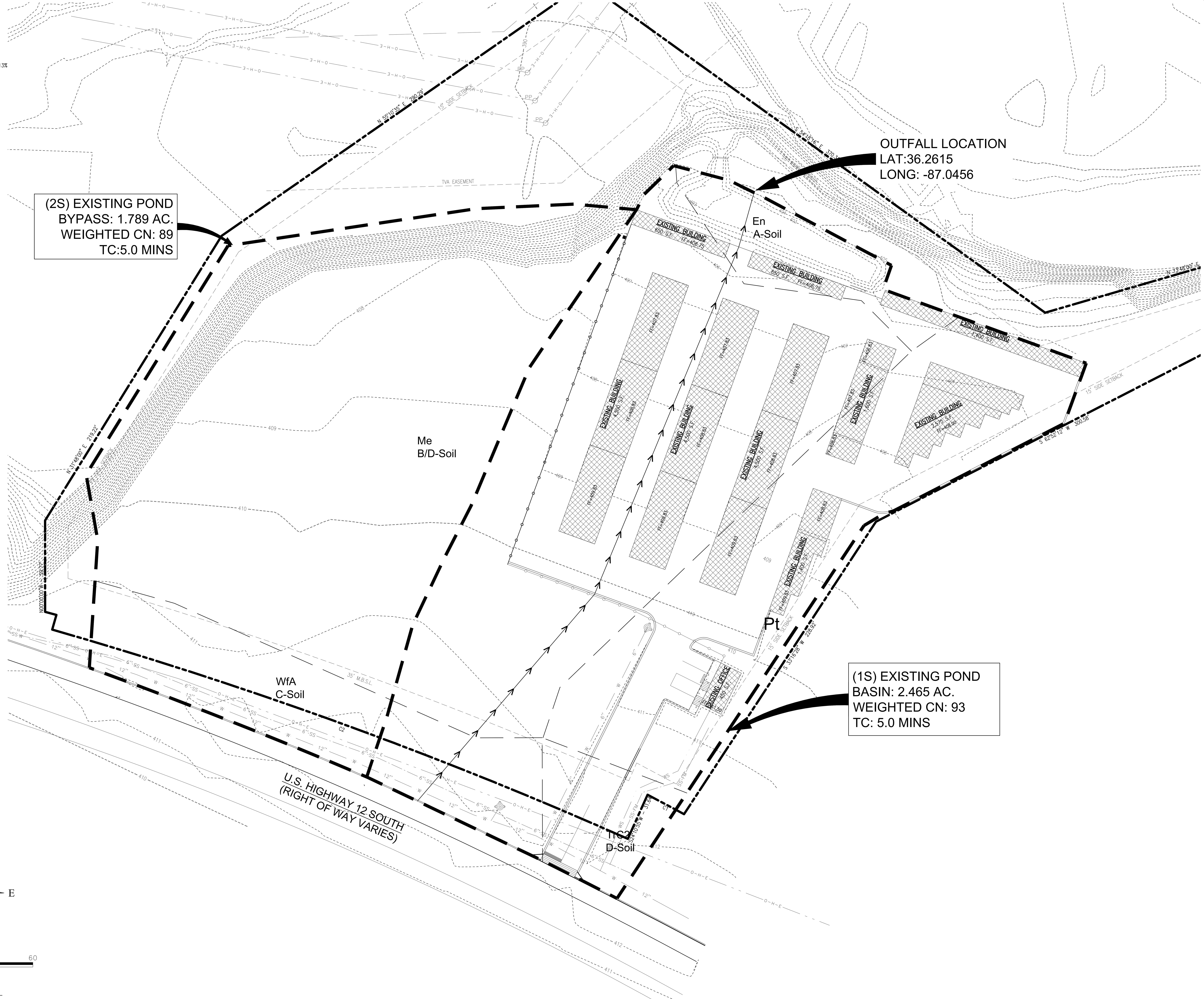
PLOTTED: 8/25/2023 10:42:32 AM

CALL BEFORE YOU DIG

811 CALL 811 NATIONWIDE

Know what's below.
Call before you dig.

IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND POSSIBLY INCOMPLETE, THEREFORE CERTIFICATION TO THE LOCATION OF ALL UNDERGROUND UTILITIES IS WITHHELD.



30 0 30 60
SCALE IN FEET

LEGEND:
PROPERTY LINE
EXISTING WATER LINE
EXISTING SEWER LINE
OVERHEAD ELECTRIC LINE
FENCE
NEW CURB
SILT FENCE
EXISTING 5' CONTOUR
EXISTING 1' CONTOUR
NEW 1' CONTOUR
DEMO LINE
MANHOLE
CO CLEAN OUT
PP POWER POLE
WM WATER METER
FIRE HYDRANT
IR(O) IRON ROD OLD
IR(N) IRON ROD NEW
INV.–25.42 PIPE INVERT
28.14 SPOT ELEVATION
SLOPE DIRECTION

Z:\PROJECT\2023\CIVIL\C05823 Ace Storage – Ashland City\Current Civil Drawings\

NOT FOR CONSTRUCTION

KLOBER
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SERVING CLIENTS WITH CIVIL ENGINEERING & LAND DEVELOPMENT SERVICES
3556 TOM AUSTIN HWY, SUITE 1, SPRINGFIELD, TN 37172
PHONE: (615) 382-2000 FAX: (888) 373-4485
www.klobereng.com

NO.	BY	DATE	DESCRIPTION

REVISIONS

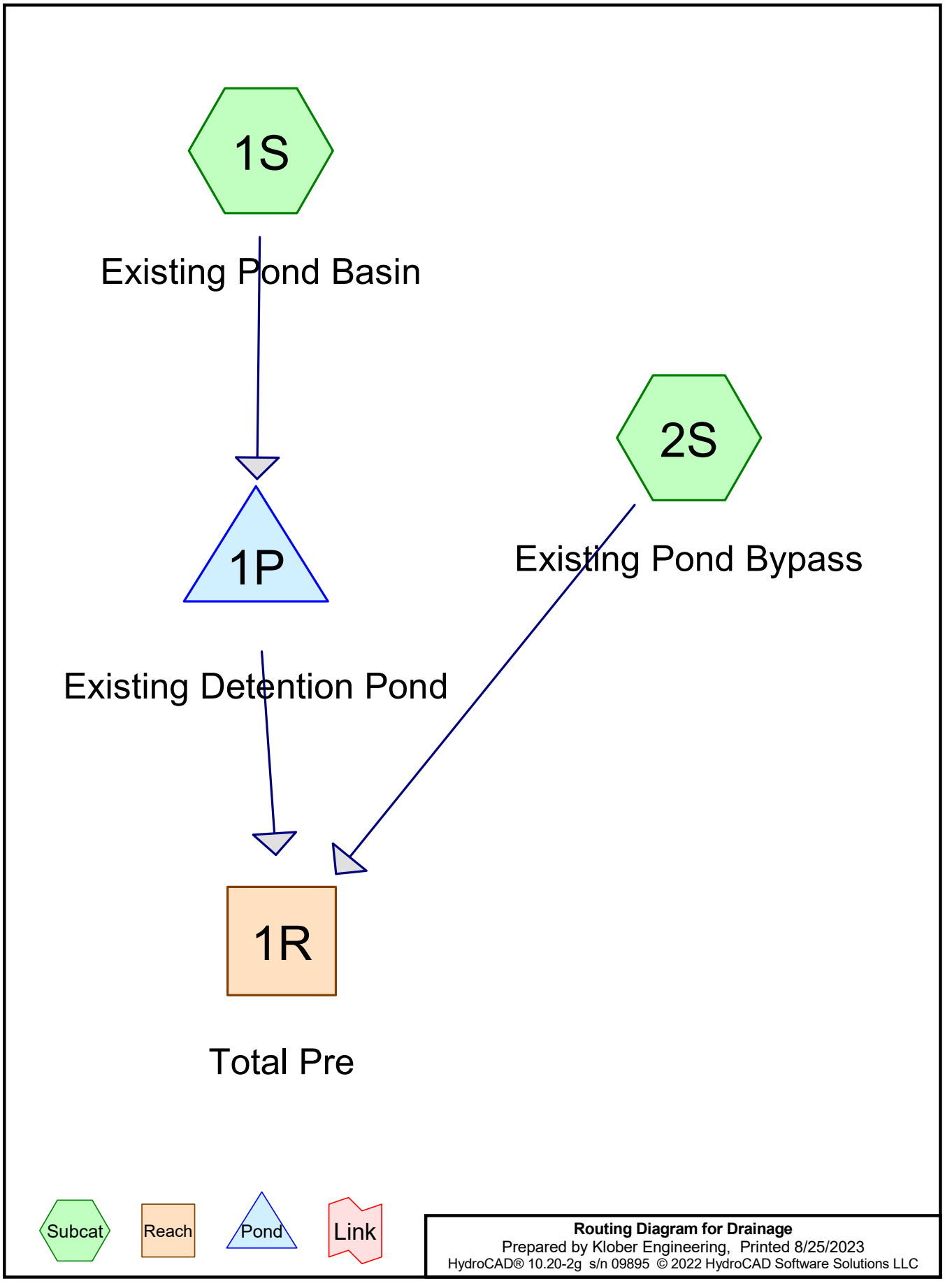
JOSHUA M. LYON, P.E. TN#112331
NOT FOR CONSTRUCTION
8/31/23

ACE MINI STORAGE
ASHLAND CITY, TN
CHEATHAM COUNTY

DRAWN BY:	CJN
CHECKED BY:	JML
DATE:	8/31/23
PROJECT NO.:	C05823

PRE DEVELOPED DRAINAGE

SHEET NUMBER
DM-1



Routing Diagram for Drainage
Prepared by Klober Engineering, Printed 8/25/2023
HydroCAD® 10.20-2g s/n 09895 © 2022 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 9.75 cfs @ 12.11 hrs, Volume= 0.552 af, Depth> 2.69"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 6.34 cfs @ 12.11 hrs, Volume= 0.345 af, Depth> 2.31"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 2.53" for 2-Year event
Inflow = 13.38 cfs @ 12.14 hrs, Volume= 0.896 af
Outflow = 13.38 cfs @ 12.14 hrs, Volume= 0.896 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 2.69" for 2-Year event
Inflow = 9.75 cfs @ 12.11 hrs, Volume= 0.552 af
Outflow = 7.59 cfs @ 12.17 hrs, Volume= 0.551 af, Atten= 22%, Lag= 3.4 min
Primary = 7.59 cfs @ 12.17 hrs, Volume= 0.551 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 402.65' @ 12.17 hrs Surf.Area= 2,933 sf Storage= 2,453 cf

Plug-Flow detention time= 4.9 min calculated for 0.551 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (760.2 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=7.42 cfs @ 12.17 hrs HW=402.63' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 7.42 cfs @ 3.56 fps)

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 12.21 cfs @ 12.11 hrs, Volume= 0.702 af, Depth> 3.42"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 8.15 cfs @ 12.11 hrs, Volume= 0.451 af, Depth> 3.02"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 3.25" for 5-Year event
Inflow = 16.98 cfs @ 12.14 hrs, Volume= 1.152 af
Outflow = 16.98 cfs @ 12.14 hrs, Volume= 1.152 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 3.42" for 5-Year event
Inflow = 12.21 cfs @ 12.11 hrs, Volume= 0.702 af
Outflow = 9.52 cfs @ 12.17 hrs, Volume= 0.701 af, Atten= 22%, Lag= 3.4 min
Primary = 9.52 cfs @ 12.17 hrs, Volume= 0.701 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 402.87' @ 12.17 hrs Surf.Area= 3,085 sf Storage= 3,117 cf

Plug-Flow detention time= 4.9 min calculated for 0.701 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (755.8 - 751.7)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=9.32 cfs @ 12.17 hrs HW=402.85' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 9.32 cfs @ 3.87 fps)

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 14.15 cfs @ 12.11 hrs, Volume= 0.823 af, Depth> 4.00"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 9.59 cfs @ 12.11 hrs, Volume= 0.536 af, Depth> 3.60"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 3.83" for 10-Year event
Inflow = 19.82 cfs @ 12.14 hrs, Volume= 1.357 af
Outflow = 19.82 cfs @ 12.14 hrs, Volume= 1.357 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 4.00" for 10-Year event
Inflow = 14.15 cfs @ 12.11 hrs, Volume= 0.823 af
Outflow = 11.04 cfs @ 12.17 hrs, Volume= 0.821 af, Atten= 22%, Lag= 3.4 min
Primary = 11.04 cfs @ 12.17 hrs, Volume= 0.821 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.04' @ 12.17 hrs Surf.Area= 3,201 sf Storage= 3,645 cf

Plug-Flow detention time= 4.9 min calculated for 0.819 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (753.2 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=10.81 cfs @ 12.17 hrs HW=403.02' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 10.81 cfs @ 4.09 fps)

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 16.92 cfs @ 12.11 hrs, Volume= 0.994 af, Depth> 4.84"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 11.64 cfs @ 12.11 hrs, Volume= 0.659 af, Depth> 4.42"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 4.66" for 25-Year event
Inflow = 23.81 cfs @ 12.13 hrs, Volume= 1.652 af
Outflow = 23.81 cfs @ 12.13 hrs, Volume= 1.652 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 4.84" for 25-Year event
Inflow = 16.92 cfs @ 12.11 hrs, Volume= 0.994 af
Outflow = 13.16 cfs @ 12.17 hrs, Volume= 0.993 af, Atten= 22%, Lag= 3.4 min
Primary = 13.16 cfs @ 12.17 hrs, Volume= 0.993 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.27' @ 12.17 hrs Surf.Area= 3,355 sf Storage= 4,404 cf

Plug-Flow detention time= 4.9 min calculated for 0.990 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (750.3 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=12.89 cfs @ 12.17 hrs HW=403.24' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 12.89 cfs @ 4.38 fps)

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 19.16 cfs @ 12.11 hrs, Volume= 1.134 af, Depth> 5.52"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 13.29 cfs @ 12.11 hrs, Volume= 0.760 af, Depth> 5.10"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 5.34" for 50-Year event
Inflow = 27.00 cfs @ 12.13 hrs, Volume= 1.892 af
Outflow = 27.00 cfs @ 12.13 hrs, Volume= 1.892 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 5.52" for 50-Year event
Inflow = 19.16 cfs @ 12.11 hrs, Volume= 1.134 af
Outflow = 14.84 cfs @ 12.17 hrs, Volume= 1.132 af, Atten= 23%, Lag= 3.4 min
Primary = 14.84 cfs @ 12.17 hrs, Volume= 1.132 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.45' @ 12.17 hrs Surf.Area= 3,478 sf Storage= 5,026 cf

Plug-Flow detention time= 4.9 min calculated for 1.129 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (748.5 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=14.54 cfs @ 12.17 hrs HW=403.42' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 14.54 cfs @ 4.59 fps)

Summary for Subcatchment 1S: Existing Pond Basin

Runoff = 21.45 cfs @ 12.11 hrs, Volume= 1.277 af, Depth> 6.22"
Routed to Pond 1P : Existing Detention Pond

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
	0.219	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.113	98	Paved parking, HSG C
	1.491	96	Gravel surface, HSG C
*	0.510	98	Roofs, HSG C
	0.008	98	Unconnected pavement, HSG C
	2.465	93	Weighted Average
	1.834		74.40% Pervious Area
	0.631		25.60% Impervious Area
	0.008		1.27% Unconnected

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

Summary for Subcatchment 2S: Existing Pond Bypass

Runoff = 14.98 cfs @ 12.11 hrs, Volume= 0.864 af, Depth> 5.79"
Routed to Reach 1R : Total Pre

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
0.215	79	50-75% Grass cover, Fair, HSG C
0.303	69	50-75% Grass cover, Fair, HSG B
1.271	96	Gravel surface, HSG C
1.789	89	Weighted Average
1.789		100.00% Pervious Area

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

Summary for Reach 1R: Total Pre

Inflow Area = 4.254 ac, 14.83% Impervious, Inflow Depth > 6.03" for 100-Year event
Inflow = 30.24 cfs @ 12.13 hrs, Volume= 2.139 af
Outflow = 30.24 cfs @ 12.13 hrs, Volume= 2.139 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: Existing Detention Pond

Inflow Area = 2.465 ac, 25.60% Impervious, Inflow Depth > 6.22" for 100-Year event
Inflow = 21.45 cfs @ 12.11 hrs, Volume= 1.277 af
Outflow = 16.53 cfs @ 12.17 hrs, Volume= 1.276 af, Atten= 23%, Lag= 3.4 min
Primary = 16.53 cfs @ 12.17 hrs, Volume= 1.276 af
Routed to Reach 1R : Total Pre

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.64' @ 12.17 hrs Surf.Area= 3,604 sf Storage= 5,673 cf

Plug-Flow detention time= 4.9 min calculated for 1.271 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (746.9 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	401.25'	11,230 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.25	16	16.0	0	0	16
402.00	2,505	355.0	680	680	10,025
403.00	3,174	346.0	2,833	3,513	10,638
404.00	3,860	357.0	3,511	7,025	11,346
405.00	4,561	368.0	4,206	11,230	12,077

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=16.21 cfs @ 12.17 hrs HW=403.60' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 16.21 cfs @ 4.80 fps)

POST-DEVELOPED

PRESENT OWNER:

MARK & TONYA YARBROUGH
400 WARIOTO WAY #708
ASHLAND CITY, TN 37105

DEED REFERENCE:

MAP 55, PARCEL 36
LEE BATSON COMMERCIAL LOTS – LOT 1

PROPERTY INFORMATION:

AREA: 226,164 S.F. = 5.19 ACRES

ZONING:

COMMERCIAL C–2

SITE USE:

EXISTING USE: MINI STORAGE
PROPOSED USE: MINI STORAGE

SIGN NOTE:

ALL SIGNS SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE ASHLAND CITY ZONING ORDINANCE. SEPARATE PERMIT REQUIRED.

LOT COVERAGE:

EXISTING BUILDING AREA = 22,225 S.F.
NEW BUILDING AREA = 24,090 S.F.
BUILDING COVERAGE = 20.5%
MAX BUILDING HEIGHT: 40'–0"
EXISTING CONCRETE SURFACE: ±350 S.F.
EXISTING ASPHALT SURFACE: ±41,782 S.F.
EXISTING IMPERVIOUS AREA: ±64,357 S.F. = 28.46%
PROPOSED ASPHALT SURFACE: ±18,144 S.F.
PROPOSED IMPERVIOUS AREA: ±106,591 S.F. = 47.13%

PARKING INFORMATION:

REQUIRED PARKING:
EXISTING: 3 SPACES, INCLUDING 1 HANDICAP SPACES

PROVIDED: 2 SPACES

TOTAL PARKING: 5 SPACES, INCLUDING 1 HANDICAP SPACES

UTILITY NOTE:

COORDINATE ALL UTILITY INSTALLATIONS WITH GOVERNING ENTITIES.

SECURITY GATE:

SECURITY GATES OR BARRIERS SHALL BE EQUIPPED WITH A RADIO OPERATED RECEIVER/CONTROLLER CAPABLE OF RECEIVING SIGNALS FROM A POLICE DEPARTMENT, SHERIFF'S DEPARTMENT (IF THE GATED FACILITY OR COMMUNITY IS IN THE COUNTY), FIRE DEPARTMENT, UTILITY AND EMERGENCY MEDICAL SERVICES' RADIO TRANSCEIVERS SERVING THE GATED FACILITY OR COMMUNITY WHICH ALLOW EMERGENCY RESPONDERS AND OTHER NECESSARY ON–DUTY EMPLOYEES TO OPEN THE SECURITY GATE OR BARRIER BY USE OF SUCH EQUIPMENT. ALL SECURITY GATES OR BARRIERS MUST MEET POLICIES DEEMED NECESSARY BY THE AUTHORITY HAVING JURISDICTION OVER THE GATED FACILITY OR COMMUNITY FOR RAPID, RELIABLE, AND MUTUAL AID ACCESS. SUCH EQUIPMENT SHALL BE FURNISHED, INSTALLED AND MAINTAINED BY THE GATED FACILITY OR COMMUNITY THAT IS SERVED BY SUCH EQUIPMENT.

GENERAL NOTES:

1. PRIOR TO BEGINNING CONSTRUCTION ON THIS SITE THE LOCATION OF UTILITIES MUST BE IDENTIFIED BY CALLING THE TOLL–FREE TENNESSEE ONE CALL REFERENCE NUMBER 1–800–351–1111.
2. ALL CONSTRUCTION ON THIS SITE SHALL COMPLY WITH APPLICABLE REGULATIONS AS SPECIFIED BY THE CITY OF MILLERSVILLE AND THE STATE OF TENNESSEE.
3. TOPSOIL SHALL BE PLACED ON EXCAVATED AREAS WHICH REQUIRE NEW VEGETATION. GROUND COVER SHALL BE REESTABLISHED WITH KENTUCKY 31 FESCUE SEEDED AT A MINIMUM OF 250 LBS. PER ACRE. SLOPES 3:1 OR GREATER SHALL BE LINED WITH NORTH AMERICAN GREEN S150 GRASS MATTING OR EQUAL.
4. SILT FENCE SHALL BE INSTALLED IN ALL EROSION AREAS WHICH COULD ALLOW UNTREATED STORMWATER RUNOFF TO BE DISCHARGED FROM THE PROPERTY. ALL EROSION CONTROL MEASURES SHALL BE CONSISTENT WITH THE PROVISIONS DESCRIBED IN THE MOST CURRENT EDITION OF THE TENNESSEE EROSION & SEDIMENT CONTROL HANDBOOK.
5. THE STORMWATER RUNOFF CALCULATIONS ON THIS SITE HAVE BEEN PERFORMED USING THE U.S. SOIL CONSERVATION SERVICE TR–55 METHOD. STORMWATER POND HAS BEEN SIZED TO HANDLE A 25 AND 100 YEAR STORM EVENT.
6. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS TAKEN FROM A SURVEY BY STEVEN E ARTZ SURVEYING OF SPRINGFIELD, TN.
7. CONSTRUCTION WILL BEGIN FOLLOWING PLAN APPROVAL BY THE CITY OF ASHLAND CITY.
8. THE BUILDING SHOULD FRONT TED DORRIS ROAD, AND BE SERVICED BY UNDERGROUND UTILITY LINES.
9. ANY DUMPSTER SHALL BE FULLY ENCLOSED, MATCHING THE FACADE OF THE BUILDING, AND A WOODEN PRIVACY FENCE GATE THAT IS 8 FEET HIGH ON ALL SIDES AND ALL SERVICE BOXES AND MECHANICALS TO BE IN THE REAR OF THE BUILDING.
10. ALL ADDITIONS IN THE FUTURE MUST BE BUILT TO THESE STANDARDS.
11. THIS PROPERTY IN LOCATED IN ZONE "A" AND ZONE "X" (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON NFIP FIRM MAP ACCORDING TO THE FEMA MAP PANEL NUMBER 47021C0170D, DATED 9/10/2010,

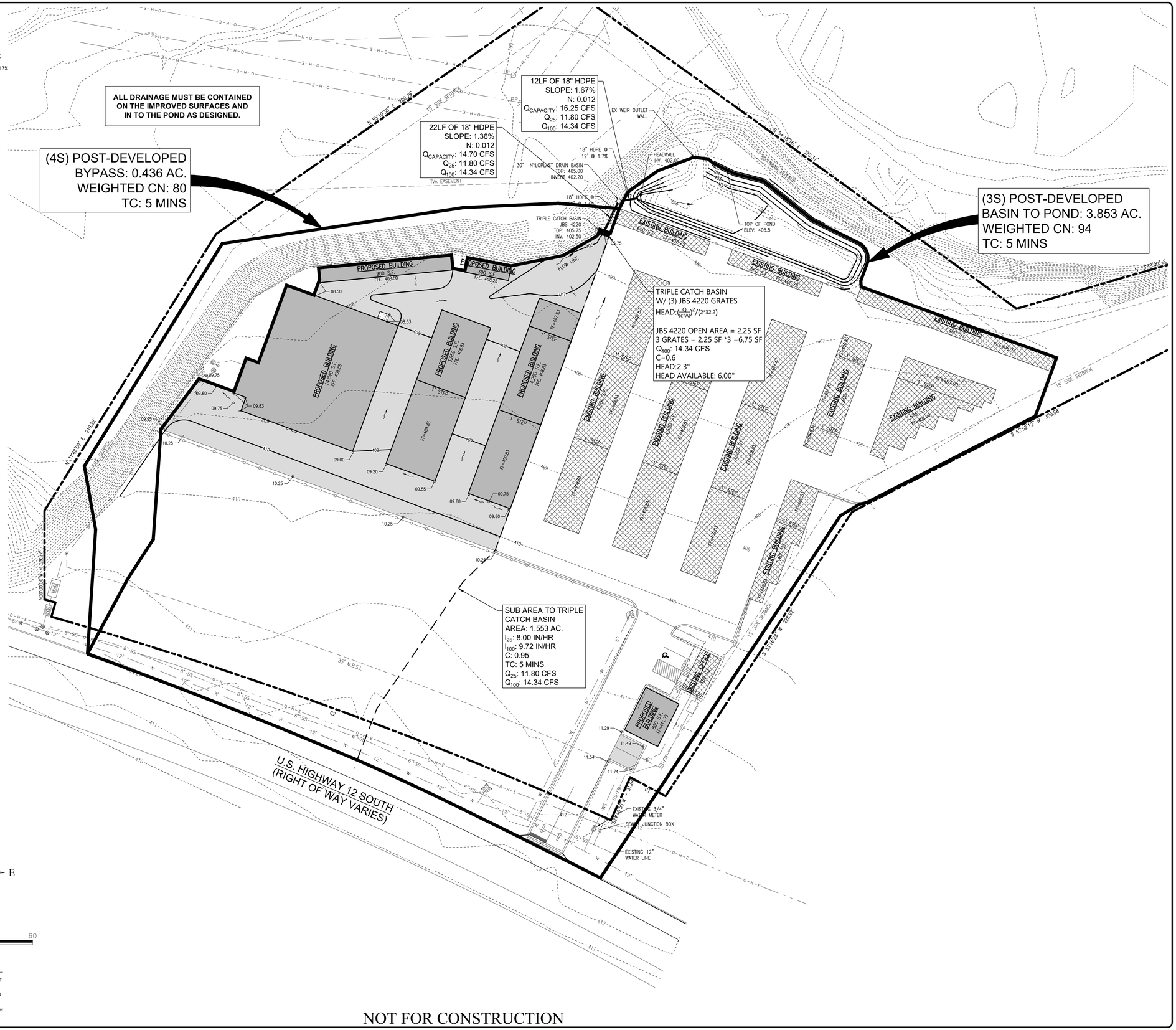
NPDES PERMIT NOTE:

THE MAXIMUM DISTURBED AREA FOR THIS PROJECT IS OVER 1 ACRE. THIS SITE IS CURRENTLY COVERED UNDER PERMIT NUMBER TNR245326.

Josh Lyon
JOSHUA M. LYON, P.E.
PROJECT MANAGER

EP&SC NOTES:

1. AN EROSION PREVENTION SILTATION CONTROL PLAN (EP&SC) AND LAND DISTURBANCE PERMIT (IF REQUIRED) SHALL BE IN PLACE PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY. EROSION CONTROL DEVICES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD; GENERALLY CONSIDERED TO BE THROUGH THE COMPLETION OF RESTORATION. IF REQUIRED, THE EP&SC PLAN ALONG WITH AN INSPECTION CHECKLIST AND STORMWATER PERMIT MUST BE AT THE PROJECT SITE AT ALL TIMES. THE INSPECTION CHECKLIST SHALL HAVE A RECORD OF DATES EP&SC DEVICES ARE INSPECTED AND ANY CORRECTION ACTION TAKEN OR MAJOR OBSERVATIONS. BMP'S MUST BE INSPECTED BY A QUALIFIED PERSON WHO HAS TAKEN AN APPROVED EROSION AND SEDIMENTATION COURSE.
2. ALL EP&SC DEVICES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND A GOOD STAND OF GRASS HAS BEEN ESTABLISHED.
3. EROSION PREVENTION AND SEDIMENT CONTROLS MUST BE INSPECTED AT LEAST TWICE EVERY CALENDAR WEEK AT LEAST 72 HOURS APART. INSPECTIONS ARE TO BE DOCUMENTED AND KEPT WITH THE SWPPP (IF REQUIRED).
4. SILT FENCE, OR OTHER SEDIMENT BARRIERS ARE TO BE INSTALLED PROPERLY ALONG TOPOGRAPHICAL CONTOURS DOWN SLOPE OF THE AREA TO BE DISTURBED PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY.
5. EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING.
6. THIS SITE SHALL CONTAIN A TEMPORARY STONE CONSTRUCTION ENTRANCE THAT CONFORMS TO REQUIRED SPECIFICATIONS PRIOR TO GRADING COMMENCEMENT. THE STONE SHALL BE 2 TO 3 INCH IN DIAMETER AND SHALL BE KEPT CLEAN BY ADDING STONE AS NEEDED. IT SHALL BE AT LEAST 8 INCHES DEEP UNDERLAIN WITH FILTER FABRIC AND 20 FEET WIDE.
7. APPROVED INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS MUST BE INSTALLED WITHIN 24 HOURS OF GRADING COMMENCEMENT.
8. VEGETATIVE BUFFERS OR OTHER PROTECTION MUST BE PROVIDED ALONG STREAMS, RIVERS, AND PONDS TO AVOID EROSION OF BANKS.
9. STABILIZATION MEASURES MUST BE PERFORMED WITHIN SEVEN (7) DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND WITHIN FIFTEEN (15) DAYS AFTER FINAL GRADING.
10. ALL TREES DESIGNATED TO REMAIN, MUST BE PROTECTED. HEAVY EQUIPMENT SHOULD NOT BE OPERATED OR STORED, NOR MATERIALS HANDLED OR STORED, WITHIN THE DRIP LINES OF TREES.
11. SEDIMENT MUST BE REMOVED FROM SEDIMENT BARRIERS, PONDS, AND OTHER SEDIMENT CONTROLS WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 33%
12. SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
13. BUILDING AND WASTE MATERIALS, AND NON STORM WATER DISCHARGES, SUCH AS CONCRETE, PAINT WASH WATER, OR MACHINERY LEAKAGE, OR SPILLAGE MUST BE MANAGED TO PREVENT THEM FROM ENTERING THE STORM WATER SYSTEM, GROUND WATER, OR NEARBY WATER BODY.
14. THE PROJECT IS SUBJECT TO INSPECTION BY THE CITY AT ANY TIME AND ITEMS FOUND DEFICIENT SHALL BE IMMEDIATELY CORRECTED. THE CITY MAY STOP CONSTRUCTION OR PROPERTIES, OR ADMINISTER OTHER ENFORCEMENT ACTIONS AS DEFINED BY THE CITY



ALL DRAINAGE MUST BE CONTAINED ON THE IMPROVED SURFACES AND IN TO THE POND AS DESIGNED.

(4S) POST-DEVELOPED
BYPASS: 0.436 AC.
WEIGHTED CN: 80
TC: 5 MINS

(3S) POST-DEVELOPED
BASIN TO POND: 3.853 AC.
WEIGHTED CN: 94
TC: 5 MINS

22LF OF 18" HDPE
SLOPE: 1.36%
N: 0.012
$Q_{CAPACITY}$: 14.70 CFS
Q_{25}: 11.80 CFS
Q_{100}: 14.34 CFS

12LF OF 18" HDPE
SLOPE: 1.67%
N: 0.012
$Q_{CAPACITY}$: 16.25 CFS
Q_{25}: 11.80 CFS
Q_{100}: 14.34 CFS

TRIPLE CATCH BASIN
W/ (3) JBS 4220 GRATES
HEAD: $\left(\frac{Q}{(c*A)}\right)^2/(2*32.2)$

JBS 4220 OPEN AREA = 2.25 SF
3 GRATES = 2.25 SF *3 =6.75 SF
Q_{100}: 14.34 CFS
C=0.6
HEAD:2.3"
HEAD AVAILABLE: 6.00"

SUB AREA TO TRIPLE CATCH BASIN
AREA: 1.553 AC.
I_{25}: 8.00 IN/HR
I_{100}: 9.72 IN/HR
C: 0.95
TC: 5 MINS
Q_{25}: 11.80 CFS
Q_{100}: 14.34 CFS

CALL BEFORE YOU DIG

811
CALL
811
NATIONWIDE

Know what's below.
Call before you dig.

IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND POSSIBLY INCOMPLETE, THEREFORE CERTIFICATION TO THE LOCATION OF ALL UNDERGROUND UTILITIES IS WITHHELD.

30 0 30 60
SCALE IN FEET

LEGEND:

———	PROPERTY LINE	Ⓢ	MANHOLE	INV.–25.42	PIPE INVERT
—W— 6"	EXISTING WATER LINE	CO ○	CLEAN OUT	28.14	SPOT ELEVATION
— 8"-SS —	EXISTING SEWER LINE	PP	POWER POLE		SLOPE DIRECTION
—O–H–E—	OVERHEAD ELECTRIC LINE	WM	WATER METER		
—○—○—	FENCE		FIRE HYDRANT		
═══	NEW CURB	IR(O)	IRON ROD OLD		
—X—SF—	SILT FENCE	IR(N)	IRON ROD NEW		
– – –	EXISTING 5' CONTOUR				
- - - -	EXISTING 1' CONTOUR				
———	NEW 1' CONTOUR				
∧∧∧∧	DEMO LINE				

NOT FOR CONSTRUCTION

Z:\PROJECT\2023\CIVIL\C05823 Ace Storage – Ashland City\Current Civil Drawings\Ace Storage – Ashland City – Drainage – 2023.dwg PLOTTED: 8/25/2023 11:19:53 AM

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REVISIONS

NO.	BY	DATE	DESCRIPTION

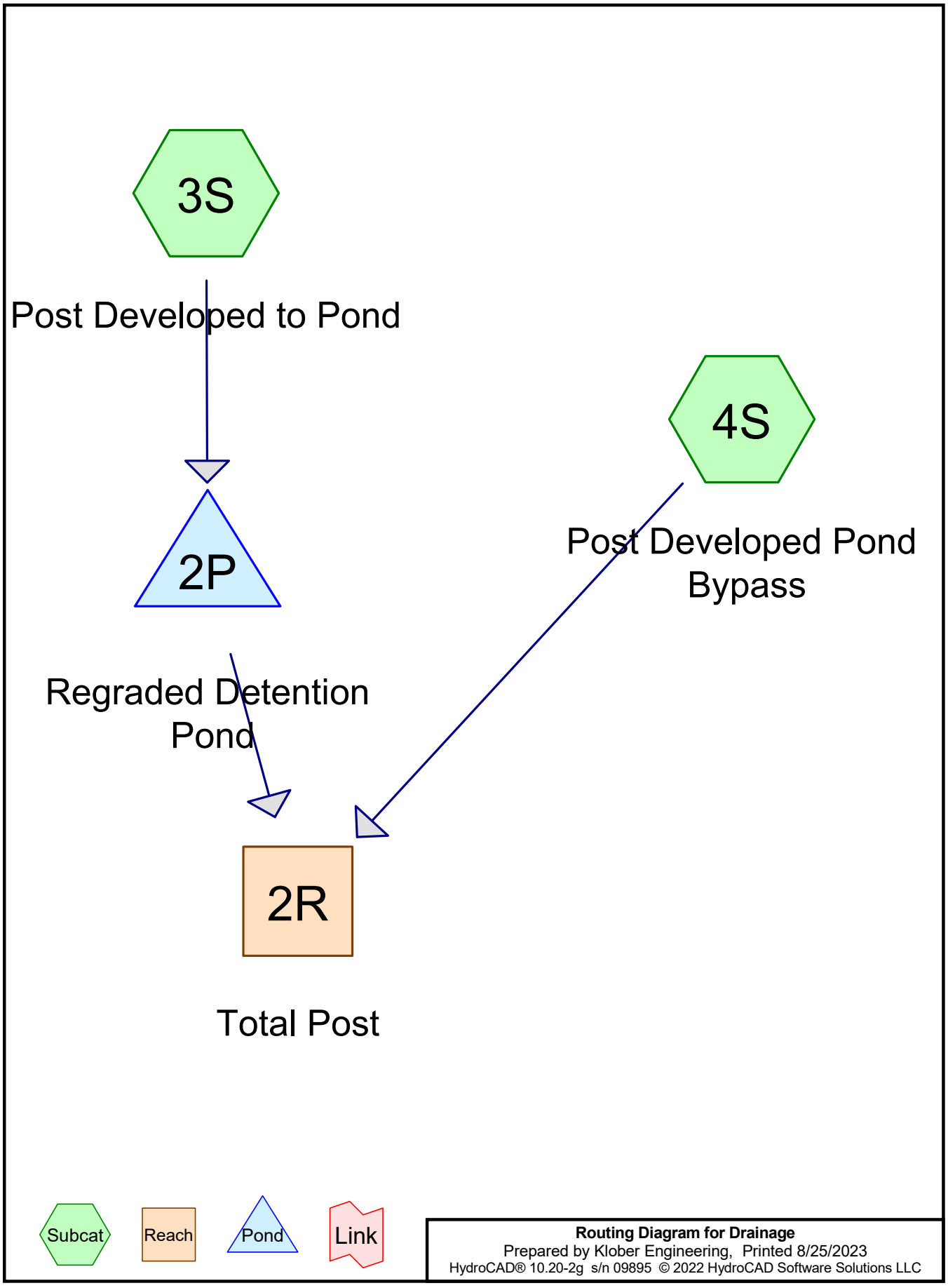
JOSHUA M. LYON
REGISTERED ENGINEER
NO. 112331
NOT FOR CONSTRUCTION
8/31/23
JOSHUA M. LYON, P.E. TN#112331

ACE
MINI STORAGE
ASHLAND CITY, TN
CHEATHAM COUNTY

DRAWN BY:	CJN
CHECKED BY:	JML
DATE:	8/31/23
PROJECT NO.:	C05823

POST
DEVELOPED
DRAINAGE

SHEET NUMBER
DM-2



Routing Diagram for Drainage
Prepared by Klober Engineering, Printed 8/25/2023
HydroCAD® 10.20-2g s/n 09895 © 2022 HydroCAD Software Solutions LLC

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 15.58 cfs @ 12.11 hrs, Volume= 0.895 af, Depth> 2.79"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 1.11 cfs @ 12.12 hrs, Volume= 0.058 af, Depth> 1.60"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 2.67" for 2-Year event
Inflow = 12.64 cfs @ 12.16 hrs, Volume= 0.953 af
Outflow = 12.64 cfs @ 12.16 hrs, Volume= 0.953 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 2.79" for 2-Year event
Inflow = 15.58 cfs @ 12.11 hrs, Volume= 0.895 af
Outflow = 11.70 cfs @ 12.17 hrs, Volume= 0.894 af, Atten= 25%, Lag= 3.6 min
Primary = 11.70 cfs @ 12.17 hrs, Volume= 0.894 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.11' @ 12.17 hrs Surf.Area= 4,097 sf Storage= 3,662 cf

Plug-Flow detention time= 2.6 min calculated for 0.894 af (100% of inflow)
Center-of-Mass det. time= 2.6 min (755.0 - 752.4)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=11.48 cfs @ 12.17 hrs HW=403.09' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 11.48 cfs @ 4.19 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 19.40 cfs @ 12.11 hrs, Volume= 1.130 af, Depth> 3.52"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 1.53 cfs @ 12.12 hrs, Volume= 0.081 af, Depth> 2.22"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 3.39" for 5-Year event
Inflow = 15.58 cfs @ 12.16 hrs, Volume= 1.210 af
Outflow = 15.58 cfs @ 12.16 hrs, Volume= 1.210 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 3.52" for 5-Year event
Inflow = 19.40 cfs @ 12.11 hrs, Volume= 1.130 af
Outflow = 14.32 cfs @ 12.17 hrs, Volume= 1.130 af, Atten= 26%, Lag= 3.7 min
Primary = 14.32 cfs @ 12.17 hrs, Volume= 1.130 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.40' @ 12.17 hrs Surf.Area= 4,327 sf Storage= 4,858 cf

Plug-Flow detention time= 2.9 min calculated for 1.130 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (751.3 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=14.05 cfs @ 12.17 hrs HW=403.37' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 14.05 cfs @ 4.53 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 22.43 cfs @ 12.11 hrs, Volume= 1.318 af, Depth> 4.10"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 1.87 cfs @ 12.12 hrs, Volume= 0.099 af, Depth> 2.73"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 3.96" for 10-Year event
Inflow = 17.91 cfs @ 12.16 hrs, Volume= 1.417 af
Outflow = 17.91 cfs @ 12.16 hrs, Volume= 1.417 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 4.10" for 10-Year event
Inflow = 22.43 cfs @ 12.11 hrs, Volume= 1.318 af
Outflow = 16.30 cfs @ 12.18 hrs, Volume= 1.318 af, Atten= 27%, Lag= 3.8 min
Primary = 16.30 cfs @ 12.18 hrs, Volume= 1.318 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.61' @ 12.18 hrs Surf.Area= 4,505 sf Storage= 5,807 cf

Plug-Flow detention time= 3.1 min calculated for 1.318 af (100% of inflow)
Center-of-Mass det. time= 3.0 min (749.1 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=16.07 cfs @ 12.18 hrs HW=403.59' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 16.07 cfs @ 4.78 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 26.73 cfs @ 12.11 hrs, Volume= 1.587 af, Depth> 4.94"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 2.37 cfs @ 12.12 hrs, Volume= 0.127 af, Depth> 3.49"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 4.79" for 25-Year event
Inflow = 21.14 cfs @ 12.16 hrs, Volume= 1.713 af
Outflow = 21.14 cfs @ 12.16 hrs, Volume= 1.713 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 4.94" for 25-Year event
Inflow = 26.73 cfs @ 12.11 hrs, Volume= 1.587 af
Outflow = 19.15 cfs @ 12.18 hrs, Volume= 1.586 af, Atten= 28%, Lag= 4.0 min
Primary = 19.15 cfs @ 12.18 hrs, Volume= 1.586 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.92' @ 12.18 hrs Surf.Area= 4,768 sf Storage= 7,248 cf

Plug-Flow detention time= 3.4 min calculated for 1.581 af (100% of inflow)
Center-of-Mass det. time= 3.3 min (746.8 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=18.89 cfs @ 12.18 hrs HW=403.90' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 18.89 cfs @ 5.11 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 30.21 cfs @ 12.11 hrs, Volume= 1.804 af, Depth> 5.62"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 2.78 cfs @ 12.11 hrs, Volume= 0.150 af, Depth> 4.13"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 5.47" for 50-Year event
Inflow = 23.68 cfs @ 12.16 hrs, Volume= 1.954 af
Outflow = 23.68 cfs @ 12.16 hrs, Volume= 1.954 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 5.62" for 50-Year event
Inflow = 30.21 cfs @ 12.11 hrs, Volume= 1.804 af
Outflow = 21.38 cfs @ 12.18 hrs, Volume= 1.804 af, Atten= 29%, Lag= 4.1 min
Primary = 21.38 cfs @ 12.18 hrs, Volume= 1.804 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 404.17' @ 12.18 hrs Surf.Area= 4,960 sf Storage= 8,457 cf

Plug-Flow detention time= 3.5 min calculated for 1.798 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (745.3 - 741.9)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=21.11 cfs @ 12.18 hrs HW=404.14' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 21.11 cfs @ 5.36 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S: Post Developed to Pond

Runoff = 33.77 cfs @ 12.11 hrs, Volume= 2.028 af, Depth> 6.32"
Routed to Pond 2P : Regraded Detention Pond

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
	0.369	79	50-75% Grass cover, Fair, HSG C
	0.124	49	50-75% Grass cover, Fair, HSG A
	0.636	98	Paved parking, HSG C
	1.804	96	Gravel surface, HSG C
*	0.911	98	Roofs, HSG C
	0.009	98	Unconnected pavement, HSG C
	3.853	94	Weighted Average
	2.297		59.62% Pervious Area
	1.556		40.38% Impervious Area
	0.009		0.58% Unconnected

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

Summary for Subcatchment 4S: Post Developed Pond Bypass

Runoff = 3.19 cfs @ 12.11 hrs, Volume= 0.174 af, Depth> 4.79"
Routed to Reach 2R : Total Post

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
0.263	69	50-75% Grass cover, Fair, HSG B
0.173	96	Gravel surface, HSG C
0.436	80	Weighted Average
0.436		100.00% Pervious Area

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

Summary for Reach 2R: Total Post

Inflow Area = 4.289 ac, 36.28% Impervious, Inflow Depth > 6.16" for 100-Year event
Inflow = 26.20 cfs @ 12.16 hrs, Volume= 2.202 af
Outflow = 26.20 cfs @ 12.16 hrs, Volume= 2.202 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 2P: Regraded Detention Pond

Inflow Area = 3.853 ac, 40.38% Impervious, Inflow Depth > 6.32" for 100-Year event
Inflow = 33.77 cfs @ 12.11 hrs, Volume= 2.028 af
Outflow = 23.59 cfs @ 12.18 hrs, Volume= 2.028 af, Atten= 30%, Lag= 4.2 min
Primary = 23.59 cfs @ 12.18 hrs, Volume= 2.028 af
Routed to Reach 2R : Total Post

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 404.43' @ 12.18 hrs Surf.Area= 5,149 sf Storage= 9,739 cf

Plug-Flow detention time= 3.7 min calculated for 2.021 af (100% of inflow)
Center-of-Mass det. time= 3.6 min (744.1 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	401.45'	12,821 cf	**DETENTION POND (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
401.45	16	16.0	0	0	16
402.00	1,807	216.0	365	365	3,709
403.00	4,007	353.0	2,835	3,200	9,919
404.00	4,834	361.0	4,414	7,614	10,497
405.00	5,589	331.0	5,207	12,821	12,185

Device	Routing	Invert	Outlet Devices
#1	Primary	401.45'	**2.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	404.95'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=23.30 cfs @ 12.18 hrs HW=404.39' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 23.30 cfs @ 5.61 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Map Scale: 1:1,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Cheatham County, Tennessee
Survey Area Data: Version 14, May 29, 2020

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
En	Ennis gravelly silt loam, occasionally flooded	A	0.4	5.6%
Me	Melvin silt loam, frequently flooded	B/D	3.6	48.9%
Ne	Newark silt loam, frequently flooded	B/D	0.5	7.1%
Pt	Pits, quarry		1.4	19.3%
TrC2	Tarklin gravelly silt loam, 5 to 12 percent slopes, eroded	D	0.5	6.4%
WfA	Wolftever silty clay loam, 0 to 2 percent slopes, occasionally flooded	C	1.0	12.8%
Totals for Area of Interest			**7.4**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher