Site Plan Review Application submitted by Phillip McCorkle, McCorkle, Johnson & McCoy LLP., of behalf of LRE Crossgate North, LLC., for PIN # 7-0035-01-007 (Northeast corner of Crossgate Rd & Jimmy Deloach Parkway) for a General Development Site Plan to allow a warehouse development in a P-I-1 (Planned Industrial) Zoning District

Issue/Item: Site Plan Review Application submitted by Phillip McCorkle, McCorkle, Johnson & McCoy LLP., of behalf of LRE Crossgate North, LLC., for PIN # 7-0035-01-007 (Northeast corner of Crossgate Rd & Jimmy Deloach Parkway) for a General Development Site Plan to allow a warehouse development in a P-I-1 (Planned Industrial) Zoning District

Background: The subject property is currently vacant woodland. There are no buildings or structures on the subject property.

Facts and Findings: The proposed project consist of a 332,450 s.f. warehouse and a 96,250 s.f. warehouse with associated parking, utilities, drainage and infrastructure improvements. The entrance will be located off of Crossgate Road. The applicant provided a Traffic Impact Analysis with the general development plan. The Traffic Impact Analysis is currently under review by City Engineer's T. R. Long Engineering.

Funding: N/A

Recommendation: The Planning Commission will hear this application on Monday, February 14, 2022 at 6:30 PM.

COMMENTS - Current Meeting:

The applicant, Phillip McCorkle, was present and gave a brief presentation of the project. Commissioner Morris asked if there would be a stop sign at the at the intersection of the project and Crossgate Road. Mr. McCorkle responded there would be a stop sign. Commissioner Hester asked if the proposed berm would affect the natural flow of water and would it affect flooding in the neighborhood. Jason Chambless, Thomas & Hutton, responded they would consider all the drainage when designing the site plan. Commissioner Rollf asked if the speed limit could be reduced due to the number of car parking spaces that is required by this development. Mr. McCorkle responded that would be a City decision. There were no public comments. Commissioner Franklin made a motion to approve the application. Commissioner Herrin seconded the motion to approve. The vote was unanimous.

ATTACHMENTS:

- 7-0035-01-007 Project 350k and 96k warehouse General Site Plan Feb 22 - Application (PDF)
- 7-0035-01-007 Project 350k and 96k warehouse General Site Plan Feb 22 - Timeline (DOCX)

RESULT:	**APPROVED [UNANIMOUS]**
MOVER:	Rosetta Franklin, Planning Commissioner
SECONDER:	Bill Herrin, Planning Commissioner
AYES:	Herrin, Franklin, Rollf, Morris, Hester, Sopson

City of Port Wentworth
▪7224 Highway 21 ▪ Port Wentworth ▪ Georgia ▪ 31407 ▪ 912-999-2084

Site Plan Review Application

Site Plan Application is required for all new construction in a "P" or "MPO" zone as defined in the Zoning Ordinance of the City of Port Wentworth.

Site Plan Type (*Check One*): ☑ General / Concept ☐ Specific Development

Site Plan Address: Northeast corner of Crossgate Road and Jimmy Deloach Parkway

PIN #(s): 7-0035-01-007

Zoning: P-I-1 Estimated Cost of Construction: $ 20,000,000.00

Type of Construction: _____

Applicant's Name: Phillip R. McCorkle

Mailing Address: McCorkle, Johnson & McCoy, LLP, 319 Tattnall Street, Savannah, Georgia 31401

Phone #: (912) 232-6000 Email: prm@mccorklejohnson.com

Owner's Name (If Different form Applicant): LRE Crossgate North, LLC

Mailing Address: 2 Cooper Street, 10th Floor

Camden, New Jersey 08102

Phone #: (856) 993-6891 Email: michael.landsburg@nfiindustries.com

I hereby acknowledge that the above information is true and correct.

Applicant's Signature — Date: 1/11/22

Owner's Signature (If Different form Applicant) — Date: January 11, 2022

Please see page 2 for required submittal checklist

City of Port Wentworth
▪7224 Highway 21 ▪ Port Wentworth ▪ Georgia ▪ 31407 ▪ 912-999-2084

Site Plan Review Application Submittal Checklist

Documentation below is required for a complete submittal.

- ☑ Signed and Completed Application
- ☑ 3 Full size sets of site plan civil drawings or concept plan (depending on type of site plan)
- ☑ 15 half size (11" X 17") sets of site plan civil drawings or concept plan (depending on type of site plan)
- ☐ 2 copies of hydrology reports (if applicable)
- ☑ Names, mailing address, and PIN number of all property owners within 250 feet of all property lines
- ☑ 1 8 ½" X 11" of site plan civil drawings or concept plan (depending on type of site plan)
- ☑ PDF of entire submittal (either flash drive or CD)
- ☐ Other Engineering details or reports may be required once submittal has been received
- ☑ Site plan review fee check
    - No Land Disturbance- $206.00 Site Plan Fee + $50.00 Admin Fee = Total $256.00
    - With Land Disturbance - $836.00 Site Plan Fee + $50.00 Admin Fee = Total $886.00

Additional Fee Statement: If engineer review cost to the City exceeds the site plan review fee that is paid at the time of initial application submittal, you may be required to pay additional review cost.

I have read and agree to the above additional fee statement

Applicant's Signature

1/11/22
Date

Updated 4/28/2020



PREPARED FOR:

CONCEPTUAL LAYOUT EXHIBIT

PROJECT 350k & 96 SF

CITY OF PORT WENTWORTH / CHATHAM COUNTY / GA

MARCH 11, 2021

THOMAS & HUTTON

50 Park of Commerce Way
Savannah, GA 31405 • 912.234.5300

www.thomasandhutton.com

This map illustrates a general plan of the development which is for discussion purposes only, does not limit or bind the owner/developer, and is subject to change and revision without prior written notice to the holder. Dimensions, boundaries and position locations are for illustrative purposes only and are subject to an accurate survey and property description.

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Property Owners Within 250 Feet
(As Requested by the Application Form)

Name:	NRPH, Inc.
PIN:	70035 01005
Property Address:	1000 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	NRPH, Inc. c/o Noritake Co., Inc. 15-22 Fair Lawn Avenue. Suite 2A Fair Lawn, New Jersey 07410

Name:	Georgia Power Company
PIN:	70035 01006
Property Address:	Highway 21 Port Wentworth, Georgia 31407
Mailing Address:	Georgia Power Company Tax Department Bin 10120 241 Ralph McGill Boulevard NE Atlanta, Georgia 30308

Name:	Stravinksi Development Group, LLC
PIN:	70033 01004
Property Address:	Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Stravinksi Development Group, LLC 413 W. Yosemite Avenue, Suite 105 Madera, California 93637

Name:	Southern Region Industrial Realty, Inc.
PIN:	70009 01001
Property Address:	Birkenhead Street Port Wentworth, Georgia 31407
Mailing Address:	Southern Region Industrial Realty, Inc. c/o Norfolk Southern Tax Department Attn: Braulia Charris 3 Commercial Place, Unit 209 Norfolk, Virginia 23510

Name:	Southern Region Industrial Realty, Inc.
PIN:	70009 01002
Property Address:	Coastal Highway Port Wentworth, Georgia 31407
Mailing Address:	Southern Region Industrial Realty, Inc. c/o Norfolk Southern Tax Department Attn: Braulia Charris 3 Commercial Place, Unit 209

Property Owners Within 250 Feet
(As Requested by the Application Form)

Norfolk, Virginia 23510

Name:	Southern Region Industrial Realty, Inc.
PIN:	70010 01001
Property Address:	Dorset Road Port Wentworth, Georgia 31407
Mailing Address:	Southern Region Industrial Realty, Inc. c/o Norfolk Southern Tax Department 3 Commercial Place, Unit 209 Norfolk, Virginia 23510

Name:	Crossgate Industrial Investors, LLC
PIN:	70035 01008
Property Address:	1500 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Crossgate Industrial Investors, LLC 1776 Peachtree Street NW, Suite 100 Atlanta, Georgia 30309

Name:	Savannah Economic Development Authority
PIN:	70033 01005
Property Address:	1501 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Savannah Economic Development Authority 131 Hutchinson Island Road Savannah, Georgia 31421

Name:	Savannah Economic Development Authority
PIN:	70009 02002
Property Address:	1 Birkenhead Street Port Wentworth, Georgia 31407
Mailing Address:	Savannah Economic Development Authority 131 Hutchinson Island Road Savannah, Georgia 31421

Name:	Kelly Laperal Gunn
PIN:	70008 03037
Property Address:	60 Warren Drive Port Wentworth, Georgia 31407
Mailing Address:	Kelly Laperal Gunn 117 Wren Court Savannah, Georgia 31419

Name:	Johnny R. Berry
PIN:	70008 03036

Property Owners Within 250 Feet
(As Requested by the Application Form)

Property Address:	58 Warren Drive Port Wentworth, Georgia 31407
Mailing Address:	Johnny R. Berry 215 Shearhouse Road Guyton, Georgia 31312
Name:	Cynthia D. Gunn & Kelly L. Gunn
PIN:	70008 03035
Property Address:	56 Warren Drive Port Wentworth, Georgia 31407
Mailing Address:	Cynthia D. Gunn & Kelly L. Gunn 117 Wren Court Savannah, Georgia 31419
Name:	Daniel E. McMahon
PIN:	70008 03034
Property Address:	54 Warren Drive Port Wentworth, Georgia 31407
Mailing Address:	Daniel E. McMahon 54 Warren Drive Savannah, Georgia 31407
Name:	John Patrick Cooper
PIN:	70008 03033
Property Address:	52 Warren Drive Port Wentworth, Georgia 31407
Mailing Address:	John Patrick Cooper 52 Warren Drive Port Wentworth, Georgia 31407
Name:	Julia McCaskle & Sarah Harris
PIN:	70010 18008
Property Address:	101 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Julia McCaskle & Sarah Harris 2059 Lilac Court, Apt. A Augusta, Georgia 30905
Name:	Robert Ewing Hendrick, Jr.
PIN:	70010 18007
Property Address:	103 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Robert Ewing Hendrick, Jr. 103 Gordon Street Port Wentworth, Georgia 31407

Property Owners Within 250 Feet
(As Requested by the Application Form)

Name:	Gary Wilson Norton & Donna Norton
PIN:	70010 18006
Property Address:	105 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Gary Wilson Norton & Donna Norton 105 Gordon Street Port Wentworth, Georgia 31407

Name:	Karen D. Partain & Edith F. Partain
PIN:	70010 18005
Property Address:	107 Gordon Road Port Wentworth, Georgia 31407
Mailing Address:	Karen D. Partain & Edith F. Partain 107 Gordon Road Port Wentworth, Georgia 31407

Name:	Julie Stallings Perry
PIN:	70010 18004
Property Address:	109 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Julie Stallings Perry 109 Gordon Street Port Wentworth, Georgia 31407

Name:	Jacqueline Watson
PIN:	70010 18003
Property Address:	111 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Jacqueline Watson 111 Gordon Street Port Wentworth, Georgia 31407

Name:	Pamela Brownfield
PIN:	70010 18002
Property Address:	113 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Pamela Brownfield 113 Gordon Street Port Wentworth, Georgia 31407

Name:	Owen E. McIntosh, Sr. & Erma J. McIntosh
PIN:	70010 18001
Property Address:	115 Gordon Street Port Wentworth, Georgia 31407

Property Owners Within 250 Feet
(As Requested by the Application Form)

Mailing Address:	Owen E. McIntosh, Sr. & Erma J. McIntosh 115 Gordon Street Port Wentworth, Georgia 31407
Name:	Real Life Christian Fellowship Church
PIN:	70013 03010
Property Address:	841 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Real Life Christian Fellowship Church P.O. Box 18344 Garden City, Georgia 31408
Name:	Real Life Christian Fellowship Church
PIN:	70013 03001
Property Address:	841 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Real Life Christian Fellowship Church P.O. Box 18344 Garden City, Georgia 31408
Name:	Hugh Vernon Morris
PIN:	70013 03002
Property Address:	908 Akin Drive Port Wentworth, Georgia 31407
Mailing Address:	Hugh Vernon Morris 908 Akin Drive Port Wentworth, Georgia 31407
Name:	Robert M. Schoenbeck & Shannon M. Tomlinson
PIN:	70013 03009
Property Address:	829 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Robert M. Schoenbeck & Shannon M. Tomlinson 829 Crossgate Road Port Wentworth, Georgia 31407
Name:	Wanda D. Rollf
PIN:	70010 17017
Property Address:	836 Crossgate Road Port Wentworth, Georgia 31407
Mailing Address:	Wanda D. Rollf 836 Crossgate Road Port Wentworth, Georgia 31407
Name:	Brad Derek Coleman & Harris H. Moore, Jr.

Property Owners Within 250 Feet
(As Requested by the Application Form)

PIN:	70010 17016
Property Address:	114 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Brad Derek Coleman & Harris H. Moore, Jr. P.O. Box 525 Springfield, Georgia 31329

Name:	Edna Dollie Dixon
PIN:	70010 17015
Property Address:	112 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Edna Dollie Dixon 112 Gordon Street Port Wentworth, Georgia 31407

Name:	Richard Henry Chester
PIN:	70010 17014
Property Address:	110 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Richard Henry Chester 110 Gordon Street Port Wentworth, Georgia 31407

Name:	Teresa A. Strickland
PIN:	70010 17013
Property Address:	108 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Teresa A. Strickland 108 Gordon Street Port Wentworth, Georgia 31407

Name:	Jack G. Rigdon
PIN:	70010 17012
Property Address:	106 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Jack G. Rigdon 106 Gordon Street Port Wentworth, Georgia 31407

Name:	George Litzinger & Carol Litzinger
PIN:	70010 17011
Property Address:	104 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	George Litzinger & Carol Litzinger 104 Gordon Street

Property Owners Within 250 Feet
(As Requested by the Application Form)

Port Wentworth, Georgia 31407

Name:	Jeremy Hendrix
PIN:	70010 17010
Property Address:	102 Gordon Street Port Wentworth, Georgia 31407
Mailing Address:	Jeremy Hendrix 102 Gordon Street Port Wentworth, Georgia 31407

CITY OF PORT WENTWORTH

(912) 964-4379

REC#: 00340758 1/14/2022 2:59 PM
OPER: ME TERM: 011
REF#: CK 3255

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220061 886.00CR
LRE CROSSGATE NORTH, LLC
7-0035-01-007
DEV-SPR 886.00CR

TENDERED: 886.00 CHECK
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CHANGE: 0.00

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THOMAS & HUTTON

TRAFFIC IMPACT ANALYSIS

NFI CROSSGATE – NORTHEAST QUADRANT

PORT WENTWORTH, GEORGIA

Prepared for:
NFI INDUSTRIES

J – 26327.0006

JUNE 2021

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1. INTRODUCTION

A 428,700 square foot warehousing development is proposed east of State Route (SR) 21 and north of Crossgate Road in Port Wentworth, Georgia (**Figure 1**). The development will have 332,450 square feet of high-cube transload and short-term storage warehousing and 96,250 square feet of warehousing. The development is anticipated to be built out by 2023.

The development has one proposed access on Crossgate Road which is shown in **Figure 2**. The Crossgate Industrial Park has approximately 638,000 square feet of previously constructed buildings that are already occupied within the site (Buildings A & DE). The driveways serving the existing buildings provide access along Crossgate Road and the volumes from these occupied buildings are included in the traffic data collected at the signalized intersection of SR 21 and Crossgate Road/Gulfstream Road. The buildings for C South, 214,500 square feet and 830,000 square feet, are not included in this study. This study will examine the morning and afternoon peak hour traffic conditions for the proposed accesses and the following intersections:

- SR 21/Augusta Road and Crossgate Road/Gulfstream Road (Signalized)
- Crossgate Road and site access (Stop Controlled)

2. EXISTING CONDITIONS

Roadway Conditions

SR 21 is a north-south four-lane roadway with a grassed median and posted speed limit of 50 mph. Crossgate Road is an east-west two-lane roadway with a 45-mph posted speed limit. Gulfstream Road is an east-west two-lane roadway with a 35-mph posted speed limit.

The intersection of SR 21 and Crossgate Road/Gulfstream Road is signalized. SR 21 northbound has two dedicated left turn lanes (protected only phase), two through lanes, and one dedicated right turn lane (yield condition). SR 21 southbound has one dedicated left turn lane (protected only phase), two through lanes, and one dedicated right turn lane (yield condition). Crossgate Road has one dedicated left turn lane (permissive phase), one through lane, and one dedicated right turn lane. Gulfstream Road has one dedicated left turn lane (protected/permissive phase), one through lane, and one dedicated right turn lane. Pedestrian accommodations are present at this signalized intersection.

Traffic Conditions

Traffic operations at intersections are typically evaluated in terms of "Level of Service" or LOS. The LOS is a measurement of delay incurred at an intersection or for a particular movement. LOS is defined by the Transportation Research Board's Highway Capacity Manual (HCM) from which LOS A represents free flow conditions with minimal delays; LOS F represents congested conditions. Generally, a LOS D or better is considered acceptable.

Table 1 shows the HCM criteria for both unsignalized and signalized intersections.

Table 1. Level of Service definitions

LEVEL OF SERVICE	Control Delay per Vehicle (seconds)	
	Unsignalized Intersection	Signalized Intersection
A	≤ 10	≤ 10
B	>10 and ≤ 15	>10 and ≤ 20
C	>15 and ≤ 25	>20 and ≤ 35
D	>25 and ≤ 35	>35 and ≤ 55
E	>35 and ≤ 50	>55 and ≤ 80
F	>50	>80

Traffic counts were taken at the study intersection in April 2021 and included in Appendix A. The morning and afternoon peak hour volumes are shown in **Figure 3**. Capacity analyses were completed based on the counts; results are shown in Table 2 and included in Appendix B.

Table 2. Current Levels of Service (2019)

Intersection	Control	2019 AM Peak Hour		2019 PM Peak Hour	
		LOS	DELAY (sec)	LOS	DELAY (sec)
SR 21 and Crossgate Rd/Gulfstream Rd	Signal				
EB approach (Gulfstream Rd)		B	20	D	45
WB approach (Crossgate Rd)		C	27	C	33
NB approach (SR 21)		B	18	C	22
SB approach (SR 21)		B	19	B	17
Intersection Overall		**B**	**19**	**C**	**24**

The intersection of SR 21 and Crossgate Road/Gulfstream Road currently operates at acceptable levels of service. The results shown are with the signal timing optimized within Synchro.

3. HISTORICAL VOLUMES

Georgia Department of Transportation count station #051-0821 is located on Crossgate Road, east of the signalized intersection of SR-21 and Crossgate Road/Gulfstream Road. Recent count station data is shown in Table 3.

Table 3. GDOT Count Station Data

Count Station	2010 ADT	2011 ADT	2012 ADT	2013 ADT	2014 ADT	2015 ADT	2016 ADT	2017 ADT	2018 ADT	2019 ADT
#051-0821 Crossgate Road	3,580	3,530	4,170	4,260	4,260	4,430	4,820	4,920	5,000	3,930

Using the annual background growth from the GDOT count station data, Crossgate Road experienced approximately 1.0% annual growth for the last 9 years. The 2021 peak hour volumes at the study intersections are raised by 1.0% annually to estimate the 2023 no-build conditions. The 2023 no-build volumes are shown in **Figure 4**.

4. TRIP GENERATION

Trips generated by the proposed development are estimated using the standard rates and equations from the Institute of Transportation Engineers, Trip Generation, 10th Edition, 2017. The development includes 322,450 square feet of high-cube warehousing and 96,250 square feet of warehousing. Trip generation is shown in Table 4, and the calculations are included in Appendix C.

Table 4. Trip Generation

ITE Land Code	Land Use	Daily	AM Peak Hour		PM Peak Hour	
			Enter	Exit	Enter	Exit
154	High-Cube Transload and Short-Term Storage Warehouse (Building C-N-A) 322,450 square feet	Total Trips = 465 Truck trips = 71	Total Trips = 21 Truck trips = 3	Total Trips = 6 Truck trips = 4	Total Trips = 9 Truck trips = 1	Total Trips = 24 Truck trips = 2
150	Warehousing (Build C-N-B) 96,250 square feet	Total Trips = 167 Truck trips = 58	Total Trips = 12 Truck trips = 1	Total Trips = 4 Truck trips = 1	Total Trips = 5 Truck trips = 2	Total Trips = 13 Truck trips = 1
Total		Total Trips = **632** Truck trips = **129**	Total Trips = **33** Truck trips = **4**	Total Trips = **10** Truck trips = **5**	Total Trips = **14** Truck trips = **3**	Total Trips = **37** Truck trips = **3**

5. TRIP DISTRIBUTION

The primary site trip distribution patterns are assumed to split in accordance with the directional patterns observed in the recent counts and the site layout. For this study, the distribution assumptions at the accesses are as follows:

- Crossgate Road and site access for passenger cars:
  - 70% to/from the west
  - 30% to/from the east
- Crossgate Road and site access for transfer trucks:
  - 100% to/from the west

The distribution assumptions at the intersection of SR 21 and Crossgate Road/Gulfstream Road are as follows:

- 38% to/from the north on SR 21 for passenger cars and 60% for transfer trucks
- 2% to/from the west on Gulfstream Road
- 30% to/from the south on SR 21 for passenger cars and 40% for transfer trucks

The site-generated trips are assigned to the study intersection and access point based on the trip distribution assumptions. Site trip distributions are shown in **Figure 5**. Site generated trips are shown in **Figure 6**.

6. FUTURE (NO-BUILD/BUILD OUT) CONDITIONS

The site generated volumes (Figure 6) are added to the no build volumes (Figure 4) to determine the morning and afternoon design hour volumes (**Figure 7**). Table 5 shows the intersection Levels of Service with and without the proposed development. Results of the capacity analyses are shown in Table 5 and included in Appendix D and Appendix E.

Table 5. Future Levels of Service (2023)

Intersection	Control	2023 AM Peak Hour		2023 PM Peak Hour	
		No-Build (LOS/DELAY)	Build Out (LOS/DELAY)	No-Build (LOS/DELAY)	Build Out (LOS/DELAY)
SR 21 and Crossgate Rd/ Gulfstream Rd	Signal				
EB approach (Gulfstream Rd)		C / 20	C / 20	D / 52	D / 53
WB approach (Crossgate Rd)		C / 27	C / 27	C / 33	C / 34
NB approach (SR 21)		B / 18	B / 19	C / 22	C / 22
SB approach (SR 21)		B / 20	B / 20	B / 18	B / 18
Intersection Overall		**B / 20**	**B / 20**	**C / 25**	**C / 25**
Crossgate Rd and site access	Stop				
SB approach (site access)		-	B / 10	-	B / 10
EB lefts (Crossgate Rd)		-	A / 8	-	A / 8

The signalized intersection and the proposed site access are projected to operate at acceptable levels of service at build out. The trips projected for the development will have minimal effect on the delay at the intersection of SR 21 and Crossgate Road/Gulfstream Road. The results shown are with the signal timing optimized within Synchro for SR 21 and Crossgate Road/Gulfstream Road for both the no-build and build out conditions.

Deceleration Lanes

The GDOT Regulations for Driveway and Encroachment Control Manual states for a 45 mph 2-lane roadway with ADT less than 6,000, a right turn deceleration lane must be installed if the minimum requirements are met or exceed 150 right-turning vehicles a day, and the left turn deceleration lane minimum requirements are 250 left-turning vehicles a day. The site is projected to have 76 right-turning vehicles a day and 240 left-turning vehicles a day. These daily volumes at the site access for the development on Crossgate Road fall below the minimum requirements, therefore, a right turn lane and a left turn lanes are not recommended for the site access on Crossgate Road.

Left Turn Phasing

The left turn phasing from Crossgate Road westbound onto SR 21 southbound is analyzed from the GDOT Policy 6786-2 for Left Turn Phasing. Within the policy, there are criteria for meeting leading left turn phasing and lagging left turn phasing. Both peak hours for 2023 build out volumes are utilized for the left turn phasing analysis.

The first criterion is for the cross-product. The cross-product for leading left turn phasing is "one hour left turn volume times the opposing one hour through movement volumes divided by the number of lanes for the opposing through movement, is greater than 50,000." For lagging left turn phasing, the cross-product needs to be greater than 30,000. The cross-product for the 2023 build out AM peak hour is 5,371 and the PM peak hour is 17,272. Neither peak hour for the 2023 build out volumes on Crossgate Road meet this criterion for leading or lagging left turn phasing.

The second criterion is for the left turn volume within an hour. For leading left turn phasing, the left turn volume must exceed 125 vehicles per hour. For lagging left turn phasing, the left turn volume must exceed 75 vehicles per hour. The 2023 build out AM peak hour has 41 left turning vehicles within an hour. The 2023 build out PM peak hour has 68 left turning vehicles. Neither peak hour for the 2023 build out volumes on Crossgate Road meet this criterion for leading or lagging left turn phasing.

Based on the two criteria above, neither leading nor lagging left turn phases are recommended on Crossgate Road westbound at this time.

7. SUMMARY / CONCLUSIONS

A 428,700 square foot warehousing development is proposed east of State Route (SR) 21 and north of Crossgate Road in Port Wentworth, Georgia (**Figure 1**). The development will have 332,450 square feet of high-cube transload and short-term storage warehousing and 96,250 square feet of warehousing. The development is anticipated to be built out by 2023. The development has one proposed access on Crossgate Road.

The signalized intersection and the proposed site access are projected to operate at acceptable levels of service at build out. The trips projected for the development will have minimal effect to the delay at the intersection of SR 21 and Crossgate Road/Gulfstream Road.

Based on GDOT requirements, the site access for the development on Crossgate Road falls below the minimum requirements for deceleration turn lanes, therefore, a right turn lane and left turn lane are not recommended for the site access on Crossgate Road.

Based on the GDOT Policy 6786-2 for Left Turn Phasing criteria, neither a leading nor a lagging left turn phase meet the minimum requirements. Neither leading nor lagging left turn phases are recommended on Crossgate Road westbound at this time.

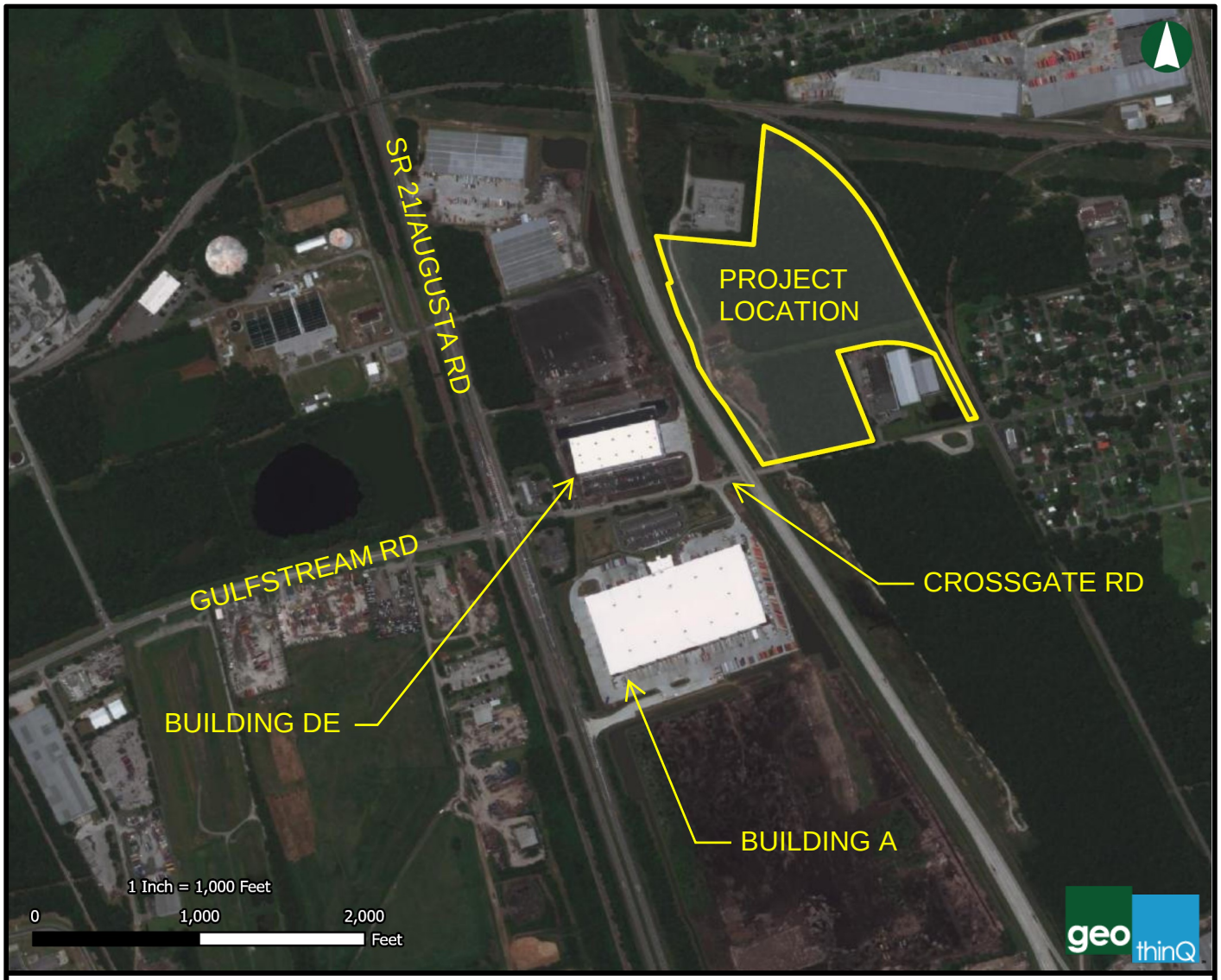


FIGURE 1

SITE LOCATION MAP

TRAFFIC IMPACT ANALYSIS
NFI CROSSGATE - NORTHEAST QUADRANT

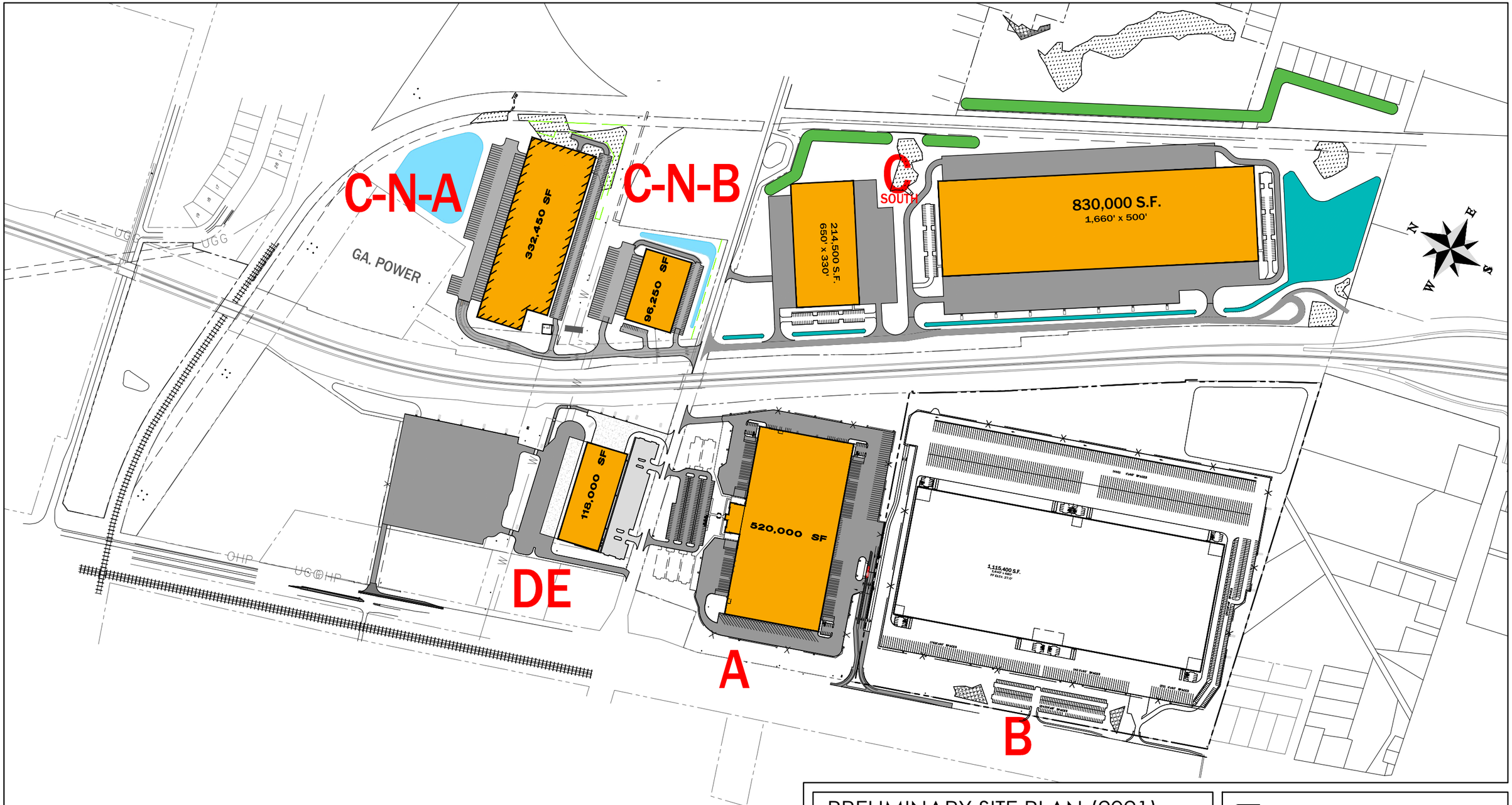
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26327.0006

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PRELIMINARY SITE PLAN (2021)

FIGURE 2

CROSSGATE INDUSTRIAL PARK

CLIENT:
NFI

LOCATION: PORT WENTWORTH, GEORGIA
DATE: APRIL 14, 2021 DRAWN BY: SSF SHEET: FIGURE 2
JOB NUMBER: J-22905 REVIEWED BY: CH SCALE: 1" = 500'

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www.thomasandhutton.com

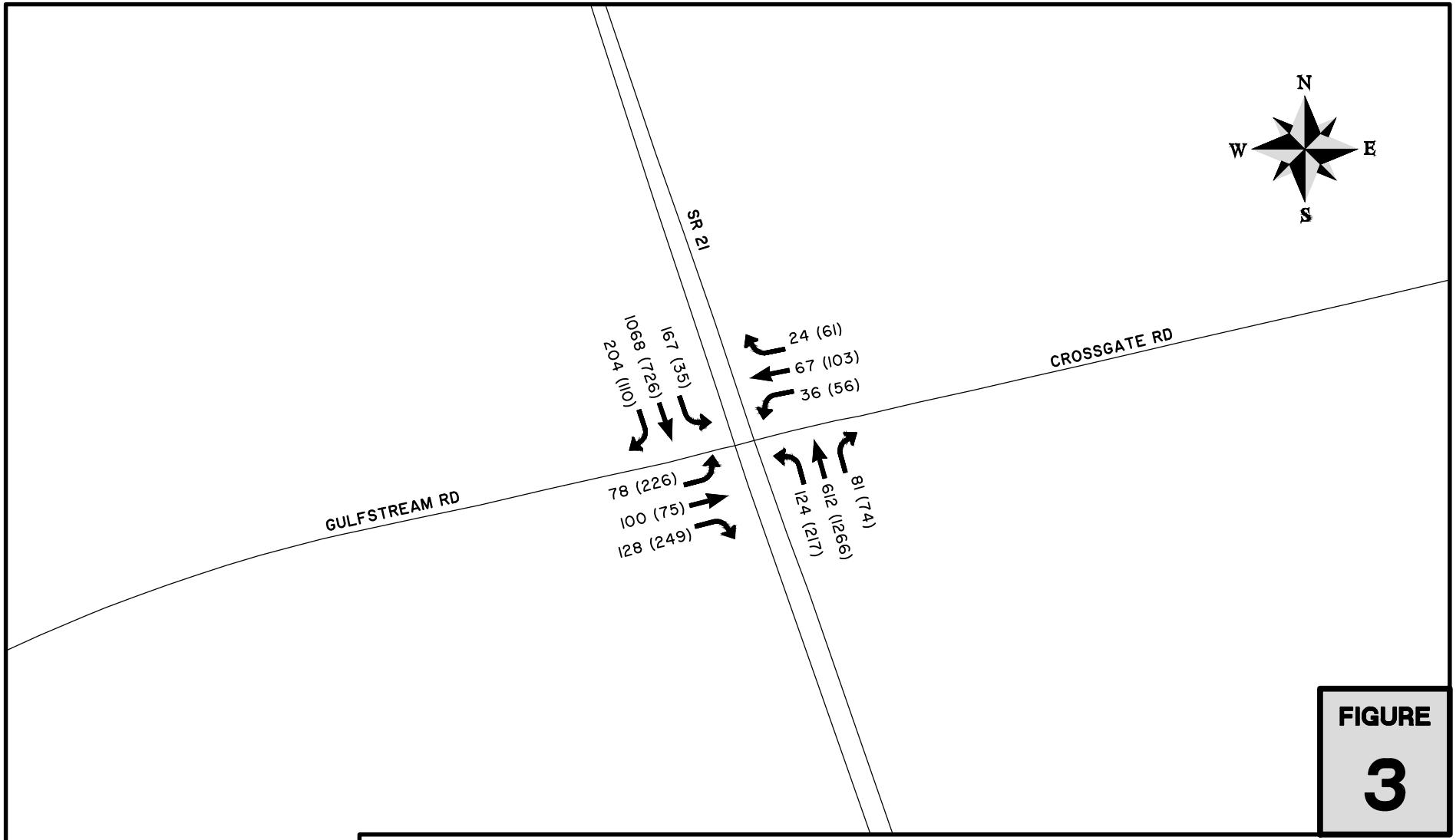


FIGURE 3

000 AM PK HR (000) PM PK HR →

AM PEAK HOUR = 7:00 AM - 8:00 AM
PM PEAK HOUR = 4:15 PM - 5:15 PM

NFI CROSSGATE - NORTHEAST QUADRANT

2021 EXISTING PEAK HOUR TRAFFIC VOLUMES

CLIENT:
NFI INDUSTRIES

LOCATION: PORT WENTWORTH, GEORGIA
DATE: JUNE 2021 DRAWN BY: DPE SHEET: FIGURE 3
JOB NUMBER: J-26327.0006 REVIEWED BY: MB SCALE: NTS

THOMAS & HUTTON
50 Park of Commerce Way
Savannah, GA 31405 • 912.234.5300
www.thomasandhutton.com

Z:\26327\26327.0006\Documents\Reports\Traffic\Supporting Documents\26327.0006-Traffic Figures.dwg - Jun 23, 2021 - 10:16:55 AM

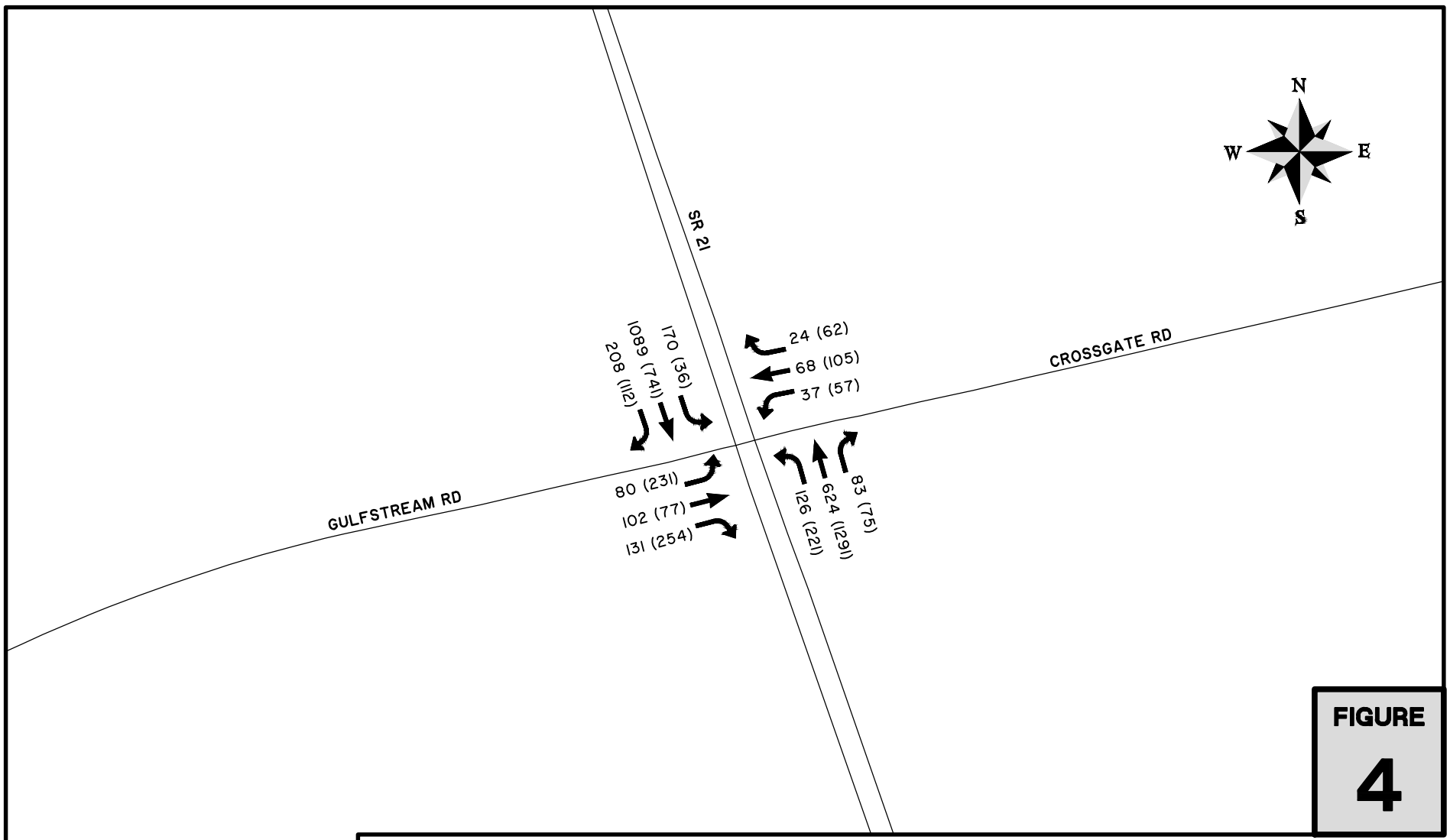


FIGURE 4

000 AM PK HR (000) PM PK HR →

2 years of background growth at 1.0% per year to Existing Volumes
Total Factor = 1.020

NFI CROSSGATE - NORTHEAST QUADRANT

2023 NO-BUILD PEAK HOUR TRAFFIC VOLUMES

CLIENT:
NFI INDUSTRIES

LOCATION: PORT WENTWORTH, GEORGIA
DATE: JUNE 2021 DRAWN BY: DPE SHEET: FIGURE 4
JOB NUMBER: J-26327.0006 REVIEWED BY: MB SCALE: NTS

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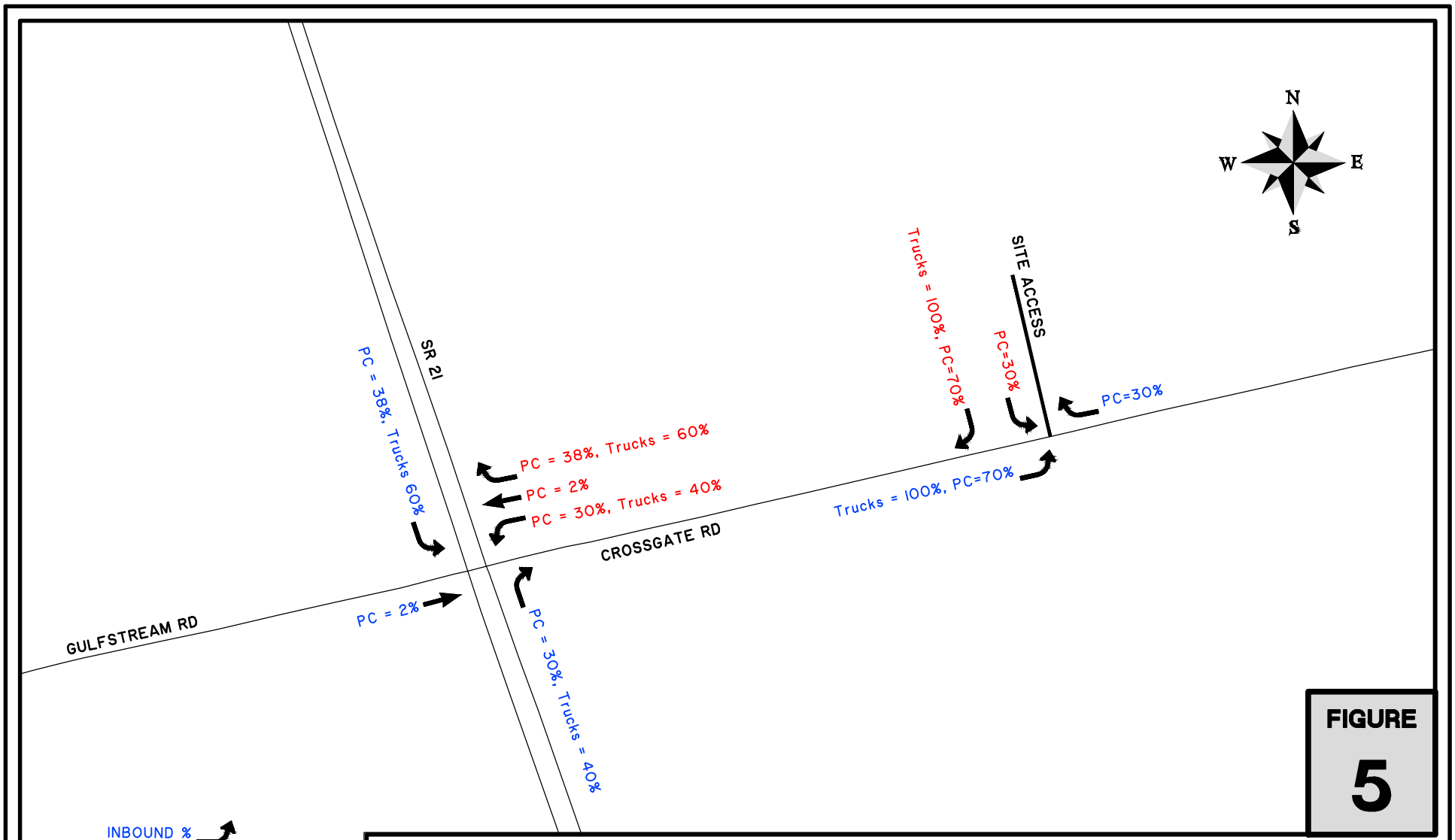


FIGURE 5

INBOUND %

OUTBOUND %

Trip Distribution is broken down between passenger cars (PC) and transfer trucks at the site access

NFI CROSSGATE - NORTHEAST QUADRANT

SITE TRIP DISTRIBUTION

CLIENT:
NFI INDUSTRIES

LOCATION: PORT WENTWORTH, GEORGIA
DATE: JUNE 2021 DRAWN BY: DPE SHEET: FIGURE 5
JOB NUMBER: J-26327.0006 REVIEWED BY: MB SCALE: NTS

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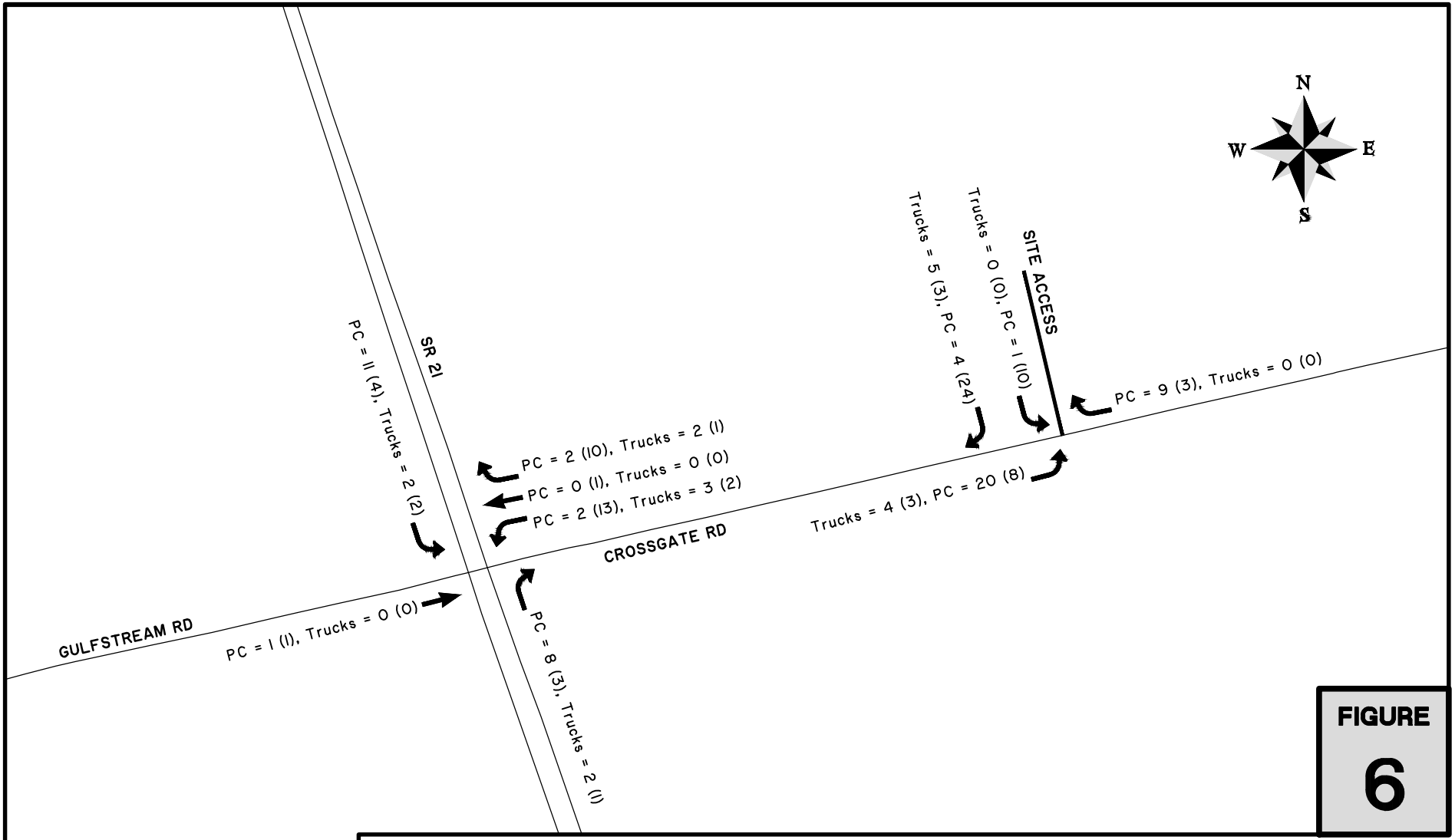


FIGURE 6

000 AM PK HR (000) PM PK HR

AM Peak Hour
Enter=33
Exit=10
PM Peak Hour
Enter=14
Exit=37

NFI CROSSGATE - NORTHEAST QUADRANT

SITE GENERATED TRIPS

CLIENT:
NFI INDUSTRIES

LOCATION: PORT WENTWORTH, GEORGIA
DATE: JUNE 2021 DRAWN BY: DPE SHEET: FIGURE 6
JOB NUMBER: J-26327.0006 REVIEWED BY: MB SCALE: NTS

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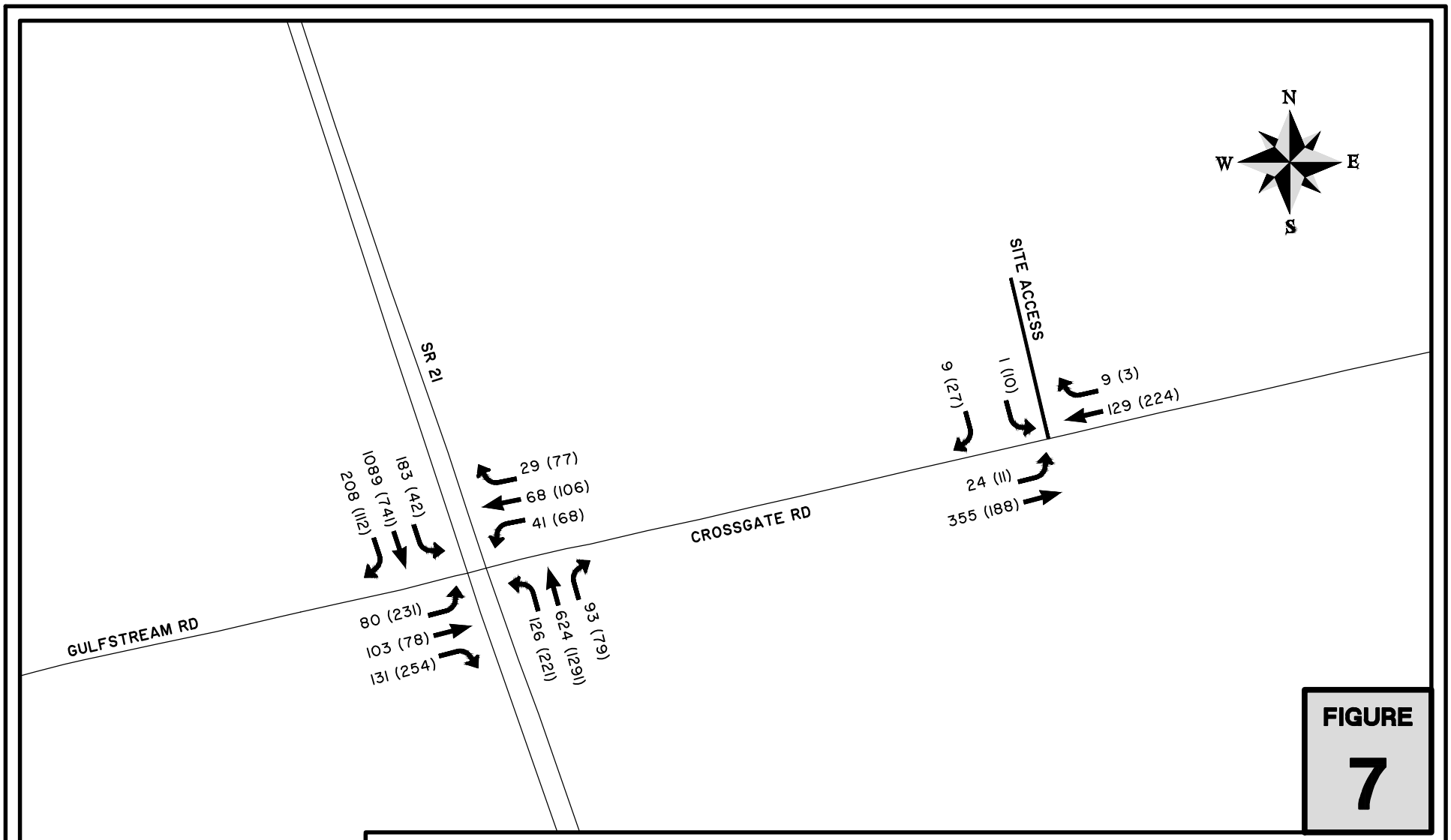


FIGURE 7

000 AM PK HR (000) PM PK HR →

NFI CROSSGATE - NORTHEAST QUADRANT

2023 BUILD OUT PEAK HOUR TRAFFIC VOLUMES

CLIENT:
NFI INDUSTRIES

LOCATION: PORT WENTWORTH, GEORGIA
DATE: JUNE 2021 | DRAWN BY: DPE | SHEET: FIGURE 7
JOB NUMBER: J-26327.0006 | REVIEWED BY: MB | SCALE: NTS

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TRAFFIC IMPACT ANALYSIS

NFI CROSSGATE – NORTHEAST QUADRANT

APPENDIX A

EXISTING TRAFFIC COUNTS

J – 26327.0006

June 2021

TRAFFIC DATA CONNECTION

PO Box 445 Abbeville, GA 31001 | ph (843) 412-6222

Counter: TU-2462/CC-001
Counted By: LME/GWM
Weather: Mild
Other: T&H

File Name : 21006-01
Site Code : 21006-01
Start Date : 4/13/2021
Page No : 1

Groups Printed- Cars - Trucks & Buses - School Buses

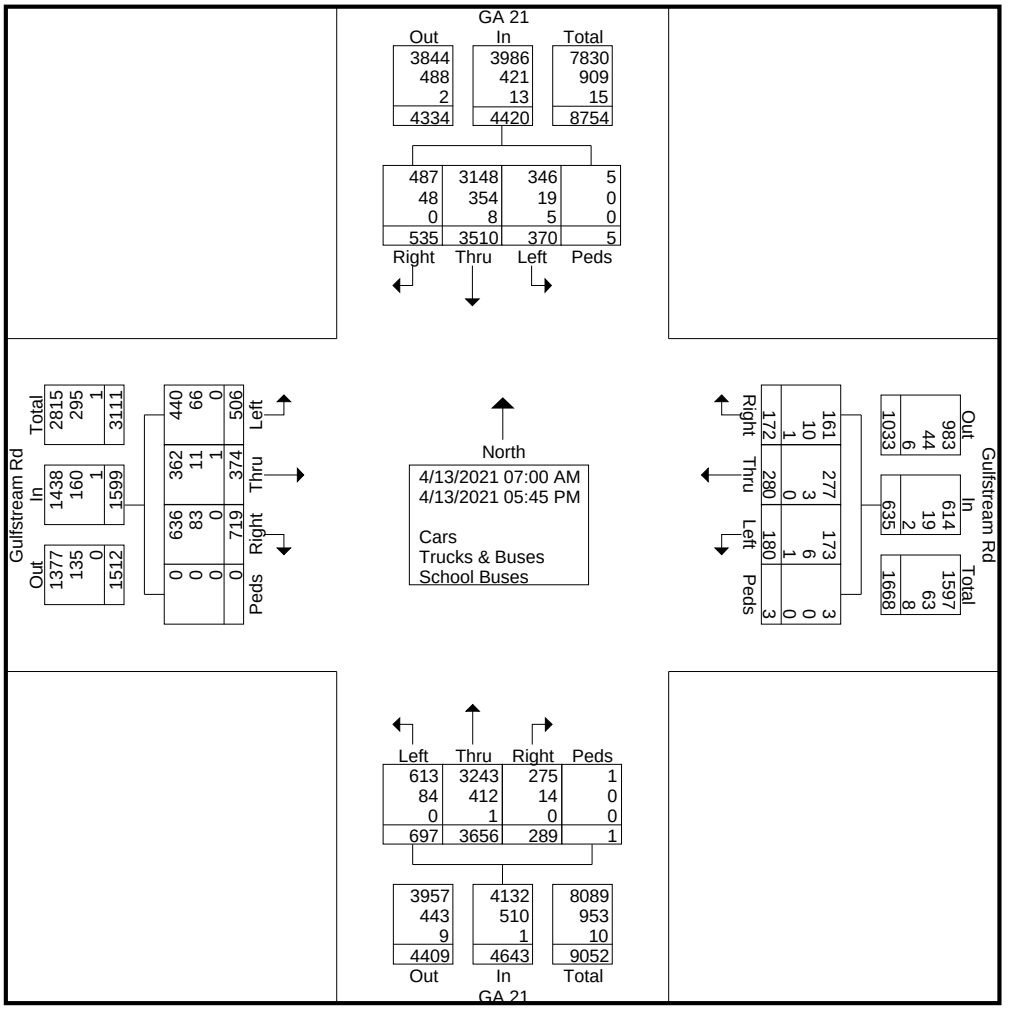
	GA 21 Northbound					GA 21 Southbound					Gulfstream Rd Eastbound					Gulfstream Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	26	132	26	0	184	33	308	68	0	409	20	20	28	0	68	13	18	3	0	34	695
07:15 AM	26	161	10	0	197	25	291	32	0	348	14	21	34	0	69	11	23	11	0	45	659
07:30 AM	39	165	16	0	220	29	280	49	0	358	25	31	30	0	86	5	12	7	0	24	688
07:45 AM	33	154	29	1	217	80	189	55	2	326	19	28	36	0	83	7	14	3	0	24	650
Total	124	612	81	1	818	167	1068	204	2	1441	78	100	128	0	306	36	67	24	0	127	2692
08:00 AM	27	136	19	0	182	18	278	46	0	342	21	36	37	0	94	8	10	8	0	26	644
08:15 AM	26	135	21	0	182	25	248	41	0	314	13	29	33	0	75	13	8	6	0	27	598
08:30 AM	30	133	15	0	178	33	263	28	0	324	22	28	29	0	79	9	11	8	0	28	609
08:45 AM	38	131	27	0	196	45	245	22	0	312	27	23	29	0	79	9	15	4	0	28	615
Total	121	535	82	0	738	121	1034	137	0	1292	83	116	128	0	327	39	44	26	0	109	2466
BREAK																					
04:00 PM	35	326	14	0	375	11	206	17	0	234	55	20	63	0	138	13	13	19	0	45	792
04:15 PM	52	306	13	0	371	9	164	20	0	193	59	14	55	0	128	13	26	14	0	53	745
04:30 PM	45	306	21	0	372	0	211	23	0	234	64	24	55	0	143	10	17	8	0	35	784
04:45 PM	52	325	25	0	402	15	208	26	0	249	68	20	73	0	161	14	27	17	0	58	870
Total	184	1263	73	0	1520	35	789	86	0	910	246	78	246	0	570	50	83	58	0	191	3191
05:00 PM	68	329	15	0	412	11	143	41	0	195	35	17	66	0	118	19	33	22	0	74	799
05:15 PM	56	333	11	0	400	10	164	31	3	208	11	16	52	0	79	5	19	12	0	36	723
05:30 PM	72	313	14	0	399	18	191	15	0	224	28	23	50	0	101	16	18	16	0	50	774
05:45 PM	72	271	13	0	356	8	121	21	0	150	25	24	49	0	98	15	16	14	3	48	652
Total	268	1246	53	0	1567	47	619	108	3	777	99	80	217	0	396	55	86	64	3	208	2948
Grand Total	697	3656	289	1	4643	370	3510	535	5	4420	506	374	719	0	1599	180	280	172	3	635	11297
Apprch %	15	78.7	6.2	0		8.4	79.4	12.1	0.1		31.6	23.4	45	0		28.3	44.1	27.1	0.5		
Total %	6.2	32.4	2.6	0	41.1	3.3	31.1	4.7	0	39.1	4.5	3.3	6.4	0	14.2	1.6	2.5	1.5	0	5.6	
Cars	613	3243					3148														10170
% Cars	87.9	88.7	95.2	100	89	93.5	89.7	91	100	90.2	87	96.8	88.5	0	89.9	96.1	98.9	93.6	100	96.7	90
Trucks & Buses																					
% Trucks & Buses	12.1	11.3	4.8	0	11	5.1	10.1	9	0	9.5	13	2.9	11.5	0	10	3.3	1.1	5.8	0	3	9.8
School Buses	0	1	0	0	1	5	8	0	0	13	0	1	0	0	1	1	0	1	0	2	17
% School Buses																					

TRAFFIC DATA CONNECTION

PO Box 445 Abbeville, GA 31001 | ph (843) 412-6222

Counter: TU-2462/CC-001
Counted By: LME/GWM
Weather: Mild
Other: T&H

File Name : 21006-01
Site Code : 21006-01
Start Date : 4/13/2021
Page No : 2



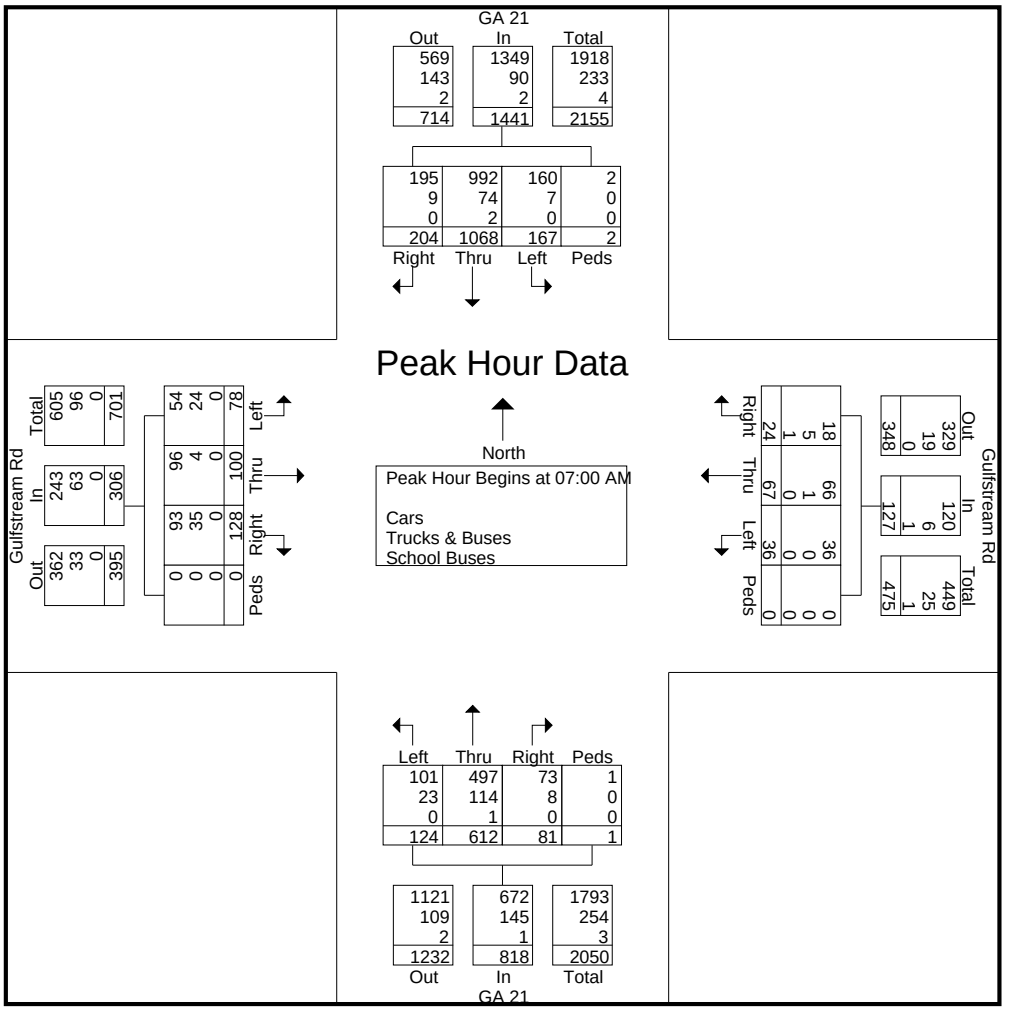
TRAFFIC DATA CONNECTION

PO Box 445 Abbeville, GA 31001 | ph (843) 412-6222

Counter: TU-2462/CC-001
Counted By: LME/GWM
Weather: Mild
Other: T&H

File Name : 21006-01
Site Code : 21006-01
Start Date : 4/13/2021
Page No : 3

	GA 21 Northbound					GA 21 Southbound					Gulfstream Rd Eastbound					Gulfstream Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	26	132	26	0	184	33	**308**	**68**	0	**409**	20	20	28	0	68	**13**	18	3	0	34	**695**
07:15 AM	26	161	10	0	197	25	291	32	0	348	14	21	34	0	69	11	**23**	**11**	0	**45**	659
07:30 AM	**39**	**165**	16	0	**220**	29	280	49	0	358	**25**	**31**	30	0	**86**	5	12	7	0	24	688
07:45 AM	33	154	**29**	**1**	217	**80**	189	55	**2**	326	19	28	**36**	0	83	7	14	3	0	24	650
Total Volume	124	612	81	1	818	167	1068	204	2	1441	78	100	128	0	306	36	67	24	0	127	2692
% App. Total	15.2	74.8	9.9	0.1		11.6	74.1	14.2	0.1		25.5	32.7	41.8	0		28.3	52.8	18.9	0		
PHF	.795	.927	.698	.250	.930	.522	.867	.750	.250	.881	.780	.806	.889	.000	.890	.692	.728	.545	.000	.706	.968
Cars	101	497	73	1	672	160	992	195	2	1349	54	96	93	0	243	36	66	18	0	120	2384
% Cars	81.5	81.2	90.1	100	82.2	95.8	92.9	95.6	100	93.6	69.2	96.0	72.7	0	79.4	100	98.5	75.0	0	94.5	88.6
Trucks & Buses																					
% Trucks & Buses	18.5	18.6	9.9	0	17.7	4.2	6.9	4.4	0	6.2	30.8	4.0	27.3	0	20.6	0	1.5	20.8	0	4.7	11.3
School Buses	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	4
% School Buses																					



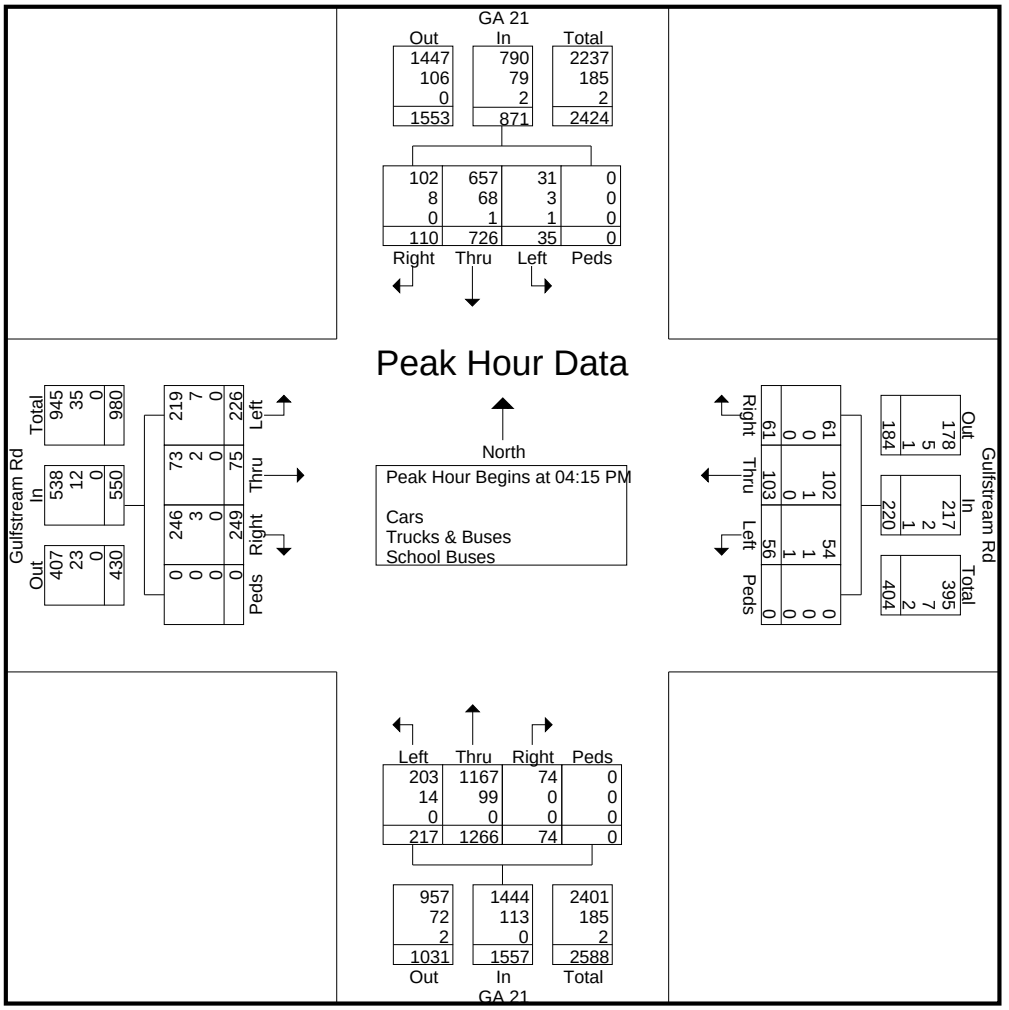
TRAFFIC DATA CONNECTION

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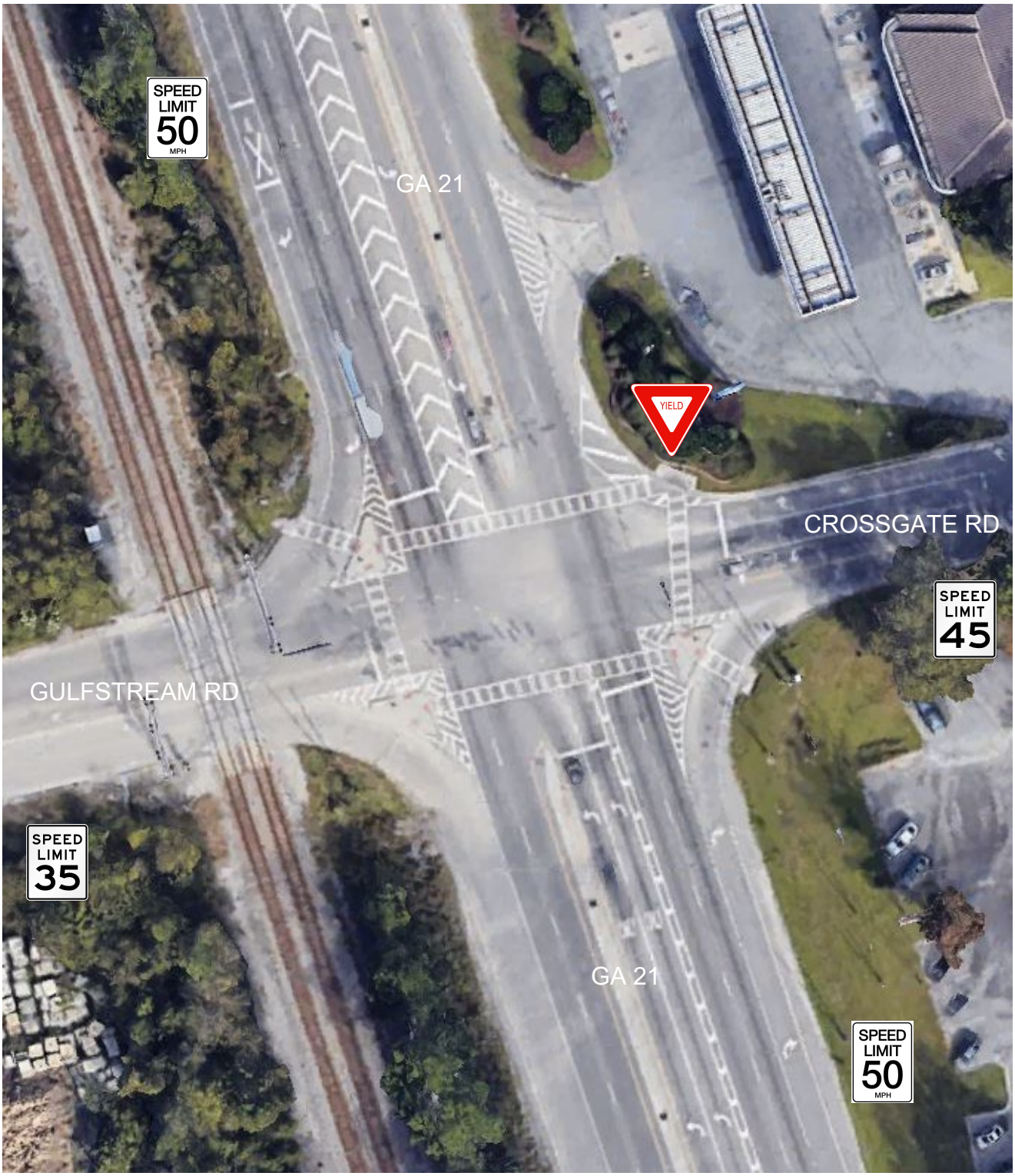
Counter: TU-2462/CC-001
Counted By: LME/GWM
Weather: Mild
Other: T&H

File Name : 21006-01
Site Code : 21006-01
Start Date : 4/13/2021
Page No : 4

	GA 21 Northbound					GA 21 Southbound					Gulfstream Rd Eastbound					Gulfstream Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	52	306	13	0	371	9	164	20	0	193	59	14	55	0	128	13	26	14	0	53	745
04:30 PM	45	306	21	0	372	0	**211**	23	0	234	64	**24**	55	0	143	10	17	8	0	35	784
04:45 PM	52	325	**25**	0	402	**15**	208	26	0	**249**	**68**	20	**73**	0	**161**	14	27	17	0	58	**870**
05:00 PM	**68**	**329**	15	0	**412**	11	143	**41**	0	195	35	17	66	0	118	**19**	**33**	**22**	0	**74**	799
Total Volume	217	1266	74	0	1557	35	726	110	0	871	226	75	249	0	550	56	103	61	0	220	3198
% App. Total	13.9	81.3	4.8	0		4	83.4	12.6	0		41.1	13.6	45.3	0		25.5	46.8	27.7	0		
PHF	.798	.962	.740	.000	.945	.583	.860	.671	.000	.874	.831	.781	.853	.000	.854	.737	.780	.693	.000	.743	.919
Cars	203	1167																			
% Cars	93.5	92.2	100	0	92.7	88.6	90.5	92.7	0	90.7	96.9	97.3	98.8	0	97.8	96.4	99.0	100	0	98.6	93.5
Trucks & Buses																					
% Trucks & Buses	6.5	7.8	0	0	7.3	8.6	9.4	7.3	0	9.1	3.1	2.7	1.2	0	2.2	1.8	1.0	0	0	0.9	6.4
School Buses	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	1	0	0	0	1	3
% School Buses																					



TRAFFIC DATA CONNECTION
PO Box 445 Abbeville, GA 31001 | ph 843-412-6222



TMC Location: 21006-01 GA 21 (Augusta Rd) at Gulfstream Rd/Crossgate Rd
Location: Savannah, GA
Survey Count Times: 7:00am-9:00 am, 4:00-6:00pm

THOMAS & HUTTON

TRAFFIC IMPACT ANALYSIS

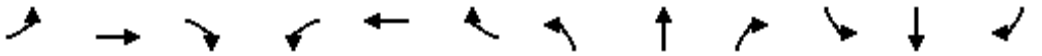
NFI CROSSGATE – NORTHEAST QUADRANT

APPENDIX B

SYNCHRO HCM 6th ANALYSIS
2021 EXISTING PEAK HOUR VOLUMES

J – 26327.0006

June 2021



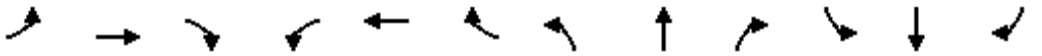
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	100	128	36	67	24	124	612	81	167	1068	204
Future Volume (veh/h)	78	100	128	36	67	24	124	612	81	167	1068	204
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1841	1500	1885	1870	1589	1618	1618	1752	1841	1796	1841
Adj Flow Rate, veh/h	80	103	0	37	69	25	128	631	0	172	1101	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	31	4	27	1	2	21	19	19	10	4	7	4
Cap, veh/h	256	440		231	156	112	223	1094		217	1382	
Arrive On Green	0.06	0.24	0.00	0.08	0.08	0.08	0.07	0.36	0.00	0.12	0.40	0.00
Sat Flow, veh/h	1372	1841	1271	1302	1870	1346	2990	3075	1485	1753	3413	1560
Grp Volume(v), veh/h	80	103	0	37	69	25	128	631	0	172	1101	0
Grp Sat Flow(s),veh/h/ln	1372	1841	1271	1302	1870	1346	1495	1537	1485	1753	1706	1560
Q Serve(g_s), s	3.0	2.6	0.0	1.6	2.1	1.0	2.4	9.8	0.0	5.6	16.6	0.0
Cycle Q Clear(g_c), s	3.0	2.6	0.0	1.6	2.1	1.0	2.4	9.8	0.0	5.6	16.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	440		231	156	112	223	1094		217	1382	
V/C Ratio(X)	0.31	0.23		0.16	0.44	0.22	0.57	0.58		0.79	0.80	
Avail Cap(c_a), veh/h	288	894		522	574	413	280	1237		341	1716	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.1	18.0	0.0	25.4	25.6	25.1	26.2	15.3	0.0	25.0	15.3	0.0
Incr Delay (d2), s/veh	0.7	0.3	0.0	0.3	2.0	1.0	2.3	0.5	0.0	6.6	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.0	0.0	0.5	0.9	0.3	0.8	2.7	0.0	2.4	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	18.3	0.0	25.7	27.6	26.1	28.6	15.8	0.0	31.6	17.5	0.0
LnGrp LOS	C	B		C	C	C	C	B		C	B	
Approach Vol, veh/h		183	A		131			759	A		1273	A
Approach Delay, s/veh		19.8			26.7			18.0			19.4	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	26.4		19.5	9.9	29.3	9.1	10.4				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	11.4	23.6		28.5	5.5	29.5	5.0	18.0				
Max Q Clear Time (g_c+I1), s	7.6	11.8		4.6	4.4	18.6	5.0	4.1				
Green Ext Time (p_c), s	0.1	3.0		0.5	0.0	5.1	0.0	0.4				

Intersection Summary			
HCM 6th Ctrl Delay		19.4	
HCM 6th LOS		B	

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	75	249	56	103	61	217	1266	74	35	726	110
Future Volume (veh/h)	226	75	249	56	103	61	217	1266	74	35	726	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1885	1856	1885	1885	1796	1781	1885	1737	1752	1796
Adj Flow Rate, veh/h	246	82	0	61	112	66	236	1376	0	38	789	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	1	3	1	1	7	8	1	11	10	7
Cap, veh/h	283	463		225	178	151	333	1629		61	1391	
Arrive On Green	0.08	0.25	0.00	0.09	0.09	0.09	0.10	0.48	0.00	0.04	0.42	0.00
Sat Flow, veh/h	1767	1856	1598	1306	1885	1598	3319	3385	1598	1654	3328	1522
Grp Volume(v), veh/h	246	82	0	61	112	66	236	1376	0	38	789	0
Grp Sat Flow(s),veh/h/ln	1767	1856	1598	1306	1885	1598	1659	1692	1598	1654	1664	1522
Q Serve(g_s), s	5.5	2.5	0.0	3.2	4.1	2.8	4.9	25.3	0.0	1.6	12.9	0.0
Cycle Q Clear(g_c), s	5.5	2.5	0.0	3.2	4.1	2.8	4.9	25.3	0.0	1.6	12.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	463		225	178	151	333	1629		61	1391	
V/C Ratio(X)	0.87	0.18		0.27	0.63	0.44	0.71	0.84		0.62	0.57	
Avail Cap(c_a), veh/h	283	757		432	477	405	546	1881		116	1536	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.9	20.9	0.0	30.6	31.0	30.4	31.0	16.1	0.0	33.7	15.8	0.0
Incr Delay (d2), s/veh	24.0	0.2	0.0	0.6	3.6	2.0	2.8	3.3	0.0	9.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	1.0	0.0	1.0	1.9	1.1	1.9	8.2	0.0	0.8	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	21.1	0.0	31.2	34.6	32.4	33.7	19.4	0.0	43.4	16.2	0.0
LnGrp LOS	D	C		C	C	C	C	B		D	B	
Approach Vol, veh/h		328	A		239			1612	A		827	A
Approach Delay, s/veh		44.9			33.1			21.5			17.4	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	39.7		23.2	12.6	35.2	11.0	12.2				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	5.0	39.5		29.0	11.7	32.8	5.5	18.0				
Max Q Clear Time (g_c+I1), s	3.6	27.3		4.5	6.9	14.9	7.5	6.1				
Green Ext Time (p_c), s	0.0	7.0		0.3	0.3	4.6	0.0	0.7				

Intersection Summary			
HCM 6th Ctrl Delay		23.9	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

THOMAS & HUTTON

TRAFFIC IMPACT ANALYSIS

NFI CROSSGATE – NORTHEAST QUADRANT

APPENDIX C

TRIP GENERATION CALCULATIONS

J – 26327.0006

June 2021

thomasandhutton.com

From ITE Trip Generation Manual, 10th Edition, Volume 2

NFI Crossgate - Building C-N-A

Land Use: 154 - High-Cube Transload and Short-Term Storage Warehouse

332.45 1,000 SF Gross Floor Area

Weekday - Vehicle Trip Ends vs KSF GFA

Average Rate = 1.40

Directional Distribution: 50% entering, 50% exiting

	Total Trips	Entering Trips	Exiting Trips
Weekday	465	232	233

Weekday - Truck Trip Ends vs KSF GFA

Average Rate = 0.22

Directional Distribution: 50% entering, 50% exiting

	Total Trips	Entering Trips	Exiting Trips
Weekday	73	36	37

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9am

Average Rate = 0.08

Directional Distribution: 77% entering, 23% exiting

	Total Trips	Entering Trips	Exiting Trips
AM Peak Hour	27	21	6

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9am

Average Rate = 0.02

Directional Distribution: 49% entering, 51% exiting

	Total Trips	Entering Trips	Exiting Trips
AM Peak Hour	7	3	4

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6pm

Average Rate = 0.10

Directional Distribution: 28% entering, 72% exiting

	Total Trips	Entering Trips	Exiting Trips
PM Peak Hour	33	9	24

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6pm

Average Rate = 0.01

Directional Distribution: 47% entering, 53% exiting

	Total Trips	Entering Trips	Exiting Trips
PM Peak Hour	3	1	2

From ITE Trip Generation Manual, 10th Edition, Volume 2

NFI Crossgate - Building C-N-B

Land Use: 150 - Warehousing

96.25 1,000 SF Gross Floor Area

Weekday - Vehicle Trip Ends vs KSF GFA

Average Rate = 1.74

Directional Distribution: 50% entering, 50% exiting

	Total Trips	Entering Trips	Exiting Trips
Weekday	167	84	83

Weekday - Truck Trips Ends vs KSF GFA

Average Rate = 0.60

Directional Distribution: 50% entering, 50% exiting

	Total Trips	Entering Trips	Exiting Trips
Weekday	58	29	29

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9am

Average Rate = 0.17

Directional Distribution: 77% entering, 23% exiting

	Total Trips	Entering Trips	Exiting Trips
AM Peak Hour	16	12	4

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9am

Average Rate = 0.02

Directional Distribution: 52% entering, 48% exiting

	Total Trips	Entering Trips	Exiting Trips
AM Peak Hour	2	1	1

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6pm

Average Rate = 0.19

Directional Distribution: 27% entering, 73% exiting

	Total Trips	Entering Trips	Exiting Trips
PM Peak Hour	18	5	13

Weekday, Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6pm

Average Rate = 0.03

Directional Distribution: 52% entering, 48% exiting

	Total Trips	Entering Trips	Exiting Trips
PM Peak Hour	3	2	1

THOMAS & HUTTON

TRAFFIC IMPACT ANALYSIS

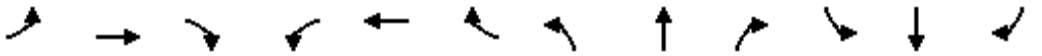
NFI CROSSGATE – NORTHEAST QUADRANT

APPENDIX D

SYNCHRO HCM 6th ANALYSIS
2023 NO-BUILD PEAK HOUR VOLUMES

J – 26327.0006

June 2021



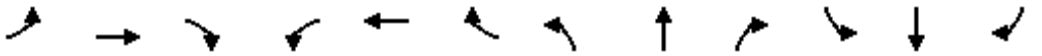
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	102	131	37	68	24	126	624	83	170	1089	208
Future Volume (veh/h)	80	102	131	37	68	24	126	624	83	170	1089	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1841	1500	1885	1870	1589	1618	1618	1752	1841	1796	1841
Adj Flow Rate, veh/h	82	105	0	38	70	25	130	643	0	175	1123	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	31	4	27	1	2	21	19	19	10	4	7	4
Cap, veh/h	255	439		228	154	111	222	1103		220	1400	
Arrive On Green	0.06	0.24	0.00	0.08	0.08	0.08	0.07	0.36	0.00	0.13	0.41	0.00
Sat Flow, veh/h	1372	1841	1271	1299	1870	1346	2990	3075	1485	1753	3413	1560
Grp Volume(v), veh/h	82	105	0	38	70	25	130	643	0	175	1123	0
Grp Sat Flow(s),veh/h/ln	1372	1841	1271	1299	1870	1346	1495	1537	1485	1753	1706	1560
Q Serve(g_s), s	3.1	2.7	0.0	1.6	2.1	1.0	2.5	10.1	0.0	5.8	17.2	0.0
Cycle Q Clear(g_c), s	3.1	2.7	0.0	1.6	2.1	1.0	2.5	10.1	0.0	5.8	17.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	439		228	154	111	222	1103		220	1400	
V/C Ratio(X)	0.32	0.24		0.17	0.45	0.23	0.59	0.58		0.79	0.80	
Avail Cap(c_a), veh/h	283	881		514	566	407	251	1209		342	1720	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	18.3	0.0	25.8	26.0	25.5	26.7	15.5	0.0	25.3	15.4	0.0
Incr Delay (d2), s/veh	0.7	0.3	0.0	0.3	2.1	1.0	2.8	0.6	0.0	6.9	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.1	0.0	0.5	0.9	0.3	0.9	2.9	0.0	2.5	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	18.6	0.0	26.2	28.1	26.6	29.4	16.1	0.0	32.2	17.7	0.0
LnGrp LOS	C	B		C	C	C	C	B		C	B	
Approach Vol, veh/h		187	A		133			773	A		1298	A
Approach Delay, s/veh		20.2			27.3			18.3			19.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	26.9		19.7	9.9	29.9	9.3	10.4				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	11.6	23.4		28.5	5.0	30.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	7.8	12.1		4.7	4.5	19.2	5.1	4.1				
Green Ext Time (p_c), s	0.1	3.0		0.5	0.0	5.2	0.0	0.4				

Intersection Summary			
HCM 6th Ctrl Delay		19.7	
HCM 6th LOS		B	

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	77	254	57	105	62	221	1291	75	36	741	112
Future Volume (veh/h)	231	77	254	57	105	62	221	1291	75	36	741	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1885	1856	1885	1885	1796	1781	1885	1737	1752	1796
Adj Flow Rate, veh/h	251	84	0	62	114	67	240	1403	0	39	805	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	1	3	1	1	7	8	1	11	10	7
Cap, veh/h	275	456		225	180	153	337	1647		62	1407	
Arrive On Green	0.07	0.25	0.00	0.10	0.10	0.10	0.10	0.49	0.00	0.04	0.42	0.00
Sat Flow, veh/h	1767	1856	1598	1303	1885	1598	3319	3385	1598	1654	3328	1522
Grp Volume(v), veh/h	251	84	0	62	114	67	240	1403	0	39	805	0
Grp Sat Flow(s),veh/h/ln	1767	1856	1598	1303	1885	1598	1659	1692	1598	1654	1664	1522
Q Serve(g_s), s	5.3	2.6	0.0	3.2	4.2	2.8	5.0	26.1	0.0	1.7	13.2	0.0
Cycle Q Clear(g_c), s	5.3	2.6	0.0	3.2	4.2	2.8	5.0	26.1	0.0	1.7	13.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	456		225	180	153	337	1647		62	1407	
V/C Ratio(X)	0.91	0.18		0.28	0.63	0.44	0.71	0.85		0.63	0.57	
Avail Cap(c_a), veh/h	275	744		427	473	401	541	1872		115	1530	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.7	21.4	0.0	30.8	31.3	30.6	31.2	16.2	0.0	34.0	15.8	0.0
Incr Delay (d2), s/veh	32.2	0.2	0.0	0.7	3.6	2.0	2.8	3.6	0.0	9.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	1.1	0.0	1.0	1.9	1.1	2.0	8.6	0.0	0.8	4.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	21.6	0.0	31.5	34.9	32.6	34.0	19.8	0.0	43.9	16.2	0.0
LnGrp LOS	E	C		C	C	C	C	B		D	B	
Approach Vol, veh/h		335	A		243			1643	A		844	A
Approach Delay, s/veh		51.7			33.4			21.9			17.5	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	40.4		23.2	12.8	35.8	10.8	12.4				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	5.0	39.7		28.8	11.7	33.0	5.3	18.0				
Max Q Clear Time (g_c+I1), s	3.7	28.1		4.6	7.0	15.2	7.3	6.2				
Green Ext Time (p_c), s	0.0	6.8		0.4	0.3	4.7	0.0	0.7				

Intersection Summary			
HCM 6th Ctrl Delay		24.8	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

THOMAS & HUTTON

TRAFFIC IMPACT ANALYSIS

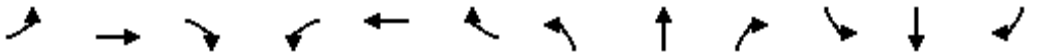
NFI CROSSGATE – NORTHEAST QUADRANT

APPENDIX E

SYNCHRO HCM 6th ANALYSIS
2023 BUILD OUT PEAK HOUR VOLUMES

J – 26327.0006

June 2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	103	131	41	68	29	126	624	93	183	1089	208
Future Volume (veh/h)	80	103	131	41	68	29	126	624	93	183	1089	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1841	1500	1826	1870	1485	1618	1618	1737	1826	1796	1841
Adj Flow Rate, veh/h	82	106	0	42	70	30	130	643	0	189	1123	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	31	4	27	5	2	28	19	19	11	5	7	4
Cap, veh/h	255	439		225	154	104	222	1072		236	1400	
Arrive On Green	0.06	0.24	0.00	0.08	0.08	0.08	0.07	0.35	0.00	0.14	0.41	0.00
Sat Flow, veh/h	1372	1841	1271	1257	1870	1259	2990	3075	1472	1739	3413	1560
Grp Volume(v), veh/h	82	106	0	42	70	30	130	643	0	189	1123	0
Grp Sat Flow(s),veh/h/ln	1372	1841	1271	1257	1870	1259	1495	1537	1472	1739	1706	1560
Q Serve(g_s), s	3.1	2.8	0.0	1.9	2.1	1.3	2.5	10.3	0.0	6.3	17.2	0.0
Cycle Q Clear(g_c), s	3.1	2.8	0.0	1.9	2.1	1.3	2.5	10.3	0.0	6.3	17.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	439		225	154	104	222	1072		236	1400	
V/C Ratio(X)	0.32	0.24		0.19	0.45	0.29	0.59	0.60		0.80	0.80	
Avail Cap(c_a), veh/h	283	881		501	565	380	251	1172		359	1719	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	18.3	0.0	25.9	26.0	25.7	26.7	16.0	0.0	25.0	15.4	0.0
Incr Delay (d2), s/veh	0.7	0.3	0.0	0.4	2.1	1.5	2.8	0.7	0.0	7.3	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.1	0.0	0.5	0.9	0.4	0.9	2.9	0.0	2.7	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	18.6	0.0	26.3	28.1	27.2	29.4	16.7	0.0	32.3	17.8	0.0
LnGrp LOS	C	B		C	C	C	C	B		C	B	
Approach Vol, veh/h		188	A		142			773	A		1312	A
Approach Delay, s/veh		20.2			27.4			18.8			19.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	26.3		19.7	9.9	29.9	9.3	10.4
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	12.3	22.7		28.5	5.0	30.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	8.3	12.3		4.8	4.5	19.2	5.1	4.1
Green Ext Time (p_c), s	0.2	2.8		0.5	0.0	5.2	0.0	0.4

Intersection Summary		
HCM 6th Ctrl Delay		20.0
HCM 6th LOS		B

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

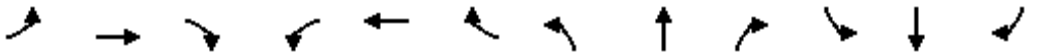
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	355	129	9	1	9
Future Vol, veh/h	24	355	129	9	1	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	250
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	17	3	2	2	2	56
Mvmt Flow	26	386	140	10	1	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	150	0	-	0	583	145
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	438	-
Critical Hdwy	4.27	-	-	-	6.42	6.76
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.353	-	-	-	3.518	3.804
Pot Cap-1 Maneuver	1344	-	-	-	475	777
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1344	-	-	-	463	777
Mov Cap-2 Maneuver	-	-	-	-	463	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1344	-	-	-	463	777
HCM Lane V/C Ratio	0.019	-	-	-	0.002	0.013
HCM Control Delay (s)	7.7	0	-	-	12.8	9.7
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	78	254	68	106	77	221	1291	79	42	741	112
Future Volume (veh/h)	231	78	254	68	106	77	221	1291	79	42	741	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1885	1856	1885	1841	1796	1781	1856	1722	1752	1796
Adj Flow Rate, veh/h	251	85	0	74	115	84	240	1403	0	46	805	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	1	3	1	4	7	8	3	12	10	7
Cap, veh/h	273	456		226	183	151	336	1641		68	1415	
Arrive On Green	0.07	0.25	0.00	0.10	0.10	0.10	0.10	0.48	0.00	0.04	0.43	0.00
Sat Flow, veh/h	1767	1856	1598	1302	1885	1560	3319	3385	1572	1640	3328	1522
Grp Volume(v), veh/h	251	85	0	74	115	84	240	1403	0	46	805	0
Grp Sat Flow(s),veh/h/ln	1767	1856	1598	1302	1885	1560	1659	1692	1572	1640	1664	1522
Q Serve(g_s), s	5.3	2.6	0.0	3.9	4.3	3.7	5.1	26.4	0.0	2.0	13.3	0.0
Cycle Q Clear(g_c), s	5.3	2.6	0.0	3.9	4.3	3.7	5.1	26.4	0.0	2.0	13.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	456		226	183	151	336	1641		68	1415	
V/C Ratio(X)	0.92	0.19		0.33	0.63	0.56	0.71	0.86		0.67	0.57	
Avail Cap(c_a), veh/h	273	738		423	468	388	536	1854		113	1516	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.0	21.6	0.0	31.3	31.5	31.2	31.6	16.4	0.0	34.2	15.8	0.0
Incr Delay (d2), s/veh	33.5	0.2	0.0	0.8	3.5	3.2	2.8	3.8	0.0	10.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	1.1	0.0	1.2	2.0	1.4	2.0	8.8	0.0	0.9	4.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	21.8	0.0	32.2	35.0	34.4	34.4	20.2	0.0	45.1	16.2	0.0
LnGrp LOS	E	C		C	D	C	C	C		D	B	
Approach Vol, veh/h		336	A		273			1643	A		851	A
Approach Delay, s/veh		53.0			34.1			22.3			17.8	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	40.6		23.3	12.8	36.3	10.8	12.5				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	5.0	39.7		28.8	11.7	33.0	5.3	18.0				
Max Q Clear Time (g_c+I1), s	4.0	28.4		4.6	7.1	15.3	7.3	6.3				
Green Ext Time (p_c), s	0.0	6.7		0.4	0.3	4.7	0.0	0.8				

Intersection Summary			
HCM 6th Ctrl Delay		25.4	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	188	224	3	10	27
Future Vol, veh/h	11	188	224	3	10	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	250
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	27	3	2	2	2	11
Mvmt Flow	12	204	243	3	11	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	246	0	-	0	473	245
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	4.37	-	-	-	6.42	6.31
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.443	-	-	-	3.518	3.399
Pot Cap-1 Maneuver	1187	-	-	-	550	772
Stage 1	-	-	-	-	796	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1187	-	-	-	544	772
Mov Cap-2 Maneuver	-	-	-	-	544	-
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1187	-	-	-	544	772
HCM Lane V/C Ratio	0.01	-	-	-	0.02	0.038
HCM Control Delay (s)	8.1	0	-	-	11.8	9.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

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February 11, 2022

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Port Wentworth, Georgia 31407

Wanda Rollf
836 Crossgate Road
Port Wentworth, Georgia 31407

Re: Application filed on behalf of LRE Crossgate North, LLC for PIN 7-0035-01-007 (Northeast corner of Crossgate Road and Jimmy DeLoach Parkway) for a General Development Site Plan

Dear Planning Commission Members:

Since the meeting will be held virtually on Monday night, I thought it best to put some information in your hands that you can review while I'm making my presentation. To that end, please find enclosed the General Site Plan; an exhibit having to do with noise mitigation; 5 exhibits showing various views of the property and the buffering; and finally the traffic study which was prepared last June.

We received a unanimous approval by Planning and Zoning but the client was not prepared to take the issue to City Council. The application was withdrawn in August 2021 but has been refiled with the intention of going forward with the project. The enclosed information is the same presented to you in April, 2021 with the addition of the completed traffic study.

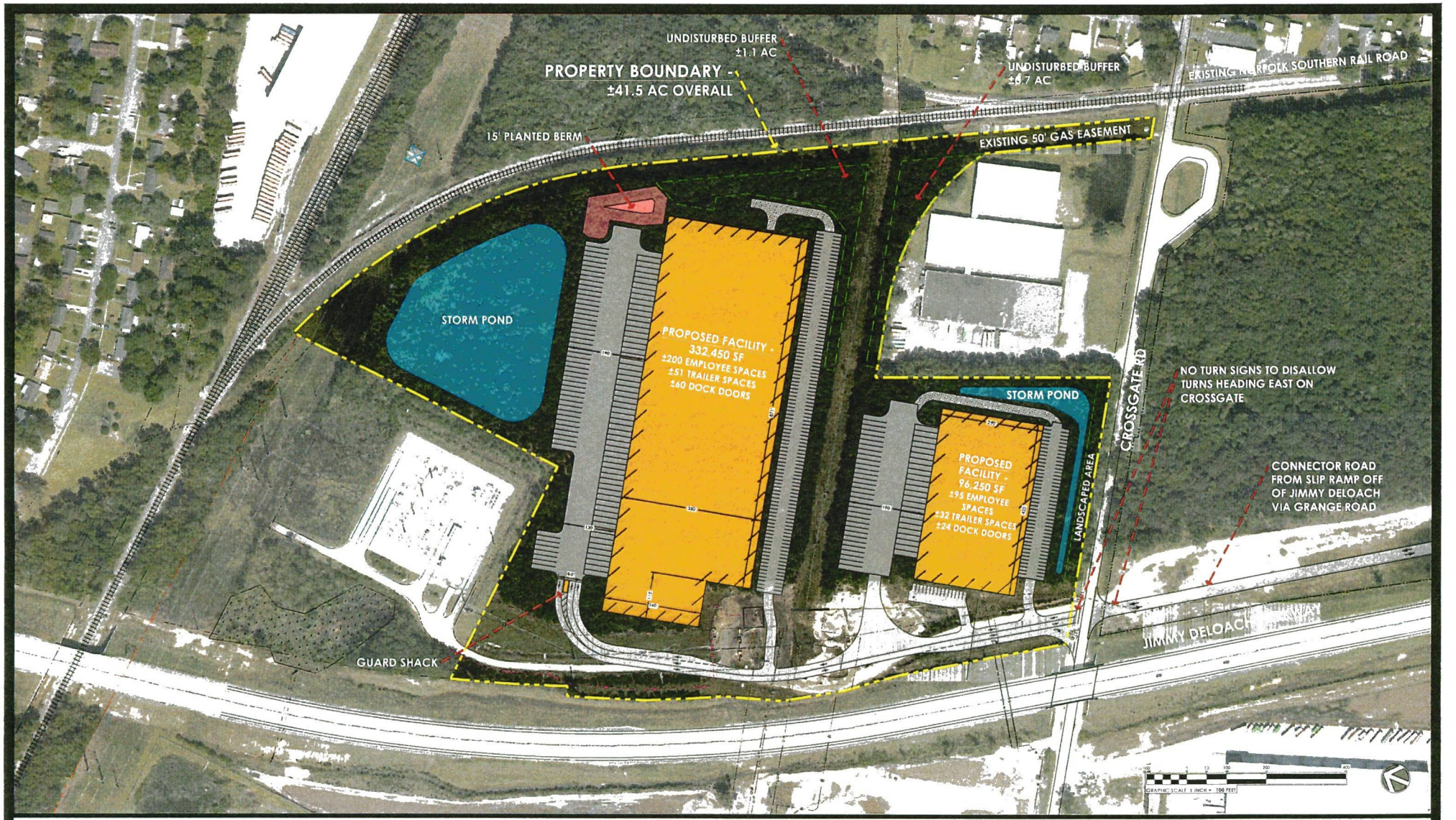
I look forward to presenting my clients case and answering any questions that you might have on Monday night. If you have any questions in the mean time please give me a call.

Sincerely yours,

McCORKLE, JOHNSON & McCOY, LLP

Phillip R. McCorkle
Attorney at Law

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PREPARED FOR:

CONCEPTUAL LAYOUT EXHIBIT

PROJECT 350k & 96 SF

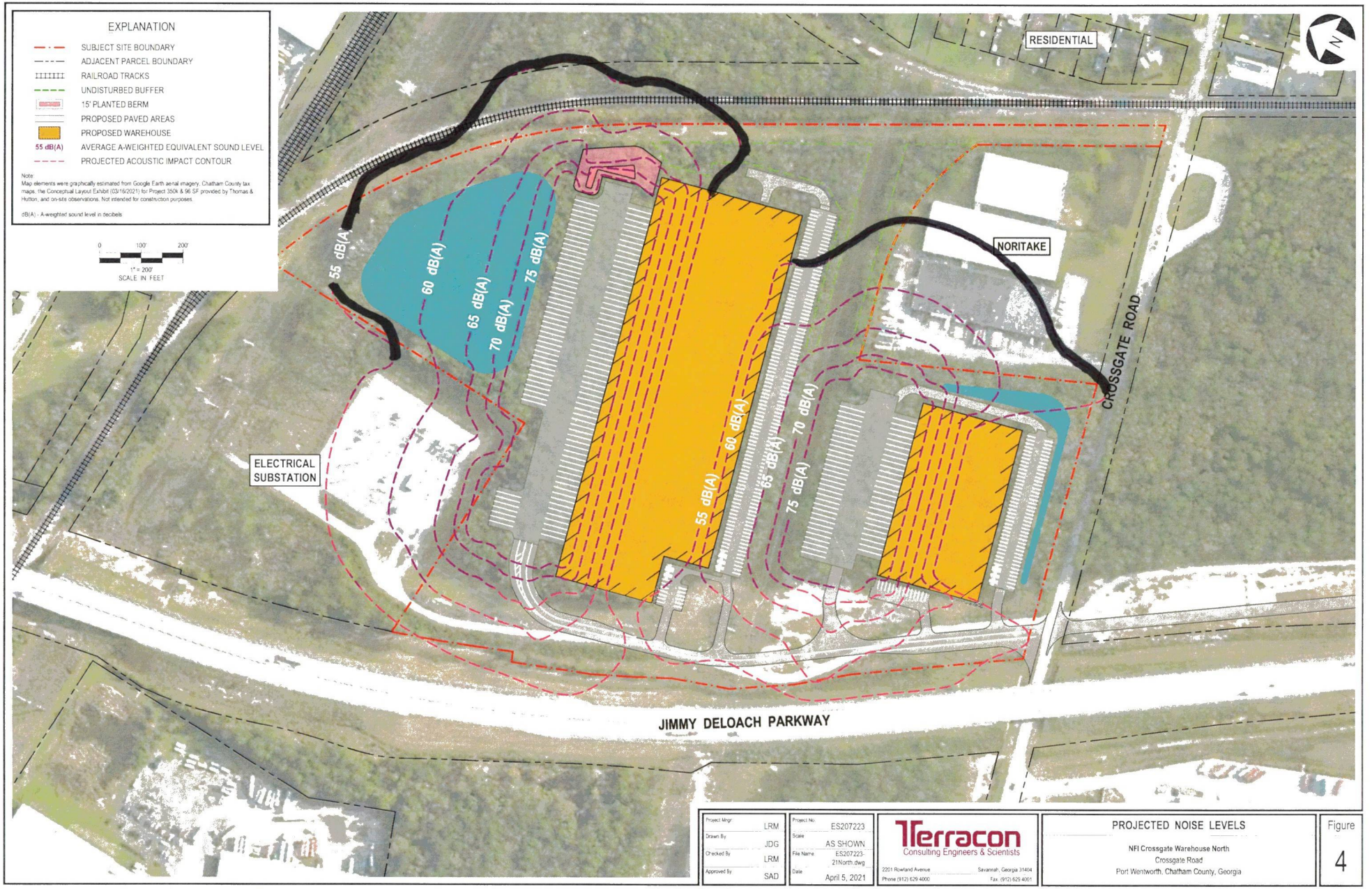
CITY OF PORT WENTWORTH / CHATHAM COUNTY / GA

MARCH 11, 2021

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Project Mngr: LRM	Project No: ES207223	Terracon Consulting Engineers & Scientists	PROJECTED NOISE LEVELS
Drawn By: JDG	Scale: AS SHOWN	2201 Rowland Avenue Savannah, Georgia 31404	NFI Crossgate Warehouse North
Checked By: LRM	File Name: ES207223-21North.dwg	Phone (912) 629 4000 Fax. (912) 629 4001	Crossgate Road
Approved By: SAD	Date: April 5, 2021		Port Wentworth, Chatham County, Georgia

Figure 4

3



PREPARED FOR:

NFI INDUSTRIES

CONCEPTUAL RENDERING

NFI FACILITY

332,450 SQUARE FOOT FACILITY & 96,250 SQUARE FOOT FACILITY | 41.5 ACRE SITE

PORT WENTWORTH | CHATHAM COUNTY | GEORGIA

MARCH 19, 2021

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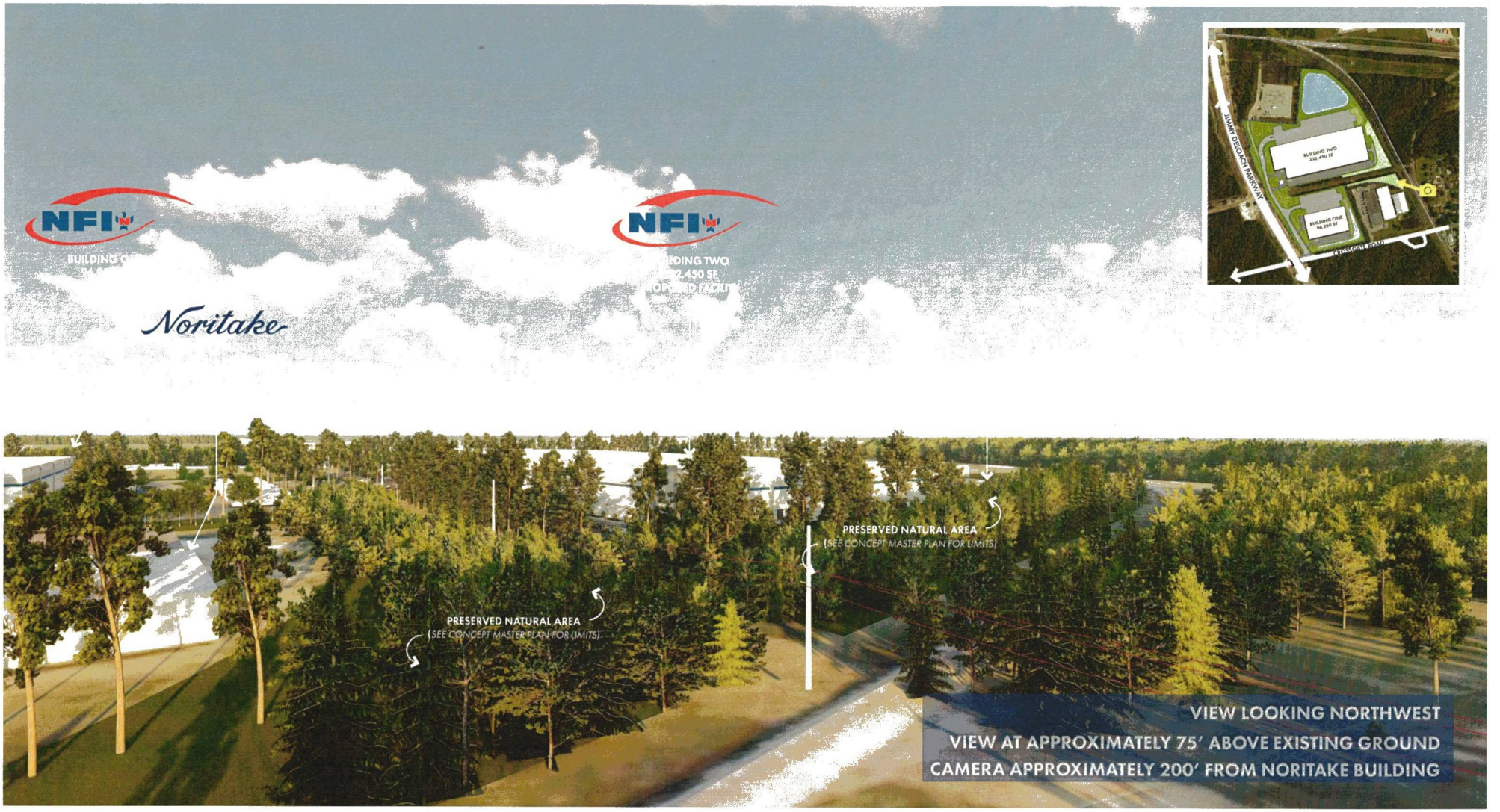
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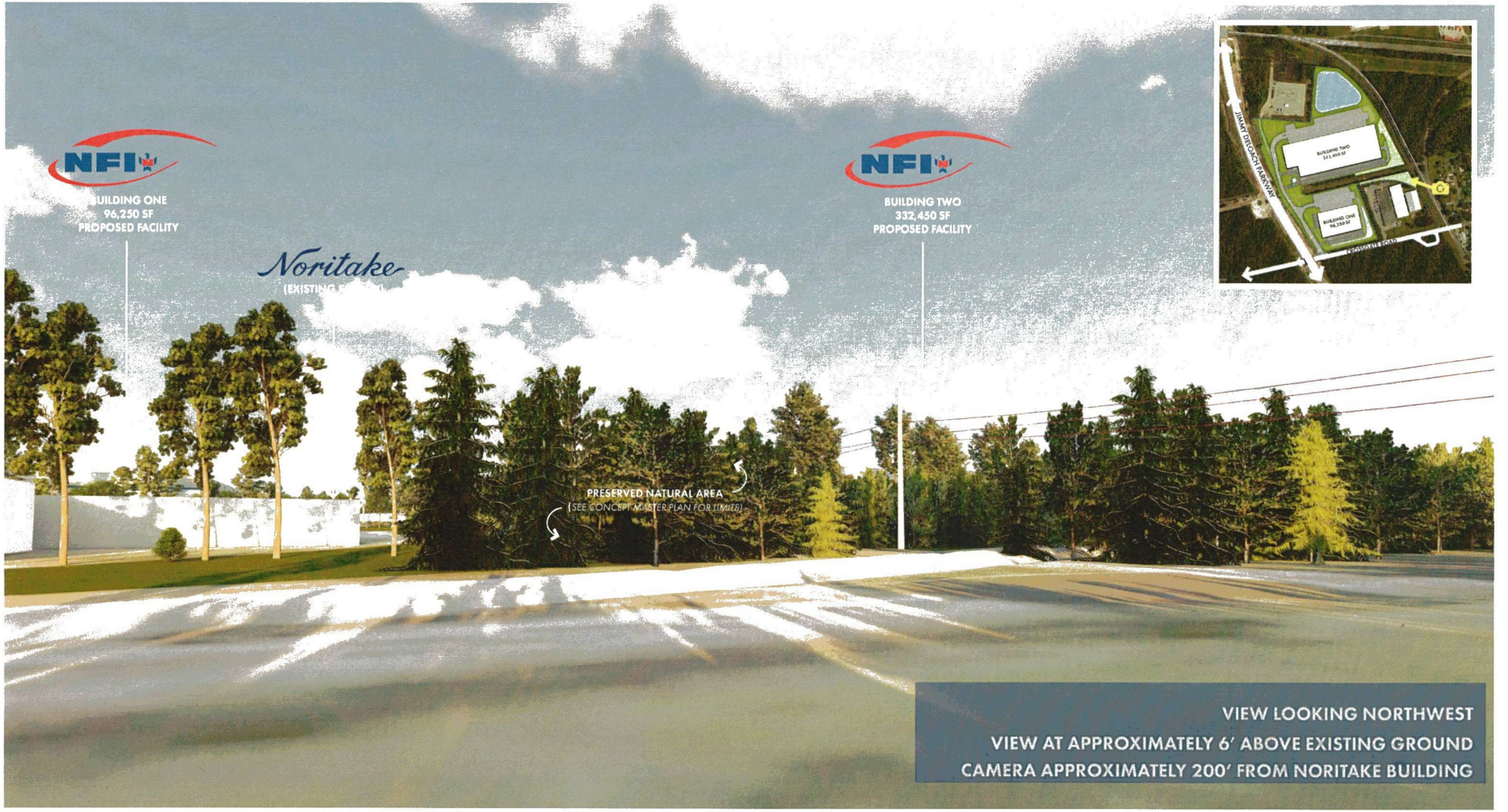
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TRAFFIC IMPACT ANALYSIS

NFI CROSSGATE – NORTHEAST QUADRANT

PORT WENTWORTH, GEORGIA

Prepared for:
NFI INDUSTRIES

J – 26327.0006

JUNE 2021

thomasandhutton.com

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Synchro HCM 6 Analysis, 2021 Existing Peak Hour Volumes ..... Appendix B

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1. INTRODUCTION

A 428,700 square foot warehousing development is proposed east of State Route (SR) 21 and north of Crossgate Road in Port Wentworth, Georgia (**Figure 1**). The development will have 332,450 square feet of high-cube transload and short-term storage warehousing and 96,250 square feet of warehousing. The development is anticipated to be built out by 2023.

The development has one proposed access on Crossgate Road which is shown in **Figure 2**. The Crossgate Industrial Park has approximately 638,000 square feet of previously constructed buildings that are already occupied within the site (Buildings A & DE). The driveways serving the existing buildings provide access along Crossgate Road and the volumes from these occupied buildings are included in the traffic data collected at the signalized intersection of SR 21 and Crossgate Road/Gulfstream Road. The buildings for C South, 214,500 square feet and 830,000 square feet, are not included in this study. This study will examine the morning and afternoon peak hour traffic conditions for the proposed accesses and the following intersections:

- SR 21/Augusta Road and Crossgate Road/Gulfstream Road (Signalized)
- Crossgate Road and site access (Stop Controlled)

2. EXISTING CONDITIONS

Roadway Conditions

SR 21 is a north-south four-lane roadway with a grassed median and posted speed limit of 50 mph. Crossgate Road is an east-west two-lane roadway with a 45-mph posted speed limit. Gulfstream Road is an east-west two-lane roadway with a 35-mph posted speed limit.

The intersection of SR 21 and Crossgate Road/Gulfstream Road is signalized. SR 21 northbound has two dedicated left turn lanes (protected only phase), two through lanes, and one dedicated right turn lane (yield condition). SR 21 southbound has one dedicated left turn lane (protected only phase), two through lanes, and one dedicated right turn lane (yield condition). Crossgate Road has one dedicated left turn lane (permissive phase), one through lane, and one dedicated right turn lane. Gulfstream Road has one dedicated left turn lane (protected/permissive phase), one through lane, and one dedicated right turn lane. Pedestrian accommodations are present at this signalized intersection.

Traffic Conditions

Traffic operations at intersections are typically evaluated in terms of "Level of Service" or LOS. The LOS is a measurement of delay incurred at an intersection or for a particular movement. LOS is defined by the Transportation Research Board's Highway Capacity Manual (HCM) from which LOS A represents free flow conditions with minimal delays; LOS F represents congested conditions. Generally, a LOS D or better is considered acceptable.

Table 1 shows the HCM criteria for both unsignalized and signalized intersections.

Table 1. Level of Service definitions

LEVEL OF SERVICE	Control Delay per Vehicle (seconds)	
	Unsignalized Intersection	Signalized Intersection
A	≤ 10	≤ 10
B	>10 and ≤ 15	>10 and ≤ 20
C	>15 and ≤ 25	>20 and ≤ 35
D	>25 and ≤ 35	>35 and ≤ 55
E	>35 and ≤ 50	>55 and ≤ 80
F	>50	>80

Traffic counts were taken at the study intersection in April 2021 and included in Appendix A. The morning and afternoon peak hour volumes are shown in **Figure 3**. Capacity analyses were completed based on the counts; results are shown in Table 2 and included in Appendix B.

Table 2. Current Levels of Service (2019)

Intersection	Control	2019 AM Peak Hour		2019 PM Peak Hour	
		LOS	DELAY (sec)	LOS	DELAY (sec)
SR 21 and Crossgate Rd/Gulfstream Rd	Signal				
EB approach (Gulfstream Rd)		B	20	D	45
WB approach (Crossgate Rd)		C	27	C	33
NB approach (SR 21)		B	18	C	22
SB approach (SR 21)		B	19	B	17
Intersection Overall		**B**	**19**	**C**	**24**

The intersection of SR 21 and Crossgate Road/Gulfstream Road currently operates at acceptable levels of service. The results shown are with the signal timing optimized within Synchro.

3. HISTORICAL VOLUMES

Georgia Department of Transportation count station #051-0821 is located on Crossgate Road, east of the signalized intersection of SR-21 and Crossgate Road/Gulfstream Road. Recent count station data is shown in Table 3.

Table 3. GDOT Count Station Data

Count Station	2010 ADT	2011 ADT	2012 ADT	2013 ADT	2014 ADT	2015 ADT	2016 ADT	2017 ADT	2018 ADT	2019 ADT
#051-0821 Crossgate Road	3,580	3,530	4,170	4,260	4,260	4,430	4,820	4,920	5,000	3,930

Using the annual background growth from the GDOT count station data, Crossgate Road experienced approximately 1.0% annual growth for the last 9 years. The 2021 peak hour volumes at the study intersections are raised by 1.0% annually to estimate the 2023 no-build conditions. The 2023 no-build volumes are shown in **Figure 4**.

4. TRIP GENERATION

Trips generated by the proposed development are estimated using the standard rates and equations from the Institute of Transportation Engineers, Trip Generation, 10th Edition, 2017. The development includes 322,450 square feet of high-cube warehousing and 96,250 square feet of warehousing. Trip generation is shown in Table 4, and the calculations are included in Appendix C.

Table 4. Trip Generation

ITE Land Code	Land Use	Daily	AM Peak Hour		PM Peak Hour	
			Enter	Exit	Enter	Exit
154	High-Cube Transload and Short-Term Storage Warehouse (Building C-N-A) 322,450 square feet	Total Trips = 465 Truck trips = 71	Total Trips = 21 Truck trips = 3	Total Trips = 6 Truck trips = 4	Total Trips = 9 Truck trips = 1	Total Trips = 24 Truck trips = 2
150	Warehousing (Build C-N-B) 96,250 square feet	Total Trips = 167 Truck trips = 58	Total Trips = 12 Truck trips = 1	Total Trips = 4 Truck trips = 1	Total Trips = 5 Truck trips = 2	Total Trips = 13 Truck trips = 1
	Total	Total Trips = **632** Truck trips = **129**	Total Trips = **33** Truck trips = **4**	Total Trips = **10** Truck trips = **5**	Total Trips = **14** Truck trips = **3**	Total Trips = **37** Truck trips = **3**

5. TRIP DISTRIBUTION

The primary site trip distribution patterns are assumed to split in accordance with the directional patterns observed in the recent counts and the site layout. For this study, the distribution assumptions at the accesses are as follows:

- Crossgate Road and site access for passenger cars:
  - 70% to/from the west
  - 30% to/from the east
- Crossgate Road and site access for transfer trucks:
  - 100% to/from the west

The distribution assumptions at the intersection of SR 21 and Crossgate Road/Gulfstream Road are as follows:

- 38% to/from the north on SR 21 for passenger cars and 60% for transfer trucks
- 2% to/from the west on Gulfstream Road
- 30% to/from the south on SR 21 for passenger cars and 40% for transfer trucks

The site-generated trips are assigned to the study intersection and access point based on the trip distribution assumptions. Site trip distributions are shown in **Figure 5**. Site generated trips are shown in **Figure 6**.

6. FUTURE (NO-BUILD/BUILD OUT) CONDITIONS

The site generated volumes (Figure 6) are added to the no build volumes (Figure 4) to determine the morning and afternoon design hour volumes (**Figure 7**). Table 5 shows the intersection Levels of Service with and without the proposed development. Results of the capacity analyses are shown in Table 5 and included in Appendix D and Appendix E.

Table 5. Future Levels of Service (2023)

Intersection	Control	2023 AM Peak Hour		2023 PM Peak Hour	
		No-Build (LOS/DELAY)	Build Out (LOS/DELAY)	No-Build (LOS/DELAY)	Build Out (LOS/DELAY)
SR 21 and Crossgate Rd/ Gulfstream Rd	Signal				
EB approach (Gulfstream Rd)		C / 20	C / 20	D / 52	D / 53
WB approach (Crossgate Rd)		C / 27	C / 27	C / 33	C / 34
NB approach (SR 21)		B / 18	B / 19	C / 22	C / 22
SB approach (SR 21)		B / 20	B / 20	B / 18	B / 18
Intersection Overall		**B / 20**	**B / 20**	**C / 25**	**C / 25**
Crossgate Rd and site access	Stop				
SB approach (site access)		-	B / 10	-	B / 10
EB lefts (Crossgate Rd)		-	A / 8	-	A / 8

Same LOS as now

The signalized intersection and the proposed site access are projected to operate at acceptable levels of service at build out. The trips projected for the development will have minimal effect on the delay at the intersection of SR 21 and Crossgate Road/Gulfstream Road. The results shown are with the signal timing optimized within Synchro for SR 21 and Crossgate Road/Gulfstream Road for both the no-build and build out conditions.

Deceleration Lanes

The GDOT Regulations for Driveway and Encroachment Control Manual states for a 45 mph 2-lane roadway with ADT less than 6,000, a right turn deceleration lane must be installed if the minimum requirements are met or exceed 150 right-turning vehicles a day, and the left turn deceleration lane minimum requirements are 250 left-turning vehicles a day. The site is projected to have 76 right-turning vehicles a day and 240 left-turning vehicles a day. These daily volumes at the site access for the development on Crossgate Road fall below the minimum requirements, therefore, a right turn lane and a left turn lanes are not recommended for the site access on Crossgate Road.

Left Turn Phasing

The left turn phasing from Crossgate Road westbound onto SR 21 southbound is analyzed from the GDOT Policy 6786-2 for Left Turn Phasing. Within the policy, there are criteria for meeting leading left turn phasing and lagging left turn phasing. Both peak hours for 2023 build out volumes are utilized for the left turn phasing analysis.

The first criterion is for the cross-product. The cross-product for leading left turn phasing is "one hour left turn volume times the opposing one hour through movement volumes divided by the number of lanes for the opposing through movement, is greater than 50,000." For lagging left turn phasing, the cross-product needs to be greater than 30,000. The cross-product for the 2023 build out AM peak hour is 5,371 and the PM peak hour is 17,272. Neither peak hour for the 2023 build out volumes on Crossgate Road meet this criterion for leading or lagging left turn phasing.

The second criterion is for the left turn volume within an hour. For leading left turn phasing, the left turn volume must exceed 125 vehicles per hour. For lagging left turn phasing, the left turn volume must exceed 75 vehicles per hour. The 2023 build out AM peak hour has 41 left turning vehicles within an hour. The 2023 build out PM peak hour has 68 left turning vehicles. Neither peak hour for the 2023 build out volumes on Crossgate Road meet this criterion for leading or lagging left turn phasing.

Based on the two criteria above, neither leading nor lagging left turn phases are recommended on Crossgate Road westbound at this time.

7. SUMMARY / CONCLUSIONS

A 428,700 square foot warehousing development is proposed east of State Route (SR) 21 and north of Crossgate Road in Port Wentworth, Georgia (**Figure 1**). The development will have 332,450 square feet of high-cube transload and short-term storage warehousing and 96,250 square feet of warehousing. The development is anticipated to be built out by 2023. The development has one proposed access on Crossgate Road.

The signalized intersection and the proposed site access are projected to operate at acceptable levels of service at build out. The trips projected for the development will have minimal effect to the delay at the intersection of SR 21 and Crossgate Road/Gulfstream Road.

Based on GDOT requirements, the site access for the development on Crossgate Road falls below the minimum requirements for deceleration turn lanes, therefore, a right turn lane and left turn lane are not recommended for the site access on Crossgate Road.

Based on the GDOT Policy 6786-2 for Left Turn Phasing criteria, neither a leading nor a lagging left turn phase meet the minimum requirements. Neither leading nor lagging left turn phases are recommended on Crossgate Road westbound at this time.

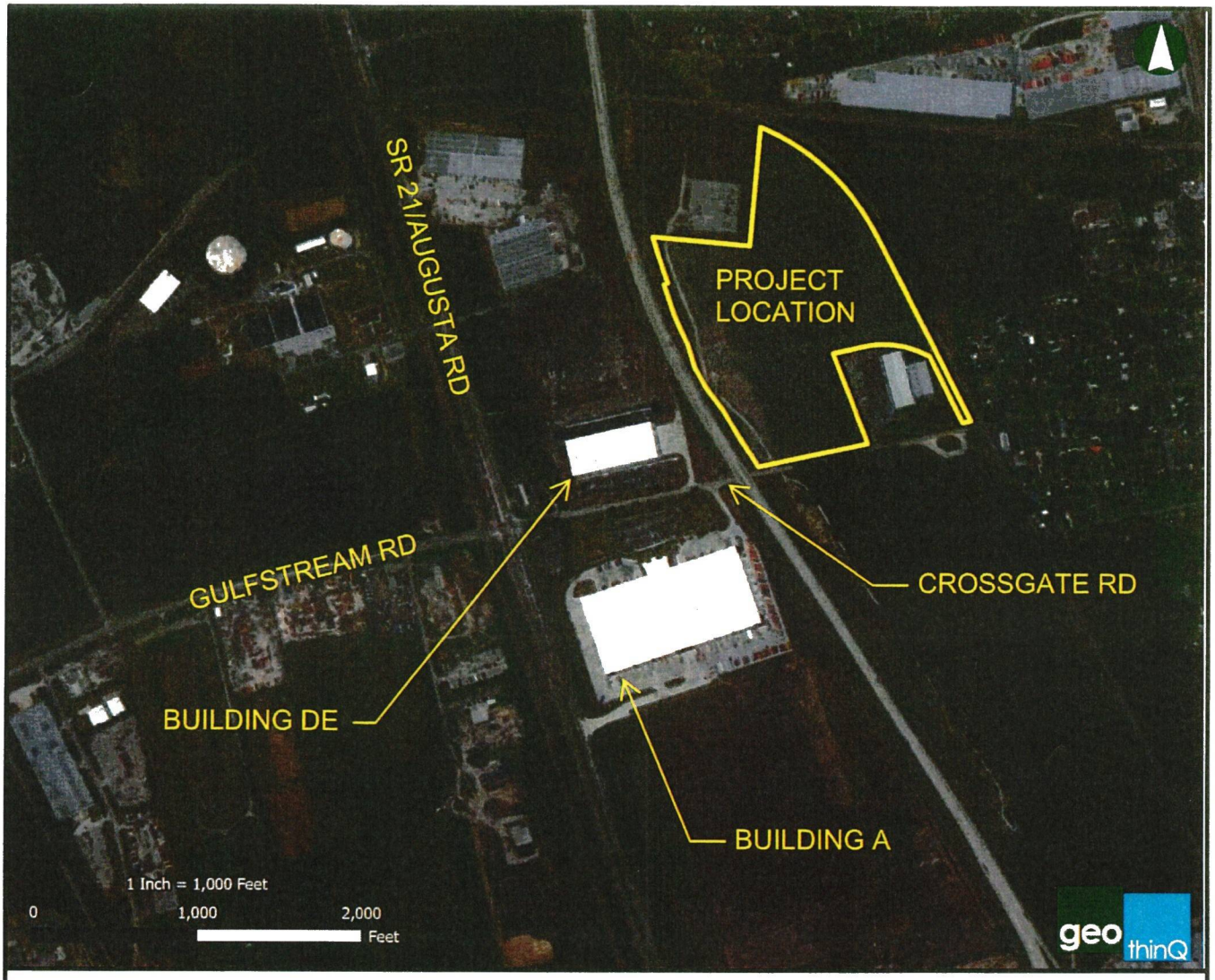


FIGURE 1

SITE LOCATION MAP

TRAFFIC IMPACT ANALYSIS
NFI CROSSGATE - NORTHEAST QUADRANT

PORT WENTWORTH, GEORGIA

THOMAS & HUTTON

26327.0006

This map was created using geothinQ | www.geothinQ.com | Mapping Smart Land Decisions

Subdivision Application submitted by Neil P. McKenzie, P.E., Coleman Company Inc., on behalf of BEP Rice Hope, LLC., for PIN # 7-0906-04-091 (Mulberry Blvd) located in a M-P-O (Master Plan Overlay) Zoning District for a Preliminary Plat of a Major Subdivision (Mulberry Tract Phase 3) for the purpose of Single-Family Homes

Issue/Item: Subdivision Application submitted by Neil P. McKenzie, P.E., Coleman Company Inc., on behalf of BEP Rice Hope, LLC., for PIN # 7-0906-04-091 (Mulberry Blvd) located in a M-P-O (Master Plan Overlay) Zoning District for a Preliminary Plat of a Major Subdivision (Mulberry Tract Phase 3) for the purpose of Single-Family Homes

Background: This is the Preliminary Plat submittal for Mulberry Phase 5 of the Rice Hope Subdivision. Mulberry Phase 5 includes sixty-two (62) single family lots on approximately 23 Acres.

Facts and Findings: The application appears to be complete. The Subdivision will be connected to City water and sewer utilities and will include new roads.

Funding: N/A

Recommendation: The Planning Commission will hear this application on Monday, February 14, 2022 at 6:30 PM.

COMMENTS - Current Meeting:

The applicant, Neil McKenzie, was present and gave a brief presentation of the project. Commissioner Hester asked where the stormwater would go off site. Mr. McKenzie responded it would flow through the other BEP property and discharge into Knoxboro Creek. There were no public comments. Commissioner Morris made a motion to approve the application. Commissioner Hester seconded the motion to approve. The vote was unanimous.

ATTACHMENTS:

- Mulberry Tract Phase 3 Preliminary Plat FEB 22 - Application (PDF)
- Mulberry Tract Phase 3 Preliminary Plat FEB 22 - Preliminary Plat (PDF)
- Mulberry Tract Phase 3 Preliminary Plat FEB 22 - Timeline (DOCX)

RESULT:	**APPROVED [UNANIMOUS]**
MOVER:	Lauree Morris, Planning Commissioner
SECONDER:	Janet Hester, Planning Commissioner
AYES:	Herrin, Franklin, Rollf, Morris, Hester, Sopson

220002

SUBDIVISION APPLICATION FORM FOR THE CITY OF PORT WENTWORTH

RECEIVED
DEC 03 2021
BY: KS

Application Form Required

This application form is to accompany **all** subdivisions submitted for Port Wentworth Planning Commission review and is to be filled out in its **entirety**. Plats/subdivisions not accompanied by this application will not be accepted for processing. All subdivisions with their completed applications must be received by the City of Port Wentworth at least 20 business days prior to the Planning Commission meeting at which they are to be considered. Revisions to a subdivision under review by the Port Wentworth Planning Commission must be received 10 business days prior to the Port Wentworth Planning Commission at which each subdivision is scheduled to be heard.

Subdivision Name: MULBERRY TRACT PHASES 3

Location: MULBERRY BOULEVARD

Number of Lots: 62

Number of Acres: ~23.00

PIN #: 7-090-0604-091

Current Zoning: M-P-O

Type of Subdivision: (Check applicable blanks from each column)

A.
- _____ Sketch Plan
- _____ Master Plan
- X Preliminary Plat
- _____ Final Plat
- _____ Revision to a Recorded Plat

B.
- X Major Subdivision (4 or more lots or a new road)
- _____ Minor Subdivision (3 or less lots & no new road)

Purpose of Subdivision:

- X Single-Family
- _____ Multi-Family
- _____ Retail
- _____ Other Business
- _____ Industrial
- _____ Institutional
- _____ Other
- _____ Sign

Variances: (List all variances being requested)

N/A

Georgia DOT Review

In all applications in which property being subdivided lies along a State Highway or access is needed from a State Highway, all applicants are required to submit a plat to the Georgia Department of Transportation for review. The subdivision application will not be considered by the Port Wentworth Planning Commission until the Georgia Department of Transportation has commented on the subdivision. The comments must accompany the application.

Previous Submittal

Has this tract of land being proposed for subdividing been submitted to the Port Wentworth Planning Commission under a different subdivision name?

Yes _____ No X

If yes, what name? -

Date Submitted: - PWPC File No: -

Number of Required Prints

All submittals, regardless of type, shall include fifteen (15) prints. **Final Plats must include a copy of the plat scanned to a CD along with the fifteen (15) printed copies. Stamp must be in contrasting ink.**

Statements as to Covenants/Deed Restrictions: (Check One)

_____ A copy of all existing deed restrictions or subdivision covenants applicable to this property are attached.

X There are no added restrictions or subdivision covenants on this property.

Contact Person (s): (Type or Print Legibly)

Engineer/Surveyor: NEIL P. MCKENZIE, P.E. / COLEMAN COMPANY, INC.

Address: 1480 CHATHAM PARKWAY, SUITE 100 SAVANNAH, GA Zip Code: 31405

Phone #: (912) 200-3041 Fax #: (912) 200-3056

Owner: BEP RICE HOPE, LLC / ATTN: SCOTT DECAIN

Address: 4800 HAMPDEN LANE, SUITE 200 BETHESDA, MD Zip Code: 20814

Phone #: (301) 915-0460 Fax #: _____

Date of Submittal: 11/23/21

Please list all property owners that are adjacent to the parcel to be subdivided including those across the public right-of-way:

BEP Rice Hope, LLC (Bald Eagle Partners-Rice Hope Plantation, LLC)
Ardmore Port Wentworth,LLC
Savannah Electric & Power Co. (Electric Easement)
City of Savannah (Water Main Easement)

Certifications

1. I hereby certify that this proposed subdivision/plan does not violate any covenants or deed restrictions currently in effect for the property being subdivided.

2. I hereby certify that all taxes applicable to this property have been paid and that there are no delinquent taxes outstanding.

3. I hereby certify that I am the owner of the property being proposed for subdivision.

4. I hereby certify that all the information pertained in this application is true and correct.

Signature of Owner

Comments: Place any pertinent comments you wish to make in the following space:

Submit this form along with the proposed subdivision and any accompanying information to:

CITY OF PORT WENTWORTH
7306 HIGHWAY 21, SUITE 301
PORT WENTWORTH, GEORGIA 31407

CITY OF PORT WENTWORTH
(912) 964-4379

REC#: 00338799 1/04/2022 11:55 AM
OPER: ME TERM: 011
REF#: CK 1776

TRAN: 112.0000 BLDG PERMIT
220002 3,566.00CR
BEP RICE HOPE LLC
7-0906-04-091
I-SUBDIV 3,566.00CR

TENDERED: 3,566.00 CHECK
APPLIED: 3,566.00-

CHANGE: 0.00

WWW.CITYOFPORTWENTWORTH.COM

ADJACENT PROPERTY OWNERS FOR MULBERRY TRACT PHASE 3

- Address: 2790 Mulberry Avenue
  Parcel B Rice Hope Plantation
  N/F: Ardmore Port Wentworth, LLC
  PIN: 7-0906-04-092

- 100 ft Savannah Electric and Power Company Easement

- 100 ft City of Savannah Water Main Easement

- Address: 27 Weavers Way
  Lot 41 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 29 Weavers Way
  Lot 42 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 31 Weavers Way
  Lot 43 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 33 Weavers Way
  Lot 44 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 35 Weavers Way
  Lot 45 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 34 Weavers Way
  Lot 46 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 32 Weavers Way
  Lot 47 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 30 Weavers Way
  Lot 48 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 28 Weavers Way
  Lot 49 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 26 Weavers Way
  Lot 50 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 27 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 28 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 29 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 30 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 31 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

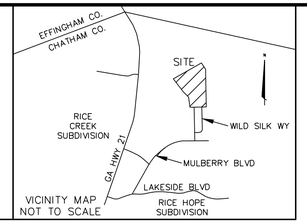
- Address: 32 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 33 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 34 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

Owner Name	Mailing Address 1	City	State	Zip
Coleman Company, Inc	1480 Chatham Parkway, Ste 100	Savannah	GA	31405
BEP Rice Hope LLC	4800 Hampden Ln, Ste 200	Bethesda	MD	20814
Ardmore Port Wentworth, LLC	2790 Mulberry Ave	Port Wentworth	GA	31407
Yong Wang Liu	27 Wild Silk Way	Port Wentworth	GA	31407
Austin Haven	28 Wild Silk Way	Port Wentworth	GA	31407
Isnatanne Cadet	29 Wild Silk Way	Port Wentworth	GA	31407
Nicole Cuff	30 Wild Silk Way	Port Wentworth	GA	31407
Reyes Bustamante	31 Wild Silk Way	Port Wentworth	GA	31407
Arkeen Smalls	32 Wild Silk Way	Port Wentworth	GA	31407
Ced'rica Johnson	33 Wild Silk Way	Port Wentworth	GA	31407
Quanikqua Moultrie	34 Wild Silk Way	Port Wentworth	GA	31407
BEP RH Tract 2 LLC	680 5th Ave, 20th Floor	New York	NY	10019

MULBERRY SUBDIVISION
PHASE 3



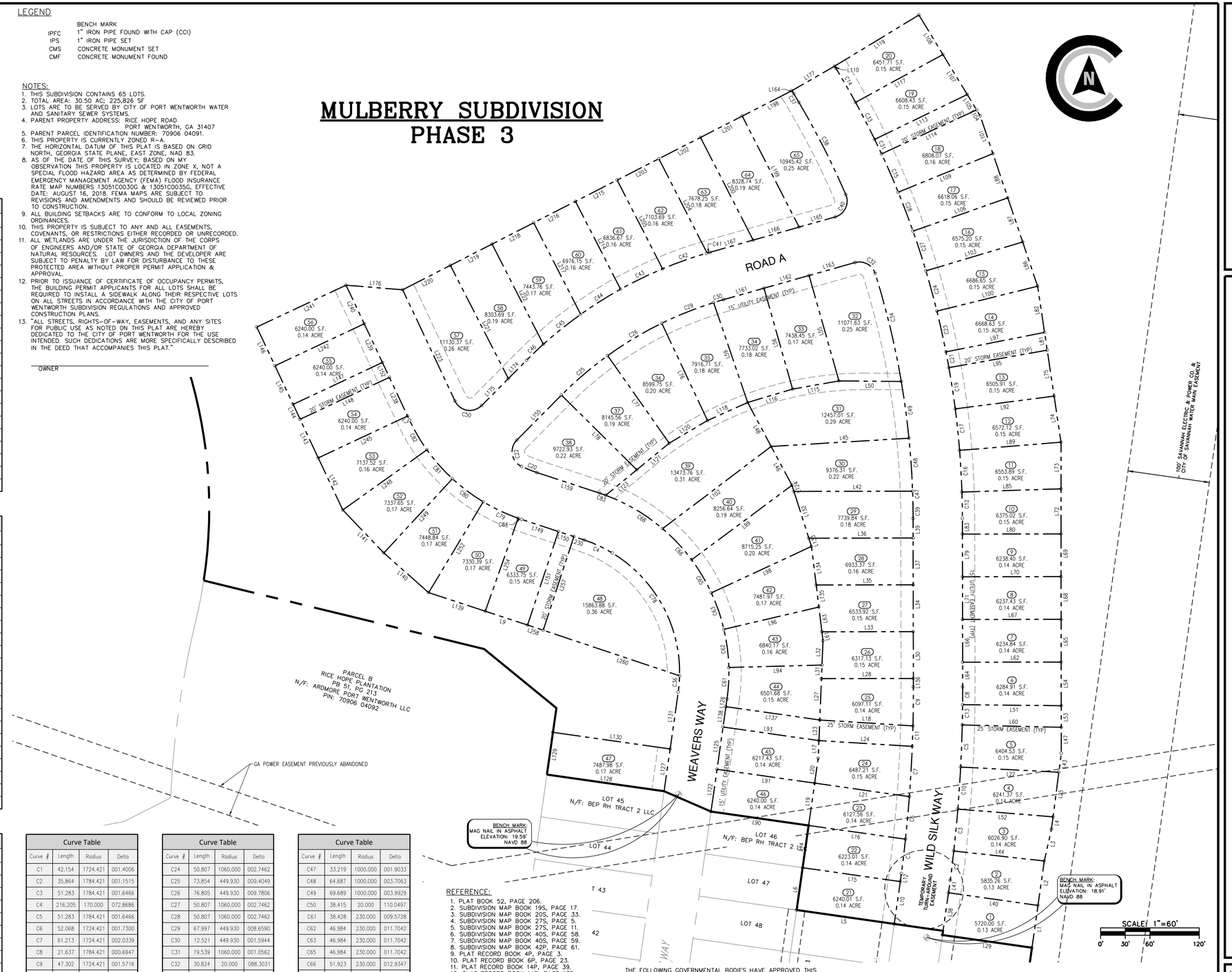
LEGEND

	BENCH MARK
IPFC	1" IRON PIPE FOUND WITH CAP (CCI)
IPS	1" IRON PIPE SET
CMS	CONCRETE MONUMENT SET
CMF	CONCRETE MONUMENT FOUND

NOTES:

1. THIS SUBDIVISION CONTAINS 65 LOTS.
2. TOTAL AREA: 30.50 AC; 225,826 SF
3. LOTS ARE TO BE SERVED BY CITY OF PORT WENTWORTH WATER AND SANITARY SEWER SYSTEMS.
4. PARENT PROPERTY ADDRESS: RICE HOPE ROAD PORT WENTWORTH, GA 31407
5. PARENT PARCEL IDENTIFICATION NUMBER: 70906 04091.
6. THIS PROPERTY IS CURRENTLY ZONED R-A.
7. THE HORIZONTAL DATUM OF THIS PLAT IS BASED ON GRID NORTH, GEORGIA STATE PLANE, EAST ZONE, NAD 83.
8. AS OF THE DATE OF THIS SURVEY; BASED ON MY OBSERVATION THIS PROPERTY IS LOCATED IN ZONE X, NOT A SPECIAL FLOOD HAZARD AREA AS DETERMINED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP NUMBERS 13051C0030G & 13051C0035G, EFFECTIVE DATE: AUGUST 16, 2018. FEMA MAPS ARE SUBJECT TO REVISIONS AND AMENDMENTS AND SHOULD BE REVIEWED PRIOR TO CONSTRUCTION.
9. ALL BUILDING SETBACKS ARE TO CONFORM TO LOCAL ZONING ORDINANCES.
10. THIS PROPERTY IS SUBJECT TO ANY AND ALL EASEMENTS, COVENANTS, OR RESTRICTIONS EITHER RECORDED OR UNRECORDED.
11. ALL WETLANDS ARE UNDER THE JURISDICTION OF THE CORPS OF ENGINEERS AND/OR STATE OF GEORGIA DEPARTMENT OF NATURAL RESOURCES. LOT OWNERS AND THE DEVELOPER ARE SUBJECT TO PENALTY BY LAW FOR DISTURBANCE TO THESE PROTECTED AREA WITHOUT PROPER PERMIT APPLICATION & APPROVAL
12. PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY PERMITS, THE BUILDING PERMIT APPLICANTS FOR ALL LOTS SHALL BE REQUIRED TO INSTALL A SIDEWALK ALONG THEIR RESPECTIVE LOTS ON ALL STREETS IN ACCORDANCE WITH THE CITY OF PORT WENTWORTH SUBDIVISION REGULATIONS AND APPROVED CONSTRUCTION PLANS.
13. "ALL STREETS, RIGHTS-OF-WAY, EASEMENTS, AND ANY SITES FOR PUBLIC USE AS NOTED ON THIS PLAT ARE HEREBY DEDICATED TO THE CITY OF PORT WENTWORTH FOR THE USE INTENDED. SUCH DEDICATIONS ARE MORE SPECIFICALLY DESCRIBED IN THE DEED THAT ACCOMPANIES THIS PLAT."

_____
OWNER



LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	52.000	S08° 05' 15.10"W
L2	54.646	S08° 05' 15.06"W
L3	39.775	S12° 36' 57.07"W
L4	15.085	S07° 27' 13.13"W
L5	120.000	N81° 54' 44.90"W
L6	52.000	N08° 05' 14.82"E
L7	5.748	N25° 10' 02.19"W
L9	54.076	N71° 52' 24.19"W
L10	52.000	S08° 05' 15.10"W
L12	9.858	S08° 05' 15.00"W
L14	52.000	N08° 05' 14.82"E
L15	120.000	N81° 54' 44.90"W
L16	119.022	N81° 54' 44.90"W
L17	21.492	N02° 19' 56.12"E
L18	113.608	S86° 23' 09.60"E
L19	52.000	N08° 05' 15.10"E
L20	30.624	N08° 05' 15.10"E
L21	116.391	N81° 54' 44.90"W
L22	119.643	N86° 58' 36.00"W
L23	25.119	N02° 19' 56.12"E
L24	113.706	S86° 26' 49.20"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L25	54.776	S07° 23' 54.63"W
L27	50.374	N02° 19' 56.12"E
L28	111.871	N89° 53' 25.11"E
L29	110.000	N81° 54' 44.90"W
L30	57.002	S00° 06' 34.89"E
L31	16.542	N02° 19' 56.12"E
L32	29.577	N02° 19' 56.12"E
L33	111.215	N89° 53' 22.07"E
L34	56.998	S00° 06' 34.89"E
L35	118.049	N89° 53' 25.11"E
L36	126.853	N89° 53' 25.11"E
L37	57.000	S00° 06' 34.89"E
L38	52.000	S08° 05' 15.10"W
L39	23.787	S00° 06' 34.89"E
L40	110.000	N81° 54' 44.90"W
L41	15.367	S08° 05' 15.03"W
L42	144.383	N89° 53' 25.11"E
L43	23.052	S07° 23' 54.63"W
L44	110.801	S83° 41' 00.12"E
L45	168.013	N86° 34' 51.05"E
L46	53.661	N28° 08' 22.50"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L47	31.799	S00° 04' 17.58"E
L48	60.682	N28° 08' 22.50"W
L50	75.952	N89° 28' 34.13"W
L51	119.988	N89° 24' 53.84"W
L52	116.249	N85° 19' 48.06"W
L53	26.320	S00° 04' 17.58"E
L54	53.152	S00° 04' 17.58"E
L55	133.386	N15° 46' 44.00"W
L56	127.612	N15° 46' 44.00"W
L59	128.461	N18° 49' 03.81"W
L60	120.471	S88° 37' 23.94"E
L61	11.001	S06° 56' 45.68"E
L62	119.883	N89° 53' 25.11"E
L63	30.407	S06° 56' 45.68"E
L64	30.060	S00° 06' 34.89"E
L65	52.000	S00° 04' 17.58"E
L66	52.000	S00° 06' 34.89"E
L67	119.918	N89° 53' 25.11"E
L68	52.013	S00° 04' 17.58"E
L69	51.999	S00° 04' 17.58"E
L70	119.953	N89° 53' 02.42"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L71	52.000	S00° 06' 34.89"E
L72	54.881	N00° 00' 53.29"W
L73	56.747	N00° 00' 53.29"W
L74	56.730	N08° 31' 08.50"W
L75	56.618	N08° 31' 08.50"W
L76	130.898	N25° 12' 58.71"W
L77	130.254	N35° 05' 42.14"W
L78	129.121	N45° 13' 03.86"W
L79	52.000	S00° 06' 34.89"E
L80	119.987	N89° 53' 03.40"E
L81	21.800	N08° 31' 08.50"W
L82	56.894	N08° 31' 08.50"W
L83	19.139	S00° 06' 34.89"E
L85	120.620	N88° 09' 17.47"E
L86	56.868	N18° 36' 54.61"W
L87	56.680	N18° 36' 54.61"W
L88	56.752	N18° 36' 54.61"W
L89	123.792	N85° 24' 31.02"E
L90	120.000	N81° 54' 44.90"W
L91	120.000	N81° 54' 44.90"W
L92	121.263	S82° 39' 44.58"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L93	117.845	S81° 54' 58.49"E
L94	113.397	S88° 30' 53.24"W
L95	121.452	S79° 54' 58.13"W
L96	118.675	S76° 48' 38.18"W
L97	122.248	N78° 51' 35.96"E
L98	134.336	S65° 06' 23.11"W
L99	152.048	S53° 24' 08.05"W
L100	126.212	N76° 06' 49.51"E
L101	48.560	N18° 36' 54.61"W
L102	165.785	S52° 51' 04.50"W
L103	122.882	N73° 22' 03.06"E
L104	8.529	N31° 15' 41.92"W
L105	21.981	N31° 15' 41.92"W
L106	122.279	N70° 37' 16.61"E
L107	56.841	N31° 15' 41.92"W
L108	56.332	N31° 15' 41.92"W
L109	124.396	S67° 52' 30.16"W
L110	2.995	S31° 15' 41.92"E
L113	125.133	S64° 04' 21.54"W
L114	127.378	S65° 07' 43.71"W
L115	57.292	S80° 00' 19.82"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L116	56.989	S73° 22' 25.72"W
L117	121.205	S61° 19' 35.10"W
L118	53.496	N65° 46' 33.11"E
L119	120.000	S58° 44' 18.08"W
L120	54.220	N59° 26' 14.10"E
L121	51.038	S50° 34' 38.20"W
L122	52.000	N08° 05' 15.55"E
L123	48.928	S50° 34' 38.20"W
L124	7.838	S17° 42' 35.15"E
L125	52.000	N08° 05' 15.50"E
L126	9.472	N08° 05' 15.50"E
L127	52.000	N08° 05' 15.31"E
L128	144.000	S81° 54' 45.00"E
L129	52.000	S08° 05' 15.10"W
L130	144.000	S81° 54' 44.90"E
L131	70.011	N08° 05' 15.31"E
L132	59.799	S17° 42' 35.15"E
L133	10.478	S17° 42' 35.15"E
L134	47.349	S06° 56' 45.68"E
L135	27.001	S06° 56' 45.68"E
L136	10.411	S00° 06' 34.89"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L137	115.326	N81° 54' 44.90"W
L138	25.000	N08° 05' 15.50"E
L139	72.628	N71° 49' 07.48"W
L140	72.834	N48° 26' 55.36"W
L141	72.331	N43° 41' 51.91"W
L142	70.057	S25° 10' 02.19"E
L143	52.000	N25° 10' 02.19"W
L144	20.000	N25° 10' 02.19"W
L145	52.000	N25° 10' 02.19"W
L146	52.000	N25° 10' 02.19"W
L147	120.000	N64° 49' 57.81"E
L148	120.000	S64° 49' 57.81"W
L149	46.982	N71° 49' 07.48"W
L150	20.000	N71° 49' 07.48"W
L151	119.948	S18° 10' 52.52"W
L152	20.000	N25° 10' 02.19"W
L155	77.107	N44° 46' 56.14"E
L159	80.410	N71° 49' 07.48"W
L161	51.274	N74° 13' 16.00"E
L162	57.000	N74° 13' 16.00"E
L163	58.069	N74° 13' 16.00"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L164	4.422	N31° 15' 41.92"W
L165	45.661	N74° 13' 16.00"E
L166	58.131	N74° 13' 16.00"E
L167	54.451	N74° 13' 16.00"E
L174	31.494	N44° 46' 56.14"E
L175	46.310	N44° 46' 56.14"E
L176	69.157	S85° 20' 49.99"E
L177	60.017	N60° 06' 03.06"E
L198	67.848	S62° 53' 57.31"W
L199	151.824	S27° 06' 02.69"E
L200	140.412	S27° 06' 02.69"E
L201	57.000	S62° 53' 57.31"W
L202	57.000	S62° 53' 57.31"W
L203	57.000	S62° 53' 57.31"W
L204	129.013	S27° 06' 02.69"E
L205	121.331	S27° 06' 02.69"E
L214	120.094	S27° 08' 59.48"E
L215	56.937	S62° 53' 57.31"W
L216	57.063	S62° 53' 57.31"W
L217	125.270	S27° 06' 02.69"E
L218	57.000	S62° 53' 57.31"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L219	57.000	S62° 53' 57.31"W
L220	65.172	S62° 53' 57.31"W
L221	154.873	S27° 06' 02.69"E
L222	137.046	S27° 06' 02.69"E
L223	149.675	S25° 10' 02.19"E
L230	13.262	N71° 49' 07.48"W
L238	52.000	N25° 10' 02.19"W
L239	52.000	N25° 10' 02.19"W
L240	52.000	N25° 10' 02.19"W
L241	120.000	S64° 49' 57.81"W
L242	120.000	S64° 49' 57.81"W
L245	120.000	S64° 49' 57.81"W
L248	125.859	S54° 25' 16.80"W
L249	122.983	S42° 43' 01.73"W
L252	128.965	S31° 00' 46.67"W
L254	120.072	S19° 24' 23.71"W
L257	119.929	S18° 10' 52.52"W
L258	20.000	N71° 52' 24.19"W
L260	175.000	N71° 30' 08.69"W

Curve Table			
Curve #	Length	Radius	Delta
C1	42.154	1724.421	001.4006
C2	35.864	1784.421	001.1515
C3	51.283	1784.421	001.6466
C4	216.205	170.000	072.8686
C5	51.283	1784.421	001.6466
C6	52.068	1724.421	001.7300
C7	61.213	1724.421	002.0339
C8	21.637	1784.421	000.6947
C9	47.302	1724.421	001.5716
C10	51.283	1784.421	001.6466
C11	25.011	1724.421	000.8310
C12	32.107	1060.000	001.7355
C13	24.655	1784.421	000.7916
C14	24.794	1060.000	001.3402
C15	50.807	1060.000	002.7462
C16	50.807	1060.000	002.7462
C17	50.807	1060.000	002.7462
C19	50.807	1060.000	002.7462
C20	20.252	170.000	006.8258
C21	19.539	1060.000	001.0562
C22	38.319	20.000	109.7752
C23	50.807	1060.000	002.7462

Curve Table			
Curve #	Length	Radius	Delta
C24	50.807	1060.000	002.7462
C25	73.854	449.930	009.4049
C26	76.805	449.930	009.7806
C27	50.807	1060.000	002.7462
C28	50.807	1060.000	002.7462
C29	67.997	449.930	008.6590
C30	12.521	449.930	001.5944
C31	19.539	1060.000	001.0562
C32	30.824	20.000	088.3031
C33	50.807	1060.000	002.7462
C34	135.501	1000.000	007.7637
C36	19.863	170.000	006.6944
C37	12.310	1000.000	000.7053
C38	125.878	1000.000	007.2123
C39	33.219	1000.000	001.9033
C40	34.057	20.000	097.5651
C41	3.678	509.930	000.4132
C42	57.546	509.930	006.4659
C43	56.877	509.930	006.3907
C44	57.430	509.930	006.4529
C45	58.235	509.930	006.5433
C46	28.238	509.930	003.1729

Curve Table			
Curve #	Length	Radius	Delta
C47	33.219	1000.000	001.9033
C48	64.687	1000.000	003.7063
C49	69.689	1000.000	003.9929
C50	38.415	20.000	110.0497
C61	38.428	230.000	009.5728
C62	46.984	230.000	011.7042
C63	46.984	230.000	011.7042
C65	46.984	230.000	011.7042
C66	51.923	230.000	012.9347
C68	80.630	230.000	020.0860
C78	216.205	170.000	072.8686
C79	46.984	230.000	011.7042
C80	46.984	230.000	011.7042
C81	46.984	230.000	011.7042
C82	41.794	230.000	010.4114
C83	7.647	230.000	001.9050
C84	4.526	230.000	001.1275

REFERENCE:

1. PLAT BOOK 52, PAGE 206.
2. SUBDIVISION MAP BOOK 19S, PAGE 17.
3. SUBDIVISION MAP BOOK 20S, PAGE 33.
4. SUBDIVISION MAP BOOK 27S, PAGE 5.
5. SUBDIVISION MAP BOOK 27S, PAGE 11.
6. SUBDIVISION MAP BOOK 40S, PAGE 58.
7. SUBDIVISION MAP BOOK 40S, PAGE 59.
8. SUBDIVISION MAP BOOK 42P, PAGE 61.
9. PLAT RECORD BOOK 4P, PAGE 3.
10. PLAT RECORD BOOK 6P, PAGE 23.
11. PLAT RECORD BOOK 14P, PAGE 39.
12. PLAT RECORD BOOK 14P, PAGE 178.
13. PLAT RECORD BOOK 15P, PAGE 76.
14. PLAT RECORD BOOK 28P, PAGE 55.
15. PLAT RECORD BOOK 29P, PAGES 24A-L.
16. PLAT RECORD BOOK 13, PAGE 270.
17. DEED BOOK 794, PAGE 561.
18. PLAT BOOK 51, PAGE 213.

MINIMUM BUILDING SETBACKS

FRONT SETBACK: 25'
REAR SETBACK: 25'
SIDE SETBACK: 5'

SURVEY DATE: 6/1/2021
EQUIPMENT USED: ELECTRONIC TOTAL STATION
ANGULAR ERROR PER "A" = 03"
ADJUSTED BY LEAST SQUARES:
PLAT ERROR OF CLOSURE: 1/420,678
FIELD ERROR OF CLOSURE: 1/137,870

THE FOLLOWING GOVERNMENTAL BODIES HAVE APPROVED THIS MAP, PLAT, OR PLAN FOR FILING:

APPROVED BY MAYOR AND COUNCIL, PORT WENTWORTH

_____
MAYOR DATE

_____ _____
COUNCILMAN COUNCILMAN

_____ _____
COUNCILMAN COUNCILMAN

_____ _____
COUNCILMAN COUNCILMAN

APPROVED BY THE CHATHAM COUNTY DEPARTMENT OF PUBLIC HEALTH, DIVISION OF ENVIRONMENTAL HEALTH

DIRECTOR _____ DATE _____

SURVEYORS CERTIFICATION

AS REQUIRED BY SUBSECTION (D) OF O.C.G.A. SECTION 15-6-67, THIS PLAT HAS BEEN PREPARED BY A LAND SURVEYOR AND APPROVED BY ALL APPLICABLE LOCAL JURISDICTIONS FOR RECORDING AS EVIDENCED BY APPROVAL CERTIFICATES, SIGNATURES, STAMPS, OR STATEMENTS HEREON. SUCH APPROVALS OR AFFIRMATIONS SHOULD BE CONFIRMED WITH THE APPROPRIATE GOVERNMENTAL BODIES BY ANY PURCHASER OR USER OF THIS PLAT AS TO INTENDED USE OF ANY PARCEL. FURTHERMORE, THE UNDERSIGNED LAND SURVEYOR CERTIFIES THAT THIS PLAT COMPLIES WITH THE MINIMUM TECHNICAL STANDARDS FOR PROPERTY SURVEYS IN GEORGIA AS SET FORTH IN THE RULES AND REGULATIONS OF THE GEORGIA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND AS SET FORTH IN O.C.G.A. SECTION 15-6-67.

GEORGIA REGISTERED No. 2486 LAND SURVEYOR TERRY MACK COLEMAN

DRAFT

TERRY MACK COLEMAN
GA REG. LAND SURVEYOR NO. 2486
COLEMAN COMPANY, INC.
CERTIFICATE OF AUTHORIZATION; LSF 1167

COLEMAN COMPANY
ENGINEERS • SURVEYORS
17 Park of Commerce, Suite 201
Savannah, Georgia | (912) 200-3041

MULBERRY SUBDIVISION, PHASE 3
A MAJOR SUBDIVISION OF PARCEL A, BEING A MINOR SUBDIVISION OF A PORTION OF TRACT A-2, AND LOT 12
BEING A PORTION OF THE JULIAN R. CHISHOLM TRACT AND BEING A PORTION OF RICE HOPE PLANTATION,
8TH G.M. DISTRICT, CITY OF PORT WENTWORTH, CHATHAM COUNTY, GEORGIA
PREPARED FOR: BALD EAGLE PARTNERS

JOB NUMBER:	21-309
DATE:	1/24/2022
DRAWN BY:	DCP
CHECKED BY:	
SCALE:	1" = 60'

PRELIMINARY PLAT

SHEET: 1/1

COLEMAN COMPANY, INC. DATE PLOTTED: 1/24/2022 11:52 AM BY: Dillon Powell DRAWING PATH: Q:\2021\21-309.000\DWG\Survey\21-309_MULBERRY PH3 PLAT.dwg

Site Plan Review Application submitted by Neil P. McKenzie, P.E., Coleman Company, LLC., on behalf of BEP Rice Hope, LLC., for PIN # 7-0906-04-091 (Mulberry Blvd) for a Specific Development Site Plan to allow a Residential Subdivision (Mulberry Tract Phase 3) in a MPO (Master Plan Overlay) Zoning District.

Issue/Item: Site Plan Review Application submitted by Neil P. McKenzie, P.E., Coleman Company, LLC., on behalf of BEP Rice Hope, LLC., for PIN # 7-0906-04-091 (Mulberry Blvd) for a Specific Development Site Plan to allow a Residential Subdivision (Mulberry Tract Phase 3) in a MPO (Master Plan Overlay) Zoning District.

Background: The subject property is currently undeveloped land in the Mulberry at Rice Hope subdivision. The preliminary plat applications for phase 3 are pending approval at the February 24, 2022 City Council meeting.

Facts and Findings: The owner intends to develop a new phase of the Mulberry at Rice Hope subdivision. The phase will be accessed off of Weavers Way and Wild Silk Way include a estimated 62 new single family home lots. The site plan also includes all associated water and sewer utilities and stormwater drainage. This application is currently under technical review by City Engineers, Thomas & Hutton.

Funding: N/A

Recommendation: The Planning Commission will hear this application on Monday, February 14, 2022 at 6:30 P.M.

COMMENTS - Current Meeting:

The applicant, Neil McKenzie, was present and gave a brief presentation of the project. There were no questions from the Commission. There were no public comments. Commissioner Herrin made a motion to approve the application. Commissioner Franklin seconded the motion to approve. The vote was unanimous.

ATTACHMENTS:

- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Application (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Appendix A, Water & Sewer Checklists & ERU Calculations (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Landfill Certification (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - NOI (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Stormwater Maint Agreement (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Wastewater Collection System Checklist (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Timeline (DOCX)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - Civil Construction Plans 9.13.21 (PDF)
- Mulberry Tract Phase 3 Site Plan Review Specific FEB 22 - 1st comment letter T&H 2.3.2022 (PDF)

RESULT:	**APPROVED [UNANIMOUS]**
MOVER:	Bill Herrin, Planning Commissioner
SECONDER:	Rosetta Franklin, Planning Commissioner
AYES:	Herrin, Franklin, Rollf, Morris, Hester, Sopson

220001

City of Port Wentworth
▪7224 Highway 21 ▪ Port Wentworth ▪ Georgia ▪ 31407 ▪ 912-999-2084

RECEIVED
DEC 03 2021
BY:

Site Plan Review Application

Site Plan Application is required for all new construction in a "P" or "MPO" zone as defined in the Zoning Ordinance of the City of Port Wentworth.

Site Plan Type (*Check One*): ☐ General / Concept ☒ Specific Development

Site Plan Address: MULBERRY BOULEVARD Mulberry Phase 3

PIN #(s): 7-090-0604-091

Zoning: M-P-O Estimated Cost of Construction: $

Type of Construction: SINGLE FAMILY RESIDENTIAL SITE DEVELOPMENT (ROADWAYS, SIDEWALKS, UTILITIES, LOT GRADING, STORM DRAINAGE)

Applicant's Name: COLEMAN COMPANY, INC. / ATTN: NEIL P. MCKENZIE, P.E.

Mailing Address: 1480 CHATHAM PARKWAY, SUITE 100 SAVANNAH, GA 31405

Phone #: (912) 200-3041 Email: NMCKENZIE@CCI-SAV.COM

Owner's Name (If Different form Applicant): BEP RICE HOPE, LLC / ATTN: SCOTT DECAIN

Mailing Address: 4800 HAMPDEN LANE, SUITE 200 BETHESDA, MD 20814

Phone #: 571-426-4310 Email: SDECAIN@BALDEAGLEPARTNERS.COM

I hereby acknowledge that the above information is true and correct.

Applicant's Signature — Date: 11/29/2021

Owner's Signature (If Different form Applicant) — Date

Please see page 2 for required submittal checklist

City of Port Wentworth
▪7224 Highway 21 ▪ Port Wentworth ▪ Georgia ▪ 31407 ▪ 912-999-2084

Site Plan Review Application Submittal Checklist

Documentation below is required for a complete submittal.

- ☒ Signed and Completed Application
- ☒ 3 Full size sets of site plan civil drawings or concept plan (depending on type of site plan)
- ☒ 15 half size (11" X 17") sets of site plan civil drawings or concept plan (depending on type of site plan)
- ☒ 2 copies of hydrology reports (if applicable)
- ☒ Names, mailing address, and PIN number of all property owners within 250 feet of all property lines
- ☒ 1 8 ½" X 11" of site plan civil drawings or concept plan (depending on type of site plan)
- ☒ PDF of entire submittal (either flash drive or CD)
- ☒ Other Engineering details or reports may be required once submittal has been received
- ☒ Site plan review fee check
  - ○ No Land Disturbance- $206.00 Site Plan Fee + $50.00 Admin Fee = Total $256.00
  - ○ With Land Disturbance - $836.00 Site Plan Fee + $50.00 Admin Fee = Total $886.00

Additional Fee Statement: If engineer review cost to the City exceeds the site plan review fee that is paid at the time of initial application submittal, you may be required to pay additional review cost.

I have read and agree to the above additional fee statement

Applicant's Signature

11/29/2021
Date

Updated 4/28/2020

CITY OF PORT WENTWORTH
(912) 964-4379

REC#: 00338793 1/04/2022 11:19 AM
OPER: ME TERM: 011
REF#: CK 1775

TRAN: 112.0000 BLDG PERMIT
220001 886.00CR
BEP RICE HOPE LLC
7-0906-04-091
DEV-SPR 886.00CR

TENDERED: 886.00 CHECK
APPLIED: 886.00-

CHANGE: 0.00

WWW.CITYOFPORTWENTWORTH.COM

ADJACENT PROPERTY OWNERS FOR MULBERRY TRACT PHASE 3

- Address: 2790 Mulberry Avenue
  Parcel B Rice Hope Plantation
  N/F: Ardmore Port Wentworth, LLC
  PIN: 7-0906-04-092

- 100 ft Savannah Electric and Power Company Easement

- 100 ft City of Savannah Water Main Easement

- Address: 27 Weavers Way
  Lot 41 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 29 Weavers Way
  Lot 42 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 31 Weavers Way
  Lot 43 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 33 Weavers Way
  Lot 44 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 35 Weavers Way
  Lot 45 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 34 Weavers Way
  Lot 46 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 32 Weavers Way
  Lot 47 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 30 Weavers Way
  Lot 48 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 28 Weavers Way
  Lot 49 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 26 Weavers Way
  Lot 50 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 27 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 28 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 29 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 30 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 31 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 32 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 33 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 34 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

Owner Name	Mailing Address 1	City	State	Zip
Coleman Company, Inc	1480 Chatham Parkway, Ste 100	Savannah	GA	31405
BEP Rice Hope LLC	4800 Hampden Ln, Ste 200	Bethesda	MD	20814
Ardmore Port Wentworth, LLC	2790 Mulberry Ave	Port Wentworth	GA	31407
Yong Wang Liu	27 Wild Silk Way	Port Wentworth	GA	31407
Austin Haven	28 Wild Silk Way	Port Wentworth	GA	31407
Isnatanne Cadet	29 Wild Silk Way	Port Wentworth	GA	31407
Nicole Cuff	30 Wild Silk Way	Port Wentworth	GA	31407
Reyes Bustamante	31 Wild Silk Way	Port Wentworth	GA	31407
Arkeen Smalls	32 Wild Silk Way	Port Wentworth	GA	31407
Ced'rica Johnson	33 Wild Silk Way	Port Wentworth	GA	31407
Quanikqua Moultrie	34 Wild Silk Way	Port Wentworth	GA	31407
BEP RH Tract 2 LLC	680 5th Ave, 20th Floor	New York	NY	10019

ADJACENT PROPERTY OWNERS FOR MULBERRY TRACT PHASE 3

- Address: 2790 Mulberry Avenue
  Parcel B Rice Hope Plantation
  N/F: Ardmore Port Wentworth, LLC
  PIN: 7-0906-04-092

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  Lot 42 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 31 Weavers Way
  Lot 43 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

- Address: 33 Weavers Way
  Lot 44 (Mulberry Phase 2)
  N/F: BEP RH Tract 2 LLC

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  N/F: BEP RH Tract 2 LLC

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  PIN: 70906D02018

- Address: 32 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

- Address: 33 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D02018

- Address: 34 Wild Silk Way
  N/F: Clayton Properties Group, LLC
  PIN: 70906D03015

ESTD 1946
75H
THOMAS & HUTTON

50 PARK OF COMMERCE WAY
SAVANNAH, GA 31405 | 912.234.5300
THOMASANDHUTTON.COM

February 3, 2022

Mr. Brian Harvey
Director of Development Services
City of Port Wentworth
305 South Coastal Highway
Port Wentworth, GA 31407

Re: Mulberry Tract Phase 3
Port Wentworth, Georgia
Site Plan Review
J–25412.0027

Dear Brian:

We have received the site plan for the referenced project submittal. The following information was included in the submittal package:

- Adjacent Property Owners Exhibit
- Water and Sewer System Analysis
- Wastewater Collection System Check List
- Storm pipe Sizing & Analysis
- Master Hydrology Report
- Landfill Certification
- Water/Wastewater Availability Request
- Water Distribution System Check List
- Wastewater Collection System Check List
- Equivalent Residential Unit (ERU) Calculations
- Construction Plans

This site plan review was completed based on our interpretation of the latest City of Port Wentworth zoning ordinance and development regulations. Thomas & Hutton's review was performed in an effort to assess if the application package for the proposed improvements is in general conformance with City of Port Wentworth regulations. Our review shall not be interpreted as a detailed technical analysis of the design or for verification of technical sufficiency for elements of design. Under no circumstances shall our review and comments related to the site plans relieve the Applicant's Design Professional of their professional obligations and professional standards of care. As such, the design submitted by the Applicant's Design Professional shall be the sole responsibility of the Applicant's Design Professional. Thomas & Hutton shall not accept any responsibility for any liability due to design and construction, in whole or in part, for any aspect of the design and construction of design documents.

We have reviewed the submittal package and offer the comments noted below for consideration.

General Comments

1. The site is zoned as Master Plan Overlay (M-P-O).

2. The site lies within an Effective FEMA Zone X, area of minimal flood hazard, as documented on FEMA FIRM Panel 13051C0035G, effective August 16, 2018.

3. Please provide EPD land disturbance approval.

4. Please provide EPD water/wastewater permits, if applicable.

5. Please provide any other pertinent permit approvals.

6. According to Section 4.1.1 in the Master Plan Overlay requirements of Section 5.2, Appendix B of the Port Wentworth Code of Ordinances, property within Phase II of the district must be surveyed for wetlands prior to land disturbing activities and a permit must be obtained from the USACE for the entire parcel before subdivision. Please provide a wetland delineation and permit. All jurisdictional wetlands must also have a minimum of a 25' buffer.

Stormwater Comments

In accordance with the City of Port Wentworth Drainage and Flood Control Ordinance (PWSMO) Section 7–79, this project proposes site development that will involve the creation of 5,000 square feet or more of impervious cover that otherwise did not exist on the site previously. As such, all stormwater provisions apply to this site.

1. The certification by the plan preparer references the City of Pooler. Please revise.

2. Provide a stormwater management inspection and maintenance agreement and plan as prescribed in Section 7–80(e) of Article III of the Drainage and Flood Control Ordinance within the Port Wentworth Code of Ordinances.

3. Acknowledge that a performance bond will be required prior to construction, as listed in Section 7–80(h) of Article III of the Drainage and Flood Control Ordinance within the Port Wentworth Code of Ordinances.

4. Runoff reduction and water quality requirements appears not to be addressed. Pursuant to Section 7-82(b) and 7-82(d) of Article III of the Drainage and Flood Control Ordinance within the Port Wentworth Code of Ordinances, provide runoff reduction and stormwater treatment requirements and calculations.

5. Pursuant to Section 3.7.9(1.) of the Port Wentworth CDM, each development shall maintain pre-development peak discharge rates for the 2, 5, 10, 25, and 50-year, 24-hour storms. It appears that post-development peak runoff rates for all the design storms exceeds the pre-development peak runoff rates for the South Outfall. Please revise or explain.

6. Provide evidence that the proposed design is providing 24 hours of extended detention for the runoff volume generated by the 1-year, 24-hour storm event pursuant to Section 7-82(c) of the Port Wentworth Code of Ordinances.

7. Per Section 3.7.10 of the CDM, provide a statement of no adverse upstream or downstream impacts to the existing stormwater system.

8. Provide the stage-storage information inputted in PondPack for the ponds.

9. The inputted rainfall depths in PondPack appear to be less than the rainfall depths provided in NOAA ATLAS 14. Please use the rainfall depths provided from NOAA Atlas 14 pursuant to Section 3.1.3 of the Georgia Stormwater Management Manual, Volume 2.

10. The proposed storm drainage for the Mulberry Tract Phase 3 site development plans appear to differ from that shown within the approved Rice Hope Comprehensive Drainage Study. Please review and revise the model, plans, and associated exhibits to be in conformance with the approved Rice Hope Comprehensive Drainage Study.

11. Additional stormwater design comments may arise upon submission of the requested requirements.

Water, Fire System, and Sanitary Sewer Design Comments

1. If construction of water and sewer facilities is to be dedicated to the City of Port Wentworth for operation and maintenance, provide a water and sewer agreement between the developer and the City.

2. If no irrigation system is proposed, please indicate on the plans pursuant to the Water Distribution System Check List.

3. Show the service lateral diameters and the number of single and double services on the plans pursuant to Section 3.1 of the CDM. Please note service laterals must be a minimum of 1".

4. Provide notes in the plans and specifications as indicated in Section 3.4.2(h) of the latest Port Wentworth CDM.

5. Ensure all water valves 8" or larger are placed in a manhole per the Water Distribution System Check List. Please provide labels on the plans indicating these valves will be in a manhole.

6. It appears that no water meters are proposed. Please provide the location and size of proposed meters on the plans per the Water Distribution Check List or explain how the development will be metered.

7. Please call out the pipe separation distances of all utility crossings per the Water Distribution Check List.

8. Ensure the water and sewer laterals are 5' from the proposed lot lines and that the water line and sanitary sewer lines are at least 7.5' from the right-of-way line per Port Wentworth detail U-2.

9. Ensure all water lines have a minimum of 3' of cover pursuant to Port Wentworth detail U-1.

10. Ensure that fire hydrants are no more than 500' apart pursuant to Section 3.4.1 of the Port Wentworth CDM.

11. Label all utility structures on the plans. Several structures do not have a label.

12. Provide isolation valves for where the existing water main is tapped pursuant to Section 3.4.1(p) of the Port Wentworth CDM.

13. Provide calculations that the minimum right-of-way requirements are satisfied using the minimum right-of-way equation provided in Section 2.4.1 of the Port Wentworth CDM based on the proposed water main and sanitary sewer main depths.

14. The proposed sanitary sewer line appears to transition from PVC to DIP. Please confirm. If DIP is proposed, please ensure all DIP sanitary sewer lines have the appropriate interior and exterior coatings with a note on the plans as described in Port Wentworth specification Section 02532.

Plan Sheets Comments

1. Pursuant to Section 3.1 of the Port Wentworth CDM, the drawings must be on a scale between 1" = 10'-0" and 1" = 50'-0". Please revise.

2. Provide a project map indexing the orientation of the sheets with match lines pursuant to Section 3.1 of the CDM.

3. Include all existing block and tax map numbers as well as the name of subdivision/property owners adjoining the property on the plans pursuant to Section 3.1 of the CDM. Some of this information appears to be missing.

4. Ensure tree yards and sidewalk widths meet the minimum requirements as outlined in the Master Plan Overlay requirements in Section 5.2, Appendix B of the Port Wentworth Code of Ordinances.

5. Pursuant to Section 3.1.11 in the Master Plan Overlay requirements in Section 5.2, Appendix B of the Port Wentworth Code of Ordinances, the maximum width of lots must be 75' and the maximum depth must be 125'. It appears that some of the proposed lots exceed these dimensions. Please explain or revise.

6. Provide a tree survey and ensure tree protection requirements are met as outlined in Section 4.2 in the Master Plan Overlay requirements of Section 5.2, Appendix B of the Port Wentworth Code of Ordinances.

7. Note that all street names within a subdivision shall be approved by the Manger and Council, pursuant to Section 15.3-2.1(k) in Appendix B of the Port Wentworth Code of Ordinances.

8. Pursuant to Section 15.3-2.1(f) in Appendix B of the Port Wentworth Code of Ordinances, dimension the centerline radius of all curvilinear streets and lot line radius at intersecting streets to ensure the minimum radius is satisfied.

9. Please note temporary dead-end streets shall meet requirements for design, maintenance, and removal as approved by the Mayor and Council pursuant to Section 15.3-2.1(h) in Appendix B of the Port Wentworth Code of Ordinances.

10. Ensure street name markers are installed at all street intersections per City specifications pursuant to Section 15.3-2.1(n) in Appendix B of the Port Wentworth Code of Ordinances.

11. Provide a certification from the developer's engineer that the subdivision will drain adequately as listed in Section 15.3-2.2 in Appendix B of the Port Wentworth Code of Ordinances.

12. Please note that monuments shall be set at each street corner and at all points of curvature in each street, and all interior lot corners of subdivisions pursuant to Section 15.3-6 of Appendix B in the Port Wentworth Code of Ordinances.

13. Please provide at least two benchmarks at opposite corners of the property being subdivided pursuant to Section 15.3-8 of Appendix B in the Port Wentworth Code of Ordinances.

14. It appears that there is an existing "30' utility easement" and "100' Savannah Electric & Power Co. & City of Savannah Water Main Easement" where lots, ponds, roads, and utilities are proposed. Please clarify if any utilities are proposed to be removed/relocated and provide encroachment approval for all entities that maintain an easement that will be encroached upon as a result of the proposed development.

15. Provide details for any proposed meters and backflow prevention devices as well as the proposed blow off valves, sub-grade drains, manhole connections, tee restraints, flared end sections (SD-11), inlet frame & cover (SD-5), flap gates, and control structure.

16. Label all proposed utility easements, building lines, etc. on the plans. It is unclear what some of the proposed linework on the plans is representing.

Site Lighting Comments

1. The provided lighting plan states the layout is not valid without an executed lighting agreement from Georgia Power. Provide a valid site lighting plan with the referenced lighting agreement from Georgia Power.

2. Provide details for the proposed lighting fixtures that meet the requirements in Section 20-64 of the Port Wentworth Code of Ordinances.

Paving, Signage, and Parking Comments

1. Applicant shall ensure construction of sidewalks, ADA parking, and accessible routes are in conformance with federal ADA standards, latest edition.

2. Any proposed signage will require a separate permit as outlined in Section 19.1–3 of Port Wentworth Code of Ordinances.

3. Any proposed buildings will require a building permit as outlined in Section 7.3, Appendix B of Port Wentworth Code of Ordinances.

4. The grading for Pond #2 does not appear to include the emergency spillway called out, and the contours appear to abruptly end without tying out to existing contours. Please revise.

Thank you for your attention to this project. If there are any questions or comments, please feel free to call us at (912) 234–5300.

Sincerely,

THOMAS & HUTTON

Darby Burk

Appendix A Water/Wastewater Availability

WATER/WASTEWATER AVAILABILITY REQUEST FORM

Date: 11/29/2021

A. Owner/Developer Bald Eagle Partners Phone# 301-915-0460
Address 4800 Hampden Lane, Suite 200, Bethesda, MD 20814
Contact Person Marty Smith Phone # 843-368-0405
Address 100 Lakeside Boulevard, Port Wentworth, GA 31407
Engineer Neil McKenzie Phone # 912-200-3041
Development Name Mulberry Tract Phase 3

B. Development Location Mulberry Boulevard
Township, Map & Parcel # (Attach Plat) 7-090-0604-091

C. Type of Development (Circle appropriate choice)
(Residential) Multi-Family Commercial Industrial Institutional
Number of lots/single family units 62 Building Square Footage _____
Number of multi/family units _____
Type of Business(es) _____

Rezoning Required: Yes (No) **Subdivision Required:** (Yes) No

D. Maximum number of employees in 24 hour period _____
If restaurant, seating capacity _____
If car wash, number of bays _____
If Laundromat, number of washers _____ If church, number of seats _____

E. **SITE PLANS AND WATER/WASTEWATER USE CALCULATIONS ARE NEEDED FOR FEE QUOTES**

3.4.3 Exhibit 1 - Water Distribution System Check List

Typical Water System Plan shall include:	Check Off
1) Layout and legend	X
2) Water System analysis and design (include calculations)	X
3) Show waterline easement (if applicable)	X
4) Pipe separated distances called out at utility crossings	X
5) Isolation Valves	X
6) Valves 8" and larger placed in manholes	X
7) Meters sized and located on plans	X
8) All service connections shown	X
9) Existing and proposed fire hydrants shown	X
10) Fire Flow Demand (Exhibit 2)	
▪ Calculate water need based upon ISO Guidelines	X
▪ Show maintenance responsibility for fire line and appurtenances in owner/client agreement (Exhibit 3)	NA
▪ Show Backflow Detector Check Assembly	NA
▪ If no fire system is proposed, please indicate on the plans	X
11) Irrigation System	
▪ Calculate water need based upon system design	NA
▪ Show size and location of backflow preventor and water meter	NA
▪ If no irrigation system is proposed, please indicate on the plans	NA
12) Attach certification that water lines are not in, nor do they serve, structures built upon solid waste landfills	X
13) City of Port Wentworth specifications and details used	X
14) Proposed water/sewer agreement attached	X
15) Georgia Registered Professional Engineer stamp & signature	X

3.5.3 Exhibit 1 - Wastewater Collection System Check List

Typical Wastewater System Plan shall include:	Check Off
1) Layout and legend	X
2) Exhibit 2 completed (load data)	X
3) For effluents with process water, comply with the City's Pretreatment Ordinance.	X
4) Show sewer easement (if applicable)	X
5) Manholes numbered and placed at 350' (max.) spacing	X
6) Manholes placed at line directional changes	X
7) Manhole frame and invert elevations shown	X
8) Invert elevations shown for all pipe inside manholes	X
9) Minimum gradient of 0.4% used for 8" pipes	X
10) Maximum height of 2' between invert of pipes and invert of discharge manholes	X
11) Minimum angle of 90 degrees for influent lines	X
12) All sanitary sewers profiled	X
13) Oil/grease traps and details provided for service station and food service preparers	NA
14) Grading, paving, drainage, erosion control plans attached	X
15) Attach certification that water and/or sewer lines are not in, nor do they serve, structures built upon solid waste landfills	X
16) For pump station design:	
a. Attach design calculations with pump curves	NA
b. City of Port Wentworth pump station design standards used to prepare drawings, details and specifications	NA
17) City of Port Wentworth sewer specifications and details used	X
18) Proposed water/sewer agreement attached	X
19) Georgia Registered Professional Engineer stamp and signature	X

3.5.4 Exhibit 2 Equivalent Residential Unit (ERU) Calculations

The following is designed to compute the total number of equivalent residential units (ERU's), as well as, total water and sewer fees.

PROJECT Mulberry Tract Phases 3 **DATE** 11/23/21

LOCATION Mulberry Boulevard

RESIDENTIAL USE: EQUIVALENT RESIDENTIAL UNITS (ERU)			
Total Number of Single Family Homes	62 @ 300 gpd	=	18,600 GP
Total Number of One Bedroom Apartments	@ 150 gpd	=	GP
Total Number of Two Bedroom Apartments	@ 200 gpd	=	GP
Total Number of Three Bedroom Apartments	@ 300 gpd	=	GP
(4 or more units per parcel)	TOTAL GPD 18,600		
	Divide by 300 gpd (1 ERU)		
	= TOTAL ERU's 62		
COMMERCIAL USE: GALLONS PER DAY (GPD)			
Offices	30 gallons/200 sq. ft.	=	GPD
Department Store/Retail	5 gallons/100 sq. ft.	=	GPD
Restaurant, Less Than 24 hr Operation	25 gallons/seat	=	GPD
Restaurant, 24 hr Operation	50 gallons/seat	=	GPD
Hotel/Motel	100 gallons per room	=	GPD
Schools/Day, Restrooms, gym &	25 gallons/person	=	GPD
Self Service Laundry	200 gallons/machine	=	GPD
Commercial Laundry	1000 gallons/machine	=	GPD
Physician's Office	100 gallons/exam room	=	GPD
Dental Office	150 gallons/chair	=	GPD
Clinic	150 gallons/exam room	=	GPD
Nursing Home	100 gallons/resident	=	GPD
Barber Shop/Beauty Parlor	100 gallons/chair	=	GPD
Banks	30 gallons/200 sq.ft.	=	GPD
Grocery Store	5 gallons/100 sq.ft.	=	GPD
Warehouse	10 gallons/1000 sq.ft.	=	GPD
Other			
	TOTAL GPD		
	= TOTAL ERU's		

Calculated by: Dillon Powell Date: 11/23/21

For determination of sewer tap fees reference Port Wentworth Code of Ordinance Article III Section 21-63

For determination of water tap fees reference Port Wentworth Code of Ordinance Article I Section 21-11

For determination of fire protection tap fees reference Port Wentworth Code of Ordinance Article I Section 21-11

CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3

PREPARED FOR
BEP RICE HOPE, LLC

NRCS ORIGINAL SUBMITTAL:

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

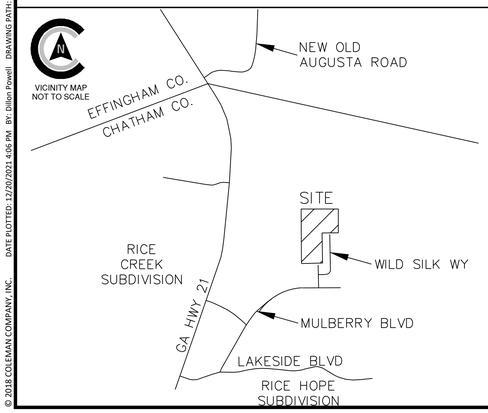
OWNER CERTIFICATION:
I CERTIFY THAT ALL LAND DISTURBING ACTIVITIES AND DEVELOPMENT ACTIVITIES WILL BE COMPLETED IN ACCORDANCE WITH THE APPROVED STORMWATER MANAGEMENT DESIGN PLAN.

M. SCOTT DECAIN

PLAN PREPARER CERTIFICATION:
I CERTIFY THAT THIS DESIGN (INCLUDING THE STORMWATER MANAGEMENT SYSTEM) MEETS THE REQUIREMENTS OF THE CITY OF POOLER AND THE LATEST EDITION OF THE COASTAL STORMWATER SUPPLEMENT TO THE GEORGIA STORMWATER MANAGEMENT MANUAL, AND ANY RELEVANT LOCAL ADDENDA.

NEIL P. McKENZIE, P.E.

VICINITY MAP (N.T.S.)



REVISIONS

PROJECT SITE DATA

PROJECT ADDRESS:	MULBERRY BOULEVARD
PROJECT CITY, STATE:	PORT WENTWORTH, GEORGIA
OWNER/REPRESENTATIVE:	BEP RICE HOPE, LLC
PROPERTY AREA:	±70.00 ACRES
DISTURBED AREA:	±30.50 ACRES
ZONING:	M-P-O
VERTICAL DATUM:	NAVD 88
HORIZONTAL DATUM:	NAD 83
FLOOD ZONE:	X [#13051C0035G 08/16/2018]
WATER & SEWER PROVIDER:	CITY OF PORT WENTWORTH
PINS:	7-090-0604-091
SURVEY PREPARED BY:	COLEMAN COMPANY, INC.
GEOTECHNICAL BY:	NA
ARCHITECT:	NA
CONSTRUCTION EXIT LOCATION:	32.22503, -81.18653 & 32.22458, -81.18563

SHEET INDEX

Sheet Number	Sheet Title	Sheet Number	Sheet Title
COV	COVER	CE4.1	EROSION CONTROL DETAILS
C1.0	CONSTRUCTION NOTES	CE5.0	NPDES PERMIT NOTES
C2.0	EXISTING CONDITIONS	CE5.1	NPDES PERMIT NOTES
C3.0	STAKING PLAN	LP1.0	LIGHTING PLAN
C4.0	PAVING GRADING & DRAINAGE		
C4.1	PAVING GRADING & DRAINAGE		
C4.2	PAVING GRADING & DRAINAGE		
C5.0	NEIGHBORHOOD GRADING PLAN		
C6.0	UTILITY PLAN		
C7.0	PROFILES		
C7.1	PROFILES		
C8.0	CONSTRUCTION DETAILS		
C8.1	CONSTRUCTION DETAILS		
CE1.0	INITIAL ES&PC PLAN		
CE1.1	INITIAL ES&PC PLAN		
CE1.2	INITIAL ES&PC PLAN		
CE2.0	INTERM ES&PC PLAN		
CE2.1	INTERM ES&PC PLAN		
CE2.2	INTERM ES&PC PLAN		
CE3.0	FINAL ES&PC PLAN		
CE3.1	FINAL ES&PC PLAN		
CE3.2	FINAL ES&PC PLAN		
CE4.0	EROSION CONTROL DETAILS		

COLEMAN COMPANY
ENGINEERS • SURVEYORS
Savannah, Georgia | (912) 200-3041 | COLSAV.COM

NOT FOR CONSTRUCTION

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE036652
11/29/21
NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

COVER

SHEET:
COV

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DATE PLOTTED: 12/20/2021 4:06 PM BY: Dillon Powell DRAWING PATH: O:\2021\21-309\000\DWG\Civil\21-309_MULBERRY PH3 & 4 BASE.dwg

GENERAL NOTES:

1. CONTRACTOR WILL BE REQUIRED TO ATTEND A PRE-CONSTRUCTION CONFERENCE WITH THE GOVERNMENTAL AGENCY IN CHARGE OF THE PROJECT.

2. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND INSPECTIONS AS REQUIRED FOR APPROVAL OF THE WORK WITH THE GOVERNMENTAL AGENCY WITH JURISDICTION.

3. CONTRACTOR WILL BE RESPONSIBLE FOR COST OF AND COORDINATION WITH LOCAL UTILITY COMPANIES OR AGENCIES FOR RELOCATION OF, OR CONNECTION TO, ALL EXISTING UTILITIES INCLUDING POWER AND TELEPHONE POLES AND WIRES.

4. ALL ELEVATIONS ARE BASED ON MEAN SEA LEVEL DATUM, NAVD 88.

5. A MINIMUM SHOULDER WIDTH OF 4 FEET WITH A MINIMUM TRANSVERSE SLOPE OF 5% WILL BE PROVIDED ADJACENT TO CURBS AND WALKS. ALL WALKS SHALL HAVE A MINIMUM SLOPE OF 2%.

6. MAXIMUM EARTH SLOPES WILL BE 3:1. GRADE FROM SHOULDER EDGE TO RIGHT- OF-WAY AT 1% MINIMUM.

7. REMOVAL AND REPLACEMENT OF UNSUITABLE SUBGRADE MATERIAL WILL BE PAID FOR ON A CUBIC YARD BASIS IN PLACE MEASUREMENT, AT SUCH AUTHORIZED PRICE PER CUBIC YARD, AS AUTHORIZED BY THE ENGINEER.

8. PROVIDE 1/2" EXPANSION JOINT IN NEW WALKS FOR DEPTH OF CONCRETE, WITH BITUMINOUS SEAL FOR TOP 1 INCH MINIMUM DEPTH AT ABUTMENTS WITH BUILDINGS OR OTHER CONCRETE STRUCTURES.

9. SAW-CUT CONTRACTION JOINTS WILL BE PROVIDED IN ACCORDANCE WITH DETAILS, CUT TO BE 1/4 DEPTH OF CONCRETE MINIMUM.

10. ALL DIMENSIONS ARE TO EXTERIOR FACE OF BUILDING , EDGE OF SURFACE COURSE OR FACE OF CURBING UNLESS OTHERWISE NOTED.

11. ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE NOTED.

12. THE CONTRACTOR SHALL KEEP ACCURATE RECORDS FOR "AS BUILTS' PURPOSES AND PROVIDE THIS INFORMATION TO THE ENGINEER AT THE COMPLETION OF THE PROJECT. IF THE CONTRACTOR FAILS TO FURNISH THIS INFORMATION, THE ENGINEER WILL OBTAIN THE NECESSARY INFORMATION AND CHARGE THE CONTRACTOR FOR THE SERVICES. THE ENGINEER WILL CHECK INFORMATION PROVIDED BY THE CONTRACTOR FOR ACCURACY. AS BUILT INFORMATION INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING: ALL UTILITIES INCLUDING INVERTS, TOP ELEVATIONS, PIPE LENGTHS AND TYPE OF CONSTRUCTION MATERIAL; SPOT ELEVATIONS ON FORCE MAINS AND WATER LINES. THE DISTANCE OF THE CENTERLINE OF UTILITIES FROM A PERMANENT STRUCTURE. ALL VALVE MANHOLES AND VALVE BOXES SHALL BE LOCATED WITH RESPECT TO A PERMANENT STRUCTURE. GRADES SHALL BE CONFIRMED IN ROADS AND PARKING AREAS AS WELL AS SWALES TO SHOW DIRECTION OF STORMWATER FLOW. THE FINISHED FLOOR ELEVATION SHALL BE SHOWN ON ALL BUILDINGS. IF THE LANDSCAPING IS CHANGED IN ANY WAY AN AS BUILT OF THE LANDSCAPE PLAN IS TO BE SUBMITTED TO THE ENGINEER; AND ANY OTHER REQUIREMENT MADE BY CITY OF PORT WENTWORTH.

13. ALL NEW DISTURBED AREAS WILL BE GRASSED BY SEEDING OR SPRIGGING IN ACCORDANCE WITH CURRENT VERSION OF THE MANUAL FOR EROSION & SEDIMENT CONTROL IN GEORGIA, AND AS DIRECTED BY THE ENGINEER.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS.

15. CONTRACTOR SHALL PROVIDE DUST CONTROL OF ALL DISTURBED AREAS BY THE USE OF WATER AND FAST GROWING, TEMPORARY VEGETATION ON ALL STOCKPILED SOILS.

16. CONTRACTOR WILL PROVIDE A CONSTRUCTION SCHEDULE INCLUDING ALL EROSION AND SEDIMENT CONTROL MEASURES.

17. CONTRACTOR SHALL PROVIDE CRUSHED STONE 6" THICK, 50' MIN. LONG BY 20' MIN. WIDE AT ALL CONSTRUCTION EXITS TO MINIMIZE TRANSPORT OF SOIL FROM SITE BY VEHICLE WHEELS.

18. ALL EXISTING INLETS AND DITCHES SUBJECT TO STORM WATER RUNOFF FROM THE SITE AND ALL NEW INLETS SHALL BE PROVIDED WITH HAY BALES SILT BARRIERS TO MINIMIZE SOIL TRANSPORT OFF SITE BY STORM WATERS.

19. ALL MATERIAL AND INSTALLATION PRACTICES ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT SHALL MEET THE CURRENT REQUIREMENTS OF THE CITY OF PORT WENTWORTH AND CHATHAM COUNTY DEVELOPMENT REGULATIONS AND SPECIFICATIONS.

20. TESTING - PROVIDE ALL TESTING AS REQUIRED IN THE SPECIFICATIONS. PROVIDE ENGINEER WITH COPY DIRECT FROM TESTING LAB.

21. CONTRACTOR SHALL MAINTAIN SITE ON A DAILY BASIS TO PROVIDE FOR POSITIVE DRAINAGE. CONTRACTOR, AT HIS COST, SHALL GRADE SITE AND PROVIDE NECESSARY TEMPORARY DRAINAGE SWALES TO INSURE STORM WATER DOES NOT POND ON SITE.

22. ANY DETENTION BASINS SHALL BE CONSTRUCTED IN CONJUNCTION WITH CLEARING AND GRADING TO HELP PREVENT THE LOSS OF SEDIMENT FROM THE SITE. THE CONTRACTOR SHOULD CLEAN OUT ANY SEDIMENT DEPOSITED IN THE BASINS DURING THE CONSTRUCTION PERIOD SO THAT THE SPECIFIED WATER DEPTH AT NORMAL POOL IS MAINTAINED; THE CONTRACTOR MAY OVER EXCAVATE THE BASINS TO ACCOMPLISH THIS, IF DESIRED, AT HIS OWN EXPENSE AND WITH THE CONCURRENCE OF THE ENGINEER.

23. PRIOR TO CONSTRUCTION, ALL BUILDING AREAS, PLUS 10 FEET ON EACH SIDE AND ALL AREAS TO BE PAVED, SHOULD BE STRIPPED OF ALL VEGETATION, TOP SOIL AND ROOT SYSTEMS.

24. SITE DRAINAGE SHOULD BE ESTABLISHED TO PREVENT ANY PONDED WATER CONDITIONS WITHIN THE CONSTRUCTION AREA AND TO FACILITATE THE RAPID RUN-OFF OF STORM WATER.

25. ANY STUMP HOLES OR OTHER DEPRESSIONS SHOULD BE CLEARED OF LOOSE MATERIAL AND DEBRIS AND SHOULD THEN BE BACKFILLED WITH APPROVED FILL. THE BACKFILL SHOULD BE PLACED IN SIX INCH MAXIMUM LIFTS AND COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM-D-1557.

26. ANY UTILITIES THAT UNDERLIE THE SITE SHOULD BE RELOCATED AND THE TRENCHES BACKFILLED WITH APPROVED SOIL. THE BACKFILL SHOULD BE PLACED IN SIX INCH MAXIMUM LIFTS AND COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM-D-1557.

27. THE SUBGRADE SHOULD BE PROOFROLLED WITH A LOADED DUMP TRUCK TO LOCATE UNSTABLE OR SOFT AREAS. THESE AREAS SHOULD THEN BE INVESTIGATED TO DETERMINE THE CAUSE OF THE INSTABILITY. IF DUE TO UNSUITABLE SOIL, SUCH AS HIGHLY ORGANIC SOILS OR SOFT CLAYS, THE AREA SHOULD BE UNDERCUT TO A FIRM SOIL AND REPLACED WITH APPROVED FILL COMPACTED IN SIX INCH LIFTS TO MINIMUM DENSITY OF 95% IN ACCORDANCE WITH ASTM-D-1557. IF THE INSTABILITY IS DUE TO EXCESS MOISTURE IN OTHERWISE SUITABLE SOIL, THE AREA SHOULD BE DRAINED AND COMPACTED TO 95% DENSITY. ANY FILL REQUIRED TO LEVEL OR RAISE THE SITE SHOULD THAN BE PLACED IN 6" THICK LOOSE LIFTS AND COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM-D-1557.

28. ALL OF THE FILL FOR THIS PROJECT SHOULD CONSIST OF A CLEAN, FREE DRAINING SAND WITH A MAXIMUM OF 15% FINES. THE FILL SHOULD BE FREE OF OBJECTIONABLE ROOTS, CLAY LUMPS AND DEBRIS.

29. MOISTURE CONTENT SHALL BE AT OR BELOW OPTIMUM.

30. ALL WATER USED FOR CONSTRUCTION SHALL BE METERED THROUGH AN APPROVED BACKFLOW PREVENTION DEVICE AND FIRE HYDRANT METER OBTAINED FROM THE CITY OF PORT WENTWORTH CONVEYANCE AND DISTRIBUTION DEPARTMENT.

31. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO FOLLOW THE COMPREHENSIVE MONITORING PLAN PREPARED FOR THE DEVELOPER BY COLEMAN COMPANY, INC.

32. ALL TAPS ON A MAIN FOR SERVICE LATERALS SHALL BE MADE WITH AN ALL STAINLESS STEEL DOUBLE STRAP EPOXY COATED TAPPING SADDLE. THE SIZE OF THE SADDLE SHALL BE WATER MAIN DIAMETER C-900 + 1"c.c. THREAD".

33. ALL FIRE HYDRANTS AND VALVES SHALL BE MANUFACTURED BY AMERICAN, DARLING, MUELLER OR M&H.

34. 50 L.F. OF 6" UNDERDRAIN AND ROCK SHALL BE INSTALLED FROM EACH SIDE OF EACH DRAINAGE INLET. CONTRACTOR SHALL VERIFY THE STATIC WATER ELEVATION OF THE PROPOSED/EXISTING DRAINAGE SYSTEM EACH ROADSIDE INLET IS A COMPONENT OF AND NOT INSTALL THE UNDERDRAIN BELOW THAT STATIC ELEVATION.

35. ANY AND ALL UTILITY CROSSINGS FOR WATER MAINS BETWEEN STORM OR SEWER PIPING SHOULD BE ACCOMPLISHED BY USING OF 45° BENDS BOTH DOWN AND UP.

36. ALL KNOWN UTILITY FACILITIES ARE SHOWN SCHEMATICALLY ON THE PLANS AND ARE NOT NECESSARILY ACCURATE AS TO PLAN OR ELEVATION. UTILITY FACILITIES SUCH AS SERVICE LINES OR UNKNOWN FACILITIES NOT SHOWN ON THE PLANS WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES, EXCEPT AS NOTED BELOW. THE CONTRACTOR WILL NOT BE RESPONSIBLE FOR THE COST OF REPAIRS TO DAMAGED UTILITY FACILITIES OTHER THAN SERVICE LINES FROM STREET MAINS TO ABUTTING PROPERTY WHEN SUCH FACILITIES ARE NOT SHOWN ON THE PLANS AND THEIR EXISTENCE IS UNKNOWN TO THE CONTRACTOR PRIOR TO THE DAMAGES OCCURRING PROVIDING THE ENGINEER DETERMINES THE CONTRACTOR HAS OTHERWISE FULLY COMPLIED WITH THE SPECIFICATIONS.

37. CONTRACTOR(S) SHALL VERIFY THE LOCATION OF ALL UNDERGOUND UTILITIES. CONTRACTOR(S) ARE RESPONSIBLE FOR LOCATING, PROTECTING, REPAIRING, AND REPLACING ANY AND ALL UNDERGROUND UTILITIES DURING ALL PHASES OF CONSTRUCTION. COLEMAN COMPANY, INC. HAS MADE A DILIGENT EFFORT TO LOCATE ALL ABOVE AND BELOW GROUND UTILITIES BUT CANNOT GUARANTEE THAT ALL PRESENT UTILITIES HAVE BEEN IDENTIFIED. CONTRACTOR SHALL CALL UTILITY PROTECTION CENTER (1-800-282-7411) AT LEAST 3 DAYS PRIOR TO DIGGING AND SHALL NOT BEGIN DIGGING UNTIL ALL UNDERGROUND UTILITY LOCATIONS ARE COMPLETE.

38. ALL DEMOLITION DEBRIS SHALL BE PROPERLY DISPOSED AT THE CONTRACTOR'S EXPENSE.

39. A CONTINUOUS RUN OF PLASTICIZED METALLIC TAPE SHALL BE INSTALLED ABOVE THE TOP OF PVC PIPE USED FOR GRAVITY SEWER AND FORCE MAINS AT APPROXIMATELY 30" BELOW FINISHED GRADE. THE TAPE SHALL BE SUITABLE FOR DETECTION WITH METAL PIPE LOCATION EQUIPMENT, COLOR CODED AND LABELED TO IDENTIFY CONTENTS OF THE PIPE AND BRIGHTLY COLORED TO CONTRAST WITH THE SOIL. IN ADDITION TO THE TAPE, A CONTINUOUS RUN OF TRACER WIRE SHALL BE ATTACHED TO THE PIPE AND CONNECTED TO MANHOLE RINGS. ON PIPE RUNS GREATER THAN 500', THE TRACER WIRE SHALL BE ATTACHED TO A 2" GALVANIZED PIPE WITH A 180 DEGREE BEND AT THE TOP, EXTENDING 36" ABOVE GRADE FOR CONNECTION TO LOCATOR EQUIPMENT. THE MAXIMUM DISTANCE BETWEEN 2" PIPE STUBS SHALL BE 500'.

40. ALL SANITARY SEWER LATERALS SHALL BE PROPERLY MARKED AT THE POINT WHERE LATERALS TERMINATE WITH PVC PIPE PAINTED GREEN. ADDITIONAL MARKINGS SHALL BE STAMPED IN THE CURB OR MARKED ON THE EDGE OF PAVING WITH AN APPROVED PERMANENT MARKER CAPABLE OF BEING LOCATED BY A MAGNETIC LOCATOR, SUCH AS A NAIL WITH CAP, IF NO CURB PRESENT. LATERALS SHALL BE MARKED WITH MARKING TAPE AN TRACER WIRE AS DESCRIBED ABOVE.

41. A CONTINUOUS RUN OF PLASTICIZED METALLIC TAPE SHALL BE INSTALLED ABOVE THE TOP OF PVC PIPE USED FOR WATER MAINS AT APPROXIMATELY 18" TO 24" BELOW FINISHED GRADE. THE TAPE SHALL BE SUITABLE FOR DETECTION WITH METAL PIPE LOCATION EQUIPMENT, COLOR CODED AND LABELED TO IDENTIFY CONTENTS OF THE PIPE AND BRIGHTLY COLORED TO CONTRAST WITH THE SOIL. IN ADDITION TO THE TAPE, A CONTINUOUS RUN OF TRACER WIRE SHALL BE ATTACHED TO THE PIPE AND CONNECTED TO CURB STOPS AND BROUGHT TO TOP OF VALVE. ON PIPE RUNS GREATER THAN 500', THE TRACER WIRE SHALL BE ATTACHED TO A 2" GALVANIZED PIPE WITH A 180 DEGREE BEND AT THE TOP, EXTENDING 36" ABOVE GRADE FOR CONNECTION TO LOCATOR EQUIPMENT. THE MAXIMUM DISTANCE BETWEEN 2" PIPE STUBS SHALL BE 500'.

42. ALL WATER SERVICES SHALL BE PROPERLY MARKED ABOVE GROUND WITH PVC PIPE PAINTED BLUE. ADDITIONAL MARKINGS SHALL BE STAMPED IN THE CURB OR MARKED ON THE EDGE OF PAVING WITH AN APPROVED PERMANENT MARKER CAPABLE OF BEING LOCATED BY A MAGNETIC LOCATOR, SUCH AS A NAIL WITH CAP, IF NO CURB PRESENT. SERVICES SHALL BE MARKED WITH MARKING TAPE AN TRACER WIRE AS DESCRIBED ABOVE.

43. TRACER WIRE SHALL BE REQUIRED ON ALL STORM PIPE.

44. THE CONTRACTOR SHALL HAVE APPROVED PLANS ON SITE AT ALL TIMES DURING LAND DISTURBING ACTIVITIES.

45. THE CONTRACTOR SHALL HAVE A CERTIFIED EROSION AND SEDIMENTATION CONTROL INSPECTOR ON SITE AT ALL TIMES DURING LAND DISTURBING ACTIVITIES.

46. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CITY OF PORT WENTWORTH AND CHATHAM COUNTIES LATEST CONSTRUCTION SPECIFICATIONS AND DETAILS.

47. ALL CURB AND GUTTER TO BE 18" STANDARD PITCH CURB UNLESS OTHERWISE NOTED.

48. FOR CITY WATER AND SEWER LINE LOCATIONS, CONTACT THE UTILITIES PROTECTION CENTER (1-800-282-7411) A MINIMUM OF SEVENTY-TWO (72) HOURS PRIOR TO DIGGING.

49. STORM SEWER SPECIFICATIONS FOR MANHOLE COVER IN STREET:

GENERAL: ALL CASTINGS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA BY NEENAH FOUNDRY COMPANY, U.S. FOUNDRY & MANUFACTURING CORPORATION, EAST JORDAN IRON WORKS, INC. OR APPROVED EQUAL. THEY SHALL BE OF UNIFORM QUALITY, FREE FROM SAND HOLES, SHRINKAGE, CRACKS, COLD SHUTS OR OTHER DEFECTS. CASTINGS SHALL BE SMOOTH AND WELL CLEANED BY SHOT BLASTING.

MATERIALS: GRAY IRON CASTINGS SHALL BE MANUFACTURED FROM IRON CONFORMING TO ASTM A48 CLASS 35B AND ASTM A48 CLASS 30. DUCTILE IRON CASTINGS SHALL BE MANUFACTURED TRUE TO PATTERN AND COMPONENT PARTS SHALL FIT TOGETHER PROPERLY. ROUND MANHOLE FRAMES, COVERS AND GRATES SHALL HAVE MACHINED BEARING SURFACES TO PREVENT ROCKING. TOLERANCES SHALL BE ACCEPTED FOUNDRY STANDARDS AS OUTLINED IN THE IRON CASTINGS HANDBOOK PUBLISHED BY THE AMERICAN FOUNDRYMEN'S SOCIETY, INC. CASTINGS WEIGHTS SHALL NOT VARY MORE THAN 5% ABOVE OR BELOW THOSE VALUES REPRESENTED BY THE MANUFACTURER.

MARKINGS: ALL CASTINGS SHALL BE CLEARLY MARKED WITH THE MANUFACTURE'S NAME, COMPANY LOGO AND "MADE IN USA" IN CAST LETTERS ADDITIONALLY, THE TOP OR TRAFFIC SIDE OF ALL CASTINGS SHALL BE CLEARLY MARKED "STORM" AND "CITY OF PORT WENTWORTH" IN FLUSH CAST LETTERS AND THE TOP OR TRAFFIC SIDE OF ALL CASTINGS DESIGNED TO COLLECT WATER, (CATCH BASINS, GRATES, ETC.) SHALL BE CLEARLY MARKED "DRAINS TO RIVER - DO NOT DUMP" OR SIMILAR VERBIAGE THAT ACHIEVES THE SAME MEANING.

50. INTERNATIONAL FIRE CODE, 2018 EDITION:

SECTION 3310
ACCESS FOR FIREFIGHTING
3310.1 REQUIRED ACCESS. APPROVED VEHICLE ACCESS FOR FIREFIGHTING SHALL BE PROVIDED TO ALL CONSTRUCTION OR DEMOLITION SITES. VEHICLE ACCESS SHALL BE PROVIDED TO WITHIN 100 FEET (30.5 METERS) OF TEMPORARY OR PERMANENT FIRE DEPARTMENT CONNECTIONS. VEHICLE ACCESS SHALL BE PROVIDED BY EITHER TEMPORARY OR PERMANENT ROADS, CAPABLE OF SUPPORTING VEHICLE LOADING UNDER ALL WEATHER CONDITIONS. VEHICLE ACCESS SHALL BE MAINTAINED UNTIL PERMANENT FIRE APPARATUS ACCESS ROADS ARE AVAILABLE.

SECTION 3312
WATER SUPPLY FOR FIRE PROTECTION
3312.1 WHEN REQUIRED. AN APPROVED WATER SUPPLY FOR FIRE PROTECTION, EITHER TEMPORARY OR PERMANENT, SHALL BE MADE AVAILABLE AS SOON AS COMBUSTIBLE MATERIAL ARRIVES ON THE SITE.

51. MAXIMUM BUILDING HEIGHT IS TO BE 45' PER APPENDIX A, ARTICLE III, SECTION 6 OF THE CITY OF PORT WENTWORTH CODIFIED ORDINANCES.

52. IN THE CASE OF ANY CONFLICT OF THESE CONSTRUCTION DOCUMENTS AND THE CITY OF PORT WENTWORTH CODIFIED ORDINANCES, STANDARDS, SPECIFICATIONS, OR DETAILS, THE CITY OF PORT WENTWORTH STANDARDS ARE TO TAKE PRECEDENCE.

ADA NOTES:

1. ACCESSIBLE ROUTE - EXTERIOR:
   MINIMUM CLEAR WIDTH IS 3'. IF ACCESSIBLE ROUTE HAS LESS THAN 5' CLEAR WIDTH, THEN PASSING SPACES AT LEAST 5'X5' SHALL BE LOCATED EVERY 200' OR LESS (INTERSECTING SIDEWALKS MEET THIS REQUIREMENT). LONGITUDINAL (RUNNING) SLOPE MAY NOT EXCEED 5% UNLESS RAMP IS INSTALLED (RAMPS MAY NOT EXCEED 8.33%). CROSS SLOPE MAY NOT EXCEED 2%. GAPS IN ROUTE MAY NOT EXCEED 1/2" IN WIDTH.
2. FINISHED SURFACE HEIGHT DIFFERENCE REQUIREMENTS:
   A. 0 TO 1/4" : NO REQUIREMENTS
   B. 1/4" TO 1/2" : BEVEL WITH 1:2 SLOPE
   C. LARGER THAN 1/2" : CONFORM TO REQUIREMENTS FOR RAMP
3. RAMPS:
   - •• MAX RAMP SLOPE 8.33% (1:12)
   - •• RAMPS STEEPER THAN 8.33% ARE NOT ACCEPTABLE
   - •• MAX RISE FOR ANY RAMP RUN IS 30" (AT 8.33% SLOPE, MAXIMUM RUN OF RAMP IS 30')
   - •• MAX CROSS SLOPE OF RAMP 2% (1:50)

   A. LANDINGS :
   - ••• RAMPS SHALL HAVE LEVEL LANDINGS AT BOTTOM AND TOP OF EACH RAMP.
   - ••• LANDINGS SHALL BE AT LEAST AS WIDE AS RAMP LEADING TO IT.
   - ••• LANDING LENGTH SHALL BE MINIMUM 5' CLEAR
   - ••• IF RAMPS CHANGE DIRECTION AT LANDING, MINIMUM LANDING SIZE SHALL BE 5'X5'.
   - ••• ALL LANDINGS ARE TO BE NO MORE THAN 2% SLOPE IN ANY DIRECTION.

   B. HANDRAILS:
   - ••• HANDRAILS REQUIRED ON BOTH SIDES (MIN. 36" CLEAR BETWEEN HANDRAILS) WHEN RAMP RISE IS GREATER THAN 6".
   - ••• PROVIDE MINIMUM 12" LONG HANDRAIL EXTENSIONS AT TOP AND BOTTOM LANDINGS.
   - ••• PROVIDE MINIMUM 2" HIGH EDGE PROTECTION OR RAIL WITH LESS THAN 4" CLEAR TO RAMP IF RAMP HAS DROP-OFFS.
   - ••• ROUTES BETWEEN BUILDINGS WITH ONLY DWELLING UNITS DO NOT HAVE TO HAVE HANDRAILS.
   - ••• STAIRS NOT ALLOWED AS PART OF ACCESSIBLE ROUTE BUT IF ADJACENT TO ROUTE OR PART OF TENANT SPACE MUST MEET REQUIREMENTS FOR STAIR RAILS.
4. CURB RAMPS :
   - •• MAX SLOPE OF CURB RAMP 8.33%
   - •• MAX SLOPE OF SIDE FLARES 10%.
   - •• MAX SLOPE OF ADJOINING GUTTERS, ROAD SURFACE, OR ACCESSIBLE ROUTE 5%.
   - •• MIN WIDTH 36" (NOT INCLUDING SIDE FLARES).
   - •• DETECTABLE WARNING IS REQUIRED ON CURB RAMPS IN PUBLIC RIGHT OF WAYS, AND SHALL BE 24" MINIMUM IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE. DETECTABLE WARNINGS SHALL BE LOCATED SO THE EDGE NEAREST THE CURB LINE IS 6" TO 8" FROM THE CURB LINE.
5. PAVEMENT MARKINGS :
   - •• AS REQUIRED BY LOCAL JURISDICTIONAL AUTHORITY (RECOMMENDED CROSSWALK MARKING TO DESIGNATE ACCESSIBLE PEDESTRIAN ROUTE)
6. PARKING SPACES :
   - •• MINIMUM 8' WIDE ACCESSIBLE PARKING SPACE.
   - •• MINIMUM 5' WIDE ACCESS AISLE AT STANDARD SPACES
   - •• MINIMUM 8' WIDE ACCESS AISLE AT VAN ACCESSIBLE SPACES
   - •• MAXIMUM 2% (1:50) SLOPE IN ANY DIRECTION
7. SIGNAGE :
   ACCESSIBLE PARKING SPACES SHALL BE DESIGNATED AS RESERVED BY A SIGN SHOWING THE SYMBOL OF ACCESSIBILITY. VAN ACCESSIBLE SPACES SHALL HAVE AN ADDITIONAL SIGN "VAN ACCESSIBLE" MOUNTED BELOW THE SYMBOL. SUCH SIGNS SHALL BE LOCATED SO THEY CANNOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE (SIGNAGE TO BE INSTALLED AT A MINIMUM HEIGHT OF 7' TO BOTTOM OF VAN ACCESSIBLE DESIGNATION, AND 7' MINIMUM TO THE BOTTOM OF ALL OTHER SIGN FACES).
8. ACCESSIBLE ROUTES :
   MUST COMPLY WITH ADA, THE FAIR HOUSING ACT AND ICC/ANSI A117.1-2003

WATER - SEWER NOTES:

1. HIGHLY CHLORINATED WATER USED IN THE DISINFECTION PROCESS SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH THE LATEST CITY OF PORT WENTWORTH CONSTRUCTION SPECIFICATIONS.

2. ANY PIPE, SOLDER AND FLUX USED DURING INSTALLATION OF THE WATER LINES MUST BE "LEAD FREE" IN ACCORDANCE WITH THE LATEST CITY OF PORT WENTWORTH CONSTRUCTION SPECIFICATIONS.

3. MAINTAIN MINIMUM HORIZONTAL/VERTICAL CLEARANCE IN ACCORDANCE WITH THE LATEST CITY OF PORT WENTWORTH CONSTRUCTION SPECIFICATIONS.

4. WHERE THE WATER MAIN CROSSES SEWER OR STORM PIPES, THE WATER LINE SHALL BE DUCTILE IRON IN ACCORDANCE WITH THE LATEST CITY OF PORT WENTWORTH CONSTRUCTION SPECIFICATIONS.

5. THE CONTRACTOR IS RESPONSIBLE TO BRING PROPOSED MANHOLE TOPS TO GRADE.

6. MAXIMUM COVER FOR THE WATER MAIN SHALL BE IN ACCORDANCE WITH THE LATEST CITY OF PORT WENTWORTH CONSTRUCTION SPECIFICATIONS.

7. CONTRACTOR TO VERIFY ALL INVERT ELEVATIONS OF SANITARY SEWER LATERALS PRIOR TO CONSTRUCTION. NOTIFY ENGINEER WITH INVERT DATA TO INSURE THERE ARE NO CONFLICTS.

8. ALL FILLING AND HYDROSTATIC TESTING OF NEW MAINS SHALL BE COORDINATED WITH AND WITNESSED BY THE CITY'S INSPECTOR.

9. INTERNAL FIRE SPRINKLER PROTECTION IS TO BE DESIGNED AND SUBMITTED SEPARATELY, BY OTHERS, TO BUILDING INSPECTIONS AS NECESSARY.

10. INDUSTRIAL WASTEWATER DISCHARGE IS NOT ANTICIPATED NOR DESIGNED FOR WITH THIS DEVELOPMENT.

11. IN ADDITION TO THE SEDIMENTATION AND EROSION CONTROL MEASURES AS INDICATED ON THE PLANS THE CONTRACTOR SHALL TAKE WHATEVER ACTIONS AS ARE NECESSARY TO ENSURE THAT ALL SEDIMENTATION IS CONFINED TO THE SITE AND THAT NO OFFSITE EROSION IS CAUSED BY THE WORK EITHER DIRECTLY OR INDIRECTLY.

DEVELOPMENT REQUIREMENTS:

FRONT SETBACK:	25 FT
SIDE YARD SETBACKS:	5 FT
REAR YARD SETBACK:	25 FT

SITE INFORMATION:

PARENT PIN: 7-090-0604-091

ZONING DISTRICT: M-P-O

FLOOD ZONE: X [#13051C0035G 08/16/2018]

SIZE: ±70.00 ACRES

PROPOSED LAND USE: RESIDENTIAL

EROSION CONTROL NOTES:

1. EROSION CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BEST MANAGEMENT PRACTICES (BMP'S) ON THE SITE AT ALL TIMES IN ACCORDANCE WITH THESE PLANS AND THE "MANUAL FOR EROSION AND SEDIMENT CONTROL OF GEORGIA",

2. NARRATIVE DESCRIPTION:

LOCATION: MULBERRY BOULEVARD PORT WENTWORTH,GEORGIA

PINs: 7-090-0604-091

NATURE OF WORK: CONSTRUCTION PHASE 3 AND 4 OF MULBERRY @ RICE HOPE RD. WILL CONSIST OF ## NEW SINGLE FAMILY LOTS AS WELL AS THE ASSOCIATED UTILITIES AND ROADWAYS. THE STORM DRAINAGE IMPLEMENTED FOR THESE TWO PHASES WILL CONSIST OF ## CURB INLETS AND ## GRATE INLETS THAT WILL CONNECT TO AN EXISTING DETENTION POND.

SIZE: TOTAL PROPERTY ACREAGE: ±70.00 ACRES
DISTURBED ACREAGE: ±30.50 ACRES

ZONING CLASSIFICATION: M-P-O

MAXIMUM BUILDING HEIGHT:

PHASES: THE WORK WILL BE PERFORMED IN TWO PHASE.

3. THERE ARE NO APPARENT WATERS OF THE UNITED STATES WITHIN 200 FEET OF THE PROJECT SITE.

4. THERE ARE NO APPARENT WETLANDS PRESENT ON THE PROPERTY.

5. ALL SUITABLE TOPSOIL WILL BE STOCKPILED BY THE CONTRACTOR AND SPREAD IN PROPOSED VEGETATIVE AREAS PRIOR TO LANDSCAPE INSTALLATION.

6. THE SOILS ON SITE ARE : CAPE FEAR SOILS (Cc), CRAVEN LOAMY FINE SAND (Cx),
OCILLA COMPLEX (Oj), AND POOLER FINE SANDY LOAM (Pn)

7. THIS SITE IS CURRENTLY UNDEVELOPED.
8. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE "MANUAL FOR EROSION AND SEDIMENT CONTROL OF GEORGIA".

9. MAINTENANCE OF ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES, WHETHER TEMPORARY OR PERMANENT, SHALL BE AT ALL TIMES THE RESPONSIBILITY OF THE OWNER.

10. THE CONTRACTOR SHALL ENSURE THAT STRUCTURAL EROSION CONTROL MEASURES ARE INSPECTED DAILY. ANY DEFICIENCIES, INCLUDING SILT REMOVAL, OBSERVED SHALL BE REPAIRED BY THE END OF THAT DAY'S WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A DAILY INSPECTION LOG AND NOTIFYING THE OWNER AND ENGINEER OF ANY DEFICIENCIES IDENTIFIED IN THE EROSION CONTROL MEASURES. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL DISTURBED AREAS ARE STABILIZED.

11. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES.

12. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL WILL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

13. ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD OF GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.

14. ACCORDING TO THE FLOOD INSURANCE RATE MAPS, AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, THIS PROJECT SITE DOES NOT APPEAR TO LIE IN AN FLOOD HAZARD AREA AS DEPICTED ON FIRM PANEL NO. 13051C0035G EFFECTIVE DATE: AUGUST 16, 2018.

15. CONTACT INFORMATION:

CIVIL ENGINEER:
NEIL P. McKENZIE, PE
COLEMAN COMPANY, INC.
1480 CHATHAM PKWY, SUITE 100
SAVANNAH, GA 31405
P: 912.200.3041
NMCKENZIE@CCI-SAV.COM

OWNER/REPRESENTATIVE CONTACT:
BEP RICE HOPE, LLC
ATTN: MR. SCOTT DECAIN
4800 HAMPDEN LANE
BETHESDA, MD 20814
301.915.0460
SDECAIN@BALDEAGLEPARTNERS.COM

16. THE INITIAL RECEIVING WATER FOR THIS PROJECT IS A DETENTION POND CONSTRUCTED IN PHASE ONE THAT WILL DRAIN INTO A WETLAND THAT WILL ULTIMATELY DISCHARGE INTO THE SAVANNAH RIVER.
17. ANY ON-SITE FUEL STORAGE TANK MUST BE PROTECTED FROM LEAKS, SPILLS, AND RUPTURE AS PER APPLICABLE CODES.
18. SILT FENCE MUST BE INSPECTED DAILY FOR FAILURES AND CLEANED OUT WHEN SILT REACHES 1/2 THE FENCE HEIGHT.
19. ALL TEMPORARY BMPS FOR EROSION & SEDIMENT CONTROL SHALL BE REMOVED ONCE FINAL STABILIZATION IS ACHIEVED.

811 Know what's below. Call before you dig.

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ENGINEERS • SURVEYORS
Savannah, Georgia | (912) 200-3041 | CCI-SAV.COM

NOT FOR CONSTRUCTION

GEORGIA REGISTERED PROFESSIONAL No. PE035652 11/22/21 ENGINEER NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN P



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NOT FOR CONSTRUCTION

GEORGIA REGISTERED No. PE036852 PROFESSIONAL 11/22/21 ENGINEER NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

EXISTING CONDITIONS

SHEET:
C2.0

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LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	45.905	S07° 21' 36.60"W
L2	47.008	S07° 27' 13.13"W
L3	36.298	S13° 03' 02.26"W
L4	54.803	S08° 05' 15.08"W
L29	110.000	N81° 54' 44.90"W
L30	120.000	N81° 54' 44.90"W
L31	52.000	S08° 05' 14.88"W
L32	52.000	S08° 05' 15.10"W
L33	9.858	S08° 05' 15.00"W
L35	52.000	S08° 05' 14.37"W
L36	10.000	S08° 05' 14.37"W
L37	118.638	N81° 54' 44.90"W
L38	55.332	S08° 05' 15.10"W
L40	110.000	N81° 54' 44.99"W
L41	12.035	S08° 05' 15.01"W
L44	110.912	S83° 47' 19.61"E
L47	55.332	S08° 05' 15.08"W
L48	52.000	S08° 05' 14.37"W
L49	10.038	S03° 03' 23.23"W
L50	115.840	N81° 54' 44.90"W
L52	118.067	N86° 17' 25.20"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L53	40.564	S00° 04' 17.58"E
L56	62.617	S03° 03' 23.23"W
L57	18.743	S03° 03' 23.23"W
L58	114.564	S88° 53' 12.79"E
L60	120.270	S88° 53' 12.79"E
L61	59.030	S00° 04' 17.58"E
L62	119.876	N89° 53' 25.11"E
L64	18.383	S00° 06' 34.89"E
L65	55.199	S00° 06' 34.89"E
L66	52.000	S00° 06' 34.89"E
L67	119.910	N89° 53' 25.11"E
L68	52.000	S00° 04' 17.58"E
L69	52.000	S00° 04' 17.58"E
L70	119.945	N89° 53' 25.11"E
L71	52.000	S00° 06' 34.89"E
L72	59.000	S89° 53' 25.11"W
L73	103.000	S00° 06' 34.89"E
L74	27.433	S89° 53' 25.11"W
L77	34.259	S59° 05' 51.68"W
L79	52.000	S00° 06' 34.89"E
L80	119.979	N89° 53' 25.11"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L81	52.000	S00° 04' 17.58"E
L82	30.816	S00° 04' 17.58"E
L83	30.816	S00° 06' 34.89"E
L85	120.000	N88° 46' 17.84"E
L89	120.000	N86° 01' 32.34"E
L92	120.000	S83° 16' 46.84"W
L95	120.000	S80° 25' 41.12"W
L97	120.000	N77° 34' 35.41"E
L100	120.000	N74° 49' 49.91"E
L103	120.000	N72° 05' 04.40"E
L106	120.000	N69° 20' 18.90"E
L109	120.000	S66° 35' 33.40"W
L113	120.000	S63° 44' 27.69"W
L117	120.000	S60° 53' 21.97"W
L119	120.000	S58° 44' 18.08"W
L120	13.265	S31° 15' 41.92"E
L121	120.000	N81° 54' 11.63"W
L122	61.981	N08° 05' 15.31"E
L123	120.000	S81° 54' 45.40"E
L124	114.475	S88° 53' 12.79"E
L125	58.475	N08° 05' 15.31"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L126	17.997	N08° 05' 15.31"E
L127	52.000	N08° 05' 15.31"E
L128	144.000	S81° 54' 45.00"E
L129	52.000	S08° 05' 15.10"W
L130	144.000	S81° 54' 44.90"E
L131	70.011	N08° 05' 15.31"E
L133	53.843	S30° 54' 08.32"E
L136	32.492	N59° 05' 51.68"E
L137	34.259	N59° 05' 51.68"E
L139	120.000	S30° 54' 08.32"E
L140	120.000	S17° 20' 57.33"E
L141	120.000	S00° 06' 34.89"E
L143	27.433	N89° 53' 25.11"E
L144	42.000	N89° 53' 25.11"E
L145	50.190	S89° 53' 25.11"W
L147	18.119	S89° 53' 25.11"W
L151	24.492	S59° 05' 51.68"W
L152	42.260	S59° 05' 51.68"W
L156	80.410	N71° 49' 07.48"W
L159	81.458	N44° 46' 56.14"E
L160	128.909	S45° 04' 10.12"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L162	48.722	S50° 21' 05.54"W
L163	22.555	S50° 21' 05.54"W
L166	130.876	N35° 47' 48.72"W
L169	130.360	N26° 18' 29.95"W
L174	128.009	N16° 52' 03.64"W
L176	50.362	N74° 13' 16.00"E
L177	61.972	N74° 13' 16.00"E
L178	56.917	N74° 13' 16.00"E
L179	127.463	N15° 46' 44.00"W
L180	135.969	N15° 46' 44.00"W
L184	45.637	N89° 53' 45.72"W
L188	128.520	S30° 54' 08.32"E
L189	129.932	S23° 59' 40.90"E
L190	132.858	S09° 43' 26.94"E
L191	136.921	S00° 06' 34.89"E
L197	4.422	N31° 15' 41.92"W
L198	53.156	S62° 53' 57.31"W
L199	151.975	S18° 52' 09.55"E
L200	141.065	S18° 52' 09.55"E
L201	55.492	S62° 53' 57.31"W
L202	56.678	S62° 53' 57.31"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L203	65.475	S62° 53' 57.31"W
L204	130.027	S19° 30' 33.32"E
L205	121.749	S25° 24' 00.89"E
L207	56.287	N74° 13' 16.00"E
L208	55.000	N74° 13' 16.00"E
L209	50.375	N74° 13' 16.00"E
L214	120.190	S31° 17' 28.45"E
L215	64.770	S62° 53' 57.31"W
L216	65.448	S62° 53' 57.31"W
L217	125.363	S37° 10' 56.02"E
L218	67.577	S62° 53' 57.31"W
L219	69.729	S62° 53' 57.31"W
L220	33.695	S62° 53' 57.31"W
L221	157.211	S48° 18' 29.42"E
L222	137.648	S43° 04' 23.59"E
L223	147.358	S25° 10' 02.19"E
L225	77.167	N44° 46' 56.14"E
L226	4.775	N44° 46' 56.14"E
L230	13.227	N71° 49' 07.48"W
L231	54.000	N71° 49' 07.48"W
L232	13.017	N71° 49' 07.48"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L238	42.857	N25° 10' 02.19"W
L239	55.500	N25° 10' 02.19"W
L240	49.000	N25° 10' 02.19"W
L241	120.000	S64° 49' 57.81"W
L242	120.000	S64° 49' 57.81"W
L243	49.000	N25° 10' 02.19"W
L244	55.500	N25° 10' 02.19"W
L245	120.000	S64° 49' 57.81"W
L246	42.857	N25° 10' 02.19"W
L248	120.000	S61° 59' 30.96"W
L249	120.000	S50° 18' 29.11"W
L252	120.000	S38° 37' 27.27"W
L254	120.000	S26° 56' 25.43"W
L256	13.017	N71° 49' 07.48"W
L257	120.000	S18° 10' 52.52"W
L258	54.000	N71° 49' 07.48"W
L259	120.000	S18° 10' 52.52"W
L260	162.204	N71° 30' 08.69"W
L261	120.000	N81° 54' 44.90"W

Curve Table			
Curve #	Length	Radius	Delta
C1	52.162	1724.421	001.7331
C2	39.147	1784.421	001.2570
C3	77.908	1784.421	002.5016
C4	62.112	1724.421	002.0638
C5	80.867	1784.421	002.5966
C6	76.672	1724.421	002.5475
C7	36.803	1724.421	001.2228
C8	38.083	1784.421	001.2228
C9	15.044	50.000	017.2396
C10	11.827	50.000	013.5531
C11	26.704	17.000	090.0000
C12	20.696	1060.000	001.1187
C13	23.039	1180.000	001.1187
C14	56.553	1180.000	002.7460
C15	56.553	1180.000	002.7460
C16	50.802	1060.000	002.7460
C17	50.802	1060.000	002.7460
C18	58.728	1180.000	002.8516
C19	52.756	1060.000	002.8516
C20	58.728	1180.000	002.8516
C21	52.756	1060.000	002.8516
C22	56.553	1180.000	002.7460

Curve Table			
Curve #	Length	Radius	Delta
C23	50.802	1060.000	002.7460
C24	50.802	1060.000	002.7460
C25	56.553	1180.000	002.7460
C26	56.553	1180.000	002.7460
C27	50.802	1060.000	002.7460
C28	50.802	1060.000	002.7460
C29	56.553	1180.000	002.7460
C30	58.728	1180.000	002.8516
C31	52.756	1060.000	002.8516
C32	58.728	1180.000	002.8516
C33	52.756	1060.000	002.8516
C34	24.794	1060.000	001.3402
C35	42.160	1180.000	002.0471
C36	19.863	170.000	006.6944
C37	112.482	230.000	028.0206
C38	23.449	17.000	079.0307
C39	40.213	170.000	013.5531
C40	51.151	170.000	017.2396
C41	27.517	17.000	092.7405
C42	38.881	230.000	009.6856
C43	57.000	230.000	014.1994
C44	27.729	230.000	006.9076

Curve Table			
Curve #	Length	Radius	Delta
C45	23.449	17.000	079.0307
C46	111.383	230.000	027.7469
C47	7.647	230.000	001.9050
C48	24.970	170.000	008.4158
C49	32.099	17.000	108.1852
C50	73.980	449.930	009.4209
C51	30.392	405.000	004.2996
C52	4.669	405.000	000.6605
C53	74.511	449.930	009.4885
C54	48.191	405.000	006.8176
C55	74.135	449.930	009.4406
C56	19.680	405.000	002.7841
C57	33.199	405.000	004.6967
C58	56.528	405.000	007.9971
C59	8.550	449.930	001.0888
C60	62.616	405.000	008.8583
C61	17.052	405.000	002.4124
C62	8.666	405.000	001.2261
C63	26.150	17.000	088.1333
C64	138.464	1000.000	007.9334
C65	119.764	1000.000	006.8619
C67	129.362	1000.000	007.4119

Curve Table			
Curve #	Length	Radius	Delta
C69	12.310	1000.000	000.7053
C70	28.889	17.000	097.3656
C71	4.346	509.930	000.4883
C72	52.430	509.930	005.8910
C73	52.430	509.930	005.8910
C74	52.430	509.930	005.8910
C75	31.924	17.000	107.5952
C76	47.941	509.930	005.3866
C77	52.430	509.930	005.8910
C78	216.205	170.000	072.8686
C79	35.161	230.000	008.7591
C80	46.902	230.000	011.6838
C81	46.902	230.000	011.6838
C82	46.902	230.000	011.6838
C83	11.404	230.000	002.8408
C84	17.353	350.000	002.8408
C85	71.373	350.000	011.6838
C86	71.373	350.000	011.6838
C87	71.373	350.000	011.6838
C88	53.507	350.000	008.7591

POND #3
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.82
10-YR: 14.58
25-YR: 15.09
50-YR: 15.52
100-YR: 15.96

POND #2
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.78
10-YR: 14.44
25-YR: 14.89
50-YR: 15.28
100-YR: 15.72

NOTE:
- FINISHED PADS SHALL BE 42'X70' UNLESS OTHERWISE NOTED

ROAD B
ROAD A
WEAVERS WAY
WILD SILK WAY
LOT 45 N/F: BEP RH TRACT 2 LLC
LOT 46 N/F: BEP RH TRACT 2 LLC
PARCEL B RICE HOPE PLANTATION PB 51 PG 206 N/F: ARD
OPEN SPACE 2
TWO STORY WOOD FRAME RESIDENCE
DIVISION, PHASE 1 PG 206
100' SAVANNAH ELECTRIC & POWER CO. & CITY OF SAVANNAH WATER MAIN EASEMENT
30' UTILITY EASEMENT CENTERED ON POWER

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED No. PE036852 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

STAKING PLAN

SHEET:
C3.0

811 Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

MATCHLINE: SEE SHEET C4.1

MATCHLINE: SEE SHEET C4.2

C. INLET-12
TOP: 16.97
I.E. IN (C. INLET-11): 13.13
I.E. OUT (FES-6): 9.98

31 LF 18"ø RCP @ 0.40%

C. INLET-11
TOP: 16.97
I.E. OUT (C. INLET-12): 13.25

C. INLET-7
TOP: 17.42
I.E. OUT (C. INLET-8): 13.70

FES-6
I.E. IN (C. INLET-12): 9.25

FES-8
I.E. IN (FES-7): 11.00

80 LF 24"ø RCP @ 1.26%

FES-7
I.E. OUT (FES-8): 12.00

POND #2
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.78
10-YR: 14.44
25-YR: 14.89
50-YR: 15.28
100-YR: 15.72

NOTE:
- SEE GENERAL NOTE #34 ON SHEET C1.0 FOR SUB-GRADE DRAIN INSTALLATION SUB-GRADE DRAINS ARE REQUIRED FOR THIS PROJECT.

31 LF 18"ø RCP @ 0.40%

C. INLET-8
TOP: 17.42
I.E. IN (C. INLET-7): 13.58
I.E. OUT (FES-4): 10.02

164 LF 24"ø RCP @ 0.45%

66 LF 18"ø RCP @ 0.40%

FES-5
I.E. IN (C. INLET-10): 8.95

C. INLET-10
TOP: 17.22
I.E. IN (C. INLET-9): 10.28
I.E. OUT (FES-5): 9.68

FES-4
I.E. IN (C. INLET-8): 9.25

C. INLET-2
TOP: 17.50
I.E. OUT (C. INLET-5): 13.75

C. INLET-9
TOP: 17.22
I.E. IN (G. INLET-3): 10.50
I.E. OUT (C. INLET-10): 10.40

C. INLET-5
TOP: 17.46
I.E. IN (C. INLET-2): 13.28
I.E. OUT (C. INLET-6): 13.18

END SECTION FLAP GATE
I.E. IN (FES-9): 12.00
INSTALL WATERMAN BRAND OR APPROVED EQUAL

36 LF 30"ø RCP @ 3.48%

33 LF 18"ø RCP @ 0.40%

POND #3
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.82
10-YR: 14.58
25-YR: 15.09
50-YR: 15.52
100-YR: 15.96

G. INLET-3
TOP: 17.50
I.E. OUT (C. INLET-9): 10.85

C. INLET-3
TOP: 17.42
I.E. IN (G. INLET-1): 7.00
I.E. OUT (C. INLET-4): 7.00

31 LF 36"ø RCP @ 0.00%

C. INLET-4
TOP: 17.42
I.E. IN (C. INLET-3): 7.00
I.E. OUT (FES-2): 7.00

FES-9
I.E. OUT (END SECTION FLAP GATE): 13.25

C. INLET-6
TOP: 17.46
I.E. IN (C. INLET-5): 13.05
I.E. OUT (FES-3): 8.64

FES-3
I.E. IN (C. INLET-6): 7.95

129 LF 36"ø RCP @ 0.00%

129 LF 36"ø RCP @ 0.00%

161 LF 36"ø RCP @ 0.00%

FES-2
I.E. IN (C. INLET-4): 7.00

EXISTING BERM CONSTRUCTED IN PHASE 2

FES-1
I.E. OUT (C. INLET-1): 7.00

60 LF 36"ø RCP @ 1.79%

C. INLET-1
TOP: 17.42
I.E. IN (FES-1): 5.92
I.E. OUT (C. INLET-2): 7.00

31 LF 36"ø RCP @ 0.00%

C. INLET-2
TOP: 17.42
I.E. IN (C. INLET-1): 7.00
I.E. OUT (G. INLET-1): 7.00

C. INLET-1
TOP: 16.40
I.E. IN (C. INLET-2): 7.00
I.E. OUT (C. INLET-3): 7.00

BACKFILL EXISTING DITCH IN 6" LIFTS. SEE GENERAL NOTE #25 ON SHEET C1.0.

MATCH EXISTING PAVEMENT ELEVATIONS

BENCH MARK:
MAG NAIL-IN ASPHALT
ELEV=19.00'
NAVD 88

GRADING LEGEND	
HP	HIGH POINT
LP	LOW POINT
EX	EXISTING ELEVATION
BP	BREAKING POINT

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

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GEORGIA REGISTERED PE No. PE013652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

PAVING GRADING & DRAINAGE

SHEET:
C4.0



GRADING LEGEND	
HP	HIGH POINT
LP	LOW POINT
EX	EXISTING ELEVATION
BP	BREAKING POINT

Know what's below. Call before you dig.

SCALE: 1"=60'

0' 30' 60' 120'

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GEORGIA REGISTERED No. PE013652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

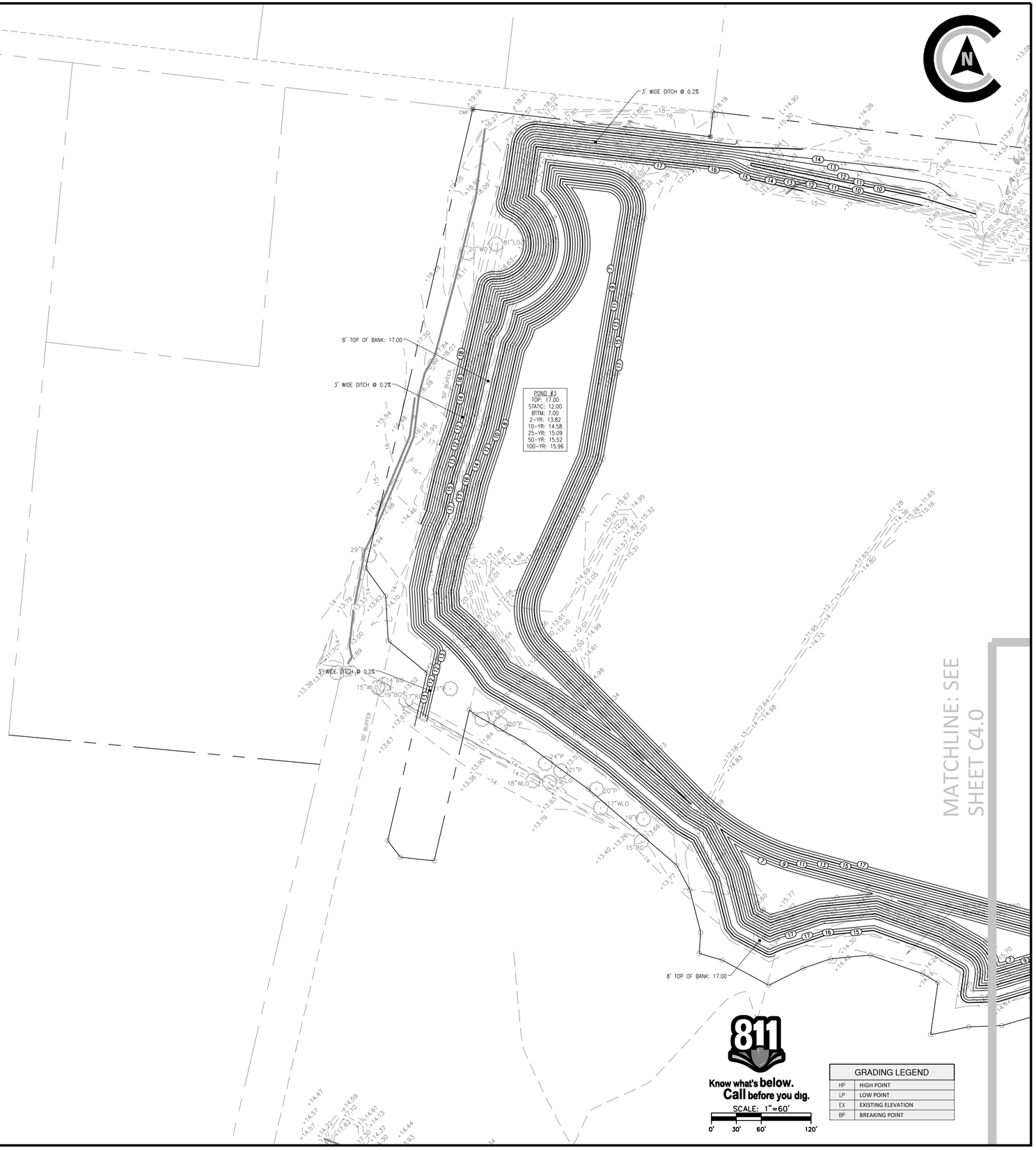
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

PAVING GRADING & DRAINAGE

SHEET:
C4.1



LIVE OAK
PINE
PALM
HICKORY
MAGNOLIA
LAUREL OAK
WATER OAK
BLACK GUM

811 Know what's below. Call before you dig.

SCALE: 1"=60'

0' 30' 60' 120'

GRADING LEGEND	
HP	HIGH POINT
LP	LOW POINT
EX	EXISTING ELEVATION
BP	BREAKING POINT

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GEORGIA REGISTERED No. PE013652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
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SCALE:	AS NOTED

PAVING GRADING & DRAINAGE

SHEET:
C4.2

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POND #3
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.82
10-YR: 14.58
25-YR: 15.09
50-YR: 15.52
100-YR: 15.96

POND #2
TOP: 17.00
STATIC: 12.00
BTTM: 7.00
2-YR: 13.78
10-YR: 14.44
25-YR: 14.89
50-YR: 15.28
100-YR: 15.72

DETENTION POND

NOTE:
- FINISHED PADS SHALL BE 18" ABOVE BACK OF CURB.

EXISTING BERM CONSTRUCTED IN PHASE 2

MATCH EXISTING PAVEMENT ELEVATIONS

BACKFILL EXISTING DITCH IN 6" LIFTS. SEE GENERAL NOTE #25 ON SHEET C1.0.

WEAVERS WAY 60' R/W

GRADING LEGEND	
HP	HIGH POINT
LP	LOW POINT
EX	EXISTING ELEVATION
BP	BREAKING POINT

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

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GEORGIA REGISTERED PE No. PE013652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

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NEIGHBORHOOD GRADING PLAN

SHEET:
C5.0



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GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE035652
11/22/21
NEIL P. McKENZIE

REVISIONS:

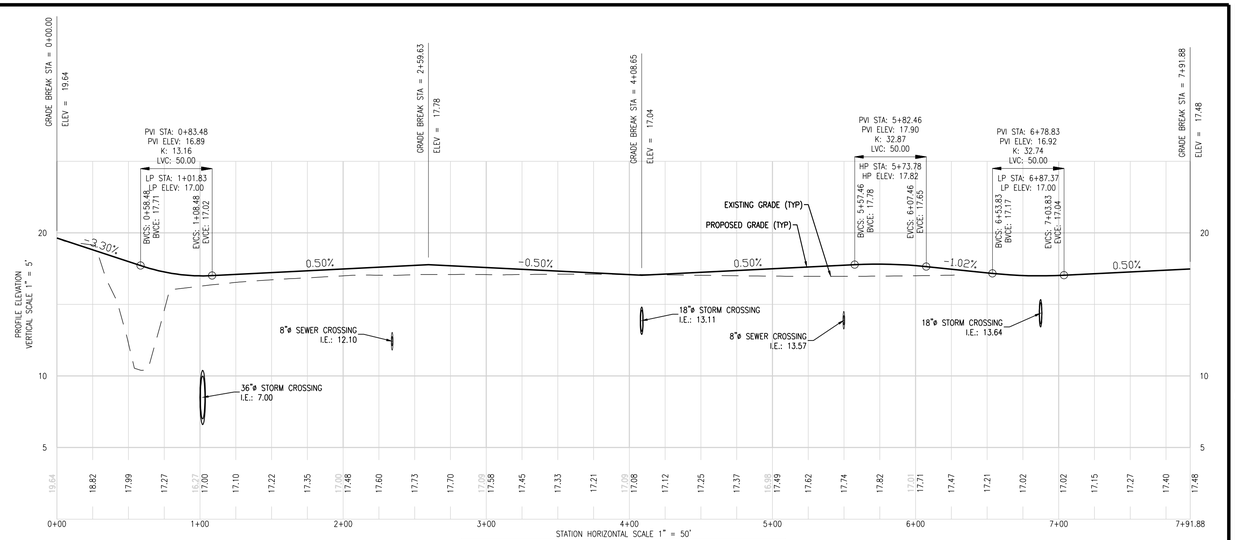
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MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

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SCALE:	AS NOTED

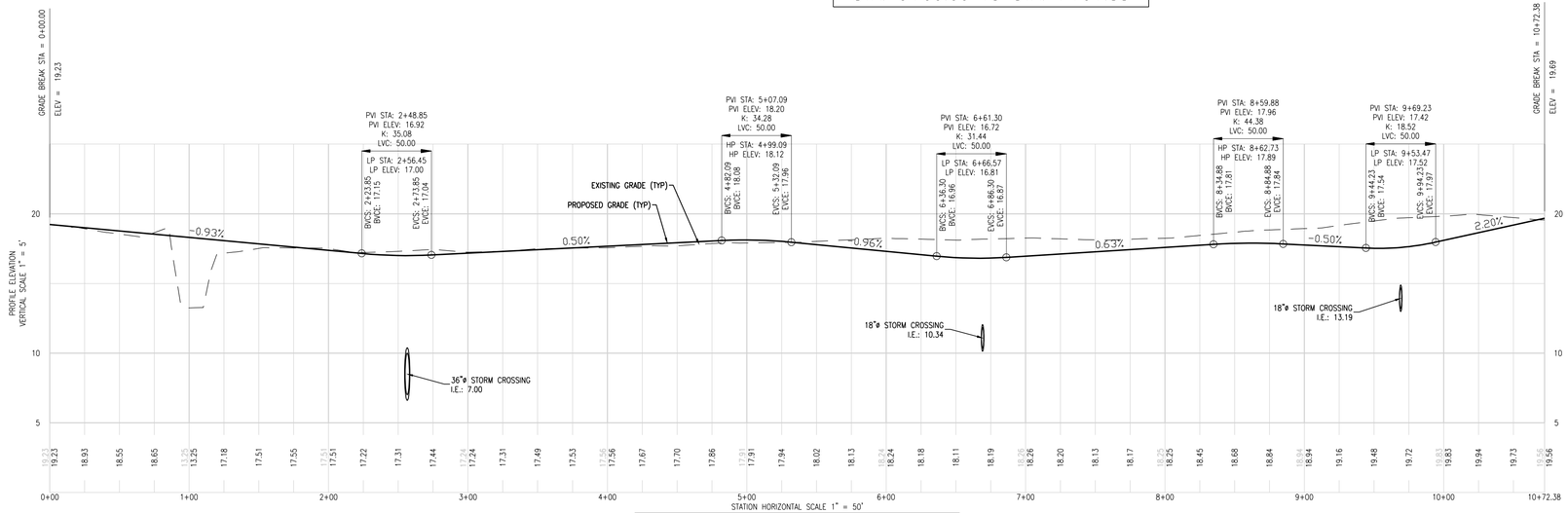
UTILITY PLAN

SHEET:
C6.0

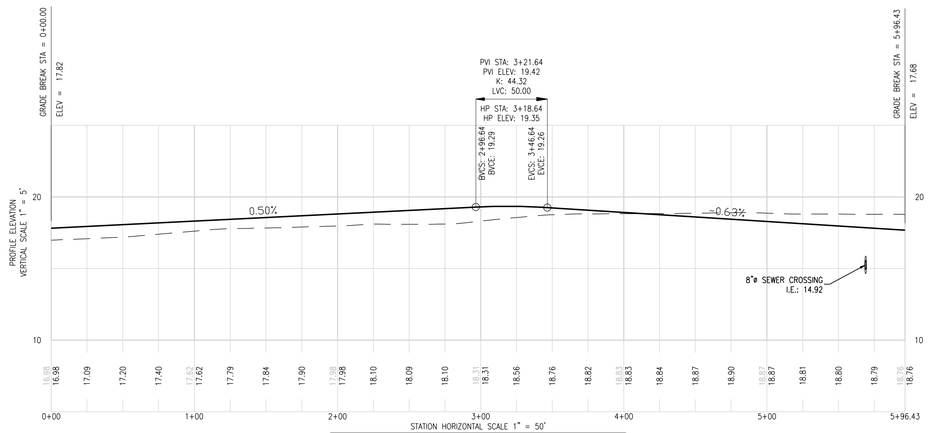
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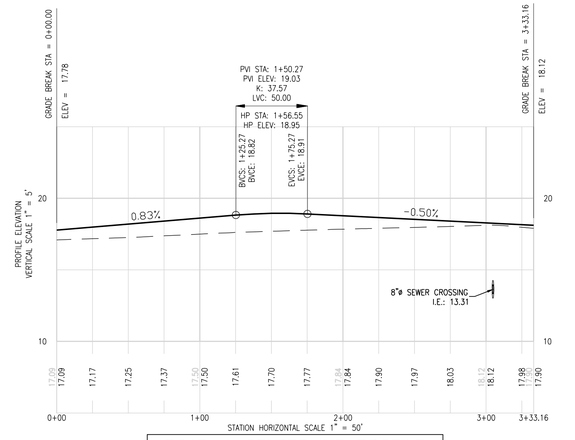
WEAVERS WAY CENTERLINE PROFILE
STA. 0+00.00 TO STA. 7+91.88



WILD SILK WAY CENTERLINE PROFILE
STA. 0+00.00 TO STA. 10+72.38



ROAD-B CENTERLINE PROFILE
STA. 0+00.00 TO STA. 5+96.43



ROAD-A CENTERLINE PROFILE
STA. 0+00.00 TO STA. 3+33.16

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GEORGIA REGISTERED No. PE036852 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

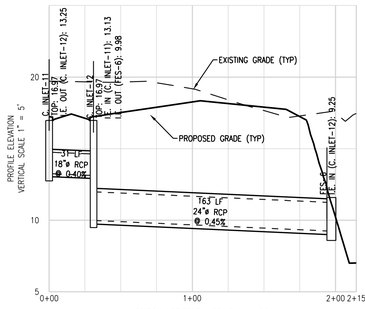
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

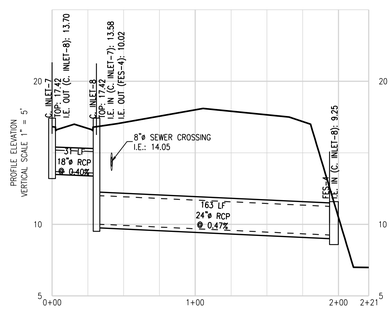
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DATE:	9/13/21
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CHECKED BY:	NPM
SCALE:	AS NOTED

PROFILES

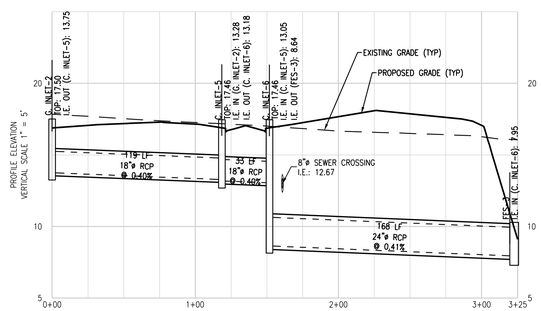
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C7.0



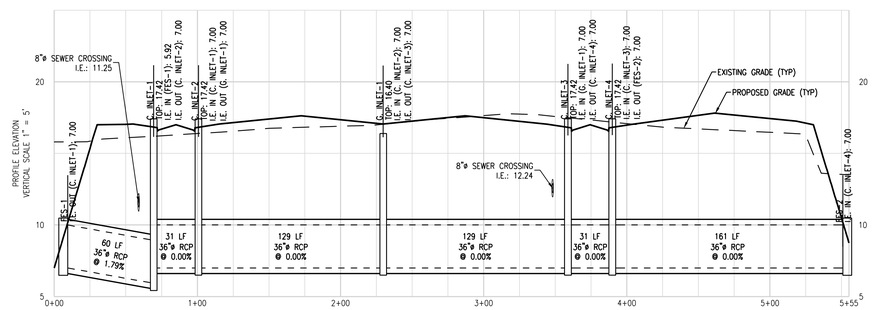
STORM SEWER PROFILE
STA. 0+00.00 TO STA. 2+14.50



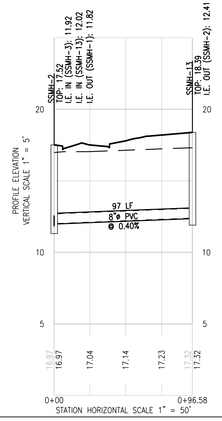
STORM SEWER PROFILE
STA. 0+00.00 TO STA. 2+21.13



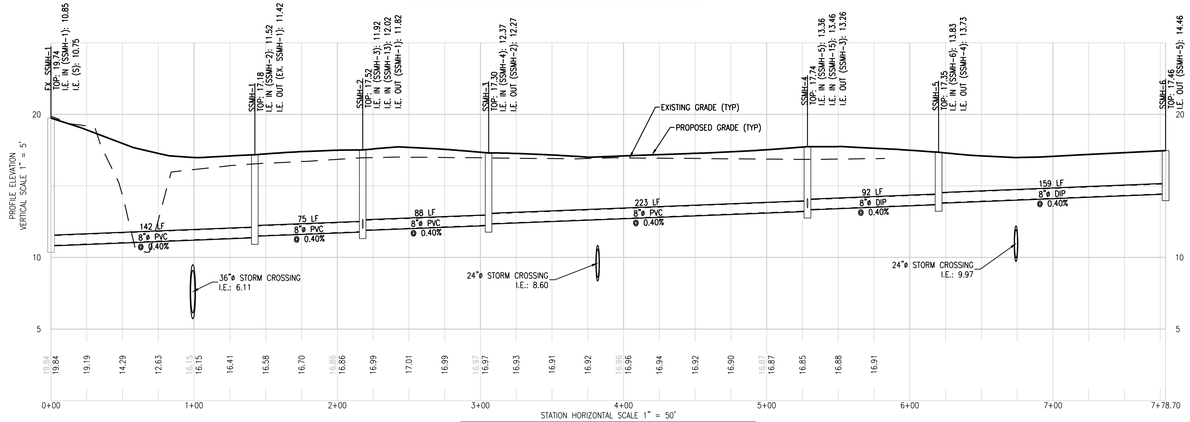
STORM SEWER PROFILE
STA. 0+00.00 TO STA. 3+25.27



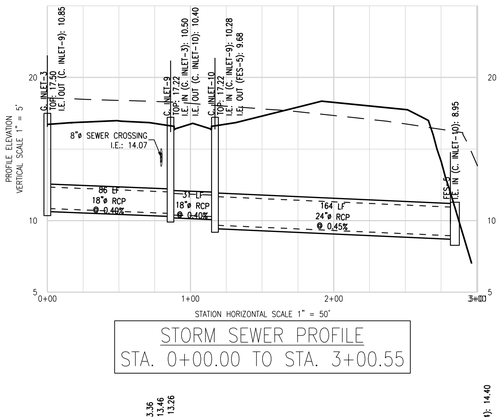
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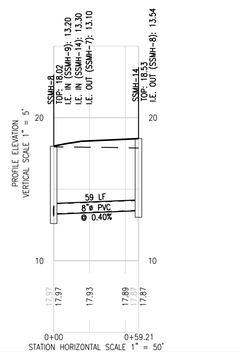
SANITARY SEWER PROFILE
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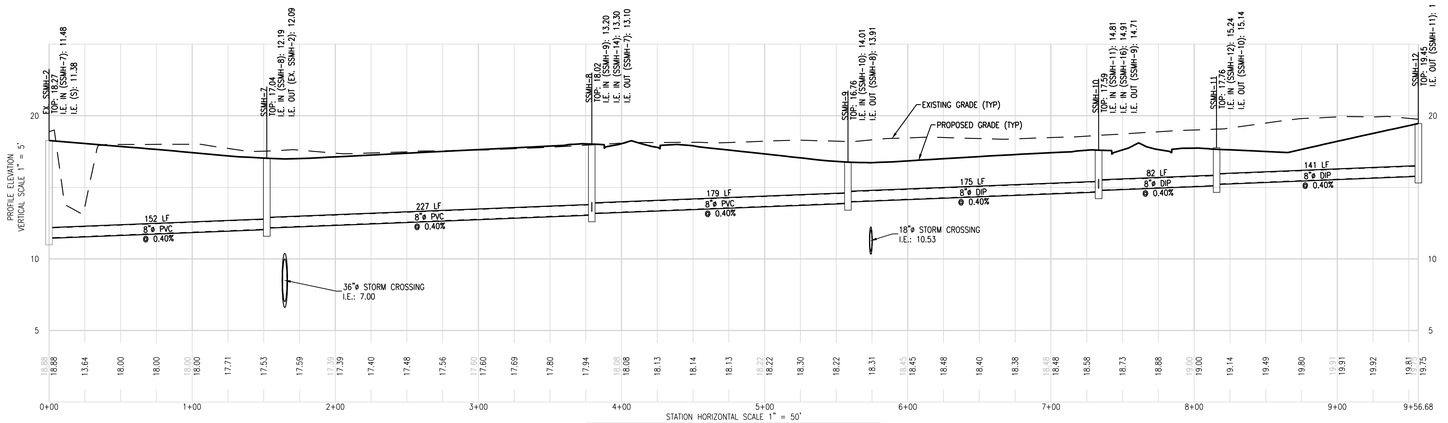
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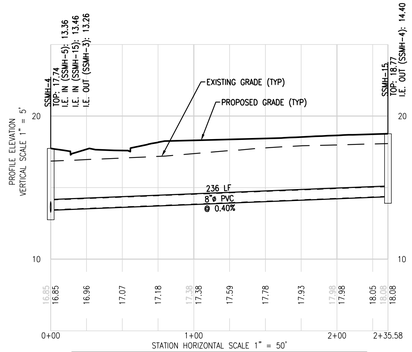
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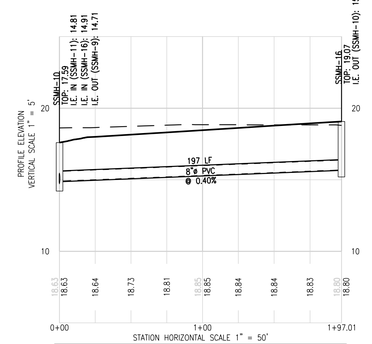
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SANITARY SEWER PROFILE
STA. 0+00.00 TO STA. 9+56.68



SANITARY SEWER PROFILE
STA. 0+00.00 TO STA. 2+35.58



SANITARY SEWER PROFILE
STA. 0+00.00 TO STA. 1+97.01

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED No. PE035652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

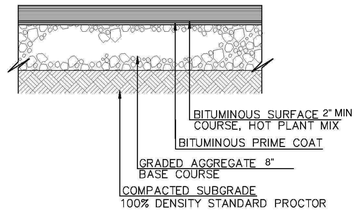
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

PROFILES

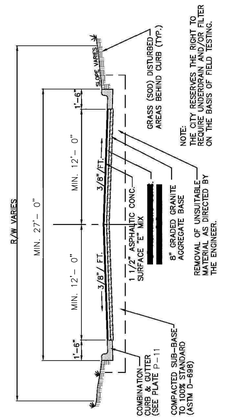
SHEET:
C7.1



TYPICAL BITUMINOUS PAVING SECTION

City of Port Wentworth
TECHNICAL DETAILS
P-1

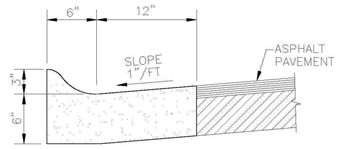
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SCALE: N.T.S.
DATED: FEBRUARY 2007



TYPICAL SECTION COLLECTOR/ARTERIAL STREET

City of Port Wentworth
TECHNICAL DETAILS
P-6

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

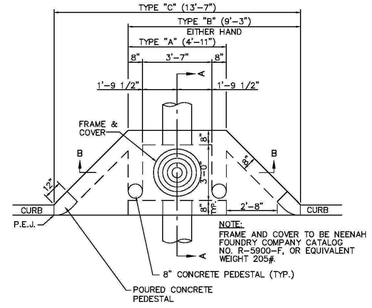


NOTE: FOR RESIDENTIAL USE ONLY

ROLL-OVER CURB

City of Port Wentworth
TECHNICAL DETAILS
P-11

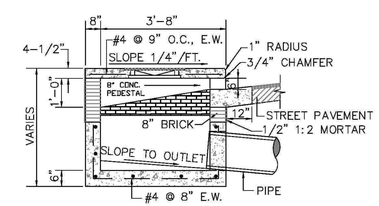
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DATED: FEBRUARY 2007



PLAN OF CURB INLET

City of Port Wentworth
TECHNICAL DETAILS
SD-1

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SCALE: N.T.S.
DATED: FEBRUARY 2007



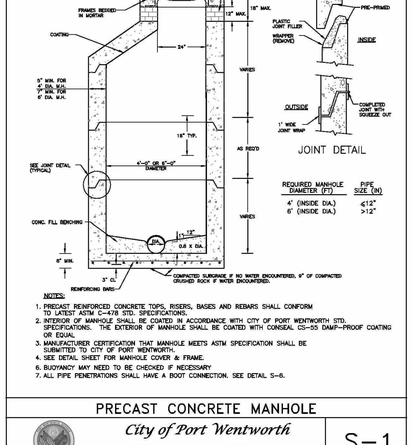
NOTES:
1. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4"
2. PIPE TIEING TO CURB INLET MUST BE SEALED INSIDE AND OUTSIDE OF STRUCTURE WITH BRICK AND MORTAR

CURB INLET SECTION A – A

City of Port Wentworth
TECHNICAL DETAILS
SD-3

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

NOTE:
C.I. MANHOLE FRAME AND COVER EQUIVALENT TO NEENAH R-5900-F. FRAME AND COVER TO BE MACHINE FITTED PRIOR TO LEAVING SHOP. WEIGHT – 205 LBS.

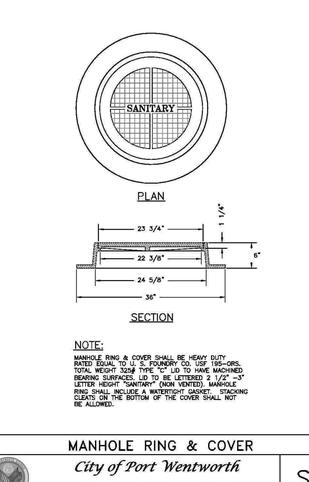


NOTES:
1. MATCH TOP OF PIPE ELEVATIONS WHEN DIFFERENT SIZE PIPES ARE CONSTRUCTED IN CURB INLET.
2. TYPE "B" INLET SHOWN

CURB INLET SECTION B – B

City of Port Wentworth
TECHNICAL DETAILS
SD-4

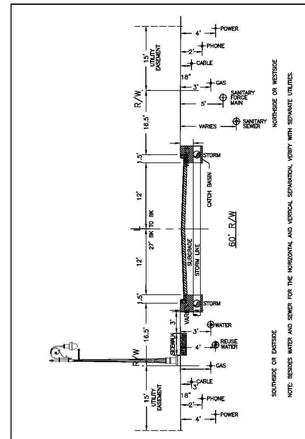
PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



GRATE INLET

City of Port Wentworth
TECHNICAL DETAILS
SD-8

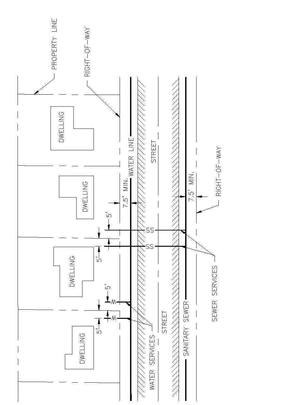
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SCALE: N.T.S.
DATED: FEBRUARY 2007



TYP. SECTION UNDERGROUND UTILITY INSTALLATION

City of Port Wentworth
TECHNICAL DETAILS
U-1

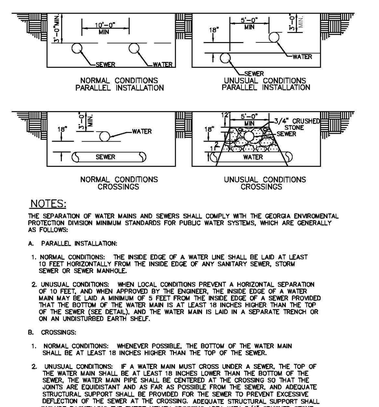
PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



TYP. WATER & SEWER PLANNING

City of Port Wentworth
TECHNICAL DETAILS
U-2

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



NOTES:

THE SEPARATION OF WATER MAINS AND SEWERS SHALL COMPLY WITH THE GEORGIA ENVIRONMENTAL PROTECTION DIVISION MINIMUM STANDARDS FOR PUBLIC WATER SYSTEMS, WHICH ARE GENERALLY AS FOLLOWS:

A. PARALLEL INSTALLATION:

1. NORMAL CONDITIONS: THE INSIDE EDGE OF A WATER LINE SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM THE INSIDE EDGE OF ANY SANITARY SEWER, STORM SEWER OR SEWER MANHOLE.
2. UNUSUAL CONDITIONS: WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF 10 FEET, AND WHEN APPROVED BY THE ENGINEER, THE INSIDE EDGE OF A WATER MAIN MAY BE LAID A MINIMUM OF 6 FEET FROM THE INSIDE EDGE OF A SEWER PROVIDED THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER (SEE DETAIL) AND THE WATER MAIN IS LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF.

B. CROSSINGS:

1. NORMAL CONDITIONS: WHENEVER POSSIBLE, THE BOTTOM OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER.
2. UNUSUAL CONDITIONS: IF A WATER MAIN MUST CROSS UNDER A SEWER, THE TOP OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES LOWER THAN THE BOTTOM OF THE SEWER, THE WATER MAIN PIPE SHALL BE CENTERED AT THE CROSSING SO THAT THE JOINTS ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER, AND ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT EXCESSIVE DEFLECTION OF THE SEWER AT THE CROSSING. ADEQUATE STRUCTURAL SUPPORT SHALL INCLUDE BACKFILLING THE ENTIRE UTILITY CROSSING AREA WITH 3/4" CRUSHED STONE AS SHOWN IN THE DETAIL.

MINIMUM WATER & SEWER PIPE SEPARATION

City of Port Wentworth
TECHNICAL DETAILS
U-3

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

NOTES:
1. PRECAST REINFORCED CONCRETE TOPS, RISERS, BASES AND REBARS SHALL CONFORM TO LATEST ASTM C-478 STD. SPECIFICATIONS.
2. INTERIOR OF MANHOLE SHALL BE COATED IN ACCORDANCE WITH CITY OF PORT WENTWORTH STD. SPECIFICATIONS. THE EXTERIOR OF MANHOLE SHALL BE COATED WITH CONSEAL CS-55 DAMP-PROOF COATING OR EQUAL
3. MANUFACTURER CERTIFICATION THAT MANHOLE MEETS ASTM SPECIFICATION SHALL BE SUBMITTED TO CITY OF PORT WENTWORTH.
4. SEE DETAIL SHEET FOR MANHOLE COVER & FRAME.
5. BUOYANCY MAY NEED TO BE CHECKED IF NECESSARY
6. ALL PIPE PENETRATIONS SHALL HAVE A BOOT CONNECTION. SEE DETAIL S-6.

PRECAST CONCRETE MANHOLE

City of Port Wentworth
TECHNICAL DETAILS
S-1

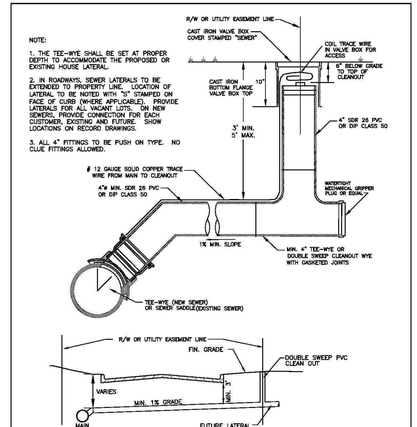
PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

NOTE:
MANHOLE RING & COVER SHALL BE HEAVY DUTY RATED EQUAL TO U. S. FOUNDRY CO. USF 195—ORS. TOTAL WEIGHT 320# TYPE "C" LID TO HAVE MACHINED BEARING SURFACES. LID TO BE LETTERED 2 1/2" –3" LETTER HEIGHT "SANITARY". (NON VENTED). MANHOLE RING SHALL INCLUDE A WATERTIGHT GASKET. STACKING CLEATS ON THE BOTTOM OF THE COVER SHALL NOT BE ALLOWED.

MANHOLE RING & COVER

City of Port Wentworth
TECHNICAL DETAILS
S-2

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

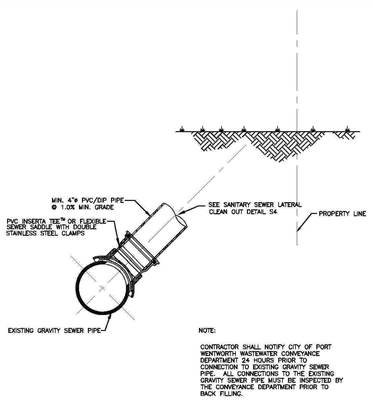


NOTE:
1. THE TEE-WYE SHALL BE SET AT PROPER DEPTH TO ACCOMMODATE THE PROPOSED OR EXISTING HOUSE LATERAL.
2. IN ROADWAYS, SEWER LATERALS TO BE EXTENDED TO PROPERTY LINE. LOCATION OF LATERAL TO BE NOTED WITH "S" STAMPED ON FACE OF CURB (WHERE APPLICABLE). PROVIDE LATERALS FOR ALL VACANT LOTS. ON NEW SEWERS, PROVIDE CONNECTION FOR EACH CUSTOMER, EXISTING AND FUTURE. SHOW LOCATIONS ON RECORD DRAWINGS.
3. ALL 4" FITTINGS TO BE PUSH ON TYPE. NO GLUE FITTINGS ALLOWED.

SANITARY SEWER SERVICE CONNECTION

City of Port Wentworth
TECHNICAL DETAILS
S-4

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SCALE: N.T.S.
DATED: FEBRUARY 2007

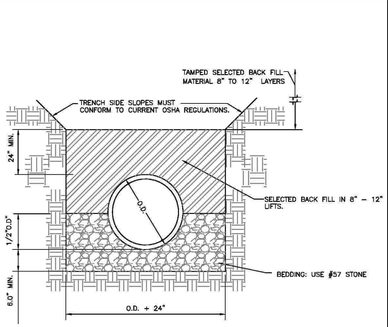


NOTE:
CONTRACTOR SHALL NOTIFY CITY OF PORT WENTWORTH WASTEWATER CONVEYANCE DEPARTMENT 24 HOURS PRIOR TO CONNECTION TO EXISTING GRAVITY SEWER PIPE. ALL CONNECTIONS TO THE EXISTING GRAVITY SEWER PIPE MUST BE INSPECTED BY THE CONVEYANCE DEPARTMENT PRIOR TO BACK FILLING.

SEWER SERVICE CONNECT TO EXT. PIPE

City of Port Wentworth
TECHNICAL DETAILS
S-5

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



PIPE BEDDING

City of Port Wentworth
TECHNICAL DETAILS
S-8

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

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GEORGIA REGISTERED PROFESSIONAL ENGINEER No. PE035652 11/22/21 NEIL P. McKENZIE

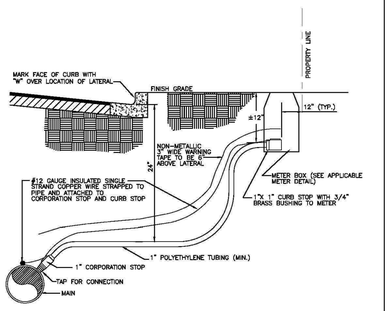
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER: 21-309
DATE: 9/13/21
DRAWN BY: MLF
CHECKED BY: NPM
SCALE: AS NOTED

CONSTRUCTION DETAILS

SHEET:
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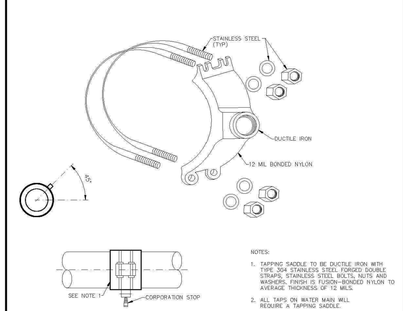


NOTE:
ALL FITTINGS IN LATERAL SHALL BE COMPRESSION TYPE.

WATER SERVICE LATERAL

City of Port Wentworth
TECHNICAL DETAILS
W-1

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

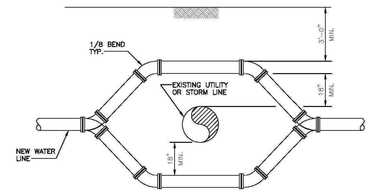


NOTES:
1. TAPPING SADDLE TO BE DUCTILE IRON WITH TYPE 304 STAINLESS STEEL FORGED DOUBLE STRAPS, STAINLESS STEEL BOLTS, NUTS AND WASHERS. FINISH IS FUSION-BONDED NYLON TO AVERAGE THICKNESS OF 12 MILS.
2. ALL TAPS ON WATER MAIN WILL REQUIRE A TAPPING SADDLE.

1" AND 2" TAPPING SADDLE

City of Port Wentworth
TECHNICAL DETAILS
W-2

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SCALE: N.T.S.
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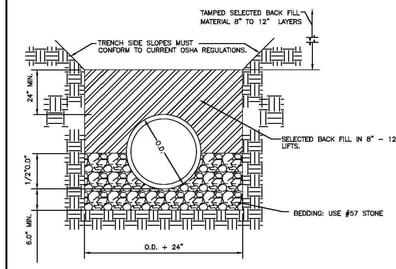


NOTES:
1. WATER LINE SHALL BE INSTALLED ABOVE SANITARY OR STORM LINE IF POSSIBLE.
2. STRAIGHT RUN OF WATER LINE DIRECTLY ABOVE OR BELOW EXISTING UTILITY LINE MUST BE 10' MINIMUM WITH NO JOINT.
3. IF WATER LINE IS INSTALLED BELOW SANITARY LINE WATER LINE SHALL BE DUCTILE IRON PIPE.
4. JOINTS SHALL BE RESTRAINED IN ACCORDANCE WITH CITY OF PORT WENTWORTH STANDARD DETAILS.

STANDARD UTILITY CROSSING

City of Port Wentworth
TECHNICAL DETAILS
W-6

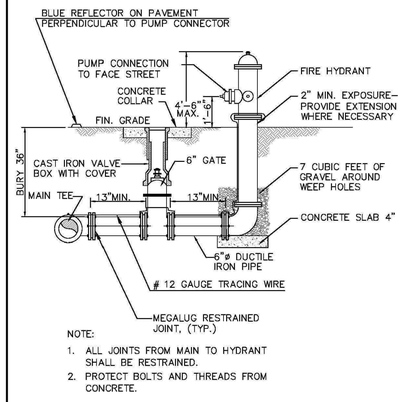
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DATED: FEBRUARY 2007



PIPE BEDDING

City of Port Wentworth
TECHNICAL DETAILS
W-8

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SCALE: N.T.S.
DATED: FEBRUARY 2007



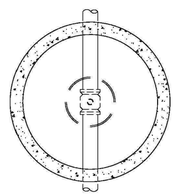
NOTE:
1. ALL JOINTS FROM MAIN TO HYDRANT SHALL BE RESTRAINED.
2. PROTECT BOLTS AND THREADS FROM CONCRETE.

STANDARD FIRE HYDRANT

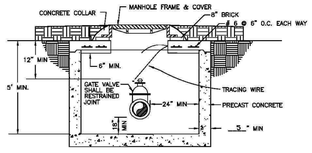
City of Port Wentworth
TECHNICAL DETAILS
W-9

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

NOTES:
1. MANHOLE FRAME AND COVER SHALL BE NEENAH FOUNDRY CO. CATALOG NO. R-1668, TYPE C, LABELED "WATER".
2. THE BOTTOM OF THE MANHOLE FRAME SHALL NOT BE MORE THAN 12" ABOVE THE TOP OF THE MANHOLE STRUCTURE.
3. PRECAST CONCENTRIC CONE RISERS MAY BE USED WHERE REQUIRED FOR DEPTH.
4. THE MANHOLE FRAME AND COVER MUST BE CENTERED OVER THE VALVE.



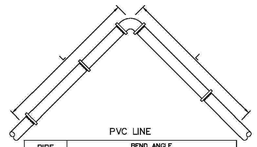
PLAN



VALVE MANHOLE FOR 8" & GREATER GATE VALVE

City of Port Wentworth
TECHNICAL DETAILS
W-14

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



PVC LINE

PIPE DIA.	BEND ANGLE			
	11 1/4°	22 1/2°	45°	90°
4	3	6	12	29
6	4	8	17	41
8	5	11	22	53
10	6	13	26	64
12	7	15	31	75

DUCTILE IRON LINE

PIPE DIA.	BEND ANGLE			
	11 1/4°	22 1/2°	45°	90°
4	2	4	8	20
6	3	6	12	28
8	4	7	15	36
10	4	9	18	43
12	5	10	21	51
16	6	13	27	65
20	8	16	33	79
24	9	18	38	92

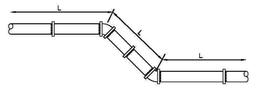
MINIMUM RESTRAINED LENGTH (L)

NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
2. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.

STANDARD HORIZONTAL BEND RESTRAINT

City of Port Wentworth
TECHNICAL DETAILS
W-27

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



PVC LINE

PIPE DIA.	BEND ANGLE			
	11 1/4°	22 1/2°	45°	90°
4	5	10	22	52
6	7	15	30	74
8	9	19	40	96
10	11	23	48	115
12	13	27	56	136

DUCTILE IRON LINE

PIPE DIA.	BEND ANGLE			
	11 1/4°	22 1/2°	45°	90°
4	3	6	12	28
6	4	8	17	40
8	4	10	22	52
10	5	12	26	62
12	6	15	30	73
16	7	19	39	94
20	11	23	47	114
24	13	26	55	132

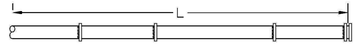
MINIMUM RESTRAINED LENGTH (L)

NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
2. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.

STANDARD VERTICAL BEND RESTRAINT

City of Port Wentworth
TECHNICAL DETAILS
W-28

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



DUCTILE IRON LINE

PIPE DIA.	L
4	28
6	40
8	52
10	62
12	73
16	94
20	114
24	132

PVC LINE

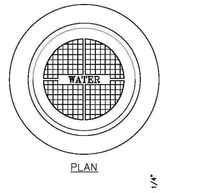
PIPE DIA.	L
4	52
6	74
8	96
10	115
12	136

NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
2. WHERE LIMITS CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.
3. FOR LINE STUBS (SEE DETAIL W39). THE LENGTH OF RESTRAINT (L) SHALL BE FROM THE VALVE AND NOT THE CAP.

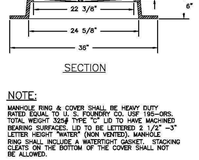
STANDARD DEAD END RESTRAINT

City of Port Wentworth
TECHNICAL DETAILS
W-31

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007



PLAN



SECTION

NOTE:
MANHOLE RING & COVER SHALL BE HEAVY DUTY RATED EQUAL TO U. S. FOUNDRY CO. USF 195-ORS, TOTAL WEIGHT 325# TYPE "C" LID TO HAVE MACHINED BEARING SURFACES. LID TO BE LETTERED 2 1/2" -3" LETTER HEIGHT "WATER" (NON VENTED). MANHOLE RING SHALL INCLUDE A WATERTIGHT GASKET. STACKING CLEATS ON THE BOTTOM OF THE COVER SHALL NOT BE ALLOWED.

MANHOLE RING & COVER

City of Port Wentworth
TECHNICAL DETAILS
W-34

PREPARED BY STEVENSON & PALMER ENGINEERING, INC.
SCALE: N.T.S.
DATED: FEBRUARY 2007

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE035652
11/22/21
NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

CONSTRUCTION DETAILS

SHEET:
C8.1

MATCHLINE: SEE SHEET CE1.1

MATCHLINE: SEE SHEET CE1.2

SOILS DELINEATION LINE (TYP)

Pn

Oj

Cc

Cx

Co

Du
Ds1
Ds2

Sd1-S
DOUBLE ROW

Sd1-NS
SINGLE ROW

LIMIT OF CONSTRUCTION

1"RFC

N032.22503
W081.18653

N032.22458
W081.18563

RIVERS WAY
60' R/W

RATIONALE FOR SEDIMENT STORAGE IN SILT FENCE IN INITIAL PHASE:

THE ONLY LAND THAT IS BEING DISTURBED IN THE INITIAL PHASE IS THE SILT FENCE AREA AND CONSTRUCTION ENTRANCE, THUS THE INITIAL PHASE IS A LINEAR PROJECT AS DEFINED BY THE EROSION CONTROL MANUAL. LINEAR PROJECTS CAN UTILIZE SILT FENCE FOR SEDIMENT STORAGE. FINALLY, THE WAY THE EXISTING SITE IS CONFIGURED, MUCH MORE AREA WOULD NEED TO BE DISTURBED IN THE INITIAL PHASE TO INCLUDE SEDIMENT BASINS AND DIVERSION SWALES TO CONVEY WATER AND SEDIMENT TO SAID BASINS. THUS, SEDIMENT STORAGE IN SILT FENCE IS THE BEST OPTION FOR SEDIMENT STORAGE IN THE INITIAL PHASE. STONE CHECK DAMS TO BE CLEANED AS NECESSARY.

SEDIMENT STORAGE REQUIREMENTS:

DISTURBED AREA (INITIAL):	8 FT WIDE DISTURBANCE FOR SILT FENCE INSTALLATION + CONSTRUCTION EXIT = 0.82 AC
REQ'D STORAGE (INITIAL):	0.82 AC X 67 C.Y./AC = 54.94 C.Y. X 27 C.F./C.Y. = 1,483.38 C.F.
STORAGE PROVIDED (INITIAL):	5,160 LF SILT FENCE X 1.5 (H) X 1.5 (W/2) = 5,157.75 C.F. STORAGE PROVIDED > REQUIRED STORAGE 5,157.75 C.F. > 1,483.38 C.F.; THEREFORE ADEQUATE STORAGE IS PROVIDED IN THE INITIAL PHASE.

NOTE:
- PROJECT AREA IS CURRENTLY PERMITTED UNDER ACTIVE NOI.

SOILS LEGEND	
Cc	CAPE FEAR SOILS
Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

SEQUENCE OF CONSTRUCTION

INITIAL PHASE:
1. INSTALL PERIMETER CONTROLS TO INCLUDE SILT FENCING AND CONSTRUCTION EXIT.
2. LIMIT CLEARING AND GRUBBING OF SITE TO ONLY AREAS NECESSARY FOR CONSTRUCTION AS SHOWN. (SILT FENCE & CONSTRUCTION ENTRANCE).

INTERMEDIATE PHASE:
1. INSTALL UNDERGROUND UTILITIES INCLUDING WATER LINES, SANITARY SEWER AND STORM SYSTEMS.
2. INSTALL INLET PROTECTION/SEDIMENT STORAGE AROUND SPECIFIED INLETS & SEDIMENT BASIN.
3. MASS GRADE SITE TO FINAL ELEVATIONS. PROVIDE AREA WITHIN SITE FOR CONCRETE WASH-OUT AND REMOVAL. ON-SITE DRUM WASH-OUT IS PROHIBITED.

FINAL PHASE:
1. REMOVE SEDIMENT STORAGE AROUND SPECIFIED INLETS.
2. INSTALL CURBING, SIDEWALKS, PAVEMENT SECTIONS, PAVEMENT INLET PROTECTIONS AND FINE GRADE SITE FOR LANDSCAPING.
3. INSTALL LANDSCAPING AND STABILIZE ALL REMAINING DISTURBED AREAS.
4. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND STABILIZE DISTURBED AREAS ACCORDINGLY.

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED No. PE036652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

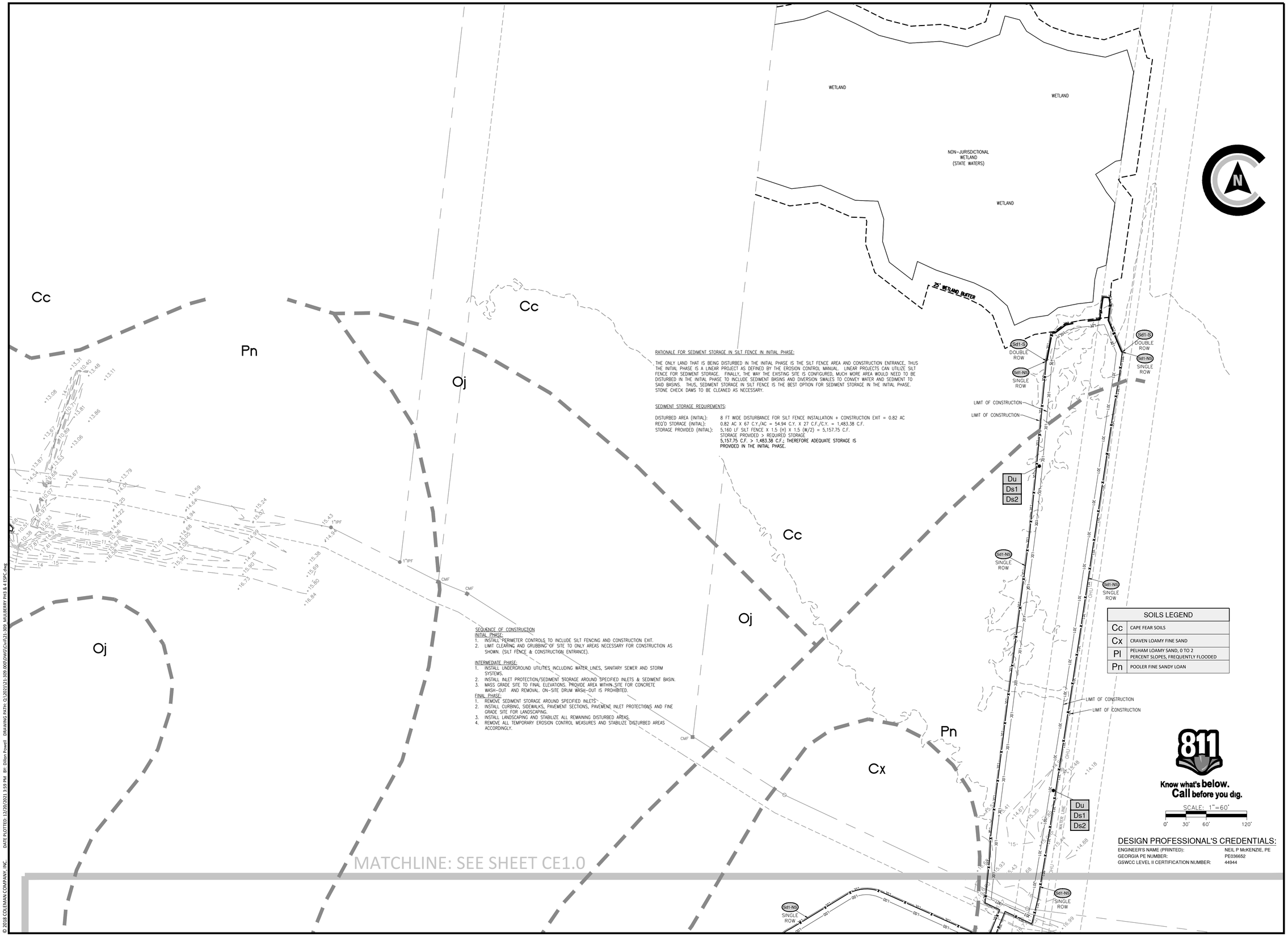
CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	DCP
CHECKED BY:	NPM
SCALE:	AS NOTED

INITIAL ES&PC PLAN

SHEET:
CE1.0

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RATIONALE FOR SEDIMENT STORAGE IN SILT FENCE IN INITIAL PHASE:

THE ONLY LAND THAT IS BEING DISTURBED IN THE INITIAL PHASE IS THE SILT FENCE AREA AND CONSTRUCTION ENTRANCE. THUS THE INITIAL PHASE IS A LINEAR PROJECT AS DEFINED BY THE EROSION CONTROL MANUAL. LINEAR PROJECTS CAN UTILIZE SILT FENCE FOR SEDIMENT STORAGE. FINALLY, THE WAY THE EXISTING SITE IS CONFIGURED, MUCH MORE AREA WOULD NEED TO BE DISTURBED IN THE INITIAL PHASE TO INCLUDE SEDIMENT BASINS AND DIVERSION SWALES TO CONVEY WATER AND SEDIMENT TO SAID BASINS. THUS, SEDIMENT STORAGE IN SILT FENCE IS THE BEST OPTION FOR SEDIMENT STORAGE IN THE INITIAL PHASE. STONE CHECK DAMS TO BE CLEANED AS NECESSARY.

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SOILS LEGEND	
Cc	CAPE FEAR SOILS
Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

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GEORGIA REGISTERED No. PE036652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

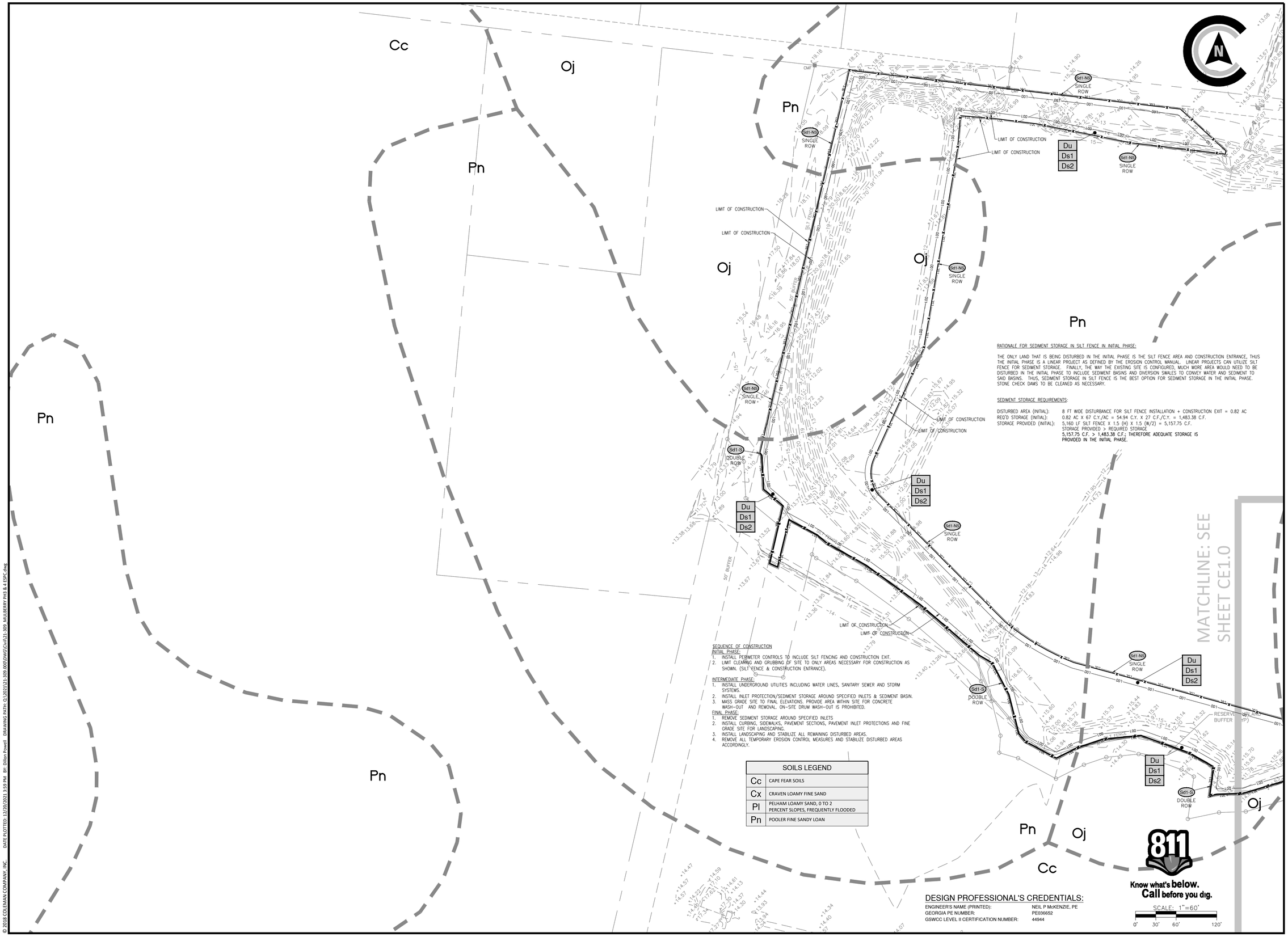
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
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CHECKED BY:	NPM
SCALE:	AS NOTED

INITIAL ES&PC PLAN

SHEET:
CE1.1



SEQUENCE OF CONSTRUCTION

INITIAL PHASE:
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Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

RATIONALE FOR SEDIMENT STORAGE IN SILT FENCE IN INITIAL PHASE:

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STORAGE PROVIDED (INITIAL): 5,160 LF SILT FENCE X 1.5 (H) X 1.5 (W/2) = 5,157.75 C.F.
STORAGE PROVIDED > REQUIRED STORAGE
5,157.75 C.F. > 1,483.38 C.F.; THEREFORE ADEQUATE STORAGE IS PROVIDED IN THE INITIAL PHASE.

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

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SCALE: 1"=60'
0' 30' 60' 120'

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED No. PE036652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
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DRAWN BY:	DCP
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SCALE:	AS NOTED

INITIAL ES&PC PLAN

SHEET:
CE1.2

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MATCHLINE: SEE SHEET CE2.1

MATCHLINE: SEE SHEET CE2.2

SOILS DELINEATION LINE (TYP)

LIMIT OF CONSTRUCTION

DRAINAGE DIVIDE

BASIN # 1
15.62 AC

BASIN # 2
14.43 AC

APRON # 1
3.67 CY RIP RAP

APRON # 2
2 CY RIP RAP

APRON # 3
2 CY RIP RAP

APRON # 4
2 CY RIP RAP

SINGLE ROW

DOUBLE ROW

SEDIMENT BARRIER

100' SAVANNAH ELECTRIC & POWER CO. & CITY OF SAVANNAH WATER MAIN EASEMENT

30' UTILITY EASEMENT (CENTERED ON POWERLINE)

N032.22503
W081.18653

N032.22458
W081.18563

SEDIMENT STORAGE REQUIREMENTS:

BASIN #1:
DISTURBED AREA: ± 15.62 AC
REQUIRED STORAGE: 15.62 AC X 67 C.Y./AC = 1,047 C.Y. X 27 C.F./C.Y. = 28,269 C.F.
STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #2
STATIC ELEV. (12.00) AREA: 143,222 S.F.
BOTTOM ELEV. (7.00) AREA: 86,840 S.F.
DEPTH: 5.00 - 0.00 = 5.00 FT
(143,222 + 86,840)/2 = 230,062/2 = 115,031 X 5.00' DEPTH= 575,155 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #1 = 575,155 C.F.
575,155 C.F. > 28,269 C.F. THEREFORE, ADEQUATE STORAGE IS PROVIDED

BASIN #2:
DISTURBED AREA: ± 14.43 AC
REQUIRED STORAGE: 14.43 AC X 67 C.Y./AC = 967 C.Y. X 27 C.F./C.Y. = 26,109 C.F.
STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #3
STATIC ELEV. (12.00) AREA: 140,077 S.F.
BOTTOM ELEV. (7.00) AREA: 75,821 S.F.
DEPTH: 5.00 - 0.00 = 5.00 FT
(140,077 + 75,821)/2 = 215,898/2 = 107,949 X 5.00' DEPTH= 539,745 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #2 = 539,745 C.F.
539,745 C.F. > 26,109 C.F. THEREFORE, ADEQUATE STORAGE IS PROVIDED

SOILS LEGEND	
Cc	CAPE FEAR SOILS
Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

SEQUENCE OF CONSTRUCTION
INITIAL PHASE:
1. INSTALL PERIMETER CONTROLS TO INCLUDE SILT FENCING AND CONSTRUCTION EXIT.
2. LIMIT CLEARING AND GRUBBING OF SITE TO ONLY AREAS NECESSARY FOR CONSTRUCTION AS SHOWN. (SILT FENCE & CONSTRUCTION ENTRANCE).

INTERMEDIATE PHASE:
1. INSTALL UNDERGROUND UTILITIES INCLUDING WATER LINES, SANITARY SEWER AND STORM SYSTEMS.
2. INSTALL INLET PROTECTION/SEDIMENT STORAGE AROUND SPECIFIED INLETS & SEDIMENT BASIN.
3. MASS GRADE SITE TO FINAL ELEVATIONS. PROVIDE AREA WITHIN SITE FOR CONCRETE WASH-OUT AND REMOVAL. ON-SITE DRUM WASH-OUT IS PROHIBITED.

FINAL PHASE:
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3. INSTALL LANDSCAPING AND STABILIZE ALL REMAINING DISTURBED AREAS.
4. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND STABILIZE DISTURBED AREAS ACCORDINGLY.

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

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GEORGIA REGISTERED No. PE036652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/22/21

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
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JOB NUMBER:	21-309
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DRAWN BY:	DCP
CHECKED BY:	NPM
SCALE:	AS NOTED

INTERM ES&PC PLAN

SHEET:
CE2.0



SOILS LEGEND	
Cc	CAPE FEAR SOILS
Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

SEDIMENT STORAGE REQUIREMENTS:

BASIN #1 :
- DISTURBED AREA: ± 15.62 AC
- REQUIRED STORAGE: 15.62 AC X 67 C.Y./AC = 1,047 C.Y. X 27 C.F./C.Y. = 28,269 C.F.
- STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
  STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #2
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BOTTOM ELEV. (7.00) AREA: 86,840 S.F.
DEPTH: 5.00 – 0.00 = 5.00 FT
(143,222 + 86,840)/2 = 230,062/2 = 115,031 X 5.00' DEPTH= 575,155 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #1 = 575,155 C.F.
575,155 C.F. > 28,269 C.F. THEREFORE, ADEQUATE STORAGE IS PROVIDED

BASIN #2:
- DISTURBED AREA: ± 14.43 AC
- REQUIRED STORAGE: 14.43 AC X 67 C.Y./AC = 967 C.Y. X 27 C.F./C.Y. = 26,109 C.F.
- STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
  STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #3
STATIC ELEV. (12.00) AREA: 140,077 S.F.
BOTTOM ELEV. (7.00) AREA: 75,821 S.F.
DEPTH: 5.00 – 0.00 = 5.00 FT
(140,077 + 75,821)/2 = 215,898/2 = 107,949 X 5.00' DEPTH= 539,745 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #2 = 539,745 C.F.
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SEQUENCE OF CONSTRUCTION

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2. LIMIT CLEARING AND GRUBBING OF SITE TO ONLY AREAS NECESSARY FOR CONSTRUCTION AS SHOWN. (SILT FENCE & CONSTRUCTION ENTRANCE).

INTERMEDIATE PHASE:
1. INSTALL UNDERGROUND UTILITIES INCLUDING WATER LINES, SANITARY SEWER AND STORM SYSTEMS.
2. INSTALL INLET PROTECTION/SEDIMENT STORAGE AROUND SPECIFIED INLETS & SEDIMENT BASIN.
3. MASS GRADE SITE TO FINAL ELEVATIONS. PROVIDE AREA WITHIN SITE FOR CONCRETE WASH-OUT AND REMOVAL. ON-SITE DRUM WASH-OUT IS PROHIBITED.

FINAL PHASE:
1. REMOVE SEDIMENT STORAGE AROUND SPECIFIED INLETS
2. INSTALL CURBING, SIDEWALKS, PAVEMENT SECTIONS, PAVEMENT INLET PROTECTIONS AND FINE GRADE SITE FOR LANDSCAPING.
3. INSTALL LANDSCAPING AND STABILIZE ALL REMAINING DISTURBED AREAS.
4. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND STABILIZE DISTURBED AREAS ACCORDINGLY.

Know what's below. Call before you dig.

SCALE: 1"=60'
0' 30' 60' 120'

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

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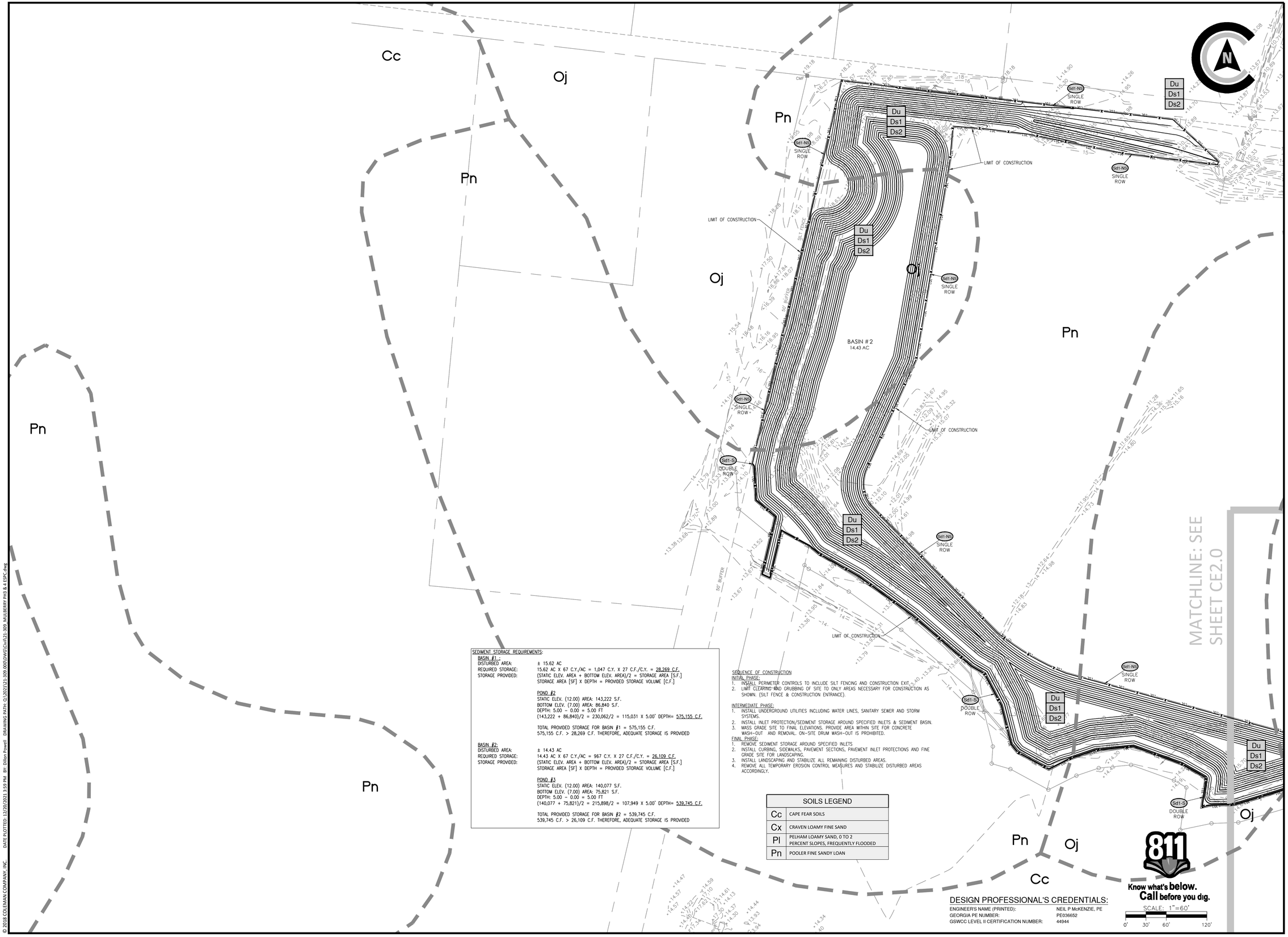
REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER:	21-309
DATE:	9/13/21
DRAWN BY:	DCP
CHECKED BY:	NPM
SCALE:	AS NOTED

INTERM ES&PC PLAN

SHEET:
CE2.1



SEDIMENT STORAGE REQUIREMENTS:

BASIN #1 :
DISTURBED AREA: ± 15.62 AC
REQUIRED STORAGE: 15.62 AC X 67 C.Y./AC = 1,047 C.Y. X 27 C.F./C.Y. = 28,269 C.F.
STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #2
STATIC ELEV. (12.00) AREA: 143,222 S.F.
BOTTOM ELEV. (7.00) AREA: 86,840 S.F.
DEPTH: 5.00 – 0.00 = 5.00 FT
(143,222 + 86,840)/2 = 230,062/2 = 115,031 X 5.00' DEPTH= 575,155 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #1 = 575,155 C.F.
575,155 C.F. > 28,269 C.F. THEREFORE, ADEQUATE STORAGE IS PROVIDED

BASIN #2:
DISTURBED AREA: ± 14.43 AC
REQUIRED STORAGE: 14.43 AC X 67 C.Y./AC = 967 C.Y. X 27 C.F./C.Y. = 26,109 C.F.
STORAGE PROVIDED: (STATIC ELEV. AREA + BOTTOM ELEV. AREA)/2 = STORAGE AREA [S.F.]
STORAGE AREA [SF] X DEPTH = PROVIDED STORAGE VOLUME [C.F.]

POND #3
STATIC ELEV. (12.00) AREA: 140,077 S.F.
BOTTOM ELEV. (7.00) AREA: 75,821 S.F.
DEPTH: 5.00 – 0.00 = 5.00 FT
(140,077 + 75,821)/2 = 215,898/2 = 107,949 X 5.00' DEPTH= 539,745 C.F.

TOTAL PROVIDED STORAGE FOR BASIN #2 = 539,745 C.F.
539,745 C.F. > 26,109 C.F. THEREFORE, ADEQUATE STORAGE IS PROVIDED

SEQUENCE OF CONSTRUCTION
INITIAL PHASE:
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SOILS LEGEND	
Cc	CAPE FEAR SOILS
Cx	CRAVEN LOAMY FINE SAND
Pl	PELHAM LOAMY SAND, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED
Pn	POOLER FINE SANDY LOAN

DESIGN PROFESSIONAL'S CREDENTIALS:

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MATCHLINE: SEE SHEET CE3.1

MATCHLINE: SEE SHEET CE3.2

Oj
Pn
Cc
Cx
Pl
Co
Fr

SOILS DELINEATION LINE (TYP)

LIMIT OF CONSTRUCTION

Sd1-NS SINGLE ROW
Sd1-S DOUBLE ROW
Sd2-P SEDIMENT BARRIER
Du Ds3
St APRON #1 3.67 CY RIP RAP
St APRON #2 2 CY RIP RAP
St APRON #3 2 CY RIP RAP
St APRON #4 2 CY RIP RAP
St APRON #5 2 CY RIP RAP

NO32.22503 W081.18653
NO32.22458 W081.18563

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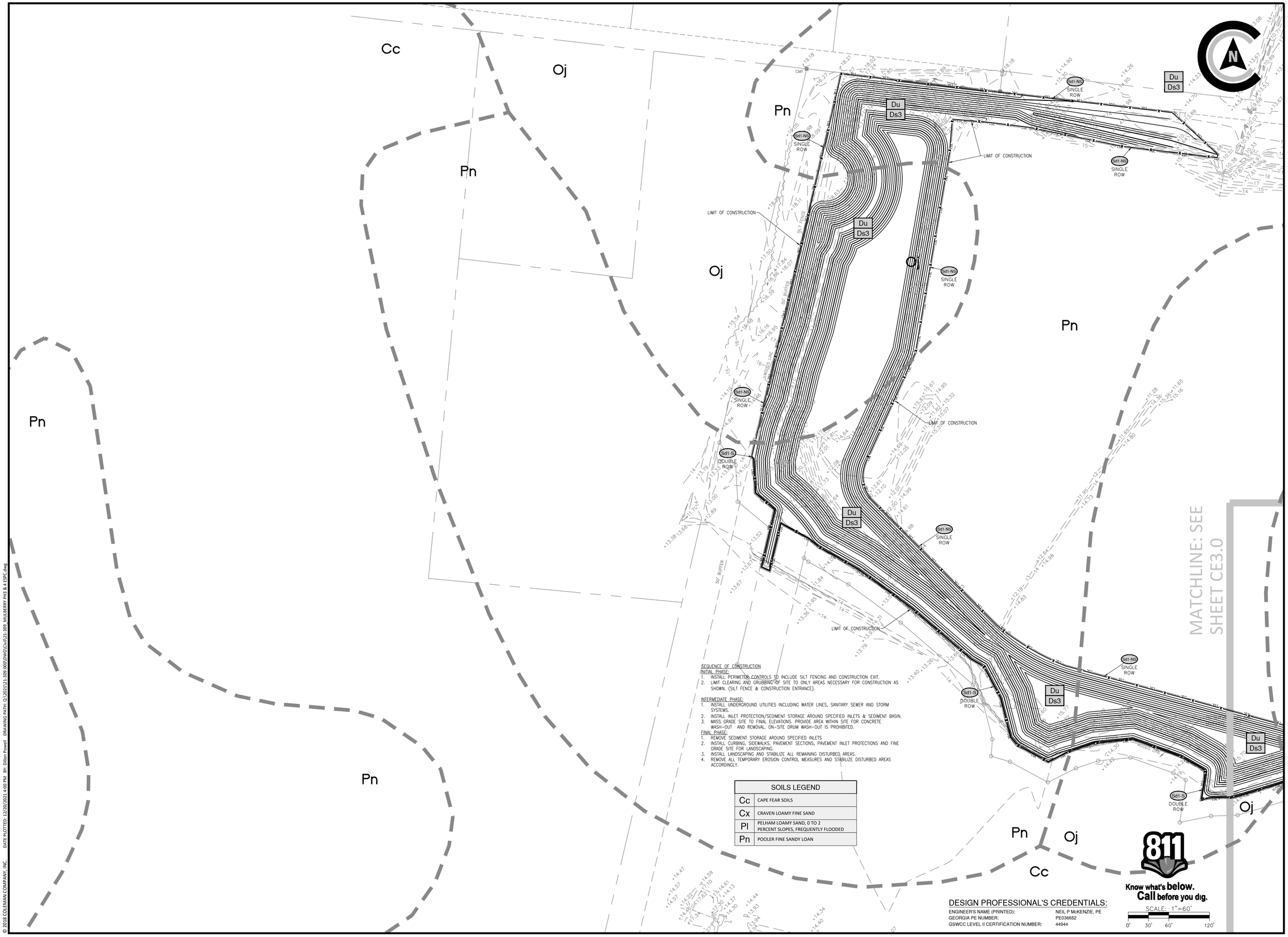
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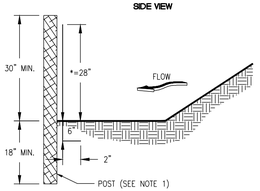
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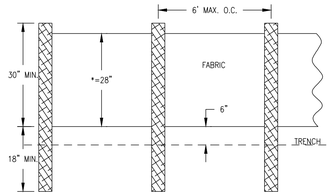
SILT FENCE – TYPE NS (NON-SENSITIVE)

Sd1-NS

SIDE VIEW



FRONT VIEW

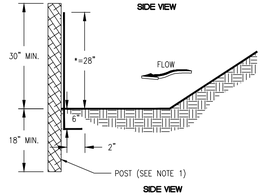


NOTES:
1. USE STEEL OR WOOD POSTS OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.
2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

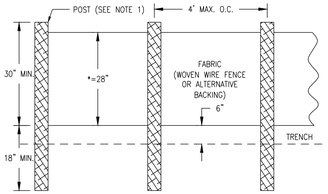
SILT FENCE – TYPE S (SENSITIVE)

Sd1-S

SIDE VIEW



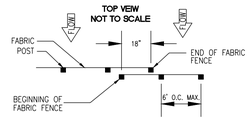
SIDE VIEW



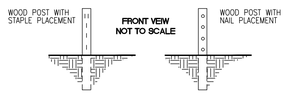
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OVERLAP AT FABRIC ENDS

TOP VIEW
NOT TO SCALE



FASTENERS FOR SILT FENCES



POST SIZE

TYPE	MIN. LENGTH	TYPE OF POST	SIZE OF POST
NS	4'	OAK	1.5"x1.5"
		STEEL	1.15 LB/FT MIN.
S	4'	SOFT WOOD	3" DIA. OR 2"x4"
		OAK	2"x2"
		STEEL	1.15 LB/FT MIN.

FASTENERS FOR WOOD POST (WIRE STAPLES)

GAUGE	CROWN	LEGS	STAPLES/POST
17 MIN.	3/4" WIDE	1/2" LONG	5 MIN.

FASTENERS FOR WOOD POST (NAILS)

GAUGE	LENGTH	BUTTON HEADS	NAIL/POST
14 MIN.	1"	3/4"	4 MIN.

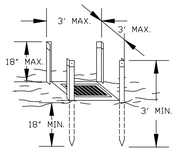
NOTE: FILTER FABRIC MAY ALSO BE ATTACHED TO THE POST BY WIRE, CORD, AND POCKETS OR ANY METHOD PROVIDED MINIMUM P-FACTOR, AS REQUIRED BY GCWCC, IS MET.

NOTES:
1. THE FABRIC AND WIRE SHOULD BE SECURELY FASTENED TO POSTS AND FABRIC ENDS MUST BE OVERLAPPED A MINIMUM OF 18" OR WRAPPED TOGETHER AROUND A POST TO PROVIDE A CONTINUOUS FABRIC BARRIER AROUND THE INLET.

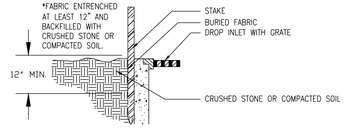
FABRIC AND SUPPORTING FRAME FOR INLET PROTECTION

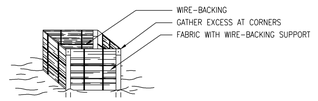
Sd2-F

STEEL FRAME AND SILT FENCE INSTALLATION



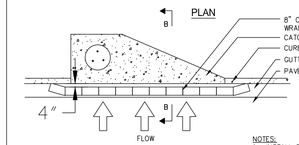
NOTES:
1. DESIGN IS FOR SLOPES NO GREATER THAN 5% (NOT DESIGNED FOR CONCENTRATED FLOWS).
2. THE STEEL POSTS SUPPORTING THE SILT FENCE MATERIAL SHOULD BE SPACED EVENLY AROUND THE PERIMETER OF THE INLET (MAXIMUM OF 3' APART).
3. THE STEEL POSTS SHOULD BE SECURELY DRIVEN AT LEAST 18" DEEP.
4. THE FABRIC SHOULD BE ENTRENCHED AT LEAST 12" AND THEN BACKFILLED WITH CRUSHED STONE OR COMPACTED SOIL.

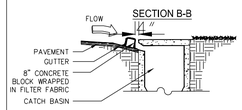




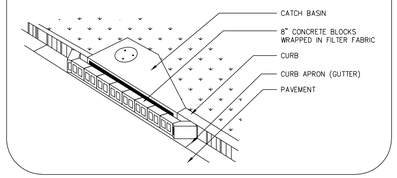
Sd2-P

CURB INLET FILTER "PIGS IN BLANKET"





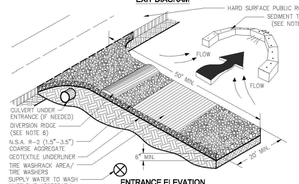
NOTES:
1. INSTALL FILTER AFTER ANY ASPHALT PAVEMENT INSTALLATION.
2. WRAP 8" CONCRETE BLOCKS IN FILTER FABRIC AND SPAN ACROSS CATCH BASIN INLET.
3. FACE OPENINGS IN BLOCKS OUTWARD.
4. LEAVE A GAP OF APPROXIMATELY 4 INCHES BETWEEN THE CURB AND THE FILTERS TO ALLOW FOR OVERFLOW TO PREVENT HAZARDOUS PONDING.
5. INSTALL OUTLET PROTECTION BELOW STORM DRAIN OUTLETS.



Co

CRUSHED STONE CONSTRUCTION EXIT

EXIT DIAGRAM



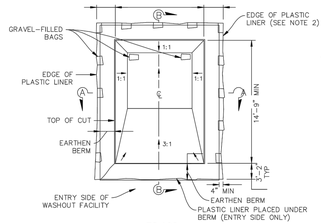
ENTRANCE ELEVATION



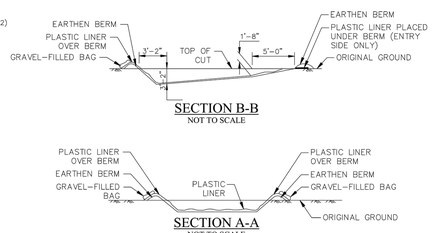
NOTES:
1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R-2 (1.5"-3.5" STONE).
4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".
5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.
6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.
7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.
8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).
9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.
10. MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

Figure 6-14.1

EXCAVATED PIT CONCRETE WASHOUT



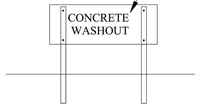
PLAN
TYPE "EXCAVATED PIT"



SECTION B-B
NOT TO SCALE

SECTION A-A
NOT TO SCALE

LETTERS A MINIMUM OF 5" IN HEIGHT



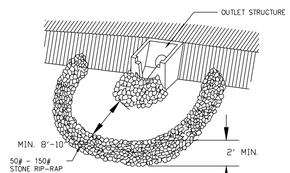
CONCRETE WASHOUT SIGN DETAIL

NOTES:
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. INSTALL CONCRETE WASHOUT SIGN (24"X24", MINIMUM) WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. TEMPORARY WASHOUT AREA MUST BE AT LEAST 50' FROM A STORM DRAIN, CREEK BANK OR PERIMETER CONTROL.
4. CLEAN OUT CONCRETE WASHOUT AREA WHEN 50% FULL.
5. THE KEY TO FUNCTIONAL CONCRETE WASHOUTS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR CLEAN OUT.
6. SILT FENCE SHALL BE INSTALLED AROUND PERIMETER OF CONCRETE WASHOUT AREA EXCEPT FOR THE SIDE UTILIZED FOR ACCESSING THE WASHOUT.
7. A ROCK CONSTRUCTION ENTRANCE MAY BE NECESSARY ALONG ONE SIDE OF THE WASHOUT TO PROVIDE VEHICLE ACCESS.

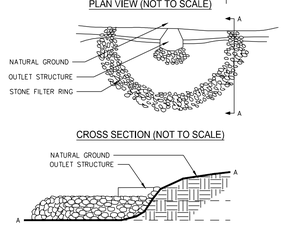
Fr

STONE FILTER RING

PERSPECTIVE VIEW



PLAN VIEW (NOT TO SCALE)

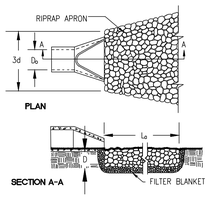


CROSS SECTION (NOT TO SCALE)

St

RIPRAP OUTLET PROTECTION

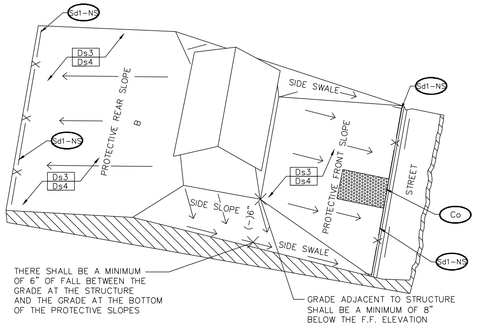
PIPE OUTLET TO FLAT AREA -- NO WELL DEFINED CHANNEL



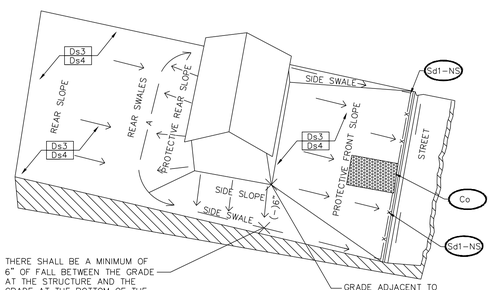
NOTES:
1. La IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN A WELL-DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK (WHICHEVER IS LESS).
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND THE SOIL FOUNDATION.

PIPE OUTLET TO WELL DEFINED CHANNEL

NOTES:
1. La IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN A WELL-DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK (WHICHEVER IS LESS).
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND THE SOIL FOUNDATION.



INDIVIDUAL LOT GRADING EROSION CONTROL BMP's
FOR TYPE "B" LOTS (DRAIN BOTH TO STREET AND REAR)



LOT GRADING TYPE "A"
ALL DRAINAGE TO STREET

RIP RAP APRON DESIGN

Date: 9/30/2021

MULBERRY TARCT PH 3 & 4 — CC#: 21-309

APRON	Outlet Pipe Diameter / Width D* ft.	Velocity V* fps	Total Outflow Q*25 cfs	Tailwater Depth < 0.5Do > < >	La and Do from figure 6-24.1 in green book L ft.	Do50 in.	W=Do+La W1 ft.	Depth of Apron=1.5*D 50 (6"min) H in.	3Do W2 ft.	RIP RAP AREA sy
ST#1	3.00	1.99	13.68	>	12.00	6.00	7.80	9.00	9.00	11
ST#2	2.00	3.36	15.27	>	9.00	3.00	5.60	4.50	6.00	6
ST#3	2.00	2.94	15.27	>	9.00	3.00	5.60	4.50	6.00	6
ST#4	2.00	3.80	14.86	>	9.00	3.00	5.60	4.50	6.00	6
ST#5	2.00	2.84	14.86	>	9.00	3.00	5.60	4.50	6.00	6
ST#6	2.00	2.84	18.12	>	9.00	3.00	5.60	4.50	6.00	6

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED): NEIL P McKENZIE, PE
GEORGIA PE NUMBER: PE036652
GSWCC LEVEL II CERTIFICATION NUMBER: 44944

COLEMAN COMPANY
ENGINEERS • SURVEYORS
Savannah, Georgia | (912) 200-3041 | COLSAV.COM

NOT FOR CONSTRUCTION

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE036652
11/22/21
NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER: 21-309
DATE: 9/13/21
DRAWN BY: DCP
CHECKED BY: NPM
SCALE: AS NOTED

EROSION CONTROL DETAILS

SHEET:
CE4.0

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DATE PLOTTED: 12/20/2021 4:00 PM - BY: Dillon Powell - DRAWING PATH: Q:\2021\21-309.000\DWG\Civil\21-309_MULBERRY PH3 & 4 ESPC.dwg

Ds1

DISTURBED AREA STABILIZATION
(WITH MULCHING ONLY)

DEFINITION

A temporary cover of plant residues or other suitable materials, produced on site if possible, applied to the soil surface.



PURPOSE

- Reduce runoff and erosion
- Modify soil temperature
- Conserve moisture
- Prevent surface compaction and crusting
- Control undesirable vegetation
- Increase biological activity in the soil

INSTALLATION

- Apply mulch or temporary grassing to all exposed areas within 14 days of disturbance.
- Applicable to graded or cleared areas where seedings may not have a suitable growing season to produce an erosion retardant cover.
- Mulch can be used as a singular erosion control device for up to 6 months.
- Apply at the appropriate depth. Refer to Table 1 for specific materials.

Site Preparation

- Grade to permit the use of equipment for applying and anchoring mulch

Ds1

- Install needed erosion control measures such as dikes, berms, and sediment barriers.
- Loosen compacted soil to a minimum depth of 3".

Applying Mulch

- Apply dry straw or hay and wood chips uniformly by hand or by mechanical equipment.
- Apply 20-30 lbs of nitrogen/acre if the area will eventually be covered with perennial vegetation.
- Apply polyethylene film on exposed areas.

Anchoring Mulch

- Press straw or hay into the soil with a disk harrow immediately after application. Tackifiers may be used when spreading mulch with blower-type equipment.
- Anchor wood waste using the appropriate size netting
- Trench polyethylene at the top as well as incrementally as necessary.

Table 1. Mulching Application Requirements

Material	Rate	Depth
Straw or hay	-	2" to 4"
Wood waste, chips, sawdust, bark	-	2" to 3"
Polyethylene film	Secure with soil, anchors, weights	-
Geotextiles, jute matting, netting, etc.	See manufac-turer's recom-mentations	-

MAINTENANCE

- The appropriate depth and 90% cover shall be maintained at all times.

Ds3

DISTURBED AREA STABILIZATION
(WITH PERMANENT VEGETATION)

ESTABLISHING A PERMANENT VEGETATIVE COVER AS A DISTURBED AREA.
- –TO STABILIZE THE SOIL
- –TO REDUCE DAMAGE FROM SEDIMENT AND RUNOFF TO DOWNSTREAM AREAS
- –TO IMPROVE WILDLIFE HABITAT AND VISUAL RESOURCES

*APPLICABLE ON HIGHLY ERODIBLE OR SEVERELY ERODED AREAS, SOMETIMES CALLED "CRITICAL AREAS"

INCLUDING:

- –CUT OR FILL SLOPES
- –EARTH SPILLWAYS
- –BORROW AREAS
- –CHANNEL BANKS
- –BERMS
- –ROADSIDES
- –SPOILS AREAS
- –GULLIED LANDS

*GRADING AND SHAPING REQUIRED WHERE FEASIBLE PRACTICAL
*SEEDED PREPARATION
–NOT REQUIRED IF USING HYDRAULIC SEEDING AND FERTILIZING
–WHEN REQUIRED:

SLOPE	SEEDBED
3:1 OR FLATTER	≥ 4" DEEP
2:1 TO 3:1	4" TO 4" DEEP
2:1 OR STEEPER	DEPRESSION EVERY 6'–8" WITH HAND TOOL

*HAVE SOIL ANALYZED FOR LIME AND FERTILIZER RATE
*MULCH ALL SLOPES STEEPER THAN 3% AND IN BOTTOM OF SPILLWAYS AND ON ROADBANKS
*ANCHOR MULCH IMMEDIATELY

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Bahia, Pensacola Alone or with temporary cover With other perennials	60 lbs. 30 lbs.	1.4 lbs. 0.7 lb.	---	4/1 -5/31	3/1-5/31	Low growing; sod producing; will spread into Bermuda lawns.
Bahia, Wilmington Alone or with temporary cover With other perennials	60 lbs. 30 lbs.	1.4 lbs. 0.7 lb.	3/15-5/31	3/1-5/31	___	Same as above
Bermuda, Common (Hulled seed) Alone With other perenials	10 lbs. 6 lbs.	0.2 lb. 0.1 lb.	---	4/1-5/31	3/15-5/31	Quick cover; low growing; sod forming; needs full sun.
Bermuda, Common (Unhulled seed) With temporary cover With other perennials	10 lbs. 6 lbs.	0.2 lb. 0.1 lb	---	10/1-2/28	11/1-1/31	Plant with Winter annuals. Plant with Tall Fescue

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Bermuda Springs Common lawn and forage hybrids	40 cu. ft. Sod plugs 3' x3'	0.9 cu.ft.	4/15-6/15	4/1-6/15	4/1-5/31	1 cu. ft. = 650 sprigs 1 bu. = 1.25 cu. ft. or 800 sprigs
Centipede	Blcok Sod Only	Block Sod Only	---	11/1-5/31	11/1-5/31	Drought tolerant. Full sun or partial shade.
Crown Vetch With winter annuals or cool season grasses	15 lbs.	0.3 lb.	9/1-10/15	9/1-10/15	--	Mix with 30 lbs. Tall Fescue or 15 lbs. Rye; inoculate seed; plant only North of Atlanta.
Fescue, Tall Alone With other perennials	50 lbs. 30 lbs.	1.1 lbs. 0.7 lb.	3/1-4/15 or 8/15-10/15	9/1-10/15	---	Can be mixed with perennial Lespedezas or Crown Vetch; not for droughty soils or heavy use areas

Ds3

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Lespedeza, Sericea Scarified	60 lbs.	1.4 lbs.	4/1-5/31	3/15-5/31	3/1-5/15	Widely adapted and low maintenance; takes 2-3 years to establish; inoculate seed with EL inoculant; mix with Weeping lovegrass, Common Bermuda, Bahia or Tall Fescue.
Unscarified	75 lbs.	1.7 lbs.	9/1-2/28	9/1-2/28	9/1-2/28	Mix with Tall Fescue or winter annuals.
Seed-bearing hay	3 tons	138 lbs.	10/1-2/28	10/1-1/31	10/15-1/15	Cut when seed is mature but before it shatters. Add Tall Fescue or winter annuals.

Ds2–Ds3 NOTES:

Ds2
1. FOR TEMPORARY GRASSING SEE SEEDING RATES FOR TEMPORARY & PERMANENT COVER. THE TEMPORARY GRASSING SHALL BE APPLIED WITHIN 14 DAYS OF DISTURBANCE.
2. A 6–12–12 FERTILIZER SHALL BE USED ON THE DISTURBED AREA OF Ds2 AND SHALL BE APPLIED AT A RATE OF 1500 LBS. PER AC.

Ds3
1. FOR PERMANENT GRASSING SEE SEEDING RATES FOR TEMPORARY & PERMANENT COVER. IF A HYDRAULIC SEEDER IS TO BE USED, REFER TO THE EROSION AND SEDIMENT CONTROL MANUAL FOR FURTHER DIRECTION ON THE METHOD OF APPLICATION.
2. A 6–12–12 FERTILIZER SHALL BE USED ON THE DISTURBED AREA OF Ds3 AND SHALL BE APPLIED AT RATE OF 1500 LBS. PER AC.
3. DRIED STRAW OR DRY HAY SHALL BE USED FOR MULCHING AND APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH WILL BE SPREAD UNIFORMLY WITHIN 24 HOURS AFTER SEEDING. THE MULCH MAY BE SPREAD BY BLOWER–TYPE SPREADING EQUIPMENT, OTHER SPREADING EQUIPMENT OR BY HAND. MULCH SHALL BE APPLIED TO COVER 75% OF THE SOIL SURFACE.

LIME
APPLY ONE (1) TON OF AGRICULTURAL LIME EVERY 4 TO 6 YEARS OR AS INDICATED BY SOIL TEST. SOIL TESTS CAN BE CONDUCTED TO DETERMINE MORE ACCURATE REQUIREMENTS.

Ds2

DISTURBED AREA STABILIZATION
(WITH TEMPORARY SEEDING)

ESTABLISHING TEMPORARY VEGETATIVE COVER WITH FAST GROWING SEEDINGS ON DISTURBED OR DENUDED AREAS.



ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.

* SITE PREPARATION
  - –GRADING AND SHAPING
  - –SEEDBED PREPARATION
  - –APPLY LIME AND FERTILIZER
  - –PLANT SEEDING, SELECT SPECIES BY SEASON AND REGION
  - –APPLY MULCHING MATERIAL IF NEEDED
  - –IRRIGATE IF NEEDED BUT NOT AT RATE TO CAUSE EROSION

*PLANTING DATES DEPEND ON SPECIES AND REGION (MOUNTAIN, PIEDMONT OR COASTAL)

SEEDING RATES FOR TEMPORARY SEEDINGS

SPECIES	RATE (A) PER 1,000 SQ FT	RATE (A) PER ACRES	PLANTING DATES (δ) MTS–L'STONE	PIEDMONT	COASTAL
RYEGRASS	0.9 POUNDS	40 LBS	8/15–11/15	9/1–12/15	9/15–12/31
ANNUAL LESPEDEZA	0.9 POUNDS	40 LBS.	3/1–3/31	3/1–3/31	2/1–2/28
WEEPING LOVEGRASS	0.1 POUNDS	4 LBS.	4/1–5/31	4/1–5/31	3/1–5/31

* ALL SEEDING NUMBERS ARE ALONE FOR MIXTURE NUMBER SEE MANUAL FOR EROSION AND SEDIMENT TABLE 6–24.1 PAGES 6–134 – 6–136.

A UNUSUAL SITE CONDITIONS MAY REQUIRE HEAVIER SEEDING RATES.
δ SEEDING DATES MAY NEED TO BE ALTERED TO FIT TEMPERATURE VARIATIONS AND LOCAL CONDITIONS.

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Lespedeza Ambro Virgata or Appalow Scarified	60 lbs.	1.4 lbs.	4/1-5/31	3/15-5/31	3/1-5/15	Spreading growth with height of 18"-24"; good in urban areas; slow to develop good stands; mix with Weeping Lovegrass, Common Bermuda, Bahia Tall Fescue or winter annuals; do not mix with Sericea Lespededeza; inoculate seed with EL inoculant.
Unscarified	75 lbs.	1.7 lbs.	9/1-2/28	9/1-2/28	9/1-2/28	
Lespedeza, Shrub (Lespedeza Bicolor or Lespedeza Thumbergii) Plants	3' x 3' spacing		10/1-3/31	11/1-3/15	11/15-2/28	Plant in small clumps for wildlife food and cover.

Ds3

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Lovegrass, weeping Alone With other perennials	4 lbs. 2 lbs.	0.1 lb. 0.05 lb.	4/1-5/31	3/15-5/31	3/1-5/31	Quick cover; drought tolerant; grows well with Sericea Lespedeza on road-banks and other steep slopes; short lived.
Maidencane sprigs	2' x 3' spacing		2/1-3/31	2/1-3/31	2/1-3/31	For very wet sites such as river banks and shorelines. Dig sprigs locally.
Panicgrass, Altantic Coastal	20 lbs.	0.5 lb.	---	3/1-4/30	3/1-4/30	Grows well on coastal sand dunes; mix with Sericea Lespedeza but not on sand dune.
Red Canary Grass With other perennials	50 lbs. 30 lbs.	1.1 lbs. 0.7 lb.	8/15-10/15	9/1-10/15	____	Grows similar to Tall Fescue; for wet sites

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region M- L	P	C	Remarks
Sunflower, Aztec Maximillian	10 lbs.	0.2 lb.	4/15-5/31	4/15-5/31	4/1-5/31	Mix with Weeping Lovegrass or other low growing grasses or legumes.

1. Rates are for broadcasted seed. If a seed drill is used, reduce the rates by one-half.
2. PLS is an abbreviation for Pure Live Seed. Refer to Glossary for an explanation of this term.
3. The resource areas are defined in the Glossary. See page 60 for Resource Area.
4. Seeding rates are based on pure live seeds (PLS).

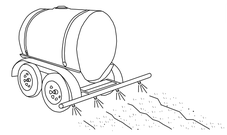
Table 2. Fertilizer Requirements for Permanent Vegetation

Ds3

Types of Species	Planting Year	Fertilizer (N-P-K)	Rate (lbs./ acre)	N Top Dressing Rate (lbs./acre)
Cool season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 1000 400	50-100 --- 30
Cool grasses and legumes	First Second Maintenance	6-12-12 0-10-10 0-10-10	1500 1000 400	0-50 --- ---
Warm season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 800 400	50-100 50-100 30
Warm season grasses and legumes	First Second Maintenance	6-12-12 0-10-10 0-10-10	1500 1000 400	50 --- ---

DUST CONTROL ON DISTURBED AREAS

Du



CONTRACTOR SHALL EMPLOY THE FOLLOWING TEMPORARY METHODS TO LIMIT THE SURFACE AND AIR MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES:

*TEMPORARY METHODS:
- –MULCHES
- –SPRAY ON ADHESIVES
- –TILLING
- –IRRIGATION
- –BARRIERS
- –CALCIUM CHLORIDE

*PERMANENT METHODS
- –PERMANENT VEGETATION
- –TOPSOIL
- –STONE COVER

*CHEMICAL CONTROL

ADHESIVE ADHESIVE	WATER DILUTION	TYPE OF NOZZLE	APPLICATION RATE (GAL/AC)
ANIONIC ASPHALT EMULSION	7:1	SPRAY	1200
LATEX EMULSION	12 1/2:1	FINE SPRAY	235
RESIN–IN–WATER EMULSION	4:1	FINE SPRAY	300

DESIGN PROFESSIONAL'S CREDENTIALS:

ENGINEER'S NAME (PRINTED): NEIL P McKENZIE, PE
GEORGIA PE NUMBER: PE036652
GSWCC LEVEL II CERTIFICATION NUMBER: 44944

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NOT FOR CONSTRUCTION

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE036652
11/22/21
NEIL P. McKENZIE

REVISIONS:

CIVIL CONSTRUCTION PLANS FOR
MULBERRY TRACT PHASE 3
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BEP RICE HOPE, LLC

JOB NUMBER: 21-309
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DRAWN BY: DCP
CHECKED BY: NPM
SCALE: AS NOTED

EROSION CONTROL DETAILS

SHEET:
CE4.1

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DATE PLOTTED: 12/20/2021 4:00 PM BY: Dillon Powell DRAWING PATH: Q:\2021\21-309 (005\DWG\Civil\21-309_MULBERRY PH3 & 4 ESPC.dwg

INITIAL PHASE
PRIOR TO THE LAND DISTURBING CONSTRUCTION, THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE AREA SITE DEVELOPMENT INSPECTOR.

THE CONTRACTOR SHALL OBSERVE THE PROJECT SEQUENCE SHOWN ON THE PLANS. THE CONTRACTOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO INSURE THAT LAND STRIPPING OF ITS NATURAL COVER IS EXPOSED ONLY IN SMALL QUANTITIES.

THE OWNER AGREES TO PROVIDE AND MAINTAIN OFF-STREET PARKING ON THE SUBJECT PROPERTY DURING THE ENTIRE CONSTRUCTION PERIOD.

NO STAGING AREAS, MATERIAL STORAGE, CONCRETE WASH OUT AREAS, OR DEBRIS BURN AND BURIAL HOLES SHALL BE LOCATED WITHIN 500 FEET OF DESIGNATED TREE PROTECTION AREAS.

A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT SHALL BE PRESENT ON THE SITE AT ALL TIMES.

THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND-DISTURBING ACTIVITIES.

PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE AND ALL STREAM BUFFERS SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO LAND DISTURBANCE SHALL OCCUR OUTSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.

PRIOR TO ANY OTHER CONSTRUCTION, A STABILIZED CONSTRUCTION EXIT SHALL BE CONSTRUCTED AT EACH POINT OF ENTRY TO OR EXIT FROM THE SITE OR ONTO ANY PUBLIC ROADWAY.

THE FOLLOWING INITIAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY OTHER CONSTRUCTION ACTIVITY:

1. THE CONSTRUCTION EXIT, CONSISTING OF A MINIMUM PAD SIZE OF 20 FEET BY 50 FEET WITH A MINIMUM 6" THICK STONE, SHALL BE PLACED AS SHOWN ON THE PLAN. THE STONE SIZE SHOULD CONSIST OF COURSE AGGREGATE BETWEEN 1-1/2" & 3-1/2" IN DIAMETER AND OVERLAID ON A GEOTEXTILE UNDERLINER. THE GEOTEXTILE UNDERLINER SHALL MEET THE REQUIREMENTS OF AASHTO M288-96, SECTION 7.3 SEPARATION REQUIREMENTS.

2. IMMEDIATELY AFTER THE ESTABLISHMENT OF CONSTRUCTION EXITS, ALL PERIMETER EROSION CONTROL AND STORM WATER MANAGEMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE INITIAL PHASE EROSION CONTROL PLAN.

3. TYPE 'NS' SILT FENCE SHALL BE INSTALLED AT THE PERIMETER OF THE DISTURBED AREA AS SHOWN ON THE PLAN. THE SILT FENCE SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL FOR EROSION CONTROL IN GEORGIA, TABLE 6-27.2. THE SILT FENCE SHALL BE KEPT ERECT AT ALL TIMES AND REPAIRED WHEN REQUESTED BY THE INSPECTOR OR THE PROJECT DESIGN PROFESSIONAL OF RECORD. SILT SHALL BE REMOVED WHEN ACCUMULATION REACHED ½ THE HEIGHT OF THE BARRIER. THE PERIMETER SILT FENCE SHALL BE INSPECTED DAILY FOR ANY FAILURES. ANY FAILURES OF SAID FENCING SHOULD BE REPAIRED IMMEDIATELY.

4. INLET SEDIMENT PROTECTION MEASURES SHALL BE INSTALLED ON ALL EXISTING STORM STRUCTURES AS SHOWN ON THE PLAN. SEE SEPARATE DETAILS FOR SPECIFICS ON TYPE OF INLET PROTECTION SPECIFIED.

5. STONE CHECK DAMS SHALL BE INSTALLED IN AREAS OF CONCENTRATED FLOWS AS SHOWN ON THE PLAN.

6. TREE PROTECTION FENCING SHALL BE INSTALLED PRIOR TO THE START OF ANY LAND DISTURBANCE ACTIVITY AND MAINTAINED UNTIL FINAL LANDSCAPE IS INSTALLED. THE TREE PROTECTION FENCING SHALL BE INSPECTED DAILY. ANY FAILURES OF SAID FENCING SHALL BE REPAIRED IMMEDIATELY.

AFTER INSTALLATION OF INITIAL EROSION CONTROL MEASURES THE SITE CONTRACTOR SHALL SCHEDULE AN INSPECTION BY THE PROJECT DESIGN PROFESSIONAL. NO OTHER CONSTRUCTION ACTIVITIES SHALL OCCUR UNTIL THE PROJECT DESIGN PROFESSIONAL APPROVES THE INSTALLATION OF SAID EROSION CONTROL MEASURES. IF UNFORESEEN CONDITIONS EXIST IN THE FIELD THAT WARRANT ADDITIONAL EROSION CONTROL MEASURE, THE CONTRACTOR MUST CONSTRUCT ANY ADDITIONAL EROSION CONTROL DEVICES DEEMED NECESSARY BY THE SITE INSPECTION.

AFTER APPROVAL OF THE INITIAL EROSION CONTROL INSTALLATION, THE CONTRACTOR MAY PROCEED WITH CLEARING AND GRUBBING ACTIVITIES. AS CLEARING PERMITS THE CONTRACTOR SHALL CONSTRUCT INLET PROTECTION AS SHOWN ON THE INTERMEDIATE PHASE PLAN TO CONTROL EROSION AND STORM WATER RUN OFF.

THE DESIGN PROFESSIONAL WHO PREPARED THE EROSION CONTROL INSTALLATION PLAN WILL INSPECT THE INSTALLATION OF THE BMPS WITHIN SEVEN DAYS AFTER INITIAL CONSTRUCTION ACTIVITY BEGINS.

INTERMEDIATE PHASE
THE FOLLOWING EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE INTERMEDIATE PHASE OF CONSTRUCTION.

DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO ENSURE THAT LAND STRIPPING OF ITS NATURAL GROUND COVER IS EXPOSED ONLY IN SMALL QUANTITIES AND THEREFORE LIMITED DURATIONS, BEFORE PERMANENT EROSION PROTECTION IS ESTABLISHED. NOTE SUB PHASES SHOWN ON PLANS.

EARTHWORK OPERATIONS IN THE VICINITY OF STREAM BUFFERS SHALL BE CAREFULLY CONTROLLED TO AVOID DUMPING OR SLOUGHING INTO THE BUFFER AREAS.

SEDIMENT SHALL NOT BE WASHED INTO INLETS. IT SHALL BE REMOVED FROM THE SEDIMENT TRAPS AND DISPOSED OF AND STABILIZED SO THAT IT WILL NOT ENTER THE INLETS AGAIN.

EROSION CONTROL DEVICES SHALL BE INSTALLED IMMEDIATELY AFTER GROUND DISTURBANCE OCCURS. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE DESIGN PROFESSIONAL IMMEDIATELY.

THE CONTRACTOR SHALL FURNISH AND MAINTAIN NECESSARY BARRICADES WHILE ROADWAY FRONTAGE IMPROVEMENTS ARE BEING MADE.

TYPE " NS" SILT FENCE SHALL BE INSTALLED AT THE TOE OF ALL FILL SLOPES 10 FEET OR GREATER IN HEIGHT. THE SILT FENCE SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL FOR EROSION CONTROL IN GEORGIA, TABLE 6.27.1. THE SILT FENCE SHALL BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED ON THE SLOPE. SILT FENCE SHALL BE REMOVED WHEN ACCUMULATION REACHES ½ THE HEIGHT OF THE BARRIER. ADDITIONALLY, DIVERSION DIKES SHALL BE CONSTRUCTED ALONG THE TOP OF ALL SAID FILL SLOPES WITH THE USE OF TEMPORARY DOWN DRAINS TO CONTROL STORM WATER RUN OFF AS SHOWN ON THE PLANS. SEE SEPARATE DETAILS FOR ADDITIONAL INFORMATION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING BARRIERS AT THE TOE OF SLOPES UNDER CONSTRUCTION. THESE BARRIERS SHALL BE AS SHOWN IN THE PLANS. THESE BARRIERS MAY BE RELOCATED AND REUSED AFTER PERMANENT SLOPE STABILIZATION BECOMES FULLY ESTABLISHED. AS THEY ARE RELOCATED, ANY DEFECTIVE MATERIALS IN THE BARRIERS SHALL BE REPLACED. IN ADDITION, ALL DEBRIS AND SILT AT THE PREVIOUS LOCATION SHALL BE REMOVED.

CUT AND FILL SLOPES ARE NOT TO EXCEED " 3H:1V"

THE CONTRACTOR CAN UTILIZE CLEARED TREES AS BARRIER BRUSH SEDIMENT CONTROL IN AREAS SHOWN ON THE PLAN WHERE INITIAL GRADING ACTIVITIES WILL NOT OCCUR.

NO BURN OR BURY PITS SHALL BE PERMITTED ON THE CONSTRUCTION SITE WITHOUT WRITTEN PERMISSION BY THE OWNER AND/OR THE ENGINEER OF RECORD.

ADDITIONAL SILT BARRIERS MUST BE PLACED AS SHOWN ON THE PLAN AS ACCESS IS OBTAINED DURING CLEARING. NO GRADING SHALL TAKE PLACE UNTIL SILT BARRIER INSTALLATION AND INLET PROTECTION ARE CONSTRUCTED AS SHOWN ON THE INTERMEDIATE PHASE EROSION CONTROL PLAN.

ALL SILT FENCE MUST MEET THE REQUIREMENTS OF SECTION 171- SILT FENCE FOR THE DEPARTMENT OF TRANSPORTATION, STATE OF GEORGIA, STANDARD SPECIFICATIONS, OF TRANSPORTATION SYSTEMS 2013 EDITION.

ALL ITEMS IN THIS SECTION OF THE SPECIFICATIONS SHALL MEET THE REQUIREMENTS AS SET FORTH IN SECTION 161, 162, 163, AND 165 OF THE GEORGIA D.O.T. STANDARD SPECIFICATION, OF TRANSPORTATION SYSTEMS, 2013 EDITION.

MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 14 DAYS OF LAND DISTURBANCE.

ALL DISTURBED AREAS LEFT MULCHED AFTER 30 DAYS SHALL BE STABILIZED WITH TEMPORARY VEGETATION.

SEDIMENT AND EROSION CONTROL MEASURES SHOULD BE CHECKED AFTER EACH RAIN EVENT. EACH DEVICE IS TO BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED ONE HALF THE CAPACITY OF THE DEVICE. ADDITIONAL DEVICES MUST BE INSTALLED IF NEW CHANNELS HAVE DEVELOPED.

THE CONSTRUCTION EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 1"-3" OF STONE, AS CONDITIONS DEMAND. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE ONTO PUBLIC ROADWAY OR INTO STORM DRAIN MUST BE REMOVED IMMEDIATELY.

CONTRACTOR SHALL INSPECT CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.

EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED AS DIRECTED BY THE ON-SITE INSPECTOR OR THE CIVIL ENGINEER.

FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB UNTIL SUCH MEASURES ARE CORRECTED BACK TO THE APPROVED EROSION CONTROL PLANS.

THE SITE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION CONTROL MEASURES INCLUDING REPLACING OR REPAIRING ANY DAMAGED DEVICES DUE TO ANY CONSTRUCTION ACTIVITY BY OTHERS.

TYPE " NS" SILT FENCE SHALL BE PLACED AT THE TOE OF ALL DIRT STOCK PILE AREAS. SEE SEPARATE DETAILS FOR ADDITIONAL INFORMATION.

INLET SEDIMENT PROTECTION MEASURES SHALL BE INSTALLED ON ALL STORM STRUCTURES AS THEY ARE CONSTRUCTED. SEE PLAN VIEW FOR SPECIFIC TYPE AND SEPARATE DETAILS FOR ADDITIONAL INFORMATION.

STONE CHECK DAMS SHALL BE INSTALLED IN AREAS OF CONCENTRATED FLOWS, AS SHOWN ON THE PLAN. SEE SEPARATE DETAIL FOR ADDITIONAL INFORMATION.

ALL DRAINAGE SWALES SHALL BE APPLIED WITH VEGETATIVE COVER AS SOON AS FINAL GRADE IS ACHIEVED.

ALL GRADED AREAS SHALL BE APPLIED WITH VEGETATIVE COVER AS SOON AS FINAL GRADE IS ACHIEVED.

FINAL PHASE
THE FOLLOWING EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE FINAL EROSION CONTROL PHASE OF CONSTRUCTION:

SEDIMENT SHALL NOT BE WASHED INTO INLETS. IT SHALL BE REMOVED FROM THE SEDIMENT TRAPS AND DISPOSED OF AND STABILIZED SO THAT IT WILL NOT ENTER THE INLETS AGAIN.

MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 14 DAYS OF LAND DISTURBANCE.

ALL DISTURBED AREAS LEFT MULCHED AFTER 30 DAYS SHALL BE STABILIZED WITH TEMPORARY GRASSING.

THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT GROUND COVER IS ESTABLISHED. SEDIMENT SHALL BE CLEANED OUT OF THE PONDS WHEN IT REACHES THE HALF WAY POINT ON THE RISER.

AFTER CURBING, GRADED AGGREGATE BASE, AND PAVEMENT HAVE BEEN INSTALLED, ALL INLET SEDIMENT TRAPS ON SINGLE AND DOUBLE WING CATCH BASINS ALONG WITH ANY CURB INLETS SHALL BE REMOVED AND REPLACED WITH CURB FILTER PROTECTION. SEE SEPARATE DETAIL FOR ADDITIONAL INFORMATION.

ALL AREAS ADJACENT TO ROADWAY AND PARKING AREAS SHOULD HAVE A VEGETATIVE COVER APPLIED AS SOON AS FINAL GRADE IS ACHIEVED BEHIND CURBS.

SEDIMENT AND EROSION CONTROL MEASURES SHOULD BE CHECKED AFTER EACH RAIN EVENT. EACH DEVICE IS TO BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED ONE HALF THE CAPACITY OF THE DEVICE. ADDITIONAL DEVICES MUST BE INSTALLED IF NEW CHANNELS HAVE DEVELOPED.

THE CONSTRUCTION EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 1"-3" OF STONE, AS CONDITIONS DEMAND. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE ONTO PUBLIC ROADWAY OR INTO STORM DRAIN MUST BE REMOVED IMMEDIATELY.

CONTRACTOR SHALL INSPECT CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.

EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES SHALL BE DIRECTED BY THE ON-SITE INSPECTION OR THE CIVIL ENGINEER.

UPON COMPLETION OF THE PROJECT AND RECEIPT OF A CERTIFICATE OF OCCUPANCY OR FINAL ACCEPTANCE OF THE SITE, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND DISPOSE OF THEM UNLESS NOTED ON PLANS.

PERMIT COVERAGE
THIS PLAN HAS BEEN PREPARED TO MEET THE REQUIREMENTS UNDER THE STATE OF GEORGIA, DEPARTMENT OF NATURAL RESOURCES, ENVIRONMENTAL PROTECTION DIVISION (EDP) FOR AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY FOR COMMON DEVELOPMENT.

AUTHORIZED DISCHARGES
1. ALL DISCHARGES OF STORM WATER ASSOCIATED WITH COMMON DEVELOPMENT CONSTRUCTION PROJECTS THAT WILL RESULT IN LAND DISTURBANCE EQUAL TO OR GREATER THAT ONE ACRE. PART I.C.1.

2. ALL DISCHARGES COVERED BY THIS PERMIT SHALL BE COMPOSED ENTIRELY OF STORM WATER EXCEPT AS PROVIDED IN PART I.C.2 AND PART III.A.2 OF THE PERMIT.

3. AUTHORIZED MIXED STORM WATER DISCHARGES: PART I.C.2
   A. THE INDUSTRIAL SOURCE OR ACTIVITY OTHER THAN CONSTRUCTION IS LOCATED ON THE SAME SITE AS THE CONSTRUCTION ACTIVITY AND IS AN INTEGRAL PART OF THE CONSTRUCTION ACTIVITY.
   B. THE STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY FROM THE AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITIES ARE OCCURRING ARE IN COMPLIANCE WITH THE TERMS OF THIS PERMIT.
   C. STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY FROM THE AREAS OF THE SITE WHERE INDUSTRIAL ACTIVITY OTHER THAN CONSTRUCTION ARE OCCURRING ARE COVERED BY A DIFFERENT NPDES GENERAL PERMIT OR INDIVIDUAL PERMIT AUTHORIZING SUCH DISCHARGES AND THE DISCHARGES ARE IN COMPLIANCE WITH A DIFFERENT NPDES PERMIT.

4. AUTHORIZED NON-STORMWATER DISCHARGES: PART III.A.2
   A. FIRE FIGHTING ACTIVITIES
   B. FIRE HYDRANT FLUSHING
   C. POTABLE WATER SOURCES INCLUDING WATER LINE FLUSHING
   D. IRRIGATION DRAINAGE
   E. AIR CONDITIONING CONDENSATE
   F. SPRINGS
   G. UNCONTAMINATED GROUND WATER
   H. FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS MATERIALS OR POLLUTANTS.

LIMITATIONS ON COVERAGE PART I.C.3
1. THE FOLLOWING STORM WATER DISCHARGES FROM CONSTRUCTION SITES ARE NOT AUTHORIZED BY THIS PERMIT:
   A. STORM WATER DISCHARGES ASSOCIATED WITH AN INDUSTRIAL ACTIVITY THAT ORIGINATE FROM THE SITE AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED AND THE SITE HAS UNDERGONE FINAL STABILIZATION.
   B. DISCHARGES THAT ARE MIXED WITH SOURCES OF NON-STORMWATER OTHER THAN DISCHARGES WHICH ARE IDENTIFIED IN PART III.A.2 OF THIS PERMIT AND WHICH ARE IN COMPLIANCE WITH PART IV.D.7 (NON-STORMWATER DISCHARGES) OF THIS PERMIT.
   C. STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY THAT ARE SUBJECT TO AN EXISTING NPDES INDIVIDUAL OR GENERAL PERMIT. SUCH DISCHARGES MAY BE AUTHORIZED UNDER THIS PERMIT AFTER AN EXISTING PERMIT EXPIRES PROVIDED THE EXISTING PERMIT DID NOT ESTABLISH NUMERIC LIMITATIONS FOR SUCH DISCHARGES.
   D. STORMWATER DISCHARGES FROM CONSTRUCTION SITES THAT THE DIRECTOR (EPD) HAS DETERMINED TO BE OR MAY REASONABLY BE EXPECTED TO BE CONTRIBUTING TO A VIOLATION OF A WATER QUALITY STANDARD.
2. WHERE A RELEASE CONTAINING A HAZARDOUS SUBSTANCE IN AN AMOUNT EQUAL TO OR IN EXCESS OF A REPORTING QUANTITY ESTABLISHED UNDER EITHER GEORGIA'S OIL OR HAZARDOUS MATERIAL SPILLS OR RELEASES ACT (O.C.G.A 12-14-2, ET SEQ.), 40 CFR 117 OR 40 CFR 302 OCCURS DURING A 24-HOUR PERIOD, THE PERMITTEE IS REQUIRED TO NOTIFY THE FOLLOWING AGENCIES IN ACCORDANCE WITH THE ABOVE-MENTIONED REGULATIONS AS SOON AS HE HAS KNOWLEDGE OF THE DISCHARGE: EPD AT (404) 656-4863 OR (800) 241-4113, AND THE NATIONAL RESPONSE CENTER (NRC) AT (800) 424-8802. PART III.B.1
3. THIS PERMIT DOES NOT AUTHORIZE THE DISCHARGE OF HAZARDOUS SUBSTANCES OR OIL RESULTING FROM AN ON-SITE SPILL. PART III.B.2

NO DISCHARGES AUTHORIZED BY THIS PERMIT SHALL CAUSE VIOLATIONS OF GEORGIA'S IN-STREAM WATER QUALITY STANDARDS AS PROVIDED BY THE RULES AND REGULATIONS FOR WATER QUALITY CONTROL, CHAPTER 391-3-6-03. WATER QUALITY COMPLIANCE PART I.C.4

SAMPLING REQUIREMENTS PART IV.D.6
ALL SAMPLING SHALL BE COLLECTED BY " GRAB SAMPLES" AND THE ANALYSIS OF THESE SAMPLES MUST BE CONDUCTED IN ACCORDANCE WITH METHODOLOGY AND TEST PROCEDURES ESTABLISHED BY 40 CFR PART 136 (UNLESS OTHER TEST PROCEDURES HAVE BEEN APPROVED), THE GUIDANCE DOCUMENT TITLED " NPDES STORMWATER SAMPLING GUIDANCE DOCUMENT, EPA 833-B-92-001" AND GUIDANCE DOCUMENTS THAT MAY BE PREPARED BY THE EPD.

1. SAMPLE CONTAINERS SHOULD BE LABELED PRIOR TO COLLECTING THE SAMPLES.
2. LARGE MOUTH, CLEAN AND RINSED GLASS OR PLASTIC JARS SHOULD BE USED FOR COLLECTING SAMPLES. THE JARS SHOULD BE CLEANED THOROUGHLY TO AVOID CONTAMINATIONS.
3. IDEALLY THE SAMPLES SHOULD BE TAKEN FROM THE HORIZONTAL AND VERTICAL CENTER OF THE RECEIVING WATER(S) OR THE STORMWATER OUTFALL CHANNEL(S).
4. SAMPLES SHOULD BE WELL MIXED BEFORE TRANSFERRING TO A SECONDARY CONTAINER.
5. MANUAL, AUTOMATIC OR RISING STAGE SAMPLING MAY BE UTILIZED. SAMPLES REQUIRED BY THIS PERMIT SHOULD BE ANALYZED IMMEDIATELY, BUT IN NO CASE LATER THAN 48 HOURS AFTER COLLECTION. HOWEVER, SAMPLES FROM AUTOMATIC SAMPLERS MUST BE COLLECTED NO LATER THAN THE NEXT BUSINESS DAY AFTER THEIR ACCUMULATION, UNLESS FLOW THROUGH AUTOMATED ANALYSIS IS UTILIZED.
6. IF MANUAL SAMPLING IS EMPLOYED, THE SAMPLING CONTAINER SHOULD BE HELD SO THAT THE OPENING FACES UPSTREAM, THE SAMPLES SHOULD BE KEPT FREE FROM FLOATING DEBRIS, AND CARE SHOULD BE TAKEN TO AVOID STIRRING THE BOTTOM SEDIMENTS IN THE RECEIVING WATER(S) OR IN THE OUTFALL STORMWATER CHANNEL.
7. THE UPSTREAM SAMPLE FOR EACH RECEIVING WATER(S) MUST BE TAKEN IMMEDIATELY UPSTREAM OF THE CONFLUENCE OF THE FIRST STORMWATER DISCHARGE FROM THE PERMITTED ACTIVITY (I.E., THE DISCHARGE FURTHEST UPSTREAM AT THE SITE) BUT DOWNSTREAM OF ANY OTHER STORMWATER DISCHARGES NOT ASSOCIATED WITH THE PERMITTED ACTIVITY. WHERE APPROPRIATE, SEVERAL UPSTREAM SAMPLES FROM ACROSS THE RECEIVING WATER(S) MAY NEED TO BE TAKEN AND THE ARITHMETIC AVERAGE OF THE TURBIDITY OF THESE SAMPLES USED FOR THE UPSTREAM TURBIDITY VALUE.
8. THE DOWNSTREAM SAMPLE FOR EACH RECEIVING WATER(S) MUST BE TAKEN DOWNSTREAM OF THE CONFLUENCE OF THE LAST STORMWATER DISCHARGE FROM THE PERMITTED ACTIVITY (I.E. THE DISCHARGE FARTHERMOST DOWNSTREAM AT THE SITE) BUT UPSTREAM OF ANY OTHER STORM WATER DISCHARGE NOT ASSOCIATED WITH THE PERMITTED ACTIVITY. WHERE APPROPRIATE, SEVERAL DOWNSTREAM SAMPLES FROM ACROSS THE RECEIVING WATER(S) MAY NEED TO BE TAKEN AND THE ARITHMETIC AVERAGE OF THE TURBIDITY OF THESE SAMPLES USED FOR THE DOWNSTREAM TURBIDITY VALUE.
9. PERMITTEES DO NOT HAVE TO SAMPLE SHEET FLOW THAT FLOWS ONTO UNDISTURBED NATURAL AREAS OR AREAS STABILIZED BY THE PROJECT.
10. DILUTION OF SAMPLES IS NOT REQUIRED.
11. SAMPLES MAY BE ANALYZED DIRECTLY WITH A PROPERLY CALIBRATED TURBIDIMETER.
12. SAMPLES ARE NOT REQUIRED TO BE COOLED.
13. SAMPLES AND ANALYSIS OF ANY STORMWATER DISCHARGE(S) OR THE RECEIVING WATER(S) BEYOND THE MINIMUM FREQUENCY STATED IN THIS PERMIT MUST BE REPORTED IN A SIMILAR MANNER TO EPD AS SPECIFIED IN PART IV.E.
14. TURBIDITY RESULTS WHICH EXCEED 1000 NTU SHALL BE REPORTED AS " EXCEEDS 1000 NTU."

SAMPLING FREQUENCY PART IV.D.6.D
1. SAMPLING FREQUENCY SHALL OCCUR IN ACCORDANCE WITH PART IV.D.6.D (3) OF THE PERMIT.
2. FOR A QUALIFYING EVENT THE PERMITTEE SHALL SAMPLE AT THE BEGINING OF ANY STORMWATER DISCHARGE RECIEVING WATER AND/OR FROM A MONITORED OUTFALL WITHIN FORTY-FIVE (45) MINUTES OF OR AS SOON AS POSSIBLE:
   A. THE ACCUMULATION OF THE MINIMUM AMOUNT OF RAINFALL FOR THE QUALIFYING EVENT, IF THE STORMWATER DISCHARGE TO A MONITORED RECEIVING WATER OR FROM A MONITORED OUTFALL HAS BEGUN PRIOR TO THE ACCUMULATION.
   B. THE BEGINNING OF ANY STORMWATER DISCHARGE TO A MONITORED RECEIVING WATER OR FROM A MONITORED OUTFALL. IF THE DISCHARGE BEGINS AFTER THE ACCUMULATION OF THE MINIMUM AMOUNT OF RAINFALL FOR THE QUALIFYING EVENT.
   C. WHERE MANUAL AND AUTOMATIC SAMPLING ARE NOT POSSIBLE (AS DEFINED IN THE PERMIT), OR ARE BEYOND THE PERMITTEE'S CONTROL. THE PERMITTEE SHALL TAKE SAMPLES AS SOON AS POSSIBLE, BUT IN NO CASE MORE THAN TWELVE (12) HOURS AFTER THE BEGINNING OF THE STORMWATER DISCHARGE.
   D. NORMAL BUSINESS HOURS, AS DEFINED BY THE PERMIT, ARE MONDAY THROUGH FRIDAY, 8:00 AM TO 5:00 PM EXCLUDING ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY & NON-WORKING FEDERAL HOLIDAY.
3. SAMPLING SHALL OCCUR FOR THE FOLLOWING QUALIFYING EVENTS FOR EACH AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL:
   A. FOR EACH AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER FROM AN OUTFALL, THE FIRST RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH WITH A STORMWATER DISCHARGE THAT OCCURS DURING NORMAL BUSINESS HOURS AS DEFINED IN THIS PERMIT AFTER ALL CLEARING AND GRUBBING OPERATIONS HAVE BEEN COMPLETED, BUT PRIOR TO COMPLETION OF MASS GRADING OPERATIONS, IN THE DRAINAGE AREA OF THE LOCATION SELECTED AS THE SAMPLING LOCATION;
   B. IN ADDITION TO (A) ABOVE. FOR EACH OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL, THE FIRST RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH WITH A STORMWATER DISCHARGE THAT OCCURS DURING NORMAL BUSINESS HOURS AS DEFINED IN THIS PERMIT EITHER 90 DAYS AFTER THE FIRST SAMPLING EVENT OR AFTER ALL MASS GRADING OPERATIONS HAVE BEEN COMPLETED, BUT PRIOR TO SUBMITTAL OF A N.O.T., IN THE DRAINAGE AREA OF THE LOCATION SELECTED AS THE SAMPLING LOCATION, WHICHEVER COMES FIRST.
   C. AT THE TIME OF SAMPLING PERFORMED PURSUANT TO (A) AND (B) ABOVE. IF BMPs IN ANY AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL ARE NOT PROPERLY DESIGNED, INSTALLED AND MAINTAINED. CORRECTIVE ACTION SHALL BE DEFINED AND IMPLEMENTED WITHIN TWO (2) BUSINESS DAYS, AND TURBIDITY SAMPLES SHALL BE TAKEN FROM DISCHARGES FROM THE AREA OF THE SITE FOR EACH SUBSEQUENT RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH DURING NORMAL BUSINESS HOURS UNTIL THE SELECTED TURBIDITY STANDARD IS ATTAINED, OR UNTIL POST-STORM EVENT INSPECTIONS DETERMINE THAT BMPs ARE PROPERLY DESIGNED, INSTALLED AND MAINTAINED.
4. IF BMPS IN ANY AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER ARE NOT PROPERLY DESIGNED, INSTALLED AND MAINTAINED, CORRECTIVE ACTION SHALL BE DEFINED AND IMPLEMENTED WITHIN 2 BUSINESS DAYS, AND TURBIDITY SAMPLES SHALL BE TAKEN FROM DISCHARGES FROM THAT AREA OF THE SITE FOR EACH SUBSEQUENT RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH DURING NORMAL BUSINESS HOURS UNTIL THE SELECTED TURBIDITY STANDARD IS ATTAINED, OR UNTIL POST-STORM EVENT INSPECTIONS DETERMINE THAT BMPs ARE PROPERLY DESIGNED, INSTALLED AND MAINTAINED.
5. THE PERMITTEE MAY CHOOSE TO MEET THE REQUIREMENTS OF NO. 3.A AND NO. 3.B BY COLLECTING TURBIDITY SAMPLES FROM ANY RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH AND ALLOWS FOR SAMPLING AT ANY TIME OF THE DAY OR WEEK."

(15) "NON-EXEMPT ACTIVITIES SHALL NOT BE CONDUCTED WITHIN THE 25 OR 50-FOOT UNDISTURBED STREAM BUFFERS AS MEASURED FROM THE POINT OF WRESTED VEGETATION OR WITHIN 25 FEET OF THE COASTAL MARSHLAND BUFFER AS MEASURED FROM THE JURISDICTIONAL DETERMINATION LINE WITHOUT FIRST ACQUIRING THE NECESSARY VARIANCES AND PERMITS."

DESIGN PROFESSIONAL'S CREDENTIALS:
ENGINEER'S NAME (PRINTED):	NEIL P McKENZIE, PE
GEORGIA PE NUMBER:	PE036652
GSWCC LEVEL II CERTIFICATION NUMBER:	44944

(30) TENTATIVE ACTIVITY SCHEDULE

CONSTRUCTION DATES: Sept. 26, 2018 - Sept. 26,2019	MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6
CONSTRUCTION EXIT (Co)	■					
SILT FENCE AND OTHER ES&PC PRACTICES	■	■	■	■	■	■
RETROFIT (Rt)	■	■	■	■	■	■
INLET SEDIMENT TRAP (Sd2)		■	■	■	■	■
CLEARING AND GRUBBING	■	■	■			
GRADING / UTILITY				■	■	■
DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING) (Ds2)		■	■	■	■	
FINE GRADING AND PAVING				■	■	
BUILDING CONSTRUCTION	■	■	■	■	■	■
DISTURBED AREA STABILIZATION (WITH TEMPORARY VEGETATION) (Ds3)		■	■	■	■	
L

4 TWENTY-FOUR HOUR CONTACT RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL
BALD EAGLE PARTNERS/ATTN: MARTY SMITH
100 LAKESIDE BLVD.
PORT WENTWORTH, GA 31407
843.368.0405

5 PRIMARY PERMITTEE / DEVELOPER / OWNER
BALD EAGLE PARTNERS
4800 HAMPDEN LANE, SUITE 200
BETHESDA, MD 20814
301.915.0460
jeff-wain@baldeaglepartners.com

6 THE TOTAL ACREAGE FOR THE SITE IS 70.00 ACRES
DISTURBED ACREAGE IN THIS PHASE IS ±30.50 ACRES

7 THE GPS LOCATION OF THE CONSTRUCTION EXIT FOR THE SITE IS 32.22503, 32.22458 ° LATITUDE -81.18653, -81.18563 ° LONGITUDE

9 DESCRIPTION AND NATURE OF THE CONSTRUCTION ACTIVITY
TWO PHASE CONSTRUCTION OF AN EXISTING SINGLE FAMILY SUBDIVISION WITH NECESSARY INFRASTRUCTURE TO SUPPORT

49 THE EXISTING SITE HAS THE FOLLOWING
THE SOILS PRESENT ON THE SITE ARE CAPE FEAR SOILS (Cc), CRAVEN LOAMY FINE SANDS (Cx), POOLER FINE LOAMY SAND (Pn)

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE SUBMIT THE INFORMATION. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

NEIL P McKINZIE, PE - DESIGN PROFESSIONAL - GSWCC LEVEL II CERTIFICATION NUMBER: 44944

12 I CERTIFY UNDER PENALTY OF LAW THAT THIS PLAN WAS PREPARED AFTER A SITE VISIT TO THE LOCATIONS DESCRIBED HEREIN BY MYSELF OR BY AN AUTHORIZED AGENT, UNDER MY SUPERVISION.

NEIL P McKINZIE, PE - DESIGN PROFESSIONAL - GSWCC LEVEL II CERTIFICATION NUMBER: 44944

13 I CERTIFY THAT THE PERMITTEE'S EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN PROVIDES FOR AN APPROPRIATE AND COMPREHENSIVE SYSTEM OF BEST MANAGEMENT PRACTICES REQUIRED BY THE GEORGIA WATER QUALITY CONTROL ACT AND THE DOCUMENT 'MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA (MANUAL) PUBLISHED BY THE STATE SOIL AND WATER CONSERVATION COMMISSION AS OF JANUARY 1 OF THE YEAR IN WHICH THE LAND DISTURBING ACTIVITY WAS PERMITTED, PROVIDES FOR THE SAMPLING OF THE RECEIVING WATER(S) OR THE SAMPLING OF THE STORM WATER OUTFALLS AND THAT THE DESIGNED SYSTEM OF BEST MANAGEMENT PRACTICES AND SAMPLING METHODS IS EXPECTED TO MEET THE REQUIREMENTS CONTAINED IN THE GENERAL NPDES PERMIT NO. GAR 100003.

NEIL P McKINZIE, PE - DESIGN PROFESSIONAL - GSWCC LEVEL II CERTIFICATION NUMBER: 44944

14 FOR COMMON DEVELOPMENT PROJECTS THAT BEGIN CONSTRUCTION ACTIVITY AFTER THE EFFECTIVE DATE OF THIS PERMIT, THE PRIMARY PERMITTEE MUST RETAIN THE DESIGN PROFESSIONAL WHO PREPARED THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, OR OTHER QUALIFIED PERSON REQUESTED IN WRITING AND EPD HAS AGREED TO AN ALTERNATE DESIGN PROFESSIONAL, TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMPS WHICH THE DESIGN PROFESSIONAL DESIGNED WITHIN SEVEN (7) DAYS AFTER INSTALLATION. THE DESIGN PROFESSIONAL SHALL DETERMINE IF THESE BMPS HAVE BEEN INSTALLED AND ARE BEING MAINTAINED AS DESIGNED. THE DESIGN PROFESSIONAL SHALL REPORT THE RESULTS OF THE INSPECTION TO THE PRIMARY PERMITTEE WITHIN SEVEN (7) DAYS AND THE PERMITTEE MUST CORRECT ALL DEFICIENCIES WITHIN TWO (2) BUSINESS DAYS OF RECEIPT OF THE INSPECTION REPORT FROM THE DESIGN PROFESSIONAL UNLESS WEATHER RELATED SITE CONDITIONS ARE SUCH THAT ADDITIONAL TIME IS REQUIRED. "THE DESIGN PROFESSIONAL WHO PREPARED THE ESⅇPC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMPS WITHIN 7 DAYS AFTER INSTALLATION"

DESIGN PROFESSIONAL 7-DAY VISIT CERTIFICATION

I CERTIFY THE SITE WAS IN COMPLIANCE WITH THE ES&PC PLAN ON THE DATE OF INSPECTION.

NEIL P. McKENZIE, PE - DESIGN PROFESSIONAL - GSWCC LEVEL II CERTIFICATION NUMBER: 44944

INSPECTION REVEALED THE FOLLOWING DISCREPANCIES FROM THE ES&PC PLAN:

THESE DEFICIENCIES MUST BE ADDRESSED IMMEDIATELY AND A RE-INSPECTION SCHEDULED. WORK SHALL NOT PROCEED ON THE SITE UNTIL DESIGN PROFESSIONAL CERTIFICATION IS OBTAINED.

18 "WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT."

19 " THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO LAND-DISTURBING ACTIVITIES."

21 " ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING."

20 " EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE;"

26 **PRACTICES THAT WILL BE USED TO REDUCE THE POLLUTANTS IN STORM WATER DISCHARGES**

1. PERMANENT SEEDING; THE SITE SHALL BE STABILIZED UTILIZING PERMANENT SEEDING TO PRE-TREAT THE STORMWATER RUNOFF PRIOR TO ENTERING THE DONWSTREAM CONVEYANCE BY REMOVING SEDIMENT AS WELL AS ANY ATTACHED CHEMICALS FROM RUNOFF. PERMANENT SEEDING ALSO PREVENTS EROSION, REDUCES THE VOLUME AND VELOCITY OF THE RUNOFF AND IMPROVES WATER QUALITY.
2. TEMPORARY DIVERSION DITCHES WILL ACT AS NATURAL BIOFILTERS TO REDUCE STORM WATER VELOCITY AND POLLUTANT LOAD PRIOR TO RELEASE OF THE RUNOFF INTO THE DOWNSTREAM CONVEYANCE. THIS IS ACCOMPLISHED VIA INFILTRATION AND SETTLEMENT.
3. WET POND: THE PERMANENT POOL OF THE WET POND ENHANCES PARTICULATE SETTLING BY INCREASING RESIDENCE TIME AND WILL EFFECTIVELY HAVE AN 80% TSS REMOVAL RATE, BY ALLOWING SETTLEMENT OF THE SEDIMENT AND OTHER POLLUTANTS THAT ARE TRANSFERRED TO THE POND VIA OTHER CONVEYANCES, THUS ELIMINATING THE RELEASE INTO AND IMPROVING THE WATER QUALITY OF THE DOWNSTREAM CONVEYANCE. WET PONDS ALSO SIGNIFICANTLY REDUCE THE VOLUME AND THE VELOCITY OF THE RUNOFF CONTRIBUTING TO THE DOWNSTREAM CONVEYANCE.

31 **INSPECTIONS REQUIREMENTS BY THE PERMITTEE:**

A. PRIMARY PERMITTEE REQUIREMENTS.

(1). EACH DAY WHEN ANY TYPE OF CONSTRUCTION ACTIVITY HAS TAKEN PLACE AT A PRIMARY PERMITTEE'S SITE, CERTIFIED PERSONNEL PROVIDED BY THE PRIMARY PERMITTEE SHALL INSPECT: (A) ALL AREAS AT THE PRIMARY PERMITTEE'S SITE WHERE PETROLEUM PRODUCTS ARE STORED, USED, OR HANDLED FOR SPILLS AND LEAKS FROM VEHICLES AND EQUIPMENT AND (B) ALL LOCATIONS AT THE PRIMARY PERMITTEE SITE WHERE VEHICLES ENTER OR EXIT THE SITE FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING. THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED.

(2). MEASURE AND RECORD RAINFALL WITHIN DISTURBED AREAS OF THE SITE THAT HAVE NOT MET FINAL STABILIZATION ONCE EVERY 24 HOURS EXCEPT ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY AND NON-WORKING FEDERAL HOLIDAY. THE DATA COLLECTED FOR THE PURPOSE OF COMPLIANCE WITH THIS PERMIT SHALL BE REPRESENTATIVE OF THE AMOUNT AND INTENSITY OF RAINFALL MAY BE SUSPENDED IF ALL AREAS OF THE SITE HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION.

(3). CERTIFIED PERSONNEL (PROVIDED BY THE PRIMARY PERMITTEE) SHALL INSPECT THE FOLLOWING AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES RAINFALL OR GREATER (UNLESS SUCH STORM ENDS AFTER 5:00 PM ON ANY FRIDAY OR ON ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY OR ANY NON-WORKING FEDERAL HOLIDAY IN WHICH CASE THE INSPECTION SHALL BE COMPLETED BY THE END OF THE NEXT BUSINESS DAY AND/OR WORKING DAY, WHICHEVER OCCURS FIRST): (A) DISTURBED AREAS OF THE PRIMARY PERMITTEE'S CONSTRUCTION SITE; (B) AREAS USED BY THE PRIMARY PERMITTEE FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION; AND (C) STRUCTURAL CONTROL MEASURES. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN APPLICABLE TO THE PRIMARY PERMITTEE'S SITE SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). FOR AREAS OF A SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION, THE PERMITTEE MUST COMPLY WITH PART IV.D.4.B.(4). THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES .

(4). CERTIFIED PERSONNEL (PROVIDED BY THE SECONDARY PERMITTEE) SHALL INSPECT AT LEAST ONCE PER MONTH DURING THE TERM OF THIS PERMIT (I.E., UNTIL A NOTICE OF TERMINATION IS SUBMITTED) THE AREAS OF THE SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION. THESE AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER(S). EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S).

(5). BASED ON THE RESULTS OF EACH INSPECTION, THE SITE DESCRIPTION AND THE POLLUTION PREVENTION AND CONTROL MEASURES IDENTIFIED IN THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, THE PLAN SHALL BE REVISED AS APPROPRIATE NOT LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING EACH INSPECTION. IMPLEMENTATION OF SUCH CHANGES SHALL BE MADE AS SOON AS PRACTICAL BUT IN NO CASE LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING EACH INSPECTION.

(6). A REPORT OF EACH INSPECTION THAT INCLUDES THE NAME(S) OF CERTIFIED PERSONNEL MAKING EACH INSPECTION, THE DATE(S) OF EACH INSPECTION, CONSTRUCTION PHASE (I.E., INITIAL, INTERMEDIATE OR FINAL) , MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PART IV.D.4.B.(5) OF THE PERMIT SHALL BE MADE AND RETAINED AT THE SITE OR BE READILY AVAILABLE AT A DESIGNATED ALTERNATE LOCATION UNTIL THE ENTIRE SITE OR THAT PORTION OF A CONSTRUCTION PROJECT THAT HAS BEEN PHASED HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION IS SUBMITTED. SUCH REPORTS SHALL BE READILY AVAILABLE BY THE END OF THE SECOND BUSINESS DAY AND/OR WORKING DAY AND SHALL IDENTIFY ALL INCIDENTS OF BEST MANAGEMENT PRACTICES THAT HAVE NOT BEEN PROPERLY INSTALLED AND/OR MAINTAINED AS DESCRIBED IN THE PLAN. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS, THE INSPECTION REPORT SHALL CONTAIN A CERTIFICATION THAT THE BEST MANAGEMENT PRACTICES ARE IN COMPLIANCE WITH THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART V.G.2 OF THIS PERMIT.

B. SECONDARY PERMITTEE.

(1). EACH DAY WHEN ANY TYPE OF CONSTRUCTION ACTIVITY HAS TAKEN PLACE AT A SECONDARY PERMITTEE'S SITE, CERTIFIED PERSONNEL PROVIDED BY THE SECONDARY PERMITTEE SHALL INSPECT: (A) ALL AREAS USED BY THE SECONDARY PERMITTEE WHERE PETROLEUM PRODUCTS ARE STORED, USED, OR HANDLED FOR SPILLS AND LEAKS FROM VEHICLES AND EQUIPMENT AND (B) ALL LOCATIONS AT THE SECONDARY PERMITTEE SITE WHERE THAT PERMITTEE'S VEHICLES ENTER OR EXIT THE SITE FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING. THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES.

(2). CERTIFIED PERSONNEL (PROVIDED BY THE UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES) SHALL INSPECT THE FOLLOWING EACH DAY ANY TYPE OF CONSTRUCTION ACTIVITY HAS TAKEN PLACE AT THE CONSTRUCTION SITE: (A) AREAS OF THE CONSTRUCTION SITE DISTURBED BY THE UTILITY COMPANIES AND UTILITY CONTRACTORS THAT HAVE NOT UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION; (B) AREAS USED BY THE UTILITY COMPANIES AND UTILITY CONTRACTORS FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION THAT HAVE NOT UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION AND (C) STRUCTURAL CONTROL MEASURES. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN APPLICABLE TO THE UTILITY COMPANY'S AND UTILITY CONTRACTORS' CONSTRUCTION ACTIVITIES SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS WHEN THEY ARE SECONDARY PERMITTEES PERFORMING SERVICE LINE INSTALLATIONS OR WHEN CONDUCTING REPAIRS ON EXISTING LINE INSTALLATIONS.

(3). CERTIFIED PERSONNEL (PROVIDED BY THE SECONDARY PERMITTEE) SHALL INSPECT THE FOLLOWING AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES RAINFALL OR GREATER (UNLESS SUCH STORM ENDS AFTER 5:00 PM ON ANY FRIDAY OR ON ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY OR ANY NON-WORKING FEDERAL HOLIDAY IN WHICH CASE THE INSPECTION SHALL BE COMPLETED BY THE END OF THE NEXT BUSINESS DAY AND/OR WORKING DAY, WHICHEVER OCCURS FIRST): (A) DISTURBED AREAS OF THE SECONDARY PERMITTEE'S CONSTRUCTION SITE; (B) AREAS USED BY THE SECONDARY PERMITTEE FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION; AND (C) STRUCTURAL CONTROL MEASURES. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN APPLICABLE TO THE SECONDARY PERMITTEE'S SITE SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). FOR AREAS OF A SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION, THE PERMITTEE MUST COMPLY WITH PART IV.D.4.B.(4). THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES .

(4). CERTIFIED PERSONNEL (PROVIDED BY THE SECONDARY PERMITTEE) SHALL INSPECT AT LEAST ONCE PER MONTH DURING THE TERM OF THIS PERMIT (I.E., UNTIL A NOTICE OF TERMINATION IS SUBMITTED) THE AREAS OF THE SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION. THESE AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER(S). EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES.

(5). BASED ON THE RESULTS OF EACH INSPECTION, THE SECONDARY PERMITTEE MUST NOTIFY THE PRIMARY PERMITTEE WITHIN 24-HOURS OF ANY SUSPECTED BMP DESIGN DEFICIENCIES. THE PRIMARY PERMITTEE MUST EVALUATE WHETHER THESE DEFICIENCIES EXIST WITHIN 48-HOURS OF SUCH NOTICE, AND IF THESE DEFICIENCIES ARE FOUND TO EXIST MUST AMEND THE PLAN IN ACCORDANCE WITH PART IV.C. OF THIS PERMIT TO ADDRESS THOSE DEFICIENT BMPS WITHIN SEVEN (7) DAYS OF BEING NOTIFIED BY THE SECONDARY PERMITTEE. WHEN THE PLAN IS AMENDED, THE PRIMARY PERMITTEE MUST FURTHER AMEND TO PROVIDE A COPY OF THE AMENDMENT TO ALL ANY EFFECTED SECONDARY PERMITTEE(S) WITHIN THIS SEVEN (7) DAY PERIOD. THE SECONDARY PERMITTEES MUST IMPLEMENT ANY NEW PLAN REQUIREMENTS AFFECTING THEIR SITE(S) WITHIN 48-HOURS OF NOTIFICATION BY THE PRIMARY PERMITTEE.

(6). A REPORT OF EACH INSPECTION THAT INCLUDES THE NAME(S) OF CERTIFIED PERSONNEL MAKING EACH INSPECTION, THE DATE(S) OF EACH INSPECTION, CONSTRUCTION PHASE (I.E., INITIAL, INTERMEDIATE OR FINAL), MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PART IV.D.4.B.(5) OF THE PERMIT SHALL BE MADE AND RETAINED AT THE SITE OR BE READILY AVAILABLE AT A DESIGNATED ALTERNATE LOCATION UNTIL THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION IS SUBMITTED TO EPD. SUCH REPORTS SHALL BE READILY AVAILABLE BY THE END OF THE SECOND BUSINESS DAY AND /OR WORKING DAY AND SHALL IDENTIFY ALL INCIDENTS OF BEST MANAGEMENT PRACTICES THAT HAVE NOT BEEN PROPERLY INSTALLED AND/OR MAINTAINED AS DESCRIBED IN THE PLAN. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS, THE INSPECTION REPORT SHALL CONTAIN A CERTIFICATION THAT THE BEST MANAGEMENT PRACTICES ARE IN COMPLIANCE WITH THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART V.G.2 OF THIS PERMIT. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES PERFORMING ONLY SERVICE LINE INSTALLATIONS OR WHEN CONDUCTING REPAIRS ON EXISTING LINE INSTALLATIONS.

22 (7). EACH SECONDARY PERMITTEE SHALL BE PROVIDED WITH A COPY OF THE EROSION CONTROL PLANS OR PORTIONS OF THE PLAN APPLICABLE TO THEIR SITE AND EACH SECONDARY PERMITTEE SHALL SIGN THE PLAN OR PORTION OF THE PLAN APPLICABLE TO THEIR SITE. SECONDARY PERMITTEES SIGN WHEN RECEIVING PLANS. ALL SECONDARY PERMITTEES SHALL SUBMIT A SECONDARY NOI AT LEAST 14 DAYS PRIOR TO BEGINNING CONSTRUCTION ACTIVITY.

COMPANY: PHONE:
ADDRESS: FAX:
ADDRESS:
GSWCC LEVEL 1A CERT #: SIGNATURE:_____

C. TERTIARY PERMITTEE.

(1). EACH DAY WHEN ANY TYPE OF CONSTRUCTION ACTIVITY HAS TAKEN PLACE AT A TERTIARY PERMITTEE'S SITE, CERTIFIED PERSONNEL PROVIDED BY THE TERTIARY PERMITTEE SHALL INSPECT: (A) ALL AREAS USED BY THE TERTIARY PERMITTEE WHERE PETROLEUM PRODUCTS ARE STORED, USED, OR HANDLED FOR SPILLS AND LEAKS FROM VEHICLES AND EQUIPMENT; AND (B) ALL LOCATIONS AT THE TERTIARY PERMITTEE SITE WHERE THAT PERMITTEE'S VEHICLES ENTER OR EXIT THE SITE FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING. THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS PERFORMING ONLY SERVICE LINE INSTALLATIONS OR WHEN CONDUCTING REPAIRS ON EXISTING LINE INSTALLATIONS.

(2).MEASURE AND RECORD RAINFALL WITHIN DISTURBED AREAS OF THE SITE THAT HAVE NOT MET FINAL STABILIZATION ONCE EVERY 24 HOURS EXCEPT ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY AND NON-WORKING FEDERAL HOLIDAY.THE DATA COLLECTED FOR THE PURPOSE OF COMPLIANCE WITH THIS PERMIT SHALL BE REPRESENTATIVE OF THE AMOUNT AND INTENSITY OF RAINFALL MAY BE SUSPENDED IF ALL AREAS OF THE SITE HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION; (B) AREAS USED BY THE UTILITY COMPANIES AND UTILITY CONTRACTORS FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION THAT HAVE NOT UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION AND (C) STRUCTURAL CONTROL MEASURES. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN APPLICABLE TO THE UTILITY COMPANY'S AND UTILITY CONTRACTORS' CONSTRUCTION ACTIVITIES SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). FOR AREAS OF A SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION, THE PERMITTEE MUST COMPLY WITH PART IV.D.4.B.(4). THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED. THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS IF THEY ARE SECONDARY PERMITTEES .

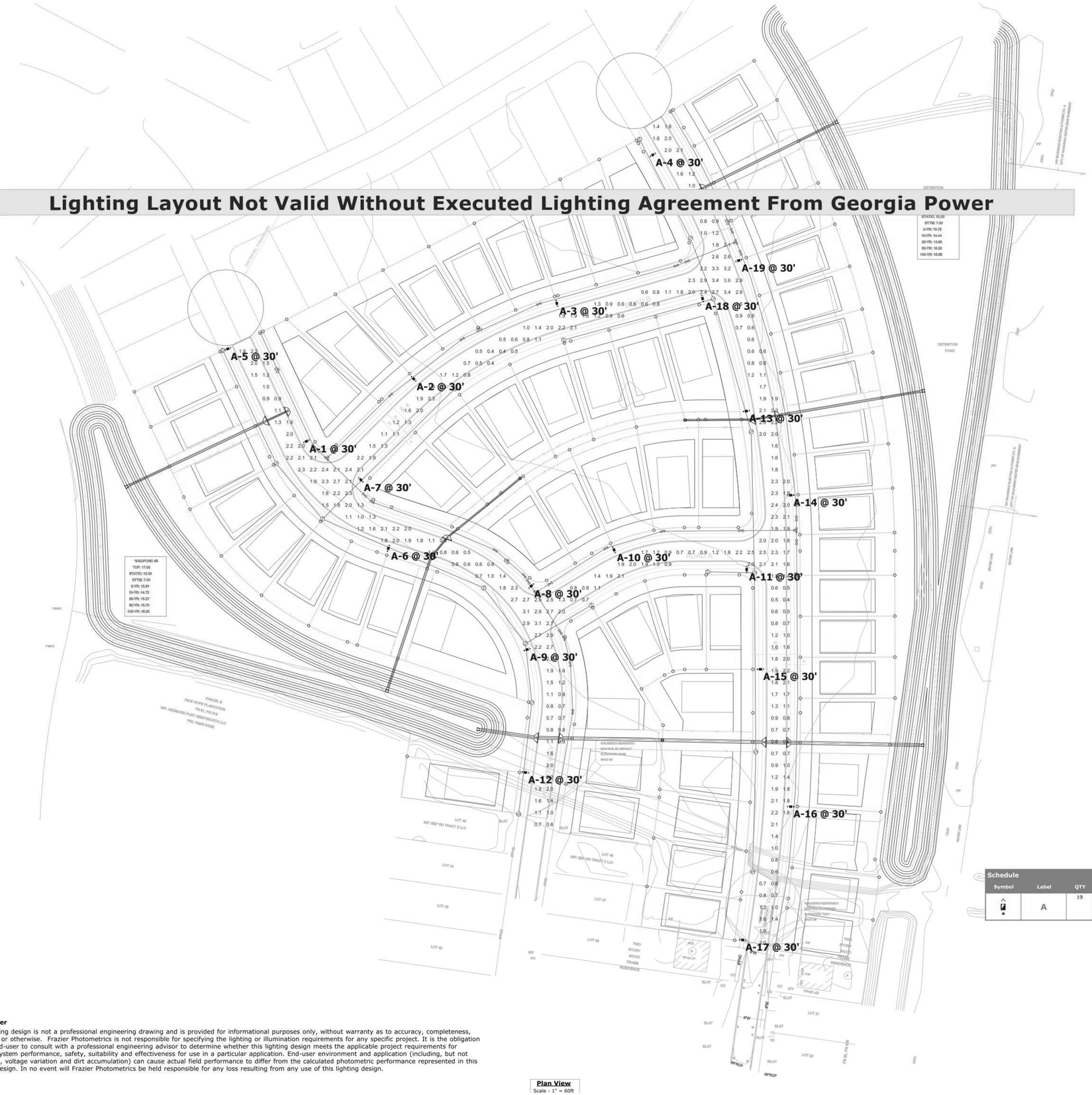
(3). CERTIFIED PERSONNEL (PROVIDED BY THE TERTIARY PERMITTEE) SHALL INSPECT AT LEAST ONCE PER MONTH DURING THE TERM OF THIS PERIOD (I.E., UNTIL A NOTICE OF TERMINATION IS SUBMITTED TO EPD) THE AREAS OF THEIR SITES THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION. THESE AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER(S). EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY . WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS PERFORMING ONLY SERVICE LINE INSTALLATIONS OR WHEN CONDUCTING REPAIRS ON EXISTING LINE INSTALLATIONS.

(4). CERTIFIED PERSONNEL (PROVIDED BY THE TERTIARY PERMITTEE) SHALL INSPECT AT LEAST ONCE PER MONTH DURING THE TERM OF THIS PERIOD (I.E., UNTIL A NOTICE OF TERMINATION IS SUBMITTED TO EPD) THE AREAS OF THEIR SITES THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION. THESE AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER(S). EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY . WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER(S). THIS PARAGRAPH IS NOT APPLICABLE TO UTILITY COMPANIES AND UTILITY CONTRACTORS PERFORMING ONLY SERVICE LINE INSTALLATIONS OR WHEN CONDUCTING REPAIRS ON EXISTING LINE INSTALLATIONS.

(5). BASED ON THE RESULTS OF EACH INSPECTION, THE SITE DESCRIPTION AND THE POLLUTION PREVENTION AND CONTROL MEASURES IDENTIFIED IN THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN. THE PLAN SHALL BE REVISED AS APPROPRIATE NOT LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING EACH INSPECTION. IMPLEMENTATION OF SUCH CHANGES SHALL BE MADE AS SOON AS PRACTICAL BUT IN NO CASE LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING THE INSPECTION.

(6). A REPORT OF EACH INSPECTION THAT INCLUDES THE NAME(S) OF CERTIFIED PERSONNEL MAKING EACH INSPECTION, THE DATE(S) OF EACH INSPECTION, CONSTRUCTION PHASE (I.E., INITIAL, INTERMEDIATE OR FINAL) , MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PART IV.D.4.C.(5) OF THE PERMIT SHALL BE MADE AND RETAINED AT THE SITE OR BE READILY AVAILABLE AT A DESIGNATED ALTERNATE LOCATION UNTIL THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION IS SUBMITTED TO EPD. SUCH REPORTS SHALL BE READILY AVAILABLE BY THE END OF THE SECOND BUSINESS DAY AND/OR WORKING DAY AND SHALL IDENTIFY ALL INCIDENTS OF BEST MANAGEMENT PRACTICES THAT HAVE NOT BEEN PROPERLY INSTALLED AND/OR MAINTAINED AS DESCRIBED IN THE PLAN. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS, THE INSPECTION REPORT SHALL CONTAIN A CERTIFICATION THAT THE BEST MANAGEMENT PRACTICES ARE IN COMPLIANCE WITH THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART V

Lighting Layout Not Valid Without Executed Lighting Agreement From Georgia Power



Plan View
Scale - 1" = 60ft

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Number Lamps	Filename	Lumens per Lamp	LLF	Wattage
	A	19	COOPER LIGHTING SOLUTIONS - STREETWORKS (FORMERLY EATON)	ARCH-M-PA2-130-740-U-T3	ARCHEON-M ROADWAY AND AREA LUMINAIRE (2) 70 CRI, 4000K, 845mA LIGHT ENGINES WITH 16 LEDS AND TYPE III OPTICS	48	ARCH-M-PA2-130-740-U-T3.ies	400	0.912	131

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #1	+	1.5 fc	3.6 fc	0.4 fc	9.0:1	3.8:1

Notes
1. Readings are shown in units of maintained footcandles.
2. Total Light Loss Factor (LLF) = .912 LLF for LED
3. Test Plane = 0' Above grade
4. Fixture Mounting Height = 30' Above grade
5. Fixture Spacing = See Plan view.
6. This photometric layout was calculated using specific criteria. Any deviation from stated parameters will affect actual performance.
7. These lighting calculations are not a substitute for independent engineering analysis of lighting system suitability and safety.

Disclaimer
This lighting design is not a professional engineering drawing and is provided for informational purposes only, without warranty as to accuracy, completeness, reliability or otherwise. Frazier Photometrics is not responsible for specifying the lighting or illumination requirements for any specific project. It is the obligation of the end-user to consult with a professional engineering advisor to determine whether this lighting design meets the applicable project requirements for lighting system performance, safety, suitability and effectiveness for use in a particular application. End-user environment and application (including, but not limited to, voltage variation and dirt accumulation) can cause actual field performance to differ from the calculated photometric performance represented in this lighting design. In no event will Frazier Photometrics be held responsible for any loss resulting from any use of this lighting design.

SouthCon

Mulberry Tract Phases 3-4

Designer	KF
Date	11/16/2021
Scale	As Shown
Drawing No.	S62621A1
Summary	

LANDFILL CERTIFICATION

Brian Harvey
City of Port Wentworth
7224 GA Highway 21
Port Wentworth, GA 31407

RE: Mulberry Phase 3 – CCI Job #21-309

Dear Brian Harvey,
This is to certify that according to the public records of City of Port Wentworth none of the sewers, services or any other utilities associated with this project are constructed on or serving structures constructed or proposed to be constructed on solid waste landfills.

Name **Neil McKenzie, PE**

Title Project Engineer

Signature

Date 11/23/21

MASTER HYDROLOGY REPORT

MULBERRY TRACT

PORT WENTWORTH, GA

JULY 2021



Project# 21-309.000

COLEMAN COMPANY
ENGINEERS • SURVEYORS

PREPARED BY NEIL P. MCKENZIE, P.E. | PREPARED FOR BEP RICE HOPE, LLC

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SITE OVERVIEW

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SITE OVERVIEW

This site is located along the east side of Augusta Road/ Route 21 within the area known as Mulberry Tract, within the Rice Hope Plantation. As of June 2021, this tract is located inside the city limits of Port Wentworth, Georgia. The site in its pre-developed state consists of approximately 120 acres of upland, managed pine forest, brush, drainage channels, and fire lanes. This site is also adjacent to jurisdictional wetlands.

The soils found on site are predominantly in the hydrologic soil groups B & D and consist of Cape Fear Soils (Cc), Craven Loamy Fine Sands (Cx), Ocilla Complex (Oj), Pelham Loamy Sand (Pl) and Pooler Fine Sandy Loam (Pn).

There is a considerable amount of offsite stormwater that drains through the site; the total drainage area under analysis of this study is approximately 260 acres. Based on input from the City of Port Wentworth, there is evidence of flooding on the adjacent property to the northwest, owned by the Thompson Family. This study has accounted for this issue and offers solutions to help mitigate the inundation.

The purpose of this study is to demonstrate that effective stormwater management facilities will be designed and constructed to serve the master-planned development. This "Master Hydrology Study" will be used as a reference for future phases of development. The results of the master study are presented here, to show how the City of Port Wentworth Stormwater requirements are satisfied.

Generally, stormwater runoff generated from this site begins as sheet flow; it then travels in a shallow concentrated flow across the property until it enters one of the many existing channels that currently drain into the seasonal wetlands, and ultimately to Knoxboro Creek. The existing outfall channels are identified on the pre-developed conditions exhibit and denoted as North, Middle, and South Outfalls. These outfalls all ultimately converge and discharge to Knoxboro Creek, a tributary to the Savannah River. Hydrologic estimates of the stormwater runoff that occur during storm events with 1-yr, 2-year, 5-yr, 10-year, 25-year, 50-year, and 100-year return frequencies were made utilizing the SCS Method for both the Pre and Post Developed conditions, in accordance with the *City of Port Wentworth.*

The calculation methods and equations used are in Appendix A and B. The results are presented below.

PRE-DEVELOPED ANALYSIS

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PRE-DEVELOPED ANALYSIS

WATERSHED DESCRIPTON

The existing drainage pattern for this property is modeled by four drainage basins based on the existing topography. The Mulberry Tract property that consists of a wooded pine, underbrush/grass ground cover, generates runoff that all will ultimately discharge to three main outfall points where it is then conveyed to wetlands and filtered out to Knoxboro Creek.

The existing site watershed has a consistent hydrologic condition consisting of woods with underbrush in good condition with a 'D' hydrological soil group and mild slopes. See Appendix D for Soil Map. The total area under analysis is the entire drainage area that discharges to the three main outfalls, which is approximately 260 acres. See Appendix A for Pre-development exhibit (drainage map).

CURVE NUMBER

The hydrological soil type information has been superimposed over the drainage basin map and the acreages of the various soil types within each basin were then measured. Next, SCS Curve Numbers (CN) were assigned corresponding to the hydrological soil type and ground cover conditions. Finally, a composite CN of 78 was determined for the pre-development drainage basins.

Post Dev Basin	Hydrologic Soil Group	Ground Cover Type	Hydrologic Condition	CN	Composite CN	Area (acres)
EX. AREA #1	D	Woods – Grass Combination	Good	78	**78**	**12.33**
EX. AREA #2A	D	Woods – Grass Combination	Good	78	**78**	**2.24**
EX. AREA #2B	D	Woods – Grass Combination	Good	78	**78**	**80.82**
EX. AREA #3	D	Woods – Grass Combination	Good	77	**77**	**71.04**
EX. AREA #4A	D	Woods – Grass Combination	Good	77	**77**	**69.32**
EX. AREA #4B	D	Woods – Grass Combination	Good	77	**77**	**84.12**

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TIME OF CONCENTRATION

The times of concentration (T_c) for the basins were determined based on the travel times in each of the sheet flow, shallow concentrated flow, and channel flow segments.

SHEET FLOW

The *Pre-Developed Drainage Exhibit* shows the hydraulic flow-path used for the drainage basin. As indicated, the runoff was assumed to sheet flow for the first 100 ft. The roughness coefficient, n, and ground slope, S, along with the resultant travel time for the sheet flow segments of each basin are tabulated below.

Pre-Dev Drainage Basin	Roughness Coefficient n (--)	Ground Slope S (%)	Sheet Flow Travel Time T_{SH} (min)
1	0.30	1.0	**18.379**
2A	0.30	0.5	**24.251**
2B	0.40	0.3	**37.445**
3	0.30	0.4	**29.996**
4A	0.40	0.3	**20.791**
4B	0.40	1.5	**19.670**

SHALLOW CONCENTRATED FLOW

The following table shows the length and slope of the shallow concentrated flow-path, the average velocity, and the resulting travel time for each drainage basin.

Pre-Dev Drainage Basin	Paved (Y/N)	Flow Length (ft)	Ground Slope S (%)	Shallow Conc. Flow Travel Time Tc (min)
1	N	517	0.7	**6.383**
2A	N	1,000	0.2	**23.098**
2B	N	1,112	0.4	**18.154**
3	N	1,620	0.3	**13.222**
4A	N	600	0.3	**33.339**
4B	N	700	1.5	**5.900**

CHANNEL FLOW

The final component of the travel time is comprised of the portion that occurs within the drainage ditch. The channel length, roughness coefficient, slope, cross-sectional area, velocity, and the resulting travel time are tabulated below for each drainage basin.

Drainage Basin	Channel Length (ft)	Channel Roughness Coefficient (--)	Channel Slope S (%)	Cross Sectional Area (ft2)	Wetted Perimeter (ft)	Channel Flow Travel Time T_{sc} (min)
1	163	0.013	0.8	4.9	7.85	**0.374**
2A	-	-	-	-	-	-
2B	2,285	0.03	0.1	4.9	7.85	**33.250**
3	1,860	0.03	0.1	4.9	7.85	**18.597**
4A	2,200	0.03	0.2	4.9	7.85	-
4B	2,300	0.03	0.2	4.9	7.85	**23.670**

TOTAL TIME OF CONCENTRATION

The total times of concentration (T_c) for each of the basins was determined by adding the travel times for the sheet, shallow concentrated, and channel flow regimes. The total times of concentration are shown in the following table.

Pre Dev Drainage Basin	Travel Time in Flow Regime (min)			
	Sheet Flow (min)	Shallow Conc. Flow (min)	Channel Flow (min)	Total Time of Concentration Tc (min)
1	18.379	6.383	0.374	**25.137**
2A	24.251	23.098	-	**47.350**
2B	37.445	18.154	33.25	**88.810**
3	29.996	13.22	18.697	**95.02**

4A	20.791	33.339	**-**	**71.37**
4B	19.670	5.900	23.670	**49.21**

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RUNOFF CALCULATION

The above data were input into PondPack to generate the runoff hydrographs for each of the drainage basins based on the SCS Hydrograph Method. The program output is included as Appendix A - Pre-Development Flow Calculations. The following table summarizes the peak stormwater runoff rates calculated for the Pre-Development conditions.

Pre-Developed Runoff Rates (cfs)							
Outfall	Storm Recurrence Frequency						
	1yr	2 yr	5 yr	10yr	25yr	50yr	100yr
SOUTH	8.44	9.62	10.50	11.07	11.99	13.61	17.61
MIDDLE	72.93	84.30	93.71	99.75	110.49	118.63	124.60
NORTH	28.87	53.27	82.24	95.67	122.94	144.83	167.10

Note: There are three (3) point of analysis for this study that are identified as the North, Middle and South Outfall. This is the theoretical confluence of the site's runoff prior to discharge as these three outfall locations. Pre and post conditions are evaluated at these locations.

The outfalls are ditches that drain east, eventually converging and draining to Knoxboro Creek. These ditches are partially blocked by the City of Savannah's double 48" I&D water lines. The stormwater flows through the space between the pipes and over the top during significant rain events. The point of analysis for each outfall is just upstream of the 48" I&D crossing.

POST-DEVELOPED ANALYSIS

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POST-DEVELOPMENT ANALYSIS

WATERSHED DESCRIPTON

The completed post development site will consist of approximately 250 single family residential detached units and the infrastructure to support it. Stormwater will generally sheet flow from the developed lots, travel via shallow concentrated flow to drainage inlets, then conveyed via concrete pipe to an interconnected pond system that will provide detention and water quality to meet the requirements of the City of Port Wentworth and the State of GA. The ponds will be controlled with multi-staged outlet control structures to control release rates and peak water surface elevations. Each pond will have an emergency spillway to safely pass the 100 yr storm event to avoid catastrophic inundation of the development.

In order to address the flooding issue on the adjacent Thompson property, this study proposes to provide improvements to bypass stormwater around the development. See Conclusion and Recommendations section for more detail of the proposed improvements. Additionally, a portion of the offsite drainage from the west (Bypass Area #1) will be captured by the proposed system in Pond #3, controlled, and allowed to discharge offsite. This offsite drainage could not be bypassed; it was originally draining to the Middle outfall in pre-developed conditions. This outfall is no longer functional and has been cut-off by development; the Middle outfall will not be utilized in the post-developed condition.

The detention pond basins were designed utilizing the SCS Curve Number Method with “PondPack” software developed by Haested Methods, Inc. This method uses a series of hydrographs for different durations and storm distribution types to find the particular storm duration that results in the maximum storage required. The pond volume data and a type of outfall structure were entered into PondPack software program to create a stage-storage discharge relationship for the detention basin. Once these pond characteristics were defined, the SCS Curve Number Method hydrograph was routed through the basins to establish the peak inflow, outflow, and maximum pond elevations in addition to the total storage volumes of the basins using the interconnected pond routine.

The individual catchment areas for the contributing drainage areas were determined based on the proposed topography and their associated Curve Numbers, Times of Concentration, and runoff estimates were then calculated. The results are presented below.

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CURVE NUMBERS AND TIMES OF CONCENTRATION

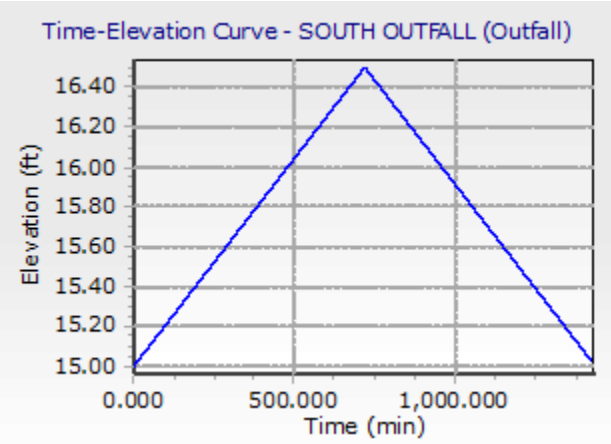
Urban Hydrology for Small Watersheds – TR55, Table 2-2a was used to determine the appropriate CN corresponding to the appropriate ground cover condition. The value for each CN, for each hydrological group was determined. A composite CN was calculated for each basin, taking into consideration impervious surfaces and is found in the table below.

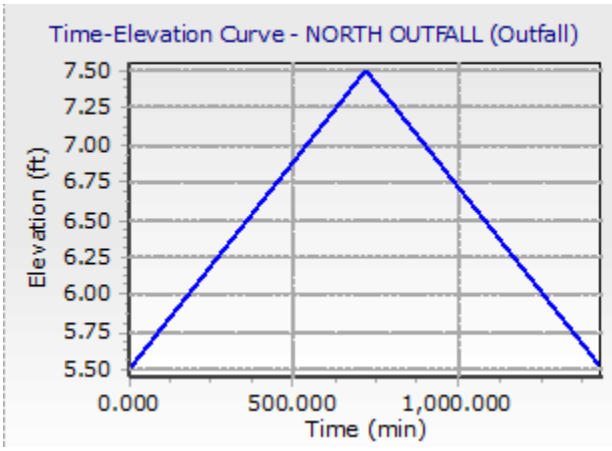
The total times of concentration (T_c) for each of the basins was determined by adding the travel times for the sheet, shallow concentrated, and channel flow regimes. Times of concentration (T_c) for the developed basins were assumed to be 10.0 and 20.0 minutes in the post-developed condition, depending on proximity to the receiving pond. The total times of concentration are shown in the following table.

Post Dev Basin	Hydrologic Soil Group	Hydrologic Condition	Area (ac)	CN	Tc (min)
EX. AREA 1	D	GOOD	3.85	**78**	**10.00**
EX. AREA 2B	D	GOOD	80.82	**78**	**80.81**
POST AREA 'A'	D	GOOD	15.53	**91**	**18.91**
POST AREA 'B'	D	GOOD	1.00	**90**	**10.00**
POST AREA 'C'	D	GOOD	22.73	**87**	**29.51**
POST AREA 'D'	D	GOOD	35.20	**83**	**29.40**
OFFSITE AREA #3	D	GOOD	28.61	**77**	**81.96**
BY-PASS #4A	D	GOOD	45.02	**77**	**71.06**
BY-PASS #4B	D	GOOD	83.73	**77**	**66.98**

TAILWATER CONDITIONS

The tailwater condition at the South Outfall is approximated by a time-elevation curve; all water surface elevations and routing calculations are based on this condition. The curve begins at minute 0 at elevation 15.00 ft, which is the approximate invert elevation of the receiving outfall ditch and normal static water elevation of the detention pond system. As the storm duration progresses, the peak is approximated to occur at minute 720 at 16.50 ft, which is the top elevation of the I&D water line that crosses the south outfall ditch and would be the limiting factor if flow under the I&D line was to become restricted.





Based on the elevation relief from the North Outfall to the discharge from Pond #2, the tailwater condition is modeled as a free outfall. The pond static water level is elevation 12.00, the discharge to the wetlands is at elevation 10.00, and the crossing at the I&D line is at approximate elevation 6.50.

RUNOFF CALCULATION

The above data were input into PondPack to generate the runoff hydrographs for each of the drainage basins based on the SCS Hydrograph Method. The runoff hydrographs are then routed the proposed detention facility utilizing stage storage relationships based on the outfall control structure and respective inflow hydrograph. The program input and output is included as Appendix B –Post-Development Flow Calculations.

CONCLUSION AND RECOMMENDATIONS

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CONCLUSION

This hydrological study of the effects of this Mulberry Tract development shows that the post-developed runoff rates do not exceed the pre-developed runoff rates. The allowable runoff rates for the post-developed outfall correspond to the pre-developed conditions and are as followed:

NORTH OUTFALL		
STORM RECURRENCE INTERVAL	TOTAL PEAK RUNOFF RATES [CFS]	
	PRE-DEVELOPMENT	POST-DEVELOPMENT
1-YR	28.87	26.86
2-YR	53.27	50.47
5-YR	82.24	76.07
10-YR	95.67	90.50
25-YR	122.94	116.59
50-YR	144.83	138.16
100-YR	167.10	161.55

NORTH OUTFALL PRE & POST DEVELOPED PEAK RUNOFF RATES

MIDDLE OUTFALL		
STORM RECURRENCE INTERVAL	TOTAL PEAK RUNOFF RATES [CFS]	
	PRE-DEVELOPMENT	POST-DEVELOPMENT
1-YR	72.93	-
2-YR	84.30	-
5-YR	93.71	-
10-YR	99.75	-
25-YR	110.49	-
50-YR	118.63	-
100-YR	124.60	-

MIDDLE OUTFALL NOT USED IN POST DEVELOPMENT

SOUTH OUTFALL		
STORM RECURRENCE INTERVAL	TOTAL PEAK RUNOFF RATES [CFS]	
	PRE-DEVELOPMENT	POST-DEVELOPMENT
1-YR	8.44	10.11
2-YR	9.62	11.48
5-YR	10.50	12.63
10-YR	11.07	13.31
25-YR	11.99	14.42
50-YR	13.61	17.03
100-YR	17.61	20.84

SOUTH OUTFALL PRE & POST DEVELOPED PEAK RUNOFF RATES

STORM RECURRENCE INTERVAL	PEAK POND ELEVATIONS [FT]				
	EX. POND	POND 1A	POND 1B	POND 2	POND 3
1-YR	16.61	16.60	16.63	13.26	13.27
2-YR	16.84	17.01	16.89	13.78	13.82
5-YR	17.03	17.29	17.14	14.19	14.28
10-YR	17.26	17.45	17.26	14.44	14.58
25-YR	17.64	17.65	17.55	14.89	15.09
50-YR	17.93	17.97	17.78	15.28	15.52
100-YR	18.22	18.23	18.06	15.72	15.96

POND STAGING ELEVATIONS

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RECOMMENDATIONS

The following is a list of improvements proposed by this study, to minimize inundation on adjacent properties and optimize the site hydraulics:

1. Provide a bypass ditch dedicated to the Thompsons runoff. This will result in upgrading the storm drain culvert under RH Plantation Drive. The bypass ditch will intercept runoff discharging from the Thompson property, and bypass the project site to give a direct connection to the culvert crossing under RH Plantation Drive. Based on elevations and cover, the culvert will be upsized to double 30" pipes. The existing condition is a single 18" pipe. The purpose of this bypass is to disconnect the Thompson property from the peak water surface elevations of the proposed system, which if connected, would make the situation on the Thompson property worse.

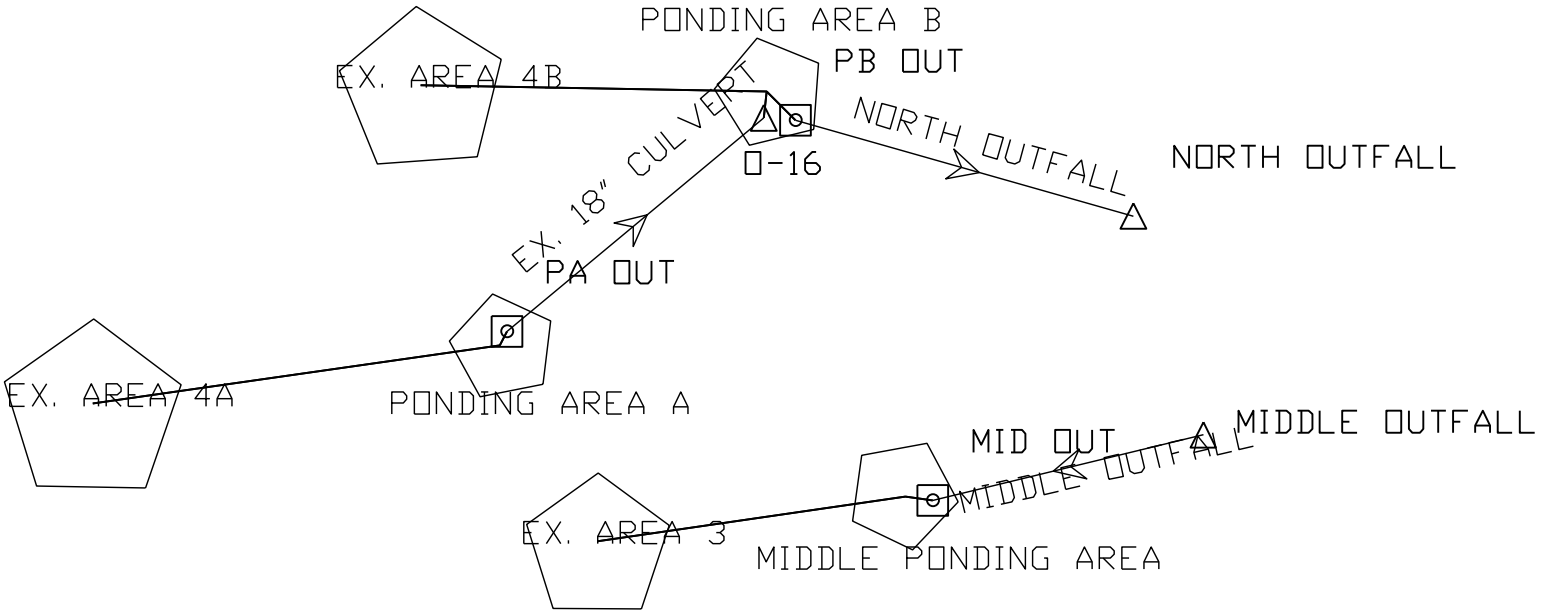
2. Capture the offsite runoff from the west in the proposed system. The "rim" ditch will be utilized and expanded to help convey and capture this offsite runoff. Due to the Middle Outfall being cut-off, this offsite runoff will need to be accommodated in the proposed system. The proposed system provides over 10 acres of detention. A flap gate will be installed to limit inundation of upstream offsite areas.

3. The outfall for Pond #2 is proposed to be an outfall ditch to the north, seeking the 10.00 elevation. The outfall elevation provides the lowest possible static water elevation in the proposed pond system, minimizing peak water surface elevations, inundation limits, and fill requirements. Also, the receiving wetland will act as potential additional storage for stormwater, attenuate flows, and provide a reasonable backwater condition for the northern I&D crossing.

APPENDIX A
PRE-DEVELOPMENT
(EXHIBIT and PONDPACK RESULTS)

Project Summary	
Title	Mulberry Tract Masterplan
Engineer	
Company	Coleman Company, Inc.
Date	11/22/2021

Notes	Pre-Development Hydrology for Mulberry Tract Masterplan


PONDING AREA B
EX. AREA 4B
PB OUT
NORTH OUTFALL
NORTH OUTFALL
EX. 18" CULVERT
D-16
PA OUT
EX. AREA 4A
PONDING AREA A
MID OUT
MIDDLE OUTFALL
MIDDLE OUTFALL
EX. AREA 3
MIDDLE PONDING AREA

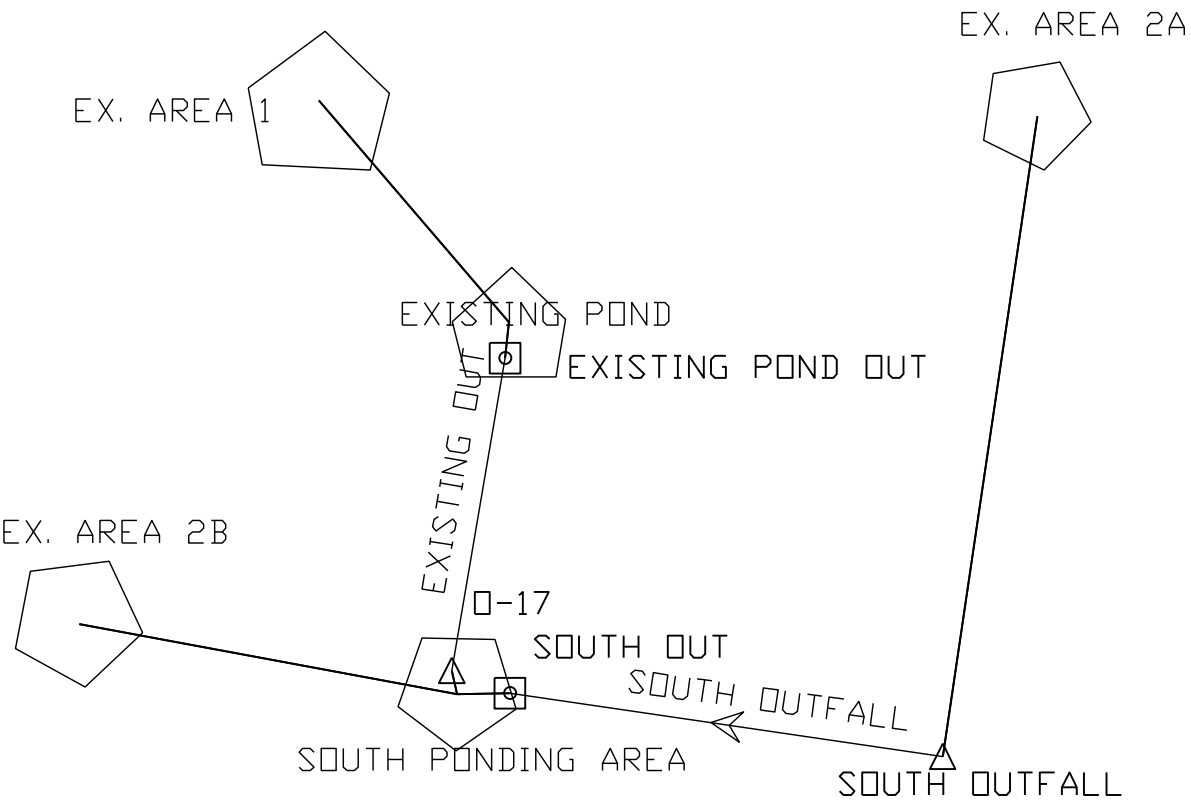

EX. AREA 2A
EX. AREA 1
EXISTING POND
EXISTING POND OUT
EXISTING OUT
EX. AREA 2B
D-17
SOUTH OUT
SOUTH OUTFALL
SOUTH PONDING AREA
SOUTH OUTFALL

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Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft^3)	Time to Peak (min)	Peak Flow (ft^3/s)
EX. AREA 1	Pre-Development 1 year	1	69,960.000	744.000	10.96
EX. AREA 1	Pre-Development 2 year	2	113,109.000	744.000	17.95
EX. AREA 1	Pre-Development 5 year	5	159,264.000	744.000	25.29
EX. AREA 1	Pre-Development 10 year	10	187,899.000	744.000	29.78
EX. AREA 1	Pre-Development 25 year	25	236,712.000	744.000	37.33
EX. AREA 1	Pre-Development 50 year	50	276,490.000	741.000	43.46
EX. AREA 1	Pre-Development 100 year	100	316,746.000	741.000	49.60
EX. AREA 2A	Pre-Development 1 year	1	12,627.000	762.000	1.36
EX. AREA 2A	Pre-Development 2 year	2	20,428.000	759.000	2.24
EX. AREA 2A	Pre-Development 5 year	5	28,776.000	759.000	3.17
EX. AREA 2A	Pre-Development 10 year	10	33,955.000	759.000	3.74
EX. AREA 2A	Pre-Development 25 year	25	42,786.000	759.000	4.70
EX. AREA 2A	Pre-Development 50 year	50	49,982.000	759.000	5.47
EX. AREA 2A	Pre-Development 100 year	100	57,266.000	759.000	6.25
EX. AREA 3	Pre-Development 1 year	1	377,014.000	798.000	25.20
EX. AREA 3	Pre-Development 2 year	2	617,109.000	798.000	42.36
EX. AREA 3	Pre-Development 5 year	5	875,539.000	798.000	60.62
EX. AREA 3	Pre-Development 10 year	10	1,036,395.000	798.000	71.88
EX. AREA 3	Pre-Development 25 year	25	1,311,242.000	798.000	90.94
EX. AREA 3	Pre-Development 50 year	50	1,535,647.000	786.000	106.53
EX. AREA 3	Pre-Development 100 year	100	1,763,055.000	786.000	122.23
EX. AREA 4A	Pre-Development 1 year	1	370,833.000	780.000	30.27
EX. AREA 4A	Pre-Development 2 year	2	606,505.000	780.000	50.72
EX. AREA 4A	Pre-Development 5 year	5	860,069.000	780.000	72.43
EX. AREA 4A	Pre-Development 10 year	10	1,017,864.000	780.000	85.80
EX. AREA 4A	Pre-Development 25 year	25	1,287,437.000	771.000	108.41
EX. AREA 4A	Pre-Development 50 year	50	1,507,508.000	771.000	126.88

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
EX. AREA 4A	Pre-Development 100 year	100	1,730,505.000	771.000	145.45
EX. AREA 4B	Pre-Development 1 year	1	453,667.000	762.000	47.36
EX. AREA 4B	Pre-Development 2 year	2	741,459.000	762.000	79.17
EX. AREA 4B	Pre-Development 5 year	5	1,050,988.000	762.000	112.87
EX. AREA 4B	Pre-Development 10 year	10	1,243,574.000	762.000	133.59
EX. AREA 4B	Pre-Development 25 year	25	1,572,539.000	762.000	168.59
EX. AREA 4B	Pre-Development 50 year	50	1,841,067.000	762.000	196.83
EX. AREA 4B	Pre-Development 100 year	100	2,113,142.000	759.000	225.29
EX. AREA 2B	Pre-Development 1 year	1	449,677.000	795.000	31.69
EX. AREA 2B	Pre-Development 2 year	2	728,416.000	792.000	52.51
EX. AREA 2B	Pre-Development 5 year	5	1,026,858.000	792.000	74.53
EX. AREA 2B	Pre-Development 10 year	10	1,212,107.000	792.000	88.06
EX. AREA 2B	Pre-Development 25 year	25	1,528,011.000	783.000	110.95
EX. AREA 2B	Pre-Development 50 year	50	1,785,514.000	783.000	129.58
EX. AREA 2B	Pre-Development 100 year	100	2,046,174.000	783.000	148.30

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
SOUTH OUTFALL	Pre-Development 1 year	1	132,123.000	1,440.000	8.44
SOUTH OUTFALL	Pre-Development 1 year	1	-492,198.000	702.000	-10.17
SOUTH OUTFALL	Pre-Development 2 year	2	186,489.000	1,440.000	9.62
SOUTH OUTFALL	Pre-Development 2 year	2	-450,521.000	0.000	-10.13
SOUTH OUTFALL	Pre-Development 5 year	5	244,606.000	1,440.000	10.50
SOUTH OUTFALL	Pre-Development 5 year	5	-425,475.000	0.000	-10.13
SOUTH OUTFALL	Pre-Development 10 year	10	274,112.000	1,440.000	11.07
SOUTH OUTFALL	Pre-Development 10 year	10	-414,037.000	0.000	-10.13
SOUTH OUTFALL	Pre-Development 25 year	25	322,246.000	1,440.000	11.99

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
SOUTH OUTFALL	Pre-Development 25 year	25	-398,653.000	0.000	-10.13
SOUTH OUTFALL	Pre-Development 50 year	50	404,223.000	1,407.000	13.61
SOUTH OUTFALL	Pre-Development 50 year	50	-389,620.000	0.000	-10.13
SOUTH OUTFALL	Pre-Development 100 year	100	561,265.000	1,233.000	17.61
SOUTH OUTFALL	Pre-Development 100 year	100	-382,716.000	0.000	-10.13
MIDDLE OUTFALL	Pre-Development 1 year	1	1,651,546.000	897.000	72.93
MIDDLE OUTFALL	Pre-Development 1 year	1	-1,568,789.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 2 year	2	1,873,009.000	903.000	84.30
MIDDLE OUTFALL	Pre-Development 2 year	2	-1,555,011.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 5 year	5	2,107,246.000	903.000	93.71
MIDDLE OUTFALL	Pre-Development 5 year	5	-1,535,788.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 10 year	10	2,251,070.000	903.000	99.75
MIDDLE OUTFALL	Pre-Development 10 year	10	-1,521,814.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 25 year	25	2,495,285.000	903.000	110.49
MIDDLE OUTFALL	Pre-Development 25 year	25	-1,496,313.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 50 year	50	2,693,294.000	903.000	118.63
MIDDLE OUTFALL	Pre-Development 50 year	50	-1,474,056.000	0.000	-71.24
MIDDLE OUTFALL	Pre-Development 100 year	100	2,892,493.000	903.000	124.60
MIDDLE OUTFALL	Pre-Development 100 year	100	-1,450,003.000	0.000	-71.24
NORTH OUTFALL	Pre-Development 1 year	1	806,771.000	855.000	28.87
NORTH OUTFALL	Pre-Development 1 year	1	-12,615.000	639.000	-1.77
NORTH OUTFALL	Pre-Development 2 year	2	1,224,322.000	831.000	53.27
NORTH OUTFALL	Pre-Development 2 year	2	-5,605.000	429.000	-0.56
NORTH OUTFALL	Pre-Development 5 year	5	1,604,174.000	816.000	82.24
NORTH OUTFALL	Pre-Development 5 year	5	-2,958.000	429.000	-0.56
NORTH OUTFALL	Pre-Development 10 year	10	1,827,927.000	816.000	95.67
NORTH OUTFALL	Pre-Development 10 year	10	-2,857.000	426.000	-0.52

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
NORTH OUTFALL	Pre-Development 25 year	25	2,205,905.000	810.000	122.94
NORTH OUTFALL	Pre-Development 25 year	25	-2,543.000	387.000	-0.42
NORTH OUTFALL	Pre-Development 50 year	50	2,637,199.000	810.000	144.83
NORTH OUTFALL	Pre-Development 50 year	50	-2,020.000	381.000	-0.35
NORTH OUTFALL	Pre-Development 100 year	100	3,100,377.000	807.000	167.10
NORTH OUTFALL	Pre-Development 100 year	100	-1,455.000	300.000	-0.22

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
EXISTING POND (IN)	Pre-Development 1 year	1	69,960.000	744.000	10.96	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 1 year	1	69,270.000	768.000	7.95	17.12	197,433.000
EXISTING POND (IN)	Pre-Development 2 year	2	113,109.000	744.000	17.95	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 2 year	2	112,102.000	765.000	13.37	17.29	204,911.000
EXISTING POND (IN)	Pre-Development 5 year	5	159,264.000	744.000	25.29	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 5 year	5	157,939.000	762.000	19.00	17.47	212,692.000
EXISTING POND (IN)	Pre-Development 10 year	10	187,899.000	744.000	29.78	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 10 year	10	186,384.000	765.000	22.06	17.58	217,744.000
EXISTING POND (IN)	Pre-Development 25 year	25	236,712.000	744.000	37.33	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 25 year	25	234,883.000	765.000	27.16	17.79	226,875.000
EXISTING POND (IN)	Pre-Development 50 year	50	276,490.000	741.000	43.46	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
EXISTING POND (OUT)	Pre-Development 50 year	50	274,410.000	765.000	31.33	17.96	234,337.000
EXISTING POND (IN)	Pre-Development 100 year	100	316,746.000	741.000	49.60	(N/A)	(N/A)
EXISTING POND (OUT)	Pre-Development 100 year	100	310,763.000	765.000	35.10	18.13	242,184.000
PONDING AREA A (IN)	Pre-Development 1 year	1	370,833.000	780.000	30.27	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 1 year	1	374,490.000	885.000	14.60	13.46	97,355.000
PONDING AREA A (IN)	Pre-Development 2 year	2	606,505.000	780.000	50.72	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 2 year	2	609,453.000	903.000	16.58	14.05	233,111.000
PONDING AREA A (IN)	Pre-Development 5 year	5	860,069.000	780.000	72.43	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 5 year	5	757,758.000	927.000	17.28	14.29	396,368.000
PONDING AREA A (IN)	Pre-Development 10 year	10	1,017,864.000	780.000	85.80	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 10 year	10	797,209.000	948.000	17.71	14.44	503,229.000
PONDING AREA A (IN)	Pre-Development 25 year	25	1,287,437.000	771.000	108.41	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 25 year	25	855,339.000	978.000	18.47	14.72	692,674.000
PONDING AREA A (IN)	Pre-Development 50 year	50	1,507,508.000	771.000	126.88	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 50 year	50	1,023,333.000	885.000	49.67	14.80	751,147.000
PONDING AREA A (IN)	Pre-Development 100 year	100	1,730,505.000	771.000	145.45	(N/A)	(N/A)
PONDING AREA A (OUT)	Pre-Development 100 year	100	1,219,217.000	864.000	77.18	14.85	782,710.000
PONDING AREA B (IN)	Pre-Development 1 year	1	828,157.000	765.000	60.32	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
PONDING AREA B (OUT)	Pre-Development 1 year	1	806,771.000	855.000	28.87	9.37	247,800.000
PONDING AREA B (Reverse)	Pre-Development 1 year	1	-12,615.000	639.000	-1.77	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 2 year	2	1,350,912.000	762.000	92.77	(N/A)	(N/A)
PONDING AREA B (OUT)	Pre-Development 2 year	2	1,224,322.000	831.000	53.27	9.75	337,241.000
PONDING AREA B (Reverse)	Pre-Development 2 year	2	-5,605.000	429.000	-0.56	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 5 year	5	1,808,747.000	762.000	127.28	(N/A)	(N/A)
PONDING AREA B (OUT)	Pre-Development 5 year	5	1,604,174.000	816.000	82.24	10.04	410,739.000
PONDING AREA B (Reverse)	Pre-Development 5 year	5	-2,958.000	429.000	-0.56	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 10 year	10	2,040,783.000	762.000	148.55	(N/A)	(N/A)
PONDING AREA B (OUT)	Pre-Development 10 year	10	1,827,927.000	816.000	95.67	10.17	464,192.000
PONDING AREA B (Reverse)	Pre-Development 10 year	10	-2,857.000	426.000	-0.52	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 25 year	25	2,427,878.000	762.000	184.47	(N/A)	(N/A)
PONDING AREA B (OUT)	Pre-Development 25 year	25	2,205,905.000	810.000	122.94	10.39	551,370.000
PONDING AREA B (Reverse)	Pre-Development 25 year	25	-2,543.000	387.000	-0.42	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 50 year	50	2,864,400.000	762.000	213.31	(N/A)	(N/A)
PONDING AREA B (OUT)	Pre-Development 50 year	50	2,637,199.000	810.000	144.83	10.56	619,403.000
PONDING AREA B (Reverse)	Pre-Development 50 year	50	-2,020.000	381.000	-0.35	(N/A)	(N/A)
PONDING AREA B (IN)	Pre-Development 100 year	100	3,332,359.000	759.000	241.87	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
PONDING AREA B (OUT)	Pre-Development 100 year	100	3,100,377.000	807.000	167.10	10.73	686,741.000
PONDING AREA B (Reverse)	Pre-Development 100 year	100	-1,455.000	300.000	-0.22	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 1 year	1	518,947.000	783.000	38.21	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 1 year	1	129,972.000	1,440.000	8.39	15.89	947,292.000
SOUTH PONDING AREA (Reverse)	Pre-Development 1 year	1	-502,675.000	723.000	-10.43	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 2 year	2	840,517.000	783.000	63.51	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 2 year	2	181,814.000	1,440.000	9.54	16.10	1,177,025.000
SOUTH PONDING AREA (Reverse)	Pre-Development 2 year	2	-466,274.000	723.000	-10.30	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 5 year	5	1,184,798.000	780.000	90.28	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 5 year	5	236,763.000	1,440.000	10.39	16.30	1,437,945.000
SOUTH PONDING AREA (Reverse)	Pre-Development 5 year	5	-446,407.000	0.000	-10.13	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 10 year	10	1,398,491.000	780.000	107.02	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 10 year	10	264,158.000	1,440.000	10.94	16.43	1,611,279.000
SOUTH PONDING AREA (Reverse)	Pre-Development 10 year	10	-438,038.000	0.000	-10.13	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 25 year	25	1,762,894.000	780.000	134.65	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 25 year	25	307,932.000	1,440.000	11.84	16.65	1,913,867.000

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
SOUTH PONDING AREA (Reverse)	Pre-Development 25 year	25	-427,124.000	0.000	-10.13	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 50 year	50	2,059,924.000	780.000	156.97	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 50 year	50	384,632.000	1,422.000	13.42	16.82	2,143,078.000
SOUTH PONDING AREA (Reverse)	Pre-Development 50 year	50	-420,010.000	0.000	-10.13	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Pre-Development 100 year	100	2,356,937.000	780.000	179.62	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Pre-Development 100 year	100	535,032.000	1,245.000	17.33	16.96	2,329,588.000
SOUTH PONDING AREA (Reverse)	Pre-Development 100 year	100	-413,749.000	0.000	-10.13	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 1 year	1	377,014.000	798.000	25.20	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 1 year	1	1,651,546.000	897.000	72.93	16.94	1,600,901.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 1 year	1	-1,568,789.000	0.000	-71.24	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 2 year	2	617,109.000	798.000	42.36	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 2 year	2	1,873,009.000	903.000	84.30	16.98	1,633,303.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 2 year	2	-1,555,011.000	0.000	-71.24	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 5 year	5	875,539.000	798.000	60.62	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 5 year	5	2,107,246.000	903.000	93.71	17.02	1,674,550.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 5 year	5	-1,535,788.000	0.000	-71.24	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
MIDDLE PONDING AREA (IN)	Pre-Development 10 year	10	1,036,395.000	798.000	71.88	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 10 year	10	2,251,070.000	903.000	99.75	17.04	1,703,241.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 10 year	10	-1,521,814.000	0.000	-71.24	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 25 year	25	1,311,242.000	798.000	90.94	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 25 year	25	2,495,285.000	903.000	110.49	17.09	1,755,588.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 25 year	25	-1,496,313.000	0.000	-71.24	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 50 year	50	1,535,647.000	786.000	106.53	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 50 year	50	2,693,294.000	903.000	118.63	17.13	1,800,480.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 50 year	50	-1,474,056.000	0.000	-71.24	(N/A)	(N/A)
MIDDLE PONDING AREA (IN)	Pre-Development 100 year	100	1,763,055.000	786.000	122.23	(N/A)	(N/A)
MIDDLE PONDING AREA (OUT)	Pre-Development 100 year	100	2,892,493.000	903.000	124.60	17.16	1,847,287.000
MIDDLE PONDING AREA (Reverse)	Pre-Development 100 year	100	-1,450,003.000	0.000	-71.24	(N/A)	(N/A)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.300
Slope	0.010 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.09 ft/s
Segment Time of Concentration	18.379 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	517.00 ft
Is Paved?	False
Slope	0.007 ft/ft
Average Velocity	1.35 ft/s
Segment Time of Concentration	6.383 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	163.00 ft
Manning's n	0.013
Slope	0.008 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	7.26 ft/s
Segment Time of Concentration	0.374 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	25.137 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.300
Slope	0.005 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.07 ft/s
Segment Time of Concentration	24.251 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.002 ft/ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	23.098 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	47.350 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,112.00 ft
Is Paved?	False
Slope	0.004 ft/ft
Average Velocity	1.02 ft/s
Segment Time of Concentration	18.162 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	2,285.00 ft
Manning's n	0.030
Slope	0.001 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.15 ft/s
Segment Time of Concentration	33.199 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	88.809 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,620.00 ft
Is Paved?	False
Slope	0.003 ft/ft
Average Velocity	0.88 ft/s
Segment Time of Concentration	30.553 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	1,860.00 ft
Manning's n	0.030
Slope	0.001 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.15 ft/s
Segment Time of Concentration	27.024 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	95.024 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	600.00 ft
Is Paved?	False
Slope	0.003 ft/ft
Average Velocity	0.88 ft/s
Segment Time of Concentration	11.316 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	2,200.00 ft
Manning's n	0.030
Slope	0.002 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.62 ft/s
Segment Time of Concentration	22.602 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	71.365 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.015 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	19.672 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	700.00 ft
Is Paved?	False
Slope	0.015 ft/ft
Average Velocity	1.98 ft/s
Segment Time of Concentration	5.904 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	2,300.00 ft
Manning's n	0.030
Slope	0.002 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.62 ft/s
Segment Time of Concentration	23.629 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	49.205 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	744.041 min
Flow (Peak, Computed)	10.96 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	10.96 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	70,438.881 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	69,960.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	744.041 min
Flow (Peak, Computed)	17.95 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	17.95 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	113,809.048 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	113,109.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	744.041 min
Flow (Peak, Computed)	25.29 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	25.29 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	160,184.682 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	159,264.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	744.041 min
Flow (Peak, Computed)	29.78 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	29.78 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	188,951.262 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	187,899.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	744.041 min
Flow (Peak, Computed)	37.33 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	37.33 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.3 in
Runoff Volume (Pervious)	237,983.288 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	236,712.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	740.690 min
Flow (Peak, Computed)	43.46 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	741.000 min
Flow (Peak Interpolated Output)	43.46 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	277,934.695 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	276,490.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	25.137 min
Area (User Defined)	12.330 acres

Computational Time Increment	3.352 min
Time to Peak (Computed)	740.690 min
Flow (Peak, Computed)	49.61 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	741.000 min
Flow (Peak Interpolated Output)	49.60 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	12.330 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.1 in
Runoff Volume (Pervious)	318,364.844 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	316,746.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	25.137 min
Computational Time Increment	3.352 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	22.28 ft³/s
Unit peak time, Tp	16.758 min
Unit receding limb, Tr	50.204 min
Total unit time, Tb	66.962 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	763.908 min
Flow (Peak, Computed)	1.36 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	1.36 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	12,796.682 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	12,627.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	2.24 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	2.24 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	20,675.772 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	20,428.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	3.17 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	3.17 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	29,100.867 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	28,776.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	3.74 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	3.74 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	34,326.912 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	33,955.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	4.71 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	4.70 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.3 in
Runoff Volume (Pervious)	43,234.596 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	42,786.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	5.48 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	5.47 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	50,492.597 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	49,982.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	47.350 min
Area (User Defined)	2.240 acres

Computational Time Increment	6.313 min
Time to Peak (Computed)	757.594 min
Flow (Peak, Computed)	6.26 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	6.25 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	2.240 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.1 in
Runoff Volume (Pervious)	57,837.564 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	57,266.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	47.350 min
Computational Time Increment	6.313 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	2.15 ft³/s
Unit peak time, Tp	31.566 min
Unit receding limb, Tr	94.569 min
Total unit time, Tb	126.135 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.358 min
Flow (Peak, Computed)	31.75 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	795.000 min
Flow (Peak Interpolated Output)	31.69 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	461,708.867 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	449,677.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.358 min
Flow (Peak, Computed)	52.57 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	52.51 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	745,989.237 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	728,416.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.358 min
Flow (Peak, Computed)	74.57 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	74.53 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	1,049,969.667 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,026,858.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.358 min
Flow (Peak, Computed)	88.09 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	88.06 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	1,238,527.248 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,212,107.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.516 min
Flow (Peak, Computed)	110.96 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	110.95 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.3 in
Runoff Volume (Pervious)	1,559,919.655 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,528,011.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.516 min
Flow (Peak, Computed)	129.62 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	129.58 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	1,821,790.918 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,785,514.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.516 min
Flow (Peak, Computed)	148.36 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	148.30 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.1 in
Runoff Volume (Pervious)	2,086,800.217 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,046,174.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	798.204 min
Flow (Peak, Computed)	25.21 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	798.000 min
Flow (Peak Interpolated Output)	25.20 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	388,155.056 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	377,014.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	798.204 min
Flow (Peak, Computed)	42.37 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	798.000 min
Flow (Peak Interpolated Output)	42.36 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	633,490.110 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	617,109.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	798.204 min
Flow (Peak, Computed)	60.63 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	798.000 min
Flow (Peak Interpolated Output)	60.62 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	897,166.471 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	875,539.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	798.204 min
Flow (Peak, Computed)	71.88 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	798.000 min
Flow (Peak Interpolated Output)	71.88 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	1,061,160.849 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,036,395.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	798.204 min
Flow (Peak, Computed)	90.94 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	798.000 min
Flow (Peak Interpolated Output)	90.94 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	1,341,212.756 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,311,242.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	785.534 min
Flow (Peak, Computed)	106.53 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	106.53 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,569,762.009 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,535,647.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	95.024 min
Area (User Defined)	71.040 acres

Computational Time Increment	12.670 min
Time to Peak (Computed)	785.534 min
Flow (Peak, Computed)	122.24 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	122.23 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	71.040 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	1,801,295.728 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,763,055.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	95.024 min
Computational Time Increment	12.670 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	33.96 ft³/s
Unit peak time, Tp	63.350 min
Unit receding limb, Tr	189.787 min
Total unit time, Tb	253.136 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	780.262 min
Flow (Peak, Computed)	30.29 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	780.000 min
Flow (Peak Interpolated Output)	30.27 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	378,757.169 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	370,833.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	780.262 min
Flow (Peak, Computed)	50.74 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	780.000 min
Flow (Peak Interpolated Output)	50.72 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	618,152.230 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	606,505.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	780.262 min
Flow (Peak, Computed)	72.44 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	780.000 min
Flow (Peak Interpolated Output)	72.43 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	875,444.535 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	860,069.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	780.262 min
Flow (Peak, Computed)	85.81 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	780.000 min
Flow (Peak Interpolated Output)	85.80 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	1,035,468.328 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,017,864.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	770.746 min
Flow (Peak, Computed)	108.42 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	771.000 min
Flow (Peak Interpolated Output)	108.41 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	1,308,739.699 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,287,437.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	770.746 min
Flow (Peak, Computed)	126.89 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	771.000 min
Flow (Peak Interpolated Output)	126.88 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,531,755.257 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,507,508.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	71.365 min
Area (User Defined)	69.320 acres

Computational Time Increment	9.515 min
Time to Peak (Computed)	770.746 min
Flow (Peak, Computed)	145.46 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	771.000 min
Flow (Peak Interpolated Output)	145.45 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	69.320 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	1,757,683.452 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,730,505.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.365 min
Computational Time Increment	9.515 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	44.12 ft³/s
Unit peak time, Tp	47.577 min
Unit receding limb, Tr	142.534 min
Total unit time, Tb	190.111 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	47.37 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	47.36 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	460,114.558 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	453,667.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	79.26 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	79.17 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	750,931.899 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	741,459.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	113.07 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	112.87 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	1,063,490.830 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,050,988.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	133.87 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	133.59 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	1,257,887.881 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,243,574.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	169.00 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	168.59 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	1,589,858.195 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,572,539.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	197.35 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	762.000 min
Flow (Peak Interpolated Output)	196.83 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,860,777.856 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,841,067.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	49.205 min
Area (User Defined)	84.210 acres

Computational Time Increment	6.561 min
Time to Peak (Computed)	761.032 min
Flow (Peak, Computed)	225.81 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	759.000 min
Flow (Peak Interpolated Output)	225.29 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	84.210 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	2,135,235.480 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,113,142.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	49.205 min
Computational Time Increment	6.561 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	77.74 ft³/s
Unit peak time, Tp	32.803 min
Unit receding limb, Tr	98.274 min
Total unit time, Tb	131.077 min

Requested Pond Water Surface Elevations	
Minimum (Headwater)	11.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	20.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	EX PIPE	Forward + Reverse	EX WEIR	11.05	20.00
Rectangular Weir	EX WEIR	Forward + Reverse	TW	16.82	20.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: EX PIPE Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	36.0 in
Length	51.00 ft
Length (Computed Barrel)	51.02 ft
Slope (Computed)	0.025 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.007
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.083
T2 ratio (HW/D)	1.184
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	14.30 ft	T1 Flow	42.85 ft³/s
T2 Elevation	14.60 ft	T2 Flow	48.97 ft³/s

Structure ID: EX WEIR Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	16.82 ft
Weir Length	20.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	13.22 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	18.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	FLOW UNDER I&D	Forward + Reverse	TW	13.22	18.00
Rectangular Weir	FLOW OVER I&D	Forward + Reverse	TW	17.72	18.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: FLOW UNDER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	13.22 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: FLOW OVER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	17.72 ft
Weir Length	20.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	4.70 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	13.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	24" CULVERT	Forward + Reverse	FLOW UNDER I&D	6.08	13.00
Rectangular Weir	FLOW UNDER I&D	Forward + Reverse	TW	4.70	13.00
Rectangular Weir	TOP OF I&D LINE	Forward + Reverse	TW	9.20	13.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: 24" CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	20.00 ft
Length (Computed Barrel)	20.01 ft
Slope (Computed)	0.030 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.900
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0340
M	1.5000
C	0.0553
Y	0.5400
T1 ratio (HW/D)	1.248
T2 ratio (HW/D)	1.410
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	8.58 ft	T1 Flow	15.55 ft³/s
T2 Elevation	8.90 ft	T2 Flow	17.77 ft³/s

Structure ID: TOP OF I&D LINE Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	9.20 ft
Weir Length	25.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: FLOW UNDER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	4.70 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	10.20 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	15.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	18" CULVERT	Forward + Reverse	TW	10.22	15.00
Rectangular Weir	Weir - 1	Forward + Reverse	TW	14.75	15.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: 18" CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	25.00 ft
Length (Computed Barrel)	25.00 ft
Slope (Computed)	0.000 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.096
T2 ratio (HW/D)	1.197
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	11.86 ft	T1 Flow	7.58 ft³/s
T2 Elevation	12.02 ft	T2 Flow	8.66 ft³/s

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	14.75 ft
Weir Length	400.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	12.25 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	17.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	18" CULVERT	Forward + Reverse	FLOW UNDER I&D	12.31	17.00
Rectangular Weir	FLOW UNDER I&D	Forward + Reverse	TW	12.25	17.00
Rectangular Weir	TOP OF I&D	Forward + Reverse	TW	16.75	17.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: FLOW UNDER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	12.25 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TOP OF I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	16.75 ft
Weir Length	20.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: 18" CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	23.00 ft
Length (Computed Barrel)	23.00 ft
Slope (Computed)	-0.009 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.900
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0340
M	1.5000
C	0.0553
Y	0.5400
T1 ratio (HW/D)	1.267
T2 ratio (HW/D)	1.429
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	14.21 ft	T1 Flow	7.58 ft³/s
T2 Elevation	14.45 ft	T2 Flow	8.66 ft³/s

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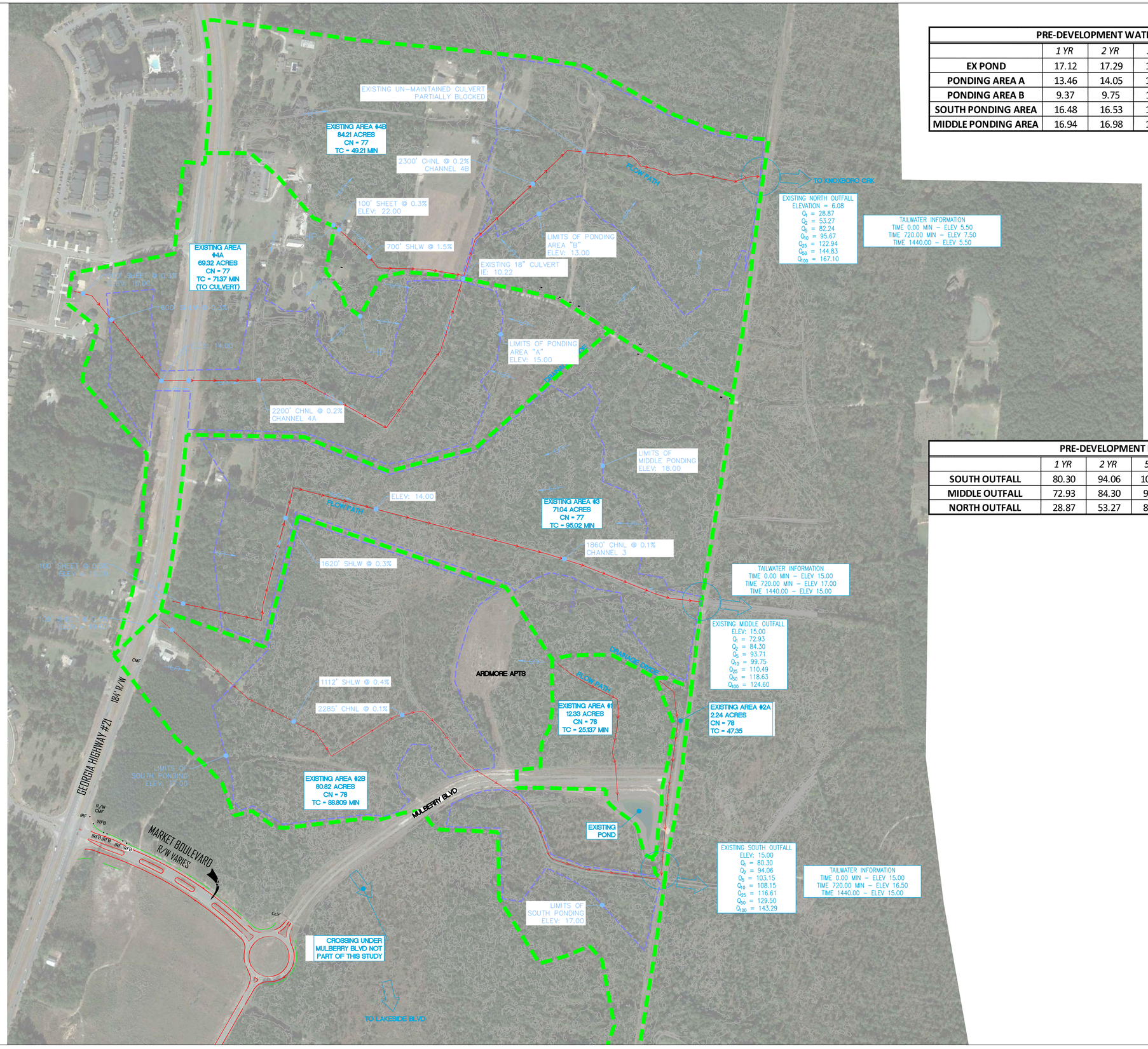
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PRE-DEVELOPMENT WATER SURFACE ELEVATIONS							
	1 YR	*2 YR*	*5 YR*	*10 YR*	*25 YR*	*50 YR*	*100 YR*
EX POND	17.12	17.29	14.47	17.58	17.79	17.96	18.13
PONDING AREA A	13.46	14.05	14.29	14.44	14.72	14.80	14.85
PONDING AREA B	9.37	9.75	10.04	10.17	10.39	10.56	10.73
SOUTH PONDING AREA	16.48	16.53	16.58	16.61	16.67	16.72	16.77
MIDDLE PONDING AREA	16.94	16.98	17.02	17.04	17.09	17.13	17.16

PRE-DEVELOPMENT DISCHARGE RATES							
	1 YR	*2 YR*	*5 YR*	*10 YR*	*25 YR*	*50 YR*	*100 YR*
SOUTH OUTFALL	80.30	94.06	103.15	108.15	116.61	129.50	143.29
MIDDLE OUTFALL	72.93	84.30	93.71	99.75	110.49	118.63	124.60
NORTH OUTFALL	28.87	53.27	82.24	95.67	122.94	144.83	167.10

Know what's below. Call before you dig.

SCALE: 1"=250'
0' 125' 250' 500'

COLEMAN COMPANY
ENGINEERS • SURVEYORS

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REVISIONS:

HYDROLOGIC EXHIBITS FOR
MULBERRY TRACT
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BALD EAGLE PARTNERS

JOB NUMBER: 21-309
DATE: 10/8/2021
DRAWN BY: MLF
CHECKED BY: NPM
SCALE: AS NOTED

PRE-DEVELOPMENT EXHIBIT

SHEET:
PRE

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APPENDIX B
POST-DEVELOPMENT
(EXHIBIT and PONDPACK RESULTS)

Project Summary	
Title	Mulberry Tract Masterplan
Engineer	
Company	Coleman Company, Inc.
Date	11/22/2021

Notes	Post-Development Hydrology for Mulberry Tract Masterplan

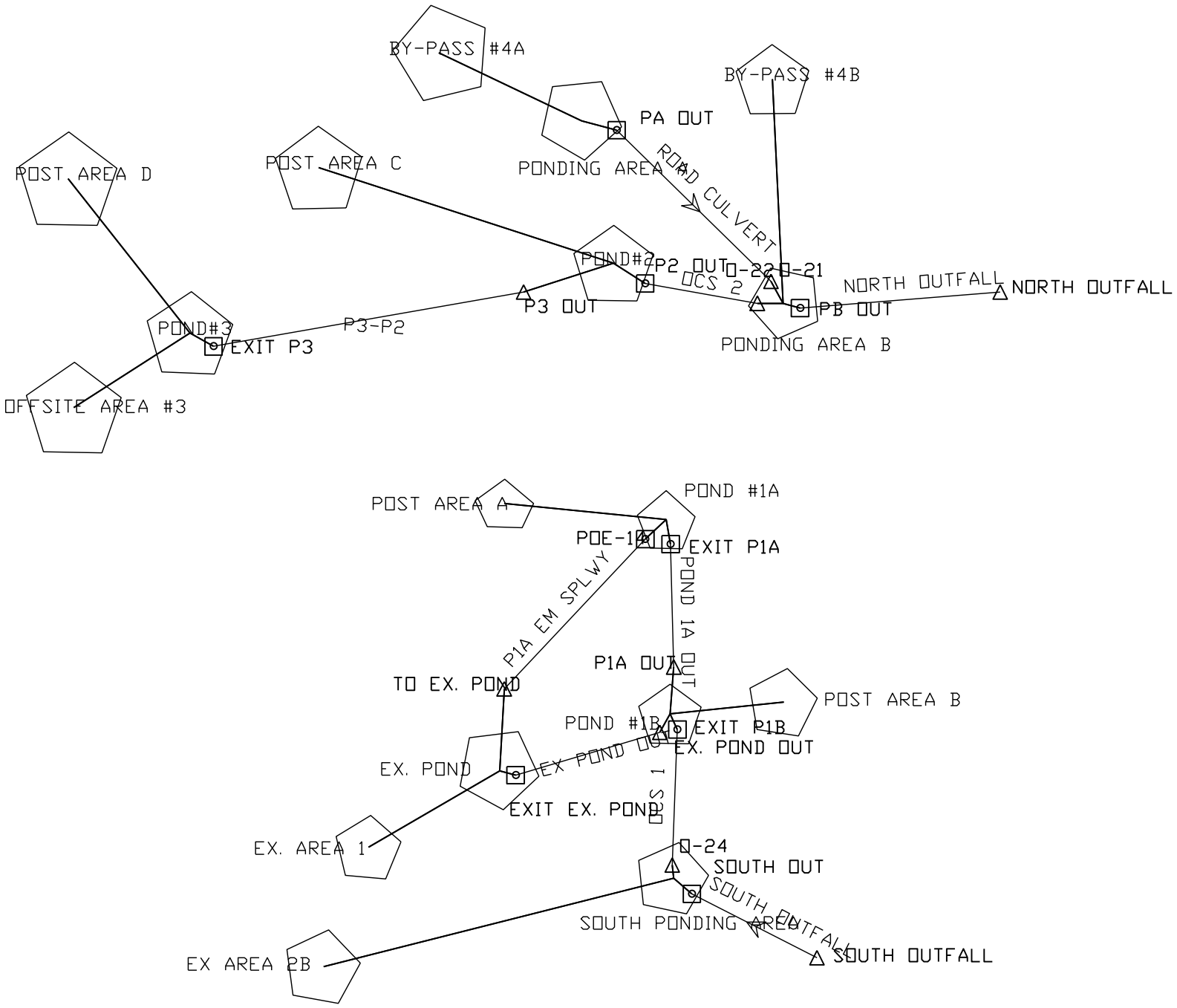

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BY-PASS #4B
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POST AREA D
POST AREA C
PONDING AREA A
ROAD CULVERT
POND#2
P2 OUT
D-22
D-21
NORTH OUTFALL
NORTH OUTFALL
DCS 2
P3 OUT
PB OUT
POND#3
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PONDING AREA B
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Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
POST AREA A	Post-Development 1 year	1	148,052.000	738.000	26.44
POST AREA A	Post-Development 2 year	2	212,809.000	738.000	37.38
POST AREA A	Post-Development 5 year	5	278,520.000	735.000	48.30
POST AREA A	Post-Development 10 year	10	318,214.000	735.000	54.82
POST AREA A	Post-Development 25 year	25	384,658.000	735.000	65.64
POST AREA A	Post-Development 50 year	50	437,994.000	735.000	74.25
POST AREA A	Post-Development 100 year	100	491,444.000	735.000	82.83
EX. AREA 1	Post-Development 1 year	1	21,937.000	732.000	5.06
EX. AREA 1	Post-Development 2 year	2	35,452.000	729.000	8.25
EX. AREA 1	Post-Development 5 year	5	49,906.000	729.000	11.63
EX. AREA 1	Post-Development 10 year	10	58,873.000	729.000	13.70
EX. AREA 1	Post-Development 25 year	25	74,157.000	729.000	17.18
EX. AREA 1	Post-Development 50 year	50	86,610.000	729.000	19.97
EX. AREA 1	Post-Development 100 year	100	99,214.000	729.000	22.77
POST AREA B	Post-Development 1 year	1	9,208.000	729.000	2.12
POST AREA B	Post-Development 2 year	2	13,347.000	729.000	3.03
POST AREA B	Post-Development 5 year	5	17,559.000	729.000	3.93
POST AREA B	Post-Development 10 year	10	20,107.000	729.000	4.47
POST AREA B	Post-Development 25 year	25	24,376.000	729.000	5.36
POST AREA B	Post-Development 50 year	50	27,805.000	729.000	6.07
POST AREA B	Post-Development 100 year	100	31,244.000	729.000	6.77
BY-PASS #4B	Post-Development 1 year	1	448,594.000	777.000	38.27
BY-PASS #4B	Post-Development 2 year	2	733,581.000	777.000	64.05
BY-PASS #4B	Post-Development 5 year	5	1,040,182.000	777.000	91.40
BY-PASS #4B	Post-Development 10 year	10	1,230,974.000	777.000	108.23
BY-PASS #4B	Post-Development 25 year	25	1,556,909.000	771.000	136.74
BY-PASS #4B	Post-Development 50 year	50	1,822,987.000	768.000	159.99

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft^3)	Time to Peak (min)	Peak Flow (ft^3/s)
BY-PASS #4B	Post-Development 100 year	100	2,092,597.000	768.000	183.37
POST AREA C	Post-Development 1 year	1	186,279.000	747.000	27.11
POST AREA C	Post-Development 2 year	2	277,130.000	744.000	39.99
POST AREA C	Post-Development 5 year	5	370,550.000	744.000	52.99
POST AREA C	Post-Development 10 year	10	427,349.000	744.000	60.78
POST AREA C	Post-Development 25 year	25	522,834.000	744.000	73.72
POST AREA C	Post-Development 50 year	50	599,750.000	744.000	84.03
POST AREA C	Post-Development 100 year	100	677,001.000	744.000	94.30
OFFSITE AREA #3	Post-Development 1 year	1	152,517.000	789.000	11.29
OFFSITE AREA #3	Post-Development 2 year	2	249,533.000	786.000	18.97
OFFSITE AREA #3	Post-Development 5 year	5	353,933.000	786.000	27.14
OFFSITE AREA #3	Post-Development 10 year	10	418,908.000	786.000	32.18
OFFSITE AREA #3	Post-Development 25 year	25	529,918.000	786.000	40.70
OFFSITE AREA #3	Post-Development 50 year	50	620,548.000	786.000	47.59
OFFSITE AREA #3	Post-Development 100 year	100	712,386.000	786.000	54.52
POST AREA D	Post-Development 1 year	1	246,498.000	747.000	35.92
POST AREA D	Post-Development 2 year	2	380,024.000	747.000	55.37
POST AREA D	Post-Development 5 year	5	519,548.000	747.000	75.24
POST AREA D	Post-Development 10 year	10	605,068.000	744.000	87.27
POST AREA D	Post-Development 25 year	25	749,628.000	744.000	107.42
POST AREA D	Post-Development 50 year	50	866,602.000	744.000	123.52
POST AREA D	Post-Development 100 year	100	984,434.000	744.000	139.59
BY-PASS #4A	Post-Development 1 year	1	240,859.000	777.000	19.67
BY-PASS #4A	Post-Development 2 year	2	393,925.000	777.000	33.05
BY-PASS #4A	Post-Development 5 year	5	558,611.000	777.000	47.25
BY-PASS #4A	Post-Development 10 year	10	661,096.000	777.000	56.01
BY-PASS #4A	Post-Development 25 year	25	836,179.000	777.000	70.81

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
BY-PASS #4A	Post-Development 50 year	50	979,112.000	777.000	82.77
BY-PASS #4A	Post-Development 100 year	100	1,123,944.000	777.000	94.79
EX AREA 2B	Post-Development 1 year	1	449,677.000	795.000	31.69
EX AREA 2B	Post-Development 2 year	2	728,415.000	792.000	52.50
EX AREA 2B	Post-Development 5 year	5	1,026,858.000	792.000	74.53
EX AREA 2B	Post-Development 10 year	10	1,212,106.000	792.000	88.06
EX AREA 2B	Post-Development 25 year	25	1,528,010.000	783.000	110.95
EX AREA 2B	Post-Development 50 year	50	1,785,514.000	783.000	129.58
EX AREA 2B	Post-Development 100 year	100	2,046,173.000	783.000	148.30

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
SOUTH OUTFALL	Post-Development 1 year	1	164,202.000	1,440.000	10.11
SOUTH OUTFALL	Post-Development 1 year	1	-584,633.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 2 year	2	226,684.000	1,440.000	11.48
SOUTH OUTFALL	Post-Development 2 year	2	-547,124.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 5 year	5	295,377.000	1,440.000	12.63
SOUTH OUTFALL	Post-Development 5 year	5	-524,958.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 10 year	10	329,733.000	1,440.000	13.31
SOUTH OUTFALL	Post-Development 10 year	10	-515,796.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 25 year	25	384,409.000	1,440.000	14.42
SOUTH OUTFALL	Post-Development 25 year	25	-503,877.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 50 year	50	514,261.000	1,320.000	17.03
SOUTH OUTFALL	Post-Development 50 year	50	-496,112.000	72.000	-13.08
SOUTH OUTFALL	Post-Development 100 year	100	664,140.000	1,218.000	20.84
SOUTH OUTFALL	Post-Development 100 year	100	-489,094.000	72.000	-13.08
NORTH OUTFALL	Post-Development 1 year	1	707,364.000	894.000	26.86

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
NORTH OUTFALL	Post-Development 1 year	1	-14,256.000	627.000	-1.46
NORTH OUTFALL	Post-Development 2 year	2	1,143,587.000	861.000	50.47
NORTH OUTFALL	Post-Development 2 year	2	-8,180.000	588.000	-0.86
NORTH OUTFALL	Post-Development 5 year	5	1,701,620.000	849.000	76.07
NORTH OUTFALL	Post-Development 5 year	5	-4,310.000	393.000	-0.56
NORTH OUTFALL	Post-Development 10 year	10	2,083,240.000	846.000	90.50
NORTH OUTFALL	Post-Development 10 year	10	-3,790.000	393.000	-0.56
NORTH OUTFALL	Post-Development 25 year	25	2,677,774.000	843.000	116.59
NORTH OUTFALL	Post-Development 25 year	25	-3,095.000	393.000	-0.55
NORTH OUTFALL	Post-Development 50 year	50	3,134,316.000	840.000	138.16
NORTH OUTFALL	Post-Development 50 year	50	-2,528.000	390.000	-0.50
NORTH OUTFALL	Post-Development 100 year	100	3,579,106.000	837.000	161.55
NORTH OUTFALL	Post-Development 100 year	100	-1,945.000	381.000	-0.36

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
POND #1A (IN)	Post-Development 1 year	1	148,052.000	738.000	26.44	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 1 year	1	82,052.000	738.000	8.38	16.60	221,569.000
POND #1A (Reverse)	Post-Development 1 year	1	-403.000	1,431.000	-0.53	(N/A)	(N/A)
POND #1A (IN)	Post-Development 2 year	2	212,809.000	738.000	37.38	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 2 year	2	135,094.000	753.000	14.76	17.01	242,136.000
POND #1A (Reverse)	Post-Development 2 year	2	-1.000	336.000	-0.02	(N/A)	(N/A)
POND #1A (IN)	Post-Development 5 year	5	278,520.000	735.000	48.30	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
POND #1A (OUT)	Post-Development 5 year	5	199,311.000	759.000	27.47	17.29	256,411.000
POND #1A (Reverse)	Post-Development 5 year	5	-1.000	279.000	-0.02	(N/A)	(N/A)
POND #1A (IN)	Post-Development 10 year	10	318,214.000	735.000	54.82	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 10 year	10	238,311.000	753.000	35.22	17.45	264,605.000
POND #1A (Reverse)	Post-Development 10 year	10	-1.000	252.000	-0.02	(N/A)	(N/A)
POND #1A (IN)	Post-Development 25 year	25	384,658.000	735.000	65.64	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 25 year	25	303,121.000	747.000	45.78	17.65	274,564.000
POND #1A (Reverse)	Post-Development 25 year	25	-1.000	219.000	-0.01	(N/A)	(N/A)
POND #1A (IN)	Post-Development 50 year	50	437,994.000	735.000	74.25	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 50 year	50	350,554.000	744.000	55.00	17.97	290,518.000
POND #1A (Reverse)	Post-Development 50 year	50	-1.000	198.000	-0.01	(N/A)	(N/A)
POND #1A (IN)	Post-Development 100 year	100	491,444.000	735.000	82.83	(N/A)	(N/A)
POND #1A (OUT)	Post-Development 100 year	100	413,900.000	738.000	58.61	18.23	303,791.000
POND #1A (Reverse)	Post-Development 100 year	100	-1.000	180.000	-0.01	(N/A)	(N/A)
POND #1B (IN)	Post-Development 1 year	1	49,802.000	738.000	7.92	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 1 year	1	-1,383.000	1,431.000	-0.80	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 1 year	1	34,261.000	774.000	0.91	16.63	40,291.000
POND #1B (IN)	Post-Development 2 year	2	114,258.000	741.000	10.49	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
POND #1B (Reverse)	Post-Development 2 year	2	-264.000	696.000	-0.54	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 2 year	2	98,090.000	768.000	5.12	16.89	43,141.000
POND #1B (IN)	Post-Development 5 year	5	196,919.000	747.000	16.99	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 5 year	5	-396.000	657.000	-0.69	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 5 year	5	179,804.000	762.000	12.89	17.14	45,979.000
POND #1B (IN)	Post-Development 10 year	10	246,845.000	741.000	22.37	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 10 year	10	-421.000	633.000	-0.70	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 10 year	10	229,558.000	756.000	16.09	17.26	47,252.000
POND #1B (IN)	Post-Development 25 year	25	329,958.000	735.000	27.51	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 25 year	25	-409.000	594.000	-0.70	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 25 year	25	312,380.000	771.000	22.76	17.55	50,536.000
POND #1B (IN)	Post-Development 50 year	50	388,048.000	744.000	31.57	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 50 year	50	-378.000	564.000	-0.66	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 50 year	50	369,241.000	768.000	27.96	17.78	53,034.000
POND #1B (IN)	Post-Development 100 year	100	463,250.000	762.000	40.19	(N/A)	(N/A)
POND #1B (Reverse)	Post-Development 100 year	100	-518.000	549.000	-0.73	(N/A)	(N/A)
POND #1B (OUT)	Post-Development 100 year	100	443,272.000	765.000	36.12	18.06	56,209.000
EX. POND (IN)	Post-Development 1 year	1	21,937.000	732.000	5.06	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
EX. POND (OUT)	Post-Development 1 year	1	1,329.000	1,437.000	0.43	16.61	174,892.000
EX. POND (Reverse)	Post-Development 1 year	1	-42,111.000	783.000	-5.79	(N/A)	(N/A)
EX. POND (IN)	Post-Development 2 year	2	35,452.000	729.000	8.25	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 2 year	2	11,968.000	1,008.000	0.55	16.84	184,983.000
EX. POND (Reverse)	Post-Development 2 year	2	-45,150.000	762.000	-8.68	(N/A)	(N/A)
EX. POND (IN)	Post-Development 5 year	5	53,366.000	729.000	11.63	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 5 year	5	26,753.000	876.000	1.36	17.03	193,277.000
EX. POND (Reverse)	Post-Development 5 year	5	-42,969.000	753.000	-11.31	(N/A)	(N/A)
EX. POND (IN)	Post-Development 10 year	10	73,421.000	729.000	13.70	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 10 year	10	40,748.000	858.000	2.46	17.26	203,283.000
EX. POND (Reverse)	Post-Development 10 year	10	-37,523.000	747.000	-11.85	(N/A)	(N/A)
EX. POND (IN)	Post-Development 25 year	25	90,529.000	753.000	23.96	(N/A)	(N/A)
EX. POND (Reverse)	Post-Development 25 year	25	-197.000	885.000	-0.26	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 25 year	25	55,574.000	825.000	3.62	17.64	220,136.000
EX. POND (Reverse)	Post-Development 25 year	25	-36,689.000	738.000	-10.70	(N/A)	(N/A)
EX. POND (IN)	Post-Development 50 year	50	105,841.000	747.000	34.41	(N/A)	(N/A)
EX. POND (Reverse)	Post-Development 50 year	50	-4,752.000	816.000	-2.12	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 50 year	50	61,715.000	777.000	4.84	17.93	233,246.000

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
EX. POND (Reverse)	Post-Development 50 year	50	-37,061.000	735.000	-9.14	(N/A)	(N/A)
EX. POND (IN)	Post-Development 100 year	100	117,629.000	744.000	44.90	(N/A)	(N/A)
EX. POND (Reverse)	Post-Development 100 year	100	-7,255.000	846.000	-2.31	(N/A)	(N/A)
EX. POND (OUT)	Post-Development 100 year	100	67,987.000	759.000	5.84	18.22	245,892.000
EX. POND (Reverse)	Post-Development 100 year	100	-38,441.000	732.000	-8.50	(N/A)	(N/A)
POND#2 (IN)	Post-Development 1 year	1	212,888.000	744.000	25.03	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 1 year	1	31,455.000	1,440.000	0.84	13.26	529,770.000
POND#2 (IN)	Post-Development 2 year	2	373,638.000	744.000	37.96	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 2 year	2	115,251.000	1,383.000	3.87	13.78	606,657.000
POND#2 (IN)	Post-Development 5 year	5	605,667.000	744.000	51.13	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 5 year	5	299,343.000	1,101.000	8.89	14.19	667,362.000
POND#2 (IN)	Post-Development 10 year	10	759,031.000	744.000	59.09	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 10 year	10	428,619.000	1,053.000	12.47	14.44	704,399.000
POND#2 (IN)	Post-Development 25 year	25	1,015,219.000	744.000	72.77	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 25 year	25	642,263.000	1,011.000	18.12	14.89	770,729.000
POND#2 (IN)	Post-Development 50 year	50	1,214,672.000	744.000	83.85	(N/A)	(N/A)
POND#2 (OUT)	Post-Development 50 year	50	803,310.000	996.000	22.01	15.28	830,026.000
POND#2 (IN)	Post-Development 100 year	100	1,406,987.000	744.000	94.89	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
POND#2 (OUT)	Post-Development 100 year	100	951,640.000	987.000	25.83	15.72	894,812.000
POND#3 (IN)	Post-Development 1 year	1	399,015.000	753.000	43.03	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 1 year	1	40,688.000	864.000	2.36	13.27	1,110,909.000
POND#3 (Reverse)	Post-Development 1 year	1	-14,080.000	762.000	-2.93	(N/A)	(N/A)
POND#3 (IN)	Post-Development 2 year	2	629,557.000	750.000	67.82	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 2 year	2	111,963.000	855.000	4.33	13.82	1,271,820.000
POND#3 (Reverse)	Post-Development 2 year	2	-15,455.000	759.000	-3.08	(N/A)	(N/A)
POND#3 (IN)	Post-Development 5 year	5	873,481.000	750.000	93.52	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 5 year	5	249,933.000	867.000	8.06	14.28	1,407,195.000
POND#3 (Reverse)	Post-Development 5 year	5	-14,816.000	756.000	-2.95	(N/A)	(N/A)
POND#3 (IN)	Post-Development 10 year	10	1,023,976.000	750.000	109.15	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 10 year	10	345,549.000	879.000	11.37	14.58	1,492,733.000
POND#3 (Reverse)	Post-Development 10 year	10	-13,867.000	753.000	-2.43	(N/A)	(N/A)
POND#3 (IN)	Post-Development 25 year	25	1,279,546.000	750.000	135.37	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 25 year	25	504,042.000	867.000	17.34	15.09	1,643,015.000
POND#3 (Reverse)	Post-Development 25 year	25	-11,661.000	756.000	-1.63	(N/A)	(N/A)
POND#3 (IN)	Post-Development 50 year	50	1,487,150.000	750.000	156.41	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 50 year	50	624,983.000	870.000	22.62	15.52	1,768,679.000

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
POND#3 (Reverse)	Post-Development 50 year	50	-10,056.000	753.000	-0.80	(N/A)	(N/A)
POND#3 (IN)	Post-Development 100 year	100	1,696,820.000	750.000	177.47	(N/A)	(N/A)
POND#3 (OUT)	Post-Development 100 year	100	739,365.000	885.000	27.47	15.96	1,896,525.000
POND#3 (Reverse)	Post-Development 100 year	100	-9,380.000	486.000	-0.50	(N/A)	(N/A)
PONDING AREA A (IN)	Post-Development 1 year	1	240,859.000	777.000	19.67	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 1 year	1	244,526.000	855.000	13.17	13.20	35,725.000
PONDING AREA A (IN)	Post-Development 2 year	2	393,925.000	777.000	33.05	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 2 year	2	397,178.000	882.000	15.33	13.82	110,904.000
PONDING AREA A (IN)	Post-Development 5 year	5	558,611.000	777.000	47.25	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 5 year	5	561,444.000	897.000	16.40	14.17	203,889.000
PONDING AREA A (IN)	Post-Development 10 year	10	661,096.000	777.000	56.01	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 10 year	10	663,663.000	903.000	16.84	14.31	266,131.000
PONDING AREA A (IN)	Post-Development 25 year	25	836,179.000	777.000	70.81	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 25 year	25	772,844.000	915.000	17.58	14.57	375,914.000
PONDING AREA A (IN)	Post-Development 50 year	50	979,112.000	777.000	82.77	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 50 year	50	819,564.000	927.000	18.18	14.79	468,153.000
PONDING AREA A (IN)	Post-Development 100 year	100	1,123,944.000	777.000	94.79	(N/A)	(N/A)
PONDING AREA A (OUT)	Post-Development 100 year	100	861,232.000	909.000	18.75	15.00	559,094.000

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
PONDING AREA B (IN)	Post-Development 1 year	1	724,575.000	777.000	51.31	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 1 year	1	707,364.000	894.000	26.86	9.37	252,595.000
PONDING AREA B (Reverse)	Post-Development 1 year	1	-14,256.000	627.000	-1.46	(N/A)	(N/A)
PONDING AREA B (IN)	Post-Development 2 year	2	1,246,010.000	777.000	78.14	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 2 year	2	1,143,587.000	861.000	50.47	9.70	335,484.000
PONDING AREA B (Reverse)	Post-Development 2 year	2	-8,180.000	588.000	-0.86	(N/A)	(N/A)
PONDING AREA B (IN)	Post-Development 5 year	5	1,900,969.000	777.000	106.67	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 5 year	5	1,701,620.000	849.000	76.07	10.00	408,499.000
PONDING AREA B (Reverse)	Post-Development 5 year	5	-4,310.000	393.000	-0.56	(N/A)	(N/A)
PONDING AREA B (IN)	Post-Development 10 year	10	2,323,257.000	777.000	125.38	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 10 year	10	2,083,240.000	846.000	90.50	10.12	459,372.000
PONDING AREA B (Reverse)	Post-Development 10 year	10	-3,790.000	393.000	-0.56	(N/A)	(N/A)
PONDING AREA B (IN)	Post-Development 25 year	25	2,972,016.000	777.000	158.95	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 25 year	25	2,677,774.000	843.000	116.59	10.34	551,597.000
PONDING AREA B (Reverse)	Post-Development 25 year	25	-3,095.000	393.000	-0.55	(N/A)	(N/A)
PONDING AREA B (IN)	Post-Development 50 year	50	3,445,862.000	777.000	186.69	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 50 year	50	3,134,316.000	840.000	138.16	10.52	626,333.000
PONDING AREA B (Reverse)	Post-Development 50 year	50	-2,528.000	390.000	-0.50	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
PONDING AREA B (IN)	Post-Development 100 year	100	3,905,469.000	777.000	214.26	(N/A)	(N/A)
PONDING AREA B (OUT)	Post-Development 100 year	100	3,579,106.000	837.000	161.55	10.68	694,801.000
PONDING AREA B (Reverse)	Post-Development 100 year	100	-1,945.000	381.000	-0.36	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 1 year	1	483,938.000	795.000	32.57	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 1 year	1	164,202.000	1,440.000	10.11	15.93	980,292.000
SOUTH PONDING AREA (Reverse)	Post-Development 1 year	1	-584,633.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 2 year	2	826,505.000	783.000	56.40	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 2 year	2	226,684.000	1,440.000	11.48	16.13	1,215,697.000
SOUTH PONDING AREA (Reverse)	Post-Development 2 year	2	-547,124.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 5 year	5	1,206,662.000	783.000	85.87	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 5 year	5	295,377.000	1,440.000	12.63	16.34	1,498,004.000
SOUTH PONDING AREA (Reverse)	Post-Development 5 year	5	-524,958.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 10 year	10	1,441,664.000	783.000	102.72	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 10 year	10	329,733.000	1,440.000	13.31	16.48	1,685,285.000
SOUTH PONDING AREA (Reverse)	Post-Development 10 year	10	-515,796.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 25 year	25	1,840,390.000	783.000	133.04	(N/A)	(N/A)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
SOUTH PONDING AREA (OUT)	Post-Development 25 year	25	384,409.000	1,440.000	14.42	16.72	2,009,859.000
SOUTH PONDING AREA (Reverse)	Post-Development 25 year	25	-503,877.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 50 year	50	2,154,755.000	783.000	156.42	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 50 year	50	514,261.000	1,320.000	17.03	16.88	2,224,978.000
SOUTH PONDING AREA (Reverse)	Post-Development 50 year	50	-496,112.000	72.000	-13.08	(N/A)	(N/A)
SOUTH PONDING AREA (IN)	Post-Development 100 year	100	2,489,445.000	783.000	181.07	(N/A)	(N/A)
SOUTH PONDING AREA (OUT)	Post-Development 100 year	100	664,140.000	1,218.000	20.84	17.00	2,384,024.000
SOUTH PONDING AREA (Reverse)	Post-Development 100 year	100	-489,094.000	72.000	-13.08	(N/A)	(N/A)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	600.00 ft
Is Paved?	False
Slope	0.003 ft/ft
Average Velocity	0.88 ft/s
Segment Time of Concentration	11.316 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	860.00 ft
Manning's n	0.035
Slope	0.002 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.39 ft/s
Segment Time of Concentration	10.308 min

Segment #4: TR-55 Channel Flow	
Flow Area	6.8 ft²
Hydraulic Length	1,325.00 ft
Manning's n	0.030
Slope	0.002 ft/ft
Wetted Perimeter	9.00 ft
Average Velocity	1.84 ft/s
Segment Time of Concentration	11.985 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	71.057 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	700.00 ft
Is Paved?	False
Slope	0.015 ft/ft
Average Velocity	1.98 ft/s
Segment Time of Concentration	5.904 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	2,300.00 ft
Manning's n	0.030
Slope	0.002 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.62 ft/s
Segment Time of Concentration	23.629 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	66.981 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.003 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.04 ft/s
Segment Time of Concentration	37.448 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,620.00 ft
Is Paved?	False
Slope	0.003 ft/ft
Average Velocity	0.81 ft/s
Segment Time of Concentration	33.469 min

Segment #3: TR-55 Channel Flow	
Flow Area	4.9 ft²
Hydraulic Length	760.00 ft
Manning's n	0.030
Slope	0.001 ft/ft
Wetted Perimeter	7.85 ft
Average Velocity	1.15 ft/s
Segment Time of Concentration	11.042 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	81.959 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	70.00 ft
Manning's n	0.300
Slope	0.010 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	13.817 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	260.00 ft
Is Paved?	False
Slope	0.010 ft/ft
Average Velocity	1.61 ft/s
Segment Time of Concentration	2.686 min

Segment #3: TR-55 Channel Flow	
Flow Area	3.1 ft²
Hydraulic Length	620.00 ft
Manning's n	0.012
Slope	0.003 ft/ft
Wetted Perimeter	6.28 ft
Average Velocity	4.28 ft/s
Segment Time of Concentration	2.412 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	18.914 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.010 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.07 ft/s
Segment Time of Concentration	23.135 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	300.00 ft
Is Paved?	False
Slope	0.005 ft/ft
Average Velocity	1.14 ft/s
Segment Time of Concentration	4.383 min

Segment #3: TR-55 Channel Flow	
Flow Area	3.1 ft²
Hydraulic Length	720.00 ft
Manning's n	0.011
Slope	0.005 ft/ft
Wetted Perimeter	6.28 ft
Average Velocity	6.03 ft/s
Segment Time of Concentration	1.989 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	29.507 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.010 ft/ft
2 Year 24 Hour Depth	4.8 in
Average Velocity	0.07 ft/s
Segment Time of Concentration	23.135 min

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	300.00 ft
Is Paved?	False
Slope	0.005 ft/ft
Average Velocity	1.14 ft/s
Segment Time of Concentration	4.383 min

Segment #3: TR-55 Channel Flow	
Flow Area	3.1 ft²
Hydraulic Length	680.00 ft
Manning's n	0.011
Slope	0.005 ft/ft
Wetted Perimeter	6.28 ft
Average Velocity	6.03 ft/s
Segment Time of Concentration	1.878 min

Time of Concentration (Composite)	
Time of Concentration (Composite)	29.396 min

==== SCS Channel Flow

Tc = R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Residential Districts - 1/8 acre (town houses) - Soil D	91.000	15.530	0.0	0.0	91.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	15.530	(N/A)	(N/A)	91.000

Subsection: Runoff CN-Area
Label: POST AREA B
Scenario: Post-Development 1 year

Return Event: 1 years
Storm Event: 1yr

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved; curbs and storm sewers - Soil D	98.000	0.590	0.0	0.0	98.000
Woods - grass combination - good - Soil D	78.000	0.410	0.0	0.0	78.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	1.000	(N/A)	(N/A)	89.800

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Residential Districts - 1/8 acre (town houses) - Soil D	92.000	13.210	0.0	0.0	92.000
Pasture, grassland, or range - good - Soil D	80.000	9.520	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	22.730	(N/A)	(N/A)	86.974

Subsection: Runoff CN-Area
Label: POST AREA D
Scenario: Post-Development 1 year

Return Event: 1 years
Storm Event: 1yr

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Residential Districts - 1/8 acre (town houses) - Soil D	92.000	8.020	0.0	0.0	92.000
Pasture, grassland, or range - good - Soil D	80.000	27.180	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	35.200	(N/A)	(N/A)	82.734

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	19.68 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	19.67 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	245,984.532 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	240,859.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	33.05 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	33.05 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	401,460.089 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	393,925.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	47.26 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	47.25 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	568,558.938 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	558,611.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	56.02 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	56.01 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	672,486.788 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	661,096.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	70.83 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	70.81 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	849,963.376 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	836,179.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	82.79 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	82.77 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	994,801.319 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	979,112.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	71.057 min
Area (User Defined)	45.020 acres

Computational Time Increment	9.474 min
Time to Peak (Computed)	776.885 min
Flow (Peak, Computed)	94.81 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	94.79 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	45.020 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	1,141,530.713 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,123,944.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	71.057 min
Computational Time Increment	9.474 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	28.78 ft³/s
Unit peak time, Tp	47.371 min
Unit receding limb, Tr	141.917 min
Total unit time, Tb	189.288 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	776.979 min
Flow (Peak, Computed)	38.27 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	38.27 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	457,491.889 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	448,594.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	776.979 min
Flow (Peak, Computed)	64.05 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	64.05 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	746,651.561 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	733,581.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	776.979 min
Flow (Peak, Computed)	91.40 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	91.40 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	1,057,428.894 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,040,182.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	776.979 min
Flow (Peak, Computed)	108.24 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	777.000 min
Flow (Peak Interpolated Output)	108.23 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	1,250,717.875 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,230,974.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	768.048 min
Flow (Peak, Computed)	136.76 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	771.000 min
Flow (Peak Interpolated Output)	136.74 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	1,580,795.947 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,556,909.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	768.048 min
Flow (Peak, Computed)	160.03 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	768.000 min
Flow (Peak Interpolated Output)	159.99 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,850,171.356 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,822,987.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	66.981 min
Area (User Defined)	83.730 acres

Computational Time Increment	8.931 min
Time to Peak (Computed)	768.048 min
Flow (Peak, Computed)	183.41 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	768.000 min
Flow (Peak Interpolated Output)	183.37 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	83.730 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	2,123,064.562 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,092,597.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	66.981 min
Computational Time Increment	8.931 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	56.78 ft³/s
Unit peak time, Tp	44.654 min
Unit receding limb, Tr	133.778 min
Total unit time, Tb	178.431 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.360 min
Flow (Peak, Computed)	31.75 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	795.000 min
Flow (Peak Interpolated Output)	31.69 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	461,708.867 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	449,677.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.360 min
Flow (Peak, Computed)	52.57 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	52.50 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	745,989.237 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	728,415.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.360 min
Flow (Peak, Computed)	74.57 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	74.53 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	1,049,969.667 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,026,858.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	793.360 min
Flow (Peak, Computed)	88.09 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	792.000 min
Flow (Peak Interpolated Output)	88.06 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	1,238,527.248 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,212,106.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.519 min
Flow (Peak, Computed)	110.96 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	110.95 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.3 in
Runoff Volume (Pervious)	1,559,919.655 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,528,010.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.519 min
Flow (Peak, Computed)	129.62 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	129.58 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	1,821,790.918 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,785,514.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	88.809 min
Area (User Defined)	80.820 acres

Computational Time Increment	11.841 min
Time to Peak (Computed)	781.519 min
Flow (Peak, Computed)	148.36 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	783.000 min
Flow (Peak Interpolated Output)	148.30 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	80.820 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.1 in
Runoff Volume (Pervious)	2,086,800.217 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,046,173.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	88.809 min
Computational Time Increment	11.841 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	41.34 ft³/s
Unit peak time, Tp	59.206 min
Unit receding limb, Tr	177.373 min
Total unit time, Tb	236.579 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	730.667 min
Flow (Peak, Computed)	5.10 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	732.000 min
Flow (Peak Interpolated Output)	5.06 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	21,994.289 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	21,937.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	730.667 min
Flow (Peak, Computed)	8.33 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	8.25 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	35,536.483 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	35,452.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	730.667 min
Flow (Peak, Computed)	11.70 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	11.63 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	50,017.115 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	49,906.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	13.76 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	13.70 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	58,999.380 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	58,873.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	17.24 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	17.18 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.3 in
Runoff Volume (Pervious)	74,309.460 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	74,157.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	20.04 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	19.97 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	86,784.141 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	86,610.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	3.850 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	22.84 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	22.77 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	3.850 acres
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.1 in
Runoff Volume (Pervious)	99,408.323 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	99,214.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	17.49 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	11.31 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	789.000 min
Flow (Peak Interpolated Output)	11.29 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	156,322.022 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	152,517.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	18.99 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	18.97 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	255,125.982 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	249,533.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	27.16 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	27.14 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	361,316.621 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	353,933.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	32.20 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	32.18 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	427,362.217 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	418,908.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	40.72 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	40.70 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	540,147.761 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	529,918.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	47.61 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	47.59 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	632,191.598 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	620,548.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	81.959 min
Area (User Defined)	28.610 acres

Computational Time Increment	10.928 min
Time to Peak (Computed)	786.802 min
Flow (Peak, Computed)	54.52 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	786.000 min
Flow (Peak Interpolated Output)	54.52 ft³/s

Drainage Area	
SCS CN (Composite)	77.000
Area (User Defined)	28.610 acres
Maximum Retention (Pervious)	3.0 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	725,437.443 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	712,386.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	81.959 min
Computational Time Increment	10.928 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	15.86 ft³/s
Unit peak time, Tp	54.639 min
Unit receding limb, Tr	163.691 min
Total unit time, Tb	218.331 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	26.60 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	738.000 min
Flow (Peak Interpolated Output)	26.44 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.6 in
Runoff Volume (Pervious)	148,598.062 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	148,052.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	37.66 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	738.000 min
Flow (Peak Interpolated Output)	37.38 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.8 in
Runoff Volume (Pervious)	213,551.658 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	212,809.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	48.65 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	735.000 min
Flow (Peak Interpolated Output)	48.30 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.0 in
Runoff Volume (Pervious)	279,457.701 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	278,520.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	55.20 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	735.000 min
Flow (Peak Interpolated Output)	54.82 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.7 in
Runoff Volume (Pervious)	319,268.600 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	318,214.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	66.07 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	735.000 min
Flow (Peak Interpolated Output)	65.64 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.8 in
Runoff Volume (Pervious)	385,906.000 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	384,658.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	74.72 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	735.000 min
Flow (Peak Interpolated Output)	74.25 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.8 in
Runoff Volume (Pervious)	439,396.602 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	437,994.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	18.914 min
Area (User Defined)	15.530 acres

Computational Time Increment	2.522 min
Time to Peak (Computed)	736.399 min
Flow (Peak, Computed)	83.34 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	735.000 min
Flow (Peak Interpolated Output)	82.83 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	15.530 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.7 in
Runoff Volume (Pervious)	493,000.668 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	491,444.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	18.914 min
Computational Time Increment	2.522 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	37.29 ft³/s
Unit peak time, Tp	12.610 min
Unit receding limb, Tr	37.777 min
Total unit time, Tb	50.386 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	2.13 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	2.12 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	9,226.347 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	9,208.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	3.04 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	3.03 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.7 in
Runoff Volume (Pervious)	13,371.761 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	13,347.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	3.94 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	3.93 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.8 in
Runoff Volume (Pervious)	17,590.538 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	17,559.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	4.48 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	4.47 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.5 in
Runoff Volume (Pervious)	20,142.581 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	20,107.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	5.37 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	5.36 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.7 in
Runoff Volume (Pervious)	24,418.347 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	24,376.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	6.08 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	6.07 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.7 in
Runoff Volume (Pervious)	27,853.152 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	27,805.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	10.000 min
Area (User Defined)	1.000 acres

Computational Time Increment	1.333 min
Time to Peak (Computed)	729.333 min
Flow (Peak, Computed)	6.79 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	729.000 min
Flow (Peak Interpolated Output)	6.77 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.6 in
Runoff Volume (Pervious)	31,296.904 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	31,244.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	10.000 min
Computational Time Increment	1.333 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	4.54 ft³/s
Unit peak time, Tp	6.667 min
Unit receding limb, Tr	19.972 min
Total unit time, Tb	26.639 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	747.504 min
Flow (Peak, Computed)	27.13 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	747.000 min
Flow (Peak Interpolated Output)	27.11 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.3 in
Runoff Volume (Pervious)	187,504.380 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	186,279.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	39.99 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	39.99 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.4 in
Runoff Volume (Pervious)	278,826.867 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	277,130.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	53.01 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	52.99 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.5 in
Runoff Volume (Pervious)	372,714.133 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	370,550.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	60.81 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	60.78 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.2 in
Runoff Volume (Pervious)	429,792.322 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	427,349.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	73.76 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	73.72 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.4 in
Runoff Volume (Pervious)	525,740.223 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	522,834.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	84.08 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	84.03 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.3 in
Runoff Volume (Pervious)	603,024.038 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	599,750.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	29.507 min
Area (User Defined)	22.730 acres

Computational Time Increment	3.934 min
Time to Peak (Computed)	743.570 min
Flow (Peak, Computed)	94.37 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	94.30 ft³/s

Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	22.730 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.2 in
Runoff Volume (Pervious)	680,642.896 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	677,001.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.507 min
Computational Time Increment	3.934 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	34.99 ft³/s
Unit peak time, Tp	19.671 min
Unit receding limb, Tr	58.932 min
Total unit time, Tb	78.603 min

Storm Event	1yr
Return Event	1 years
Duration	1,440.000 min
Depth	3.6 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	748.625 min
Flow (Peak, Computed)	35.96 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	747.000 min
Flow (Peak Interpolated Output)	35.92 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.9 in
Runoff Volume (Pervious)	248,266.238 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	246,498.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	2yr
Return Event	2 years
Duration	1,440.000 min
Depth	4.8 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	55.43 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	747.000 min
Flow (Peak Interpolated Output)	55.37 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.0 in
Runoff Volume (Pervious)	382,526.494 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	380,024.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	5yr
Return Event	5 years
Duration	1,440.000 min
Depth	6.0 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	75.46 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	747.000 min
Flow (Peak Interpolated Output)	75.24 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	522,778.760 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	519,548.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	10yr
Return Event	10 years
Duration	1,440.000 min
Depth	6.7 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	87.55 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	87.27 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.8 in
Runoff Volume (Pervious)	608,732.678 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	605,068.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	25yr
Return Event	25 years
Duration	1,440.000 min
Depth	7.9 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	107.73 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	107.42 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.9 in
Runoff Volume (Pervious)	754,012.926 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	749,628.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	50yr
Return Event	50 years
Duration	1,440.000 min
Depth	8.9 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	123.85 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	123.52 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.8 in
Runoff Volume (Pervious)	871,559.664 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	866,602.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Storm Event	100yr
Return Event	100 years
Duration	1,440.000 min
Depth	9.8 in
Time of Concentration (Composite)	29.396 min
Area (User Defined)	35.200 acres

Computational Time Increment	3.920 min
Time to Peak (Computed)	744.705 min
Flow (Peak, Computed)	139.94 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	744.000 min
Flow (Peak Interpolated Output)	139.59 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	35.200 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.7 in
Runoff Volume (Pervious)	989,962.646 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	984,434.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	29.396 min
Computational Time Increment	3.920 min
Unit Hydrograph Shape Factor	323.000
K Factor	0.501
Receding/Rising, Tr/Tp	2.996
Unit peak, qp	54.39 ft³/s
Unit peak time, Tp	19.598 min
Unit receding limb, Tr	58.712 min
Total unit time, Tb	78.309 min

Requested Pond Water Surface Elevations	
Minimum (Headwater)	11.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	20.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	CULVERT OUT	Forward + Reverse	TW	15.20	20.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: CULVERT OUT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	40.00 ft
Length (Computed Barrel)	40.00 ft
Slope (Computed)	0.000 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.095
T2 ratio (HW/D)	1.197
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	17.39 ft	T1 Flow	15.55 ft³/s
T2 Elevation	17.59 ft	T2 Flow	17.77 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	10.40 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	15.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	ROAD CULVERT	Forward + Reverse	TW	10.40	15.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: ROAD CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	25.00 ft
Length (Computed Barrel)	25.00 ft
Slope (Computed)	0.006 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.092
T2 ratio (HW/D)	1.194
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	12.04 ft	T1 Flow	7.58 ft³/s
T2 Elevation	12.19 ft	T2 Flow	8.66 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	6.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	13.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	24" CULVERT	Forward + Reverse	FLOW UNDER I&D	6.08	13.00
Rectangular Weir	FLOW UNDER I&D	Forward + Reverse	TW	4.70	13.00
Rectangular Weir	TOP OF I&D WEIR	Forward + Reverse	TW	9.20	13.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: 24" CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	20.00 ft
Length (Computed Barrel)	20.01 ft
Slope (Computed)	0.030 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.900
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0340
M	1.5000
C	0.0553
Y	0.5400
T1 ratio (HW/D)	1.248
T2 ratio (HW/D)	1.410
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	8.58 ft	T1 Flow	15.55 ft³/s
T2 Elevation	8.90 ft	T2 Flow	17.77 ft³/s

Structure ID: TOP OF I&D WEIR Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	9.20 ft
Weir Length	25.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: FLOW UNDER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	4.70 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	13.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	19.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	O1	Forward + Reverse	C1	15.20	19.00
Rectangular Weir	WEIR1	Forward + Reverse	C1	16.70	19.00
Culvert-Circular	C1	Forward + Reverse	TW	15.20	19.00
Rectangular Weir	SPILLWAY1	Forward + Reverse	TW	17.20	19.00
Rectangular Weir	SPILLWAY2	Forward + Reverse	TW	18.00	19.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: O1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	15.20 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: C1 Structure Type: Culvert-Circular	
Number of Barrels	2
Diameter	18.0 in
Length	38.00 ft
Length (Computed Barrel)	38.00 ft
Slope (Computed)	0.003 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.094
T2 ratio (HW/D)	1.196
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	16.84 ft	T1 Flow	7.58 ft³/s
T2 Elevation	16.99 ft	T2 Flow	8.66 ft³/s

Structure ID: WEIR1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	16.70 ft
Weir Length	15.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: SPILLWAY1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	17.20 ft
Weir Length	4.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: SPILLWAY2 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	18.00 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	9.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	17.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	WQ ORIFICE	Forward + Reverse	CULVERT OUT	12.00	17.00
Rectangular Weir	WEIR 1	Forward + Reverse	CULVERT OUT	13.50	17.00
Rectangular Weir	EM SPLWY	Forward + Reverse	CULVERT OUT	15.50	17.00
Culvert-Circular	CULVERT OUT	Forward + Reverse	TW	12.00	17.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: WQ ORIFICE Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	12.00 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: CULVERT OUT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	30.00 ft
Length (Computed Barrel)	30.00 ft
Slope (Computed)	0.017 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.087
T2 ratio (HW/D)	1.189
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	14.17 ft	T1 Flow	15.55 ft³/s
T2 Elevation	14.38 ft	T2 Flow	17.77 ft³/s

Structure ID: WEIR 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	13.50 ft
Weir Length	5.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: EM SPLWY Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	15.50 ft
Weir Length	24.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	12.20 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	19.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir - 1	Forward + Reverse	TW	17.20	19.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	17.20 ft
Weir Length	20.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	12.20 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	19.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	CULVERT	Forward + Reverse	TW	13.09	19.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	48.0 in
Length	100.00 ft
Length (Computed Barrel)	100.00 ft
Slope (Computed)	-0.001 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.096
T2 ratio (HW/D)	1.198
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	17.47 ft	T1 Flow	87.96 ft³/s
T2 Elevation	17.88 ft	T2 Flow	100.53 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	9.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	16.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	CULVERT	Forward + Reverse	TW	9.00	16.00
Rectangular Weir	EM SPLWY	Forward + Reverse	TW	15.50	16.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: CULVERT Structure Type: Culvert-Circular	
Number of Barrels	2
Diameter	36.0 in
Length	515.00 ft
Length (Computed Barrel)	515.00 ft
Slope (Computed)	0.000 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.007
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.095
T2 ratio (HW/D)	1.197
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	12.29 ft	T1 Flow	42.85 ft³/s
T2 Elevation	12.59 ft	T2 Flow	48.97 ft³/s

Structure ID: EM SPLWY Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	15.50 ft
Weir Length	5.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	12.25 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	17.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	18" CULVERT	Forward + Reverse	FLOW UNDER I&D	12.31	17.00
Rectangular Weir	FLOW UNDER I&D	Forward + Reverse	TW	12.25	17.00
Rectangular Weir	TOP OF I&D	Forward + Reverse	TW	16.75	17.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: FLOW UNDER I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	12.25 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TOP OF I&D Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	16.75 ft
Weir Length	20.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: 18" CULVERT Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	23.00 ft
Length (Computed Barrel)	23.00 ft
Slope (Computed)	-0.009 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.100
T2 ratio (HW/D)	1.202
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	13.96 ft	T1 Flow	7.58 ft³/s
T2 Elevation	14.11 ft	T2 Flow	8.66 ft³/s

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EXISTING UN-MAINTAINED CULVERT PARTIALLY BLOCKED

EXISTING AREA #4B
84.21 ACRES
CN = 77
TC = 49.21 MIN

2300' CHNL @ 0.2%
CHANNEL 4B

FLOW PATH

TO KNOXBORO CRK

EXISTING NORTH OUTFALL
ELEVATION = 6.08
Q_1 = 28.87
Q_2 = 53.27
Q_5 = 82.24
Q_{10} = 95.67
Q_{25} = 122.94
Q_{50} = 144.83
Q_{100} = 167.10

TAILWATER INFORMATION
TIME 0.00 MIN – ELEV 5.50
TIME 720.00 MIN – ELEV 7.50
TIME 1440.00 – ELEV 5.50

100' SHEET @ 0.3%
ELEV: 22.00

HP

700' SHLW @ 1.5%

LIMITS OF PONDING
AREA "B"
ELEV: 13.00

EXISTING 18" CULVERT
IE: 10.22

EXISTING AREA #4A
69.32 ACRES
CN = 77
TC = 71.37 MIN
(TO CULVERT)

100' SHEET @ 0.3%
ELEV: 16.00

600' SHLW @ 0.3%

ELEV: 14.00

HP

LIMITS OF PONDING
AREA "A"
ELEV: 15.00

DRAINAGE DIVIDE

2200' CHNL @ 0.2%
CHANNEL 4A

LIMITS OF
MIDDLE PONDING
ELEV: 18.00

ELEV: 14.00

FLOW PATH

EXISTING AREA #3
71.04 ACRES
CN = 77
TC = 95.02 MIN

1860' CHNL @ 0.1%
CHANNEL 3

1620' SHLW @ 0.3%

100' SHEET @ 0.3%
ELEV = 19.00

100' SHEET @ 0.3%
ELEV = 19.00

TAILWATER INFORMATION
TIME 0.00 MIN – ELEV 15.00
TIME 720.00 MIN – ELEV 17.00
TIME 1440.00 – ELEV 15.00

EXISTING MIDDLE OUTFALL
ELEV: 15.00
Q_1 = 80.15
Q_2 = 88.24
Q_5 = 96.80
Q_{10} = 102.18
Q_{25} = 111.88
Q_{50} = 118.91
Q_{100} = 124.25

DRAINAGE DIVIDE

ARDMORE APTS

FLOW PATH

1112' SHLW @ 0.4%

2285' CHNL @ 0.1%

EXISTING AREA #1
12.33 ACRES
CN = 78
TC = 25.137 MIN

EXISTING AREA #2A
2.24 ACRES
CN = 78
TC = 47.35

GEORGIA HIGHWAY #21
184' R/W

LIMITS OF
SOUTH PONDING
ELEV: 17.00

EXISTING AREA #2B
80.82 ACRES
CN = 78
TC = 25.137 MIN

MULBERRY BLVD

EXISTING
POND

MARKET BOULEVARD
R/W VARIES

EXISTING SOUTH OUTFALL
ELEV: 15.00
Q_1 = 88.62
Q_2 = 100.65
Q_5 = 108.44
Q_{10} = 113.16
Q_{25} = 121.10
Q_{50} = 127.49
Q_{100} = 133.90

TAILWATER INFORMATION
TIME 0.00 MIN – ELEV 15.00
TIME 720.00 MIN – ELEV 16.50
TIME 1440.00 – ELEV 15.00

LIMITS OF
SOUTH PONDING
ELEV: 17.00

CROSSING UNDER
MULBERRY BLVD NOT
PART OF THIS STUDY

TO LAKESIDE BLVD

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SCALE: 1"=250'
0' 125' 250' 500'

811
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REVISIONS:

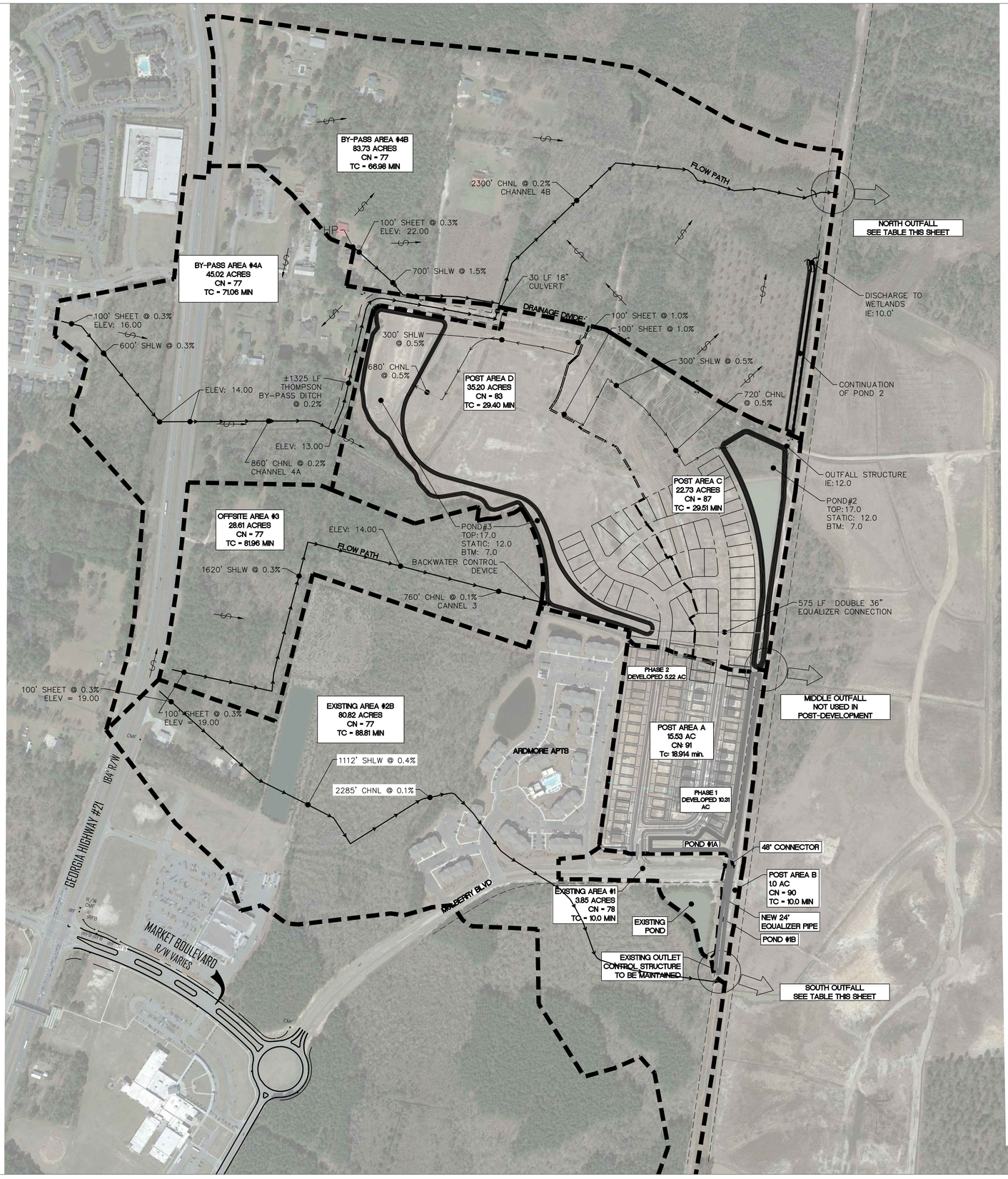
HYDROLOGIC EXHIBITS FOR
MULBERRY TRACT
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BALD EAGLE PARTNERS

JOB NUMBER:	21-309
DATE:	10/8/2021
DRAWN BY:	MLF
CHECKED BY:	NPM
SCALE:	AS NOTED

PRE-DEVELOPMENT EXHIBIT

SHEET:
PRE

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DATE PLOTTED: 10/8/2021 5:53 PM BY: Neil McKenzie DRAWING PATH: Q:\2021\21-309.000\Civil\Documents\Reports\HYDRO\21-309_Mulberry Hydrology Exhibits_8.25.21.dwg



POST-DEVELOPMENT DISCHARGE RATES							
	1 YR	*2 YR*	*5 YR*	*10 YR*	*25 YR*	*50 YR*	*100 YR*
SOUTH OUTFALL	77.83	94.03	104.36	110.22	120.06	132.92	146.70
MIDDLE OUTFALL	NOT USED						
NORTH OUTFALL	26.86	50.47	76.07	90.50	116.59	138.16	161.55

POST-DEVELOPMENT WATER SURFACE ELEVATIONS							
	1 YR	*2 YR*	*5 YR*	*10 YR*	*25 YR*	*50 YR*	*100 YR*
EX POND	16.75	16.89	17.16	17.39	17.77	18.08	18.31
PONDING AREA A	13.20	13.82	14.17	14.31	14.57	14.79	15.00
PONDING AREA B	9.37	9.70	10.00	10.12	10.34	10.52	10.68
SOUTH PONDING AREA	16.46	16.51	16.57	16.61	16.67	16.73	16.78
MIDDLE PONDING AREA	16.94	16.98	17.02	17.04	17.09	17.13	17.16
POND 1A	16.75	17.09	17.37	17.52	17.81	18.07	18.34
POND 1B	16.75	16.99	17.21	17.34	17.66	17.89	18.11
POND 2	13.26	13.78	14.19	14.44	14.89	15.28	15.72
POND 3	13.27	13.82	14.28	14.58	15.09	15.52	15.96

SCALE: 1"=250'
0' 125' 250' 500'

Know what's below. Call before you dig.

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REVISIONS:

HYDROLOGIC EXHIBITS FOR
MULBERRY TRACT
LOCATED IN PORT WENTWORTH, GEORGIA
PREPARED FOR BALD EAGLE PARTNERS

JOB NUMBER: 19-663
DATE: 03/02/2020
DRAWN BY: MLF
CHECKED BY: NPM
SCALE: AS NOTED

POST EXHIBIT

SHEET:
POST

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DATE PLOTTED: 10/13/2021 3:28 PM BY: Nell McKenzie DRAWING PATH: Q:\2021\21-309.000\Civil\Documents\Reports\HYDRO\21-309_Mulberry 3&4 Hydrology Exhibits_10.11.21.dwg

APPENDIX C
FEMA MAP

National Flood Hazard Layer FIRMette

FEMA

81°11'31"W 32°13'46"N



81°10'53"W 32°13'15"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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/10/2021 at 9:44 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX D
SOIL MAP

Custom Soil Resource Report
Soil Map



NOTICE OF INTENT

GAR385F07-V4

Permittee NOI Number

VERSION September 24, 2018

State of Georgia
Department of Natural Resources
Environmental Protection Division

7/16/2019

Application Submittal Date

For Coverage Under the 2018 Re-Issuance of the NPDES General Permits To Discharge Storm Water Associated With Construction Activity

THESE PERMITS EXPIRE JULY 31, 2023

Facility Information

Facility Name: Mulberry Tract Phase 1 (Chatham County)

Mailing Address 1: _____ Mailing Address 2: _____

County: _____ City: _____ State: _____ Zip Code: _____

Facility/Property Address 1: Rice Hope Road Address 2: _____

County: Chatham City: Port Wentworth State: GA Zip Code: 31407

Latitude: 32.222389 Longitude: -81.186453

PRIMARY PERMITTEE

NOTICE OF INTENT:

☐ Initial Notification ☐ Re-Issuance Notification ☑ Change of Information

☐ Change of Owner/Operator: Formerly Known As: _____

I. SITE/OWNER/OPERATOR INFORMATION

Facility Ownership Type: Mixed Ownership (e.g., Public/Private)

Common Development Name: Mulberry Tract

City: Port Wentworth County or Counties: Chatham Construction Site Zip Code: 31407

Owner's Name: BETHESDA Phone: 571-426-4310

Email Address: msdecain@gmail.com Address: 4800 Hampden Lane

City: BETHESDA State: MD Zip Code: 20814

Duly Authorized Representative(s): Neil McKenzie Phone: 912-200-3041

Email Address: nmckenzie@cci-sav.com

Operator's Name: _____ Phone: _____

Email Address: _____ Address: _____

City: _____ State: GA Zip Code: _____

Facility/Construction Site Contact: Scott Decain Phone: 571-426-4310

Email Address: msdecain@gmail.com

II. CONSTRUCTION SITE ACTIVITY INFORMATION AND FEE CALCULATONS

Start Date: 09/01/2018 Completion Date: 06/30/2020

Regulated by a certified Local Issuing Authority (LIA): ☐ Yes ☑ No

Name of Local Issuing Authority: _____

☑ Acres Disturbed (to the nearest tenth (1/10th) acre) 74 X $80/acre = 5920

In an area with no certified Local Issuing Authority

TOTAL FEE SUBMITTED = 5920

Number of Secondary Permittees: 3

Does the Erosion, Sedimentation and Pollution Control Plan (Plan) provide for disturbing more than 50 acres at any one time for each individual permittee (i.e., primary, secondary or tertiary permittees), or more than 50 contiguous acres total at any one time ?

☑ YES - 06/21/2019 Date of EPD Written Authorization

☐ NO

☐ N/A - if construction activities are covered under the General NPDES Permit No. GAR100002 for Infrastructure construction projects

Construction Activity Type:

☐ Commercial ☐ Industrial ☐ Municipal/Institutional ☐ Mixed Use

☐ Water Quality/Aquatic Habitat Restoration ☐ Linear ☐ Utility ☑ Residential

☐ Agricultural Buildings ☐ Other: _____

III. RECEIVING WATER INFORMATION

A. Name of Initial Receiving Water(s): Un-named Marshy Wetland to Savannah River

☐ Trout Stream ☑ Water Supporting Warm Water Fisheries

B. Name of MS4 Receiving Waters: Savannah River

☑ N/A ☐ Trout Stream ☐ Water Supporting Warm Water Fisheries

Name of MS4 Owner/Operator: City of Savannah

C. Sampling of Receiving Stream(s):

☐ Trout Stream (Δ 10 NTU) ☐ Water Supporting Warm Water Fisheries (Δ 25 NTU)

D. Sampling of Outfall(s):

☐ N/A

☐ Trout Stream

☑ Water Supporting Warm Water Fisheries

A summary chart (if applicable) delineating the following information for each outfall must be attached:

Number of Sampling Outfalls: 2 Construction Site Size (acres): 74

Appendix B NTU Value: 50 Surface Water Drainage Area (square miles): 4.99

E. Does the facility/construction site discharge storm water into an Impaired Stream Segment, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment identified as "not supporting" its designated use(s), as shown on Georgia's most current "305(b)/303(d) List Documents (Final)" listed for the criteria violated, "Bio F" (Impaired Fish Community) and/or "Bio M" (Impaired Macroinvertebrate Community), within Category 4a, 4b or 5, and the potential cause is either "NP" (nonpoint source) or "UR" (urban runoff) ?

☑ No ☐ Yes, Name of Impaired Stream Segment(s): _____

F. Does the facility/construction site discharge storm water into an Impaired Stream Segment where a Total Maximum Daily Load (TMDL) Implementation Plan for "sediment" was finalized at least six (6) months prior to the submittal of the Initial NOI ?

☑ No ☐ Yes, Name of Impaired Stream Segment(s): _____

IV. CERTIFICATIONS:

☑ I certify that to the best of my knowledge and belief, that the Erosion, Sedimentation and Pollution Control Plan (Plan) was prepared by a design professional, as defined by this permit, that has completed the appropriate certification course approved by the Georgia Soil and Water Conservation Commission in accordance with the provisions of O.C.G.A. 12-7-19 and that I will adhere to the Plan and comply with all applicable requirements of this permit.

☑ I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that certified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

STORM PIPE SIZING & ANALYSIS

FOR

MULBERRY SUBDIVISION PHASE 3

LOCATED IN:

PORT WENTWORTH, GEORGIA

PROJECT NO. 21-309.000

November 2021



CITY OF
Port Wentworth

PREPARED BY:

COLEMAN COMPANY, INC.

1480 Chatham Pkwy, Suite 100
SAVANNAH, GEORGIA 31405

PREPARED FOR:

BALD EAGLE PARTNERS
4800 Hampden Lane,
Suite 200
Bethesda, MD 20814

TABLE OF CONTENTS

I. Project Narrative

II. Storm Pipe Sizing & Analysis

A. Basin Input

B. Storm CAD Output

C. Pipe Sizing Exhibit

I. Project Narrative

The following presents an analysis of the storm drainage system designed for the Mulberry Tract Phases 3 & 4 subdivision. This project consists of approximately 62 lots and the infrastructure to support it.

Storm Drainage System

The Stormwater drainage system is being designed to accommodate the 25-year; 24-hour discharge generated by the new development. The 100-year storm was checked to ensure compliance with Port Wentworth's Comprehensive Design Manual.

II. Storm Pipe Sizing & Analysis

The stormwater drainage system is designed to accommodate the 25-year, 24-hour discharge generated by the new development. The overall storm water drainage system for this development is comprised of an interconnected pipe system which discharges into an existing wetland adjacent to the property. There will multiple inlets that drain the roadway and backyard lots. The pipe system runs downstream until discharged into proposed Ponds 2 & 3. A 25-year tailwater condition was imposed on this system in the downstream Pond 2 & 3 at an elevation of 14.89 & 15.09 respectively. The pipe sizing criteria are described in the following section, A. Input. Storm drainage design spreadsheet output shows that the storm water conveyance system described above will be adequate for this site. An inlet time of 10 minutes for the first inlet and a runoff coefficient of 0.40 & 0.60 were assumed for every inlet which is a conservative design choice.

A. Input

The following information was entered into the storm drainage design spreadsheet to determine the ideal pipe sizes to convey storm water runoff generated by the post-developed site. Inlets that will be installed in Phases 3 & 4.

Outflow Element	Area (Unified) (acres)	Runoff Coefficient (Rational)	Time of Concentration (min)	Catchment Intensity (in/h)
C. INLET-4	1.010	0.600	10.000	9.110
C. INLET-3	1.160	0.600	10.000	9.110
G. INLET-1	0.840	0.400	10.000	9.110
C. INLET-2	0.770	0.600	10.000	9.110
C. INLET-1	0.210	0.600	10.000	9.110
C. INLET-6	0.600	0.600	10.000	9.110
C. INLET-5	1.210	0.600	10.000	9.110
G. INLET-2	0.490	0.400	10.000	9.110
G. INLET-3	0.540	0.400	10.000	9.110
C. INLET-9	1.200	0.600	10.000	9.110
C. INLET-10	0.770	0.600	10.000	9.110
C. INLET-12	0.460	0.600	10.000	9.110
C. INLET-11	1.170	0.600	10.000	9.110
C. INLET-7	1.210	0.600	10.000	9.110
C. INLET-8	0.480	0.600	10.000	9.110

B. Storm CAD Output

Scenario: 25-YR
Current Time Step: 0.000 h
FlexTable: Catchment Table

Label	Outflow Element	Area (Unified) (acres)	Runoff Coefficient (Rational)	Time of Concentration (min)	Catchment Intensity (in/h)
CM-1	C. INLET-4	1.010	0.600	10.000	9.110
CM-2	C. INLET-3	1.160	0.600	10.000	9.110
CM-3	G. INLET-1	0.840	0.400	10.000	9.110
CM-4	C. INLET-2	0.770	0.600	10.000	9.110
CM-5	C. INLET-1	0.210	0.600	10.000	9.110
CM-6	C. INLET-6	0.600	0.600	10.000	9.110
CM-7	C. INLET-5	1.210	0.600	10.000	9.110
CM-8	G. INLET-2	0.490	0.400	10.000	9.110
CM-9	G. INLET-3	0.540	0.400	10.000	9.110
CM-10	C. INLET-9	1.200	0.600	10.000	9.110
CM-11	C. INLET-10	0.770	0.600	10.000	9.110
CM-12	C. INLET-12	0.460	0.600	10.000	9.110
CM-13	C. INLET-11	1.170	0.600	10.000	9.110
CM-14	C. INLET-7	1.210	0.600	10.000	9.110
CM-15	C. INLET-8	0.480	0.600	10.000	9.110

Q:\2021\21-309.000\Civil\Documents\Reports\STORM\21-309_MULBERRY PH3 - PIPE SIZING_07.06.2021.stsw

Scenario: 25-YR
Current Time Step: 0.000 h
FlexTable: Conduit Table

Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Diameter (in)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Material	Manning's n	Velocity (ft/s)	Flow (cfs)	Capacity (Full Flow) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
PIPE-1	FES-1	7.00	C. INLET-1	5.92	36.0	69.0	0.016	Concrete	0.013	0.00	0.00	83.44	14.99	14.99
PIPE-2	C. INLET-1	7.00	C. INLET-2	7.00	36.0	31.3	0.000	Concrete	0.013	0.16	1.16	0.67	14.99	14.99
PIPE-3	C. INLET-2	7.00	G. INLET-1	7.00	36.0	129.1	0.000	Concrete	0.013	0.64	4.53	0.67	14.99	14.98
PIPE-4	G. INLET-1	7.00	C. INLET-3	7.00	36.0	129.1	0.000	Concrete	0.013	0.87	6.17	0.67	14.98	14.97
PIPE-5	C. INLET-3	7.00	C. INLET-4	7.00	36.0	31.0	0.000	Concrete	0.013	1.46	10.31	0.67	14.97	14.96
PIPE-6	C. INLET-4	7.00	FES-2	7.00	36.0	165.0	0.000	Concrete	0.013	1.99	14.07	0.67	14.96	14.89
PIPE-7	G. INLET-2	13.75	C. INLET-5	13.28	18.0	118.6	0.004	Concrete	0.013	1.02	1.80	6.61	15.68	15.64
PIPE-8	C. INLET-5	13.18	C. INLET-6	13.05	18.0	33.2	0.004	Concrete	0.013	4.32	7.64	6.57	15.64	15.47
PIPE-9	C. INLET-6	8.64	FES-3	7.95	24.0	173.0	0.004	Concrete	0.013	3.36	10.55	14.29	15.47	15.09
PIPE-10	C. INLET-7	13.70	C. INLET-8	13.58	18.0	31.0	0.004	Concrete	0.013	3.77	6.67	6.54	15.53	15.41
PIPE-11	C. INLET-8	10.02	FES-4	9.25	24.0	190.1	0.004	Concrete	0.013	2.94	9.25	14.40	15.41	15.09
PIPE-12	G. INLET-3	10.85	C. INLET-9	10.50	18.0	86.1	0.004	Concrete	0.013	1.12	1.98	6.70	15.61	15.58
PIPE-13	C. INLET-9	10.40	C. INLET-10	10.28	18.0	31.0	0.004	Concrete	0.013	4.55	8.04	6.54	15.58	15.40
PIPE-14	C. INLET-10	9.68	FES-5	8.95	24.0	183.5	0.004	Concrete	0.013	3.80	11.94	14.27	15.40	14.89
PIPE-15	C. INLET-11	13.25	C. INLET-12	13.13	18.0	31.0	0.004	Concrete	0.013	3.65	6.45	6.54	15.29	15.18
PIPE-16	C. INLET-12	9.98	FES-6	9.25	24.0	183.5	0.004	Concrete	0.013	2.84	8.92	14.31	15.18	14.89

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Scenario: 25-YR
Current Time Step: 0.000 h
FlexTable: Manhole Table

Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Flow (Total Out) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
C. INLET-1	17.42	17.42	1.16	14.99	14.99
C. INLET-2	17.42	17.42	4.53	14.99	14.99
C. INLET-3	17.42	17.42	10.31	14.97	14.97
C. INLET-4	17.42	17.42	14.07	14.96	14.96
C. INLET-5	17.46	17.46	7.64	15.64	15.64
C. INLET-6	17.46	17.46	10.55	15.47	15.47
C. INLET-7	17.42	17.42	6.67	15.53	15.53
C. INLET-8	17.42	17.42	9.25	15.41	15.41
C. INLET-9	17.22	17.22	8.04	15.58	15.58
C. INLET-10	17.22	17.22	11.94	15.40	15.40
C. INLET-11	16.97	16.97	6.45	15.29	15.29
C. INLET-12	16.97	16.97	8.92	15.18	15.18
FES-1	17.00	17.00	0.00	14.99	14.99
G. INLET-1	17.50	17.50	6.17	14.98	14.98
G. INLET-2	17.50	17.50	1.80	15.68	15.68
G. INLET-3	17.50	17.50	1.98	15.61	15.61

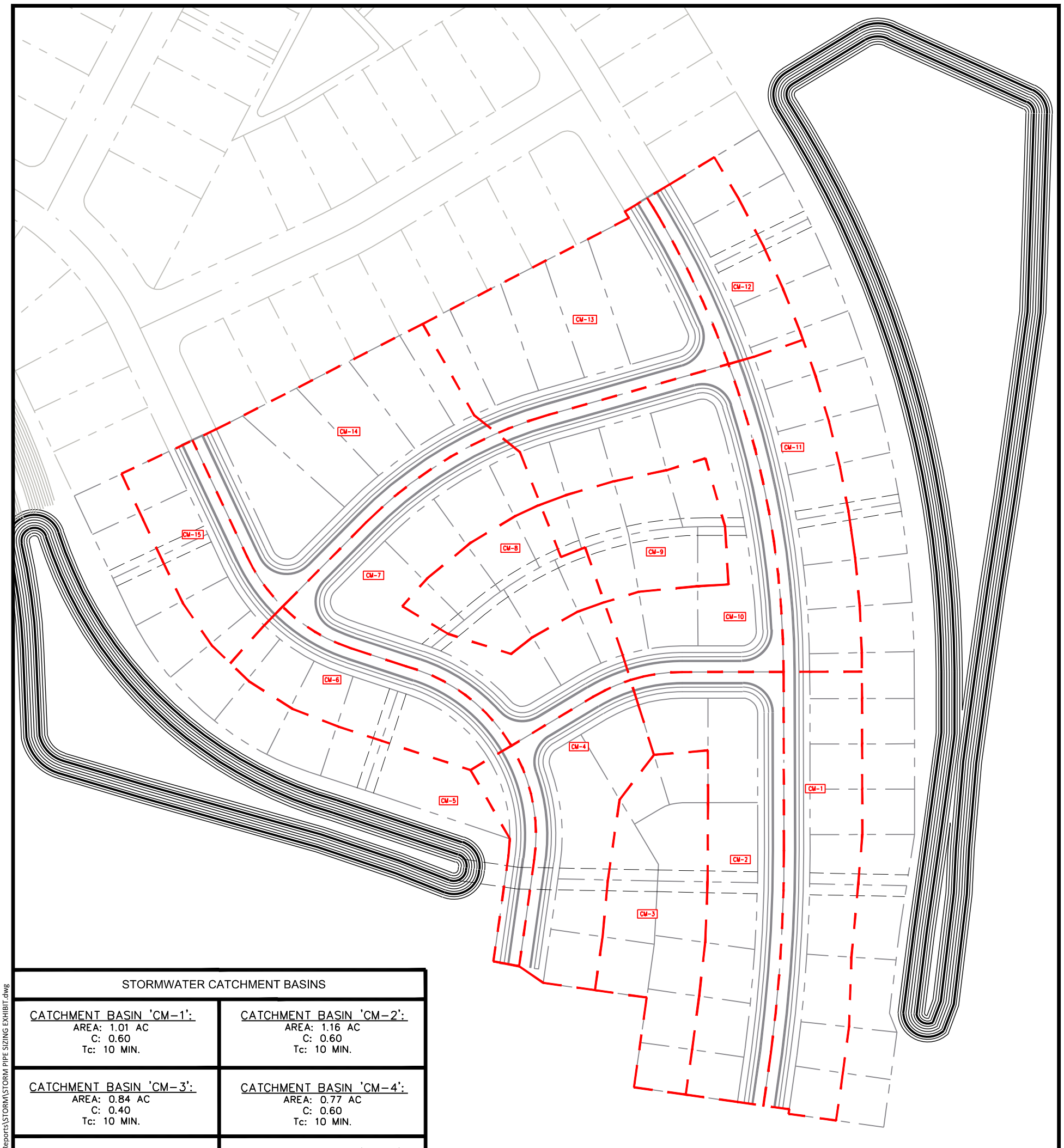
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Scenario: 25-YR
Current Time Step: 0.000 h
FlexTable: Outfall Table

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Elevation (User Defined Tailwater) (ft)	Flow (Total Out) (cfs)	Hydraulic Grade (ft)
FES-2	17.00	7.00	14.89	13.68	14.89
FES-3	17.00	7.95	15.09	10.04	15.09
FES-4	17.00	9.25	15.09	8.74	15.09
FES-5	17.00	8.95	14.89	11.42	14.89
FES-6	17.00	9.25	14.89	8.43	14.89

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C. Pipe Sizing Exhibit



STORMWATER CATCHMENT BASINS	
CATCHMENT BASIN 'CM-1': AREA: 1.01 AC C: 0.60 Tc: 10 MIN.	CATCHMENT BASIN 'CM-2': AREA: 1.16 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-3': AREA: 0.84 AC C: 0.40 Tc: 10 MIN.	CATCHMENT BASIN 'CM-4': AREA: 0.77 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-5': AREA: 0.21 AC C: 0.60 Tc: 10 MIN.	CATCHMENT BASIN 'CM-6': AREA: 0.60 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-7': AREA: 1.21 AC C: 0.60 Tc: 10 MIN.	CATCHMENT BASIN 'CM-8': AREA: 0.49 AC C: 0.40 Tc: 10 MIN.
CATCHMENT BASIN 'CM-9': AREA: 0.54 AC C: 0.40 Tc: 10 MIN.	CATCHMENT BASIN 'CM-10': AREA: 1.20 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-11': AREA: 0.77 AC C: 0.60 Tc: 10 MIN.	CATCHMENT BASIN 'CM-12': AREA: 0.46 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-13': AREA: 1.17 AC C: 0.60 Tc: 10 MIN.	CATCHMENT BASIN 'CM-14': AREA: 1.21 AC C: 0.60 Tc: 10 MIN.
CATCHMENT BASIN 'CM-15': AREA: 0.48 AC C: 0.60 Tc: 10 MIN.	

N

SCALE: 1"=120'

0' 60' 120' 240'

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DATE PLOTTED: 11/22/2021 4:22 PM BY: Dillon Powell DRAWING PATH: Q:\2021\21-309.000\Civil\Documents\Reports\STORM\STORM PIPE SIZING EXHIBIT.dwg

JOB NUMBER: 21-309.000
DATE: 07.06.2021
DRAWN BY: MLF
CHECKED BY: NPM
SCALE: AS NOTED

SHEET: 1 OF 1

STORM PIPE SIZING EXHIBIT
MULBERRY PHASES 3 & 4
LOCATED IN: PORT WENTWORTH, GEORGIA
PREPARED FOR: BEP RICE HOPE, LLC

COLEMAN COMPANY
ENGINEERS • SURVEYORS
Savannah, Georgia | (912) 200-3041 | CCI-SAV.COM

City of Port Wentworth
Stormwater Facility Inspection & Maintenance Agreement

This AGREEMENT, made and entered into this _29__ day of __November, 2021, by and between BEP Rice Hope, LLC, his/her successors and assigns, including but not limited to any homeowners association, commercial developer, holder of any portion of the below described property, and/or similar (hereinafter called the "Landowner"), and the City of Port Wentworth, Georgia; hereinafter called the "City", as required by state and local regulation and ordinances.

WITNESSETH, that WHEREAS, the Landowner is the owner of certain real property described A Portion of Parcel A, Rice Hope Plantation and recorded by deed in the land records of Chatham County, Georgia, Plat Book 51, Page 213, hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to develop the property and/or build upon the property; and

WHEREAS, the Stormwater Management and Operations and Maintenance (O&M) Plan; hereinafter called "the Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for management of stormwater runoff for the property; and

WHEREAS, the Landowner, its successors and assigns, agree that the health, safety, and welfare of the residents of Port Wentworth, Georgia, require that stormwater management facilities be constructed and maintained on the Property and in accordance with the Plan; and

WHEREAS, the City requires that stormwater management facilities as shown within the Plan be constructed and adequately maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The stormwater management facilities shall be constructed and/or upgraded as well as maintained by the Landowner, its successors and assigns, in accordance with the specifications identified in the Plan.

2. The Landowner, its successors and assigns, shall adequately maintain the stormwater management facilities and perform the work necessary to keep those facilities in good working order at all times, as described in the Plan. This includes all pipes, channels or other conveyances built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater runoff. Adequate maintenance is herein defined as good working condition so that these facilities are performing their approved design functions.

3. The Landowner, its successors and assigns, shall inspect the stormwater management facility annually and maintain an inspection report on site that will be available for review by the City. The purpose of the inspection is to ensure safe and proper functioning of the stipulated facilities. The inspection shall cover all applicable stormwater management facilities, including but not limited to, conveyance measures, berms, outlet structures, pond areas, etc. Deficiencies shall be noted in the inspection report along with a schedule for repair. The inspection procedures, frequency and report shall follow the procedures established and approved in the Plan.

4. The Landowner, its successors and assigns, hereby grant permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the stormwater management facilities whenever the City deems necessary and with reasonable notice having been given to the Landowner. The City shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.

5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the City, the City may issue citations to the Landowner for resulting, continuing ordinance violations (as set forth in the Port Wentworth City Code of Ordinances), until such time as the issues are satisfactorily resolved. Additionally, the City may enter upon the Property and implement the necessary measures to correct deficiencies identified in the inspection report and to recover the costs of such repairs from the Landowner, its successors and assigns through the appropriate means. This provision shall not be construed to allow the City to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the City is under no obligation to routinely maintain or repair said facilities, and in no event shall this AGREEMENT be construed to impose any such obligation on the City.

6. Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management facilities (including sediment removal) is outlined on the approved plan, the schedule will be followed.

7. In the event the City, pursuant to this AGREEMENT, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the City hereunder. Work will not commence without written notice from the City to the owner.

8. This Agreement imposes no liability of any kind whatsoever on the City and the Landowner agrees to hold the City harmless from any liability in the event the stormwater management facilities fail to operate properly.

9. This AGREEMENT shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association.

CERTIFICATION

OWNER:

WITNESS the following signatures and seals:

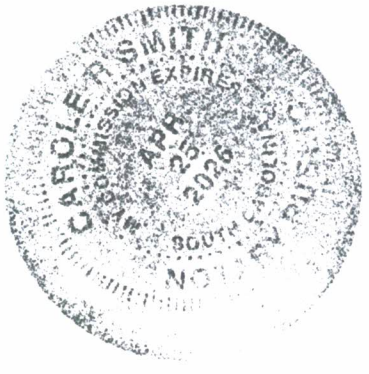
B.E.P. Rice Hope, LLC.
Company/Corporation/Partnership Name (Seal)

By: _____
M. Scott DeCain/Manager
(Type Name and Title)

The foregoing AGREEMENT was acknowledged before me this 30th day of November, 2021, by _____.

_____
NOTARY PUBLIC

My Commission Expires: 4/25/26



3.5.3 Exhibit 1 - Wastewater Collection System Check List

Typical Wastewater System Plan shall include:	Check Off
1) Layout and legend	X
2) Exhibit 2 completed (load data)	X
3) For effluents with process water, comply with the City's Pretreatment Ordinance.	X
4) Show sewer easement (if applicable)	X
5) Manholes numbered and placed at 350' (max.) spacing	X
6) Manholes placed at line directional changes	X
7) Manhole frame and invert elevations shown	X
8) Invert elevations shown for all pipe inside manholes	X
9) Minimum gradient of 0.4% used for 8" pipes	X
10) Maximum height of 2' between invert of pipes and invert of discharge manholes	X
11) Minimum angle of 90 degrees for influent lines	X
12) All sanitary sewers profiled	X
13) Oil/grease traps and details provided for service station and food service preparers	NA
14) Grading, paving, drainage, erosion control plans attached	X
15) Attach certification that water and/or sewer lines are not in, nor do they serve, structures built upon solid waste landfills	X
16) For pump station design:	
a. Attach design calculations with pump curves	NA
b. City of Port Wentworth pump station design standards used to prepare drawings, details and specifications	NA
17) City of Port Wentworth sewer specifications and details used	X
18) Proposed water/sewer agreement attached	X
19) Georgia Registered Professional Engineer stamp and signature	X

WATER AND SEWER SYSTEM ANALYSIS

FOR

MULBERRY TRACT PHASE 3, 4, & REMAINING PHASES

LOCATED IN:

PORT WENTWORTH, GEORGIA

PROJECT NO. 21-309

November 2021

GEORGIA REGISTERED No. PE036652 PROFESSIONAL ENGINEER NEIL P. McKENZIE 11/11/21

PREPARED BY:

COLEMAN COMPANY, INC.
1480 CHATHAM PARKWAY
SUITE 100
SAVANNAH, GEORGIA 31405

PREPARED FOR:

BALD EAGLE PARTNERS
4800 HAMPDEN LANE
SUITE 200
BETHESDA, MD 20814

COLEMAN COMPANY
ENGINEERS • SURVEYORS
SAVANNAH, GA | (912) 200-3041 | WWW.CCI-SAV.COM

Mulberry Tract Phase 3, 4, & Remaining Phases
Water System Analysis

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Demand Calculations 4

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- Required Fire Flow 4
- Required Water Analysis Results 4
- Required Fire Flow Analysis Results 4
- Results 4
- Sanitary Sewer Loading & Capacity Calculations 5

Appendices

- A – Hydrant Flow Test Report
- B – Water System Exhibit
- C – Water Analysis Results (WaterCAD Output)

Narrative

This report presents an analysis of the water supply capacity of the proposed water system designed for the remaining phases of Mulberry Tract. The planned development consists of 172 single family lots. Water service to the residences will be provided through a 10-in water supply line. The proposed supply line will be connected to an existing 10-inch & 8-inch water main stubbed out as an extension of Phases 1 & 2 that run along Weavers Way & Wild Silk Way.

The water source information is based upon flow tests performed on existing fire hydrants on Weavers Way & Wild Silk Way. This test was performed on July 21, 2021 by Coleman Company, Inc. The hydrants tested are located at the end of Phases 1 & 2. The Water Analysis was performed using average daily flow and a peaking factor of 3 to calculate peak daily demand within this development. The analysis was then performed with peak daily demand conditions combined with a fire flow on the most remote hydrant. This report indicates adequate water availability for this proposed development as mandated in the *ISO Guide for Determination of Required Fire Flow 2006 edition.*

EXISTING FLOW DATA

To determine the water delivery capacity a flow test was performed by Coleman Company, Inc. on the existing 10-inch & 8-inch water main along Weavers Way & Wild Silk Way on July 21, 2021, see attached flow test. The results are shown in Table 1 below.

Table 1

Fire Hydrant(s) Test Data	
Static Pressure at Hydrant	63 psi
Residual Pressure at Hydrant	33 psi
Flow at Hydrant	770 gpm

A hydraulic model of the proposed Mulberry Tract water delivery system was created using the WaterCAD modeling software written by Haestad Methods. The City of Port Wentworth's water supply system was represented in the program as a pump connected to an infinite reservoir. The fire hydrant flow test data was used to develop a curve to simulate the theoretical pump output curve, as shown below.

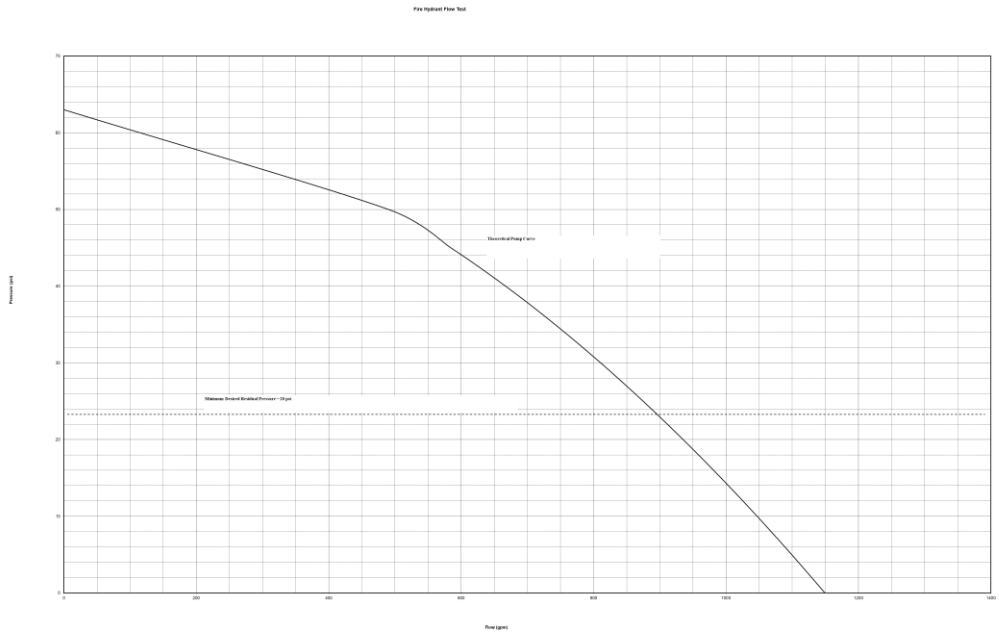
Flow During Test	=	770 gpm	
Test Static Pressure/Head	=	63 psi =	146 ft
Test Residual Pressure/Head	=	33 psi =	76 ft
Desired Residual Pressure/Head	=	20 psi =	46 ft

$$Q_{dr} = Q_t \{(P_{ts} - P_{dr}) / (P_{ts} - P_{tr})\}^{0.54}$$

Where, Q_{dr} = Flow at Desired Residual Pressure
Q_t = Flow During Test
P_{ts} = Static Pressure
P_{dr} = Desired Residual Pressure
P_{tr} = Residual Pressure During Test

The following table of flow versus pressure (or head) was derived using the above equation and the assumed flow and pressure:

P_{dr} (psi)	Q_{dr} (gpm)	Head (ft)
0	**1149**	**0**
5	1099	12
10	1047	23
15	992	35
20	**935**	**46**
25	875	58
30	811	69
35	742	81
40	667	92
45	584	104
50	490	116
63	**0**	**146**



Note that three lines are highlighted on the table. The top line represents the maximum flow condition with no head (i.e., no resistance to flow). The middle line represents the flow condition at the minimum desired residual pressure of 20 psi. The bottom line represents the static condition (i.e., no flow) or the shut-off head. These three data points were entered in the WaterCAD model to represent the theoretical water supply pump.

WATER DEMAND CALCULATIONS

A water delivery system must be capable of supplying the needed fire flow while also meeting the maximum regular supply demands of its customers. To model the highest water demand placed on the City's distribution system by the proposed development, the total peak domestic usage rate was added to the needed fire flow.

Domestic Water Demand

ADD = Average Daily Demand = 300 gpd per lot

PDD = Peak Daily Demand = ADD x 3

The water demand at each junction was calculated as the sum of the ADD per lot. The following demands were imposed at the appropriate points in the model to simulate Peak Daily Demand usage.

172 Lots (Remaining Phases):	**172 Lots @ 300 gpd/bldg. =**	**51,600 gpd**
	TOTAL:	**51,600 gpd**

ADD = 51,600 gpd = 35.83 gpm
PDD = 154,800 gpd = 107.50 gpm

Required Fire Flow

A fire flow requirement of 1,000 GPM for residential dwellings with separation of 11-30' is being used per ISO guidelines as set forth in City of Port Wentworth water & sewer standards. The building separation for this development should be an average of 15'.

RESULTS

As indicated on the attached report from the WaterCAD program, there will be adequate water availability to provide the needed fire flow for the proposed development. The lowest pressure of 44 psi occurs where a fire flow demand of 1,000 GPM was imposed at Junction-13. This is above the required 20 psi delivery pressure.

SANITARY SEWER LOADING AND CAPACITY CALCULATIONS

Sanitary Sewer Demand

ADF = Average Daily Flow = 300 gpd per lot

PDF = Peak Daily Flow = ADF x 3

172 Lots (Remaining Phases):	**172 Lots @ 300 gpd/bldg. =**	**51,600 gpd**
	TOTAL:	**51,600 gpd**

ADD = 51,600 gpd = 35.83 gpm
PDD = 154,800 gpd = 107.50 gpm

SEWER PIPE CALCULATIONS:

PIPE SIZE AND SLOPE: 8" DIAMETER @ 0.4%

- **ADF = 51,600 gpd = 35.83 gpm**

  VELOCITY = 1.68 fps

  DEPTH OF FLOW = 0.15 ft

  PIPE % FULL = 22%

- **PDF = 154,800 gpd = 107.50 gpm**

  VELOCITY = 2.27 fps

  DEPTH OF FLOW = 0.25 ft

  PIPE % FULL = 37%

APPENDIX A

HYDRANT FLOW TEST REPORT

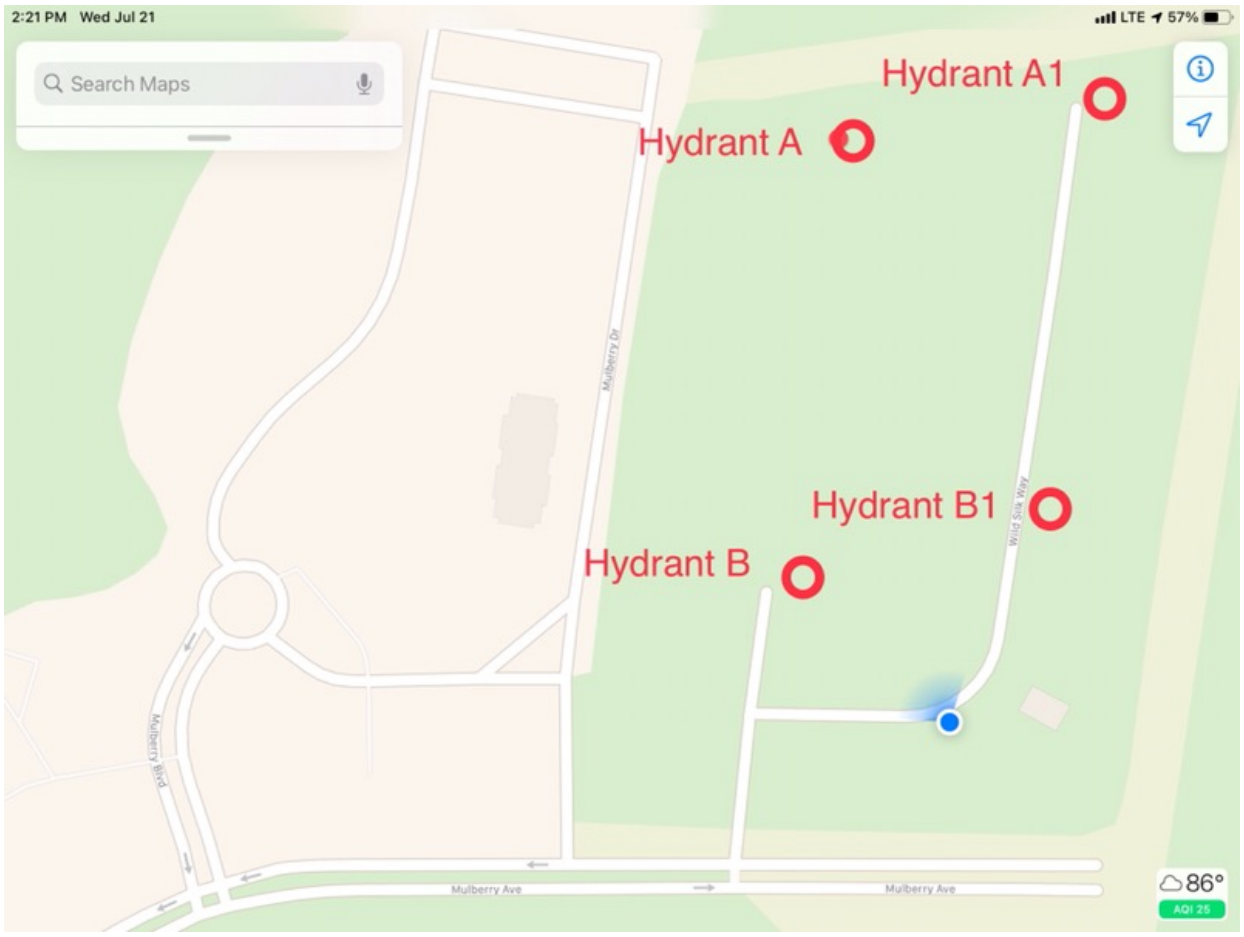
COLEMAN COMPANY
ENGINEERS • SURVEYORS

Water Hydrant Flow Test Report

Report Info

CCI Job #:	21-309	Flow Test By:	William J Roundtree
Project Name:	Mulberry Phase 3	Test Date:	07/21/2021
Project Location:	Georgia	Test Time:	02:45 PM

Water Hydrant Locations



Hydrant A Location: Lots 48/49 Weavers Way

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Hydrant B Location:	Lots 57/58 Weavers Way
Hydrant A1 Location:	34 Wild Silk Way
Hydrant B1 Location:	20/22 Wild Silk Way

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Water Hydrant Calculations

Note:
This information represents the water supply characteristics in the immediate area on the date and time tested.

Flow Test Number:	GPM Hydrant A	Flow (PSI) Hydrant A	Static (PSI) Hydrant B	Residual (PSI) Hydrant B	Size of Main	Flow Type
A).	770	24	63	33	10"	Single
A1).	770	24	63	33	8"	Single

Tester Signature:



William J Roundtree
CCI Inspector
07/21/2021

Witness Signature:



Chris Lee
CWS Project Manager
07/21/2021

APPENDIX B

WATER SYSTEM EXHIBIT

J-31
10-IN-6
J-33
10-IN-5
8-IN-10
8-IN-9
8-IN-8
J-34
J-30
10-IN-4
8-IN-7
8-IN-6
J-37
J-32
10-IN-4
8-IN-5
J-35
J-29
8-IN-4
10-IN-3
8-IN-3
J-28
10-IN-2
8-IN-2
J-26
J-27
N-01
8-IN
J-36
P-27
HYD WEAVERS WAY
P-26
R-3
J-38
P-29
HYD WILD SILK WAY
P-28
R-4

APPENDIX C

WATER ANALYSIS RESULTS (WATERCAD OUTPUT)

Scenario: PDD+FF
Current Time Step: 0.000 h
FlexTable: Junction Table

Label	Demand (gpm)	Elevation (ft)	Pressure (psi)	Hydraulic Grade (ft)
J-33	0	15.50	44	118.21
J-31	1,108	14.50	45	117.48
J-30	0	15.00	45	118.27
J-32	0	15.50	45	118.84
J-35	0	15.00	45	119.45
J-34	0	14.50	45	119.51
J-28	0	15.50	46	120.71
J-36	0	16.50	46	122.39
J-37	0	14.00	46	120.09
J-29	0	14.50	46	120.71
J-27	0	15.00	46	121.77
J-26	0	15.00	46	121.95
J-38	0	16.50	47	125.02

Q:\2021\21-309.000\Civil\Documents\Reports\WATER\21-309 Master Water Model.wtg

Scenario: PDD+FF
Current Time Step: 0.000 h
FlexTable: Pipe Table

Label	Start Node	Stop Node	Material	Hazen-Williams C	Diameter (in)	Length (ft)	Velocity (ft/s)	Flow (gpm)	Pressure (Start) (psi)	Pressure (Stop) (psi)	Hydraulic Grade (Start) (ft)	Hydraulic Grade (Stop) (ft)
8-IN	J-38	J-26	C900 PVC	130.0	8.0	523	3.46	542	47	46	125.02	121.95
8-IN-10	J-30	J-31	C900 PVC	130.0	8.0	605	1.54	241	45	45	118.27	117.48
8-IN-2	J-26	J-27	C900 PVC	130.0	8.0	351	0.93	145	46	46	121.95	121.77
8-IN-3	J-26	J-29	C900 PVC	130.0	8.0	376	2.53	397	46	46	121.95	120.71
8-IN-4	J-28	J-29	C900 PVC	130.0	8.0	599	0.03	5	46	46	120.71	120.71
8-IN-5	J-29	J-37	C900 PVC	130.0	8.0	185	2.56	401	46	46	120.71	120.09
8-IN-6	J-34	J-37	C900 PVC	130.0	8.0	171	2.56	-401	45	46	119.51	120.09
8-IN-7	J-34	J-35	C900 PVC	130.0	8.0	627	0.38	59	45	45	119.51	119.45
8-IN-8	J-33	J-34	C900 PVC	130.0	8.0	519	2.18	-342	44	45	118.21	119.51
8-IN-9	J-32	J-33	C900 PVC	130.0	8.0	604	1.36	213	45	44	118.84	118.21
10-IN	J-36	J-27	C900 PVC	130.0	10.0	289	2.31	566	46	46	122.39	121.77
10-IN-2	J-27	J-28	C900 PVC	130.0	10.0	323	2.91	711	46	46	121.77	120.71
10-IN-3	J-28	J-35	C900 PVC	130.0	10.0	390	2.89	707	46	45	120.71	119.45
10-IN-4	J-35	J-32	C900 PVC	130.0	10.0	163	3.13	766	45	45	119.45	118.84
10-IN-4	J-32	J-30	C900 PVC	130.0	10.0	277	2.26	553	45	45	118.84	118.27
10-IN-5	J-30	J-31	C900 PVC	130.0	10.0	1,113	1.27	312	45	45	118.27	117.48
10-IN-6	J-31	J-33	C900 PVC	130.0	10.0	353	2.27	-555	45	44	117.48	118.21
P-26	R-3	HYD WEAVERS WAY	C900 PVC	130.0	10.0	69	2.31	566	0	0	16.50	16.35
P-27	HYD WEAVERS WAY	J-36	C900 PVC	130.0	10.0	57	2.31	566	46	46	122.52	122.39
P-28	R-4	HYD WILD SILK WAY	C900 PVC	130.0	8.0	75	3.46	542	0	0	16.50	16.06
P-29	HYD WILD SILK WAY	J-38	C900 PVC	130.0	8.0	58	3.46	542	47	47	125.36	125.02

Scenario: PDD+FF
Current Time Step: 0.000 h
FlexTable: Pump Table

Label	Pump Definition	Flow (Total) (gpm)	Pump Head (ft)	Pressure (Discharge) (psi)	Pressure (Suction) (psi)	Hydraulic Grade (Discharge) (ft)	Hydraulic Grade (Suction) (ft)
HYD WEAVERS WAY	WEAVERS WAY	566	106.16	46	0	122.52	16.35
HYD WILD SILK WAY	WILD SILK WAY	542	109.31	47	0	125.36	16.06

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Scenario: PDD+FF
Current Time Step: 0.000 h
FlexTable: Reservoir Table

Label	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-3	566	16.50
R-4	542	16.50

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