

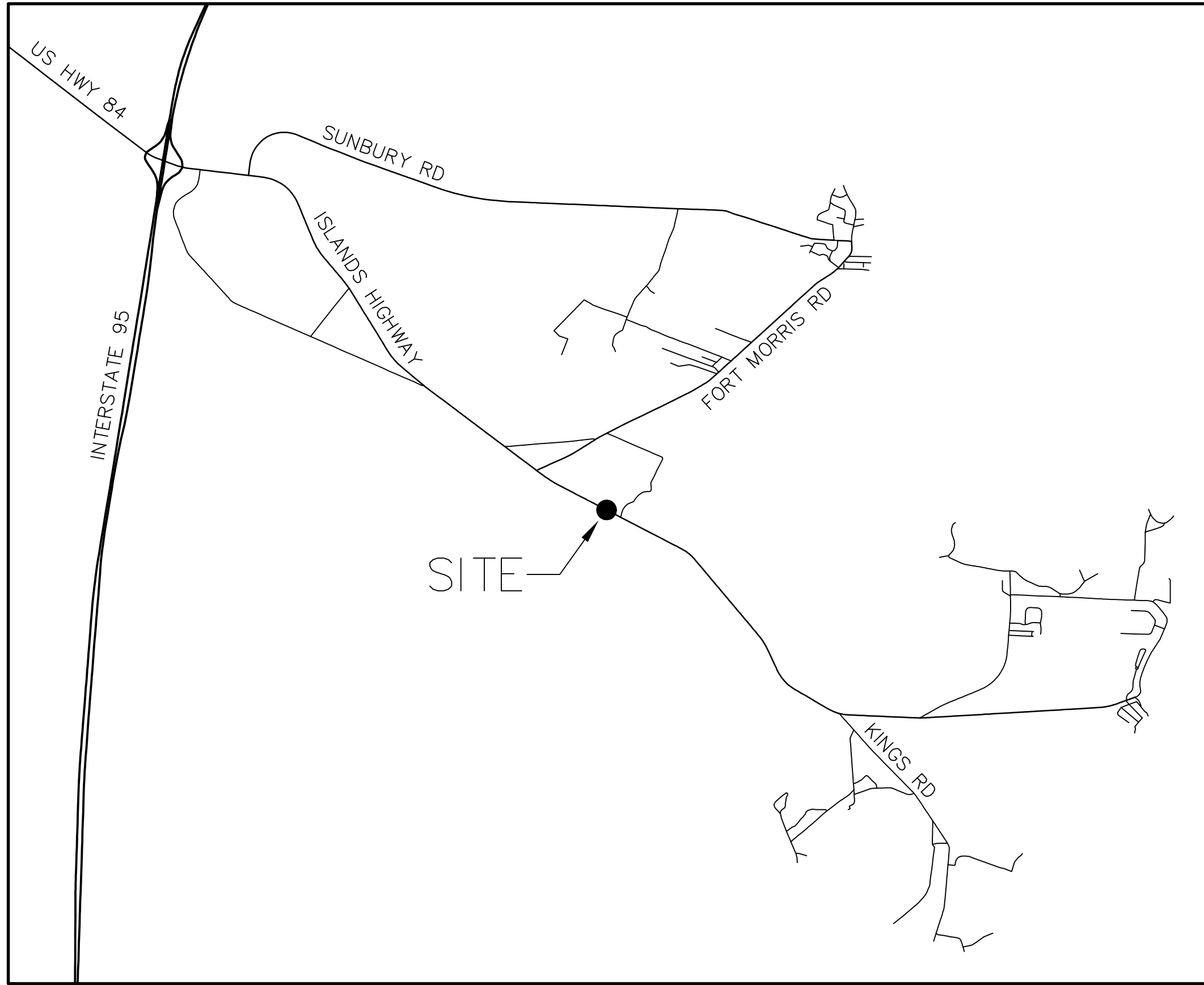
ISLANDS HWY BOX CULVERT REPLACEMENT FOR LIBERTY COUNTY BOARD OF COMMISSIONERS

OWNER
**LIBERTY COUNTY BOARD OF
COMMISSIONERS**
112 N. MAIN STREET, SUITE 201
HINESVILLE, GEORGIA
(912) 368-5664

24-HOUR CONTACT
TRENT LONG
(912) 368-5664
TRLONG@TRLONGENG.COM

CIVIL ENGINEERING PLANS	
SHEET C1.1	COVER SHEET
SHEET C2.1	EXISTING CONDITIONS
SHEET C3.1	BOX CULVERT REPLACEMENT PLAN
SHEET C3.2	BOX CULVERT PLAN & PROFILE
SHEET C3.3	NORTH END MODIFIED HEADWALL DETAIL
SHEET C3.4	TRAFFIC CONTROL PLAN, PHASE 1
SHEET C3.5	TRAFFIC CONTROL PLAN, PHASE 2
SHEET C3.6	OVERLAY PLAN
SHEET C3.7	OVERLAY PLAN
SHEET C3.8	PAVEMENT DETAILS
SHEET C3.9	PROJECT LAYOUT SHEET
SHEET C6.1	EROSION CONTROL PLAN (INITIAL)
SHEET C6.2	EROSION CONTROL PLAN (INTERMEDIATE)
SHEET C6.3	EROSION CONTROL PLAN (FINAL)
SHEET C6.4	EROSION CONTROL NOTES
SHEET C6.5	EROSION CONTROL NOTES
SHEET C6.6	EROSION CONTROL DETAILS
SHEET C6.7	EROSION CONTROL DETAILS

GEORGIA DOT STANDARD DETAILS	
D.O.T. STD 2402, PAGE 1	
D.O.T. STD 2402, PAGE 2	
D.O.T. STD 2402, PAGE 3	
D.O.T. STD 2404	
D.O.T. STD 2406-1	
D.O.T. STD 2406-2	
D.O.T. STD 2530	
D.O.T. STD 2535	



VICINITY MAP N.T.S.

LOCATION: N31° 44' 07.69", W81° 18' 58.12"
(31.735741, -81.316146)

DRAWING LEGEND		
DESCRIPTION	PROPOSED	EXISTING
RIGHT OF WAY	--- R/W	--- R/W
EDGE OF PAVEMENT	---	---
DITCH CENTERLINE	---	---
SANITARY SEWER	8"S	---
WATER LINE	10"W	--- 10"W
FORCE MAIN	FM	--- FM
UNDERGROUND GAS LINE	8"G	--- 8"G
CONTOURS	81	--- 81
STORM DRAINAGE PIPE	---	==
ELEVATION	FG: 78.15	X 81.90
SILT FENCE NON-SENSITIVE	Sd1-NS	
SILT FENCE SENSITIVE	Sd1-S	
INLET PROTECTION	Sd2-P	
CHECK DAM- HAY BALE	Cd-Hb	
CHECK DAM - RIP RAP	Cd-Rp	
CONSTRUCTION EXIT	Co	
STORM OUTLET PROTECTION	St	
SILT FENCE	---	
MULCHING	Da1	
TEMPORARY GRASSING	Da2	
PERMANENT GRASSING	Da3	
FIRE HYDRANT	---	---
SEWER MANHOLE	---	---
WATER VALVE	---	---
DRAINAGE FLOW	---	---
WATER METER	---	---
BENCHMARK	---	---
WELL	---	---
GUY POLE	---	---
IRON PIN	SET O I.P.S	FOUND O I.P.F
TELEPHONE PEDESTAL	---	---
POWER POLE	---	---

THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

CSWCC# 000002134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

TRLONG
ENGINEERING, P.C.

www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

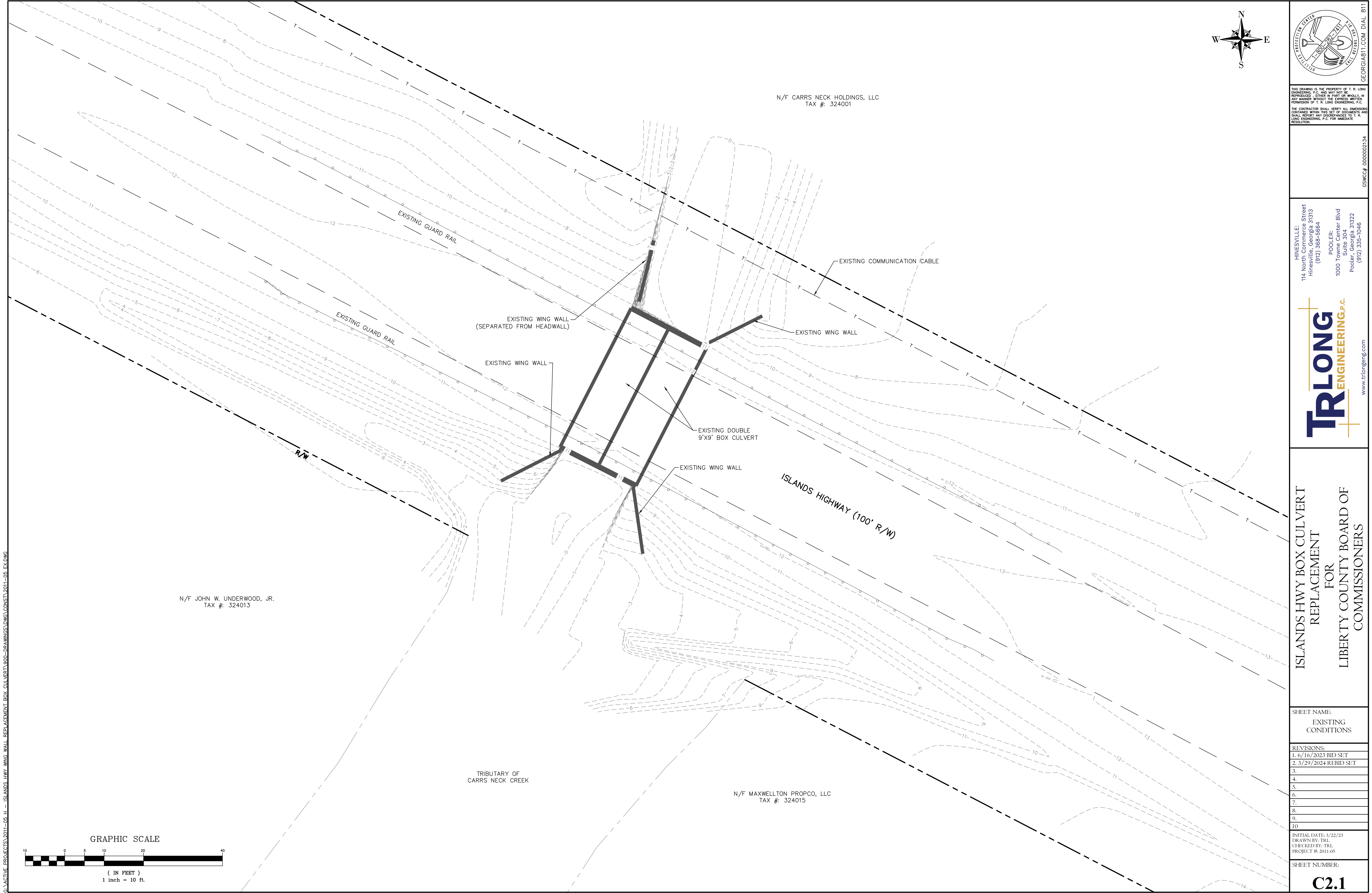
SHEET NAME:
TITLE SHEET

REVISIONS:

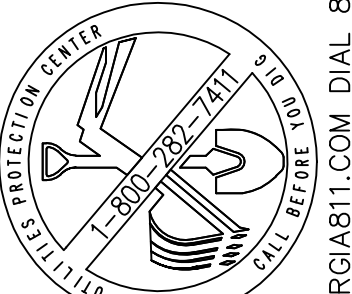
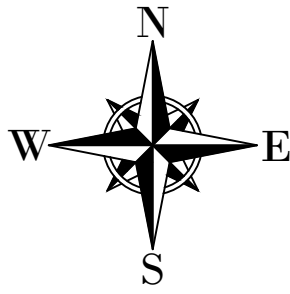
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C1.1



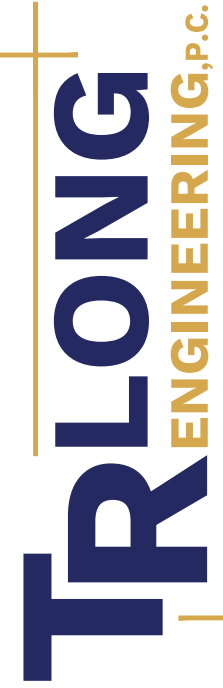
G:\ACTIVE PROJECTS\2011-05-H- ISLANDS HWY. WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05-EX.DWG



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GSWCC# 00000202134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 535-1046



www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

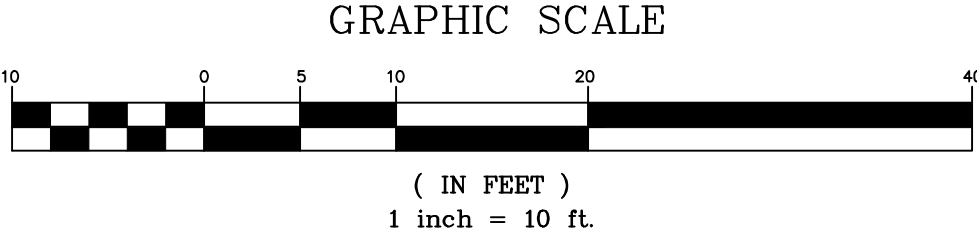
SHEET NAME:
EXISTING
CONDITIONS

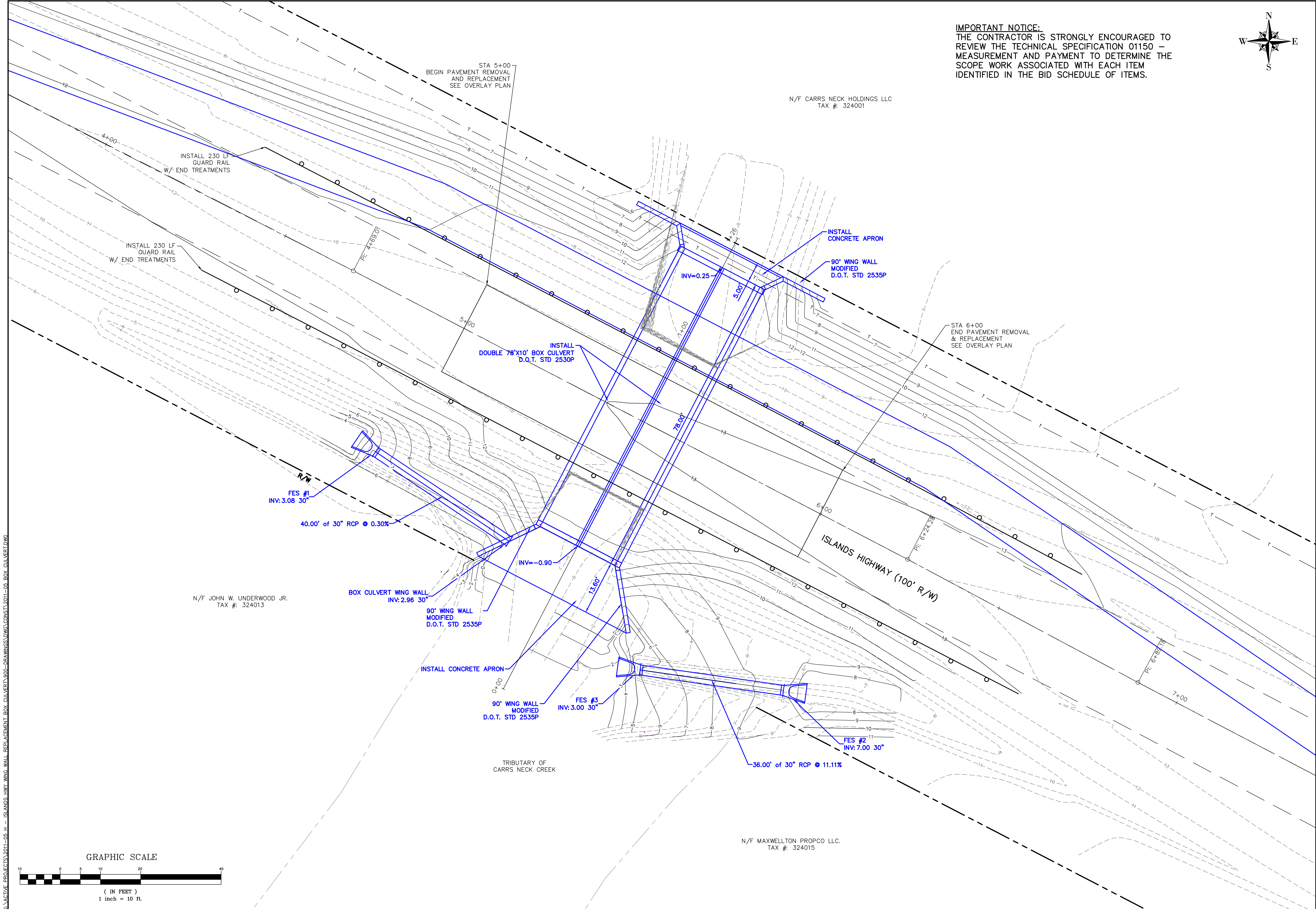
REVISIONS:	
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

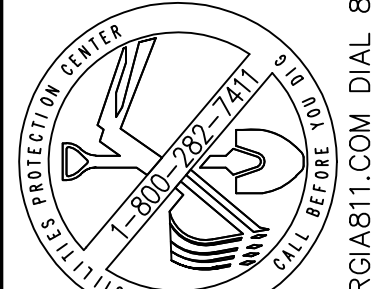
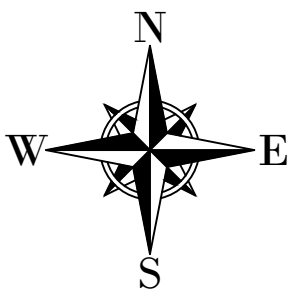
SHEET NUMBER:

C2.1





IMPORTANT NOTICE:
THE CONTRACTOR IS STRONGLY ENCOURAGED TO REVIEW THE TECHNICAL SPECIFICATION 01150 - MEASUREMENT AND PAYMENT TO DETERMINE THE SCOPE WORK ASSOCIATED WITH EACH ITEM IDENTIFIED IN THE BID SCHEDULE OF ITEMS.



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046



ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

SHEET NAME:
BOX CULVERT
REPLACEMENT PLAN

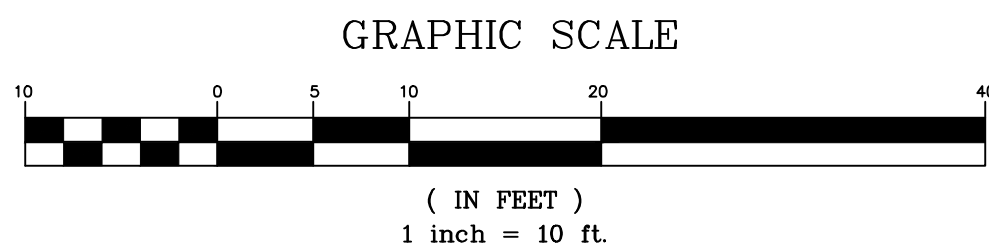
REVISIONS:	
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

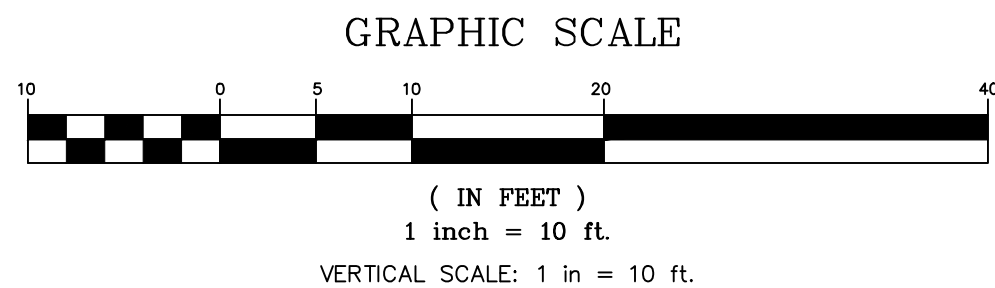
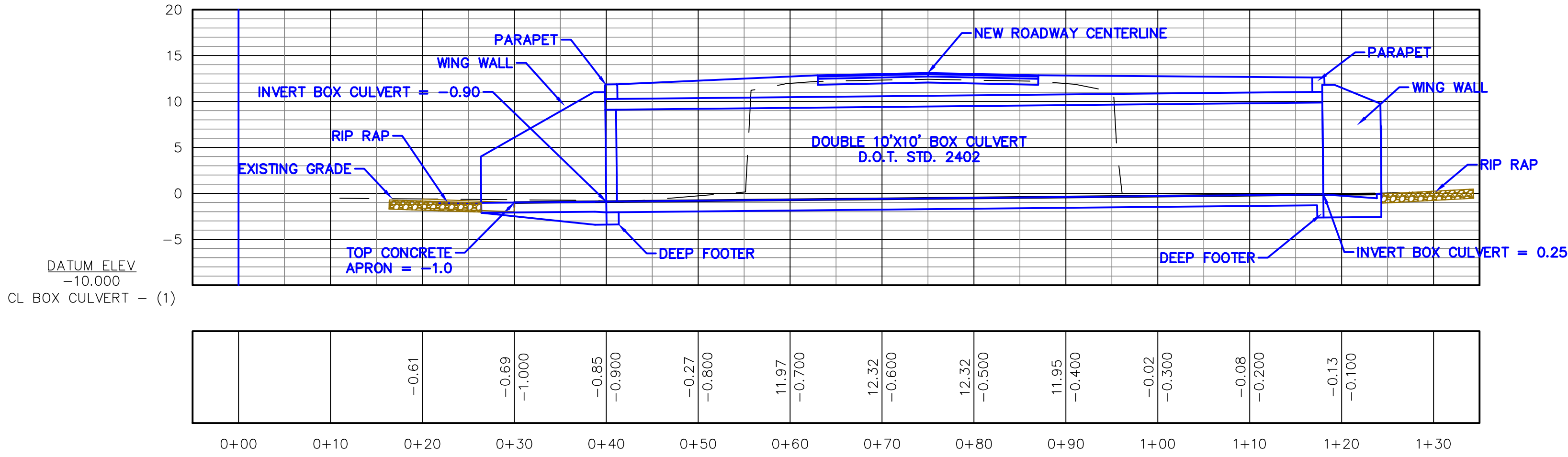
SHEET NUMBER:

C3.1

G:\ACTIVE PROJECTS\2011-05-H- ISLANDS HWY BOX CULVERT REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05-BOX CULVERT.DWG



G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_BOX_CULVERT.DWG



ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

SHEET NAME:
BOX CULVERT PLAN
& PROFILE

REVISIONS:
1. 6/16/2023 BID SET
2. 3/29/2024 REBID SET
3.
4.
5.
6.
7.
8.
9.
10

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

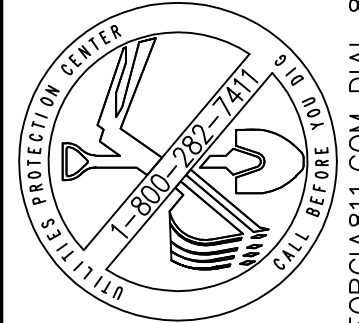
SHEET NUMBER:

C3.2



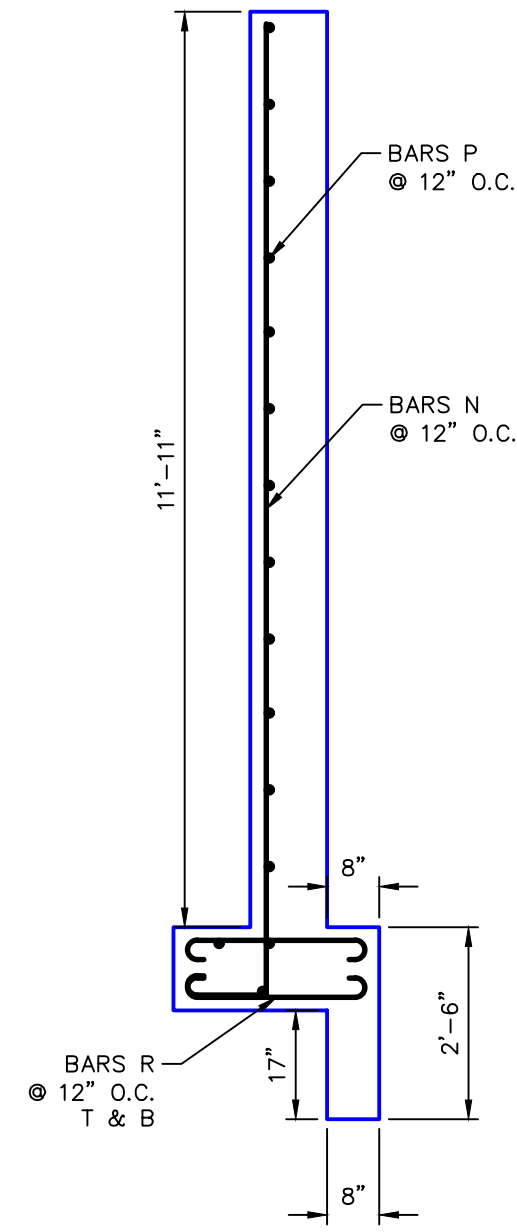
HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

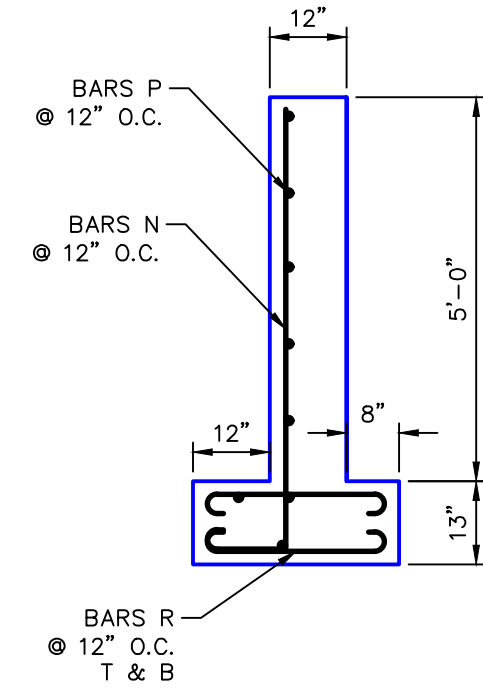


CSWCC# 00000202134

GEORGIA811.COM DIAL 811

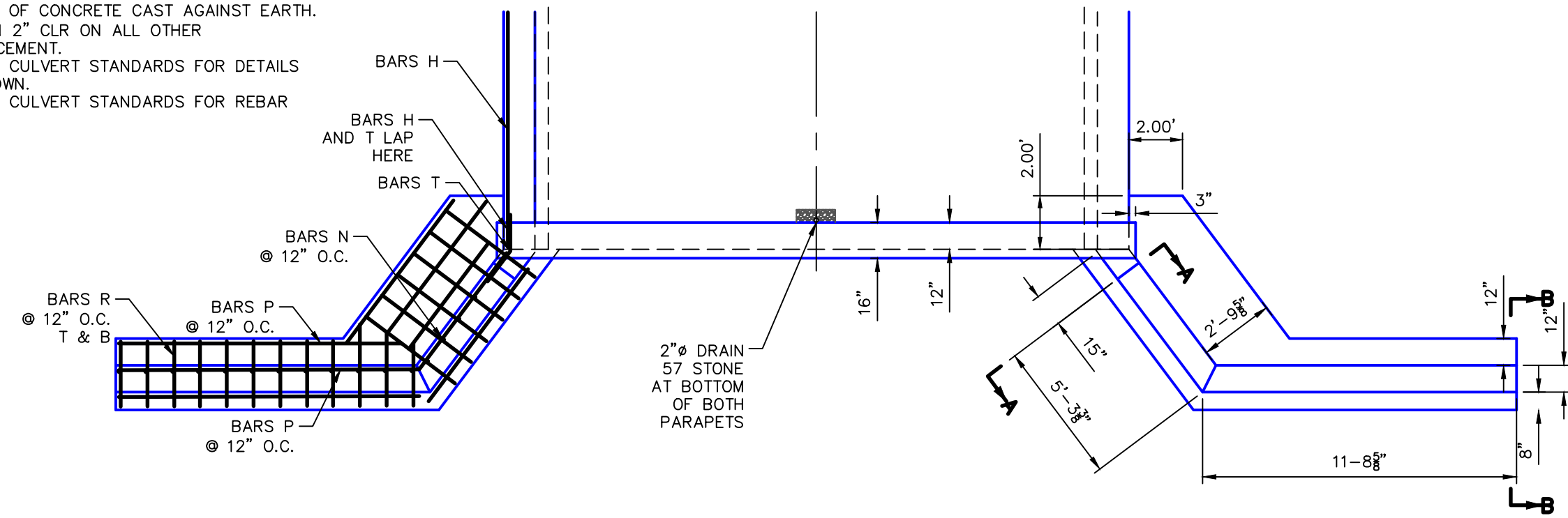


SECTION A-A

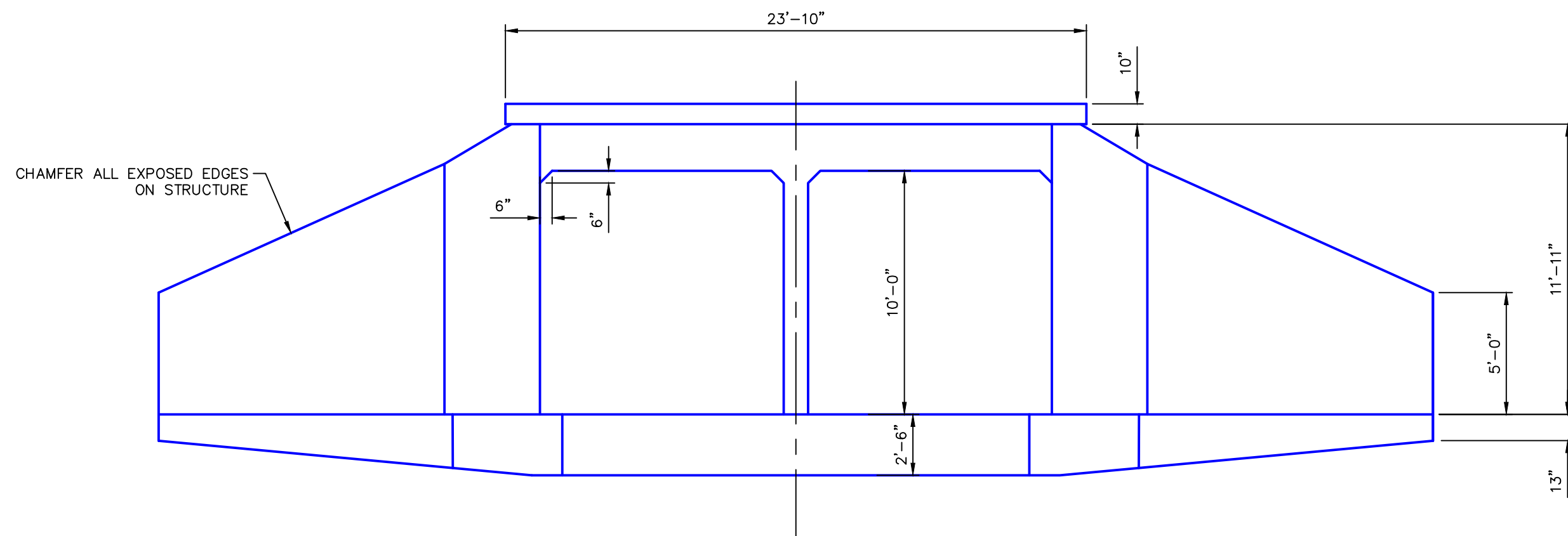


SECTION B-B

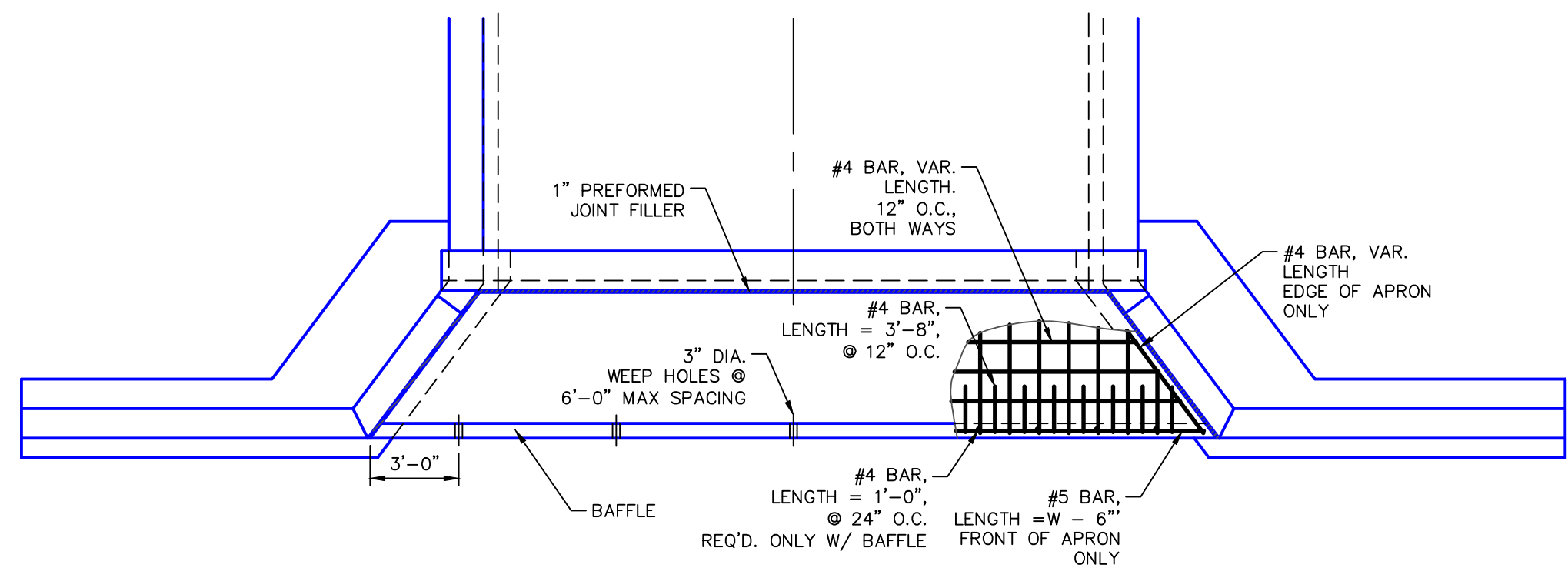
- NOTES:
1. MAINTAIN 3" CLEARANCE ON REINFORCEMENT AT FACE OF CONCRETE CAST AGAINST EARTH. MAINTAIN 2" CLR ON ALL OTHER REINFORCEMENT.
 2. SEE BOX CULVERT STANDARDS FOR DETAILS NOT SHOWN.
 3. SEE BOX CULVERT STANDARDS FOR REBAR DETAILS.



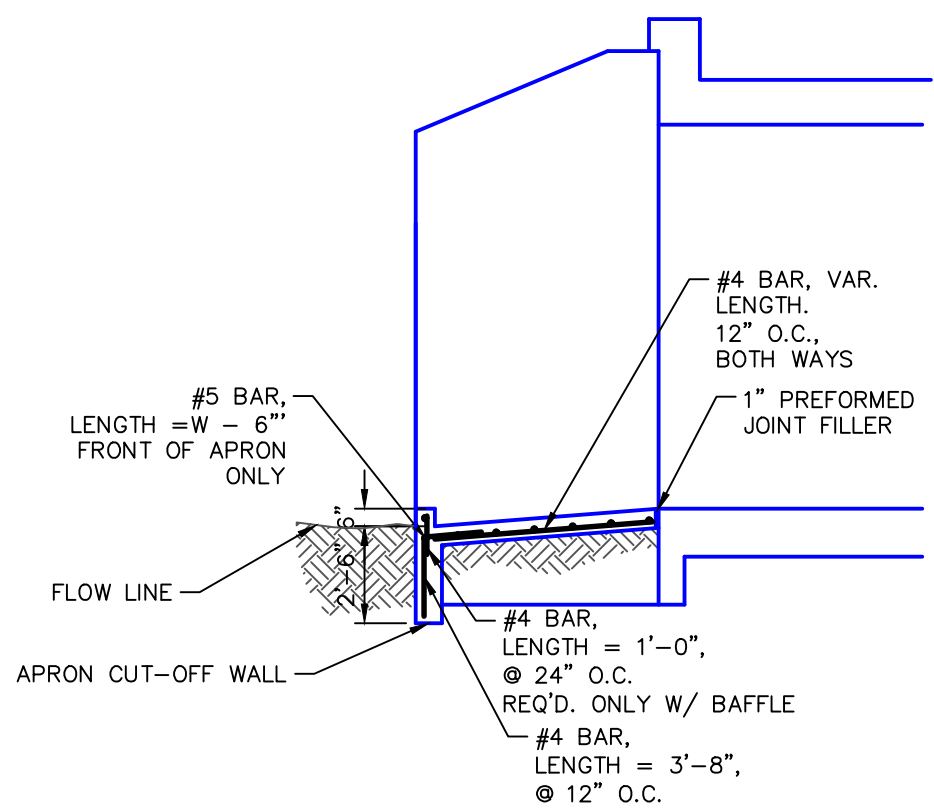
PLAN VIEW (WING WALL)



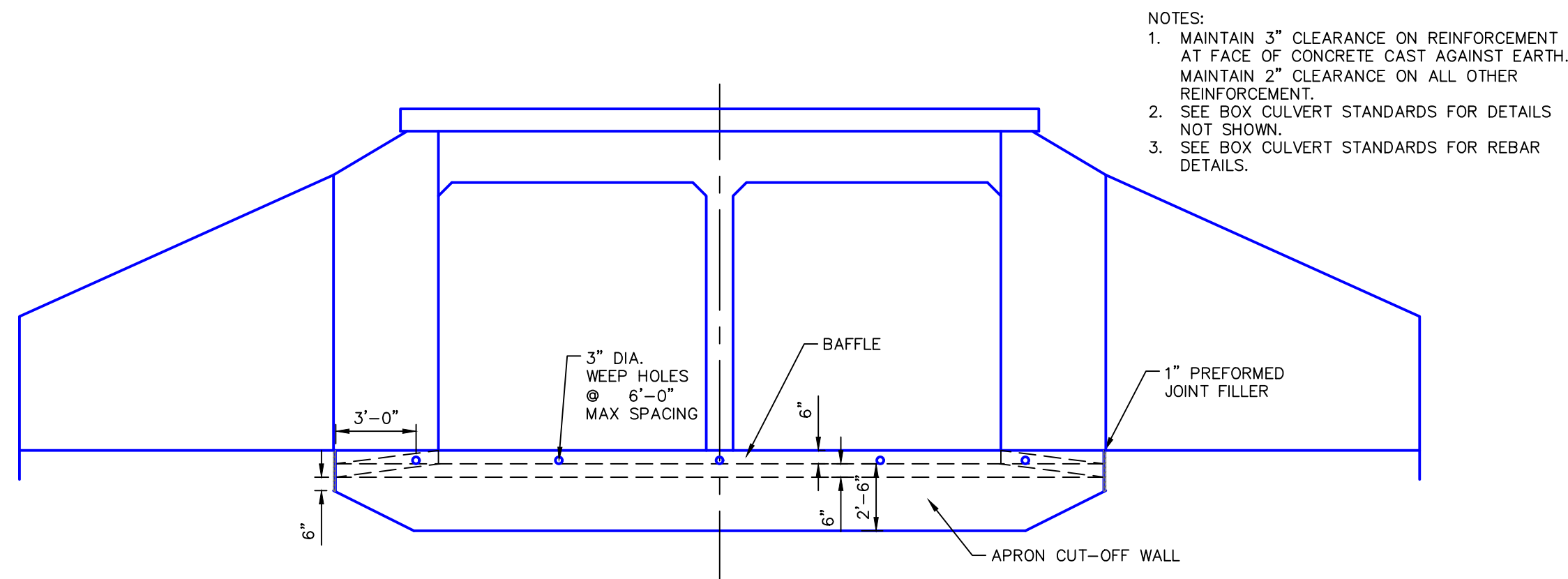
FRONT ELEVATION (WING WALL)



PLAN VIEW OF APRON

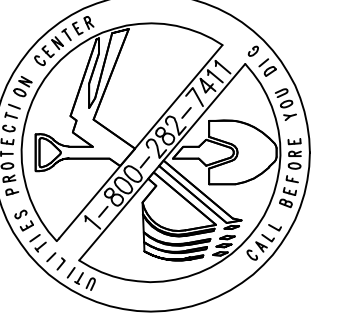
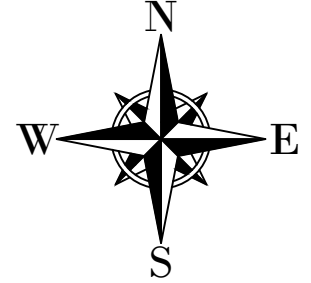
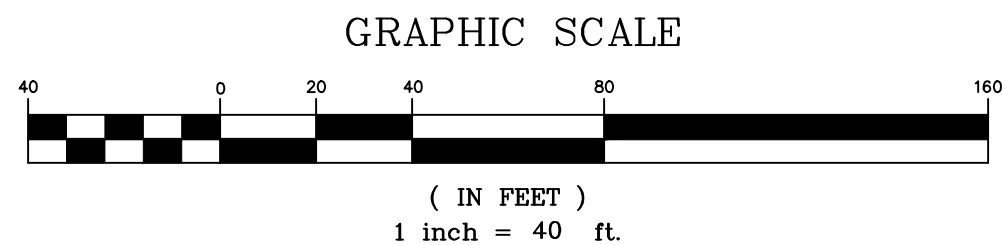


SECTION VIEW OF APRON



FRONT VIEW OF APRON

- NOTES:
1. MAINTAIN 3" CLEARANCE ON REINFORCEMENT AT FACE OF CONCRETE CAST AGAINST EARTH. MAINTAIN 2" CLEARANCE ON ALL OTHER REINFORCEMENT.
 2. SEE BOX CULVERT STANDARDS FOR DETAILS NOT SHOWN.
 3. SEE BOX CULVERT STANDARDS FOR REBAR DETAILS.



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

CSWCC# 000002134

T. R. Long Engineering, P.C.
SAVANNAH
306 Commercial Drive
Savannah, Georgia 31406
Office (912) 335-1046
www.trlongeng.com

HINESVILLE
114 North Commerce St.
Hinesville, Georgia 31313
Office (912) 368-5664

**PROPOSED IMPROVEMENTS FOR
ISLANDS HIGHWAY HEADWALL
LIBERTY COUNTY, GEORGIA**

SHEET NAME:
NORTH END
MODIFIED
HEADWALL DETAIL

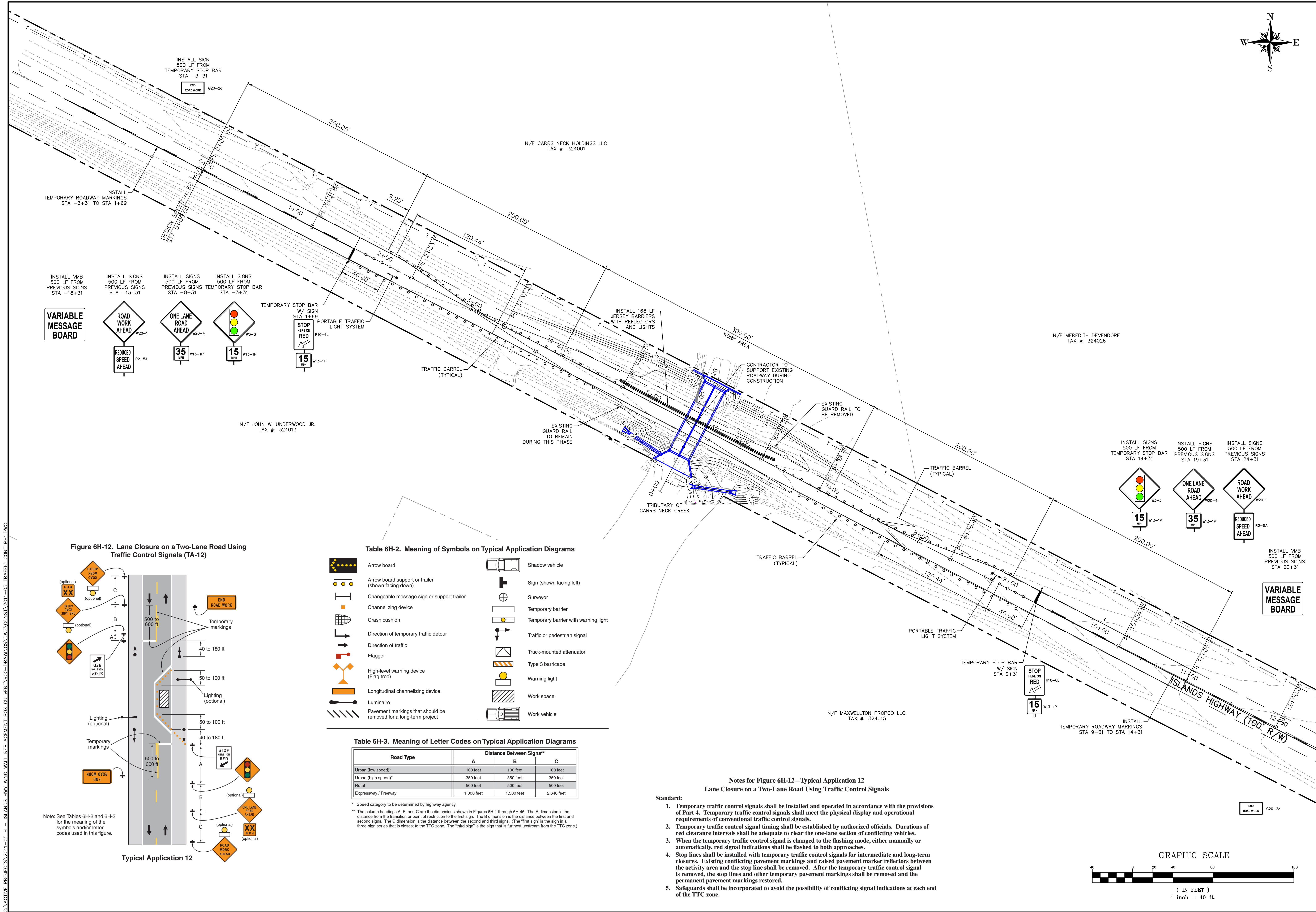
REVISIONS:
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

INITIAL DATE: JANUARY 2011
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT # 2011-05

SHEET NUMBER:

C3.3

G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY. WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_TRAFFIC_CTRL_P41.DWG



PROTECTION CENTER
SPECIALTY
SPECIALTY

THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GEORGIA811.COM DIAL 811

CSWC# 000002134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

www.trlongeng.com

ISLANDS HWY BOX CULVERT REPLACEMENT FOR LIBERTY COUNTY BOARD OF COMMISSIONERS

SHEET NAME:
TRAFFIC CONTROL PLAN, PHASE I

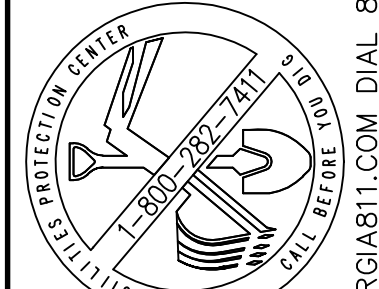
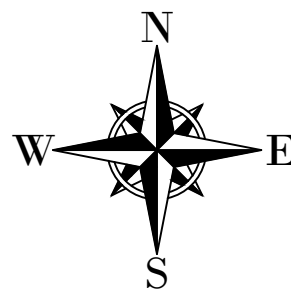
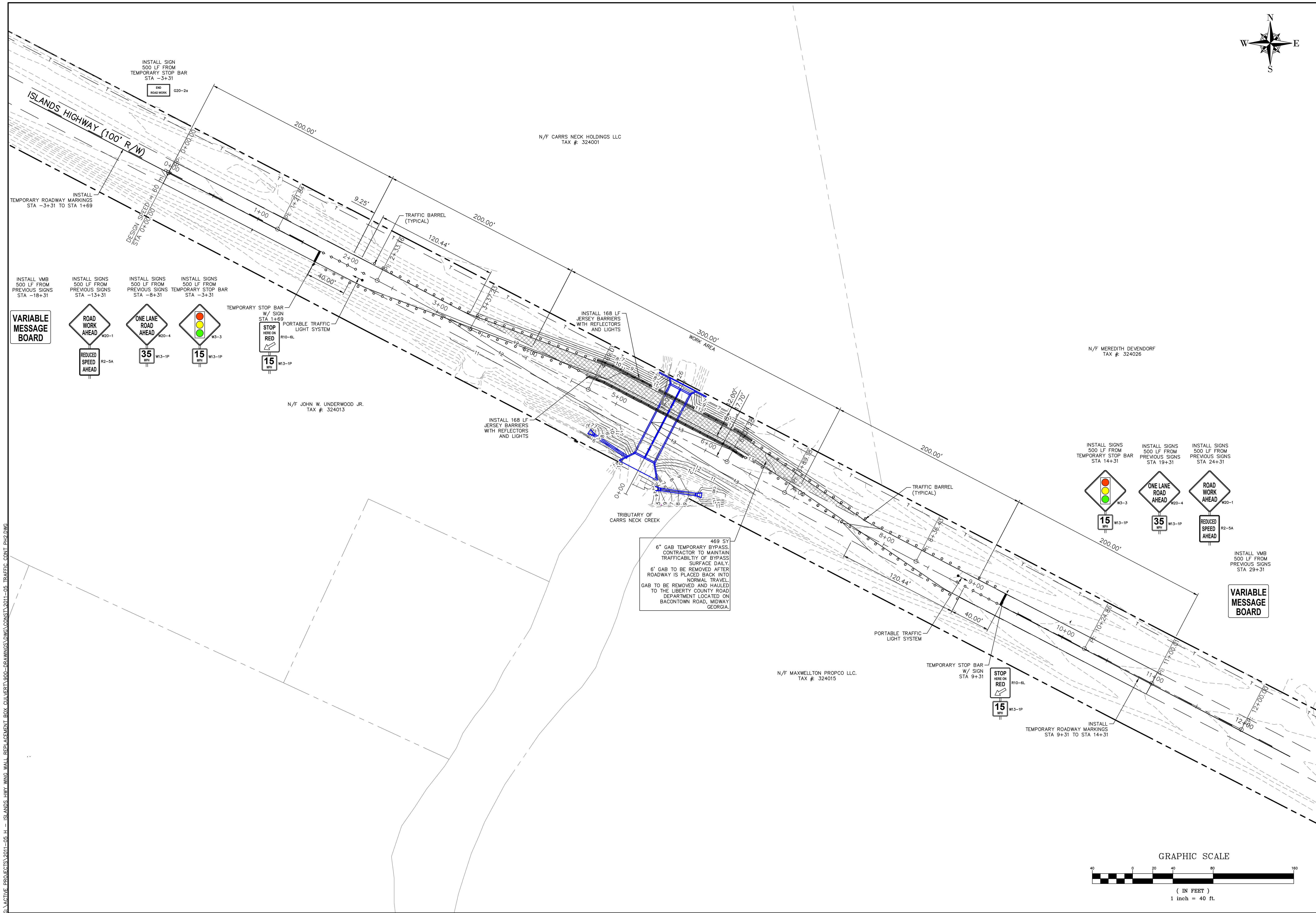
REVISIONS:

1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C3.4

G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY. WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_TRAFFIC_CTRL_PH2.DWG



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(812) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(812) 335-1046



ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

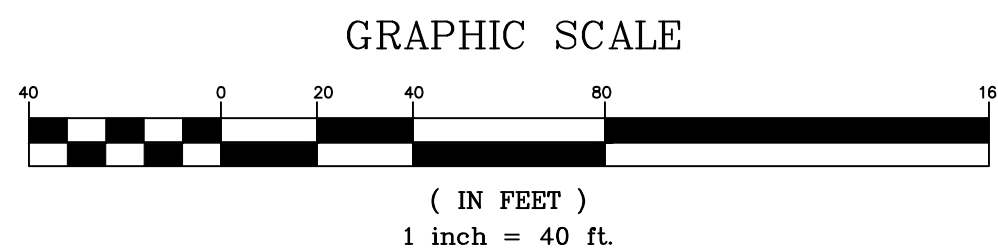
SHEET NAME:
TRAFFIC CONTROL
PLAN, PHASE 2

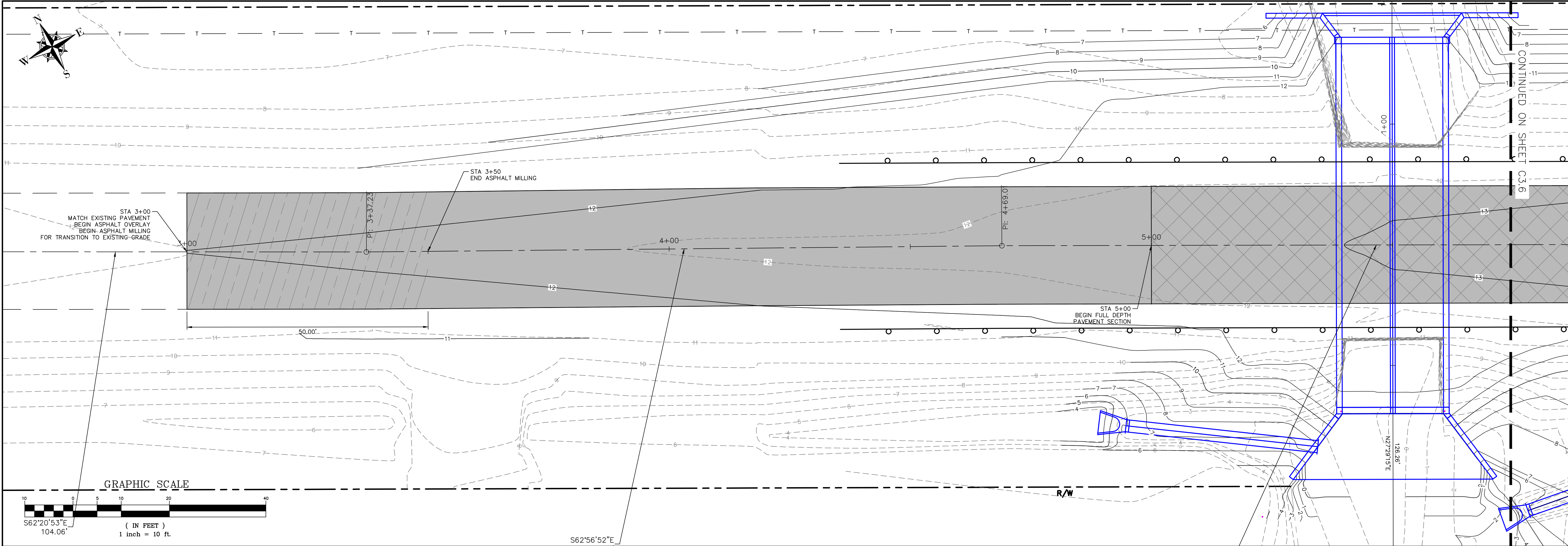
REVISIONS:
1. 6/16/2023 BID SET
2. 3/29/2024 REMID SET
3.
4.
5.
6.
7.
8.
9.
10.

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:

C3.5





PROFESSIONAL SEAL
T. R. LONG
ENGINEERING, P.C.
LIBERTY COUNTY, GEORGIA
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

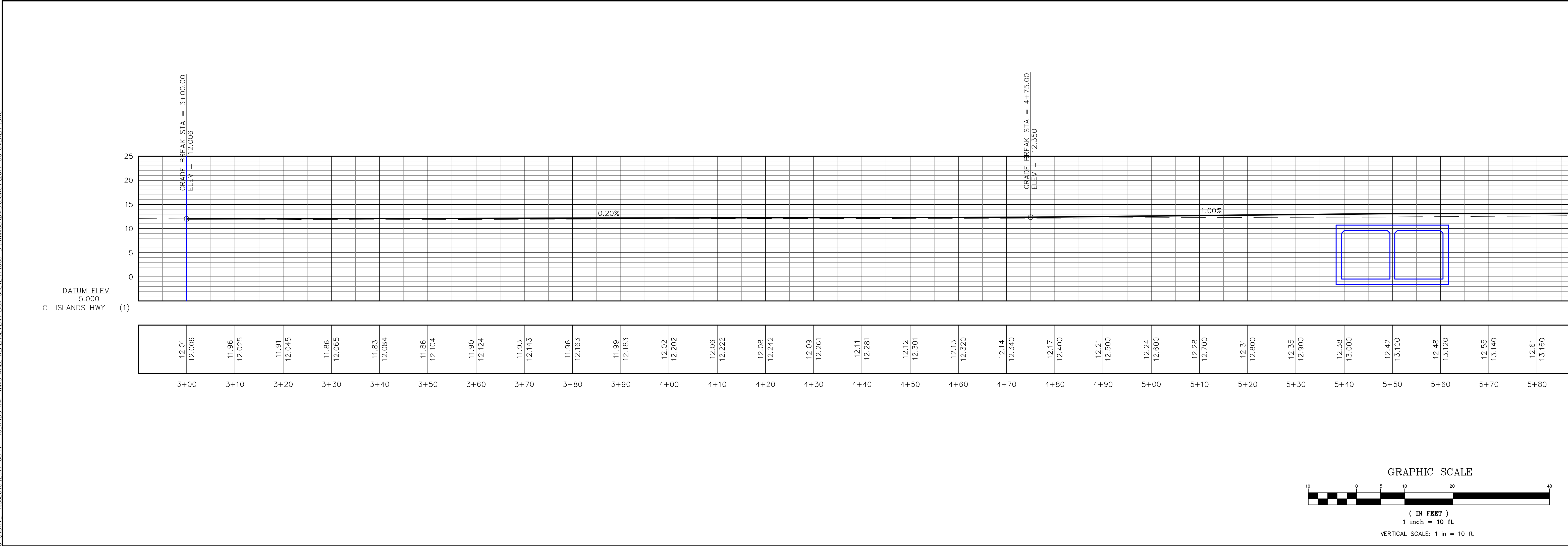
THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GSWC# 0000020234

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

TR LONG
ENGINEERING, P.C.
www.trlongeng.com



ISLANDS HWY BOX CULVERT REPLACEMENT FOR LIBERTY COUNTY BOARD OF COMMISSIONERS

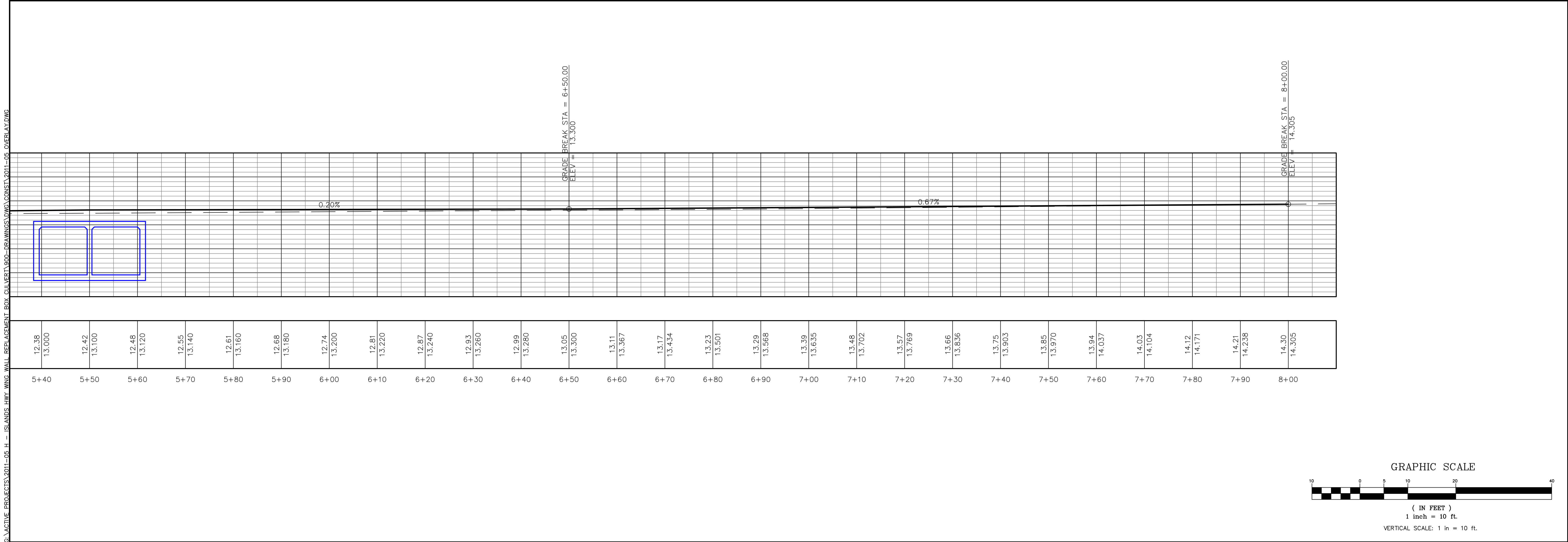
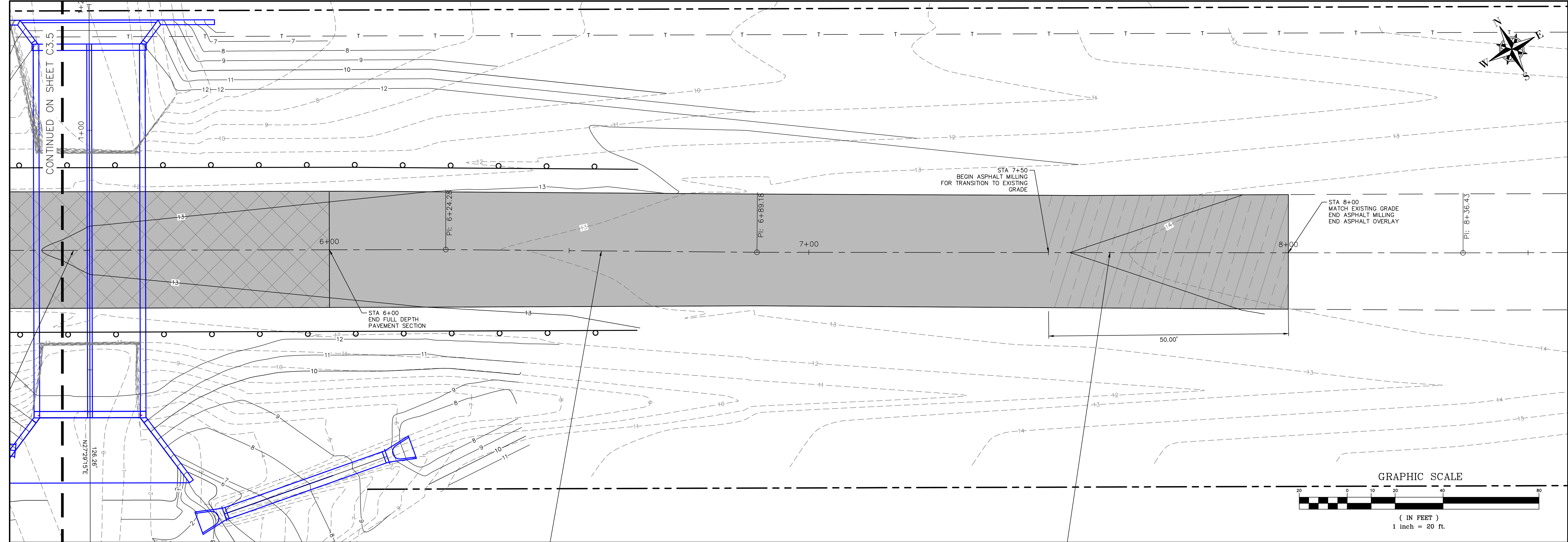
SHEET NAME:
OVERLAY PLAN

REVISIONS:

NO.	DATE	DESCRIPTION
1.	6/16/2023	RID SET
2.	3/29/2024	REBID SET
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C3.6



G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY. WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_OVERLAY.DWG

THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GEORGIA811.COM DIAL 811

GSWC# 0000020234

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

www.trlongeng.com

ISLANDS HWY BOX CULVERT REPLACEMENT FOR LIBERTY COUNTY BOARD OF COMMISSIONERS

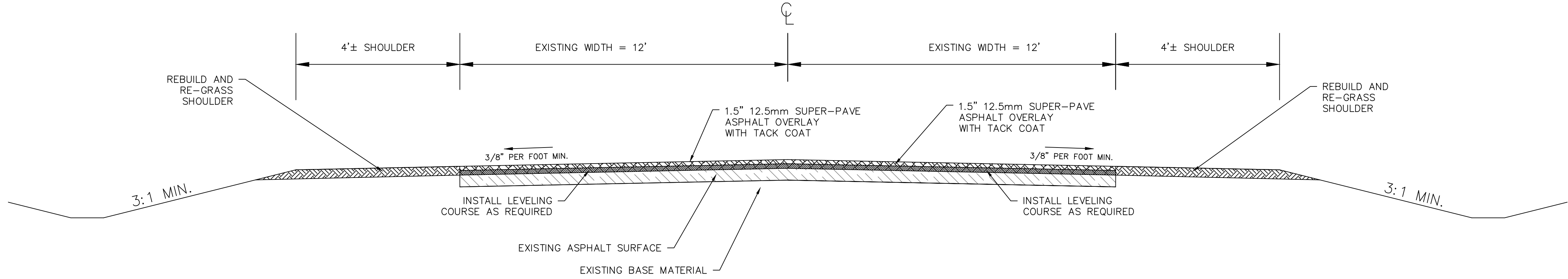
SHEET NAME:
OVERLAY PLAN

REVISIONS:

1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

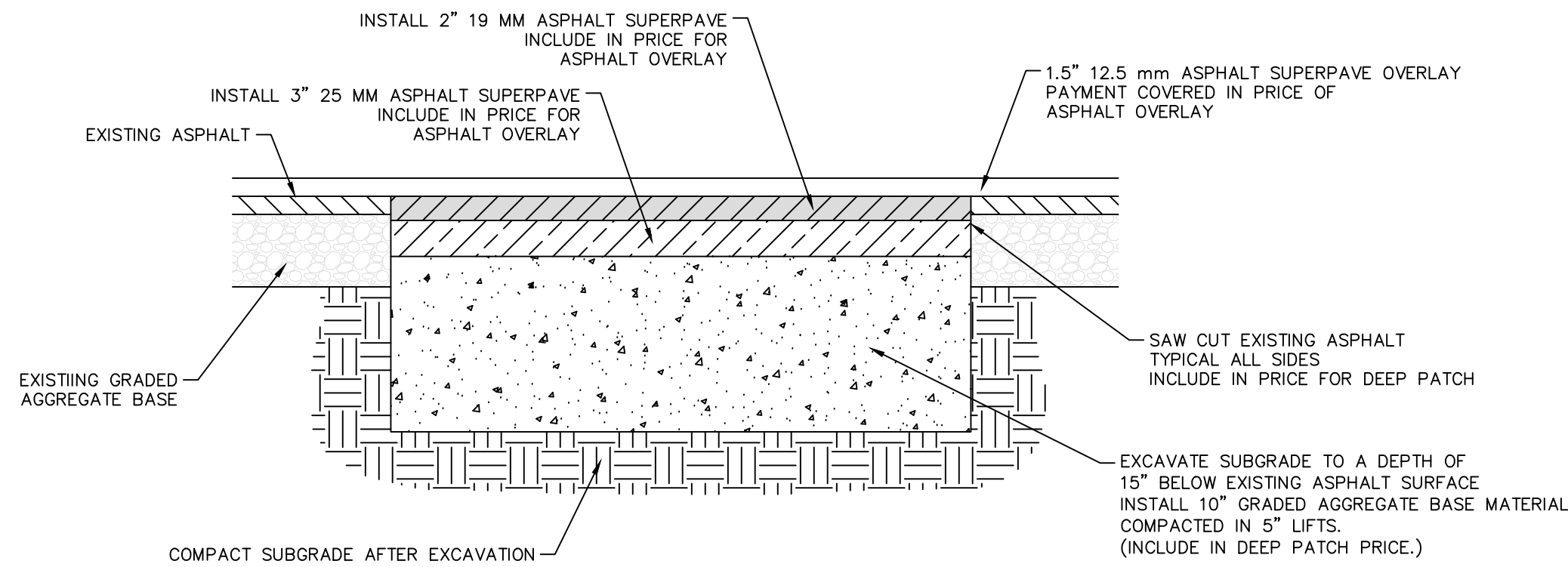
INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C3.7



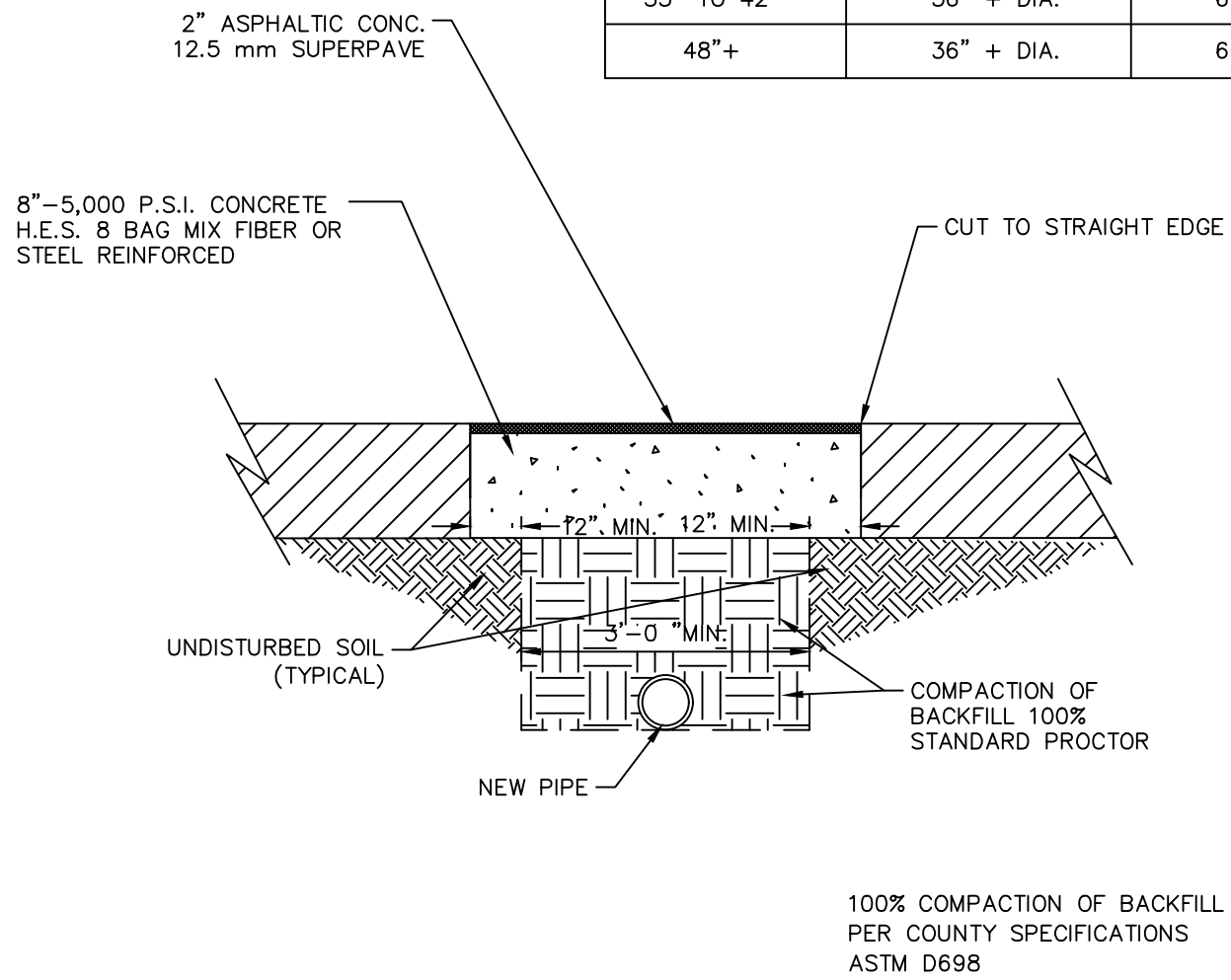
- NOTES:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLACEMENT, MAINTENANCE AND INSPECTION OF ALL TRAFFIC CONTROL DEVICES.
 2. ALL STRIPING TO BE REPLACED WITH HIGH BUILD PAINT MEETING GEORGIA D.O.T. STANDARD SPECIFICATIONS.
 3. ALL WORK SHALL COMPLY WITH THE GEORGIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES, MOST CURRENT EDITION.
 4. 5" WHITE STRIPING SHALL BE 4" FROM EDGE OF NEW PAVEMENT.

TYPICAL ROAD CROSS-SECTION
N.T.S.



DEEP PATCH DETAIL
N.T.S.

PIPE DIAMETER	MAXIMUM TRENCH WIDTH	MAXIMUM PAYMENT WIDTH
6" TO 15"	16" + DIA.	40" + DIA.
18" TO 21"	20" + DIA.	44" + DIA.
24" TO 30"	24" + DIA.	48" + DIA.
33" TO 42"	36" + DIA.	60" + DIA.
48"+	36" + DIA.	60" + DIA.



- NOTES:
1. COMPACT BASE AND SUB-BASE TO 100% STANDARD PROCTOR.
 2. CONCRETE IN THE RIGHT OF WAY TO BE 5000 PSI AND REINFORCED WITH FIBERMESH OR STEEL.
 3. ALL LATERAL STREET CUTS MUST BE COVERED WITH STEEL PLATES OF SUFFICIENT THICKNESS TO SPAN THE CUT WITHOUT NOTICABLE DEFLECTION. PLATES TO REMAIN IN PLACE UNTIL THE CONCRETE BASE HAS GAINED SUFFICIENT STRENGTH TO WITHSTAND TRAFFIC LOADS (24 HOUR MINIMUM).
 4. ALL LONGITUDINAL CUTS EXCEEDING 150' IN LENGTH WILL REQUIRE AN ASPHALT OVERLAY OF THE ENTIRE ROADWAY WIDTH. CONCRETE IN THE TRENCH WILL BE BROUGHT FLUSH WITH THE EXISTING PAVEMENT. PAVING WILL BE SAW CUT TO A STRAIGHT EDGE AND THE ENTIRE WIDTH OF THE ROADWAY WILL BE RESURFACED WITH A MINIMUM OF 1.5" OF 9.5mm ASPHALT SUPERPAVE.
 5. ALL STREET PATCHES MUST BE SQUARE OR RECTANGULAR WITH STRAIGHT, SAW CUT EDGES.

BITUMINOUS PAVEMENT REPLACEMENT
N.T.S.

THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GSWCC# 0000002134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

TR LONG
ENGINEERING, P.C.

www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

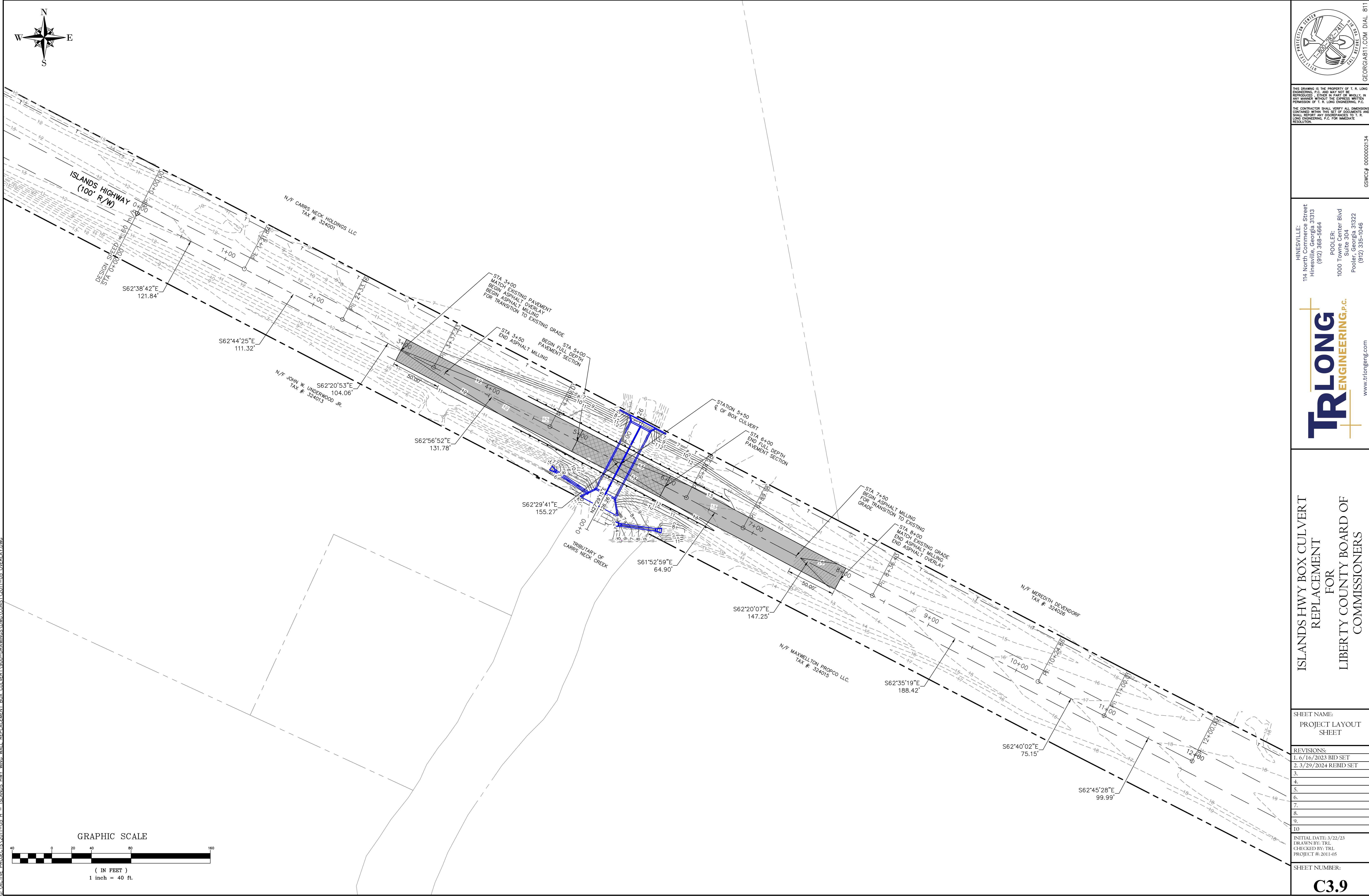
SHEET NAME:
PAVEMENT DETAILS

REVISIONS:

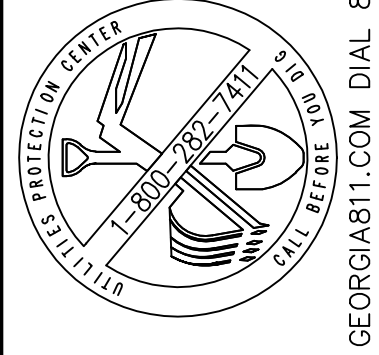
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C3.8



G:\ACTIVE PROJECTS\2011-05-H - ISLANDS HWY. WING WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05-OVERLAY.DWG



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

CSWCC# 00000202134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(812) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(812) 335-1046



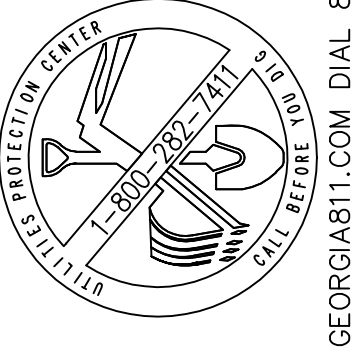
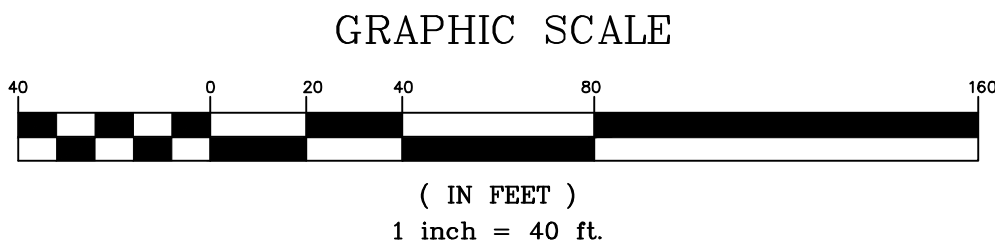
ISLANDS HWY BOX CULVERT
REPLACEMENT
FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

SHEET NAME:
PROJECT LAYOUT
SHEET

REVISIONS:	
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C3.9



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GSWCC# 0000002134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046



www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

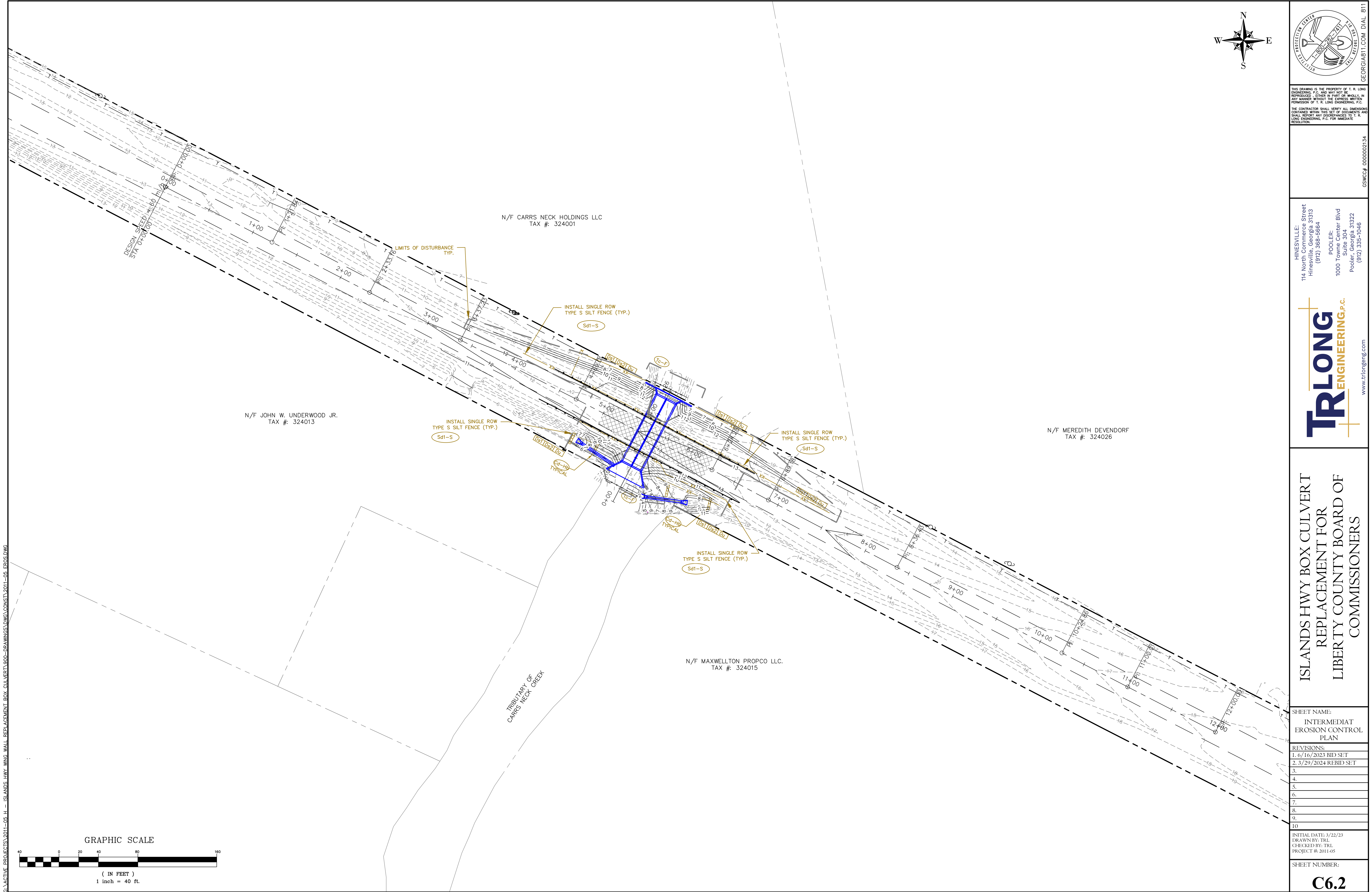
SHEET NAME:
INITIAL EROSION
CONTROL PLAN

REVISIONS:
1. 6/16/2023 BID SET
2. 3/29/2024 REBID SET
3.
4.
5.
6.
7.
8.
9.
10.

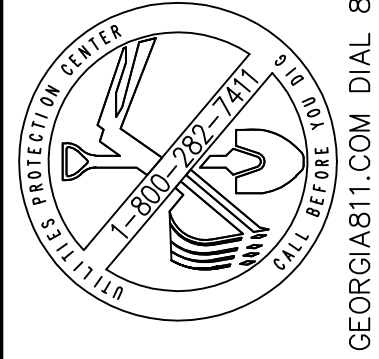
INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:

C6.1



G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY WALL REPLACEMENT BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_EROS.DWG



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

GSWCC# 0000002134

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046



ISLANDS HWY BOX CULVERT
REPLACEMENT FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

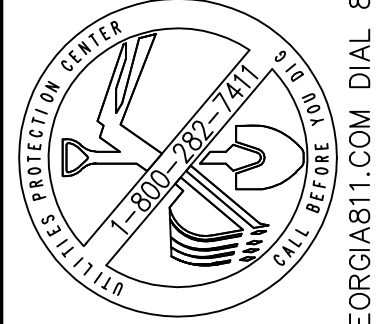
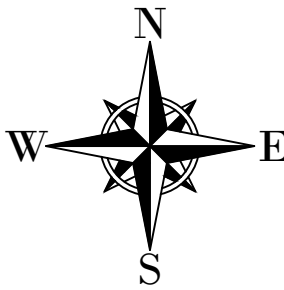
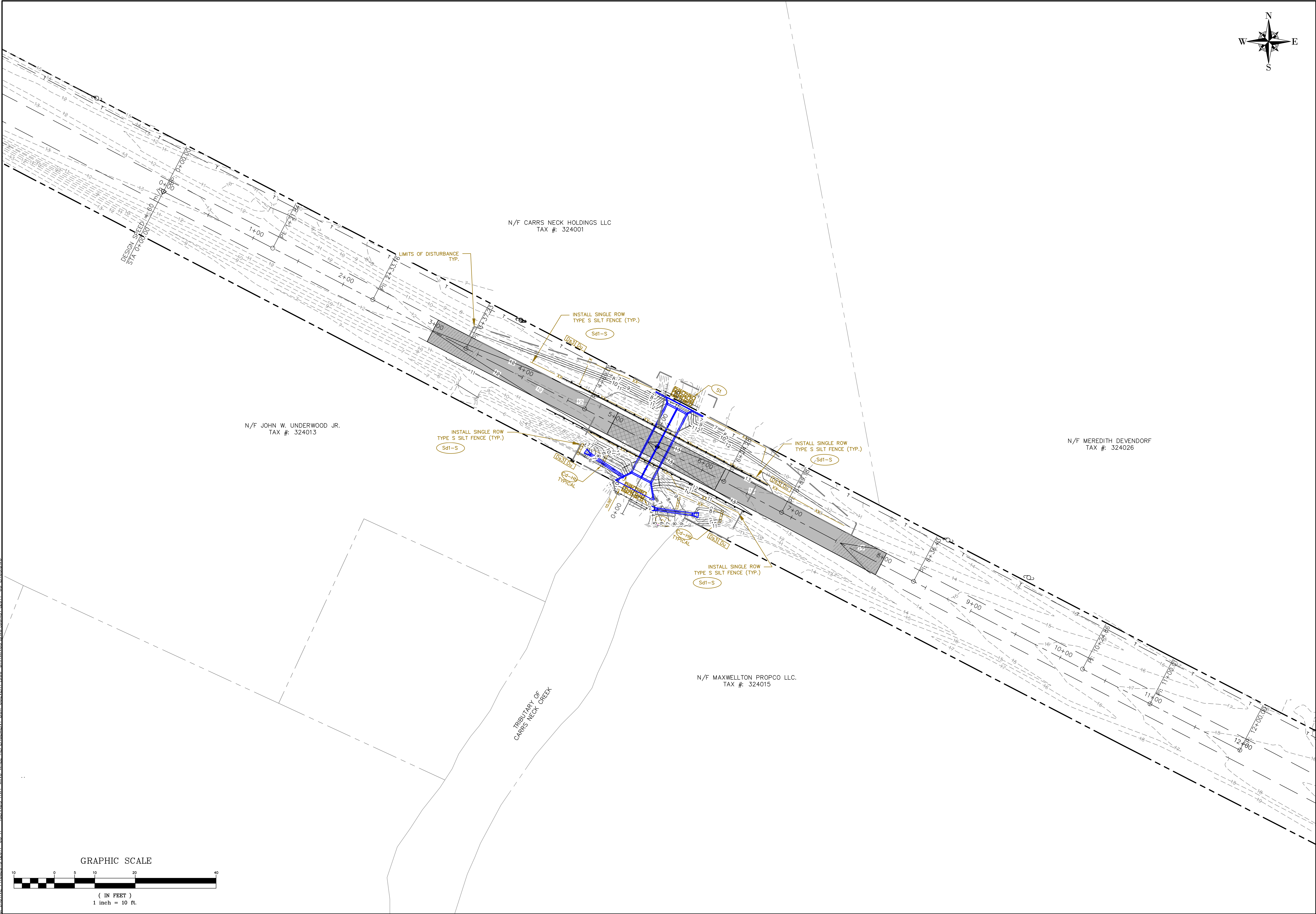
SHEET NAME:
INTERMEDIAT
EROSION CONTROL
PLAN

REVISIONS:	
1.	6/16/2023 BID SET
2.	3/29/2024 REBID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:

C6.2



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664
POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046



ISLANDS HWY BOX CULVERT
REPLACEMENT FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS

SHEET NAME:
FINAL EROSION
CONTROL PLAN

REVISIONS:	
1.	6/16/2023 BID SET
2.	3/29/2024 REMID SET
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:
C6.3

G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05_EROS.DWG

G:\ACTIVE PROJECTS\2011-05_H - ISLANDS HWY WING WALL REPLACEMENT BOX CULVERT\900-Drawings\DWG\CONSTR\2011-05_EROS-DWG

PROJECT INFORMATION

PROJECT TITLE: ISLANDS HWY BOX CULVERT REPLACEMENT

OWNER: LIBERTY COUNTY BOARD OF COMMISSIONERS
112 N. MAIN STREET, SUITE 201
HINESVILLE, GEORGIA
(912) 368-5664

24 HOUR CONTACT: TRENT LONG
(912) 368-5664
TRLONG@TRLONGENG.COM

ENGINEER: T.R. LONG ENGINEERING, P.C.
114 NORTH COMMERCE ST.
HINESVILLE, GEORGIA 31313
(912) 368-5664

GOVERNING AUTHORITY: LIBERTY COUNTY
112 N. MAIN STREET
HINESVILLE, GA 31313
(912) 876-8454

EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN CHECKLIST
INFRASTRUCTURE CONSTRUCTION PROJECTS

SWCD: COASTAL GEORGIA
PROJECT NAME: ISLANDS HWY BOX CULVERT REPLACEMENT ADDRESS: HWY 84
CITY/COUNTY: LIBERTY DATE ON PLANS: 3/22/23
NAME & EMAIL OF PERSON FILLING OUT CHECKLIST: TRENT LONG, trlong@trlongeng.com

EROSION, SEDIMENT, & POLLUTION CONTROL PLAN CHECKLIST

1. REQUIREMENT: THE APPLICABLE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN CHECKLIST ESTABLISHED BY THE COMMISSION AS OF JANUARY 1 OF THE YEAR IN WHICH THE LAND-DISTURBING ACTIVITY WAS PERMITTED.

RESPONSE: THE 2024 EROSION, SEDIMENT AND POLLUTION CONTROL PLAN CHECKLIST FOR INFRASTRUCTURE WAS USED FOR THIS PROJECT.

2. REQUIREMENT: LEVEL II CERTIFICATION NUMBER ISSUED BY THE COMMISSION, SIGNATURE AND SEAL OF THE CERTIFIED DESIGN PROFESSIONAL.

RESPONSE: THE LEVEL II CERTIFICATION NUMBER ISSUED BY THE COMMISSION, SIGNATURE AND SEAL OF THE CERTIFIED DESIGN PROFESSIONAL IS FOUND ON THE UPPER RIGHT HAND SIDE OF ALL SHEETS.

3. REQUIREMENT: THE NAME AND PHONE NUMBER OF THE 24-HOUR LOCAL CONTACT RESPONSIBLE FOR EROSION, SEDIMENTATION AND POLLUTION CONTROLS.

RESPONSE: THE NAME AND PHONE NUMBER OF THE 24-HOUR LOCAL CONTACT IS SHOWN IN THE ABOVE "PROJECT INFORMATION" SECTION.

4. REQUIREMENT: PROVIDE THE NAME, ADDRESS, EMAIL ADDRESS AND PHONE NUMBER OF THE PRIMARY PERMITTEE.

RESPONSE: THE NAME, ADDRESS AND PHONE NUMBER OF THE PRIMARY PERMITTEE IS SHOWN ABOVE ON THE "PROJECT INFORMATION" SECTION.

5. REQUIREMENT: NOTE TOTAL AND DISTURBED ACREAGE OF THE PROJECT OR PHASE UNDER CONSTRUCTION.

RESPONSE: THE TOTAL ACREAGE OF THE SITE IS 3.54 AND THE DISTURBED ACREAGE IS 0.58

6. REQUIREMENT: PROVIDE THE GPS LOCATIONS OF THE BEGINNING AND END OF THE INFRASTRUCTURE PROJECT. GIVE THE LATITUDE AND LONGITUDE IN DECIMAL DEGREES.

RESPONSE: THE GPS LOCATIONS OF THE BEGINNING OF THE PROJECT IS N31.735741", W81.316148" AND END OF THE PROJECT IS N31.735471", W81.316146".

7. REQUIREMENT: INITIAL DATE OF THE PLAN AND THE DATES OF ANY REVISIONS MADE TO THE PLAN INCLUDING THE ENTITY WHO REQUESTED THE REVISIONS.

RESPONSE: THE INITIAL DATE AND ANY REVISIONS ARE ON THE BOTTOM RIGHT SIDE OF ALL SHEETS

8. REQUIREMENT: DESCRIPTION OF THE NATURE OF CONSTRUCTION ACTIVITY AND EXISTING SITE CONDITIONS.

RESPONSE: THE PROJECT CONSISTS OF THE REMOVING AND REPLACING A CONCRETE BOX CULVERT UNDERNEATH ISLANDS HWY.

9. REQUIREMENT: PROVIDE VICINITY MAP SHOWING SITE'S RELATION TO SURROUNDING AREAS. INCLUDE DESIGNATION OF SPECIFIC PHASE, IF NECESSARY.

RESPONSE: A VICINITY MAP IS SHOWN ON THE TITLE SHEET OF THESE PLANS.

10. REQUIREMENT: IDENTIFY THE PROJECT RECEIVING WATERS AND DESCRIBE ALL SENSITIVE ADJACENT AREAS INCLUDING STREAMS, LAKES, RESIDENTIAL AREAS, WETLANDS, ETC. WHICH MAY BE AFFECTED.

RESPONSE: THE SITE CURRENTLY DRAINS TO DRAINAGE DITCHES LOCATED IN THE RIGHT OF WAY OF ISLANDS HWY, AND DRAIN INTO CARRS NECK CREEK.

11. REQUIREMENT: DESIGN PROFESSIONAL'S CERTIFICATION STATEMENT AND SIGNATURE THAT THE SITE WAS VISITED PRIOR TO DEVELOPMENT OF THE ES&PC PLAN AS STATED ON PART IV PAGE 21 OF THE PERMIT.

RESPONSE: PLEASE SEE THE DESIGN PROFESSIONAL'S CERTIFICATION SECTION ON THIS SHEET.

12. REQUIREMENT: DESIGN PROFESSIONAL'S CERTIFICATION STATEMENT AND SIGNATURE THAT THE PERMITTEE'S ES&PC PLAN PROVIDES FOR AN APPROPRIATE AND COMPREHENSIVE SYSTEM OF BMPs AND SAMPLING TO MEET PERMIT REQUIREMENTS AS STATED ON PART IV PAGE 20 OF THE PERMIT.

RESPONSE: PLEASE SEE THE DESIGN PROFESSIONAL'S 7 DAY VISIT CERTIFICATION ON SECTION ON THIS SHEET.

13. REQUIREMENT: DESIGN PROFESSIONAL'S CERTIFICATION STATEMENT AND SIGNATURE THAT THE PERMITTEE'S ES&PC PLAN PROVIDES REPRESENTATIVE SAMPLING AS STATED ON PART IV D.6.c(3) PAGE 37 OF THE PERMIT AS APPLICABLE.

RESPONSE: PLEASE SEE THE DESIGN PROFESSIONAL'S 7 DAY VISIT CERTIFICATION ON SECTION ON THIS SHEET.

14. REQUIREMENT: CLEARLY NOTE THE STATEMENT THAT "THE DESIGN PROFESSIONAL, WHO PREPARED THE ES&PC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMPs WITHIN 7 DAYS AFTER INSTALLATION." IN ACCORDANCE WITH PART IV A.5, PAGE 26 OF THE PERMIT.

RESPONSE: PLEASE SEE THE DESIGN PROFESSIONAL'S 7 DAY VISIT CERTIFICATION ON SECTION ON THIS SHEET.

15. REQUIREMENT: CLEARLY NOTE THE STATEMENT THAT "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."

RESPONSE: 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 WITH 25-FEET OF THE COASTAL MARSHLAND BUFFER AS MEASURED FROM THE JURISDICTIONAL DETERMINATION LINE WITHOUT FIRST ACQUIRING THE NECESSARY VARIANCES AND PERMITS.

16. REQUIREMENT: PROVIDE A DESCRIPTION OF ANY BUFFER ENCROACHMENTS AND INDICATE WHETHER A BUFFER VARIANCE IS REQUIRED.

RESPONSE: THIS PROJECT SHOULD NOT ENCROACH ON ANY BUFFERS.

17. REQUIREMENT: CLEARLY NOTE THE STATEMENT THAT "AMENDMENTS/REVISIONS TO THE ES&PC PLAN WHICH HAVE A SIGNIFICANT EFFECT ON BMPs WITH A HYDRAULIC COMPONENT MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL."

RESPONSE: AMENDMENTS/REVISIONS TO THE ES&PC PLAN WHICH HAVE A SIGNIFICANT EFFECT ON BMPs WITH A HYDRAULIC COMPONENT MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL.

18. REQUIREMENT: CLEARLY NOTE THE STATEMENT THE "WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT."

RESPONSE: WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT.

19. REQUIREMENT: CLEARLY NOTE THE STATEMENT THAT "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."

RESPONSE: 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.

20. REQUIREMENT: CLEARLY NOTE STATEMENT THAT "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."

RESPONSE: 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.

21. REQUIREMENT: CLEARLY NOTE THE STATEMENT "ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING."

RESPONSE: ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING. SEE MULCHING AND VEGETATIVE PLAN REQUIREMENTS ON DETAIL SHEETS.

22. REQUIREMENT: ANY CONSTRUCTION ACTIVITY WHICH DISCHARGES STORM WATER INTO AN IMPAIRED STREAM SEGMENT, OR WITHIN 1 LINEAR MILE UPSTREAM OF AND WITHIN THE SAME WATERSHED AS, ANY PORTION OF AN BIOTA IMPAIRED STREAM SEGMENT MUST COMPLY WITH PART III, C, OF THE PERMIT. INCLUDE THE COMPLETED APPENDIX 1 LISTING ALL THE BMPs THAT WILL BE USED FOR THOSE AREAS OF THE SITE WHICH DISCHARGE TO THE IMPAIRED STREAM SEGMENT.

RESPONSE: NO CONSTRUCTION ACTIVITY WILL DISCHARGE IN STORM WATER INTO AN IMPAIRED STREAM OR 1 LINEAR MILE UPSTREAM OF AND WITHIN THE SAME WATER SHED AS, ANY PORTION OF AN BIOTA IMPAIRED STREAM SEGMENT. THE SITE IS NOT LOCATED WITHIN ONE MILE OF AN IMPAIRED STREAM.

23. REQUIREMENT: IF A TMDL IMPLEMENTATION PLAN FOR SEDIMENT HAS BEEN FINALIZED FOR THE IMPAIRED STREAM SEGMENT (IDENTIFIED IN ITEM 22 ABOVE) AT LEAST SIX MONTHS PRIOR TO SUBMITTAL OF NOI, THE ES&PC PLAN MUST ADDRESS ANY SITE SPECIFIC CONDITIONS OR REQUIREMENTS INCLUDED IN THE TMDL IMPLEMENTATION PLAN.

RESPONSE: NO TMDL IMPLEMENTATION PLAN IS NEEDED FOR THIS SITE.

24. REQUIREMENT: BMPs FOR CONCRETE WASHDOWN OF TOOLS, CONCRETE MIXER CHUTES, HOPPERS AND THE REAR OF THE VEHICLES. WASHOUT OF THE DRUM AT THE CONSTRUCTION SITE IS PROHIBITED.

RESPONSE: A CONCRETE WASHOUT AREA HAS BEEN ILLUSTRATED ON EACH EROSION CONTROL SHEET. NO CONCRETE TRUCKS WILL BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON-SITE.

25. REQUIREMENT: PROVIDE BMPs FOR THE REMEDIATION OF ALL PETROLEUM SPILLS AND LEAKS.

RESPONSE: CONTAINERS FOR PRODUCTS SUCH AS FUELS, LUBRICANTS AND TARS WILL BE INSPECTED DAILY FOR LEAKS AND SPILLS. THIS INCLUDES ON-SITE VEHICLE AND MACHINERY DAILY INSPECTIONS AND REGULAR PREVENTATIVE MAINTENANCE OF SUCH EQUIPMENT. EQUIPMENT MAINTENANCE AREAS WILL BE LOCATED AWAY FROM STATE WATER, NATURAL DRAINS AND STORM WATER DRAINAGE INLETS. IN ADDITION, TEMPORARY FUELING TANKS SHALL HAVE A SECONDARY CONTAINMENT LINER TO PREVENT/MINIMIZE SITE CONTAMINATION. DISCHARGE OF OILS, FUELS AND LUBRICANTS IS PROHIBITED. PROPER DISPOSAL METHODS WILL INCLUDE COLLECTION IN A SUITABLE CONTAINER AND DISPOSAL AS REQUIRED BY LOCAL AND STATE REGULATIONS. LOCAL, STATE AND MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND PROCEDURES WILL BE MADE AVAILABLE TO SITE PERSONNEL.

MATERIAL AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREAS. TYPICAL MATERIALS AND EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO, BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, CAT LITTER, SAND, SAWDUST AND PROPERLY LABELED PLASTIC AND METAL WASTE CONTAINERS.

SPILL PREVENTION PRACTICES AND PROCEDURES WILL BE REVIEWED AFTER A SPILL AND ADJUSTED AS NECESSARY TO PREVENT FUTURE SPILLS.

ALL SPILLS WILL BE CLEANED UP IMMEDIATELY UPON DISCOVERY. ALL SPILLS WILL BE REPORTED AS REQUIRED BY LOCAL, STATE AND FEDERAL REGULATIONS.

FOR SPILLS THAT IMPACT SURFACE WATER (LEAVE A SHEEN ON SURFACE WATER), THE NATIONAL RESPONSE CENTER (NRC) WILL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.

FOR SPILLS OF AN UNKNOWN AMOUNT, THE NATIONAL RESPONSE CENTER (NRC) WILL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.

FOR SPILLS GREATER THAN 25 GALLONS AND NO SURFACE WATER IMPACTS, THE GEORGIA EPD WILL BE CONTACTED WITHIN 24 HOURS.

FOR SPILLS LESS THAN 25 GALLONS AND NO SURFACE WATER IMPACTS, THE SPILL WILL BE CLEANED UP AND LOCAL AGENCIES WILL BE CONTACTED AS REQUIRED.

THE CONTRACTOR SHALL NOTIFY THE LICENSED PROFESSIONAL WHO PREPARED THIS PLAN IF MORE THAN 1320 GALLONS OF PETROLEUM IS STORED ON SITE (THIS INCLUDES CAPACITIES OF EQUIPMENT) OR IF ANY ONE PIECE OF EQUIPMENT HAS A CAPACITY GREATER THAN 660 GALLONS. THE CONTRACTOR WILL NEED A SPILL PREVENTION CONTAINMENT AND COUNTERMEASURES PLAN PREPARED BY THAT LICENSED PROFESSIONAL.

26. REQUIREMENT: DESCRIPTION OF THE MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER THAT WILL OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED.

RESPONSE: DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION)

a. USED TO PROVIDE A PROTECTIVE COVER FOR EXPOSED AREAS INCLUDING CUTS, FILLS, DAMS, AND OTHER DENuded AREAS.

b. FOR UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES, AT LEAST 70% OF THE SOIL SURFACE IS UNIFORMLY COVERED IN PERMANENT VEGETATION OR EQUIVALENT PERMANENT STABILIZATION MEASURES.

c. PERMANENT VEGETATION SHALL CONSIST OF: PLANTED TREES, SHRUBS, PERENNIAL VINES; A CROP OF PERENNIAL VEGETATION APPROPRIATE FOR THE REGION, SUCH THAT WITHIN THE GROWING SEASON A 70% COVERAGE BY PERENNIAL VEGETATION SHALL BE ACHIEVED

d. USE CONVENTIONAL PLANTING METHODS WHEN POSSIBLE.

e. WHEN MIXED PLANTINGS ARE DONE DURING MARGINAL PLANTING PERIODS, COMPANION CROPS SHALL BE USED.

f. IRRIGATION SHOULD BE USED WHEN THE SOIL IS DRY OR WHEN SUMMER PLANTINGS ARE DONE.

g. LOW MAINTENANCE PLANTS, AS WELL AS NATIVES, SHOULD BE USED TO ENSURE LONG-LASTING EROSION CONTROL.

h. MOWING SHOULD NOT BE PERFORMED DURING QUAIL NESTING SEASON (MAY TO SEPTEMBER).

i. WILDLIFE PLANTINGS SHOULD BE INCLUDED IN CRITICAL AREA PLANTINGS.

j. VERTICAL BANKS SHALL BE SLOPED TO ENABLE PLANT ESTABLISHMENT.

k. AGRICULTURAL LIME IS REQUIRED AT THE RATE OF ONE TO TWO TONS PER ACRE UNLESS SOIL TESTS INDICATE OTHERWISE. GRADED AREAS REQUIRE LIME APPLICATION. IF LIME IS ALLIED WITHIN SIX MONTHS OF PLANTING PERMANENT PERENNIAL VEGETATION, ADDITIONAL LIME IS NOT REQUIRED.

l. AGRICULTURAL LIME SHALL BE WITHIN THE SPECIFICATIONS OF THE GEORGIA DEPARTMENT OF AGRICULTURE. LIME SPREAD BY CONVENTIONAL EQUIPMENT SHALL BE "GROUND LIMESTONE" AND LIME SPREAD BY HYDRAULIC SEEDING EQUIPMENT SHALL BE "FINELY GROUND LIMESTONE."

m. WHEN HYDRAULIC SEEDING EQUIPMENT IS USED, THE INITIAL FERTILIZER SHALL BE MIXED WITH SEED, INOCULANT (IF NEEDED), AND WOOD CELLULOSE OR WOOD PULP FIBER MULCH AND APPLIED IN A SLURRY. THE INOCULANT, IF NEEDED, SHALL BE MIXED WITH THE SEED PRIOR TO BEING PLACED INTO THE HYDRAULIC SEEDER. THE SLURRY MIXTURE WILL BE AGITATED DURING APPLICATION TO KEEP THE INGREDIENTS THOROUGHLY MIXED. THE MIXTURE WILL BE SPREAD UNIFORMLY OVER THE AREA WITHIN ONE HOUR AFTER BEING PLACED IN THE HYDROSEEDER.

n. WHEN CONVENTIONAL PLANTING IS TO BE DONE, LIME AND FERTILIZER SHALL BE APPLIED UNIFORMLY IN ONE OF THE FOLLOWING WAYS: 1. APPLY BEFORE LAND PREPARATION SO THAT IT WILL BE MIXED WITH THE SOIL DURING SEEDBED PREPARATION. 2. MIX WITH THE SOIL USED TO FILL THE HOLES, DISTRIBUTE IN FURROWS. 3. BROADCAST AFTER STEEP SURFACES ARE SCARPED, PITTED OR TRENCHED. 4. FERTILIZER PELLET SHALL BE PLACED AT ROOT DEPTH IN THE CLOSING HOLE BESIDE EACH PINE TREE SEEDLING.

o. MULCH IS REQUIRED FOR ALL PERMANENT VEGETATION APPLICATIONS. MULCH APPLIED TO SEEDDED AREAS SHALL ACHIEVE 75% SOIL COVER. STRAW OR HAY MULCH WILL BE SPREAD UNIFORMLY WITHIN 24 HOURS AFTER SEEDING AND/OR PLANTING. 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. WOOD CELLULOSE OR WOOD FIBER MULCH SHALL BE APPLIED UNIFORMLY WITH HYDRAULIC SEEDING EQUIPMENT.

p. MOW SERICEA LESPEDEZA ONLY AFTER FROST TO ENSURE THAT THE SEEDS ARE MATURE. MOW BETWEEN NOVEMBER AND MARCH. BERMUDAGRASS, BAHIA GRASS AND TALL FESCUE MAY BE MOWED AS DESIRED. MAINTAIN AT LEAST 6 INCHES OF TOP GROWTH UNDER ANY USE AND MANAGEMENT. MODERATE USE OF TOP GROWTH IS BENEFICIAL AFTER ESTABLISHMENT. EXCLUDE TRAFFIC UNTIL THE PLANTS ARE WELL ESTABLISHED. BECAUSE OF THE QUAIL NESTING SEASON, MOWING SHOULD NOT TAKE PLACE BETWEEN MAY AND SEPTEMBER.

q. APPLY ONE TON OF AGRICULTURAL LIME EVERY 4 TO 6 YEARS OR AS INDICATED BY SOIL TESTS. SOIL TESTS CAN BE CONDUCTED TO DETERMINE MORE ACCURATE REQUIREMENTS IF DESIRED.

VEGETATED WATERWAY OR STORMWATER CONVEYANCE

a. A NATURAL OR CONSTRUCTED CHANNEL THAT IS SHAPED OR GRADED TO REQUIRED DIMENSIONS AND ESTABLISHED IN SUITABLE VEGETATION FOR THE STABLE CONVEYANCE OF RUNOFF WITHOUT CAUSING DAMAGE EITHER BY EROSION OR BY FLOODING.

b. THIS STANDARD APPLIES TO ALL SITES WHERE ADDED CHANNEL CAPACITY AND/OR STABILIZATION IS REQUIRED TO CONTROL EROSION RESULTING FROM CONCENTRATED RUNOFF AND WHERE SUCH CONTROL CAN BE ACHIEVED BY THIS PRACTICE ALONE OR IN COMBINATION WITH OTHERS

c. THE MINIMUM CAPACITY SHALL BE THAT REQUIRED TO CONVEY THE PEAK RUNOFF EXPECTED FROM A 25-YEAR, 24-HOUR STORM OR THE STORM SPECIFIED IN THE GSWCC EROSION AND SEDIMENT CONTROL MANUAL.

d. CONSTRUCTION SPECIFICATIONS

d.1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.

d.2. THE WATERWAY OR OUTLET SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN. IT WILL BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPED NORMAL FLOW. IF THE CHANNEL MUST HAVE EROSION PROTECTION OTHER THAN VEGETATION, THE LINING SHALL NOT COMPROMISE THE CAPACITY OF THE EMERGENCY SPILLWAY, I.E. THE CHANNEL SHALL BE OVER-EXCAVATED SO THAT THE LINING WILL BE FLUSH WITH THE SLOPE SURFACE.

d.3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETED WATERWAY.

d.4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH WATERWAY FUNCTIONING.

d.5. STABILIZATION: APPLICABLE VEGETATIVE STANDARDS SHALL BE FOLLOWED FOR TIME OF SEEDING, SPRIGGING OR SODDING, LINING AND FERTILIZING, AND SITE AND SEEDBED PREPARATION. EROSION CONTROL BLANKETS OR MATTING OR SOD SHALL BE USED TO AID IN THE ESTABLISHMENT OF VEGETATION. INSTALLATION METHODS SHOULD FOLLOW MANUFACTURER RECOMMENDATIONS.

e. MULCHING SHALL BE A REQUIREMENT FOR ALL SEEDED OR SPRIGGED CHANNELS. TEMPORARY PROTECTION DURING ESTABLISHMENT SHOULD BE PROVIDED WHEN CONDITIONS PERMIT THROUGH TEMPORARY DIVERSIONS OR OTHER MEANS TO DISPOSE OF WATER.

27. DESCRIPTION OF PRACTICES TO PROVIDE COVER FOR BUILDING MATERIALS AND BUILDING PRODUCTS ON SITE.

RESPONSE: PLASTIC SHEETING OR TEMPORARY ROOFS TO BE UTILIZED TO COVER BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTE, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS IN ORDER TO MINIMIZE EXPOSURE TO PRECIPITATION AND TO STORMWATER.

28. REQUIREMENT: DESCRIPTION OF THE PRACTICES THAT WILL BE USED TO REDUCE THE POLLUTANTS IN STORM WATER DISCHARGES.

RESPONSE: PRODUCT SPECIFIC PRACTICES

PETROLEUM BASED PRODUCTS - CONTAINERS FOR PRODUCTS SUCH AS FUELS, LUBRICANTS, AND TARS WILL BE INSPECTED DAILY FOR LEAKS AND SPILLS. THIS INCLUDES ON-SITE VEHICLE AND MACHINERY DAILY INSPECTIONS AND REGULAR PREVENTATIVE MAINTENANCE OF SUCH EQUIPMENT. EQUIPMENT MAINTENANCE AREAS WILL BE LOCATED AWAY FROM STATE WATER, NATURAL DRAINS, AND STORM WATER DRAINAGE INLETS. IN ADDITION, TEMPORARY FUELING TANKS SHALL HAVE A SECONDARY CONTAINMENT LINER TO PREVENT/MINIMIZE SITE CONTAMINATION. DISCHARGE OF OILS, FUELS, AND LUBRICANTS IS PROHIBITED. PROPER DISPOSAL METHODS WILL INCLUDE COLLECTION IN A SUITABLE CONTAINER AND DISPOSAL AS REQUIRED BY LOCAL AND STATE REGULATIONS.

POINTS/FINISHES/SOLVENTS - ALL PRODUCTS WILL BE STORED IN TIGHTLY SEALED ORIGINAL CONTAINERS WHEN NOT IN USE. EXCESS PRODUCT WILL NOT BE DISCHARGED TO THE STORM WATER COLLECTION SYSTEM. EXCESS PRODUCT MATERIALS USED WITH THESE PRODUCTS AND PRODUCT CONTAINERS WILL BE DISPOSED OF ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

CONCRETE TRUCK WASHING - A CONCRETE WASHOUT AREA HAS BEEN DETAILED FOR THIS SITE.

FERTILIZER/HERBICIDES - THESE PRODUCTS WILL BE APPLIED AT RATES THAT DO NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS OR ABOVE THE GUIDELINES SET FORTH IN THE CROP ESTABLISHMENT OR IN THE GSWCC MANUAL FOR THE EROSION AND SEDIMENT CONTROL IN GEORGIA. ANY STORAGE OF THESE MATERIALS WILL BE UNDER ROOF IN SEALED CONTAINERS.

BUILDING MATERIALS - NO BUILDING OR CONSTRUCTION MATERIALS WILL BE BURIED OR DISPOSED OF ONSITE. ALL SUCH MATERIAL WILL BE DISPOSED OF IN PROPER WASTE DISPOSAL PROCEDURES

PRIOR TO THE LAND DISTURBING CONSTRUCTION, THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE AREA SITE DEVELOPMENT INSPECTOR.

OTHER PRACTICES

THE CONTRACTOR SHALL OBSERVE THE PROJECT SEQUENCE SHOWN ON THE PLANS. THE CONTRACTOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO INSURE THAT LAND STRIPPED OF ITS NATURAL COVER IS EXPOSED ONLY IN SMALL QUANTITIES.

A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT SHALL BE PRESENT ON THE SITE AT ALL TIMES.

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.

THE FOLLOWING INITIAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY OTHER CONSTRUCTION ACTIVITY.

a. THE CONSTRUCTION EXIT, CONSISTING OF A MINIMUM PAD SIZE OF 20 FEET BY 50 FEET WITH A MINIMUM OF 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 OVERLAD ON A GEOTEXTILE UNDERLINER. THE GEOTEXTILE UNDERLINER SHALL MEET THE REQUIREMENTS OF AASHTO M28-86, SECTION 7.3 SEPARATION REQUIREMENTS.

b. IMMEDIATELY AFTER THE ESTABLISHMENT OF CONSTRUCTION ENTRANCE/EXITS, ALL PERIMETER EROSION CONTROL AND STORM WATER MANAGEMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE INITIAL PHASE EROSION CONTROL PLAN.

c. SILT FENCE SHOULD BE INSTALLED AT THE PERIMETER OF THE DISTURBED AREA AS SHOWN ON THE PLAN. THE SILT FENCE SHOULD BE PLACED IN ACCORDANCE WITH THE MANUAL FOR EROSION CONTROL IN GEORGIA. THE SILT FENCE SHOULD BE KEPT ERECT AT ALL TIMES AND REPAIRED WHEN REQUESTED BY THE SITE INSPECTOR OR THE PROJECT DESIGN PROFESSIONAL OF RECORD. SILT SHOULD BE REMOVED WHEN ACCUMULATION REACHES 1/2 HEIGHT OF THE BARRIER. THE PERIMETER SILT FENCE SHOULD BE INSPECTED DAILY FOR ANY FAILURES. ANY FAILURES OF SALT FENCING SHOULD 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 MEASURES, 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 TEMPORARY SEDIMENT PONDS AND DIVERSION DIKES AS SHOWN ON THE INITIAL PHASE PLAN TO CONTROL EROSION AND STORM WATER RUN OFF.

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 SEDIMENT PONDS ARE CONSTRUCTED AS SHOWN ON THE INITIAL PHASE EROSION CONTROL PLAN.

MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 7 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 TRACK 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 TO CONTROL OR TREAT THE SEDIMENT SOURCE 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 FOLLOWING EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE PRELIMINARY GRADING PHASE OF CONSTRUCTION:

INLET SEDIMENT TRAPS WILL BE INSTALLED AROUND ALL NEW INLETS.

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 CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE DESIGN PROFESSIONAL IMMEDIATELY.

STORM DRAIN OUTLET PROTECTION SHALL BE PLACED AT ALL OUTLET HEADWALLS AS SOON AS THE HEADWALL IS CONSTRUCTED. SEE SEPARATE DETAILS FOR ADDITIONAL INFORMATION.

ALL DRAINAGE SWALES SHALL BE APPLIED WITH VEGETATIVE COVER AS SOON AS FINAL GRADE IS ACHIEVED.

MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 7 DAYS OF LAND DISTURBANCE.

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.

INSTALL TEMPORARY SEDIMENT TRAP.

29. REQUIREMENT: DESCRIPTION AND CHART OR TIMELINE OF THE INTENDED SEQUENCE OF MAJOR ACTIVITIES WHICH DISTURB SOILS FOR THE MAJOR PORTION OF THE SITE (I.E. INITIAL PERIMETER AND SEDIMENT STORAGE BMPs, CLEARING AND GRUBBING ACTIVITIES, EXCAVATION ACTIVITIES, UTILITY ACTIVITIES, TEMPORARY AND FINAL STABILIZATION).

RESPONSE: SEE CHART BELOW.

INFRASTRUCTURE	2024					
	JUN	JUL	AUG	SEP	OCT	NOV
INSTALLATION OF INITIAL BEST MANAGEMENT PRACTICES						
CLEARING & GRUBBING						
BY-PASS CONSTRUCTION						
BUILDING BOX CULVERT						
INSTALL INTERMEDIATE PHASE EROSION BEST MANAGEMENT PRACTICES						
PAVEMENT						
INSTALL FINAL PHASE EROSION BEST MANAGEMENT PRACTICES						
REMOVE TEMPORARY EROSION MEASURES AND TREE PROTECTION FENCING						
MAINTENANCE OF EROSION BMPs						

G:\ACTIVE PROJECTS\2011-05-H - ISLANDS HWY BOX CULVERT\900-DRAWINGS\DWG\CONST\2011-05-EROS.DWG

DS1
DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)

DEFINITION
APPLYING PLANT RESIDUES OR OTHER SUITABLE MATERIALS, PRODUCED ON THE SITE IF POSSIBLE, TO THE SOIL SURFACE.

PURPOSE
1. TO REDUCE RUNOFF EROSION
2. TO CONSERVE MOISTURE
3. TO PREVENT SURFACE COMPACTION OR CRUSTING
4. TO CONTROL UNDESIRABLE VEGETATION
5. TO INCREASE BIOLOGICAL ACTIVITY IN THE SOIL.

REQUIREMENT FOR REGULATORY COMPLIANCE
MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 14 DAYS OF DISTURBANCE. MULCH CAN BE USED AS A SINGULAR EROSION CONTROL DEVICE FOR UP TO SIX MONTHS, BUT IT SHALL BE APPLIED AT THE APPROPRIATE DEPTH, DEPENDING ON THE MATERIAL USED, ANCHORED, AND HAVE A CONTINUOUS 90% COVER OR GREATER OF THE SOIL SURFACE. MAINTENANCE SHALL BE REQUIRED TO MAINTAIN APPROPRIATE DEPTH AND 90% COVER. TEMPORARY VEGETATION MAY BE EMPLOYED INSTEAD OF MULCH IF THE AREA WILL REMAIN UNDISTURBED FOR LESS THAN SIX MONTHS. IF AN AREA WILL REMAIN UNDISTURBED FOR GREATER THAN SIX MONTHS, PERMANENT VEGETATIVE TECHNIQUES SHALL BE EMPLOYED.

SPECIFICATIONS
MULCHING WITHOUT SEEDING
THIS STANDARD APPLIES TO GRADES OR CLEARED AREAS WHERE SEEDINGS MAY NOT HAVE A SUITABLE GROWING SEASON TO PRODUCE AN EROSION RETARDANT COVER, BUT CAN BE STABILIZED WITH A MULCH COVER.

SITE PREPARATION
1. GRADE TO PERMIT THE USE OF EQUIPMENT FOR APPLYING AND ANCHORING MULCH.
2. INSTALL NEEDED EROSION CONTROL MEASURES AS REQUIRED SUCH AS DIKES, DIVERSIONS, BERMS, TERRACES AND SEDIMENT BARRIERS.
3. LOOSEN COMPACT SOIL TO A MINIMUM DEPTH OF 3 INCHES.

MULCHING MATERIALS
SELECT ONE OF THE FOLLOWING MATERIALS AND APPLY AT THE DEPTH INDICATED:
1. DRY STRAW OR HAY SHALL BE APPLIED AT A DEPTH OF 2 TO 4 INCHES PROVIDING COMPLETE SOIL COVERAGE. ONE ADVANTAGE OF THIS MATERIAL IS EASY APPLICATION.
2. WOOD WASTE (CHIPS, SAMOUST OR BARK) SHALL BE APPLIED AT A DEPTH OF 2 TO 3 INCHES. ORGANIC MATERIAL FROM THE CLEARING STAGE OF DEVELOPMENT SHOULD REMAIN ON SITE, BE CHIPPED, AND APPLIED AS MULCH. THIS METHOD OF MULCHING CAN GREATLY REDUCE EROSION CONTROL COSTS.
3. POLYETHYLENE FILM SHALL BE SECURED OVER BANKS OR STOCKPILED SOIL MATERIAL FOR TEMPORARY PROTECTION. THIS MATERIAL CAN BE SALVAGED AND REUSED.

APPLYING MULCH
WHEN MULCH IS USED WITHOUT SEEDING, MULCH SHALL BE APPLIED TO PROVIDE FULL COVERAGE OF THE EXPOSED AREA.
1. DRY STRAW OR HAY MULCH AND WOOD CHIPS SHALL BE APPLIED UNIFORMLY BY HAND OR BY MECHANICAL EQUIPMENT.
2. IF THE AREA WILL EVENTUALLY BE COVERED WITH PERENNIAL VEGETATION, 20-30 POUNDS OF NITROGEN PER ACRE IN ADDITION TO THE NORMAL AMOUNT SHALL BE APPLIED TO OFFSET THE UPTAKE OF NITROGEN CAUSED BY THE DECOMPOSITION OF THE ORGANIC MULCHES.
3. APPLY POLYETHYLENE FILM ON EXPOSED AREAS.

ANCHORING MULCH
1. STRAW OR HAY MULCH CAN BE PRESSED INTO THE SOIL WITH A DISK HARROW WITH THE DISK SET STRAIGHT OR WITH A SPECIAL "PACKER DISK."DISKS MAY BE SMOOTH OR SERRATED AND SHOULD BE 20 INCHES OR MORE IN DIAMETER AND 8 TO 12 INCHES APART. THE EDGES OF THE DISK SHOULD BE DULL ENOUGH NOT TO CUT THE MULCH BUT TO PRESS IT INTO THE SOIL LEAVING MULCH OF 1 IN ANCHORED. DISKS SHOULD BE ANCHORED IMMEDIATELY AFTER APPLICATION. STRAW OR HAY MULCH SPREAD WITH SPECIAL BLOWER-TYPE EQUIPMENT MAY BE ANCHORED. TACKIFIERS, BINDERS AND HYDRAULIC MULCH WITH TACKIFIERS SPECIFICALLY DESIGNED FOR TACKLING STRAW CAN BE SUBSTITUTED FOR EMULSIFIED ASPHALT. PLEASE REFER TO SPECIFICATION TACKIFIERS. PLASTIC MESH OR NETTING WITH MESH NO LARGER THAN ONE INCH BY ONE INCH SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
2. NETTING OF THE APPROPRIATE SIZE SHALL BE USED TO ANCHOR WOOD WASTE. OPENINGS OF THE NETTING SHALL NOT BE LARGER THAN THE AVERAGE SIZE OF THE WOOD WASTE CHIPS.
3. POLYETHYLENE FILM SHALL BE ANCHOR TRENCHED AT THE TOP AS WELL AS INCREMENTALLY AS NECESSARY.

APPLICATION RATE FOR EACH TYPE OF SOIL ENCOUNTERED ON THE SITE.

MULCHING: MULCHING IS REQUIRED FOR ALL PERMANENT VEGETATION APPLICATIONS. MULCHING APPLIED TO SEEDDED AREAS SHALL ACHIEVE 75% SOIL COVER. SELECT THE MULCHING MATERIAL FROM THE FOLLOWING AND APPLY AS INDICATED:
1. DRY STRAW OR DRY HAY OF GOOD QUALITY AND FREE OF WEED SEEDS CAN BE USED. DRY STRAW SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE. DRY HAY SHALL BE APPLIED AT A RATE OF 2 1/2 TONS PER ACRE.
2. WOOD CELLULOSE MULCH OR WOOD PULP FIBER SHALL BE USED WITH HYDRAULIC SEEDING. IT SHALL BE APPLIED AT A RATE OF 500 LBS PER ACRE. DRY STRAW R DRY HAY SHALL BE APPLIED AFTER HYDRAULIC SEEDING.
3. ONE THOUSAND POUNDS OF WOOD CELLULOSE OF WOOD PULP FIBER, WHICH INCLUDES A TACKIFIER SHALL BE USED WITH HYDRAULIC SEEDING ON SLOPES GREATER THAN 3/4:1 OR STEEPER.
4. SERICEA LESPEDEZA HAY CONTAINING MATURE SEED SHALL BE APPLIED AT A RATE OF THREE TONS PER ACRE.
5. PINE STRAW OR PINE BARK SHALL BE APPLIED AT A THICKNESS OF 3" FOR BEDDING PURPOSES. OTHER SUITABLE MATERIALS IN SUFFICIENT QUANTITIES MAY BE USED WHERE ORNAMENTALS OR OTHER GROUND COVERS ARE PLANTED. THIS IS NOT APPROPRIATE FOR SEEDDED AREAS.
6. WHEN USING TEMPORARY EROSION CONTROL BLANKETS OR BLOCK SOD, MULCHING IS NOT REQUIRED.

MULCHING
NOT TO SCALE [Ds1]

DS2
DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)

DEFINITION
THE ESTABLISHMENT OF TEMPORARY VEGETATIVE COVER WITH FAST GROWING SEEDINGS FOR SEASONAL PROTECTION ON DISTURBED OR DENUDED AREAS.

PUPROSE
TO REDUCE RUNOFF AND SEDIMENT DAMAGE OF DOWN STRAM RESOURCES
TO PROTECT THE SOIL SURFACE FROM EROSION
TO IMPROVE WILDLIFE HABITAT
TO IMPROVE AESTHETICS
TO IMPROVE TILTH, INFILTRATION AND AERATION AS WELL AS ORGANIC MATTER FOR PERMANENT PLANTINGS

REQUIREMENT FOR REGULATORY COMPLIANCE
MULCH OR TEMPORARY GRASSING SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 14 DAYS OF DISTUR- BANCE. TEMPORARY GRASSING, INSTEAD OF MULCH, CAN BE APPLIED TO ROUGH GRADED AREAS THAT WILL BE EXPOSED FOR LESS THAN SIX MONTHS. IF AN AREA IS EXPECTED TO BE UNDISTURBED FOR LONGER THAN SIX MONTHS, PERMANENT PERENNIAL VEGETATION SHALL BE USED. IF OPTIMUM PLANTING CONDITIONS FOR TEMPORARY GRASSING IS LACKING, MULCH CAN BE USED AS A SINGULAR EROSION CONTROL DEVICE FOR UP TO SIX MONTHS BUT IT SHALL BE APPLIED AT THE APPROPRIATE DEPTH, ANCHORED, AND HAVE A CONTINUOUS 90% COVER OR GREATER OF THE SOIL SURFACE.

CONDITIONS
TEMPORARY GRASSING, INSTEAD OF MULCH, CAN BE APPLIED TO ROUGH GRADED AREAS THAT WILL BE EXPOSED FOR LESS THAN SIX MONTHS. TEMPORARY VEGETATIVE MEASURES SHOULD BE COORDINATED WITH PERMANENT MEASURES TO ASSURE ECONOMICAL AND EFFECTIVE STABILIZATION. MOST TYPES OF TEMPORARY VEGETATION ARE IDEAL TO USE AS COMPANION CROPS UNTIL THE PERMANENT VEGETATION IS ESTABLISHED.

SPECIFICATIONS
GRADING AND SHAPING
EXCESSIVE WATER RUN-OFF SHALL BE REDUCED BY PROPERLY DESIGNED AND INSTALLED EROSION CONTROL PRACTICES SUCH AS SLOPED DITCHES, DIKES, DIVERSIONS, SEDIMENT BARRIERS AND OTHERS. NO SHAPING OR GRADING IS REQUIRED IF SLOPES CAN BE STABILIZED BY HAND-SEEDED VEGETATION OR IF HYDRAULIC SEEDING EQUIPMENT IS TO BE USED.

SEEDBED PREPARATION
WHEN A HYDRAULIC SEEDER IS USED, SEEDBED PREPARATION IS NOT REQUIRED. WHEN USING CONVENTIONAL OR HANDSEEDING, SEEDBED PREPARATION IS NOT REQUIRED IF THE SOIL MATERIAL IS LOOSE AND NOT SEALED BY RAINFALL.
WHEN SOIL HAS BEEN SEALED BY RAINFALL OR CONSISTS OF SMOOTH CUT SLOPES, THE SOIL SHALL BE PITTED, TRENCHED OR OTHERWISE SCARIFIED TO PROVIDE A PLACE FOR SEED TO LODGE AND GERMINATE.

LIME AND FERTILIZER
AGRICULTURAL LIME IS REQUIRED UNLESS SOIL TESTS INDICATE OTHERWISE. APPLY AGRICULTURAL LIME AT A RATE OF ONE TON PER ACRE. GRADED AREAS REQUIRE LIME APPLICATION. SOILS CAN BE TESTED TO DETERMINE IF FERTILIZER IS NEEDED, ON REASONABLY FERTILE SOILS OR SOIL MATERIAL, WHICH APPLY LOW FERTILITY. VERY LOW FERTILITY SOILS, 500 TO 700 POUNDS OF 10-10-10 FERTILIZER OR THE EQUIVALENT PER ACRE (12-16 LBS./1,000 SQ. FT.) SHALL BE APPLIED. FERTILIZER SHOULD BE APPLIED BEFORE LAND PREPARATION AND INCORPORATED WITH A DISK, RIPPER OR CHISEL.

SEEDING
SELECT A GRASS OR GRASS-LEGUME MIXTURE SUITABLE TO THE AREA AND SEASON OF THE YEAR. SEED SHALL BE APPLIED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDRAULIC SEEDER (SLURRY INCLUDING SEED AND FERTILIZER). DRILL OR CULTIPACKER SEEDERS SHOULD NORMALLY PLACE SEED ONE-QUARTER TO ONE-HALF INCH DEEP. APPROPRIATE DEPTH OF PLANTING IS TEN TIMES THE SEED DIAMETER. SOIL SHOULD BE "RAKED"LIGHTLY TO COVER SEED WITH SOIL IF SEEDDED BY HAND.

MULCHING
TEMPORARY VEGETATION CAN, IN MOST CASES, BE ESTABLISHED WITHOUT THE USE OF MULCH. MULCH WITHOUT SEEDING SHOULD BE CONSIDERED FOR SHORT TERM PROTECTION. REFER TO DS1-DISTURBED AREA STABILIZATION (WITH MULCHING ONLY).

IRRIGATION
DURING TIMES OF DROUGHT, WATER SHALL BE APPLIED AT A RATE NOT CAUSING RUNOFF AND EROSION. THE SOIL SHALL BE THOROUGHLY WETTED TO A DEPTH THAT WILL INSURE GERMINATION OF THE SEED. SUBSEQUENT APPLICATIONS SHOULD BE MADE WHEN NEEDED.

GRASSING TEMPORARY
NOT TO SCALE [Ds2]

SEEDING RATES FOR TEMPORARY SEEDING.

SPECIES	RATE PER 1,000 SQ.FT.	RATE PER ACRE*	PLANTING DATES**
RYE	3.9 LBS.	3 BU	9/1 - 3/1
RYE GRASS	0.9 LBS.	40 LBS.	8/15 - 4/1
ANNUAL LESPEDEZA	0.9 LBS.	40 LBS.	1/15 -9/15
WEeping LOVEGRASS	0.1 LBS.	4 LBS.	2/15 - 6/15
SUNDANGRASS	1.4 LBS.	60 LBS.	3/1 - 8/1
BROWN MILLET	0.9 LBS.	40 LBS.	4/1 - 7/15
WHEAT	4.1 LBS.	3 BU	9/15 - 2/1

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

DU

DUST CONTROL ON DISTURBED AREAS

DEFINITION
CONTROLLING SURFACE AND AIR MOVEMENT OF DUST ON CONSTRUCTION SITES, ROADS, AND DEMOLITION SITES.

CONDITIONS
THIS PRACTICE IS APPLICABLE TO AREAS SUBJECT TO SURFACE AND AIR MOVEMENT OF DUST WHERE ON AND OFF-SITE DAMAGE MAY OCCUR WITHOUT TREATMENT.

METHOD AND MATERIALS
A. TEMPORARY METHODS

MULCHES. SEE STANDARD DS1-DISTURBED AREA STABILIZATION (WITH MULCHING ONLY). SYNTHETIC RESINS MAY BE USED INSTEAD OF ASPHALT TO BIND MULCH MATERIAL. REFER TO STANDARD TB-TACKIFIERS AND BINDERS. RESINS SUCH AS CURASOL OR TERRATAK SHOULD BE USED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

VEGETATIVE COVER. SEE STANDARD DS2- DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)

SPRAY-ON ADHESIVES. THESE ARE USED ON MINERAL SOILS (NOT EFFECTIVE ON MUCK SOILS) KEEP TRAFFIC OFF THESE AREAS. REFER TO STANDARD TB-TACKIFIERS AND BINDERS.

TILLAGE. THIS PRACTICE IS DESIGNED TO ROUGHEN AND BRING CLODS TO THE SURFACE. IT IS AN EMERGENCY MEASURE WHICH SHOULD BE USED BEFORE WIND EROSION STARTS. BEGIN PLOWING ON INWARD SIDE OF SITE; CHISEL-TYPE PLOWS SPACED ABOUT 12 INCHES APART, SPRING-TOOTHED HARROWS, AND SIMILAR PLOWS ARE EXAMPLES OF EQUIPMENT WHICH MAY PRODUCE THE DESIRED EFFECT.

IRRIGATION. THIS IS GENERALLY DONE AS AN EMERGENCY TREATMENT. SITE IS SPRINKLED WITH WATER UNTIL THE SURFACE IS WET. REPEAT AS NEEDED.

BARRIERS. SOLID BOARD FENCES, SNOW FENCES, BURLAP FENCES, CRATE WALLS, BALES OF HAY AND SIMILAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING. BARRIERS PLACED AT RIGHT ANGLES TO PREVAILING CURRENTS AT INTERVALS OF ABOUT 15 TIMES THEIR HEIGHT ARE EFFECTIVE IN CONTROLLING WIND EROSION.

CALCIUM CHLORIDE. APPLY AT RATE THAT WILL KEEP SURFACE MOIST. MAY NEED RETREATMENT.

B. PERMANENT METHODS

PERMANENT VEGETATION. SEE STANDARD DS3-DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION). EXISTING TREES AND LARGE SHRUBS MAY AFFORD VALUABLE PROTECTION IF LEFT IN PLACE.

TOPSOILING. THIS ENTAILS COVERING THE SURFACE WITH LESS EROSIVE SOIL MATERIAL. SEE STANDARD TP-TOPSOILING.

STONE. COVER SURFACE WITH CRUSHED STONE OR COARSE GRAVEL. SEE STANDARD CR-CONSTRUCTION ROAD STABILIZATION.

DUST CONTROL
NOT TO SCALE [Du]

TABLE 6-5.1 FERTILIZER REQUIREMENTS

TYPE OF SPECIES	YEAR	ANALYSIS FOR EQUIVALENT N-P-K	RATE	N TOP DRESSING RATE
1. COOL SEASON GRASSES	FIRST SECOND MAINTENANCE	6-12-12 10-10-10	1500 LBS./AC. 1000 LBS./AC. 400 LBS./AC.	50-100 LBS./AC. 1/2-30
2. COOL SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6-12-12 0-10-10 0-10-10	1500 LBS./AC. 1000 LBS./AC. 400 LBS./AC.	0-50 LBS./AC. 1/-
3. GROUND COVERS	FIRST SECOND MAINTENANCE	10-10-10 10-10-10	1300 LBS./AC. 1300 LBS./AC. 1100 LBS./AC.	-
4. PINE SEEDLINGS				ONE 21-GRAM PELLET PER SEEDLING PLACED IN THE CLOSING HOLE
5. SHRUB LESPEDEZA	FIRST MAINTENANCE	20-10-6 0-10-10 0-10-10	700 LBS./AC. 700 LBS./AC.4/	-
6. TEMPORARY COVER CROPS SEEDDED ALONE	FIRST	10/10/2010	500 LBS./AC.	30 LB./ACRE/ 5/
7. WARM SEASON GRASSES	FIRST SECOND MAINTENANCE	6-12-12 6-12-12 10-10-10	1500 LBS./AC. 1000 LBS./AC. 400 LBS./AC.	50-100 LBS./AC. 2/6/ 30 LBS./AC.
8. WARM SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6-12-12 0-10-10 0-10-10	1500 LBS./AC. 1000 LBS./AC. 400 LBS./AC.	50 LBS./AC./6/

- 1/ APPLY IN SPRING FOLLOWING SEEDING.
- 2/ APPLY IN SPLIT APPLICATIONS WHEN HIGH RATES ARE USED.
- 3/ APPLY IN 3 SPLIT APPLICATIONS.
- 4/ APPLY WHEN PLANTS ARE PRUNED.
- 5/ APPLY TO GRASS SPECIES ONLY.
- 6/ APPLY WHEN PLANTS GROW TO A HEIGHT OF 2 TO 4 INCHES.

FOR BEST RESULTS TAKE AT LEAST ONE SAMPLE OF SOIL TO THE COUNTY EXTENSION AGENT FOR ANALYSIS TO DETERMINE THE BEST FERTILIZER

1. DRY STRAW OR DRY HAY OF GOOD QUALITY AND FREE OF WEED SEEDS CAN BE USED. DRY STRAW SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE. DRY HAY SHALL BE APPLIED AT A RATE OF 2 1/2 TONS PER ACRE.
2. WOOD CELLULOSE MULCH OR WOOD PULP FIBER SHALL BE USED WITH HYDRAULIC SEEDING. IT SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE. DRYSTRAW OR DRY HAY SHALL BE APPLIED (AT THE RATE INDICATED ABOVE) AFTER HYDRAULIC SEEDING.
3. ONE THOUSAND POUNDS OF WOOD CELLULOSE OR WOOD PULP FIBER, WHICH INCLUDES A TACKIFIER, SHALL BE USED WITH HYDRAULIC SEEDING ON SLOPES 3/4:1 OR STEEPER.
4. SERICEA LESPEDEZA HAY CONTAINING MATURE SEED SHALL BE APPLIED AT A RATE OF THREE TONS PER ACRE.
5. PINE STRAW OR PINE BARK SHALL BE APPLIED AT A THICKNESS OF 3 INCHES FOR BEDDING PURPOSES. OTHER SUITABLE MATERIALS IN SUFFICIENT QUANTITY MAY BE USED WHERE ORNAMENTALS OR OTHER GROUND COVERS ARE PLANTED. THIS IS NOT APPROPRIATE FOR SEEDDED AREAS.
6. WHEN USING TEMPORARY EROSION CONTROL BLANKETS OR BLOCK SOD, MULCH IS NOT REQUIRED

AGRICULTURAL LIME IS REQUIRED UNLESS SOIL TESTS INDICATE OTHERWISE. APPLY AGRICULTURAL LIME AT A RATE OF ONE TON PER ACRE. GRADED AREAS REQUIRE LIME APPLICATION. SOILS CAN BE TESTED TO DETERMINE IF FERTILIZER IS NEEDED, ON REASONABLY FERTILE SOILS OR SOIL MATERIAL. FERTILIZER IS NOT REQUIRED, FOR SOILS WITH VERY LOW FERTILITY, 500 TO 700 POUNDS OF 10-10-10 FERTILIZER OR THE EQUIVALENT PER ACRE (12-16 LBS./1,000 SQ. FT.) SHALL BE APPLIED. FERTILIZER SHOULD BE APPLIED BEFORE LAND PREPARATION AND INCORPORATED WITH A DISK, RIPPER OR CHISEL.

DS3
DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION)

DEFINITION
THE PLANTING OF PERENNIAL VEGETATION SUCH AS TREES, SHRUBS, VINES, GRASSES, OR LEGUMES ON EXPOSED AREAS FOR FINAL PERMANENT STABILIZATION. PERMANENT PERENNIAL VEGETATION SHALL BE USED TO ACHIEVE FINAL STABILIZATION.

CONDITIONS
PERMANENT PERENNIAL VEGETATION IS USED TO PROVIDE A PROTECTIVE COVER FOR EXPOSED AREAS INCLUDING OUTCROPS, FILLS, DAMS, AND OTHER DENUDED AREAS.

SPECIFICATIONS
GRADING AND SHAPING
GRADING AND SHAPING MAY NOT BE REQUIRED WHERE HYDRAULIC SEEDING AND FERTILIZING EQUIPMENT IS TO BE USED. VERTICAL BANKS SHALL BE SLOPED TO ENABLE PLANT ESTABLISHMENT. WHEN CONVENTIONAL SEEDING AND FERTILIZING ARE TO BE DONE, GRADE AND SHAPE WHERE FEASIBLE AND PRACTICAL, SO THAT EQUIPMENT CAN BE USED SAFELY AND EFFICIENTLY DURING SEEDBED PREPARATION. SEEDING, MULCHING AND MAINTENANCE OF THE VEGETATION. CONCENTRATIONS OF WATER THAT WILL CAUSE EXCESSIVE SOIL EROSION SHALL BE DIVERTED TO A SAFE OUTLET. DIVERSIONS AND OTHER TREATMENT PRACTICES SHALL CONFORM WITH THE APPROPRIATE STANDARDS AND SPECIFICATIONS.

SEEDBED PREPARATION
SEEDBED PREPARATION MAY NOT BE REQUIRED WHERE HYDRAULIC SEEDING AND FERTILIZING EQUIPMENT IS TO BE USED. WHEN CONVENTIONAL SEEDING IS TO BE USED, SEEDBED PREPARATION WILL BE DONE AS FOLLOWS:

BROADCAST PLANTINGS

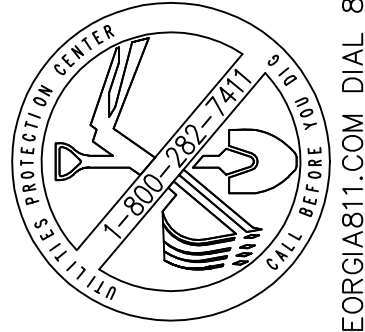
1. TILLAGE AT A MINIMUM, SHALL ADEQUATELY LOOSEN THE SOIL TO A DEPTH OF 4 TO 6 INCHES; ALLEVIATE COMPACTION; INCORPORATE LIME AND FERTILIZER; SMOOTH AND FIRM THE SOIL; ALLOW FOR THE PROPER PLACEMENT OF SEED, SPRIGS, OR PLANTS; AND ALLOW FOR THE ANCHORING OF STRAW OR HAY MULCH IF DISK IS TO BE USED.
 2. TILLAGE MAY BE DONE WITH ANY SUITABLE EQUIPMENT.
 3. TILLAGE SHOULD BE DONE ON THE CONTOUR WHERE FEASIBLE.
 4. ON SLOPES TOO STEEP FOR THE SAFE OPERATION OF TILLAGE EQUIPMENT, THE SOIL SURFACE SHALL BE PITTED OR TRENCHED ACROSS THE SLOPE WITH APPROPRIATE HAND TOOLS TO PROVIDE TWO PLACES 6 TO 8 INCHES APART IN WHICH SEED MAY LODGE AND GERMINATE. HYDRAULIC SEEDING MAY ALSO BE USED.
- INDIVIDUAL PLANTS
1. WHERE INDIVIDUAL PLANTS ARE TO BE SET, THE SOIL SHALL BE PREPARED BY EXCAVATING HOLES, OPENING FURROWS, OR DISBLE PLANTING.
 2. FOR NURSERY STOCK PLANTS, HOLES SHALL BE LARGE ENOUGH TO ACCOMMODATE ROOTS WITHOUT CROWDING.
 3. WHERE PINE SEEDLINGS ARE TO BE PLANTED, SUBSOIL UNDER THE ROW 36 INCHES DEEP ON THE CONTOUR FOUR TO SIX MONTHS PRIOR TO PLANTING. SUBSOILING SHOULD BE DONE WHEN THE SOIL IS DRY, PREFERABLY IN AUGUST OR SEPTEMBER.

PLANTING
HYDRAULIC SEEDING
MIX THE SEED (INOCULATED IF NEEDED), FERTILIZER, AND WOOD CELLULOSE OR WOOD PULP FIBER MULCH WITH WATER AND APPLY IN A SLURRY UNIFORMLY OVER THE AREA TO BE TREATED. APPLY WITHIN ONE HOUR AFTER THE MIXTURE IS MADE.

CONVENTIONAL SEEDING
SEEDING WILL BE DONE ON A FRESHLY PREPARED AND FIRMED SEEDBED. FOR BROADCAST PLANTING, USE A CULTIPACKER SEEDER, DRILL, ROTARY SEEDER, OTHER MECHANICAL SEEDER, OR HAND SEEDING TO DISTRIBUTE THE SEED UNIFORMLY OVER THE AREA TO BE TREATED. COVER THE SEED LIGHTLY WITH 1/8 TO 1/4 INCH OF SOIL FOR SMALL SEED AND 1/4 TO 1 INCH FOR LARGE SEED WHEN USING A CULTIPACKER OR OTHER SUITABLE EQUIPMENT.

NO-TILL SEEDING
NO-TILL SEEDING IS PERMISSIBLE INTO ANNUAL COVER CROPS WHEN PLANTING IS DONE FOLLOWING MATURITY OF THE COVER CROP OR IF THE TEMPORARY COVER STAND IS SPARSE ENOUGH TO ALLOW ADEQUATE GROWTH OF THE PERMANENT (PERENNIAL) SPECIES. NO-TILL SEEDING SHALL BE DONE WITH APPROPRIATE NO-TILL SEEDING EQUIPMENT. THE SEED MUST BE UNIFORMLY DISTRIBUTED AND PLANTED AT THE PROPER DEPTH.

GRASSING PERMANENT
NOT TO SCALE [Ds3]



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED HEREIN AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31113
(912) 368-5664

POOLER:
1000 Turbine Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

TR LONG
ENGINEERING, P.C.

www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS
TAX PARCEL NUMBER: CITY, COUNTY, STATE:

SHEET NAME:

EROSION CONTROL
DETAILS

REVISIONS:

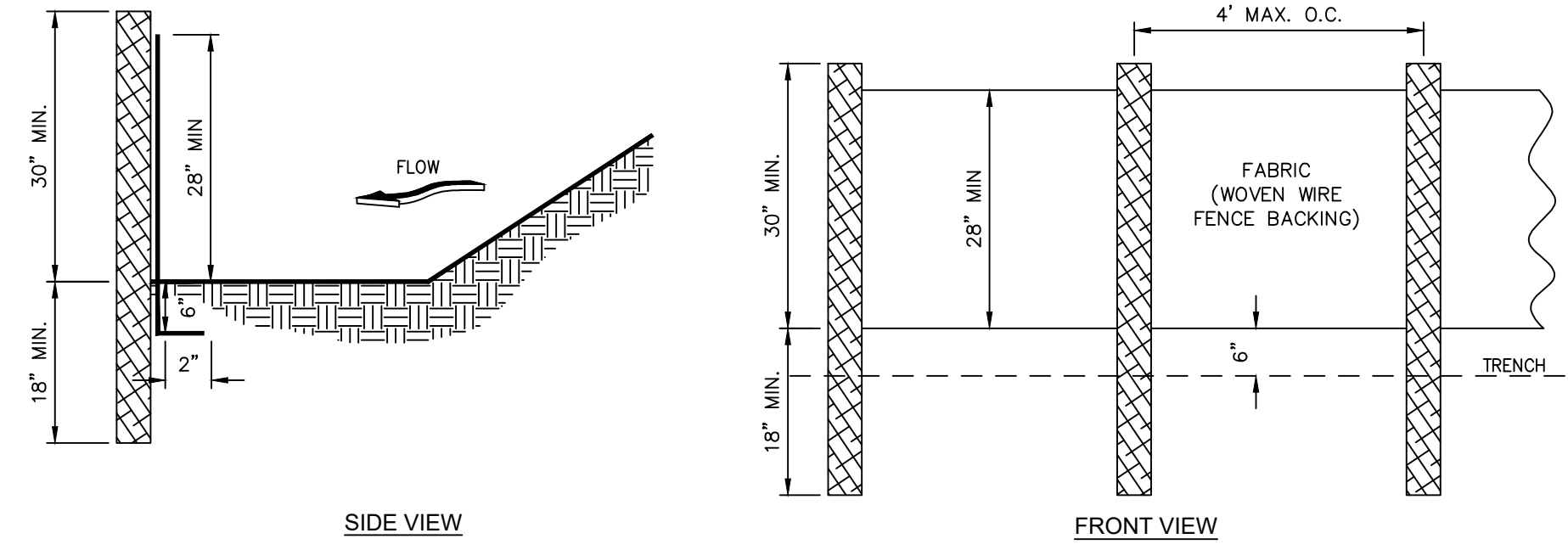
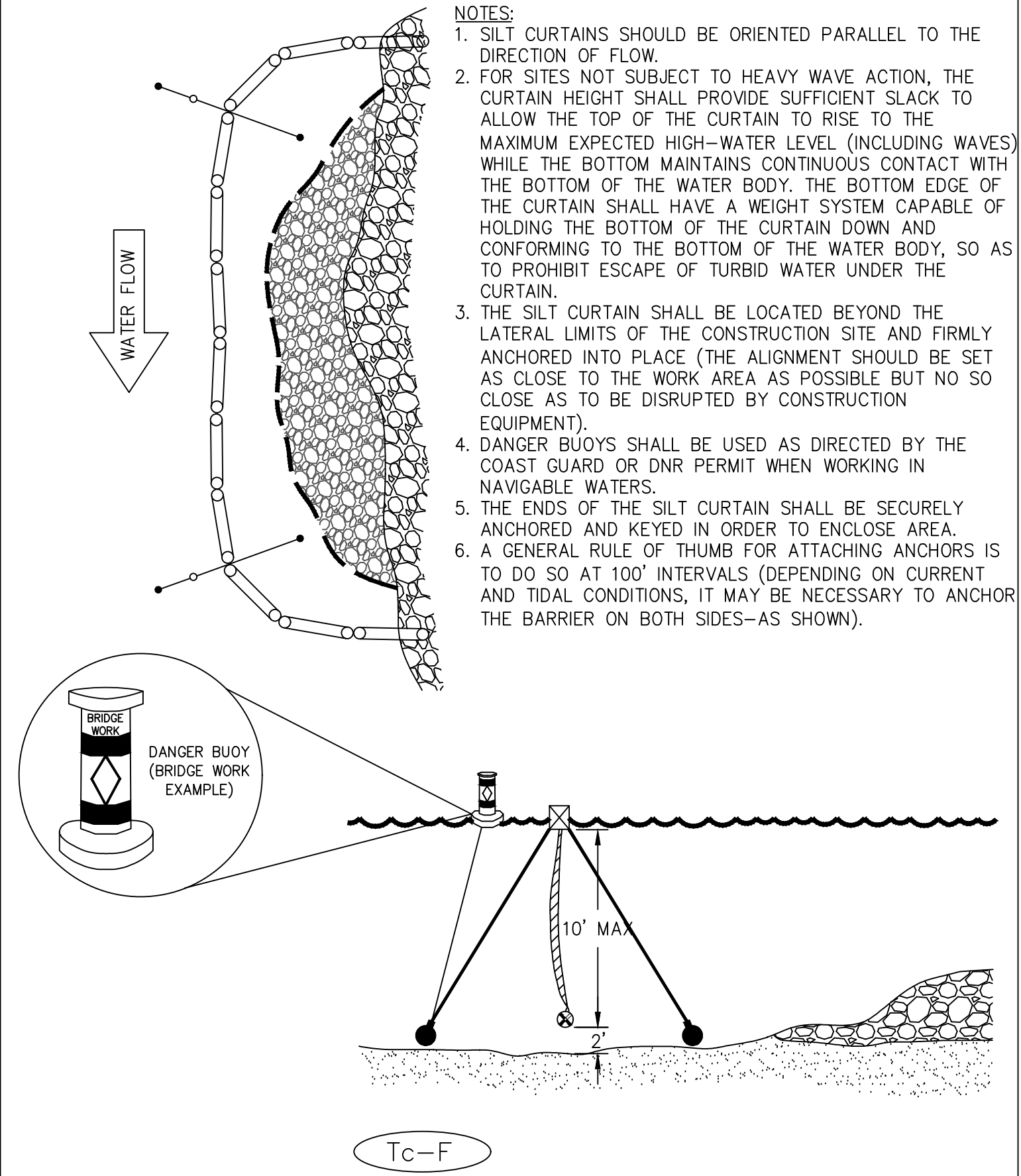
1. 6/16/2023 RID SET
2. 3/29/2024 REMID SET
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10

INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:

C6.6

ANCHOR SYSTEM AND LAYOUT DETAILS



NOTES:

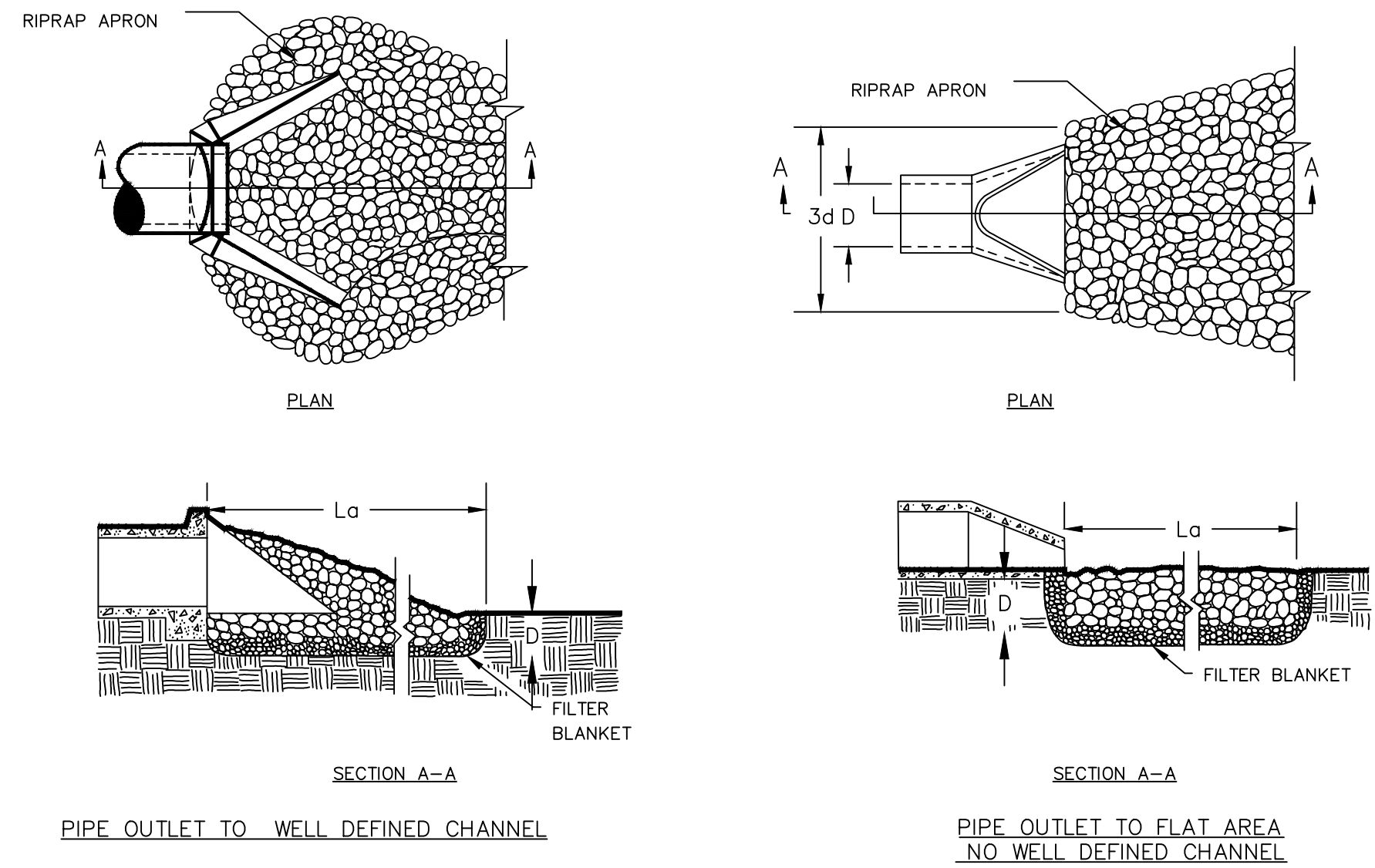
1. USE STEEL OR WOOD POSTS OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.
2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

SILT FENCE - TYPE S

Sensitive - Type C

NOT TO SCALE

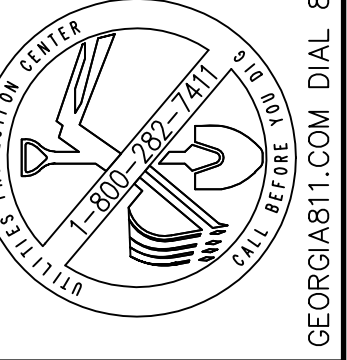
Sd1-S



NOTES:

1. L IS THE LENGTH OF THE REPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN A WELL-DEFINED CHANNEL, EXTEND TO APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAIL WATER 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

RIPRAP OUTLET PROTECTION (St)



THIS DRAWING IS THE PROPERTY OF T. R. LONG ENGINEERING, P.C. AND MAY NOT BE REPRODUCED, EITHER IN PART OR WHOLLY, IN ANY MANNER WITHOUT THE EXPRESS WRITTEN PERMISSION OF T. R. LONG ENGINEERING, P.C.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS CONTAINED WITHIN THIS SET OF DOCUMENTS AND SHALL REPORT ANY DISCREPANCIES TO T. R. LONG ENGINEERING, P.C. FOR IMMEDIATE RESOLUTION.

HINESVILLE:
114 North Commerce Street
Hinesville, Georgia 31313
(912) 368-5664

POOLER:
1000 Towne Center Blvd
Suite 304
Pooler, Georgia 31322
(912) 335-1046

TRLONG
ENGINEERING, P.C.

www.trlongeng.com

ISLANDS HWY BOX CULVERT
REPLACEMENT FOR
LIBERTY COUNTY BOARD OF
COMMISSIONERS
TAX PARCEL NUMBER: CITY, COUNTY, STATE:

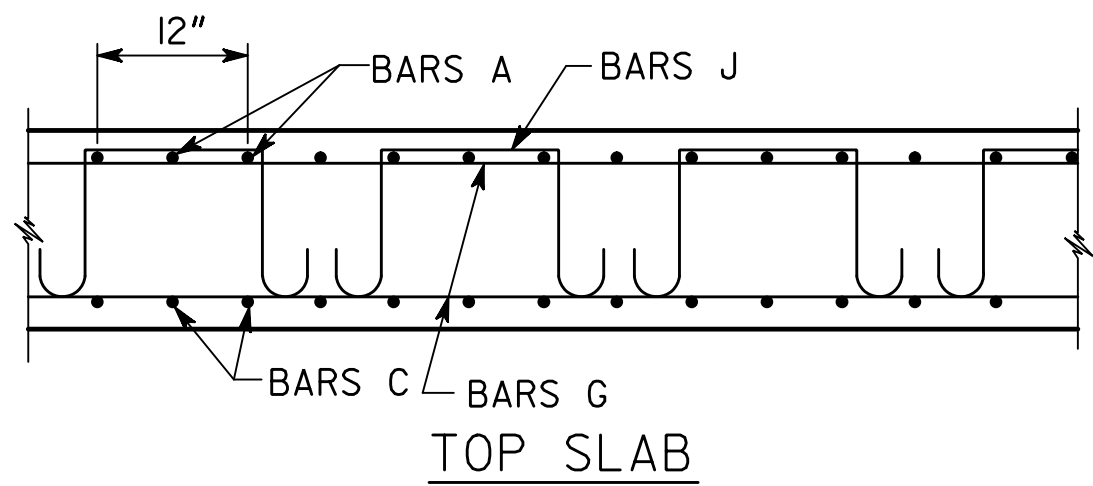
SHEET NAME:
EROSION CONTROL
DETAILS

REVISIONS:
1. 6/16/2023 BID SET
2. 3/29/2024 REBID SET
3.
4.
5.
6.
7.
8.
9.
0

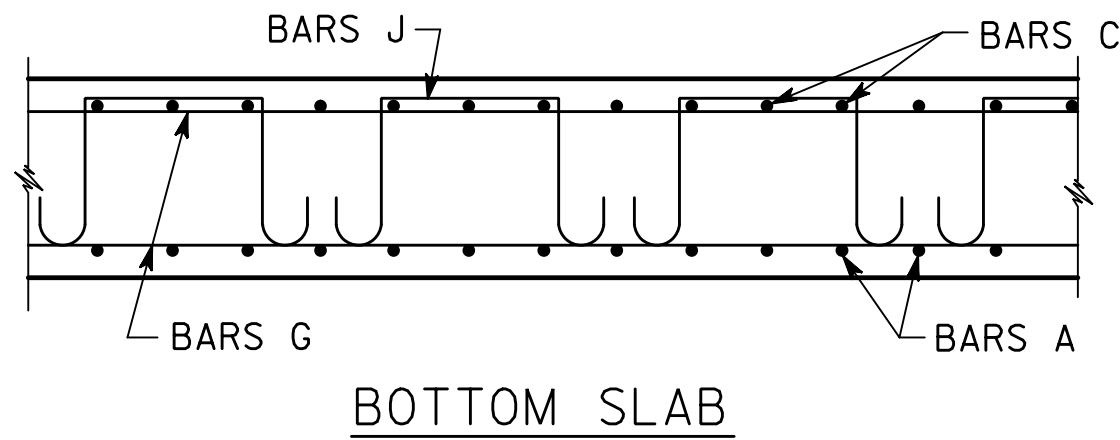
INITIAL DATE: 3/22/23
DRAWN BY: TRL
CHECKED BY: TRL
PROJECT #: 2011-05

SHEET NUMBER:

C6.7

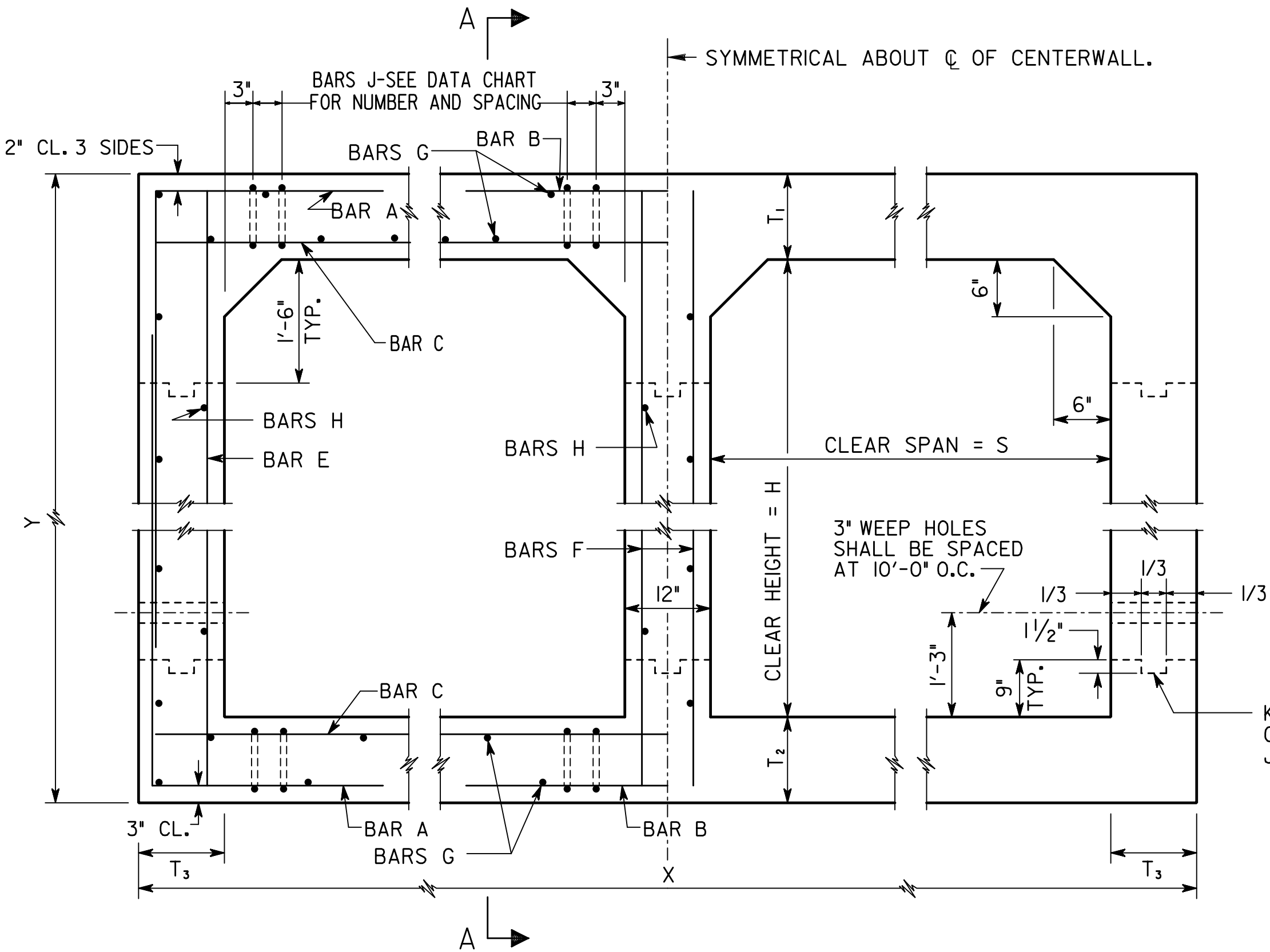


NOTE: SPACING OF BARS A AND C IS 6" OR 12". SEE BARREL REINFORCEMENT QUANTITIES AND DIMENSIONS.



NOTE: LONGITUDINAL WINGWALL AND PARAPET BARS EXTEND INTO BARREL. SEE WINGWALL AND PARAPET STANDARDS.

SECTION A-A



CULVERT SIZES ARE DESIGNATED AS CLEAR SPAN (S) X CLEAR HEIGHT (H).

* AT CONTRACTORS OPTION, THE LOWER CONSTRUCTION JOINT IN THE BARREL WALL MAY BE SHIFTED TO 6" ABOVE THE TOP OF THE BOTTOM SLAB.

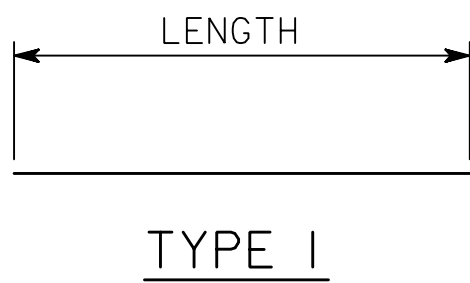
KEYED CONSTRUCTION * JOINT, TYP.

TYPICAL BARREL SECTION-ALL DESIGNS

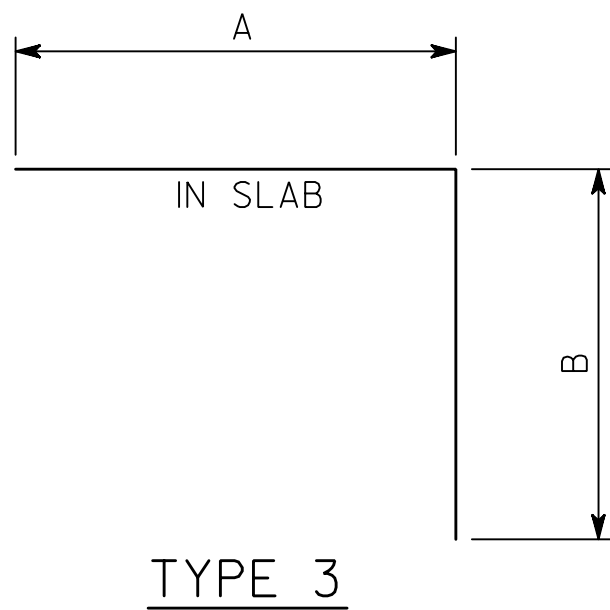
DESIGN	1	2	3	4	5	6	7	8
MAXIMUM FILL HEIGHT	10'	20'	30'	40'	50'	60'	70'	80'

- 1) MINIMUM HEIGHT FROM TOP OF CULVERT TO BOTTOM OF BASE WITHIN TRAVELWAY SHALL BE 1'-0".
- 2) DESIGN OF THE CULVERT SHALL BE DETERMINED BY THE MAXIMUM HEIGHT OF FILL WITH ONLY A SINGLE DESIGN BEING USED FOR THE ENTIRE INSTALLATION.
- 3) TRANSVERSE CONSTRUCTION JOINTS SHALL BE PLACED NORMAL TO THE CENTERLINE OF THE CULVERT AT THE OUTSIDE SHOULDER BREAK POINTS. THE MAXIMUM POUR LENGTH ALONG THE LENGTH OF THE CULVERT SHALL NOT EXCEED 40'-0" FOR DESIGNS 1 TO 3 AND 30'-0" FOR DESIGNS 4 AND ABOVE.
- 4) LONGITUDINAL BARREL REINFORCEMENT STEEL IN THE TRANSVERSE CONSTRUCTION JOINTS SHALL EXTEND THROUGH JOINTS.
- 5) CONSTRUCTION JOINTS SHALL BE WATERPROOFED ON THE EXTERIOR TOP AND SIDES OF BARREL IN ACCORDANCE WITH SECTION 530 OF GEORGIA STANDARD SPECIFICATIONS. WATERPROOFING SHALL BE APPLIED WHEN CONCRETE IS AT LEAST 7 DAYS OLD. ALL COSTS ASSOCIATED WITH WATERPROOFING SHALL BE INCLUDED IN OTHER ITEMS AND WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.
- 6) MINIMUM LENGTH OF LAP SPICE FOR LONGITUDINAL BARREL REINFORCING STEEL SHALL BE 2'-0".

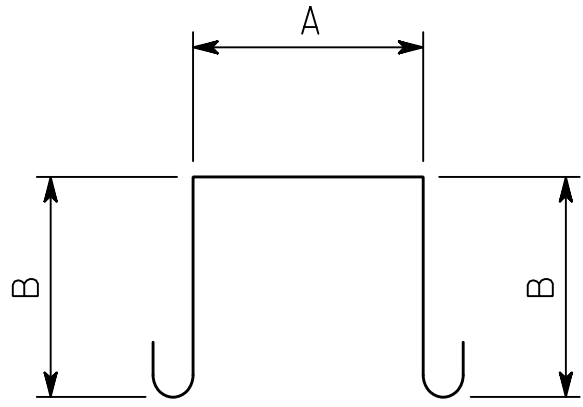
FOR BAR DIMENSIONS SEE BAR REINFORCEMENT DETAILS. NUMBER OF J BARS SHOWN IN DATA CHART IS THE NUMBER PER CORNER IN ANY ONE TRANSVERSE PLANE. THE TOTAL NUMBER OF J BARS REQUIRED DEPENDS UPON THE LENGTH OF THE SECTION.



TYPE 1



TYPE 3



TYPE 6

A = 12" + DIAMETER BAR A + 1"
B = T₁ - 3"

GENERAL NOTES

- 1) SPECIFICATIONS: GEORGIA STANDARD, CURRENT EDITION & SUPPLEMENTS THERETO.
- 2) ALL CONCRETE SHALL BE CLASS "AA".
- 3) CHAMFER ALL EXPOSED EDGES 3/4".
- 4) COST OF DRAIN PIPES, WEEP HOLES, COARSE AGGREGATE, AND ANY OTHER INCIDENTAL ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CONTRACT ITEMS.
- 5) CONSTRUCTION JOINTS IN BARREL WALLS ARE REQUIRED.
- 6) FOR DETAILS OF WINGWALLS AND PARAPETS SEE "REINFORCED CONCRETE WINGWALLS, TOEWALLS AND PARAPETS FOR CONCRETE BOX CULVERTS" SHEETS.

DESIGN DATA

SPECIFICATIONS - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION, 2014. TYPICAL HL-93 LOADING.

	DATE	DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA	
	REVISION	STANDARD REINFORCED CONCRETE DOUBLE BOX CULVERT	
		NO SCALE	SEPTEMBER 2017
BY	DES. YSK. DRW. FGS. TRA. _____ CHK. JWB.	(SUBMITTED) STATE DESIGN POLICY ENGINEER (APPROVED) <i>Margaret B. Pivelo</i> CHIEF ENGINEER	NUMBER 2402 SHEET 1 OF 3

								STATE	PROJECT NUMBER		SHEET NO.	TOTAL SHEETS
								GA.				

DOUBLE 10'-0" X 9'-0" BOX CULVERT								
BARREL REINFORCEMENT QUANTITIES AND DIMENSIONS								
DESIGN	1	2	3	4	5	6	7	8
BAR A	480A @ 6"	479A @ 6"	715A @ 12"	573A @ 6"	576A @ 6"			
BAR B	558 @ 6"	632 @ 6"	723 @ 6"	728 @ 6"	807 @ 6"			
BAR C	743 @ 12"	571 @ 6"	644 @ 6"	645 @ 6"	646 @ 6"			
BAR E	457 @ 12"	459 @ 12"	461 @ 12"	553 @ 12"	555 @ 12"			
BAR F	457 @ 12"	459 @ 12"	461 @ 12"	463 @ 12"	465 @ 12"			
BAR G IN 2 SLABS	64 - 401	68 - 401	68 - 401	80 - 401	80 - 401			
BAR H IN 3 WALLS	38 - 402	38 - 402	38 - 402	50 - 402	50 - 402			
BAR J IN EXT. CORNER	0	0	0	0	0			
BAR J IN INT. CORNER	0	3-425B @ 10¼"	3-428B @ 11½"	4-433B @ 13"	4-436B @ 12"			
T ₁	14"	16"	18"	20"	22"			
T ₂	15"	17"	19"	21"	23"			
T ₃	14"	16"	18"	20"	22"			
X	23'-4"	23'-8"	24'-0"	24'-4"	24'-8"			
Y	11'-5"	11'-9"	12'-1"	12'-5"	12'-9"			
YD³ CLASS AA CONCRETE/FT	3.218	3.651	4.093	4.542	5.000			
LB BAR REINF STEEL/FT	317.5	364.0	474.7	518.6	555.9			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 90° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	11.0	11.4	11.9	12.4	12.8			
LB BAR REINF STEEL	1441	1477	1475	1674	1672			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 75° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	11.4	11.9	12.4	12.8	13.3			
LB BAR REINF STEEL	1778	1818	1820	2027	2029			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 60° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	12.7	13.3	13.8	14.3	14.9			
LB BAR REINF STEEL	1881	1923	1926	2136	2140			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 45° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	15.7	16.3	16.9	17.6	18.3			
LB BAR REINF STEEL	2128	2172	2178	2395	2402			

DOUBLE 10'-0" X 10'-0" BOX CULVERT								
BARREL REINFORCEMENT QUANTITIES AND DIMENSIONS								
DESIGN	1	2	3	4	5	6	7	8
BAR A	575A @ 12"	484A @ 6"	578A @ 6"	580A @ 6"	610A @ 6"			
BAR B	555 @ 6"	631 @ 6"	727 @ 6"	724 @ 6"	806 @ 6"			
BAR C	743 @ 12"	571 @ 6"	644 @ 6"	645 @ 6"	646 @ 6"			
BAR E	463 @ 12"	555 @ 12"	557 @ 12"	468 @ 6"	469 @ 6"			
BAR F	463 @ 12"	465 @ 12"	467 @ 12"	468 @ 12"	469 @ 12"			
BAR G IN 2 SLABS	64 - 401	68 - 401	68 - 401	80 - 401	80 - 401			
BAR H IN 3 WALLS	42 - 402	42 - 402	42 - 402	50 - 402	50 - 402			
BAR J IN EXT. CORNER	0	0	0	0	3-434B @ 14½"			
BAR J IN INT. CORNER	0	3-425B @ 10¼"	3-431B @ 11½"	4-433B @ 13"	4-436B @ 11¾"			
T ₁	14"	16"	18"	20"	22"			
T ₂	15"	17"	19"	21"	23"			
T ₃	14"	16"	18"	20"	22"			
X	23'-4"	23'-8"	24'-0"	24'-4"	24'-8"			
Y	12'-5"	12'-9"	13'-1"	13'-5"	13'-9"			
YD³ CLASS AA CONCRETE/FT	3.342	3.787	4.241	4.703	5.173			
LB BAR REINF STEEL/FT	308.1	382.8	502.2	536.0	652.2			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 90° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	11.2	11.7	12.2	12.7	13.2			
LB BAR REINF STEEL	1467	1503	1501	1674	1672			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 75° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	11.7	12.2	12.7	13.2	13.7			
LB BAR REINF STEEL	1805	1845	1847	2027	2029			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 60° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	13.0	13.6	14.1	14.7	15.3			
LB BAR REINF STEEL	1909	1950	1954	2136	2140			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 45° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	16.0	16.7	17.4	18.0	18.8			
LB BAR REINF STEEL	2157	2201	2207	2395	2402			

DOUBLE 10'-0" X 12'-0" BOX CULVERT								
BARREL REINFORCEMENT QUANTITIES AND DIMENSIONS								
DESIGN	1	2	3	4	5	6	7	8
BAR A	485A @ 6"	717A @ 12"	584A @ 6"	612A @ 6"	613A @ 6"			
BAR B	547 @ 6"	619 @ 6"	719 @ 6"	719 @ 6"	802 @ 6"			
BAR C	743 @ 12"	571 @ 6"	644 @ 6"	645 @ 6"	646 @ 6"			
BAR E	561 @ 12"	473 @ 6"	474 @ 6"	736 @ 12"	737 @ 12"			
BAR F	471 @ 12"	473 @ 12"	474 @ 12"	475 @ 12"	476 @ 12"			
BAR G IN 2 SLABS	64 - 401	68 - 401	68 - 401	80 - 401	80 - 401			
BAR H IN 3 WALLS	50 - 402	50 - 402	50 - 402	66 - 402	66 - 402			
BAR J IN EXT. CORNER	0	0	0	0	3-434B @ 14½"			
BAR J IN INT. CORNER	0	3-425B @ 10¼"	3-431B @ 11½"	4-433B @ 13"	5-436B @ 11½"			
T ₁	14"	16"	18"	20"	22"			
T ₂	15"	17"	19"	21"	23"			
T ₃	14"	16"	18"	20"	22"			
X	23'-4"	23'-8"	24'-0"	24'-4"	24'-8"			
Y	14'-5"	14'-9"	15'-1"	15'-5"	15'-9"			
YD³ CLASS AA CONCRETE/FT	3.588	4.059	4.537	5.024	5.519			
LB BAR REINF STEEL/FT	353.0	455.1	535.0	653.6	719.4			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 90° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	11.8	12.3	12.9	13.4	13.9			
LB BAR REINF STEEL	1543	1579	1577	1802	1800			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 75° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	12.3	12.8	13.3	13.9	14.5			
LB BAR REINF STEEL	1883	1923	1925	2159	2162			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 60° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	13.7	14.3	14.9	15.5	16.1			
LB BAR REINF STEEL	1988	2029	2033	2271	2275			
PARAPET, BARREL END, AND TOEWALL QUANTITIES - 45° SKEW - TOTAL								
YD³ CLASS AA CONCRETE	16.8	17.6	18.3	19.1	19.8			
LB BAR REINF STEEL	2239	2283	2289	2536	2542			

			DATE	DEPARTMENT OF TRANSPORTATION								
				STATE OF GEORGIA								
			REVISION	STANDARD								
				REINFORCED CONCRETE								
				DOUBLE BOX CULVERT								
				10'X9', 10'X10', 10'X11' AND 10'X12'								
				NO SCALE								
				SEPTEMBER 2017								
		BY	DES. YSK DRW. FGS TRA. CHK. JWB	(SUBMITTED) <i>B. A. H.</i> STATE DESIGN POLICY ENGINEER (APPROVED) <i>Margaret B. Puelo</i> CHIEF ENGINEER	NUMBER 2402				SHEET 2-N OF			

MARK	LENGTH	TYPE
401	L* - 4"	I
402	L* + 20"	I
403	3'-7"	I
404	3'-9"	I
405	3'-11"	I
406	4'-0"	I
407	4'-1"	I
408	4'-2"	I
409	4'-3"	I
410	4'-4"	I
411	4'-6"	I
412	4'-8"	I
413	4'-10"	I
414	5'-0"	I
415	5'-2"	I
416	5'-4"	I
417	5'-6"	I
418	5'-8"	I
419	5'-10"	I
420	6'-0"	I
421	6'-2"	I
422	6'-4"	I
423	6'-5"	I
424	6'-6"	I
425	6'-8"	I
426	6'-10"	I
427	6'-11"	I
428	7'-0"	I
429	7'-2"	I
430	7'-3"	I
431	7'-4"	I
432	7'-6"	I
433	7'-7"	I
434	7'-8"	I
435	7'-9"	I
436	7'-10"	I
437	8'-0"	I
438	8'-2"	I
439	8'-3"	I
440	8'-4"	I
441	8'-6"	I
442	8'-8"	I
443	8'-10"	I
444	9'-0"	I
445	9'-2"	I
446	9'-3"	I
447	9'-4"	I
448	9'-6"	I
449	9'-8"	I
450	9'-10"	I
451	10'-0"	I
452	10'-2"	I
453	10'-4"	I
454	10'-6"	I
455	10'-8"	I
456	10'-10"	I
457	11'-0"	I
458	11'-2"	I
459	11'-4"	I
460	11'-6"	I
461	11'-8"	I
462	11'-10"	I
463	12'-0"	I
464	12'-2"	I
465	12'-4"	I
466	12'-6"	I
467	12'-8"	I
468	13'-0"	I
469	13'-4"	I
470	13'-8"	I
471	14'-0"	I
472	14'-2"	I
473	14'-4"	I
474	14'-8"	I
475	15'-0"	I
476	15'-4"	I
477	16'-4"	I
478	18'-8"	I
479	18'-10"	I

MARK	LENGTH	TYPE
480	21'-0"	I
481	21'-2"	I
482	23'-0"	I
501	4'-0"	I
502	4'-2"	I
503	4'-5"	I
504	4'-9"	I
505	4'-10"	I
506	5'-0"	I
507	5'-2"	I
508	5'-4"	I
509	5'-6"	I
510	5'-8"	I
511	5'-9"	I
512	5'-10"	I
513	6'-0"	I
514	6'-2"	I
515	6'-4"	I
516	6'-5"	I
517	6'-7"	I
518	6'-11"	I
519	7'-0"	I
520	7'-1"	I
521	7'-2"	I
522	7'-3"	I
523	7'-4"	I
524	7'-5"	I
525	7'-6"	I
526	7'-7"	I
527	7'-8"	I
528	7'-9"	I
529	7'-10"	I
530	7'-11"	I
531	8'-0"	I
532	8'-2"	I
533	8'-4"	I
534	8'-6"	I
535	8'-8"	I
536	8'-10"	I
537	9'-0"	I
538	9'-2"	I
539	9'-4"	I
540	9'-6"	I
541	9'-10"	I
542	10'-0"	I
543	10'-2"	I
544	10'-4"	I
545	10'-8"	I
546	10'-10"	I
547	11'-0"	I
548	11'-2"	I
549	11'-4"	I
550	11'-6"	I
551	11'-8"	I
552	11'-10"	I
553	12'-0"	I
554	12'-2"	I
555	12'-4"	I
556	12'-6"	I
557	12'-8"	I
558	13'-0"	I
559	13'-6"	I
560	13'-10"	I
561	14'-0"	I
562	14'-2"	I
563	14'-4"	I
564	14'-6"	I
565	14'-8"	I
566	16'-2"	I
567	16'-4"	I
568	16'-6"	I
569	19'-0"	I
570	21'-4"	I
571	23'-4"	I
572	23'-8"	I

• L = LENGTH OF CULVERT

MARK	LENGTH	TYPE
601	4'-9"	I
602	5'-3"	I
603	5'-6"	I
604	5'-7"	I
605	5'-8"	I
606	6'-2"	I
607	6'-4"	I
608	6'-7"	I
609	6'-11"	I
610	7'-3"	I
611	7'-4"	I
612	8'-0"	I
613	8'-4"	I
614	8'-10"	I
615	9'-2"	I
616	9'-4"	I
617	9'-6"	I
618	10'-1"	I
619	10'-2"	I
620	10'-6"	I
621	10'-8"	I
622	11'-10"	I
623	11'-2"	I
624	11'-3"	I
625	11'-6"	I
626	11'-8"	I
627	11'-10"	I
628	12'-2"	I
629	12'-3"	I
630	12'-5"	I
631	12'-8"	I
632	13'-0"	I
633	13'-6"	I
634	13'-8"	I
635	14'-0"	I
636	14'-2"	I
637	14'-8"	I
638	16'-8"	I
639	16'-10"	I
640	19'-2"	I
641	19'-4"	I
642	21'-6"	I
643	21'-8"	I
644	23'-8"	I
645	24'-0"	I
646	24'-4"	I

MARK	LENGTH	TYPE
701	7'-8"	I
702	7'-10"	I
703	8'-4"	I
704	8'-6"	I
705	8'-8"	I
706	8'-10"	I
707	9'-0"	I
708	9'-2"	I
709	9'-3"	I
710	9'-4"	I
711	9'-6"	I
712	9'-8"	I
713	9'-10"	I
714	10'-0"	I
715	10'-2"	I
716	10'-4"	I
717	10'-8"	I
718	11'-0"	I
719	11'-4"	I
720	11'-6"	I
721	11'-8"	I
722	11'-10"	I
723	12'-0"	I
724	12'-2"	I
725	12'-3"	I
726	12'-4"	I
727	12'-6"	I
728	12'-8"	I
729	13'-0"	I
730	13'-2"	I
731	13'-4"	I
732	13'-6"	I
733	13'-8"	I
734	14'-0"	I
735	14'-4"	I
736	15'-0"	I
737	15'-4"	I
738	16'-2"	I
739	18'-8"	I
740	18'-10"	I
741	21'-0"	I
742	21'-2"	I
743	23'-0"	I
801	10'-4"	I
802	11'-0"	I
803	11'-3"	I
804	11'-6"	I
805	11'-8"	I
806	12'-0"	I
807	12'-4"	I
808	12'-8"	I
809	13'-0"	I
810	13'-2"	I
811	13'-4"	I

MARK	LENGTH	TYPE	A	B
401A	4'-2"	3	1'-7"	2'-7"
402A	4'-3"	3	1'-8"	2'-7"
403A	4'-4"	3	1'-8"	2'-8"
404A	4'-4"	3	1'-9"	2'-7"
405A	4'-5"	3	1'-9"	2'-8"
406A	4'-6"	3	1'-10"	2'-8"
407A	4'-7"	3	1'-10"	2'-9"
408A	4'-8"	3	2'-1"	2'-9"
409A	4'-9"	3	2'-0"	2'-9"
410A	5'-0"	3	2'-2"	2'-10"
411A	5'-4"	3	1'-9"	3'-7"
412A	5'-5"	3	1'-9"	3'-8"
413A	5'-6"	3	1'-10"	3'-8"
414A	5'-8"	3	1'-11"	3'-9"
415A	5'-8"	3	2'-1"	3'-7"
416A	5'-9"	3	2'-0"	3'-9"
417A	6'-0"	3	2'-2"	3'-10"
418A	6'-0"	3	2'-4"	3'-8"
419A	6'-3"	3	2'-4"	3'-11"
420A	6'-6"	3	1'-11"	4'-7"
421A	6'-6"	3	2'-6"	4'-0"
422A	6'-7"	3	2'-0"	4'-7"
423A	6'-8"	3	2'-0"	4'-8"
424A	6'-9"	3	2'-0"	4'-9"
425A	6'-9"	3	2'-1"	4'-8"
426A	6'-9"	3	2'-8"	4'-11"
427A	6'-10"	3	2'-1"	4'-9"
428A	6'-10"	3	2'-3"	4'-7"
429A	6'-11"	3	2'-2"	4'-9"
430A	6'-11"	3	2'-3"	4'-8"
431A	7'-0"	3	2'-2"	4'-10"
432A	7'-1"	3	2'-3"	4'-10"
433A	7'-1"	3	2'-11"	4'-2"
434A	7'-5"	3	3'-2"	4'-3"
435A	7'-6"	3	3'-5"	4'-1"
436A	7'-7"	3	2'-7"	5'-0"
437A	7'-9"	3	2'-2"	5'-7"
438A	7'-10"	3	2'-2"	5'-8"
439A	7'-10"	3	2'-3"	5'-7"
440A	7'-10"	3	2'-9"	5'-11"
441A	7'-10"	3	3'-3"	4'-7"
442A	8'-0"	3	2'-3"	5'-9"
443A	8'-1"	3	2'-4"	5'-9"
444A	8'-2"	3	3'-0"	5'-2"
445A	8'-3"	3	2'-5"	5'-10"
446A	8'-3"	3	2'-7"	5'-8"
447A	8'-3"	3	2'-8"	5'-7"
448A	8'-4"	3	3'-1"	5'-3"
449A	8'-5"	3	3'-4"	5'-11"
450A	8'-6"	3	3'-3"	5'-3"
451A	8'-8"	3	2'-8"	6'-0"
452A	8'-10"	3	3'-3"	5'-7"
453A	8'-11"	3	2'-10"	6'-11"
454A	9'-1"	3	2'-5"	6'-8"
455A	9'-1"	3	2'-6"	6'-7"
456A	9'-2"	3	2'-5"	6'-9"
457A	9'-3"	3	3'-1"	6'-2"
458A	9'-4"	3	2'-7"	6'-9"
459A	9'-5"	3	3'-2"	6'-3"
460A	9'-5"	3	3'-4"	6'-11"
461A	9'-6"	3	3'-3"	6'-3"
462A	9'-10"	3	2'-10"	7'-0"
463A	9'-11"	3	3'-3"	6'-8"
464A	10'-1"	3	3'-0"	7'-11"
465A	10'-4"	3	3'-2"	7'-2"
466A	10'-5"	3	2'-2"	7'-7"
467A	10'-6"	3	2'-10"	7'-8"
468A	10'-6"	3	2'-11"	7'-7"
469A	10'-7"	3	2'-10"	7'-9"
470A	10'-7"	3	3'-4"	7'-3"
471A	10'-8"	3	3'-5"	7'-3"
472A	10'-9"	3	4'-2"	6'-7"
473A	11'-1"	3	3'-1"	8'-0"
474A	11'-6"	3	3'-4"	8'-2"
475A	11'-9"	3	3'-6"	8'-3"
476A	12'-4"	3	3'-4"	9'-0"
477A	12'-5"	3	4'-9"	7'-8"
478A	12'-9"	3	3'-7"	9'-2"

MARK	LENGTH	TYPE	A	B
479A	13'-0"	3	3'-9"	9'-3"
480A	13'-5"	3	4'-4"	9'-11"
481A	13'-7"	3	3'-7"	10'-0"
482A	13'-8"	3	3'-9"	9'-11"
483A	14'-0"	3	3'-10"	10'-2"
484A	14'-2"	3	3'-11"	10'-3"
485A	16'-8"	3	4'-7"	12'-1"
486A	18'-11"	3	7'-0"	11'-11"
501A	4'-4"	3	1'-9"	2'-7"
502A	4'-8"	3	2'-1"	2'-7"
503A	5'-3"	3	2'-4"	2'-11"
504A	5'-6"	3	1'-11"	3'-7"
505A	5'-8"	3	2'-11"	3'-7"
506A	6'-3"	3	2'-4"	3'-11"
507A	6'-6"	3	2'-6"	4'-0"
508A	6'-8"	3	2'-11"	4'-7"
509A	6'-10"	3	2'-11"	3'-11"
510A	7'-0"	3	2'-5"	4'-7"
511A	7'-0"	3	2'-10"	4'-2"
512A	7'-3"	3	2'-4"	4'-11"
513A	7'-4"	3	3'-3"	4'-11"
514A	7'-5"	3	3'-2"	4'-3"
515A	7'-6"	3	2'-6"	5'-0"
516A	7'-7"	3	3'-3"	4'-4"
517A	7'-9"	3	2'-10"	4'-11"
518A	7'-11"	3	2'-4"	5'-7"
519A	8'-0"	3	2'-4"	5'-8"
520A	8'-0"	3	3'-7"	4'-5"
521A	8'-11"	3	2'-5"	5'-8"
522A	8'-3"	3	2'-6"	5'-9"
523A	8'-3"	3	3'-2"	5'-11"
524A	8'-4"	3	3'-9"	4'-7"
525A	8'-5"	3	2'-6"	5'-11"
526A	8'-5"	3	3'-2"	5'-3"
527A	8'-7"	3	3'-3"	5'-4"
528A	8'-8"	3	2'-8"	6'-0"
529A	8'-11"	3	3'-0"	5'-11"
530A	9'-0"	3	3'-7"	5'-5"
531A	9'-3"	3	3'-2"	6'-11"
532A	9'-4"	3	2'-8"	6'-8"
533A	9'-5"	3	3'-2"	6'-3"
534A	9'-5"	3	3'-10"	5'-7"
535A	9'-6"	3	2'-8"	6'-10"
536A	9'-6"	3	2'-9"	6'-9"
537A	9'-7"	3	2'-8"	6'-11"
538A	9'-8"	3	2'-9"	6'-11"
539A	9'-8"	3	3'-4"	6'-4"
540A	9'-10"	3	4'-11"	5'-9"
541A	10'-0"	3	3'-7"	6'-5"
542A	10'-2"	3	3'-2"	7'-0"
543A	10'-3"	3	3'-2"	7'-11"
544A	10'-3"	3	3'-4"	6'-11"
545A	10'-4"	3	3'-2"	7'-2"
546A	10'-5"	3	3'-10"	6'-7"
547A	10'-6"	3	2'-11"	7'-7"
548A	10'-7"	3	2'-11"	7'-8"
549A	10'-7"	3	3'-4"	7'-3"
550A	10'-7"	3	3'-6"	7'-11"
551A	10'-8"	3	2'-10"	7'-10"
552A	10'-8"	3	2'-11"	7'-9"
553A	10'-9"	3	3'-5"	7'-4"
554A	10'-10"	3	3'-0"	7'-10"
555A	10'-11"	3	3'-0"	7'-11"
556A	10'-11"	3	4'-2"	6'-9"
557A	11'-0"	3	3'-7"	7'-5"
558A	11'-11"	3	3'-2"	7'-11"
559A	11'-5"	3	3'-4"	8'-11"
560A	11'-7"	3	3'-5"	8'-2"
561A	11'-7"	3	4'-0"	7'-7"
562A	11'-11"	3	3'-7"	8'-4"
563A	11'-11"	3	3'-8"	8'-3"
564A	12'-0"	3	3'-11"	8'-11"
565A	12'-0"	3	4'-3"	7'-9"
566A	12'-3"	3	3'-10"	8'-5"
567A	12'-8"	3	4'-11"	8'-7"

WINGWALLS, TOEWALLS AND PARAPETS

CLEAR HEIGHT	N BARS AT 1'-0" C. TO C.						P BARS AT 1'-0" C. TO C.						R BARS AT 1'-0" C. TO C.				M BARS			CLEAR HEIGHT
	SIZE	NO. (CONSTANT LENGTH)	* LENGTH	NO. (VARIABLE LENGTH)	LENGTH *		SIZE	NO. (CONSTANT LENGTH)	LENGTH	NO. (VARIABLE LENGTH)	LENGTH		SIZE	NO. (VARIABLE LENGTH)	LENGTH **		SIZE	NO. (CONSTANT LENGTH)	LENGTH	
					SHORTEST	LONGEST					SHORTEST	LONGEST			SHORTEST	LONGEST				
2'	#4	4	5'-4"	12	4'-4"	5'-2"	#4	20	3'-5"	4	1'-2"	1'-2"	#6	32	3'-6"	3'-6"	#6	14	X+2"	2'
3'	#4	4	6'-7"	24	4'-4"	6'-5"	#4	20	6'-4"	8	1'-9"	4'-2"	#6	56	3'-6"	3'-6"	#6	14	X+2"	3'
4'	#5	4	8'-2"	40	4'-5"	8'-2"	#4	20	9'-10"	12	2'-11"	7'-9"	#6	88	3'-6"	3'-6"	#6	14	X+2"	4'
5'	#5	4	9'-11"	44	4'-11"	9'-0"	#4	20	11'-3"	16	2'-11"	10'-4"	#6	96	3'-6"	3'-6"	#6	14	X+2"	5'
6'	#5	4	10'-2"	48	5'-5"	9'-11"	#4	24	12'-7"	16	2'-11"	10'-5"	#6	104	3'-6"	3'-6"	#6	14	X+2"	6'
7'	#5	4	11'-2"	56	5'-11"	11'-2"	#4	24	13'-11"	20	3'-0"	13'-0"	#6	120	3'-6"	3'-6"	#6	14	X+2"	7'
8'	#6	4	12'-4"	60	6'-6"	12'-3"	#4	28	15'-2"	24	3'-2"	13'-0"	#6	128	3'-8"	4'-0"	#6	14	X+2"	8'
9'	#6	4	13'-5"	64	7'-0"	13'-2"	#4	28	16'-6"	24	3'-4"	15'-7"	#6	136	3'-8"	4'-6"	#6	14	X+2"	9'
10'	#7	4	14'-7"	72	7'-8"	14'-7"	#4	32	17'-9"	24	3'-4"	15'-7"	#6	152	3'-8"	5'-0"	#6	14	X+2"	10'
11'	#7	4	15'-7"	76	8'-2"	15'-6"	#4	32	19'-1"	28	3'-4"	18'-2"	#6	160	3'-8"	5'-6"	#6	14	X+2"	11'
12'	#8	4	16'-8"	80	8'-9"	16'-6"	#4	36	20'-5"	28	3'-5"	18'-3"	#6	168	3'-8"	6'-0"	#6	14	X+2"	12'

* LENGTH INCLUDES VERTICAL LEG, HORIZONTAL LEG AND 180° STANDARD HOOK.

** LENGTH INCLUDES 2 STANDARD 180° HOOKS.

X = TOTAL BARREL WIDTH OUT TO OUT (DIMENSION "X" FROM CULVERT SHEET)

Y = TOTAL BARREL HEIGHT OUT TO OUT (DIMENSION "Y" FROM CULVERT SHEET)

GENERAL NOTES

- 1) SPECIFICATIONS: GEORGIA STANDARD, CURRENT EDITION & SUPPLEMENTS THERETO.
- 2) MAINTAIN 3" CLEARANCE ON REINFORCEMENT AT FACE OF CONCRETE CAST AGAINST EARTH. MAINTAIN 2" CLEARANCE ON ALL OTHER REINFORCEMENT.
- 3) CHAMFER ALL EXPOSED EDGES $\frac{3}{4}$ ".
- 4) CONCRETE APRONS (SEPARATE STANDARD SHEETS) ARE REQUIRED AT ALL OUTLETS. THE ENGINEER MAY ALLOW AN EXCEPTION FOR BED ROCK CONDITIONS. TOEWALLS UNDER PARAPETS MAY BE MODIFIED AT OUTLETS AS SHOWN ON STANDARDS FOR CONCRETE APRONS.
- 5) PARAPETS AT INLETS SHALL BE CONSTRUCTED WITH A 4°/45° BEVEL.
- 6) CULVERT TO HAVE MINIMUM OF 1'-0" BELOW BOTTOM OF BASE OR CONCRETE PAVEMENT.

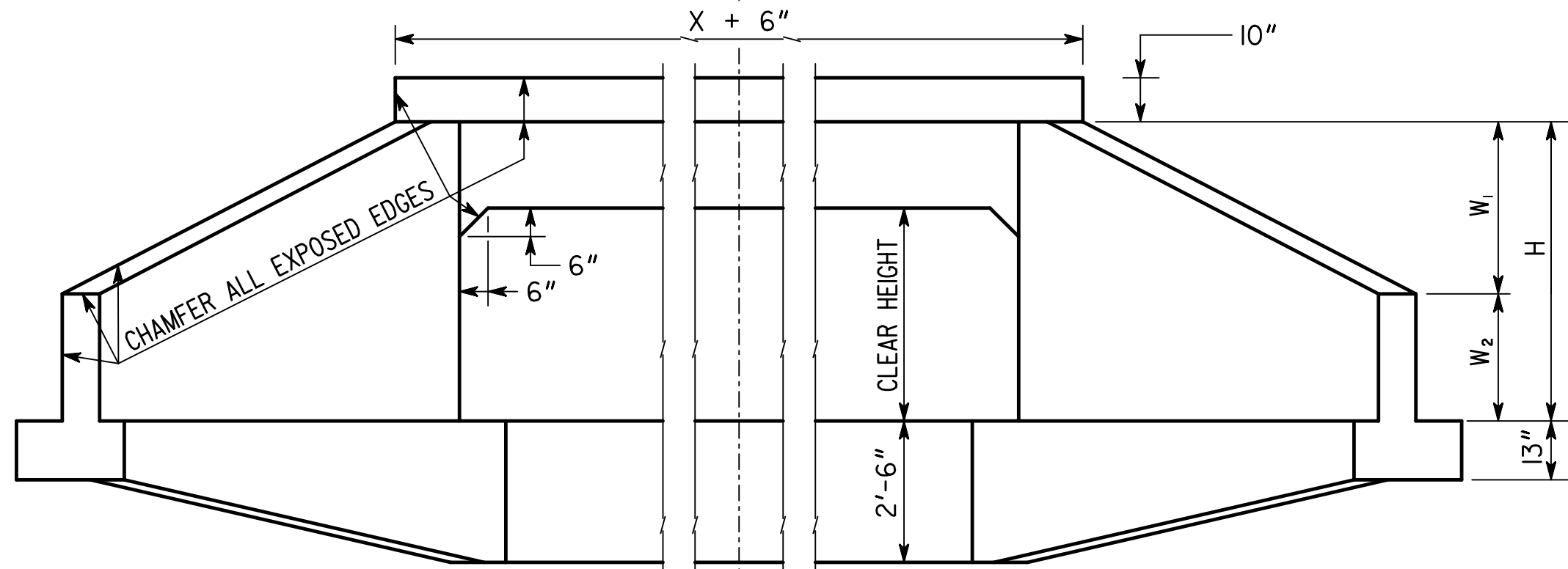
DESIGN DATA

SPECIFICATIONS - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION, 2014
LOADING - HL-93

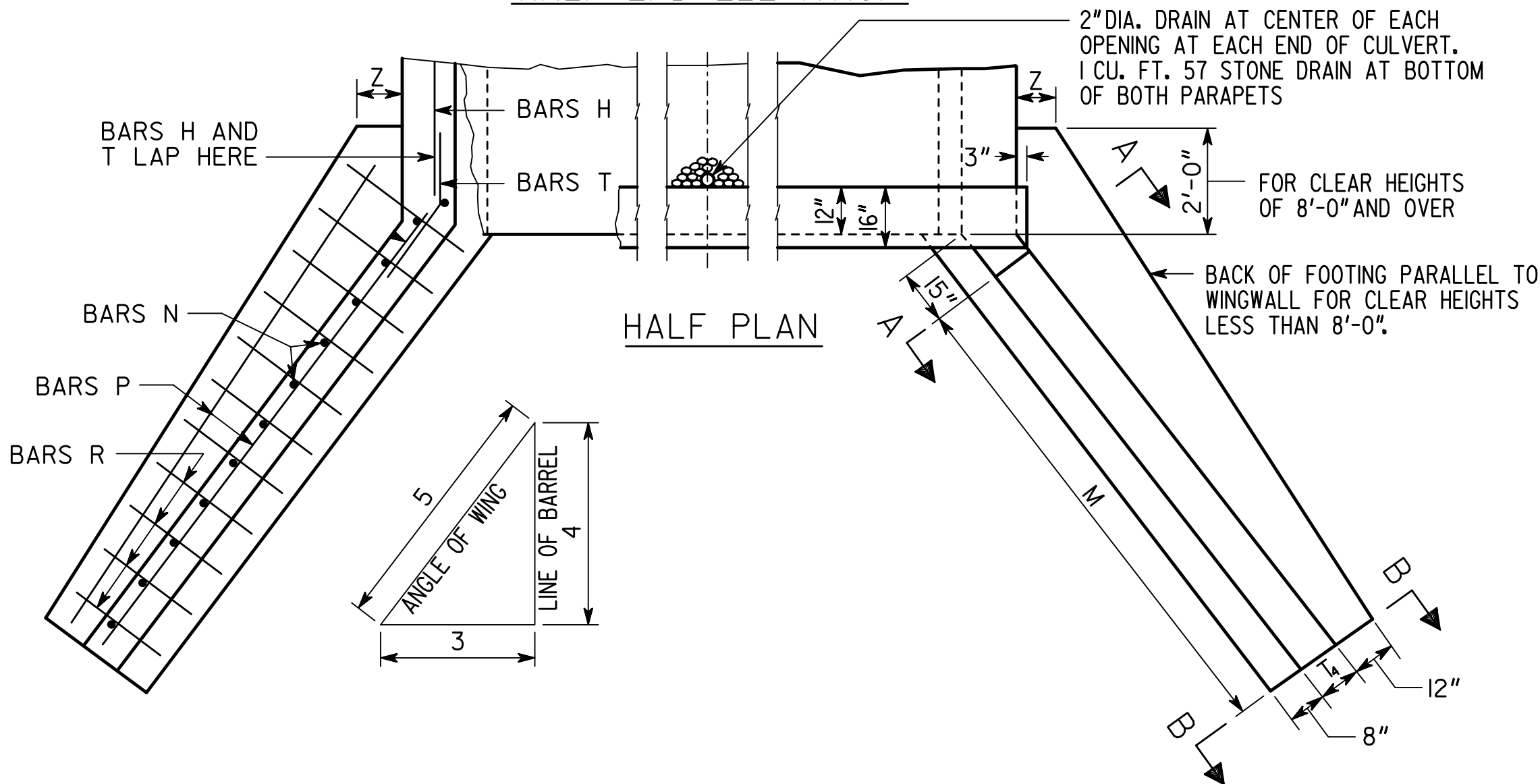
DIMENSIONS AND QUANTITIES										
CLEAR HEIGHT	H	W ₁	W ₂	S	M	T ₄	Z	CY CLASS AA CONCRETE	LBS. BAR REINF STEEL	CLEAR HEIGHT
2'	3'-1"	1'-1"	2'-0"	1'-1"	2'-8"	10"	-	3.3	270	2'
3'	4'-3 1/2"	2'-3 1/2"	2'-0"	2'-1 1/2"	5'-7"	10"	-	6.0	499	3'
4'	5'-9"	3'-9"	2'-0"	2'-7"	9'-2"	10"	-	9.2	795	4'
5'	6'-9"	4'-3"	2'-6"	2'-7"	10'-6"	10"	-	12.4	1083	5'
6'	7'-9"	4'-9"	3'-0"	2'-7"	11'-10"	10"	-	15.0	1246	6'
7'	8'-9 1/2"	5'-3 1/2"	3'-6"	2'-7 1/2"	13'-2"	10"	-	17.9	1507	7'
8'	9'-10 1/2"	5'-10 1/2"	4'-0"	2'-8 1/2"	14'-5"	12"	1'-0"	25.3	2070	8'
9'	10'-11"	6'-5"	4'-6"	2'-9"	15'-9"	12"	1'-6"	29.9	2345	9'
10'	11'-11"	6'-11"	5'-0"	2'-9"	17'-0"	12"	2'-0"	34.7	3277	10'
11'	12'-11"	7'-5"	5'-6"	2'-9"	18'-4"	12"	2'-6"	40.0	3676	11'
12'	13'-11 1/2"	7'-11 1/2"	6'-0"	2'-9 1/2"	19'-8"	12"	3'-0"	45.8	4788	12'

QUANTITIES GIVEN INCLUDE WINGWALL, WINGWALL FOOTING, AND WINGWALL TOEWALL FOR BOTH ENDS.

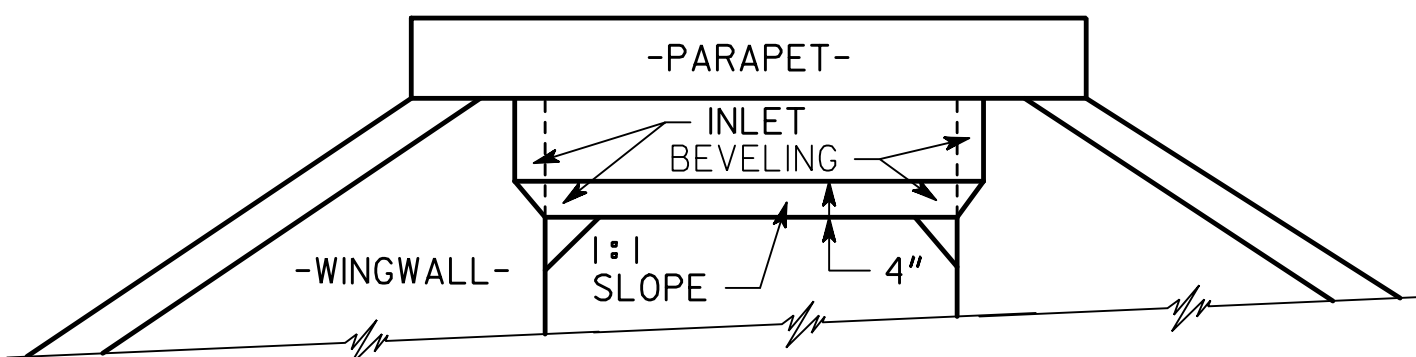
SYMMETRICAL ABOUT C CULVERT



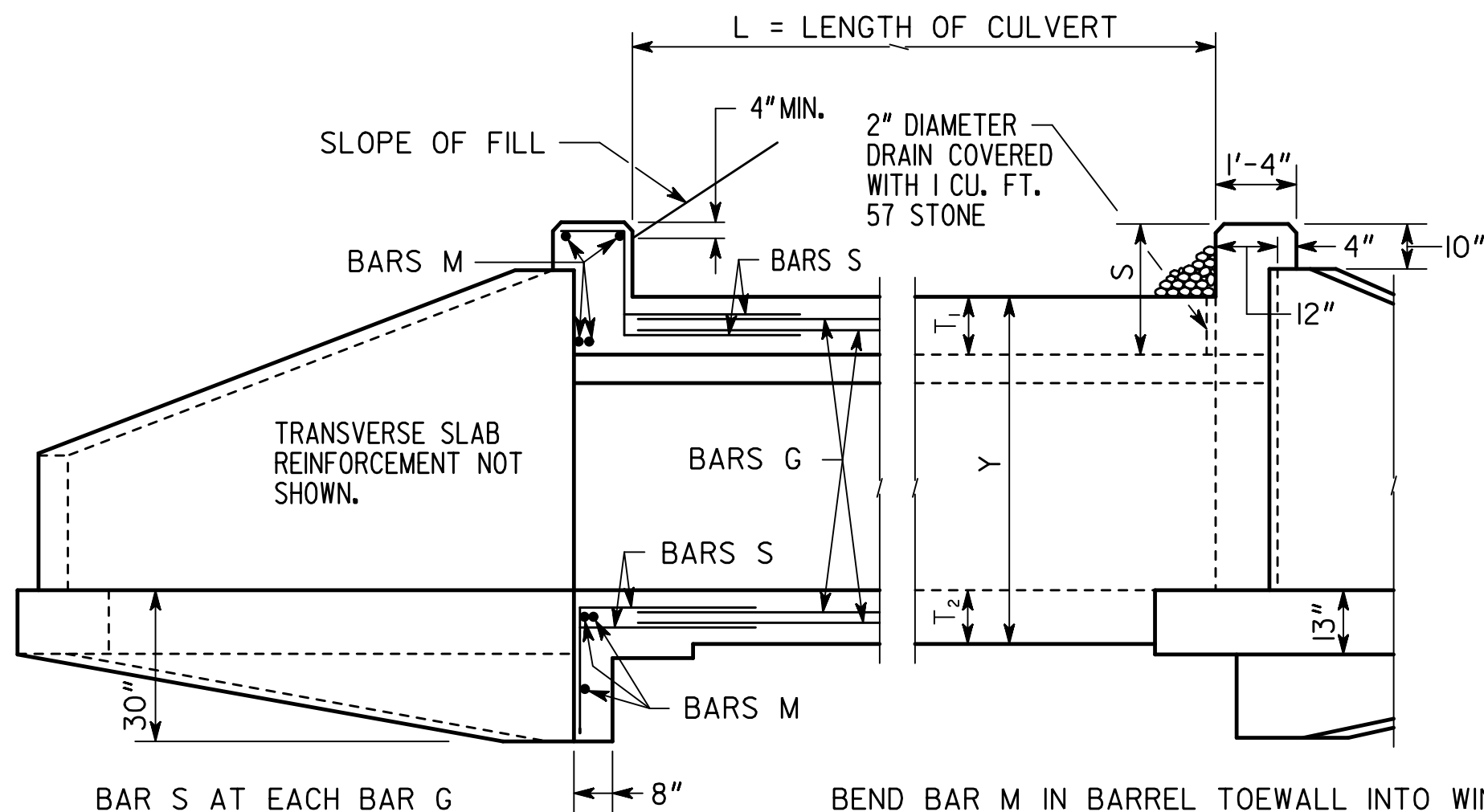
HALF END ELEVATION



HALF PLAN



INLET BEVELING IS REQUIRED AT THE INLET OF ALL BOX CULVERTS EXTENDING FROM WINGWALL TO WINGWALL, AT TOP OF CULVERT AS SHOWN.



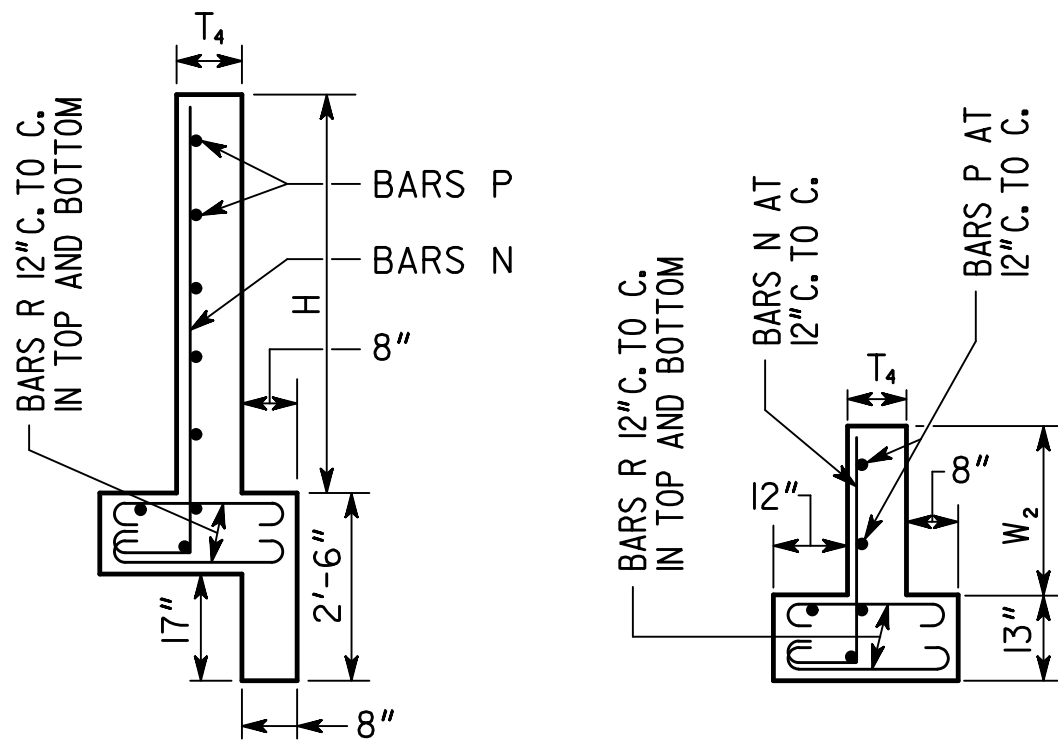
BAR S AT EACH BAR G IN TOP AND BOTTOM OF SLAB.

BEND BAR M IN BARREL TOEWALL INTO WING TOEWALL AS NECESSARY TO PROVIDE 2" CLEARANCE AT EACH END.

PART SECTION

SIDE VIEW

PART ELEVATION



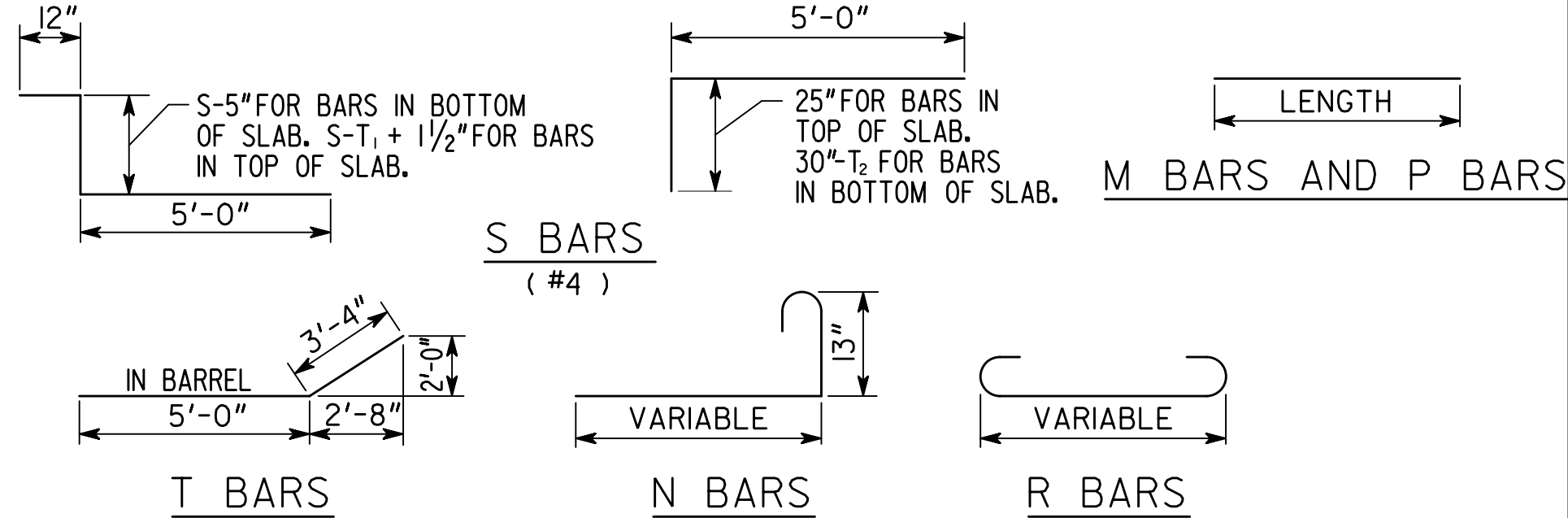
SECTION A-A

SECTION B-B

BAR S AND T ARE LAPPED WITH BAR G AND H, RESPECTIVELY.

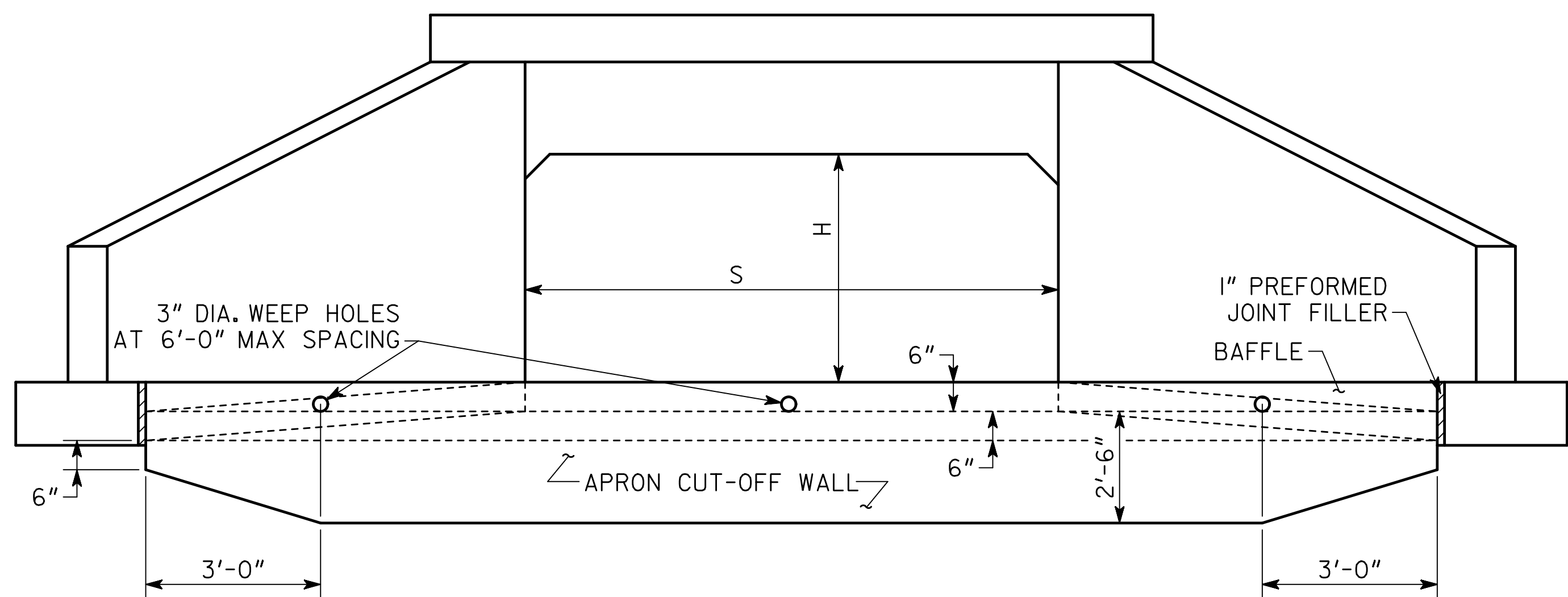
INLET BEVELING DETAIL

T₁ = TOP SLAB THICKNESS
T₂ = BOTTOM SLAB THICKNESS
NOTE: SEE BOX CULVERT STANDARDS FOR DIMENSIONS.



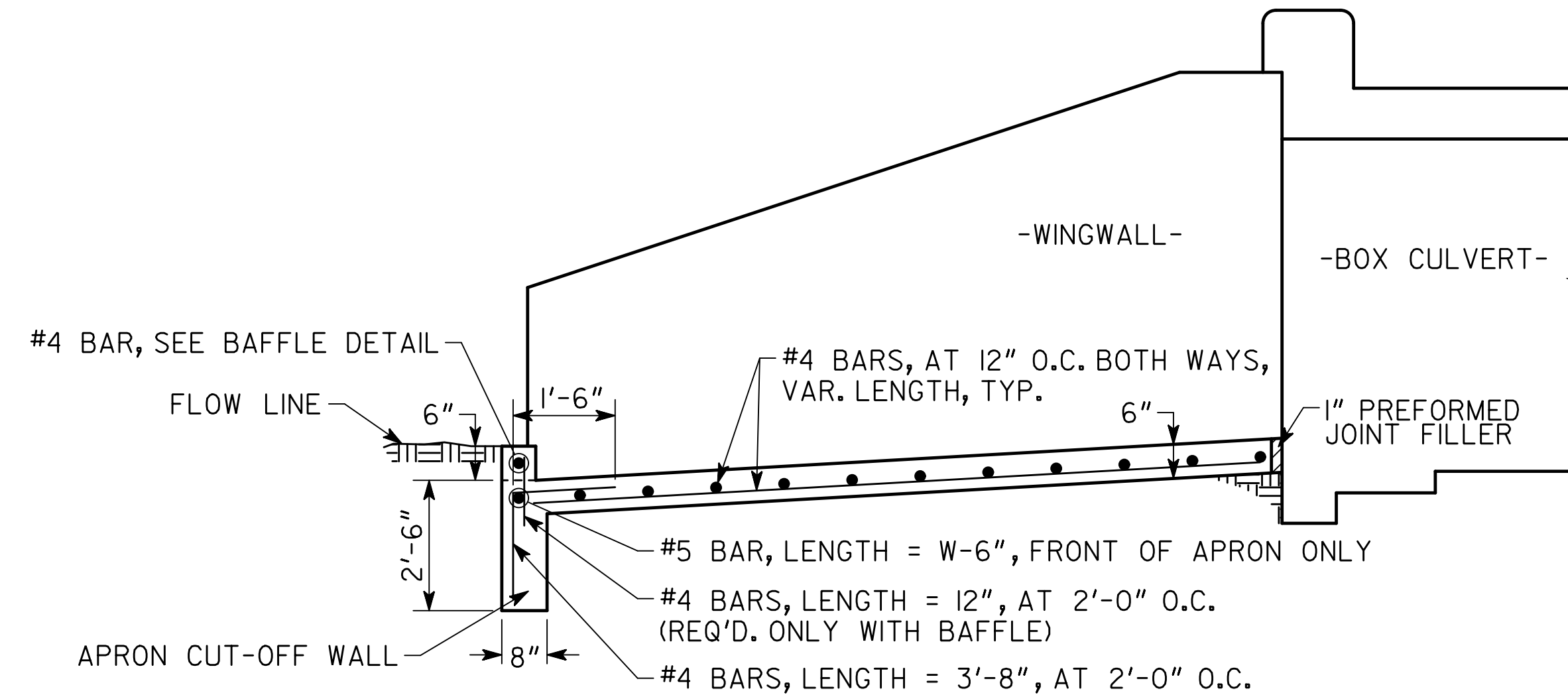
ELEVATION OF WING

DATE	DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA		
REVISION	STANDARD REINFORCED CONCRETE WINGWALLS, TOEWALLS AND PARAPETS FOR CONCRETE BOX CULVERTS		
BY	DES. WEI TRA. WEI CHK. YSK	(SUBMITTED) (APPROVED) STATE DESIGN POLICY ENGINEER CHIEF ENGINEER	NO SCALE SEPTEMBER 2017
			NUMBER 2404 SHEET 1 OF 1



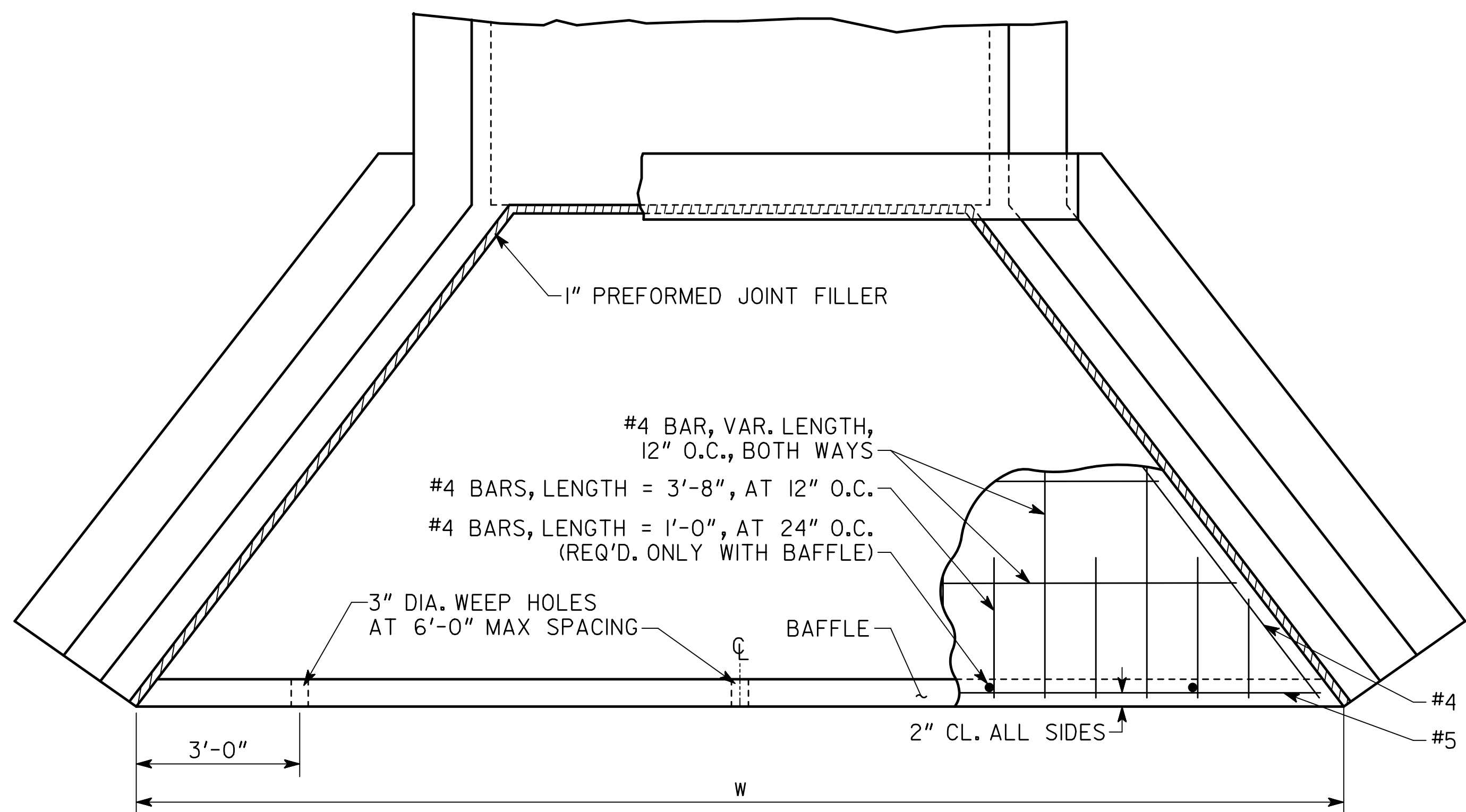
FRONT VIEW OF APRON

S = CLEAR SPAN OF BOX CULVERT
H = CLEAR HEIGHT (RISE) OF BOX CULVERT

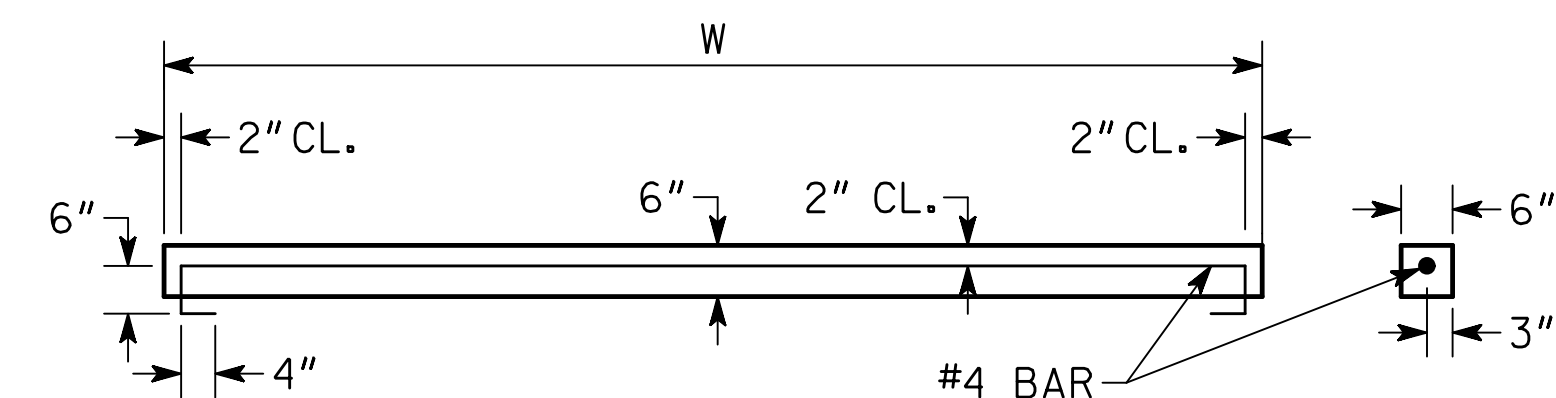


ELEVATION VIEW OF APRON

NOTE: 2" CL MIN. ON ALL SIDES UNLESS OTHERWISE NOTED.
SEE BOX CULVERT STANDARDS FOR DETAILS NOT SHOWN.
END OF EMBEDDED CULVERT APRON (NOT SHOWN) HAS THE SAME MINIMUM BACKFILL AS BARREL.



PLAN VIEW OF APRON



BAFFLE DETAIL

NOTE: CONSTRUCT BAFFLES FROM CLASS AA CONCRETE, MAY BE PRECAST OR CAST IN PLACE.
USE BAFFLES ON APRONS AT OUTLETS OF PIPES AND BOX CULVERTS AND IN PAVED DITCHES OR ELSEWHERE AT LOCATIONS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES

- SPECIFICATIONS: GEORGIA STANDARD, CURRENT EDITION & SUPPLEMENTS THERETO.
- CONCRETE APRONS AND BAFFLES ARE REQUIRED AT ALL OUTLETS OF ALL BOX CULVERT DRAINS. APRON IS NOT TO BE OMITTED AT OUTLETS UNLESS THE ENGINEER DETERMINES THAT BEDROCK WILL PREVENT EROSION AND MAKE THE APRON DIFFICULT TO CONSTRUCT. APRONS (WITHOUT BAFFLES) ARE USED AT INLETS ONLY IF PLANS SPECIFY.
- DETAILS HERESHOWN APPLY TO LRFD STANDARD BOX CULVERTS.
- ALL CONCRETE SHALL BE CLASS "AA" CONCRETE.
- SEE SEPARATE STANDARDS FOR DETAILS OF BOX CULVERTS, WINGWALLS, PARAPETS, ETC.

DESIGN DATA

SPECIFICATIONS - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION, 2014
LOADING - HL- 93.

		DATE	DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA	
		REVISION	STANDARD CONCRETE BOX CULVERT APRONS AND BAFFLES DETAIL	
			NO SCALE	SEPTEMBER 2017
BY	DES. WEI DRW. EJC TRA. CHK. EJC	(SUBMITTED) (APPROVED)	STATE DESIGN POLICY ENGINEER CHIEF ENGINEER	
			NUMBER 2406	SHEET 1 OF 2

S	H	APRON QUANTITIES FOR CONCRETE BOX CULVERTS																														H	S						
		SINGLE 90°			SINGLE 75°			SINGLE 60°			SINGLE 45°			DOUBLE 90°			DOUBLE 75°			DOUBLE 60°			DOUBLE 45°			TRIPLE 90°			TRIPLE 75°					TRIPLE 60°			TRIPLE 45°		
		W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL	W (FT.)	CU.YDS. CONC.	LBS. STEEL			W (FT.)	CU.YDS. CONC.	LBS. STEEL			
4'	3'	11.133	1.27	108	12.831	1.55	127	12.831	1.55	127	16.715	1.95	157	16.133	2.11	170	17.825	2.45	193	17.825	2.45	193	21.715	2.83	222	21.133	2.95	232	22.821	3.35	260	22.821	3.35	260	26.714	3.71	287	3'	4'
	4'	15.433	2.23	178	17.279	2.58	204	17.279	2.58	204	23.174	3.35	262	20.433	3.33	259	22.275	3.75	290	22.275	3.75	290	28.174	4.49	345	25.433	4.43	339	27.273	4.91	375	27.273	4.91	375	33.174	5.63	429	4'	
	5'	17.033	2.65	209	20.324	3.44	267	20.324	3.44	267	26.244	4.16	320	22.033	3.85	297	25.322	4.78	365	25.322	4.78	365	31.243	5.42	413	27.033	5.05	385	30.321	6.12	463	30.321	6.12	463	36.243	6.69	506	5'	
	6'	18.633	3.09	240	22.109	3.99	307	23.553	4.45	340	29.386	5.06	385	23.633	4.39	335	27.107	5.44	413	28.551	5.98	452	34.386	6.45	488	28.633	5.69	431	32.106	6.88	519	33.550	7.52	563	39.386	7.85	589	6'	
5'	3'	12.133	1.44	121	13.830	1.73	140	13.830	1.73	140	17.715	2.13	170	18.133	2.44	195	19.823	2.81	219	19.823	2.81	219	23.714	3.18	248	24.133	3.45	269	25.820	3.89	299	25.820	3.89	299	29.714	4.24	326	3'	5'
	4'	16.433	2.45	194	18.278	2.82	222	18.278	2.82	222	24.174	3.58	279	22.433	3.77	291	24.274	4.21	324	24.274	4.21	324	30.174	4.95	379	28.433	5.10	388	30.272	5.61	426	30.272	5.61	426	36.174	6.32	479	4'	
	5'	18.083	2.89	227	21.324	3.71	286	21.324	3.71	286	27.244	4.41	339	24.033	4.33	333	27.322	5.32	404	27.322	5.32	404	33.243	5.93	450	30.033	5.77	438	33.320	6.93	522	33.320	6.93	522	39.243	7.45	561	5'	
	6'	19.633	3.35	259	23.108	4.28	328	24.553	4.76	362	30.386	5.33	406	25.633	4.91	373	29.107	6.01	455	30.551	6.60	497	36.386	7.01	528	31.633	6.47	487	35.105	7.75	582	36.549	8.43	631	42.386	8.68	651	6'	
6'	7'	21.233	3.85	297	24.553	4.76	362	27.742	5.91	445	33.653	6.31	476	27.233	5.53	419	30.551	6.60	497	33.740	7.97	596	39.652	8.13	609	33.233	7.20	542	36.549	8.43	631	39.738	10.03	746	45.652	9.95	742	7'	6'
	8'	22.833	4.38	334	26.398	5.41	411	29.988	6.80	510	36.753	7.37	553	28.833	6.17	465	32.396	7.38	554	35.986	9.02	671	42.753	9.34	697	34.833	7.97	596	38.395	9.35	698	41.985	11.24	833	48.753	11.31	841	8'	
	3'	13.133	1.61	133	14.828	1.91	153	14.828	1.91	153	18.715	2.30	183	20.133	2.78	220	21.822	3.17	246	21.822	3.17	246	25.714	3.53	274	27.133	3.95	306	28.818	4.43	339	28.818	4.43	339	32.714	4.77	365	3'	
	4'	17.433	2.67	210	19.278	3.05	238	19.278	3.05	238	25.174	3.81	295	24.433	4.21	324	26.273	4.68	358	26.273	4.68	358	32.174	5.41	412	31.433	5.76	436	33.271	6.30	477	33.271	6.30	477	39.174	7.00	529	4'	
7'	5'	19.033	3.13	244	22.323	3.98	306	22.323	3.98	306	28.244	4.66	358	26.033	4.81	368	29.321	5.86	443	29.321	5.86	443	35.243	6.44	487	33.033	6.49	491	36.320	7.74	581	36.320	7.74	581	42.243	8.21	617	5'	7'
	6'	20.633	3.61	278	24.108	4.57	350	25.552	5.06	384	31.386	5.61	426	27.633	5.43	411	31.06	6.59	498	32.550	7.21	541	38.386	7.57	569	34.633	7.25	545	38.105	8.62	646	39.549	9.35	698	45.386	9.52	712	6'	
	7'	22.233	4.13	317	25.552	5.06	384	28.742	6.25	471	34.653	6.61	499	29.233	6.09	460	32.550	7.21	541	35.379	8.66	646	41.652	8.74	653	36.233	8.04	603	39.549	9.35	698	42.738	11.06	822	48.652	10.86	809	7'	
	8'	23.833	4.68	355	27.397	5.74	434	30.988	7.17	537	37.753	7.70	577	30.833	6.77	509	34.396	8.04	602	37.986	9.76	725	44.753	10.00	745	37.833	8.87	661	41.394	10.33	769	44.985	12.35	914	51.753	12.30	913	8'	
8'	3'	18.433	2.89	227	20.277	3.28	256	20.277	3.28	256	26.174	4.04	312	26.433	4.65	356	28.272	5.14	392	28.272	5.14	392	34.174	5.86	446	34.433	6.42	485	36.270	7.00	528	36.270	7.00	528	42.174	7.68	579	4'	8'
	5'	20.033	3.37	262	23.323	4.24	325	23.323	4.24	325	29.243	4.92	376	28.033	5.29	403	31.321	6.39	483	31.321	6.39	483	37.243	6.94	524	36.033	7.21	544	39.319	8.54	640	39.319	8.54	640	45.243	8.97	672	5'	
	6'	21.633	3.87	297	25.108	4.86	371	26.552	5.37	407	32.386	5.89	447	29.633	5.95	449	33.106	7.17	540	34.550	7.82	586	40.386	8.12	610	37.633	8.03	601	41.105	9.49	709	42.549	10.27	765	48.386	10.36	773	6'	
	7'	23.233	4.41	337	26.552	5.37	407	29.741	6.60	496	35.653	6.92	521	31.233	6.64	501	34.550	7.82	586	37.739	9.34	696	43.652	9.34	698	39.233	8.88	664	42.549	10.27	765	45.737	12.09	896	51.652	11.77	875	7'	
9'	8'	24.833	4.98	378	28.397	6.07	458	31.987	7.54	564	38.753	8.03	601	32.833	7.37	552	36.395	8.69	650	39.985	10.50	779	46.753	10.65	793	40.833	9.77	727	44.394	11.32	841	47.984	13.46	995	54.753	13.28	985	8'	9'
	4'	19.433	3.11	242	21.276	3.51	272	21.276	3.51	272	27.174	4.27	328	28.433	5.10	388	30.272	5.61	426	30.272	5.61	426	36.174	6.32	479	37.433	7.08	533	39.269	7.70	579	39.269	7.70	579	45.174	8.37	629	4'	
	5'	21.033	3.61	280	24.323	4.51	345	24.323	4.51	345	30.243	5.17	395	30.033	5.77	438	33.320	6.93	522	33.320	6.93	522	39.243	7.45	561	39.033	7.93	596	42.319	9.35	699	42.319	9.35	699	48.243	9.73	728	5'	
	6'	22.633	4.13	316	26.107	5.15	392	27.552	5.68	429	33.386	6.17	467	31.633	6.47	487	35.105	7.75	582	36.549	8.43	631	42.386	8.68	651	40.633	8.81	659	44.104	10.36	773	45.548	11.19	832	51.386	11.19	834	6'	
10'	7'	24.233	4.69	358	27.552	5.68	429	30.741	6.94	521	36.653	7.22	543	33.233	7.20	542	36.549	8.43	631	39.738	10.03	746	45.652	9.95	742	42.233	9.72	726	45.548	11.19	832	48.737	13.12	972	54.652	12.68	942	7'	10'
	8'	25.833	5.28	399	29.397	6.40	482	32.987	7.91	591	39.753	8.35	625	34.833	7.97	596	38.395	9.35	698	41.985	11.24	833	48.753	11.31	841	43.833	10.66	793	47.393	12.30	913	50.984	14.57	1076	57.753	14.27	1056	8'	
	9'	27.333	5.86	443	31.142	7.11	535	35.233	8.94	668	43.040	9.64	720	36.333	8.72	652	40.140	10.25	764	44.232	12.51	928	52.040	12.83	954	45.333	11.58	860	49.138	13.38	992	53.231	16.08	1187	61.040	16.03	1186	9'	
	10'	28.833	6.46	486	32.666	7.78	582	37.379	9.98	743	46.141	10.93	815	37.833	9.49	706	41.664	11.07	822	46.378	13.77	1019	55.141	14.35															

CULVERT SIZE		DESIGN I-A 2 FT. MINIMUM COVER						DESIGN I-B 3 FT. MINIMUM COVER						CULVERT SIZE	
CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	T (INCHES)	MINIMUM AREAS OF CIRCUMFERENTIAL REINFORCING STEEL (SQ. IN. PER LIN. FT.)			MAXIMUM FILL HEIGHTS (FEET)	MINIMUM AREA OF CIRCUMFERENTIAL REINFORCING STEEL (SQ. IN. PER LIN. FT.)			MAXIMUM FILL HEIGHTS (FEET)	T (INCHES)	CLEAR HEIGHT (FT.) H	CLEAR SPAN (FT.) S		
			As1	As2	As4		As1	As2	As4						
4'	3	6	0.21	0.27	0.12	16	0.13	0.18	0.12	10	6	3	4'		
	4	6	0.18	0.30	0.12	16	0.12	0.19	0.12	10	6	4			
	5	6	0.24	0.33	0.14	16	0.15	0.23	0.14	10	6	5			
	6	7	0.27	0.37	0.17	16	0.20	0.27	0.17	10	7	6			
5'	3	6	0.26	0.29	0.14	16	0.17	0.21	0.14	10	6	3	5'		
	4	6	0.24	0.33	0.14	16	0.16	0.23	0.14	10	6	4			
	5	6	0.20	0.35	0.14	16	0.14	0.25	0.14	10	6	5			
	6	7	0.25	0.39	0.17	16	0.18	0.29	0.17	10	7	6			
6'	3	7	0.32	0.33	0.17	16	0.23	0.23	0.17	10	7	3	6'		
	4	7	0.27	0.37	0.17	16	0.20	0.27	0.17	10	7	4			
	5	7	0.25	0.39	0.17	16	0.18	0.29	0.17	10	7	5			
	6	7	0.23	0.41	0.17	16	0.17	0.30	0.17	10	7	6			
7'	4	8	0.35	0.41	0.19	16	0.25	0.27	0.19	10	8	4	7'		
	5	8	0.31	0.44	0.19	16	0.23	0.29	0.19	10	8	5			
	6	8	0.28	0.44	0.19	14	0.21	0.34	0.19	10	8	6			
	7	8	0.26	0.44	0.19	14	0.19	0.36	0.19	10	8	7			
8'	4	8	0.43	0.40	0.19	10	0.33	0.30	0.19	8	8	4	8'		
	5	8	0.38	0.43	0.19	10	0.30	0.33	0.19	8	8	5			
	6	8	0.35	0.47	0.19	10	0.27	0.35	0.19	8	8	6			
	7	8	0.33	0.50	0.19	10	0.25	0.38	0.19	8	8	7			
9'	4	8	0.31	0.53	0.19	10	0.24	0.43	0.19	8	8	8	9'		
	4	9	0.47	0.45	0.22	10	0.38	0.38	0.22	8	9	4			
	5	9	0.43	0.45	0.22	10	0.35	0.39	0.22	8	9	5			
	6	9	0.40	0.48	0.22	10	0.32	0.42	0.22	8	9	6			
10'	7	9	0.37	0.52	0.22	10	0.30	0.45	0.22	8	9	7	10'		
	8	9	0.35	0.54	0.22	10	0.28	0.47	0.22	8	9	8			
	9	9	0.33	0.57	0.22	10	0.27	0.49	0.22	8	9	9			
	10	10	0.35	0.61	0.24	10	0.30	0.55	0.24	8	10	10			
10'	4	10	0.50	0.46	0.24	10	0.44	0.42	0.24	8	10	4	10'		
	5	10	0.47	0.46	0.24	10	0.41	0.42	0.24	8	10	5			
	6	10	0.44	0.50	0.24	10	0.38	0.45	0.24	8	10	6			
	7	10	0.41	0.53	0.24	10	0.35	0.48	0.24	8	10	7			
10'	8	10	0.38	0.56	0.24	10	0.33	0.51	0.24	8	10	8	10'		
	9	10	0.36	0.60	0.24	10	0.32	0.53	0.24	8	10	9			
	10	10	0.35	0.61	0.24	10	0.30	0.55	0.24	8	10	10			



