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PROPOSED PLANS

FOR

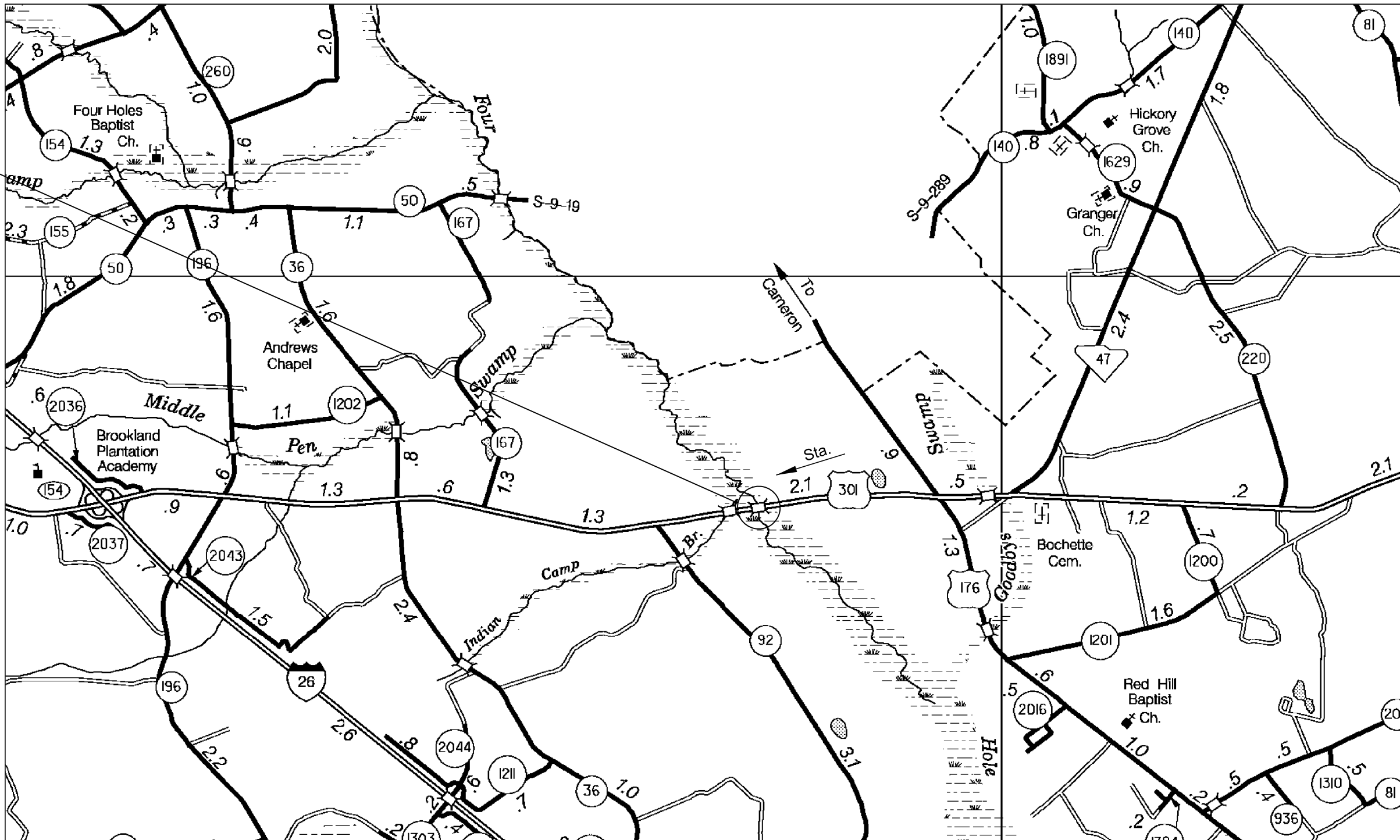
ORANGEBURG COUNTY

PROJECT ID: 0040308

US ROUTE 301 SOUTHBOUND (FIVE CHOP ROAD)

REPLACE BRIDGE OVER FOUR HOLE SWAMP

SITE LOCATION



LAYOUT

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.055	MILES
NET LENGTH OF PROJECT	0.055	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.055	MILES

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

Submit Shop Plans to:

SCDOT  
Preconstruction Support Engineer  
Attn: Logistics Coordinator - Shop Plans  
955 Park Street - Room 409  
Columbia, SC 29201

Approximate Location of Bridge is

Latitude 33°-27'-27" N  
Longitude 80°-38'-55" W

	FOR CONSTRUCTION	
	INITIAL	DATE
RPG - HYDROLOGY		
RPG - STRUCTURES		
RPG - GEOTECHNICAL		
PRECONSTRUCTION SUPPORT - STRUCTURES		
RPG - DESIGN MANAGER		
RPG - PROGRAM MANAGER		

3 DAYS BEFORE DIGGING IN  
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)  
WWW.SC811.COM  
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

ASSET ID 1753

TRAFFIC DATA

2013 ADT 11500 V.P.D.

2033 ADT 17500 V.P.D.

TRUCKS 17 %

ENGINEER OF RECORD



FOR CONSTRUCTION : \_\_\_\_\_  
DATE \_\_\_\_\_

REVIEWED	DR.	MRB	CFD	CHK	DATE

SUMMARY OF ESTIMATED QUANTITIES			
ITEM NO.	B I D I T E M	UNIT	QUANTITY
1075001	MONITORING OF CONSTRUCTION-RELATED EARTHBORNE VIBRATIONS	LS	NEC.
2028100	REMOVAL & DISPOSAL OF EXISTING BRIDGE	LS	NEC.
2033025	BORROW EXCAVATION - (AASHTO TYPE A-1 SAND)⦿	TON	1110.000
2043000	WET EXCAVATION FOR BRIDGES*	CY	3150.000
2045040	COFFERDAM - TYPE 4 (30,001 - 40,000 C.F.)	EA	6.000
2103000	FLOWABLE FILL	CY	1682.000
6750278	FURNISH & INSTALL 2.0" SCHEDULE 80 PVC CONDUIT	LF	1340.000
7011400	CONC. FOR STRUCTURES - CLASS 4000	CY	1015.100
7011600	CONC. FOR STRUCTURES - CLASS 5000	CY	316.300
7020300	COMPRESSION SEAL JOINT	LF	94.500
7023200	GROOVED SURFACE FINISH	SY	1368.000
7031200	REINF. STEEL FOR STRUCTURES (BRIDGE)	LB	281511.000
7031220	HOOP REINFORCING STEEL FOR STRUCTURES (BRIDGE)	LB	18408.000
7051000	CONCRETE BRIDGE BARRIER PARAPET	LF	619.300
7051910	CONCRETE BRIDGE BARRIER PARAPET TRANSITION	EA	3.000
7110001	DYNAMIC PILE ANAL.TEST SET-UP	EA	16.000
7110010	PILE DRIVING SET-UP	EA	42.000
7112220	STEEL H BEARING PILING (HP 14 X 73)★	LF	375.000
7112222	STEEL H BEARING INDEX PILING (HP 14 X 73)★	LF	79.000
7113480	STEEL PIPE PILING (48" DIAMETER)⦿	LF	2520.000
7113482	STEEL PIPE INDEX PILING (48" DIAMETER)⦿	LF	642.000
7243150	ELASTOMERIC BEARING ASSEMBLY (FLAT SLAB)	EA	10.000
8041010	RIP-RAP (CLASS-A)	TON	630.000
8048105	GEOTEXTILE FOR EROSION CONTROL UNDER RIP RAP (CLASS 1) TYPE B	SY	822.000
8990566	CLASS 5000 CONCRETE WITH FIBER (HIGH SLUMP)*	CY	238.200

Notes:

- ⦿ For use as Class A-1-a loose sand backfill inside Steel Pipe Piles. See Interior Bent Geotechnical Notes, Sh. 22.
- ★ Provide HP14x73 Steel Piling that conforms to the latest AASHTO Specifications for M270 Steel with a minimum yield strength of 50 ksi.
- ⦿ Provide 48" Dia.Steel Pipe Piling that conforms to the latest ASTM Specifications for A252 Grade 3 Modified Steel with a minimum yield strength of 50 ksi.
- \* Wet Excavation to include cofferdam excavation (See Cofferdam Backfill detail, Sh. 22) and soil extracted from inside of steel pipe piles to facilitate driving of pile through very dense layers.
- \* See Special Provisions.

TABULATION OF ESTIMATED BRIDGE QUANTITIES

ITEM	NO.	CONC. FOR STRUCTURES CLASS 4000	CONC. FOR STRUCTURES CLASS 5000	REINF. STEEL FOR STRUCTURES (BRIDGE)	HOOP REINF. STEEL FOR STRUCTURES (BRIDGE)	CONC. BRIDGE BARRIER PARAPET	CONC. BRIDGE BARRIER PARAPET TRANSITION	DYNAMIC PILE ANAL. TEST SET-UP	PILE DRIVING SET-UP	STEEL PILING (HP14X73)	STEEL INDEX PILING (HP14X73)	STEEL PIPE PILING (48" DIA.)	STEEL INDEX PIPE PILING (48" DIA.)	ELASTOMERIC BEARING ASSEMBLY (FLAT SLAB)	CONC.CLASS 5000 WITH FIBER ( HIGH SLUMP)
		CY	CY	LB	LB	LF	EA	EA	EA	LF	LF	LF	LF	EA	CY
End Bents 1 & 8	2	_____	37.4	8,093	_____	_____	_____	4	12	375	79	_____	_____	_____	_____
Interior Bents 2 thru 7	6	_____	278.9	77,240	18,408	_____	_____	12	30	_____	_____	2,520	642	_____	238.2
132' Span Superstructure	2	852.7	_____	161,966	_____	527.5	_____	_____	_____	_____	_____	_____	_____	8	_____
30' Span Superstructure	1	84.2	_____	15,964	_____	59.8	_____	_____	_____	_____	_____	_____	_____	2	_____
Approach Slabs	2	78.2	_____	18,248	_____	32.0	3	_____	_____	_____	_____	_____	_____	_____	_____
TOTALS	_____	1015.1	316.3	281,511	18,408	619.3	3	16	42	375	79	2,520	642	10	238.2



REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION  SUMMARY OF ESTIMATED QUANTITIES			
REV.							
REV.							
REVIEWED							
QUAN.	GFD	TL	11-16	COUNTY ORANGEBURGROUTE US 301			
DR.	GFD	TL	09-16				
DES.							
	BY	CHK.	DATE				

## DRAWING NO. 700-04



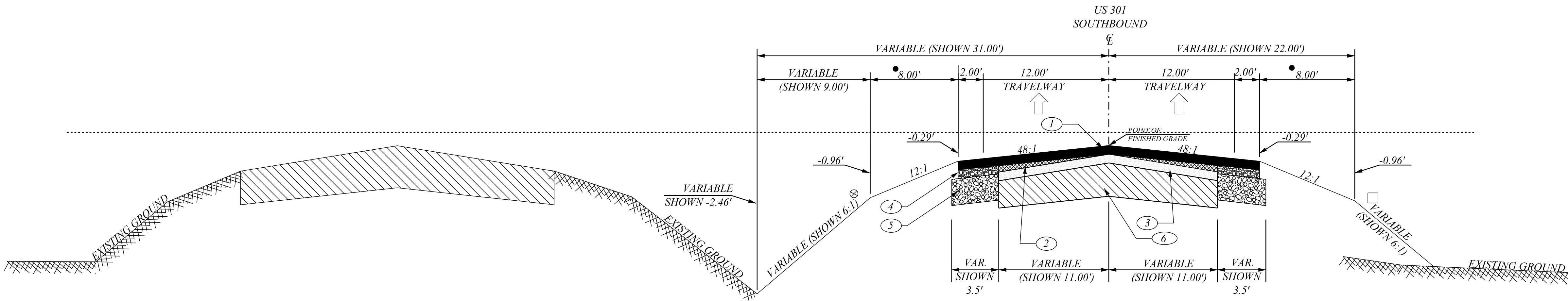




DelcoughtGF  
GF\Desktop\US 301\over Four Hole Swamp\road ao 092816\~40308typ.p.dgn  
28-SEP-2016

TYPICAL SECTION OF IMPROVEMENT  
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION  
COLUMBIA, S.C.

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID#	ROUTE	SHEET NO.
3	S.C.	ORANGEBURG	0040308	US 301	5



USE THIS TYPICAL SECTION ON US ROUTE 301 SOUTHBOUND  
FROM STATION 5941+ 40.00 TO 5960+ 00.00

FOR INFORMATION ONLY

⊗ NOTES:  
THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE  $\mathcal{C}$  CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH. SEE PROFILE FOR THE SPECIAL DITCH GRADES.

☐ FILL SLOPES  
6:1-----0' TO 5' FILL  
4:1-----5' TO 10' FILL  
2:1-----OVER 10' FILL  
IF 2:1 SLOPE IS USED, WIDEN SHOULDER 3.5' FOR GUARDRAIL

PAVEMENT LEGEND

- |   |  |                                                                         |
|---|--|-------------------------------------------------------------------------|
| 1 |  | HOT MIX ASPHALT SURFACE COURSE TYPE B (200 LBS/SY)                      |
| 2 |  | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE B FOR BUILDUP AND LEVELING     |
| 3 |  | MILL EXISTING SURFACE 2" & REPLACE WITH HMA SURFACE TYPE B (200 LBS/SY) |
| 4 |  | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE B (200 LBS/SY)                 |
| 5 |  | HOT MIX ASPHALT BASE COURSE TYPE A (600 LBS/SY)                         |
| 6 |  | EXISTING ASPHALT PAVEMENT - RETAIN                                      |

US ROUTE 301	RURAL PRINCIPAL ARTERIAL	DESIGN SPEED			PAVEMENT DESIGN	SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION ROAD DESIGN COLUMBIA, S.C.		
		MPH	FROM STA.	TO STA.				
		60	5941 + 40.00	5960 + 00.00		TYPICAL SECTION		
EXCEPTIONS TO DESIGN SPEED								
							SCALE 1"V=NTS	SCALE 1"=NTS

PLAN	SURVEYED	DATE
BY		
DATE		
NOTE BOOK		
ALIGNED CHECKED		
RT. OF WAY CHECKED		
N/A		

McKownWR  
P:\orangeburg\40308-us30\road\40308pf6.dgn  
02-Nov-2016

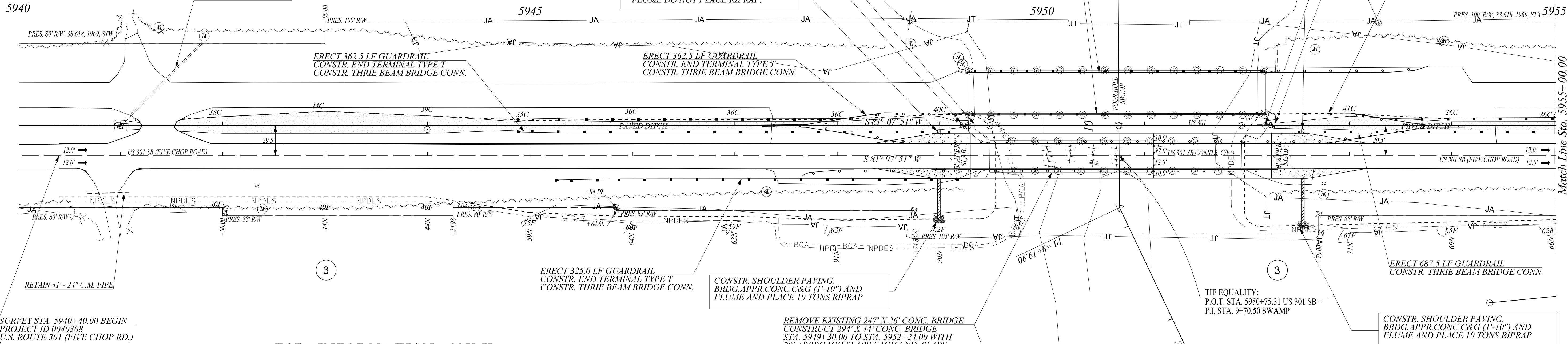
PROFILE	SURVEYED	DATE
BY		
DATE		
NOTE BOOK		
GRADES CHECKED		
RAW'S NOTED		
CONSTRUCTION NOTATIONS CHECKED		
N/A		

UTILITY OWNERS:		ABOVE GROUND	BURIED	BOTH
POWER:	DEPT. OF PUBLIC UTILITY	X		
TELEPHONE:	AT&T		X	
GAS:	DEPT. OF PUBLIC UTILITY		X	
SEWER:	N/A			
CABLE TV:	N/A			
WATER	DEPT. OF PUBLIC UTILITY		X	

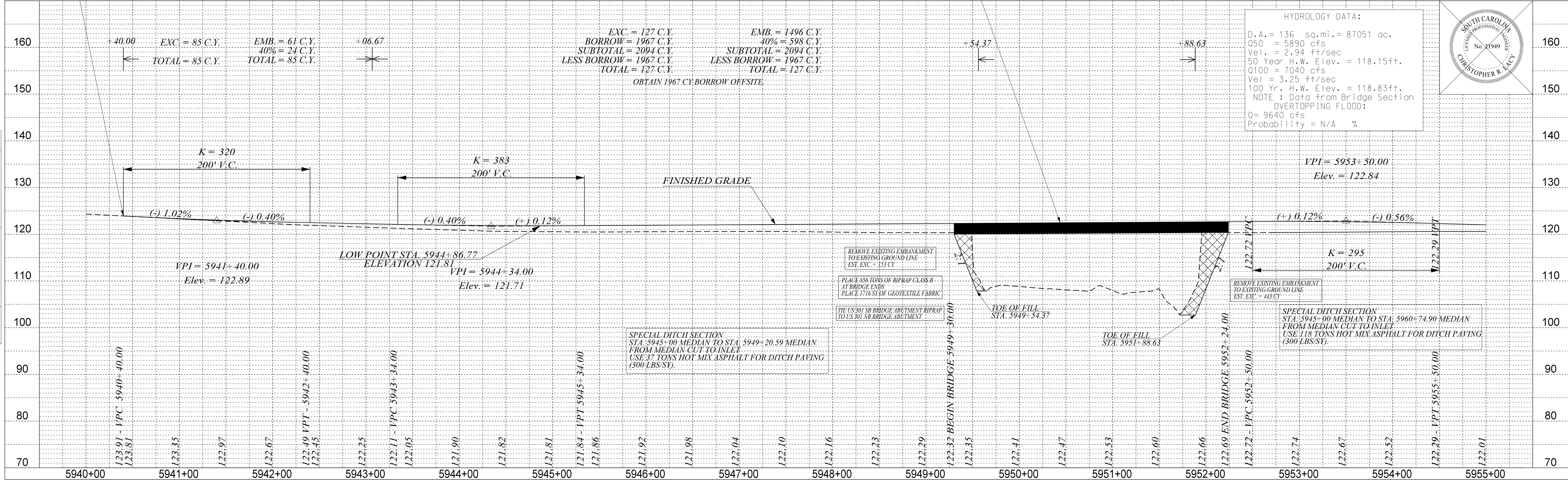
ALIGNMENT CONTROL CAN BE FOUND ON REFERENCE SHEET

FED. ROAD DIST. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	ORANGEBURG	0040308	US 301	6

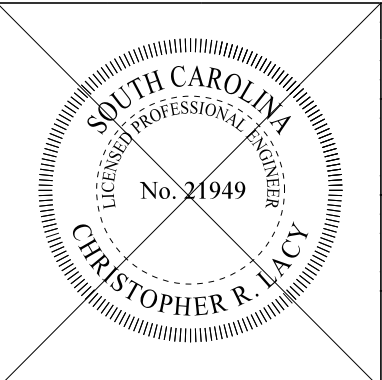
FIVE CHOP ROAD

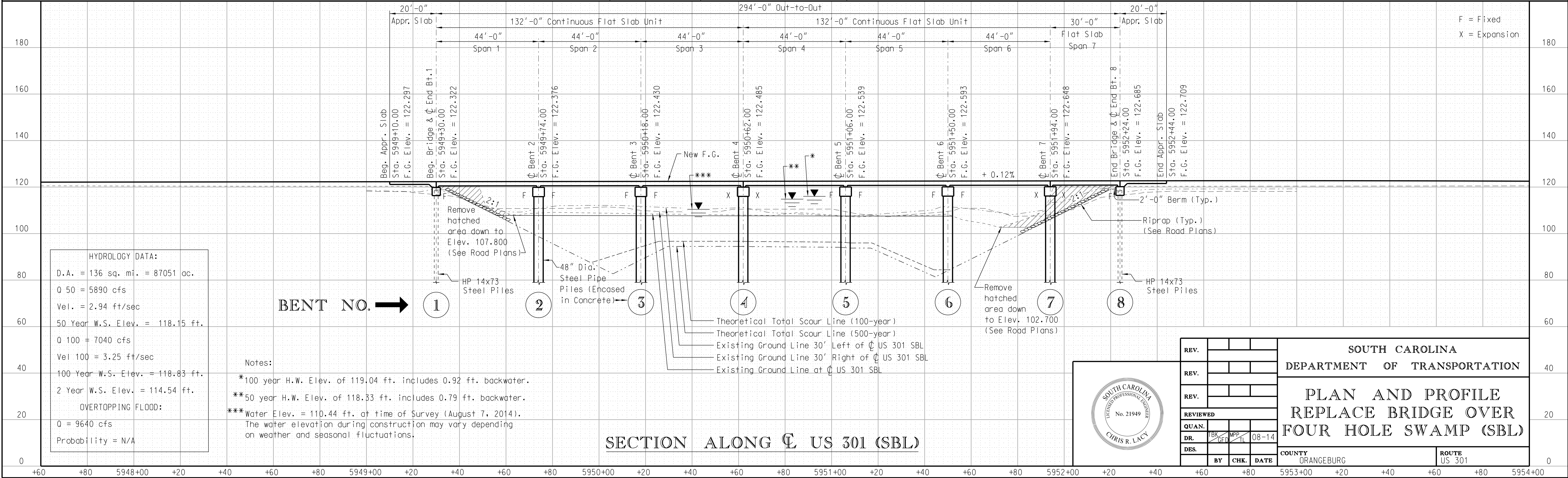
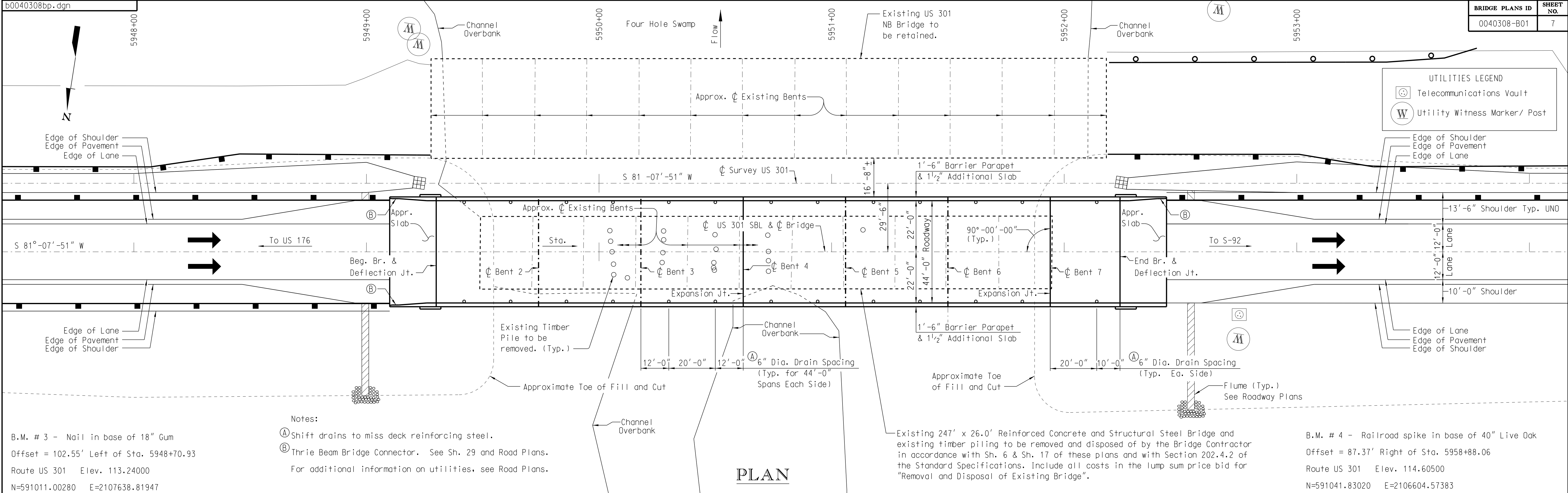


FOR INFORMATION ONLY

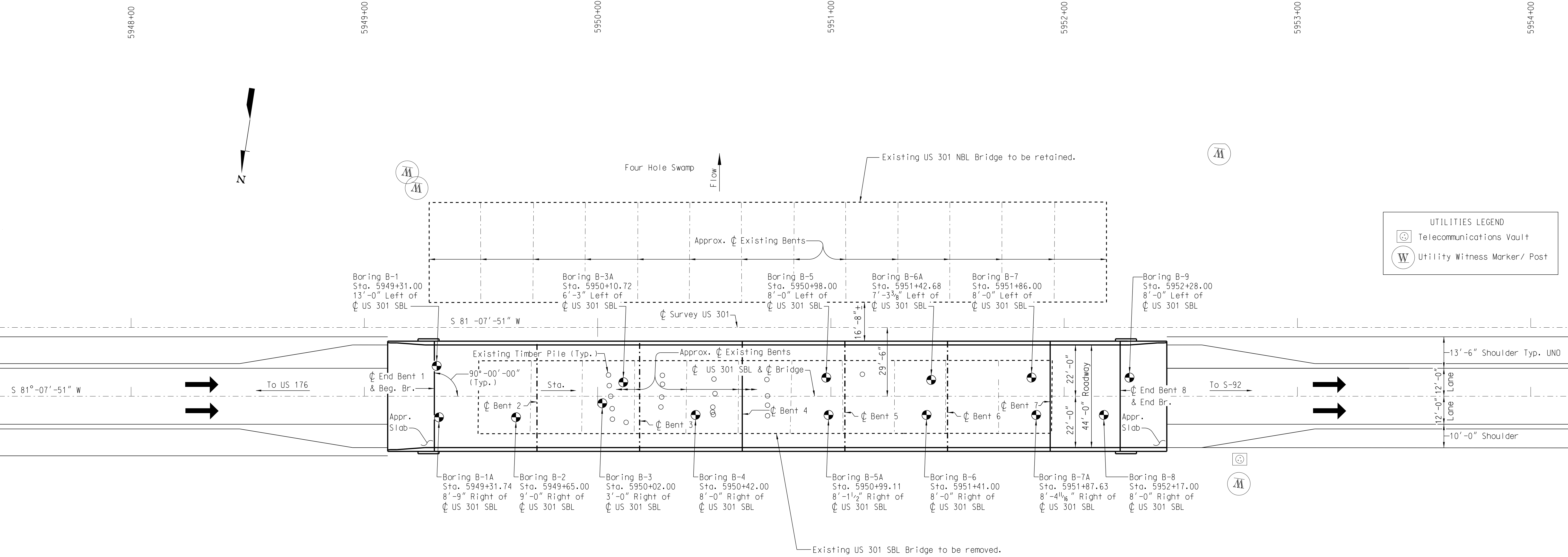


HYDROLOGY DATA:  
D.A. = 136 sq.mi. = 87051 ac.  
Q50 = 5890 cfs  
Vel. = 2.94 ft/sec  
50 Year H.W. Elev. = 118.15ft.  
Q100 = 7040 cfs  
Vel = 3.25 ft/sec  
100 Yr. H.W. Elev. = 118.83ft.  
NOTE : Data from Bridge Section  
OVERTOPPING FLOOD:  
Q = 9640 cfs  
Probability = N/A %





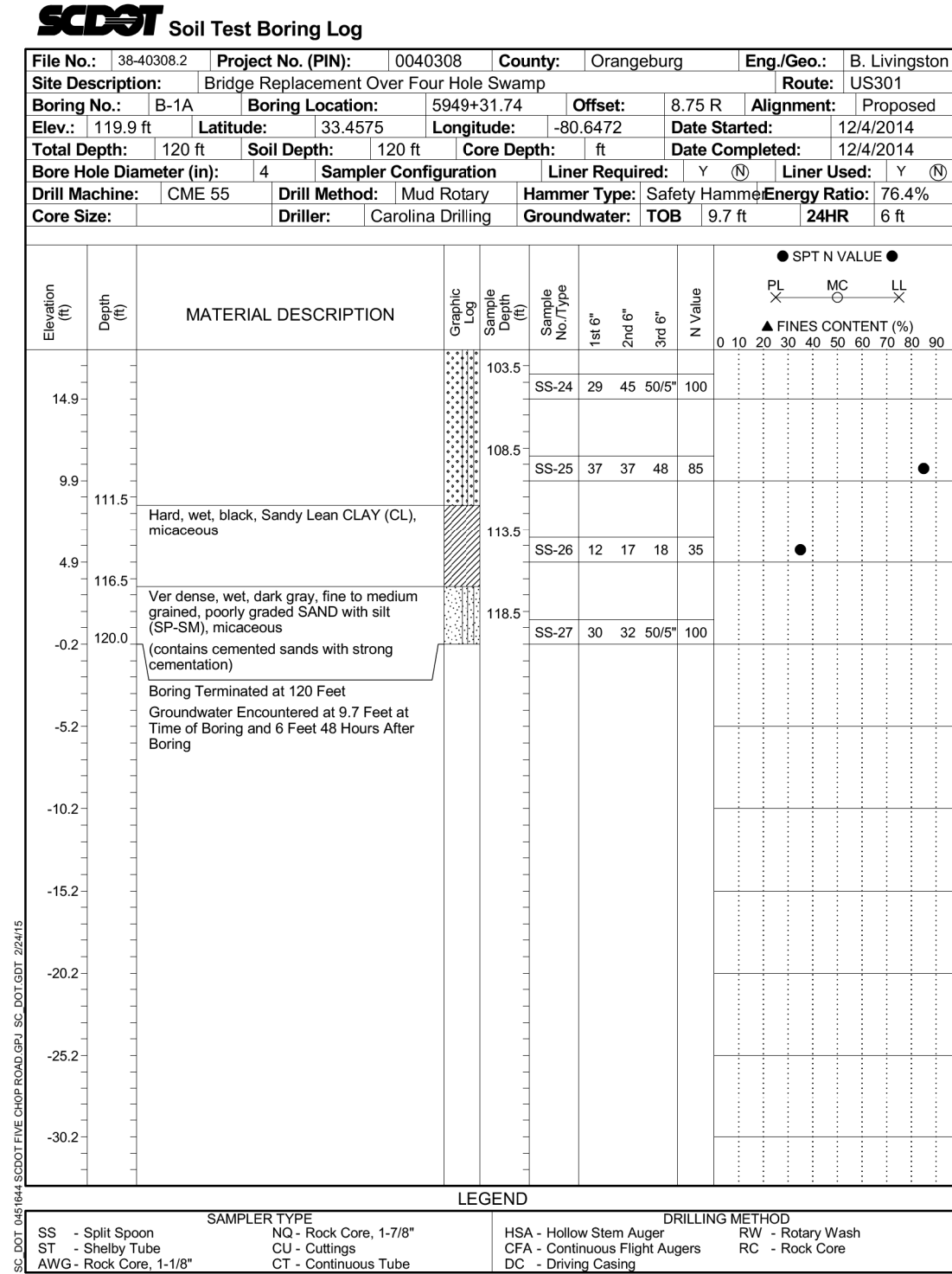
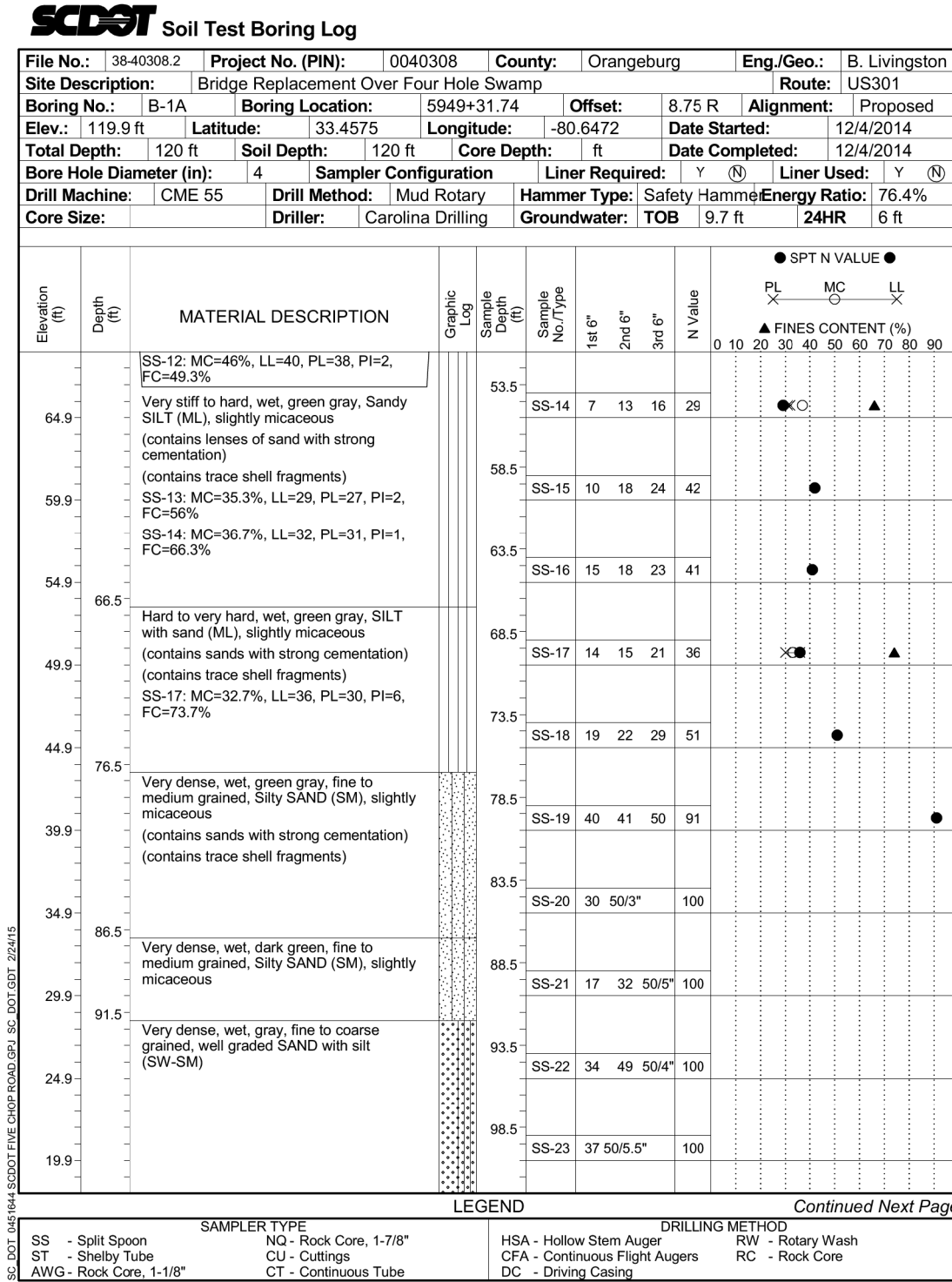
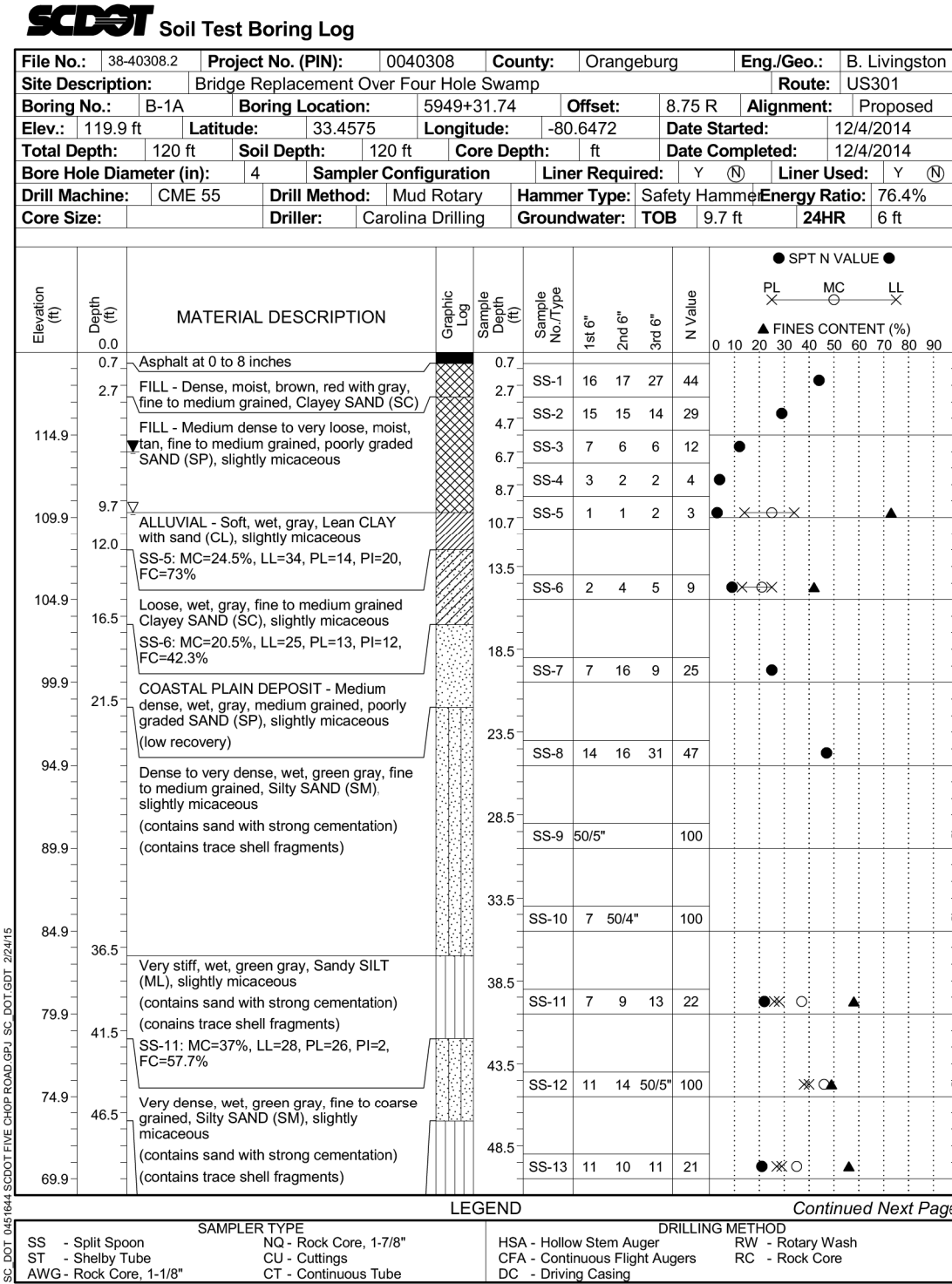




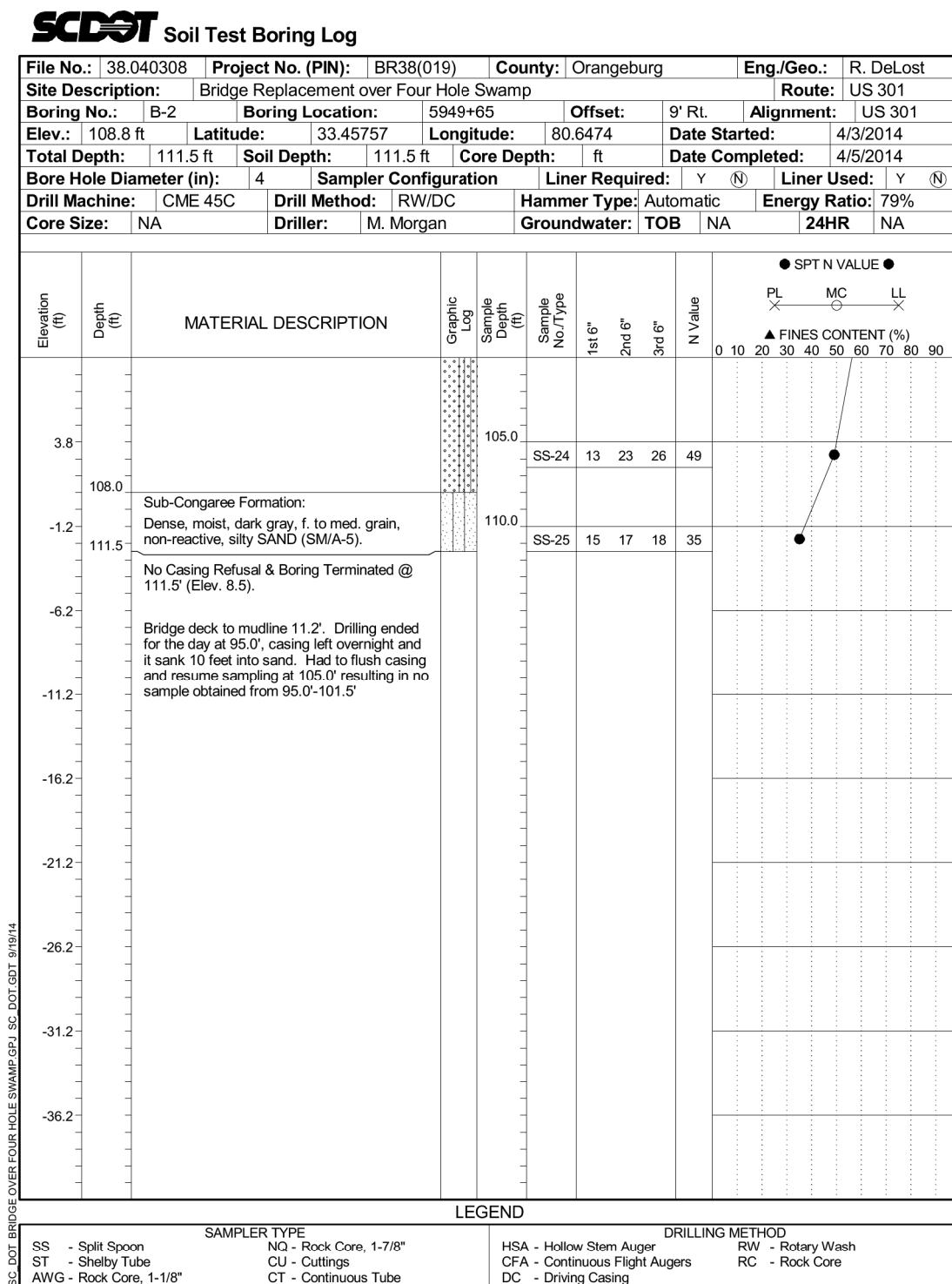
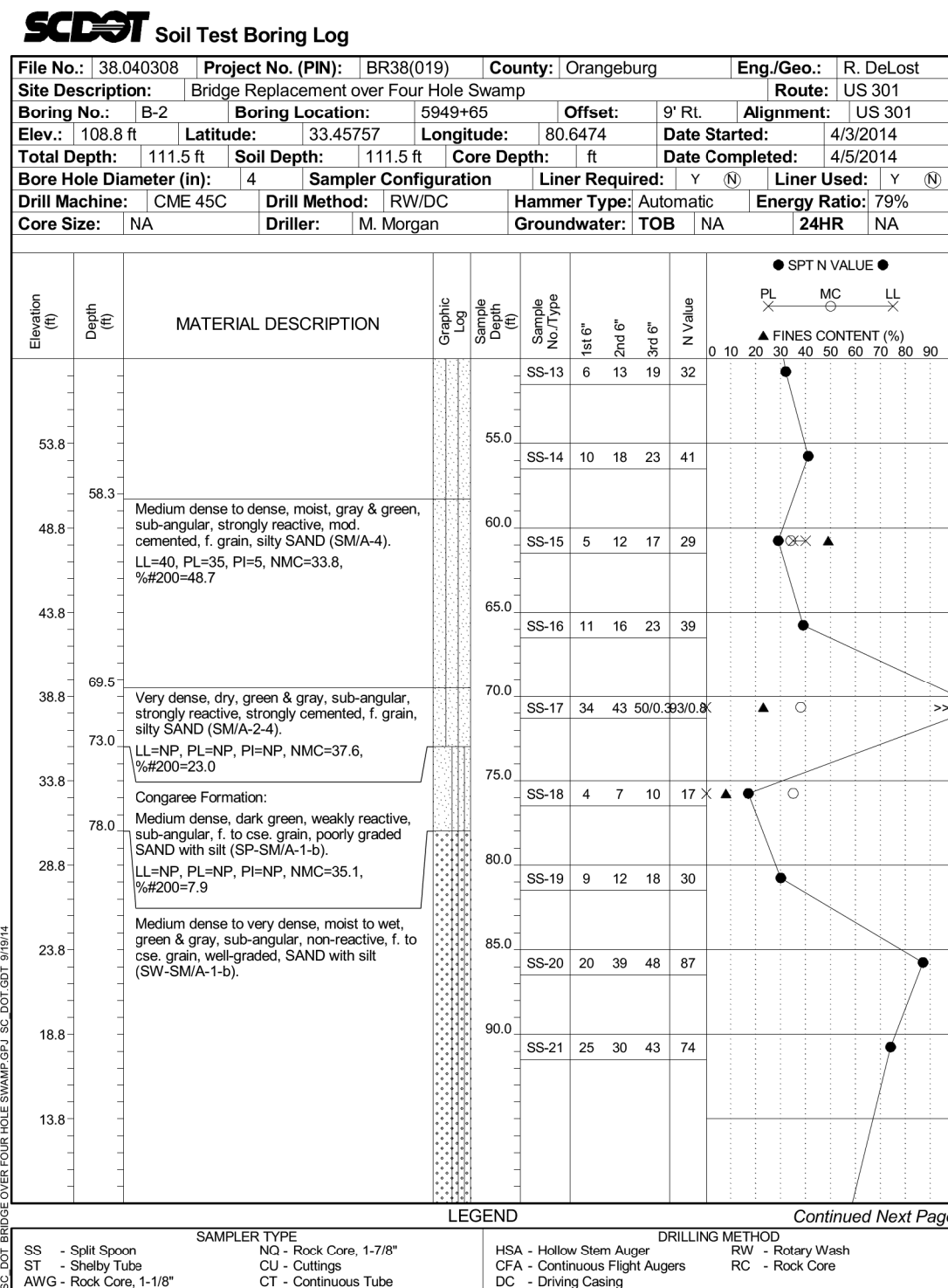
PLAN

FOR INFORMATION ONLY

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION			
REV.							
REV.							
REVIEWED				BORING LOCATIONS			
QUAN.							
DR.	GFD	BKB	09-16				
DES.							
	BY	CHK.	DATE	COUNTY ORANGEBURG			ROUTE US 301

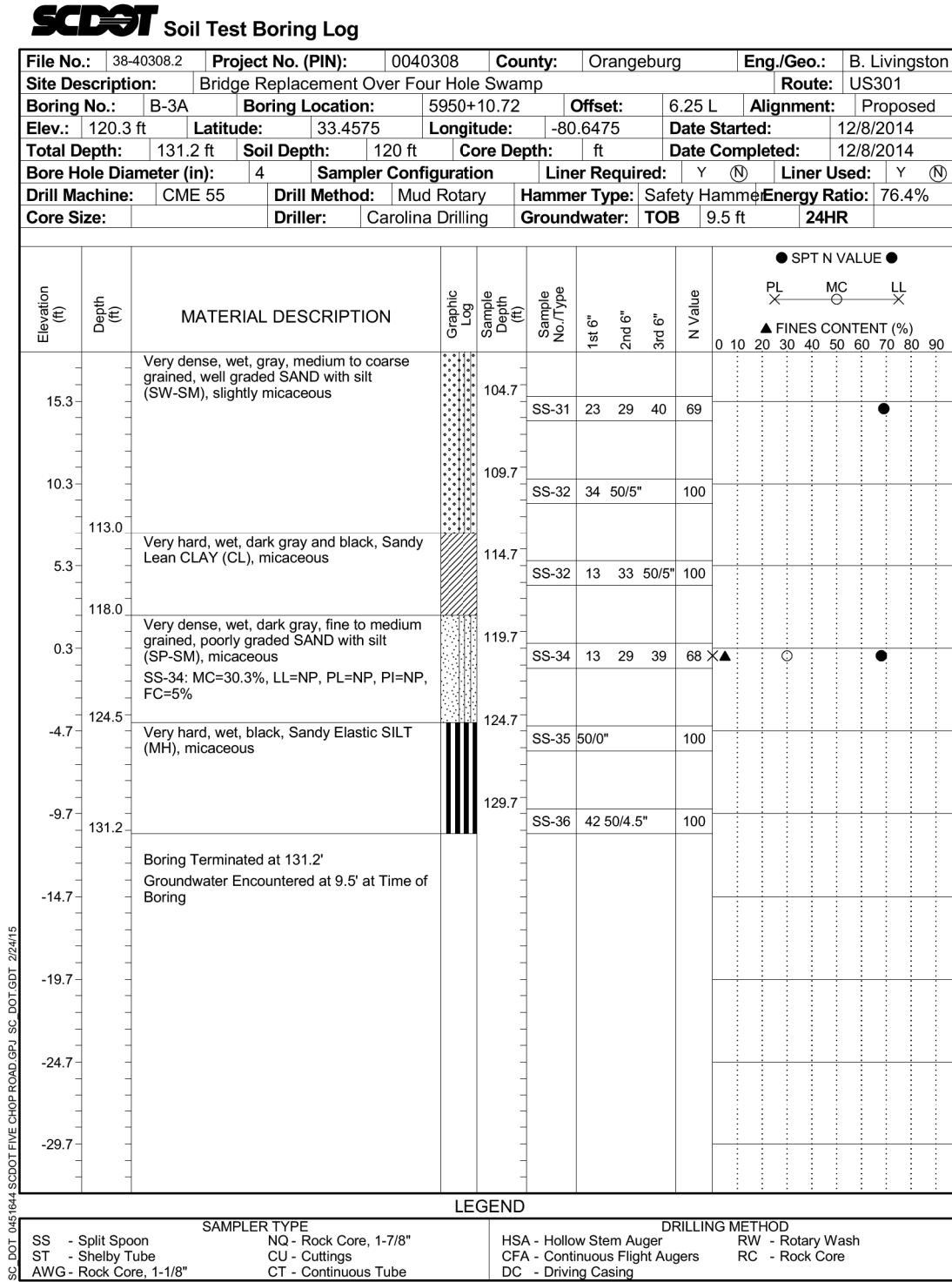
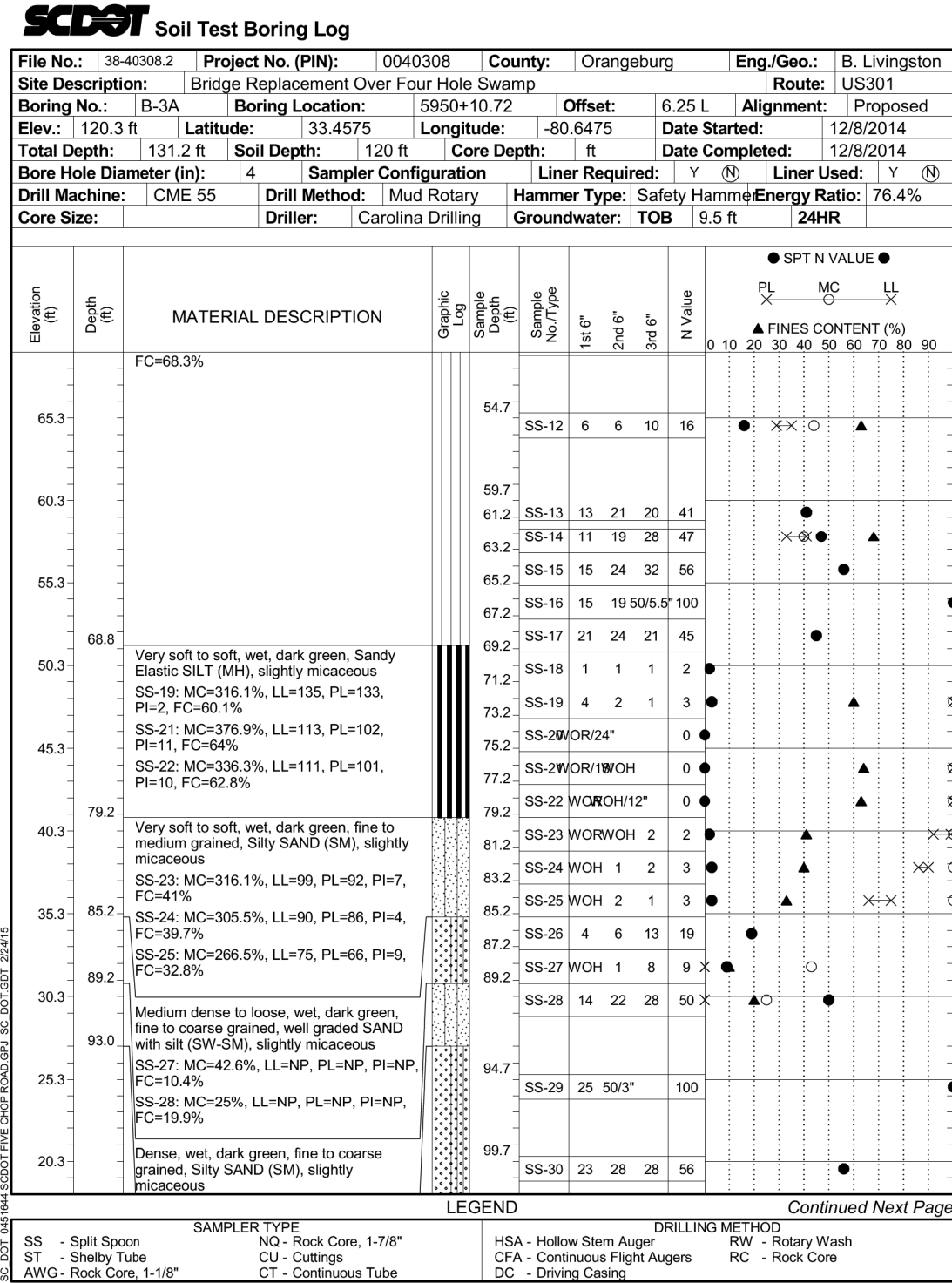
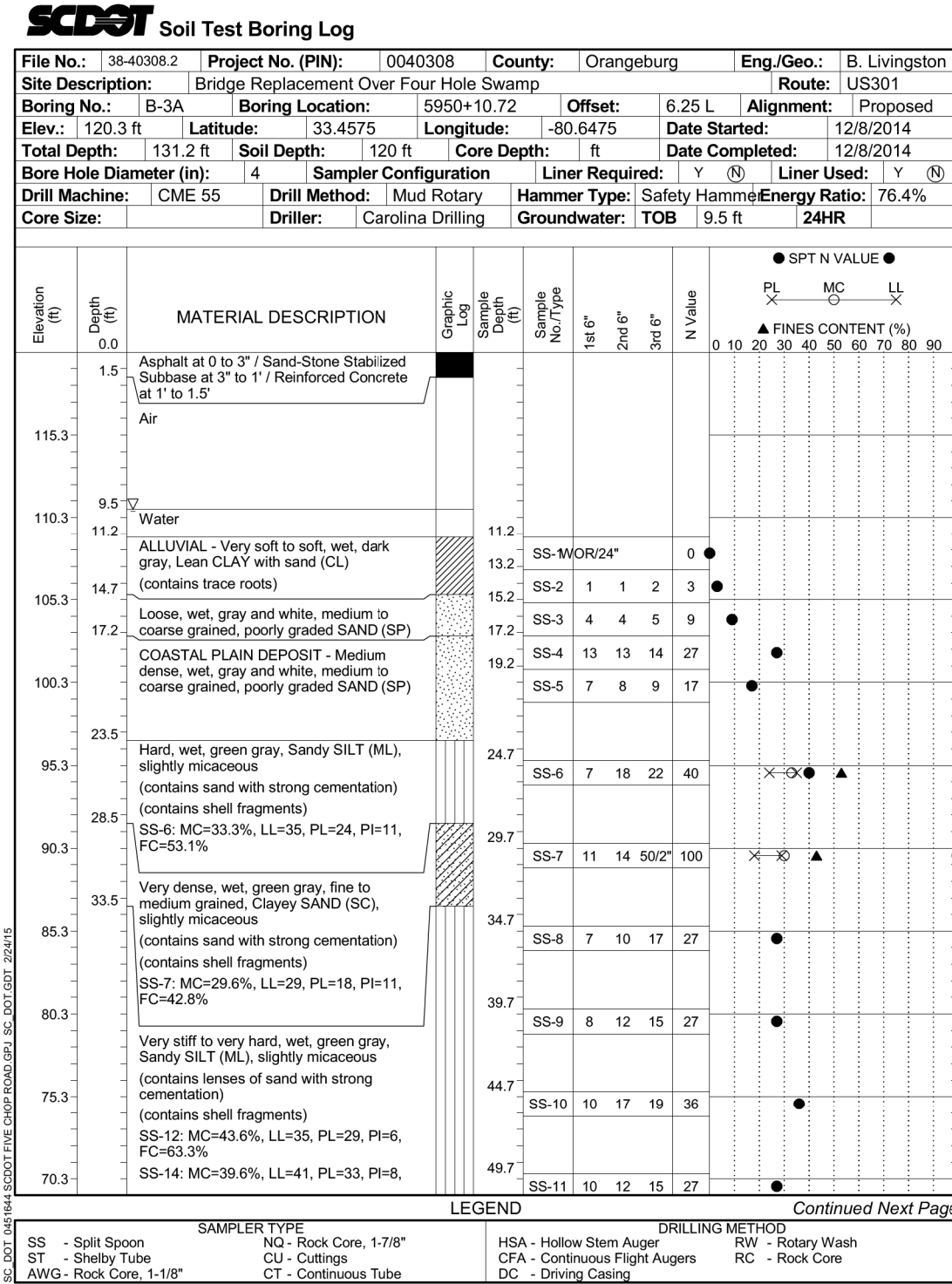


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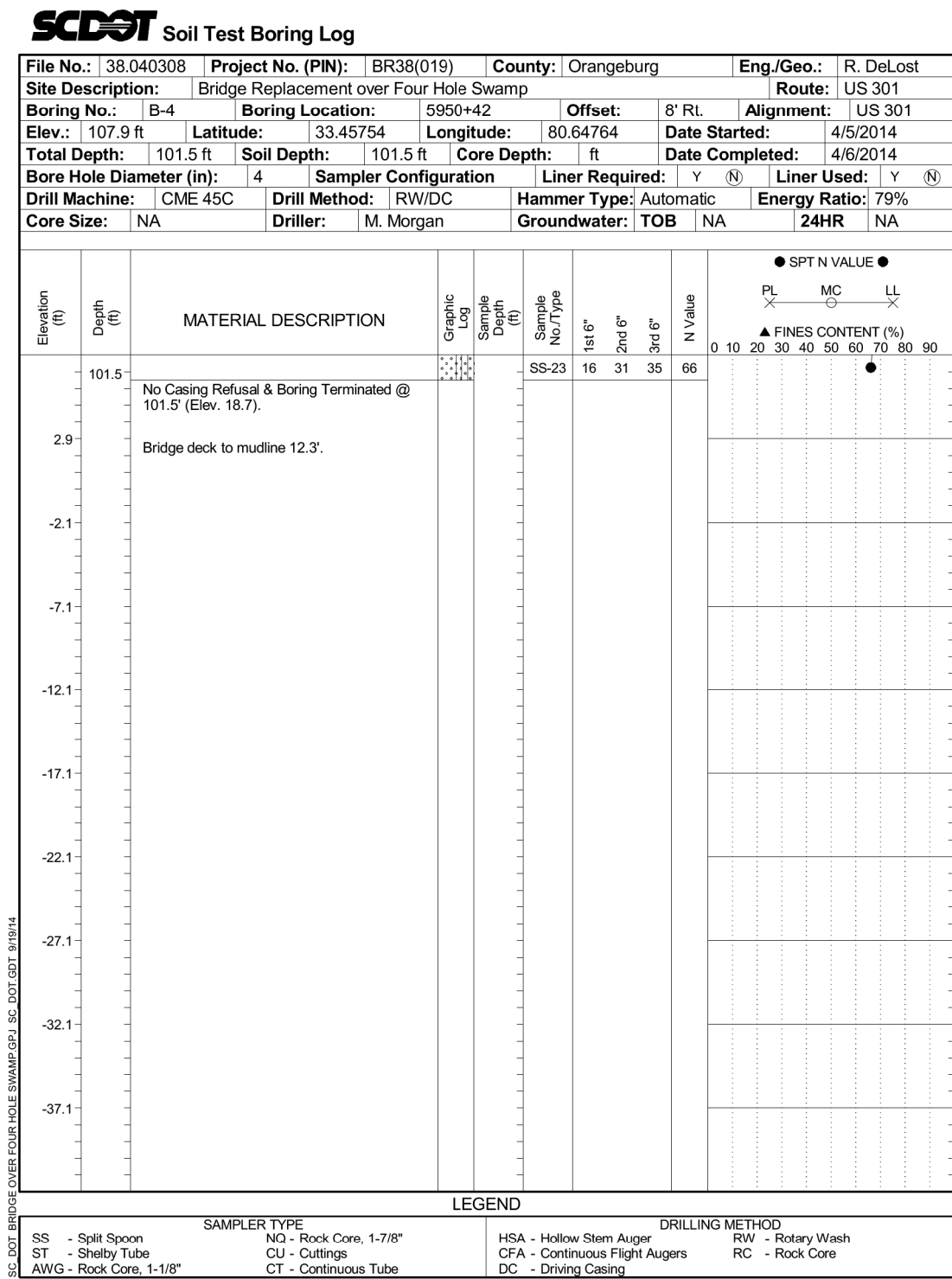


REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
REV.					
REV.					
REVIEWED					
QUAN.					
DR.	GFD	BKB	09-16	BORING LOGS (2 OF 8)	
DES.					
	BY	CHK.	DATE	COUNTY	ROUTE
				ORANGEBURG	US 301

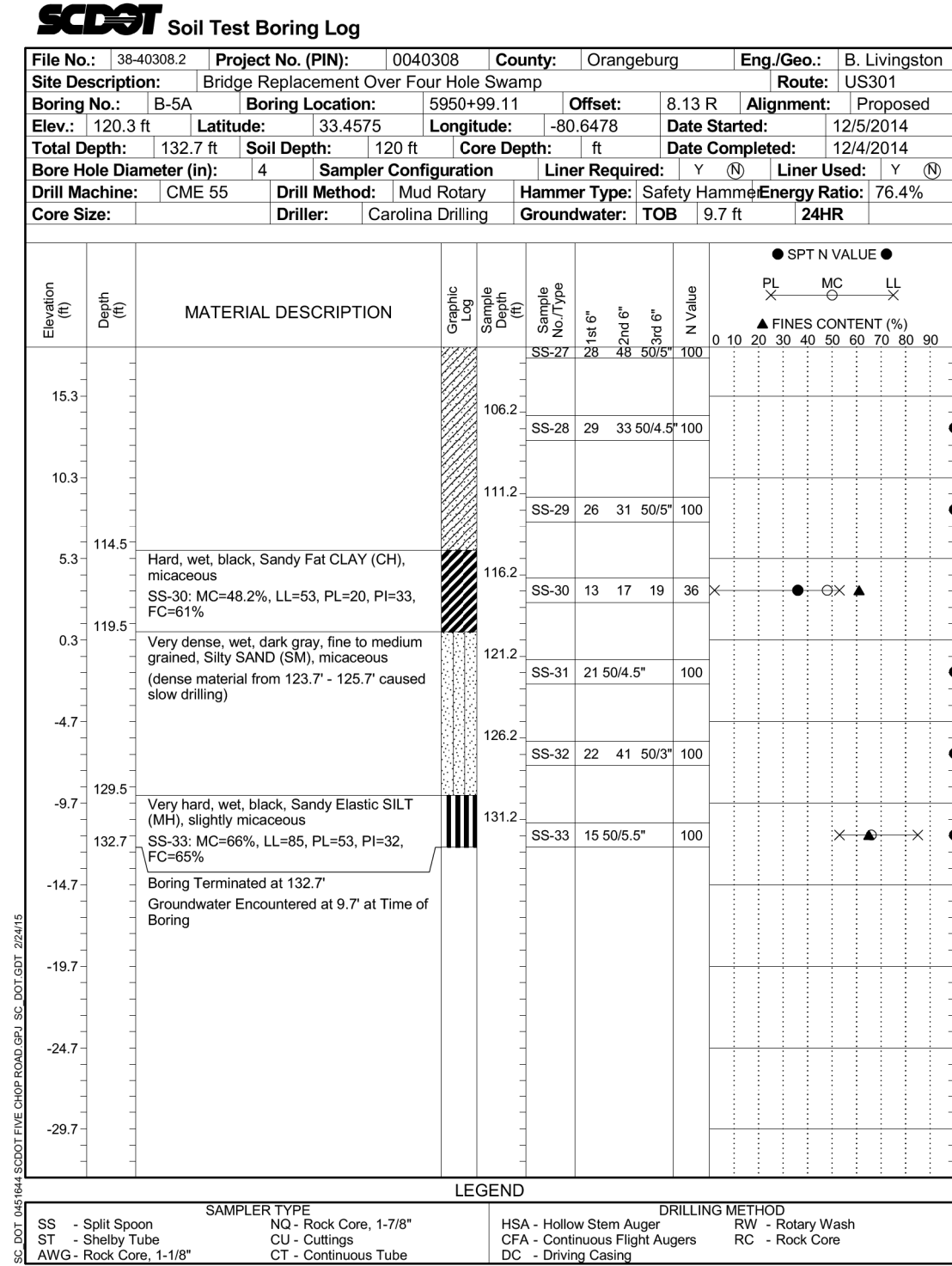
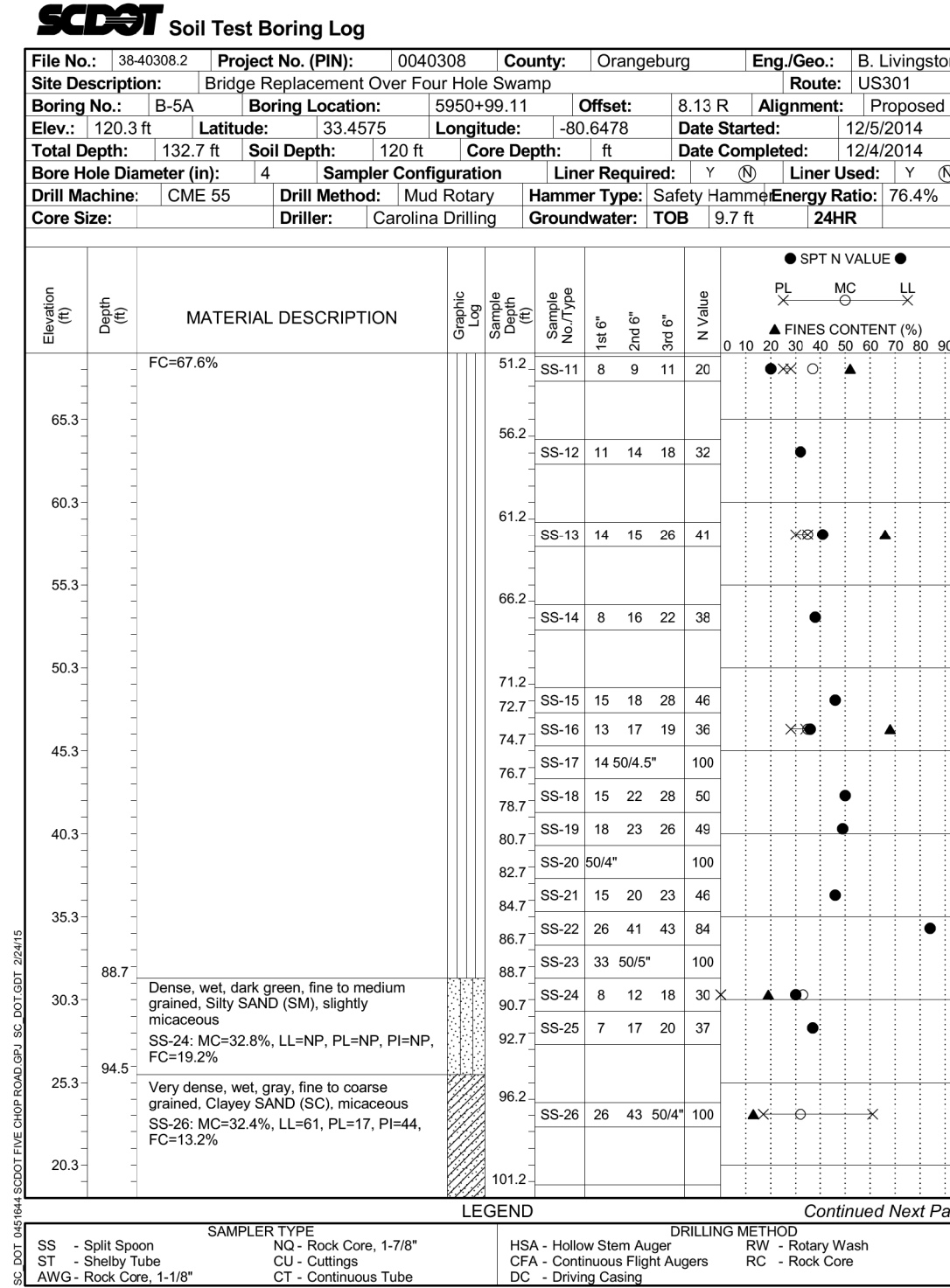
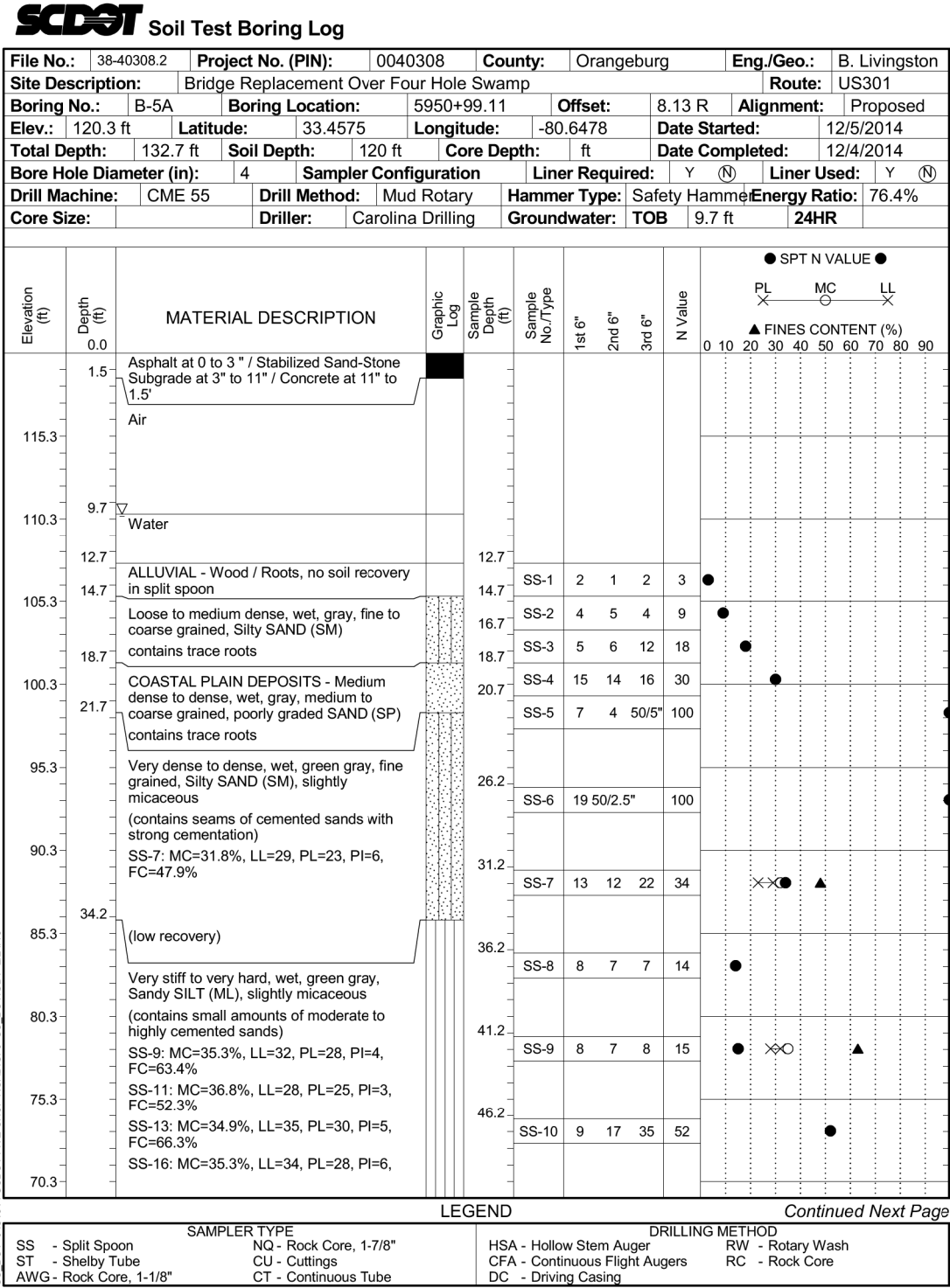
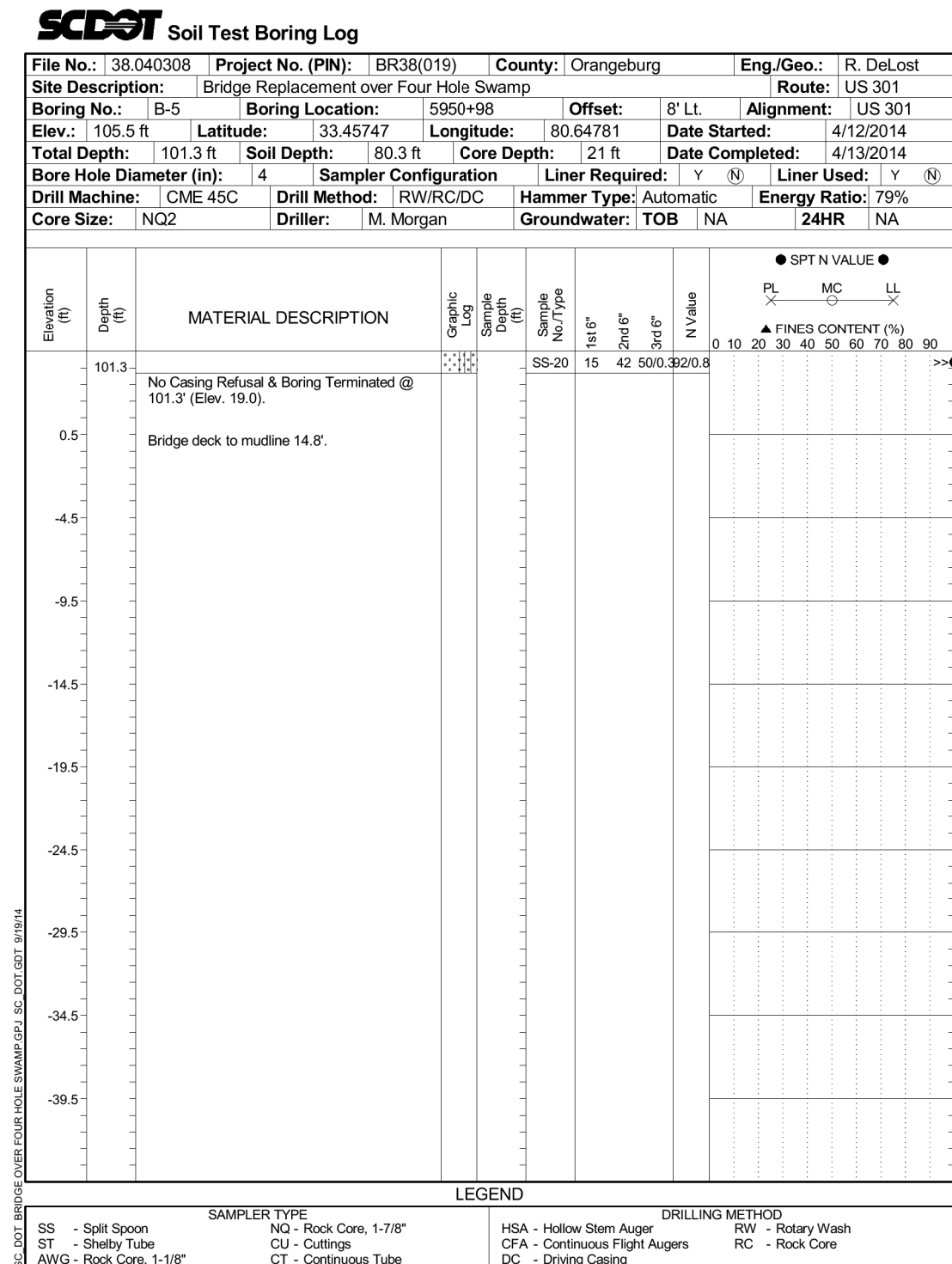
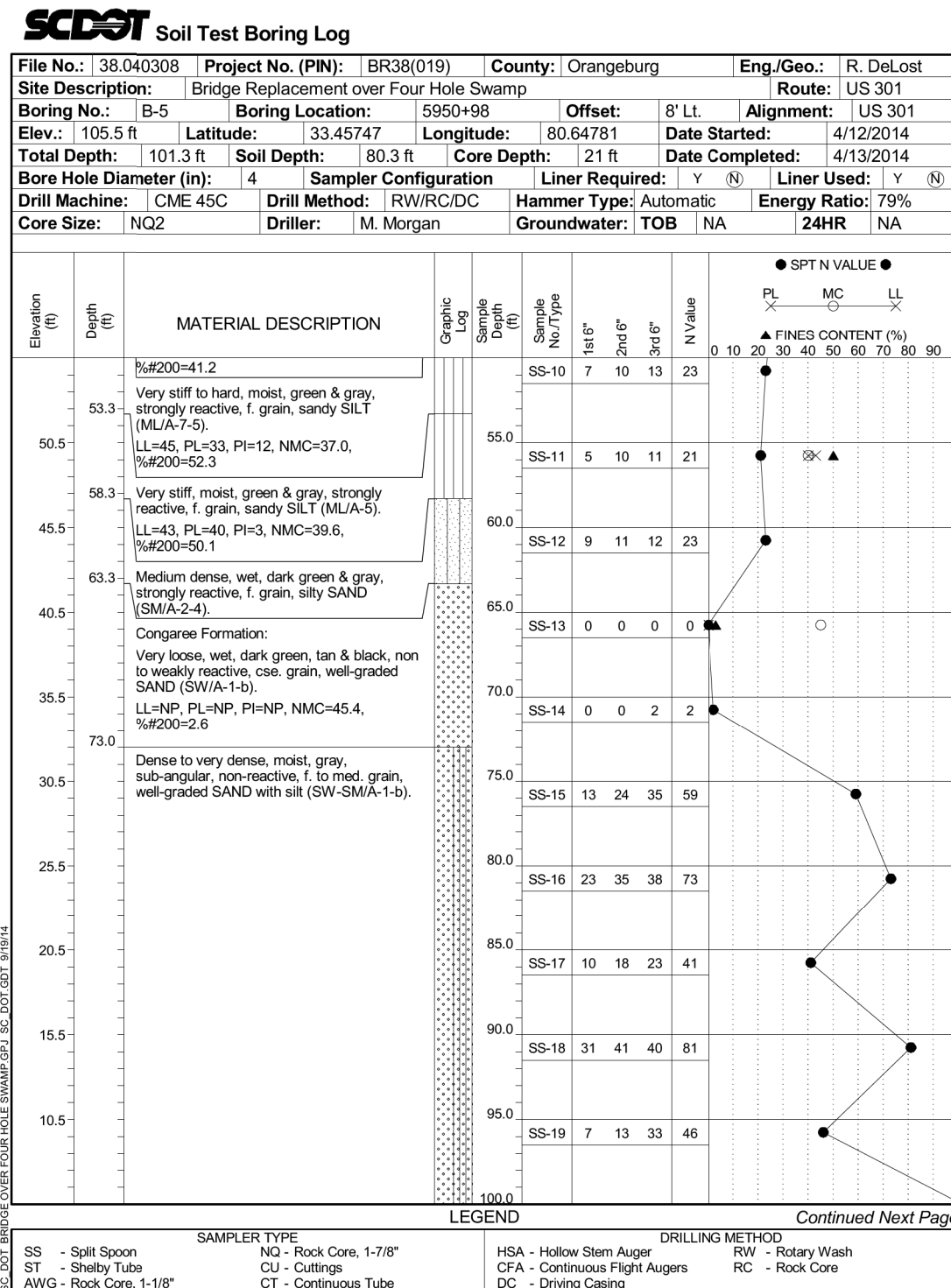
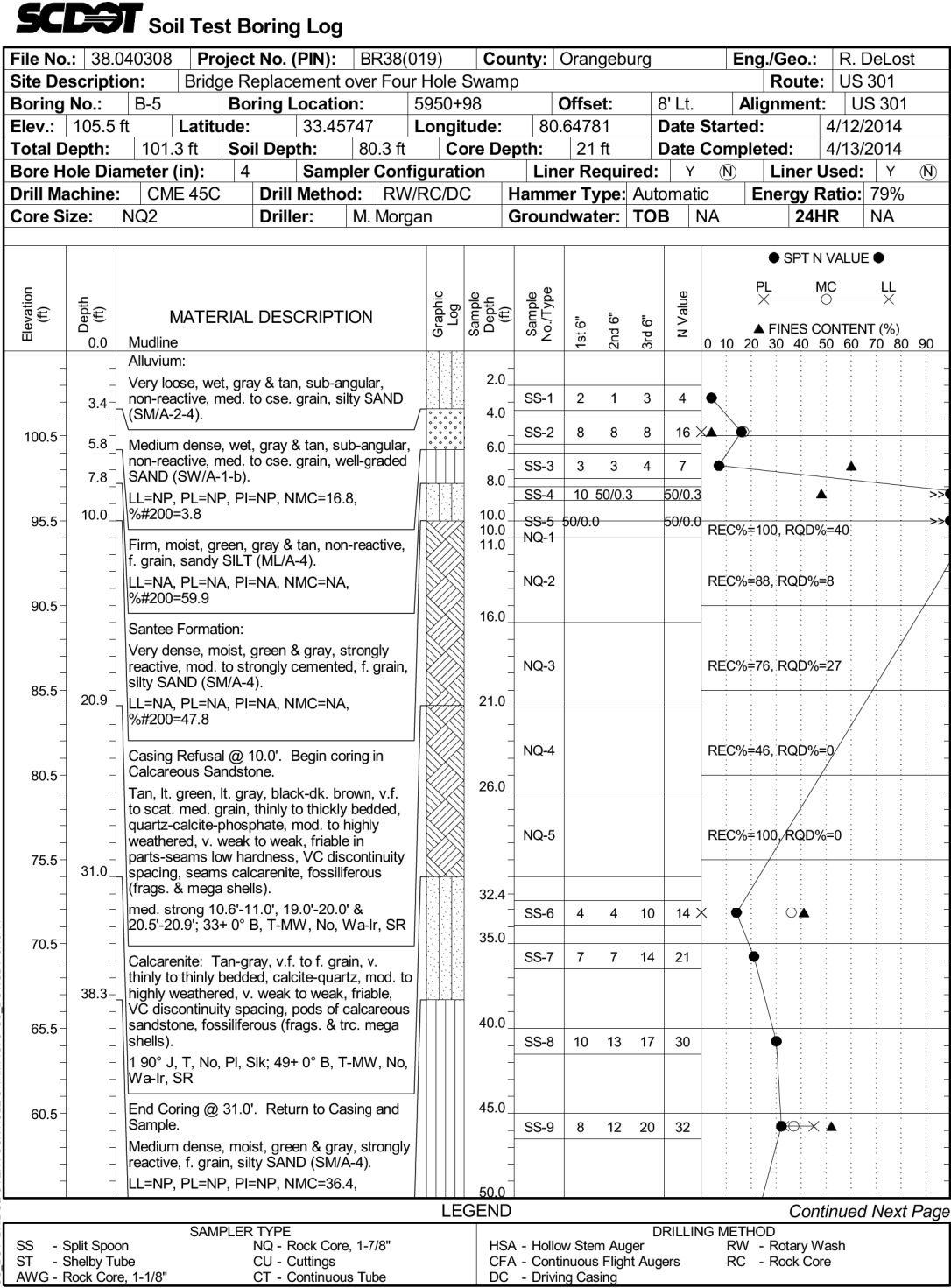




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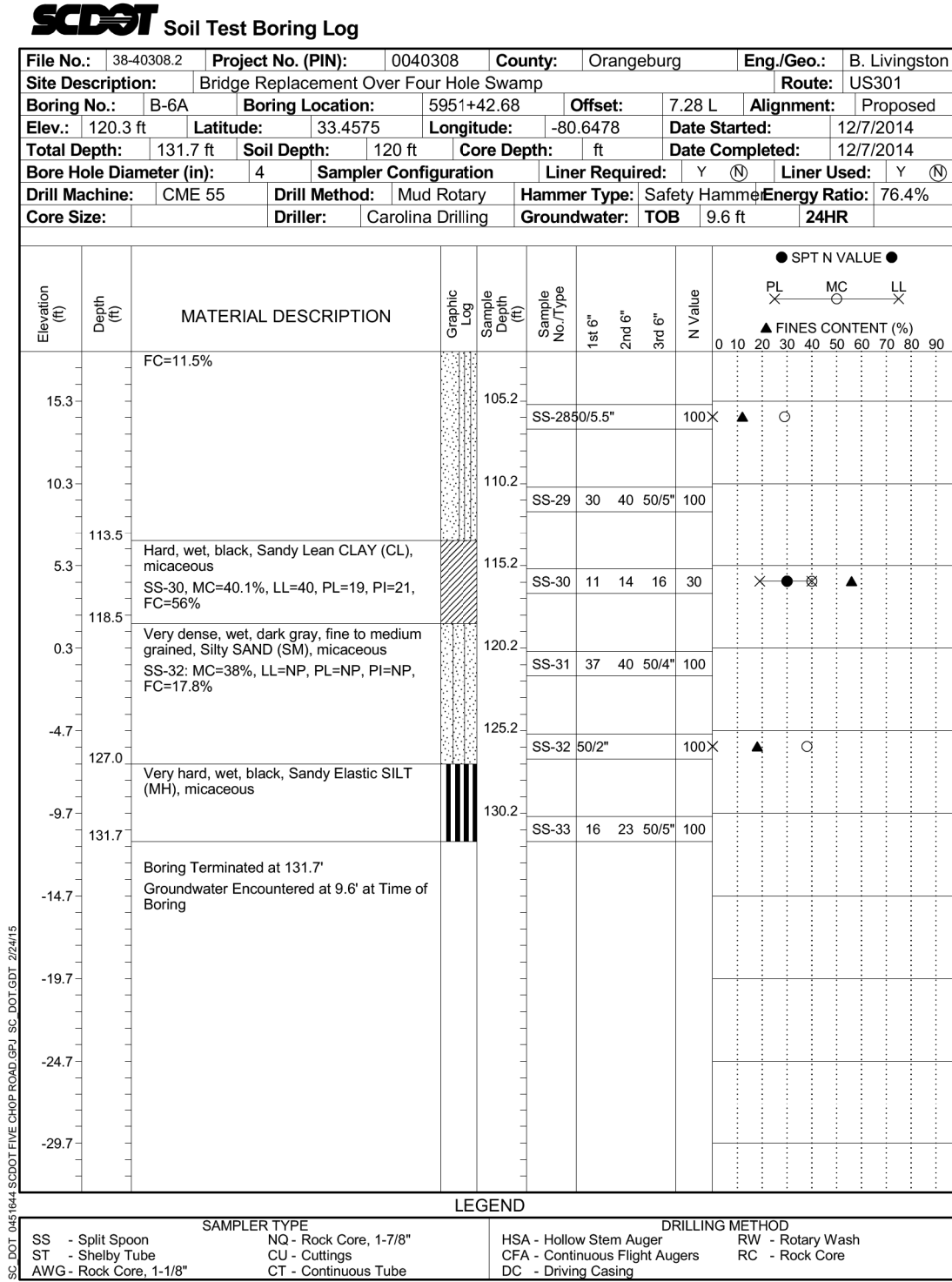
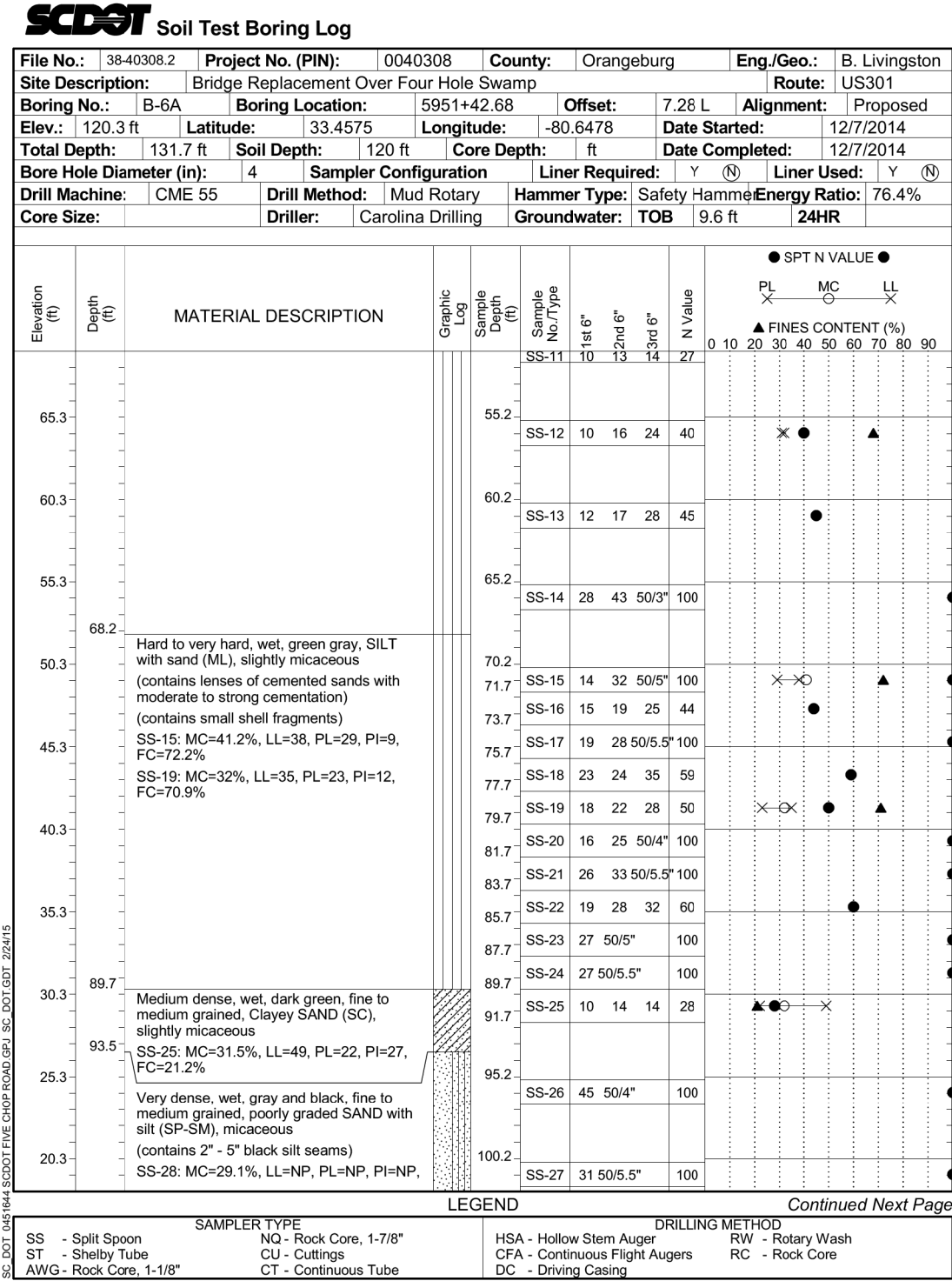
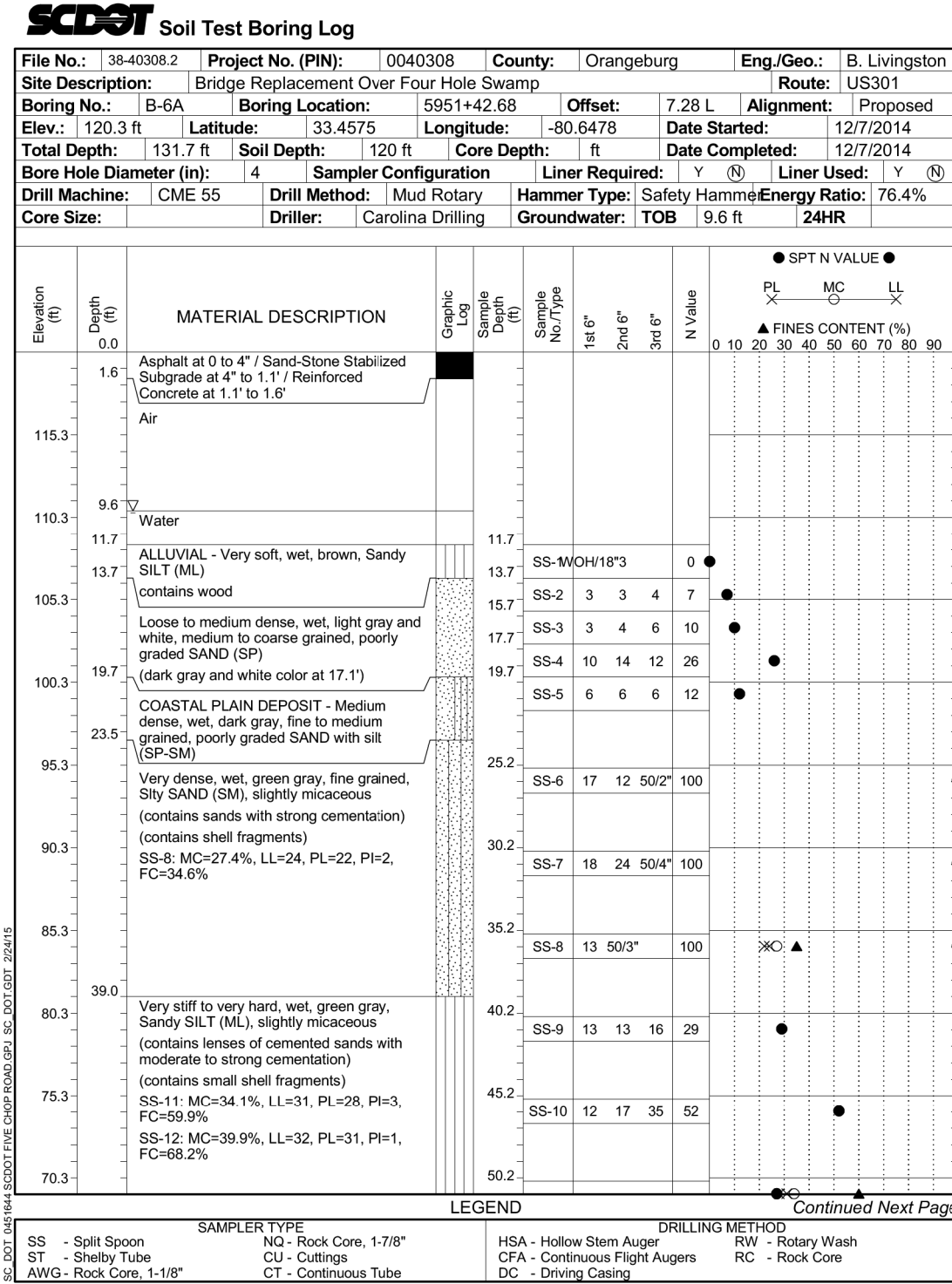
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REV.				DEPARTMENT OF TRANSPORTATION			
REV.				BORING LOGS (4 OF 8)			
REVIEWED							
QUAN.							
DR.	GFD	BKB	09-16				
DES.				COUNTY		ROUTE	
	BY	CHK.	DATE	ORANGEBURG		US 301	



FOR INFORMATION ONLY

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION		
REV.						
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REVIEWED						
QUAN.				BORING LOGS (5 OF 8)		
DR.	GFD	BKB	09-16			
DES.						
BY	CHK.	DATE				
COUNTY				ORANGEBURG	ROUTE	US 301





REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
REV.				
REV.				
REV.				
REVIEWED				BORING LOGS (6 OF 8)
QUAN.				
DR.	GFD	BKB	09-16	
DES.				
BY	CHK.	DATE	COUNTY	ROUTE
			ORANGEBURG	US 301

<b>SCSST</b> Soil Test Boring Log																																																																																																																																																																											
File No.: 38.040308		Project No. (PIN): BR38(019)			County: Orangeburg			Eng./Geo.: R. DeLost																																																																																																																																																																			
Site Description:		Bridge Replacement over Four Hole Swamp																																																																																																																																																																									
Boring No.: 18-7		Bearing Location:			5951+86		Offset:		8' LL		Alignment:		US 301																																																																																																																																																														
Elev.: 1105.0 ft		Latitude:		33.45744		Longitude:		80.6481		Date Started:		4/12/2014																																																																																																																																																															
Total Depth:		41 ft		Soil Depth:		20 ft		Core Depth:		21 ft		Date Completed:		4/12/2014																																																																																																																																																													
Bore Hole Diameter (in):		4		Sampler Configuration				Liner Required:		Y N		Liner Used:		Y N																																																																																																																																																													
Drill Machine:		CME 45C		Drill Method:		RW/RCDC		Hammer Type:		Automatic		Energy Ratio:		79%																																																																																																																																																													
Core Size:		NQ2		Driller:		M. Morgan		Groundwater:		TOB NA		24HR		NA																																																																																																																																																													
<div style="text-align: right;">● SPT N VALUE ●</div> <div style="float: right; margin-right: 20px;">           PL      MC      LL            ▲ FINEG CONTENT (%)         </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Elevation (ft)</th> <th>Depth (ft)</th> <th>MATERIAL DESCRIPTION</th> <th>Graphic Log</th> <th>Soils Name</th> <th>Soils No/Type</th> <th>1st Ft</th> <th>2nd Ft</th> <th>3rd Ft</th> <th>N Value</th> <th>PL</th> <th>MC</th> <th>LL</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>Boring Terminated @ 41.0' (Elev. 79.1).</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Bridge deck to mudline 15.1'</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr><td>50.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>45.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>40.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>35.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>30.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>25.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>20.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>15.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>																Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Soils Name	Soils No/Type	1st Ft	2nd Ft	3rd Ft	N Value	PL	MC	LL			Boring Terminated @ 41.0' (Elev. 79.1).													Bridge deck to mudline 15.1'											50.0													45.0													40.0													35.0													30.0													25.0													20.0													15.0													10.0												
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SCSOT Soil Test Boring Log																			
File No.: 13-0498.2		Project No. (PIN): 0040308		County: Orangeburg		Eng./Geo.: B. Livingston		US 301											
Site Description: Bridge Replacement Over Four Hole Swamp		Route:																	
Boring No.: B-7A	Boring Location:	5951-87.63	Offset:	8.39 R	Alignment:	Proposed													
Elev.: 120.31'	Latitude: 33.4575	Longitude: -80.6481	Date Started:	12/6/2014															
Total Depth: 132.1	Soil Depth: 120.9	Core Depth: 120.9	Date Completed:	12/6/2014															
Bore Hole Diameter (in): 4	Sampler Configuration:	Linear Required: Y	Linear Used: Y																
Drill Machine: CME 55	Drill Method: Mud Rotary	Hammer Type: Safety Hammer	Energy Rate: 76.4%																
Core Size: CME	Driller: Carolina Drilling	Groundwater: TOB	9.5 ft	24HR															

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Soil Sample Depth (ft)	Soil Type	Grain Size Distribution (%)									
						1/4" #	1/2" #	3/4" #	2" #	4" #	10" #	20" #	40" #	60" #	100" #
65.3				55.9	SS-11	15	20	33	53						
58.5															
60.3				60.5	SS-13	12	30	50*	100*						
55.5															
				65.5	SS-14	13	21	41	61						
				70.5											
				72.0	SS-15	16	21	50	71						
				74.0	SS-16	16	25	45	72						
45.3				76.0	SS-17	12	14	29	43						
				78.0	SS-18	17	13	505.5*	100*						
				80.0	SS-19	13	38	504*	100*						
				82.0	SS-20	40	504*	100*							
				84.0	SS-21	2	4	4	7						
				86.0	SS-22	2	3	4	6						
				88.0	SS-23	2	3	4	7						
				90.0	SS-24	13	38	504*	100*						
				92.0	SS-25	22	30	37	67 X						
				95.5											
				100.5	SS-26	19	46	503*	100*						
				102.0	SS-27	40	505.5*	100*							

LEGEND									
SAMPLER TYPE					DRILLING METHOD				
SS - Split Spoon	NC - Rock Core, 1-7/8"				ORA - Hollow Stem Auger	RW - Rotary Wash			
SS - Shelby Tube	CU - Castings				CFB - Continuous Flight Augers	DC - Direct Control			
AWG - Rock Core, 1-1/8"	CI - Continuous Tube					RC - Rock Core			

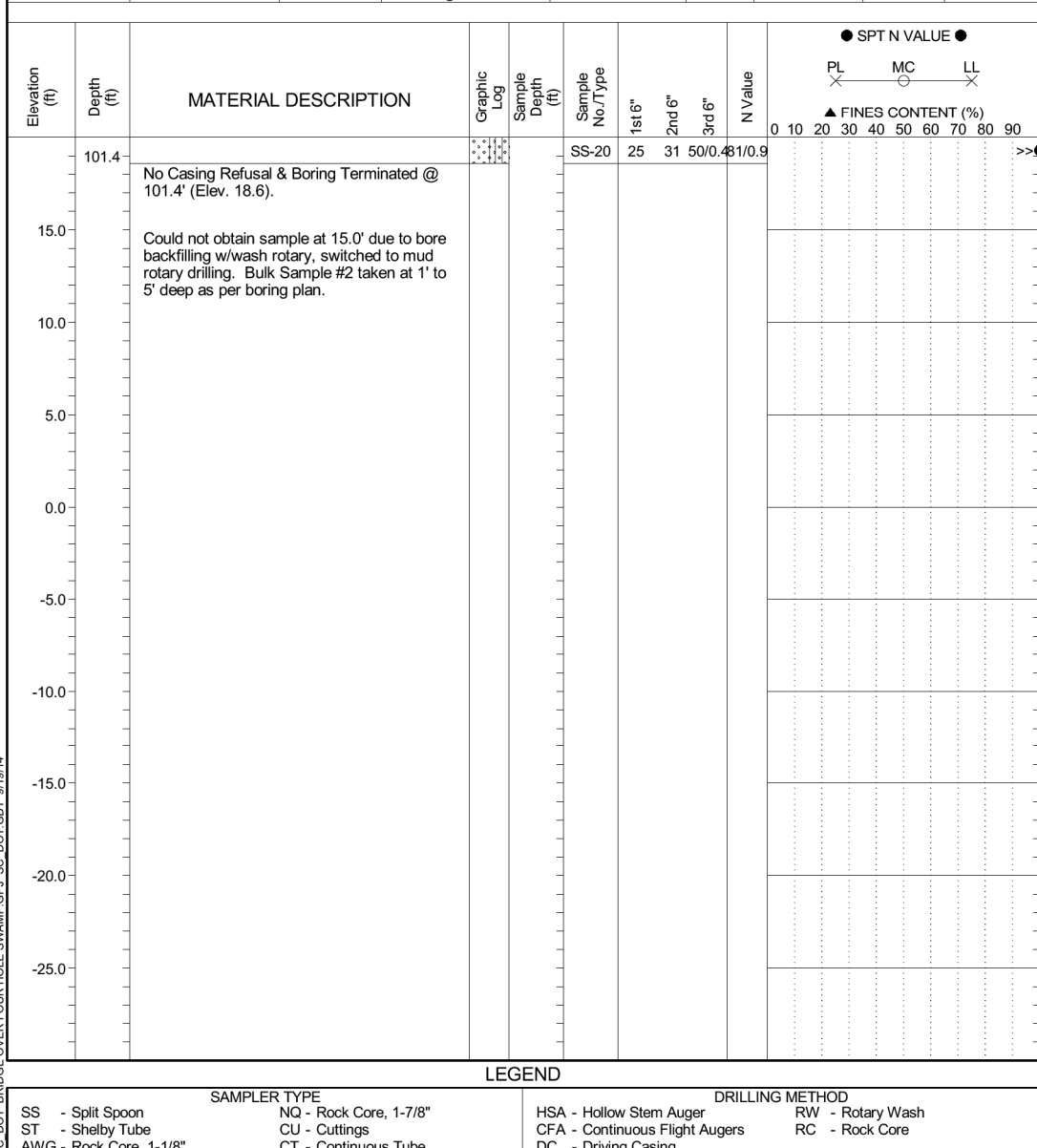
File No.: 76-4058R.2		Project No. (PIN): 0040308		County: Orangeburg		Eng./Geotechnical Engineer: US301				
Site Description: Bridge Replacement Over Four Hole Swamp										
Boring No:	B-7A	Boring Location:	595°187.63	Offset:	8.39 R	Alignment:	Proposed			
Elev. @ Top of Borehole:	120.3 ft	Latitude:	33.4575	Longitude:	-80.6481	Date Started:	12/6/2014			
Total Depth:	132 ft	Soil Depth:	120 ft	Core Depth:	ft	Date Completed:	12/6/2014			
Dave Hole Diameter (in):	4	Sampler Configuration:		Liner Required:	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Liner Used:	1 Y <input checked="" type="checkbox"/> N <input type="checkbox"/>			
Drill Machine:	CME 55	Drill Method:	Mud Rotary	Hammer Type:	Safety Hammer	Energy Ratio:	76.4%			
Core Size:		Driller:	Carolina Drilling	Groundwater:	TOD	N/A	24HR			
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Organic Content (%)	Sample No.	No. Tests	SPT Value	FINES CONTENT (%)			
							PL	MC	LL	
15.3	106.5	Very dense, wet, black, fine to medium grained, poorly graded SAND with silt (SP-SM), micaceous SS-28: MC=26.7%, LL=N/P, PL=N/P, PI=N/P, FC=2.5%		SS-28	19	33	50*	100*	<input checked="" type="radio"/>	<input type="radio"/>
10.3	101.5	Very hard, wet, black, Sandy Lean CLAY (CL), micaceous		SS-29	15	50**	100			
5.3	113.5	Very dense, wet, dark gray, fine to medium grained, Silty SAND (SM), micaceous		SS-30	15	40	50.4-5*	100		
0.3	120.5			SS-31	15	42	50*	100		
-4.7	124.5	Very hard, wet, black, Sandy Elastic SILT (MH), micaceous		SS-32	16	30	50*	100		
-13.7	132.0			SS-33	50*	100				
-14.7		Boring Terminated at 132' Groundwater Encountered at 9.5' at Time of Borehole Completion								
LEGEND										
SPT - Split Spoon SS - Shelby Tube AWG - Rock Core - 1.5"	SAMPLER TYPE NC - Rock Core - 1-7/8" CU - Cuttings CT - Continuous Tube									
DRILLING METHOD HSA - Hollow Stem Auger CFA - Continuous Flight Augers DC - Direct Casting RW - Rotary Wash RC - Rock Core										

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REV.				
REV.				
REVIEWED				BORING LOGS (7 OF 8)
QUAN.				
DR.	GFD	BKB	09-16	
DES.				
BY	CHK.	DATE	COUNTY	ROUTE
			ORANGEBURG	US 301

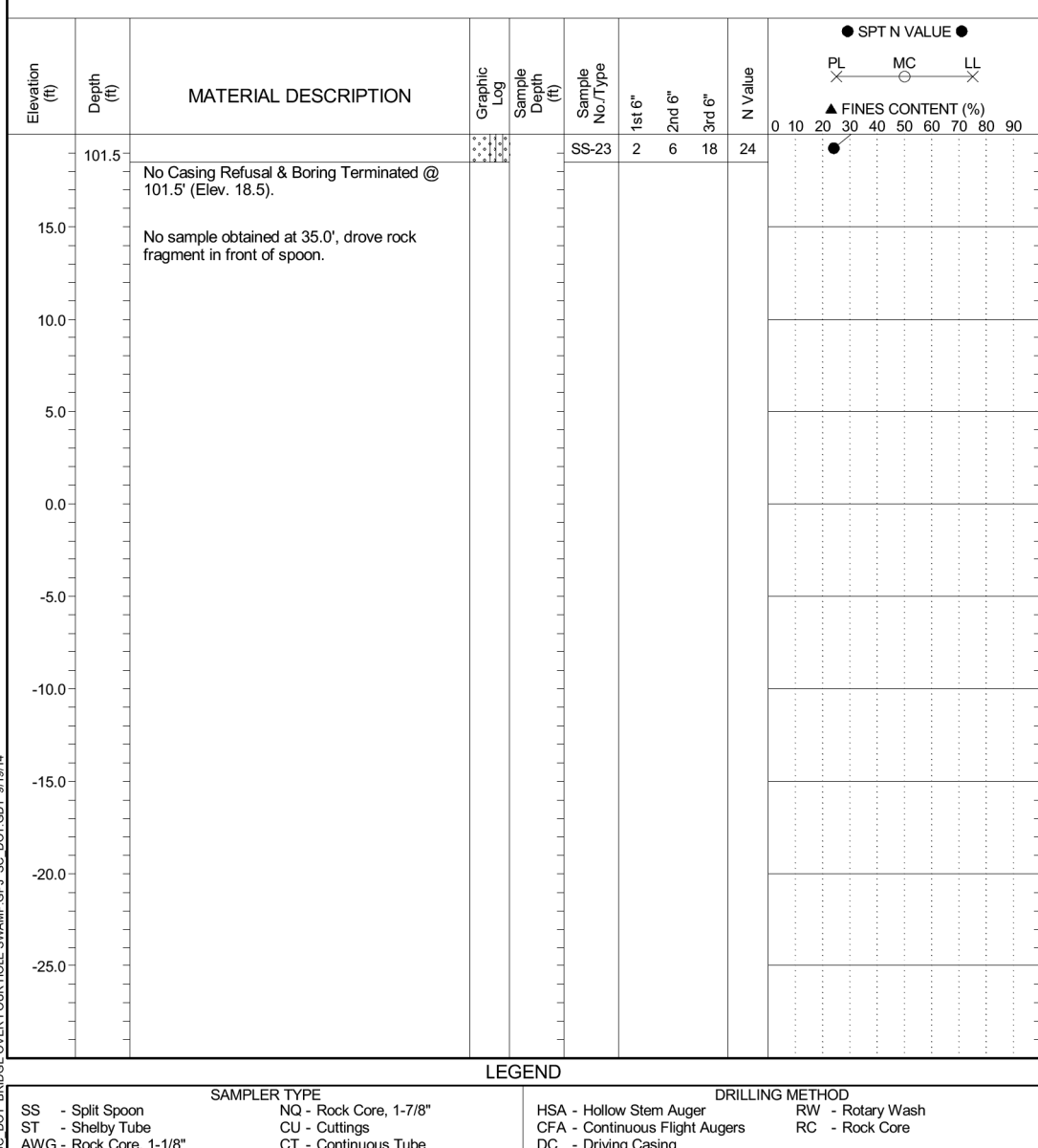
FOR INFORMATION ONLY

**SCDOT** Soil Test Boring Log

File No.: 38.043038	Project No. (PIN): BR38(0.4)	County: Orangeburg	Eng. No.: R. Delost
Site Description: Bridge Replacement over Four Hole Span		Revs.: US 301	
Boring No.: B-8	Boring Location: 59521+2	Offset: 8' R/L	Revs.: US 301
Elev.: 120.0 ft	Latitude: 33.45747	Longitude: 80.64821	Date Started: 4/8/2014
Bottom Depth: 101.4 ft	Soil Depth: 80.5 ft	Core Depth: 20.9 ft	Date Completed: 4/9/2014
Total Hole Diameter (in.): 4	Sampler Configuration	Liner Required: Y	NLiner Used: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
Drill Machine: CMC 45C	Drill Method: RW/RWCDC	Hammer Type: Automatic	Energy Ratio: 79%
Core Size: NQ2	Driller: M. Morgan	Groundwater: T2	12 ft. 24HR 10.4 ft.

**SCDOT** Soil Test Boring Log

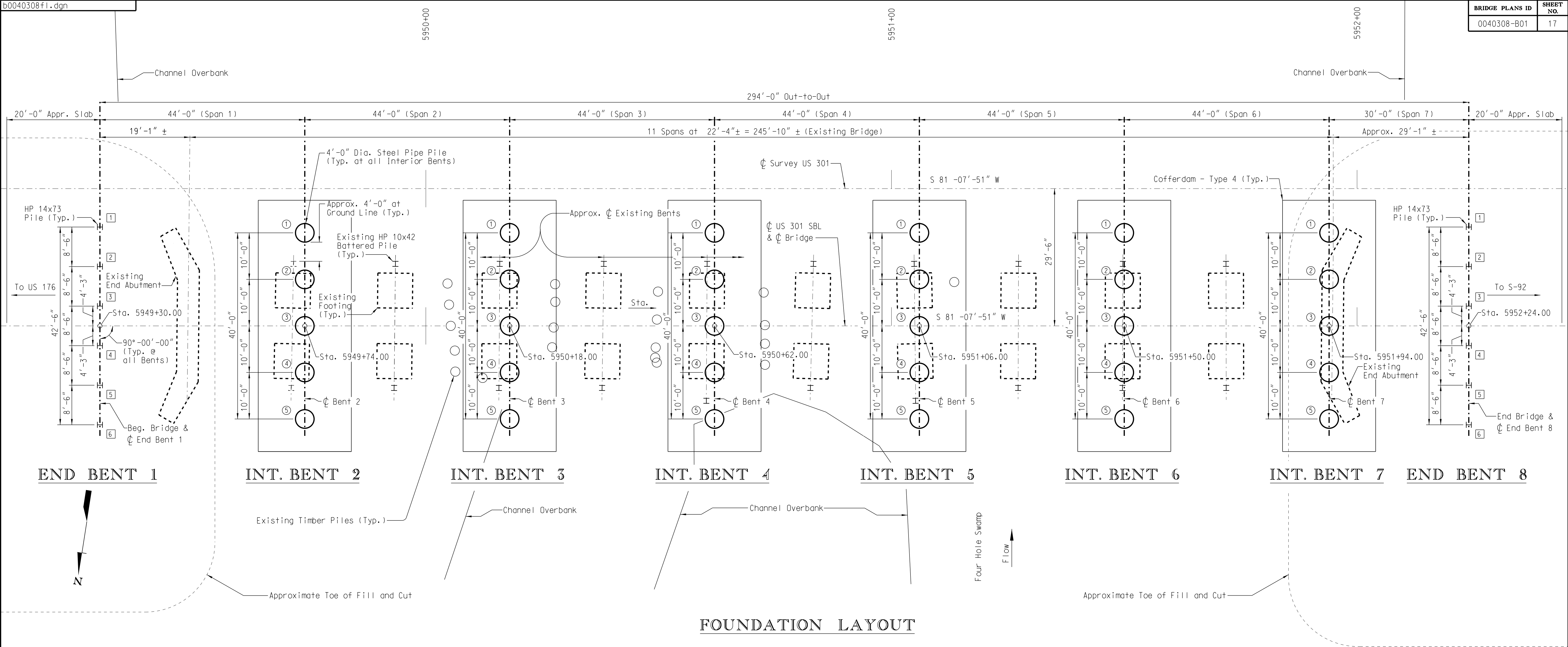
File No.:	38.043038	Project No. (PIN):	BR38(010)	County:	Orangeburg	Eng./Geo.:	R. Delost
Site Description:		Bridge Replacement over Four Hole Swamp			Route:		
Boring No.:		B-9	Boring Location:	5952+28	Offset:	8' L	Alignment:
Elev.:	120.0 ft	Latitude:	33.4572	Longitude:	80.6482	Date Started:	4/11/2014
Depth:	101.5 ft	Soil Depth:	101.5 ft	Core Depth:	ft	Date Completed:	4/11/2014
Total Hole Diameter (in.):		4	Sampler Configuration	Linear Required:	Y	N	Linear Used:
Drill Machine:		CME 45C	Drill Method:	RWDC	Hammer Type:	Automatic	Energy Rate:
Core Size:		NA	Driller:	M. Morgan	Groundwater:	TOB	5.9 ft
						24HR	12.6 ft



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FOR INFORMATION ONLY





FOUNDATION LAYOUT

Notes:  
No more than two cofferdams are allowed to be in the channel at any point in time during construction. Maximum size of cofferdams is limited to 22' x 56' in plan to conform with environmental permit.

Bridge plans for the original portion of the existing bridge have not been located. The original substructure is assumed to be supported by footings, based on details provided in plans for the widened portions of the existing bridge. Whether the footings are spread footings or supported on piles is unknown. Also, exact dimensions for the footings are unknown. Therefore, the footings shown in the Foundation Layout are representative and do not necessarily show all potential conflicts between the existing foundations and the new foundations. While best effort has been made to locate potential conflicts between the existing foundations and the new foundations, other conflicts may occur that are not indicated in the Foundation Layout.

Completely remove portions of the existing foundations that interfere with the installation of the new steel pipe piles. Remove all other portions of existing foundations including existing piling from previous bridgels) according to Section 202.4.2 of the Standard Specifications or as directed by the RCE. Include all costs for this work in the lump sum price bid for "Removal and Disposal of Existing Bridge".

- Ⓜ Indicates HP Pile Number.
- Ⓢ Indicates Steel Pipe Pile Number.

<div><div><div><div><div><span></span></div><div>SOUTH CAROLINA</div></div><div><div><span></span></div><div>REGISTERED PROFESSIONAL ENGINEER</div></div><div><div><span></span></div><div>No. 21949</div></div><div><div><span></span></div><div>CHRIS R. LACY</div></div></div></div></div>	REV.			SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION			
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				ORANGEBURG		US 301	

REINF. STEEL SCHED. (Reinforcing Quantities are for one bent only)							
MARK	EB 1 NO. REQ'D	EB 8 NO. REQ'D	DIMENSION			LENGTH	
			"a"	"b"	"c"	"d"	
A1601	6	6	49'-1"	---	---	---	49'-1"
A1901	20	20	7'-7"	---	---	---	7'-7"
A2501	90	90	1'-8"	---	---	---	1'-8"
A2901	9	9	49'-1"	---	---	---	49'-1"
C1901	8	8	5'-1"	3'-2"	---	---	8'-3"
C1902	8	8	7'-7"	3'-2"	---	---	10'-9"
J1601	18	---	8"	4'-6 1/2"	---	---	9'-9"
J1602	---	18	8"	4'-3 1/2"	---	---	9'-3"
J2901	5	5	7'-2"	2'-0"	---	---	11'-2"
S1601	63	63	2'-8"	2'-7"	0'-8"	---	11'-10"
SA1601	18	18	2'-8"	2'-7"	0'-7"	---	9'-0"
V1901	12	12	1'-10"	---	---	---	3'-8"

QUANTITIES

ITEM	UNIT	BENT 1	BENT 8
Concrete, Class 5000	CY	18.8	18.6
Reinforcing Steel	LB	4,051	4,042
Pile Driving Set-up	EA	6	6
Dynamic Pile Analyzer Test Set-up	EA	2	2
Steel Piling (HP14x73) (4)	LF	185	190
Steel Index Piling (HP14x73) (4)	LF	39	40

Note:  
HP14x73 Steel Piling to conform to the latest AASHTO Specifications for M270 Steel and have a Minimum Yield Strength of 50 ksi.

HP piles are numbered from left to right looking in direction of stationing.

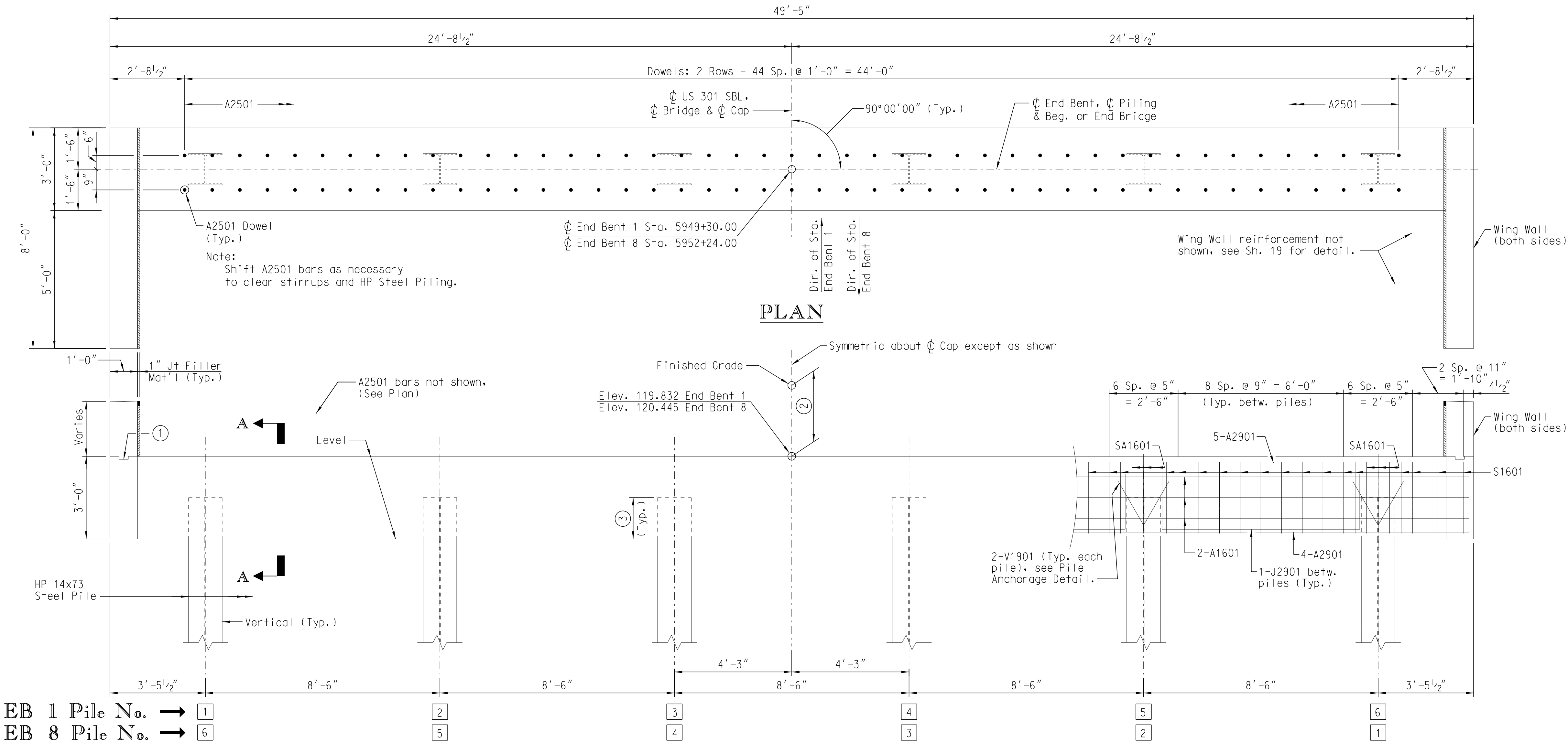
For Index Pile and pile installation requirements, see Geotechnical Notes on Sh. 19.

For Reinforcing Bending Details, see Sh. 4.

For A2501 dowel bar details, see Sh. 3.

UNO - Unless Noted Otherwise.  
EB 1 - End Bent 1  
EB 8 - End Bent 8

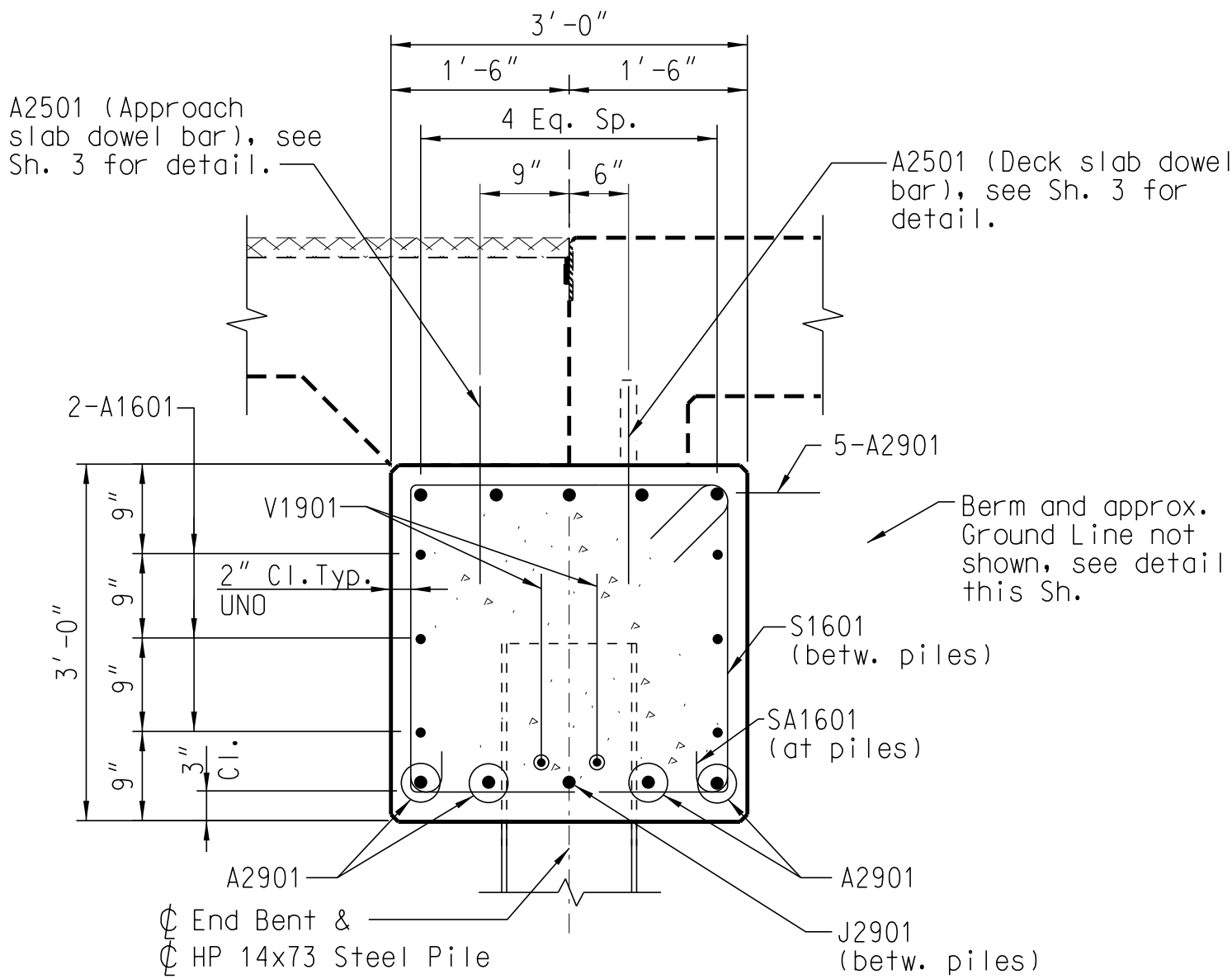
- ① Construction joint. Cast bottom portion of Wing Wall with End Bent Cap. Cast top portion of Wing Wall after Deck slab and Approach slab have been constructed. See Sh. 3 for Construction Joint detail.
- ② 2'-5 7/8" at  $\phi$  End Bent 1, and 2'-2 7/8" at  $\phi$  End Bent 8.
- ③ Piles to be embedded a minimum of 1'-6" and a maximum of 2'-0" into the end bent cap. See this Sh. for pile anchorage details.
- ④ Pile length calculated based on an assumed pile embedment of 2'-0".



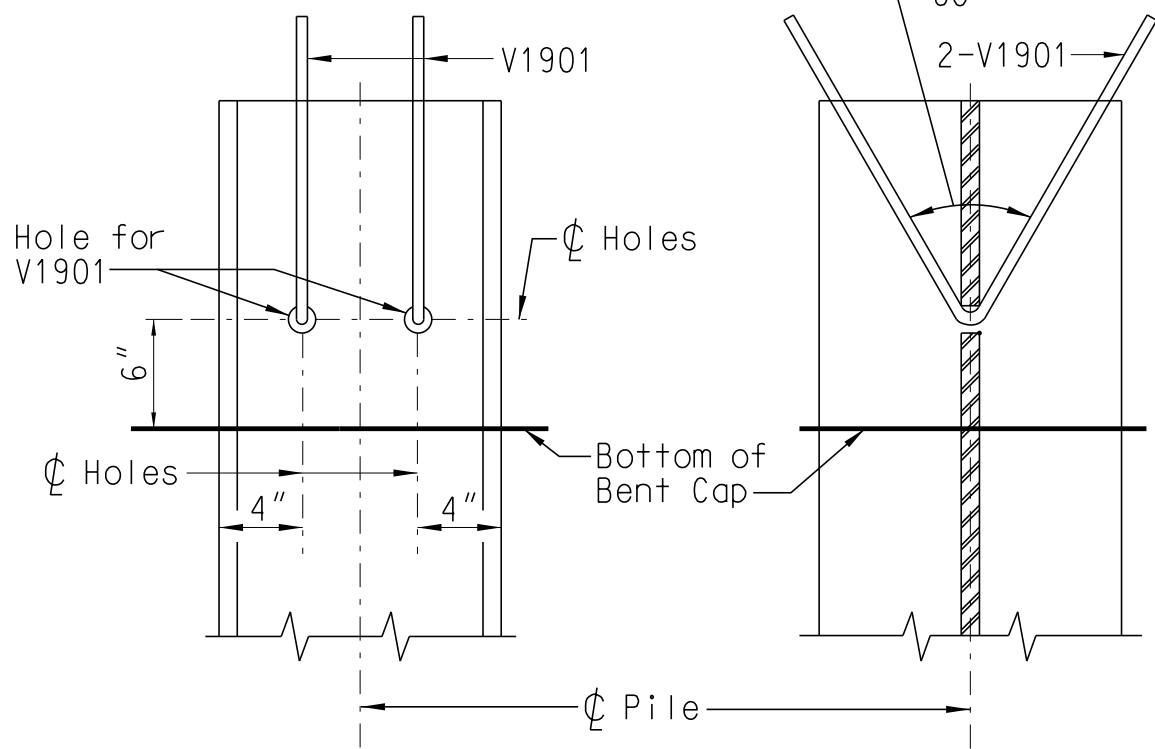
EB 1 Pile No. → 1  
EB 8 Pile No. → 6

ELEVATION

(EB 1: Looking in direction of stationing)  
(EB 8: Looking in opposite direction of stationing)



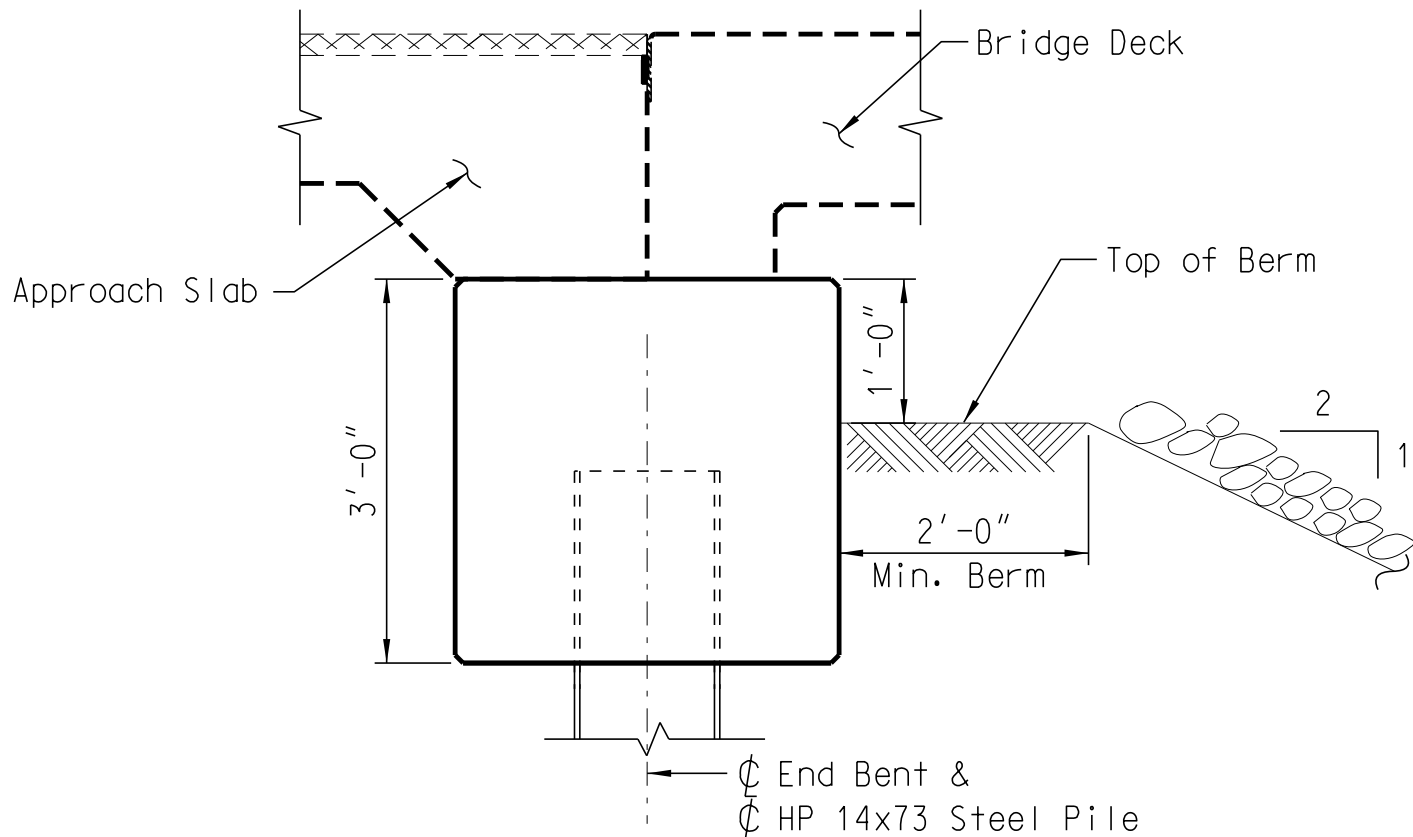
SECTION A-A



PILE ANCHORAGE DETAIL

Holes for V1901 to be 1" min. and 1 1/2" max.

Drill or flame cut the holes. Grind area around flame cut holes to remove burrs. Tie or wedge tightly the reinforcing bar against the top of the hole.



BERM AND APPROXIMATE GROUND LINE



REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION				
REV.								
REV.				END BENTS 1 AND 8				
REVIEWED								
QUAN.	TL	GFD	12-16					
DR.	TL	GFD	12-16					
DES.	TL	GFD	12-16					
	BY	CHK.	DATE	COUNTY	ORANGEBURG		ROUTE	US 301



Note:  
UNO - Unless Noted Otherwise  
EB 1 - End Bent 1  
EB 8 - End Bent 8

- ① Construction joint. Cast bottom portion of Wing Wall with End Bent Cap. Cast top portion of Wing Wall after Deck slab and Approach slab have been constructed. See Sh. 4 for Construction Joint detail.
- ② Level in longitudinal direction. Slope in transverse direction, see "Section Showing Top of Wing Wall" for detail.
- ③ EB 1:  $1'-11\frac{3}{4}"$  @ Outside Face  
EB 8:  $1'-8\frac{3}{4}"$  @ Outside Face
- ④ End Bent 1: 2 Sp. @  $8" = 1'-4"$ . End Bent 8: 2 Sp. @  $6\frac{1}{2}" = 1'-1"$ .
- ⑤ Space C1901 with A1901 (Inside Face) in bottom portion of Wing Walls (below construction joint).

PILE BEARING END BENTS 1 and 8	
Factored Axial Compression Load	105 Tons
Geotechnical Resistance Factor	0.65
Nominal Resistance	162 Tons
Estimated loss of Resistance due to Scour	0 Tons
Estimated loss of Resistance due to Downdrag	0 Tons
Required Driving Resistance	162 Tons

## Method of controlling installation of piles and verifying their capacity: Dynamic Testing with PDA and CAPWAP analysis

GOVERNING CONDITIONS	
Loading Type	Loading Direction
Static	Axial (Compression)

The following estimated parameters were used for performing a driveability analysis:

DRIVEABILITY PARAMETERS			
Skin Quake (QS)	0.10 in	% Skin Friction	54%
Toe Quake (QT)	0.10 in	Distribution Shape No.	0.00
Skin Damping (SD)	0.05 s/ft	Pile Penetration	100%
Toe Damping (TD)	0.15 s/ft	Bearing Graph	Proportional

**Note:** GRLWEAP (2010-6) was used to perform the wave equation analysis.

A pile hammer having a rated energy between 29 kip-feet and 65 kip-feet should be suitable for driven pile installation. However, the Contractor is responsible for selecting a hammer, based on a wave equation analysis that accurately reflects the Contractor's proposed pile driving system, which will properly install the piling.

The estimated pile tip elevation to achieve axial capacity (static) for the HP 14x73 steel H-pile for End Bents 1 and 8 is 79 feet-msl. The required minimum tip elevation to achieve critical depth (lateral stability) for the HP 14x73 steel H-pile is 90 feet-msl for End Bents 1 and 8. Piles must be installed as shown on plans.

Pile Driving Analyzer (PDA) testing shall be performed on the first production pile driven at End Bent 1 and End Bent 8. These piles shall include an additional two feet of HP14x73 steel H-pile length in order to accommodate the initial PDA testing. If a CAPWAP analysis determines that capacity has not been achieved, a restrike of one of the production piles may be required. The restrike shall be performed on the production pile exhibiting the lowest blows per foot. PDA testing shall also be performed on the restrike. The time between initial driving and restrike will be determined by the Engineer, but should be between a minimum of 3 days and a maximum of 7 days. Within seven days of completion of the PDA testing (on initial drive and/or restrike, if required), the results will be evaluated by the RPG3 GDS. Construction of the bent caps shall not proceed until the end bent piles have been accepted by the RPG3 GDS.

Reference the 2007 SCDOT Standard Specifications for Driven Pile Foundation (Section 711). Notes included in these plans are in addition to the requirements of the Standard Specifications.



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REV.				END BENT DETAILS			
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DR.	TL	GFD	12-16				
DES.	TL	GFD	12-16				
BY	CHK.	DATE	COUNTY		ROUTE		
			ORANGEBURG		US 301		







—  $\phi$  Dowels



SECTION THRU CAP

END CAP  
ELEVATION

## CONSTRUCTION SEQUENCE FOR STEEL PIPE PILES<sup>(5)</sup>

- Notes:

⑤ As an alternate method of encasing the steel pipe piles, the Contractor may elect to place 54" Class V reinforced concrete pipe around the steel pipe piles. The limits of the reinforced concrete pipe are the same as the limits of the concrete encasement. Place pipe vertical (plumb) with the bell end down and the pipe centered around the steel pipe pile. Seal joints in pipe with joint sealant (See Standard Drawing 714-205-01). Fill the void space between the reinforced concrete and the steel pipe pile with Class 5000 Concrete with Fiber (High Slump). No additional compensation or time extension will be granted for construction of either encasement alternative.

QUANTITIES FOR ONE BENT

I T E M	UNIT	BENTS 2,3,5 & 6	BENTS 4 & 7
Concrete, Class 5000	CY	*	*
Concrete, Class 5000 with Fiber (High Slump)	CY	39.7	39.7
Reinforcing Steel	LB	*12,747	*13,126
Hoop Reinforcing Steel	LB	3,068	3,068
Dynamic Pile Anal. Test Set-Up	EA	2	2
Pile Driving Set-Up	EA	5	5
Steel Pipe Piling (48" Dia.)	LF	(4) 420	(4) 420
Steel Pipe Index Piling (48" Dia.)	LF	(4) 107	(4) 107



## DETAIL "A"

- ① The allowable range for the top elevation of the driven Steel Pipe Piles is 3" Minimum and 1'-0" Maximum below the bottom of the Bent Cap. See Elev. B in table on Sh. 20.
- ② Field paint steel pipe piles using NS3 Paint System a minimum of 1'-0" below the top of the pile including the top surface, inside and outside of the pile. Include all costs of field painting in the unit price bid for Steel Pipe Piling and Steel Index Pipe Piling.



SECTION B-B

SECTION C-C

SECTION D-D

(See Sh. 20)



REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
REV.				
REV.				
REVIEWED				INTERIOR BENT  DETAILS
QUAN.	GFD	TL	10-16	
DR.	GFD	TL	5-16	
DES.	GFD	TL	5-16	
BY CHK. DATE				COUNTY ORANGEBURG
				ROUTE US 301



Foundation Plan Notes

48-inch PIPE PILE BEARING INTERIOR BENTS	
Factored Axial Compression Load (Tons)	186
Geotechnical Resistance Factor	0.65
Required Nominal Resistance (Tons)	286
Estimated Pile Tip Penetration (feet)	98
Estimated Pile Tip Elevation (feet-msl)	10
Unplugged Required Pile Driving Resistance (Tons)	1369
Plugged Required Pile Driving Resistance (Tons)	2801

Method of controlling installation of piles and verifying their capacity: Capacity will be verified by pile driving analyzer and CAPWAP analysis of index piles(s). A Pile Installation Chart developed from the analysis will be used to verify the capacity of production piles.

GOVERNING CONDITIONS	
Loading Type	Loading Direction
Static	Axial (Compression)

The following estimated parameters were used for performing a driveability analysis:

DRIVEABILITY PARAMETERS - UNPLUGGED CONDITIONS			
Skin Quake (QS)	0.10 in	% Skin Friction	92%
Toe Quake (QT)	0.10 in	Distribution Shape No.	Variable
Skin Damping (SD)	0.05 s/ft	Pile Penetration %	89%
Toe Damping (TD)	0.15 s/ft	Bearing Graph	Proportional

Note: GRLWEAP (2010-6) was used to perform the wave equation analysis.

DRIVEABILITY PARAMETERS - PLUGGED CONDITIONS			
Skin Quake (QS)	0.10 in	% Skin Friction	66%
Toe Quake (QT)	0.40 in	Distribution Shape No.	Variable
Skin Damping (SD)	0.05 s/ft	Pile Penetration %	89%
Toe Damping (TD)	0.15 s/ft	Bearing Graph	Proportional

Note: GRLWEAP (2010-6) was used to perform the wave equation analysis.

Cofferdam Plan Notes

Contractor is responsible for cofferdam design. For all soils, buoyant unit weights shall be used in computations for soils below the water level. The designer shall consider all unbalanced water forces. The designer is responsible for determining a design water level. The designer shall use the following soil strength parameters for determining earth pressure coefficients.

SOIL PARAMETERS FOR COFFERDAM DESIGN

Depth (ft)	IB2 (B-2)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-5	-	31	115	0.485	0.320	3.124
5-9	-	36	120	0.412	0.260	3.852
9-11	-	36	115	0.412	0.260	3.852
11-12	-	36	110	0.412	0.260	3.852
12-19	1700	15	115	0.741	0.589	1.698
19-74	-	36	115	0.412	0.260	3.852
74+	-	36	120	0.412	0.260	3.852

Depth (ft)	IB3 (B-3)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-5	-	31	120	0.485	0.320	3.124
5-9	-	36	120	0.412	0.260	3.852
9-20	1700	15	110	0.741	0.589	1.698
20-59	-	36	115	0.412	0.260	3.852
59-78	-	24	120	0.593	0.422	2.371
78+	-	36	120	0.412	0.260	3.852

Depth (ft)	IB3 (B-3A)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-4	400	0	110	1.000	1.000	1.000
4-13	-	32	120	0.470	0.307	3.255
13-18	1700	0	110	1.000	1.000	1.000
18-23	1780	15	115	0.741	0.589	1.698
23-47	-	36	110	0.412	0.260	3.852
47-59	2218	0	110	1.000	1.000	1.000
59-62	-	26	110	0.562	0.390	2.561
62-68	300	3	110	0.948	0.901	1.110
68-70	-	26	115	0.562	0.390	2.561
70-74	300	0	115	1.000	1.000	1.000
74+	-	36	120	0.412	0.260	3.852

A double-acting hydraulic pile driving hammer with monitoring and recording equipment capable of measuring continuously the hammer energy and rate of impact having a maximum rated energy between 66 kip-feet and 146 kip-feet should be suitable for driven pile installation under unplugged conditions. Larger hammers having a maximum rated energy between 292 kip-feet and 658 kip-feet may be suitable under plugged conditions; but, may require limiting the energy delivered. The Contractor is responsible for selecting a hammer(s), based on a wave equation analysis that accurately reflects the Contractor's proposed pile driving system, which will properly install the piling.

The estimated pile tip elevation for the 48-inch steel pipe piles at Interior Bents 2 through 7 is 10 feet-msl in order to achieve penetration 20 feet beyond a potentially weak soil zone below the Santee Limestone Formation. For very hard or stiff soils (i.e., Santee Limestone Formation) the inside of the pipe pile may need to be augered out in order to drive the pile. No pre-augering will be allowed. The inside of the pipe pile should not be augered out deeper than the bottom of the Santee Limestone Formation which varies in elevation from 51 to 24 feet-msl based on the boring logs. The Contractor is responsible for verifying the bottom of the Santee Limestone formation by referring to the test-hole logs and the Table of Approximate Formation Elevations.

Bent No.	Approximate Formation Elevations					
	IB-2	IB-3	IB-4	IB-5	IB-6	IB-7
Offset direction	(L/R)	(L/R)	(L/R)	(L/R)	(L/R)	(L/R)
Top of SLF Elevation	Unk/91	92/99	Unk/98	96/99	97/93	100/100
Bottom of SLF Elevation & Top of WHF	Unk/36	51/50	Unk/24	42/32	31/Unk	Unk/38
Bottom of WHF & Top of CF	Unk/14	7/9	Unk/6	10/6	Unk/7	Unk/14
Pile Tip Elevation	10	10	10	10	10	10

The elevations presented in this table are approximate. Actual field conditions may vary  
SLF = Santee Limestone Formation, WHF = Warley Hill Formation, CF = Congaree Formation

Depth (ft)	IB4 (B-4)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-10	-	32	120	0.470	0.307	3.255
10-18	-	36	110	0.412	0.260	3.852
18-84	-	36	115	0.412	0.260	3.852
84+	-	36	120	0.412	0.260	3.852

Depth (ft)	IB5 (B-5)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-3	-	30	115	0.500	0.333	3.000
3-6	-	38	120	0.384	0.238	4.204
6-8	-	30	110	0.500	0.333	3.000
8-10	-	36	115	0.412	0.260	3.852
10-38	-	36	115	0.412	0.260	3.852
38-48	2125	15	110	0.741	0.589	1.698
48-58	-	30	110	0.500	0.333	3.000
58-63	-	36	115	0.412	0.260	3.852
63-72	-	24	120	0.593	0.422	2.371
72+	-	36	120	0.412	0.260	3.852

Depth (ft)	IB5 (B-5A)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-6	-	35	115	0.426	0.271	3.690
6-9	-	32	120	0.470	0.307	3.255
9-21	-	36	115	0.412	0.260	3.852
21-76	-	30	110	0.500	0.333	3.000
76-101	-	36	115	0.412	0.260	3.852
101-	4000	0	110	1.000	1.000	1.000

Depth (ft)	IB6 (B-6)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-3	-	34	115	0.441	0.283	3.537
3-9	-	32	120	0.470	0.307	3.255
9-13	-	30	120	0.500	0.333	3.000
13+	-	36	115	0.412	0.260	3.852

Depth (ft)	IB6 (B-6A)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-1	-	20	110	0.658	0.490	2.040
1-5	-	32	120	0.470	0.307	3.255
5-10	-	36	120	0.412	0.260	3.852
10-25	-	36	115	0.412	0.260	3.852
25-54	-	30	110	0.500	0.333	3.000
54-76	2440	15	110	0.741	0.589	1.698
76-79	-	36	115	0.412	0.260	3.852
79-	-	36	120	0.412	0.260	3.852

Depth (ft)	IB7 (B-7)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-3	-	30	120	0.500	0.333	3.000
3-5	-	32	120	0.470	0.307	3.255
5-10	-	36	110	0.412	0.260	3.852
10+	-	36	115	0.412	0.260	3.852

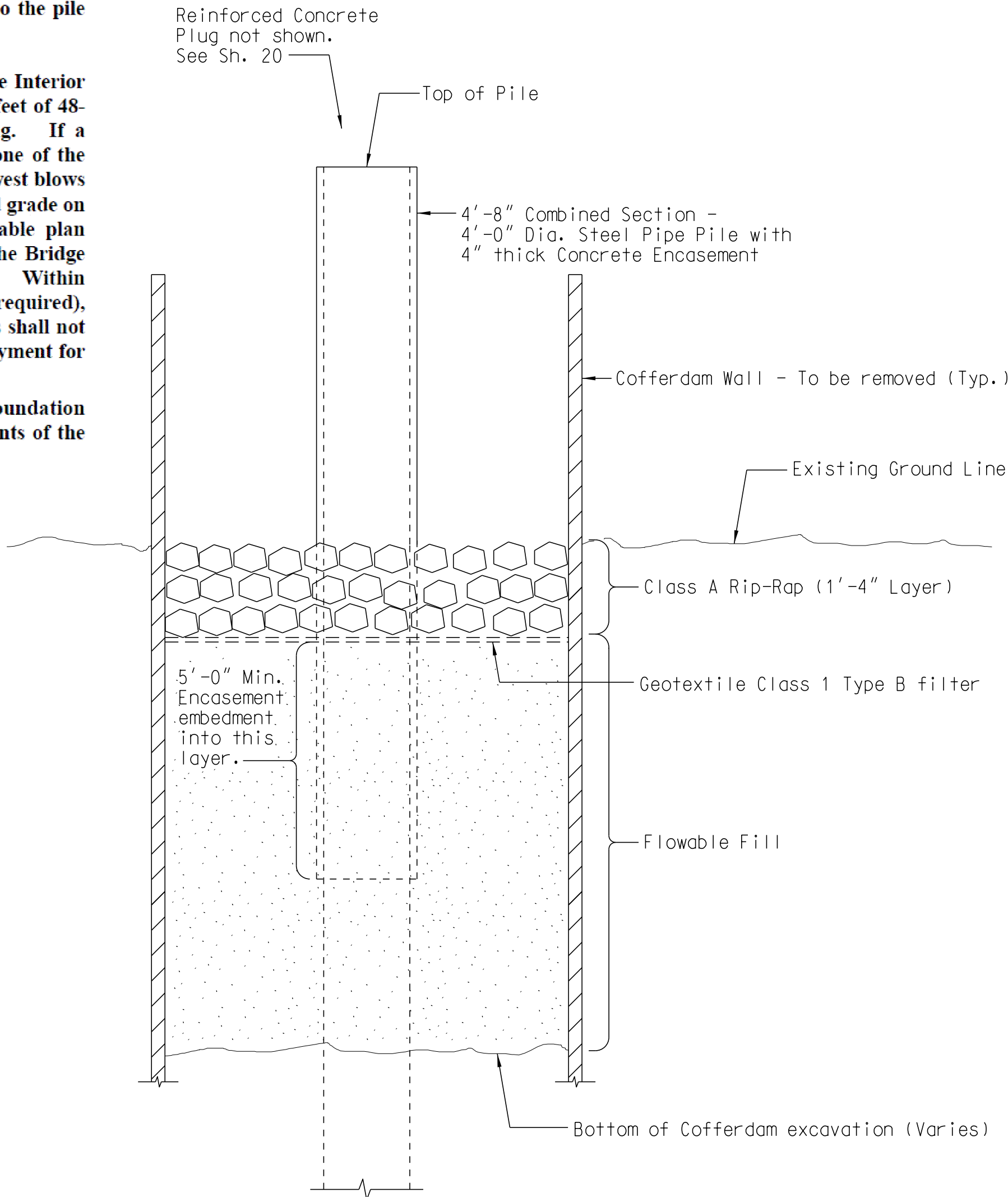
Depth (ft)	IB7 (B-7A)					
	c (psf)	φ	γ sat (pcf)	K <sub>a</sub>	K <sub>p</sub>	K <sub>φ</sub>
0-3	-	24	110	0.593	0.422	2.371
3-7	-	29	120	0.515	0.347	2.882
7-21	-	36	115	0.412	0.260	3.852
21-47	-	30	110	0.500	0.333	3.000
47-61	-	34	110	0.441	0.283	3.537
61-69	2320	15	110	0.741	0.589	1.698
69-76	-	30	115	0.500	0.333	3.000
76	-	36	115	0.412	0.260	3.852

The final pipe pile tip elevation must not be shallower than 20 feet below the augered depth if no weak soil zone is encountered. If a weak soil zone (i.e., Warley Hill Formation) is encountered the final pipe pile tip elevation must not be shallower than 20 feet below the weak soil zone.

Once the pipe pile is driven to the final bearing stratum, establish the final elevation of the material inside the pipe pile as the elevation of the bottom of the concrete plug as shown on the plans as Elevation C. If top elevation of material inside pipe pile is lower than the plans Elevation C, backfill with loose sand classified as A-1-a to the plans Elevation C. If top elevation of material inside pipe pile is higher than the plans Elevation C, remove material to the plans Elevation C. This soil shall be removed in order to construct the composite section at the top of the pile for connection to the pile cap.

Perform Pile Driving Analyzer (PDA) on the first production pile driven at the Interior Bents 2 through Interior Bents 7. These piles shall include an additional two feet of 48-inch steel pipe pile length in order to accommodate the initial PDA testing. If a CAPWAP analysis determines that capacity has not been achieved, restrike one of the production piles. Perform the restrike on the production pile exhibiting the lowest blows per foot. On initial drive, piles shall be stopped at the highest allowable finished grade on the plans to accommodate a restrike while still remaining within an allowable plan finished grade elevation. Perform PDA testing during the restrike. Contact the Bridge Construction Office to determine the time between initial driving and restrike. Within seven days of completion of the PDA testing (on initial drive and/or restrike, if required), the results will be evaluated by the RPG3 GDS. Construction of the bent caps shall not proceed until the interior bent piles have been accepted by the RPG3 GDS. Payment for the restrike will be as indicated in the Standard Specifications.

Reference the 2007 SCDOT Standard Specifications for Driven Pile Foundation (Section 711). Notes included in these plans are in addition to the requirements of the Standard Specifications.



COFFERDAM BACKFILL DETAIL

(Bents 2 thru 7)

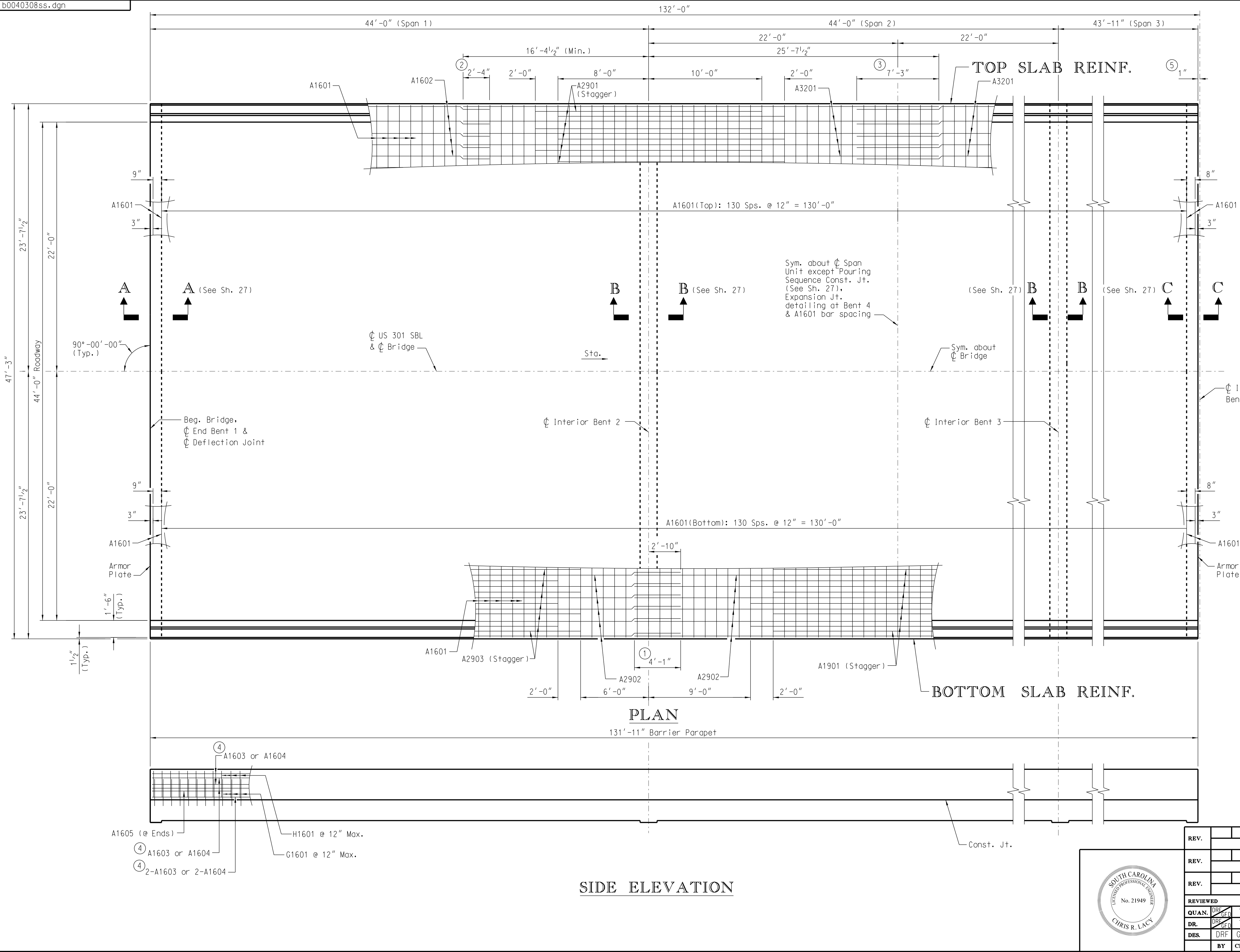
After Piles are driven, Reinforced Concrete Plug and Encasement are installed and prior to removal of the Cofferdam, backfill with the following materials in the following sequence:

- At the bottom of the Cofferdam begin with backfilling with flowable fill to approximately 1'-4" below the existing groundline surrounding the Cofferdam.
- Place Geotextile Class 1 Type B filter over entire cured layer of flowable fill.
- Place an approximate 1'-4" layer of Class A Rip-Rap over the Geotextile Class 1 Type B filter to the same elevation of the ground line surrounding the cofferdam.



REV.				SOUTH CAROLINA			
				DEPARTMENT OF TRANSPORTATION			
REV.				INTERIOR BENT			
REV.				GEOTECHNICAL &			
REVIEWED				COFFERDAM PLAN NOTES			
QUAN.							
DR.	GFD	TL	9-16				
DES.				COUNTY		ROUTE	
BY	CHK.	DATE		ORANGEBURG		US 301	





REINF. STEEL SCHED.						
MARK	NO. REQ'D	DIMENSION				LENGTH
		"a"	"b"	"c"	"d"	
A1601	266	46'-9"	_____	_____	_____	46'-9"
A1602	94	29'-10"	_____	_____	_____	29'-10"
A1603	12	60'-0"	_____	_____	_____	60'-0"
A1604	24	38'-10"	_____	_____	_____	38'-10"
A1605	4	7'-0"	_____	_____	_____	7'-0"
A1607	8	30'-2"	_____	_____	_____	30'-2"
A1901	48	24'-0"	_____	_____	_____	24'-0"
A2901	96	20'-0"	_____	_____	_____	20'-0"
A2902	141	46'-8"	_____	_____	_____	46'-8"
A2903	96	35'-10"	_____	_____	_____	35'-10"
A3201	94	42'-0"	_____	_____	_____	42'-0"
G1601	266	1'-10 <sup>3</sup> / <sub>8</sub> "	2'-9 <sup>1</sup> / <sub>8</sub> "	_____	_____	7'-3"
H1601	266	2'-3 <sup>1</sup> / <sub>8</sub> "	2'-3 <sup>1</sup> / <sub>2</sub> "	7 <sup>3</sup> / <sub>8</sub> "	_____	5'-2"
J1301	62	8"	1'-6"	_____	_____	3'-8"
J1302	62	1'-2"	1'-6"	_____	_____	4'-2"
SB	1" Ht.		As Necessary			
CHCU	1'-3 <sup>1</sup> / <sub>2</sub> " Ht.		(6) As Necessary for Spans 1 & 3			
CHCU	1'-2 <sup>3</sup> / <sub>4</sub> " Ht.		(7) As Necessary			
QUANTITIES						
ITEM			UNIT		132' SPAN	
Concrete, Class 4000			CY		426.5	
Reinforcing Steel			LB		80,983	
Barrier Parapet			LF		263.8	
Elastomeric Bearing Assembly (Flat Slab)			EA		4	

- Notes:
- For Reinforcing Bending Details, see Sh. 4.
- For Slab Drain Locations, see Sh. 7.
- For Section thru Span, see Sh. 26.
- For Deck Pouring Sequence with locations of construction joints, See Sh. 27.
- For Slab Drain Details, see Sh. 27.
- ① Splice A2902 to A2902 bars 4'-1" Min.
- ② Splice A1602 to A3201 bars 2'-4" Min.
- ③ Splice A3201 to A3201 bars 7'-3" Min.
- ④ Splice A1603 to A1604 bars 3'-0" Min. & Splice A1604 to A1604 bars 3'-0" Min.
- ⑤ Expansion Joint not shown. 1" dimension corresponds to half of the Nominal Expansion Joint Width "W" of 2" at 70°F. See Compression Seal Expansion Joint Details, Sh. 30.
- ⑥ Use where the longitudinal A1602 bars are present in the top mat of reinforcement.
- ⑦ Use where the longitudinal A3201 bars are present in the top mat of reinforcement.

REV.

REV.

REV.

REVIEWED

QUAN.

DR.

DES.

BY

CHK.

DATE

9-16

9-16

5-13

TL

TL

GFD

9-16

9-16

5-13

COUNTY

ROUTE

ORANGEBURG

US 301

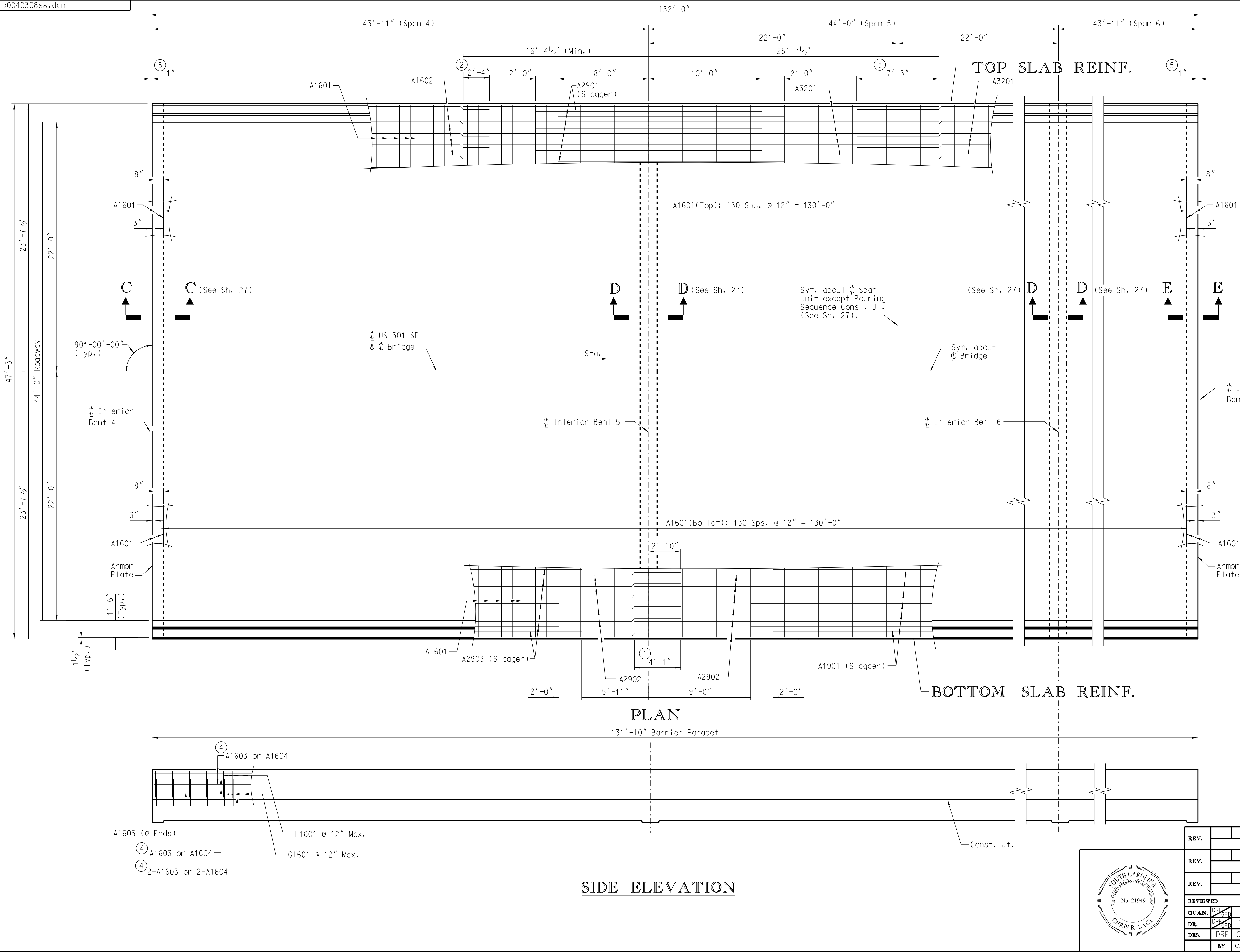
SOUTH CAROLINA

DEPARTMENT OF TRANSPORTATION

3 SPAN- 132'-0" UNIT

SUPERSTRUCTURE

(SPANS 1 - 3)



REINF. STEEL SCHED.						
MARK	NO. REQ'D	DIMENSION				LENGTH
		"a"	"b"	"c"	"d"	
A1601	266	46'-9"	_____	_____	_____	46'-9"
A1602	94	29'-10"	_____	_____	_____	29'-10"
A1603	12	60'-0"	_____	_____	_____	60'-0"
A1604	24	38'-10"	_____	_____	_____	38'-10"
A1605	4	7'-0"	_____	_____	_____	7'-0"
A1607	8	30'-2"	_____	_____	_____	30'-2"
A1901	48	24'-0"	_____	_____	_____	24'-0"
A2901	96	20'-0"	_____	_____	_____	20'-0"
A2902	141	46'-8"	_____	_____	_____	46'-8"
A2903	96	35'-10"	_____	_____	_____	35'-10"
A3201	94	42'-0"	_____	_____	_____	42'-0"
G1601	266	1'-10 <sup>3</sup> / <sub>8</sub> "	2'-9 <sup>1</sup> / <sub>8</sub> "	_____	_____	7'-3"
H1601	266	2'-3 <sup>1</sup> / <sub>8</sub> "	2'-3 <sup>1</sup> / <sub>2</sub> "	7 <sup>3</sup> / <sub>8</sub> "	_____	5'-2"
J1301	62	8"	1'-6"	_____	_____	3'-8"
J1302	62	1'-2"	1'-6"	_____	_____	4'-2"
SB	1" Ht.		As Necessary			
CHCU	1'-3 <sup>1</sup> / <sub>2</sub> " Ht.		(6) As Necessary for Spans 4 & 6			
CHCU	1'-2 <sup>3</sup> / <sub>4</sub> " Ht.		(7) As Necessary			
QUANTITIES						
ITEM			UNIT		132' SPAN	
Concrete, Class 4000			CY		426.2	
Reinforcing Steel			LB		80,983	
Barrier Parapet			LF		263.7	
Elastomeric Bearing Assembly (Flat Slab)			EA		4	

- Notes:
- For Reinforcing Bending Details, see Sh. 4.
- For Slab Drain Locations, see Sh. 7.
- For Section thru Span, see Sh. 26.
- For Deck Pouring Sequence with locations of construction joints, See Sh. 27.
- For Slab Drain Details, see Sh. 27.
- ① Splice A2902 to A2902 bars 4'-1" Min.
- ② Splice A1602 to A3201 bars 2'-4" Min.
- ③ Splice A3201 to A3201 bars 7'-3" Min.
- ④ Splice A1603 to A1604 bars 3'-0" Min. & Splice A1604 to A1604 bars 3'-0" Min.
- ⑤ Expansion Joint not shown. 1" dimension corresponds to half of the Nominal Expansion Joint Width "W" of 2" at 70°F. See Compression Seal Expansion Joint Details, Sh. 30.
- ⑥ Use where the longitudinal A1602 bars are present in the top mat of reinforcement.
- ⑦ Use where the longitudinal A3201 bars are present in the top mat of reinforcement.

REV.

REV.

REV.

REVIEWED

QUAN. DRG GFD TL 9-16

DR. DRG GFD TL 9-16

DES. DRF GFD 5-13

BY CHK. DATE

SOUTH CAROLINA  
LICENSED PROFESSIONAL ENGINEER  
No. 21949  
CHRIS R. LACY

SOUTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

3 SPAN- 132'-0" UNIT  
SUPERSTRUCTURE  
(SPANS 4 - 6)

COUNTY ORANGEBURG ROUTE US 301

REINF. STEEL SCHED.						
MARK	NO. REQ'D	DIMENSION				LENGTH
		"a"	"b"	"c"	"d"	
A1601	72	46'-9"	_____	_____	_____	46'-9"
A1605	4	7'-0"	_____	_____	_____	7'-0"
A1606	59	29'-7"	_____	_____	_____	29'-7"
A1607	4	30'-2"	_____	_____	_____	30'-2"
A2904	95	29'-7"	_____	_____	_____	29'-7"
G1602	62	1'-7 <sup>1</sup> / <sub>4</sub> "	2'-6 <sup>3</sup> / <sub>4</sub> "	_____	_____	6'-9"
H1602	62	2'-3 <sup>1</sup> / <sub>8</sub> "	2'-3 <sup>1</sup> / <sub>2</sub> "	7 <sup>3</sup> / <sub>8</sub> "	_____	5'-2"
J1301	62	8"	1'-6"	_____	_____	3'-8"
SB	1" Ht.		As Necessary			
CHCU	12 <sup>1</sup> / <sub>2</sub> " Ht.		As Necessary			
QUANTITIES						
ITEM			UNIT	30' END SPAN		
Concrete, Class 4000			CY	84.2		
Reinforcing Steel			LB	15,964		
Barrier Parapet			LF	59.8		
Elastomeric Bearing Assembly (Flat Slab)			EA	2		

Notes:

For Reinforcing Bending Details, see Sh. 4.

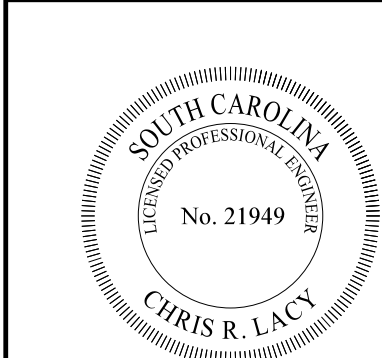
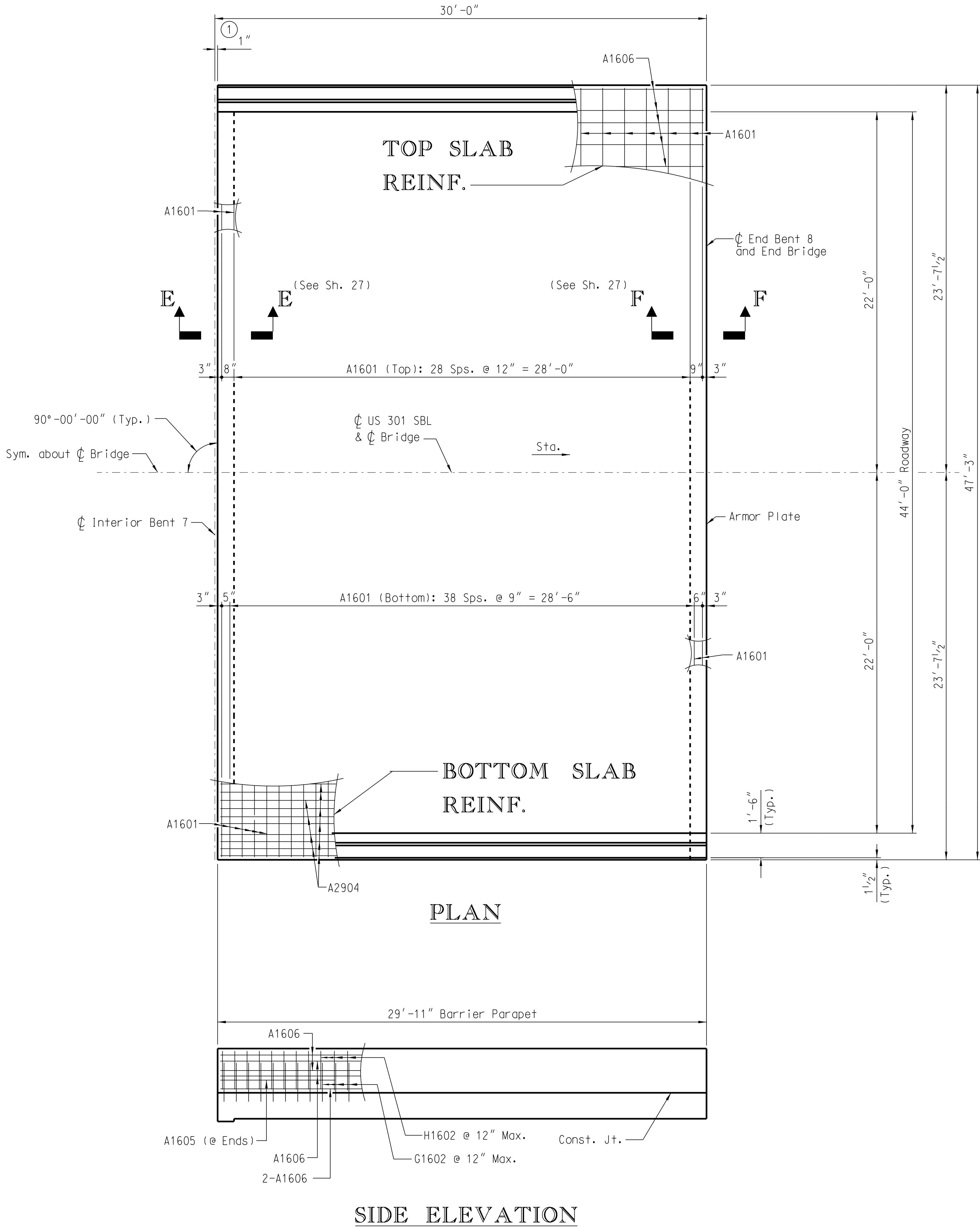
For Slab Drain Locations, see Sh. 7.

For Section thru Span, see Sh. 26.

For Deck Pouring Sequence, See Sh. 27.

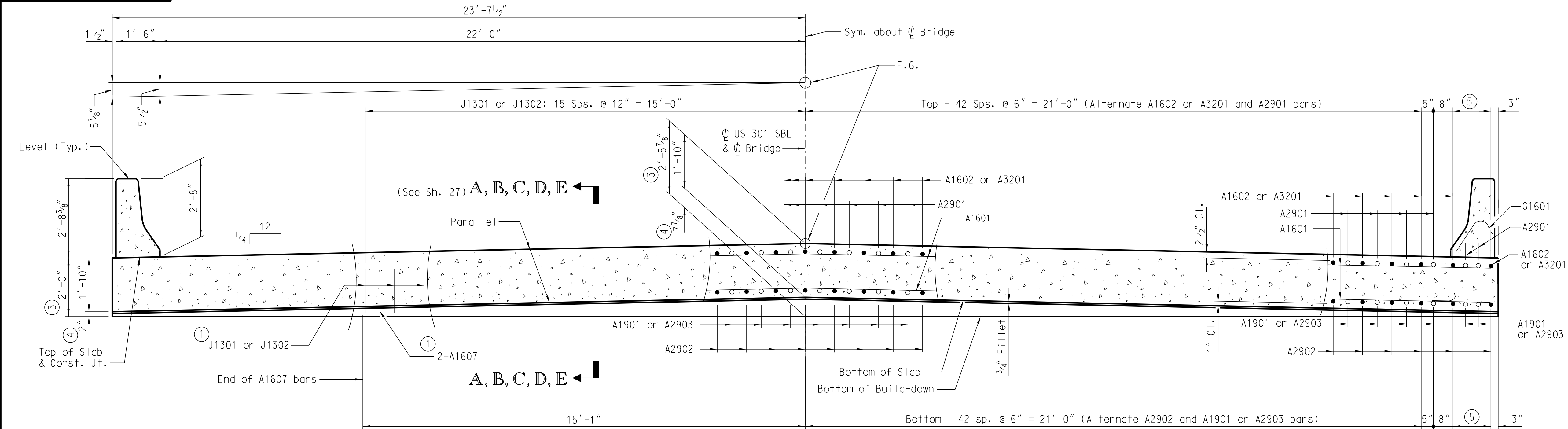
For Slab Drain Details, see Sh. 27.

① Expansion Joint not shown. 1" dimension corresponds to half of the Nominal Expansion Joint Width "W" of 2" at 70°F. See Compression Seal Expansion Joint Details, Sh. 30.



REV.				SOUTH CAROLINA			
REV.				DEPARTMENT OF TRANSPORTATION			
REV.				30'-0" END SPAN			
REVIEWED				SUPERSTRUCTURE			
QUAN.	ASC	GFD	TL	9-16			
DR.	ASC	GFD	TL	9-16			
DES.	DRF	GFD	5-13				
BY				COUNTY		ROUTE	
CHK. DATE				ORANGEBURG		US 301	

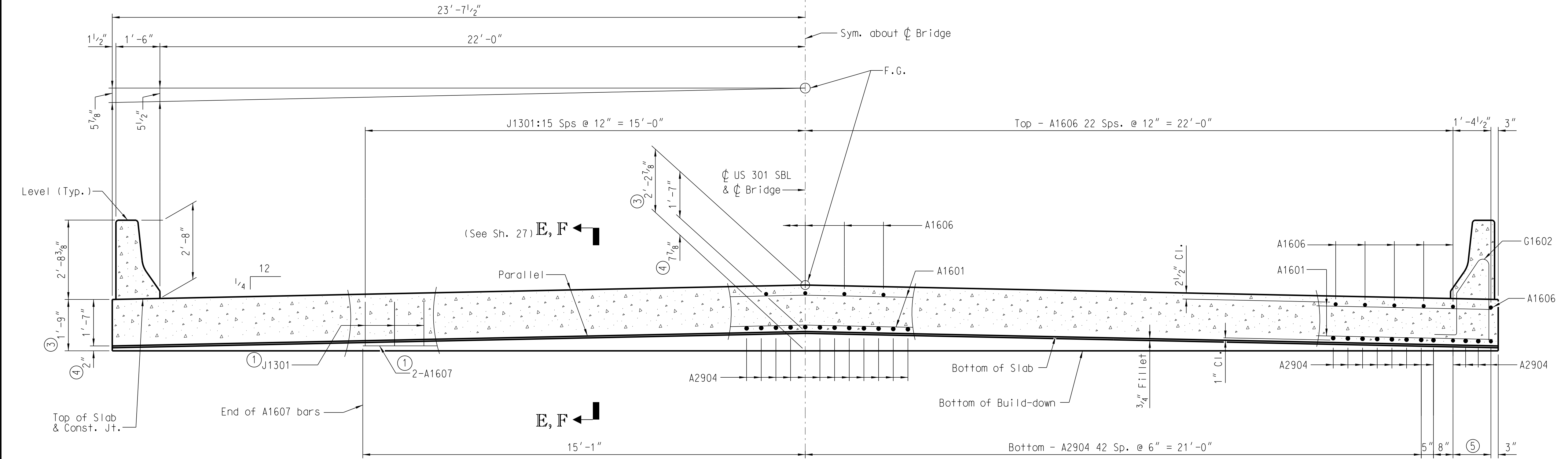




SECTION THRU 132' SPANS

(Spans 1 - 3 and Spans 4 - 6)  
(Deck Drains Not Shown)

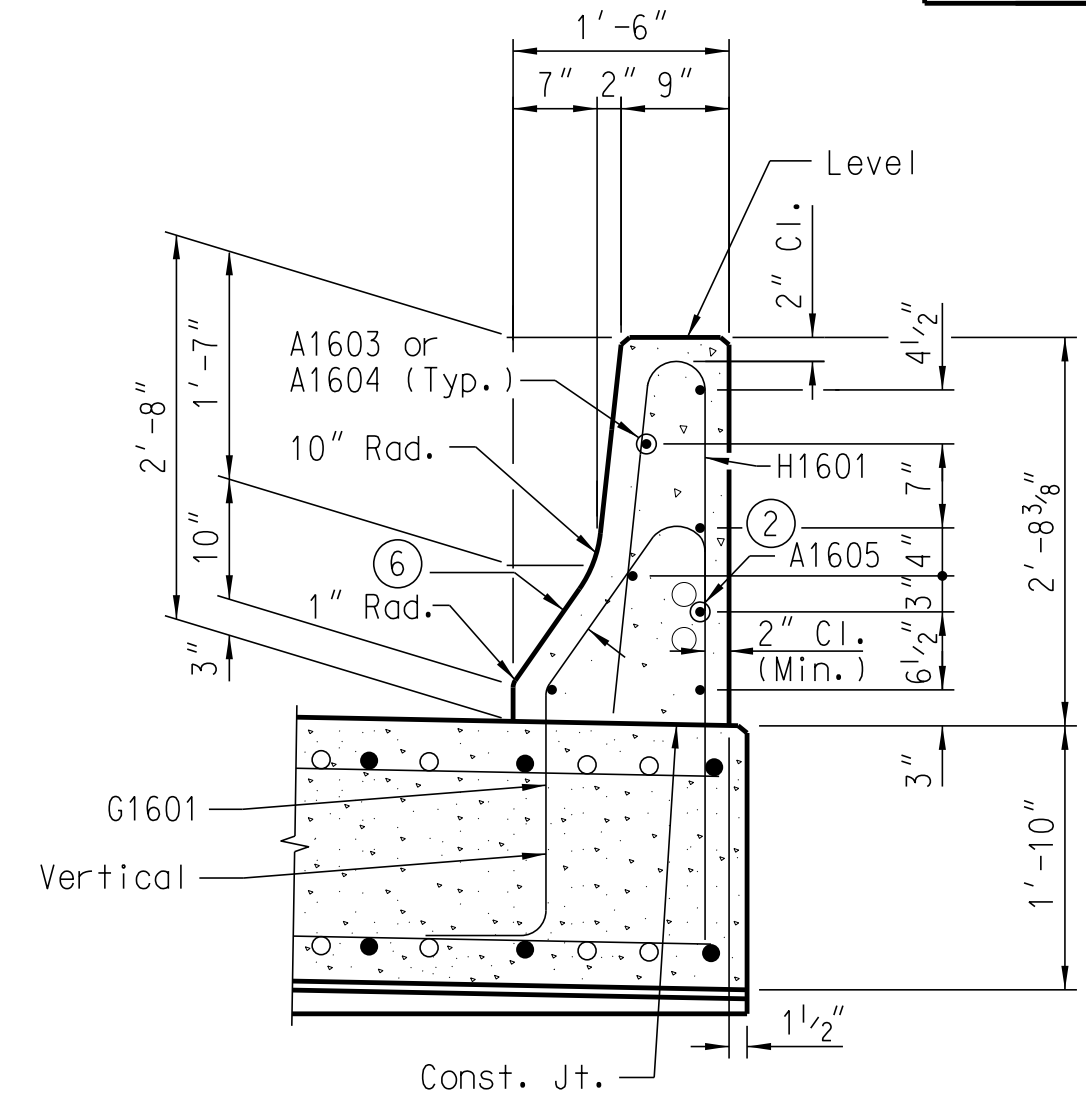
- LEGEND
- Continuous Reinforcement
  - Non-Continuous Reinforcement



SECTION THRU 30' END SPAN

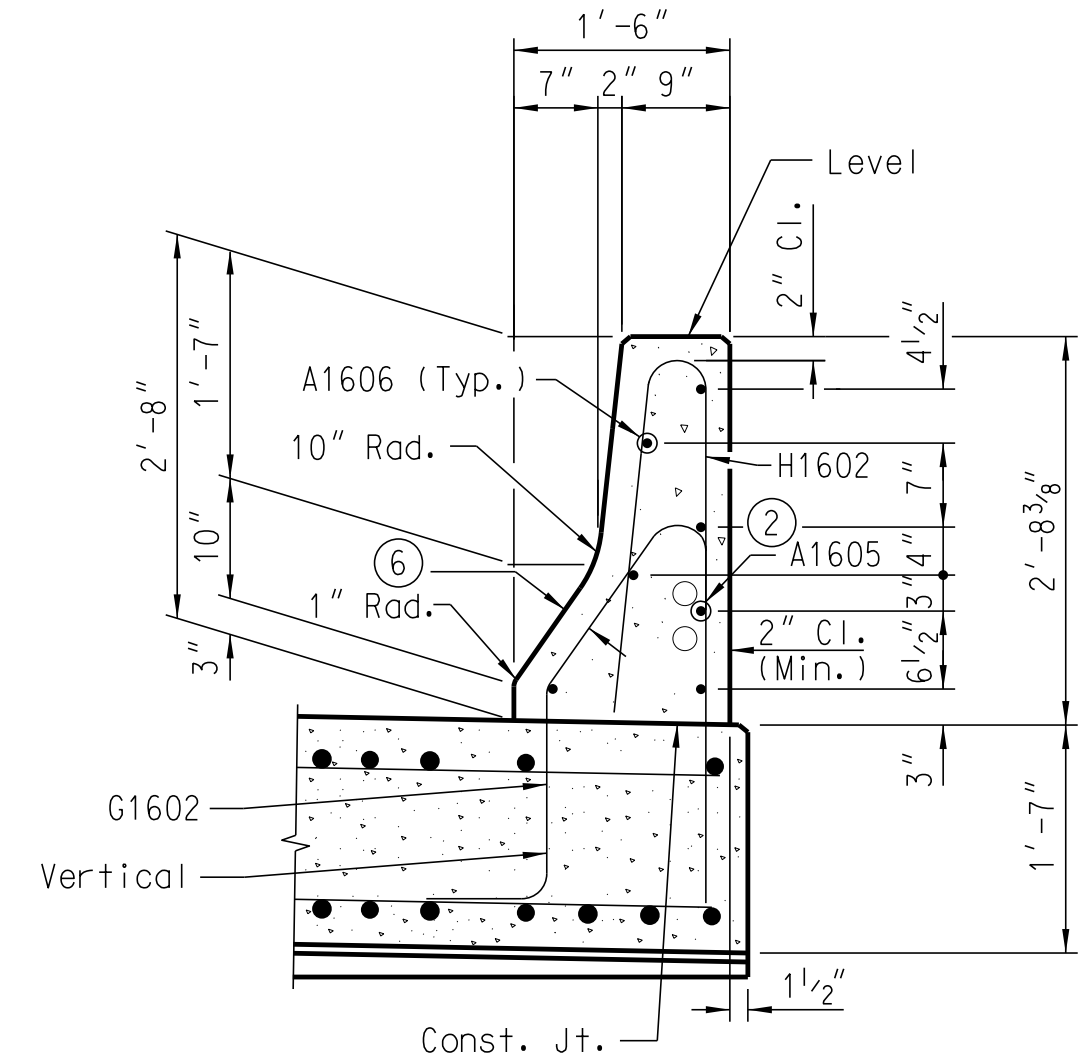
(Span 7)  
(Deck Drains Not Shown)

- Notes:
- For slab build-down details, see Sh. 27.
  - At ends of parapet only.
  - At  $\phi$  Bent.
  - Includes  $\frac{1}{2}$ " elastomeric bearing pad.
  - 3 eq. sp. = 1'-3 1/2"
  - 2 1/2" Cl. (Min.)



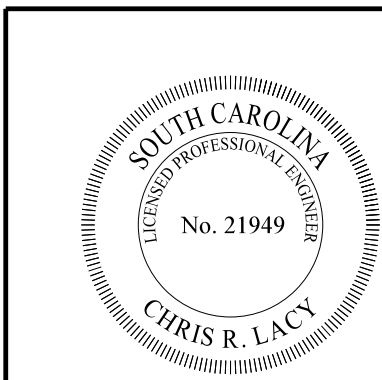
SECTION THRU  
BARRIER PARAPET

(Spans 1 - 3 and Spans 4 - 6)  
(Deck Drains Not Shown)

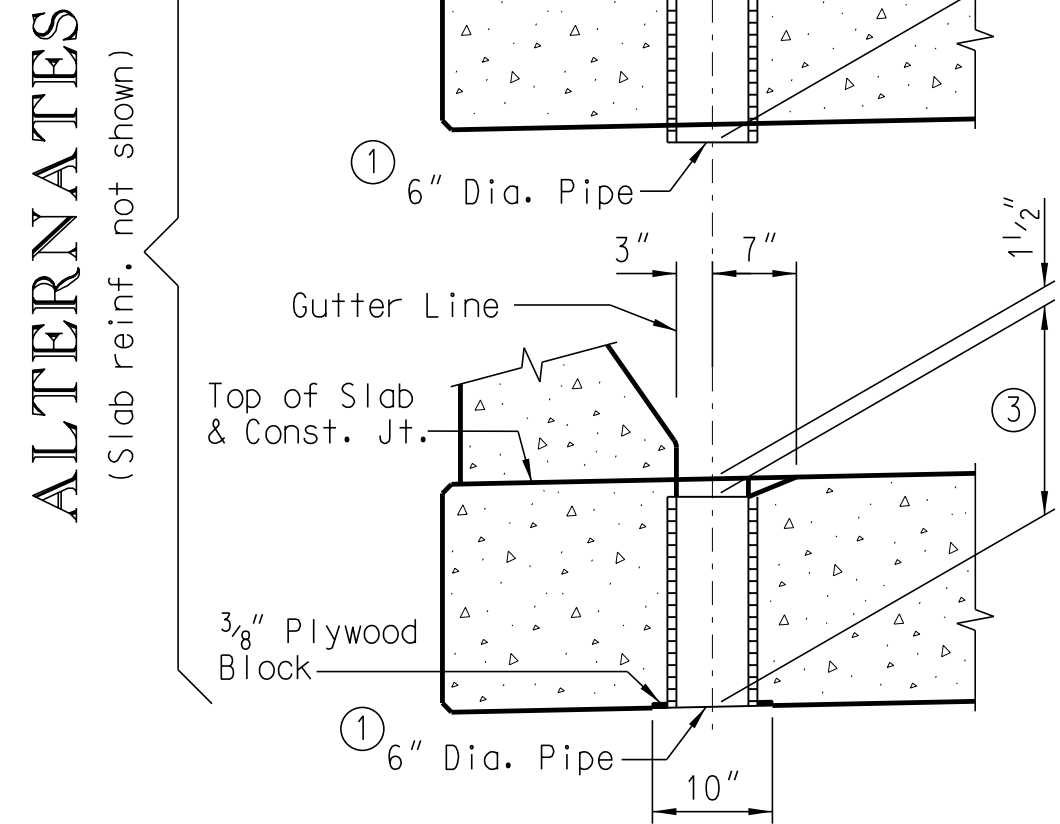
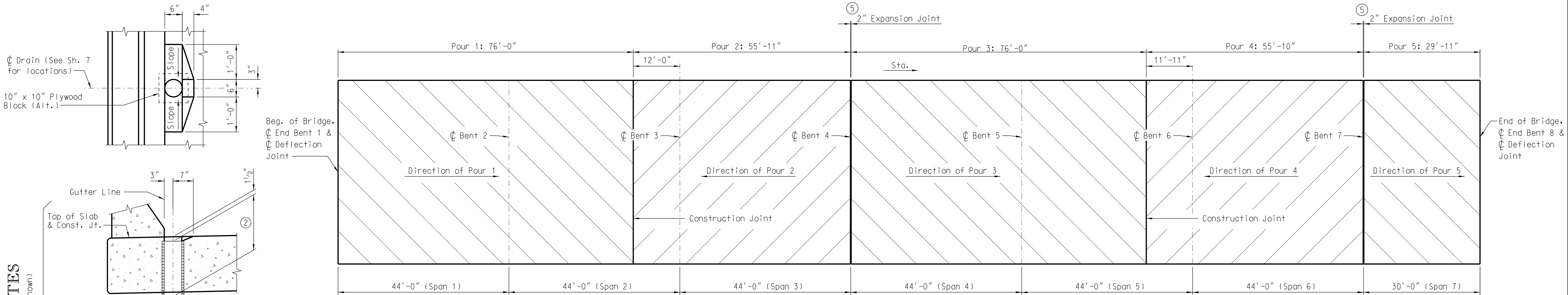
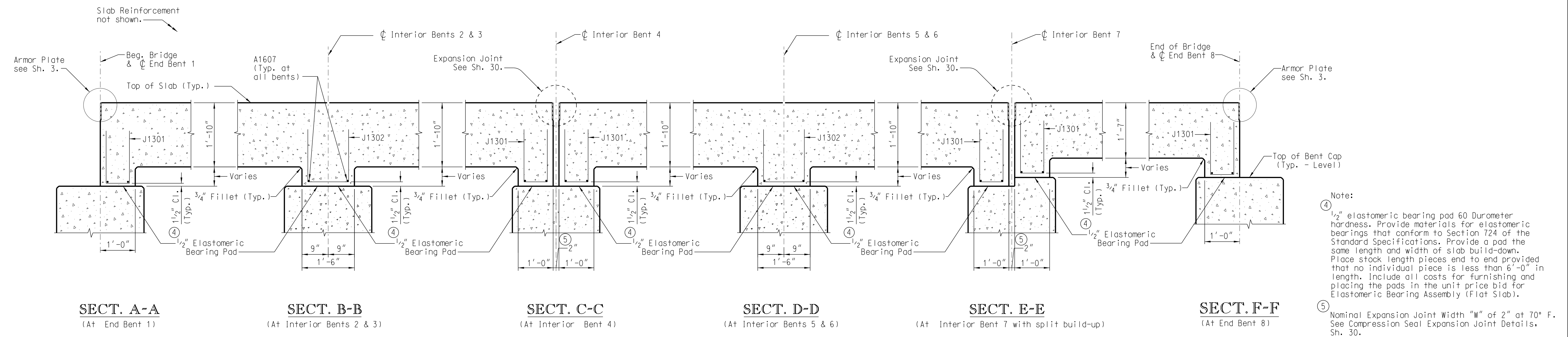


SECTION THRU  
BARRIER PARAPET

(Span 7)  
(Deck Drains Not Shown)




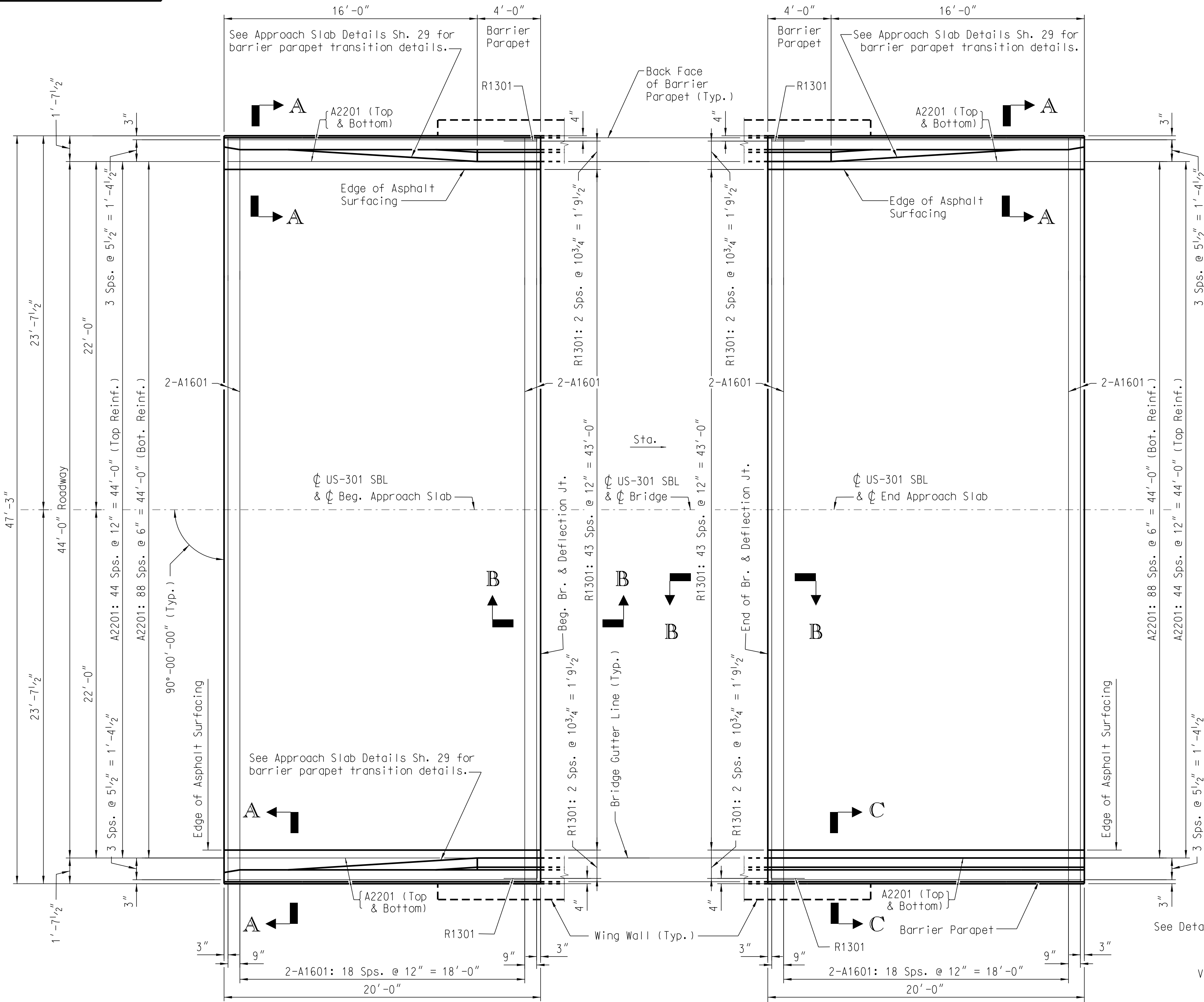
REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPERSTRUCTURE DETAILS (1 OF 2)	
REV.					
REV.					
REVIEWED					
QUAN.					
DR.	DRP	GFD	TL		9-16
DES.	DRP	ASC	GFD		5-13
	BY	CHK.	DATE		
COUNTY				ORANGEBURG	
				ROUTE	US 301



- Notes:
- ① Provide drain pipes that are 6" nominal diameter Schedule 40 PVC Pipe meeting the requirements of ASTM D 1785 or 6" nominal diameter fiberglass pipe meeting the requirements of ASTM D 2996. Cement at least two lugs, of a size suitable to anchor the pipe, to the portion of the pipe embedded in the concrete slab. Include all costs of furnishing and placing drains in the unit price bid for Concrete for Structures, Class 4000.
  - ② 1'-10" for Spans 1 - 6, 1'-7" for Span 7.
  - ③ 1'-8 1/2" for Spans 1 - 6, 1'-5 1/2" for Span 7.

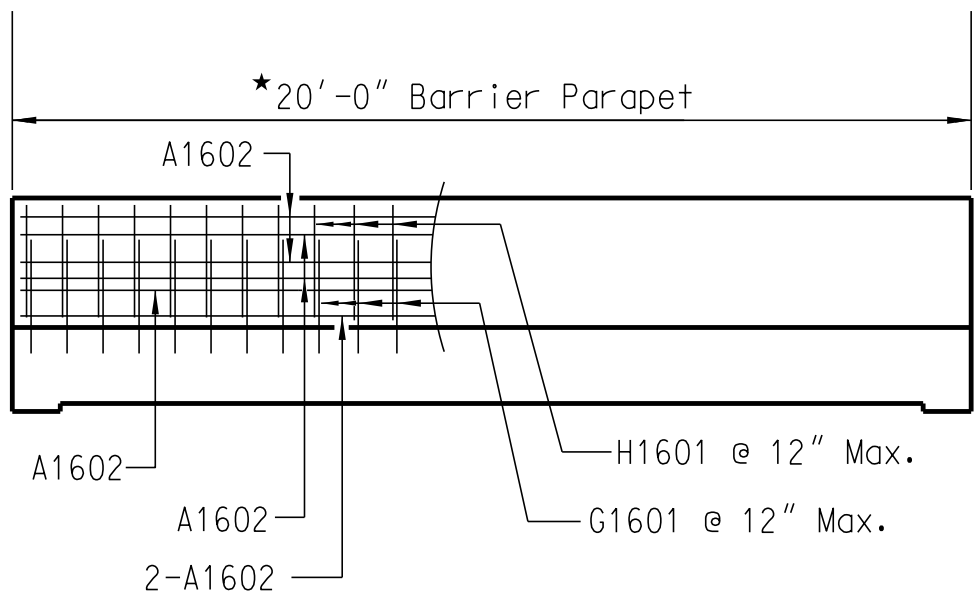
- Notes:
- Cast the 132' continuous units using the construction joints shown with a suitable screed from the far end of the continuous span to the construction joint. Use an approved retarding agent and establish and maintain a minimum pouring rate of 50 CY per hour unless approved otherwise by the RCE.
- Cast the 30' end span unit in one pour from one end of span to the other using a suitable screed. Use an approved retarding agent and establish and maintain a minimum pouring rate of 45 CY per hour unless approved otherwise by the RCE.
- Do not remove slab falsework until each entire span unit has been poured and cured according to Section 702 of the Standard Specifications.
- Cast parapet concrete after slab falsework has been struck.
- For Construction Joint Details and Notes, see Sh. 3.
- Submit a pouring plan to the RCE for approval prior to pouring concrete.

	REV.				SOUTH CAROLINA			
	REV.				DEPARTMENT OF TRANSPORTATION			
	REV.				SUPERSTRUCTURE			
	REVIEWED				DETAILS			
	QUAN.				(2 OF 2)			
	DR.		GFD	TL	9-16		COUNTY	
	DES.		DRF	ASC	DRF	5-13		
BY		CHK.	DATE		ORANGEBURG		ROUTE	
						US 301		



PLAN - BEG. APPR. SLAB

PLAN - END APPR. SLAB



SIDE ELEVATION

Notes:

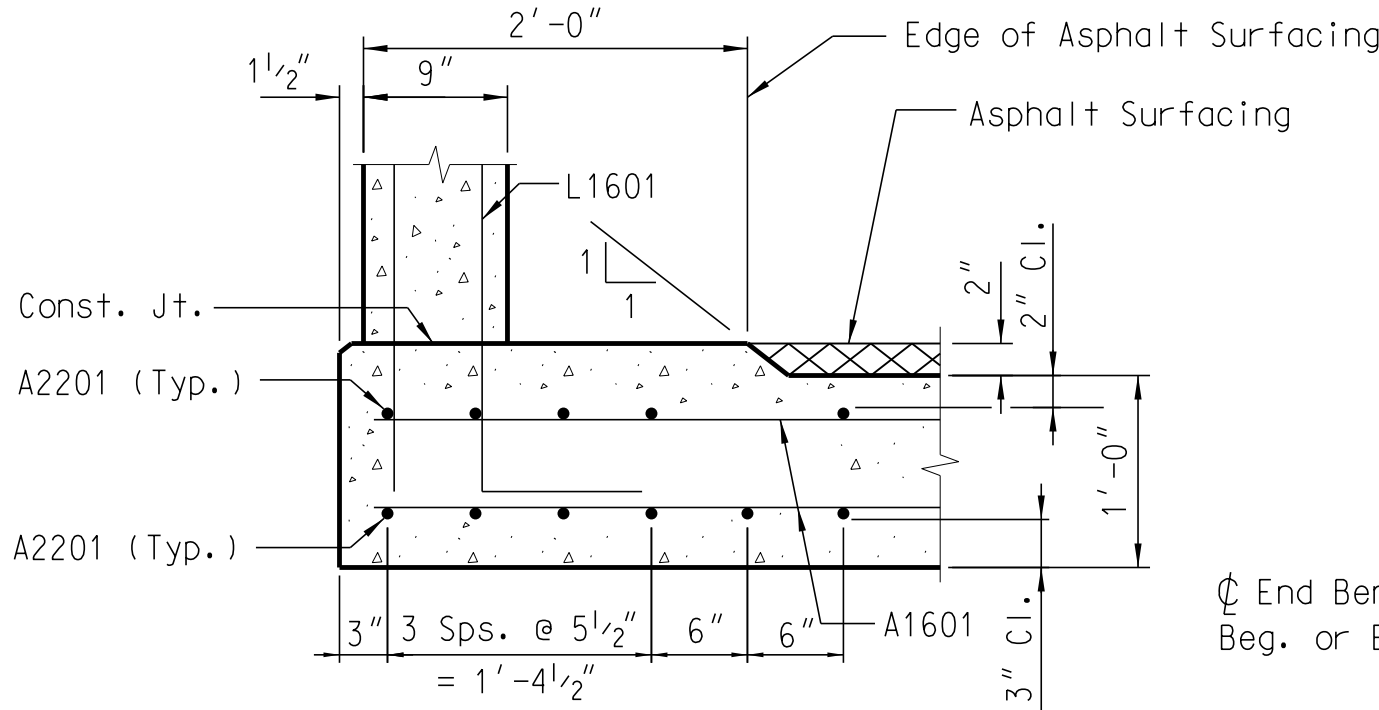
Construct approach slabs to the grades and elevations shown on the Bridge Plan and Profile drawing. Construct approach slabs to the same crown as the bridge deck.

Grade fill under approach slabs to a uniform surface 1'-2" below the finished surface of roadway. Thoroughly compact fill under the approach slab in accordance with Section 208 of the Standard Specifications. Include all costs associated with compaction of fill beneath approach slab to not less than 95% of maximum density in the unit price bid for Concrete for Structures - Class 4000.

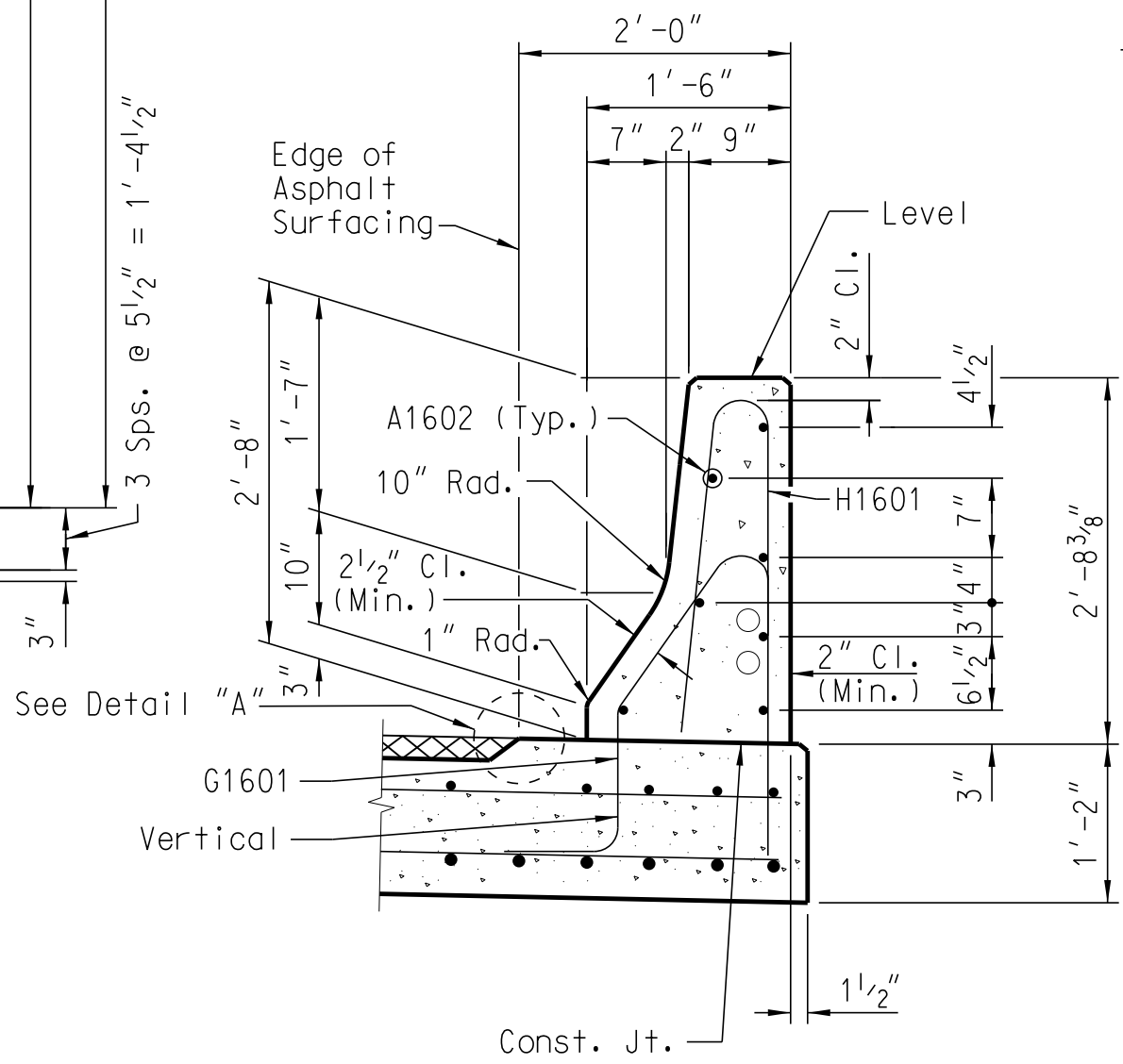
Support the bottom mat of reinforcing steel using concrete block or similar material. Provide a minimum concrete cover of 3" below the bottom reinforcing steel.

Space CHCU bolsters to provide adequate support for top reinforcing steel, approximately 2'-6" on center and parallel to centerline of approach slab. Weight of bar supports is not included in the reinforcing steel quantities. Consider bar supports as incidental to the reinforcing steel, and include all costs for furnishing and placing bar supports in the unit price bid for reinforcing steel.

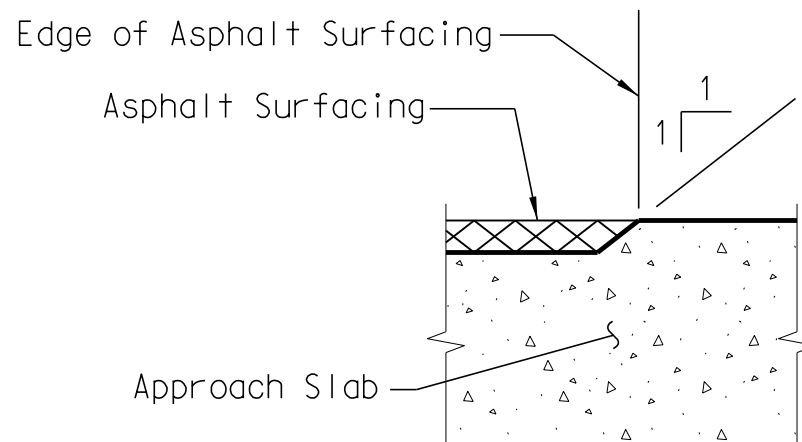
\*Construct a 1/2" open joint between barrier parapets for the End Span and End Approach Slab at the End of the Bridge.



SECTION A-A



SECTION C-C



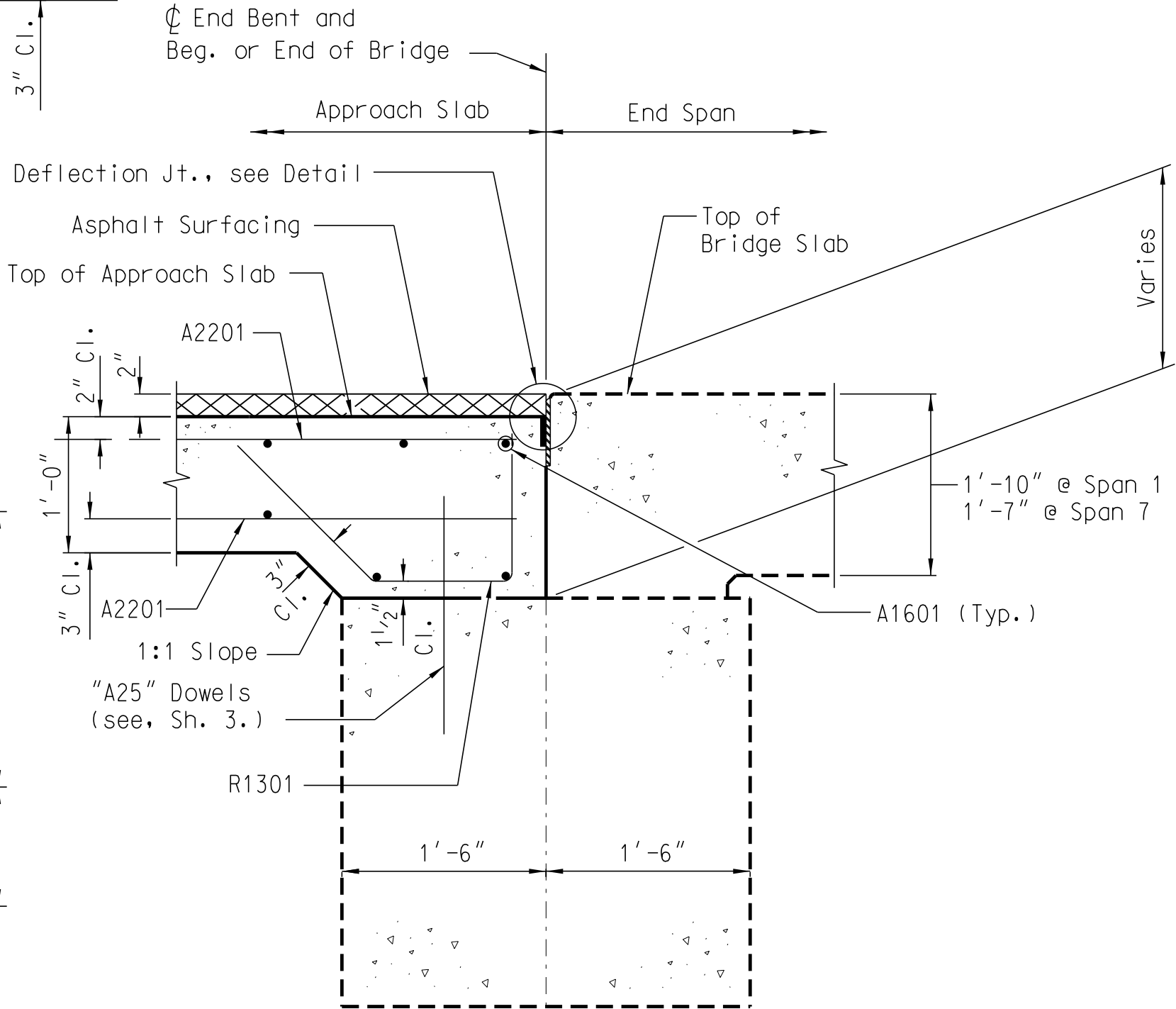
DETAIL "A"

REINF. STEEL SCHED.

MARK	BEG. APPR. SLAB NO. REQ'D	END APPR. SLAB NO. REQ'D	DIMENSION				LENGTH
			"a"	"b"	"c"	"d"	
A1601	42	42	46'-11"				46'-11"
A1602	12	13	19'-8"				19'-8"
A1603	2	1	16'-0"				16'-0"
A2201	146	146	19'-8"				19'-8"
C1601	42	21	2'-3"	10"			3'-1"
L1601	88	44	10"	3'-4"	5"	3'-4"	7'-11"
R1301	48	48	1'-5"	1'-1"	2'-0"	1'-5"	4'-6"
U1601	2	1	2'-0"	5"			4'-2"
G1601		21	1'-2 1/4"	2'-1 3/4"			5'-11"
H1601		21	2'-3 7/8"	2'-3 1/2"	7 3/8"		5'-2"
CHCU	4" Ht.		As Necessary				

QUANTITIES

ITEM	UNIT	BEG APPR.SLAB	END APPR.SLAB
Concrete, Class 4000	CY	39.7	38.5
Reinforcing Steel	LB	9218	9030
Barrier Parapet	LF	8	24
Barrier Parapet Transition	EA	2	1



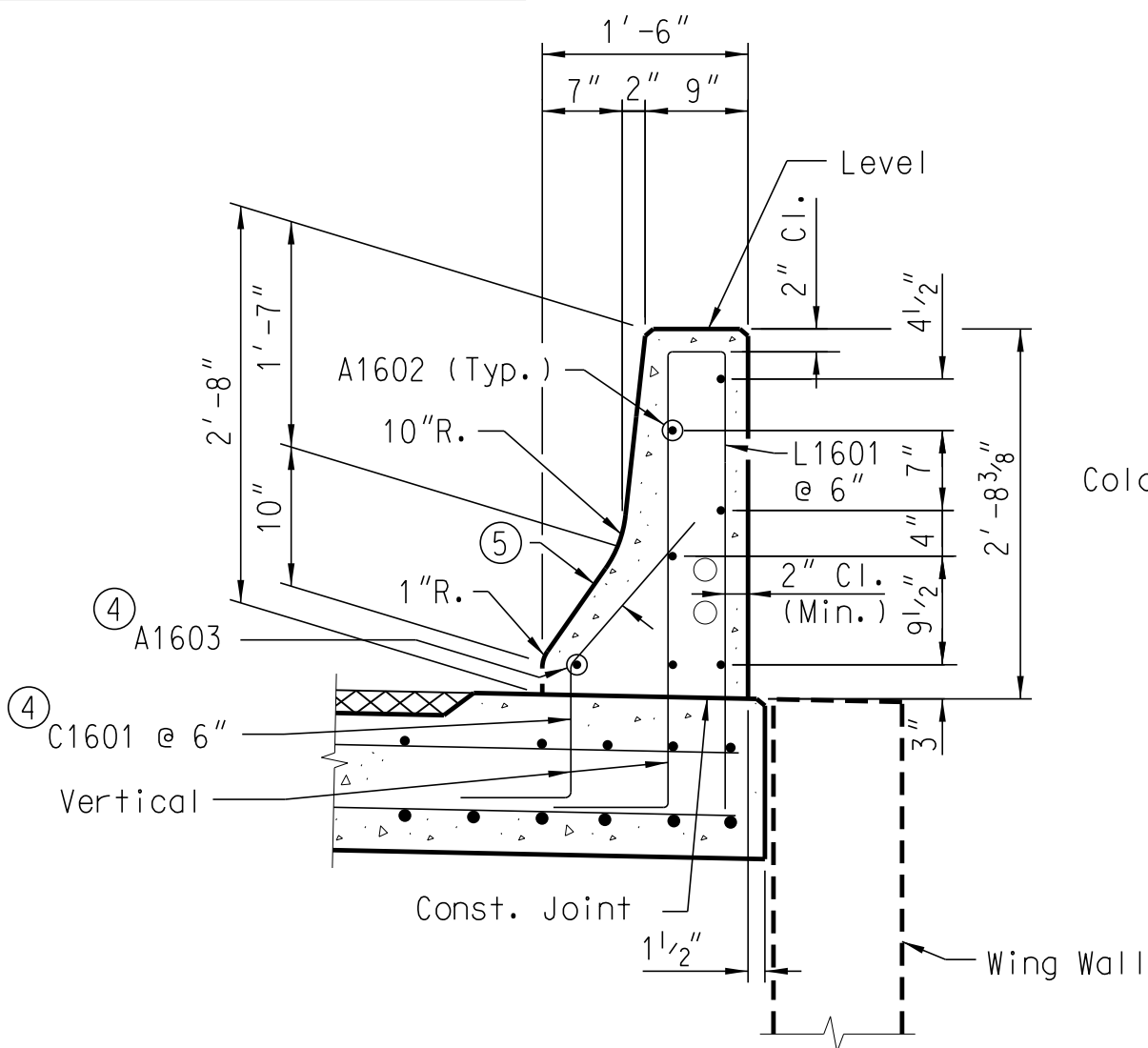
SECTION B-B

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION				APPROACH SLAB BEG. & END OF BRIDGE			
COUNTY				ROUTE			
ORANGEBURG				US 301			

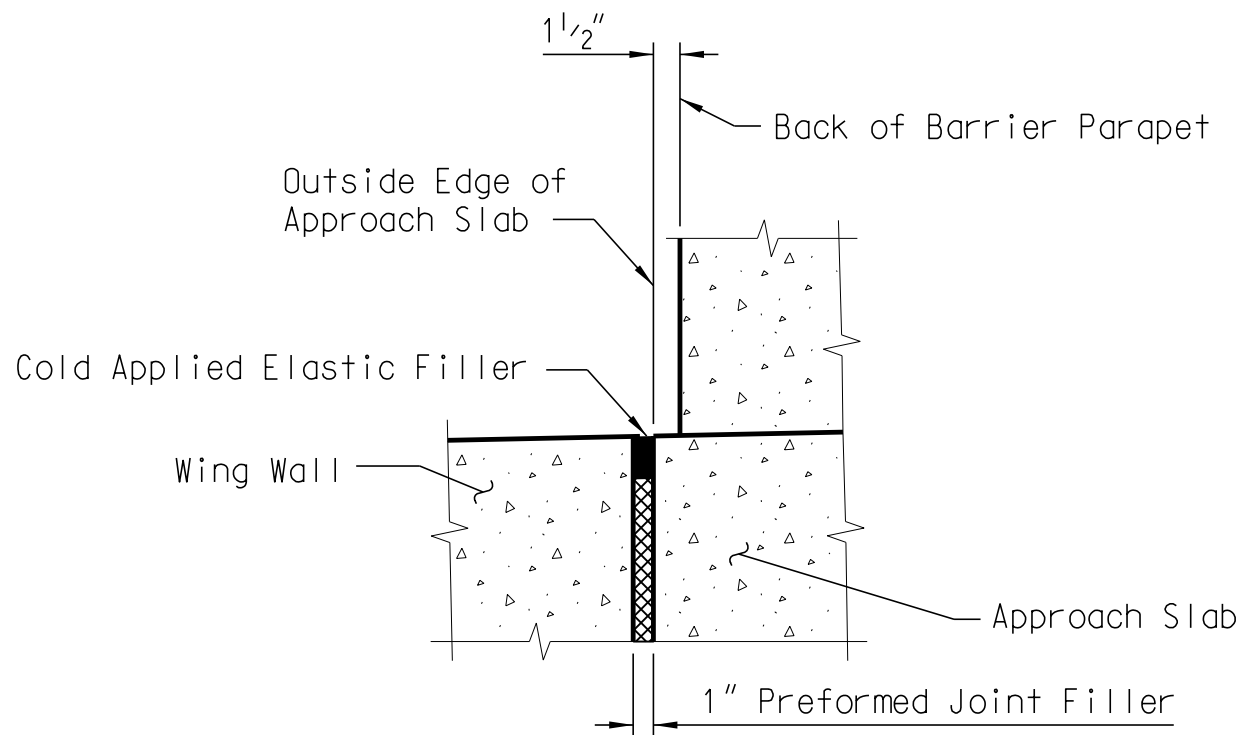
REV.	DMG	GFD	7-16
REV.	JXY	SAN	3-14
REV.	MRW	SAN	1-12
REVIEWED			
QUAN.	DMG	GFD	7-16
DR.	PNP	SAN	11-07
DES.	MRW	JDC	1-12
BY	CHK.	DATE	



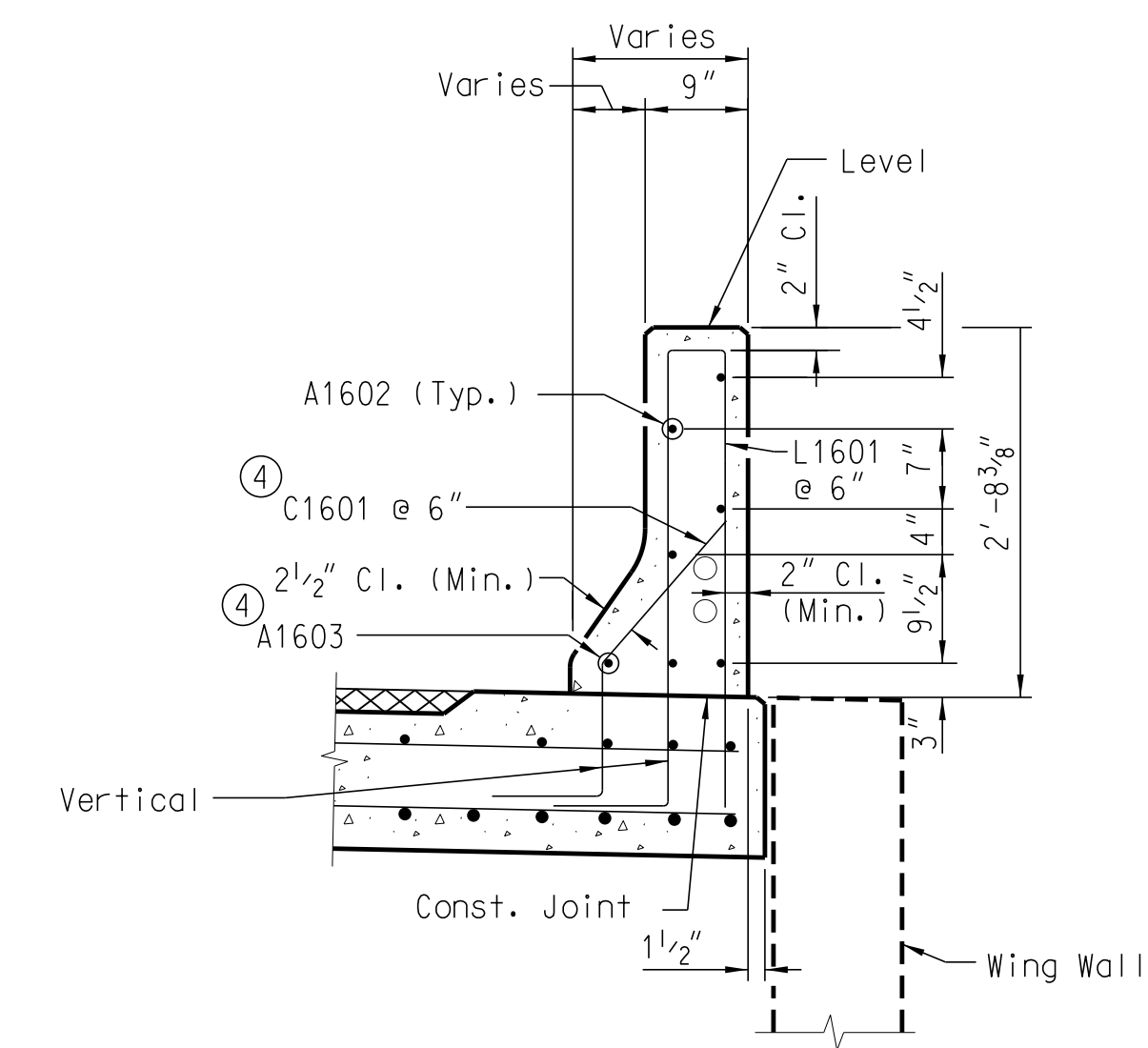




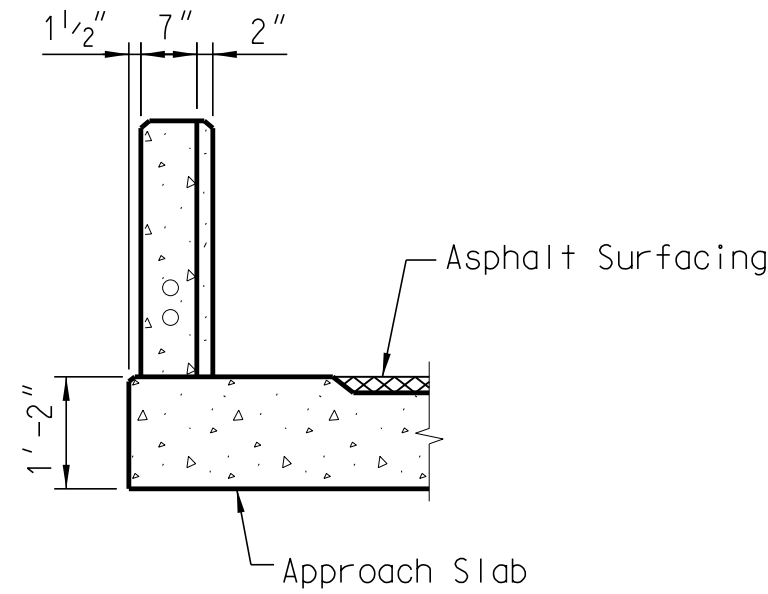
SECTION D-D



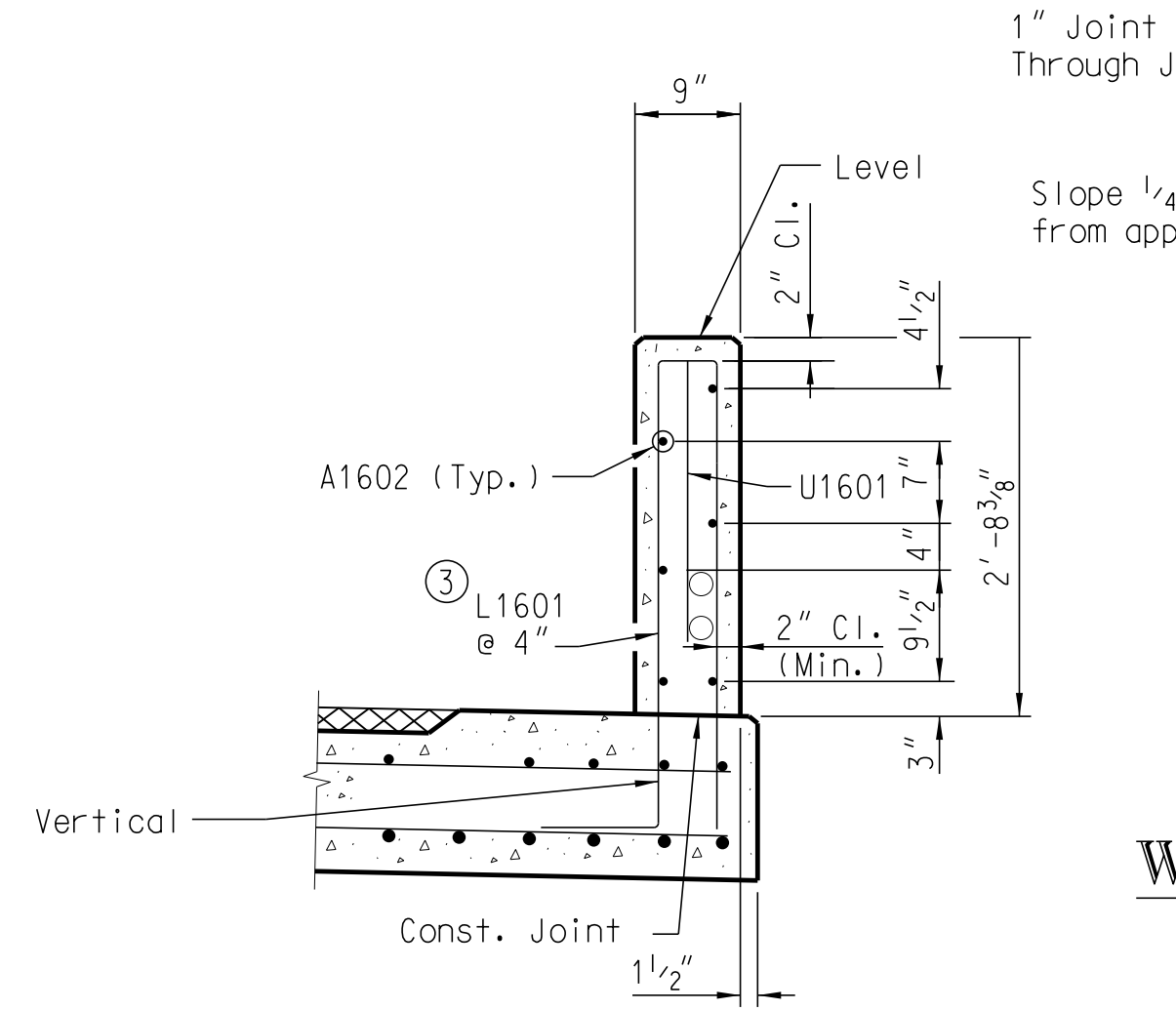
SECTION THROUGH JOINT



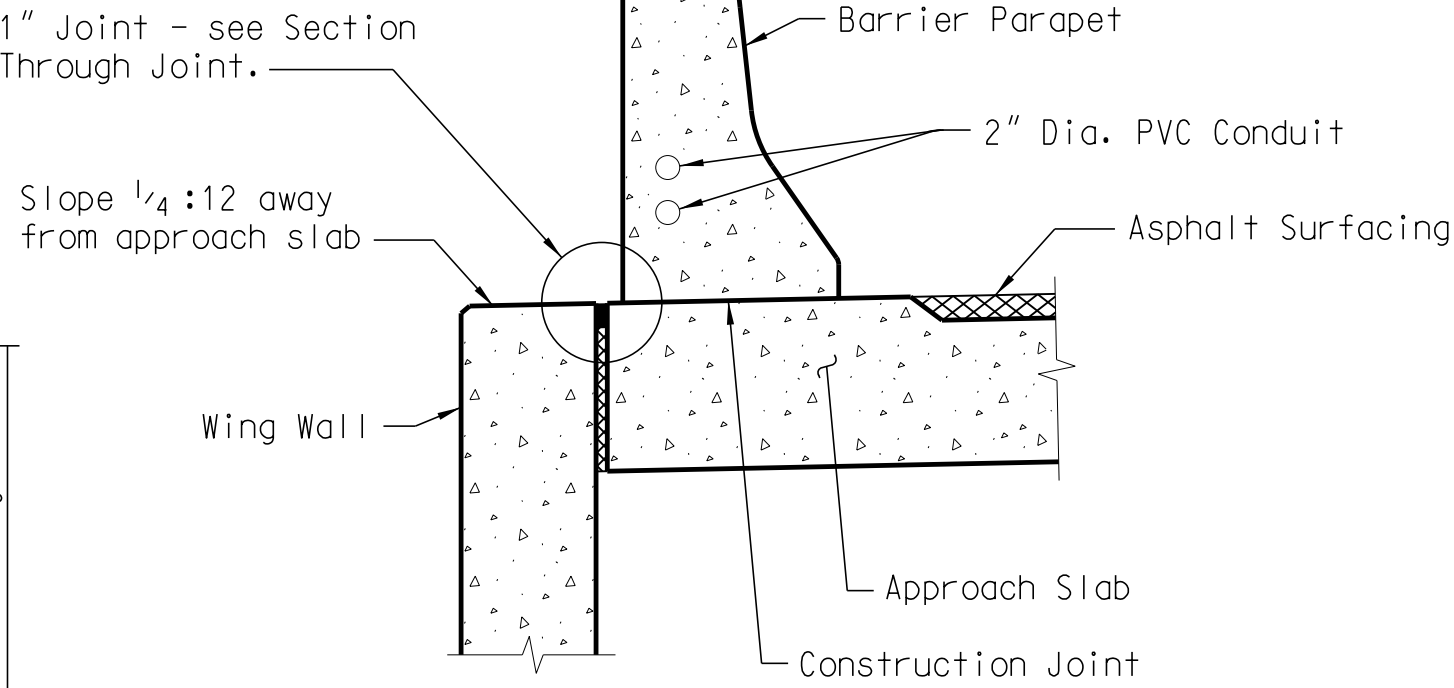
SECTION E-E



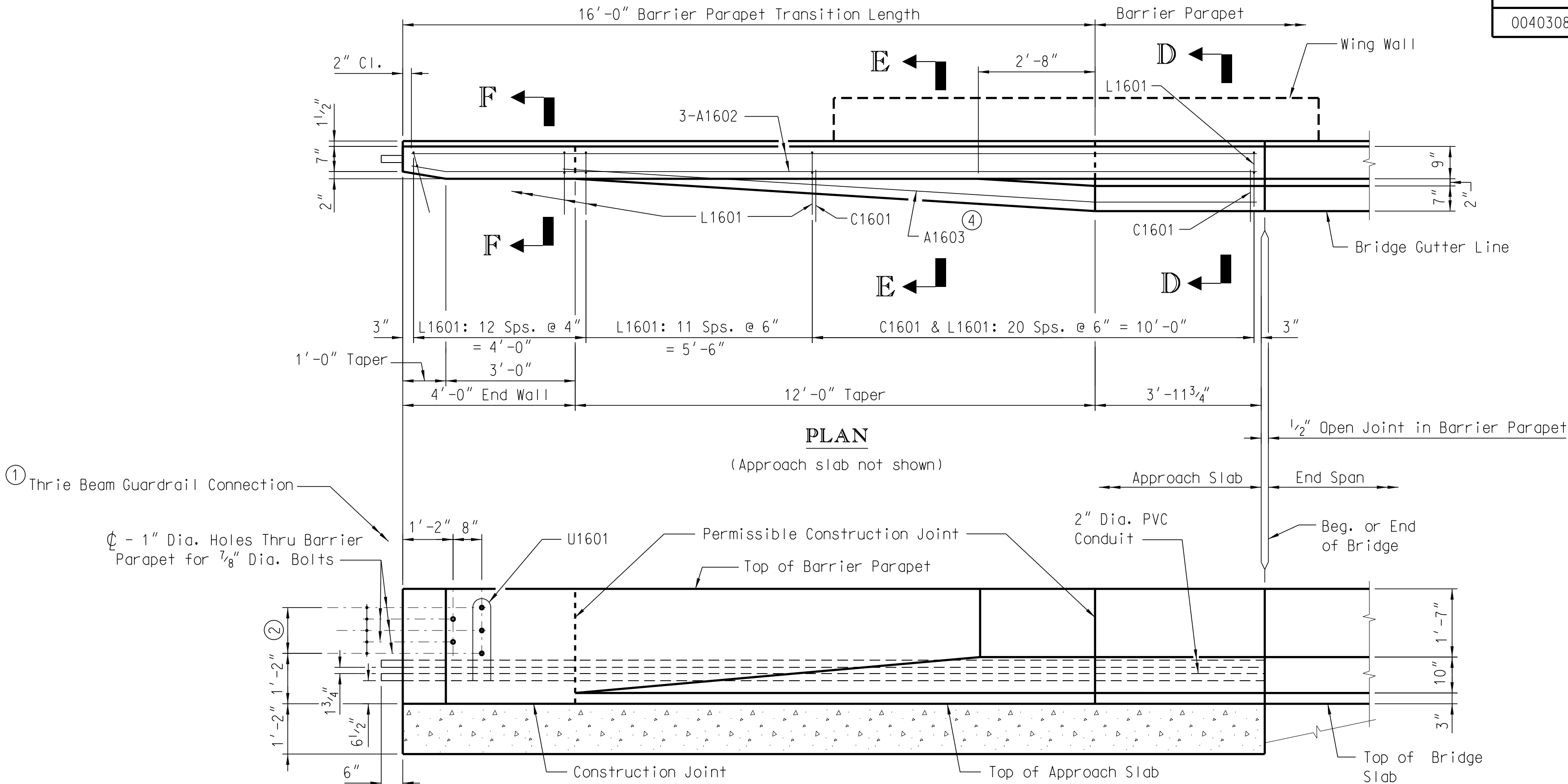
END ELEVATION



SECTION F-F



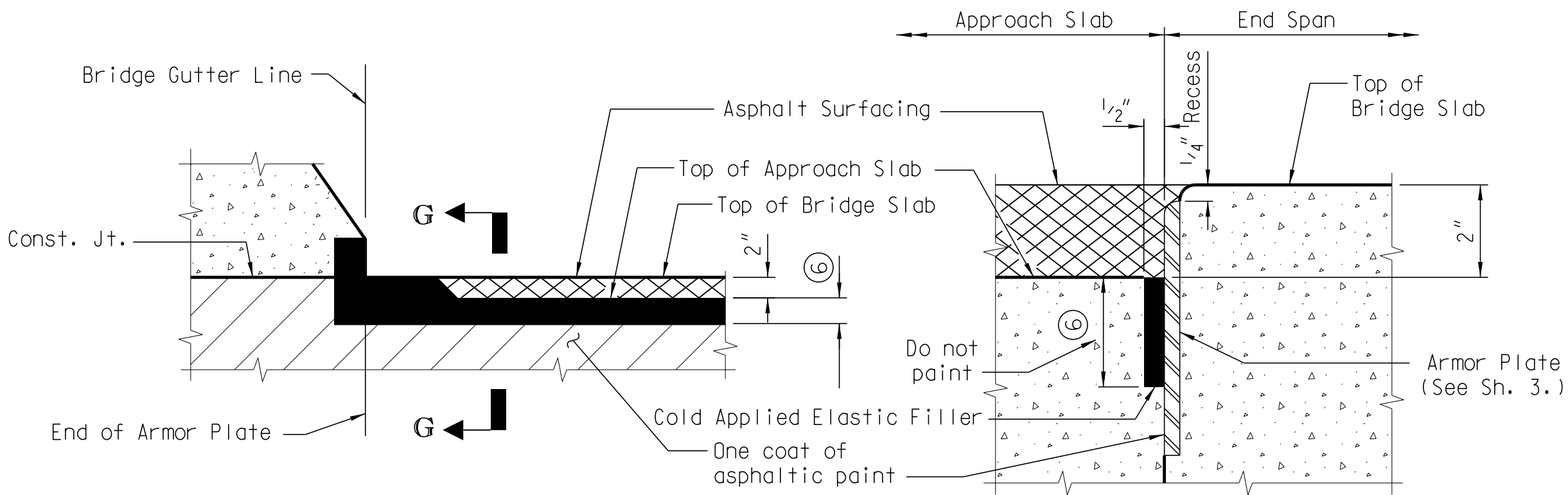
SECTION THROUGH WING WALL / APPROACH SLAB



ELEVATION

BARRIER TRANSITION DETAILS

Provide Concrete Bridge Barrier Parapet Transition conforming to the requirements of Section 705 of the Standard Specifications. Include all costs of furnishing, preparing and placing concrete, expansion joint material, and all of the materials required in the finished railing transition, except for the reinforcing steel, in the unit price bid for Concrete Bridge Barrier Parapet Transition. Payment for reinforcing steel is determined in accordance with Section 703 of the Standard Specifications.



SECTION ALONG DEFLECTION JOINT

SECTION G-G

DEFLECTION JOINT DETAIL

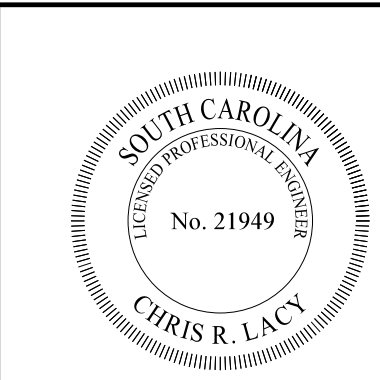
Form or saw cut the deflection joint.

Apply one coat of asphaltic point to the joint to prevent bonding of end span and approach slab concrete. Alternate methods to prevent bonding may be proposed. Submit details of bond breaking method to RCE for approval.

Include all costs for furnishing and installing cold applied elastic filler in the unit price bid for Concrete for Structures - Class 4000.

Notes:  
For additional notes and details see Approach Slab Sh. 28.

- Form the 1" Dia. holes with plastic, PVC, or galvanized standard weight steel pipe having an ID of 1". Include all cost of pipe and installation in the unit price bid for Reinforcing Steel. All pipe to remain in place when forms are removed. RCE to verify the location of the holes to ensure the guardrail shoe will fit properly when installed.
- 4 spaces @ 3 1/6" = 1'-3 1/4"
- Rotate as required for clearance at the 7" transition.
- Field Bend as necessary for clearance.
- 2 1/2" Cl. (Min.)
- Set this dimension in accordance with the Manufacturer's recommendations.



REVIEWED				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
REV.	DMG	GFD	7-16		
REV.	JXY	SAN	3-14		
REV.	MRW	SAN	1-12		
REVIEWED				APPROACH SLAB DETAILS	
QUAN.	DMG	GFD	7-16		
DR.	PNP	SAN	12-07		
DES.	MRW	JDC	1-12		
BY	CHK.	DATE		COUNTY	ORANGEBURG
				ROUTE	US 301

