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PROPOSED PLANS

FOR

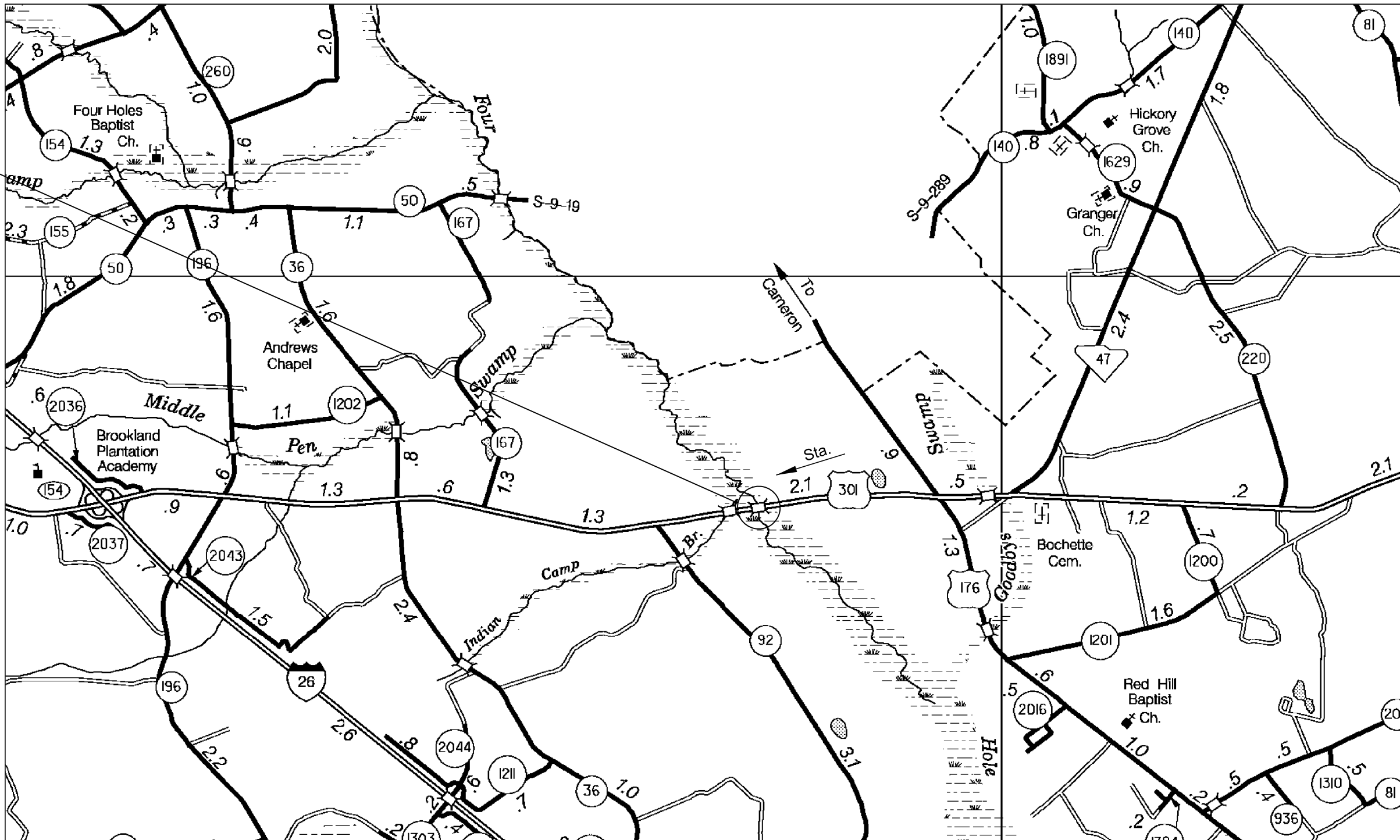
ORANGEBURG COUNTY

PROJECT ID: 0040308

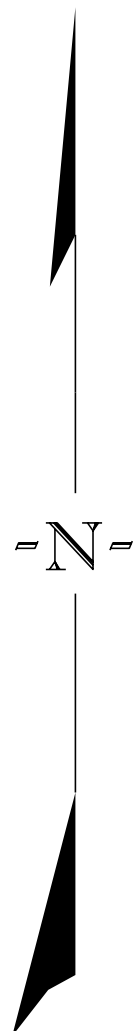
US ROUTE 301 SOUTHBOUND (FIVE CHOP ROAD)

REPLACE BRIDGE OVER FOUR HOLE SWAMP

SITE LOCATION



LAYOUT



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 %

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.

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	2945.000
2045030	COFFERDAM - TYPE 3 (20,001 - 30,000 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
8048105	GEOTEXTILE FOR EROSION CONTROL UNDER RIP RAP (CLASS 1) TYPE B	SY	822.000
8041010	RIP-RAP (CLASS-A)	TON	630.000
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.

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	13,272	_____	_____	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	13,272	619.3	3	16	42	375	79	2,520	642	10	238.2



REV.			
REV.			
REV.			
REVIEWED			
QUAN.	GFD	TL	11-16
DR.	GFD	TL	09-16
DES.			
BY	CHK.	DATE	

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUMMARY
OF ESTIMATED
QUANTITIES

COUNTY

ORANGEBURG

ROUTE

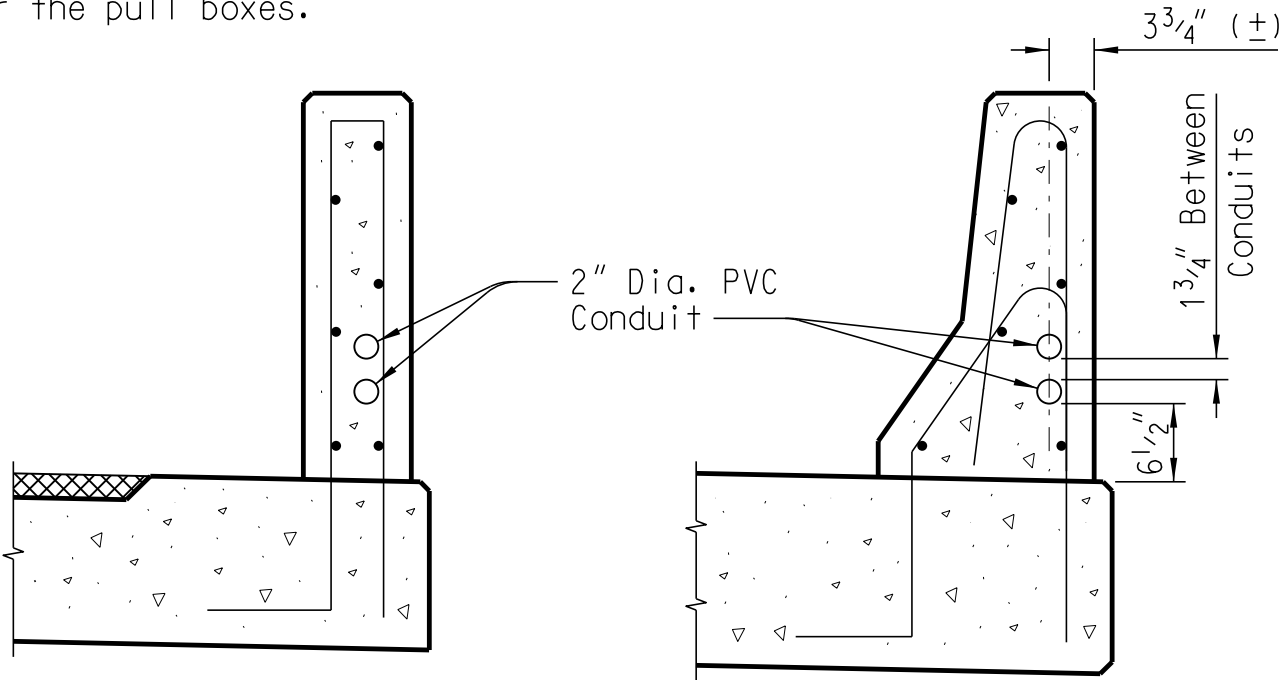
US 301

GENERAL CONDUIT NOTES

Furnish and install approved conduits and fittings in accordance with the National Electric Code (NEC) and as directed by the RCE.

Furnish Schedule 80 PVC rigid nonmetallic conduits in accordance with NEMA TC-2 and UL Standard 651 and furnish fittings in accordance with NEMA TC-3 and UL Standard 514B. Furnish conduit and fittings with UL labels; conduit - on each 10 foot length; fittings - stamped or molded on each fitting. Connect conduit and fittings using solvent cement in accordance with manufacturer's recommendations.

Furnish and install NEMA Type 4X non-metallic or galvanized steel pull boxes sized in accordance with NEC requirements and the maximum limits shown. Provide gasketed weatherproof covers for the pull boxes.



SECTION THRU
BARRIER TRANSITION

SECTION THRU
BARRIER PARAPET

DETAILS OF CONDUIT IN BARRIER PARAPET

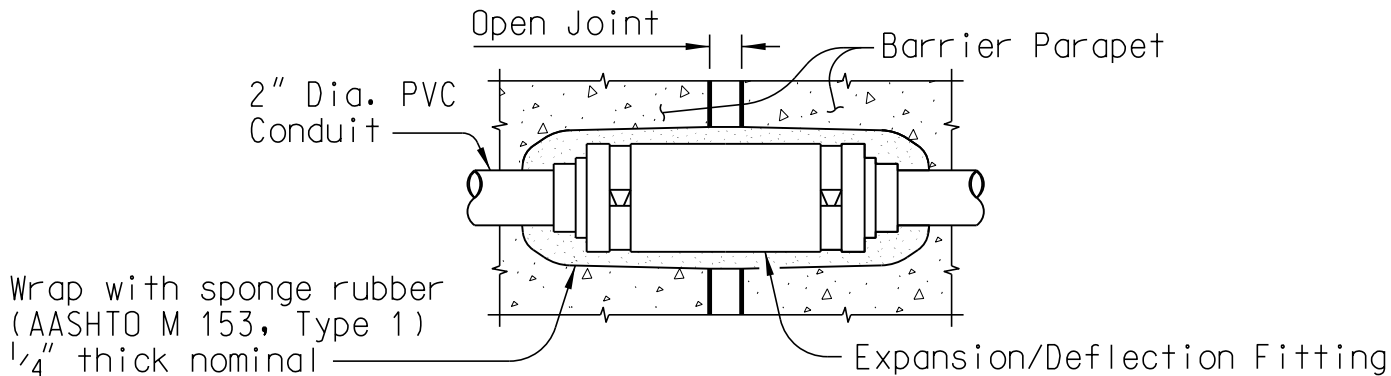
(Typ. ea. side of bridge)

Use Schedule 80 PVC nonmetallic pipe for conduit.

Extend conduits 6 inches beyond each end of the barrier parapet transition and cap with watertight covers.

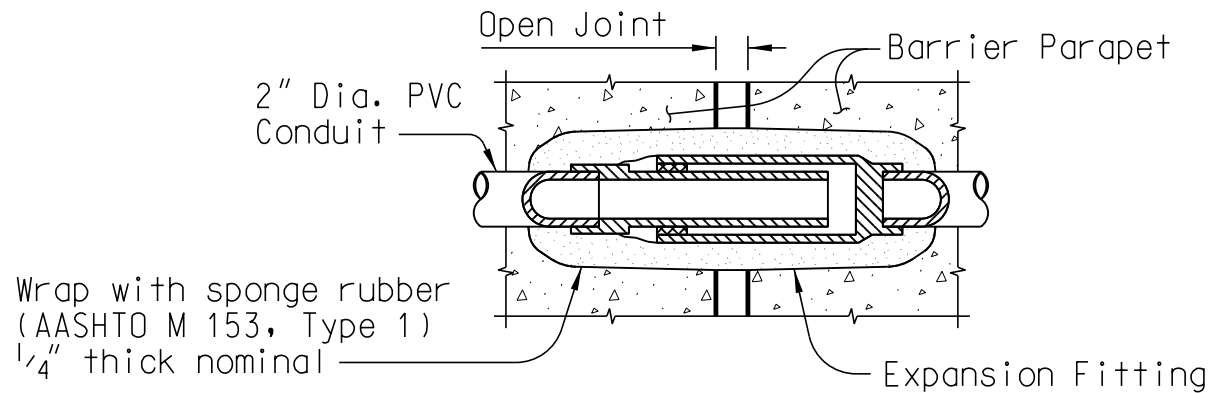
Provide expansion fittings and/or expansion/deflection fittings at all open joints in the barrier parapet.

Include all costs for furnishing and installing conduit, expansion/deflection and/or expansion fittings, and any incidentals required in the unit price bid for 2.0" Schedule 80 PVC Conduit.



EXPANSION / DEFLECTION FITTING DETAIL

(For open joints located at End Bents 1 & 8)



EXPANSION FITTING DETAIL

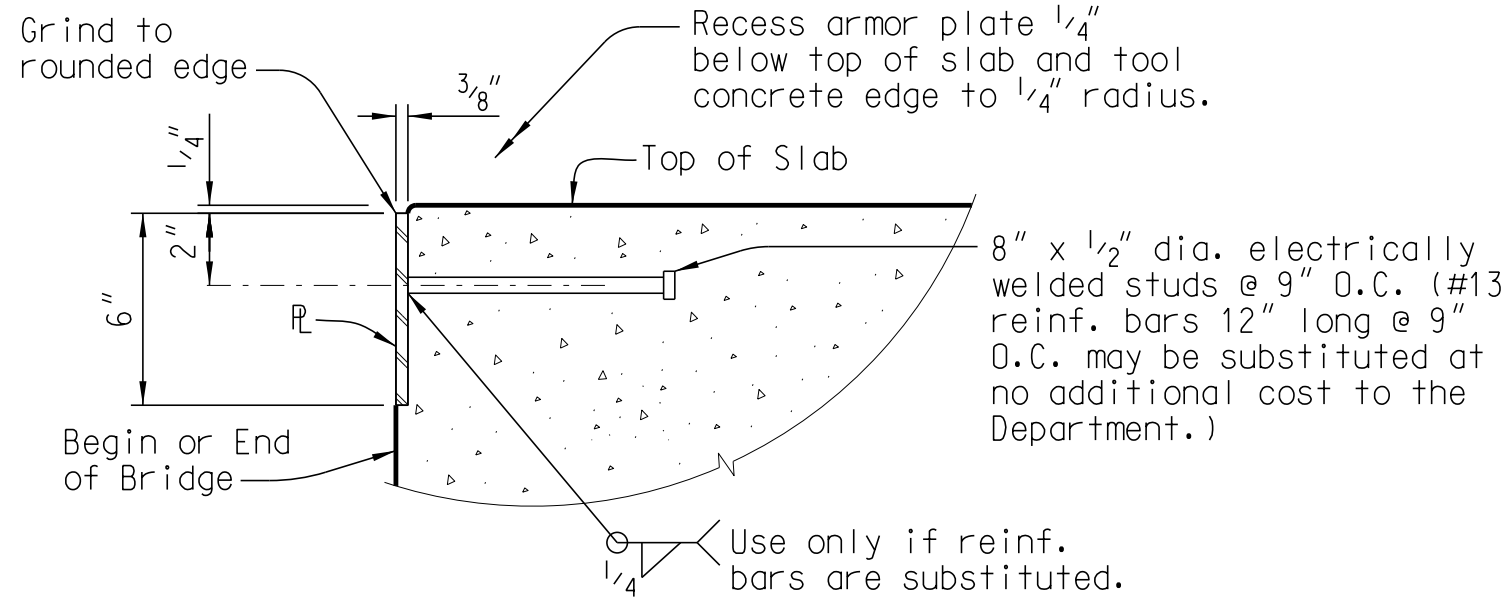
(For open joints located at Interior Bents 4 & 7)

WATER ELEVATIONS

The water elevations shown in the plans are for information only and the actual water elevation during construction may vary depending on weather conditions and seasonal fluctuations.

ORIENTATION IN RELATION TO STATIONING

Left and right sides, where referred to in these plans, are in relation to direction of stationing.



ARMOR PLATE DETAIL AT END BENTS

Install 3/8" thick plates, as detailed above, at the beginning and end of the bridge.

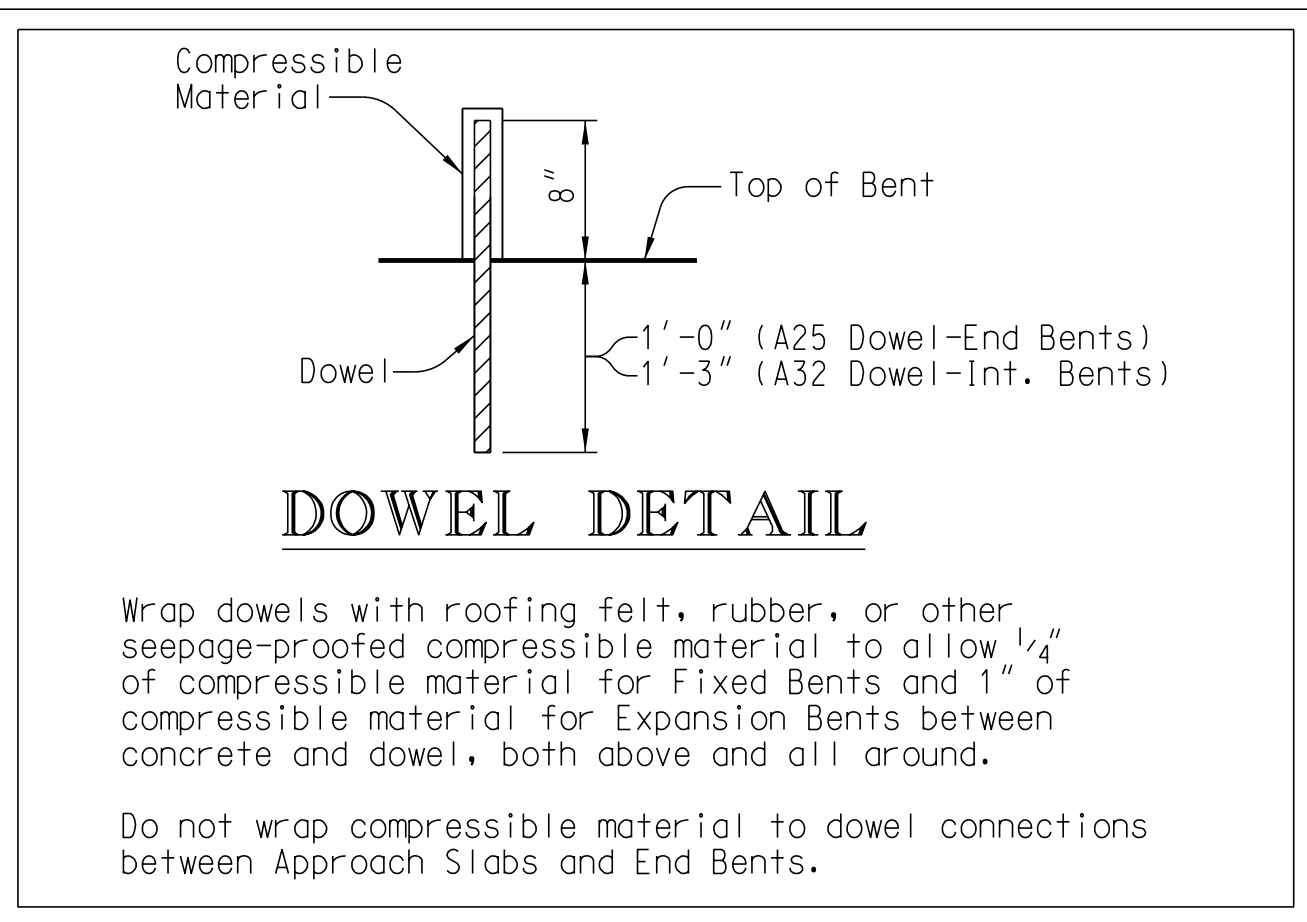
Provide steel for the armor plates that conforms to the latest AASHTO M 270 Grade 50W (ASTM A 709 Gr. 50W) steel and neither the plates nor the anchor studs need to be painted.

Provide fabricated plates that conform to the crown and grade of the roadway and extend from gutter line to gutter line. The plates may be fabricated in reasonable lengths and connected at the job site with full penetration butt welds ground flush along the top face of connected plates.

If necessary, longitudinal reinforcing bars of the slab may be shifted laterally to clear anchor studs.

Holes, 9/16" dia., spaced approximately 2'-0" on center may be provided in the lower portion of the plates to bolt the plates to the forms.

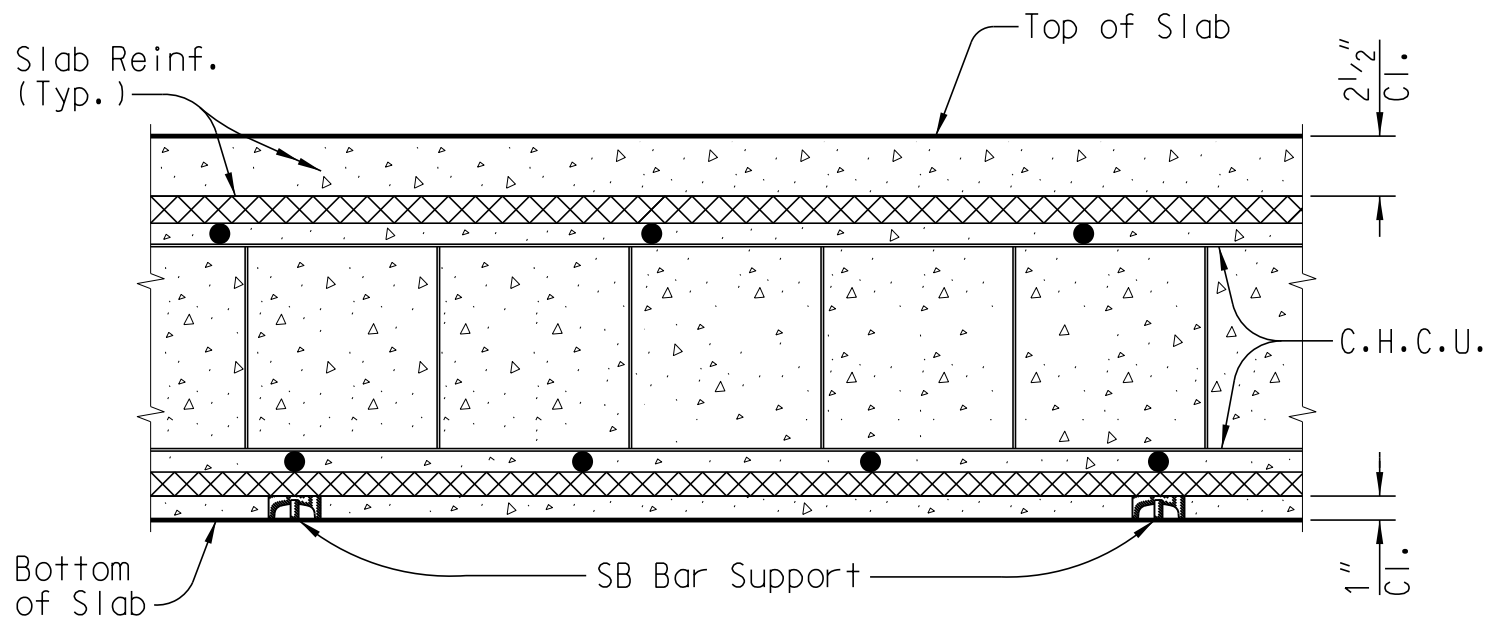
Include all costs of material and workmanship to fabricate, furnish, and install the armor plates and anchor studs complete and in place, in the unit price bid for Class 4000 concrete.



DOWEL DETAIL

Wrap dowels with roofing felt, rubber, or other seepage-proofed compressible material to allow 1/4" of compressible material for Fixed Bents and 1" of compressible material for Expansion Bents between concrete and dowel, both above and all around.

Do not wrap compressible material to dowel connections between Approach Slabs and End Bents.



BAR SUPPORT DETAIL

Section Parallel to C Roadway

For bar supports that contact forms or floor surfaces, use plastic bar supports that conform to the requirements of the Standard Specifications. Protect the plastic bar supports from exposure to sunlight until placed in the form. Where removable forms are used, do not use continuous legs or rails that are in contact with the forms.

For supports that do not contact forms or floor surfaces, use wire bar supports that conform to the requirements of the Standard Specifications. In applications where galvanized bars are used, use galvanized wire supports.

MATERIAL AND WORKMANSHIP

Provide all material and workmanship in accordance with the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction, unless otherwise specified on the Plans or in the Special Provisions.

COMPLETION DATES

On inside face of right side barrier parapet/railing at beginning of bridge and on left side barrier parapet/railing at end of bridge, place year of completion adjacent to guardrail attachment. Place this completion date so that it will not be covered by the guardrail connector when it is installed. Recess numbers in the concrete using numbers fabricated from reusable/durable material that is approved by the RCE. Provide numbers in accordance with SCDOT Standard Drawing No. 702-305-00.

REINFORCING STEEL

Fabricate reinforcing bars in accordance with the current C.R.S.I. Manual of Standard Practice except for ties, stirrups, and welded hoops.

Provide all ties and stirrups with 135° hooks that have extensions no less than the larger of ten bar diameters or six inches. This 135° hook requirement does not apply to stirrups extending from prestressed concrete beams.

The fabrication tolerance for out-to-out dimension of welded hoop diameter is ± 1/2 inch.

Do not use lap splices in column and shaft reinforcing steel.

CONCRETE

Provide the class of concrete as noted in the contract documents. For cast-in-place structural elements, use Class 4000 concrete where the class of concrete is not specified in the contract documents.

Payment for concrete in slab is based on theoretical plan quantity. No adjustment is made for variation in camber.

Chamfer all exposed edges 3/4" unless otherwise noted.

The minimum acceptable concrete cover for reinforcing steel is 1/2" less than the plan dimensions when required by reinforcing bar fabrication tolerances.

Cast shear keys on bent caps monolithic with the cap unless indicated otherwise in these plans. Construct the top of each shear key level.

GRINDING & TEXTURING CONCRETE DECKS

For bridge stage construction projects, grind and texture the bridge decks as necessary near the stage longitudinal construction joints in order to meet the longitudinal and transverse rideability and rolling straightedge requirements of the Contract.

Prior to casting any closure pour, grinding, or texturing, make profile line surveys (2 to 6 as determined by the RCE) of each stage of the bridge decks. Make one of these profile line surveys for each stage along the edge of the deck adjacent to the closure pour. Compare the surveys within each stage and compare the surveys of each stage to surveys of the adjacent stage to aid in determining the amount of grinding and texturing needed to meet the rideability and rolling straightedge requirements. Submit all grinding and texturing procedures, plotted survey profiles, and proposed grinding depths to the RCE for approval. Maintain a final cover of 2" minimum over the bridge deck reinforcing steel.

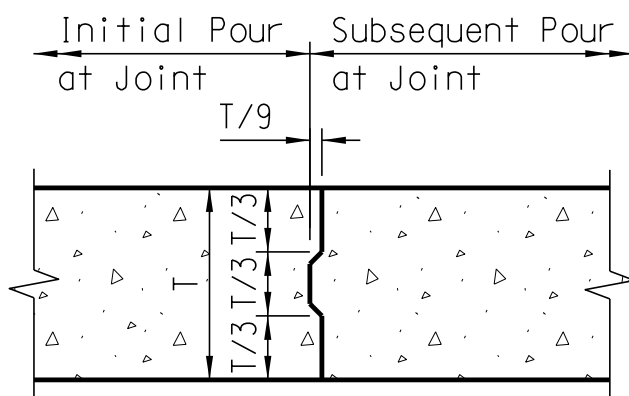
Follow the above procedures for all stages of the work. For all surveys performed on the same bridge, use identical stations for survey shots in order to facilitate survey comparisons. All costs for performing, evaluating, and submitting the surveys are considered incidental to the Contract and no additional compensation is allowed for the performance of this work.

Payment for grinding and texturing concrete bridge decks at the junction of new and existing bridge deck slabs is determined in accordance with Subsection 702.6 of the Standard Specifications. No payment is made for grinding and texturing of new bridge decks to correct irregularities and excessive deviations.

ALLOWANCE FOR DEAD LOAD DEFLECTION AND SETTLEMENT

In setting falsework for reinforced concrete spans, make an allowance for the deflection of the falsework, for any settlement of the falsework, for the instantaneous dead load deflection of the span, and for the long-time dead load deflection of the span such that on removal of the falsework the top of the structure shall conform to theoretical finished grade plus the allowance for long-time deflection.

For instantaneous and long-time dead load deflection, use a camber of 1/8" for concrete flat slab spans 22 feet in length, 3/16" for concrete flat slab spans 30 feet in length, and 3/8" for concrete flat slab spans 40 feet and 44 feet in length, unless otherwise directed by the RCE. Adjust these cambers as necessary to allow for falsework deflection, falsework settlement and vertical curve ordinates.



CONST. JT. DETAIL

Before making subsequent pour, wait either a minimum of 96 hours after placement of the initial pour or until the initial pour concrete has attained a minimum of 75% of the specified 28-day compressive strength as verified by testing extra cylinders.

COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

Generally, in case of discrepancy, this General Notes and Details for Flat Slabs sheet governs over the Standard Specifications but the remainder of the plans govern over notes on this sheet and Special Provisions govern over all. See Subsection 105.4 of the Standard Specifications.

DRIVEN PILE FOUNDATIONS

Where piles occur in fill, place fill before driving piles.

Where prestressed concrete piles are to be driven through fill, install piles in pre-bored holes extending to the original ground. For square prestressed concrete piles bore holes having a minimum diameter of 1.25 times the nominal pile size. Include all cost of pre-boring fills for pile installation in the unit price bid for the piles.

EXCAVATION FOR END BENTS

Include all cost of excavation necessary to construct end bents and to remove material under superstructure to an elevation twelve inches below tops of end bent caps, in the unit price bid for class of concrete specified in the Plans.

If a concrete footing is used for the end bent, the excavation below that included for the cap and berm in the above paragraph is paid for at the unit price bid for excavation. Include excavation above this in the unit price bid for class of concrete specified in the Plans.

BEARINGS

Provide a suitable trowel finish to the top surface of concrete caps where concrete slabs bear. See Subsection 702.4.13 of the Standard Specifications.

SPECIFICATIONS

AASHTO 2012 LRFD Bridge Design Specifications, 6th Edition, with Interim Revisions through 2013.

ANSI/AASHTO/AWS D1.5 Bridge Welding Code (latest edition), with additions and revisions as stated in the Standard Specifications.

DESIGN DATA

Load and Resistance Factor Design (LRFD) method

Live Load: AASHTO HL-93 loading

The top 1/4" of all concrete slabs is considered as a wearing surface and is not included in the slab depth used for the calculation of section properties.

An extra dead load of 0.015 KSF is incorporated into the design of this structure as an allowance for a future wearing surface.

Seismic design is in accordance with the 2008 SCDOT "Seismic Design Specifications for Highway Bridges", Version 2.0, with the following parameters:

Seismic Design Category: C

Analysis Method: Multimode Spectral with Pushover

Operational Classification: II

Site Class: D

Design Acceleration Coefficients:

PGA (FEE):	0.20 g	PGA (SEE):	0.43 g
S _{0S} (FEE):	0.39 g	S _{0S} (SEE):	0.87 g
S ₀₁ (FEE):	0.18 g	S ₀₁ (SEE):	0.49 g

Values determined from Three Point Method

FINAL FINISH OF EXPOSED CONCRETE SURFACES

Apply the final surface finish on the bridge(s) only to the following checked and designated bridge areas:

- ☐ A) Entire surface of all barrier rails, parapet walls, approach slab curbs, concrete utility supports, and wing walls; outside vertical edge of bridge deck slabs and sidewalks.
- ☐ B) Outside face of exterior prestressed girders.
- ☐ C) Entire surface of designated substructure units, except top of bent caps and piers.

☐ All Units

☐ Designated Units:

☒ D) No final surface required.

REV.	MRB	GFD	10-14
			From Dwg & Det.
REV.	BMH	JXY	12-14
			Const. Jt.
REV.	JXY	SAN	3-14
			New Border
REVIEWED			
QUAN.			
DR.	SRM	GFD	SAN 8-07
DES.			
BY	CHK.	DATE	



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

GENERAL NOTES AND DETAILS FOR FLAT SLABS

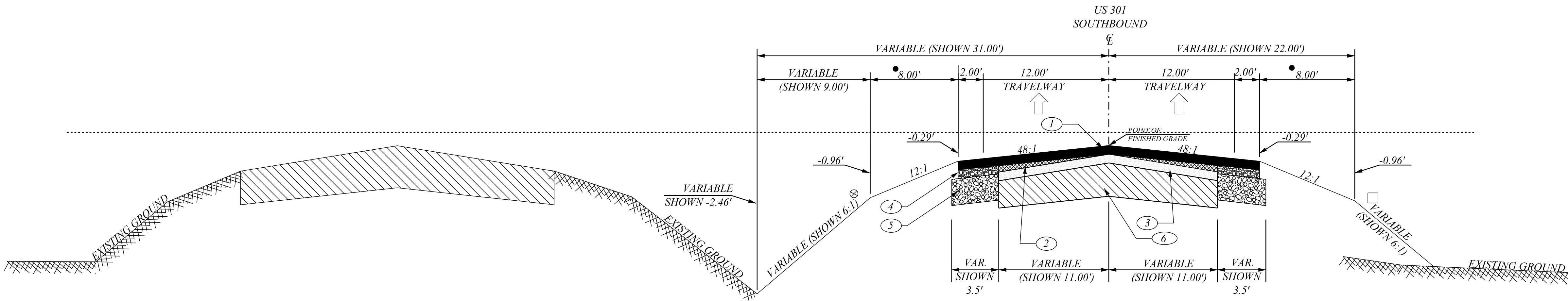
COUNTY
ORANGEBURG

ROUTE
US 301

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		<div>PAVEMENT DESIGN</div> <div></div>	SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION ROAD DESIGN COLUMBIA, S.C.	
		MPH	FROM STA.	TO STA.				
		60	5941 + 40.00	5960 + 00.00				
		EXCEPTIONS TO DESIGN SPEED						
						TYPICAL SECTION		
						SCALE 1"=10'	SCALE 1"=10'	RTE./RD.

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

McKownWR
P:\orangeburg\40308-us301\road\40308pf6.dgn
02-Nov-2016

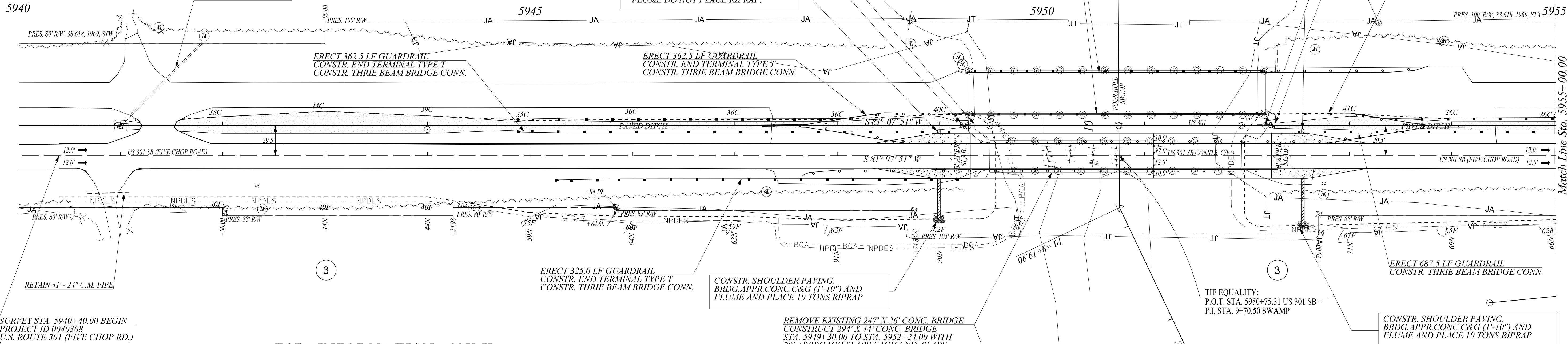
PROFILE	SURVEYED	DATE
BY		
DATE		
NOTE BOOK		
GRADES CHECKED		
RAW'S NOTED		
CONSTRUCTION NOTATIONS CHECKED		
N/A		

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	

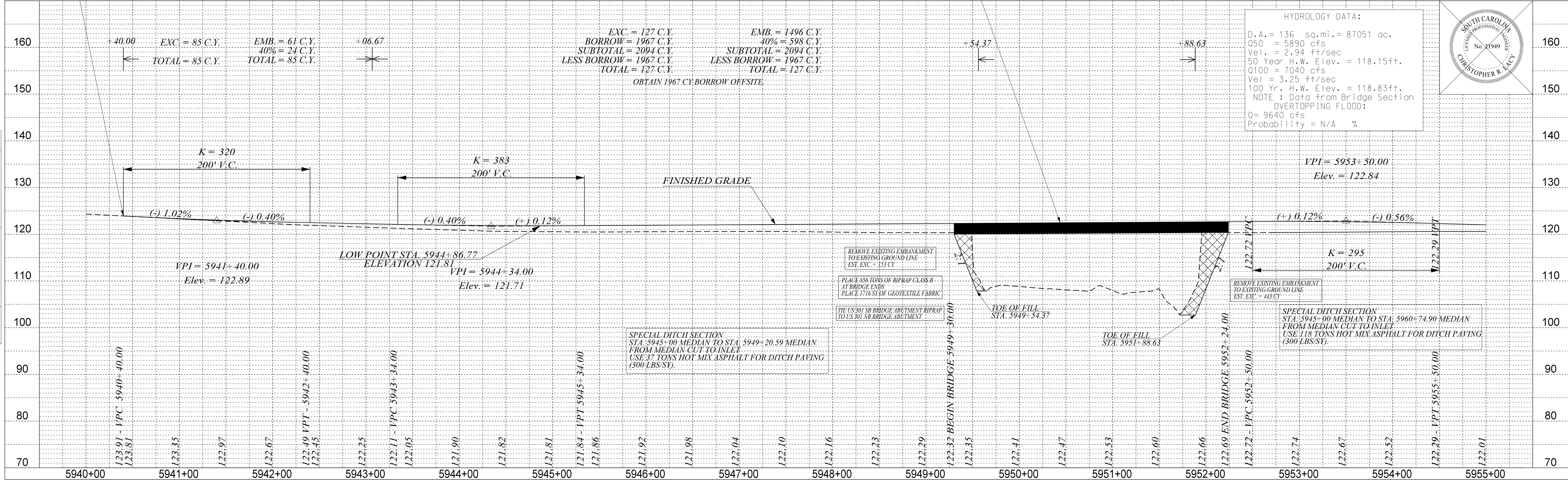
ALIGNMENT CONTROL CAN BE FOUND ON REFERENCE SHEET

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

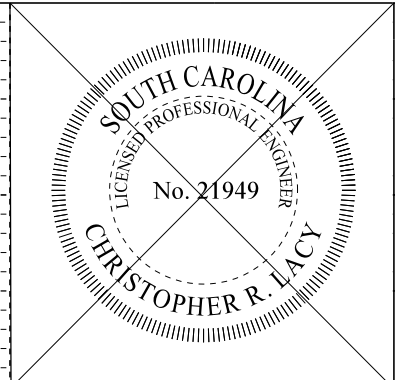
FIVE CHOP ROAD

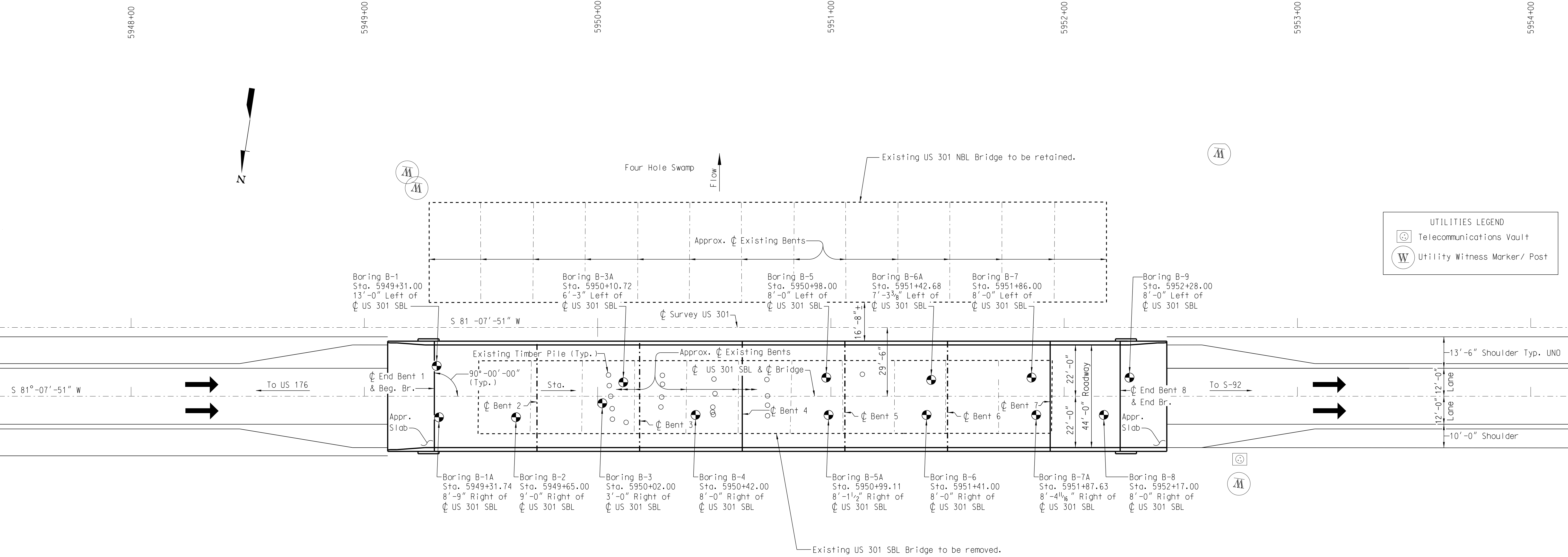


FOR INFORMATION ONLY



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 %

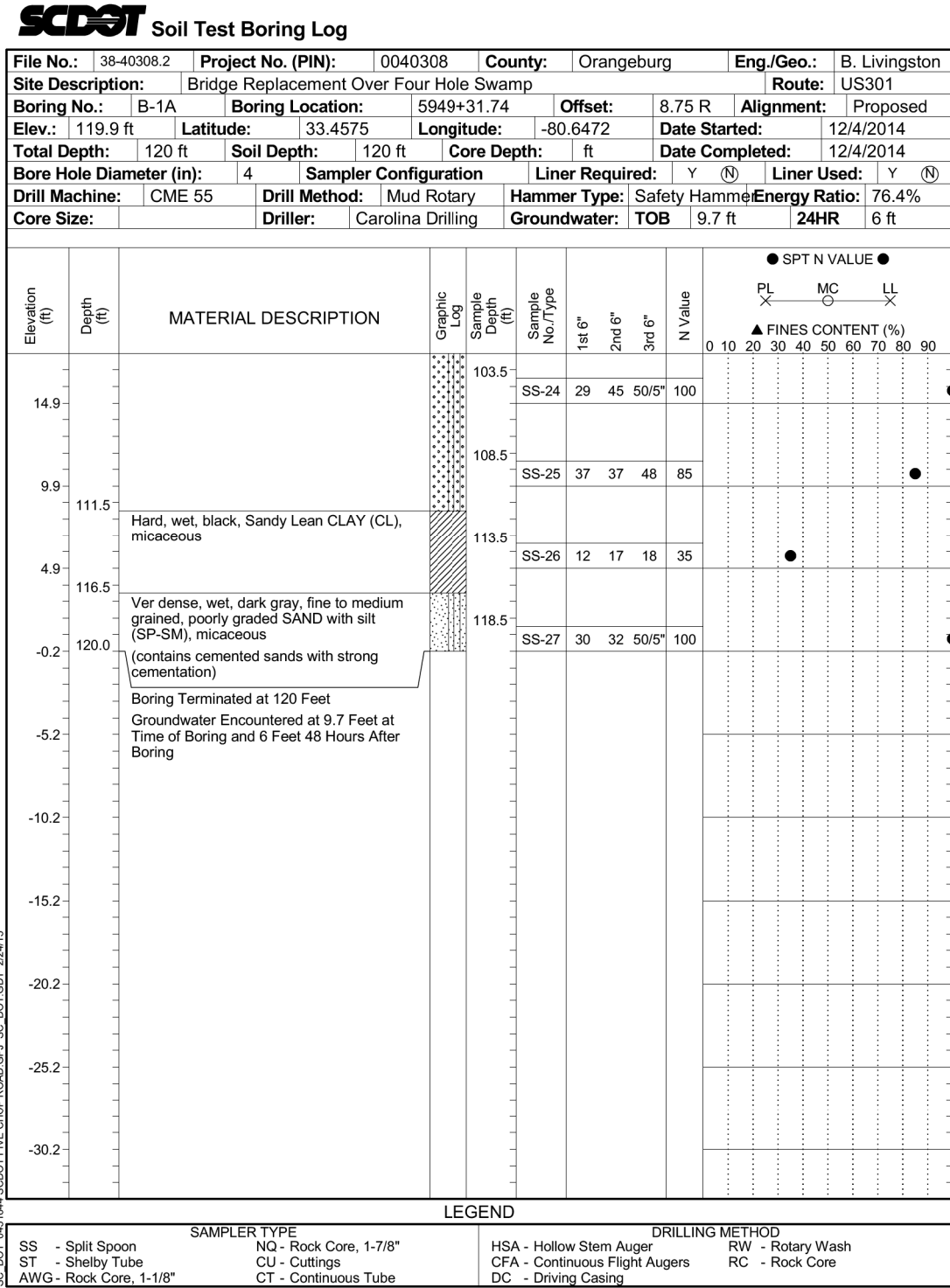
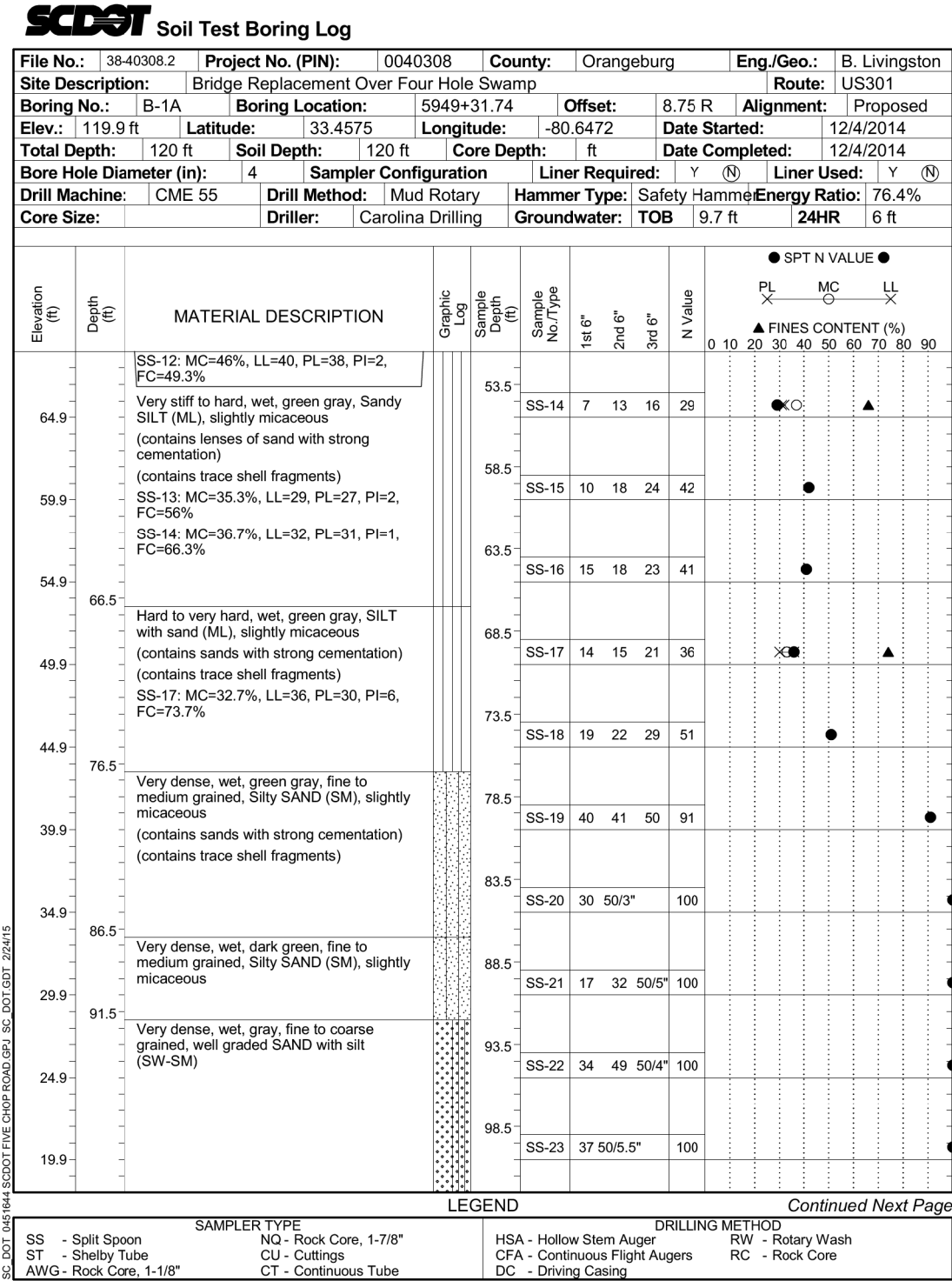
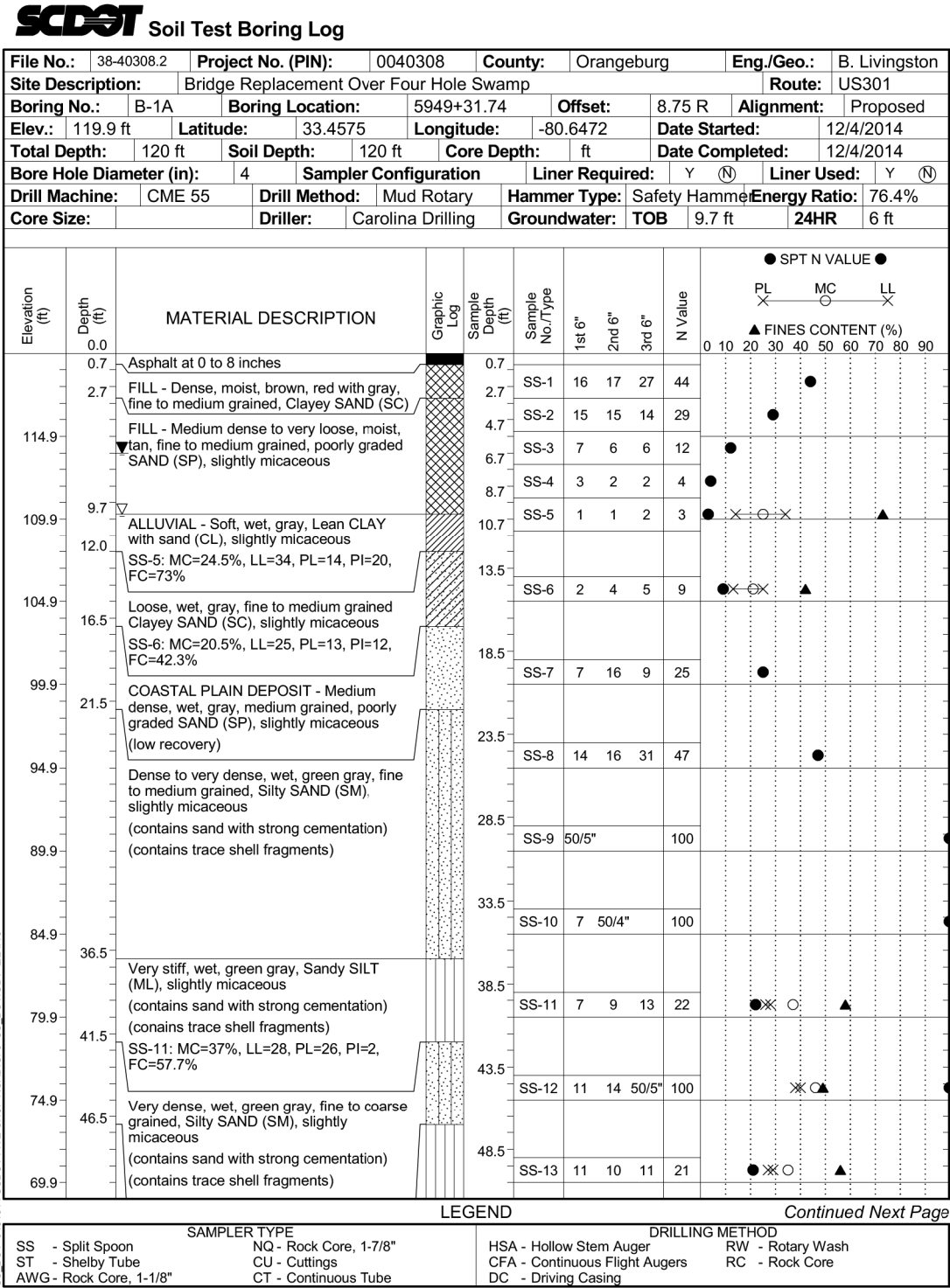
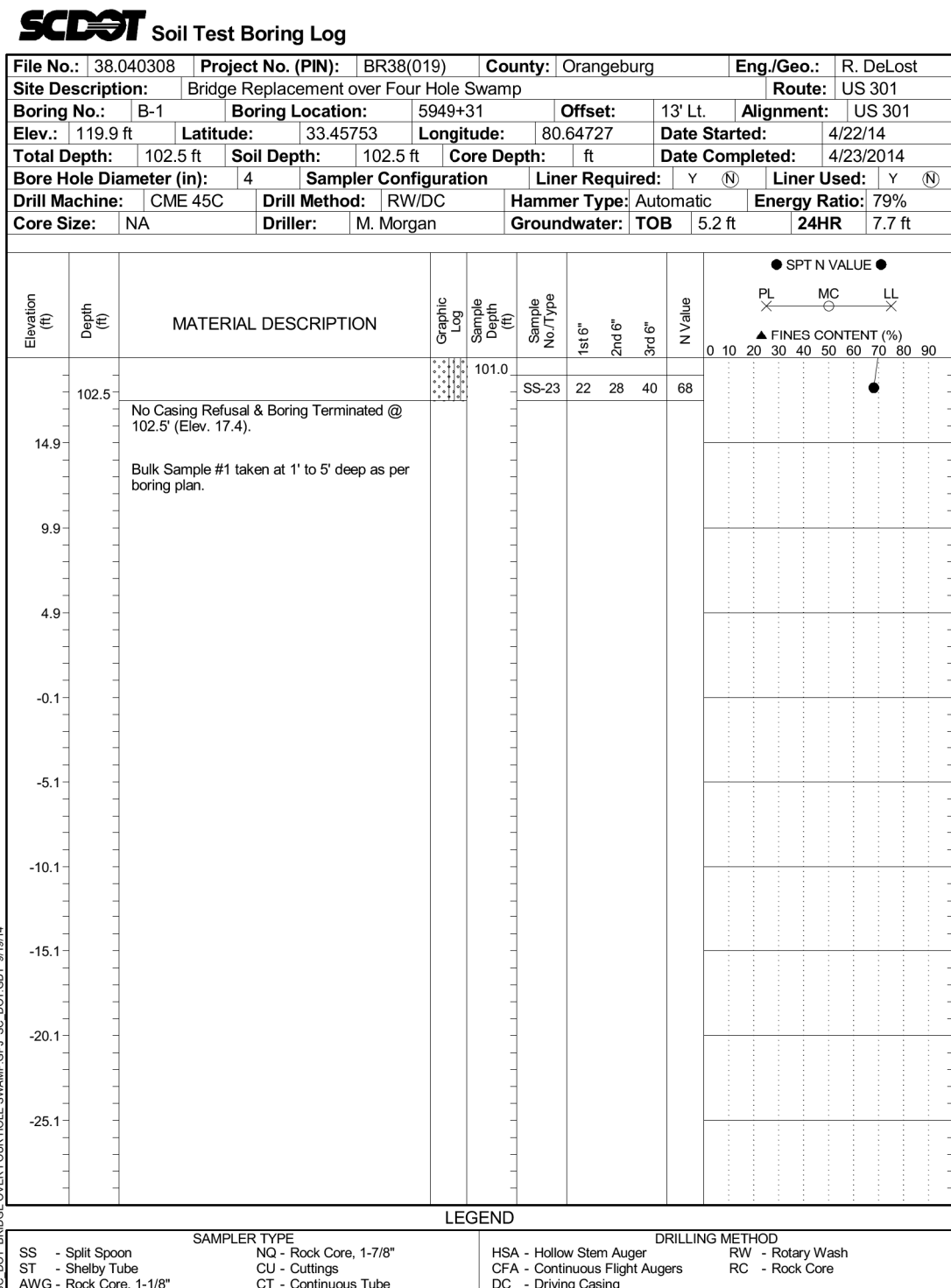
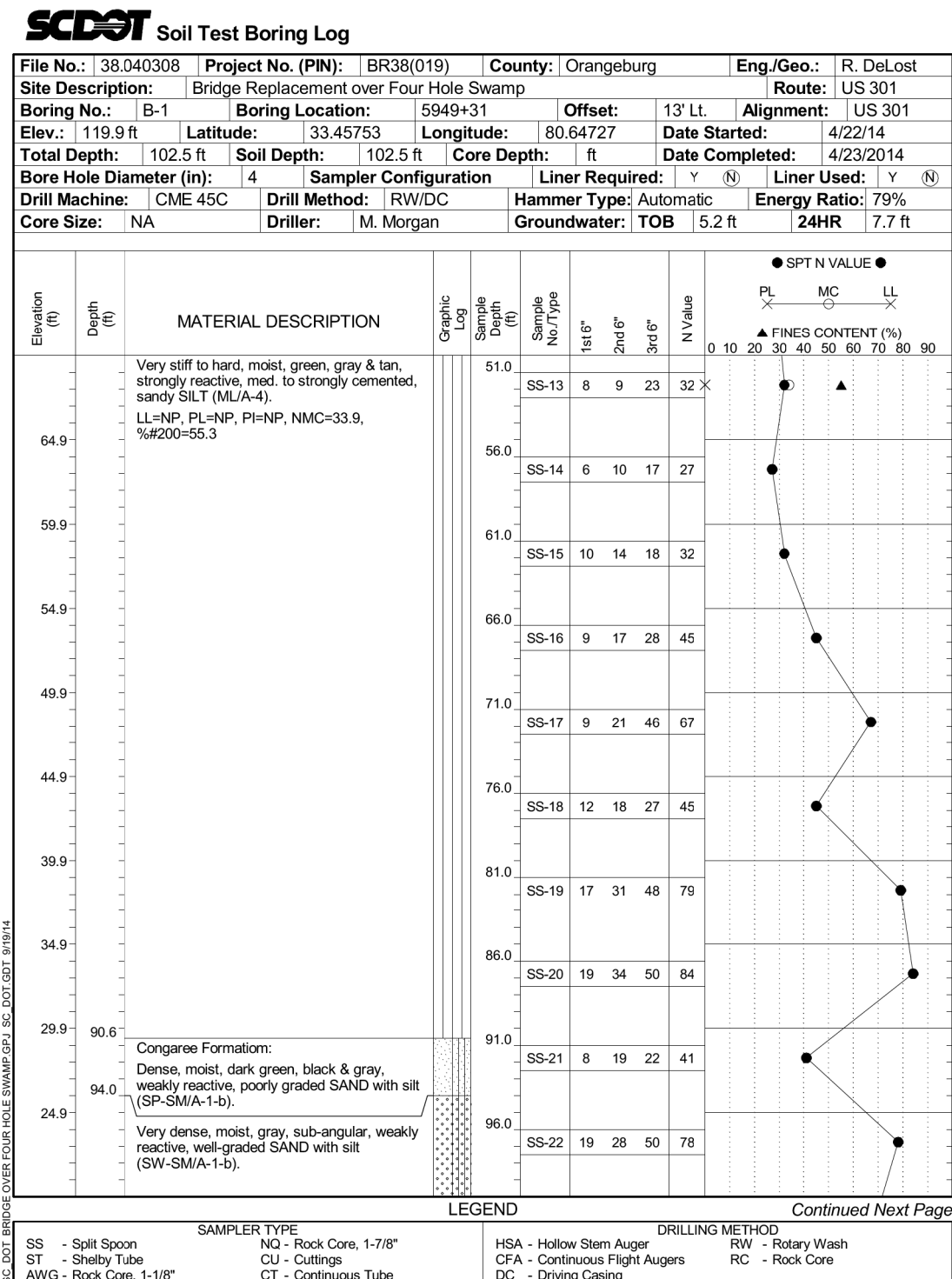
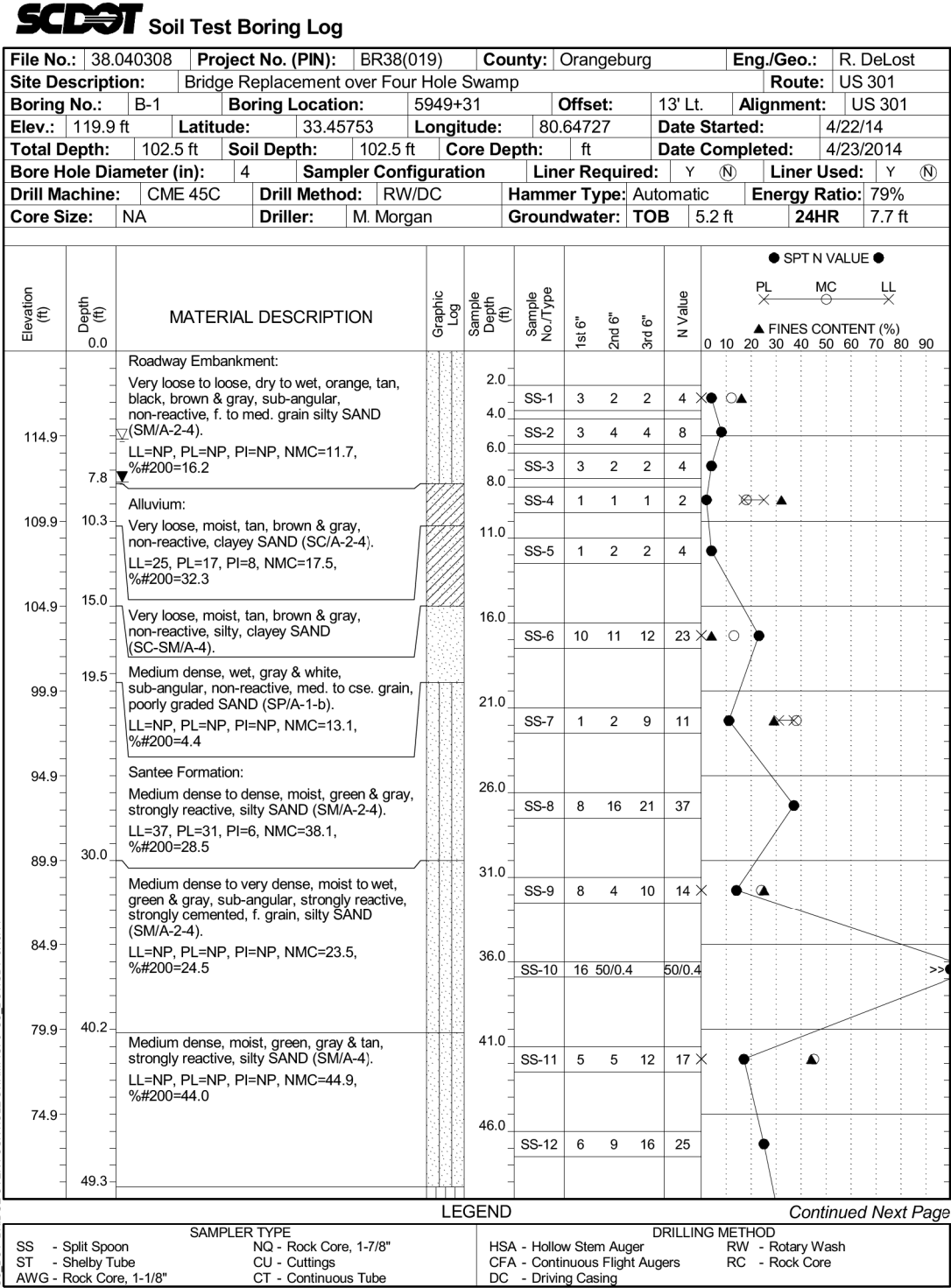




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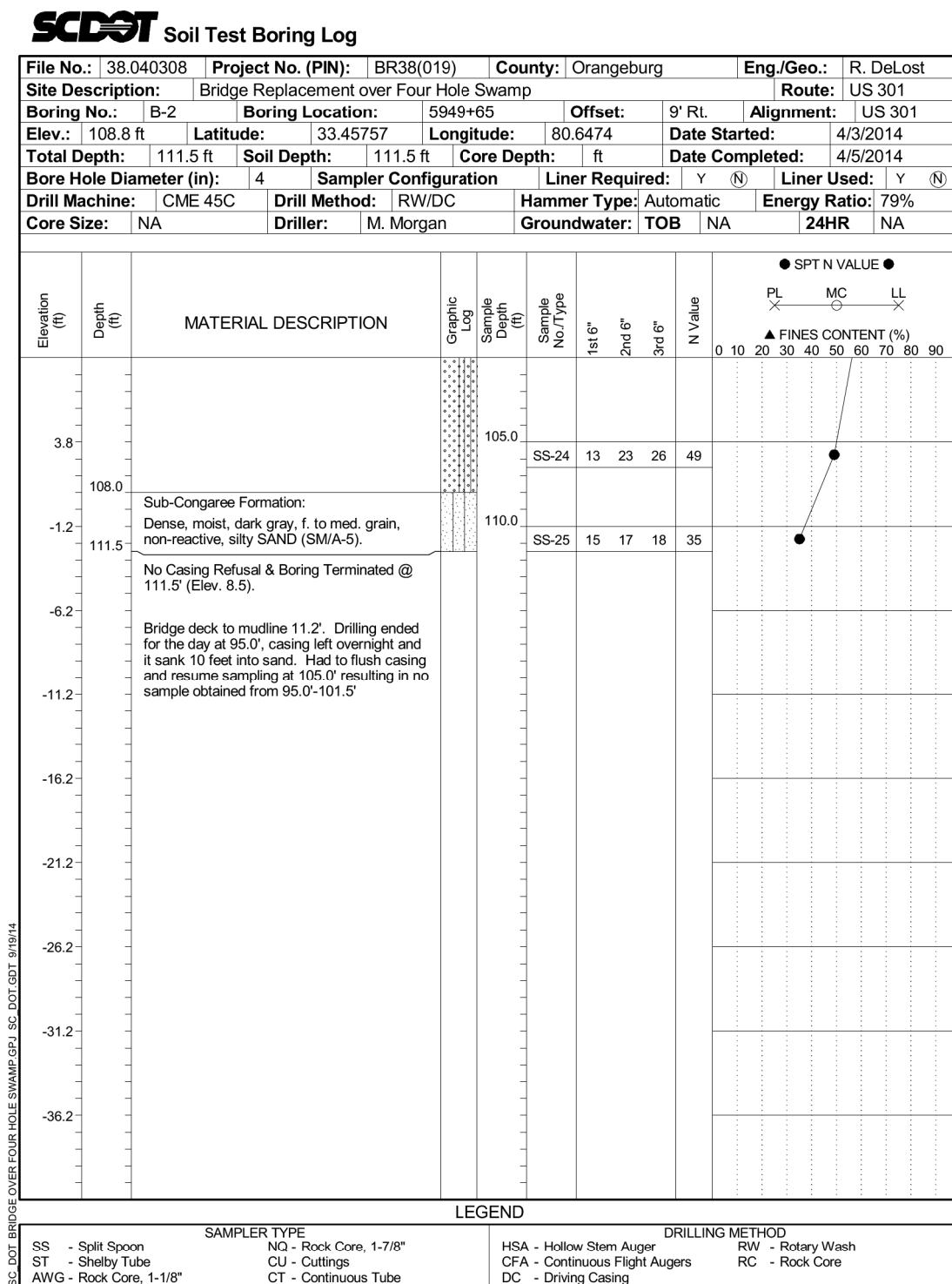
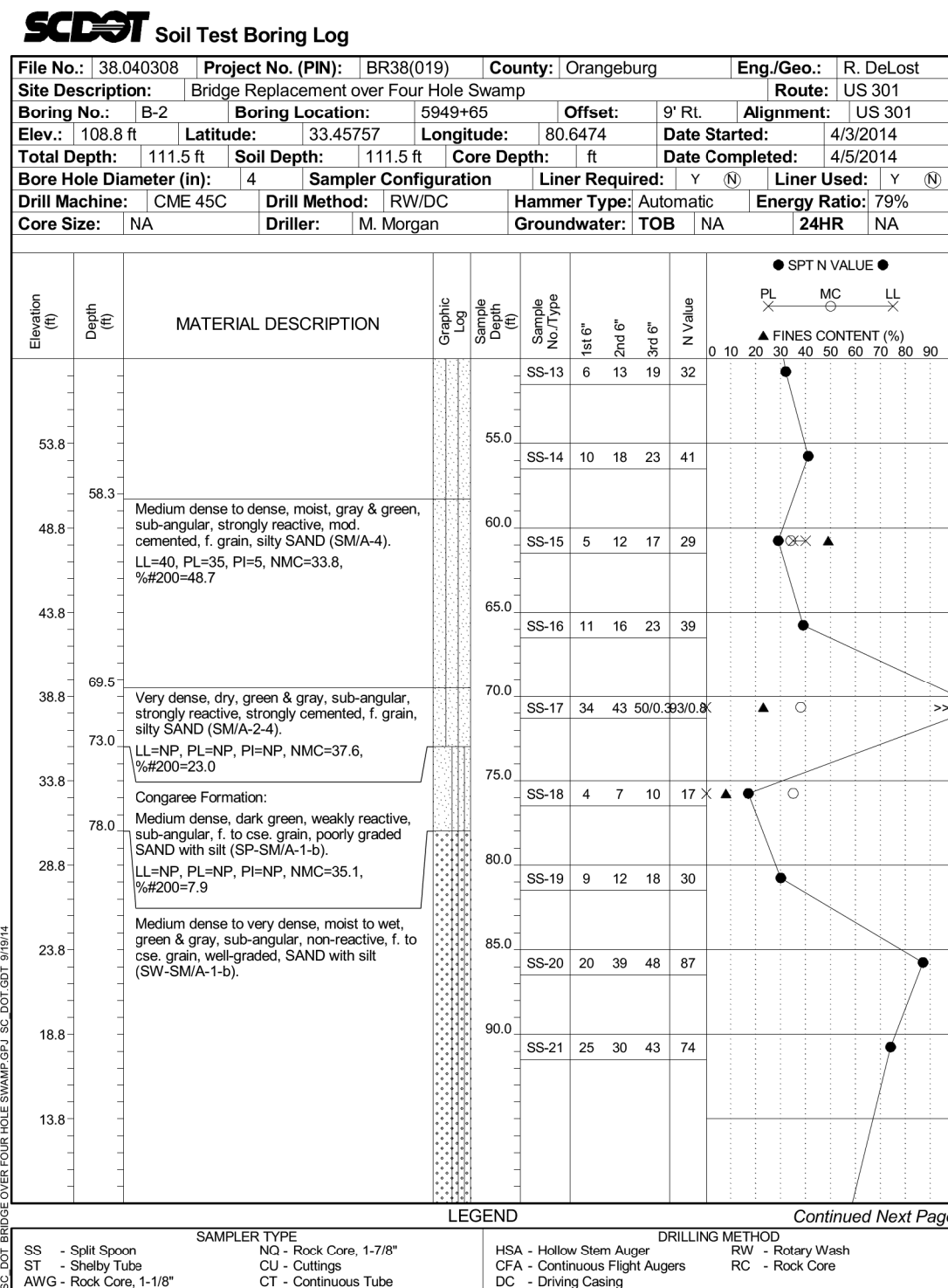
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DR.	GFD	BKB	09-16				
DES.							
	BY	CHK.	DATE	COUNTY ORANGEBURG			ROUTE US 301

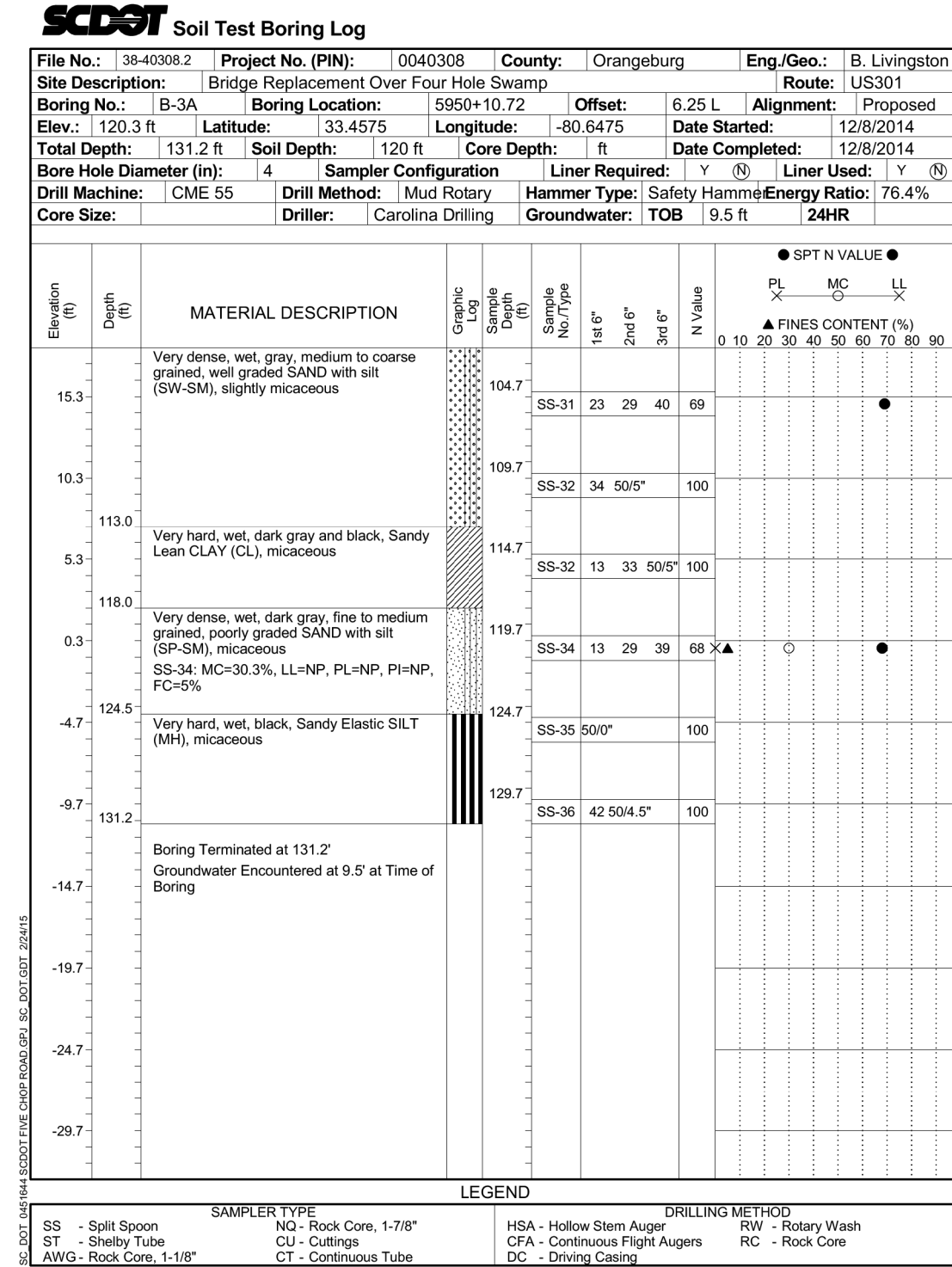
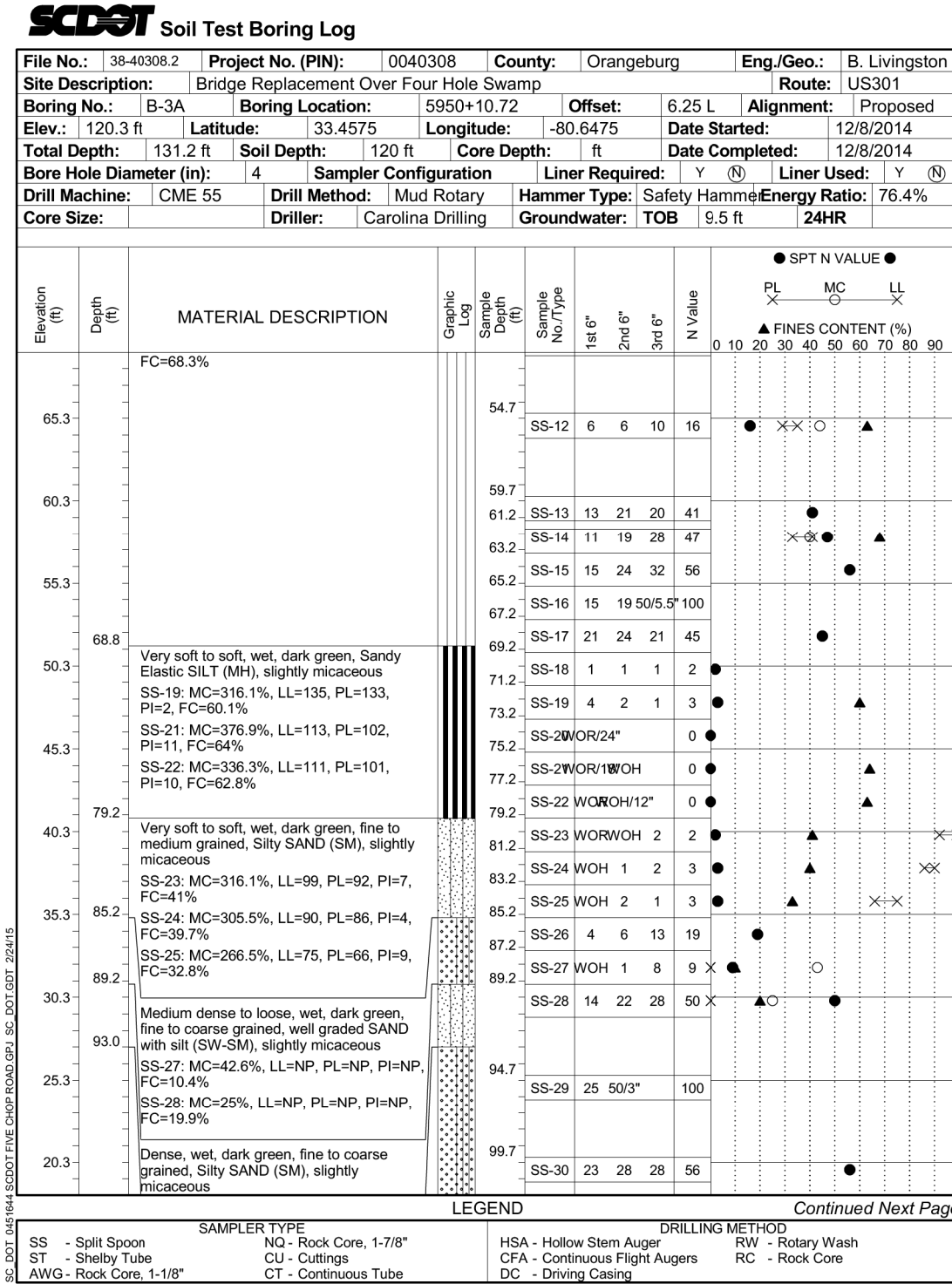
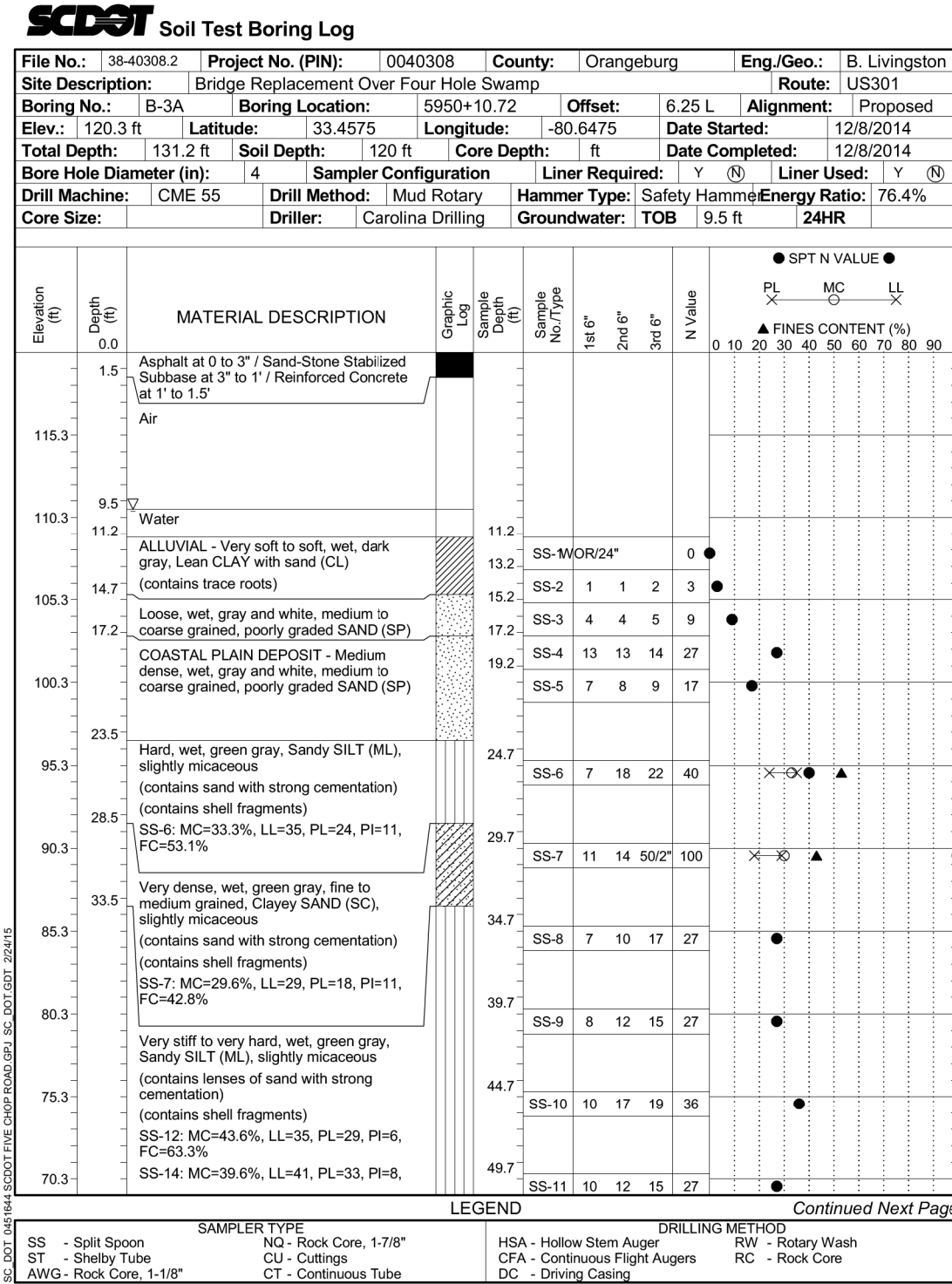


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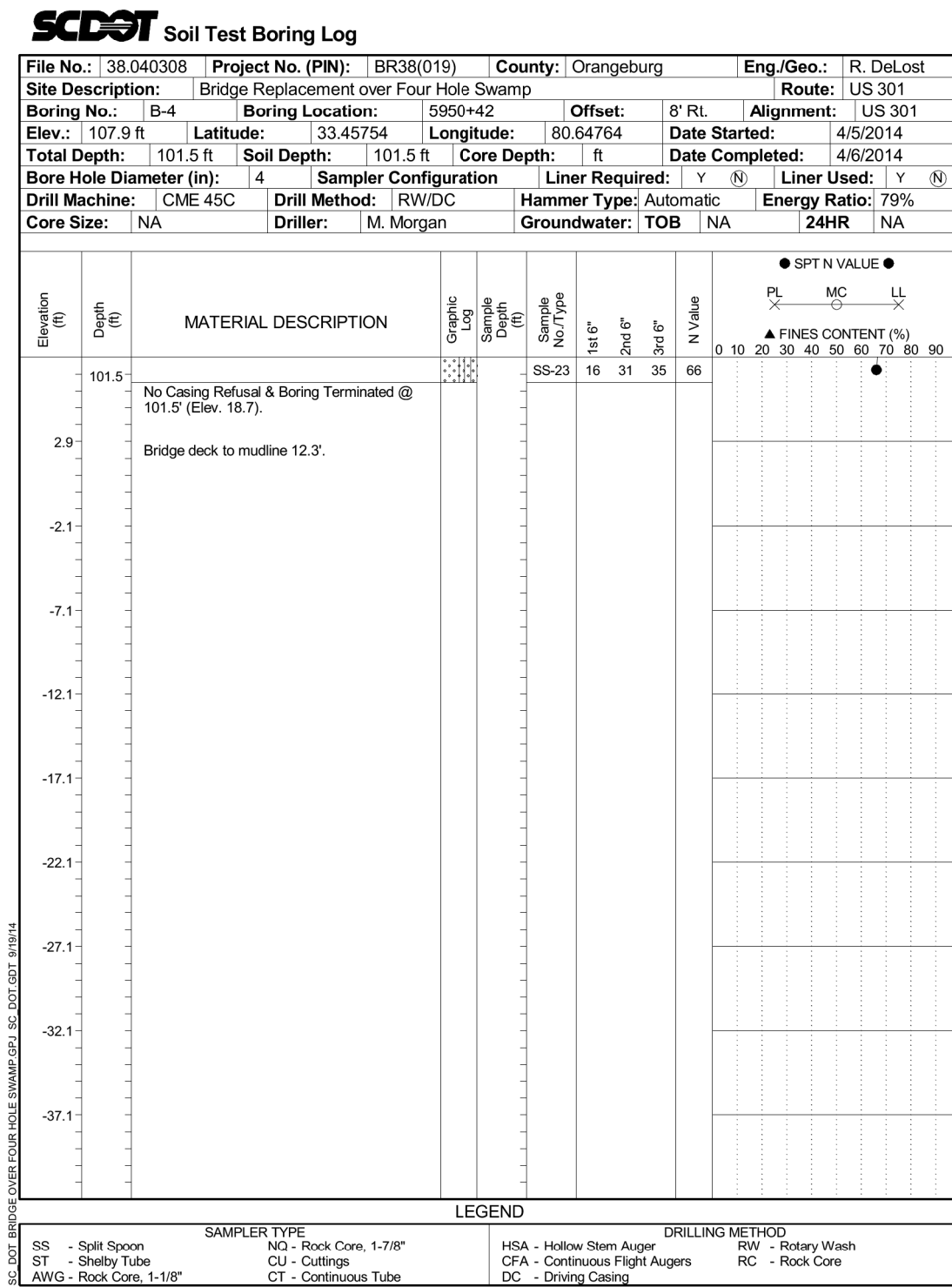
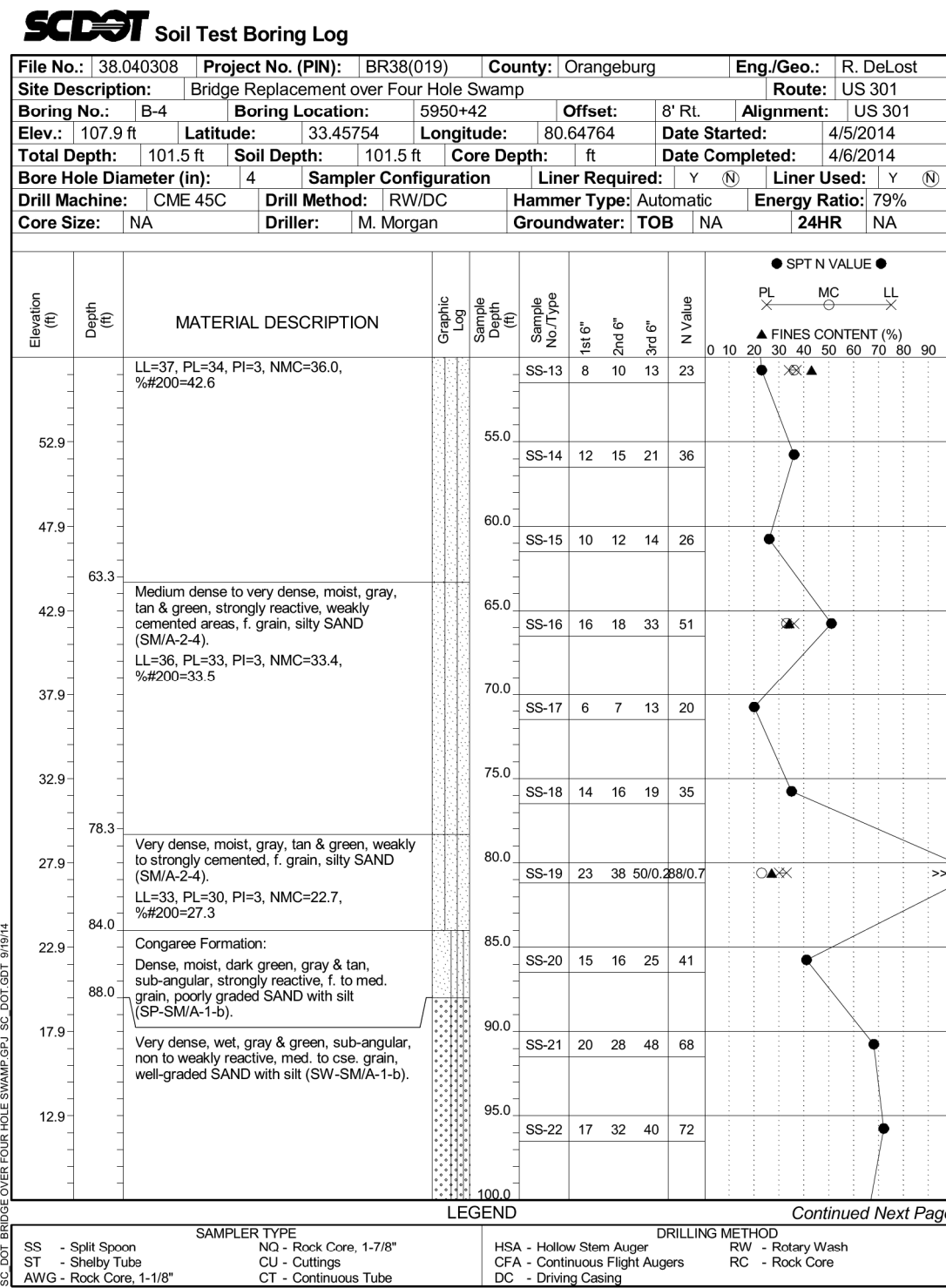
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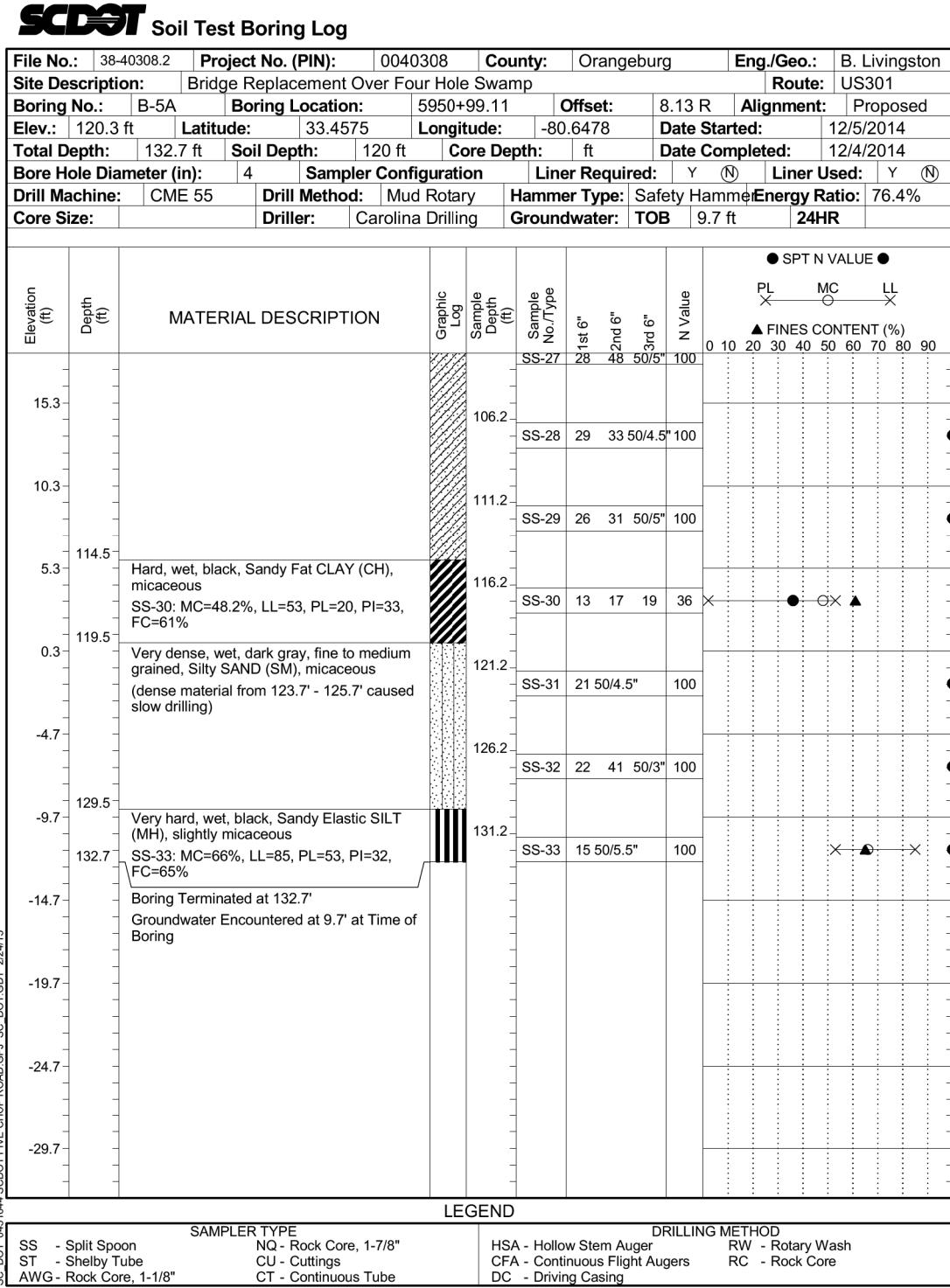
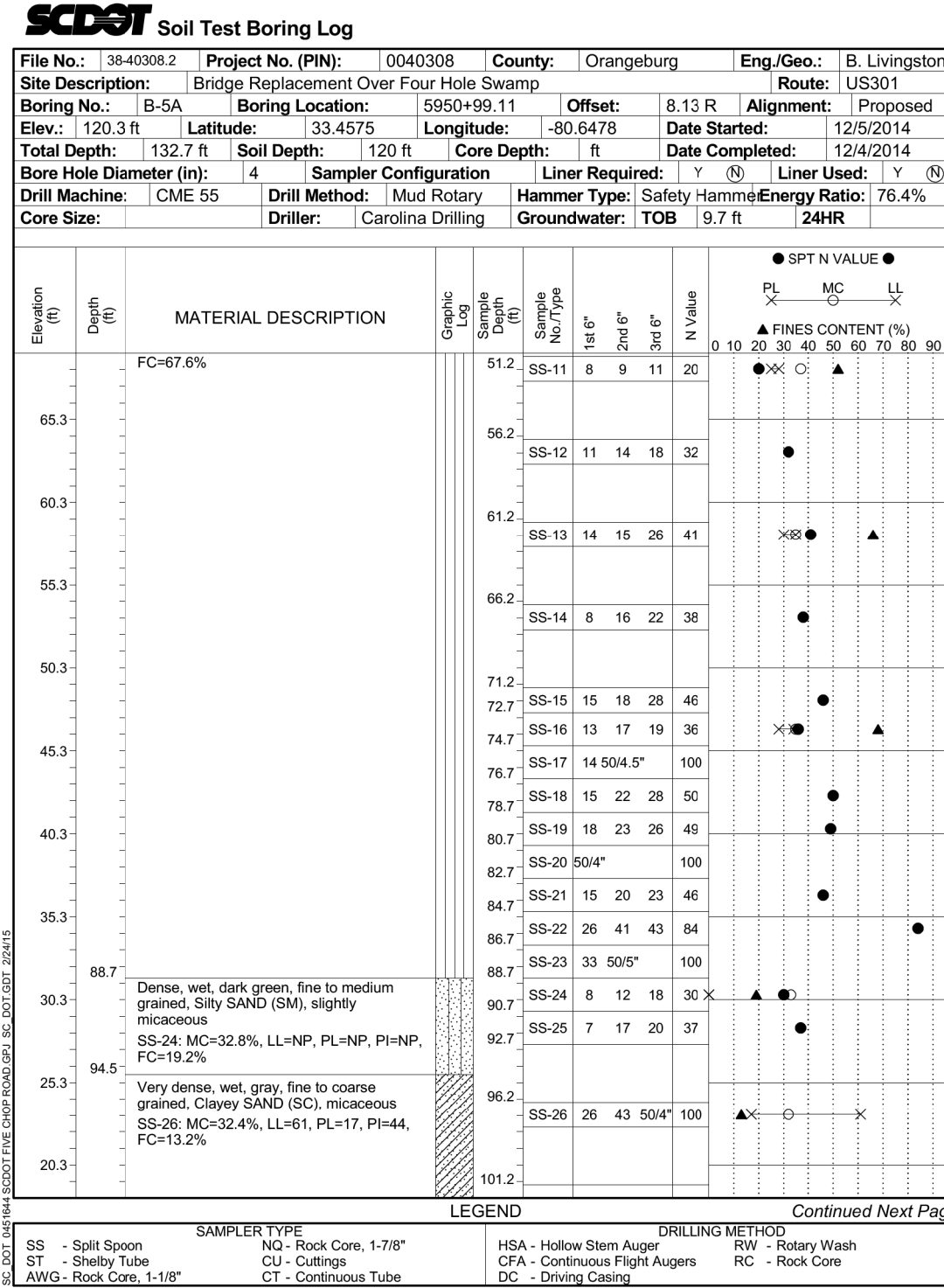
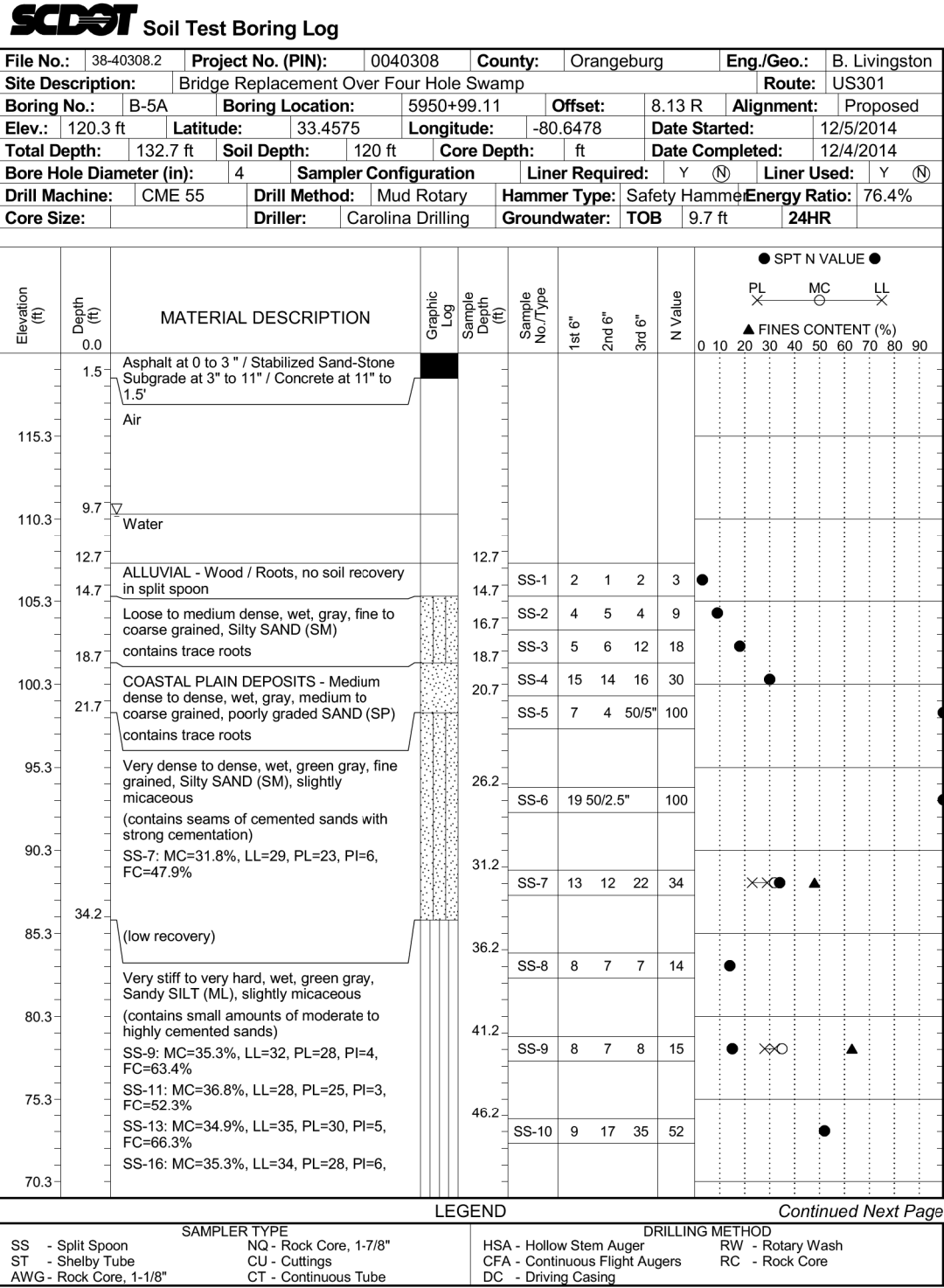
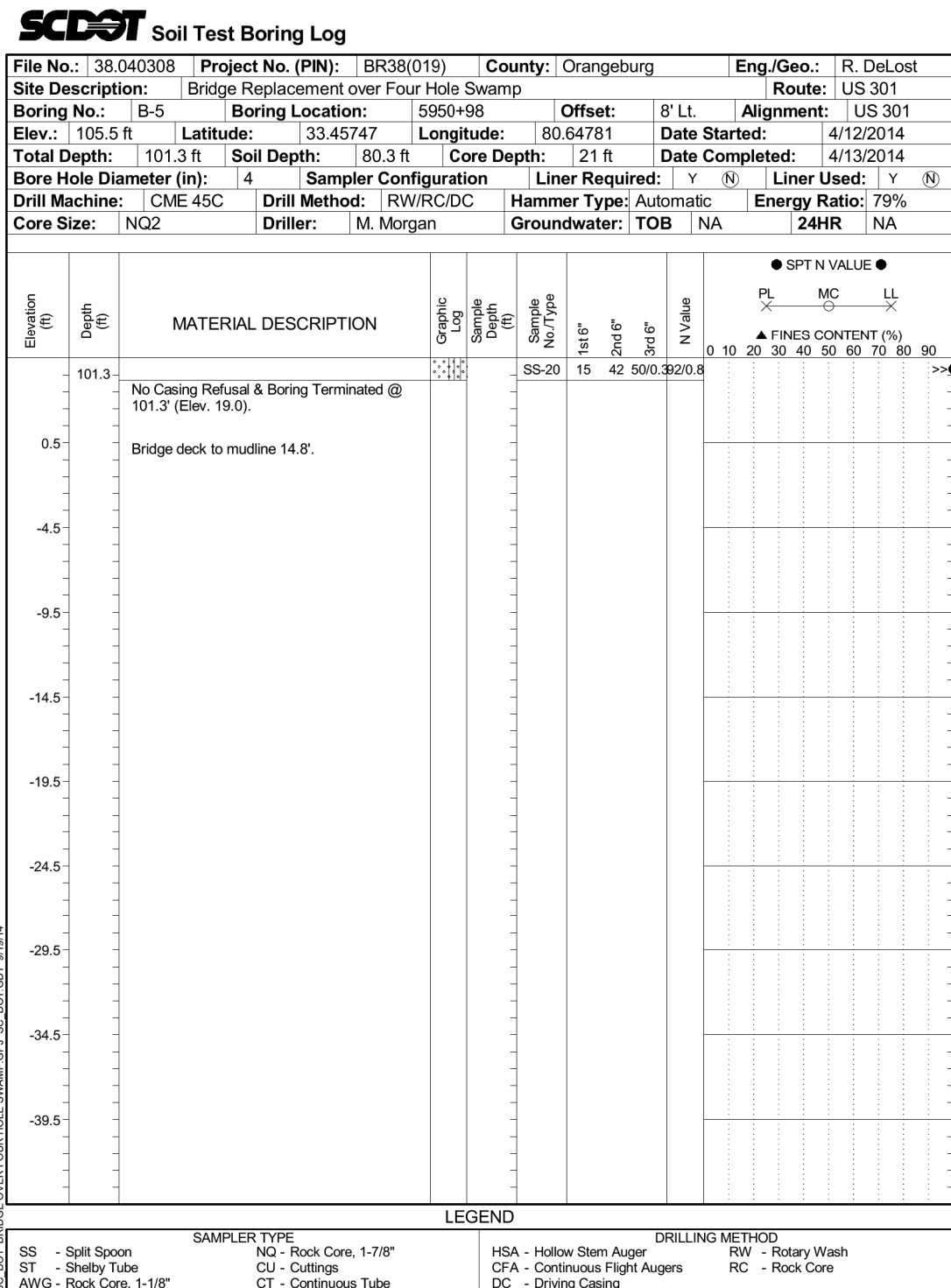
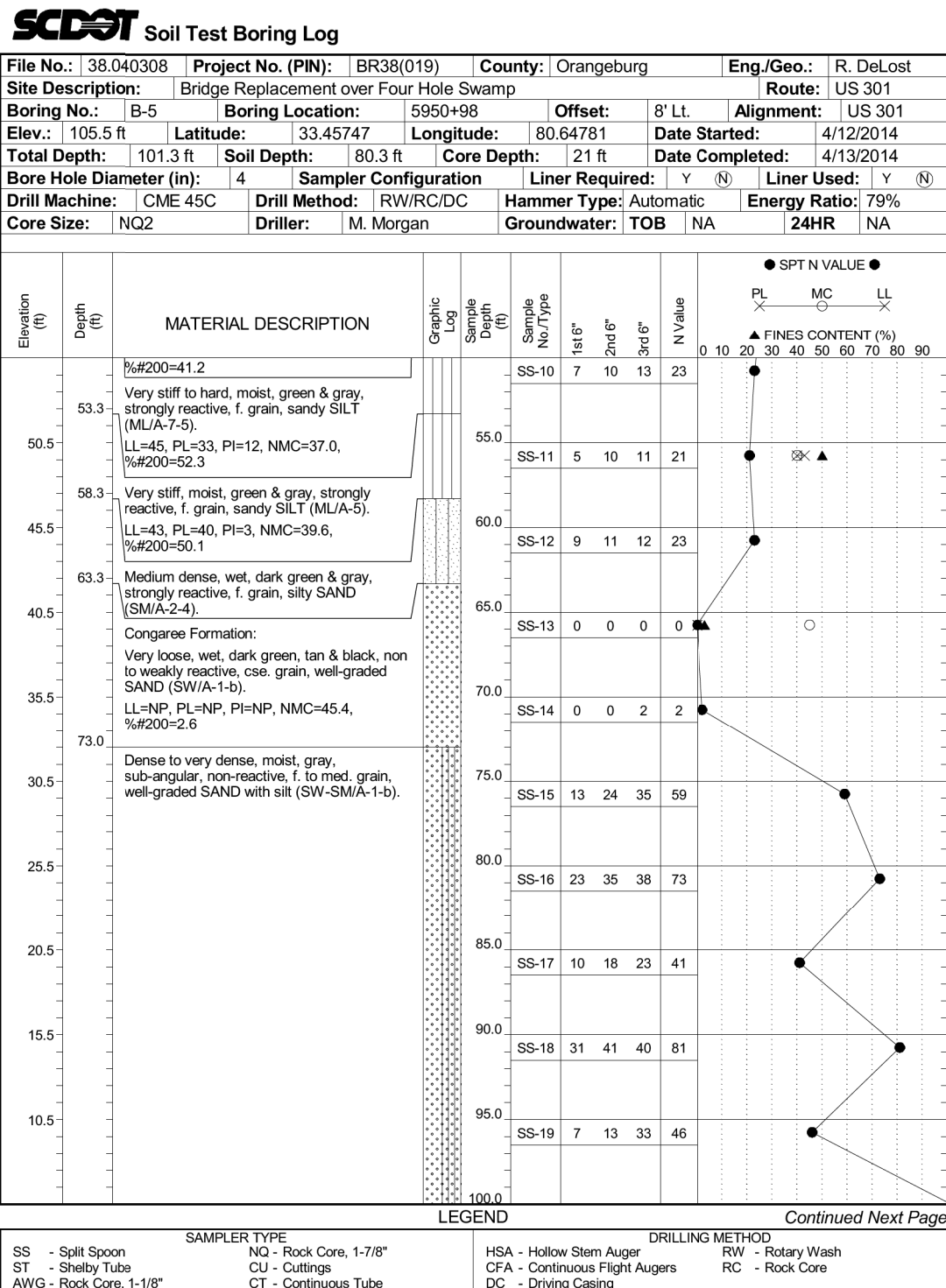
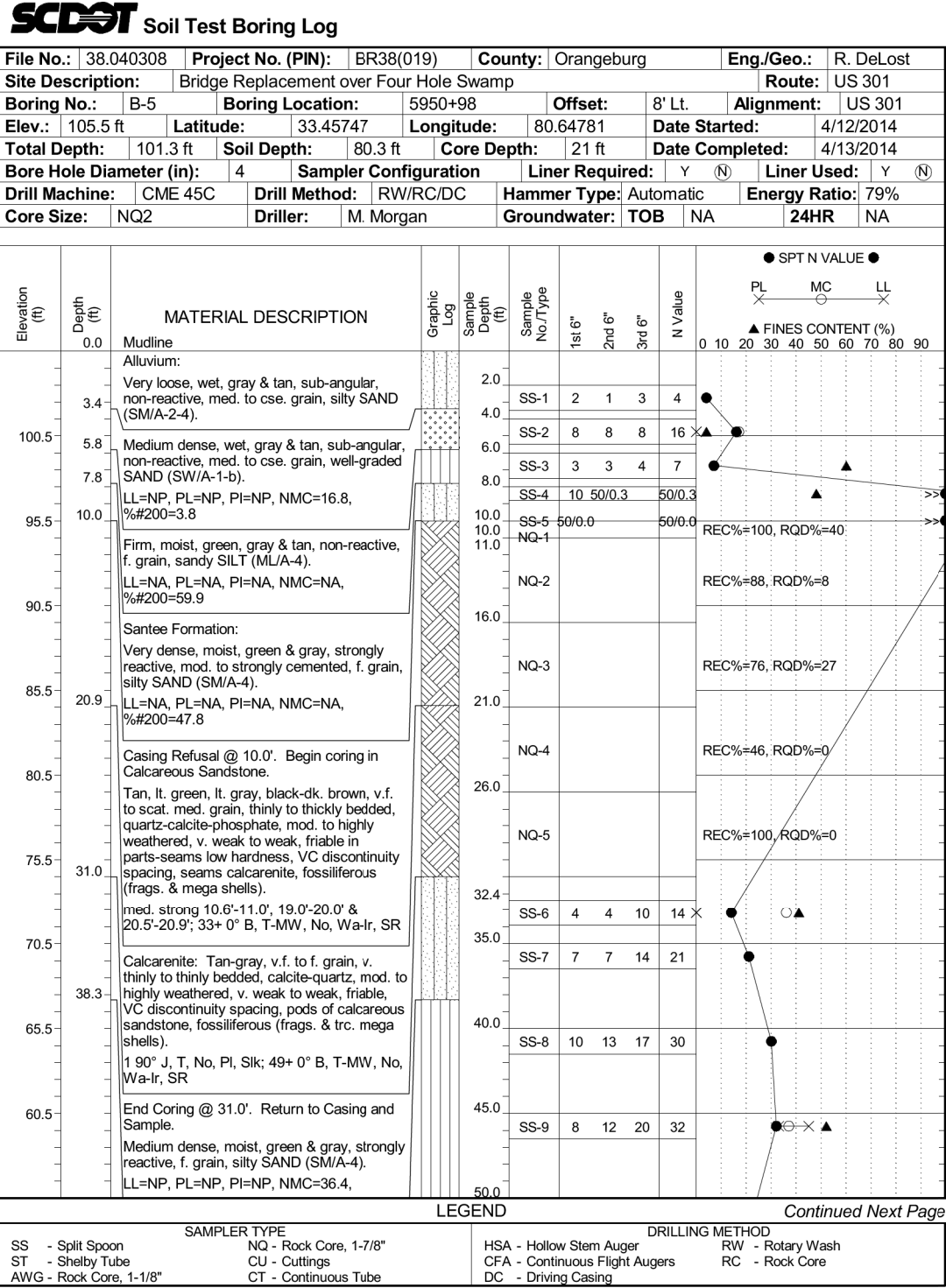
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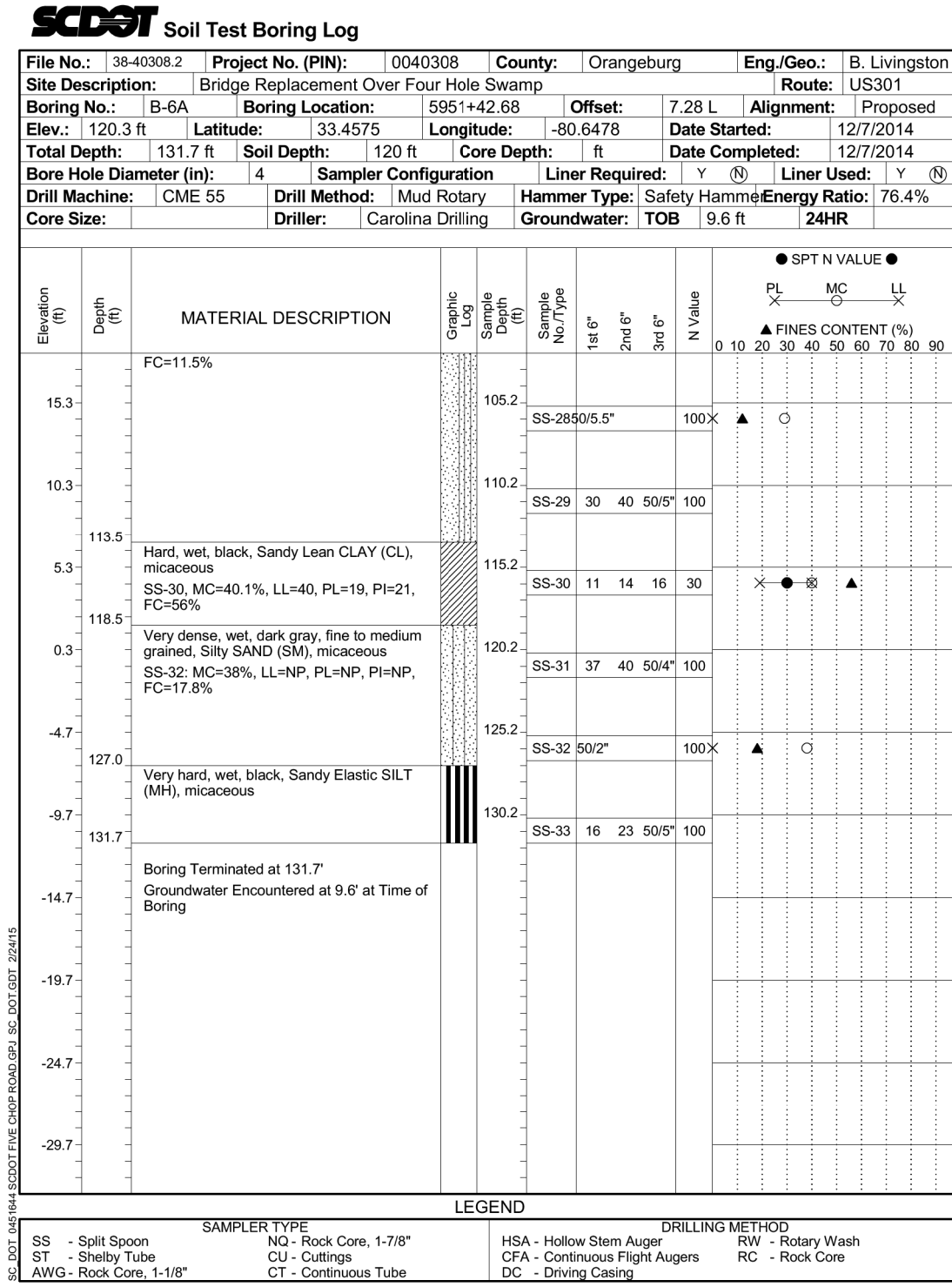
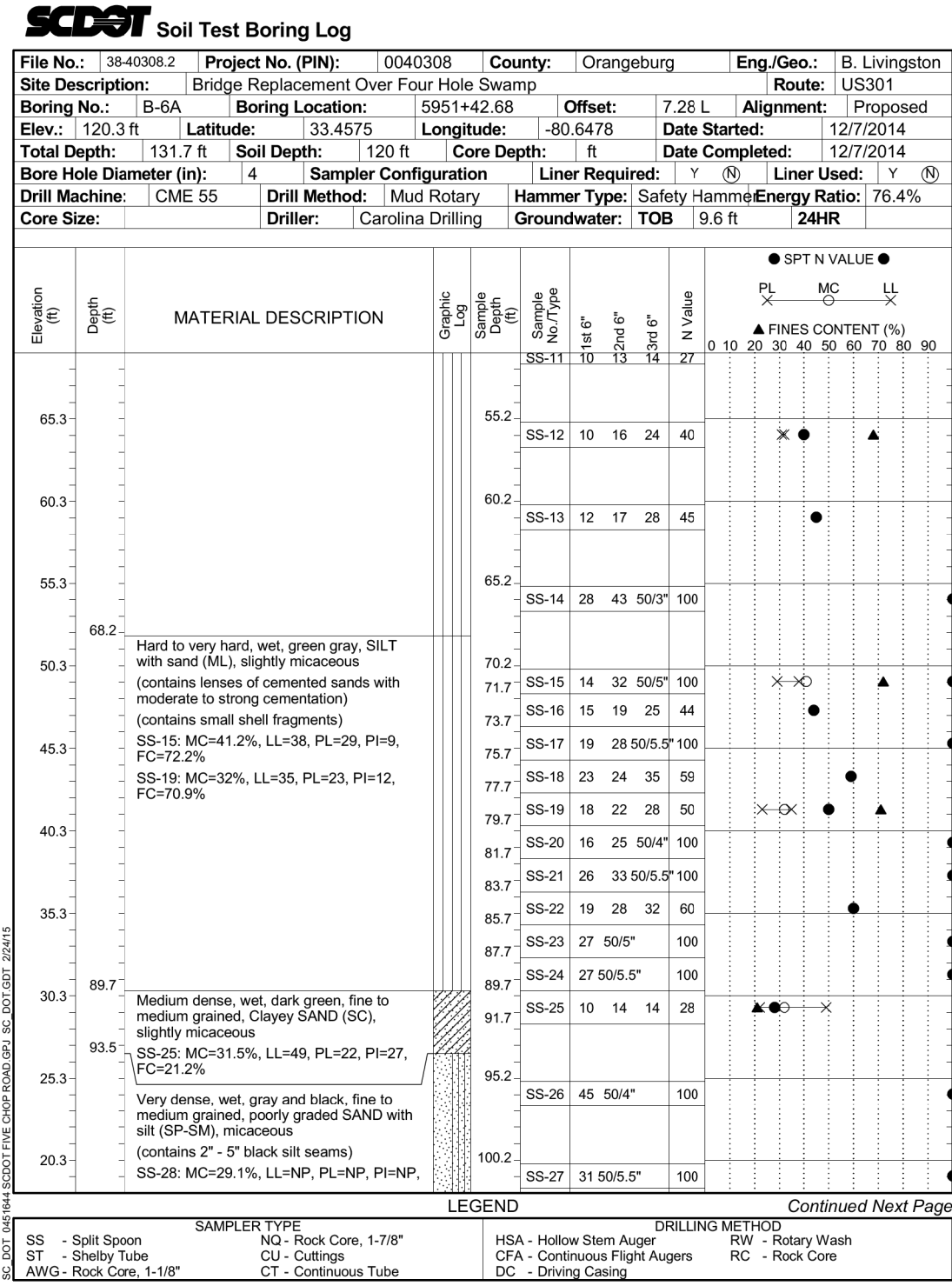
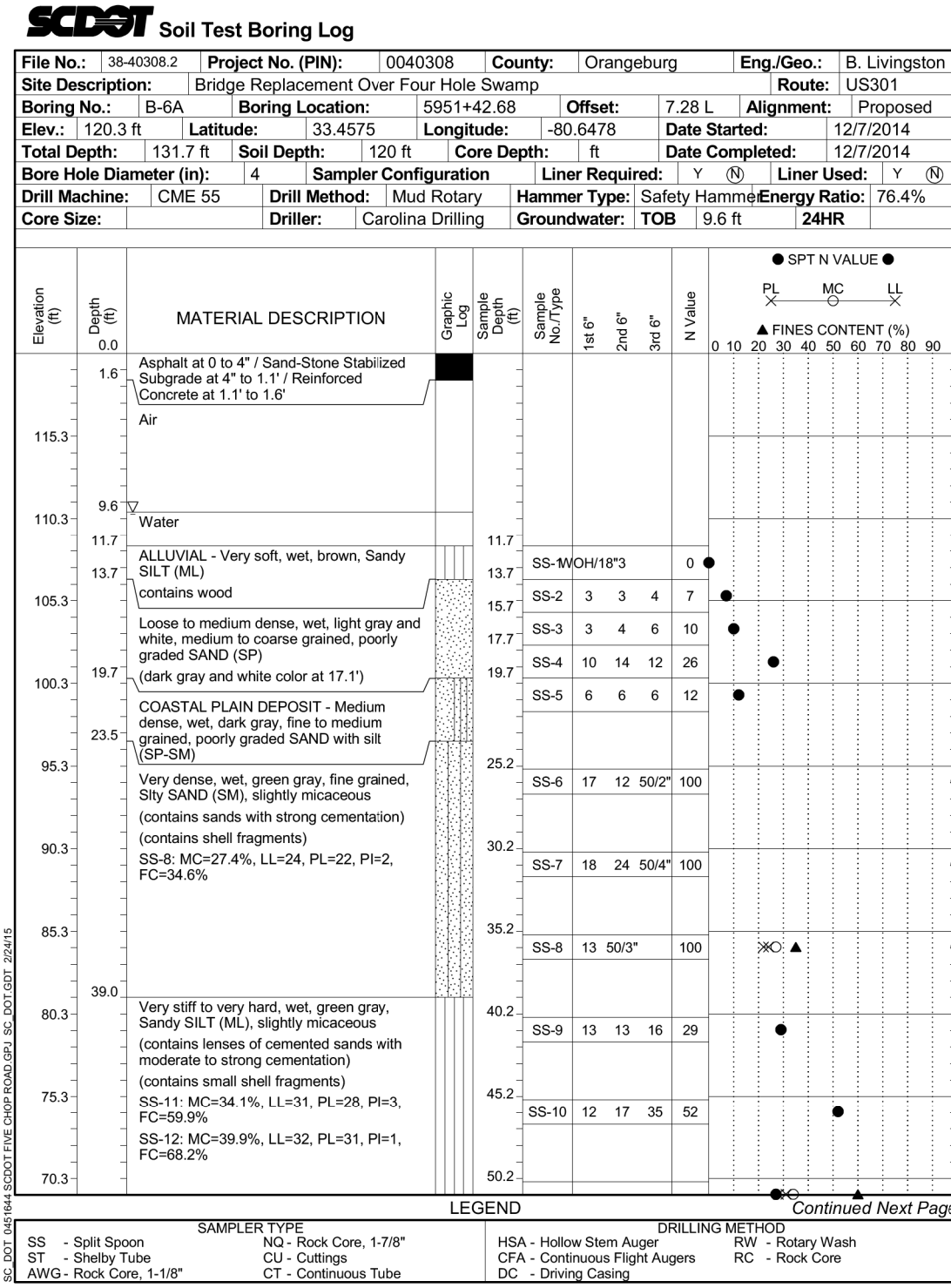


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DR.	GFD	BKB	09-16				
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REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
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QUAN.				BORING LOGS (5 OF 8)
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REVIEWED				BORING LOGS (6 OF 8)
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DR.	GFD	BKB	09-16	
DES.				
BY	CHK.	DATE	COUNTY	ROUTE
			ORANGEBURG	US 301

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Border Sheet 6/08

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 Route: US 301

Boring No.: 187 Boring 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 Liner Used: Y (S)

Drill Machine: CME 45C Drill Method: RW/RCDC Hammer Type: Automatic Energy Rate: 79%

Core Size: NG2 Driller: M. Morgan Groundwater: TOB NA 24HR NA

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Soil Sample No/Type	SPT N VALUE			Fines Content (%)
					1st F	2nd F	3rd F	
		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								

LEGEND

SAMPLER TYPE

- SS - Soft Spoon
- ST - Shelby Tube
- W/C - Wire Core 1-1/8"

ROCK CORE

- NG - Rock Core 1-7/8"
- CU - Cuttings
- CT - Continuous Tube

HSA - Hollow Stem Auger

CFA - Continuous Flight Augers

CC - Driving Casings

DRILLING METHOD

- RW - Rotary Wash
- RC - Rock Core

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:	5951-18.673	Offset:	8.39 R	Alignment:	Proposed					
Elev.: 120.3 ft	Latitude:	33.4575	Longitude:	-80.6481	Date Started:	12/6/2014					
Total Depth: 132 ft	Soil Depth:	120 R	Core Depth:		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:		Driller:	Carolina Drilling	Groundwater:	TOB	9.5 ft	24HR				

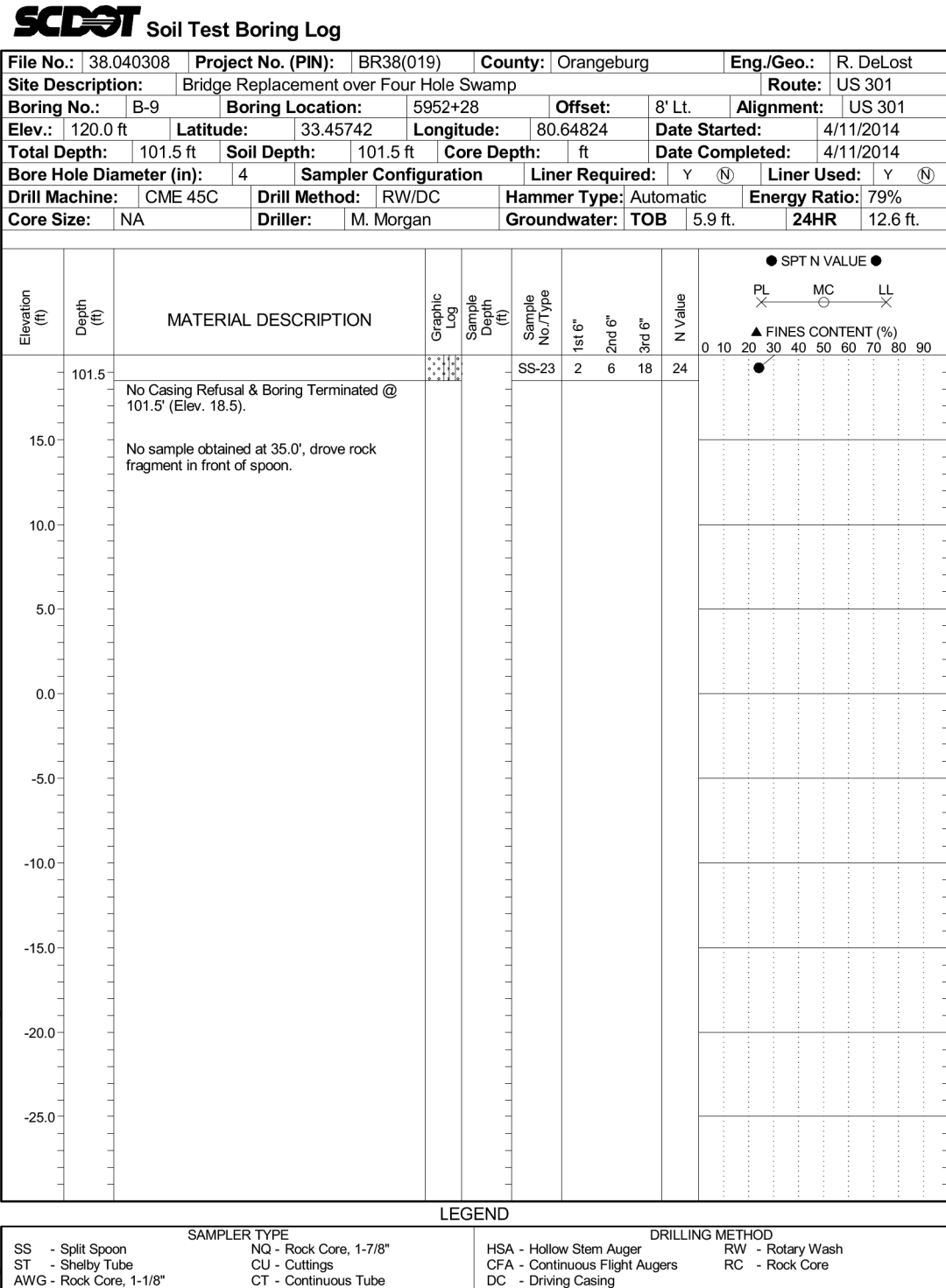
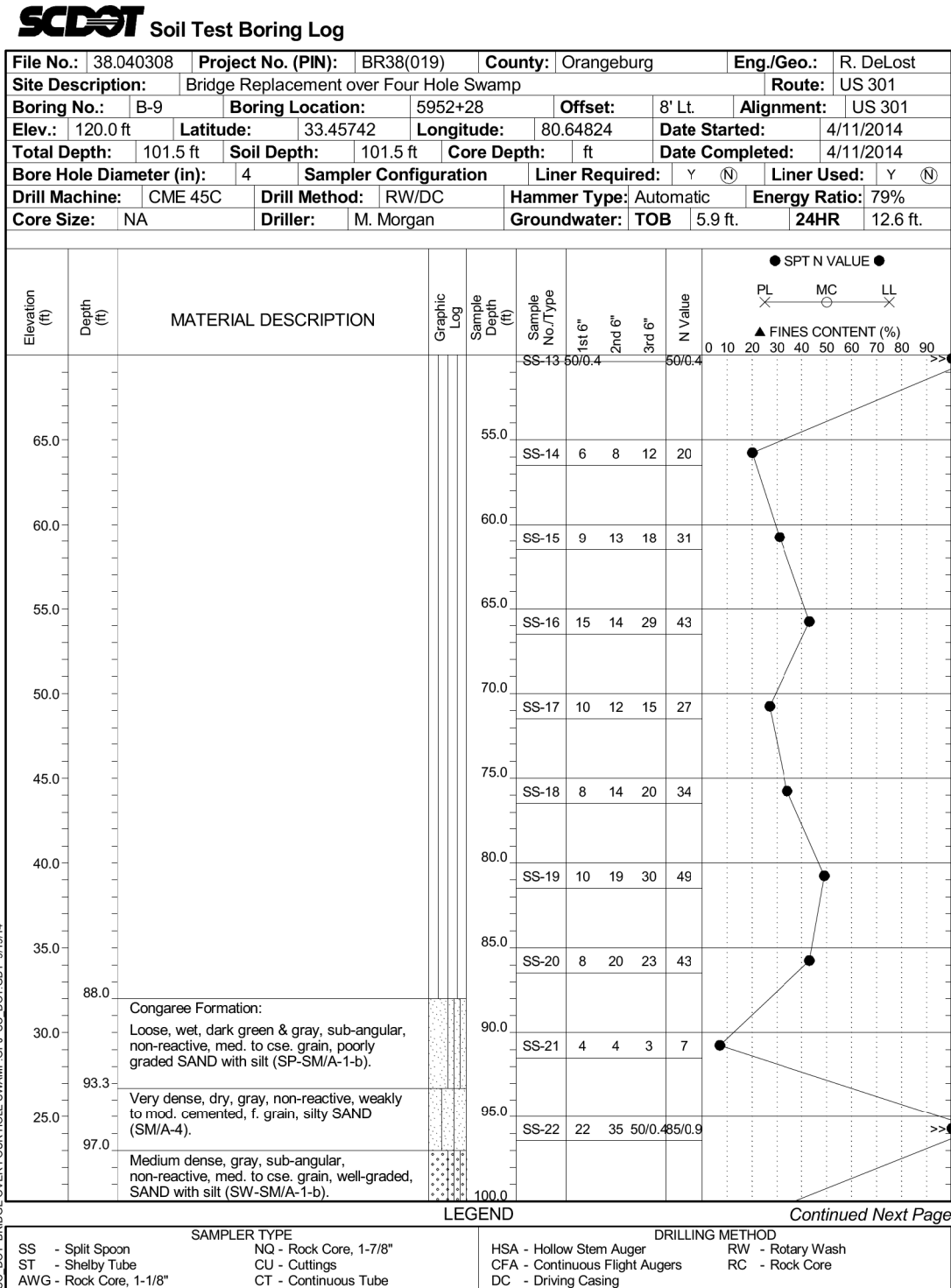
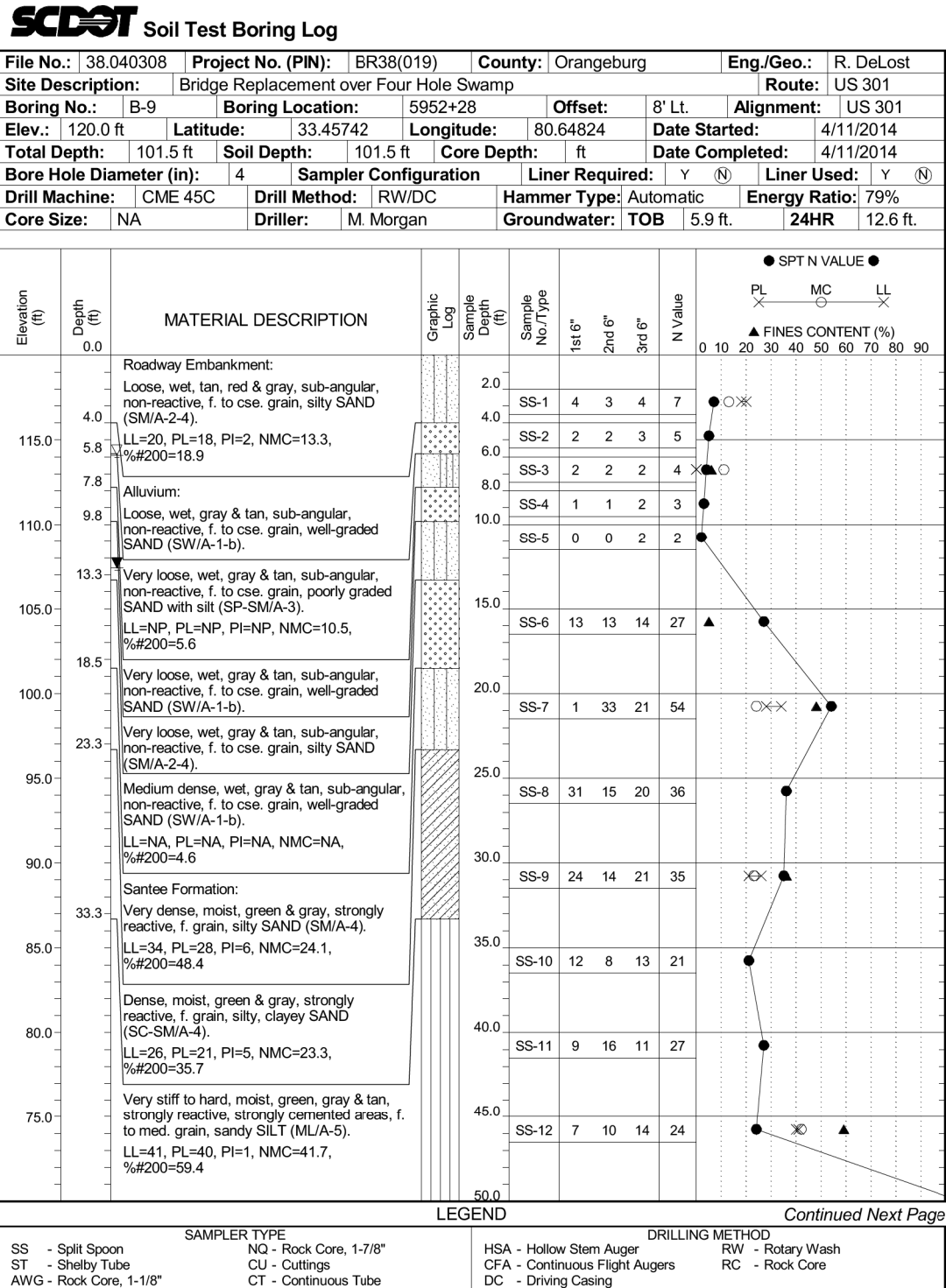
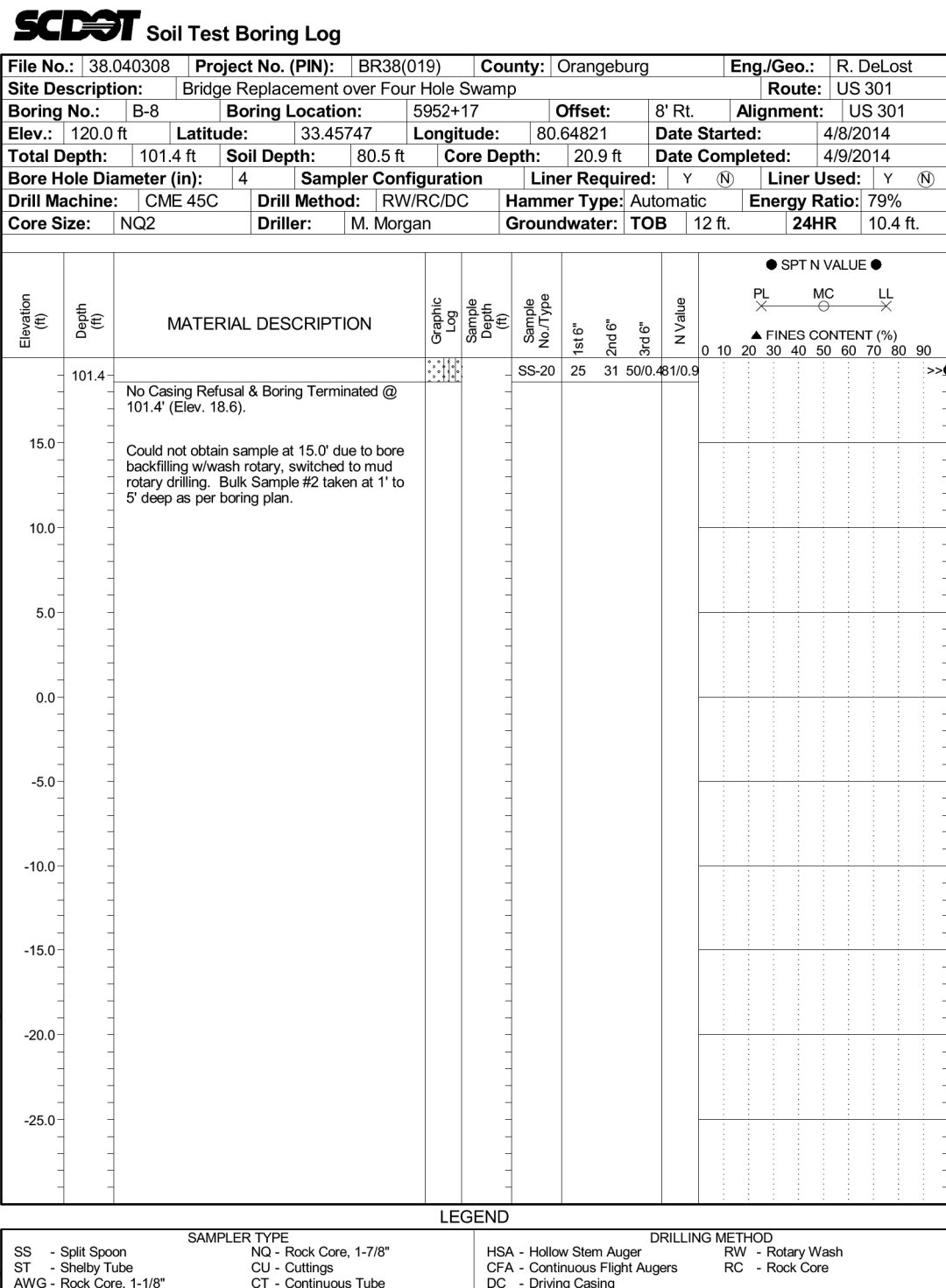
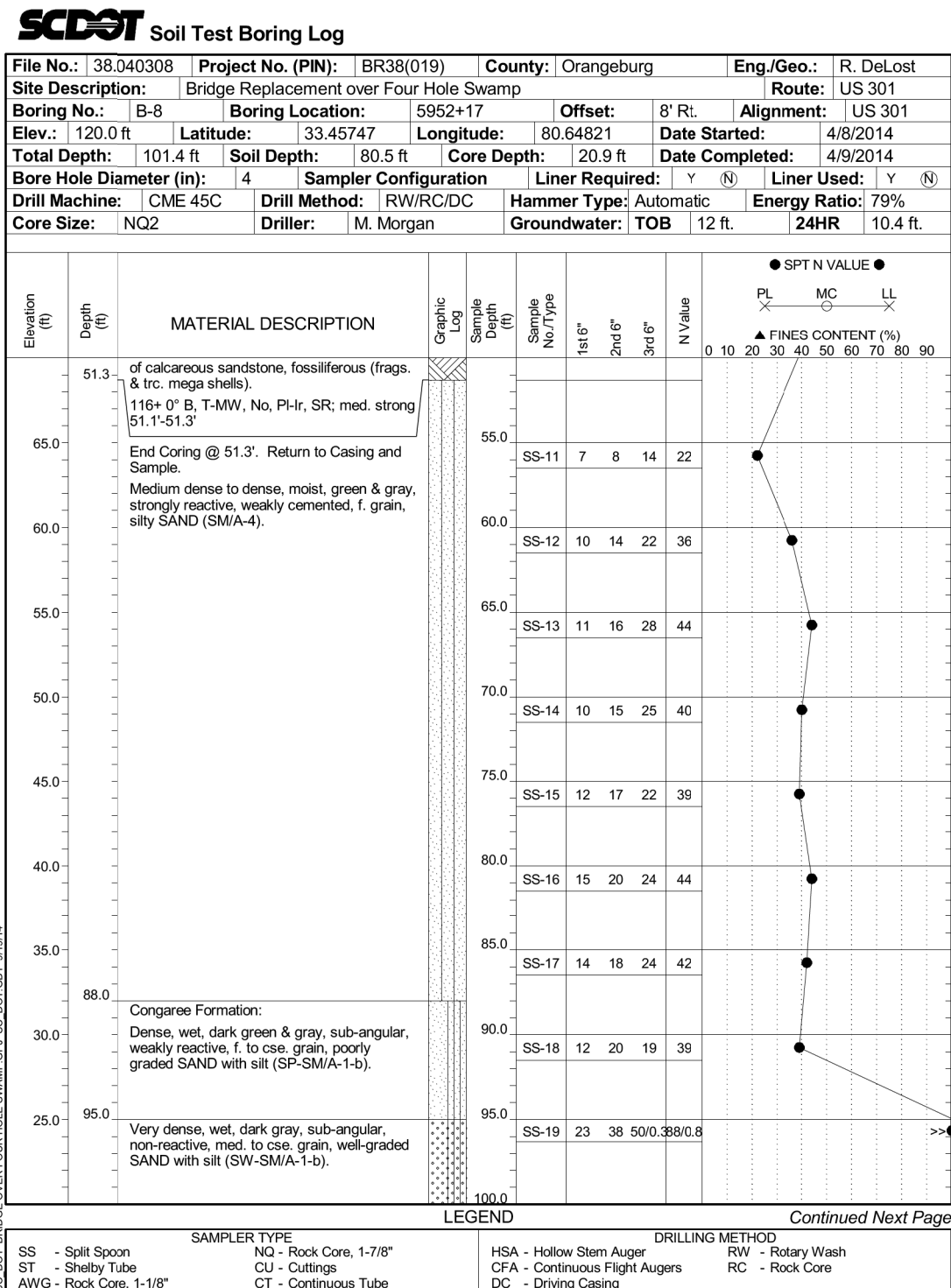
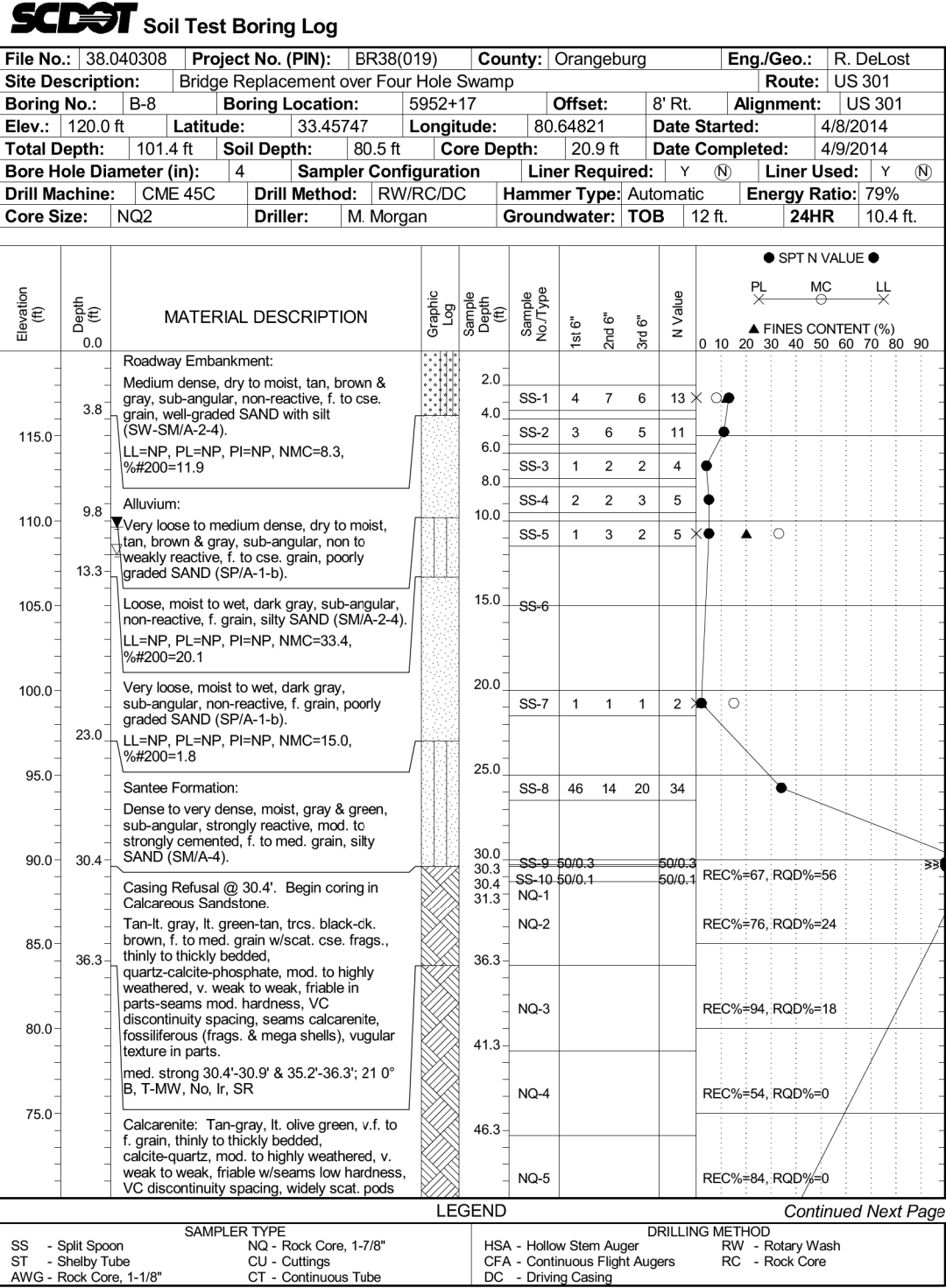
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION		Graphic Log	Soil Sample Depth (ft)	Soil Type	Grain Size		R Value	<div> <div>● SPT N Value ●</div> <div> <div>PL</div> <div>MC</div> <div>LL</div> </div> <div>▲ FINES CONTENT (%)</div> <div>10 20 30 40 50 60 70 80 90</div> </div>	
65.3						SS-11	4 1/4" F"	2 1/2" F"			
						SS-12	15	20	33	53	
58.5										●	
60.3						SS-13	12	30	504"	100	
										X-XX	●
55.5											●
						SS-14	13	21	41	61	
											●
											●
74.0						SS-15	16	21	50	71	
						SS-16	16	25	47	72	
45.3						SS-17	12	14	29	43	
						SS-18	17	13	505"	100	
						SS-19	13	38	504"	100	
36.3						SS-20	40	504"	100		
						SS-21	2	4	4	6	
82.0						SS-22	2	3	4	7	
						SS-23	2	3	4	7	
89.1						SS-24	13	38	504"	100	
30.3						SS-25	22	30	37	67 X	
										●	
						SS-26	19	46	503"	100	
											●
102.0						SS-27	40	505"	100		

LEGEND				Continued Next Page	
SAMPLER TYPE		DRILLING METHOD			
SS - Split Spoon	NC - Rock Core, 1-7/8"	CHA - Hollow Stem Auger	RW - Rotary Wash		
SS - Shelby Tube	CU - Castings	HFA - Hollow Stem Auger	RC - Rock Core		
AWG - Rock Core, 1-1/8"	CI - Continuous Tube	DS - Down the Hole			

Soil Test Boring Log											
File No.:	76-4058R.2		Project No. (PIN):	0040308		County:	Orangeburg		E. Livingston		
Site Description:	Bridge Replacement Over Four Hole Swamp										
Boring No.:	B-7A		Boring Location:	5951+87.63		Offset:	8.39 R		Alignment: US301 Proposed		
Elev.:	120.3 ft		Latitude:	33.45575		Longitude:	-80.6481		Date Started: 12/6/2014 Date Completed: 12/6/2014		
Total Depth:	132 ft		Soil Depth:	120 ft		Core Depth:	ft		Liner Used: 1 y (N)		
Dore Hole Diameter (in):	4		Sampler Configuration			Hammer Type:	Safety Hammer		Energy Ratio: 76.4%		
Drill Machine:	CME 55		Drill Method:	Mud Rotary		Groundwater:	TOD		24HR		
Driller:	Carolina Drilling										
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Organic (%)	Sample No.	No. Tests	SPT N VALUE				FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90	
						PL	MC	LL	N Value		
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*	▲ ○
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*	50*			
-14.7		Boring Terminated at 132' Groundwater Encountered at 9.5' at Time of Abandonment									
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 - Down Casting RW - Rotary Wash RC - Rock Core											

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

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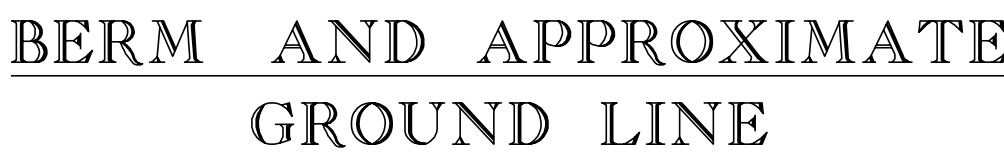


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DES.						
BY	CHK.	DATE				
COUNTY				ORANGEBURG	ROUTE	US 301

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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.



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'-6½"	—	—	9'-9"
J1602	—	18	8"	4'-3½"	—	—	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.

UND - 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 $\frac{7}{8}$ " at ∇ End Bent 1, and 2'-2 $\frac{7}{8}$ " at ∇ 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".

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



- 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

GOVERNING CONDITIONS	
Loading Type	Loading Direction
Static	Axial (Compression)

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

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 82 feet-msl. The required minimum tip elevation to achieve critical depth (lateral stability) for the HP 14x73 steel H-pile is 97 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 restrrike of one of the production piles may be required. The restrrike shall be performed on the production pile exhibiting the lowest blows per foot. PDA testing shall also be performed on the restrrike. The time between initial driving and restrrike 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 restrrike, 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.



- ϕ Dowels



SECTION THRU CAP

END CAP
ELEVATION

(Showing J1301 bars)



SECTION B-B

SECTION C-C

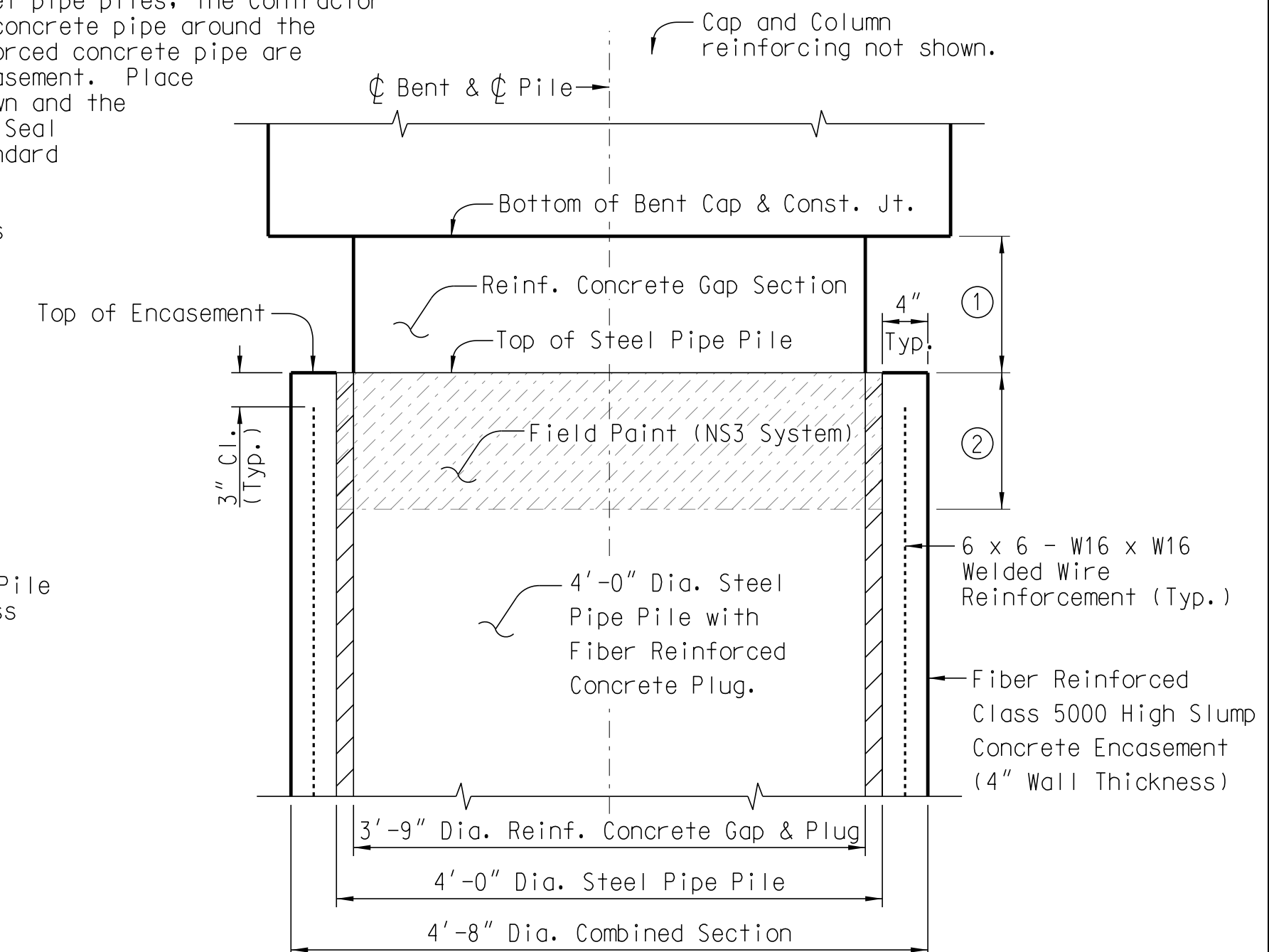
SECTION D-D

(See Sh. 20)

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 fiber reinforced Class 5000 high slump concrete. No additional compensation for 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.

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

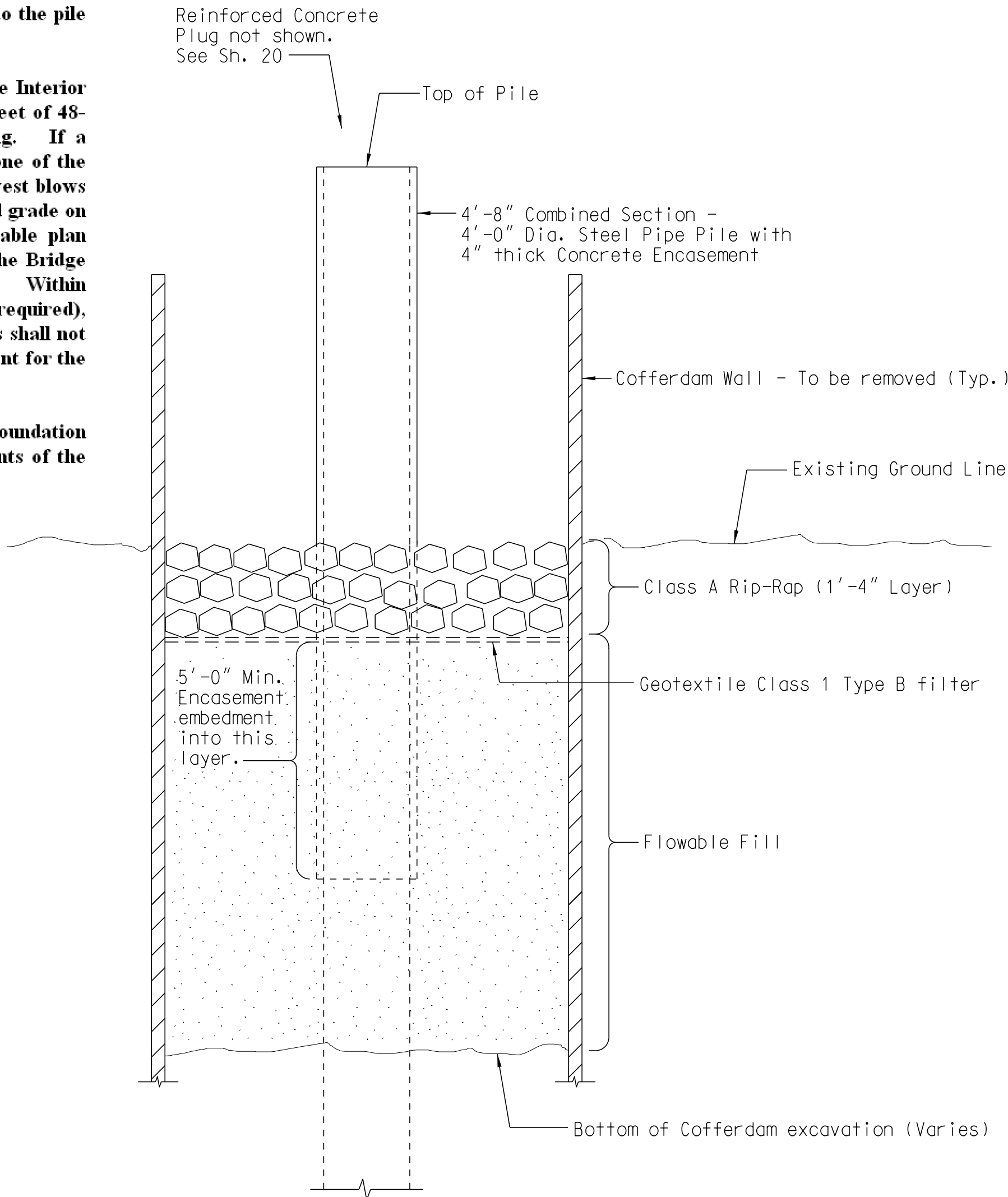
Depth (ft)	IB7 (B-7A)					
	c (psf)	φ	γ sat (pcf)	K _a	K _p	K _φ
0-3	-	24	110	0.593	0.422	2.371
3-7	-	29	120	0.515	0.347	2.882
7-21	-	36	115	0.412	0.260	3.852
21-47	-	30	110	0.500	0.333	3.000
47-61	-	34	110	0.441	0.283	3.537
61-69	2320	15	110	0.741	0.589	1.698
69-76	-	30	115	0.500	0.333	3.000
76	-	36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

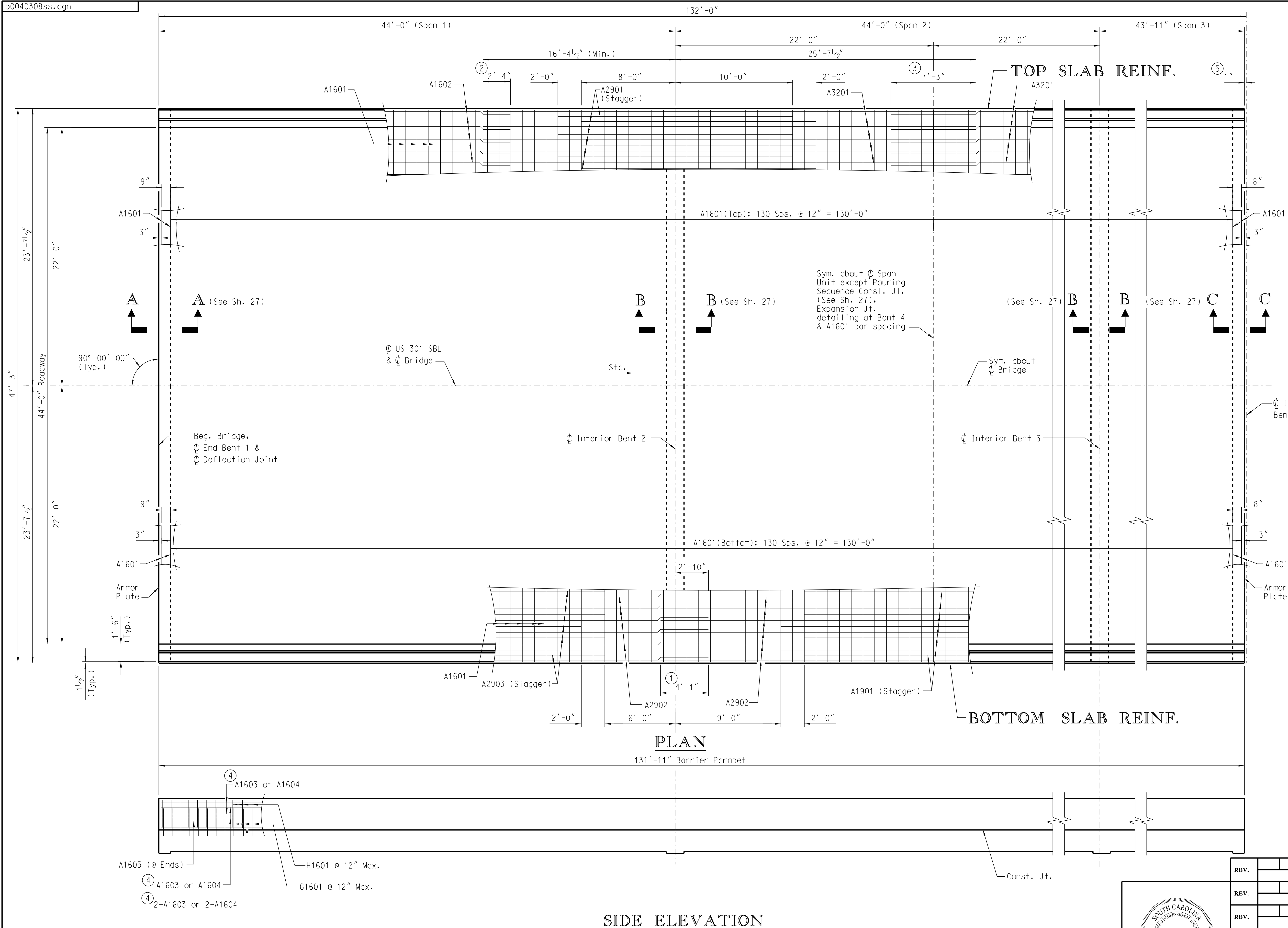
(Bents 2 thru 7)

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.							
BY	CHK.	DATE	COUNTY		ROUTE		
			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 ³ / ₈ "	2'-9 ⁷ / ₈ "	_____	_____	7'-3"
H1601	266	2'-3 ³ / ₈ "	2'-3 ¹ / ₂ "	7 ³ / ₈ "	_____	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 ¹ / ₂ " Ht.		(6) As Necessary for Spans 1 & 3			
CHCU	1'-2 ³ / ₄ " 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.

) Splice A2902 to A2902 bars 4'-1" Min.

) Splice A1602 to A3201 bars 2'-4" Min.

) Splice A3201 to A3201 bars 7'-3" Min.

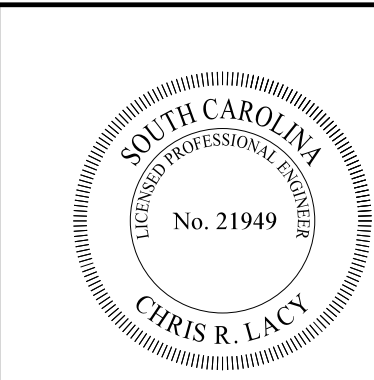
) Splice A1603 to A1604 bars 3'-0" Min. &
Splice A1604 to A1604 bars 3'-0" Min.

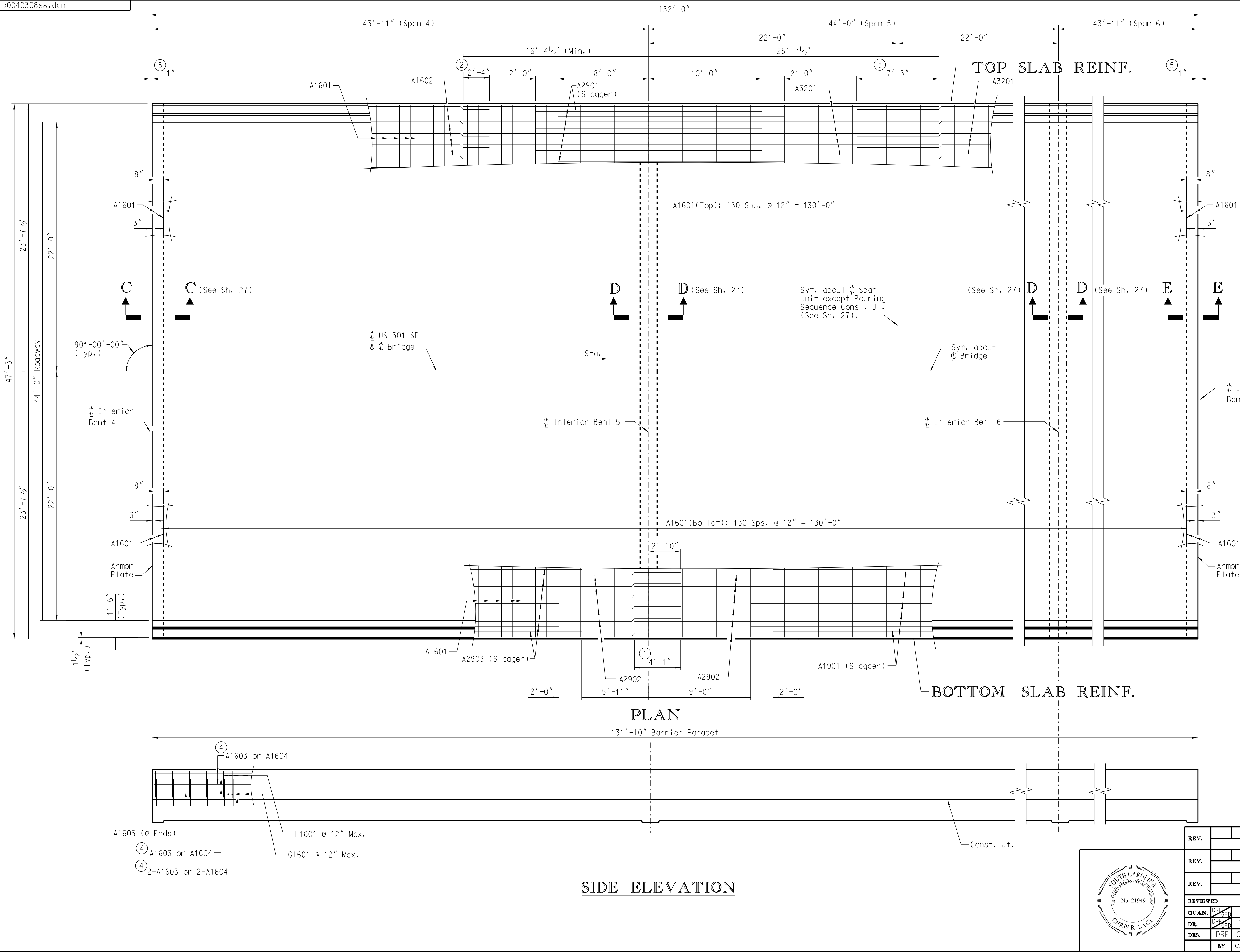
Expansion Joint not shown. 1" dimension corresponds to half of the Nominal Expansion Joint Width "W" of 2" at 70°F. See Compression Seal Expansion Joint Details, Sh. 30.

Use where the longitudinal A1602 bars are present in the top mat of reinforcement.

Use where the longitudinal A3201 bars are present in the top mat of reinforcement.

REV.				SOUTH CAROLINA				
				DEPARTMENT OF TRANSPORTATION				
REV.				3 SPAN- 132'-0" UNIT SUPERSTRUCTURE (SPANS 1 - 3)				
REV.								
REVIEWED								
QUAN.	DRF	GFD	TL					9-16
DR.	DRF	GFD	TL					9-16
DES.	DRF	GFD	5-13					
	BY	CHK.	DATE	COUNTY	ORANGEBURG	ROUTE	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 ³ / ₈ "	2'-9 ¹ / ₈ "	_____	_____	7'-3"
H1601	266	2'-3 ¹ / ₈ "	2'-3 ¹ / ₂ "	7 ³ / ₈ "	_____	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 ¹ / ₂ " Ht.		(6) As Necessary for Spans 4 & 6			
CHCU	1'-2 ³ / ₄ " 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 ¹ / ₄ "	2'-6 ³ / ₄ "	_____	_____	6'-9"
H1602	62	2'-3 ¹ / ₈ "	2'-3 ¹ / ₂ "	7 ³ / ₈ "	_____	5'-2"
J1301	62	8"	1'-6"	_____	_____	3'-8"
SB	1" Ht.		As Necessary			
CHCU	12 ¹ / ₂ " 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.

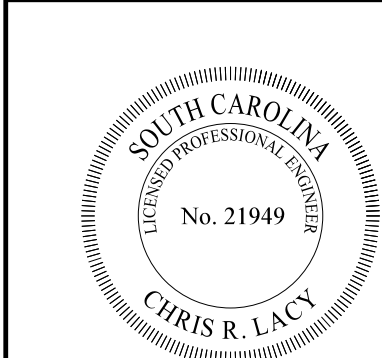
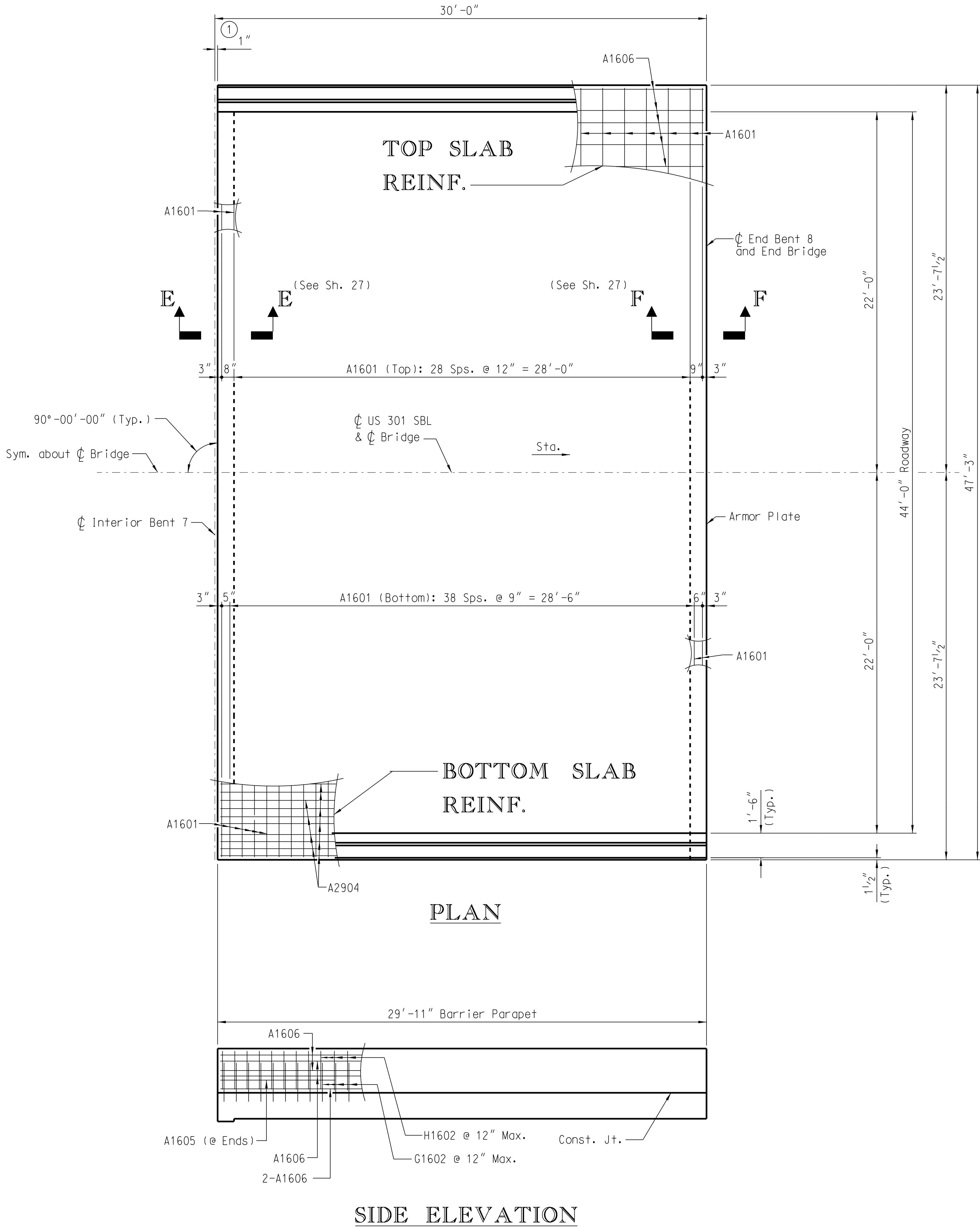
For Slab Drain Locations, see Sh. 7.

For Section thru Span, see Sh. 26.

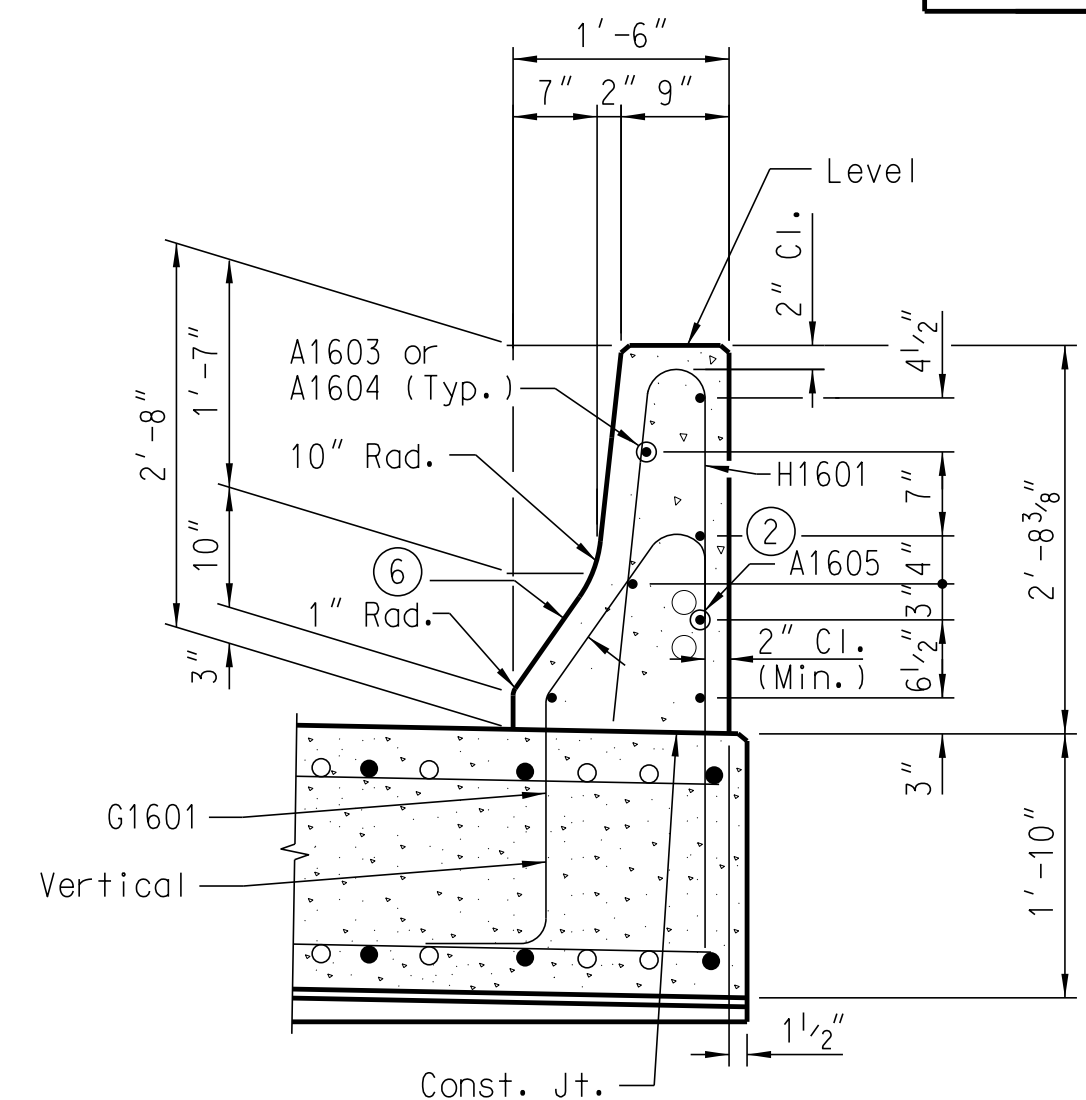
For Deck Pouring Sequence, See Sh. 27.

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.

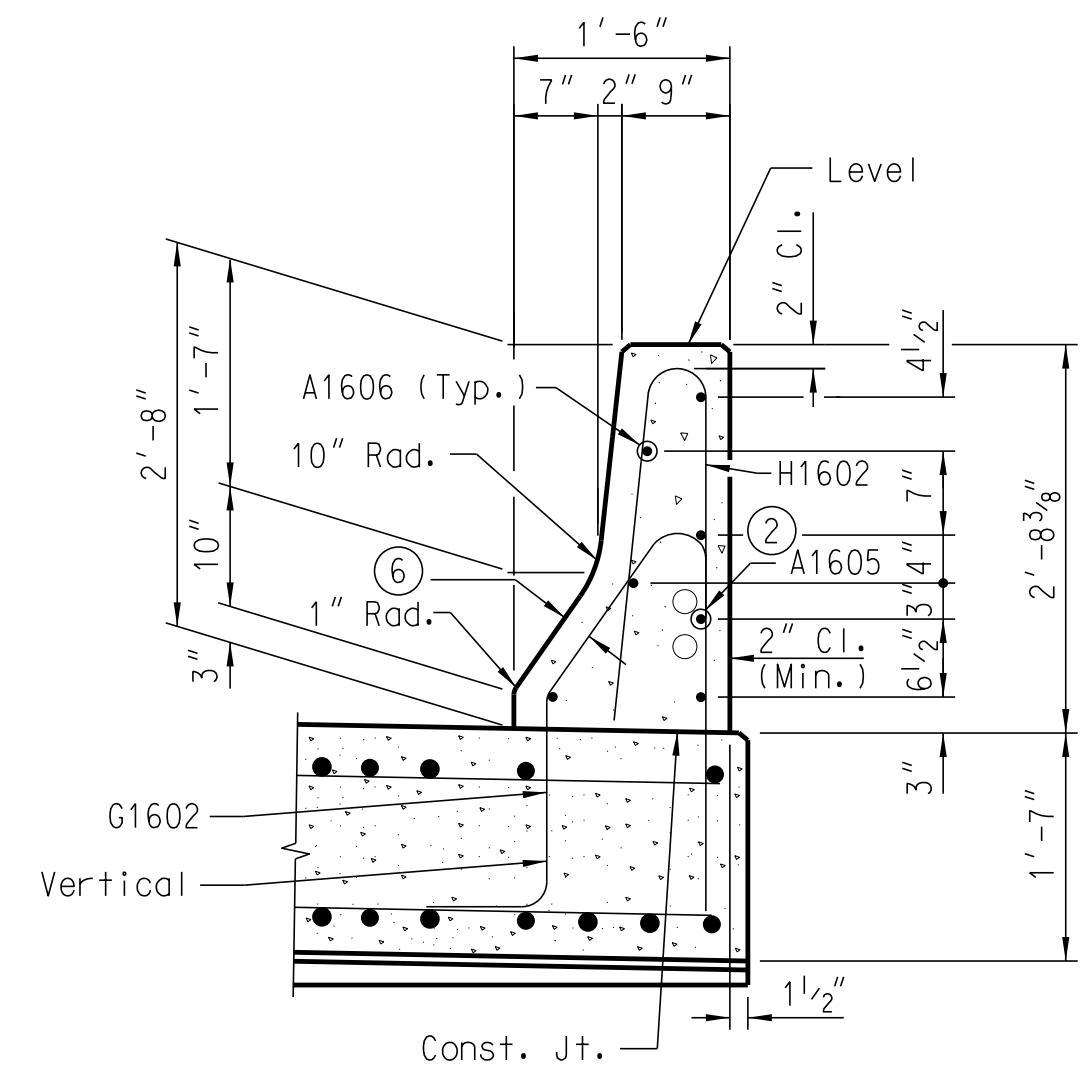


REV.				SOUTH CAROLINA			
REV.				DEPARTMENT OF TRANSPORTATION			
REV.				30'-0" END SPAN			
REVIEWED				SUPERSTRUCTURE			
QUAN.	ASC	GFD	TL	9-16			
DR.	ASC	GFD	TL	9-16			
DES.	DRF	GFD	5-13				
BY	CHK.	DATE	COUNTY		ROUTE		
			ORANGEBURG		US 301		



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

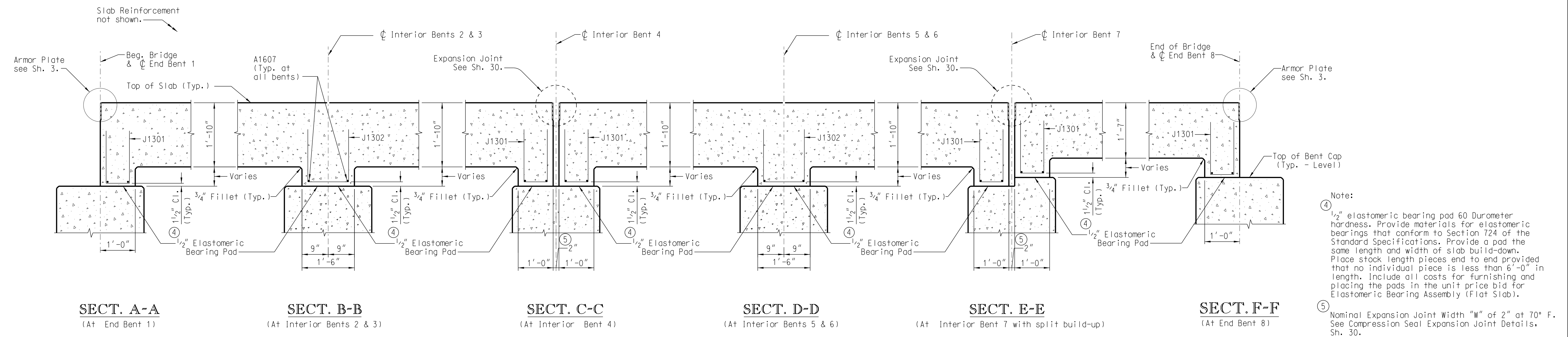
(Spans 1 - 3 and Spans 4 - 6)
(Deck Drains Not Shown)



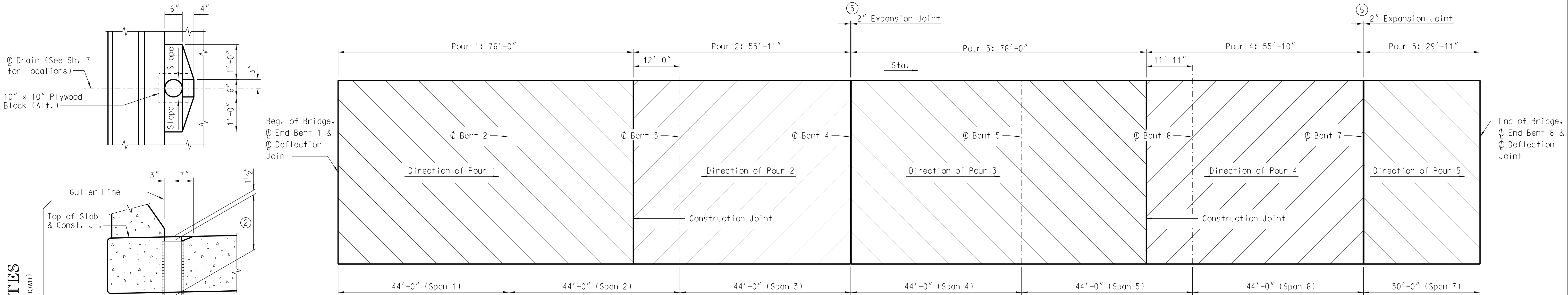
(Span 7)
(Deck Drains Not Shown)



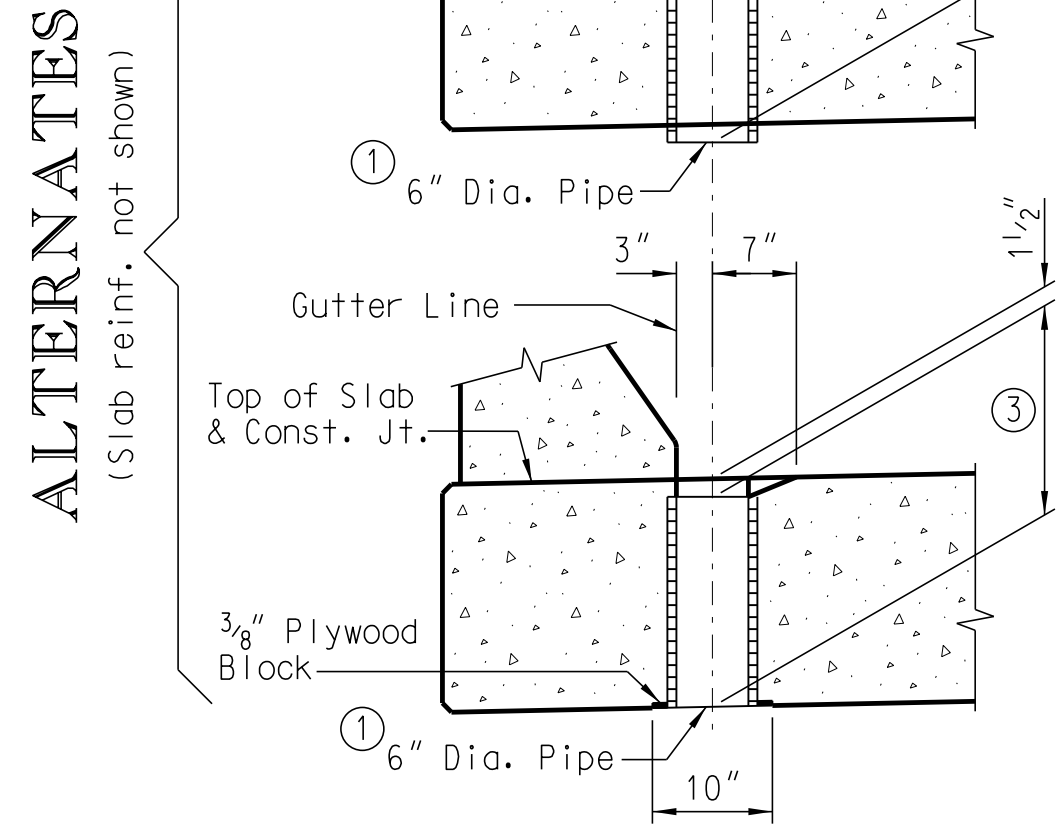
REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPERSTRUCTURE DETAILS (1 OF 2)
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	DRG ASC	GFD TL	9-16	
DES.	DRG ASC	GFD DRG	5-13	
BY	CHK.	DATE		
COUNTY	ORANGEBURG		ROUTE	
			US 301	



SLAB BUILD-DOWN DETAILS



DECK POURING SEQUENCE



DRAIN DETAILS

- 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.

REV.

REV.

REVIEWED

QUAN.

DR.

DES.

BY

CHK.

DATE

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

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SUPERSTRUCTURE
DETAILS
(2 OF 2)

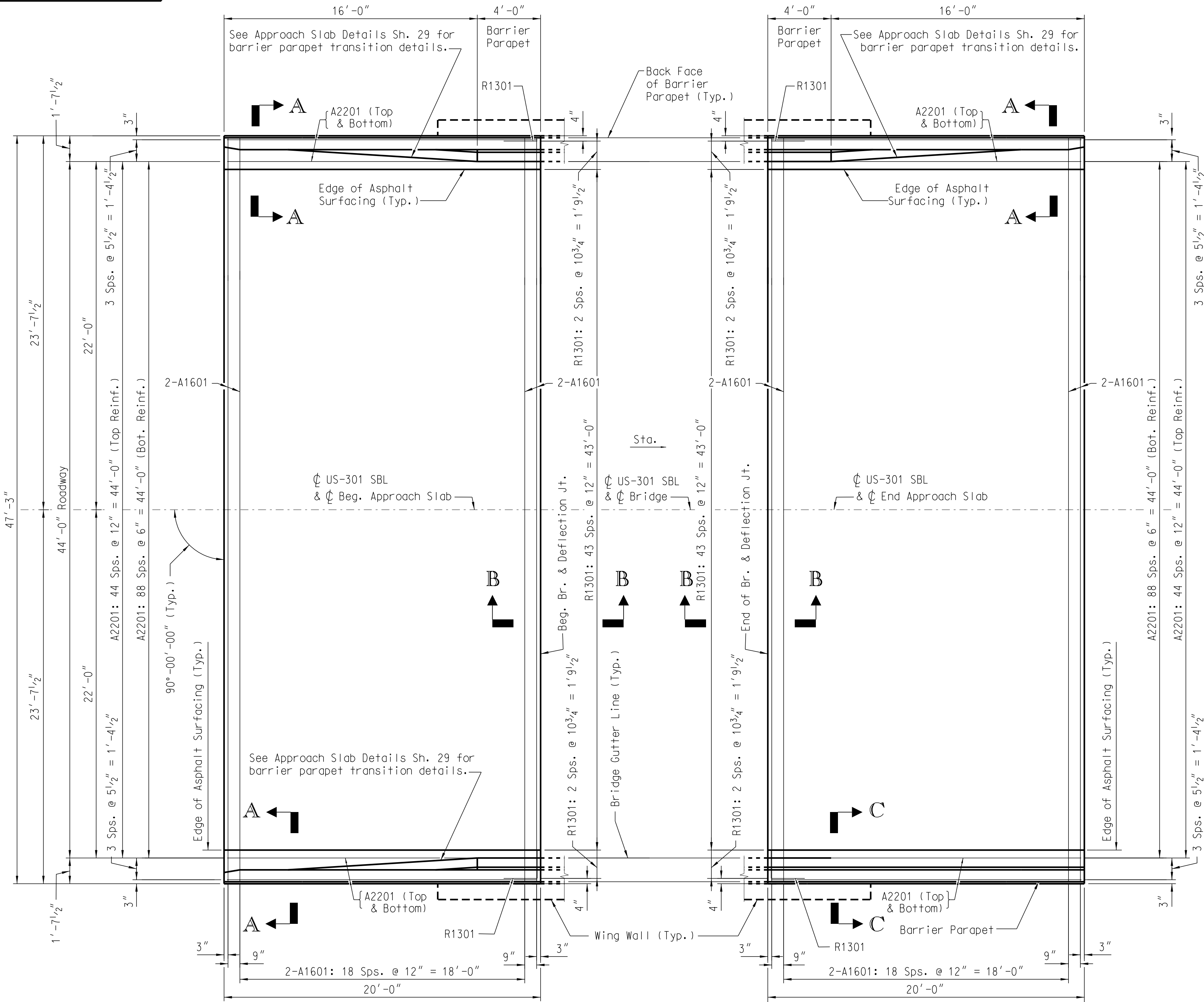
COUNTY

ORANGEBURG

ROUTE

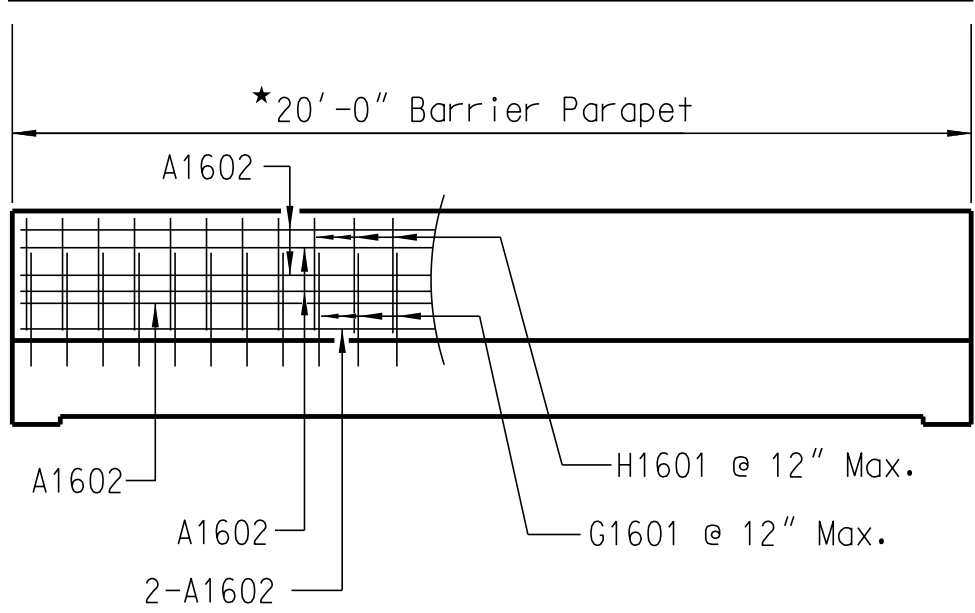
US 301

Printed: Wednesday, December 28, 2016 10:16:51 AM



PLAN - BEG. APPR. SLAB

PLAN - END APPR. SLAB



SIDE ELEVATION

Notes:

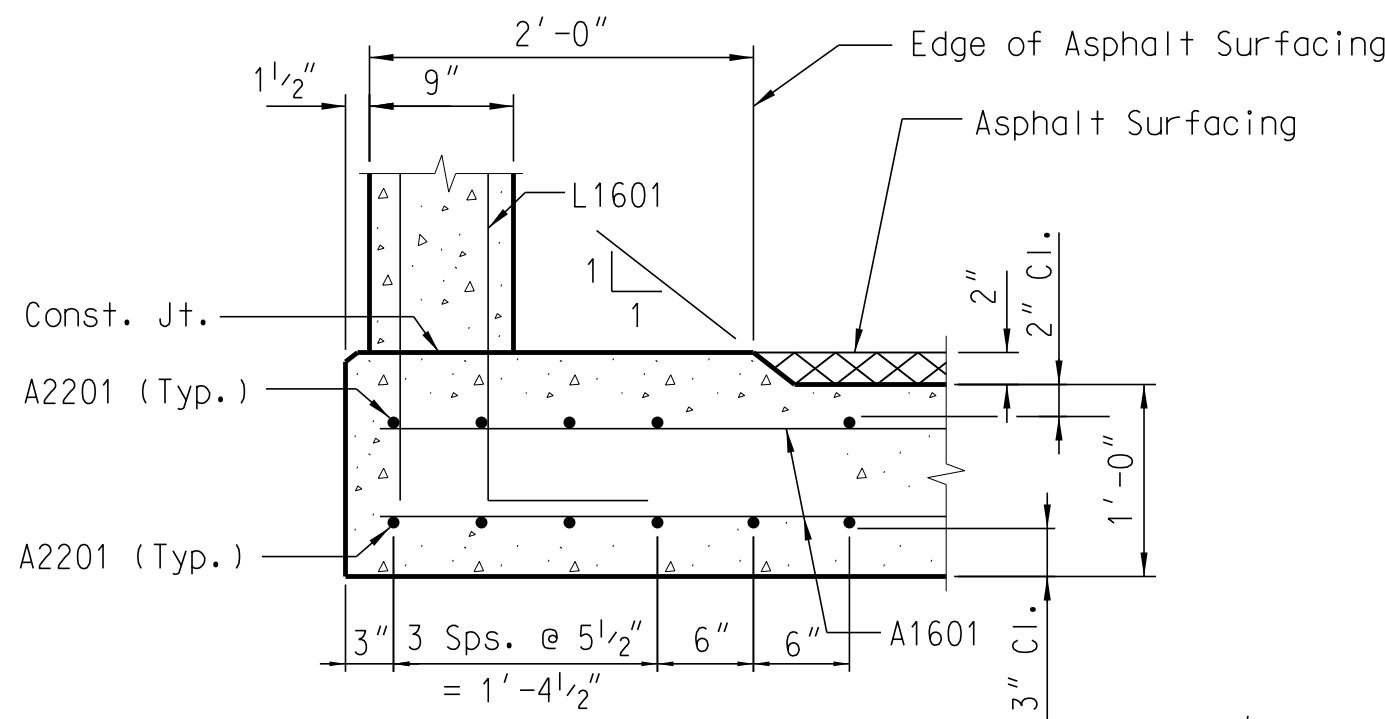
Construct approach slabs to the grades and elevations shown on the Bridge Plan and Profile drawing. Construct approach slabs to the same crown as the bridge deck.

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.

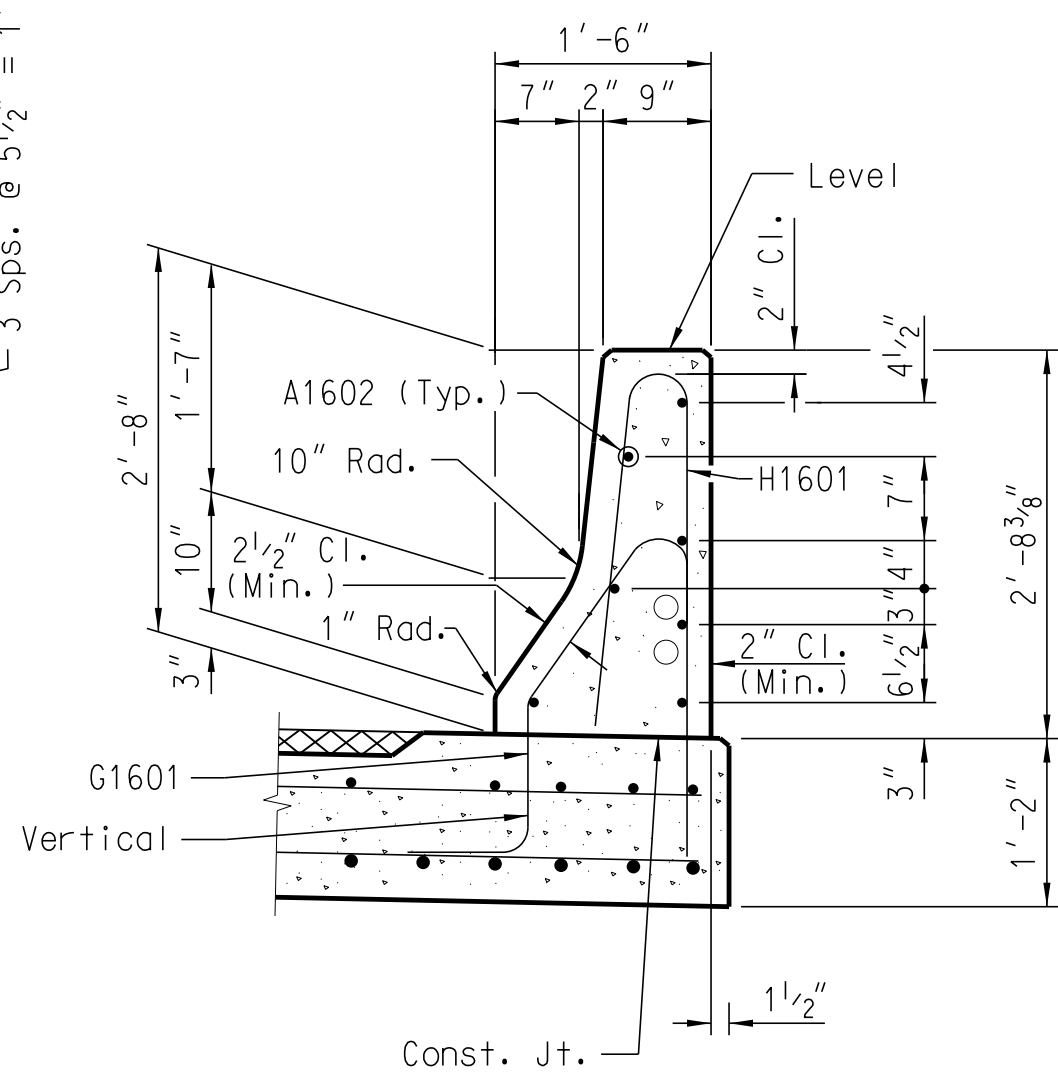
Support the bottom mat of reinforcing steel using concrete block or similar material. Provide a minimum concrete cover of 3" below the bottom reinforcing steel.

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.

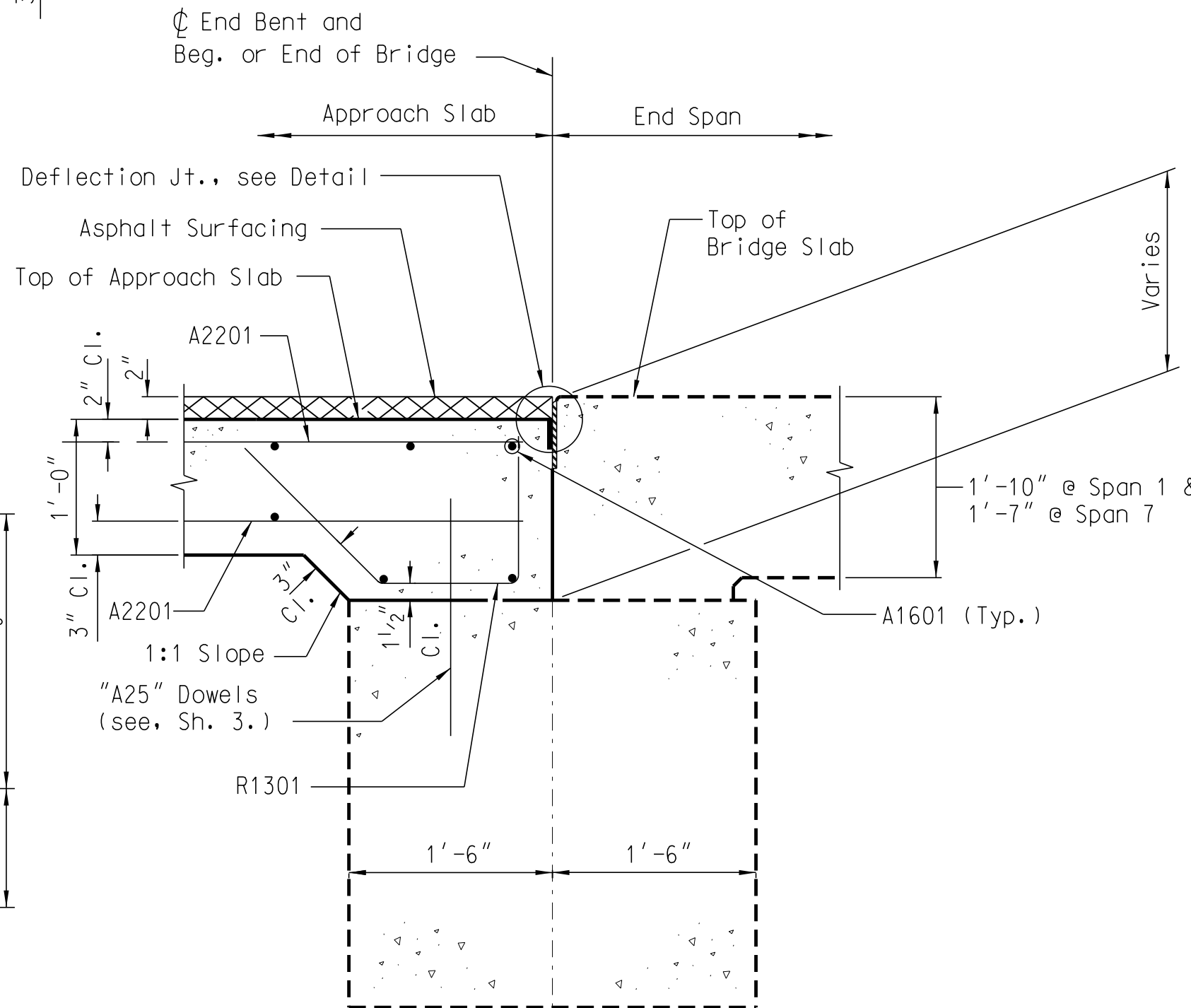
*Construct a 1/2" open joint between barrier parapets for the End Span and End Approach Slab at the End of the Bridge.



SECTION A-A



SECTION C-C



SECTION B-B

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 1/8"	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

REV.	DMG	GFD	7-16
	From Dwg. & Det.		
REV.	JXY	SAN	3-14
	New Border		
REV.	MRW	SAN	1-12
	Section A-A		

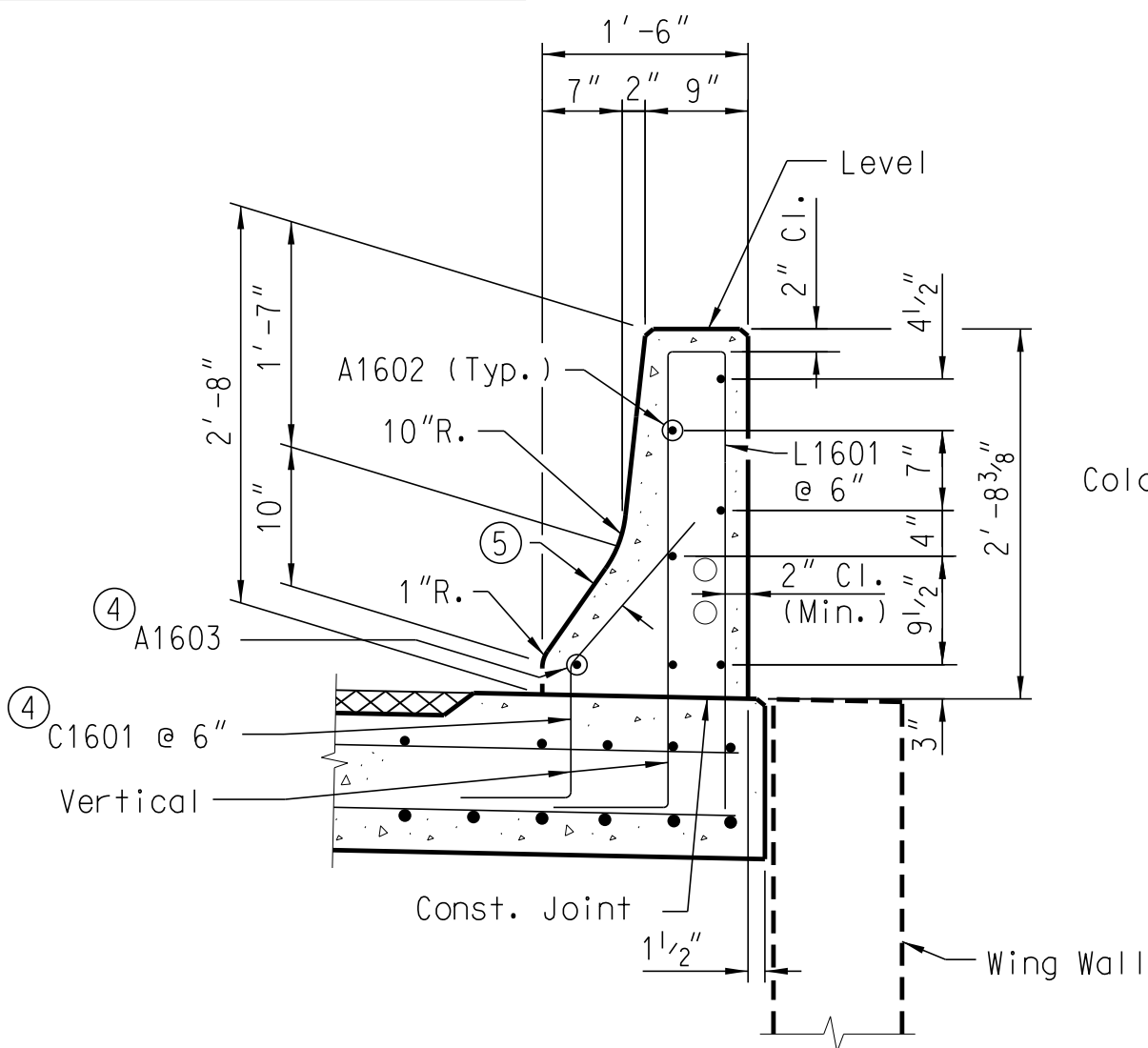
QUAN.	DMG	GFD	7-16
DR.	PNP	SAN	11-07
DES.	MRW	JDC	1-12
BY	CHK.	DATE	

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

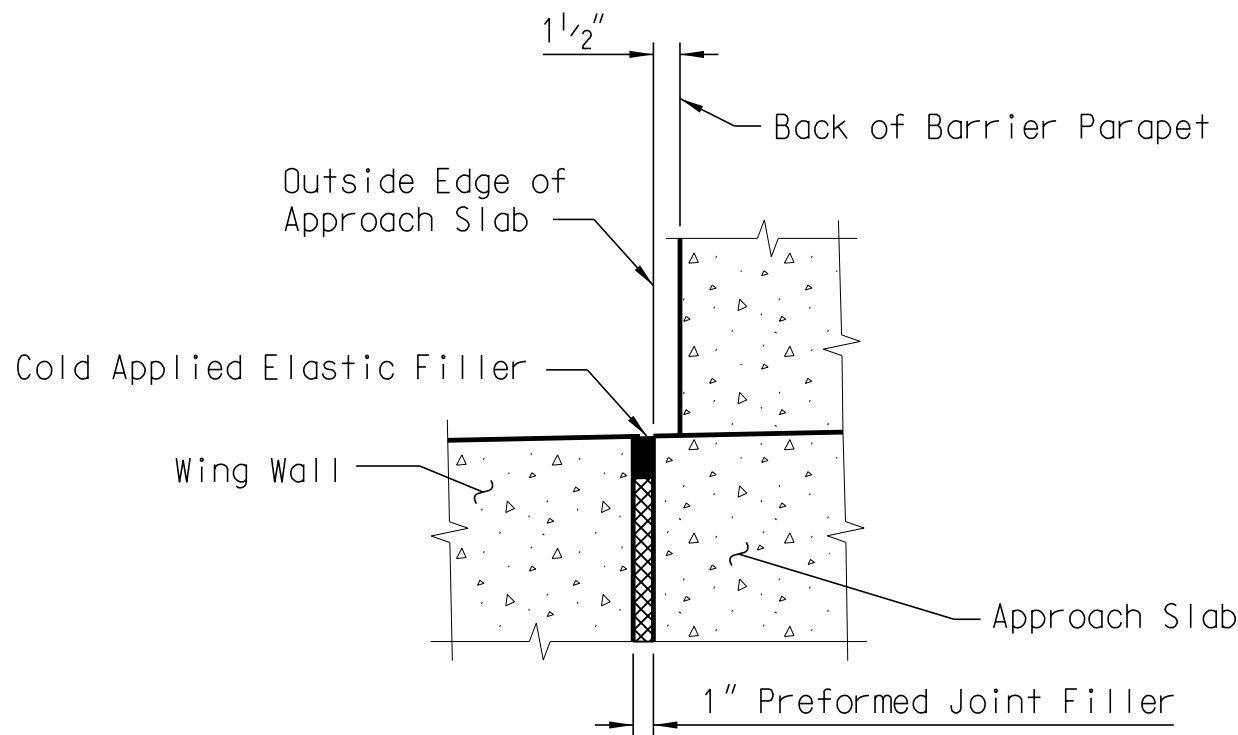
APPROACH SLAB
BEG. & END OF BRIDGE

COUNTY ORANGEBURG ROUTE US 301

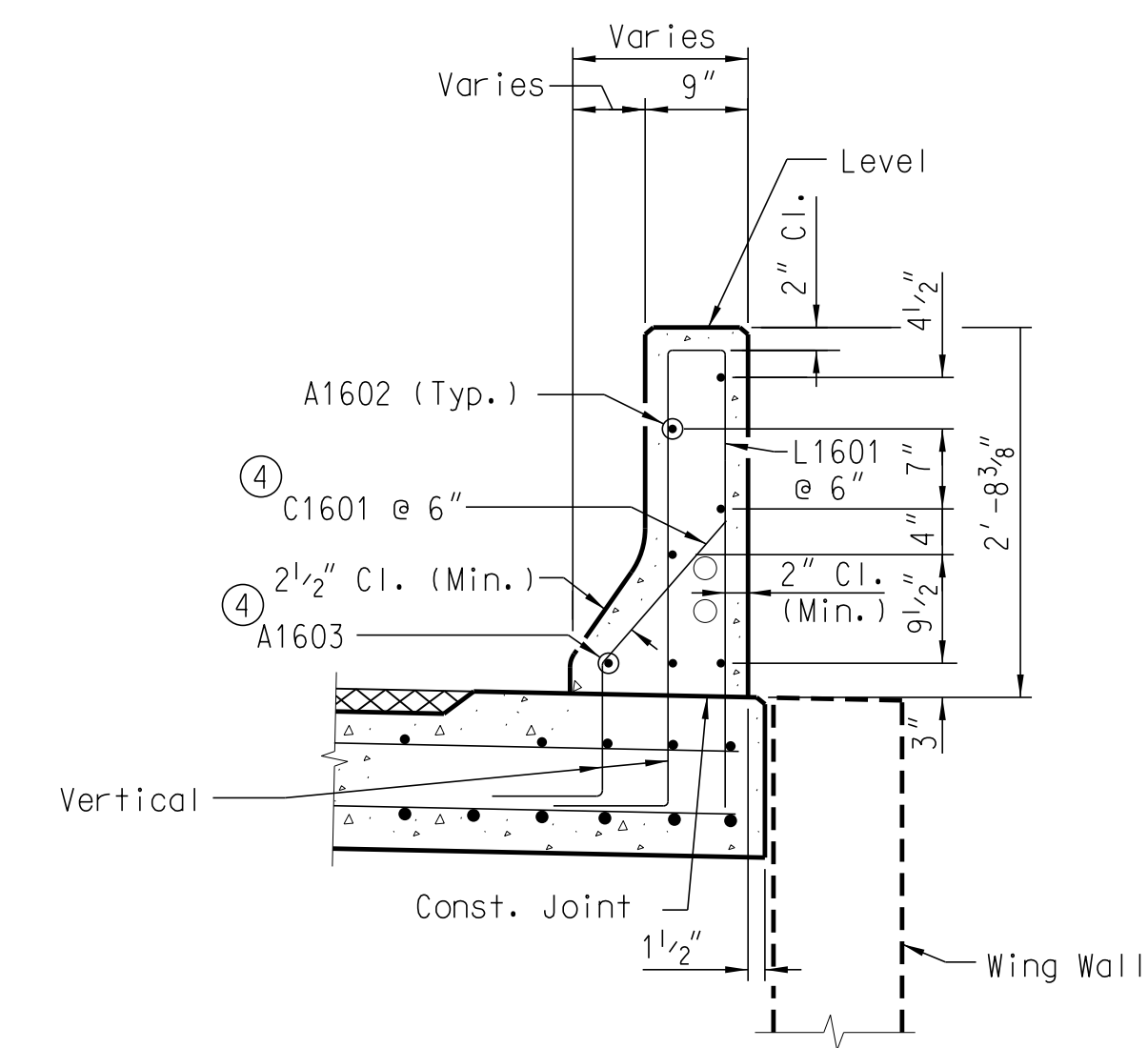




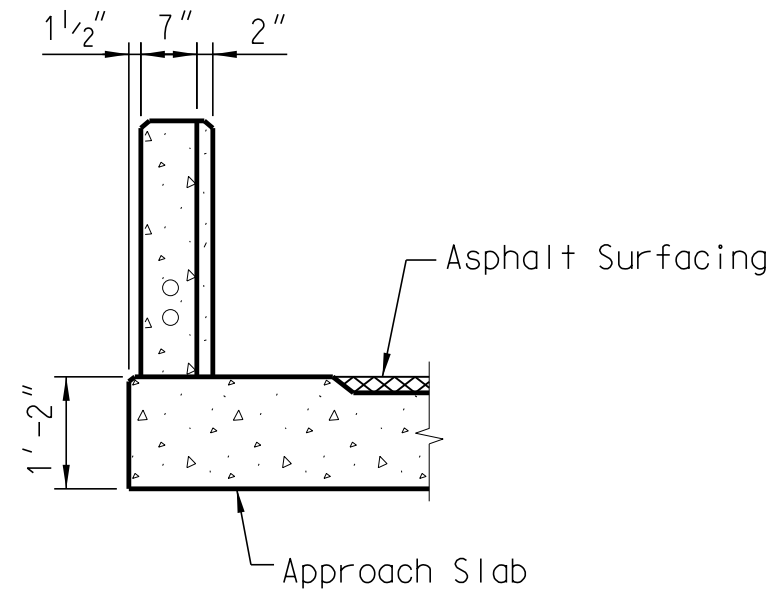
SECTION D-D



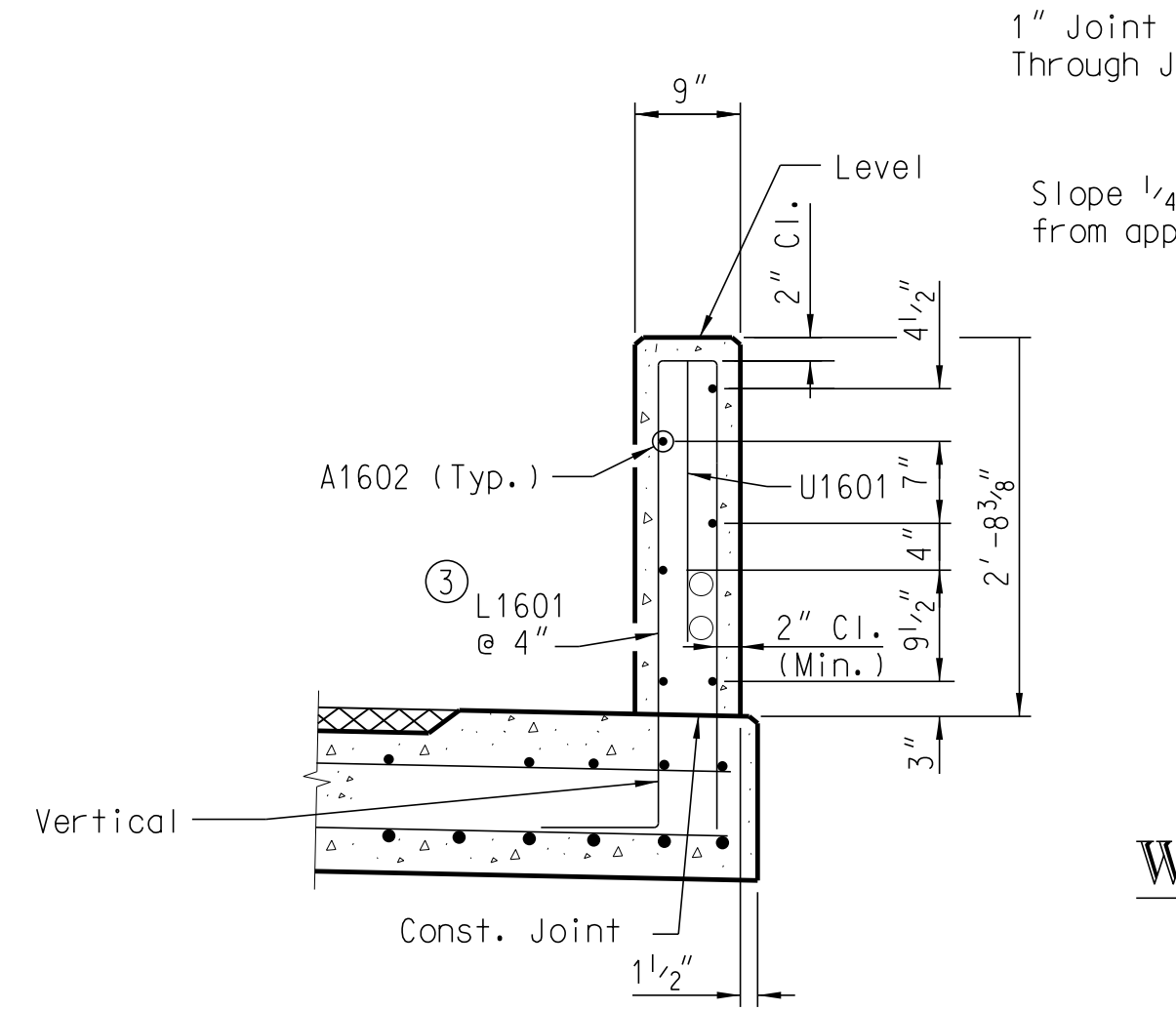
SECTION THROUGH JOINT



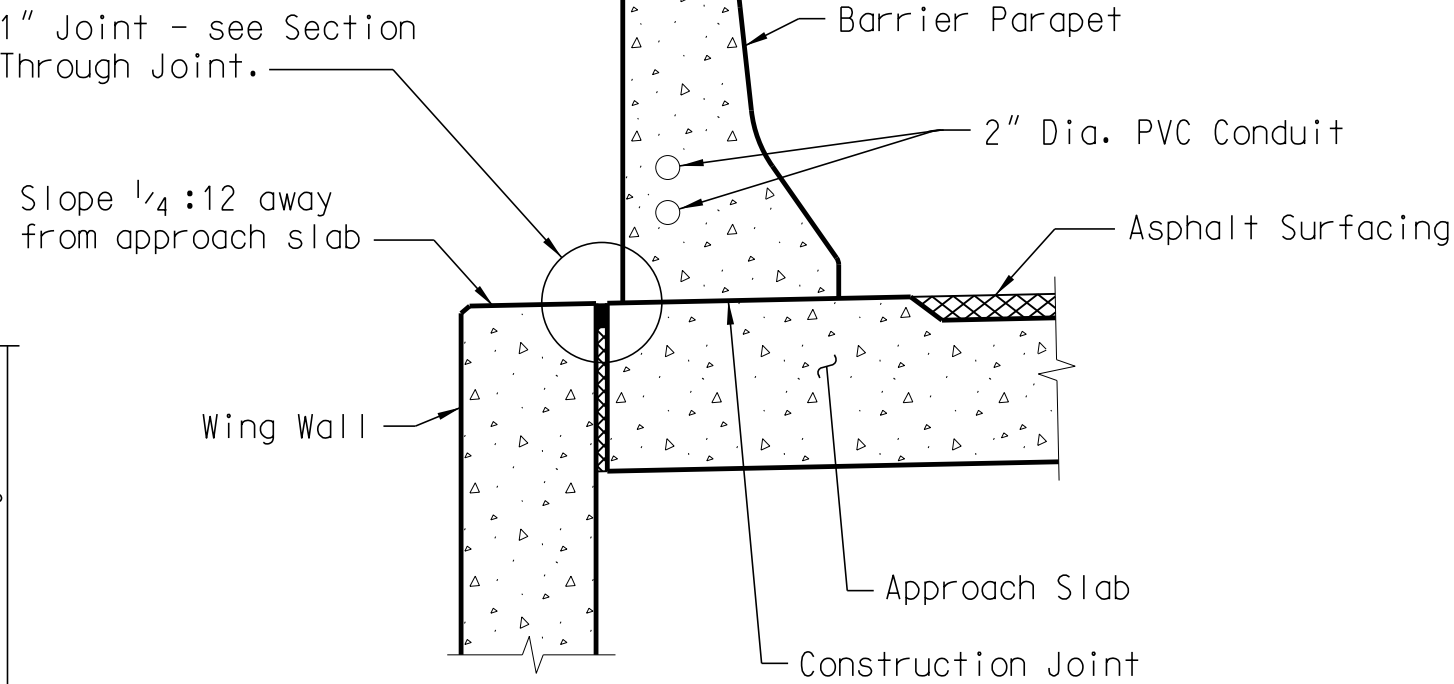
SECTION E-E



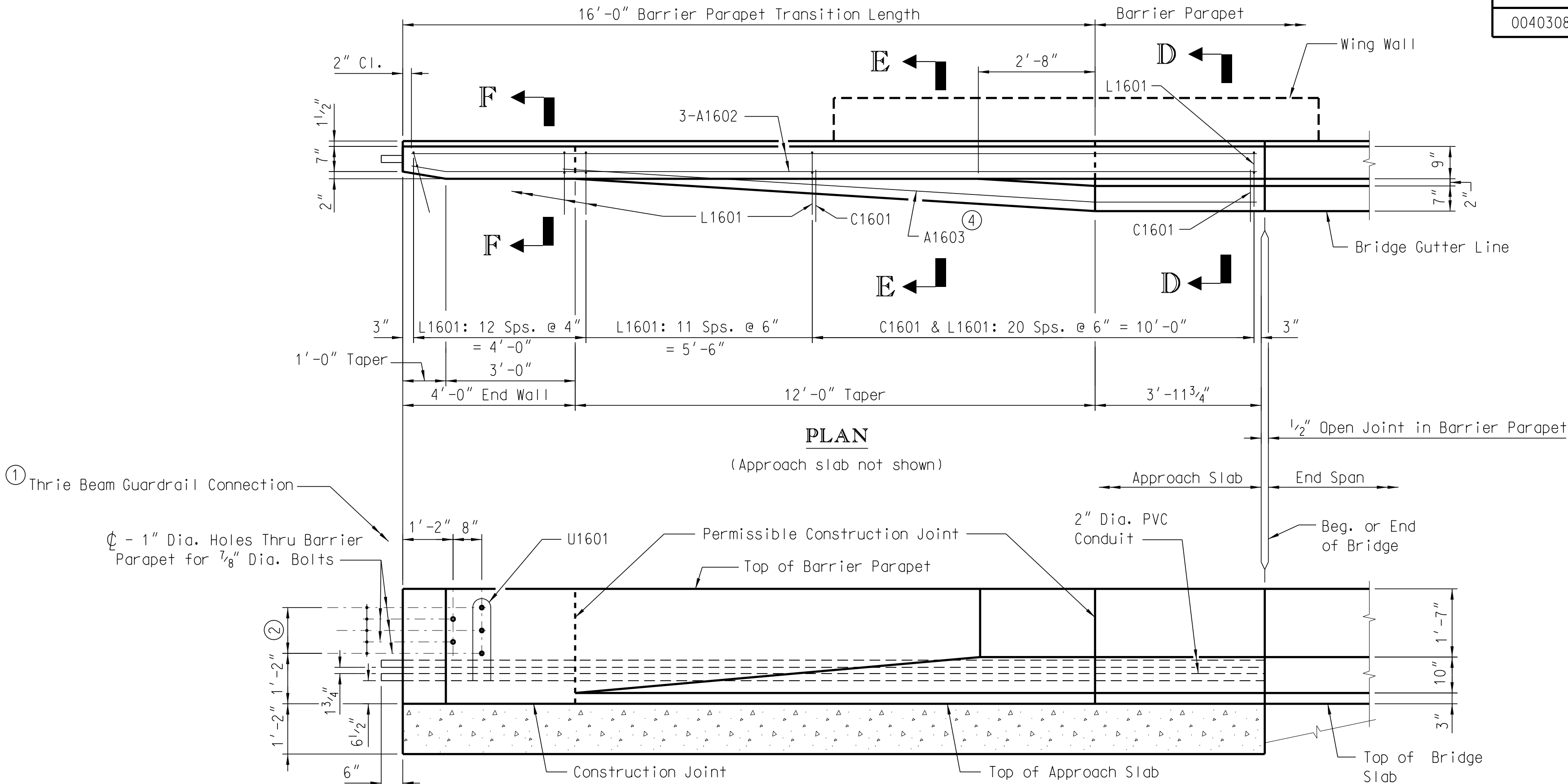
END ELEVATION



SECTION F-F



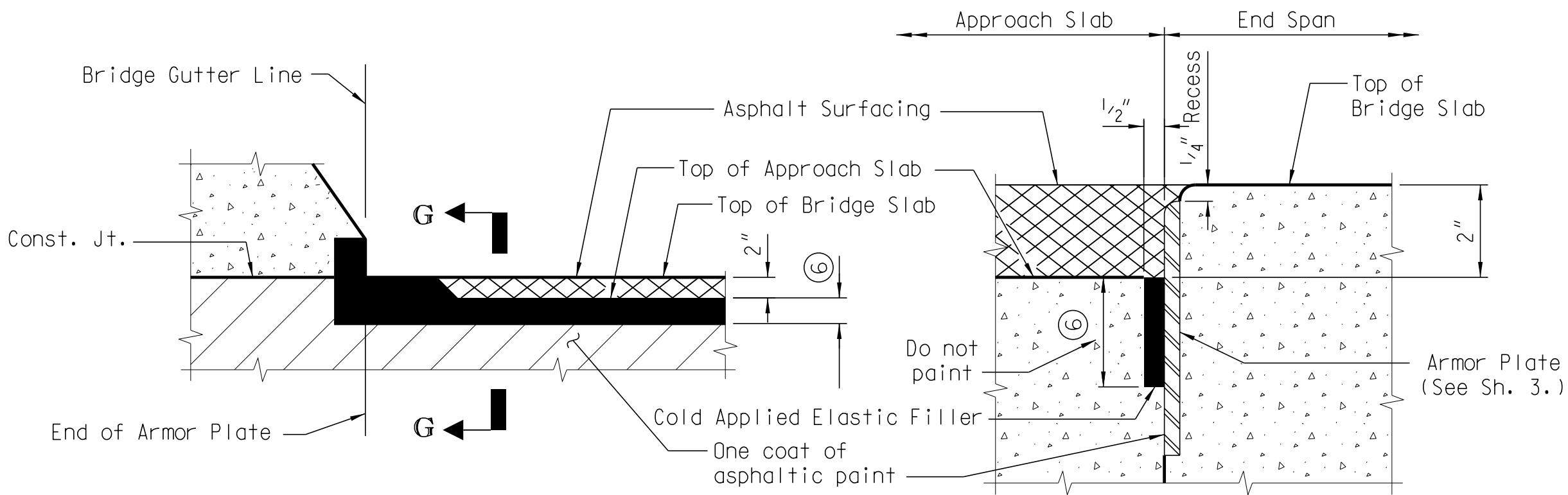
SECTION THROUGH WING WALL / APPROACH SLAB



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.

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



