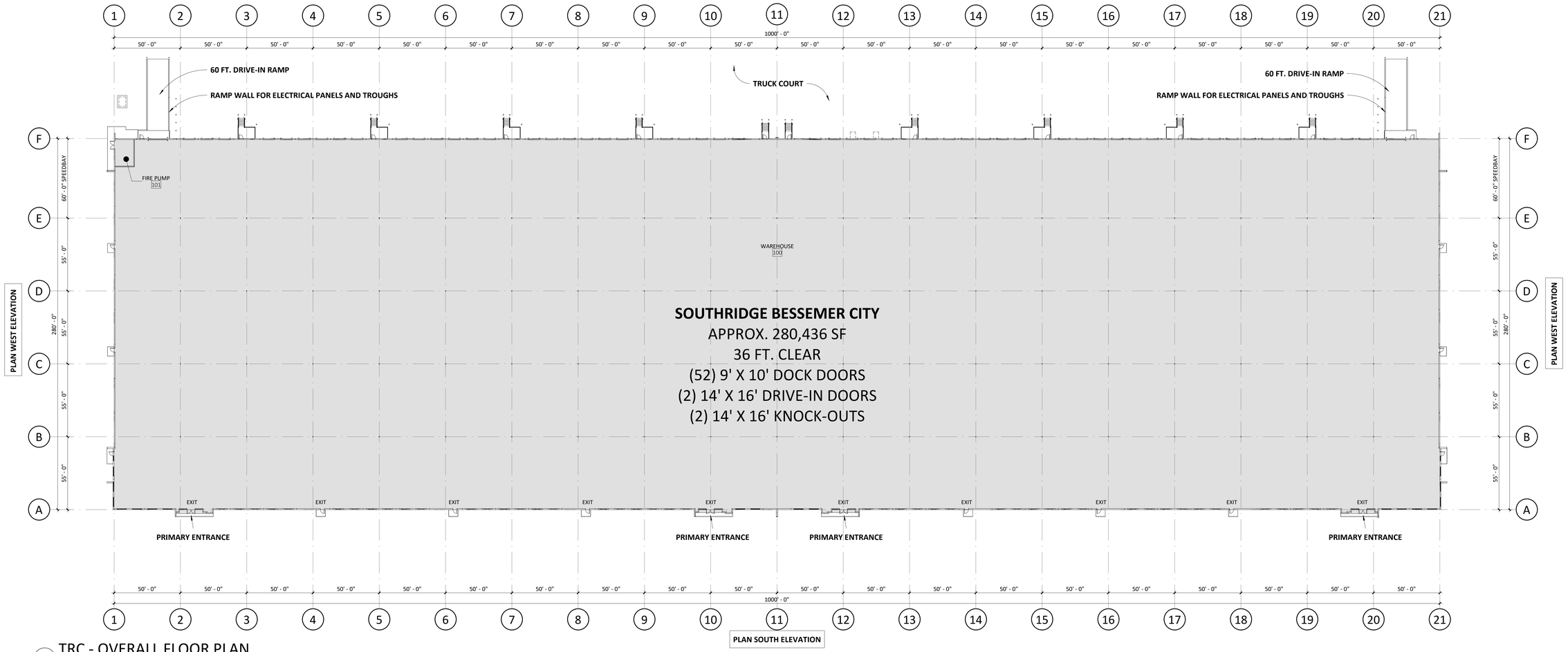
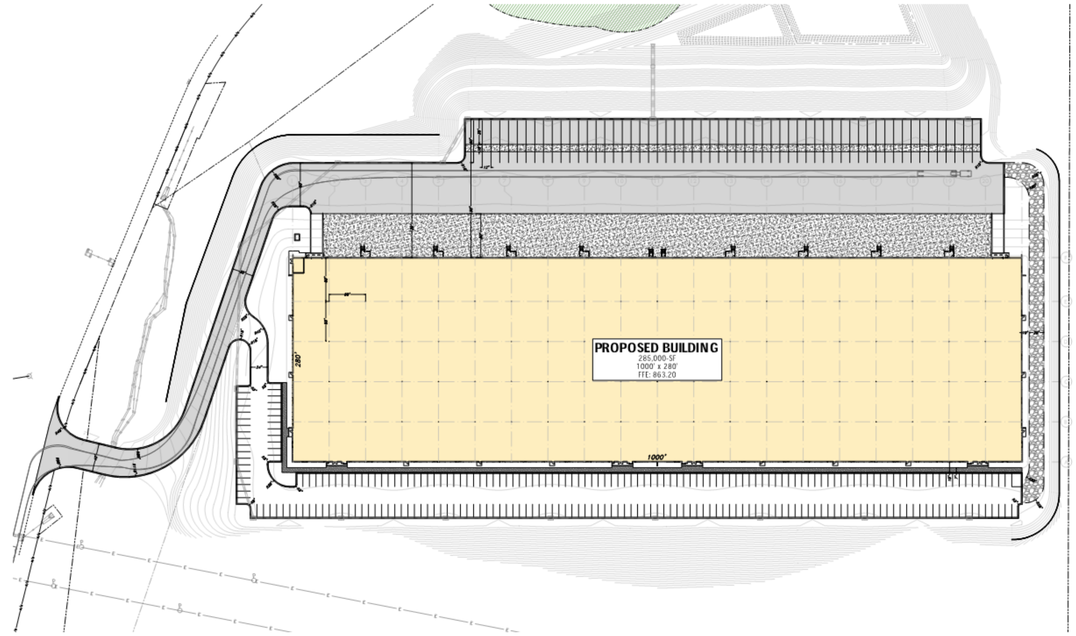
Southridge - Bessemer
05/05/2022

Table 1 - Trip Generation										
ITE LUC	Land Use	Intensity	Daily	AM Peak Hour			PM Peak Hour			Peak Hour Type/Data Source
				Total	In	Out	Total	In	Out	
150	Warehousing	280,000 SF	481	57	44	13	60	17	43	Adj Street/ITE Eqn
154	High-Cube Transload and Short-Term Storage Warehouse	280,000 SF	392	22	17	5	28	8	20	Adj Street/ITE Rate

PLAN NORTH ELEVATION - TRUCK COURT SIDE



1 TRC - OVERALL FLOOR PLAN
1/32" = 1'-0"



5/4/2022 1:05:04 PM

architects msa merriman schmitt
architecture · planning
interior design
605 LEXINGTON AVENUE
SUITE 300
CHARLOTTE, NC 28203
704.377.1177
704.377.3060 (fax)

CONSULTANTS:

GENERAL CONTRACTOR:

CLIENT: FOUNDRY COMMERCIAL

SOUTHRIDGE BESSEMER CITY WAREHOUSE
SHELL BUILDING ONLY

BESSEMER CITY, NC

SEALS:

REVISIONS		
MARK	DATE	DESCRIPTION
1	05-10-2022	TRC SUBMITTAL

NOTE: MINIMUM 36 FT. CLEAR HEIGHT UNDER STRUCTURE, TYPICAL

PROJECT NUMBER: C22026 — PERMIT TRACKING: —

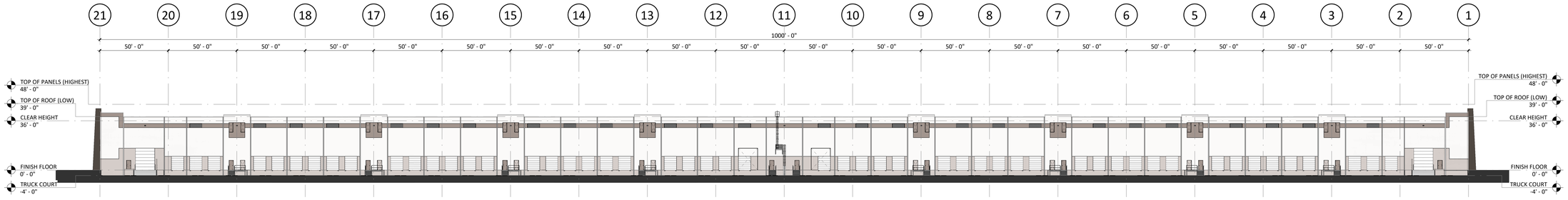
DRAWING STATUS:
- (●) NOT FOR CONSTRUCTION
- ( ) ISSUED FOR BIDDING
- ( ) ISSUED FOR CONSTRUCTION

SHEET TITLE: OVERALL FLOOR PLAN & SITE PLAN

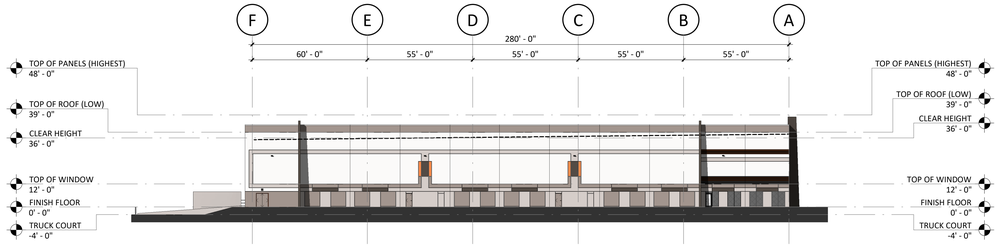
SHEET NUMBER: TRC 1

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SHELL BUILDING ONLY
SOUTHRIDGE BESSEMER CITY WAREHOUSE
C22026



4 COLOR ELEVATION - TRUCK COURT - PLAN NORTH
1/32" = 1'-0"



2 COLOR ELEVATION - PLAN WEST
1/32" = 1'-0"

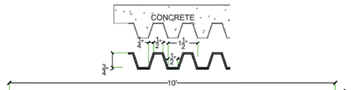
FORMLINER USED ON CORNERS TO ESTABLISH HEIRARCHY OF FEATURES

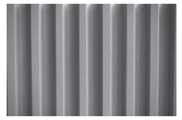
Pattern# 4004
3/4" Deep Rib 1 1/2"oc (1/2" Peak, 1/2" Valley)

customrock FORMLINER

General Information:

Thermoformed ABS and Styrene plastic formliners are an inexpensive alternative for providing architectural concrete. The Styrene single use liner is the least expensive liner option. The ABS plastic formliner properties allows for an up to ten reuse factor depending on the design and handling.





Thermal Deformation:
- Do not expose to temperatures >140°F (60°C)

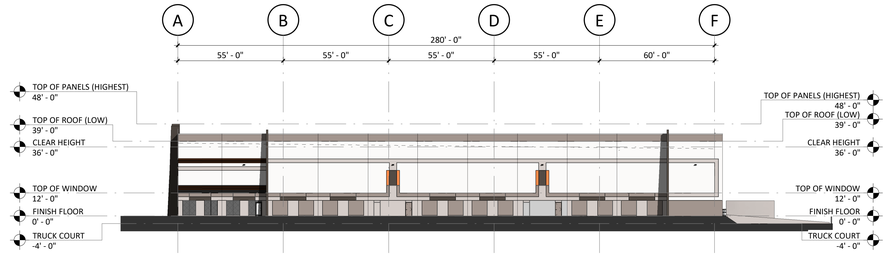
Care and Handling:
- Keep out of the sunlight and covered when not in use
- Keep away from steam, acids, and certain fuels
- For further instructions refer to the application guide

Thermal expansion:
- +/- 1/8" @ 70°F

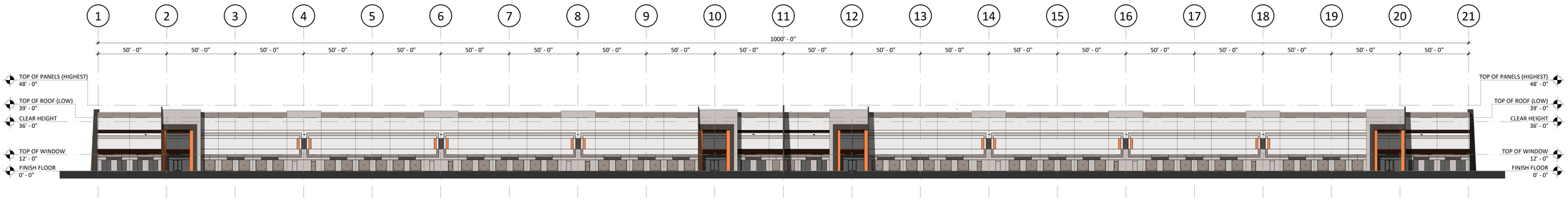
Note:
Pattern may require additional backing. We recommend a mockup pour simulating job conditions.

Material	Product Code	# of Reuses	Std. Dims.	Color
Styrene	4004-STY	1	4'x10'	White
ABS	4004-ABS	Up to 10	4'x10'	Gray

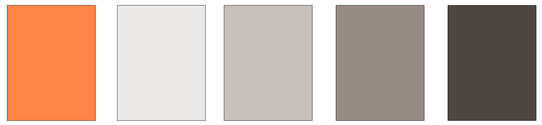
Custom Rock Formliner • 2020 West 7th Street • St. Paul, MN 55116 • (800) 637-2447
www.customrock.com



1 COLOR ELEVATION - PLAN EAST
1/32" = 1'-0"



3 COLOR ELEVATION - PLAN SOUTH
1/32" = 1'-0"



BESIDES 1 ACCENT COLOR, THE 4 OTHER COLORS ARE CLOSE MONOCHROMES OF EACH OTHER TO CREATE SUBTLE ELEVATIONAL INTEREST IN THE PATTERNS



MEDIUM TEXTURE PAINT ON CONCRETE WALL PANELS

architects msa merriman schmitt architects+ planning interior design
600 LEXINGTON AVENUE SUITE 300 CHARLOTTE, NC 28203
704.377.1177 704.377.3060 (fax)

CONSULTANTS:

GENERAL CONTRACTOR:

CLIENT: FOUNDRY COMMERCIAL

SOUTHRIDGE BESSEMER CITY WAREHOUSE
SHELL BUILDING ONLY
BESSEMER CITY, NC

SEALS:

REVISIONS		
MARK	DATE	DESCRIPTION
1	05-10-2022	TRC SUBMITTAL

NOTE: MINIMUM 36 FT. CLEAR HEIGHT UNDER STRUCTURE, TYPICAL.

PROJECT NUMBER: C22026
PERMIT TRACKING: ---

DRAWING STATUS:
- (●) NOT FOR CONSTRUCTION
- ( ) ISSUED FOR BIDDING
- ( ) ISSUED FOR CONSTRUCTION

SHEET TITLE: COLOR ELEVATIONS, PAINT COLORS, & WALL FORMLINER

SHEET NUMBER: TRC 2

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SHELL BUILDING ONLY
SOUTHRIDGE BESSEMER CITY WAREHOUSE
C22026

4/5/2022 12:01:18 PM

CONTINUOUS TOP PAINT BAND THAT WRAPS THE BUILDING ON ALL SIDES

DARK PAINT ON FINS FOR BREAKS IN FACADE FEATURES

HORIZONTAL FLUTED FORMLINER WITH ACCENT PAINT

INTERMEDIATE PATTERNS OF LIGHTER PAINT COLORS FOR BALANCE AND VISUAL PROPORTIONALITY OF FACADE

MEDIUM PAINT ON BOTTOM STRIP WITH ARTICULATED DARKER PAINT ON LOCATIONS THAT DON'T HAVE GLAZING

GREY TINT INSULATED GLAZING STOREFRONTS



PERSPECTIVE VIEW - CORNER



PERSPECTIVE VIEW - CENTER

5/10/2022 1:03:18 PM

architects
msa
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architecture · planning
interior design
605 LEXINGTON AVENUE
SUITE 300
CHARLOTTE, NC 28203
704.377.1177
704.377.3060 (fax)

CONSULTANTS:

GENERAL CONTRACTOR:

CLIENT:

FOUNDRY COMMERCIAL

SOUTHRIDGE BESSEMER CITY WAREHOUSE

SHELL BUILDING ONLY

BESSEMER CITY, NC

SEALS:

REVISIONS		
MARK	DATE	DESCRIPTION
1	05-10-2022	TRC SUBMITTAL

NOTE:
MINIMUM 36 FT. CLEAR HEIGHT UNDER STRUCTURE, TYPICAL

PROJECT NUMBER: C22026
PERMIT TRACKING: —

DRAWING STATUS:
- (●) NOT FOR CONSTRUCTION
- ( ) ISSUED FOR BIDDING
- ( ) ISSUED FOR CONSTRUCTION

SHEET TITLE:
PERSPECTIVE VIEWS

SHEET NUMBER:
TRC 3

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architects msa merriman schmitt

SHELL BUILDING ONLY

SOUTHRIDGE BESSEMER CITY WAREHOUSE

C22026

STORMWATER DESIGN REPORT

FOR

SOUTHRIDGE - BESSEMER

BESSEMER CITY, NORTH CAROLINA



04/28/2022

BY

OAK ENGINEERING
4929 MONROE ROAD
CHARLOTTE, NC 28205
NC FIRM LICENSE #P1742

April 28, 2022

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NARRATIVE

Foundry Commercial is proposing the construction of a 280,000-sf speculative industrial building off Southridge Parkway, located in Bessemer City, NC (Tax Parcel #305599). Associated with this project is the construction of the industrial/warehouse/manufacturing building, trailer parking, and vehicular parking.

The purpose of this report is to show that the proposed improvements will meet or exceed the Bessemer City and Gaston County's erosion control requirements and Stormwater Management requirements

STORM WATER MANAGEMENT REQUIREMENTS

City of Statesville Stormwater Management Requirements

1. Must provide 85% reduction (by weight) in the export of total suspended solids (TSS) on an average annual basis.
2. Must provide peak control for the 1YR-24HR storm event.

The *NCDEQ Stormwater Design Manual* was used as the basis for the water quality BMP design. One wet detention pond was used to provide the required treatment for the proposed improvements.

EXISTING SITE CONDITIONS

The existing conditions of Parcel #305599 is predominantly wooded land with a stream and creek that run along the northwest portion of the property. The site drains to the Norther Corner of the site, toward the creek.

PROPOSED SITE CONDITIONS

A wet pond is proposed to provide water quality and quantity control for the site improvements. The contributing drainage area is approximately 17.32 acres at 75% impervious. The wet pond will provide 85% TSS water quality for the first inch of runoff. Additionally, the pond will provide peak control for the 1yr-24hr Storm Event. See the Pre/Post Comparison Table below.

PRE/POST COMPARISON TABLE

STORM EVENT	PRE (1S)	POST TO POND (3S)	WET POND (DISCHARGE & WSE) (2P)
1"	0.00	8.65	0.13 / 824.94
1yr-24hr	0.88	55.79	0.73 / 827.33
10yr-24hr	16.26	114.38	23.09 / 828.54
25yr-24hr	26.95	140.09	69.19 / 828.97
50yr-24hr	36.44	160.45	96.30 / 829.23
100yr-24hr	46.85	181.25	116.82 / 829.50

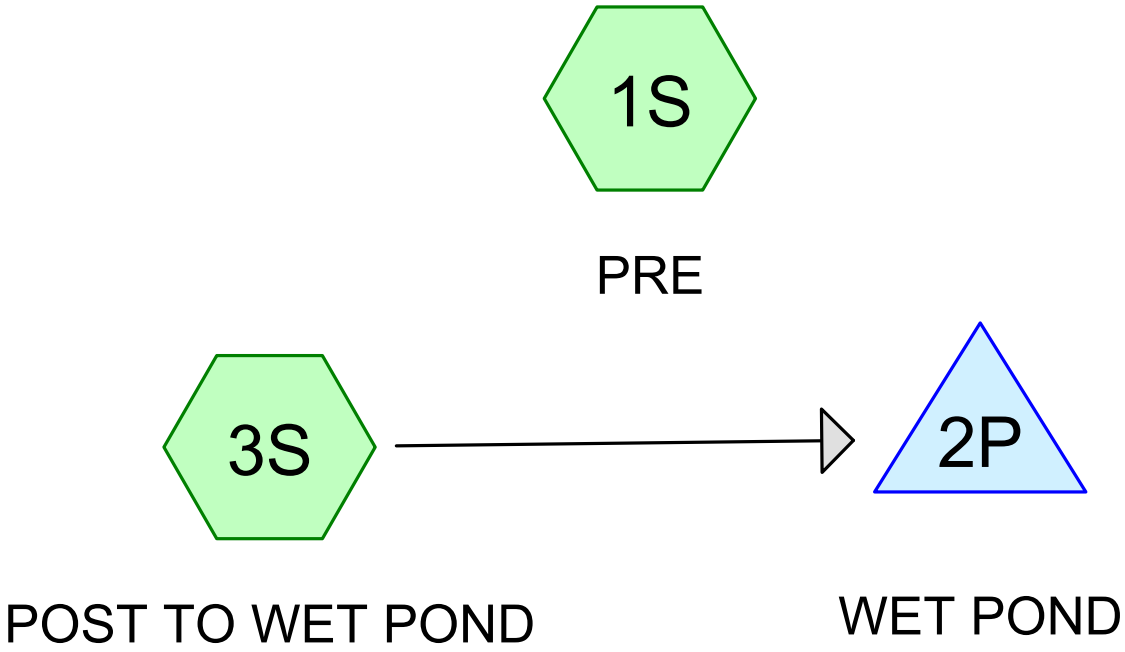
*INDICATES HYDROCAD NODE

OAK ENGINEERING

MAPS & FIGURES

HYDROCAD MODEL ROUTING DIAGRAM
NOAA RAINFALL DATA
FEMA FIRM MAP
SOILS MAP

April 28, 2022



Subcat Reach Pond Link

Routing Diagram for Gravedigger SWM V1
Prepared by OAK Engineering , Printed 4/28/2022
HydroCAD® 10.00-20 s/n 10066 © 2017 HydroCAD Software Solutions LLC

NOAA Atlas 14, Volume 2, Version 3
Location name: Bessemer City, North Carolina, USA*
Latitude: 35.2735°, Longitude: -81.2626°
Elevation: 862.09 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.396** (0.364-0.432)	**0.469** (0.431-0.512)	**0.549** (0.503-0.599)	**0.610** (0.558-0.665)	**0.683** (0.621-0.744)	**0.736** (0.665-0.802)	**0.787** (0.708-0.858)	**0.836** (0.745-0.913)	**0.895** (0.789-0.982)	**0.941** (0.821-1.04)
10-min	**0.633** (0.582-0.690)	**0.750** (0.689-0.818)	**0.880** (0.806-0.960)	**0.976** (0.892-1.06)	**1.09** (0.990-1.19)	**1.17** (1.06-1.28)	**1.25** (1.12-1.36)	**1.33** (1.18-1.45)	**1.42** (1.25-1.55)	**1.48** (1.29-1.63)
15-min	**0.792** (0.728-0.862)	**0.942** (0.866-1.03)	**1.11** (1.02-1.21)	**1.23** (1.13-1.35)	**1.38** (1.25-1.50)	**1.48** (1.34-1.62)	**1.58** (1.42-1.72)	**1.67** (1.49-1.83)	**1.78** (1.57-1.96)	**1.86** (1.62-2.05)
30-min	**1.09** (0.998-1.18)	**1.30** (1.20-1.42)	**1.58** (1.45-1.73)	**1.79** (1.63-1.95)	**2.04** (1.86-2.23)	**2.24** (2.02-2.44)	**2.42** (2.18-2.64)	**2.60** (2.32-2.84)	**2.84** (2.50-3.11)	**3.01** (2.63-3.32)
60-min	**1.35** (1.24-1.47)	**1.63** (1.50-1.78)	**2.03** (1.86-2.21)	**2.33** (2.13-2.54)	**2.72** (2.47-2.96)	**3.03** (2.74-3.30)	**3.34** (3.00-3.64)	**3.65** (3.25-3.99)	**4.07** (3.59-4.46)	**4.39** (3.84-4.84)
2-hr	**1.58** (1.45-1.73)	**1.91** (1.75-2.10)	**2.39** (2.18-2.62)	**2.76** (2.51-3.02)	**3.27** (2.96-3.57)	**3.67** (3.31-4.01)	**4.09** (3.66-4.47)	**4.52** (4.01-4.96)	**5.12** (4.49-5.65)	**5.61** (4.86-6.21)
3-hr	**1.68** (1.54-1.86)	**2.03** (1.86-2.24)	**2.55** (2.32-2.81)	**2.96** (2.69-3.25)	**3.54** (3.19-3.89)	**4.01** (3.60-4.41)	**4.51** (4.01-4.96)	**5.04** (4.44-5.56)	**5.80** (5.03-6.42)	**6.42** (5.50-7.14)
6-hr	**2.06** (1.89-2.25)	**2.47** (2.27-2.71)	**3.09** (2.84-3.39)	**3.59** (3.28-3.93)	**4.30** (3.90-4.70)	**4.88** (4.40-5.33)	**5.50** (4.91-6.01)	**6.16** (5.45-6.74)	**7.10** (6.18-7.80)	**7.88** (6.77-8.69)
12-hr	**2.47** (2.28-2.70)	**2.98** (2.75-3.26)	**3.73** (3.43-4.08)	**4.34** (3.97-4.73)	**5.20** (4.73-5.66)	**5.91** (5.33-6.43)	**6.66** (5.96-7.24)	**7.47** (6.60-8.12)	**8.62** (7.51-9.38)	**9.58** (8.23-10.4)
24-hr	**2.92** (2.71-3.14)	**3.53** (3.28-3.80)	**4.43** (4.12-4.76)	**5.14** (4.77-5.53)	**6.12** (5.66-6.57)	**6.90** (6.37-7.40)	**7.70** (7.08-8.27)	**8.54** (7.82-9.16)	**9.69** (8.83-10.4)	**10.6** (9.62-11.4)
2-day	**3.45** (3.21-3.71)	**4.15** (3.87-4.47)	**5.19** (4.82-5.58)	**6.00** (5.57-6.45)	**7.11** (6.58-7.64)	**8.00** (7.38-8.59)	**8.91** (8.19-9.57)	**9.85** (9.03-10.6)	**11.2** (10.2-12.0)	**12.2** (11.1-13.1)
3-day	**3.66** (3.41-3.93)	**4.40** (4.10-4.73)	**5.46** (5.08-5.86)	**6.30** (5.85-6.76)	**7.44** (6.89-7.98)	**8.36** (7.72-8.96)	**9.29** (8.56-9.96)	**10.3** (9.41-11.0)	**11.6** (10.6-12.4)	**12.6** (11.5-13.6)
4-day	**3.88** (3.62-4.15)	**4.65** (4.34-4.98)	**5.74** (5.34-6.14)	**6.60** (6.13-7.06)	**7.78** (7.21-8.32)	**8.71** (8.05-9.33)	**9.67** (8.92-10.4)	**10.7** (9.80-11.4)	**12.0** (11.0-12.9)	**13.1** (11.9-14.0)
7-day	**4.48** (4.20-4.77)	**5.34** (5.01-5.69)	**6.50** (6.10-6.92)	**7.43** (6.95-7.90)	**8.70** (8.12-9.25)	**9.72** (9.04-10.3)	**10.8** (9.98-11.4)	**11.8** (10.9-12.6)	**13.3** (12.2-14.2)	**14.4** (13.2-15.4)
10-day	**5.10** (4.81-5.43)	**6.07** (5.72-6.45)	**7.29** (6.87-7.76)	**8.26** (7.77-8.77)	**9.55** (8.96-10.1)	**10.6** (9.90-11.2)	**11.6** (10.8-12.3)	**12.6** (11.8-13.4)	**14.1** (13.1-15.0)	**15.2** (14.0-16.2)
20-day	**6.82** (6.45-7.21)	**8.05** (7.62-8.51)	**9.50** (8.98-10.0)	**10.6** (10.1-11.3)	**12.2** (11.5-12.9)	**13.4** (12.6-14.2)	**14.6** (13.7-15.5)	**15.9** (14.8-16.8)	**17.5** (16.3-18.6)	**18.8** (17.5-20.0)
30-day	**8.36** (7.95-8.81)	**9.84** (9.35-10.4)	**11.4** (10.9-12.0)	**12.7** (12.0-13.3)	**14.3** (13.6-15.1)	**15.6** (14.7-16.4)	**16.8** (15.9-17.7)	**18.1** (17.0-19.1)	**19.7** (18.5-20.8)	**21.0** (19.6-22.2)
45-day	**10.5** (10.1-11.0)	**12.3** (11.8-12.9)	**14.1** (13.4-14.7)	**15.4** (14.7-16.1)	**17.2** (16.4-18.0)	**18.5** (17.6-19.4)	**19.8** (18.8-20.8)	**21.1** (19.9-22.1)	**22.7** (21.5-23.9)	**24.0** (22.6-25.2)
60-day	**12.5** (12.0-13.1)	**14.6** (14.0-15.3)	**16.5** (15.8-17.2)	**18.0** (17.2-18.7)	**19.9** (19.0-20.7)	**21.3** (20.3-22.2)	**22.7** (21.6-23.7)	**24.0** (22.9-25.1)	**25.7** (24.5-26.9)	**27.0** (25.6-28.3)

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

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

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

NOAA Atlas 14, Volume 2, Version 3
Location name: Bessemer City, North Carolina, USA*
Latitude: 35.2735°, Longitude: -81.2626°
Elevation: 862.09 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.75** (4.37-5.18)	**5.63** (5.17-6.14)	**6.59** (6.04-7.19)	**7.32** (6.70-7.98)	**8.20** (7.45-8.93)	**8.83** (7.98-9.62)	**9.44** (8.50-10.3)	**10.0** (8.94-11.0)	**10.7** (9.47-11.8)	**11.3** (9.85-12.4)
10-min	**3.80** (3.49-4.14)	**4.50** (4.13-4.91)	**5.28** (4.84-5.76)	**5.86** (5.35-6.38)	**6.53** (5.94-7.12)	**7.03** (6.35-7.66)	**7.51** (6.74-8.18)	**7.95** (7.09-8.68)	**8.50** (7.49-9.32)	**8.89** (7.76-9.79)
15-min	**3.17** (2.91-3.45)	**3.77** (3.46-4.12)	**4.45** (4.08-4.86)	**4.94** (4.51-5.38)	**5.52** (5.02-6.01)	**5.94** (5.36-6.47)	**6.32** (5.68-6.89)	**6.68** (5.96-7.30)	**7.13** (6.29-7.82)	**7.44** (6.49-8.19)
30-min	**2.17** (2.00-2.36)	**2.60** (2.39-2.84)	**3.16** (2.90-3.45)	**3.58** (3.27-3.90)	**4.09** (3.72-4.45)	**4.47** (4.04-4.87)	**4.84** (4.35-5.28)	**5.20** (4.64-5.69)	**5.67** (5.00-6.22)	**6.02** (5.26-6.63)
60-min	**1.35** (1.24-1.47)	**1.63** (1.50-1.78)	**2.03** (1.86-2.21)	**2.33** (2.13-2.54)	**2.72** (2.47-2.96)	**3.03** (2.74-3.30)	**3.34** (3.00-3.64)	**3.65** (3.25-3.99)	**4.07** (3.59-4.46)	**4.39** (3.84-4.84)
2-hr	**0.790** (0.724-0.866)	**0.956** (0.876-1.05)	**1.19** (1.09-1.31)	**1.38** (1.26-1.51)	**1.63** (1.48-1.79)	**1.84** (1.65-2.01)	**2.04** (1.83-2.24)	**2.26** (2.01-2.48)	**2.56** (2.25-2.82)	**2.81** (2.43-3.10)
3-hr	**0.560** (0.512-0.618)	**0.677** (0.619-0.746)	**0.848** (0.774-0.934)	**0.986** (0.895-1.08)	**1.18** (1.06-1.30)	**1.34** (1.20-1.47)	**1.50** (1.34-1.65)	**1.68** (1.48-1.85)	**1.93** (1.67-2.14)	**2.14** (1.83-2.38)
6-hr	**0.343** (0.315-0.376)	**0.413** (0.380-0.453)	**0.517** (0.474-0.566)	**0.600** (0.548-0.657)	**0.718** (0.651-0.784)	**0.815** (0.735-0.890)	**0.918** (0.820-1.00)	**1.03** (0.909-1.13)	**1.19** (1.03-1.30)	**1.32** (1.13-1.45)
12-hr	**0.205** (0.189-0.224)	**0.248** (0.228-0.271)	**0.310** (0.285-0.338)	**0.360** (0.330-0.393)	**0.432** (0.392-0.470)	**0.491** (0.443-0.534)	**0.553** (0.494-0.601)	**0.620** (0.548-0.674)	**0.715** (0.623-0.779)	**0.795** (0.683-0.867)
24-hr	**0.122** (0.113-0.131)	**0.147** (0.137-0.158)	**0.184** (0.172-0.199)	**0.214** (0.199-0.230)	**0.255** (0.236-0.274)	**0.287** (0.265-0.309)	**0.321** (0.295-0.345)	**0.356** (0.326-0.382)	**0.404** (0.368-0.434)	**0.442** (0.401-0.475)
2-day	**0.072** (0.067-0.077)	**0.086** (0.081-0.093)	**0.108** (0.100-0.116)	**0.125** (0.116-0.134)	**0.148** (0.137-0.159)	**0.167** (0.154-0.179)	**0.186** (0.171-0.199)	**0.205** (0.188-0.220)	**0.232** (0.212-0.250)	**0.254** (0.230-0.273)
3-day	**0.051** (0.047-0.055)	**0.061** (0.057-0.066)	**0.076** (0.071-0.081)	**0.087** (0.081-0.094)	**0.103** (0.096-0.111)	**0.116** (0.107-0.124)	**0.129** (0.119-0.138)	**0.142** (0.131-0.153)	**0.161** (0.147-0.173)	**0.175** (0.160-0.188)
4-day	**0.040** (0.038-0.043)	**0.048** (0.045-0.052)	**0.060** (0.056-0.064)	**0.069** (0.064-0.074)	**0.081** (0.075-0.087)	**0.091** (0.084-0.097)	**0.101** (0.093-0.108)	**0.111** (0.102-0.119)	**0.125** (0.115-0.134)	**0.136** (0.124-0.146)
7-day	**0.027** (0.025-0.028)	**0.032** (0.030-0.034)	**0.039** (0.036-0.041)	**0.044** (0.041-0.047)	**0.052** (0.048-0.055)	**0.058** (0.054-0.061)	**0.064** (0.059-0.068)	**0.070** (0.065-0.075)	**0.079** (0.073-0.084)	**0.086** (0.079-0.092)
10-day	**0.021** (0.020-0.023)	**0.025** (0.024-0.027)	**0.030** (0.029-0.032)	**0.034** (0.032-0.037)	**0.040** (0.037-0.042)	**0.044** (0.041-0.047)	**0.048** (0.045-0.051)	**0.053** (0.049-0.056)	**0.059** (0.054-0.062)	**0.063** (0.059-0.067)
20-day	**0.014** (0.013-0.015)	**0.017** (0.016-0.018)	**0.020** (0.019-0.021)	**0.022** (0.021-0.023)	**0.025** (0.024-0.027)	**0.028** (0.026-0.030)	**0.030** (0.029-0.032)	**0.033** (0.031-0.035)	**0.036** (0.034-0.039)	**0.039** (0.036-0.042)
30-day	**0.012** (0.011-0.012)	**0.014** (0.013-0.014)	**0.016** (0.015-0.017)	**0.018** (0.017-0.019)	**0.020** (0.019-0.021)	**0.022** (0.020-0.023)	**0.023** (0.022-0.025)	**0.025** (0.024-0.026)	**0.027** (0.026-0.029)	**0.029** (0.027-0.031)
45-day	**0.010** (0.009-0.010)	**0.011** (0.011-0.012)	**0.013** (0.012-0.014)	**0.014** (0.014-0.015)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.020** (0.018-0.020)	**0.021** (0.020-0.022)	**0.022** (0.021-0.023)
60-day	**0.009** (0.008-0.009)	**0.010** (0.010-0.011)	**0.011** (0.011-0.012)	**0.012** (0.012-0.013)	**0.014** (0.013-0.014)	**0.015** (0.014-0.015)	**0.016** (0.015-0.016)	**0.017** (0.016-0.017)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

National Flood Hazard Layer FIRMette

FEMA

81°16'4"W 35°16'37"N



81°15'26"W 35°16'8"N

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

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

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

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

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

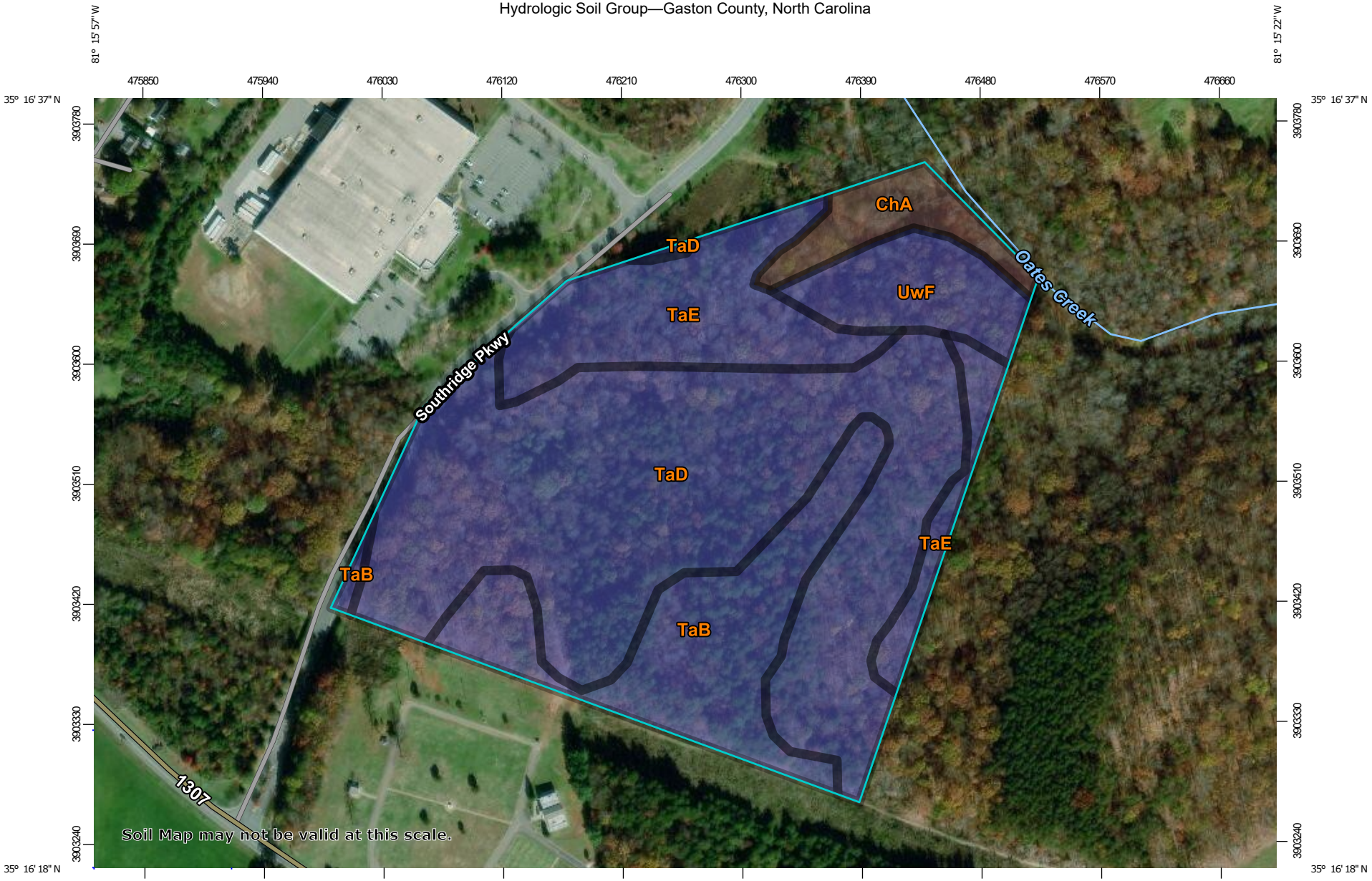
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The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/28/2022 at 4:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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



Map Scale: 1:4,070 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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: Gaston County, North Carolina
Survey Area Data: Version 22, Jan 21, 2022

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

Date(s) aerial images were photographed: Apr 23, 2014—Nov 28, 2017

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
ChA	Chewacla loam, 0 to 2 percent slopes, frequently flooded	B/D	1.9	5.0%
TaB	Tatum gravelly loam, 2 to 8 percent slopes	B	6.5	17.2%
TaD	Tatum gravelly loam, 8 to 15 percent slopes	B	20.2	53.6%
TaE	Tatum gravelly loam, 15 to 25 percent slopes	B	6.4	17.1%
UwF	Uwharrie stony loam, 25 to 45 percent slopes, very bouldery	B	2.7	7.1%
Totals for Area of Interest			**37.6**	**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

WET POND DESIGN

WET POND DESIGN SPREADSHEET
1" STORM EVENT (HYDROCAD OUTPUT – POND ONLY)

April 28, 2022

WET POND DESIGN

SURFACE AREA REQ'D

Drainage Area =	17.96	ac	85	%
% Impervious =	75.00	%		
Try Perm. Pool Depth =	4.0			
SA/DA=	2.09			
Surface Area Req'd =	0.380	ac	16,553	sf
Area Provided =	0.400	ac	17,424	sf
at Elev =	824.50			
VOL prov'd perm pool=	1.61	ac-ft	(includes Forebay)	
Avg Depth =	4.03	ft		

Mountain & Piedmont Regions

Table 10-1

SA/DA RATIO CHART (for 85% TSS removal)

% imp cover avg. permanent pool depth (ft)

	3	4	5	6	7	8	9
10	0.51	0.43	0.37	0.30	0.27	0.25	
20	0.84	0.69	0.61	0.51	0.44	0.40	
30	1.17	0.94	0.84	0.72	0.61	0.56	
40	1.51	1.24	1.09	0.91	0.78	0.71	
50	1.79	1.51	1.31	1.13	0.95	0.87	
60	2.09	1.77	1.49	1.31	1.12	1.03	
70	2.51	2.09	1.80	1.56	1.34	1.17	
80	2.92	2.41	2.07	1.82	1.62	1.40	
90	3.25	2.64	2.66	2.04	1.84	1.59	

TEMP. DRAWDOWN (DETERMINE 1" STORM VOLUME)

USE SIMPLE METHOD Rv=0.05+0.009(I)

Rv=	0.725	IN/IN		
P=	1.0	IN		
VOLUME=DESIGN RAINFALL(Rv)DA				
VOLUME=	1.085	AC-FT	47,266 CF	
VOLprov=	1.085	AC-FT	at elevation	826.75

Coastal Region

Table 10-3

SA/DA RATIO CHART (for 90% TSS removal)

% imp cover avg. permanent pool depth (ft)

	3.0	4.0	5.0	6.0	7.0	8.0	9.0
10	0.78	0.61	0.44	0.00	0.00	0.00	
20	1.48	1.04	0.87	0.70	0.52	0.35	
30	2.18	1.65	1.39	1.13	0.87	0.70	
40	2.96	2.26	1.83	1.39	0.96	0.78	
50	3.65	2.87	2.35	1.83	1.31	0.96	
60	4.35	3.31	2.78	2.26	1.74	1.13	
70	5.22	3.92	3.22	2.52	1.83	1.31	
80	5.92	4.52	3.65	2.78	1.91	1.57	
90	6.53	5.05	4.18	2.96	2.44	1.74	

FOREBAY SIZE

PRE-BAY VOL=20% OF PERM POOL VOLUME

PRE-BAY VOLreqd=	0.322	ac-ft
PRE-BAY VOLprov.=	0.703	ac-ft
Actual % Used =	43.7	%

ORIFICE SIZING

2 DAY DRAWDOWN	Q_2=	0.27	cfs
5 DAY DRAWDOWN=	Q_5=	0.11	cfs
FROM ORIFICE CALC'S: USE		4.50	IN DIA ORIFICE
Approx Draw Down Time =		2.1	days
		49	hours

ORIFICE CALCULATIONS

orifice formula Q=cA(2gh)^.5 w/ c=.6

DIA (in)	4.50	
Inv =	824.50	
	Elev	(cfs) Q
Top 1" Stor =	826.75	
Perm. Pool =	824.50	
Head =	0.75	
Avg Q =	0.27	cfs

Summary for Pond 2P: WET POND

Inflow Area = 17.310 ac, 74.81% Impervious, Inflow Depth = 0.28" for 1" Water Quality event
Inflow = 8.65 cfs @ 11.97 hrs, Volume= 0.411 af
Outflow = 0.13 cfs @ 20.43 hrs, Volume= 0.386 af, Atten= 98%, Lag= 508.0 min
Primary = 0.13 cfs @ 20.43 hrs, Volume= 0.386 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 824.94' @ 20.43 hrs Surf.Area= 29,200 sf Storage= 12,496 cf

Plug-Flow detention time= 1,336.2 min calculated for 0.386 af (94% of inflow)
Center-of-Mass det. time= 1,305.8 min (2,171.6 - 865.7)

Volume	Invert	Avail.Storage	Storage Description
#1	824.50'	283,447 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

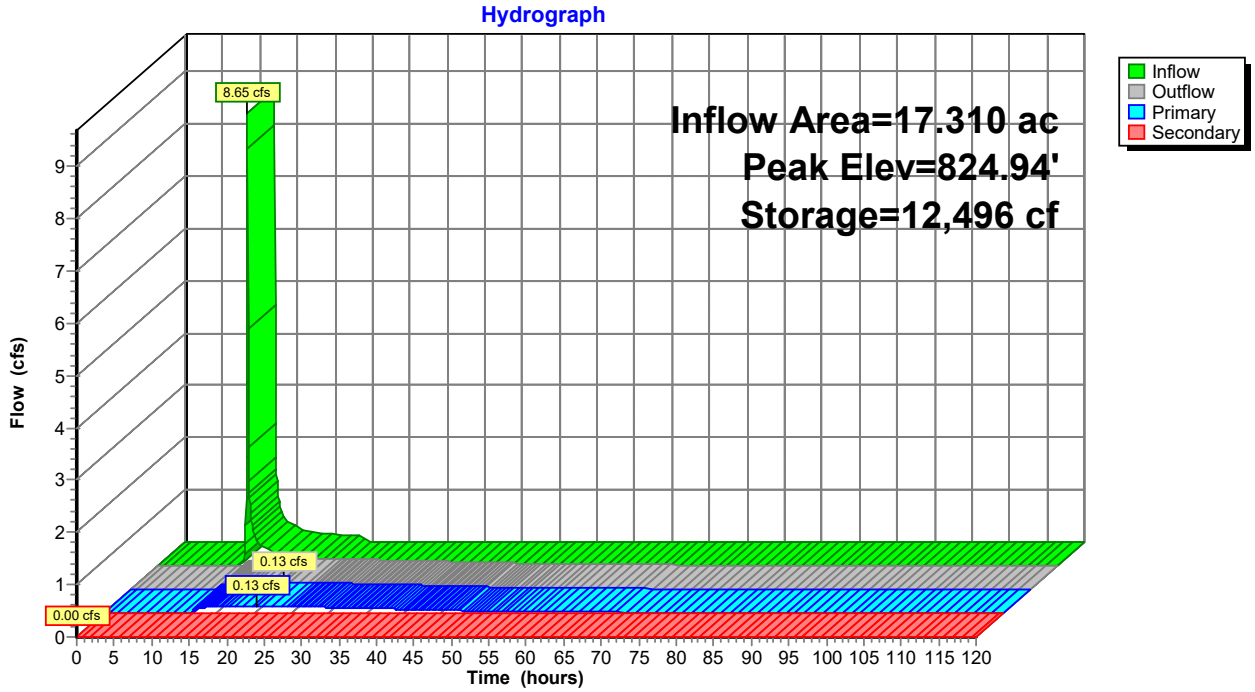
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
824.50	27,110	0	0
825.00	29,464	14,144	14,144
826.00	31,977	30,721	44,864
827.00	34,527	33,252	78,116
828.00	37,113	35,820	113,936
829.00	39,735	38,424	152,360
830.00	42,393	41,064	193,424
831.00	45,088	43,741	237,165
832.00	47,477	46,283	283,447

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**30.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 821.00' / 820.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	824.50'	**3.0" Vert. 3" WQ Orifice** C= 0.600
#3	Device 1	827.00'	**8.0" Vert. 8" CPv Orifice** C= 0.600
#4	Device 1	828.00'	**48.0" x 48.0" Horiz. Top of OS** C= 0.600 Limited to weir flow at low heads
#5	Secondary	828.50'	**20.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

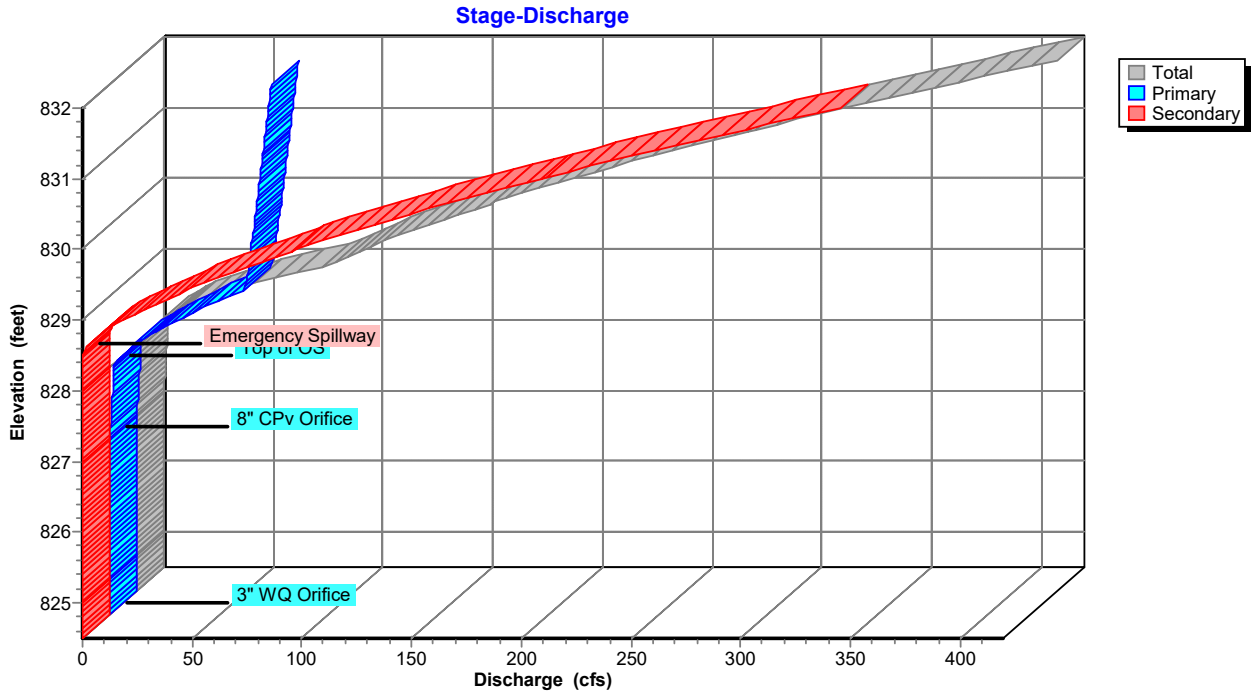
Primary OutFlow Max=0.13 cfs @ 20.43 hrs HW=824.94' (Free Discharge)
↑—**1=Culvert** (Passes 0.13 cfs of 38.79 cfs potential flow)
↑—**2=3" WQ Orifice** (Orifice Controls 0.13 cfs @ 2.72 fps)
—**3=8" CPv Orifice** (Controls 0.00 cfs)
—**4=Top of OS** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=824.50' (Free Discharge)
↑—**5=Emergency Spillway** (Controls 0.00 cfs)

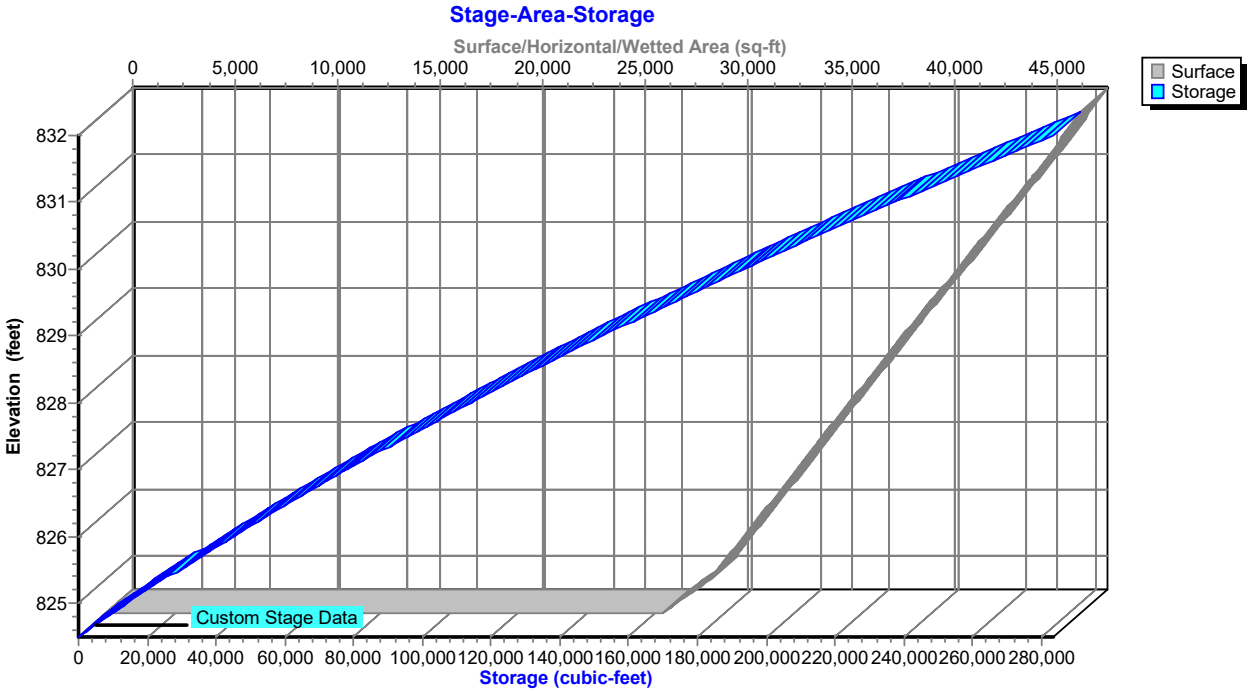
Pond 2P: WET POND



Pond 2P: WET POND



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	**0.00**
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.00	0	824.50	0.00	0.00	0.00
7.50	0.00	0	824.50	0.00	0.00	0.00
10.00	**0.00**	0	824.50	0.00	0.00	0.00
12.50	**0.88**	8,274	824.80	0.10	0.10	0.00
15.00	0.29	11,255	824.90	0.12	0.12	0.00
17.50	0.20	12,188	824.93	0.13	0.13	0.00
20.00	0.14	**12,494**	**824.94**	**0.13**	**0.13**	0.00
22.50	0.12	**12,465**	**824.94**	**0.13**	**0.13**	0.00
25.00	0.00	11,963	824.93	0.13	0.13	0.00
27.50	0.00	10,836	824.89	0.12	0.12	0.00
30.00	0.00	9,787	824.85	0.11	0.11	0.00
32.50	0.00	8,816	824.82	0.10	0.10	0.00
35.00	0.00	7,925	824.79	0.09	0.09	0.00
37.50	0.00	7,113	824.76	0.09	0.09	0.00
40.00	0.00	6,378	824.73	0.08	0.08	0.00
42.50	0.00	5,726	824.71	0.07	0.07	0.00
45.00	0.00	5,161	824.69	0.06	0.06	0.00
47.50	0.00	4,676	824.67	0.05	0.05	0.00
50.00	0.00	4,259	824.66	0.04	0.04	0.00
52.50	0.00	3,901	824.64	0.04	0.04	0.00
55.00	0.00	3,591	824.63	0.03	0.03	0.00
57.50	0.00	3,321	824.62	0.03	0.03	0.00
60.00	0.00	3,085	824.61	0.02	0.02	0.00
62.50	0.00	2,878	824.61	0.02	0.02	0.00
65.00	0.00	2,694	824.60	0.02	0.02	0.00
67.50	0.00	2,531	824.59	0.02	0.02	0.00
70.00	0.00	2,385	824.59	0.02	0.02	0.00
72.50	0.00	2,254	824.58	0.01	0.01	0.00
75.00	0.00	2,135	824.58	0.01	0.01	0.00
77.50	0.00	2,028	824.57	0.01	0.01	0.00
80.00	0.00	1,930	824.57	0.01	0.01	0.00
82.50	0.00	1,841	824.57	0.01	0.01	0.00
85.00	0.00	1,760	824.56	0.01	0.01	0.00
87.50	0.00	1,685	824.56	0.01	0.01	0.00
90.00	0.00	1,616	824.56	0.01	0.01	0.00
92.50	0.00	1,552	824.56	0.01	0.01	0.00
95.00	0.00	1,492	824.55	0.01	0.01	0.00
97.50	0.00	1,437	824.55	0.01	0.01	0.00
100.00	0.00	1,386	824.55	0.01	0.01	0.00
102.50	0.00	1,338	824.55	0.01	0.01	0.00
105.00	0.00	1,293	824.55	0.00	0.00	0.00
107.50	0.00	1,251	824.55	0.00	0.00	0.00
110.00	0.00	1,212	824.54	0.00	0.00	0.00
112.50	0.00	1,175	824.54	0.00	0.00	0.00
115.00	0.00	1,140	824.54	0.00	0.00	0.00
117.50	0.00	1,107	824.54	0.00	0.00	0.00
120.00	0.00	1,075	824.54	0.00	0.00	0.00

Stage-Discharge for Pond 2P: WET POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

OAK ENGINEERING

HYDROCAD OUTPUT

1YR-24HR STORM EVENT

April 28, 2022

Summary for Subcatchment 1S: PRE

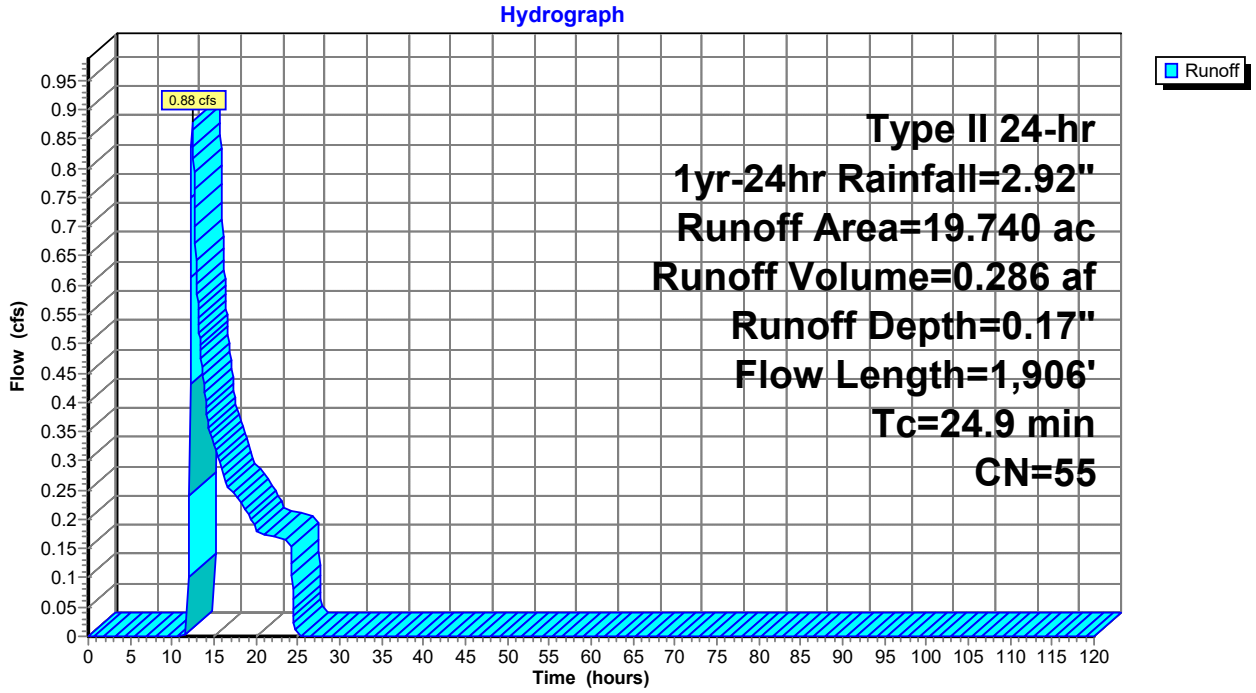
Runoff = 0.88 cfs @ 12.37 hrs, Volume= 0.286 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr-24hr Rainfall=2.92"

Area (ac)	CN	Description
19.740	55	Woods, Good, HSG B
19.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	42	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
15.3	1,276	0.0768	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	588	0.0204	2.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.9	1,906	Total			

Subcatchment 1S: PRE



Hydrograph for Subcatchment 1S: PRE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.08	0.00	0.00
5.00	0.18	0.00	0.00
7.50	0.32	0.00	0.00
10.00	0.53	0.00	**0.00**
12.50	2.15	0.03	**0.84**
15.00	2.49	0.08	0.33
17.50	2.66	0.11	0.24
20.00	2.78	0.14	0.18
22.50	**2.87**	**0.16**	0.17
25.00	**2.92**	**0.17**	0.00
27.50	2.92	0.17	0.00
30.00	2.92	0.17	0.00
32.50	2.92	0.17	0.00
35.00	2.92	0.17	0.00
37.50	2.92	0.17	0.00
40.00	2.92	0.17	0.00
42.50	2.92	0.17	0.00
45.00	2.92	0.17	0.00
47.50	2.92	0.17	0.00
50.00	2.92	0.17	0.00
52.50	2.92	0.17	0.00
55.00	2.92	0.17	0.00
57.50	2.92	0.17	0.00
60.00	2.92	0.17	0.00
62.50	2.92	0.17	0.00
65.00	2.92	0.17	0.00
67.50	2.92	0.17	0.00
70.00	2.92	0.17	0.00
72.50	2.92	0.17	0.00
75.00	2.92	0.17	0.00
77.50	2.92	0.17	0.00
80.00	2.92	0.17	0.00
82.50	2.92	0.17	0.00
85.00	2.92	0.17	0.00
87.50	2.92	0.17	0.00
90.00	2.92	0.17	0.00
92.50	2.92	0.17	0.00
95.00	2.92	0.17	0.00
97.50	2.92	0.17	0.00
100.00	2.92	0.17	0.00
102.50	2.92	0.17	0.00
105.00	2.92	0.17	0.00
107.50	2.92	0.17	0.00
110.00	2.92	0.17	0.00
112.50	2.92	0.17	0.00
115.00	2.92	0.17	0.00
117.50	2.92	0.17	0.00
120.00	2.92	0.17	0.00

Summary for Subcatchment 3S: POST TO WET POND

[49] Hint: Tc<2dt may require smaller dt

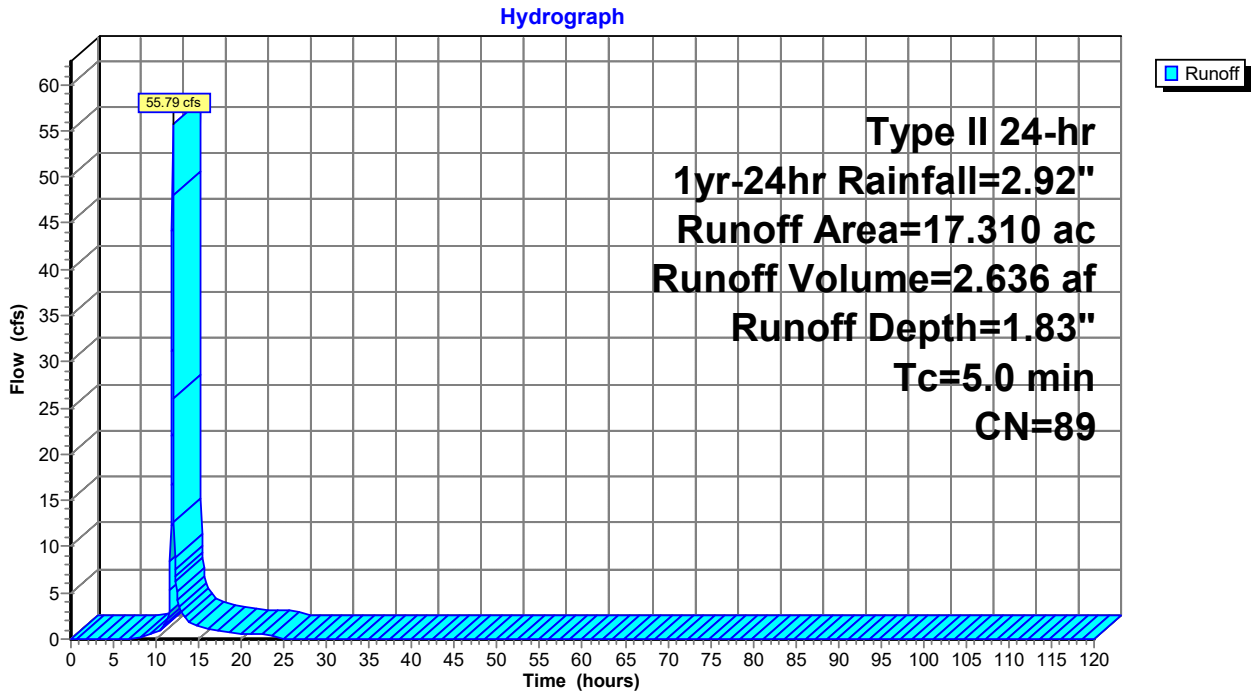
Runoff = 55.79 cfs @ 11.95 hrs, Volume= 2.636 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr-24hr Rainfall=2.92"

	Area (ac)	CN	Description
*	12.950	98	Impervious
	4.360	61	>75% Grass cover, Good, HSG B
	17.310	89	Weighted Average
	4.360		25.19% Pervious Area
	12.950		74.81% Impervious Area

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

Subcatchment 3S: POST TO WET POND



Hydrograph for Subcatchment 3S: POST TO WET POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.08	0.00	0.00
5.00	0.18	0.00	0.00
7.50	0.32	0.00	0.11
10.00	0.53	0.05	**0.65**
12.50	2.15	1.15	**4.49**
15.00	2.49	1.45	1.36
17.50	2.66	1.60	0.88
20.00	2.78	1.70	0.60
22.50	**2.87**	**1.78**	0.54
25.00	**2.92**	**1.83**	0.00
27.50	2.92	1.83	0.00
30.00	2.92	1.83	0.00
32.50	2.92	1.83	0.00
35.00	2.92	1.83	0.00
37.50	2.92	1.83	0.00
40.00	2.92	1.83	0.00
42.50	2.92	1.83	0.00
45.00	2.92	1.83	0.00
47.50	2.92	1.83	0.00
50.00	2.92	1.83	0.00
52.50	2.92	1.83	0.00
55.00	2.92	1.83	0.00
57.50	2.92	1.83	0.00
60.00	2.92	1.83	0.00
62.50	2.92	1.83	0.00
65.00	2.92	1.83	0.00
67.50	2.92	1.83	0.00
70.00	2.92	1.83	0.00
72.50	2.92	1.83	0.00
75.00	2.92	1.83	0.00
77.50	2.92	1.83	0.00
80.00	2.92	1.83	0.00
82.50	2.92	1.83	0.00
85.00	2.92	1.83	0.00
87.50	2.92	1.83	0.00
90.00	2.92	1.83	0.00
92.50	2.92	1.83	0.00
95.00	2.92	1.83	0.00
97.50	2.92	1.83	0.00
100.00	2.92	1.83	0.00
102.50	2.92	1.83	0.00
105.00	2.92	1.83	0.00
107.50	2.92	1.83	0.00
110.00	2.92	1.83	0.00
112.50	2.92	1.83	0.00
115.00	2.92	1.83	0.00
117.50	2.92	1.83	0.00
120.00	2.92	1.83	0.00

Summary for Pond 2P: WET POND

Inflow Area = 17.310 ac, 74.81% Impervious, Inflow Depth = 1.83" for 1yr-24hr event
Inflow = 55.79 cfs @ 11.95 hrs, Volume= 2.636 af
Outflow = 0.73 cfs @ 18.83 hrs, Volume= 2.499 af, Atten= 99%, Lag= 412.6 min
Primary = 0.73 cfs @ 18.83 hrs, Volume= 2.499 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 827.33' @ 18.83 hrs Surf.Area= 35,387 sf Storage= 89,738 cf

Plug-Flow detention time= 2,224.9 min calculated for 2.498 af (95% of inflow)
Center-of-Mass det. time= 2,196.9 min (3,007.7 - 810.8)

Volume	Invert	Avail.Storage	Storage Description
#1	824.50'	283,447 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

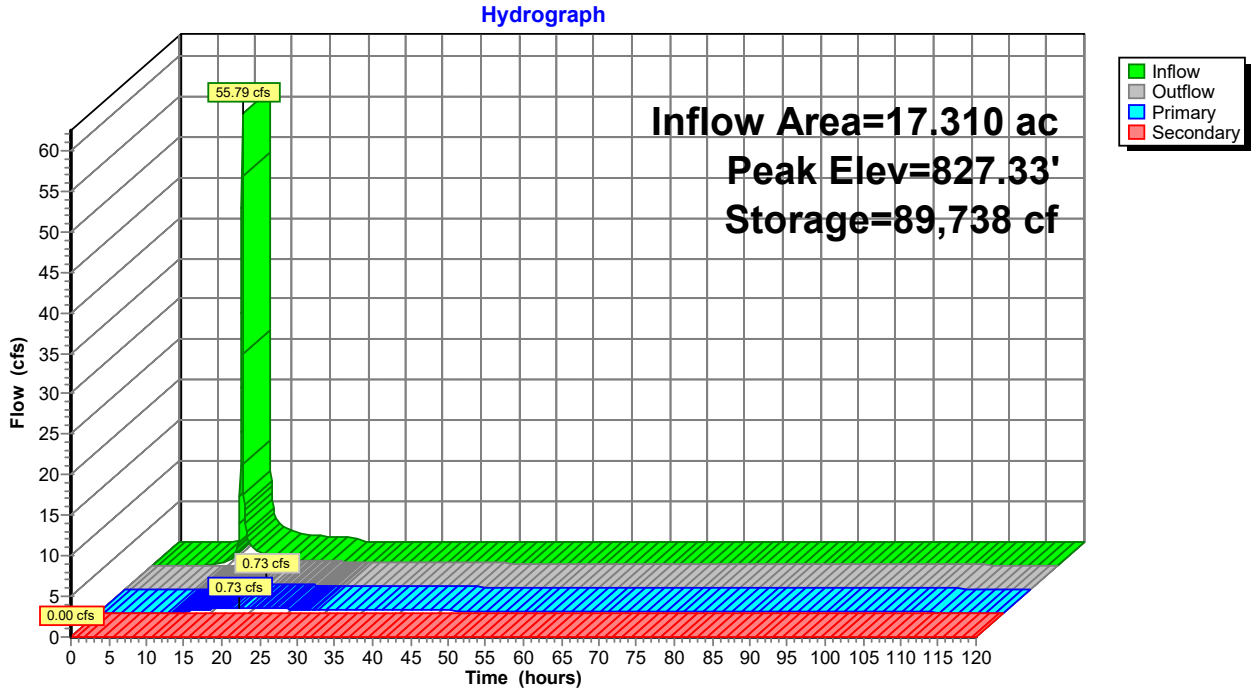
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
824.50	27,110	0	0
825.00	29,464	14,144	14,144
826.00	31,977	30,721	44,864
827.00	34,527	33,252	78,116
828.00	37,113	35,820	113,936
829.00	39,735	38,424	152,360
830.00	42,393	41,064	193,424
831.00	45,088	43,741	237,165
832.00	47,477	46,283	283,447

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**30.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 821.00' / 820.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	824.50'	**3.0" Vert. 3" WQ Orifice** C= 0.600
#3	Device 1	827.00'	**8.0" Vert. 8" CPv Orifice** C= 0.600
#4	Device 1	828.00'	**48.0" x 48.0" Horiz. Top of OS** C= 0.600 Limited to weir flow at low heads
#5	Secondary	828.50'	**20.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

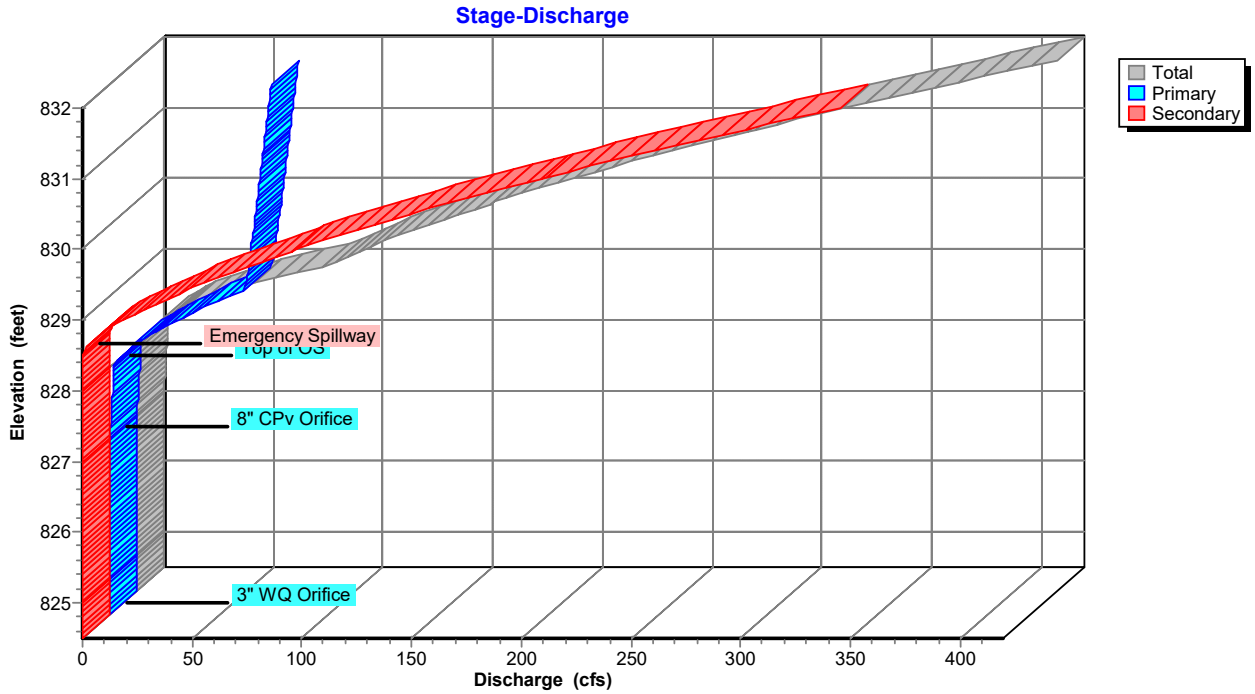
Primary OutFlow Max=0.73 cfs @ 18.83 hrs HW=827.33' (Free Discharge)
└─**1=Culvert** (Passes 0.73 cfs of 53.28 cfs potential flow)
  ├─**2=3" WQ Orifice** (Orifice Controls 0.39 cfs @ 7.92 fps)
  ├─**3=8" CPv Orifice** (Orifice Controls 0.34 cfs @ 1.96 fps)
  └─**4=Top of OS** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=824.50' (Free Discharge)
└─**5=Emergency Spillway** (Controls 0.00 cfs)

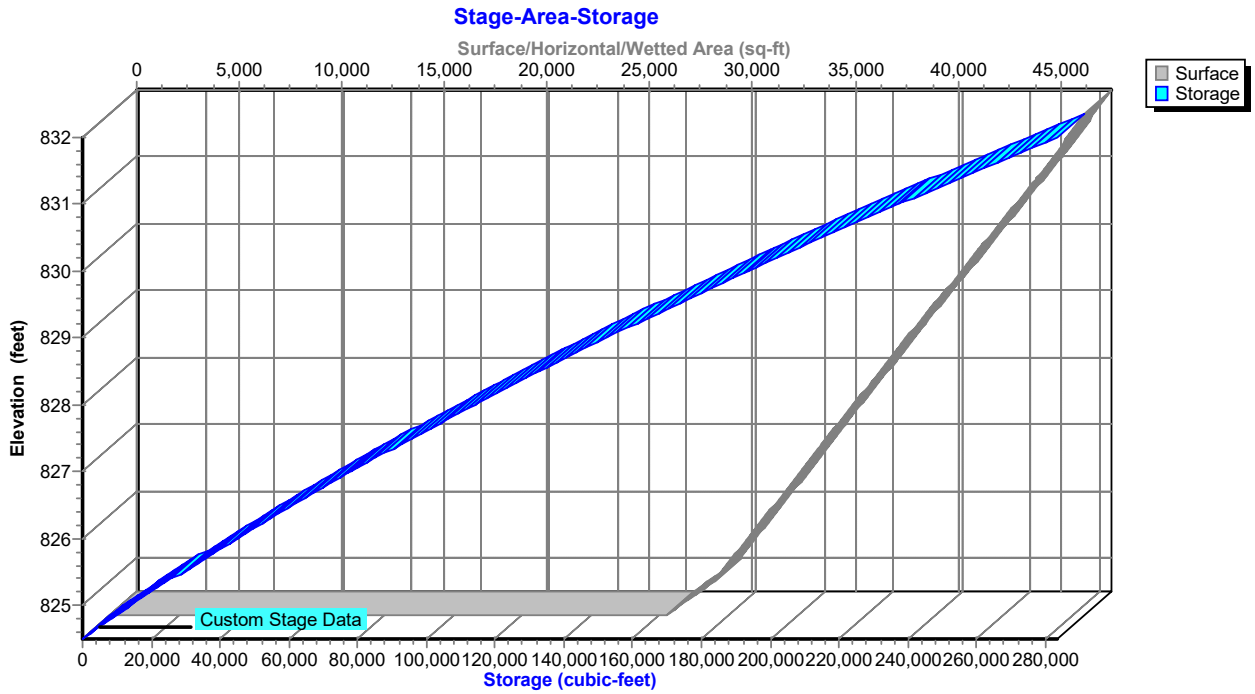
Pond 2P: WET POND



Pond 2P: WET POND



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	**0.00**
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.00	0	824.50	0.00	0.00	0.00
7.50	0.11	217	824.51	0.00	0.00	0.00
10.00	**0.65**	3,038	824.61	0.02	0.02	0.00
12.50	**4.49**	69,782	826.76	0.35	0.35	0.00
15.00	1.36	85,596	827.21	0.53	0.53	0.00
17.50	0.88	**89,354**	**827.32**	**0.71**	**0.71**	0.00
20.00	0.60	**89,484**	**827.33**	**0.72**	**0.72**	0.00
22.50	0.54	88,386	827.29	0.66	0.66	0.00
25.00	0.00	85,764	827.22	0.54	0.54	0.00
27.50	0.00	81,586	827.10	0.41	0.41	0.00
30.00	0.00	78,167	827.00	0.36	0.36	0.00
32.50	0.00	74,921	826.91	0.36	0.36	0.00
35.00	0.00	71,740	826.81	0.35	0.35	0.00
37.50	0.00	68,626	826.72	0.34	0.34	0.00
40.00	0.00	65,579	826.63	0.33	0.33	0.00
42.50	0.00	62,599	826.54	0.33	0.33	0.00
45.00	0.00	59,688	826.46	0.32	0.32	0.00
47.50	0.00	56,844	826.37	0.31	0.31	0.00
50.00	0.00	54,069	826.28	0.30	0.30	0.00
52.50	0.00	51,363	826.20	0.30	0.30	0.00
55.00	0.00	48,727	826.12	0.29	0.29	0.00
57.50	0.00	46,161	826.04	0.28	0.28	0.00
60.00	0.00	43,666	825.96	0.27	0.27	0.00
62.50	0.00	41,241	825.89	0.27	0.27	0.00
65.00	0.00	38,888	825.81	0.26	0.26	0.00
67.50	0.00	36,607	825.74	0.25	0.25	0.00
70.00	0.00	34,398	825.67	0.24	0.24	0.00
72.50	0.00	32,261	825.60	0.23	0.23	0.00
75.00	0.00	30,198	825.53	0.23	0.23	0.00
77.50	0.00	28,208	825.47	0.22	0.22	0.00
80.00	0.00	26,292	825.41	0.21	0.21	0.00
82.50	0.00	24,450	825.34	0.20	0.20	0.00
85.00	0.00	22,683	825.29	0.19	0.19	0.00
87.50	0.00	20,990	825.23	0.18	0.18	0.00
90.00	0.00	19,373	825.18	0.18	0.18	0.00
92.50	0.00	17,832	825.12	0.17	0.17	0.00
95.00	0.00	16,367	825.08	0.16	0.16	0.00
97.50	0.00	14,977	825.03	0.15	0.15	0.00
100.00	0.00	13,665	824.98	0.14	0.14	0.00
102.50	0.00	12,429	824.94	0.13	0.13	0.00
105.00	0.00	11,271	824.90	0.12	0.12	0.00
107.50	0.00	10,192	824.86	0.12	0.12	0.00
110.00	0.00	9,190	824.83	0.11	0.11	0.00
112.50	0.00	8,267	824.80	0.10	0.10	0.00
115.00	0.00	7,424	824.77	0.09	0.09	0.00
117.50	0.00	6,660	824.74	0.08	0.08	0.00
120.00	0.00	5,973	824.72	0.07	0.07	0.00

Stage-Discharge for Pond 2P: WET POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

OAK ENGINEERING

HYDROCAD OUTPUT

10YR-24HR STORM EVENT

April 28, 2022

Summary for Subcatchment 1S: PRE

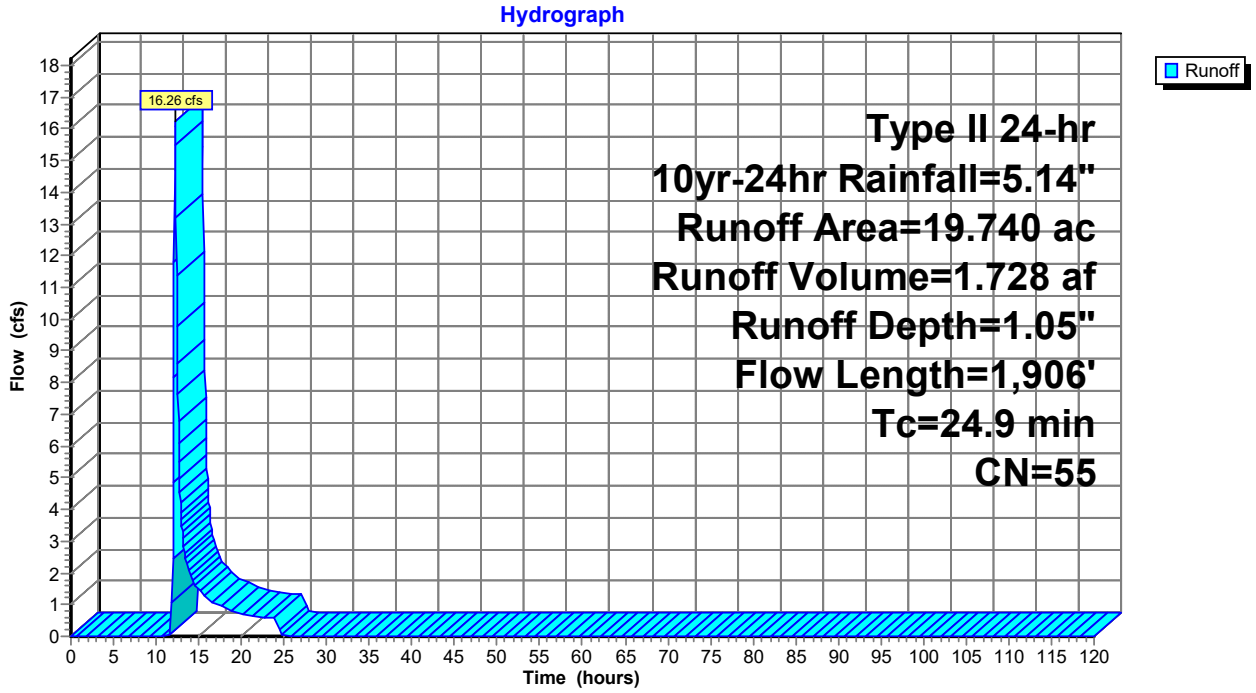
Runoff = 16.26 cfs @ 12.22 hrs, Volume= 1.728 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr-24hr Rainfall=5.14"

Area (ac)	CN	Description
19.740	55	Woods, Good, HSG B
19.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	42	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
15.3	1,276	0.0768	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	588	0.0204	2.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.9	1,906	Total			

Subcatchment 1S: PRE



Hydrograph for Subcatchment 1S: PRE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.14	0.00	0.00
5.00	0.32	0.00	0.00
7.50	0.56	0.00	0.00
10.00	0.93	0.00	**0.00**
12.50	3.78	0.44	**8.59**
15.00	4.39	0.69	1.45
17.50	4.69	0.83	0.96
20.00	4.89	0.93	0.69
22.50	**5.05**	**1.01**	0.61
25.00	**5.14**	**1.05**	0.01
27.50	5.14	1.05	0.00
30.00	5.14	1.05	0.00
32.50	5.14	1.05	0.00
35.00	5.14	1.05	0.00
37.50	5.14	1.05	0.00
40.00	5.14	1.05	0.00
42.50	5.14	1.05	0.00
45.00	5.14	1.05	0.00
47.50	5.14	1.05	0.00
50.00	5.14	1.05	0.00
52.50	5.14	1.05	0.00
55.00	5.14	1.05	0.00
57.50	5.14	1.05	0.00
60.00	5.14	1.05	0.00
62.50	5.14	1.05	0.00
65.00	5.14	1.05	0.00
67.50	5.14	1.05	0.00
70.00	5.14	1.05	0.00
72.50	5.14	1.05	0.00
75.00	5.14	1.05	0.00
77.50	5.14	1.05	0.00
80.00	5.14	1.05	0.00
82.50	5.14	1.05	0.00
85.00	5.14	1.05	0.00
87.50	5.14	1.05	0.00
90.00	5.14	1.05	0.00
92.50	5.14	1.05	0.00
95.00	5.14	1.05	0.00
97.50	5.14	1.05	0.00
100.00	5.14	1.05	0.00
102.50	5.14	1.05	0.00
105.00	5.14	1.05	0.00
107.50	5.14	1.05	0.00
110.00	5.14	1.05	0.00
112.50	5.14	1.05	0.00
115.00	5.14	1.05	0.00
117.50	5.14	1.05	0.00
120.00	5.14	1.05	0.00

Summary for Subcatchment 3S: POST TO WET POND

[49] Hint: Tc<2dt may require smaller dt

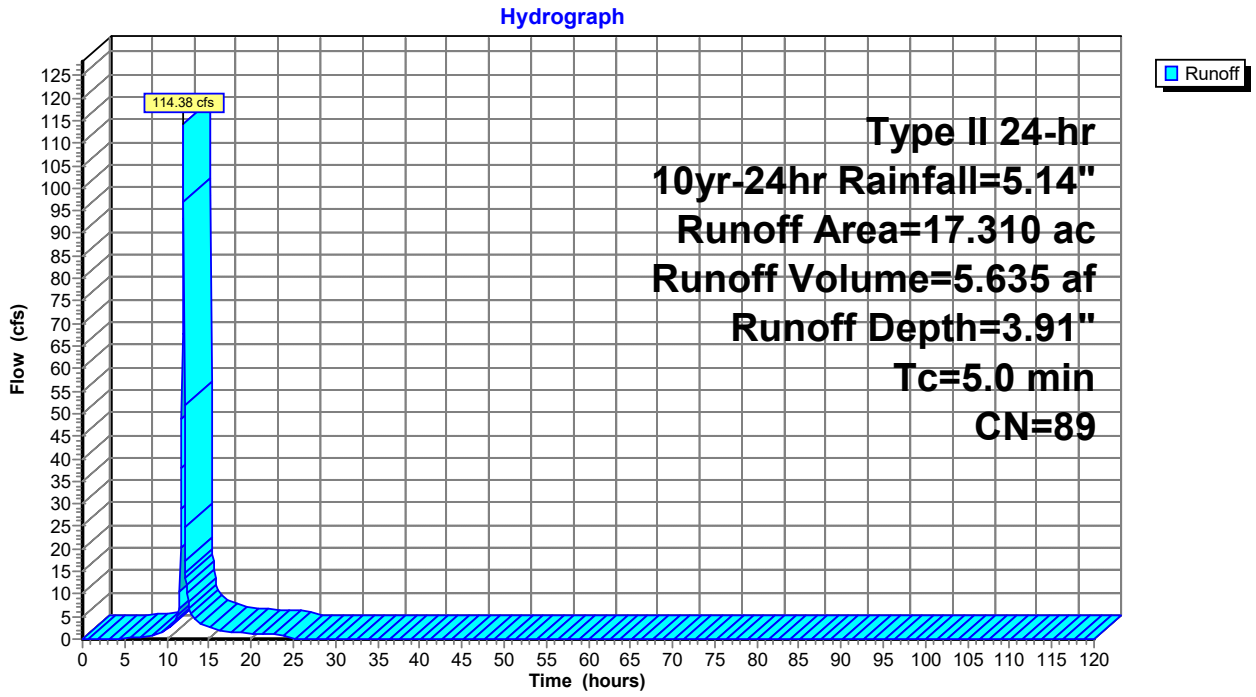
Runoff = 114.38 cfs @ 11.95 hrs, Volume= 5.635 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr-24hr Rainfall=5.14"

	Area (ac)	CN	Description
*	12.950	98	Impervious
	4.360	61	>75% Grass cover, Good, HSG B
	17.310	89	Weighted Average
	4.360		25.19% Pervious Area
	12.950		74.81% Impervious Area

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

Subcatchment 3S: POST TO WET POND



Hydrograph for Subcatchment 3S: POST TO WET POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.14	0.00	0.00
5.00	0.32	0.00	0.15
7.50	0.56	0.06	0.67
10.00	0.93	0.24	**2.01**
12.50	3.78	2.62	**8.74**
15.00	4.39	3.19	2.59
17.50	4.69	3.47	1.66
20.00	4.89	3.67	1.13
22.50	**5.05**	**3.82**	1.01
25.00	**5.14**	**3.91**	0.00
27.50	5.14	3.91	0.00
30.00	5.14	3.91	0.00
32.50	5.14	3.91	0.00
35.00	5.14	3.91	0.00
37.50	5.14	3.91	0.00
40.00	5.14	3.91	0.00
42.50	5.14	3.91	0.00
45.00	5.14	3.91	0.00
47.50	5.14	3.91	0.00
50.00	5.14	3.91	0.00
52.50	5.14	3.91	0.00
55.00	5.14	3.91	0.00
57.50	5.14	3.91	0.00
60.00	5.14	3.91	0.00
62.50	5.14	3.91	0.00
65.00	5.14	3.91	0.00
67.50	5.14	3.91	0.00
70.00	5.14	3.91	0.00
72.50	5.14	3.91	0.00
75.00	5.14	3.91	0.00
77.50	5.14	3.91	0.00
80.00	5.14	3.91	0.00
82.50	5.14	3.91	0.00
85.00	5.14	3.91	0.00
87.50	5.14	3.91	0.00
90.00	5.14	3.91	0.00
92.50	5.14	3.91	0.00
95.00	5.14	3.91	0.00
97.50	5.14	3.91	0.00
100.00	5.14	3.91	0.00
102.50	5.14	3.91	0.00
105.00	5.14	3.91	0.00
107.50	5.14	3.91	0.00
110.00	5.14	3.91	0.00
112.50	5.14	3.91	0.00
115.00	5.14	3.91	0.00
117.50	5.14	3.91	0.00
120.00	5.14	3.91	0.00

Summary for Pond 2P: WET POND

Inflow Area = 17.310 ac, 74.81% Impervious, Inflow Depth = 3.91" for 10yr-24hr event
Inflow = 114.38 cfs @ 11.95 hrs, Volume= 5.635 af
Outflow = 23.39 cfs @ 12.12 hrs, Volume= 5.469 af, Atten= 80%, Lag= 10.1 min
Primary = 23.09 cfs @ 12.12 hrs, Volume= 5.467 af
Secondary = 0.30 cfs @ 12.11 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 828.54' @ 12.12 hrs Surf.Area= 38,531 sf Storage= 134,384 cf

Plug-Flow detention time= 1,183.0 min calculated for 5.469 af (97% of inflow)
Center-of-Mass det. time= 1,165.1 min (1,954.4 - 789.3)

Volume	Invert	Avail.Storage	Storage Description
#1	824.50'	283,447 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

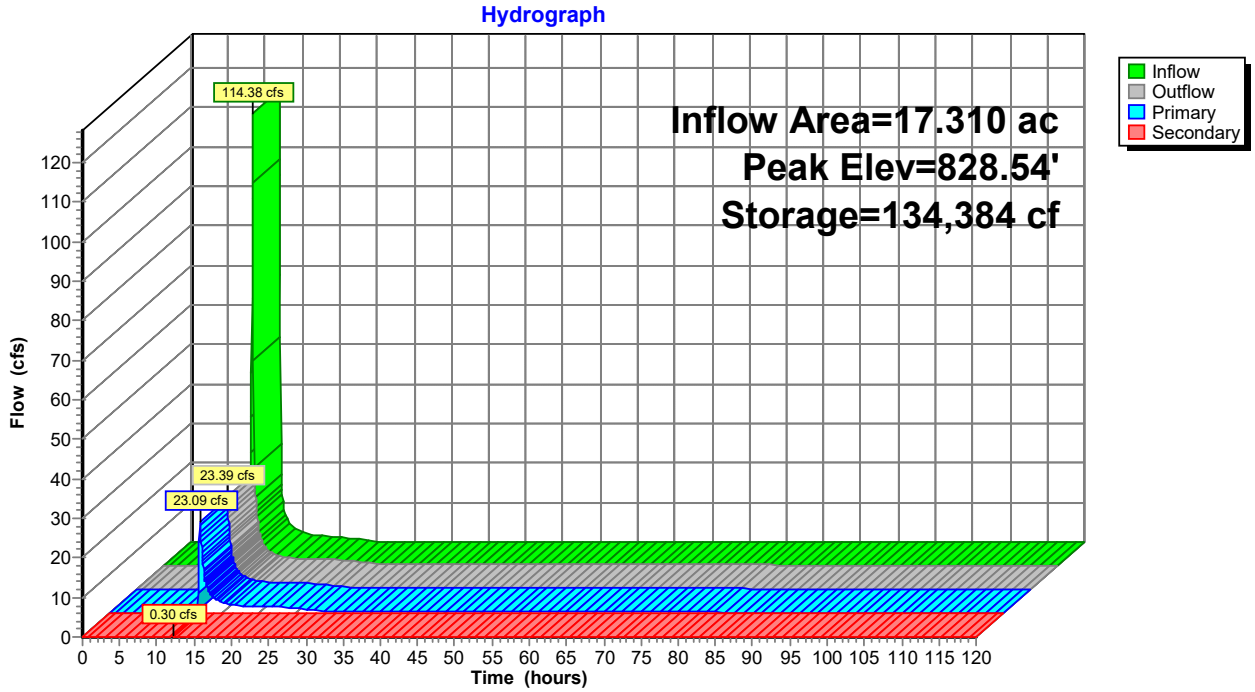
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
824.50	27,110	0	0
825.00	29,464	14,144	14,144
826.00	31,977	30,721	44,864
827.00	34,527	33,252	78,116
828.00	37,113	35,820	113,936
829.00	39,735	38,424	152,360
830.00	42,393	41,064	193,424
831.00	45,088	43,741	237,165
832.00	47,477	46,283	283,447

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**30.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 821.00' / 820.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	824.50'	**3.0" Vert. 3" WQ Orifice** C= 0.600
#3	Device 1	827.00'	**8.0" Vert. 8" CPv Orifice** C= 0.600
#4	Device 1	828.00'	**48.0" x 48.0" Horiz. Top of OS** C= 0.600 Limited to weir flow at low heads
#5	Secondary	828.50'	**20.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

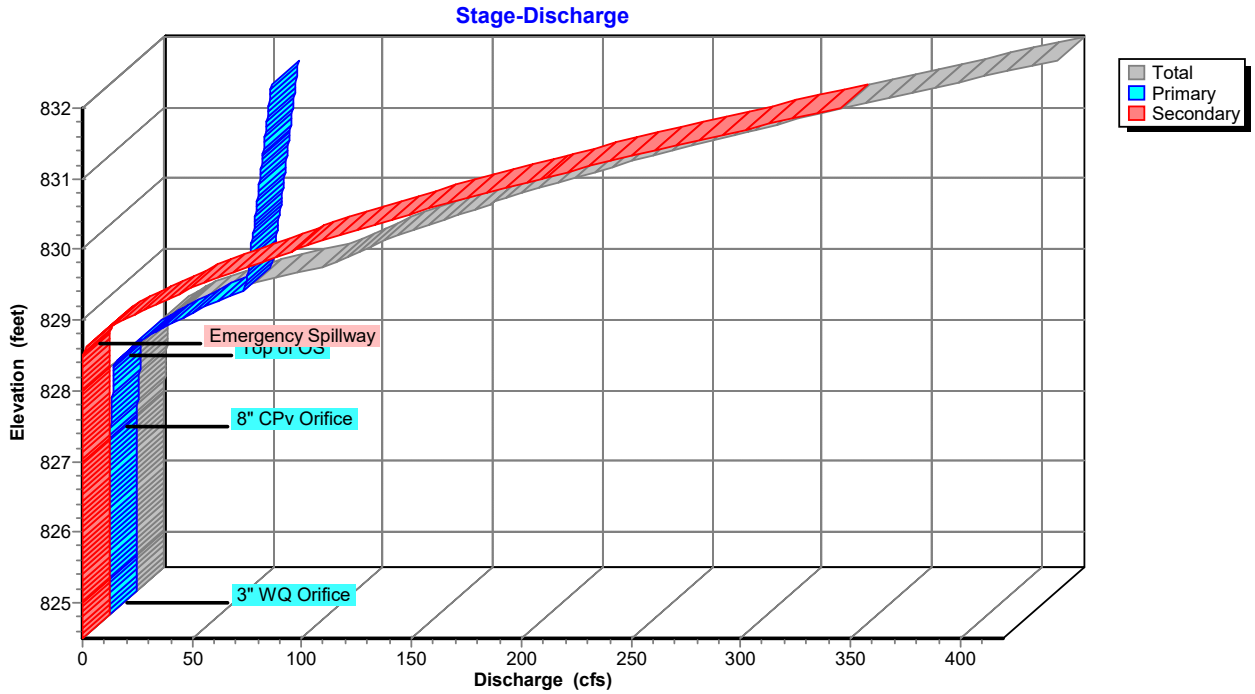
Primary OutFlow Max=22.46 cfs @ 12.12 hrs HW=828.53' (Free Discharge)
└**1=Culvert** (Passes 22.46 cfs of 59.23 cfs potential flow)
  ├**2=3" WQ Orifice** (Orifice Controls 0.47 cfs @ 9.51 fps)
  ├**3=8" CPv Orifice** (Orifice Controls 1.84 cfs @ 5.27 fps)
  └**4=Top of OS** (Weir Controls 20.16 cfs @ 2.38 fps)

Secondary OutFlow Max=0.27 cfs @ 12.11 hrs HW=828.53' (Free Discharge)
└**5=Emergency Spillway** (Weir Controls 0.27 cfs @ 0.44 fps)

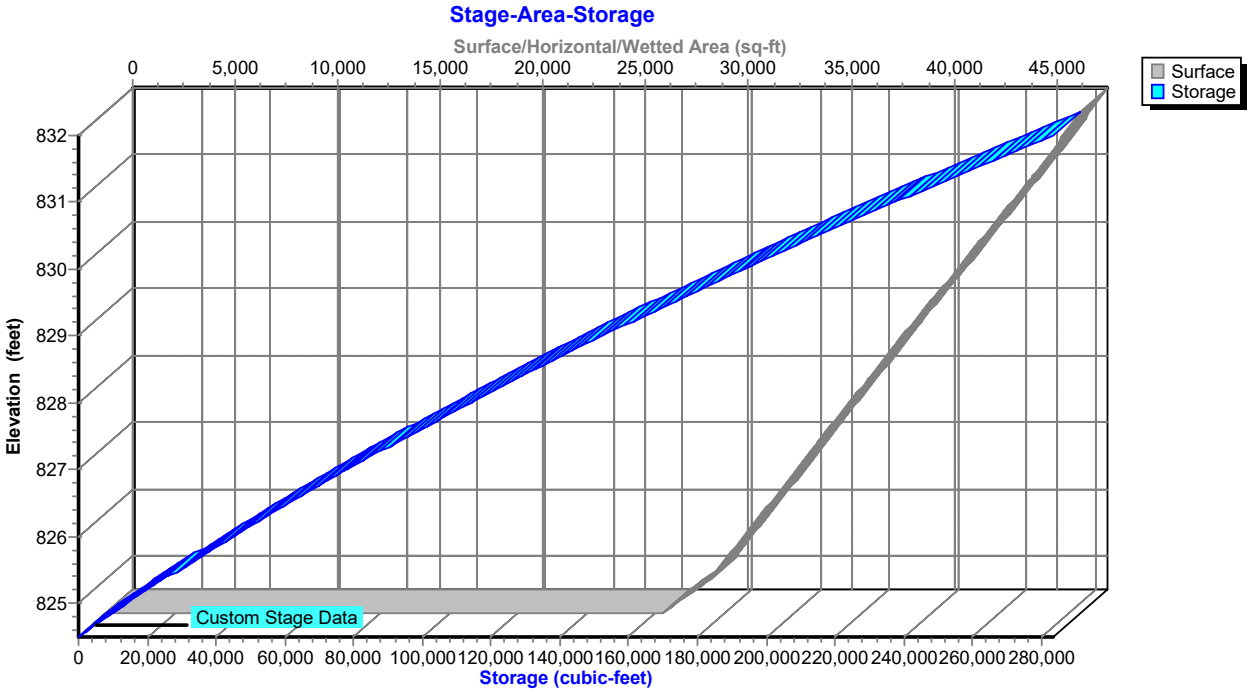
Pond 2P: WET POND



Pond 2P: WET POND



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	0.00
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.15	238	824.51	0.00	0.00	0.00
7.50	0.67	3,730	824.64	0.03	0.03	0.00
10.00	**2.01**	**13,828**	**824.99**	**0.14**	**0.14**	**0.00**
12.50	**8.74**	**127,283**	**828.36**	**13.23**	**13.23**	**0.00**
15.00	2.59	116,627	828.07	2.90	2.90	0.00
17.50	1.66	114,292	828.01	1.87	1.87	0.00
20.00	1.13	110,858	827.92	1.71	1.71	0.00
22.50	1.01	105,803	827.78	1.54	1.54	0.00
25.00	0.00	98,475	827.58	1.24	1.24	0.00
27.50	0.00	89,816	827.33	0.73	0.73	0.00
30.00	0.00	84,451	827.18	0.49	0.49	0.00
32.50	0.00	80,573	827.07	0.39	0.39	0.00
35.00	0.00	77,240	826.97	0.36	0.36	0.00
37.50	0.00	74,012	826.88	0.35	0.35	0.00
40.00	0.00	70,850	826.79	0.35	0.35	0.00
42.50	0.00	67,755	826.70	0.34	0.34	0.00
45.00	0.00	64,727	826.61	0.33	0.33	0.00
47.50	0.00	61,767	826.52	0.33	0.33	0.00
50.00	0.00	58,874	826.43	0.32	0.32	0.00
52.50	0.00	56,050	826.35	0.31	0.31	0.00
55.00	0.00	53,295	826.26	0.30	0.30	0.00
57.50	0.00	50,609	826.18	0.29	0.29	0.00
60.00	0.00	47,992	826.10	0.29	0.29	0.00
62.50	0.00	45,446	826.02	0.28	0.28	0.00
65.00	0.00	42,971	825.94	0.27	0.27	0.00
67.50	0.00	40,566	825.86	0.26	0.26	0.00
70.00	0.00	38,234	825.79	0.26	0.26	0.00
72.50	0.00	35,973	825.72	0.25	0.25	0.00
75.00	0.00	33,784	825.65	0.24	0.24	0.00
77.50	0.00	31,669	825.58	0.23	0.23	0.00
80.00	0.00	29,626	825.51	0.22	0.22	0.00
82.50	0.00	27,657	825.45	0.21	0.21	0.00
85.00	0.00	25,762	825.39	0.21	0.21	0.00
87.50	0.00	23,941	825.33	0.20	0.20	0.00
90.00	0.00	22,195	825.27	0.19	0.19	0.00
92.50	0.00	20,524	825.21	0.18	0.18	0.00
95.00	0.00	18,928	825.16	0.17	0.17	0.00
97.50	0.00	17,409	825.11	0.16	0.16	0.00
100.00	0.00	15,965	825.06	0.16	0.16	0.00
102.50	0.00	14,597	825.02	0.15	0.15	0.00
105.00	0.00	13,307	824.97	0.14	0.14	0.00
107.50	0.00	12,093	824.93	0.13	0.13	0.00
110.00	0.00	10,957	824.89	0.12	0.12	0.00
112.50	0.00	9,899	824.85	0.11	0.11	0.00
115.00	0.00	8,920	824.82	0.10	0.10	0.00
117.50	0.00	8,020	824.79	0.10	0.10	0.00
120.00	0.00	7,200	824.76	0.09	0.09	0.00

Stage-Discharge for Pond 2P: WET POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

OAK ENGINEERING

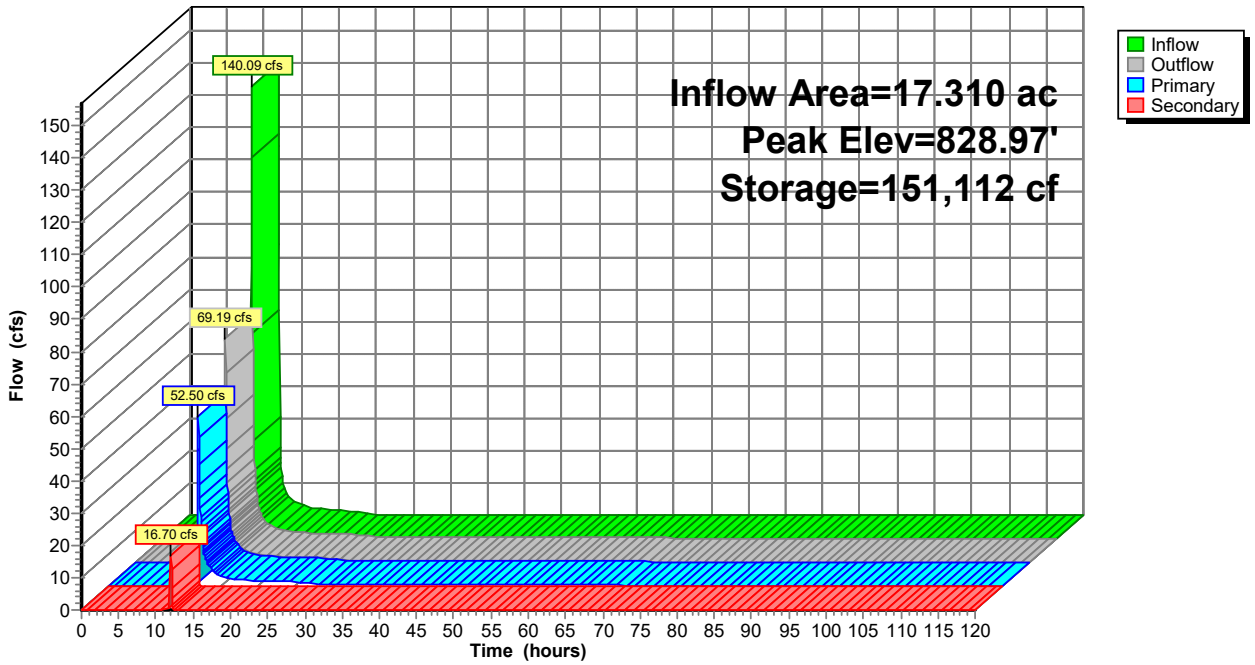
HYDROCAD OUTPUT

25YR-24HR STORM EVENT

April 28, 2022

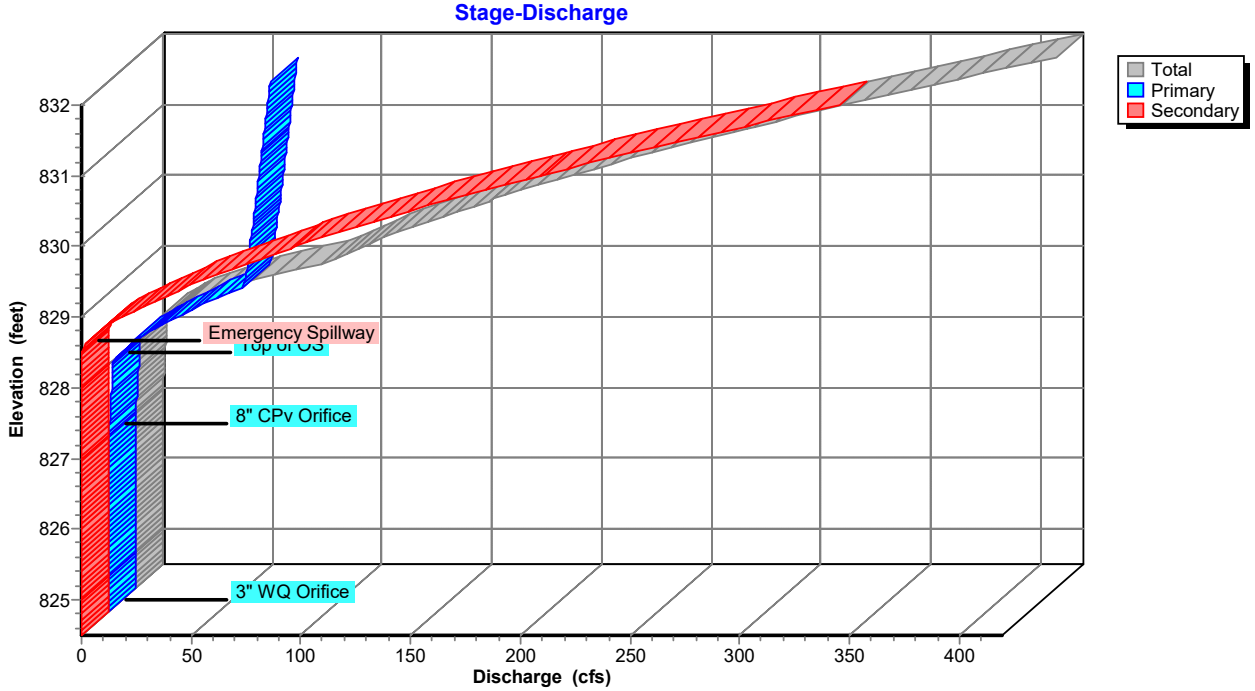
Pond 2P: WET POND

Hydrograph

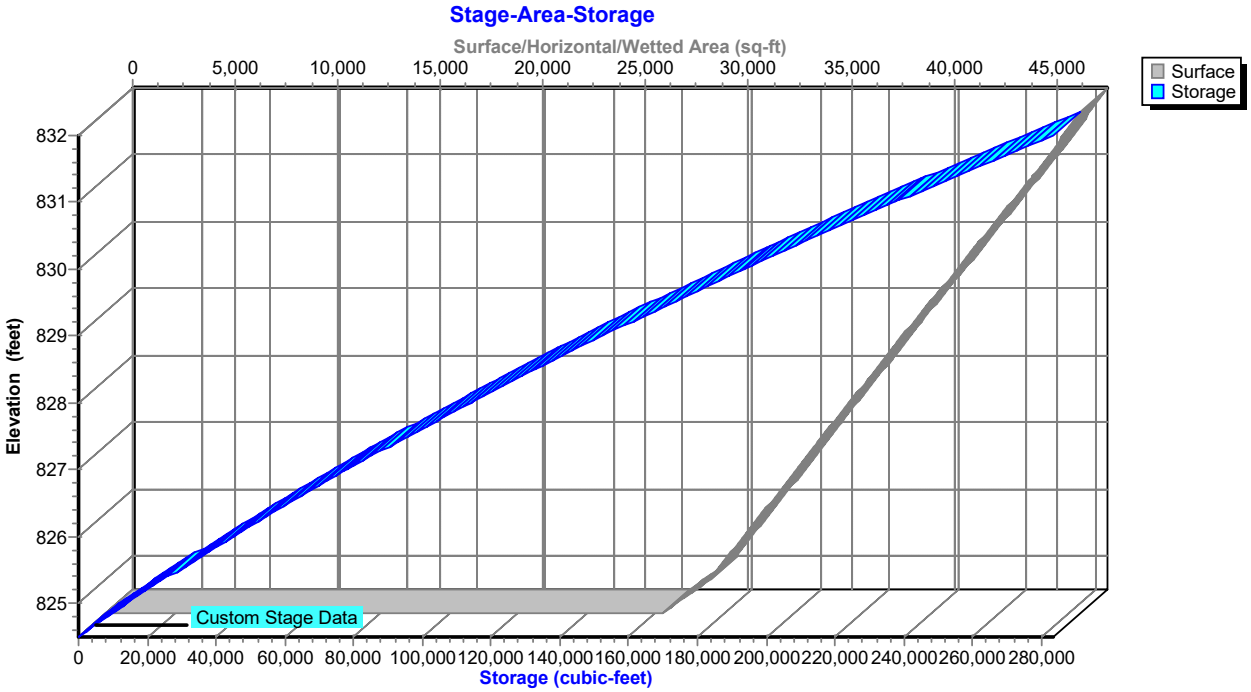


Pond 2P: WET POND

Stage-Discharge



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	0.00
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.31	786	824.53	0.00	0.00	0.00
7.50	0.97	6,212	824.72	0.08	0.08	0.00
10.00	**2.68**	**20,059**	**825.20**	**0.18**	**0.18**	**0.00**
12.50	**10.60**	**129,807**	**828.42**	**16.52**	**16.52**	**0.00**
15.00	3.13	117,493	828.10	3.45	3.45	0.00
17.50	2.00	115,202	828.03	2.17	2.17	0.00
20.00	1.36	113,070	827.98	1.78	1.78	0.00
22.50	1.22	109,143	827.87	1.66	1.66	0.00
25.00	0.00	101,755	827.67	1.38	1.38	0.00
27.50	0.00	91,778	827.39	0.84	0.84	0.00
30.00	0.00	85,731	827.22	0.54	0.54	0.00
32.50	0.00	81,561	827.10	0.41	0.41	0.00
35.00	0.00	78,145	827.00	0.36	0.36	0.00
37.50	0.00	74,899	826.91	0.36	0.36	0.00
40.00	0.00	71,719	826.81	0.35	0.35	0.00
42.50	0.00	68,606	826.72	0.34	0.34	0.00
45.00	0.00	65,559	826.63	0.33	0.33	0.00
47.50	0.00	62,580	826.54	0.33	0.33	0.00
50.00	0.00	59,668	826.45	0.32	0.32	0.00
52.50	0.00	56,825	826.37	0.31	0.31	0.00
55.00	0.00	54,051	826.28	0.30	0.30	0.00
57.50	0.00	51,345	826.20	0.30	0.30	0.00
60.00	0.00	48,710	826.12	0.29	0.29	0.00
62.50	0.00	46,144	826.04	0.28	0.28	0.00
65.00	0.00	43,649	825.96	0.27	0.27	0.00
67.50	0.00	41,225	825.89	0.27	0.27	0.00
70.00	0.00	38,873	825.81	0.26	0.26	0.00
72.50	0.00	36,592	825.74	0.25	0.25	0.00
75.00	0.00	34,383	825.67	0.24	0.24	0.00
77.50	0.00	32,247	825.60	0.23	0.23	0.00
80.00	0.00	30,184	825.53	0.23	0.23	0.00
82.50	0.00	28,195	825.47	0.22	0.22	0.00
85.00	0.00	26,279	825.40	0.21	0.21	0.00
87.50	0.00	24,438	825.34	0.20	0.20	0.00
90.00	0.00	22,671	825.29	0.19	0.19	0.00
92.50	0.00	20,979	825.23	0.18	0.18	0.00
95.00	0.00	19,363	825.18	0.18	0.18	0.00
97.50	0.00	17,822	825.12	0.17	0.17	0.00
100.00	0.00	16,357	825.07	0.16	0.16	0.00
102.50	0.00	14,968	825.03	0.15	0.15	0.00
105.00	0.00	13,656	824.98	0.14	0.14	0.00
107.50	0.00	12,421	824.94	0.13	0.13	0.00
110.00	0.00	11,264	824.90	0.12	0.12	0.00
112.50	0.00	10,185	824.86	0.12	0.12	0.00
115.00	0.00	9,184	824.83	0.11	0.11	0.00
117.50	0.00	8,262	824.80	0.10	0.10	0.00
120.00	0.00	7,419	824.77	0.09	0.09	0.00

Stage-Discharge for Pond 2P: WET POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

OAK ENGINEERING

HYDROCAD OUTPUT

50YR-24HR STORM EVENT

April 28, 2022

Summary for Subcatchment 1S: PRE

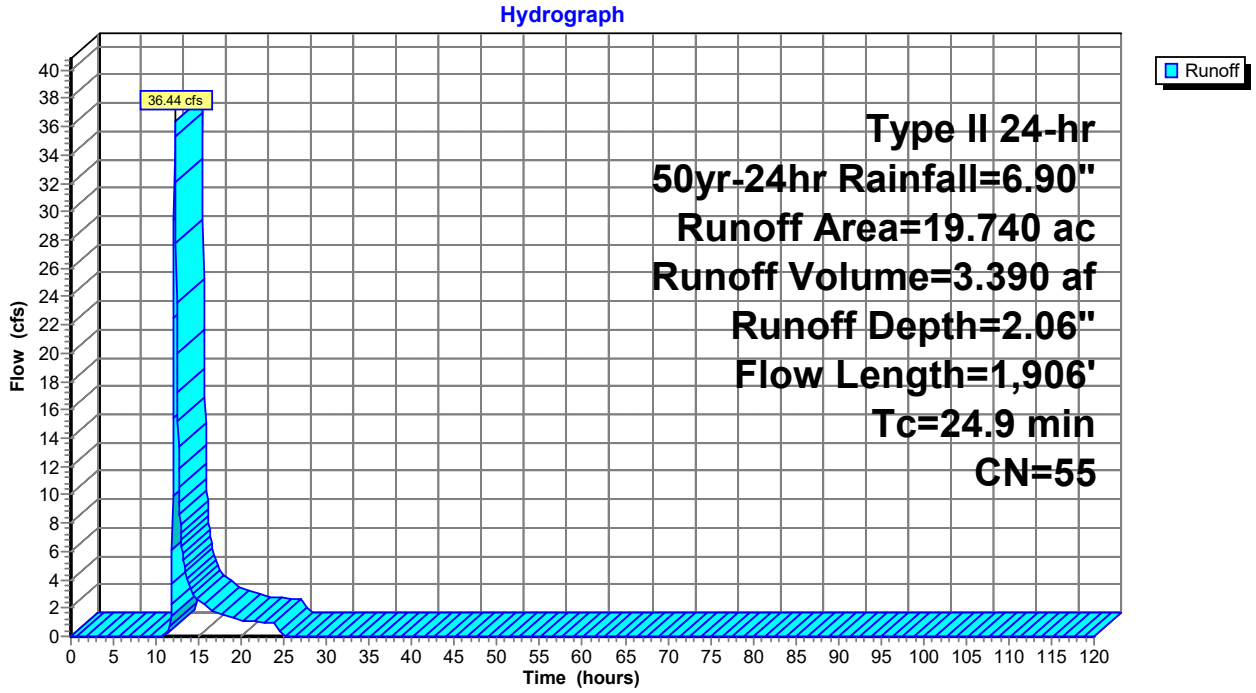
Runoff = 36.44 cfs @ 12.21 hrs, Volume= 3.390 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 50yr-24hr Rainfall=6.90"

Area (ac)	CN	Description
19.740	55	Woods, Good, HSG B
19.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	42	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
15.3	1,276	0.0768	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	588	0.0204	2.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.9	1,906	Total			

Subcatchment 1S: PRE



Hydrograph for Subcatchment 1S: PRE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.19	0.00	0.00
5.00	0.43	0.00	0.00
7.50	0.75	0.00	0.00
10.00	1.25	0.00	**0.00**
12.50	5.07	1.02	**17.29**
15.00	5.89	1.45	2.52
17.50	6.29	1.69	1.64
20.00	6.57	1.86	1.17
22.50	**6.78**	**1.99**	1.02
25.00	**6.90**	**2.06**	0.01
27.50	6.90	2.06	0.00
30.00	6.90	2.06	0.00
32.50	6.90	2.06	0.00
35.00	6.90	2.06	0.00
37.50	6.90	2.06	0.00
40.00	6.90	2.06	0.00
42.50	6.90	2.06	0.00
45.00	6.90	2.06	0.00
47.50	6.90	2.06	0.00
50.00	6.90	2.06	0.00
52.50	6.90	2.06	0.00
55.00	6.90	2.06	0.00
57.50	6.90	2.06	0.00
60.00	6.90	2.06	0.00
62.50	6.90	2.06	0.00
65.00	6.90	2.06	0.00
67.50	6.90	2.06	0.00
70.00	6.90	2.06	0.00
72.50	6.90	2.06	0.00
75.00	6.90	2.06	0.00
77.50	6.90	2.06	0.00
80.00	6.90	2.06	0.00
82.50	6.90	2.06	0.00
85.00	6.90	2.06	0.00
87.50	6.90	2.06	0.00
90.00	6.90	2.06	0.00
92.50	6.90	2.06	0.00
95.00	6.90	2.06	0.00
97.50	6.90	2.06	0.00
100.00	6.90	2.06	0.00
102.50	6.90	2.06	0.00
105.00	6.90	2.06	0.00
107.50	6.90	2.06	0.00
110.00	6.90	2.06	0.00
112.50	6.90	2.06	0.00
115.00	6.90	2.06	0.00
117.50	6.90	2.06	0.00
120.00	6.90	2.06	0.00

Summary for Subcatchment 3S: POST TO WET POND

[49] Hint: Tc<2dt may require smaller dt

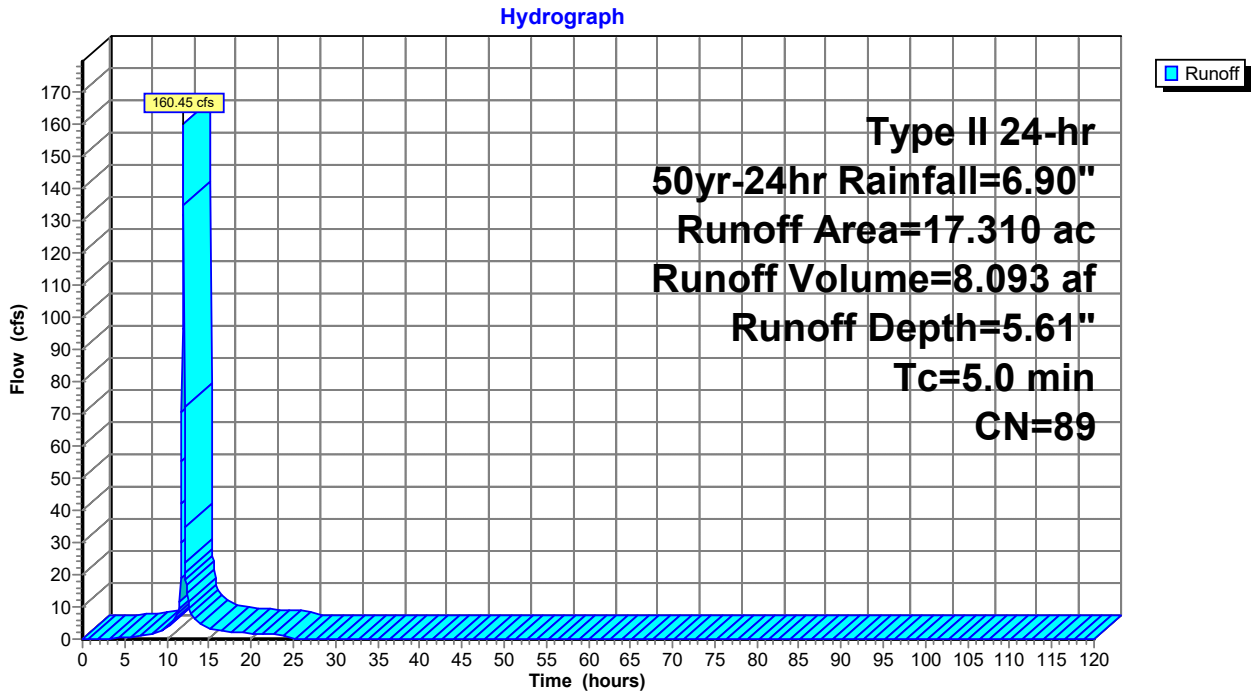
Runoff = 160.45 cfs @ 11.95 hrs, Volume= 8.093 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 50yr-24hr Rainfall=6.90"

	Area (ac)	CN	Description
*	12.950	98	Impervious
	4.360	61	>75% Grass cover, Good, HSG B
	17.310	89	Weighted Average
	4.360		25.19% Pervious Area
	12.950		74.81% Impervious Area

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

Subcatchment 3S: POST TO WET POND



Hydrograph for Subcatchment 3S: POST TO WET POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.19	0.00	0.00
5.00	0.43	0.02	0.45
7.50	0.75	0.15	1.23
10.00	1.25	0.45	**3.22**
12.50	5.07	3.84	**12.07**
15.00	5.89	4.63	3.56
17.50	6.29	5.02	2.27
20.00	6.57	5.29	1.55
22.50	**6.78**	**5.50**	1.38
25.00	**6.90**	**5.61**	0.00
27.50	6.90	5.61	0.00
30.00	6.90	5.61	0.00
32.50	6.90	5.61	0.00
35.00	6.90	5.61	0.00
37.50	6.90	5.61	0.00
40.00	6.90	5.61	0.00
42.50	6.90	5.61	0.00
45.00	6.90	5.61	0.00
47.50	6.90	5.61	0.00
50.00	6.90	5.61	0.00
52.50	6.90	5.61	0.00
55.00	6.90	5.61	0.00
57.50	6.90	5.61	0.00
60.00	6.90	5.61	0.00
62.50	6.90	5.61	0.00
65.00	6.90	5.61	0.00
67.50	6.90	5.61	0.00
70.00	6.90	5.61	0.00
72.50	6.90	5.61	0.00
75.00	6.90	5.61	0.00
77.50	6.90	5.61	0.00
80.00	6.90	5.61	0.00
82.50	6.90	5.61	0.00
85.00	6.90	5.61	0.00
87.50	6.90	5.61	0.00
90.00	6.90	5.61	0.00
92.50	6.90	5.61	0.00
95.00	6.90	5.61	0.00
97.50	6.90	5.61	0.00
100.00	6.90	5.61	0.00
102.50	6.90	5.61	0.00
105.00	6.90	5.61	0.00
107.50	6.90	5.61	0.00
110.00	6.90	5.61	0.00
112.50	6.90	5.61	0.00
115.00	6.90	5.61	0.00
117.50	6.90	5.61	0.00
120.00	6.90	5.61	0.00

Summary for Pond 2P: WET POND

Inflow Area = 17.310 ac, 74.81% Impervious, Inflow Depth = 5.61" for 50yr-24hr event
Inflow = 160.45 cfs @ 11.95 hrs, Volume= 8.093 af
Outflow = 96.30 cfs @ 12.03 hrs, Volume= 7.920 af, Atten= 40%, Lag= 5.0 min
Primary = 62.64 cfs @ 12.03 hrs, Volume= 7.424 af
Secondary = 33.68 cfs @ 12.04 hrs, Volume= 0.495 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 829.23' @ 12.04 hrs Surf.Area= 40,351 sf Storage= 161,635 cf

Plug-Flow detention time= 849.2 min calculated for 7.920 af (98% of inflow)
Center-of-Mass det. time= 835.7 min (1,615.1 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	824.50'	283,447 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
824.50	27,110	0	0
825.00	29,464	14,144	14,144
826.00	31,977	30,721	44,864
827.00	34,527	33,252	78,116
828.00	37,113	35,820	113,936
829.00	39,735	38,424	152,360
830.00	42,393	41,064	193,424
831.00	45,088	43,741	237,165
832.00	47,477	46,283	283,447

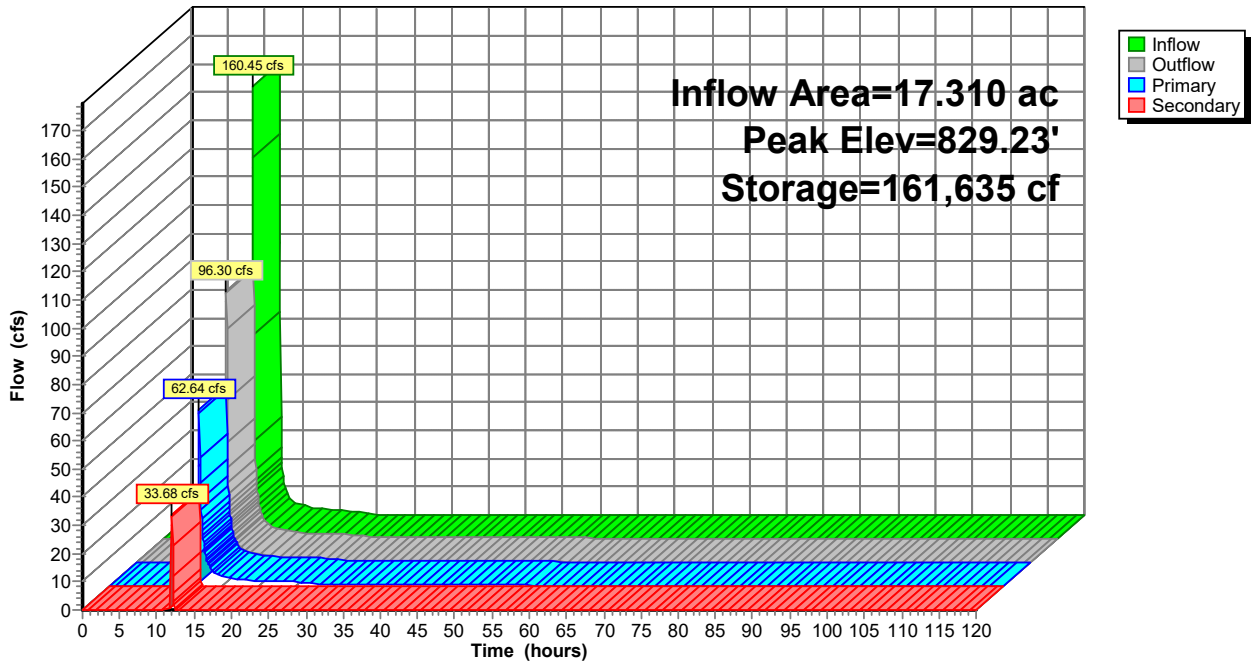
Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**30.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 821.00' / 820.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	824.50'	**3.0" Vert. 3" WQ Orifice** C= 0.600
#3	Device 1	827.00'	**8.0" Vert. 8" CPv Orifice** C= 0.600
#4	Device 1	828.00'	**48.0" x 48.0" Horiz. Top of OS** C= 0.600 Limited to weir flow at low heads
#5	Secondary	828.50'	**20.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=62.33 cfs @ 12.03 hrs HW=829.20' (Free Discharge)
└**1=Culvert** (Inlet Controls 62.33 cfs @ 12.70 fps)
  └**2=3" WQ Orifice** (Passes < 0.51 cfs potential flow)
  └**3=8" CPv Orifice** (Passes < 2.30 cfs potential flow)
  └**4=Top of OS** (Passes < 69.20 cfs potential flow)

Secondary OutFlow Max=32.30 cfs @ 12.04 hrs HW=829.21' (Free Discharge)
└**5=Emergency Spillway** (Weir Controls 32.30 cfs @ 2.27 fps)

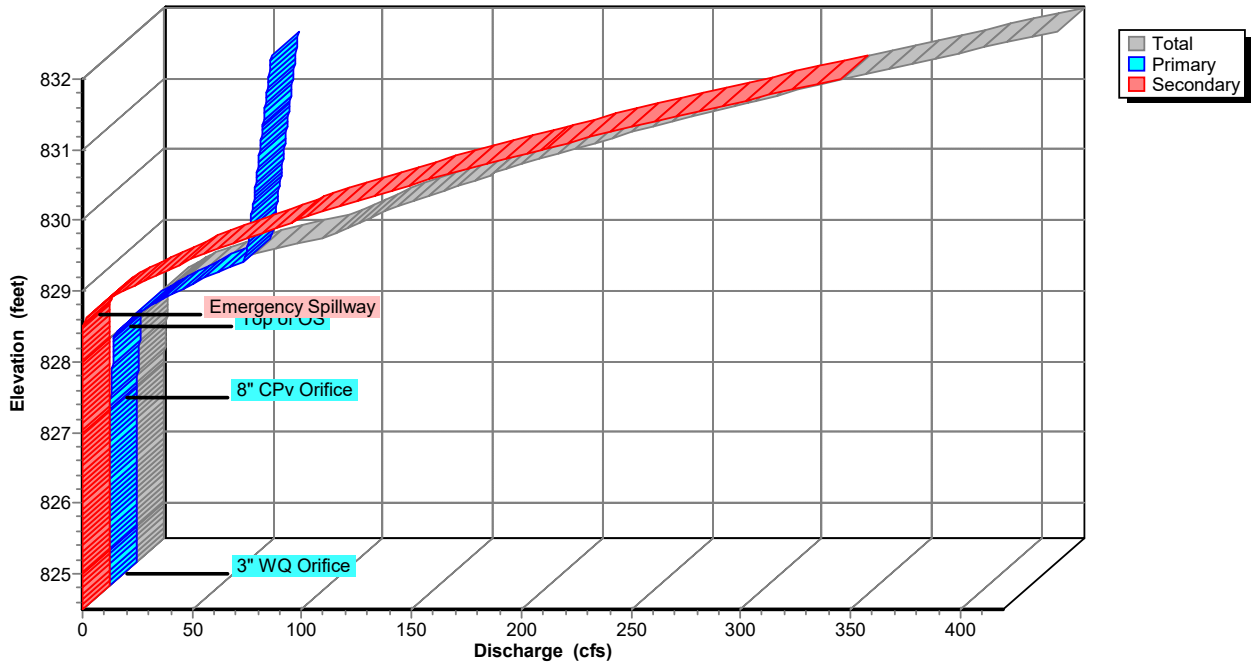
Pond 2P: WET POND

Hydrograph

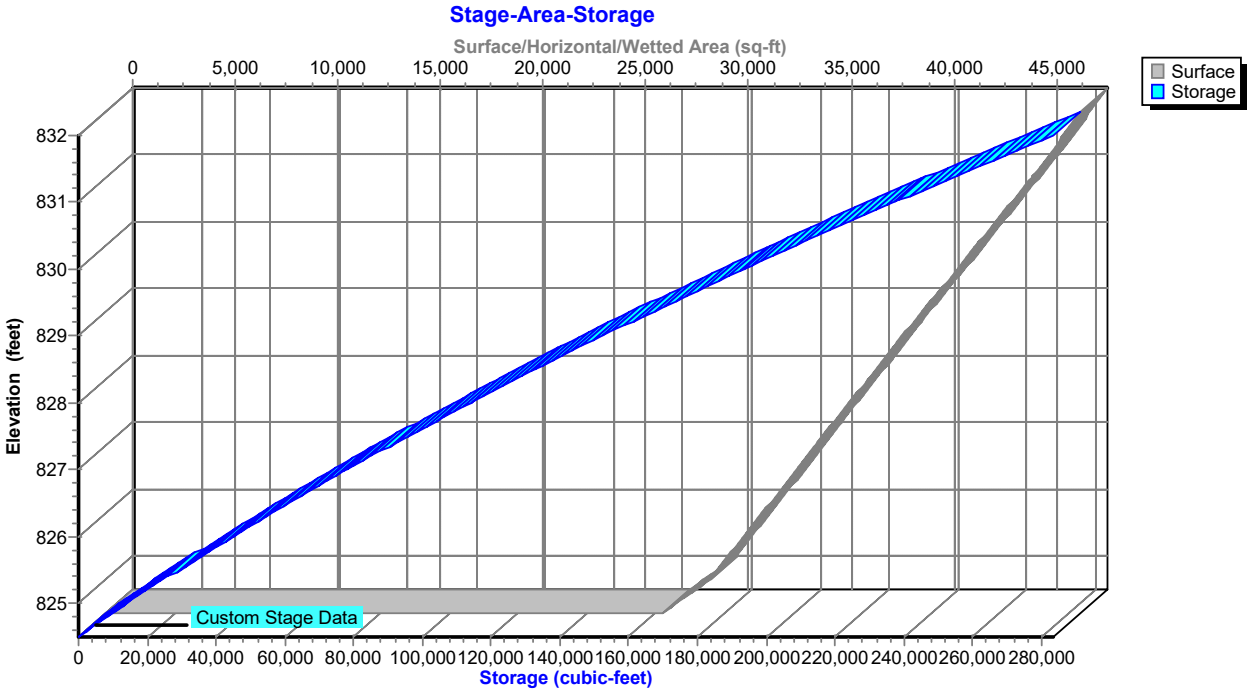


Pond 2P: WET POND

Stage-Discharge



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	0.00
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.45	1,417	824.55	0.01	0.01	0.00
7.50	1.23	8,486	824.80	0.10	0.10	0.00
10.00	**3.22**	**25,489**	**825.38**	**0.21**	**0.21**	**0.00**
12.50	**12.07**	**131,115**	**828.46**	**18.33**	**18.33**	**0.00**
15.00	3.56	118,117	828.11	3.89	3.89	0.00
17.50	2.27	115,779	828.05	2.44	2.44	0.00
20.00	1.55	114,035	828.00	1.82	1.82	0.00
22.50	1.38	111,224	827.93	1.72	1.72	0.00
25.00	0.00	104,004	827.73	1.47	1.47	0.00
27.50	0.00	93,168	827.43	0.93	0.93	0.00
30.00	0.00	86,609	827.24	0.58	0.58	0.00
32.50	0.00	82,213	827.12	0.42	0.42	0.00
35.00	0.00	78,720	827.02	0.37	0.37	0.00
37.50	0.00	75,462	826.92	0.36	0.36	0.00
40.00	0.00	72,270	826.83	0.35	0.35	0.00
42.50	0.00	69,145	826.74	0.34	0.34	0.00
45.00	0.00	66,087	826.65	0.34	0.34	0.00
47.50	0.00	63,096	826.56	0.33	0.33	0.00
50.00	0.00	60,172	826.47	0.32	0.32	0.00
52.50	0.00	57,317	826.38	0.31	0.31	0.00
55.00	0.00	54,531	826.30	0.31	0.31	0.00
57.50	0.00	51,813	826.22	0.30	0.30	0.00
60.00	0.00	49,165	826.13	0.29	0.29	0.00
62.50	0.00	46,588	826.05	0.28	0.28	0.00
65.00	0.00	44,080	825.98	0.27	0.27	0.00
67.50	0.00	41,644	825.90	0.27	0.27	0.00
70.00	0.00	39,279	825.82	0.26	0.26	0.00
72.50	0.00	36,985	825.75	0.25	0.25	0.00
75.00	0.00	34,764	825.68	0.24	0.24	0.00
77.50	0.00	32,615	825.61	0.23	0.23	0.00
80.00	0.00	30,539	825.54	0.23	0.23	0.00
82.50	0.00	28,537	825.48	0.22	0.22	0.00
85.00	0.00	26,609	825.42	0.21	0.21	0.00
87.50	0.00	24,754	825.35	0.20	0.20	0.00
90.00	0.00	22,974	825.30	0.19	0.19	0.00
92.50	0.00	21,269	825.24	0.19	0.19	0.00
95.00	0.00	19,640	825.19	0.18	0.18	0.00
97.50	0.00	18,086	825.13	0.17	0.17	0.00
100.00	0.00	16,607	825.08	0.16	0.16	0.00
102.50	0.00	15,206	825.04	0.15	0.15	0.00
105.00	0.00	13,880	824.99	0.14	0.14	0.00
107.50	0.00	12,632	824.95	0.13	0.13	0.00
110.00	0.00	11,461	824.91	0.13	0.13	0.00
112.50	0.00	10,368	824.87	0.12	0.12	0.00
115.00	0.00	9,353	824.84	0.11	0.11	0.00
117.50	0.00	8,417	824.80	0.10	0.10	0.00
120.00	0.00	7,560	824.77	0.09	0.09	0.00

Stage-Discharge for Pond 2P: WET POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

OAK ENGINEERING

HYDROCAD OUTPUT

100YR-24HR STORM EVENT

April 28, 2022

Summary for Subcatchment 1S: PRE

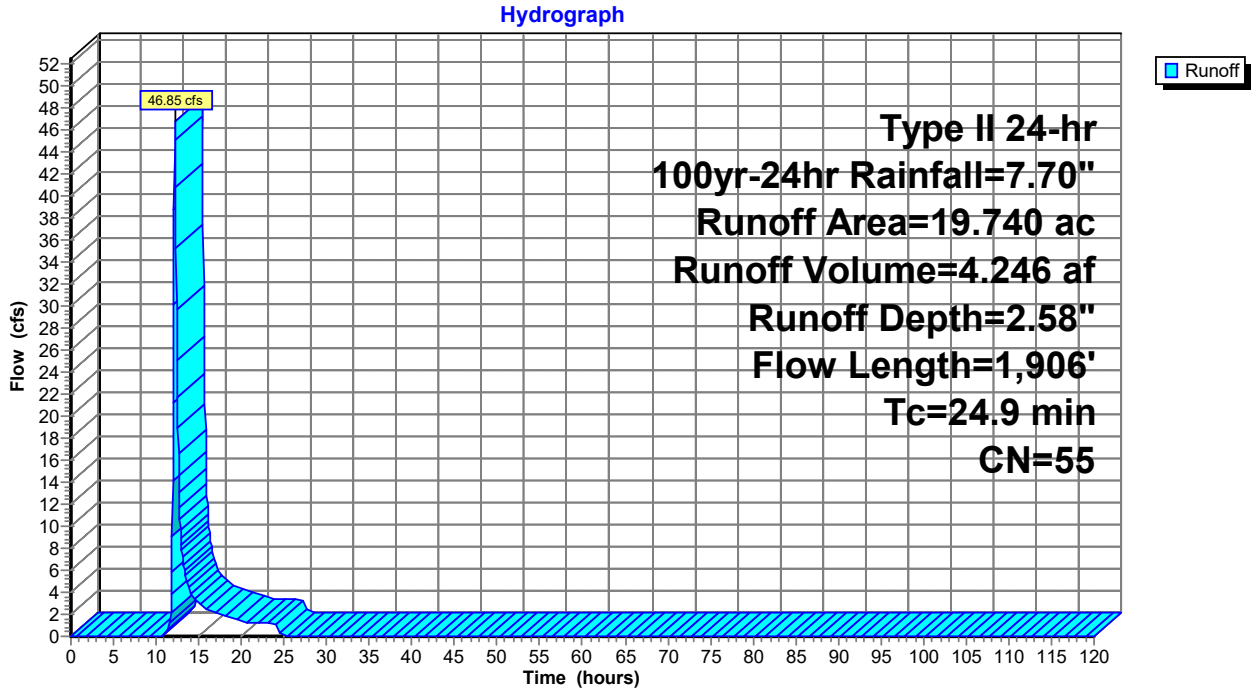
Runoff = 46.85 cfs @ 12.20 hrs, Volume= 4.246 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr-24hr Rainfall=7.70"

Area (ac)	CN	Description
19.740	55	Woods, Good, HSG B
19.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	42	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
15.3	1,276	0.0768	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	588	0.0204	2.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.9	1,906	Total			

Subcatchment 1S: PRE



Hydrograph for Subcatchment 1S: PRE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.22	0.00	0.00
5.00	0.49	0.00	0.00
7.50	0.84	0.00	0.00
10.00	1.39	0.00	**0.00**
12.50	5.66	1.33	**21.65**
15.00	6.57	1.86	3.03
17.50	7.02	2.14	1.96
20.00	7.33	2.34	1.39
22.50	**7.57**	**2.49**	1.21
25.00	**7.70**	**2.58**	0.01
27.50	7.70	2.58	0.00
30.00	7.70	2.58	0.00
32.50	7.70	2.58	0.00
35.00	7.70	2.58	0.00
37.50	7.70	2.58	0.00
40.00	7.70	2.58	0.00
42.50	7.70	2.58	0.00
45.00	7.70	2.58	0.00
47.50	7.70	2.58	0.00
50.00	7.70	2.58	0.00
52.50	7.70	2.58	0.00
55.00	7.70	2.58	0.00
57.50	7.70	2.58	0.00
60.00	7.70	2.58	0.00
62.50	7.70	2.58	0.00
65.00	7.70	2.58	0.00
67.50	7.70	2.58	0.00
70.00	7.70	2.58	0.00
72.50	7.70	2.58	0.00
75.00	7.70	2.58	0.00
77.50	7.70	2.58	0.00
80.00	7.70	2.58	0.00
82.50	7.70	2.58	0.00
85.00	7.70	2.58	0.00
87.50	7.70	2.58	0.00
90.00	7.70	2.58	0.00
92.50	7.70	2.58	0.00
95.00	7.70	2.58	0.00
97.50	7.70	2.58	0.00
100.00	7.70	2.58	0.00
102.50	7.70	2.58	0.00
105.00	7.70	2.58	0.00
107.50	7.70	2.58	0.00
110.00	7.70	2.58	0.00
112.50	7.70	2.58	0.00
115.00	7.70	2.58	0.00
117.50	7.70	2.58	0.00
120.00	7.70	2.58	0.00

Summary for Subcatchment 3S: POST TO WET POND

[49] Hint: Tc<2dt may require smaller dt

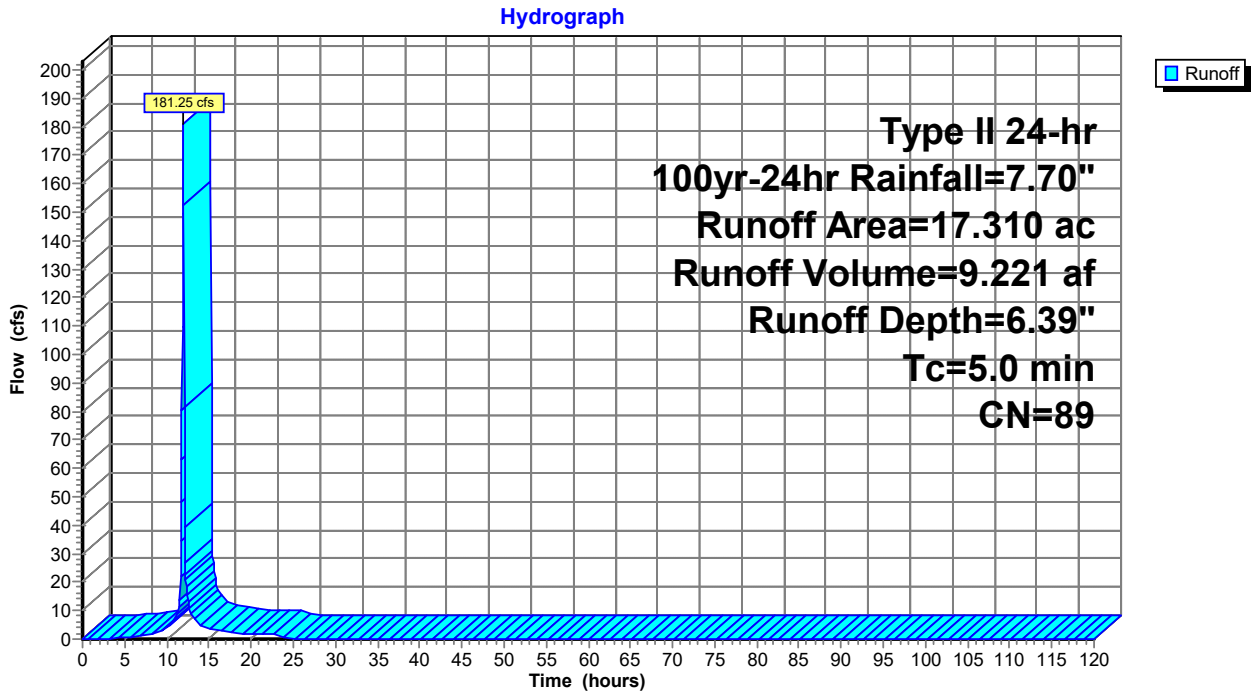
Runoff = 181.25 cfs @ 11.95 hrs, Volume= 9.221 af, Depth= 6.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr-24hr Rainfall=7.70"

	Area (ac)	CN	Description
*	12.950	98	Impervious
	4.360	61	>75% Grass cover, Good, HSG B
	17.310	89	Weighted Average
	4.360		25.19% Pervious Area
	12.950		74.81% Impervious Area

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

Subcatchment 3S: POST TO WET POND



Hydrograph for Subcatchment 3S: POST TO WET POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.22	0.00	0.00
5.00	0.49	0.04	0.61
7.50	0.84	0.19	1.51
10.00	1.39	0.55	**3.78**
12.50	5.66	4.41	**13.57**
15.00	6.57	5.29	3.99
17.50	7.02	5.73	2.55
20.00	7.33	6.03	1.73
22.50	**7.57**	**6.26**	1.55
25.00	**7.70**	**6.39**	0.00
27.50	7.70	6.39	0.00
30.00	7.70	6.39	0.00
32.50	7.70	6.39	0.00
35.00	7.70	6.39	0.00
37.50	7.70	6.39	0.00
40.00	7.70	6.39	0.00
42.50	7.70	6.39	0.00
45.00	7.70	6.39	0.00
47.50	7.70	6.39	0.00
50.00	7.70	6.39	0.00
52.50	7.70	6.39	0.00
55.00	7.70	6.39	0.00
57.50	7.70	6.39	0.00
60.00	7.70	6.39	0.00
62.50	7.70	6.39	0.00
65.00	7.70	6.39	0.00
67.50	7.70	6.39	0.00
70.00	7.70	6.39	0.00
72.50	7.70	6.39	0.00
75.00	7.70	6.39	0.00
77.50	7.70	6.39	0.00
80.00	7.70	6.39	0.00
82.50	7.70	6.39	0.00
85.00	7.70	6.39	0.00
87.50	7.70	6.39	0.00
90.00	7.70	6.39	0.00
92.50	7.70	6.39	0.00
95.00	7.70	6.39	0.00
97.50	7.70	6.39	0.00
100.00	7.70	6.39	0.00
102.50	7.70	6.39	0.00
105.00	7.70	6.39	0.00
107.50	7.70	6.39	0.00
110.00	7.70	6.39	0.00
112.50	7.70	6.39	0.00
115.00	7.70	6.39	0.00
117.50	7.70	6.39	0.00
120.00	7.70	6.39	0.00

Summary for Pond 2P: WET POND

Inflow Area = 17.310 ac, 74.81% Impervious, Inflow Depth = 6.39" for 100yr-24hr event
Inflow = 181.25 cfs @ 11.95 hrs, Volume= 9.221 af
Outflow = 116.82 cfs @ 12.03 hrs, Volume= 9.045 af, Atten= 36%, Lag= 4.6 min
Primary = 63.63 cfs @ 12.03 hrs, Volume= 8.155 af
Secondary = 53.20 cfs @ 12.03 hrs, Volume= 0.890 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 829.50' @ 12.03 hrs Surf.Area= 41,054 sf Storage= 172,409 cf

Plug-Flow detention time= 754.7 min calculated for 9.045 af (98% of inflow)
Center-of-Mass det. time= 742.6 min (1,518.5 - 775.9)

Volume	Invert	Avail.Storage	Storage Description
#1	824.50'	283,447 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
824.50	27,110	0	0
825.00	29,464	14,144	14,144
826.00	31,977	30,721	44,864
827.00	34,527	33,252	78,116
828.00	37,113	35,820	113,936
829.00	39,735	38,424	152,360
830.00	42,393	41,064	193,424
831.00	45,088	43,741	237,165
832.00	47,477	46,283	283,447

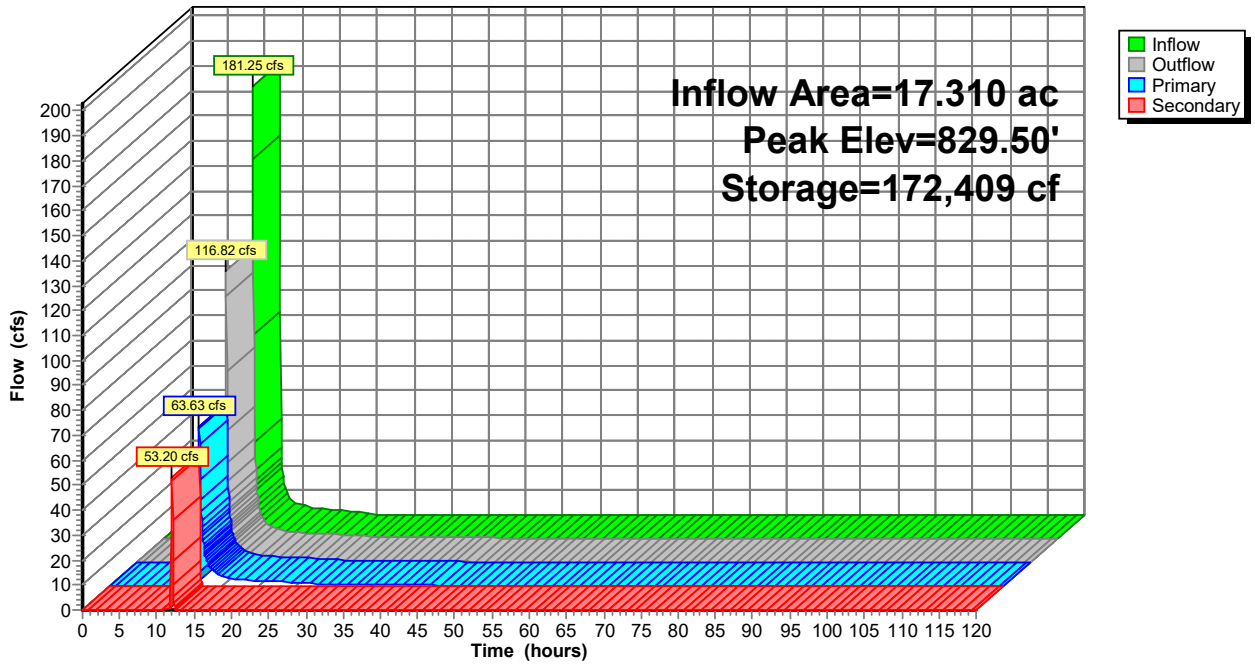
Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**30.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 821.00' / 820.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	824.50'	**3.0" Vert. 3" WQ Orifice** C= 0.600
#3	Device 1	827.00'	**8.0" Vert. 8" CPv Orifice** C= 0.600
#4	Device 1	828.00'	**48.0" x 48.0" Horiz. Top of OS** C= 0.600 Limited to weir flow at low heads
#5	Secondary	828.50'	**20.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=63.51 cfs @ 12.03 hrs HW=829.47' (Free Discharge)
└**1=Culvert** (Inlet Controls 63.51 cfs @ 12.94 fps)
  └**2=3" WQ Orifice** (Passes < 0.52 cfs potential flow)
  └**3=8" CPv Orifice** (Passes < 2.46 cfs potential flow)
  └**4=Top of OS** (Passes < 93.21 cfs potential flow)

Secondary OutFlow Max=51.20 cfs @ 12.03 hrs HW=829.47' (Free Discharge)
└**5=Emergency Spillway** (Weir Controls 51.20 cfs @ 2.64 fps)

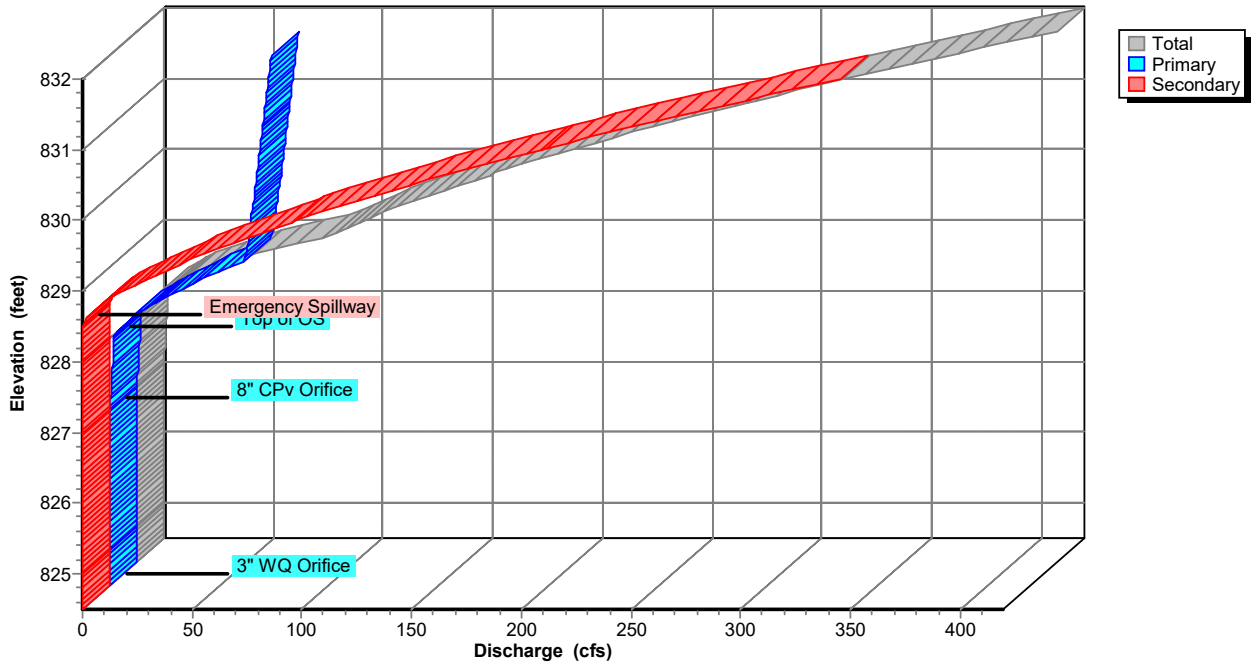
Pond 2P: WET POND

Hydrograph

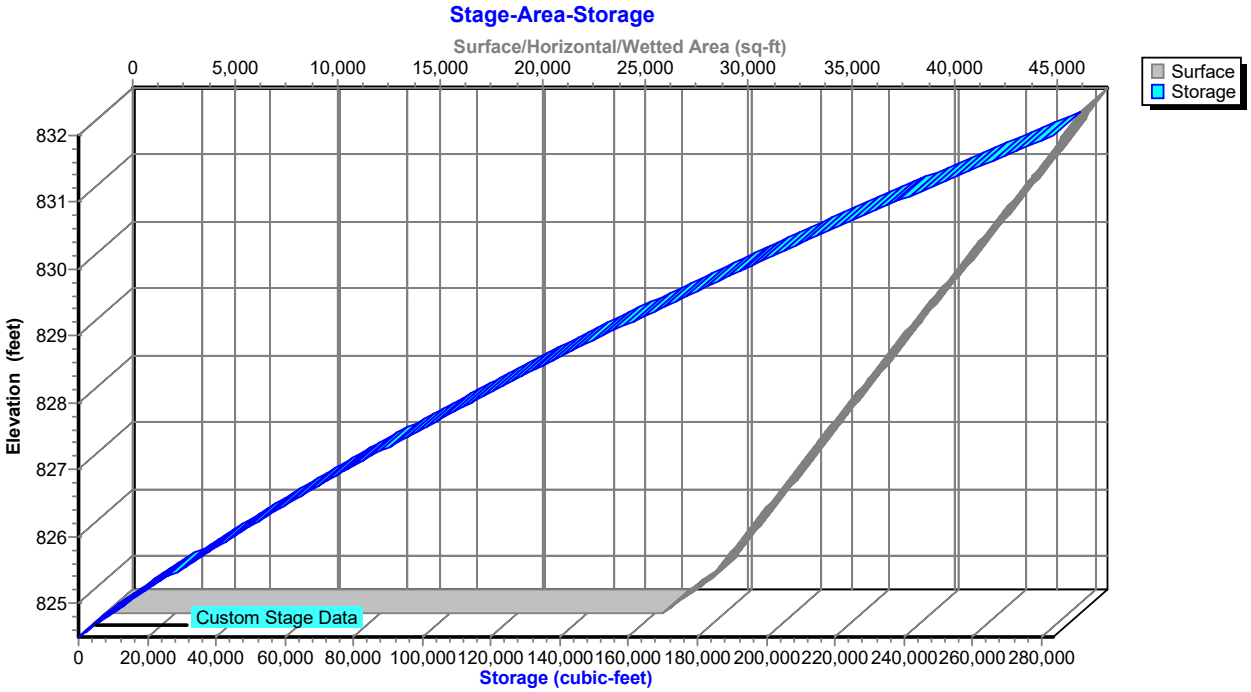


Pond 2P: WET POND

Stage-Discharge



Pond 2P: WET POND



Hydrograph for Pond 2P: WET POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	824.50	0.00	0.00	0.00
2.50	0.00	0	824.50	0.00	0.00	0.00
5.00	0.61	2,219	824.58	0.01	0.01	0.00
7.50	1.51	11,071	824.89	0.12	0.12	0.00
10.00	**3.78**	**31,413**	**825.57**	**0.23**	**0.23**	**0.00**
12.50	**13.57**	**132,352**	**828.49**	**20.10**	**20.10**	**0.00**
15.00	3.99	118,714	828.13	4.34	4.34	0.00
17.50	2.55	116,303	828.06	2.71	2.71	0.00
20.00	1.73	114,638	828.02	1.96	1.96	0.00
22.50	1.55	112,926	827.97	1.78	1.78	0.00
25.00	0.00	106,024	827.79	1.55	1.55	0.00
27.50	0.00	94,455	827.47	1.00	1.00	0.00
30.00	0.00	87,402	827.27	0.61	0.61	0.00
32.50	0.00	82,787	827.13	0.44	0.44	0.00
35.00	0.00	79,212	827.03	0.37	0.37	0.00
37.50	0.00	75,941	826.94	0.36	0.36	0.00
40.00	0.00	72,740	826.84	0.35	0.35	0.00
42.50	0.00	69,605	826.75	0.34	0.34	0.00
45.00	0.00	66,536	826.66	0.34	0.34	0.00
47.50	0.00	63,535	826.57	0.33	0.33	0.00
50.00	0.00	60,602	826.48	0.32	0.32	0.00
52.50	0.00	57,736	826.40	0.31	0.31	0.00
55.00	0.00	54,940	826.31	0.31	0.31	0.00
57.50	0.00	52,212	826.23	0.30	0.30	0.00
60.00	0.00	49,554	826.15	0.29	0.29	0.00
62.50	0.00	46,966	826.07	0.28	0.28	0.00
65.00	0.00	44,448	825.99	0.28	0.28	0.00
67.50	0.00	42,001	825.91	0.27	0.27	0.00
70.00	0.00	39,625	825.84	0.26	0.26	0.00
72.50	0.00	37,321	825.76	0.25	0.25	0.00
75.00	0.00	35,089	825.69	0.24	0.24	0.00
77.50	0.00	32,929	825.62	0.24	0.24	0.00
80.00	0.00	30,843	825.55	0.23	0.23	0.00
82.50	0.00	28,830	825.49	0.22	0.22	0.00
85.00	0.00	26,890	825.42	0.21	0.21	0.00
87.50	0.00	25,025	825.36	0.20	0.20	0.00
90.00	0.00	23,234	825.30	0.19	0.19	0.00
92.50	0.00	21,518	825.25	0.19	0.19	0.00
95.00	0.00	19,877	825.19	0.18	0.18	0.00
97.50	0.00	18,311	825.14	0.17	0.17	0.00
100.00	0.00	16,822	825.09	0.16	0.16	0.00
102.50	0.00	15,409	825.04	0.15	0.15	0.00
105.00	0.00	14,072	825.00	0.14	0.14	0.00
107.50	0.00	12,812	824.95	0.14	0.14	0.00
110.00	0.00	11,630	824.91	0.13	0.13	0.00
112.50	0.00	10,525	824.88	0.12	0.12	0.00
115.00	0.00	9,498	824.84	0.11	0.11	0.00
117.50	0.00	8,551	824.81	0.10	0.10	0.00
120.00	0.00	7,683	824.78	0.09	0.09	0.00

Stage-Discharge for Pond 2P: WET POND

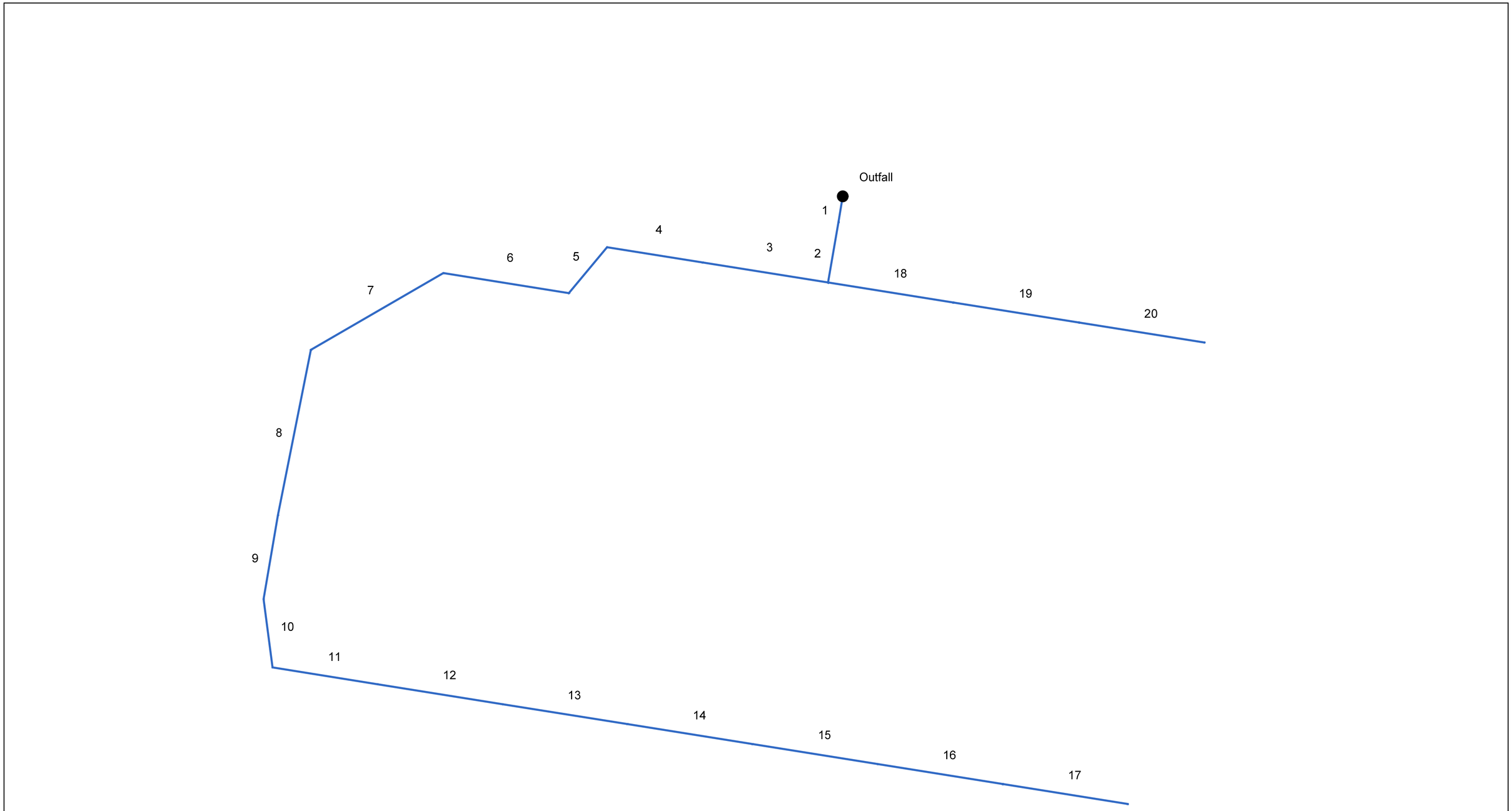
Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
824.50	0.00	0.00	0.00
824.60	0.02	0.02	0.00
824.70	0.06	0.06	0.00
824.80	0.10	0.10	0.00
824.90	0.12	0.12	0.00
825.00	0.14	0.14	0.00
825.10	0.16	0.16	0.00
825.20	0.18	0.18	0.00
825.30	0.19	0.19	0.00
825.40	0.21	0.21	0.00
825.50	0.22	0.22	0.00
825.60	0.23	0.23	0.00
825.70	0.25	0.25	0.00
825.80	0.26	0.26	0.00
825.90	0.27	0.27	0.00
826.00	0.28	0.28	0.00
826.10	0.29	0.29	0.00
826.20	0.30	0.30	0.00
826.30	0.31	0.31	0.00
826.40	0.31	0.31	0.00
826.50	0.32	0.32	0.00
826.60	0.33	0.33	0.00
826.70	0.34	0.34	0.00
826.80	0.35	0.35	0.00
826.90	0.36	0.36	0.00
827.00	0.36	0.36	0.00
827.10	0.41	0.41	0.00
827.20	0.51	0.51	0.00
827.30	0.67	0.67	0.00
827.40	0.86	0.86	0.00
827.50	1.08	1.08	0.00
827.60	1.28	1.28	0.00
827.70	1.43	1.43	0.00
827.80	1.57	1.57	0.00
827.90	1.69	1.69	0.00
828.00	1.81	1.81	0.00
828.10	3.57	3.57	0.00
828.20	6.69	6.69	0.00
828.30	10.70	10.70	0.00
828.40	15.43	15.43	0.00
828.50	20.78	20.78	0.00
828.60	28.25	26.68	1.57
828.70	37.54	33.08	4.45
828.80	48.25	39.96	8.30
828.90	60.22	47.26	12.95
829.00	73.58	54.98	18.60
829.10	86.96	61.86	25.10
829.20	93.88	62.31	31.57
829.30	101.25	62.76	38.50
829.40	109.05	63.20	45.85
829.50	117.24	63.64	53.60
829.60	126.03	64.08	61.95
829.70	135.23	64.51	70.72
829.80	144.39	64.94	79.45
829.90	153.83	65.37	88.46
830.00	163.35	65.80	97.55
830.10	173.08	66.22	106.86
830.20	183.67	66.64	117.03
830.30	194.57	67.06	127.51
830.40	205.76	67.47	138.28
830.50	217.23	67.89	149.34
830.60	228.98	68.30	160.68
830.70	241.00	68.71	172.29
830.80	253.28	69.11	184.17
830.90	265.83	69.51	196.31
831.00	278.62	69.91	208.71
831.10	291.67	70.31	221.36
831.20	304.96	70.71	234.25
831.30	318.49	71.10	247.38
831.40	332.25	71.49	260.75
831.50	346.24	71.88	274.36
831.60	360.46	72.27	288.19
831.70	374.90	72.66	302.24
831.80	389.56	73.04	316.52
831.90	404.44	73.42	331.02
832.00	**419.53**	**73.80**	**345.73**

HYDRAFLOW STORM SEWER OUTPUT

10YR-24HR STORM EVENT

April 28, 2022

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: SOUTHRIDGE STORM V1.stm	Number of lines: 20	Date: 4/28/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	30.444	99.360	MH	0.00	0.00	0.00	5.0	824.50	0.49	824.65	48	Cir	0.012	0.15	834.32	Pipe - (459)
2	1	71.777	0.000	Comb	0.00	1.57	0.95	5.0	826.65	12.00	835.26	48	Cir	0.012	2.25	854.73	Pipe - (458)
3	2	144.000	90.000	Comb	0.00	1.57	0.95	5.0	835.76	1.75	838.28	42	Cir	0.012	0.50	854.73	Pipe - (457)
4	3	110.000	0.000	Comb	0.00	0.40	0.95	5.0	838.78	0.50	839.33	36	Cir	0.012	1.34	855.07	Pipe - (456)
5	4	68.964	-60.461	Comb	0.00	1.04	0.95	5.0	839.43	1.00	840.12	36	Cir	0.012	1.34	856.38	Pipe - (455)
6	5	144.000	60.461	Comb	0.00	1.46	0.90	5.0	840.62	0.50	841.34	30	Cir	0.012	1.04	856.38	Pipe - (454)
7	6	174.998	-40.274	Comb	0.00	0.31	0.90	5.0	841.44	0.50	842.31	30	Cir	0.012	1.18	858.38	Pipe - (453)
8	7	196.951	-48.131	Comb	0.00	0.10	0.95	5.0	842.81	1.00	844.78	24	Cir	0.012	0.50	860.48	Pipe - (452)
9	8	99.750	-1.595	Comb	0.00	0.23	0.95	5.0	844.88	1.00	845.88	24	Cir	0.012	0.50	859.98	Pipe - (451)
10	9	80.601	-16.580	Comb	0.00	0.07	0.95	5.0	845.98	0.99	846.78	24	Cir	0.012	1.45	860.98	Pipe - (450)
11	10	120.600	-73.420	Comb	0.00	0.31	0.88	5.0	846.88	1.00	848.09	24	Cir	0.012	0.50	860.75	Pipe - (449)
12	11	143.600	0.000	Comb	0.00	0.42	0.74	5.0	848.19	1.00	849.63	24	Cir	0.012	0.50	860.75	Pipe - (448)
13	12	143.600	0.000	Comb	0.00	0.60	0.62	5.0	849.73	1.00	851.17	18	Cir	0.012	0.50	860.75	Pipe - (447)
14	13	143.600	0.000	Comb	0.00	0.78	0.56	5.0	851.27	1.00	852.71	18	Cir	0.012	0.50	860.75	Pipe - (446)
15	14	143.600	0.000	Comb	0.00	0.66	0.60	5.0	852.81	1.00	854.25	18	Cir	0.012	0.50	860.75	Pipe - (445)
16	15	143.600	0.000	Comb	0.00	0.42	0.73	5.0	854.35	1.00	855.78	18	Cir	0.012	0.50	860.75	Pipe - (444)
17	16	143.600	0.000	Comb	0.00	0.27	0.94	5.0	855.88	1.00	857.31	15	Cir	0.012	1.00	860.75	Pipe - (443)
18	2	144.000	-90.000	Comb	0.00	1.57	0.95	5.0	843.38	1.50	845.54	30	Cir	0.012	0.50	854.73	Pipe - (462)
19	18	144.000	0.000	Comb	0.00	1.57	0.95	5.0	845.64	1.50	847.80	30	Cir	0.012	0.50	854.73	Pipe - (461)
20	19	144.000	0.000	Comb	0.00	1.53	0.95	5.0	848.30	1.50	850.46	24	Cir	0.012	1.00	854.71	Pipe - (460)

Project File: SOUTHRIDGE STORM V1.stm | Number of lines: 20 | Date: 4/28/2022

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	JB-1	Manhole	834.32	Rect	2.00	2.00	48	Cir	824.65	48	Cir	826.65
2	CB-2	Combination	854.73	Rect	2.00	2.00	48	Cir	835.26	42 30	Cir Cir	835.76 843.38
3	CB-3	Combination	854.73	Rect	2.00	2.00	42	Cir	838.28	36	Cir	838.78
4	CB-4	Combination	855.07	Rect	2.00	2.00	36	Cir	839.33	36	Cir	839.43
5	CB-5	Combination	856.38	Rect	2.00	2.00	36	Cir	840.12	30	Cir	840.62
6	CB-6	Combination	856.38	Rect	2.00	2.00	30	Cir	841.34	30	Cir	841.44
7	CB-7	Combination	858.38	Rect	2.00	2.00	30	Cir	842.31	24	Cir	842.81
8	CB-8	Combination	860.48	Rect	2.00	2.00	24	Cir	844.78	24	Cir	844.88
9	CB-9	Combination	859.98	Rect	2.00	2.00	24	Cir	845.88	24	Cir	845.98
10	CB-10	Combination	860.98	Rect	2.00	2.00	24	Cir	846.78	24	Cir	846.88
11	CB-11	Combination	860.75	Rect	2.00	2.00	24	Cir	848.09	24	Cir	848.19
12	CB-12	Combination	860.75	Rect	2.00	2.00	24	Cir	849.63	18	Cir	849.73
13	CB-13	Combination	860.75	Rect	2.00	2.00	18	Cir	851.17	18	Cir	851.27
14	CB-14	Combination	860.75	Rect	2.00	2.00	18	Cir	852.71	18	Cir	852.81
15	CB-15	Combination	860.75	Rect	2.00	2.00	18	Cir	854.25	18	Cir	854.35
16	CB-16	Combination	860.75	Rect	2.00	2.00	18	Cir	855.78	15	Cir	855.88
17	CB-17	Combination	860.75	Rect	2.00	2.00	15	Cir	857.31			
18	CB-18	Combination	854.73	Rect	2.00	2.00	30	Cir	845.54	30	Cir	845.64
19	CB-19	Combination	854.73	Rect	2.00	2.00	30	Cir	847.80	24	Cir	848.30
20	CB-20	Combination	854.71	Rect	2.00	2.00	24	Cir	850.46			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (459)	69.77	48	Cir	30.444	824.50	824.65	0.493	827.10	827.17	0.16	827.17	End	Manhole
2	Pipe - (458)	70.22	48	Cir	71.777	826.65	835.26	11.996	827.63	837.79	2.46	837.79	1	Combination
3	Pipe - (457)	39.16	42	Cir	144.000	835.76	838.28	1.750	837.79	840.22	n/a	840.22 j	2	Combination
4	Pipe - (456)	31.42	36	Cir	110.000	838.78	839.33	0.500	840.48	841.15	n/a	841.15	3	Combination
5	Pipe - (455)	29.57	36	Cir	68.964	839.43	840.12	1.001	841.15	841.88	0.98	841.88	4	Combination
6	Pipe - (454)	24.44	30	Cir	144.000	840.62	841.34	0.500	842.28	843.02	n/a	843.02	5	Combination
7	Pipe - (453)	17.46	30	Cir	174.998	841.44	842.31	0.497	843.02	843.72	n/a	843.72 j	6	Combination
8	Pipe - (452)	16.17	24	Cir	196.951	842.81	844.78	1.000	844.00	846.23	n/a	846.23	7	Combination
9	Pipe - (451)	15.78	24	Cir	99.750	844.88	845.88	1.002	846.23	847.31	n/a	847.31	8	Combination
10	Pipe - (450)	14.61	24	Cir	80.601	845.98	846.78	0.993	847.31	848.16	n/a	848.16	9	Combination
11	Pipe - (449)	14.42	24	Cir	120.600	846.88	848.09	1.003	848.16	849.46	0.31	849.46	10	Combination
12	Pipe - (448)	12.99	24	Cir	143.600	848.19	849.63	1.003	849.46	850.93	n/a	850.93	11	Combination
13	Pipe - (447)	11.19	18	Cir	143.600	849.73	851.17	1.003	850.94	852.45	0.38	852.45	12	Combination
14	Pipe - (446)	8.98	18	Cir	143.600	851.27	852.71	1.003	852.45	853.87	n/a	853.87 j	13	Combination
15	Pipe - (445)	6.31	18	Cir	143.600	852.81	854.25	1.003	853.87	855.22	n/a	855.22 j	14	Combination
16	Pipe - (444)	3.85	18	Cir	143.600	854.35	855.78	0.996	855.22	856.53	n/a	856.53 j	15	Combination
17	Pipe - (443)	1.86	15	Cir	143.600	855.88	857.31	0.996	856.53	857.85	n/a	857.85 j	16	Combination
18	Pipe - (462)	30.82	30	Cir	144.000	843.38	845.54	1.500	844.73	847.43	n/a	847.43	2	Combination
19	Pipe - (461)	20.92	30	Cir	144.000	845.64	847.80	1.500	847.43	849.35	n/a	849.35 j	18	Combination
20	Pipe - (460)	10.63	24	Cir	144.000	848.30	850.46	1.500	849.35	851.63	n/a	851.63	19	Combination

Project File: SOUTHRIDGE STORM V1.stm | Number of lines: 20 | Run Date: 4/28/2022

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	30.444	0.00	14.88	0.00	0.00	13.11	5.0	14.3	5.3	69.77	109.2	8.21	48	0.49	824.50	824.65	827.10	827.17	829.42	834.32	Pipe - (45
2	1	71.777	1.57	14.88	0.95	1.49	13.11	5.0	14.1	5.4	70.22	539.0	18.99	48	12.00	826.65	835.26	827.63	837.79	834.32	854.73	Pipe - (45
3	2	144.000	1.57	8.64	0.95	1.49	7.18	5.0	13.5	5.5	39.16	144.2	6.95	42	1.75	835.76	838.28	837.79	840.22	854.73	854.73	Pipe - (45
4	3	110.000	0.40	7.07	0.95	0.38	5.69	5.0	13.1	5.5	31.42	51.07	7.31	36	0.50	838.78	839.33	840.48	841.15	854.73	855.07	Pipe - (45
5	4	68.964	1.04	6.67	0.95	0.99	5.31	5.0	12.8	5.6	29.57	72.27	6.97	36	1.00	839.43	840.12	841.15	841.88	855.07	856.38	Pipe - (45
6	5	144.000	1.46	5.63	0.90	1.31	4.32	5.0	12.3	5.7	24.44	31.42	7.01	30	0.50	840.62	841.34	842.28	843.02	856.38	856.38	Pipe - (45
7	6	174.998	0.31	4.17	0.90	0.28	3.01	5.0	11.4	5.8	17.46	31.33	5.72	30	0.50	841.44	842.31	843.02	843.72	856.38	858.38	Pipe - (45
8	7	196.951	0.10	3.86	0.95	0.10	2.73	5.0	10.8	5.9	16.17	24.51	7.48	24	1.00	842.81	844.78	844.00	846.23	858.38	860.48	Pipe - (45
9	8	99.750	0.23	3.76	0.95	0.22	2.63	5.0	10.4	6.0	15.78	24.53	6.78	24	1.00	844.88	845.88	846.23	847.31	860.48	859.98	Pipe - (45
10	9	80.601	0.07	3.53	0.95	0.07	2.42	5.0	10.1	6.0	14.61	24.41	6.46	24	0.99	845.98	846.78	847.31	848.16	859.98	860.98	Pipe - (45
11	10	120.600	0.31	3.46	0.88	0.27	2.35	5.0	9.7	6.1	14.42	24.54	6.56	24	1.00	846.88	848.09	848.16	849.46	860.98	860.75	Pipe - (44
12	11	143.600	0.42	3.15	0.74	0.31	2.08	5.0	9.1	6.3	12.99	24.54	6.11	24	1.00	848.19	849.63	849.46	850.93	860.75	860.75	Pipe - (44
13	12	143.600	0.60	2.73	0.62	0.37	1.77	5.0	8.7	6.3	11.19	11.39	7.16	18	1.00	849.73	851.17	850.94	852.45	860.75	860.75	Pipe - (44
14	13	143.600	0.78	2.13	0.56	0.44	1.39	5.0	8.3	6.4	8.98	11.39	6.08	18	1.00	851.27	852.71	852.45	853.87	860.75	860.75	Pipe - (44
15	14	143.600	0.66	1.35	0.60	0.40	0.96	5.0	7.6	6.6	6.31	11.39	4.98	18	1.00	852.81	854.25	853.87	855.22	860.75	860.75	Pipe - (44
16	15	143.600	0.42	0.69	0.73	0.31	0.56	5.0	6.6	6.9	3.85	11.35	3.99	18	1.00	854.35	855.78	855.22	856.53	860.75	860.75	Pipe - (44
17	16	143.600	0.27	0.27	0.94	0.25	0.25	5.0	5.0	7.3	1.86	6.98	3.26	15	1.00	855.88	857.31	856.53	857.85	860.75	860.75	Pipe - (44
18	2	144.000	1.57	4.67	0.95	1.49	4.44	5.0	6.3	6.9	30.82	54.41	9.58	30	1.50	843.38	845.54	844.73	847.43	854.73	854.73	Pipe - (46
19	18	144.000	1.57	3.10	0.95	1.49	2.95	5.0	5.7	7.1	20.92	54.41	6.05	30	1.50	845.64	847.80	847.43	849.35	854.73	854.73	Pipe - (46
20	19	144.000	1.53	1.53	0.95	1.45	1.45	5.0	5.0	7.3	10.63	30.01	5.96	24	1.50	848.30	850.46	849.35	851.63	854.73	854.71	Pipe - (46

Project File: SOUTHRIDGE STORM V1.stm | Number of lines: 20 | Run Date: 4/28/2022

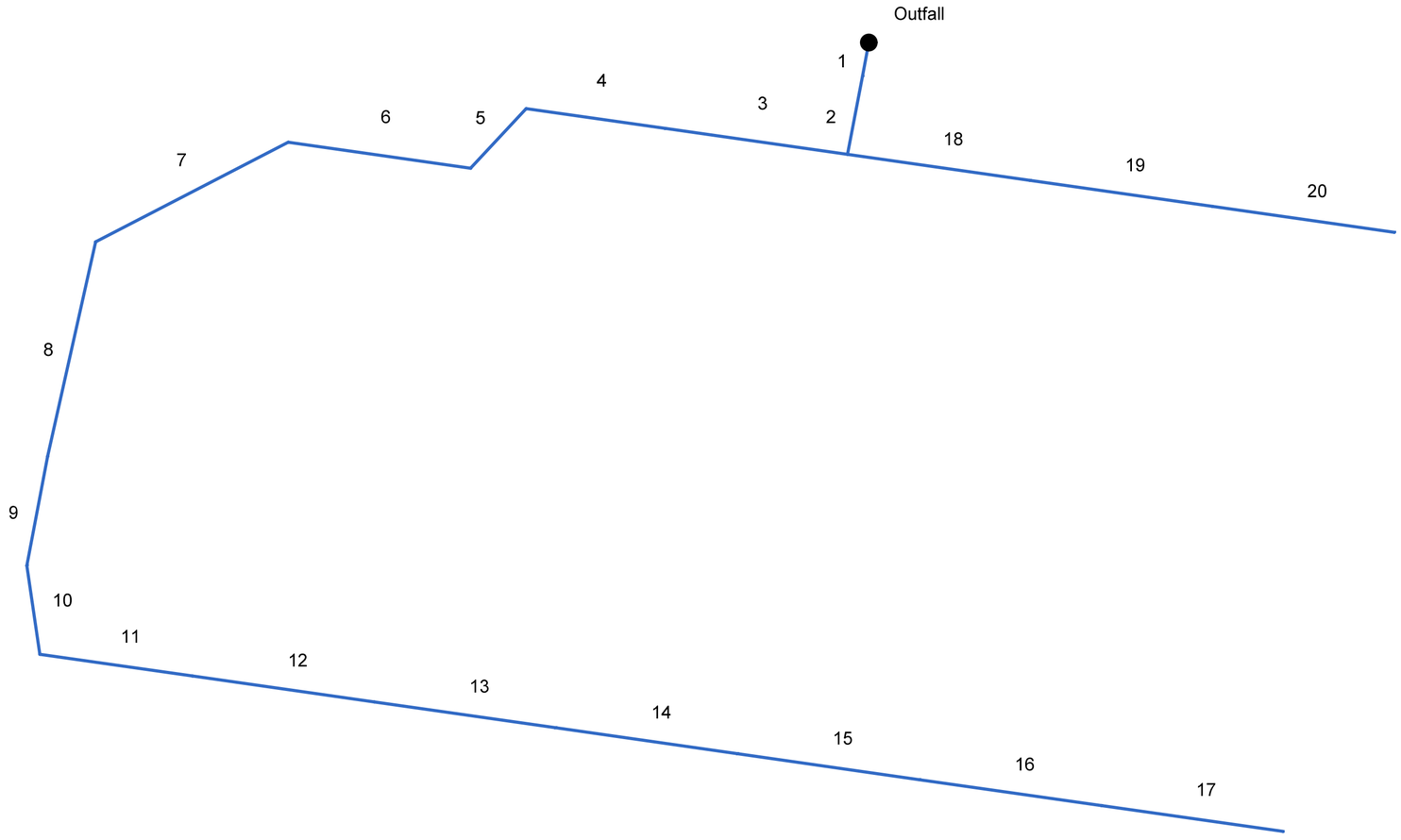
NOTES:Intensity = 81.83 / (Inlet time + 14.50) ^ 0.81; Return period =Yrs. 10 ; c = cir e = ellip b = box

HYDRAFLOW STORM SEWER OUTPUT

25YR-24HR STORM EVENT

April 28, 2022

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: SOUTHRIDGE STORM 2022.04.26.stm	Number of lines: 20	Date: 4/26/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	30.444	99.360	MH	0.00	0.00	0.00	5.0	824.50	0.49	824.65	48	Cir	0.012	0.15	834.32	Pipe - (459)
2	1	71.777	0.000	Comb	0.00	1.57	0.95	5.0	826.65	12.00	835.26	48	Cir	0.012	2.25	854.73	Pipe - (458)
3	2	144.000	90.000	Comb	0.00	1.57	0.95	5.0	835.76	1.75	838.28	42	Cir	0.012	0.50	854.73	Pipe - (457)
4	3	110.000	0.000	Comb	0.00	0.40	0.95	5.0	838.78	0.50	839.33	36	Cir	0.012	1.34	855.07	Pipe - (456)
5	4	68.964	-60.461	Comb	0.00	1.04	0.95	5.0	839.43	1.00	840.12	36	Cir	0.012	1.34	856.38	Pipe - (455)
6	5	144.000	60.461	Comb	0.00	1.46	0.90	5.0	840.62	0.50	841.34	30	Cir	0.012	1.04	856.38	Pipe - (454)
7	6	174.998	-40.274	Comb	0.00	0.31	0.90	5.0	841.44	0.50	842.31	30	Cir	0.012	1.18	858.38	Pipe - (453)
8	7	196.951	-48.131	Comb	0.00	0.10	0.95	5.0	842.81	1.00	844.78	24	Cir	0.012	0.50	860.48	Pipe - (452)
9	8	99.750	-1.595	Comb	0.00	0.23	0.95	5.0	844.88	1.00	845.88	24	Cir	0.012	0.50	859.98	Pipe - (451)
10	9	80.601	-16.580	Comb	0.00	0.07	0.95	5.0	845.98	0.99	846.78	24	Cir	0.012	1.45	860.98	Pipe - (450)
11	10	120.600	-73.420	Comb	0.00	0.31	0.88	5.0	846.88	1.00	848.09	24	Cir	0.012	0.50	860.75	Pipe - (449)
12	11	143.600	0.000	Comb	0.00	0.42	0.74	5.0	848.19	1.00	849.63	24	Cir	0.012	0.50	860.75	Pipe - (448)
13	12	143.600	0.000	Comb	0.00	0.60	0.62	5.0	849.73	1.00	851.17	18	Cir	0.012	0.50	860.75	Pipe - (447)
14	13	143.600	0.000	Comb	0.00	0.78	0.56	5.0	851.27	1.00	852.71	18	Cir	0.012	0.50	860.75	Pipe - (446)
15	14	143.600	0.000	Comb	0.00	0.66	0.60	5.0	852.81	1.00	854.25	18	Cir	0.012	0.50	860.75	Pipe - (445)
16	15	143.600	0.000	Comb	0.00	0.42	0.73	5.0	854.35	1.00	855.78	18	Cir	0.012	0.50	860.75	Pipe - (444)
17	16	143.600	0.000	Comb	0.00	0.27	0.94	5.0	855.88	1.00	857.31	15	Cir	0.012	1.00	860.75	Pipe - (443)
18	2	144.000	-90.000	Comb	0.00	1.57	0.95	5.0	843.38	1.50	845.54	30	Cir	0.012	0.50	854.73	Pipe - (462)
19	18	144.000	0.000	Comb	0.00	1.57	0.95	5.0	845.64	1.50	847.80	30	Cir	0.012	0.50	854.73	Pipe - (461)
20	19	144.000	0.000	Comb	0.00	1.53	0.95	5.0	848.30	1.50	850.46	24	Cir	0.012	1.00	854.71	Pipe - (460)

Project File: SOUTHRIDGE STORM 2022.04.26.stm | Number of lines: 20 | Date: 4/26/2022

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	JB-1	Manhole	834.32	Rect	2.00	2.00	48	Cir	824.65	48	Cir	826.65
2	CB-2	Combination	854.73	Rect	2.00	2.00	48	Cir	835.26	42 30	Cir Cir	835.76 843.38
3	CB-3	Combination	854.73	Rect	2.00	2.00	42	Cir	838.28	36	Cir	838.78
4	CB-4	Combination	855.07	Rect	2.00	2.00	36	Cir	839.33	36	Cir	839.43
5	CB-5	Combination	856.38	Rect	2.00	2.00	36	Cir	840.12	30	Cir	840.62
6	CB-6	Combination	856.38	Rect	2.00	2.00	30	Cir	841.34	30	Cir	841.44
7	CB-7	Combination	858.38	Rect	2.00	2.00	30	Cir	842.31	24	Cir	842.81
8	CB-8	Combination	860.48	Rect	2.00	2.00	24	Cir	844.78	24	Cir	844.88
9	CB-9	Combination	859.98	Rect	2.00	2.00	24	Cir	845.88	24	Cir	845.98
10	CB-10	Combination	860.98	Rect	2.00	2.00	24	Cir	846.78	24	Cir	846.88
11	CB-11	Combination	860.75	Rect	2.00	2.00	24	Cir	848.09	24	Cir	848.19
12	CB-12	Combination	860.75	Rect	2.00	2.00	24	Cir	849.63	18	Cir	849.73
13	CB-13	Combination	860.75	Rect	2.00	2.00	18	Cir	851.17	18	Cir	851.27
14	CB-14	Combination	860.75	Rect	2.00	2.00	18	Cir	852.71	18	Cir	852.81
15	CB-15	Combination	860.75	Rect	2.00	2.00	18	Cir	854.25	18	Cir	854.35
16	CB-16	Combination	860.75	Rect	2.00	2.00	18	Cir	855.78	15	Cir	855.88
17	CB-17	Combination	860.75	Rect	2.00	2.00	15	Cir	857.31			
18	CB-18	Combination	854.73	Rect	2.00	2.00	30	Cir	845.54	30	Cir	845.64
19	CB-19	Combination	854.73	Rect	2.00	2.00	30	Cir	847.80	24	Cir	848.30
20	CB-20	Combination	854.71	Rect	2.00	2.00	24	Cir	850.46			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (459)	82.74	48	Cir	30.444	824.50	824.65	0.493	827.10	827.40	n/a	827.40	End	Manhole
2	Pipe - (458)	83.19	48	Cir	71.777	826.65	835.26	11.996	827.71	838.02	2.83	838.02	1	Combination
3	Pipe - (457)	46.26	42	Cir	144.000	835.76	838.28	1.750	838.02	840.40	n/a	840.40 j	2	Combination
4	Pipe - (456)	37.04	36	Cir	110.000	838.78	839.33	0.499	840.68	841.31	1.17	841.31	3	Combination
5	Pipe - (455)	34.81	36	Cir	68.964	839.43	840.12	1.001	841.31	842.04	n/a	842.04	4	Combination
6	Pipe - (454)	28.69	30	Cir	144.000	840.62	841.34	0.500	842.50	843.22	0.85	844.07	5	Combination
7	Pipe - (453)	20.41	30	Cir	174.998	841.44	842.31	0.497	844.07	844.36	0.41	844.77	6	Combination
8	Pipe - (452)	18.84	24	Cir	196.951	842.81	844.78	1.000	844.77	846.34	n/a	846.34 j	7	Combination
9	Pipe - (451)	18.35	24	Cir	99.750	844.88	845.88	1.002	846.34	847.42	0.39	847.42	8	Combination
10	Pipe - (450)	16.96	24	Cir	80.601	845.98	846.78	0.993	847.42	848.26	n/a	848.26	9	Combination
11	Pipe - (449)	16.69	24	Cir	120.600	846.88	848.09	1.003	848.26	849.56	n/a	849.56	10	Combination
12	Pipe - (448)	14.99	24	Cir	143.600	848.19	849.63	1.003	849.56	851.02	0.32	851.02	11	Combination
13	Pipe - (447)	12.88	18	Cir	143.600	849.73	851.17	1.003	851.23*	853.07*	0.41	853.49	12	Combination
14	Pipe - (446)	10.30	18	Cir	143.600	851.27	852.71	1.003	853.49*	854.66*	0.26	854.93	13	Combination
15	Pipe - (445)	7.21	18	Cir	143.600	852.81	854.25	1.003	854.93	855.42	0.18	855.61	14	Combination
16	Pipe - (444)	4.36	18	Cir	143.600	854.35	855.78	0.996	855.61	856.58	n/a	856.58 j	15	Combination
17	Pipe - (443)	2.08	15	Cir	143.600	855.88	857.31	0.996	856.58	857.88	n/a	857.88 j	16	Combination
18	Pipe - (462)	34.90	30	Cir	144.000	843.38	845.54	1.500	844.84	847.54	0.53	847.54	2	Combination
19	Pipe - (461)	23.59	30	Cir	144.000	845.64	847.80	1.500	847.54	849.45	n/a	849.45 j	18	Combination
20	Pipe - (460)	11.92	24	Cir	144.000	848.30	850.46	1.500	849.45	851.70	n/a	851.70	19	Combination

Project File: SOUTHRIDGE STORM 2022.04.26.stm | Number of lines: 20 | Run Date: 4/26/2022

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

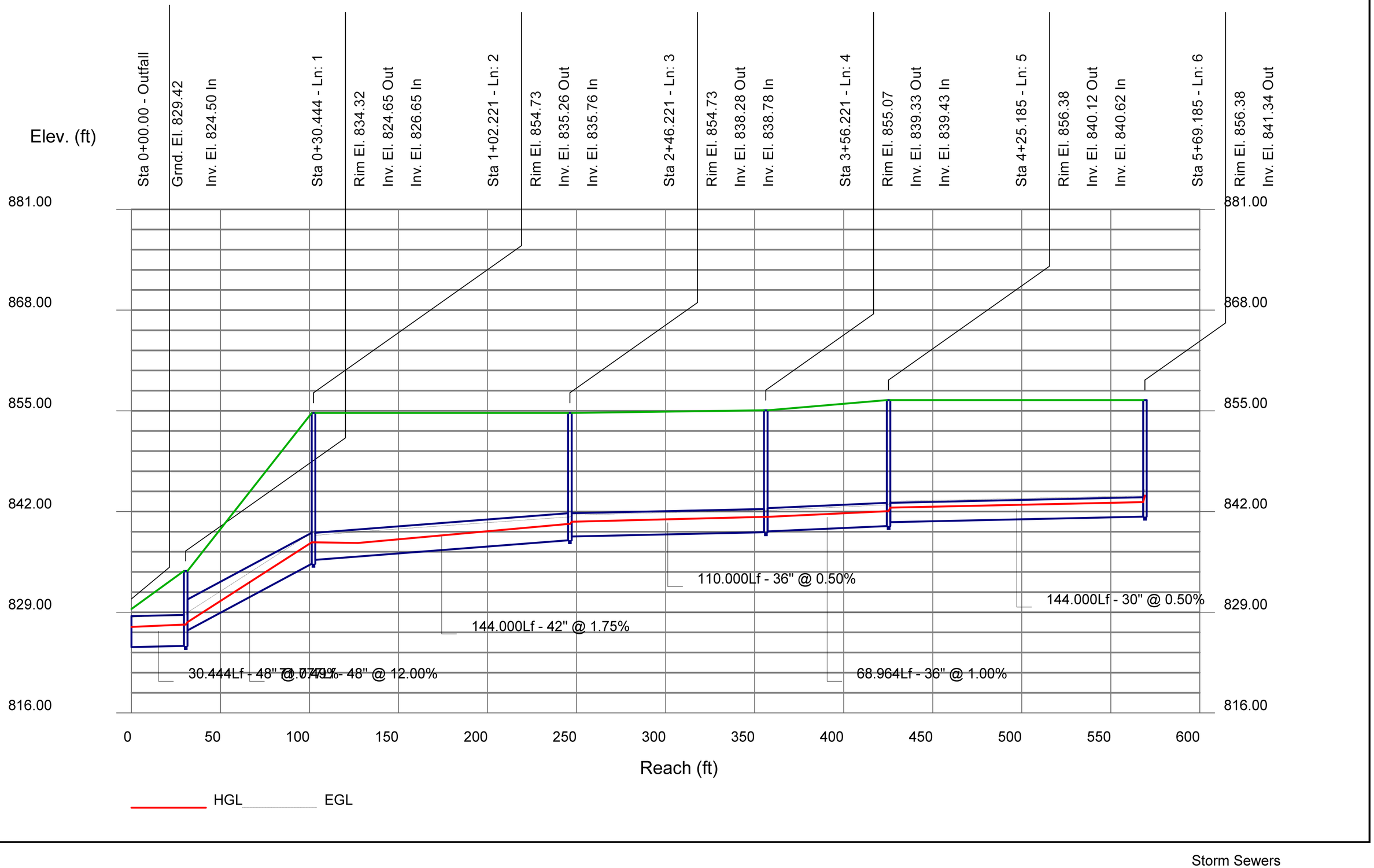
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	30.444	0.00	14.88	0.00	0.00	13.11	5.0	13.2	6.3	82.74	109.2	9.26	48	0.49	824.50	824.65	827.10	827.40	829.42	834.32	Pipe - (45
2	1	71.777	1.57	14.88	0.95	1.49	13.11	5.0	13.0	6.3	83.19	539.0	20.04	48	12.00	826.65	835.26	827.71	838.02	834.32	854.73	Pipe - (45
3	2	144.000	1.57	8.64	0.95	1.49	7.18	5.0	12.5	6.4	46.26	144.2	7.31	42	1.75	835.76	838.28	838.02	840.40	854.73	854.73	Pipe - (45
4	3	110.000	0.40	7.07	0.95	0.38	5.69	5.0	12.1	6.5	37.04	51.06	7.68	36	0.50	838.78	839.33	840.68	841.31	854.73	855.07	Pipe - (45
5	4	68.964	1.04	6.67	0.95	0.99	5.31	5.0	11.8	6.6	34.81	72.27	7.39	36	1.00	839.43	840.12	841.31	842.04	855.07	856.38	Pipe - (45
6	5	144.000	1.46	5.63	0.90	1.31	4.32	5.0	11.4	6.6	28.69	31.42	7.25	30	0.50	840.62	841.34	842.50	843.22	856.38	856.38	Pipe - (45
7	6	174.998	0.31	4.17	0.90	0.28	3.01	5.0	10.7	6.8	20.41	31.33	4.45	30	0.50	841.44	842.31	844.07	844.36	856.38	858.38	Pipe - (45
8	7	196.951	0.10	3.86	0.95	0.10	2.73	5.0	10.1	6.9	18.84	24.51	6.59	24	1.00	842.81	844.78	844.77	846.34	858.38	860.48	Pipe - (45
9	8	99.750	0.23	3.76	0.95	0.22	2.63	5.0	9.8	7.0	18.35	24.53	7.26	24	1.00	844.88	845.88	846.34	847.42	860.48	859.98	Pipe - (45
10	9	80.601	0.07	3.53	0.95	0.07	2.42	5.0	9.6	7.0	16.96	24.41	6.89	24	0.99	845.98	846.78	847.42	848.26	859.98	860.98	Pipe - (45
11	10	120.600	0.31	3.46	0.88	0.27	2.35	5.0	9.2	7.1	16.69	24.54	6.97	24	1.00	846.88	848.09	848.26	849.56	860.98	860.75	Pipe - (44
12	11	143.600	0.42	3.15	0.74	0.31	2.08	5.0	8.7	7.2	14.99	24.54	6.47	24	1.00	848.19	849.63	849.56	851.02	860.75	860.75	Pipe - (44
13	12	143.600	0.60	2.73	0.62	0.37	1.77	5.0	8.3	7.3	12.88	11.39	7.29	18	1.00	849.73	851.17	851.23	853.07	860.75	860.75	Pipe - (44
14	13	143.600	0.78	2.13	0.56	0.44	1.39	5.0	7.9	7.4	10.30	11.39	5.83	18	1.00	851.27	852.71	853.49	854.66	860.75	860.75	Pipe - (44
15	14	143.600	0.66	1.35	0.60	0.40	0.96	5.0	7.4	7.5	7.21	11.39	4.47	18	1.00	852.81	854.25	854.93	855.42	860.75	860.75	Pipe - (44
16	15	143.600	0.42	0.69	0.73	0.31	0.56	5.0	6.4	7.8	4.36	11.35	3.65	18	1.00	854.35	855.78	855.61	856.58	860.75	860.75	Pipe - (44
17	16	143.600	0.27	0.27	0.94	0.25	0.25	5.0	5.0	8.2	2.08	6.98	3.36	15	1.00	855.88	857.31	856.58	857.88	860.75	860.75	Pipe - (44
18	2	144.000	1.57	4.67	0.95	1.49	4.44	5.0	6.1	7.9	34.90	54.41	10.02	30	1.50	843.38	845.54	844.84	847.54	854.73	854.73	Pipe - (46
19	18	144.000	1.57	3.10	0.95	1.49	2.95	5.0	5.6	8.0	23.59	54.41	6.36	30	1.50	845.64	847.80	847.54	849.45	854.73	854.73	Pipe - (46
20	19	144.000	1.53	1.53	0.95	1.45	1.45	5.0	5.0	8.2	11.92	30.01	6.09	24	1.50	848.30	850.46	849.45	851.70	854.73	854.71	Pipe - (46

Project File: SOUTHRIDGE STORM 2022.04.26.stm | Number of lines: 20 | Run Date: 4/26/2022

NOTES:Intensity = 107.81 / (Inlet time + 17.20) ^ 0.83; Return period =Yrs. 25 ; c = cir e = ellip b = box

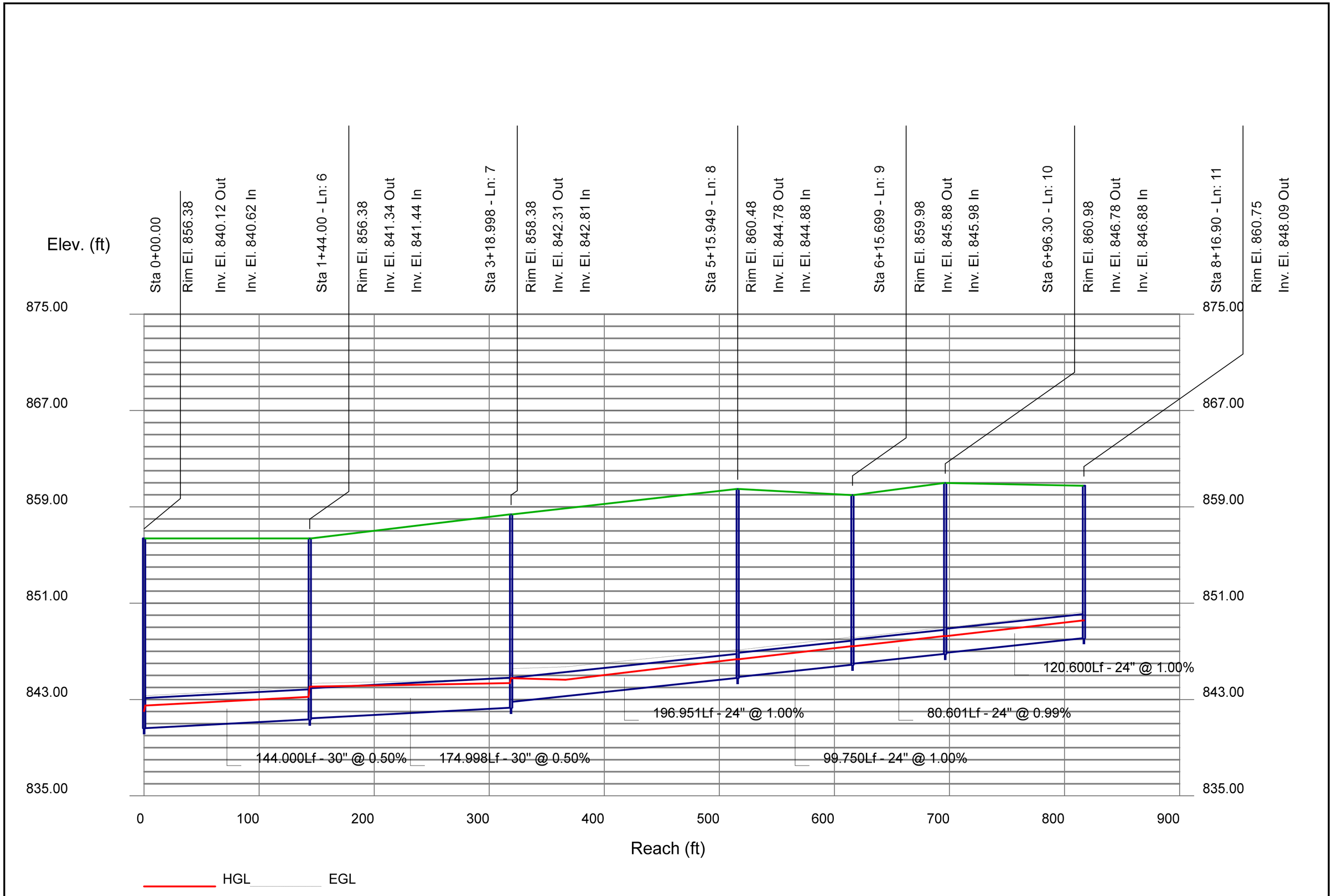
Storm Sewer Profile

Proj. file: SOUTHRIDGE STORM V1.stm



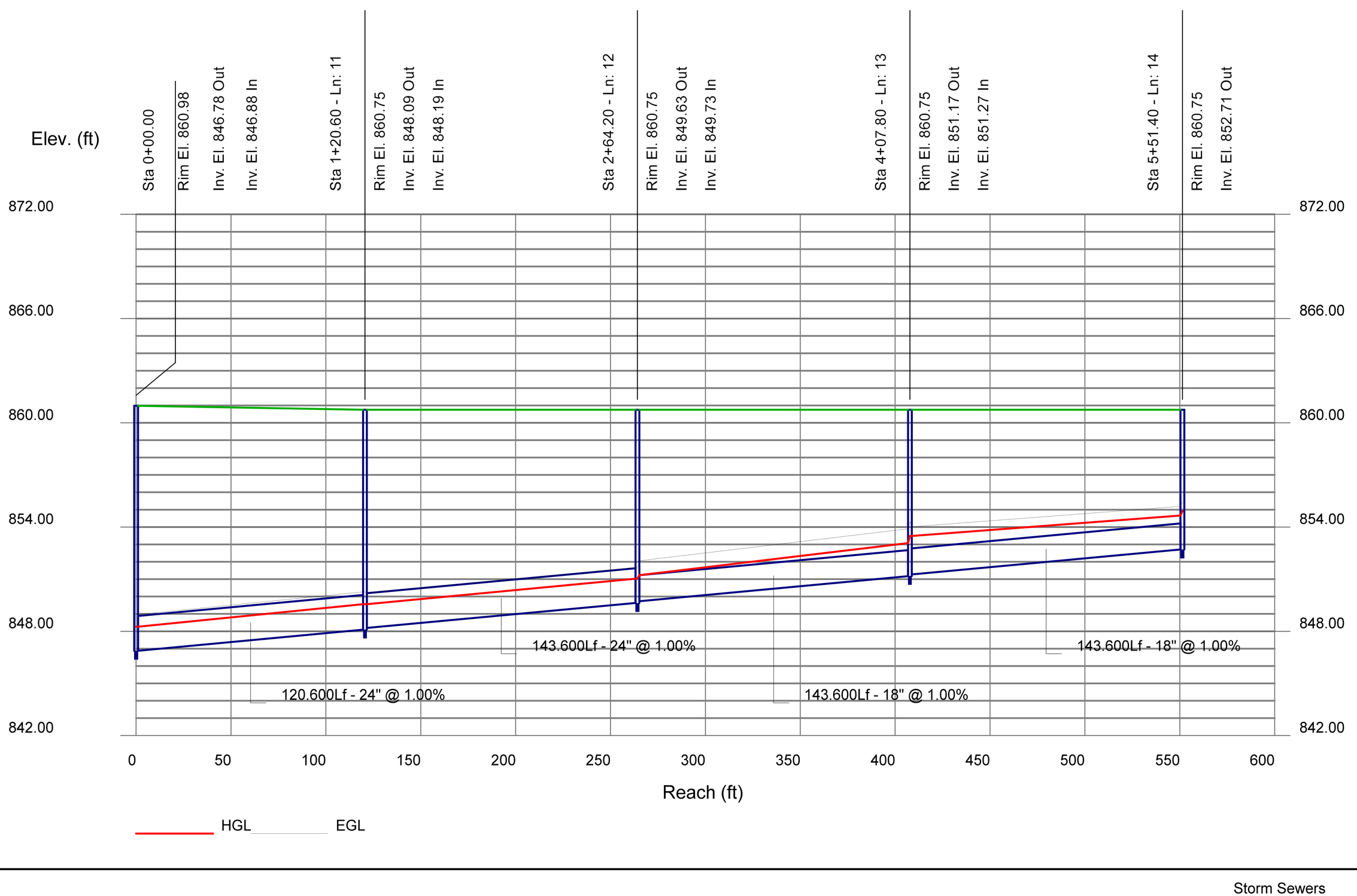
Storm Sewer Profile

Proj. file: SOUTHRIDGE STORM V1.stm



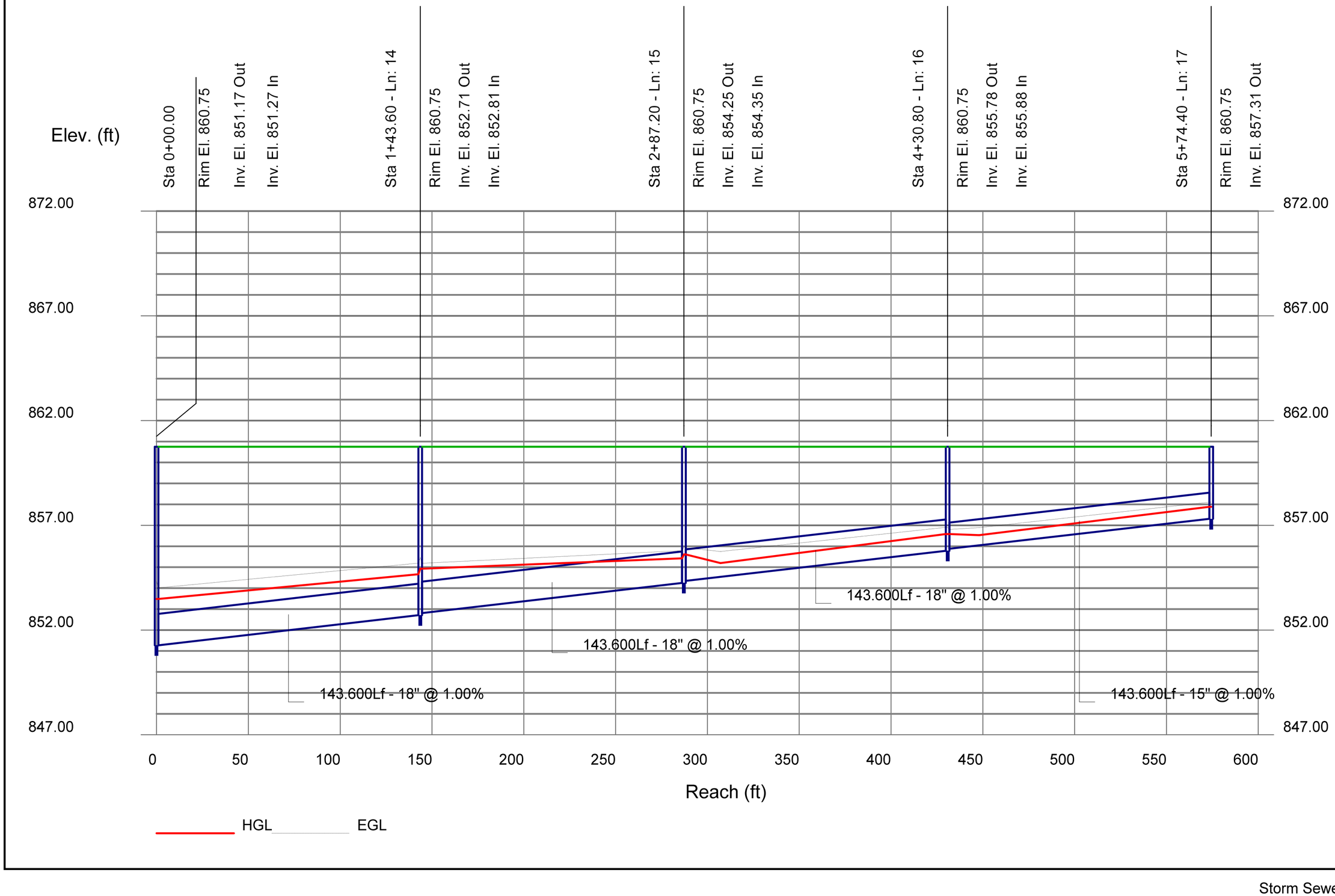
Storm Sewer Profile

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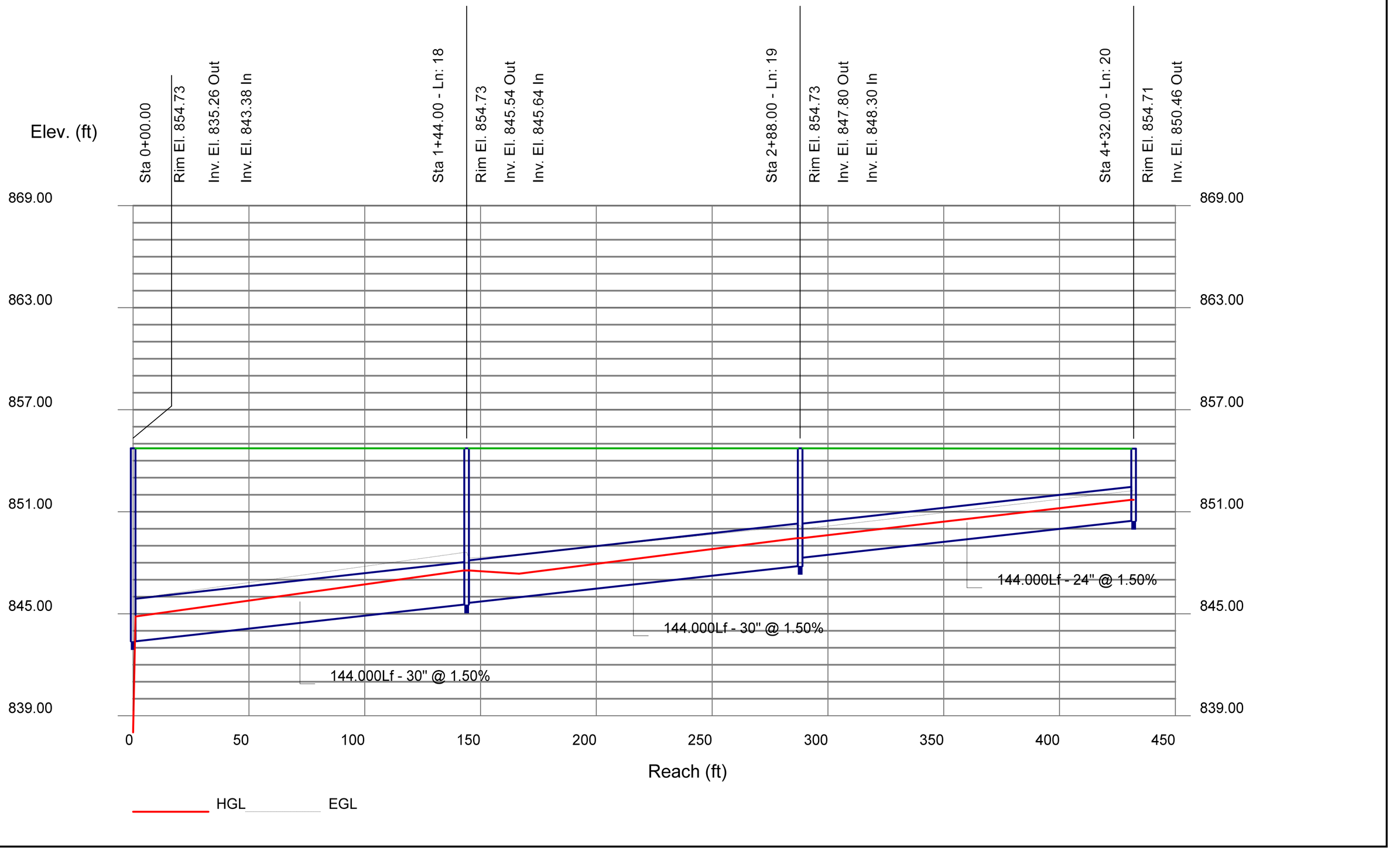
Storm Sewer Profile

Proj. file: SOUTHRIDGE STORM V1.stm



Storm Sewer Profile

Proj. file: SOUTHRIDGE STORM V1.stm



OAK ENGINEERING

HYDRAFLOW STORM SEWER OUTPUT

50YR-24HR CULVERT DESIGN

April 28, 2022

Summary for Subcatchment 4S: DA TO CULVERT

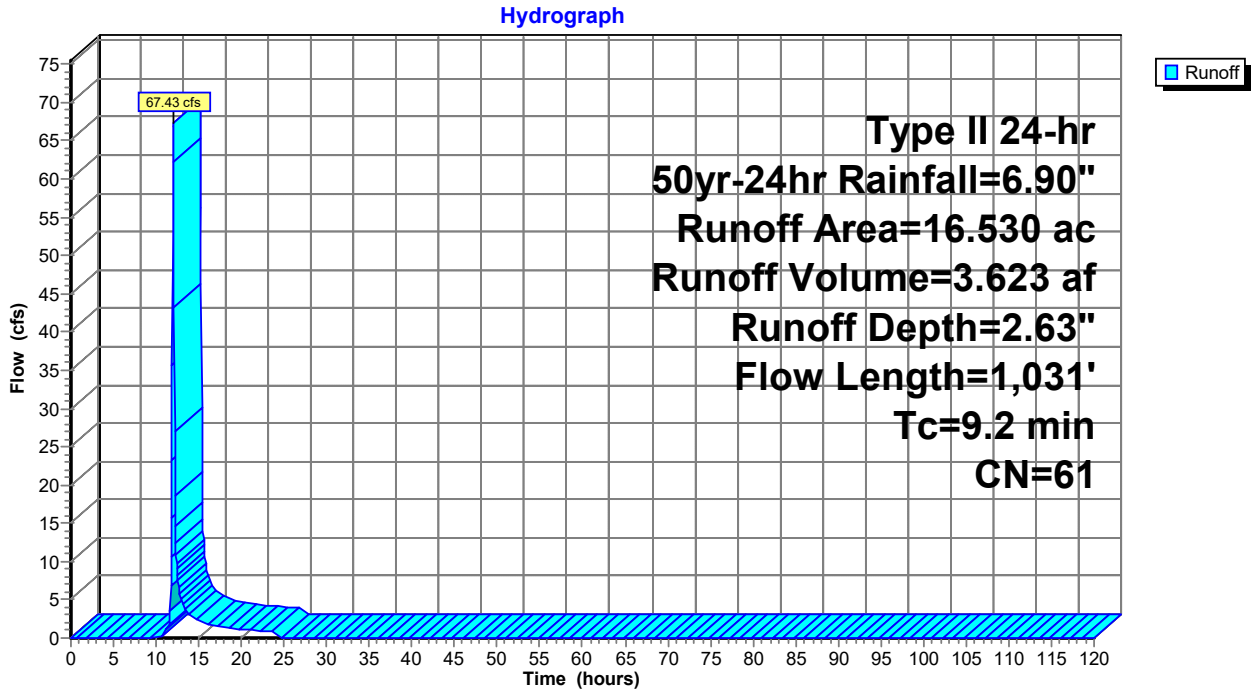
Runoff = 67.43 cfs @ 12.01 hrs, Volume= 3.623 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 50yr-24hr Rainfall=6.90"

	Area (ac)	CN	Description
	4.230	55	Woods, Good, HSG B
*	0.700	98	Southridge Impervious
	11.600	61	>75% Grass cover, Good, HSG B
	16.530	61	Weighted Average
	15.830		95.77% Pervious Area
	0.700		4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	38	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
4.4	993	0.0544	3.76		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.2	1,031	Total			

Subcatchment 4S: DA TO CULVERT



Hydrograph for Subcatchment 4S: DA TO CULVERT

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.50	0.19	0.00	0.00
5.00	0.43	0.00	0.00
7.50	0.75	0.00	0.00
10.00	1.25	0.00	**0.00**
12.50	5.07	1.41	**8.20**
15.00	5.89	1.93	2.35
17.50	6.29	2.20	1.54
20.00	6.57	2.40	1.08
22.50	**6.78**	**2.55**	0.97
25.00	**6.90**	**2.63**	0.00
27.50	6.90	2.63	0.00
30.00	6.90	2.63	0.00
32.50	6.90	2.63	0.00
35.00	6.90	2.63	0.00
37.50	6.90	2.63	0.00
40.00	6.90	2.63	0.00
42.50	6.90	2.63	0.00
45.00	6.90	2.63	0.00
47.50	6.90	2.63	0.00
50.00	6.90	2.63	0.00
52.50	6.90	2.63	0.00
55.00	6.90	2.63	0.00
57.50	6.90	2.63	0.00
60.00	6.90	2.63	0.00
62.50	6.90	2.63	0.00
65.00	6.90	2.63	0.00
67.50	6.90	2.63	0.00
70.00	6.90	2.63	0.00
72.50	6.90	2.63	0.00
75.00	6.90	2.63	0.00
77.50	6.90	2.63	0.00
80.00	6.90	2.63	0.00
82.50	6.90	2.63	0.00
85.00	6.90	2.63	0.00
87.50	6.90	2.63	0.00
90.00	6.90	2.63	0.00
92.50	6.90	2.63	0.00
95.00	6.90	2.63	0.00
97.50	6.90	2.63	0.00
100.00	6.90	2.63	0.00
102.50	6.90	2.63	0.00
105.00	6.90	2.63	0.00
107.50	6.90	2.63	0.00
110.00	6.90	2.63	0.00
112.50	6.90	2.63	0.00
115.00	6.90	2.63	0.00
117.50	6.90	2.63	0.00
120.00	6.90	2.63	0.00

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

Driveway Culvert

Invert Elev Dn (ft)	=	833.00
Pipe Length (ft)	=	106.00
Slope (%)	=	4.72
Invert Elev Up (ft)	=	838.00
Rise (in)	=	48.0
Shape	=	Circular
Span (in)	=	48.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

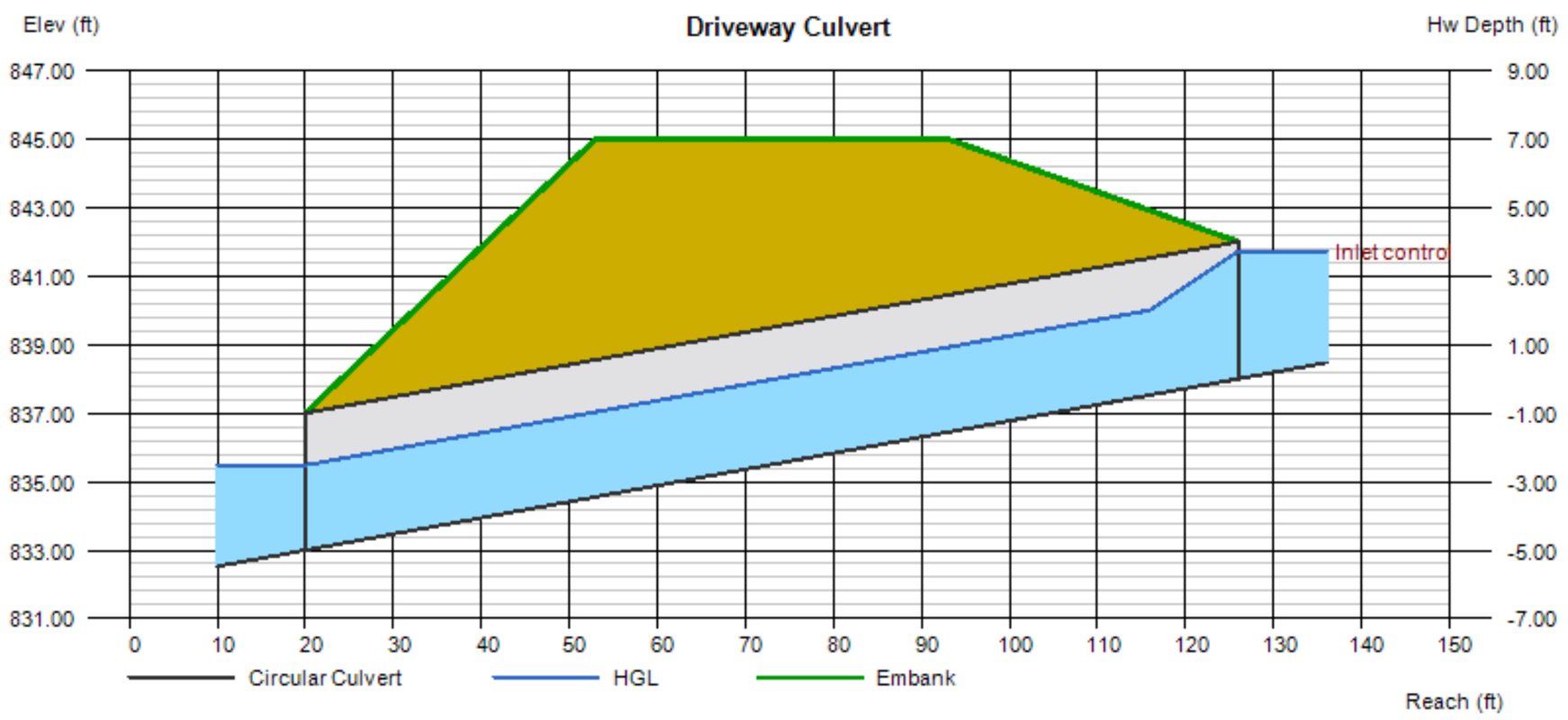
Top Elevation (ft)	=	845.00
Top Width (ft)	=	40.00
Crest Width (ft)	=	10.00

Calculations

Qmin (cfs)	=	67.43
Qmax (cfs)	=	67.43
Tailwater Elev (ft)	=	Normal

Highlighted

Qtotal (cfs)	=	67.43
Qpipe (cfs)	=	67.43
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	8.25
Veloc Up (ft/s)	=	8.25
HGL Dn (ft)	=	835.48
HGL Up (ft)	=	840.48
Hw Elev (ft)	=	841.72
Hw/D (ft)	=	0.93
Flow Regime	=	Inlet Control



EROSION CONTROL

SKIMMER SEDIMENT BASIN #1 W/ RISER PHASE 1
SKIMMER SEDIMENT BASIN #2 W/ RISER PHASE 1
SKIMMER SEDIMENT BASIN #1 W/ RISER PHASE 2
TEMPORARY DIVERSION DITCH CALCULATIONS
RIP RAP CALCULATIONS

April 28, 2022

SEDIMENT BASIN CALCULATIONS			
SOUTHRIDGE BESSMER			
OAK JOB NO.:	022-003		
DATE:	4/26/2022	BY:	MB
REVISED:	03/15/22	RVW:	LB

OAK ENGINEERING
4929 MONROE ROAD - CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

FAIRCLOTH SKIMMER TYPE BASIN DESIGN WITH RISER 1 PH 1

DRAINAGE AREAS/REQ'D STORAGE			
Total drainage area (TDA)		15.30	ac
Disturbed area(DA)		15.30	ac
Rqd sediment storage	1800xDA	27540	cf

ESTIMATED BASIN SIZE (RECTANGULAR)	Length(ft)	Width(ft)
Bottom	130	62
Top	150	82

BASIN CONFIGURATION		
Proposed sediment depth	3	ft
Depth of flow over spillway	1.5	ft
Bottom elevation of basin	825.0	msl
Skimmer Invert elevation	826.0	msl
Sediment Storage elevation	828.0	msl
Spillway crest	828.5	msl
Top of Berm	830.0	msl

PLANNED BASIN SIZE (REFER TO EROSION CONTROL PLAN)

Elev.	Area (SF)	Cumulative Volume (CF)
825	27138	0
826	29999	28569
827	33006	60071
828	36164	94656
828.5	39488	113569
829	39488	133313
830	42992	174553

BASIN EFFICIENCY	
Sediment storage required:	27540 cf
Sediment storage provided:	66087 cf
Surface area required (25-yr 24-hr Storm):	32747 sf
Surface area provided:	39488 sf

SKIMMER/ORIFICE DESIGN

Basin No. 1 PH 1 — Required Volume

Total Required Sediment Storage: 27540 cf
Skimmer Size: 4 in.
Of Skimmers: 1

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	3202.00	3.31
3	4803.00	2.70
4	6404.00	2.34
5	8005.00	2.09

Orifice Size = 3.25 in.

Basin No. 1 PH 1 — Provided Storage

Total Provided Sediment Storage: 66,087 cf
Skimmer Size: 4 in.
Of Skimmers: 1

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	3202.00	5.13
3	4803.00	4.19
4	6404.00	3.62
5	8005.00	3.24

Orifice Size = 3.25 in.

SKIMMER CONNECTION PIPE LENGTH = 5 FT.

**Calculations reflect J.W. Faircloth & Son, Inc. faircloth skimmer technical sizing instructions.*

SKIMMER DESIGN TABLE

	CF drained	Drawdown	Factor		CF drained	Drawdown	Factor
1.5" Skimmer	1728	1 day	960	4" Skimmer	20109	1 day	1601
	3456	2 days	1920		40218	2 days	3202
	5184	3 days	2880		60327	3 days	4803
	6912	4 days	3840		80436	4 days	6404
	12096	7 days	6720		140763	7 days	11207
2" Skimmer	3283	1 day	1123	5" Skimmer	32832	1 day	1642
	6566	2 days	2246		65664	2 days	3283
	9849	3 days	3369		98496	3 days	4926
	13132	4 days	4492		131328	4 days	6568
	22981	7 days	7861		229824	7 days	11491
2.5" Skimmer	6234	1 day	1270	6" Skimmer	51840	1 day	1814
	12468	2 days	2540		103680	2 days	3628
	18702	3 days	3810		155520	3 days	5442
	24936	4 days	5080		207360	4 days	7256
	43638	7 days	8890		362880	7 days	12701
3" Skimmer	9744	1 day	1382	8" Skimmer	97978	1 day	1987
	19548	2 days	2765		195956	2 days	3974
	29322	3 days	4146		293934	3 days	5961
	39096	4 days	5528		391912	4 days	7948
	68418	7 days	9677		658846	7 days	13909

This table contains maximum drainage volumes for a given Skimmer size and drawdown period.

The orifice area is calculated by dividing the Provided storage volume by the corresponding Factor. The factors are taken from the table and were generated assuming a constant head.

The diameter of the orifice is calculated by: (2*(√(Area/3.14))

SEDIMENT BASIN CALCULATIONS			
SOUTHRIDGE BESSMER			
OAK JOB NO.:	022-003		
DATE:	4/26/2022	BY:	MB
REVISED:	03/15/22	RVW:	LB

OAK ENGINEERING
4929 MONROE ROAD - CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

FAIRCLOTH SKIMMER TYPE BASIN DESIGN WITH RISER 2 PH 1

DRAINAGE AREAS/REQ'D STORAGE		
Total drainage area (TDA)		5.32 ac
Disturbed area(DA)		5.32 ac
Rqd sediment storage	1800xDA	9576 cf

ESTIMATED BASIN SIZE (RECTANGULAR)	Length(ft)	Width(ft)
Bottom	94	45
Top	110	61

BASIN CONFIGURATION	
Proposed sediment depth	2 ft
Depth of flow over spillway	0.5 ft
Bottom elevation of basin	836.0 msl
Skimmer Invert elevation	836.0 msl
Sediment Storage elevation	838.0 msl
Spillway crest	839.5 msl
Top of Berm	840.0 msl

PLANNED BASIN SIZE (REFER TO EROSION CONTROL PLAN)

Elev.	Area (SF)	Cumulative Volume (CF)
836	6336	0
837	7644	6990
838	9024	15324
839	10473	25073
839.5	11226	30497
840	11979	

BASIN EFFICIENCY	
Sediment storage required:	9576 cf
Sediment storage provided:	15324 cf
Surface area required (25-yr 24-hr Storm):	10436 sf
Surface area provided:	11226 sf

SKIMMER/ORIFICE DESIGN

Basin No. 2 PH 1 — Required Volume

Total Required Sediment Storage: 9576 cf
Skimmer Size: 2.5 in.
Of Skimmers: 1

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	2540.00	2.19
3	3810.00	1.79
4	5080.00	1.55
5	6350.00	1.39

Orifice Size = 1.75 in.

Basin No. 2 PH 1 — Provided Storage

Total Provided Sediment Storage: 15,324 cf
Skimmer Size: 2.5 in.
Of Skimmers: 1

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	2540.00	2.77
3	3810.00	2.26
4	5080.00	1.96
5	6350.00	1.75

Orifice Size = 1.75 in.

SKIMMER CONNECTION PIPE LENGTH = 5 FT.

Calculations reflect J.W. Faircloth & Son, Inc. faircloth skimmer technical sizing instructions.

SKIMMER DESIGN TABLE

	CF drained	Drawdown	Factor		CF drained	Drawdown	Factor
1.5" Skimmer	1728	1 day	960	4" Skimmer	20109	1 day	1601
	3456	2 days	1920		40218	2 days	3202
	5184	3 days	2880		60327	3 days	4803
	6912	4 days	3840		80436	4 days	6404
	12096	7 days	6720		140763	7 days	11207
2" Skimmer	3283	1 day	1123	5" Skimmer	32832	1 day	1642
	6566	2 days	2246		65664	2 days	3283
	9849	3 days	3369		98496	3 days	4926
	13132	4 days	4492		131328	4 days	6568
	22981	7 days	7861		229824	7 days	11491
2.5" Skimmer	6234	1 day	1270	6" Skimmer	51840	1 day	1814
	12468	2 days	2540		103680	2 days	3628
	18702	3 days	3810		155520	3 days	5442
	24936	4 days	5080		207360	4 days	7256
	43638	7 days	8890		362880	7 days	12701
3" Skimmer	9744	1 day	1382	8" Skimmer	97978	1 day	1987
	19548	2 days	2765		195956	2 days	3974
	29322	3 days	4146		293934	3 days	5961
	39096	4 days	5528		391912	4 days	7948
	68418	7 days	9677		658846	7 days	13909

This table contains maximum drainage volumes for a given Skimmer size and drawdown period.

The orifice area is calculated by dividing the Provided storage volume by the corresponding Factor. The factors are taken from the table and were generated assuming a constant head.

The diameter of the orifice is calculated by: (2*(√(Area/3.14))

SEDIMENT BASIN CALCULATIONS			
SOUTHRIDGE BESSMER			
OAK JOB NO.:	022-003		
DATE:	4/26/2022	BY:	MB
REVISED:	03/15/22	RVW:	LB

OAK ENGINEERING
4929 MONROE ROAD - CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

FAIRCLOTH SKIMMER TYPE BASIN DESIGN WITH RISER 1 PH 2

DRAINAGE AREAS/REQ'D STORAGE			
Total drainage area (TDA)		17.31	ac
Disturbed area(DA)		17.31	ac
Rqd sediment storage	1800xDA	31158	cf

ESTIMATED BASIN SIZE (RECTANGULAR)	Length(ft)	Width(ft)
Bottom	139	67
Top	159	87

BASIN CONFIGURATION		
Proposed sediment depth	3	ft
Depth of flow over spillway	1.5	ft
Bottom elevation of basin	825.0	msl
Skimmer Invert elevation	826.0	msl
Sediment Storage elevation	828.0	msl
Spillway crest	828.5	msl
Top of Berm	830.0	msl

PLANNED BASIN SIZE (REFER TO EROSION CONTROL PLAN)

Elev.	Area (SF)	Cumulative Volume (CF)
825	27138	0
826	29999	28569
827	33006	60071
828	36164	94656
828.5	39488	113569
829	39488	133313
830	42992	174553

BASIN EFFICIENCY	
Sediment storage required:	31158 cf
Sediment storage provided:	66087 cf
Surface area required (25-yr 24-hr Storm):	37049 sf
Surface area provided:	39488 sf

SKIMMER/ORIFICE DESIGN

Basin No. 1 PH 2 — Required Volume		
Total Required Sediment Storage:	31158	cf
Skimmer Size:	4	in.
# Of Skimmers:	1	

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	3202.00	3.52
3	4803.00	2.87
4	6404.00	2.49
5	8005.00	2.23

Orifice Size = 3.25 in.

Basin No. 1 PH 2 — Provided Storage		
Total Provided Sediment Storage:	66,087	cf
Skimmer Size:	4	in.
# Of Skimmers:	1	

Draw Down Time (Days)	Flow Rate (ft^3/day)	Required Orifice Diameter (in.)
2	3202.00	5.13
3	4803.00	4.19
4	6404.00	3.62
5	8005.00	3.24

Orifice Size = 3.25 in.

SKIMMER CONNECTION PIPE LENGTH = 5 FT.

**Calculations reflect J.W. Faircloth & Son, Inc. faircloth skimmer technical sizing instructions.*

SKIMMER DESIGN TABLE

	CF drained	Drawdown	Factor		CF drained	Drawdown	Factor
1.5" Skimmer	1728	1 day	960	4" Skimmer	20109	1 day	1601
	3456	2 days	1920		40218	2 days	3202
	5184	3 days	2880		60327	3 days	4803
	6912	4 days	3840		80436	4 days	6404
	12096	7 days	6720		140763	7 days	11207
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	9849	3 days	3369		98496	3 days	4926
	13132	4 days	4492		131328	4 days	6568
	22981	7 days	7861		229824	7 days	11491
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	18702	3 days	3810		155520	3 days	5442
	24936	4 days	5080		207360	4 days	7256
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	39096	4 days	5528		391912	4 days	7948
	68418	7 days	9677		658846	7 days	13909

This table contains maximum drainage volumes for a given Skimmer size and drawdown period.

The orifice area is calculated by dividing the Provided storage volume by the corresponding Factor. The factors are taken from the table and were generated assuming a constant head.

The diameter of the orifice is calculated by: (2*(√(Area/3.14))

Hydrology Report

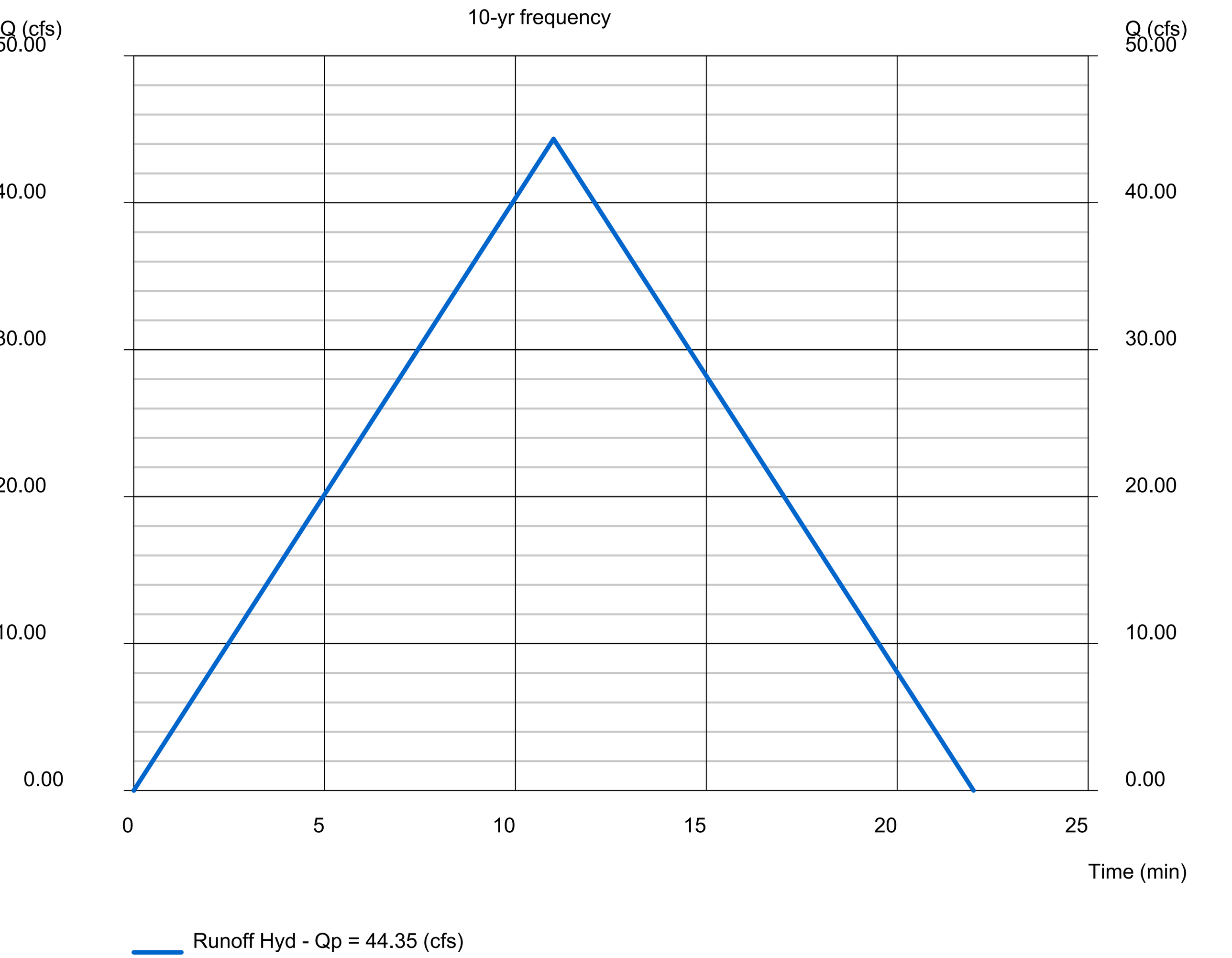
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD 1 DA

Hydrograph type	=	Rational	Peak discharge (cfs)	=	44.35
Storm frequency (yrs)	=	10	Time interval (min)	=	1
Drainage area (ac)	=	12.630	Runoff coeff. (C)	=	0.6
Rainfall Inten (in/hr)	=	5.852	Tc by User (min)	=	11
IDF Curve	=	Bessemer City.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 29,270 (cuft); 0.672 (acft)

Runoff Hydrograph



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No.1

Trapezoidal

Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 2.00, 2.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 824.00
Slope (%)	= 2.00
N-Value	= 0.025

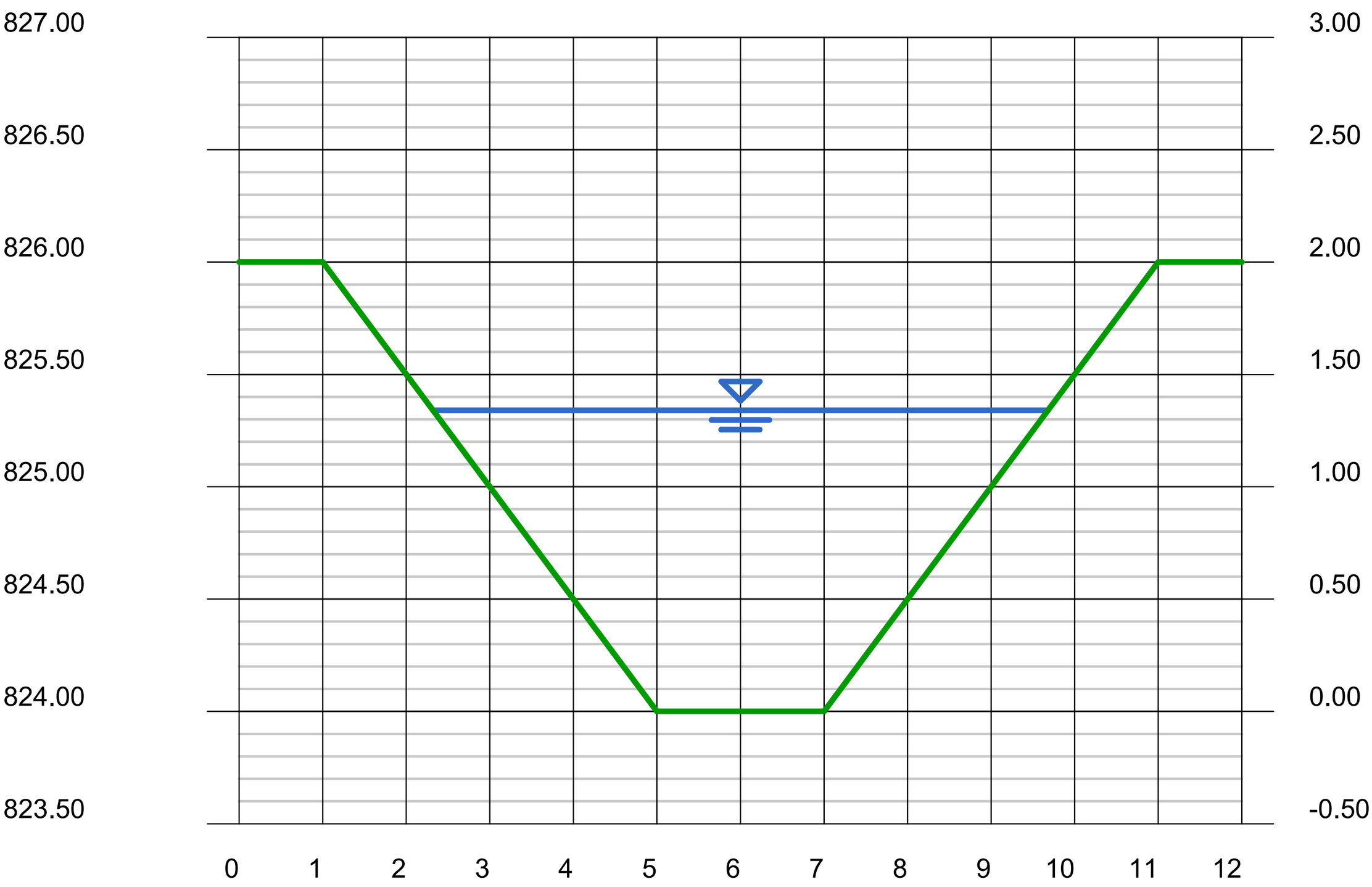
Calculations

Compute by:	Known Q
Known Q (cfs)	= 44.35

Highlighted

Depth (ft)	= 1.34
Q (cfs)	= 44.35
Area (sqft)	= 6.27
Velocity (ft/s)	= 7.07
Wetted Perim (ft)	= 7.99
Crit Depth, Yc (ft)	= 1.56
Top Width (ft)	= 7.36
EGL (ft)	= 2.12

Section



Hydrology Report

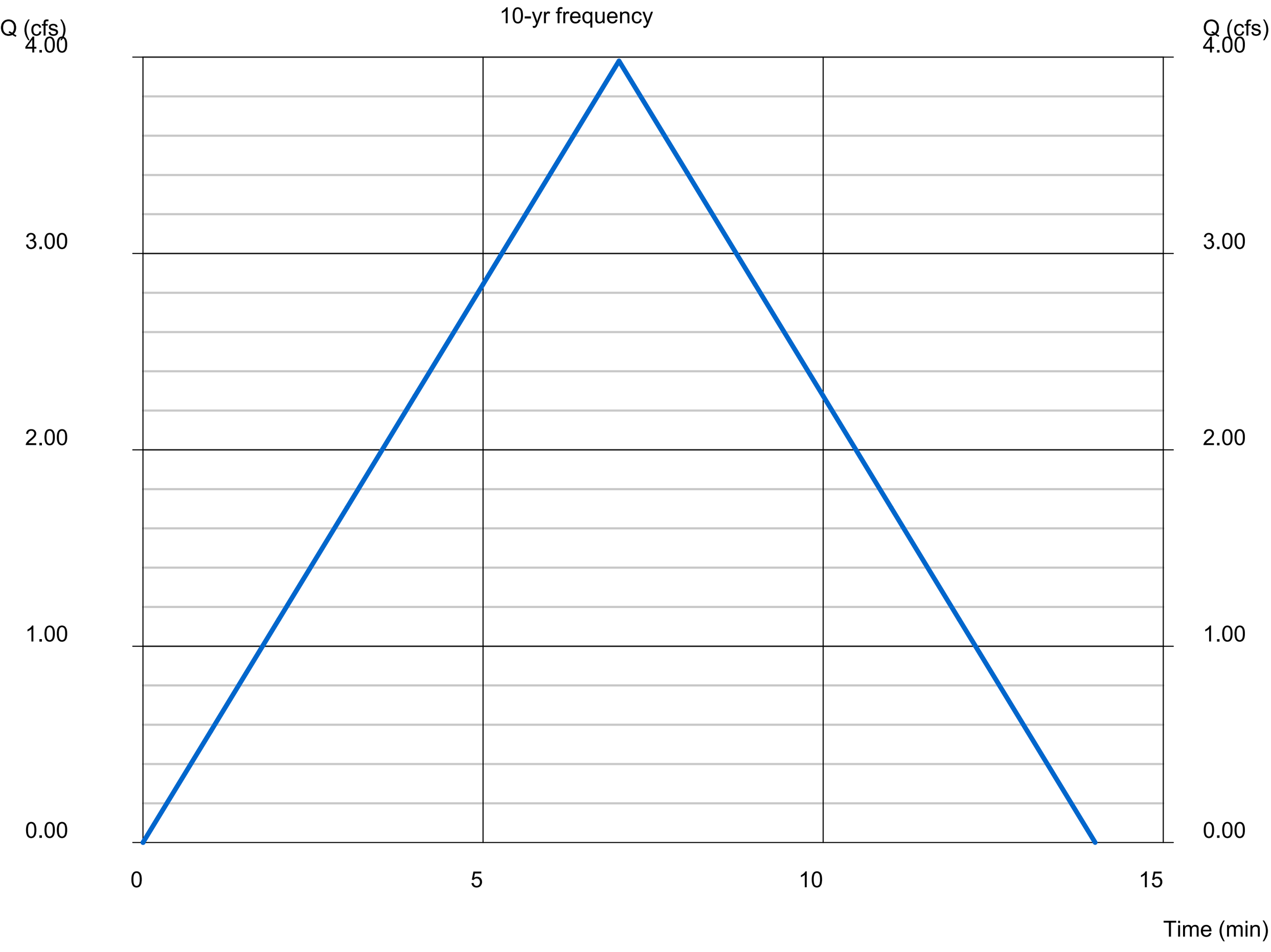
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD 2 DA

Hydrograph type	=	Rational	Peak discharge (cfs)	=	3.981
Storm frequency (yrs)	=	10	Time interval (min)	=	1
Drainage area (ac)	=	0.990	Runoff coeff. (C)	=	0.6
Rainfall Inten (in/hr)	=	6.701	Tc by User (min)	=	7
IDF Curve	=	Bessemer City.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 1,672 (cuft); 0.038 (acft)

Runoff Hydrograph



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No.2

Trapezoidal

Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 830.00
Slope (%)	= 10.00
N-Value	= 0.025

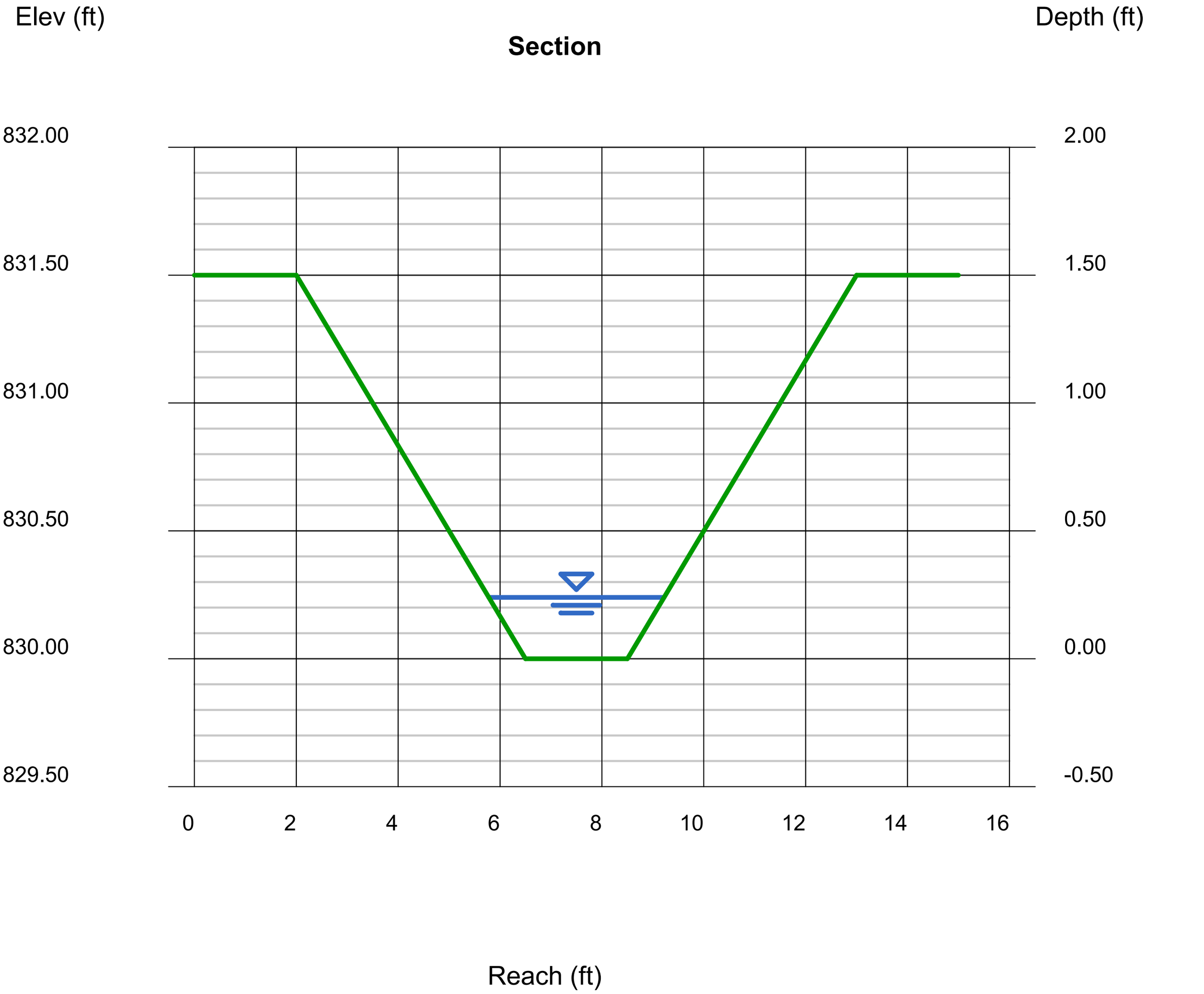
Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.98

Highlighted

Depth (ft)	= 0.24
Q (cfs)	= 3.980
Area (sqft)	= 0.65
Velocity (ft/s)	= 6.10
Wetted Perim (ft)	= 3.52
Crit Depth, Yc (ft)	= 0.41
Top Width (ft)	= 3.44
EGL (ft)	= 0.82

Section



Hydrology Report

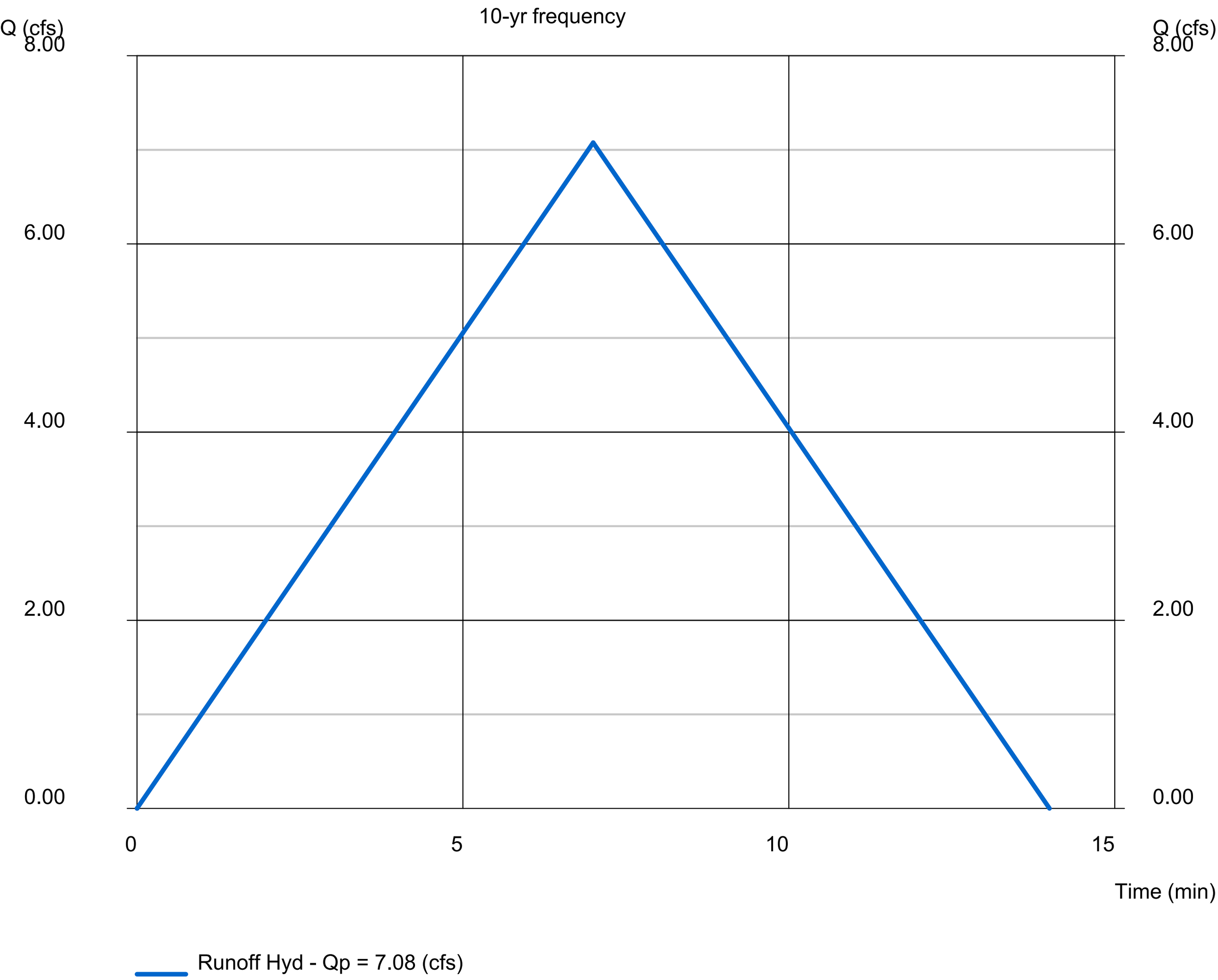
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD 3 DA

Hydrograph type	=	Rational	Peak discharge (cfs)	=	7.076
Storm frequency (yrs)	=	10	Time interval (min)	=	1
Drainage area (ac)	=	1.760	Runoff coeff. (C)	=	0.6
Rainfall Inten (in/hr)	=	6.701	Tc by User (min)	=	7
IDF Curve	=	Bessemer City.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 2,972 (cuft); 0.068 (acft)

Runoff Hydrograph



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No.3

Trapezoidal

Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 830.00
Slope (%)	= 5.00
N-Value	= 0.025

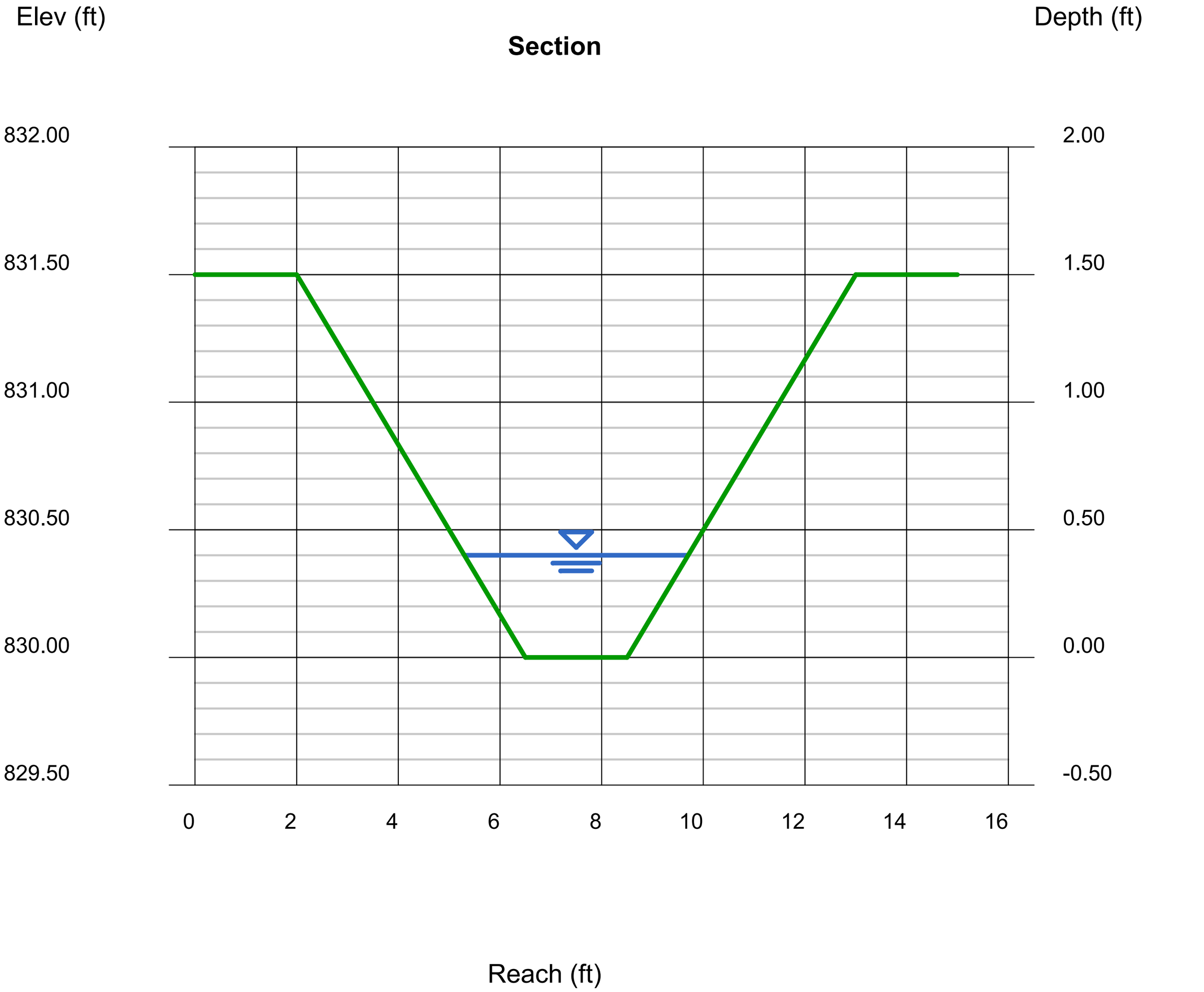
Calculations

Compute by:	Known Q
Known Q (cfs)	= 7.08

Highlighted

Depth (ft)	= 0.40
Q (cfs)	= 7.080
Area (sqft)	= 1.28
Velocity (ft/s)	= 5.53
Wetted Perim (ft)	= 4.53
Crit Depth, Yc (ft)	= 0.56
Top Width (ft)	= 4.40
EGL (ft)	= 0.88

Section



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No. 3 Slope Drain

Invert Elev Dn (ft)	=	836.00
Pipe Length (ft)	=	23.00
Slope (%)	=	17.39
Invert Elev Up (ft)	=	840.00
Rise (in)	=	12.0
Shape	=	Circular
Span (in)	=	12.0
No. Barrels	=	1
n-Value	=	0.021
Culvert Type	=	Circular Culvert
Culvert Entrance	=	Smooth tapered inlet throat
Coeff. K,M,c,Y,k	=	0.534, 0.555, 0.0196, 0.9, 0.2

Embankment

Top Elevation (ft)	=	842.00
Top Width (ft)	=	2.00
Crest Width (ft)	=	22.50

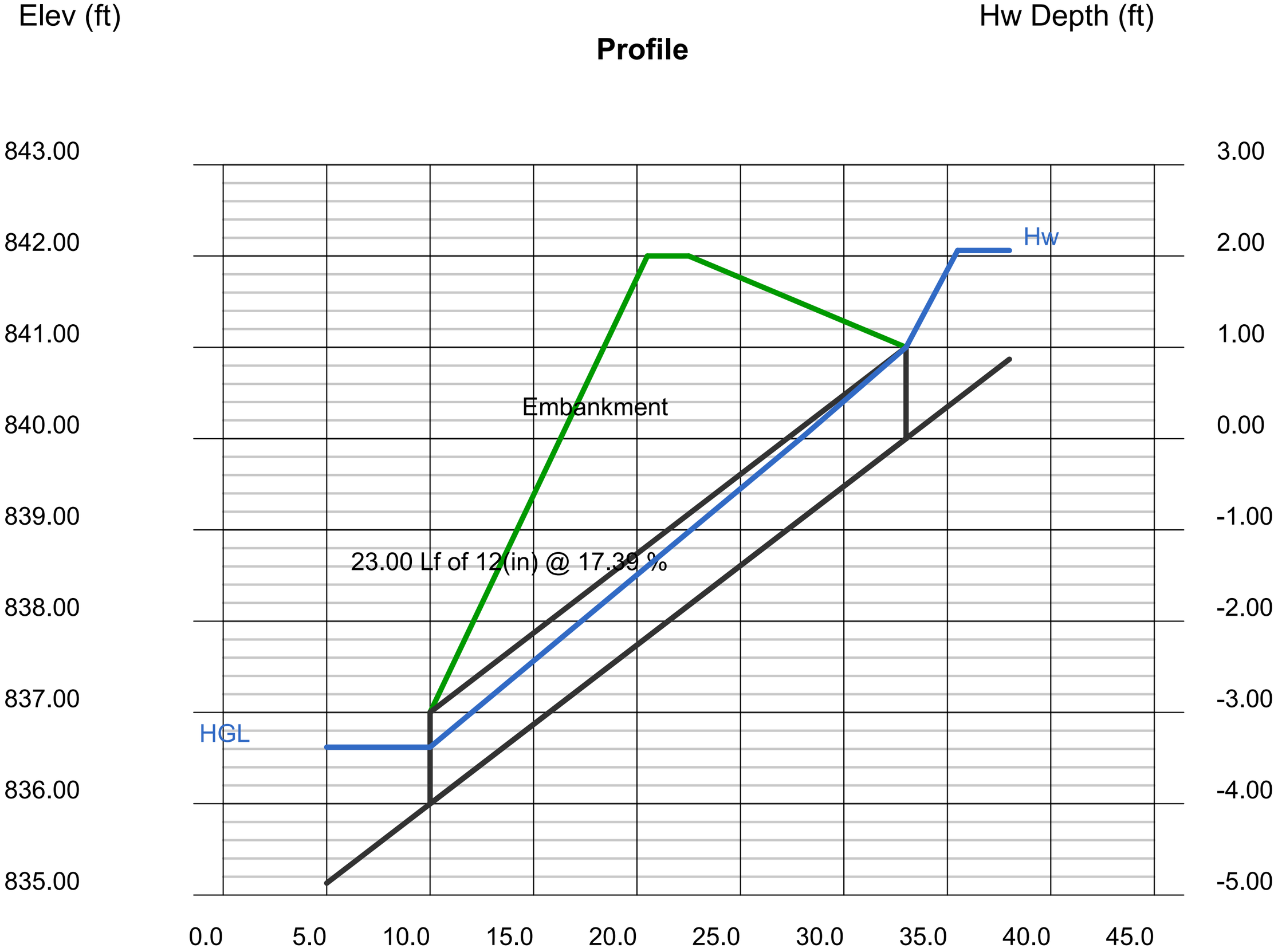
Calculations

Qmin (cfs)	=	7.08
Qmax (cfs)	=	7.08
Tailwater Elev (ft)	=	Normal

Highlighted

Qtotal (cfs)	=	7.08
Qpipe (cfs)	=	6.27
Qovertop (cfs)	=	0.81
Veloc Dn (ft/s)	=	12.29
Veloc Up (ft/s)	=	8.08
HGL Dn (ft)	=	836.62
HGL Up (ft)	=	840.96
Hw Elev (ft)	=	842.06
Hw/D (ft)	=	2.06
Flow Regime	=	Inlet Control

Profile



Hydrology Report

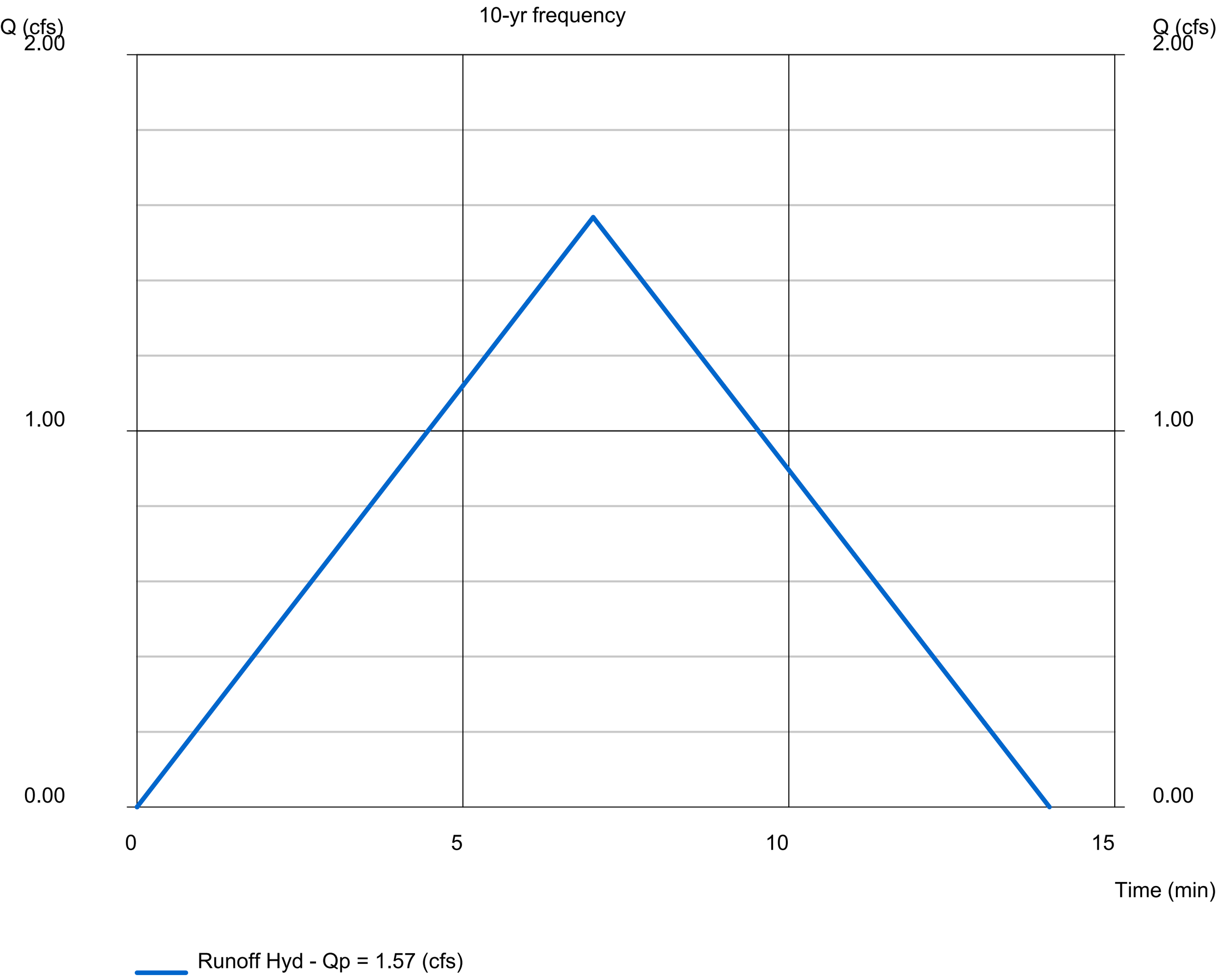
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD 4 DA

Hydrograph type	=	Rational	Peak discharge (cfs)	=	1.568
Storm frequency (yrs)	=	10	Time interval (min)	=	1
Drainage area (ac)	=	0.390	Runoff coeff. (C)	=	0.6
Rainfall Inten (in/hr)	=	6.701	Tc by User (min)	=	7
IDF Curve	=	Bessemer City.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 659 (cuft); 0.015 (acft)

Runoff Hydrograph



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No.4

Trapezoidal

Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 844.00
Slope (%)	= 7.00
N-Value	= 0.025

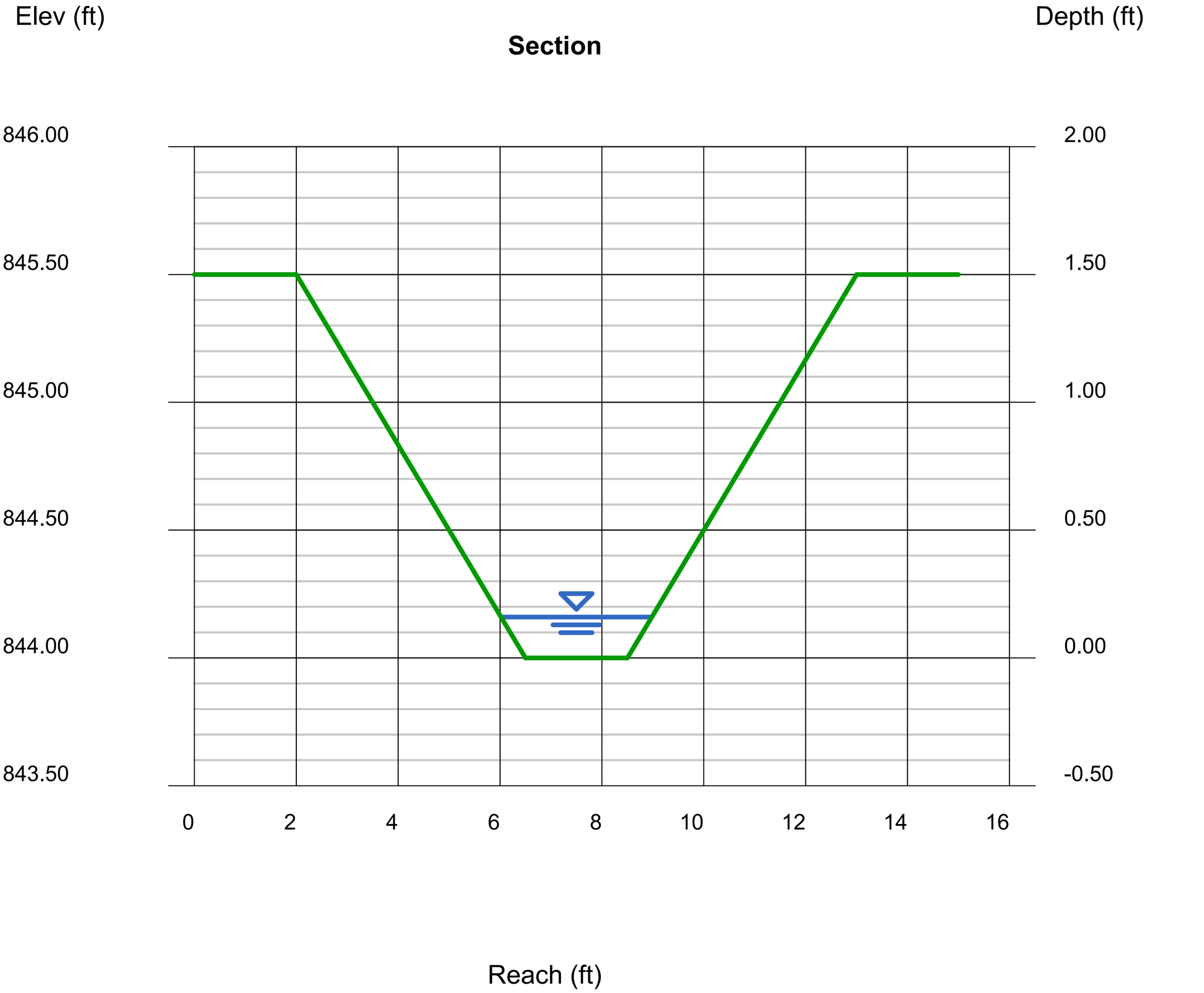
Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.57

Highlighted

Depth (ft)	= 0.16
Q (cfs)	= 1.570
Area (sqft)	= 0.40
Velocity (ft/s)	= 3.96
Wetted Perim (ft)	= 3.01
Crit Depth, Yc (ft)	= 0.24
Top Width (ft)	= 2.96
EGL (ft)	= 0.40

Section



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 28 2022

TD No.4 Slope Drain

Invert Elev Dn (ft)	=	836.00
Pipe Length (ft)	=	27.00
Slope (%)	=	25.93
Invert Elev Up (ft)	=	843.00
Rise (in)	=	12.0
Shape	=	Circular
Span (in)	=	12.0
No. Barrels	=	1
n-Value	=	0.021
Culvert Type	=	Circular Culvert
Culvert Entrance	=	Smooth tapered inlet throat
Coeff. K,M,c,Y,k	=	0.534, 0.555, 0.0196, 0.9, 0.2

Embankment

Top Elevation (ft)	=	845.00
Top Width (ft)	=	2.00
Crest Width (ft)	=	26.50

Calculations

Qmin (cfs)	=	1.57
Qmax (cfs)	=	1.57
Tailwater Elev (ft)	=	Normal

Highlighted

Qtotal (cfs)	=	1.57
Qpipe (cfs)	=	1.57
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	10.03
Veloc Up (ft/s)	=	3.70
HGL Dn (ft)	=	836.25
HGL Up (ft)	=	843.53
Hw Elev (ft)	=	843.78
Hw/D (ft)	=	0.78
Flow Regime	=	Inlet Control

Profile



Rip Rap Apron Design

Project Name: FES-CULVERT
Drainage Specialist: MWB **Date:** April 28, 2022
Checked By: LJB **Date:** April 28, 2022

Step 1. Determine the tailwater depth from the channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classifies as minimum tailwater conditions. If the tailwater is greater than half the pipe diameter, it is classified as maximum tailwater conditions. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Rational Method for Flow

Total Drainage Area (Acres):	16.5
Outlet pipe diameter, D_o (in.)	48
Tailwater depth (Feet)	0.0
Tailwater Method To Be Used	**Min TW (Fig. 8.06a)**
Discharge (cfs)	63.5
Velocity (ft./s)	8.3

Step 2. Based on the tailwater conditions determined in Step 1, enter Figure 8.06a or Figure 8.06b and determine the d_{50} rip rap size and minimum apron length (La). The d_{50} size is the median stone size in a well-graded rip rap apron.

Step 3. Determine the apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	**Maximum TW**
Riprap d_{50}, (ft.)	0.8	0.1
Minimum apron length, L_a (ft.) **	26	10
Apron width at pipe outlet (ft.)	12	12
Apron shape	W = Do + La	W = Do + .4La
Apron width at outlet end (ft.)	30	8

**** - Minimum Apron Length Is 10 Feet per CLDS 20.23**

Step 4. Determine the maximum Stone Diameter. $D_{max} = 1.5 \times d_{50}$

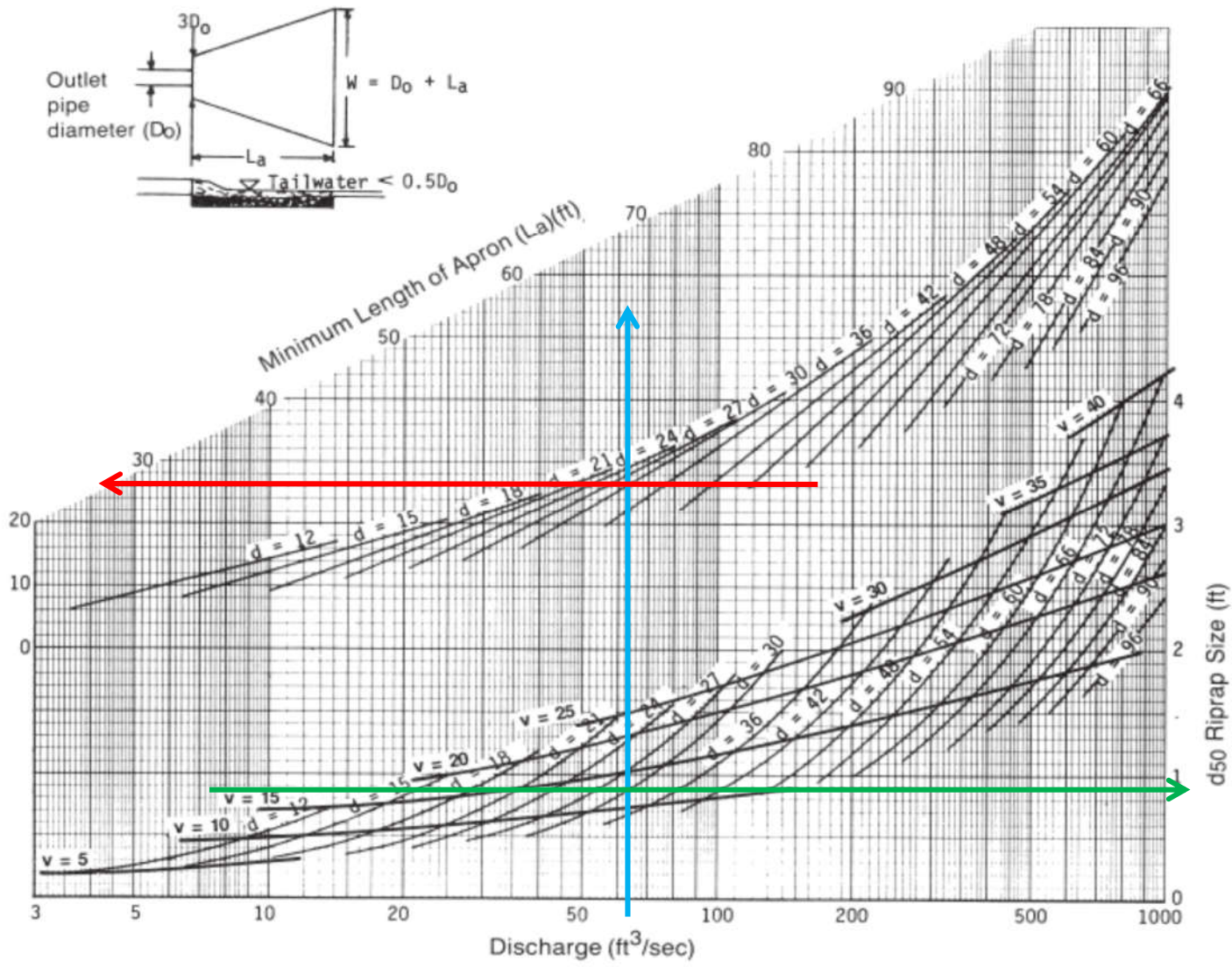
Determine the Apron Thickness, $Ta = 1.5 \times d_{max}$

	Minimum TW	**Maximum TW**
Max Stone Diameter, dmax (Inches):	14	2
Apron Thickness (Inches):	22	10

**** - Minimum Apron Thickness Is 10 Inches per CLDS 20.23**

Step 5. Fit the rip rap apron to the site by making it level for the minimum length *La* . Extend the apron farther downstream and along the channel banks until stability is assured. Keep apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight. Some locations may require lining of the entire channel cross section to assure stability. It may be necessary to increase the size of the rip rap where protection of the channel side slopes is necessary. Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered.

Figure 8.06a: Design of outlet protection from a round pipe flowing full, minimum tailwater condition (Tw<0.5 diameter)



Curves may not be extrapolated.

Figure 8.06a Design of outlet protection protection from a round pipe flowing full, minimum tailwater condition (T_w < 0.5 diameter).

Rip Rap Apron Design

Project Name: FES-OCS
Drainage Specialist: MWB **Date:** April 28, 2022
Checked By: LJB **Date:** April 28, 2022

Step 1. Determine the tailwater depth from the channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classifies as minimum tailwater conditions. If the tailwater is greater than half the pipe diameter, it is classified as maximum tailwater conditions. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Rational Method for Flow

Total Drainage Area (Acres):	NA
Outlet pipe diameter, D_o (in.)	30
Tailwater depth (Feet)	0.0
Tailwater Method To Be Used	**Min TW (Fig. 8.06a)**
Discharge (cfs)	23.1
Velocity (ft./s)	12.4

Step 2. Based on the tailwater conditions determined in Step 1, enter Figure 8.06a or Figure 8.06b and determine the d_{50} rip rap size and minimum apron length (La). The d_{50} size is the median stone size in a well-graded rip rap apron.

Step 3. Determine the apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	Maximum TW
Riprap d_{50}, (ft.)	0.5	0.1
Minimum apron length, L_a (ft.) **	20	10
Apron width at pipe outlet (ft.)	8	8
Apron shape	W = Do + La	W = Do + .4La
Apron width at outlet end (ft.)	23	7

**** - Minimum Apron Length Is 10 Feet per CLDS 20.23**

Step 4. Determine the maximum Stone Diameter. $D_{max} = 1.5 \text{ X } d_{50}$

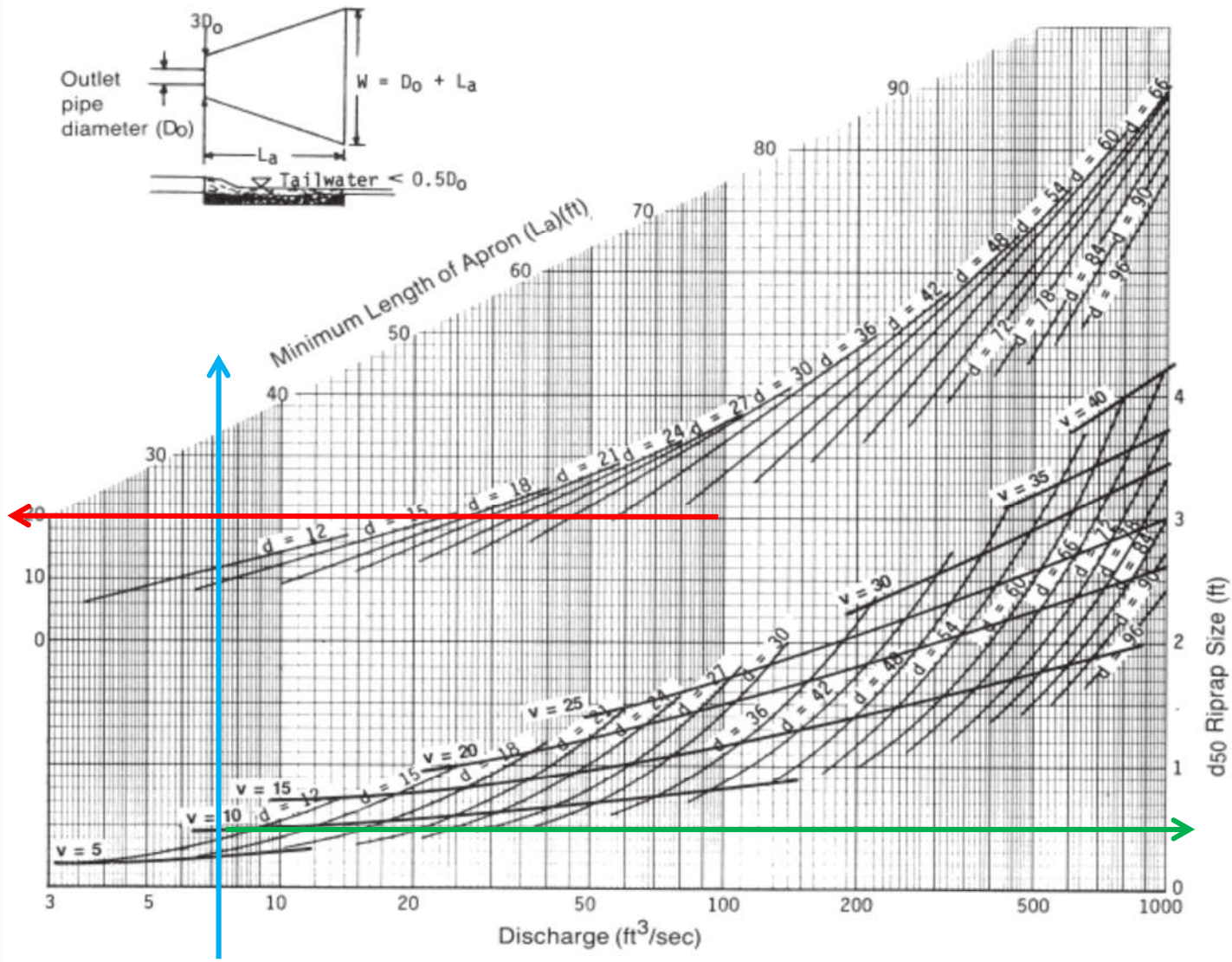
Determine the Apron Thickness, $Ta = 1.5 \text{ X } d_{max}$

	Minimum TW	Maximum TW
Max Stone Diameter, dmax (Inches):	9	2
Apron Thickness (Inches):	14	10

**** - Minimum Apron Thickness Is 10 Inches per CLDS 20.23**

Step 5. Fit the rip rap apron to the site by making it level for the minimum length *La* . Extend the apron farther downstream and along the channel banks until stability is assured. Keep apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight. Some locations may require lining of the entire channel cross section to assure stability. It may be necessary to increase the size of the rip rap where protection of the channel side slopes is necessary. Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered.

Figure 8.06a: Design of outlet protection from a round pipe flowing full, minimum tailwater condition (Tw<0.5 diameter)



Curves may not be extrapolated.

Figure 8.06a Design of outlet protection protection from a round pipe flowing full, minimum tailwater condition (T_w < 0.5 diameter).

Rip Rap Apron Design

Project Name: FES
Drainage Specialist: MWB **Date:** April 28, 2022
Checked By: LJB **Date:** April 28, 2022

Step 1. Determine the tailwater depth from the channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classifies as minimum tailwater conditions. If the tailwater is greater than half the pipe diameter, it is classified as maximum tailwater conditions. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Rational Method for Flow

Total Drainage Area (Acres):	17.3
Outlet pipe diameter, D_o (in.)	48
Tailwater depth (Feet)	0.0
Tailwater Method To Be Used	**Min TW (Fig. 8.06a)**
Discharge (cfs)	82.7
Velocity (ft./s)	9.6

Step 2. Based on the tailwater conditions determined in Step 1, enter Figure 8.06a or Figure 8.06b and determine the d_{50} rip rap size and minimum apron length (La). The d_{50} size is the median stone size in a well-graded rip rap apron.

Step 3. Determine the apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	Maximum TW
Riprap d_{50}, (ft.)	0.8	0.1
Minimum apron length, L_a (ft.) **	26	10
Apron width at pipe outlet (ft.)	12	12
Apron shape	W = Do + La	W = Do + .4La
Apron width at outlet end (ft.)	30	8

**** - Minimum Apron Length Is 10 Feet per CLDS 20.23**

Step 4. Determine the maximum Stone Diameter. D_{max} = 1.5 X d_{50}

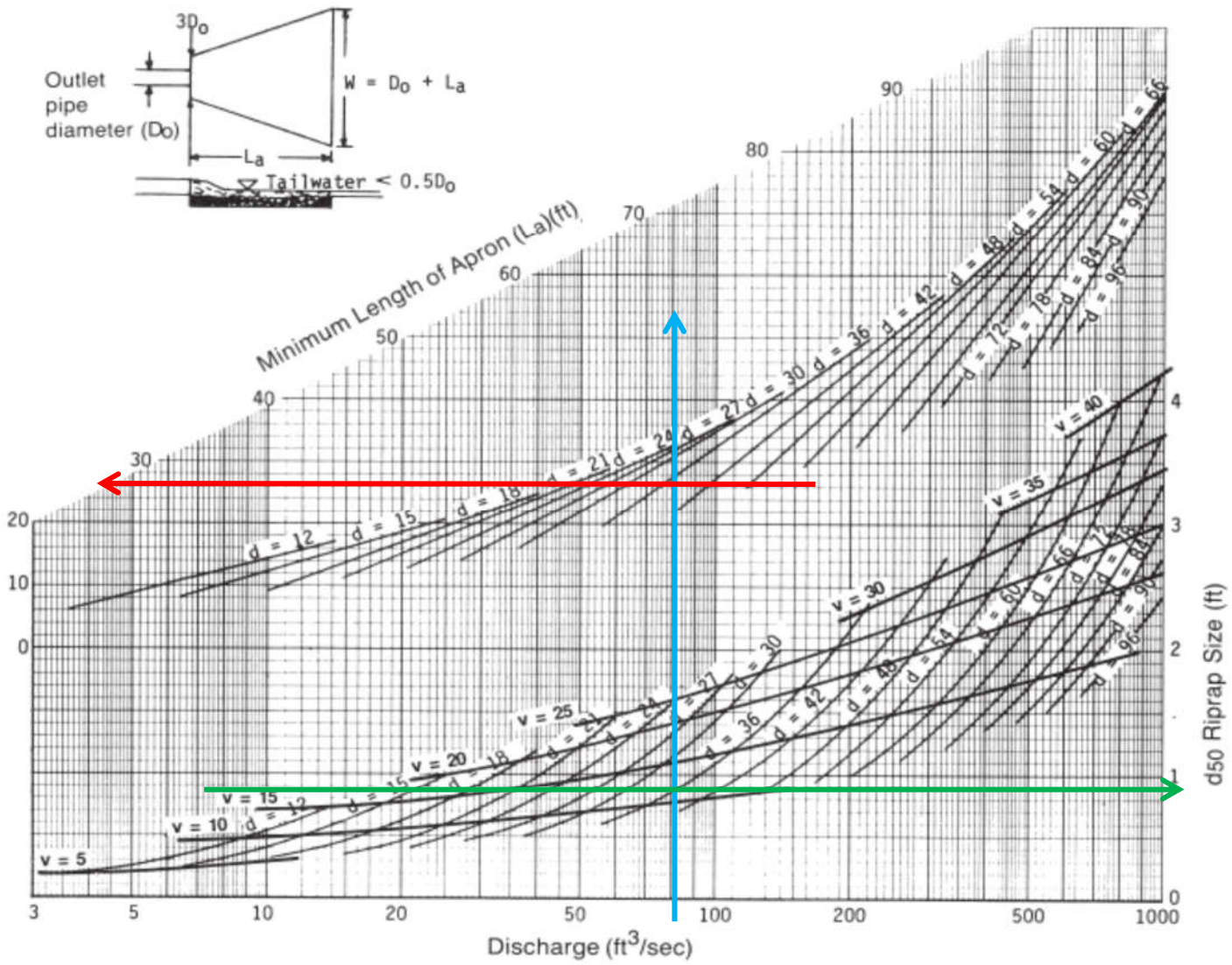
Determine the Apron Thickness, Ta = 1.5 X d_{max}

	Minimum TW	Maximum TW
Max Stone Diameter, dmax (Inches):	14	2
Apron Thickness (Inches):	22	10

**** - Minimum Apron Thickness Is 10 Inches per CLDS 20.23**

Step 5. Fit the rip rap apron to the site by making it level for the minimum length *La* . Extend the apron farther downstream and along the channel banks until stability is assured. Keep apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight. Some locations may require lining of the entire channel cross section to assure stability. It may be necessary to increase the size of the rip rap where protection of the channel side slopes is necessary. Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered.

Figure 8.06a: Design of outlet protection from a round pipe flowing full, minimum tailwater condition (Tw<0.5 diameter)



Curves may not be extrapolated.

Figure 8.06a Design of outlet protection protection from a round pipe flowing full, minimum tailwater condition (T_w < 0.5 diameter).

Rip Rap Apron Design

Project Name: TEMPORARY DITCH #3
Drainage Specialist: MWB **Date:** April 28, 2022
Checked By: LJB **Date:** April 28, 2022

Step 1. Determine the tailwater depth from the channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classifies as minimum tailwater conditions. If the tailwater is greater than half the pipe diameter, it is classified as maximum tailwater conditions. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Rational Method for Flow

Total Drainage Area (Acres):	1.8
Outlet pipe diameter, D_o (in.)	12
Tailwater depth (Feet)	0.0
Tailwater Method To Be Used	**Min TW (Fig. 8.06a)**
Discharge (cfs)	7.1
Velocity (ft./s)	12.3

Step 2. Based on the tailwater conditions determined in Step 1, enter Figure 8.06a or Figure 8.06b and determine the d_{50} rip rap size and minimum apron length (La). The d_{50} size is the median stone size in a well-graded rip rap apron.

Step 3. Determine the apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	Maximum TW
Riprap d_{50}, (ft.)	0.4	0.1
Minimum apron length, L_a (ft.) **	12	10
Apron width at pipe outlet (ft.)	3	3
Apron shape	W = Do + La	W = Do + .4La
Apron width at outlet end (ft.)	13	5

**** - Minimum Apron Length Is 10 Feet per CLDS 20.23**

Step 4. Determine the maximum Stone Diameter. $D_{max} = 1.5 \times d_{50}$

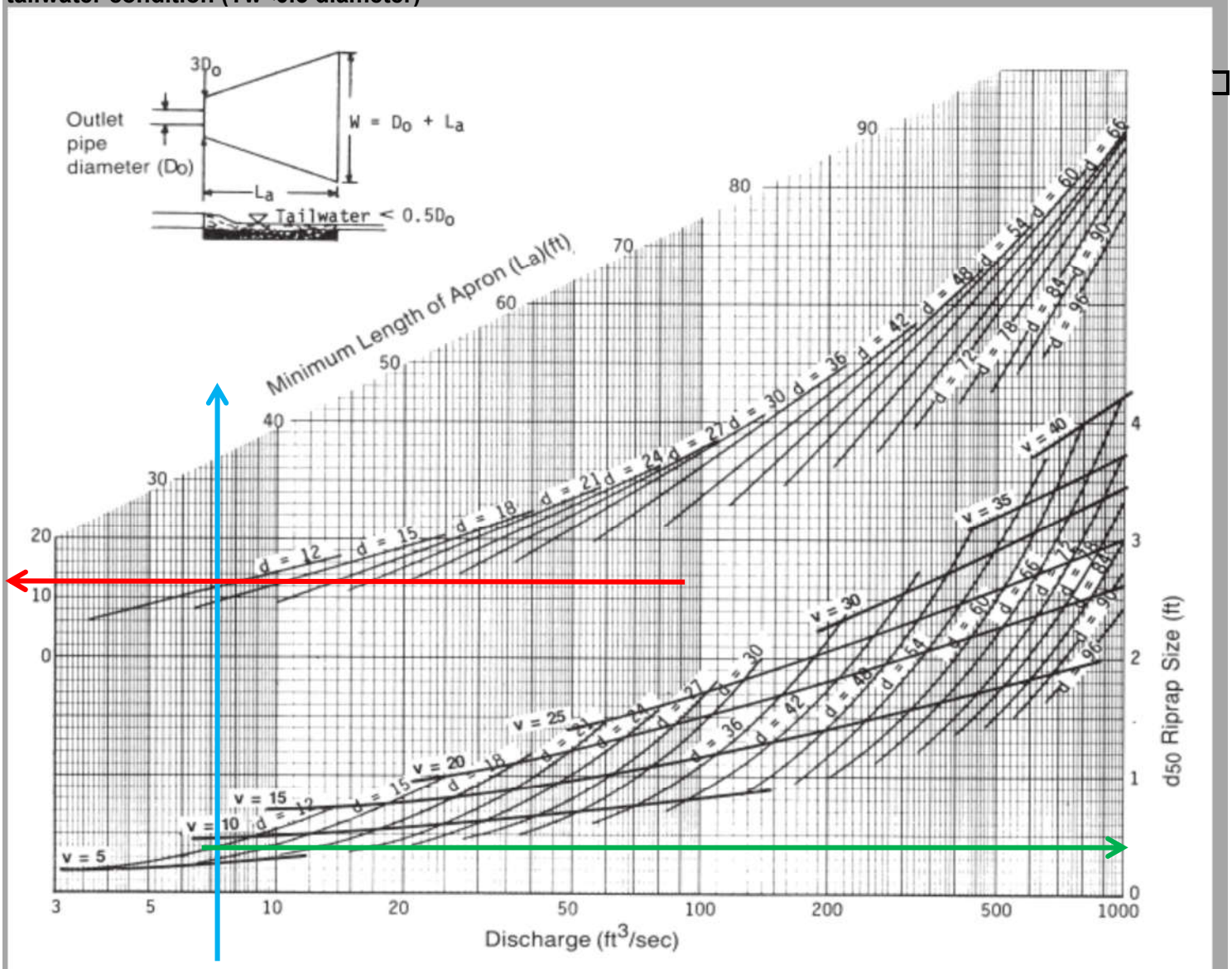
Determine the Apron Thickness, $Ta = 1.5 \times d_{max}$

	Minimum TW	Maximum TW
Max Stone Diameter, dmax (Inches):	7	2
Apron Thickness (Inches):	11	10

**** - Minimum Apron Thickness Is 10 Inches per CLDS 20.23**

Step 5. Fit the rip rap apron to the site by making it level for the minimum length *La* . Extend the apron farther downstream and along the channel banks until stability is assured. Keep apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight. Some locations may require lining of the entire channel cross section to assure stability. It may be necessary to increase the size of the rip rap where protection of the channel side slopes is necessary. Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered.

Figure 8.06a: Design of outlet protection from a round pipe flowing full, minimum tailwater condition (Tw<0.5 diameter)



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Figure 8.06a Design of outlet protection protection from a round pipe flowing full, minimum tailwater condition (T_w < 0.5 diameter).

Rip Rap Apron Design

Project Name: TEMPORARY DITCH #4
Drainage Specialist: MWB **Date:** April 28, 2022
Checked By: LJB **Date:** April 28, 2022

Step 1. Determine the tailwater depth from the channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classifies as minimum tailwater conditions. If the tailwater is greater than half the pipe diameter, it is classified as maximum tailwater conditions. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Rational Method for Flow

Total Drainage Area (Acres):	0.4
Outlet pipe diameter, D_o (in.)	12
Tailwater depth (Feet)	0.0
Tailwater Method To Be Used	**Min TW (Fig. 8.06a)**
Discharge (cfs)	1.6
Velocity (ft./s)	10.3

Step 2. Based on the tailwater conditions determined in Step 1, enter Figure 8.06a or Figure 8.06b and determine the d_{50} rip rap size and minimum apron length (La). The d_{50} size is the median stone size in a well-graded rip rap apron.

Step 3. Determine the apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	Maximum TW
Riprap d_{50}, (ft.)	0.3	0.1
Minimum apron length, L_a (ft.) **	10	10
Apron width at pipe outlet (ft.)	3	3
Apron shape	W = Do + La	W = Do + .4La
Apron width at outlet end (ft.)	11	5

**** - Minimum Apron Length Is 10 Feet per CLDS 20.23**

Step 4. Determine the maximum Stone Diameter. D_{max} = 1.5 X d_{50}

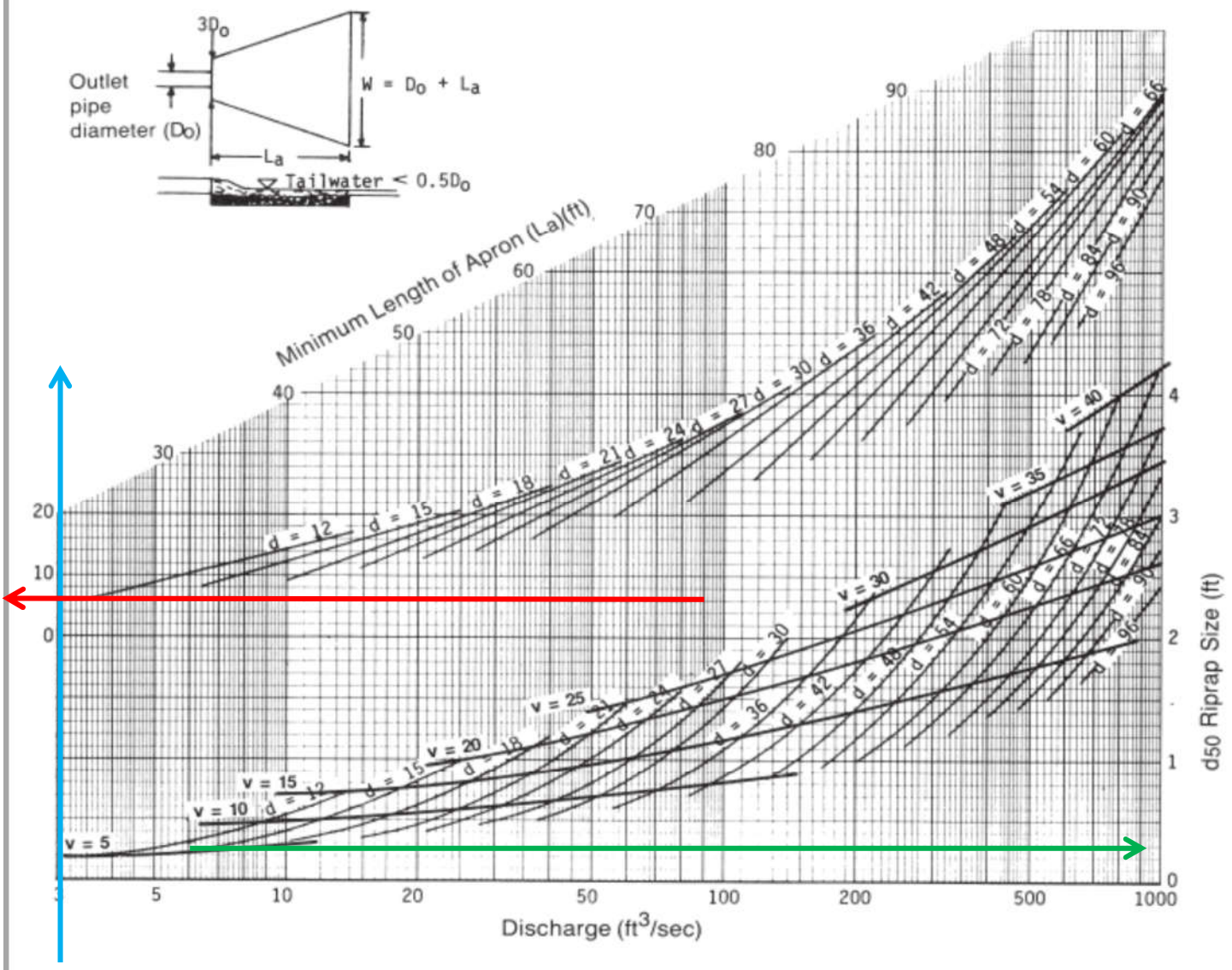
Determine the Apron Thickness, Ta = 1.5 X d_{max}

	Minimum TW	Maximum TW
Max Stone Diameter, dmax (Inches):	5	2
Apron Thickness (Inches):	10	10

**** - Minimum Apron Thickness Is 10 Inches per CLDS 20.23**

Step 5. Fit the rip rap apron to the site by making it level for the minimum length *La* . Extend the apron farther downstream and along the channel banks until stability is assured. Keep apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight. Some locations may require lining of the entire channel cross section to assure stability. It may be necessary to increase the size of the rip rap where protection of the channel side slopes is necessary. Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered.

Figure 8.06a: Design of outlet protection from a round pipe flowing full, minimum tailwater condition (Tw<0.5 diameter)



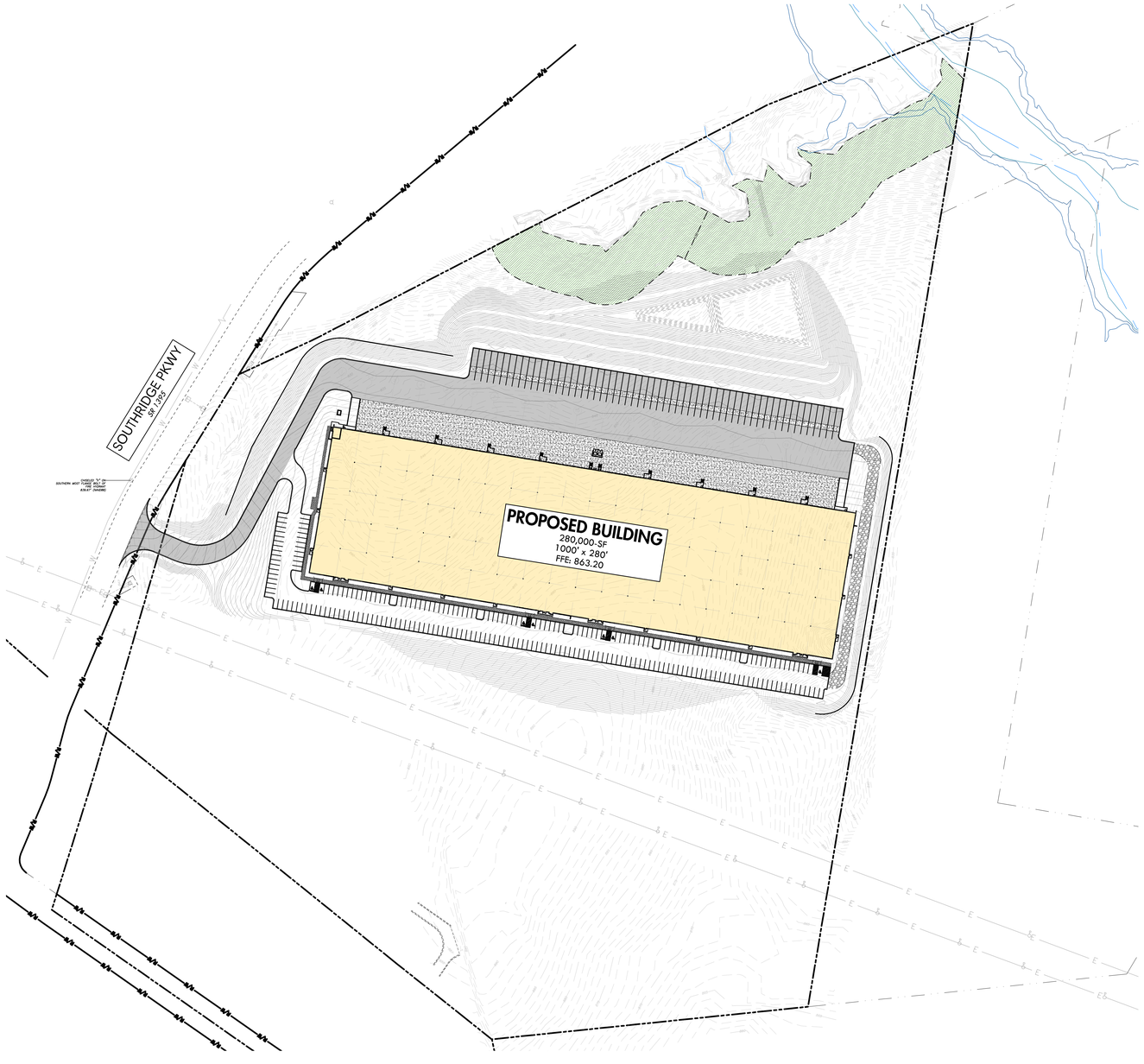
Curves may not be extrapolated.

Figure 8.06a Design of outlet protection protection from a round pipe flowing full, minimum tailwater condition (T_w < 0.5 diameter).

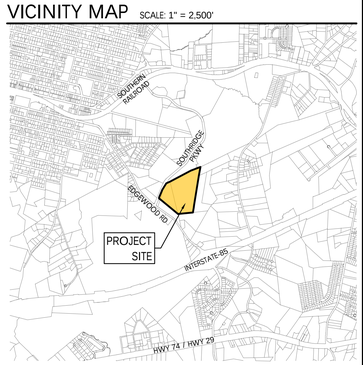
SOUTHRIDGE - BESSEMER

CONSTRUCTION DRAWING PACKAGE

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL



VICINITY MAP SCALE: 1" = 2,500'



PROJECT SUMMARY

PROJECT NAME:	SOUTHRIDGE - BESSEMER
DEVELOPER/CONTRACTOR:	FOUNDRY COMMERCIAL
PLANS PREPARED BY:	OAK ENGINEERING, PLLC
TAX PARCEL NUMBER:	PORTION OF 305599
ZONING:	BC (BUSINESS CAMPUS/PRODUCTION)
JURISDICTION:	BESSEMER CITY
RIVER BASIN:	CATAWBA
HUC:	UPPER CROWDERS CREEK
FEMA INFORMATION:	MAP NO. 3710352600J MAP DATE: 9/28/2007 FLOOD ZONE: OUT (ZONE X)
LOT SIZE:	±51.755 ACRES
CONSTRUCTION DATES:	7/1/22 - 3/2/23
DENUDED AREA:	27.5 ACRES

DRAWING INDEX

SHEET	SHEET TITLE	ORIGINAL DATE	LATEST ISSUE	LATEST REV.
C1.0	COVER SHEET	4/29/22	4/29/22	
C1.1	PROJECT NOTES	4/29/22	4/29/22	
C2.0	EXISTING CONDITIONS (BY OTHERS)	FOR REFERENCE ONLY		
C3.0	SITE PLAN	4/29/22	4/29/22	
C3.1	UTILITY PLAN	4/29/22	4/29/22	
C4.0	GRADING & DRAINAGE PLAN	4/29/22	4/29/22	
C4.1	RETAINING WALL PROFILES	4/29/22	4/29/22	
C4.2	STORM DRAINAGE PROFILES	4/29/22	4/29/22	
C4.3	STORMWATER MANAGEMENT PLAN	4/29/22	4/29/22	
C5.0	EROSION CONTROL PHASE 1	4/29/22	4/29/22	
C5.1	EROSION CONTROL PHASE 1	4/29/22	4/29/22	
C5.2	EROSION CONTROL PHASE 2	4/29/22	4/29/22	
C6.0	LANDSCAPING PLAN	4/29/22	4/29/22	
C7.0	PROJECT DETAILS	4/29/22	4/29/22	
C7.1	PROJECT DETAILS	4/29/22	4/29/22	
C7.2	PROJECT DETAILS	4/29/22	4/29/22	
C7.3	PROJECT DETAILS	4/29/22	4/29/22	

PROJECT CONTACTS

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GASTONIA, NC 28052

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4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

PE SEAL:



04/29/2022

100 0 100

SCALE: 1" = 100'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

COVER SHEET

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C1.0
SHEET 1 OF 18

SEEDBED PREPARATION

1. AREAS TO BE SEEDED SHALL BE RIPPED OR TILLED AND SPREAD WITH AVAILABLE TOPSOIL 4" DEEP. TOTAL SEEDBED PREPARED DEPTH SHALL BE 6".
2. ROCKS, ROOTS & OTHER OBSTRUCTIONS & CONSTRUCTION DEBRI SHALL BE REMOVED FROM THE SURFACE OF THE SEEDBED. SURFACE OF COMPLETED PREPARED SEEDBED SHALL BE LOOSE, SMOOTH AND UNIFORM. CONTRACTOR SHALL TILL, DISC AND/OR HARROW IF NECESSARY TO ACHIEVE THIS.
3. IF NO SOIL TEST IS TAKEN, FERTILIZER AND LIME SHALL BE APPLIED ACCORDING TO THE SEEING SPECIFICATIONS.
4. IF SOIL TEST IS TAKEN, APPLY FERTILIZER AND LIME IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS.
5. LIME AND FERTILIZER SHALL BE APPLIED UNIFORMLY AND MIXED WITH THE SOIL DURING SEEDBED PREPARATION.
6. IMMEDIATELY AFTER SEEDING, MUCH ALL SEEDED AREAS WITH A THIN DENSE LAYER OF CLEAN WHEAT STRAW.

LANDSCAPING NOTES

1. ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET FORTH IN THE AMERICAN STANDARDS FOR NURSERY STOCK BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC., WASHINGTON, D.C.
2. ALL PLANTS SHALL BE COMPACT, UNIFORM, AND WELL GROWN. PLANTS SHALL NOT BE LOOSE, OPEN PLANTS. THE CLIENT'S LANDSCAPE ARCHITECT RESERVES THE RIGHT, IN OUR SOLE OPINION, TO REJECT ANY AND ALL MATERIALS WHICH DO NOT MEET THESE REQUIREMENTS.
3. ALL PLANTING BEDS SHALL BE MULCHED A MINIMUM OF 4" WITH PINE NEEDLE MULCH.
4. ALL PLANTS SHALL BE FREE FROM DISEASE, INSECT INFESTATIONS, AND INJURIES.
5. ALL PLANT BEDS SHALL HAVE A 4" V-CUT TRENCH INSTALLED AT THE PERIMETER OF THE BED.
6. CONTRACTOR MUST PROVIDE A ONE YEAR WRITTEN GUARANTEE FOR ALL PLANT MATERIALS FROM THE DATE OF FINAL ACCEPTANCE BY THE ENGINEER / OWNER. CONTRACTOR TO PROVIDE TEMPORARY IRRIGATION AS NECESSARY UNTIL PLANTS ARE ESTABLISHED.
7. THE SPECIES, VARIETIES, AND SIZE LISTED SHALL BE PROVIDED AS SPECIFIED. SUBSTITUTIONS WILL BE PERMITTED ONLY UPON WRITTEN APPLICATION BY THE CONTRACTOR TO THE ENGINEER / OWNER, AND WHEN APPROVAL IS IN WRITING.
8. SYMBOLS: B&B = BALLED AND BURLAPPED; O.C. = ON CENTER; GAL. = GALLON CONTAINER, M.S. = MULTI-STEM; HT. = HEIGHT, CAL. = CALIPER.
9. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL PLANTS ILLUSTRATED ON THE PLANTING PLAN. IF ANY DISCREPANCIES EXIST BETWEEN THE QUANTITIES LISTED ON THE PLANT LIST AND THE QUANTITIES SHOWN ON THE PLAN, THE CONTRACTOR SHALL PROVIDE ALL QUANTITIES ILLUSTRATED ON THE PLAN. IF ANY PLANTS ARE SHOWN NOT LABELED, THE CONTRACTOR SHALL VERIFY THE PLANT IDENTITY WITH THE ENGINEER AND THESE PLANTINGS SHALL BE INCLUDED IN THE CONTRACTOR'S INITIAL BID.
10. SOIL AMENDMENTS SHALL BE UNIFORMLY SPREAD AND CULTIVATED THOROUGHLY BY A MECHANICAL TILLER INTO THE TOP 12" OF SOIL THROUGHOUT SHRUB BEDS.
11. THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE OWNER IN WRITING OF ALL SOIL CONDITIONS THE CONTRACTOR CONSIDERS DETRIMENTAL TO THE GROWTH OF PLANT MATERIALS. PROPER DRAINAGE MUST BE ASSURED.
12. ALL SIGNAGE AND SITE LIGHTING TO BE COORDINATED AROUND THE TREES LOCATED ON THE PLANTING PLAN. ALL TREES SHOWN ON THE PLANTING PLAN MUST GO IN AS SPECIFIED. ANY CHANGES TO THE PLANTING PLAN COULD RESULT IN A DELAY IN RECEIVING AND OCCUPANCY PERMIT.
13. CONSULT PLANT LIST FOR PLANT SIZES AND SPECIFICATIONS.
14. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO INSTALLATION. NOTIFY ENGINEER IF FIELD CONDITIONS WARRANT ADJUSTMENT OF PLANT LOCATIONS.
15. CONTRACTOR IS RESPONSIBLE FOR ALL PLANTS SHOWN ON PLANS. QUANTITIES ARE FOR CONVENIENCES ONLY.
16. GENERAL CONTRACTOR TO SEED ALL DISTURBED AREAS BEYOND PARKING LOT PERIMETER. LANDSCAPE CONTRACTOR SHALL SEED ALL AREAS WITHIN PARKING AS NOTED.
17. CONTRACTOR MAY CONTACT THE COUNTY INSPECTOR FOR A PRELIMINARY MEETING TO NEGOTIATE CREDIT FOR EXISTING TREES IN THE BUFFER AREA.

TREE PLANTING NOTES

1. ALL STRAPPING AND TOP 2/3 OF WIRE BASKET MUST BE CUT AWAY AND REMOVED FROM ROOT BALL PRIOR TO BACKFILLING PLANTING PIT. REMOVE TOP 1/3 OF THE BURLAP FROM ROOT BALL.
2. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL SUB-BASE, AND CONSTRUCTION DEBRIS; REMOVE COMPACTED SOIL AND ADD 24" NEW TOPSOIL -OR- UNCOMPACT AND AMEND TOP 24" OF EXISTING SOIL TO MEET TOPSOIL/PLANTING MIX STANDARDS FOR TREES.
3. MINIMUM TREE SIZE AT PLANTING IS 2-INCH CALIPER (FOR SINGLE STEM TREES). ALL MULTI-STEM PLANTS MUST BE TREE FORM, MAXIMUM 3 TO 5 TRUNKS, AND MINIMUM 8 FEET TALL.
4. ADJUST TREE PLANTING LOCATIONS TO AVOID UNDERGROUND UTILITIES.
5. ATTENTION LANDSCAPER: NOTIFY ENGINEER OF ANY SIGN, POWER LINE, OR OTHER CONFLICTS BEFORE PLANTING NEW TREES.
6. LARGE MATURING TREES MUST BE A MINIMUM 25 TO 30 FEET FROM THE OVERHEAD DISTRIBUTION OR TRANSMISSION LINES. IF TREES CONFLICT WITH POWER LINES OR SIGNS, CALL URBAN FORESTER TO RESOLVE BEFORE PLANTING.
7. UNLESS APPROVED BY URBAN FORESTRY STAFF, ALL REQUIRED TREES MUST HAVE SINGLE STEM TRUNKS WITH NO CO-DOMINANT TRUNKS OR BRANCHES. TREE TRUNKS SHALL BE STRAIGHT IN FORM AND FREE OF DAMAGE OR CRACKS. PRUNING CUTS SHALL BE CALLUSED OVER. BRANCH LENGTH SHALL BE TYPICAL FOR THE TREES AGE AND NOT BE BROKEN, DISEASED OR INJURED. ROOT FLARE SHALL BE LOCATED AT GRADE AND BE FREE FROM EXCESSIVE ADVENTITIOUS ROOT GROWTH.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR / LANDSCAPER TO NOTIFY THE ENGINEER OF ANY SITE CONFLICTS THAT AFFECT TREE SPECIES OR LOCATIONS PRIOR TO PLANTING TREES.

UTILITY NOTES

1. DIMENSIONS TO, OR COORDINATES OF MANHOLES, VALVES, PIPELINES, ETC., ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL OBTAIN & PAY FOR, PRIOR TO THE BEGINNING OF ANY WORK, ALL PERMITS & LICENSES NECESSARY TO ACCOMPLISH WORK. PERMITS CAN INCLUDE, BUT ARE NOT LIMITED TO BESSEMER CITY ENCROACHMENT PERMIT, GRADING PERMIT, &/OR UTILITY COMPANY'S PERMIT FOR THE WORK TO BE PERFORMED ON THEIR RESPECTIVE FACILITIES.
3. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF WITH THE THE JOB SITE & LOCATION OF ALL EXISTING FACILITIES & UNDERGROUND UTILITIES SHOWN OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR WILL BE UNILATERALLY RESPONSIBLE FOR ANY DAMAGE DONE TO EXISTING FACILITIES OR UNDERGROUND UTILITIES THAT ARE SHOWN OR NOT SHOWN ON THESE PLANS; & IF DAMAGED, THEY SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER AT NO COST TO THE OWNER.
4. THE CONTRACTOR SHALL RE-SET ALL MANHOLE COVERS, CATCH BASIN GRATES & ANY OTHER UTILITY ACCESS COVERS TO FINISHED PAVEMENT SURFACE OR SIDEWALK GRADE. THE CONTRACTOR SHALL PROTECT UNDERGROUND UTILITIES & THEIR APPURTENANCES TO REMAIN ON SITE FROM DAMAGE DURING CONSTRUCTION OPERATIONS.
5. SEWER CLEAN-OUTS TO BE PROVIDED AT ALL BENDS ON 6"Ø OR LESS LINES. CLEAN-OUTS SHALL BE PROVIDED EVERY 75' ON 4" Ø LINES AND EVERY 100' ON 6"Ø LINES. SEWER LATERALS TO BE PLACED AT A MINIMUM SLOPE OF 1/4" PER FOOT ON 4"Ø LINES AND 1/8" PER FOOT ON 6"Ø LINES.
6. WHEN WATER MAIN IS ABOVE SEWER, BUT WITH LESS THAN 18" CLEARANCE, OR WHEN THE SEWER IS ABOVE THE WATER MAIN, BOTH WATER MAIN & SEWER LINE SHALL BE CONSTRUCTED OF FERROUS MATERIALS WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A MINIMUM LATERAL DISTANCE, MEASURED AT RIGHT ANGLES TO THE SEWER, OF 10' ON EACH SIDE OF THE CROSSING WITH FULL SECTIONS CENTERED AT THE POINT OF CROSSING.
7. UPON COMPLETION OF CONSTRUCTION & BEFORE ACTIVATION OF SEWER LINES & WATER MAINS, THE CONTRACTOR SHALL PROVIDE AS-BUILT SURVEY INFORMATION TO THE ENGINEER.
8. ALL STANDARD NCDENR/COUNTY UTILITY SEPARATIONS MUST BE PROVIDED FOR WATER AND SEWER MAINS.
9. THERE SHALL BE NO TAPS, PIPING BRANCHES, UNAPPROVED BYPASS PIPING, HYDRANTS, FIRE DEPT. CONNECTION POINTS, OR OTHER WATER-USING APPURTENANCES CONNECTED TO THE SUPPLY LINE BETWEEN ANY WATER METER AND ITS REQUIRED BACKFLOW PREVENTER.
10. CONSTRUCT UTILITIES IN ACCORDANCE WITH THE REQUIREMENTS OF BESSEMER CITY & THE STATE OF NORTH CAROLINA. COMPLY WITH ALL APPLICABLE HEALTH & SAFETY REQUIREMENTS.
14. VERIFY EXISTING UTILITY LOCATIONS & OTHER EXISTING FEATURES PRIOR TO CONSTRUCTION. REPORT ANY INCONSISTENCIES TO OWNER PRIOR TO BEGINNING WORK.
15. CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY TO RELOCATE ANY EXISTING UTILITY POLES. ALL EXISTING FACILITIES WHICH CONFLICT WITH THE IMPROVEMENTS UNDER THE SCOPE OF THIS PROJECT MUST BE RELOCATED, AND SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
16. ALL ON-SITE PRIVATE WATER AND SEWER LINES TO BE MAINTAINED BY OWNER.

EROSION CONTROL MAINTENANCE NOTES

1. ALL EROSION SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF ANY STORM EVENT OF GREATER THAN 1/2" RAIN IN A 24 HOUR PERIOD. A RAIN GAUGE SHALL BE MAINTAINED ON THE SITE AND A RECORD OF THE RAINFALL AMOUNTS AND DATES SHALL BE KEPT. SEE SPECIFIC MAINTENANCE FOR EACH EROSION CONTROL MEASURE.
2. A RECORD OF INSPECTIONS BY THE CONTRACTOR SHALL BE KEPT AND MADE AVAILABLE TO THE INSPECTOR UPON REQUEST. VISIBLE SEDIMENTATION FOUND OUTSIDE THE DENUDED AREA LIMITS SHALL BE RECORDED AND A BRIEF EXPLANATION KEPT WITH THE RECORDS AS TO THE MEASURES TAKEN TO CONTROL FUTURE RELEASES. ANY MEASURES TAKEN TO CLEAN UP THE SEDIMENT THAT HAS LEFT THE DENUDED AREA LIMITS SHALL ALSO BE RECORDED.
3. SEDIMENT SHALL BE REMOVED & TRAP(S)/BASIN(S) RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL (CLEANOUT POINT) OF THE BASIN.
5. SEDIMENT BASINS SHALL BE STABILIZED IMMEDIATELY AFTER INSTALLATION. IF STABILIZATION IS INTERRUPTED DURING MAINTENANCE WORK, CONTRACTOR SHALL WORK TO RE-ESTABLISH STABILIZATION IMMEDIATELY.

PERMANENT SEEDING SCHEDULE

LATE WINTER / EARLY SPRING

SEEDING DATES:
2/15 TO 4/15

SEEDING MIXTURE:
TALL FESCUE - 258 LBS/ACRE

SLOPES 3:1 AND OVER:
TALL FESCUE** - 258 LBS/ACRE
SERICEA LESPEDEZA* - 90 LBS/ACRE
KOBE LESPEDEZA* - 30 LBS/ACRE

SOIL AMMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LBS/ACRE GROUND AGRICULTURAL LIMESTONE AND 1000 LBS/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LBS/ACRE THRESHED WHEAT OR OAT STRAW. ANCHOR BY TACKING WITH EMULSIFIED ASPHALT, NETTING OR A MULCH ANCHORING TOOL (EMULSIFIED ASPHALT TACK RATE: 400 GAL/ACRE). A DISK WITH BLADES SET AT NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
SEE SEED/SOD MAINTENANCE NOTES

SUMMER

SEEDING DATES:
4/15 TO 8/15

SEEDING MIXTURE:
TALL FESCUE - 215 LBS/ACRE
HULLED BERMUDA GRASS - 43 LBS/ACRE

SLOPES 3:1 AND OVER:
TALL FESCUE** - 258 LBS/ACRE
SERICEA LESPEDEZA* - 90 LBS/ACRE
KOBE LESPEDEZA* - 30 LBS/ACRE

SOIL AMMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LBS/ACRE GROUND AGRICULTURAL LIMESTONE AND 1000 LBS/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LBS/ACRE THRESHED WHEAT OR OAT STRAW. ANCHOR BY TACKING WITH EMULSIFIED ASPHALT, NETTING OR A MULCH ANCHORING TOOL (EMULSIFIED ASPHALT TACK RATE: 400 GAL/ACRE). A DISK WITH BLADES SET AT NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
SEE SEED/SOD MAINTENANCE NOTES

FALL

SEEDING DATES:
8/15 TO 10/15

SEEDING MIXTURE:
TALL FESCUE - 80 LBS/ACRE
(OVERSEED WITH 15 LBS/ACRE KOBE LESPEDEZA*
MIN. OF ONE TIME)
NOTE: OVER SEEDING IS PART OF THE BASE BID AND THERE SHALL BE NO SEPARATE PAYMENT

SLOPES 3:1 AND OVER:
TALL FESCUE** - 258 LBS/ACRE
SERICEA LESPEDEZA* - 90 LBS/ACRE
KOBE LESPEDEZA* - 30 LBS/ACRE

SOIL AMMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LBS/ACRE PELLETIZED DOLOMITIC LIMESTONE AND 1000 LBS/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LBS/ACRE THRESHED WHEAT OR OAT STRAW. ANCHOR BY TACKING WITH EMULSIFIED ASPHALT, NETTING OR A MULCH ANCHORING TOOL (EMULSIFIED ASPHALT TACK RATE: 400 GAL/ACRE). A DISK WITH BLADES SET AT NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.
MAINTENANCE:
SEE SEED/SOD MAINTENANCE NOTES

NOTES:

* APPROVED ALTERNATIVES INCLUDE SWITCHGRASS (PANICUM VIRGATUM), SPUTBARD BLUESTRAM (ANDROPOGON TERNARIUS), OR PARTRIDGE PEA (CHAMAECRISTA FASCICULATA)
** APPROVED ALTERNATIVES INCLUDE SWITCHGRASS (PANICUM VIRGATUM), BIG BLUESTEM (ANDROPOGON GERARDI), LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM), INDIAN GRASS (SORGHASTRUM NUTANS), BEAKED PANICGRASS (PANICUM ANCEPS), PURPLETOP (TRIDENS FLAVUS), BROOMSEDGE (ANDROPOGON VIRGINICUS), DEER TONGUE (DICANTHELIUM CLANDESTINUM), CANADIAN WILDRYE (ELYMUS CANADENSIS), VIRGINIA WILDRYE (ELYMUS VIRGINICUS), SENSITIVE PARTRIDGE PEA (CHAMAECRISTA NICITANS), AND PARTRIDGE PEA (CHAMAECRISTA FASCICULATA).
1. SUBSTITUTIONS WILL BE PERMITTED ONLY UPON WRITTEN APPLICATION BY THE CONTRACTOR TO THE ENGINEER, AND WHEN APPROVED BY SAID ENGINEER IN WRITING.
2. ALL SEED SHALL HAVE A 98% MINIMUM PURITY, 85% MINIMUM GERMINATION, AND BE FREE OF NOXIOUS WEED. SEED OVER YEAR OLD, OR OTHERWISE DAMAGED, WILL NOT BE ACCEPTED.
3. ALL OTHER SITE WORK REQUIRED BY THIS CONTRACT, IN THE AREA TO BE SEEDED, SHALL BE COMPLETE AND IN PLACE BEFORE GRASSING OPERATIONS ARE BEGUN. WORK MAY BE COMPLETED IN PARTS IF SO REQUESTED BY THE CONTRACTOR AND APPROVED BY THE OWNER OR ENGINEER.
4. PROTECTIVE COVER MUST BE ESTABLISHED ON ALL DISTURBED AREAS, GRADED SLOPES AND FILLS WITHIN 21 CALENDAR DAYS AFTER LAND DISTURBING ACTIVITY IS COMPLETED OR HAS TEMPORARLY CEASED.
5. FOR ADDITIONAL INFORMATION, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11.

SEDIMENT BASIN CONSTRUCTION SPECIFCATIONS

1. SITE PREPARATIONS- CLEAR, GRUB, AND STRIP TOPSOIL FROM AREAS UNDER THE EMBANKMENT TO REMOVE TREES, VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. DELAY CLEARING THE POOL AREA UNTIL THE DAM IS COMPLETE AND THEN REMOVE BRUSH, TREES, AND OTHER OBJECTIONABLE MATERIALS TO FACILITATE SEDIMENT CLEANOUT. STOCKPILE ALL TOPSOIL OR SOIL CONTAINING ORGANIC MATTER FOR USE ON THE OUTER SHELL OF THE EMBANKMENT TO FACILITATE VEGETATIVE ESTABLISHMENT. PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW THE BASIN AS NEEDED.
2. CUT-OFF TRENCH- EXCAVATE A CUT-OFF TRENCH ALONG THE CENTER LINE OF THE EARTH FILL EMBANKMENT. CUT THE TRENCH TO STABLE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN 2 FEET DEEP. THE CUT-OFF TRENCH MUST EXTEND INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER CREST. MAKE THE MINIMUM BOTTOM WIDTH WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN 2 FEET. MAKE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1. COMPACTION REQUIREMENTS ARE THE SAME AS THOSE FOR THE EMBANKMENT. KEEP THE TRENCH DRY DURING BACKFILLING AND COMPACTION OPERATIONS
3. EMBANKMENT - TAKE FILL MATERIAL FROM THE APPROVED AREAS SHOWN ON THE PLANS. IT SHOULD BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOODY VEGETATION, ROCKS, AND OTHER OBJECTIONABLE MATERIAL. SCARIFY AREAS ON WHICH FILL IS TO BE PLACED BEFORE PLACING FILL THE FILL MATERIAL MUST CONTAIN SUFFICIENT MOISTURE SO IT CAN BE FORMED BY HAND INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION. PLACE FILL MATERIAL IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL AREA AND COMPACT IT. COMPACTION MAY BE OBTAINED BY ROUTING THE CONSTRUCTION HAULING EQUIPMENT OVER THE FILL SO THAT THE ENTIRE SURFACE OF EACH LAYER IS TRAVERSED BY AT LEAST ONE WHEEL OR TREAD TRACK OF HEAVY EQUIPMENT, OR A COMPACTOR MAY BE USED. CONSTRUCT THE EMBANKMENT TO AN ELEVATION 10 PERCENT HIGHER THAN THE DESIGN HEIGHT TO ALLOW FOR SETTLING.
4. CONDUIT SPILLWAYS- SECURELY ATTACH THE RISER TO THE BARREL OR BARREL STUB TO MAKE A WATERTIGHT STRUCTURAL CONNECTION. SECURE ALL CONNECTIONS BETWEEN BARREL SECTIONS BY APPROVED WATERTIGHT ASSEMBLIES. PLACE THE BARREL AND RISER ON A FIRM, SMOOTH FOUNDATION OF IMPERVIOUS SOIL. DO NOT USE PERVIOUS MATERIAL SUCH AS SAND, GRAVEL, OR CRUSHED STONE AS BACKFILL AROUND THE PIPE OR ANTI-SEEP COLLARS. PLACE THE FILL MATERIAL AROUND THE PIPE SPILLWAY IN 4-INCH LAYERS, AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST THE SAME DENSITY AS THE ADJACENT EMBANKMENT. CARE MUST BE TAKEN NOT TO RAISE THE PIPE FROM FIRM CONTACT WITH ITS FOUNDATION WHEN COMPACTING UNDER THE PIPE HAUNCHES. PLACE A MINIMUM DEPTH OF 2 FEET OF COMPACTED BACKFILL OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT. ANCHOR THE RISER IN PLACE BY CONCRETE OR OTHER SATISFACTORY MEANS TO PREVENT FLOTATION. IN NO CASE SHOULD THE PIPE CONDUIT BE INSTALLED BY CUTTING A TRENCH THROUGH THE DAM AFTER THE EMBANKMENT IS COMPLETE.
5. EMERGENCY SPILLWAY- INSTALL THE EMERGENCY SPILLWAY IN UNDISTURBED SOIL. THE ACHIEVEMENT OF PLANNED ELEVATIONS, GRADE, DESIGN WIDTH, AND ENTRANCE AND EXIT CHANNEL SLOPES ARE CRITICAL TO THE SUCCESSFUL OPERATION OF THE EMERGENCY SPILLWAY.
6. INLETS- DISCHARGE WATER INTO THE BASIN IN A MANNER TO PREVENT EROSION. USE DIVERSIONS WITH OUTLET PROTECTION TO DIVERT SEDIMENT-LADEN WATER TO THE UPPER END OF THE POOL AREA TO IMPROVE BASIN TRAP EFFICIENCY
7. EROSION CONTROL- CONSTRUCT THE STRUCTURE SO THAT THE DISTURBED AREA IS MINIMIZED. DIVERT SURFACE WATER AWAY FROM BARE AREAS. COMPLETE THE EMBANKMENT BEFORE THE AREA IS CLEARED. STABILIZE THE EMERGENCY SPILLWAY EMBANKMENT AND ALL OTHER DISTURBED AREAS ABOVE THE CREST OF THE PRINCIPAL SPILLWAY IMMEDIATELY AFTER CONSTRUCTION .
8. INSTALL POROUS BAFFLES AS SPECIFIED IN DETAILS.

EROSION CONTROL MEASURES MAINTENANCE PLAN

EFFECTIVE OCTOBER 1, 2010, PERSONS RESPONSIBLE FOR LAND DISTURBING ACTIVITIES MUST INSPECT THE SEDIMENT AND EROSION CONTROL MEASURES ON A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED SEDIMENT & EROSION CONTROL PLAN IS BEING FOLLOWED. SELF-INSPECTION REPORTS ARE REQUIRED. A SAMPLE SELF-INSPECTION REPORT, AS WELL AS DETAILS OF THE SELF-INSPECTION PROGRAM, CAN BE FOUND ON THE LAND QUALITY WEBSITE: HTTPS://DEQ.NC.GOV/ABOUT/DIVISIONS/ENERGY-MINERAL-LAND-RESOURCES

AS A MINIMUM, THE INSPECTIONS SHALL BE PERFORMED AFTER EACH OF THE FOLLOWING PHASES OF A PLAN:

1. INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES
2. INSTALLATION OF SEDIMENT TRAPS/BASINS
3. CLEARING AND GRUBBING OF EXISTING GROUND COVER
4. COMPLETION OF ANY PHASE OF GRADING THAT REQUIRES PROVISION OF STABILIZATION
5. INSTALLATION OF MEASURES DURING ANY PHASE OF THE PROJECT
6. COMPLETION OF CONSTRUCTION OR DEVELOPMENT
7. INSTALLATION OF STORMWATER RETENTION MEASURES
8. QUARTERLY UNTIL THE ESTABLISHMENT OF PERMANENT GROUND COVER IS FULLY ESTABLISHED

GENERAL EROSION CONTROL NOTES

1. ON-SITE BURIAL PITS REQUIRE AN ON-SITE DEMOLITION LANDFILL PERMIT FROM THE ZONING ADMINISTRATOR AND THE DIVISION OF WASTE MANAGEMENT, SOLID WASTE SECTION.
2. ANY GRADING BEYOND THE DENUDED LIMITS SHOWN ON THE PLAN IS A VIOLATION OF THE EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE
3. GRADING MORE THAN ONE ACRE WITHOUT AN APPROVED EROSION CONTROL PLAN IS A VIOLATION OF THE CITY/COUNTY EROSION CONTROL ORDINANCE & IS SUBJECT TO A FINE.
4. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 (H:V) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTIBLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITH 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
5. ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BY A REPRESENTATIVE OF THE COUNTY OR STATE ENGINEERING DEPARTMENT.
6. SLOPES SHALL BE GRADED NO STEEPER THAN 2:1. SOILS ENGINEER TO VERIFY STABILITY OF SLOPES GREATER THAN 2:1.
7. TEMPORARY DRIVEWAY PERMIT FOR CONSTRUCTION ENTRANCES IN NCDOT RIGHT-OF-WAY MUST BE PRESENTED AT PRE-CONSTRUCTION MEETING.
8. ALL EMBANKMENTS MUST BE CONSTRUCTED PER SECTION 4.0.6 EMBANKMENT REQUIREMENTS IN THE BMP DESIGN MANUAL. (IF APPLICABLE).
9. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON LARGE DENUDED AREAS AND ESPECIALLY WHEN SPECIFICALLY REQUIRED AS PART OF THE CONSTRUCTION SEQUENCE SHOWN ON THE PLAN.

EROSION CONTROL MEASURES MAINTENANCE NOTES

ALL EROSION & SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH HEAVY RUNOFF RAINFALL. ALL MEASURES SHALL COMPLY WITH NCDEQ REGULATIONS. CONTRACTOR TO COORDINATE ALL INSTALLATION AND INSPECTIONS WITH NCDEQ EROSION CONTROL INSPECTOR.
EROSION CONTROL MEASURES TO BE INSPECTED INCLUDE:

TEMPORARY SEDIMENT BASINS

INSPECT TEMPORARY SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE-HALF THE DESIGN DEPTH. PLACE REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.

REPAIR THE BAFFLES IF THEY ARE DAMAGED. RE-ANCHOR THE BAFFLES IF WATER IS FLOWING UNDERNEATH OR AROUND THEM.

IF THE SKIMMER IS CLOGGED WITH TRASH AND THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE THE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THE FLOW DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN AND REMOVE THE DEBRIS. ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO REMOVE DEBRIS.

IF THE SKIMMER ARM OR BARREL PIP IS CLOGGED, THE ORIFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE AND REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.

CHECK THE SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE SKIMMER AND POOL AREAS.

SILT FENCE

INSPECT SILT FENCE AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY. SHOULD THE FABRIC OF A SILT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

CHECK DAMS

ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE OR WATTLE CHECK DAM AND TO PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONE OR ADDITIONAL WATTLES AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

DIVERSION DITCHES

CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED TO AVOID GULLY FORMATION. WHEN THE AREA ABOVE THE TEMPORARY DIVERSION DITCH IS PERMANENTLY STABILIZED, REMOVED THE DIKE AND FILL AND STABILIZE THE CHANNEL TO BLEND WITH THE NATURAL SURFACE.

OUTLET PROTECTION

INSPECT RIPRAP OUTLET STRUCTURES AF

File Location: N:\2021-133V (Gravedigger Site)\Civil 3D\7 - Survey\Boundary-Plat\21-133_VS-BNDY-TOPO-01.dwg
Last Saved on: 4/26/2022 6:51 AM Last Saved By: TBrown

GENERAL SURVEY NOTES

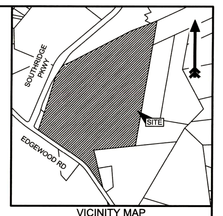
1. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET AND DECIMAL PARTS THEREOF, UNLESS NOTED OTHERWISE.
2. AREAS COMPUTED BY COORDINATE METHOD.
3. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE SEARCH. SUBJECT TRACT(S) MAY BE SUBJECT TO AGREEMENTS, EASEMENTS, RIGHTS-OF-WAYS, SETBACKS AND/OR RESTRICTIONS NOT SHOWN OR STATED HEREON.
4. THE PURPOSE OF THIS PLAT IS TO BE UTILIZED AS A BOUNDARY AND TOPOGRAPHIC SURVEY.
5. NO RECOVERABLE NCGS MONUMENTS WERE FOUND WITHIN 2,000 FEET.
6. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP NO. 3710352600J (DATED SEPTEMBER 28, 2007), THE SUBJECT TRACT SHOWN HEREON LIES WITHIN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), ZONE AE (AREAS DETERMINED TO BE WITHIN THE 1% ANNUAL CHANCE FLOODPLAIN), FLOODWAY (AREA DETERMINED TO BE WITHIN THE REGULATORY FLOODWAY). ANY FLOODPLAIN LINES SHOWN HEREON ARE GEOREFERENCED AND ARE NOT BASED ON ACTUAL FIELD LOCATIONS/ELEVATIONS.
7. UNDERGROUND UTILITIES SHOWN ON THE FACE OF SURVEY HEREON ARE BASED UPON, ALL OR A COMBINATION OF THE FOLLOWING: STRUCTURE INVERT INFORMATION, AN 811 UTILITY LOCATE, A PRIVATE UTILITY LOCATE AND EXISTING MARKINGS OBSERVED ON SITE AT THE TIME OF SURVEY. THE SURVEYOR MAKES NO GUARANTEE OF THE EXACT LOCATION(S) OF THESE UNDERGROUND UTILITIES, UNDERGROUND UTILITIES ARE CURRENT IN SERVICE OR HAVE BEEN ABANDONED OR THAT ALL UNDERGROUND UTILITIES ON SITE ARE SHOWN. UNDERGROUND UTILITIES ARE SHOWN FOR GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE UTILIZED FOR DESIGN PURPOSES.
8. ADJACENT PROPERTY LINES TO THE SUBJECT TRACT ARE CONTIGUOUS WITH ONE ANOTHER.
9. NO ORIGINAL DOCUMENT OF RIGHT OF WAY DEDICATION FOUND. NCDOT CLAIMS RIGHT OF WAY AS MAINTAINED (ASSUMED BACK OF DITCH TO BACK OF DITCH).
10. CONTOURS SHOWN HEREON ARE ONE FOOT INTERVALS.

NOMENCLATURE

M.B.	MAP BOOK
P.N.	PARCEL NUMBER
PG.	PAGE
AC.	ACRE
D.B.	DEED BOOK
POB	POINT OF BEGINNING
R/W	RIGHT-OF-WAY
CF	COMBINED FACTOR (GROUND TO GRID)
NGS	NATIONAL GEODETIC SURVEY
GIS	GEOGRAPHIC INFORMATION SYSTEM
RTN	REAL-TIME NETWORK
CORS	CONTINUOUSLY OPERATING REFERENCE SYSTEM
CONUS	CONTINENTAL UNITED STATES
TYP	TYPICAL
NAD	NORTH AMERICAN DATUM
NCSPCS	NORTH CAROLINA STATE PLANE COORDINATE SYSTEM
PDE	PERMANENT DRAINAGE EASEMENT
SSMH	SANITARY SEWER MANHOLE
MISC.	MISCELLANEOUS
C&G	CURB AND GUTTER INLET
RCP	REINFORCED CONCRETE PIPE
SSMH	SANITARY SEWER MANHOLE
TL	TOTAL DISTANCE
RBR	REBAR

LEGEND

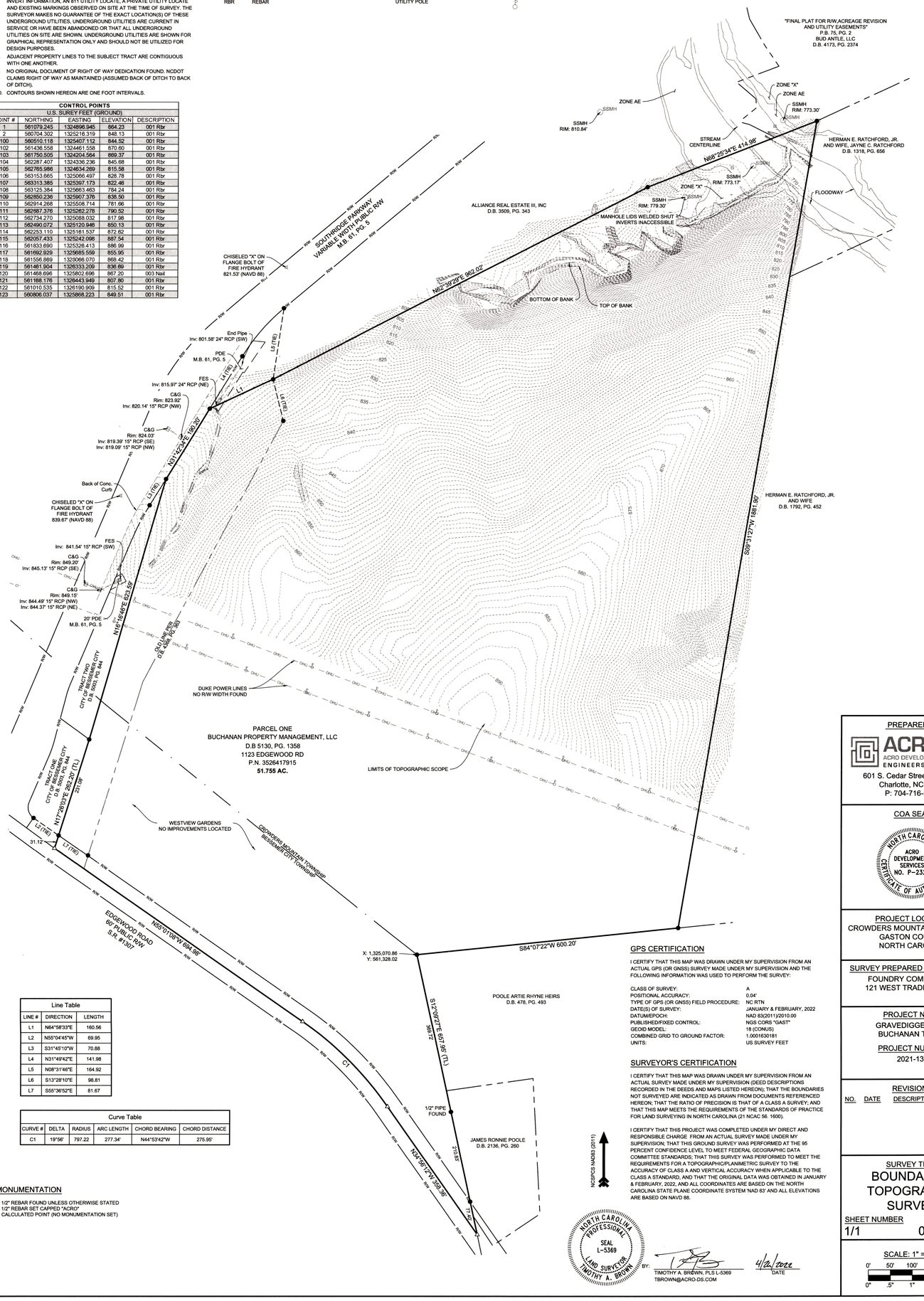
SUBJECT PARCEL
ADJACENT PARCEL
CENTERLINE ROAD
R/W
TIE LINE
STORM DRAINAGE
EASEMENT
OVERHEAD UTILITIES
STORM SEWER
BOTTOM OF BANK
TOP OF BANK
CENTERLINE OF STREAM
BACK OF CURB
MINOR CONTOUR
MAJOR CONTOUR — 660
CURB AND GUTTER INLET
FLARED END SECTION
SANITARY MANHOLE
FIRE HYDRANT
GAS METER
UTILITY POLE



VICINITY MAP
NOT TO SCALE

CONTROL POINTS
U.S. SURVEY FEET (GROUND)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	561079.245	1324896.945	864.23	001 Rbr
2	560704.302	1325216.319	848.13	001 Rbr
100	560510.118	1325407.112	844.52	001 Rbr
102	561436.558	1324461.558	870.60	001 Rbr
103	561750.505	1324204.564	869.37	001 Rbr
104	562287.407	1324336.236	845.68	001 Rbr
105	562765.986	1324634.269	815.58	001 Rbr
106	563153.665	1325066.497	828.78	001 Rbr
107	563313.385	1325397.173	822.46	001 Rbr
108	563125.384	1325663.463	784.24	001 Rbr
109	562850.236	1325907.376	838.50	001 Rbr
110	562914.268	1325508.714	781.66	001 Rbr
111	562687.376	1325262.278	790.52	001 Rbr
112	562734.270	1325088.032	817.98	001 Rbr
113	562490.072	1325120.946	850.13	001 Rbr
114	562253.110	1325161.537	872.62	001 Rbr
115	562057.433	1325242.098	887.54	001 Rbr
116	561833.690	1325326.413	886.99	001 Rbr
117	561692.929	1325685.559	855.95	001 Rbr
118	561556.889	1326066.070	868.42	001 Rbr
119	561461.904	1326333.209	836.69	001 Rbr
120	561468.696	1325802.696	867.20	003 Nail
121	561168.176	1326443.949	807.80	001 Rbr
122	561010.535	1326190.909	815.52	001 Rbr
123	560806.037	1325868.223	849.51	001 Rbr



Line Table		
LINE #	DIRECTION	LENGTH
L1	N64°58'33"E	160.56
L2	N55°04'45"W	69.95
L3	S31°45'10"W	70.88
L4	N31°49'42"E	141.98
L5	N08°31'46"E	164.92
L6	S13°28'10"E	98.81
L7	S55°36'52"E	81.67

Curve Table					
CURVE #	DELTA	RADIUS	ARC LENGTH	CHORD BEARING	CHORD DISTANCE
C1	19°56'	797.22	277.34'	N44°53'42"W	275.95'

MONUMENTATION

● 1/2" REBAR FOUND UNLESS OTHERWISE STATED
○ 1/2" REBAR SET CAPPED "ACRO"
△ CALCULATED POINT (NO MONUMENTATION SET)

GPS CERTIFICATION

I CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL GPS (OR GNSS) SURVEY MADE UNDER MY SUPERVISION AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

CLASS OF SURVEY:	A
POSITIONAL ACCURACY:	0.04'
TYPE OF GPS (OR GNSS) FIELD PROCEDURE:	NC RTN
DATE(S) OF SURVEY:	JANUARY & FEBRUARY, 2022
DATUM/EPOCH:	NAD 83(2011)2010.00
PUBLISHED/FIXED CONTROL:	NGS CORS "GAST"
GEOID MODEL:	18 (CONUS)
COMBINED GRID TO GROUND FACTOR:	1.0001630181
UNITS:	US SURVEY FEET

SURVEYOR'S CERTIFICATION

I CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTIONS RECORDED IN THE DEEDS AND MAPS LISTED HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM DOCUMENTS REFERENCED HEREON; THAT THE RATIO OF PRECISION IS THAT OF A CLASS A SURVEY; AND THAT THIS MAP MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 56. 1600).

I CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT THIS GROUND SURVEY WAS PERFORMED AT THE 95 PERCENT CONFIDENCE LEVEL TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS FOR A TOPOGRAPHIC/PLANIMETRIC SURVEY TO THE ACCURACY OF CLASS A AND VERTICAL ACCURACY WHEN APPLICABLE TO THE CLASS A STANDARD, AND THAT THE ORIGINAL DATA WAS OBTAINED IN JANUARY & FEBRUARY, 2022, AND ALL COORDINATES ARE BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM NAD 83' AND ALL ELEVATIONS ARE BASED ON NAVD 88.

NORTH CAROLINA PROFESSIONAL SEAL L-5369 LAND SURVEYOR TIMOTHY A. BROWN

BY: _____ 4/26/2022
TIMOTHY A. BROWN, PLS L-5369 — DATE
TBROWN@ACRO-DS.COM

PREPARED BY
ACRO-DS
ACRO DEVELOPMENT SERVICES
ENGINEERS • SURVEYORS
601 S. Cedar Street, Suite 101
Charlotte, NC 28202
P: 704-716-5680

COA SEAL
NORTH CAROLINA ACRO DEVELOPMENT SERVICES NO. P-2329 CERTIFICATE OF AUTHORIZATION

PROJECT LOCATION
CROWDERS MOUNTAIN TOWNSHIP, GASTON COUNTY, NORTH CAROLINA

SURVEY PREPARED FOR / OWNER
FOUNDRY COMMERCIAL
121 WEST TRADE STREET

PROJECT NAME
GRAVEDIGGER SITE
BUCHANAN TRACT

PROJECT NUMBER
2021-133

REVISIONS

NO.	DATE	DESCRIPTION

SURVEY TITLE
BOUNDARY & TOPOGRAPHIC SURVEY

SHEET NUMBER 1/1 — DATE 04/26/2022

SCALE: 1" = 100'
0' 50' 100' 200'
0" .5" 1" 2"

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C2.0
SHEET 3 OF 18

REVISIONS:

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

EXISTING CONDITIONS

FOR REFERENCE ONLY

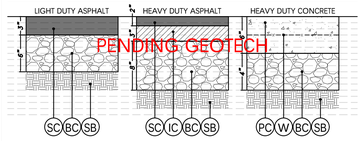
PE SEAL

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PAVEMENT HATCH LEGEND

LIGHT DUTY ASPHALT | HEAVY DUTY ASPHALT | CONCRETE PAVEMENT

PAVEMENT SECTIONS



SC ASPHALT SURFACE COURSE (S9.5B)
IC INTERMEDIATE COURSE (I19.0B)
BC AGGREGATE BASE COURSE
SB COMPACTED SUBBASE
W 6" x 6" #10 WELDED WIRE MESH (IF REQUIRED BY GEOTECH)

NOTES:
1. CONFIRM WITH GEOTECHNICAL ENGINEER FOR PAVEMENT SECTIONS AND SUBGRADE. NOTIFY ENGINEER IN CASE OF CONFLICT.
2. PROVIDE CONSTRUCTION JOINTS PER ACI AND/OR GEOTECHNICAL ENGINEER RECOMMENDATIONS (CONCRETE PAVEMENT ONLY).

SITE KEYS

1 1'-6" CURB & GUTTER
2 TIE TO EXISTING CURB & GUTTER
3 NEW 4-INCH THICK CONCRETE SIDEWALK
4 NEW 4-INCH WHITE PAINTED STRIPING
5 NEW LIGHT DUTY ASPHALT PAVEMENT. SEE PAVEMENT SECTION, THIS SHEET
6 NEW HEAVY DUTY ASPHALT PAVEMENT. SEE PAVEMENT SECTION, THIS SHEET
7 NEW HEAVY DUTY CONCRETE PAVEMENT. SEE PAVEMENT SECTIONS, THIS SHEET
8 NEW DRIVE-IN RAMP. SEE ARCHITECTURAL PLANS FOR DETAILS
9 NEW 10' CONCRETE DOLLY STRIP. SEE PAVEMENT SECTION, THIS SHEET
10 NEW ACCESSIBLE PEDESTRIAN RAMP w/ TRUNCATED DOMES
11 ACCESSIBLE PARKING SIGN
12 ACCESSIBLE PARKING SIGN (VAN)
13 NEW DUMPSTER ENCLOSURE. SEE ARCHITECTURAL PLANS FOR DETAILS
14 NEW RETAINING WALL (BY OTHERS). SEE SHEET C4.1 FOR PROFILES.
15 NEW INVERTED 'U' BICYCLE RACK PER BESSEMER CITY STANDARDS (6 TOTAL)
16 NEW GRAVEL FIRE TRUCK ACCESS
17 NEW MOUNTABLE CURB
18 10' X 70' SIGHT TRIANGLE

PARKING REQUIREMENTS

VEHICLE PARKING
BUILDING: ±280,000-SF (WAREHOUSE w/ APPROX. 10% OFFICE)

REQUIRED:
1 SPACE PER 1,000-SF WAREHOUSE, PLUS
1 SPACE PER 250-SF OFFICE

252 (WAREHOUSE) + 112 (OFFICE) = 364 SPACES REQUIRED

PROPOSED:
237 REGULAR SPACES
7 ACCESSIBLE SPACES (INCLUDING 3 VAN ACCESSIBLE)

244 TOTAL SPACES PROVIDED (PENDING VARIANCE APPROVAL)

BICYCLE PARKING
REQUIRED:
5% OF VEHICLE PARKING = 12 SPACES REQUIRED

PROPOSED:
12 BICYCLE PARKING SPACES PROVIDED

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PE SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045345 ENGINEER GREGORY T. WELSH
04/29/2022

40 0 40
SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

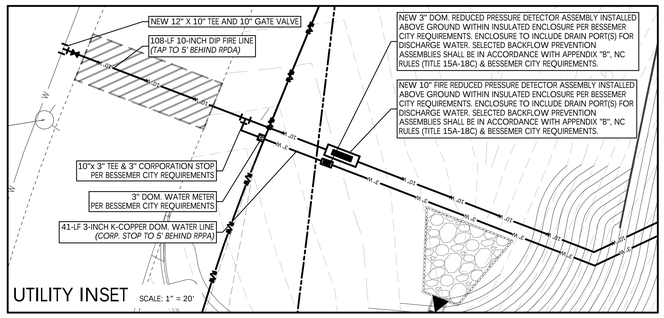
SITE PLAN

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C3.0
SHEET 4 OF 18



UTILITY LEGEND

EXISTING WATERLINE	W
PROPOSED WATERLINE/FIRE LINE (SIZE)	10" W
FIRE HYDRANT HOSE PULL	FIRE
PROPOSED FIRE HYDRANT	
PROPOSED GATE VALVE	
PROPOSED WATER METER	
PROPOSED BACK FLOW PREVENTER	
PROPOSED FIRE DEPARTMENT CONNECTION	FDC
EXISTING SANITARY SEWER LINE	SS
EXISTING SANITARY SEWER MANHOLE	S
PROPOSED SANITARY SEWER LINE	SS
PROPOSED SANITARY SEWER EASEMENT	SSE
PROPOSED SANITARY SEWER CLEANOUT	
PROPOSED SANITARY SEWER MANHOLE	

SOUTHRIDGE PKWY
SR 1392

NEW SS CO

SHEET C3.2
MATCHLINE

100'

1,234 LF OF 6-INCH PVC (SDR 35) @ 1.0% SLOPE (MIN)

NEW PRIVATE FIRE HYDRANT
WITH 8"x6" REDUCER, 6" GATE VALVE,
AND 88 LF OF 6" PVC (C900)

NEW 8" x 8" TEE
NEW 8" x 4" REDUCER

886 LF OF 8-INCH PVC (C900) FIRELINE

NEW 8" X 8" TEE

NEW 5-INCH STORZ FDC
MAINTAIN 10' CLEAR
ZONE IN ALL DIRECTIONS.
POST "FDC" SIGN

NEW PRIVATE FIRE HYDRANT
WITH 10"x6" TEE
AND 6" GATE VALVE

68 LF OF 8-INCH PVC
(C900) FIRELINE

68 LF OF 8-INCH PVC
(C900) FIRELINE

68 LF OF 8-INCH PVC
(C900) FIRELINE

68 LF OF 8-INCH PVC
(C900) FIRELINE

NEW TRANSFORMER
SEE ELECTRICAL PLANS FOR DETAILS

52 LF OF 4" PVC FDC PIPING
(TO FDC STANDPIPE)

FIRE PUMP ROOM
COORDINATE w/ PUMP DESIGN & A/MEP

3" DOMESTIC SERVICE CONNECTION
COORDINATE w/ PLUMBING PLANS

10" FIRE SERVICE CONNECTION
COORDINATE w/ PLUMBING PLANS

390 LF OF 10-INCH PVC (C900) FIRELINE
(5' BEHIND RPDA TO BUILDING)

400 LF OF 3-INCH PVC (SCH 40) DOM. WATER LINE
(5' BEHIND RPPA TO BUILDING)

PROPOSED 6-INCH SEWER CONNECTION
IE = ±855.20
(REFER TO PLUMBINGS PLANS)

PROPOSED BUILDING
280,000-SF
1000' x 280'
FFE: 863.20

SEE UTILITY INSET,
THIS SHEET

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PE SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045345 ENGINEER TIMOTHY W. BLEVINS

04/29/2022

40 0 40
SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

OVERALL UTILITY PLAN

REVISIONS:

ENGINEER: JJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C3.1
SHEET 5 OF 18

UTILITY LEGEND

- EXISTING WATERLINE
- PROPOSED WATERLINE/FIRE LINE (SIZE)
- FIRE HYDRANT HOSE PULL
- PROPOSED FIRE HYDRANT
- PROPOSED GATE VALVE
- PROPOSED WATER METER
- PROPOSED BACK FLOW PREVENTER
- PROPOSED FIRE DEPARTMENT CONNECTION
- EXISTING SANITARY SEWER LINE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY SEWER EASEMENT
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED SANITARY SEWER MANHOLE

SSMH RIM: 773.30'

SSMH RIM: 773.17'

SSMH RIM: 779.30'

CONNECT TO EXISTING SANITARY SEWER LINE IE: TBD

NEW SS CO

NEW SS CO

MATCHLINE SHEET C3.1

TOP OF BANK

BOTTOM OF BANK

100' BUFFER

1,234 LF OF 6-INCH PVC (SDR 35) @ 1.0% SLOPE (MIN)

SOUTHRIDGE PKWY SR 1392

PROPOSED BUILDING

OAK ENGINEERING
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NORTH CAROLINA FIRM LICENSE #P1742
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PE SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045345 ENGINEER LUKE J. BESSEMER

04/29/2022

40 0 40

SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

SANITARY SEWER PLAN

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C3.2
SHEET 6 OF 18

GRADING LEGEND

- EXISTING CONTOUR — 100
- PROPOSED CONTOUR — 100
- PROPOSED LIMITS OF CONSTRUCTION
- PROPOSED STORM DRAINAGE EASEMENT — SDE — SDE
- PROPOSED STORM DRAINAGE PIPE
- EXISTING JURISDICTIONAL WETLAND
- PROPOSED SPOT ELEVATION (GUTTER LINE ELEV) — 100.00
- PROPOSED JUNCTION BOX
- PROPOSED CATCH BASIN
- PROPOSED DROP INLET
- PROPOSED FLARED END SECTION
- PROPOSED OUTLET STRUCTURE
- PROPOSED HEADWALL
- PROPOSED RIPRAP APRON

RIPRAP APRON SIZING CHART

STRUCTURE	PIPE Ø	D50 (FT)	LENGTH (FT)	W1 (FT)	W2 (FT)	DMAX (IN)	THICKNESS (IN)
FES-1	48	0.8	26	12	30	14	22
FES-2	48	0.8	26	12	30	14	22
FES	48	0.8	26	12	30	14	22
FES-OS	30	0.5	20	8	23	9	14

PERENNIAL STREAM
TOP OF BANK
BOTTOM OF BANK
INTERMITTENT STREAM
SOUTHRIDGE PKWY
SR 1395

FES-OS
INV IN: 819.90 30" RCP

OCS
TOP: 828.00
INV OUT: 821.00 30" RCP

FES
INV IN: 824.50 48" RCP
48" RCP @ 0.49%
30.44 LF

JB-1
RIM/GRATE: 834.32
INV IN: 826.65 48" RCP
INV OUT: 824.65 48" RCP

48" RCP @ 12.00%
113.28 LF

CB-6
RIM/GRATE: 856.38
INV IN: 841.44 30" RCP
INV OUT: 841.34 30" RCP

WEST RETAINING WALL
(BY OTHERS)
SEE SHEET C4.1 FOR PROFILE

End Pipe
Inv: 801.58' 24" RCP (SW)

FES
Inv: 815.97' 24" RCP (NE)

C&G
Rim: 823.92'
Inv: 820.14' 15" RCP (NW)

C&G
Rim: 824.03'
Inv: 819.39' 15" RCP (SE)
Inv: 819.09' 15" RCP (NW)

41.54' 15" RCP

36" RCP @ 0.50%
110.00 LF

42" RCP @ 1.75%
144.00 LF

144.00 LF
30" RCP @ 1.50%

144.00 LF
30" RCP @ 1.50%

144.00 LF
24" RCP @ 1.50%

30" RCP @ 0.50%
144.00 LF

30" RCP @ 0.50%
175.00 LF

24" RCP @ 1.00%
196.35 LF

24" RCP @ 1.00%
99.75 LF

24" RCP @ 1.00%
66.00 LF

CB-20
RIM/GRATE: 854.71
INV OUT: 850.46 24" RCP

CB-4
RIM/GRATE: 855.07
INV IN: 839.43 36" RCP
INV OUT: 839.33 36" RCP

CB-3
RIM/GRATE: 854.73
INV IN: 838.78 36" RCP
INV OUT: 838.28 42" RCP

CB-2
RIM/GRATE: 854.73
INV IN: 835.76 42" RCP
INV IN: 843.38 30" RCP
INV OUT: 835.26 48" RCP

CB-18
RIM/GRATE: 854.73
INV IN: 845.64 30" RCP
INV OUT: 845.54 30" RCP

CB-19
RIM/GRATE: 854.73
INV IN: 848.30 24" RCP
INV OUT: 847.80 30" RCP

CB-5
RIM/GRATE: 856.38
INV IN: 840.62 30" RCP
INV OUT: 840.12 36" RCP

EAST RETAINING WALL
(BY OTHERS)
SEE SHEET C4.1 FOR PROFILE

PROPOSED BUILDING
280,000-SF
1000' x 280'
FFE: 863.20

CB-7
RIM/GRATE: 858.38
INV IN: 842.81 24" RCP
INV OUT: 842.31 30" RCP

CB-8
RIM/GRATE: 860.48
INV IN: 844.88 24" RCP
INV OUT: 844.78 24" RCP

FES-2
INV IN: 833.00 48" RCP

FES-1
INV OUT: 838.00 48" RCP

CB-9
RIM/GRATE: 859.98
INV IN: 845.98 24" RCP
INV OUT: 845.88 24" RCP

CB-10
RIM/GRATE: 860.98
INV IN: 846.88 24" RCP
INV OUT: 846.78 24" RCP

CB-11
RIM/GRATE: 860.75
INV IN: 848.19 24" RCP
INV OUT: 848.09 24" RCP

CB-12
RIM/GRATE: 860.75
INV IN: 849.73 18" RCP
INV OUT: 849.63 24" RCP

CB-13
RIM/GRATE: 860.75
INV IN: 851.27 18" RCP
INV OUT: 851.17 18" RCP

CB-14
RIM/GRATE: 860.75
INV IN: 852.81 18" RCP
INV OUT: 852.71 18" RCP

CB-15
RIM/GRATE: 860.75
INV IN: 854.35 18" RCP
INV OUT: 854.25 18" RCP

CB-16
RIM/GRATE: 860.75
INV IN: 855.88 15" RCP
INV OUT: 855.78 18" RCP

CB-17
RIM/GRATE: 860.75
INV OUT: 857.31 15" RCP

120.60 LF
24" RCP @ 1.00%

143.60 LF
24" RCP @ 1.00%

143.60 LF
18" RCP @ 1.00%

143.60 LF
18" RCP @ 1.00%

143.60 LF
18" RCP @ 1.00%

143.60 LF
18" RCP @ 1.00%

143.60 LF
15" RCP @ 1.00%

OAK ENGINEERING
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NORTH CAROLINA FIRM LICENSE #P1742
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PE SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045345 BRIAN T. LIEB

04/29/2022

40 0 40
SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

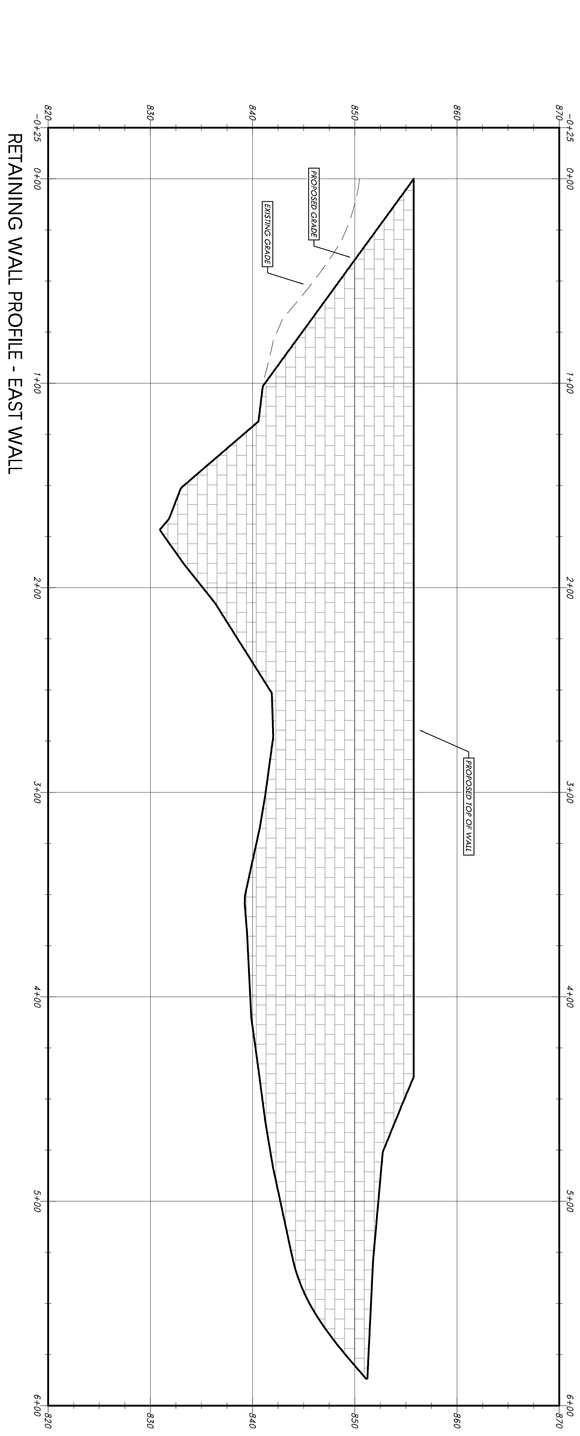
GRADING & DRAINAGE PLAN

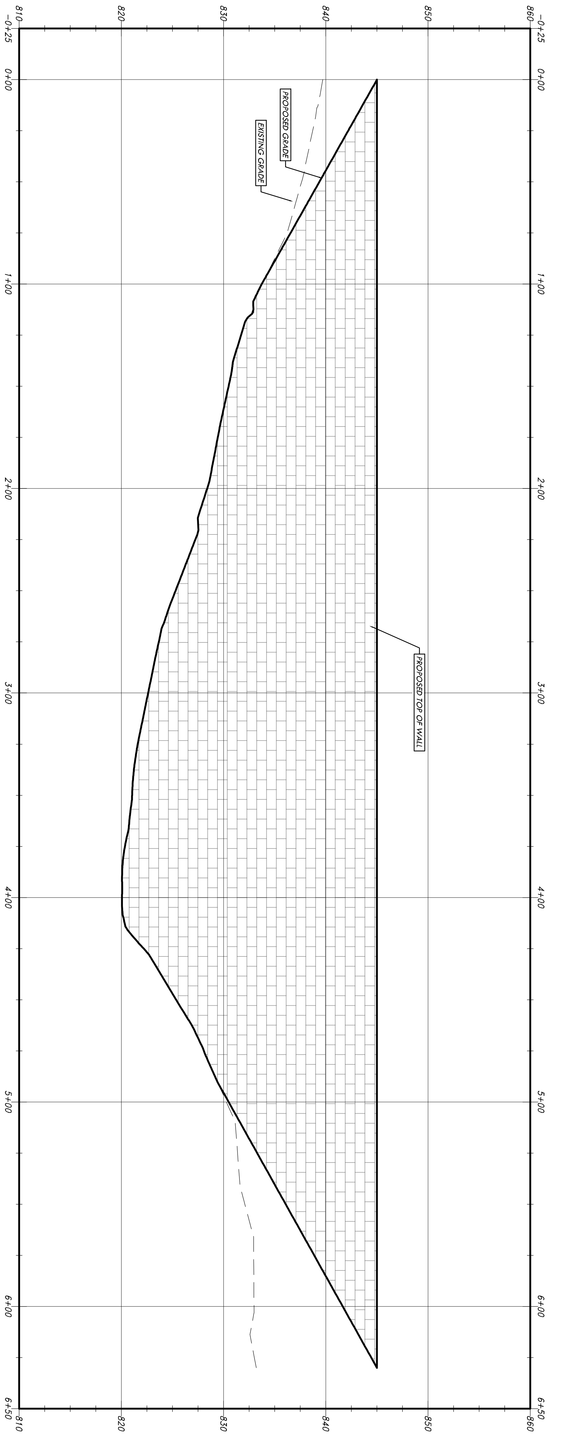
REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C4.0
SHEET 7 OF 18





ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C4.1
SHEET 8 OF 18

REVISIONS:

SOUTHRIDGE - BESSEMER

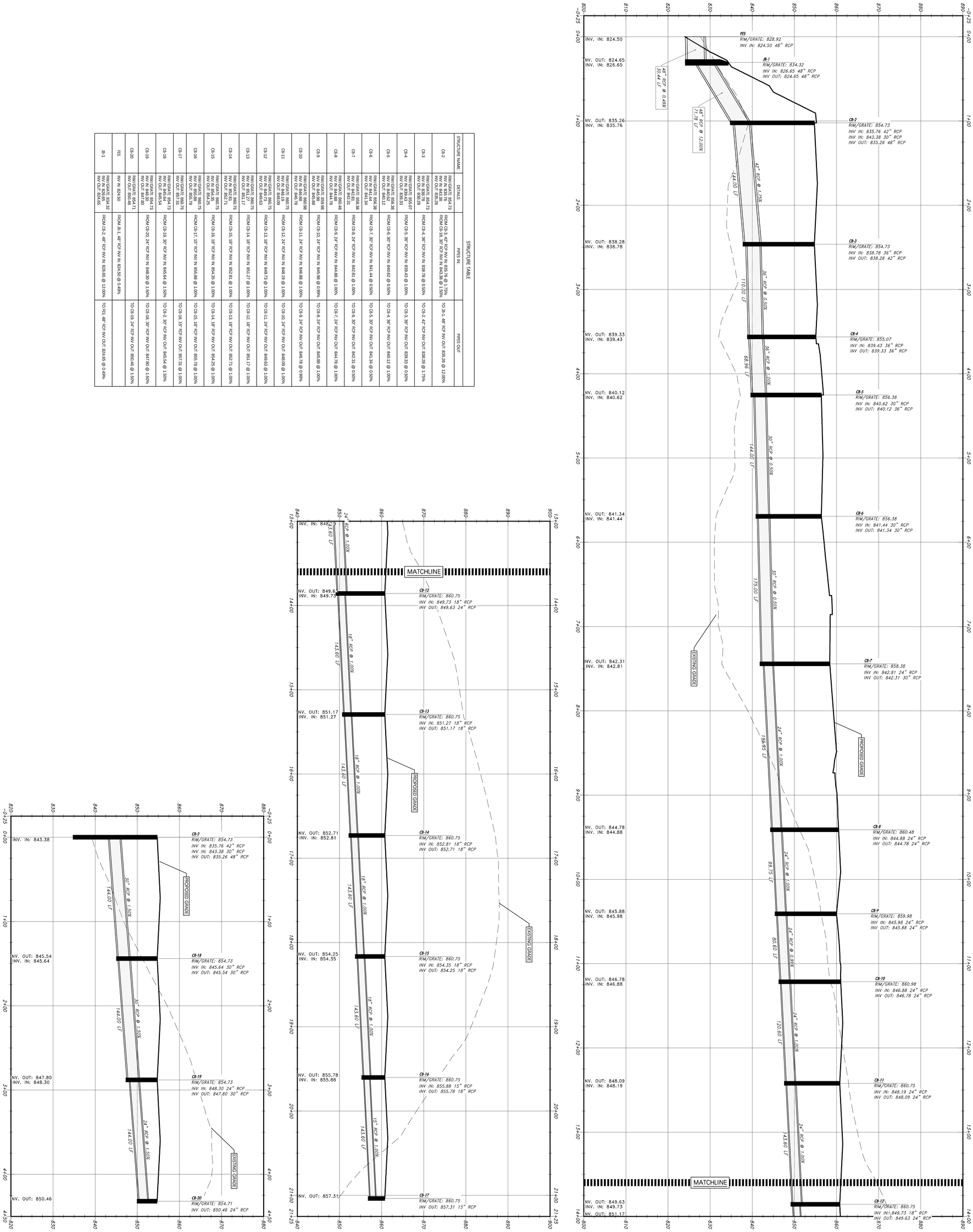
SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

RETAINING WALL PROFILES

PROFILE SCALES
VERT. SCALE: 1" = 6'
HOR. SCALE: 1" = 30'

PE SEAL:
04/29/2022

OAK ENGINEERING
4929 MONROE ROAD · CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering



STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:	PIPES IN:	PIPES OUT:
CB-2	RIM/GRATE: 854.73 INV IN: 835.76 INV OUT: 835.26	FROM CB-3: 42" RCP INV IN: 838.78 @ 1.75% FROM JB-1: 30" RCP INV IN: 843.38 @ 1.50%	TO JB-1: 48" RCP INV OUT: 835.26 @ 12.00%
CB-3	RIM/GRATE: 854.73 INV IN: 838.78	FROM CB-4: 36" RCP INV IN: 839.78 @ 0.50%	TO CB-2: 42" RCP INV OUT: 838.28 @ 1.75%
CB-4	RIM/GRATE: 855.07 INV IN: 839.43	FROM CB-5: 36" RCP INV IN: 839.43 @ 1.00%	TO CB-3: 36" RCP INV OUT: 839.33 @ 0.50%
CB-5	RIM/GRATE: 856.38 INV IN: 840.62	FROM CB-6: 30" RCP INV IN: 840.62 @ 0.50%	TO CB-4: 36" RCP INV OUT: 840.12 @ 1.00%
CB-6	RIM/GRATE: 856.38 INV IN: 841.44	FROM CB-7: 30" RCP INV IN: 841.44 @ 0.50%	TO CB-5: 30" RCP INV OUT: 841.34 @ 0.50%
CB-7	RIM/GRATE: 858.38 INV IN: 842.81	FROM CB-8: 24" RCP INV IN: 842.81 @ 1.00%	TO CB-6: 30" RCP INV OUT: 842.31 @ 0.50%
CB-8	RIM/GRATE: 860.48 INV IN: 844.88 INV OUT: 844.78	FROM CB-9: 24" RCP INV IN: 844.88 @ 1.00%	TO CB-7: 24" RCP INV OUT: 844.78 @ 1.00%
CB-9	RIM/GRATE: 859.98 INV IN: 845.98 INV OUT: 845.88	FROM CB-10: 24" RCP INV IN: 845.98 @ 0.99%	TO CB-8: 24" RCP INV OUT: 845.88 @ 1.00%
CB-10	RIM/GRATE: 860.98 INV IN: 846.88 INV OUT: 846.78	FROM CB-11: 24" RCP INV IN: 846.88 @ 1.00%	TO CB-9: 24" RCP INV OUT: 846.78 @ 0.99%
CB-11	RIM/GRATE: 860.75 INV IN: 848.19 INV OUT: 848.09	FROM CB-12: 24" RCP INV IN: 848.19 @ 1.00%	TO CB-10: 24" RCP INV OUT: 848.09 @ 1.00%
CB-12	RIM/GRATE: 860.75 INV IN: 849.73 INV OUT: 849.63	FROM CB-13: 18" RCP INV IN: 849.73 @ 1.00%	TO CB-11: 24" RCP INV OUT: 849.63 @ 1.00%
CB-13	RIM/GRATE: 860.75 INV IN: 851.27 INV OUT: 851.17	FROM CB-14: 18" RCP INV IN: 851.27 @ 1.00%	TO CB-12: 18" RCP INV OUT: 851.17 @ 1.00%
CB-14	RIM/GRATE: 860.75 INV IN: 852.81	FROM CB-15: 18" RCP INV IN: 852.81 @ 1.00%	TO CB-13: 18" RCP INV OUT: 852.71 @ 1.00%
CB-15	RIM/GRATE: 860.75 INV IN: 854.35 INV OUT: 854.25	FROM CB-16: 18" RCP INV IN: 854.35 @ 1.00%	TO CB-14: 18" RCP INV OUT: 854.25 @ 1.00%
CB-16	RIM/GRATE: 860.75 INV IN: 855.88 INV OUT: 855.78	FROM CB-17: 15" RCP INV IN: 855.88 @ 1.00%	TO CB-15: 18" RCP INV OUT: 855.78 @ 1.00%
CB-17	RIM/GRATE: 860.75 INV OUT: 857.31		TO CB-16: 15" RCP INV OUT: 857.31 @ 1.00%
CB-18	RIM/GRATE: 854.73 INV IN: 845.64 INV OUT: 845.54	FROM CB-19: 30" RCP INV IN: 845.64 @ 1.50%	TO CB-2: 30" RCP INV OUT: 845.54 @ 1.50%
CB-19	RIM/GRATE: 854.73 INV IN: 848.30 INV OUT: 847.80	FROM CB-20: 24" RCP INV IN: 848.30 @ 1.50%	TO CB-18: 30" RCP INV OUT: 847.80 @ 1.50%
CB-20	RIM/GRATE: 854.71 INV OUT: 850.46		TO CB-19: 24" RCP INV OUT: 850.46 @ 1.50%
FES	INV IN: 824.50	FROM JB-1: 48" RCP INV IN: 823.50 @ 0.49%	
JB-1	RIM/GRATE: 834.32 INV IN: 826.65 INV OUT: 824.65	FROM CB-2: 48" RCP INV IN: 826.65 @ 12.00%	TO FES: 48" RCP INV OUT: 824.65 @ 0.49%

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C4.2
SHEET 9 OF 18

REVISIONS:

SOUTHRIDGE - BESSEMER

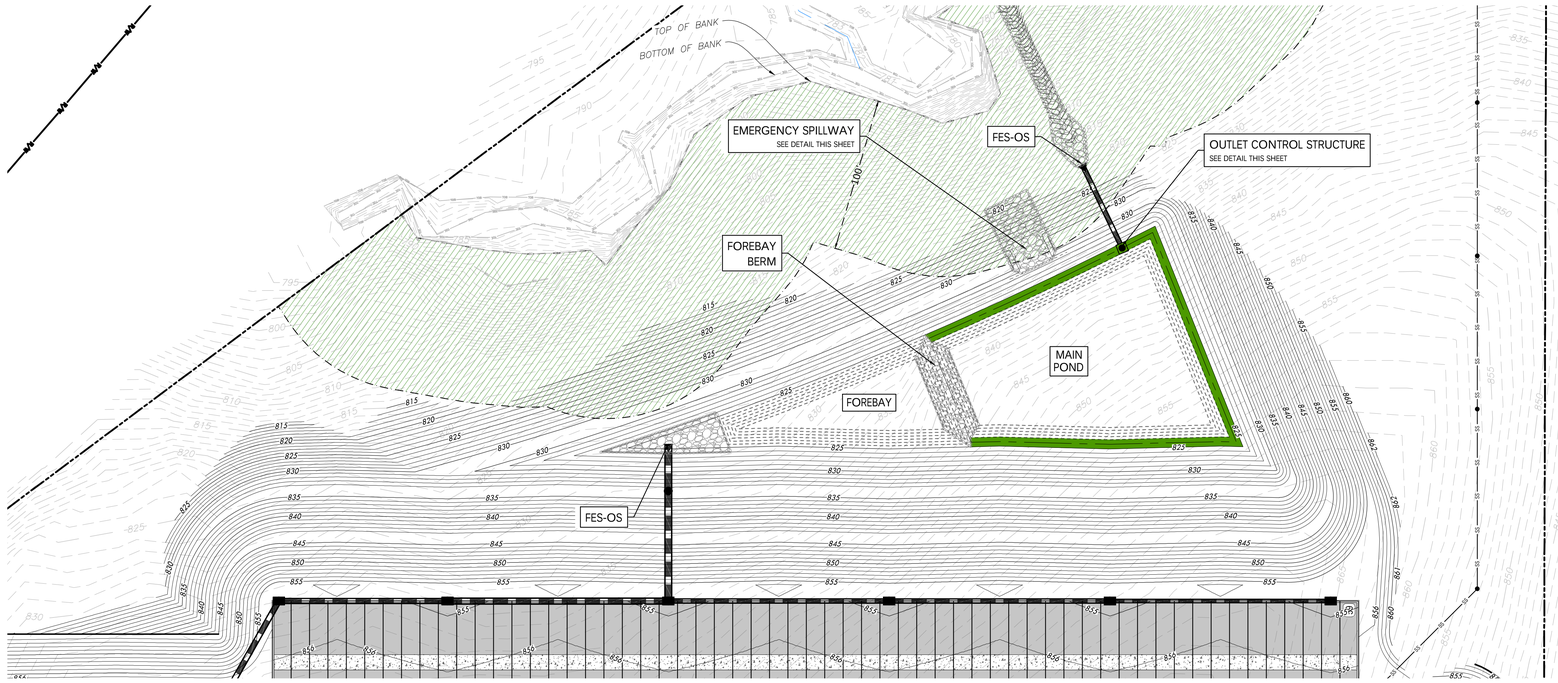
SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

STORM DRAINAGE PROFILES

PROFILE SCALES
VERT. SCALE: 1" = 8'
HOR. SCALE: 1" = 40'

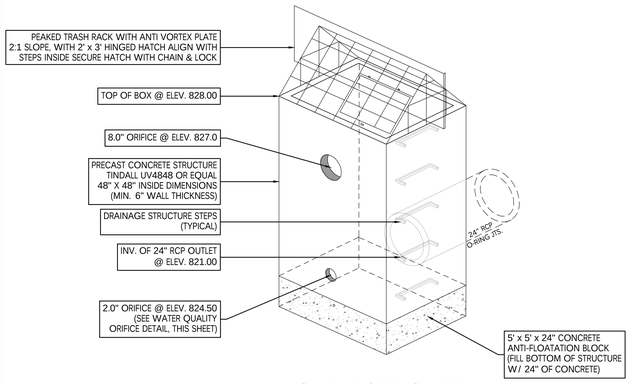
PE SEAL:
04/29/2022

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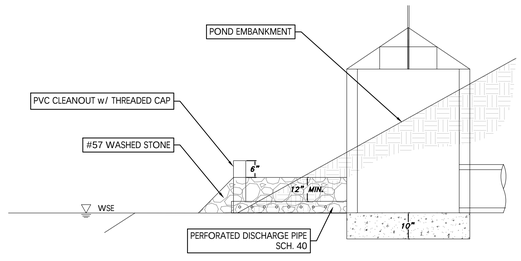
RIPRAP APRON SIZING CHART

STRUCTURE	PIPE Ø	D50 (FT)	LENGTH (FT)	W1 (FT)	W2 (FT)	DMAX (IN)	THICKNESS (IN)
FES	48	0.8	26	12	30	14	22
FES-OS	30	0.5	20	8	23	9	14



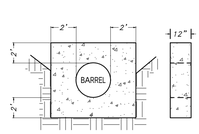
OUTLET STRUCTURE

NOT TO SCALE



WATER QUALITY ORIFICE DETAIL

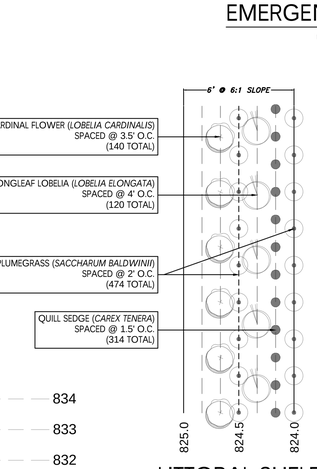
NOT TO SCALE



NOTES:
USE SIDE WALLS AND BOTTOM OF TRENCH AS FORM COMPACT OVER-EXCAVATION TO 95% DENSITY (PER ASTM D-698) CONCRETE SHALL BE 3,000-PSI

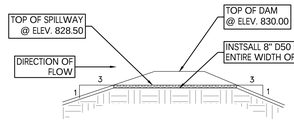
CONCRETE ANTI-SEEP COLLARS TYPICAL SECTION

NOT TO SCALE



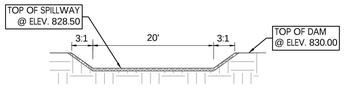
LITTORAL SHELF TYPICAL PLANTING

NOT TO SCALE



SECTION THROUGH SPILLWAY

NOT TO SCALE

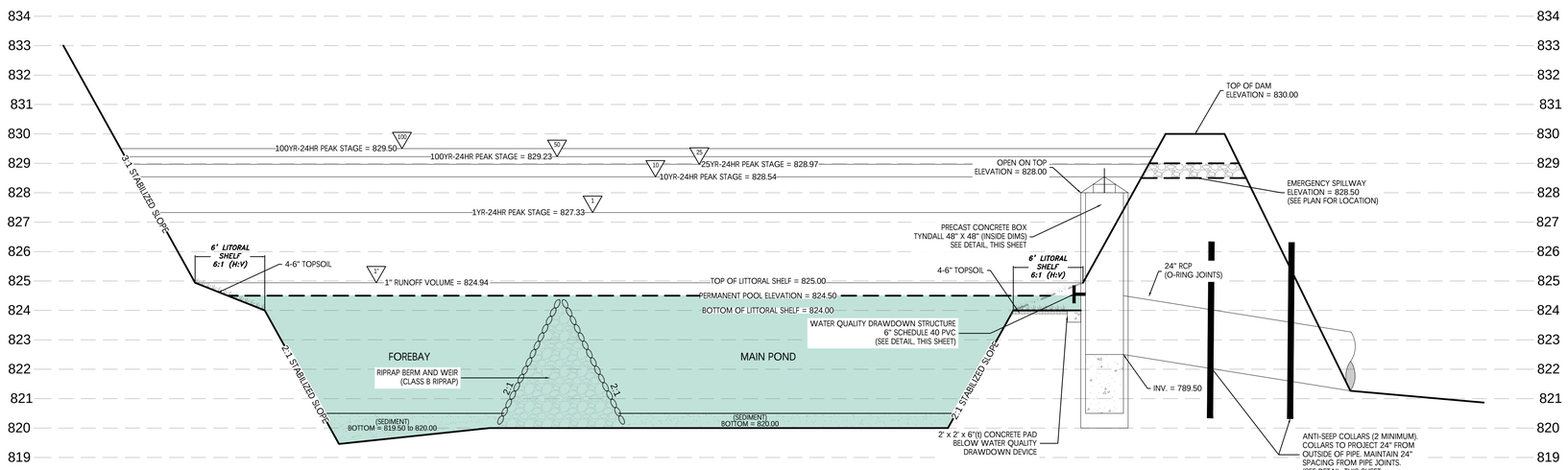


EMERGENCY SPILLWAY ELEVATION

NOT TO SCALE

EMERGENCY SPILLWAY

NOT TO SCALE



WET DETENTION POND SECTION A-A

NOT TO SCALE

WET POND NOTE:
IN LIEU OF MAINTENANCE DRAIN PIPE, POND TO BE MECHANICALLY PUMPED FOR MAINTENANCE.

WET POND MAINTENANCE REQUIREMENTS

BMP ELEMENT	POTENTIAL PROBLEM	HOW TO REMEDIATE THE PROBLEM
THE ENTIRE BMP	TRASH/DEBRIS IS PRESENT	REMOVE THE TRASH/DEBRIS
THE PERIMETER OF THE BMP	AREAS OF BARE SOIL AND/OR EROSIVE GULLIES HAVE FORMED	REGRADE THE SOIL IF NECESSARY TO REMOVE THE GULLY, AND THEN PLANT A GROUND COVER AND WATER UNTIL IT IS ESTABLISHED. PROVIDE LIME AND A ONE-TIME FERTILIZER APPLICATION.
	VEGETATION IS TOO SHORT OR TOO LONG	MAINTAIN VEGETATION AT A HEIGHT OF APPROXIMATELY SIX INCHES
THE INLET DEVICE	THE PIPE IS CLOGGED	UNCLOG THE PIPE. DISPOSE OF THE SEDIMENT OFF-SITE
	THE PIPE IS CRACKED OR OTHERWISE DAMAGED	REPLACE THE PIPE
	EROSION IS OCCURRING IN THE SWALE	REGRADE THE SWALE IF NECESSARY TO SMOOTH IT OVER AND PROVIDE EROSION CONTROL DEVICES SUCH AS REINFORCED TURF MATTING OR RIPRAP TO AVOID FUTURE PROBLEMS WITH EROSION.
	STONE VERGE IS CLOGGED OR COVERED IN SEDIMENT (IF APPLICABLE)	REMOVE SEDIMENT AND REPLACE WITH CLEAN STONE
THE FOREBAY	TRASH/DEBRIS IS PRESENT	REMOVE THE TRASH/DEBRIS
	EROSION HAS OCCURRED OR RIPRAP IS DISPLACED	PROVIDE ADDITIONAL EROSION PROTECTION SUCH AS REINFORCED TURF MATTING OR RIPRAP IF NEEDED TO PREVENT FUTURE EROSION PROBLEMS
	WEEDS ARE PRESENT	REMOVE THE WEEDS, PREFERABLY BY HAND. IF PESTICIDES ARE USED, WIPE THEM ON THE PLANTS RATHER THAN SPRAYING
THE MAIN TREATMENT AREA	SEDIMENT HAS ACCUMULATED AND REDUCED THE DEPTH TO 75% OF THE ORIGINAL DESIGN DEPTH (PER POND DESIGN DATA SHEET)	SEARCH FOR THE SOURCE OF THE SEDIMENT AND REMEDY THE PROBLEM IF POSSIBLE. REMOVE THE SEDIMENT AND DISPOSE OF IT IN A LOCATION WHERE IT WILL NOT CAUSE IMPACTS TO STREAMS OR THE BMP. REVEGETATE DISTURBED AREAS IMMEDIATELY WITH SOD (PREFERRED) OR SEED PROTECTED WITH SECURELY STAKED EROSION CONTROL MAT.
	ALGAL GROWTH COVERS OVER 50% OF THE AREA	CONSULT A PROFESSIONAL TO REMOVE AND CONTROL THE ALGAL GROWTH
	CATTAILS, PHRAGMITES OR OTHER INVASIVE PLANTS COVER 50% OF THE BASIN SURFACE	REMOVE THE PLANTS BY WIPING THEM WITH PESTICIDE (DO NOT SPRAY)
THE EMBANKMENT	SHRUBS HAVE STARTED TO GROW ON THE EMBANKMENT	REMOVE SHRUBS IMMEDIATELY
	EVIDENCE OF MUSKRAT OR BEAVER IS PRESENT	USE TRAPS TO REMOVE MUSKRATS AND CONSULT A PROFESSIONAL TO REMOVE BEAVERS
	A TREE HAS STARTED TO GROW ON THE EMBANKMENT	CONSULT A DAM SPECIALIST TO REMOVE THE TREE
	AN ANNUAL INSPECTION BY AN APPROPRIATE PROFESSIONAL SHOWS THAT THE EMBANKMENT NEEDS REPAIR.	MAKE ALL NEEDED REPAIRS
THE OUTLET DEVICE	CLOGGING HAS OCCURRED	CLEAN OUT THE OUTLET DEVICE. DISPOSE OF THE SEDIMENT OFF-SITE
	THE OUTLET DEVICE IS DAMAGED	REPAIR OR REPLACE THE OUTLET DEVICE
THE RECEIVING WATER	EROSION OR OTHER SIGNS OF DAMAGE HAVE OCCURRED AT THE OUTLET	CONTACT THE LOCAL NC DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES REGIONAL OFFICE

BMP MAINTENANCE NOTE

OWNERSHIP & MAINTENANCE OF BMP BELONGS TO THE OWNER

SEDIMENT BASIN CONVERSION NOTES

1. RECEIVE PERMISSION FROM THE CITY OF STATESVILLE AND GASTON COUNTY PRIOR TO DEWATERING (email stormwater@statesvillenc.net)
2. ALL SLOPES AND BOTTOM OF POND SHALL BE PREPARED & SEEDED TO PERMANENT GROUND COVER SPECIFICATIONS.
3. THE SEDIMENT BASIN SHALL NOT BE CONVERTED TO THE PERMANENT WET POND UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. ANY SEDIMENT THAT ACCUMULATES WITHIN THE POND SHALL BE REMOVED AND THE FINAL GRADE REESTABLISHED TO THE PROPOSED CONTOURS SHOWN.
4. THE CONVERSION TO A PERMANENT WET POND SHALL BE ACCOMPLISHED BY REGRADING THE BASIN CONTOURS TO THOSE SHOWN ON THE PLAN, REMOVING SKIMMER BASIN (PLUG VOID) AND CORING PERMANENT WATER QUALITY ORIFICE(S) AND INSTALLING WET POND PLANTINGS (AS SHOWN).
5. ANY SEDIMENT LADEN WATER WITHIN THE SEDIMENT BASIN SHALL BE DRAWN DOWN BY USE OF PUMPS AND DISCHARGES THROUGH A 'BLADDER' TYPE SYSTEM OR DISPOSED OF OFFSITE IN AN APPROVED SYSTEM.
6. ALL SEDIMENT REMOVED SHALL BE PLACED IN A DESIGNATED SPOIL PILE AND ADEQUATELY PROTECTED WITH EROSION CONTROL MEASURES AND PERMANENTLY STABILIZED WITH PERMANENT SEEDING.

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NORTH CAROLINA FIRM LICENSE #P1742
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PE SEAL:



04/29/2022

30 0 30

SCALE: 1" = 30'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

STORMWATER MANAGEMENT PLAN

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C4.4
SHEET 10 OF 18

TEMPORARY DIVERSION DITCH NOTES

- ALL TEMPORARY DIVERSION DITCHES SHALL HAVE WATTLE CHECK DAMS WITH POLYACRYLAMIDE (PAM) PLACED EVERY 50' (MAX).
- TEMPORARY DIVERSION DITCHES SHALL REMAIN IN PLACE TO THE MAXIMUM EXTENT POSSIBLE TO CARRY RUNOFF TO SEDIMENT BASINS UNTIL SITE IS STABILIZED.
- AS SITE IS BROUGHT TO GRADE, ADJUST TEMPORARY DIVERSION DITCHES AND CHECK DAMS TO ENSURE MAXIMUM DRAINAGE AREA REACHES SEDIMENT BASINS.

EROSION CONTROL KEYS

CE	TEMPORARY STABILIZED CONSTRUCTION ENTRANCE (100' X 24')
RA	RIPRAP APRON AT OUTFALL. 12" THICK CLASS 'B' RIPRAP. DIMENSIONS AS SHOWN.
PB	TEMPORARY POROUS BAFFLES
SF	TEMPORARY ROW OF WIRE BACK SILT FENCE
SF2	TEMPORARY DOUBLE-ROW OF WIRE BACK SILT FENCE (NOTE: SEE PLANS FOR LOCATION OF HIGH HAZARD SILT FENCE)
SFO	TEMPORARY SILT FENCE OUTLET
SK	TEMPORARY FAIRCLOTH SKIMMER
TD	TEMPORARY DIVERSION DITCH
SD	TEMPORARY 12" SLOPE DRAIN
SM	SLOPE MATTING - NAG S75 ON ALL SLOPES 5:1 OR STEEPER AND AS INDICATED
IP	TEMPORARY HARDWARE CLOTH & GRAVEL INLET PROTECTION
IP2	TEMPORARY SEDIMENT TUBES IN EXISTING CATCH BASIN
CD	TEMPORARY CHECK DAM

GROUND STABILIZATION NOTES

1. SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE:
   - 1.1. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
   - 1.2. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
2. CONDITIONS - IN MEETING THE STABILIZATION REQUIREMENTS ABOVE, THE FOLLOWING CONDITIONS OR EXEMPTIONS SHALL APPLY:
   - 2.1. EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE.
   - 2.2. ALL SLOPES 50' IN LENGTH OR GREATER SHALL APPLY THE GROUND COVER WITHIN 7 DAYS EXCEPT WHEN THE SLOPE IS FLATTER THAN 4:1. SLOPES LESS THAN 50' SHALL APPLY GROUND COVER WITHIN 14 DAYS EXCEPT WHEN SLOPES ARE STEEPER THAN 3:1, THE 7 DAY-REQUIRMENT APPLIES.
   - 2.3. ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT.
   - 2.4. SLOPES 10' OR LESS IN LENGTH SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT EXCEPT WHEN THE SLOPE IS STEEPER THAN 2:1.
   - 2.5. ALTHOUGH STABILIZATION IS USUALLY SPECIFIED AS GROUND COVER, OTHER METHODS, SUCH AS CHEMICAL STABILIZATION, MAY BE ALLOWED ON A CASE-BY-CASE BASIS.
   - 2.6. FOR PORTIONS OF PROJECTS WITHIN THE SEDIMENT CONTROL COMMISSION-DEFINED "HIGH QUALITY WATER ZONE" (15A NCAC 04A. 0105) , STABILIZATION WITH GROUND COVER SHALL BE ACHIEVED AS SOON AS PRACTICABLE BUT IN ANY EVENT ON ALL AREAS OF THE SITE WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACT.
   - 2.7. PORTIONS OF A SITE THAT ARE LOWER IN ELEVATION THAN ADJACENT DISCHARGE LOCATIONS AND ARE NOT EXPECTED TO DISCHARGE DURING CONSTRUCTION MAY BE EXEMPT FROM THE TEMPORARY GROUND COVER REQUIREMENTS IF IDENTIFIED ON THE APPROVED E&SC PLAN OR ADDED BY THE PERMITTING AUTHORITY.

GENERAL EROSION CONTROL NOTES

1. SEDIMENT BASIN(S) SHALL BE STABILIZED IMMEDIATELY AFTER INSTALLATION.
2. ALL STOCKPILES SHALL BE PLACED AT LEAST 50' FROM JURISDICTIONAL AREAS AND DRAINAGE FEATURES.
3. ANY OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN, A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES OR GENERATED BY ANY ACTIVITIES ON SITE MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT OR PER DIVISION OF SOLID WASTE MANAGEMENT OR DIVISION OF WATER RESOURCES RULES AND REGULATIONS (15A NCAC 4B .0110)

EROSION CONTROL LEGEND

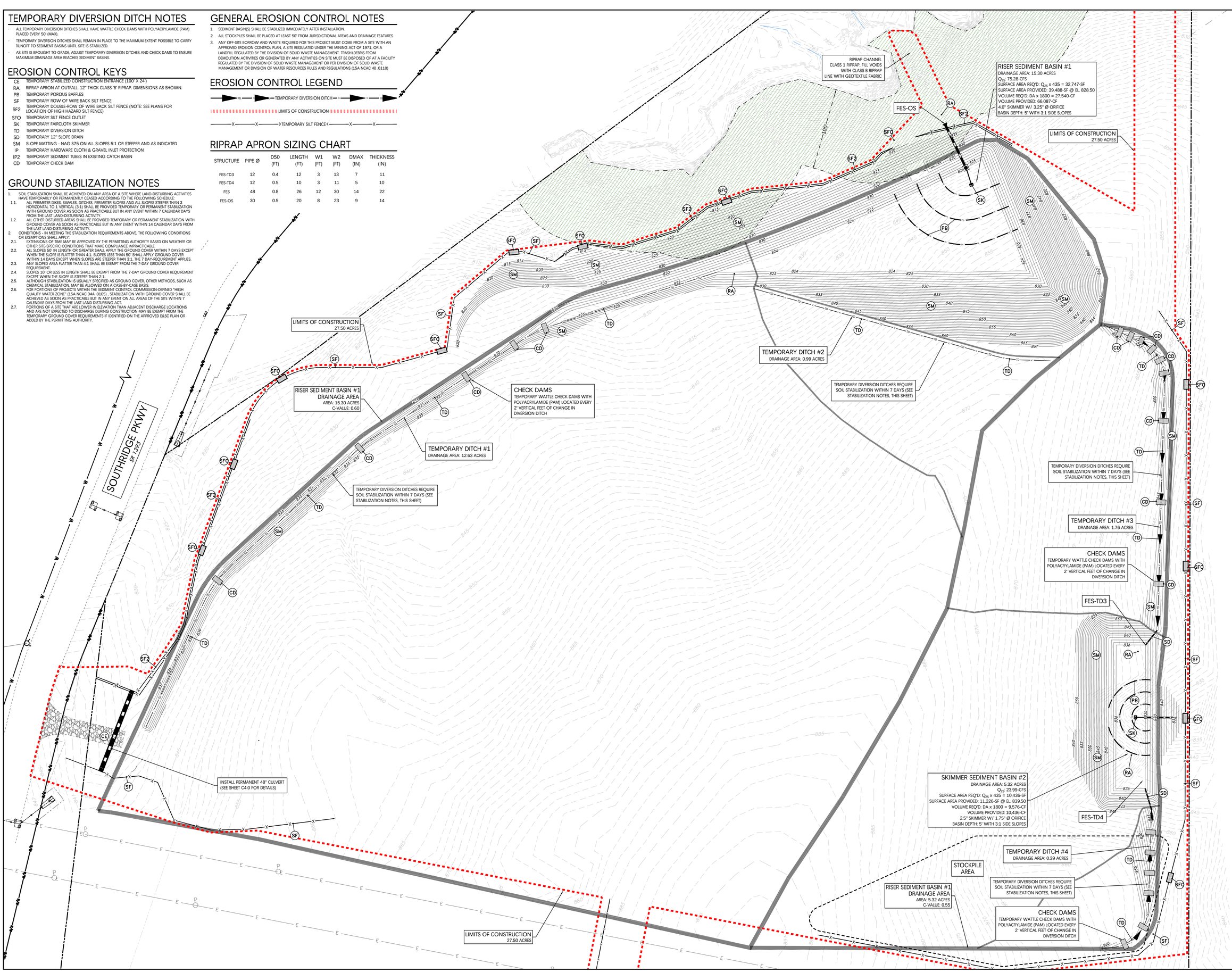
TEMPORARY DIVERSION DITCH

LIMITS OF CONSTRUCTION

TEMPORARY SILT FENCE

RIPRAP APRON SIZING CHART

STRUCTURE	PIPE Ø	D50 (FT)	LENGTH (FT)	W1 (FT)	W2 (FT)	DMAX (IN)	THICKNESS (IN)
FES-TD3	12	0.4	12	3	13	7	11
FES-TD4	12	0.5	10	3	11	5	10
FES	48	0.8	26	12	30	14	22
FES-OS	30	0.5	20	8	23	9	14



OAK ENGINEERING
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NORTH CAROLINA FIRM LICENSE #P1742
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PE SEAL:



40 0 40

SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

EROSION CONTROL PHASE 1

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C5.0
SHEET 11 OF 18

TEMPORARY DIVERSION DITCH NOTES

- ALL TEMPORARY DIVERSION DITCHES SHALL HAVE WATTLE CHECK DAMS WITH POLYACRYLAMIDE (PAM) PLACED EVERY 50' (MAX).
- TEMPORARY DIVERSION DITCHES SHALL REMAIN IN PLACE TO THE MAXIMUM EXTENT POSSIBLE TO CARRY RUNOFF TO SEDIMENT BASINS UNTIL SITE IS STABILIZED.
- AS SITE IS BROUGHT TO GRADE, ADJUST TEMPORARY DIVERSION DITCHES AND CHECK DAMS TO ENSURE MAXIMUM DRAINAGE AREA REACHES SEDIMENT BASINS.

EROSION CONTROL KEYS

CE	TEMPORARY STABILIZED CONSTRUCTION ENTRANCE (100' X 24')
RA	RIPRAP APRON AT OUTFALL. 12" THICK CLASS 'B' RIPRAP. DIMENSIONS AS SHOWN.
PB	TEMPORARY POROUS BAFFLES
SF	TEMPORARY ROW OF WIRE BACK SILT FENCE
SF2	TEMPORARY DOUBLE-ROW OF WIRE BACK SILT FENCE (NOTE: SEE PLANS FOR LOCATION OF HIGH HAZARD SILT FENCE)
SFO	TEMPORARY SILT FENCE OUTLET
SK	TEMPORARY FAIRCLOTH SKIMMER
TD	TEMPORARY DIVERSION DITCH
SM	SLOPE MATTING - NAG S75 ON ALL SLOPES 5:1 OR STEEPER AND AS INDICATED
CD	TEMPORARY CHECK DAM

GROUND STABILIZATION NOTES

1. SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE.
   - 1.1. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
   - 1.2. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
2. CONDITIONS - IN MEETING THE STABILIZATION REQUIREMENTS ABOVE, THE FOLLOWING CONDITIONS OR EXEMPTIONS SHALL APPLY:
   - 2.1. EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE.
   - 2.2. ALL SLOPES 50' IN LENGTH OR GREATER SHALL APPLY THE GROUND COVER WITHIN 7 DAYS EXCEPT WHEN THE SLOPE IS FLATTER THAN 4:1. SLOPES LESS THAN 50' SHALL APPLY GROUND COVER WITHIN 14 DAYS EXCEPT WHEN SLOPES ARE STEEPER THAN 3:1, THE 7 DAY-REQUIREMENT APPLIES. ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT.
   - 2.3. SLOPES 10' OR LESS IN LENGTH SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT EXCEPT WHEN THE SLOPE IS STEEPER THAN 2:1.
   - 2.4. ALTHOUGH STABILIZATION IS USUALLY SPECIFIED AS GROUND COVER, OTHER METHODS, SUCH AS CHEMICAL STABILIZATION, MAY BE ALLOWED ON A CASE-BY-CASE BASIS.
   - 2.5. FOR PORTIONS OF PROJECTS WITHIN THE SEDIMENT CONTROL COMMISSION-DEFINED "HIGH QUALITY WATER ZONE" (15A NCAC 04A .0105), STABILIZATION WITH GROUND COVER SHALL BE ACHIEVED AS SOON AS PRACTICABLE BUT IN ANY EVENT ON ALL AREAS OF THE SITE WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACT.
   - 2.6. PORTIONS OF A SITE THAT ARE LOWER IN ELEVATION THAN ADJACENT DISCHARGE LOCATIONS AND ARE NOT EXPECTED TO DISCHARGE DURING CONSTRUCTION MAY BE EXEMPT FROM THE TEMPORARY GROUND COVER REQUIREMENTS IF IDENTIFIED ON THE APPROVED E&SC PLAN OR ADDED BY THE PERMITTING AUTHORITY.
   - 2.7.

GENERAL EROSION CONTROL NOTES

1. SEDIMENT BASIN(S) SHALL BE STABILIZED IMMEDIATELY AFTER INSTALLATION.
2. ALL STOCKPILES SHALL BE PLACED AT LEAST 50' FROM JURISDICTIONAL AREAS AND DRAINAGE FEATURES.
3. ANY OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN, A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES OR GENERATED BY ANY ACTIVITIES ON SITE MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT OR PER DIVISION OF SOLID WASTE MANAGEMENT OR DIVISION OF WATER RESOURCES RULES AND REGULATIONS (15A NCAC 4B .0110)

EROSION CONTROL LEGEND

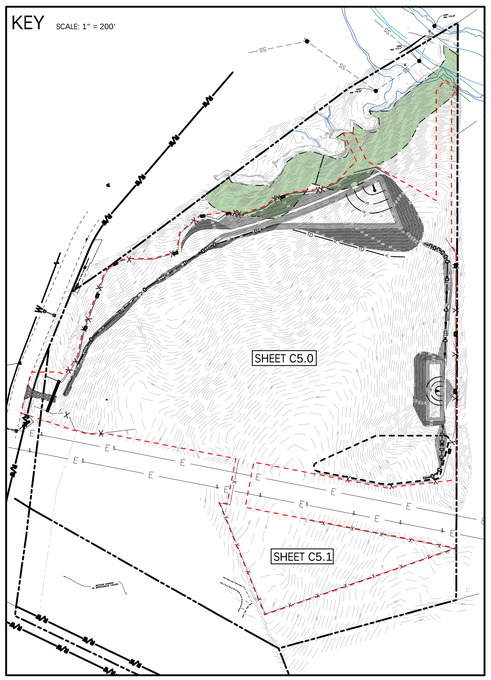
TEMPORARY DIVERSION DITCH

LIMITS OF CONSTRUCTION

TEMPORARY SILT FENCE



KEY SCALE: 1" = 200'



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NORTH CAROLINA FIRM LICENSE #P1742
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PE SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045345 ENGINEER LEE BESSEMER REGISTERED

04/29/2022

40 0 40
SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

EROSION CONTROL PHASE 1

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C5.1
SHEET 11 OF 18

TEMPORARY DIVERSION DITCH NOTES

- ALL TEMPORARY DIVERSION DITCHES SHALL HAVE WATTLE CHECK DAMS WITH POLYACRYLAMIDE (PAM) PLACED EVERY 50' (MAX).
- TEMPORARY DIVERSION DITCHES SHALL REMAIN IN PLACE TO THE MAXIMUM EXTENT POSSIBLE TO CARRY RUNOFF TO SEDIMENT BASINS UNTIL SITE IS STABILIZED.
- AS SITE IS BROUGHT TO GRADE, ADJUST TEMPORARY DIVERSION DITCHES AND CHECK DAMS TO ENSURE MAXIMUM DRAINAGE AREA REACHES SEDIMENT BASINS.

EROSION CONTROL KEYS

CE	TEMPORARY STABILIZED CONSTRUCTION ENTRANCE (100' X 24')
SF	TEMPORARY ROW OF WIRE BACK SILT FENCE
SFO	TEMPORARY SILT FENCE OUTLET
SM	SLOPE MATTING - NAG S75 ON ALL SLOPES 5:1 OR STEEPER AND AS INDICATED

GROUND STABILIZATION NOTES

1. SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE:
   - 1.1. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
   - 1.2. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
2. CONDITIONS - IN MEETING THE STABILIZATION REQUIREMENTS ABOVE, THE FOLLOWING CONDITIONS OR EXEMPTIONS SHALL APPLY:
   - 2.1. EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE.
   - 2.2. ALL SLOPES 50' IN LENGTH OR GREATER SHALL APPLY THE GROUND COVER WITHIN 7 DAYS EXCEPT WHEN THE SLOPE IS FLATTER THAN 4:1. SLOPES LESS THAN 50' SHALL APPLY GROUND COVER WITHIN 14 DAYS EXCEPT WHEN SLOPES ARE STEEPER THAN 3:1, THE 7 DAY-REQUIREMENT APPLIES. ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT.
   - 2.3. ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT.
   - 2.4. SLOPES 10' OR LESS IN LENGTH SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT EXCEPT WHEN THE SLOPE IS STEEPER THAN 2:1.
   - 2.5. ALTHOUGH STABILIZATION IS USUALLY SPECIFIED AS GROUND COVER, OTHER METHODS, SUCH AS CHEMICAL STABILIZATION, MAY BE ALLOWED ON A CASE-BY-CASE BASIS.
   - 2.6. FOR PORTIONS OF PROJECTS WITHIN THE SEDIMENT CONTROL COMMISSION-DEFINED "HIGH QUALITY WATER ZONE" (15A NCAC 04A .0105) , STABILIZATION WITH GROUND COVER SHALL BE ACHIEVED AS SOON AS PRACTICABLE BUT IN ANY EVENT ON ALL AREAS OF THE SITE WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACT.
   - 2.7. PORTIONS OF A SITE THAT ARE LOWER IN ELEVATION THAN ADJACENT DISCHARGE LOCATIONS AND ARE NOT EXPECTED TO DISCHARGE DURING CONSTRUCTION MAY BE EXEMPT FROM THE TEMPORARY GROUND COVER REQUIREMENTS IF IDENTIFIED ON THE APPROVED E&SC PLAN OR ADDED BY THE PERMITTING AUTHORITY.

GENERAL EROSION CONTROL NOTES

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2. ALL STOCKPILES SHALL BE PLACED AT LEAST 50' FROM JURISDICTIONAL AREAS AND DRAINAGE FEATURES.
3. ANY OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN, A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES OR GENERATED BY ANY ACTIVITIES ON SITE MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT OR PER DIVISION OF SOLID WASTE MANAGEMENT OR DIVISION OF WATER RESOURCES RULES AND REGULATIONS (15A NCAC 48 .0110)

EROSION CONTROL LEGEND

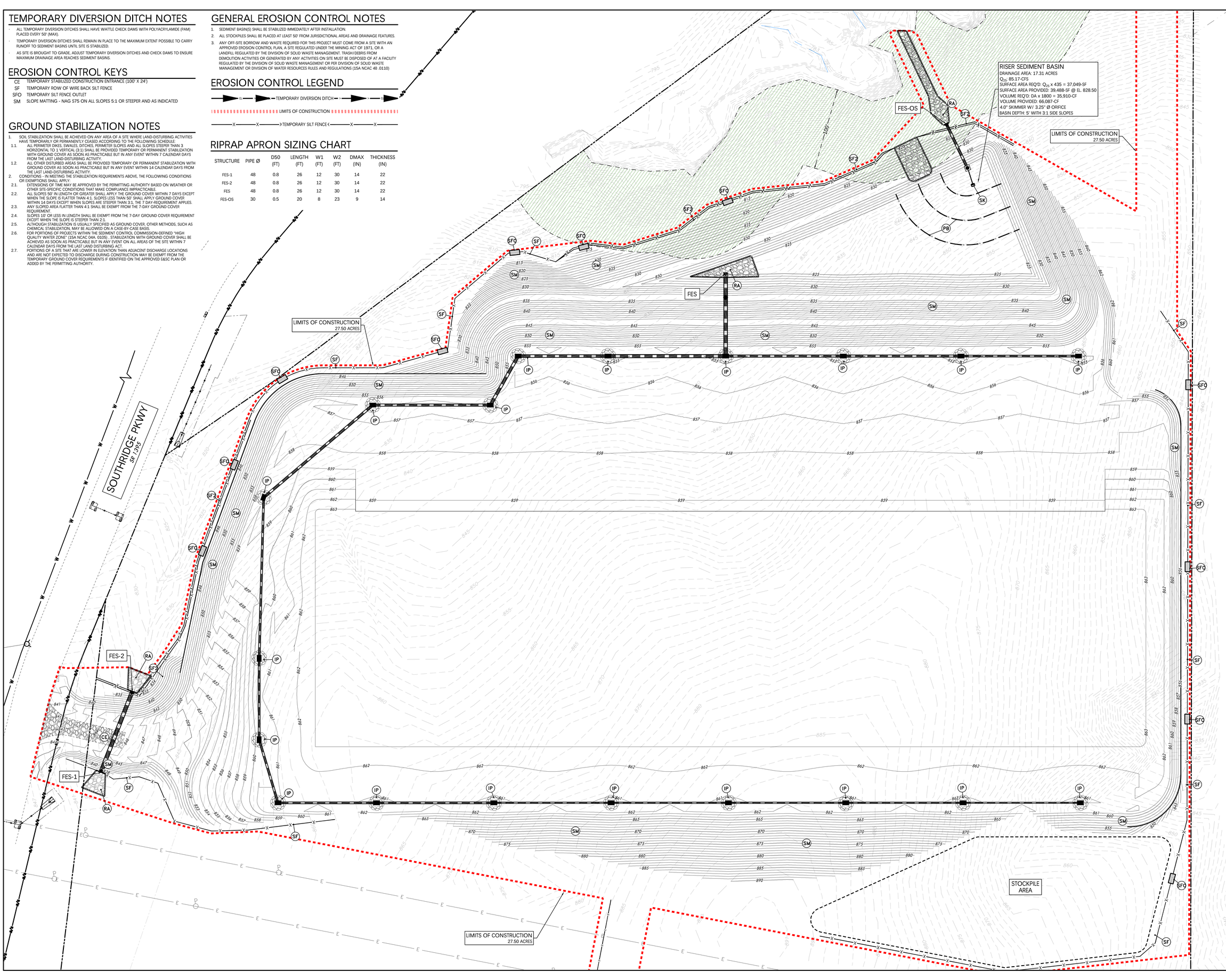
TEMPORARY DIVERSION DITCH

LIMITS OF CONSTRUCTION

TEMPORARY SILT FENCE

RIPRAP APRON SIZING CHART

STRUCTURE	PIPE Ø	D50 (FT)	LENGTH (FT)	W1 (FT)	W2 (FT)	DMAX (IN)	THICKNESS (IN)
FES-1	48	0.8	26	12	30	14	22
FES-2	48	0.8	26	12	30	14	22
FES	48	0.8	26	12	30	14	22
FES-OS	30	0.5	20	8	23	9	14



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PE SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045345 LAUREN T. BRADLEY

04/29/2022

40 0 40
SCALE: 1" = 40'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

EROSION CONTROL PHASE 2

REVISIONS:

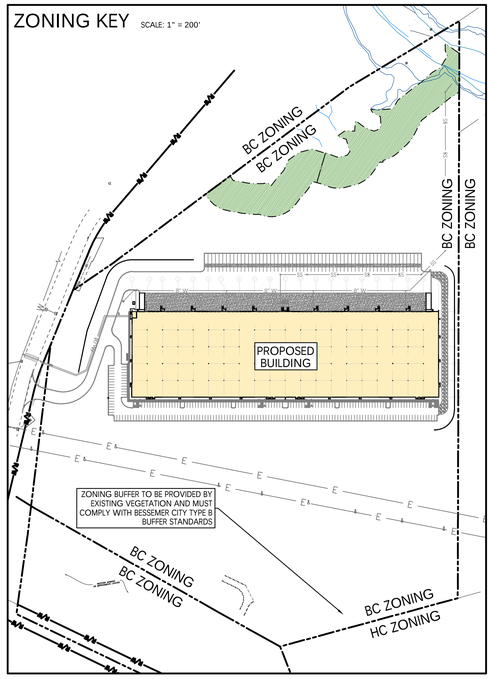
ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C5.1
SHEET 12 OF 18

ZONING KEY

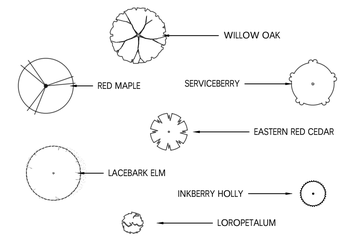
SCALE: 1" = 200'



PLANTING SCHEDULE

QTY	BOTANICAL NAME	COMMON NAME	LOCATION	TYPE	ROOT / CONTAINER	PLANTING HEIGHT / SIZE	SPACING
21	ACER RUBRUM	RED MAPLE	PARKING	CANOPY	B & B	MIN. 10' TALL & 1" CALIPER	AS SHOWN
35	AMELANCHIER ALNIFOLIA	SERVICEBERRY	PARKING	UNDERSTORY	B & B	MIN. 5' TALL & 3/4" CALIPER	AS SHOWN
15	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	TRUCK COURT	EVERGREEN	B&B	MIN. 10' TALL & 1" CALIPER	15' O.C.
12	QUERCUS PHELLOS	WILLOW OAK	STREET	CANOPY	B & B	MIN. 10' TALL & 1" CALIPER	AS SHOWN
4	ULMUS PARVIFOLIA	LACEBARK ELM	PARKING	CANOPY	B & B	MIN. 10' TALL & 1" CALIPER	AS SHOWN
232	LOROPETALUM CHINENSE 'PURPLE DAYDREAM'	LOROPETALUM	BUILDING / PARKING	SHRUB	3 GAL	MIN. 24" HIGH	5' O.C.
300	ILEX GLABRA	INKBERRY HOLLY	PARKING	SHRUB	3 GAL	MIN. 24" HIGH	5' O.C.

LANDSCAPING KEY



LANDSCAPE NOTES

1. EXISTING VEGETATION LOCATED ON SITE MAY BE SUBSTITUTED SO LONG AS URBAN FORESTRY REQUIREMENTS ARE MET. COORDINATE ONSITE WITH URBAN FORESTER.
2. ALL TREES 8-INCHES OR GREATER IN DIAMETER AND LOCATED WITHIN PERIMETER BUFFER YARDS SHALL BE PROTECTED UNTIL REMOVAL IS CONFIRMED WITH ZONING ADMINISTRATOR.
3. ALL TREES 2-INCHES OR GREATER IN DIAMETER AND LOCATED WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PROTECTED UNTIL REMOVAL IS CONFIRMED WITH URBAN FORESTRY INSPECTOR.
4. PLANT SPECIES MAY BE SUBSTITUTED DEPENDING ON TIME OF PLANTING, AVAILABILITY, ETC. UPON APPROVAL OF URBAN FORESTER AND AS LONG AS PLANT SELECTION, TYPE, SPACING MEETING BESSEMER CITY'S LANDSCAPING ORDINANCE.

LANDSCAPING CALCULATIONS

FOUNDATION LANDSCAPING REQUIRED

FRONTAGE FACING SOUTHRIDGE PKWY : 225 LF

TREES REQUIRED = (225 LF / 5 LF / 1 TREE) = 44 TREES
OR SHRUBS REQUIRED = (225 LF / 5 LF / 1 SHRUB) = 44 SHRUBS

LANDSCAPING PROVIDED = 44 SHRUBS

PARKING LANDSCAPING REQUIRED

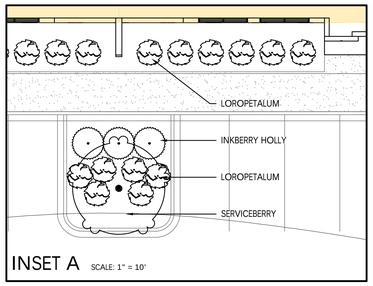
TREES REQUIRED = (244 SPACES / 10 SP / 1 CANOPY) = 25 CANOPY TREES
TREES REQUIRED = (244 SPACES / 7 SP / 1 UNDERSTORY) = 35 UNDERSTORY TREES
SHRUBS REQUIRED = (244 SPACES / 1 SP / 2 SHRUBS) = 488 SHRUBS

LANDSCAPING PROVIDED = 25 CANOPY TREES
35 UNDERSTORY TREES
488 SHRUBS

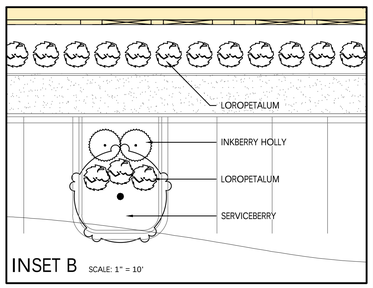
STREET LANDSCAPING REQUIRED:

SOUTHRIDGE PKWY FRONTAGE : 488 LF
TREES REQUIRED = (488 LF / 40 LF OR 30 LF/ 1 TREE) = 12 CANOPY TREES OR 16 UNDERSTORY

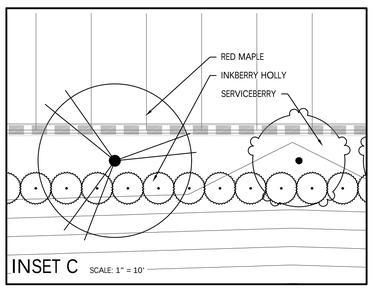
LANDSCAPING PROVIDED = 12 CANOPY TREES



INSET A SCALE: 1" = 10'



INSET B SCALE: 1" = 10'



INSET C SCALE: 1" = 10'

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PE SEAL:



50 0 50

SCALE: 1" = 50'

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

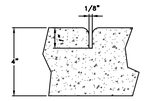
LANDSCAPING PLAN

REVISIONS:

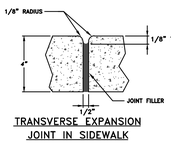
ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C6.0
SHEET 13 OF 18



GROOVE JOINT IN SIDEWALK

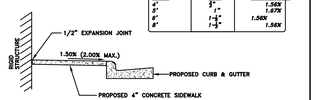


TRANSVERSE EXPANSION JOINT IN SIDEWALK

GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 6'. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE COOT.
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE BASED ON TYPICAL STREET SECTION, A MINIMUM OF 5'. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.
6. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.
7. LOS FOR JUNCTION BOXES AND UTILITY VAULTS SHALL BE NON-SKID AS SPECIFIED BY ENGINEER.
8. JOINT MATERIALS SHALL LIMIT SHRINK/SWELL TO 200 POUND CONSTRUCTION INSTALLATION RESULTS IN A MAXIMUM OF 1/4" FROM FLAT.

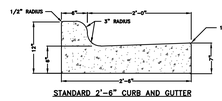
WIDTH	RISE	CROSS-SLOPE
4'	1"	1.56%
5'	1"	1.67%
6'	1-1/4"	1.56%
8'	1-3/4"	1.56%



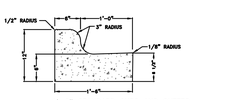
DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

NOT TO SCALE

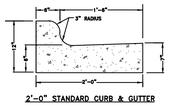
CONCRETE SIDEWALKS



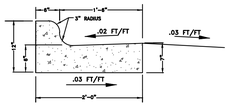
STANDARD 2'-6" CURB AND GUTTER



1'-6" STANDARD CURB AND GUTTER



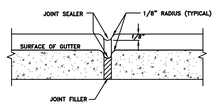
2'-0" STANDARD CURB & GUTTER



SLOPE FOR VARIABLE SUPERELEVATION RATES

NOT TO SCALE

STANDARD CURB AND GUTTER



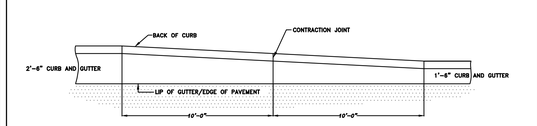
TRANSVERSE EXPANSION JOINT

NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. FOR VALLEY GUTTER, A 10-FOOT SPACING MAY BE USED WHEN A MACHINE IS USED. JOINT SPACING MAY BE ALTERED BY THE CITY ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
5. TOP 6" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

NOT TO SCALE

CURB AND GUTTER



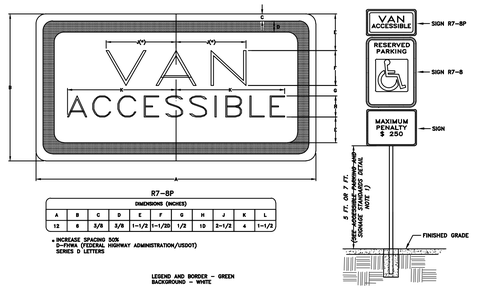
PLAN VIEW

NOTES:

1. TRANSITION TO BE ALONG BACK OF CURB.

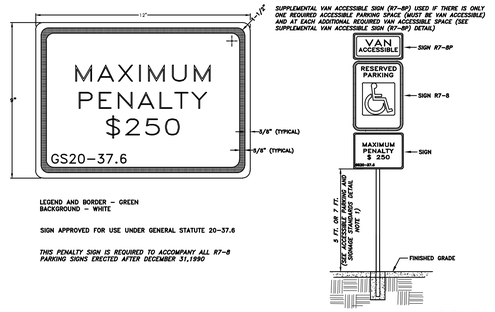
NOT TO SCALE

CURB TRANSITION 2'-6" CURB AND GUTTER TO 1'-6" CURB AND GUTTER



NOT TO SCALE

SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7-8P)



NOT TO SCALE

SUPPLEMENTAL ACCESSIBLE SIGN

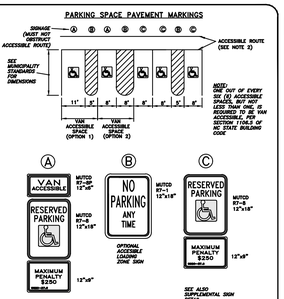
ACCESSIBLE PARKING REQUIREMENTS

TOTAL PARKING SPACES PROVIDED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED TO BE VAN ACCESSIBLE
1 TO 25	1	1
26 TO 50	2	1
51 TO 75	3	1
76 TO 100	4	1
101 TO 150	5	1
151 TO 200	6	1
201 TO 300	7	2
301 TO 400	8	2
401 TO 500	9	2
501 TO 1000	2% OF TOTAL	1 IN EVERY 8 ACCESSIBLE SPACES
1001 AND OVER	20 PLUS 1 FOR EACH 100 OVER 1000	1 IN EVERY 8 ACCESSIBLE SPACES
REFERENCE: SECTION 1106 OF NC BUILDING CODE		

NOTES:

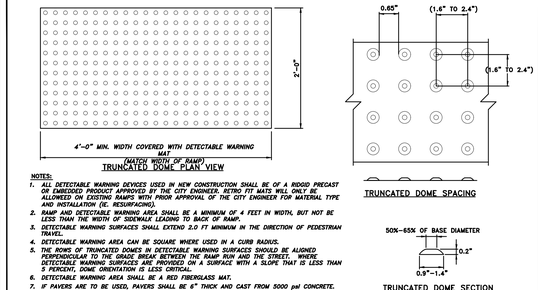
1. ALL ACCESSIBLE SIGNS (R7-8P, R7-8, R7-1 & S0.10G) SHALL BE MOUNTED AT 7 FEET FROM GRADE TO BOTTOM EDGE OF SIGN FACE (MIN'D.). MOUNTING HEIGHT CAN BE REDUCED TO 5 FEET IF PLACED IN AN AREA BETWEEN SIDEWALK AND BUILDING FACE IN WHICH PEDESTRIANS ARE NOT EXPECTED TO GO.
2. 5' ACCESSIBLE ROUTE IS A RAISED SIDEWALK AREA, THEN RAMPS ARE REQUIRED AT LOADING ZONE AREA. MAINTAIN MIN. 4' WIDE CONTINUOUS PASSAGE.
3. VERTICAL CLEARANCE FOR VANS MUST BE GREATER THAN 98-INCHES.
4. THIS DETAIL IS TO PROVIDE GENERAL GUIDANCE FOR PARKING LAYOUT AND SIGNING. REFER TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), U.S. DEPARTMENT OF TRANSPORTATION AND NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPPLEMENT AND NC BUILDING CODE FOR ADDITIONAL INFORMATION.

PARKING SPACE PAVEMENT MARKINGS



NOT TO SCALE

ACCESSIBLE PARKING AND SIGNAGE STANDARDS



NOTES:

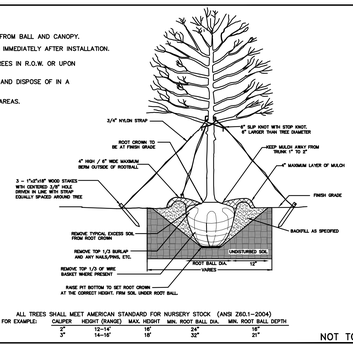
1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE CITY ENGINEER. RETRO FIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (I.E. RESURFACING).
2. RAMP AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NOT BE LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET, WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT; DOME ORIENTATION IS LESS CRITICAL.
6. DETECTABLE WARNING AREA SHALL BE A RED FIBERGLASS MAT.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE 6" THICK AND CAST FROM 5000 psi CONCRETE.
8. MATS ARE TO BE RIGID WITH TURN DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06

NOT TO SCALE

TRUNCATED DOMES PLAN AND CROSS-SECTION

NOTES:

1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.



ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

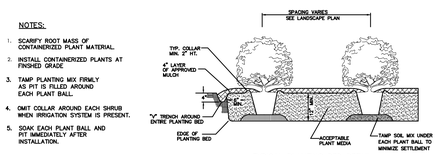
FOR EXAMPLE: CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
2"	12-14'	16'	24"	16"
3"	14-16'	18'	32"	21"

NOT TO SCALE

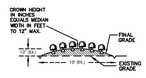
TREE PLANTING (FOR SINGLE AND MULTI-STEM TREES)

NOTES:

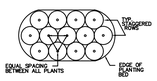
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINISHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL

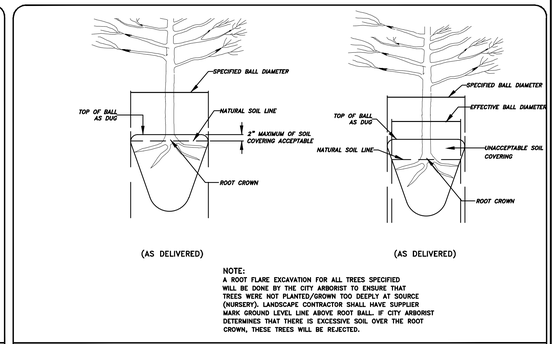


TYPICAL BED CROWNING



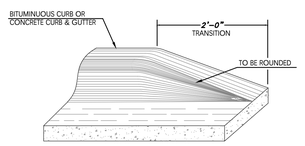
TYPICAL PLANTING BED PLAN

SHRUB PLANTING BED

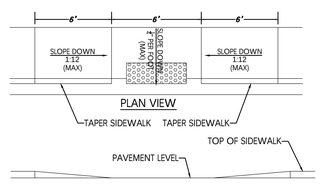


NOTE:
A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE CITY ARBORIST TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF CITY ARBORIST DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.

ROOT FLARE DEPTHS (TREE ROOT BALL CONDITION ON TREES FROM SUPPLIERS)



FEATHERING CURB AND GUTTER DETAIL
(N.T.S.)



DEPRESSED SIDEWALK FOR HANDICAP ACCESS RAMP
(N.T.S.)

OAK ENGINEERING
4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oakengineering

PE SEAL:



SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

PROJECT DETAILS

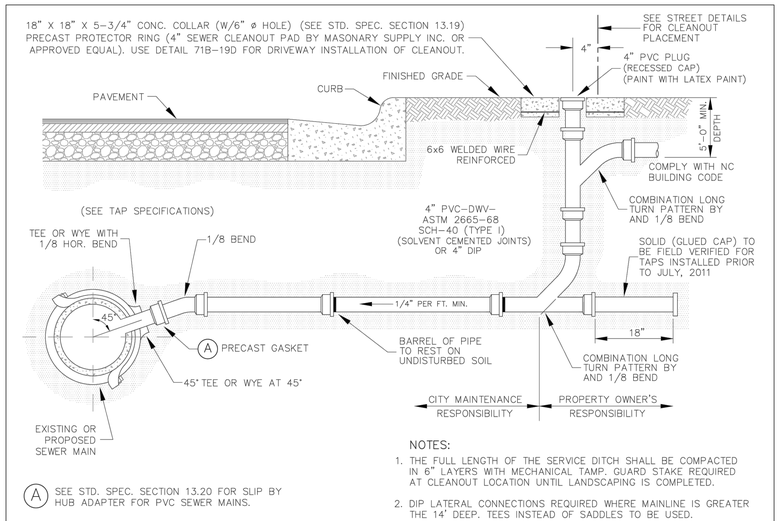
REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C7.0

SHEET 14 OF 18

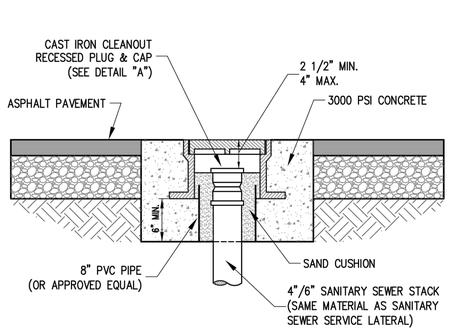


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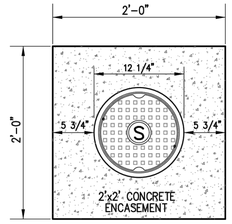
1. THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6" LAYERS WITH MECHANICAL TAMP. GUARD STAKE REQUIRED AT CLEANOUT LOCATION UNTIL LANDSCAPING IS COMPLETED.
2. DIP LATERAL CONNECTIONS REQUIRED WHERE MAINLINE IS GREATER THE 14' DEEP. TEES INSTEAD OF SADDLES TO BE USED.

(A) SEE STD. SPEC. SECTION 13.20 FOR SLIP BY HUB ADAPTER FOR PVC SEWER MAINS.

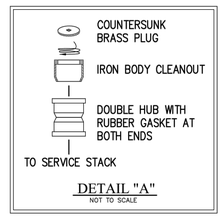
REVISED	F.B.	PG.	DATE: 9/10/2019	Standard Detail	OFFICE OF THE CITY ENGINEER GASTONIA, N.C.
JW 3/7/03 JW 1/6/05 GQ 6/28/11 DL 9/10/19 MB 8/31/21			SCALE: NONE DRAWN BY: DBL, MGB CHECKED BY: JB, TAJ CITY ENGINEER: GVS	Sanitary Sewer Lateral Connection Main Depths Are Greater Than 8'	FILE NO. 71B-19A



ASSEMBLY SECTION VIEW
NOT TO SCALE



ASSEMBLY PLAN VIEW
NOT TO SCALE

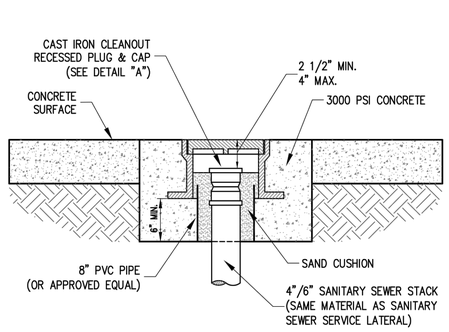


DETAIL "A"
NOT TO SCALE

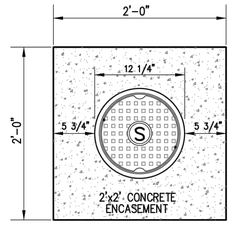
NOTES:

1. APPROVED MANUFACTURES: US FOUNDRY 7631 (OR APPROVED EQUAL).
2. TO BE USED IN ALL AREAS DESIGNED FOR TRAFFIC.

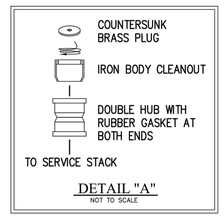
REVISED	DATE: JAN. 10, 2016	Standard Detail	OFFICE OF THE CITY ENGINEER GASTONIA, N.C.
	SCALE: NONE DRAWN BY: MGB CHECKED BY: JB, TAJ, JSW, GVS CITY ENGINEER: CCB	Sanitary Sewer Cleanout Cover For Traffic Bearing Areas in Asphalt	FILE NO. 71B-19C



ASSEMBLY SECTION VIEW
NOT TO SCALE



ASSEMBLY PLAN VIEW
NOT TO SCALE



DETAIL "A"
NOT TO SCALE

NOTES:

1. APPROVED MANUFACTURES: US FOUNDRY 7631 (OR APPROVED EQUAL).
2. TO BE USED IN ALL AREAS DESIGNED FOR TRAFFIC.

REVISED	DATE: JAN. 10, 2016	Standard Detail	OFFICE OF THE CITY ENGINEER GASTONIA, N.C.
	SCALE: NONE DRAWN BY: MGB CHECKED BY: JB, TAJ, JSW, GVS CITY ENGINEER: CCB	Sanitary Sewer Cleanout Cover For Traffic Bearing Areas in Concrete	FILE NO. 71B-19D

CLASS B
COMPACTED GRANULAR BEDDING
LOAD FACTOR 1.9

REVISED	F.B.	PG.	DATE: 3-15-74	STANDARD DETAIL	OFFICE OF THE CITY ENGINEER GASTONIA, N.C.
2/17/88 5/28/92 01/05/95			SCALE: NONE DRAWN BY: GAQ, EZ CHECKED BY: PNR, FAP CITY ENGINEER: JPB	STANDARD BEDDING DETAIL FOR PVC SANITARY SEWER PIPE.	FILE NO. 71B-5A

CLASS B
COMPACTED GRANULAR BEDDING
LOAD FACTOR 1.9

CLASS C
SHAPED BOTTOM
LOAD FACTOR 1.5

REVISED	F.B.	PG.	DATE: 3-15-74	STANDARD DETAIL	OFFICE OF THE CITY ENGINEER GASTONIA, N.C.
12/13/84			SCALE: NONE DRAWN BY: RMN CHECKED BY: NBM, FAP CITY ENGINEER: DEC	STANDARD BEDDING DETAILS FOR SANITARY SEWER & STORM DRAIN PIPES	FILE NO. 71B-5

OAK ENGINEERING
4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

PE SEAL:



SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

PROJECT DETAILS

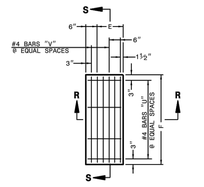
REVISIONS:

ENGINEER: LJB
DRAWN BY: EBT
CHECKED BY: GTW

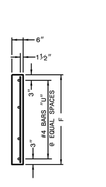
PROJECT #: 022.003

SHEET
C7.1

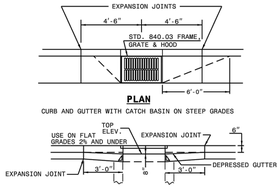
SHEET 15 OF 18



PLAN OF TOP SLAB



SECTION S-S

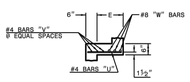


PLAN

CURB AND GUTTER WITH CATCH BASIN ON STEEP GRADES

ELEVATION

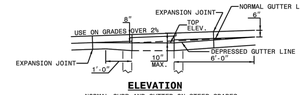
NORMAL CURB AND GUTTER ON LIGHT GRADES



SECTION R-R



DOWEL



ELEVATION

NORMAL CURB AND GUTTER ON STEEP GRADES

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

DIMENSIONS OF BOX AND PIPE				COVER DIMENSION			BARS-U		BARS-V		BARS-W			CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT									TOP SLAB	BOTTOM SLAB (SEE NOTE BELOW)	C.Y.	R.C.
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.					
12"	3'-0"	2'-2"	--	--	2'-9"	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			3'-0"			--	--	--	--	--	--	--	0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			3'-3"										0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-9"										0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"		4'-3"	1'-2"	4'-0"	4	1'-5"	2	3'-9"	3	3'-9"	39	0.123	0.321	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"		4'-9"	1'-8"	4'-0"	4	1'-11"	3	3'-9"	3	3'-9"	43	0.161	0.358	1.714	0.132	0.178
42"	3'-0"	2'-2"		4'-5"	5'-3"	1'-8"	3'-2"	4	2'-11"	3	2'-11"	3	2'-11"	32	0.112	0.318	1.728	0.180	0.243
48"	3'-0"	2'-2"		5'-0"	5'-9"	2'-0"	3'-2"	4	2'-3"	3	2'-11"	3	2'-11"	35	0.145	0.352	2.082	0.235	0.317
54"	3'-0"	2'-2"		5'-7"	6'-3"	2'-7"	3'-2"	4	2'-10"	5	2'-11"	3	2'-11"	41	0.180	0.386	2.387	0.297	0.401

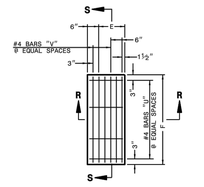
* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

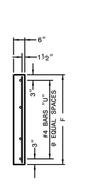
1-18

ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

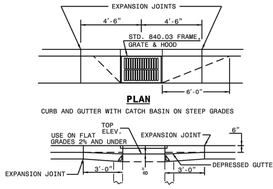
SHEET 2 OF 2
840.02



PLAN OF TOP SLAB



SECTION S-S

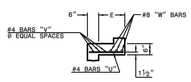


PLAN

CURB AND GUTTER WITH CATCH BASIN ON STEEP GRADES

ELEVATION

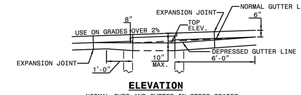
NORMAL CURB AND GUTTER ON LIGHT GRADES



SECTION R-R



DOWEL



ELEVATION

NORMAL CURB AND GUTTER ON STEEP GRADES

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER)

DIMENSIONS OF BOX AND PIPE				COVER DIMENSION			BARS-U		BARS-V		BARS-W			CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT									TOP SLAB	BOTTOM SLAB (SEE NOTE BELOW)	C.Y.	R.C.
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.					
12"	3'-0"	2'-2"	--	--	2'-9"	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			3'-0"			--	--	--	--	--	--	--	0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			3'-3"										0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-9"										0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"		4'-3"	1'-2"	4'-0"	4	1'-5"	2	3'-9"	3	3'-9"	39	0.123	0.321	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"		4'-9"	1'-8"	4'-0"	4	1'-11"	3	3'-9"	3	3'-9"	43	0.161	0.358	1.714	0.132	0.178
42"	3'-0"	2'-2"		4'-5"	5'-3"	1'-8"	3'-2"	4	2'-11"	3	2'-11"	3	2'-11"	32	0.112	0.318	1.728	0.180	0.243
48"	3'-0"	2'-2"		5'-0"	5'-9"	2'-0"	3'-2"	4	2'-3"	3	2'-11"	3	2'-11"	35	0.145	0.352	2.082	0.235	0.317
54"	3'-0"	2'-2"		5'-7"	6'-3"	2'-7"	3'-2"	4	2'-10"	5	2'-11"	3	2'-11"	41	0.180	0.386	2.387	0.297	0.401

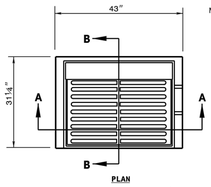
* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

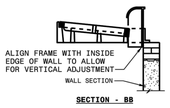
SHEET 2 OF 2
840.02



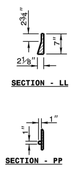
PLAN

FRAME,GRATE, & HOOD ASS'Y

NOTE: USE TYPE "E", "F" AND "G" GRATE UNLESS OTHERWISE NOTED.



SECTION - BB



SECTION - LL



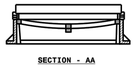
SECTION - MM



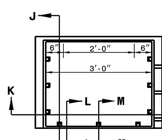
SECTION - PP



SECTION - NN

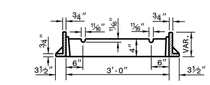


SECTION - AA

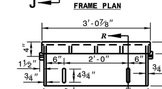




SECTION - JJ



SECTION - KK





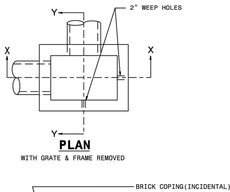
SECTION - RR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN

SHEET 1 OF 2
840.03



GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

CONSTRUCT WITH PIPE CROWNS MATCHING.

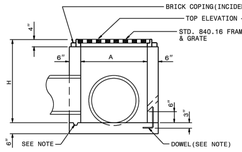
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.

INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.

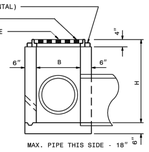
INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

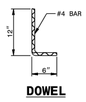
DRAWING NOT TO SCALE.



SECTION X-X



SECTION Y-Y



DOWEL

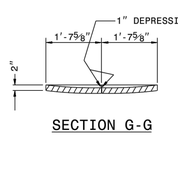
DIMENSIONS AND QUANTITIES FOR DROP INLET(BASED ON MIN. HEIGHT, H)							
DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE
PIPE	SPAN	WIDTH	MIN. HEIGHT	BOTTOM SLAB	WALL PER FT. HT	TOTAL (ADD ON FOR MINIMUM HEIGHT - H	C.M.	R.C.
D	A	B	H					
12"	3'-0"	2'-0"	2'-0"	0.222	0.222	0.592	0.015	0.026
15"	/	/	2'-3"	/	/	0.648	0.023	0.036
18"	/	/	2'-6"	/	/	0.703	0.033	0.049
24"	/	/	3'-0"	/	/	0.814	0.059	0.085
30"	3'-0"	2'-0"	3'-6"	0.222	0.222	0.925	0.092	0.127

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

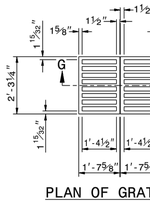
1-18

ROADWAY STANDARD DRAWING FOR
CONCRETE DROP INLET
12" THRU 30" PIPE

SHEET 1 OF 1
840.14

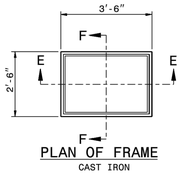


SECTION G-G



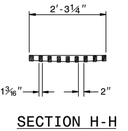
PLAN OF GRATING

CAST IRON

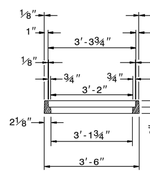


PLAN OF FRAME

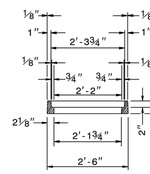
CAST IRON



SECTION H-H



SECTION E-E



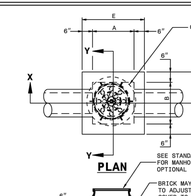
SECTION F-F

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

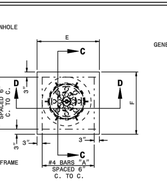
1-18

ROADWAY STANDARD DRAWING FOR
DROP INLET FRAME AND GRATES
FOR USE WITH STD. DWG.S 840.14 AND 840.15

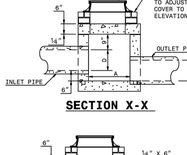
SHEET 1 OF 1
840.16



SECTION X-X



SECTION C-C OR D-D



SECTION Y-Y



DOWEL

GENERAL NOTES:

CHAMFER ALL EXPOSED CORNERS 1".

USE CLASS "B" CONCRETE THROUGHOUT.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS TO CONSTRUCT THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.00.

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.

ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES											
DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS "A"		TOP SLAB DIMENSIONS		CUBIC YARDS IN BOX		TOTAL QUANTITIES BOX AND SLABS		DEDUCTIONS FOR ONE PIPE CU.YDS.	
PIPE	SPAN	WIDTH	HEIGHT	NO.	LENGTH	E	F	TOP SLAB	BOTTOM SLAB	WALL/ FT. OF HT.	LBS./ REINF	CU. YDS. IN BOX	C.S.	R.C.
D	A	B	H											
12"	2'-0"	2'-0"	2'-3"	12	2'-9"	3'-0"	3'-0"	0.167	0.167	0.185	22	0.750	0.015	0.024
15"	2'-3"	2'-3"	2'-6"	12	3'-0"	3'-3"	3'-3"	0.196	0.196	0.204	24	0.902	0.023	0.036
18"	2'-6"	2'-6"	2'-9"	14	3'-3"	3'-6"	3'-6"	0.227	0.227	0.222	30	1.065	0.033	0.049
24"	3'-0"	3'-0"	3'-3"	16	3'-9"	4'-0"	4'-0"	0.296	0.296	0.259	39	1.434	0.059	0.085
30"	3'-6"	3'-6"	3'-9"	18	4'-3"	4'-6"	4'-6"	0.375	0.375	0.296	51	1.860	0.092	0.127
36"	4'-0"	4'-0"	4'-3"	20	4'-9"	5'-0"	5'-0"	0.463	0.463	0.333	64	2.341	0.132	0.178
42"	4'-6"	4'-6"	4'-9"	22	5'-3"	5'-6"	5'-6"	0.560	0.560	0.370	77	2.878	0.180	0.243
48"	5'-4"	5'-4"	5'-3"	26	6'-3"	6'-4"	6'-4"	0.743	0.743	0.407	111	3.623	0.235	0.317
54"	5'-10"	5'-10"	5'-9"	28	6'-7"	6'-10"	6'-10"	0.865	0.865	0.444	126	4.283	0.297	0.401
60"	6'-6"	6'-6"	6'-3"	30	7'-3"	7'-6"	7'-6"	1.042	1.042	0.481	145	5.090	0.367	0.495
66"	7'-1"	7'-1"	6'-9"	32	7'-10"	8'-1"	8'-1"	1.210	1.210	0.518	169	5.917	0.444	0.589

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
CONCRETE JUNCTION BOX
(WITH OPTIONAL MANHOLE)
12" THRU 66" PIPE

SHEET 1 OF 1
840.31

TABLE OF DIMENSIONS							
D	T	A	B	C	E	L	WT.
12"	2-1/4"	4"	2'-0"	4'-1"	2'-0"	6'-1"	730
15"	2-1/4"	6"	2'-3"	3'-10"	2'-0"	6'-1"	730
18"	2-1/2"	9"	2'-3"	3'-10"	3'-0"	6'-1"	1180
24"	3"	10"	3'-8"	2'-6"	4'-0"	6'-2"	1770
30"	3-1/2"	1'-0"	4'-6"	1'-8"	5'-0"	6'-2"	2580
36"	4"	1'-3"	5'-3"	2'-11"	6'-0"	8'-2"	5320
42"	4-1/2"	1'-9"	5'-3"	2'-11"	6'-6"	8'-2"	5920
48"	5"	2'-0"	6'-0"	2'-2"	7'-0"	8'-2"	7470
54"	5-1/2"	2'-3"	5'-6"	2'-10"	7'-6"	8'-4"	8810
60"	6"	2'-6"	5'-0"	3'-3"	8'-0"	8'-3"	11180
66"	6-1/2"	3'-0"	6'-0"	2'-3"	8'-6"	8'-3"	12530
72"	7"	3'-0"	6'-6"	1'-9"	9'-0"	8'-3"	13980

GENERAL NOTES:

1. SEE FORMER NCDOT STANDARD 310.01 FOR DETAILS.
2. REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF REINFORCED CONCRETE PIPE OF LIKE DIAMETER PER AASHTO M170, TABLE 2, WALL B.
3. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
4. PROVIDE TONGUE OR SPIGOT JOINT AT INLET END SECTION.
5. PROVIDE GROOVE OR BELL JOINT AT OUTLET END SECTION.
6. THE DIMENSIONS FOR END SECTIONS SHALL SUBSTANTIALLY AGREE WITH THE TABLE. MINOR VARIATIONS WILL BE PERMITTED BASED ON THE MANUFACTURER'S STANDARD FORMS AND TEMPLATES.
7. NOT TO BE USED IN NCDOT MAINTAINED RIGHT OF WAY.

NOT TO SCALE

FLARED END SECTION
12" THRU 72" PIPE

OAK ENGINEERING
4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

PE SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045345 ENGINEER LUCAS BESSEMER
04/29/2022

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

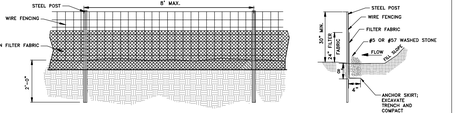
PROJECT DETAILS

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C7.2
SHEET 16 OF 18



GENERAL NOTES:

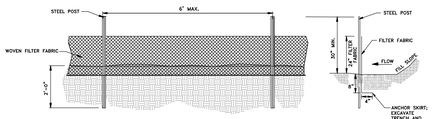
1. WIRE FENCING SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 6" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.
6. WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
7. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
8. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
9. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
10. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

HIGH HAZARD TEMPORARY SILT FENCE



GENERAL NOTES :

1. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
2. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
3. TURN SILT FENCE UP SLOPE AT ENDS.
4. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
5. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
6. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
7. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROX. HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

TEMPORARY SILT FENCE

FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) - 120 LB/ACRE
ANNUAL LESPEDEZA (KOBE) - 50 LB/ACRE
(OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE)

SEEDING DATES:
JAN 1 - MAY 1

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER:

SEEDING MIXTURE:
GERMAN MILLET – 40 LB/ACRE
(A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE)

SEEDING DATES:
MAY 1 - AUG. 15

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL:

SEEDING MIXTURE:
RYE (GRAIN) - 120 LB/ACRE

SEEDING DATES:
AUG. 15 - DEC 30

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

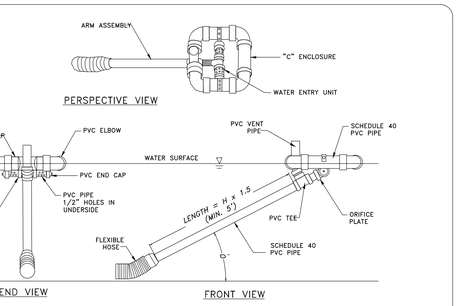
FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10.
FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11.

TEMPORARY SEEDING SCHEDULE

GENERAL NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE BASIN AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE BEING ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL CONSTRUCTED THROUGH FILL SECTIONS. ALL SPILLWAYS SHOULD BE LINED AND/OR RIPRAPPED. CONSTRUCTED. SPILLWAYS SHOULD NOT BE
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO DEPTH SHOWN ON STANDARD. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE TRAP SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
5. CONSTRUCTION OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER, UNLESS CERTIFIED BY REGISTERED GEOTECHNICAL ENGINEER.
6. PROVIDED WITH EROSION CONTROL AND STABILIZATION. SEDIMENT BASIN EMBANKMENTS SHOULD BE
7. STORAGE AREA MAY BE CONSTRUCTED IN ANY SHAPE PROVIDED THE MINIMUM STORAGE VOLUME REQUIREMENT IS MET. THE BASIN SHOULD ALSO BE ORIENTED SUCH THAT
8. THE FILTER AND THE MAIN FLOW OF WATER AND SEDIMENT ARE ON OPPOSITE ENDS ON THE LONGER BASIN DIMENSIONS.
9. THE LENGTH OF THE STONE OUTLET (SPILLWAY) IS TO BE BASED ON A 10 YEAR STORM.
10. WHENEVER TOPOGRAPHY ALLOWS, THE BASIN LENGTH SHOULD BE TWICE (2X) THE BASIN WIDTH, TO ALLOW FOR SETTLING. BAFFLES SHALL BE INSTALLED IN ALL BASINS.
11. CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL, CLEANOUT POINT, OF THE BASIN.
12. SAFETY FENCING 3' HIGH SHOULD BE PLACED AROUND ALL SEDIMENT BASINS.
13. FOR DESIGN OF SEDIMENT BASINS, REFER TO THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
14. FOR SLOPES GREATER THAN 10' IN LENGTH AND PROTECTED BY SILT FENCE AT THE TOE OF THE SLOPE, SLOPE TERRACING WILL BE REQUIRED. THE BERM ON SEDIMENT BASINS SHALL BE SEEDED ONCE FINAL GRADE HAS BEEN REACHED. THE SILT FENCE MAY BE REMOVED IF PERMISSION
15. HAS BEEN GRANTED BY THE CITY LAND DEVELOPMENT INSPECTOR AFTER THE GRASS HAS GERMINATED AND STABLE GROUND HAS BEEN ESTABLISHED.
16. WASHED STONE AND WIRE BACKING SHALL BE USED WITH SILT FENCE WHENEVER SILT FENCE IS PLACED AT THE TOE OF A SLOPE > 10' VERTICAL OR ALONG ANY CHANNEL OR WATER COURSE

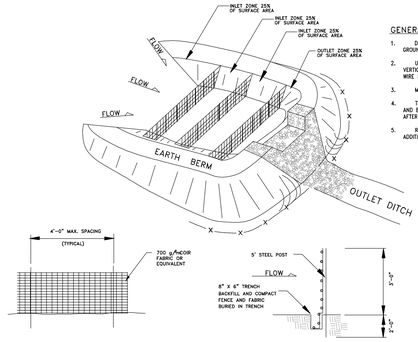
GENERAL NOTES–SEDIMENT BASINS



SCHEMATIC OF SKIMMER TAKEN FROM PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, MARCH 2000. "H" REFERS TO THE HEIGHT FROM INVERT OF FLEXIBLE HOSE ON SKIMMER TO THE INVERT OF THE PRIMARY SPILLWAY.

NOT TO SCALE

SKIMMER



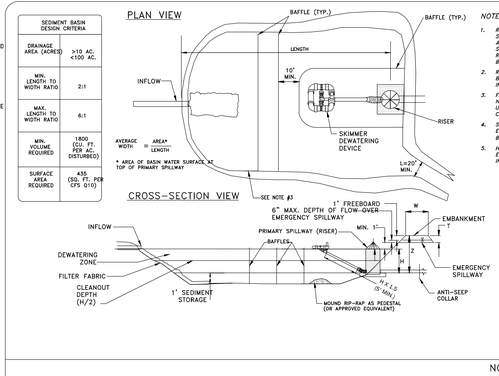
GENERAL NOTES:

1. DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.
2. USE STAPLES 1" APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FILTER FABRIC TO THE WIRE FENCE.
3. MINIMUM BAFFLE SPACING IS 10'.
4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.
5. REFER TO NCESCPDM SECTION #6.65 FOR ADDITIONAL SPECIFIATIONS.

NOT TO SCALE

BAFFLE INSTALLATION

SEDIMENT BASIN DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	>10 AC. <100 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MAX. LENGTH TO WIDTH RATIO	6:1
MIN. VOLUME REQUIRED	1800 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	435 (SQ. FT. PER CFS Q10)



NOTES:

1. REFER TO NCESCPDM SECTION #6.61 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SEDIMENT BASINS.
2. REFER TO DETAIL FOR BAFFLE SPACING AND INSTALLATION.
3. FLASHBOARD RISER NOT PERMITTED FOR USE IN THE CITY OF CHARLOTTE
4. SKIMMER INVERT ELEVATION = BASIN BOTTOM + 1' MIN.
5. H = SPILLWAY ELEVATION –SKIMMER INVERT ELEVATION

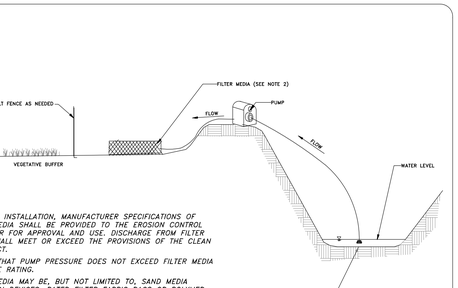
NOT TO SCALE

SEDIMENT BASIN

STD. & SPEC. #	TITLE	SPECIAL REQUIREMENTS & NOTES
6.11	PERMANENT SEEDING	—
6.17	ROLLED EROSION CONTROL PRODUCTS	—
6.51	HARDWARE CLOTH & GRAVEL INLET PROTECTION	—
6.60	TEMPORARY SEDIMENT TRAP	WEIR TOP WIDTH 10' MIN., BOTTOM 7' MIN.
6.61	SEDIMENT BASIN	FLASH BOARD RISER NOT PERMITTED
6.64	SKIMMER SEDIMENT BASIN	1ST BAFFLE: RIP RAP & WASHED STONE BERM 2ND BAFFLE: STANDARD BAFFLE 3RD BAFFLE: STANDARD BAFFLE
NCDOT 1606.1	SPECIAL SEDIMENT CONTROL FENCE	—

THE STANDARDS & SPECIFICATIONS SHOWN ARE FROM THE "NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" (NCESCPDM) PREPARED BY NC DEPT. OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR); ALSO REFERENCE NCDOT "ROADWAY STANDARD DRAWINGS," LATEST EDITION.

SPECIAL EROSION CONTROL REQUIREMENTS & NOTES

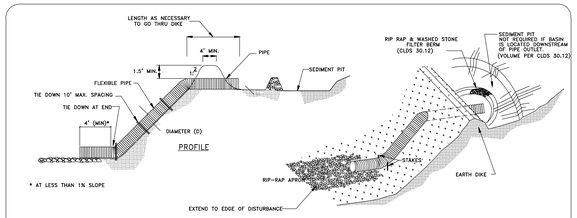


NOTE:

1. PRIOR TO INSTALLATION, MANUFACTURER SPECIFICATIONS OF FILTER MEDIA SHALL BE PROVIDED TO THE EROSION CONTROL INSPECTOR FOR APPROVAL AND USE. DISCHARGE FROM FILTER MEDIA SHALL MEET OR EXCEED THE PROVISIONS OF THE CLEAN WATER ACT.
2. ENSURE THAT PUMP PRESSURE DOES NOT EXCEED FILTER MEDIA PRESSURE RATING.
3. FILTER MEDIA MAY BE, BUT NOT LIMITED TO, SAND MEDIA FILTRATION DEVICES, RATED FILTER FABRIC BAGS OR POLYMER BASED DEWATERING PRACTICES.
4. PUMP STRAINER SHALL NOT BE IN CONTACT WITH BOTTOM OF POND.

NOT TO SCALE

EROSION CONTROL DEWATERING

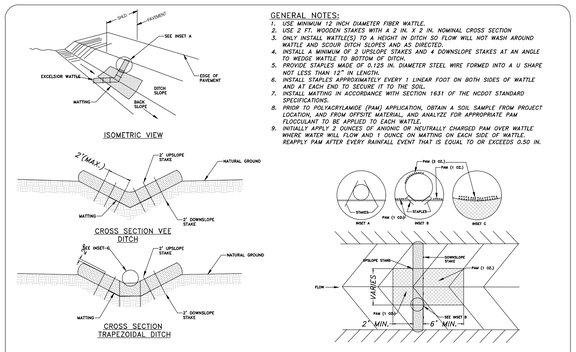


CONSTRUCTION SPECIFICATIONS:

1. THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1.5 FEET HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.
2. THE PIPE SHALL BE FLEXIBLE WITH WATER TIGHT CONNECTING BANDS. FLEXIBLE PIPE SHOULD BE STAKED ON EITHER SIDE.
3. A RIP RAP APRON SHALL BE PROVIDED AT THE OUTLET, IF EMPTYING INTO A DISTURBED AREA.
4. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.
5. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH STORM BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT.
6. OUTLET PIPE SHOULD BE TAKEN OVER OR THROUGH ANY SILT FENCE, TAKING CARE NOT TO VOID THE EFFECTIVENESS OF THE SILT FENCE.

NOT TO SCALE

FLEXIBLE PIPE SLOPE DRAIN

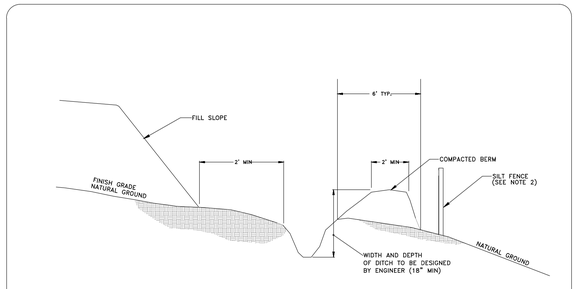


GENERAL NOTES:

1. USE MINIMUM 12 INCH DIAMETER FIBER WATTLE.
2. USE 2 FT. WOODEN STAKES WITH A 2 IN. X 2 IN. NOMINAL CROSS SECTION
3. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
4. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
5. PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
7. INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE NCDOT STANDARD SPECIFICATIONS.
8. PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.
9. INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

NOT TO SCALE

TEMPORARY WATTLE CHECK DAM WITH MATTING AND OPTIONAL PAM

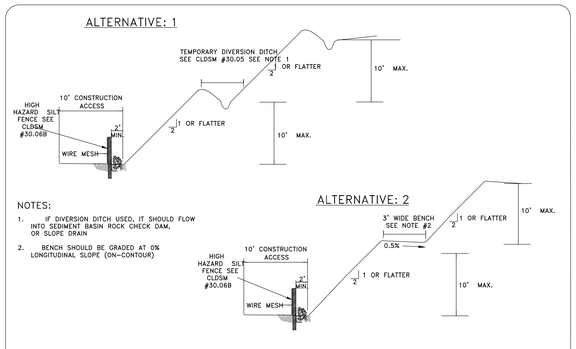


NOTE:

1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM

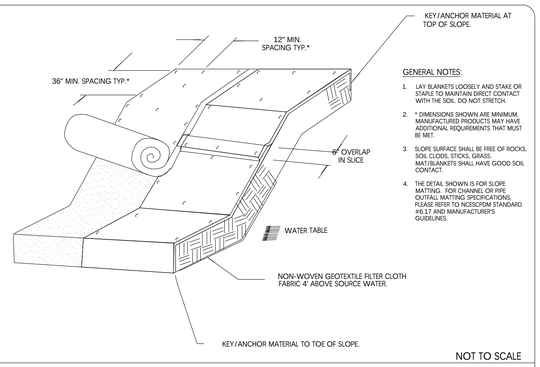
NOT TO SCALE

TEMPORARY SILT DITCH



NOT TO SCALE

SLOPE STABILITY



GENERAL NOTES:

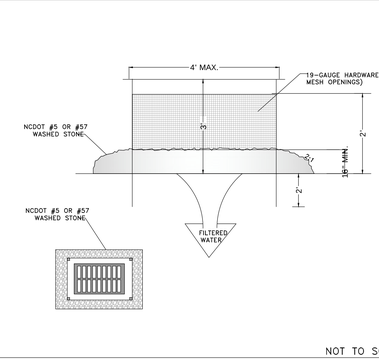
1. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
2. * DIMENSIONS SHOWN ARE MINIMUM. MANUFACTURED PRODUCTS MAY HAVE ADDITIONAL REQUIREMENTS THAT MUST BE MET.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, SOIL CLODS, STICKS, GRASS, MAT/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
4. THE DETAIL SHOWN IS FOR SLOPE MATTING. FOR CHANNEL OR PIPE OUTFALL MATTING SPECIFICATIONS, PLEASE REFER TO NCDSDPM STANDARD #6.17 AND MANUFACTURER'S GUIDELINES.

NOT TO SCALE

EMBANKMENT MATTING DETAIL

GENERAL NOTES:

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.

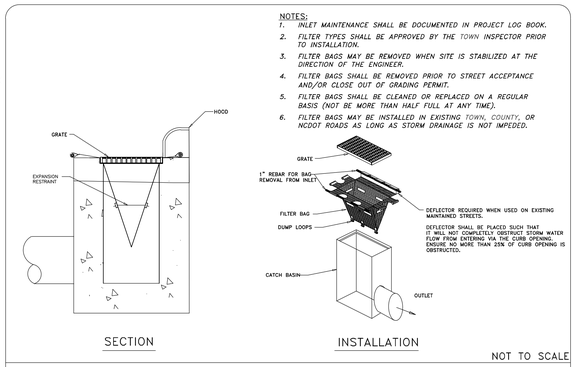


NOT TO SCALE

HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NOTES:

1. INLET MAINTENANCE SHALL BE DOCUMENTED IN PROJECT LOG BOOK.
2. FILTER TYPES SHALL BE APPROVED BY THE TOWN INSPECTOR PRIOR TO INSTALLATION.
3. FILTER BAGS MAY BE REMOVED WHEN SITE IS STABILIZED AT THE DIRECTION OF THE ENGINEER.
4. FILTER BAGS SHALL BE REMOVED PRIOR TO STREET ACCEPTANCE AND/OR CLOSE OUT OF GRADING PERMIT.
5. FILTER BAGS SHALL BE CLEANED OR REPLACED ON A REGULAR BASIS (NOT BE MORE THAN HALF FULL AT ANY TIME).
6. FILTER BAGS MAY BE INSTALLED IN EXISTING TOWN, COUNTY, OR NCDOT ROADS AS LONG AS STORM DRAINAGE IS NOT IMPEDED.



NOT TO SCALE

CATCH BASIN INLET PROTECTION

OAK ENGINEERING
4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

PE SEAL:



SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

PROJECT DETAILS

REVISIONS:

ENGINEER: JJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C7.3
SHEET 17 OF 18

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

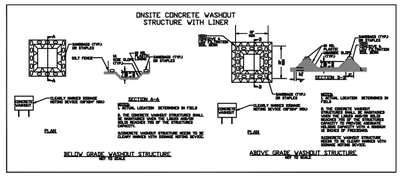
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA Environmental Quality



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a)-of this permit of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

Item to Document	Documentation Requirements
(a) Each E&SC Measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC Plan.	Initial and date each E&SC Measure on a copy of the approved E&SC Plan or complete, date and sign an inspection report that lists each E&SC Measure shown on the approved E&SC Plan. This documentation is required upon the initial installation of the E&SC Measures or if the E&SC Measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC Plan.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC Measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC Measures.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation

In addition to the E&SC Plan documents above, the following items shall be kept on the site and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This general permit as well as the certificate of coverage, after it is received.

(b) Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

(c) All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(a) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(b) Anticipated bypasses and unanticipated bypasses.

(c) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

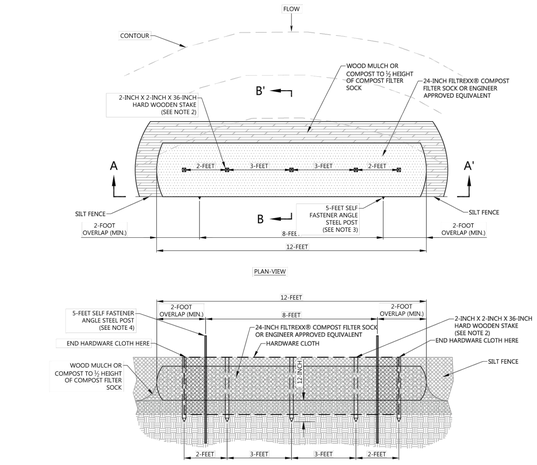
After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19



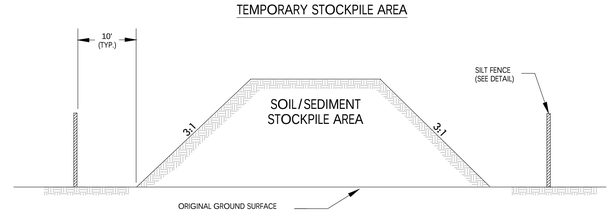
SILT FENCE OUTLET NOTES:

1. USE 24-INCH FILTREXX® COMPOST FILTER SOCK OR ENGINEER APPROVED EQUIVALENT. FILTER SOCKS SHALL BE A MINIMUM OF 12' LONG. MINIMUM OF 16-INCH HEIGHT OF COMPOST FILTER SOCK AFTER INSTALLATION.
2. WATTLES ARE NOT TO BE USED IN PLACE OF COMPOST SOCK OR STONE.
3. HARD WOODEN STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE COMPOST FILTER SOCK. SPACE STAKES A MAXIMUM OF 3-FEET. DRIVE THE STAKE TO A MINIMUM OF 1-FOOT INTO THE GROUND LEAVING A MINIMUM OF 3-INCH PROTRUDING ABOVE THE COMPOST FILTER SOCK.
4. OVERLAP SILT FENCE OUTLET OPENING WITH FILTER SOCK A MINIMUM OF 2 FEET, STARTING AT STEEL POST. EXTEND HARDWARE CLOTH AT LEAST 12 INCHES PAST STEEL POST.
5. USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH ½" MESH OPENINGS.
6. SILT FENCE OUTLET LOCATIONS MAY VARY FROM THE APPROVED PLANS AS DIRECTED BY THE OWNER'S INSPECTOR OR DESIGNATED REPRESENTATIVE AND BASED UPON FIELD CONDITIONS.
7. SILT FENCE OUTLETS SHOULD BE INSTALLED AT POINTS OF CONCENTRATED FLOW AND LOW POINTS. IF WATER IS POOLING BEHIND INSTALLED SILT FENCE AN ADDITIONAL SILT FENCE OUTLET MAY NEED TO BE INSTALLED.

SILT FENCE OUTLET INSPECTION & MAINTENANCE:

1. REGULAR INSPECTIONS OF SILT FENCE OUTLETS SHALL BE CONDUCTED ONCE EVERY CALENDAR WEEK AND, AS RECOMMENDED, WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION.
2. MAKE ANY NECESSARY REPAIRS IMMEDIATELY.
3. REMOVE ACCUMULATED SEDIMENT AND ANY DEBRIS. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN.
4. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED.
5. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.
6. SHOULD THE SILT FENCE ADJACENT TO THE OUTLET COLLAPSE, TEAR, OR BECOME INEFFECTIVE, REPAIR OR REPLACE IT PROMPTLY.
7. REMOVE ALL FENCING AND OUTLET MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SILT FENCE OUTLET



NOTES:

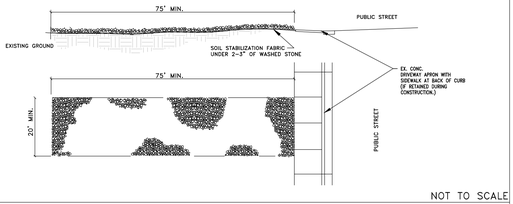
1. *SILT FENCE TO EXTEND AROUND ENTIRE PERIMETER OF STOCKPILE, OR IF STOCKPILE AREA IS LOCATED ON/NEAR A SLOP THE SILT FENCE IS TO EXTEND ALONG CONTOURS OF THE DOWN-GRADIENT AREA.*
2. *IF STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS, TEMPORARY STABILIZATION MEASURES MUST BE IMPLEMENTED.*
3. *SILT FENCE SHALL BE MAINTAINED UNTIL STOCKPILE AREA HAS EITHER BEEN REMOVED OR PERMANENTLY STABILIZED.*
4. *THE KEY TO FUNCTIONAL TEMPORARY STOCKPILE AREAS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR SEDIMENT REMOVAL.*

TEMPORARY STOCKPILE

NOT TO SCALE

NOTES :

1. *A STABILIZED ENTRANCE PAD OF 2-3" OF WASHED STONE AND/OR RAILROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.*
2. *FILTER FABRIC OR COMPACTED CRUSHER RUN STONE SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.*
3. *THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.*
4. *ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEPT BACK ONSITE ON A NIGHTLY BASIS.*
5. *WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN.*
6. *A STANDARD COMMERCIAL DRIVEWAY MAY BE REQUIRED TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE, OR ON ANY STREET WITH AN EXISTING SIDEWALK TO REMAIN OPEN DURING CONSTRUCTION.*
7. *FOLLOW WORK AREA TRAFFIC CONTROL HANDBOOK (WATCH) FOR SIDEWALK CLOSURE OR DETOUR/DIVERSION.*



NOT TO SCALE

STABILIZED CONSTRUCTION ENTRANCE

OAK ENGINEERING
4929 MONROE ROAD CHARLOTTE, NC 28205
NORTH CAROLINA FIRM LICENSE #P1742
oak.engineering

PE SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045345 ENGINEERING CORPORATION

04/29/2022

SOUTHRIDGE - BESSEMER

SOUTHRIDGE PARKWAY
GASTON COUNTY, NORTH CAROLINA
FOUNDRY COMMERCIAL

PROJECT DETAILS

REVISIONS:

ENGINEER: LJB
DRAWN BY: ERT
CHECKED BY: GTW

PROJECT #: 022.003

SHEET
C7.4
SHEET 18 OF 18