

INDEX OF SHEETS

1. TITLE SHEET
2. SUMMARY OF ESTIMATED QUANTITIES
3. GENERAL NOTES AND DETAILS FOR FLAT SLABS
4. REINFORCING BENDING DETAILS
5. ROADWAY TYPICAL SECTION
6. ROAD PLAN AND PROFILE
7. BRIDGE PLAN AND PROFILE
8. BORING LOCATIONS
9. BORING LOGS (1 OF 8)
10. BORING LOGS (2 OF 8)
11. BORING LOGS (3 OF 8)
12. BORING LOGS (4 OF 8)
13. BORING LOGS (5 OF 8)
14. BORING LOGS (6 OF 8)
15. BORING LOGS (7 OF 8)
16. BORING LOGS (8 OF 8)
17. FOUNDATION LAYOUT
18. END BENTS 1 & 8
19. END BENT DETAILS
20. INTERIOR BENTS 2 THRU 7
21. INTERIOR BENT DETAILS
22. INTERIOR BENT GEOTECHNICAL & COFFERDAM PLAN NOTES
23. 3 SPAN - 132'-0" UNIT SUPERSTRUCTURE (SPANS 1 - 3)
24. 3 SPAN - 132'-0" UNIT SUPERSTRUCTURE (SPANS 4 - 6)
25. 30'-0" END SPAN SUPERSTRUCTURE (SPAN 7)
26. SUPERSTRUCTURE DETAILS (1 OF 2)
27. SUPERSTRUCTURE DETAILS (2 OF 2)
28. APPROACH SLAB BEG. & END OF BRIDGE
29. APPROACH SLAB DETAILS
30. COMPRESSION SEAL EXPANSION JOINT DETAILS



PROPOSED PLANS

FOR

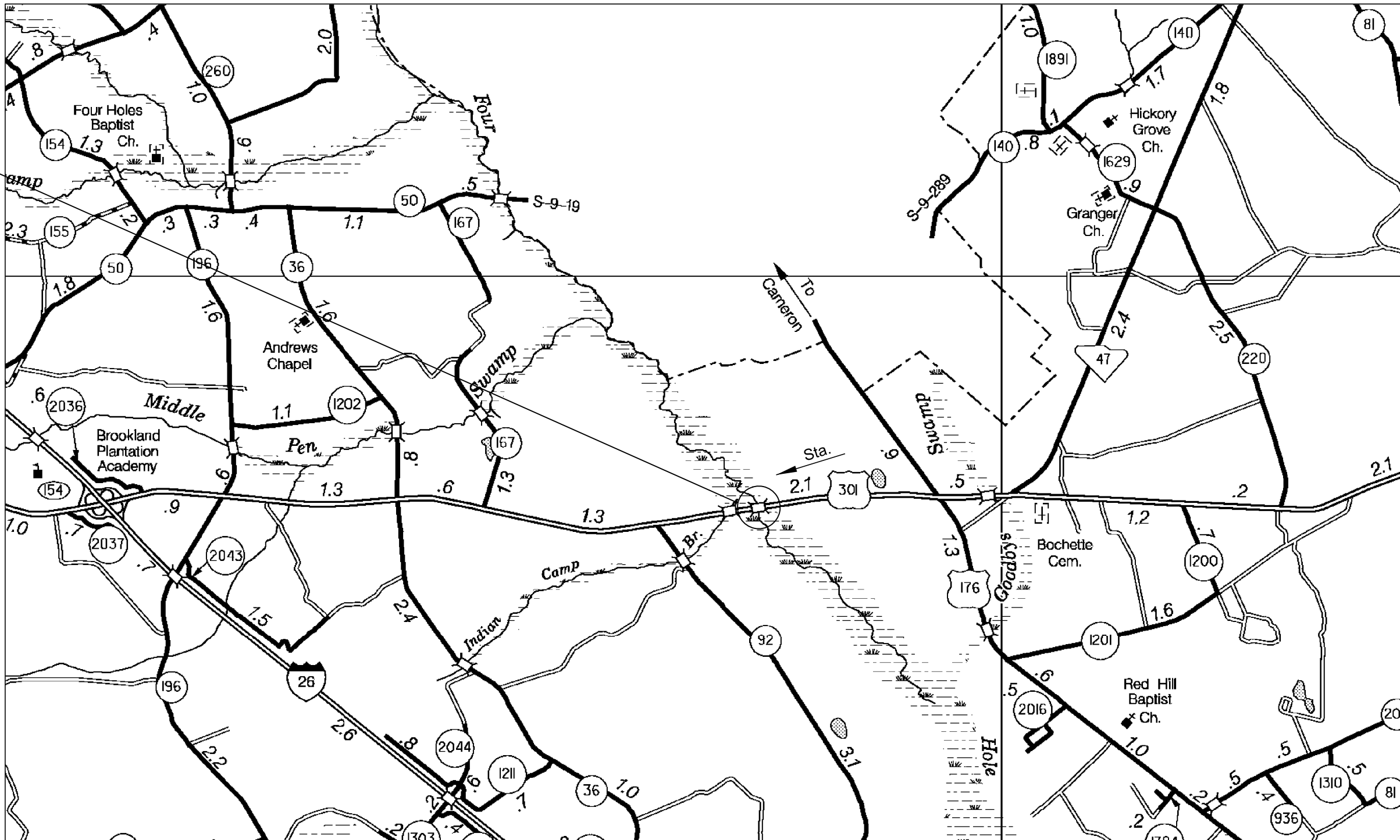
ORANGEBURG COUNTY

PROJECT ID: 0040308

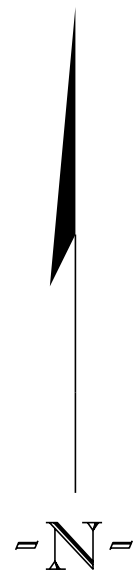
US ROUTE 301 SOUTHBOUND (FIVE CHOP ROAD)

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.

95% BRIDGE PLANS

PLANS PREPARED BY

DESIGN GROUP LEADER DATE

ENGINEER OF RECORD



FOR CONSTRUCTION : DATE

REVIEWED	MRB	CFD	8-14
DR.	BY	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	1625.000
2045030	COFFERDAM - TYPE 3 (20,001 - 30,000 C.F.)	EA	6.000
6750278	FURNISH & INSTALL 2.0" SCHEDULE 80 PVC CONDUIT	LF	1340.000
7011400	CONC. FOR STRUCTURES - CLASS 4000	CY	1015.100
7011500	CONC. FOR STRUCTURES - CLASS 4000S⚡	CY	720.000
7011600	CONC. FOR STRUCTURES - CLASS 5000	CY	545.600
7020300	COMPRESSION SEAL JOINT	LF	94.500
7023200	GROOVED SURFACE FINISH	SY	1368.000
7031200	REINF. STEEL FOR STRUCTURES (BRIDGE)	LB	280019.000
7031220	HOOP REINFORCING STEEL FOR STRUCTURES (BRIDGE)	LB	13272.000
7051000	CONCRETE BRIDGE BARRIER PARAPET	LF	603.300
7051910	CONCRETE BRIDGE BARRIER PARAPET TRANSITION	EA	4.000
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

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 from groundline to Elev. 103.000 MSL and soil extracted from inside of steel pipe piles to facilitate driving of pile through very dense layers.
- ⚡ Estimated quantity of Class 4000S Concrete for the construction of the cofferdam seals is provided for bid purposes only and is based on a 3'-0" thickness.

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)
		CY	CY	LB	LB	LF	EA	EA	EA	LF	LF	LF	LF	EA
End Bents 1 & 8	2	_____	37.4	8,093	_____	_____	_____	4	12	375	79	_____	_____	_____
Interior Bents 2 thru 7	6	_____	508.2	75,560	13,272	_____	_____	12	30	_____	_____	2,520	642	_____
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	_____	18,436	_____	16.0	4	_____	_____	_____	_____	_____	_____	_____
TOTALS	_____	1015.1	545.6	280,019	13,272	603.3	4	16	42	375	79	2,520	642	10

REV.

REV.

REV.

REVIEWED

QUAN.

GFD

TL

11-16

DR.

GFD

TL

09-16

DES.

BY

CHK.

DATE

SOUTH CAROLINA

DEPARTMENT OF TRANSPORTATION

No. 21949

CHRISTOPHER K. LACY

SOUTH CAROLINA

DEPARTMENT OF TRANSPORTATION

SUMMARY OF ESTIMATED QUANTITIES

COUNTY

ORANGEBURG

ROUTE

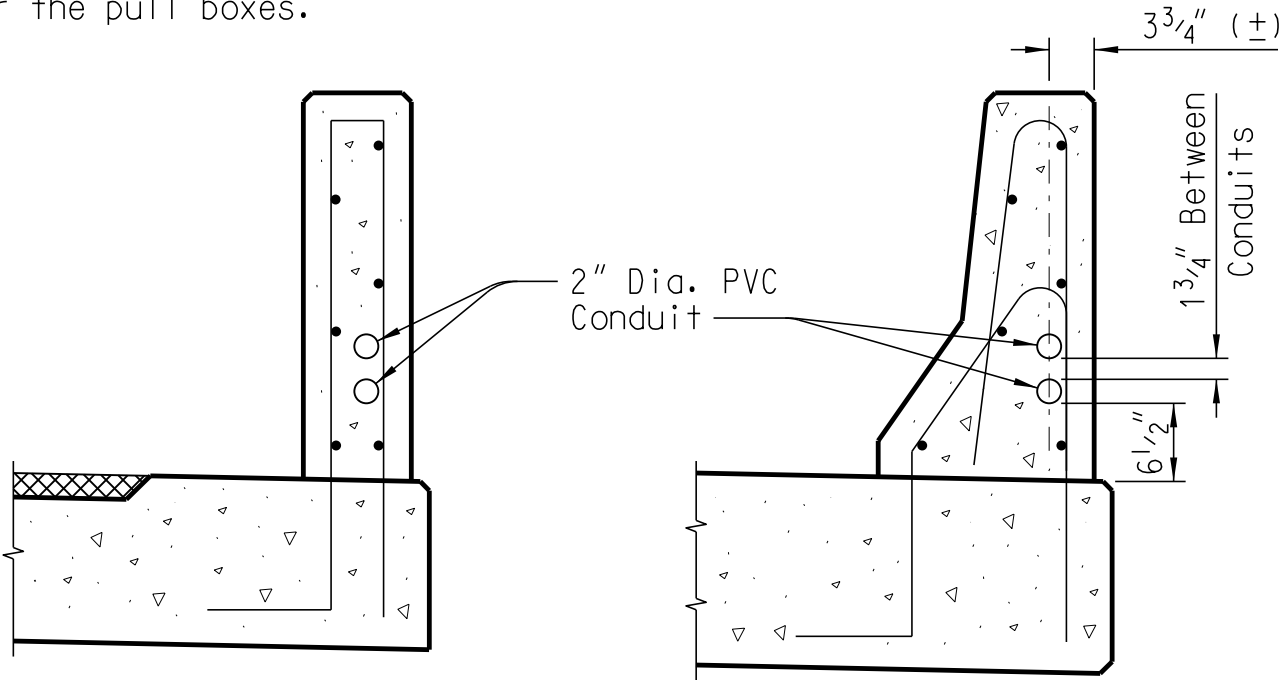
US 301

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

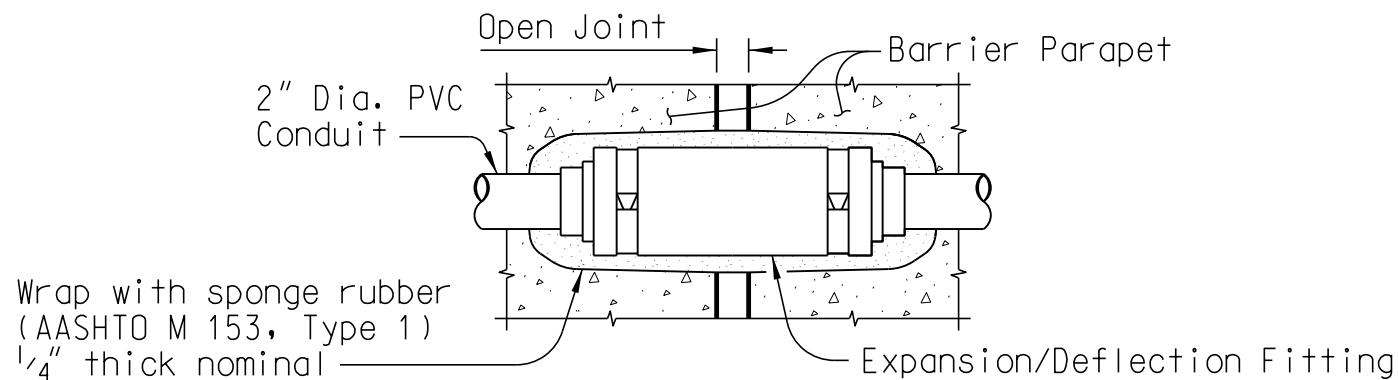
(Typ. ea. side of bridge)

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.

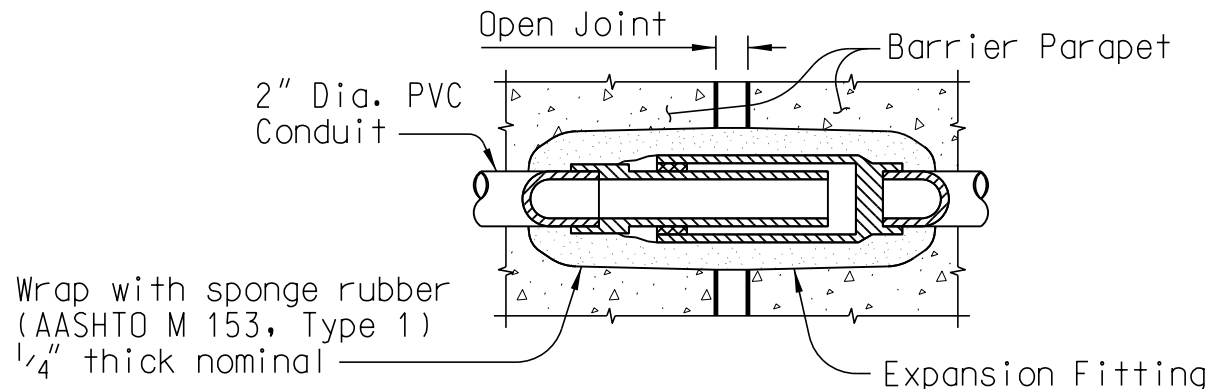
Provide expansion fittings and/or expansion/deflection fittings at all open joints in the barrier parapet.

Include all costs for furnishing and installing conduit, expansion/deflection and 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

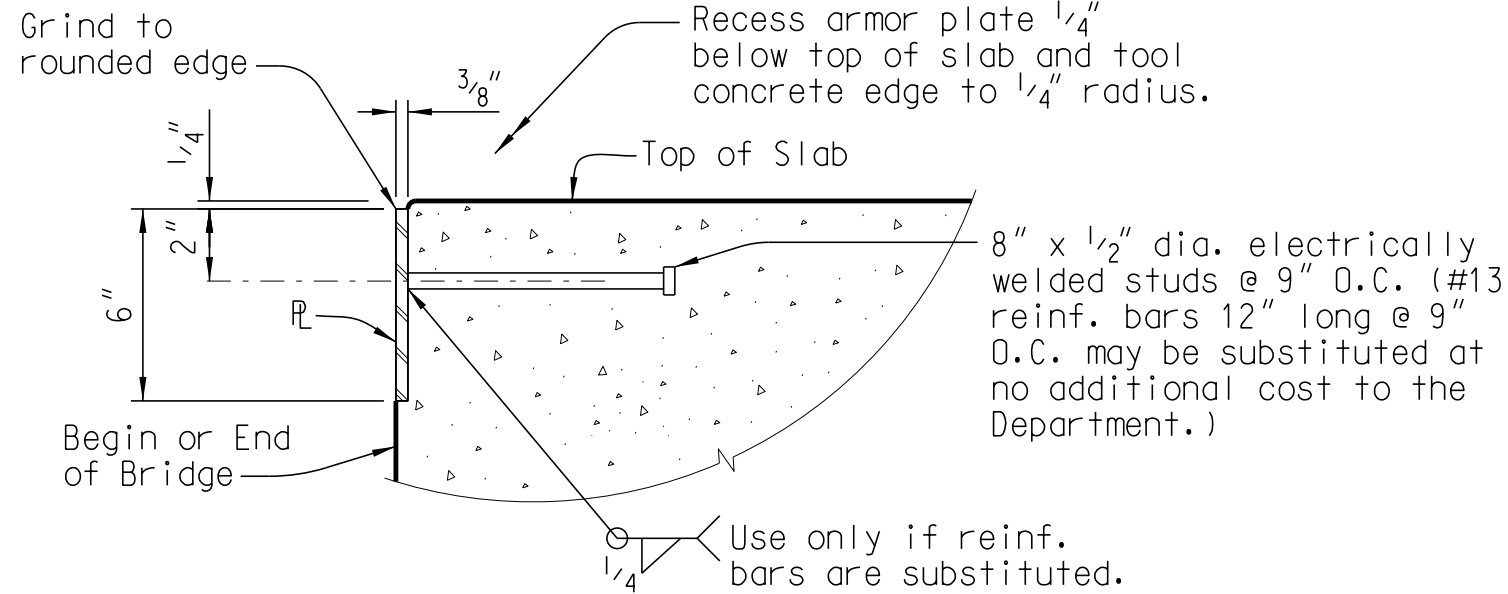
(For open joints located at Interior Bents 4 & 7)

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.

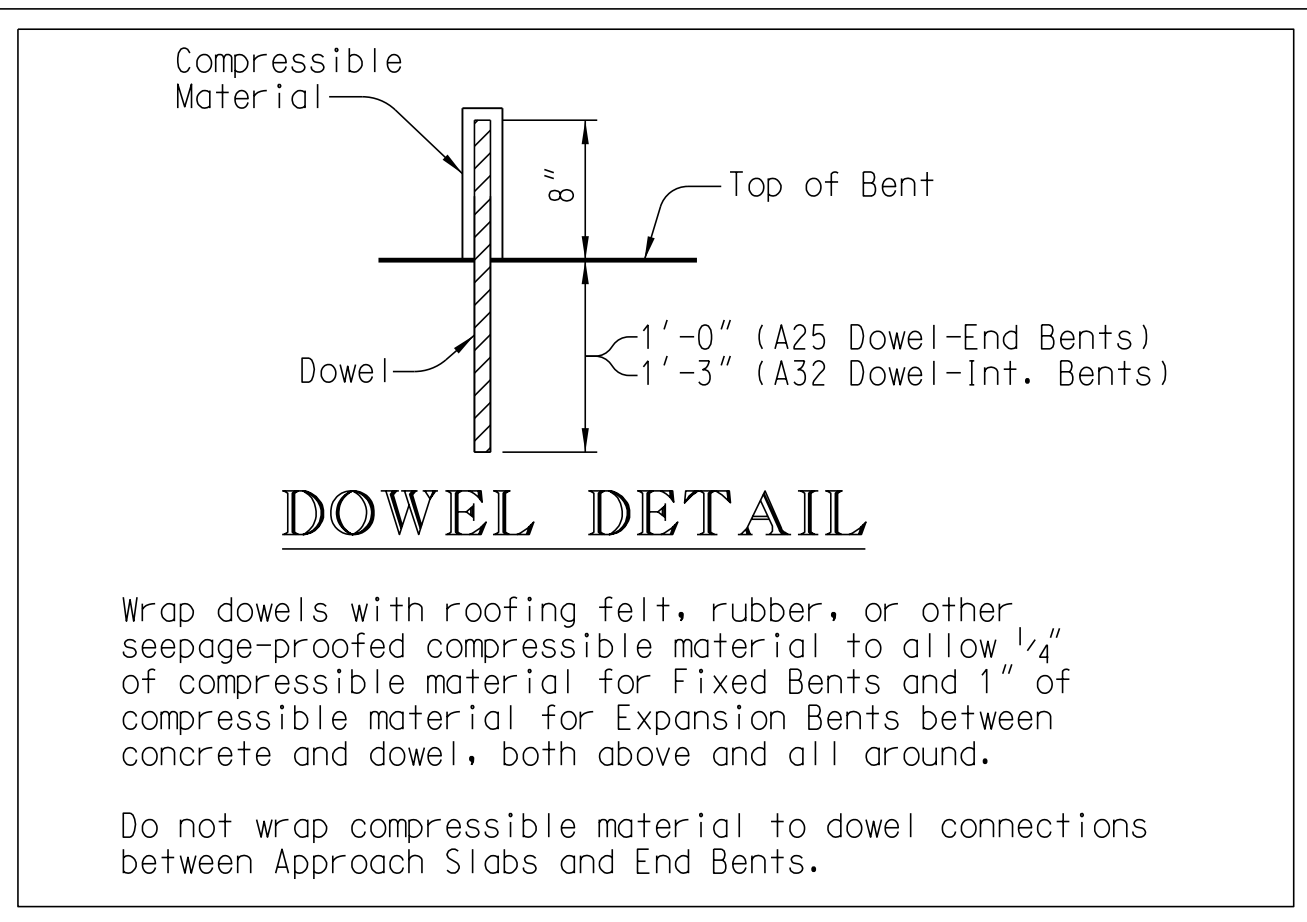
Provide steel for the armor plates that conforms to the latest AASHTO M 270 Grade 50W (ASTM A 709 Gr. 50W) steel and neither the plates nor the anchor studs need to be painted.

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.

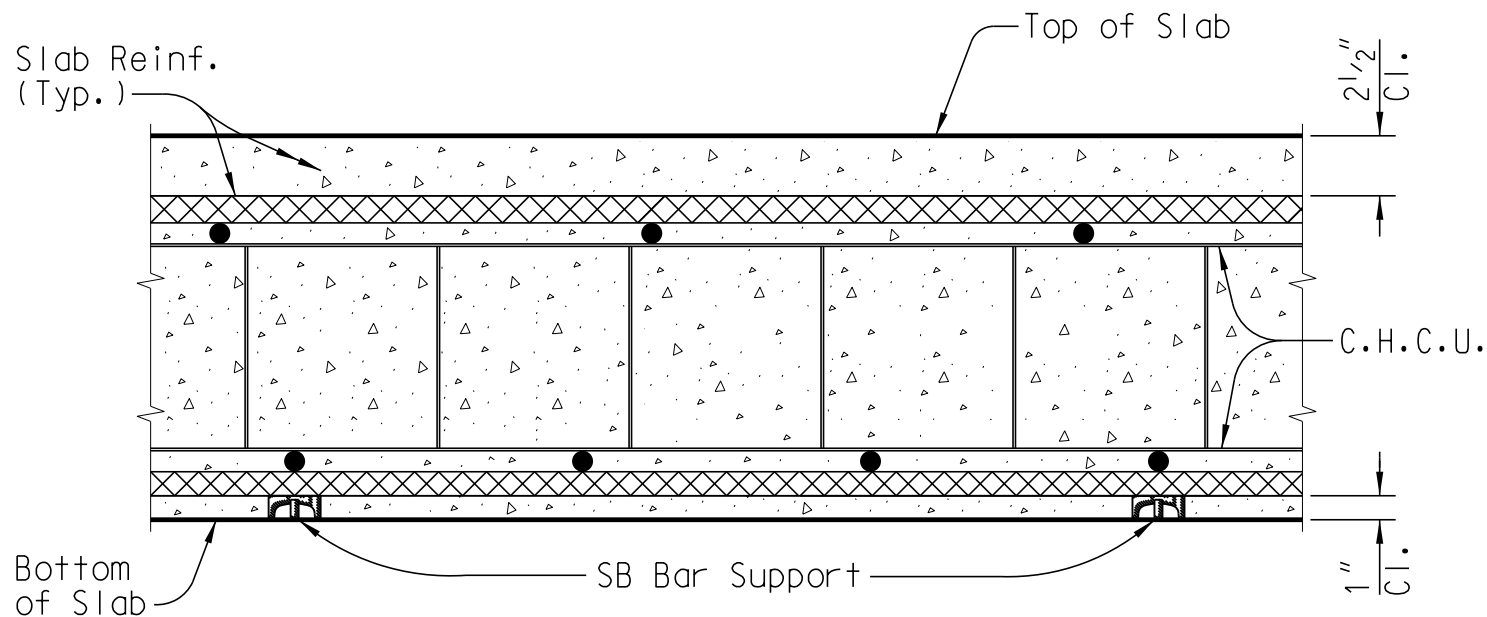
Include all costs of material and workmanship to fabricate, furnish, and install the armor plates and anchor studs complete and in place, in the unit price bid for Class 4000 concrete.



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.

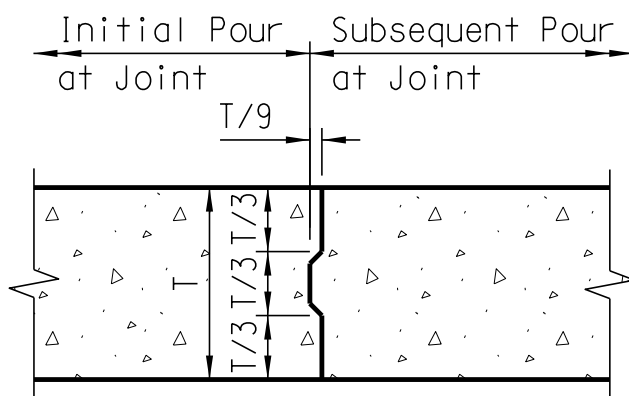
Follow the above procedures for all stages of the work. For all surveys performed on the same bridge, use identical stations for survey shots in order to facilitate survey comparisons. All costs for performing, evaluating, and submitting the surveys are considered incidental to the Contract and no additional 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 _{0.5} (FEE):	0.39 g	S _{0.5} (SEE):	0.87 g
S _{0.1} (FEE):	0.18 g	S _{0.1} (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.	JXY	SAN	3-14
			New Border
REV.	JXY	BMH	8-13
			AASHTO Spec.

REVIEWED			
QUAN.	DR.	SRM	GFD
DES.			
BY	CHK.	DATE	



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

GENERAL NOTES AND DETAILS FOR FLAT SLABS

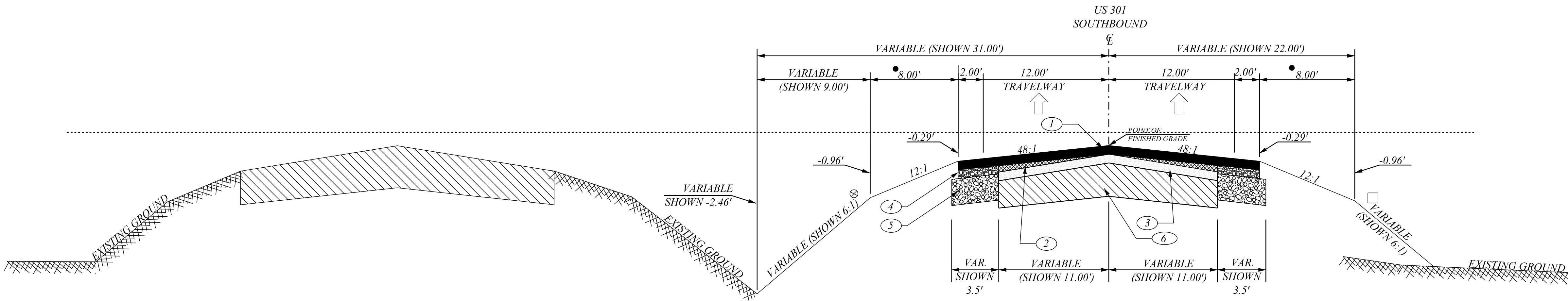
COUNTY
ORANGEBURG

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"=1' NTS	SCALE 1"=1' NTS	RTE./RD.

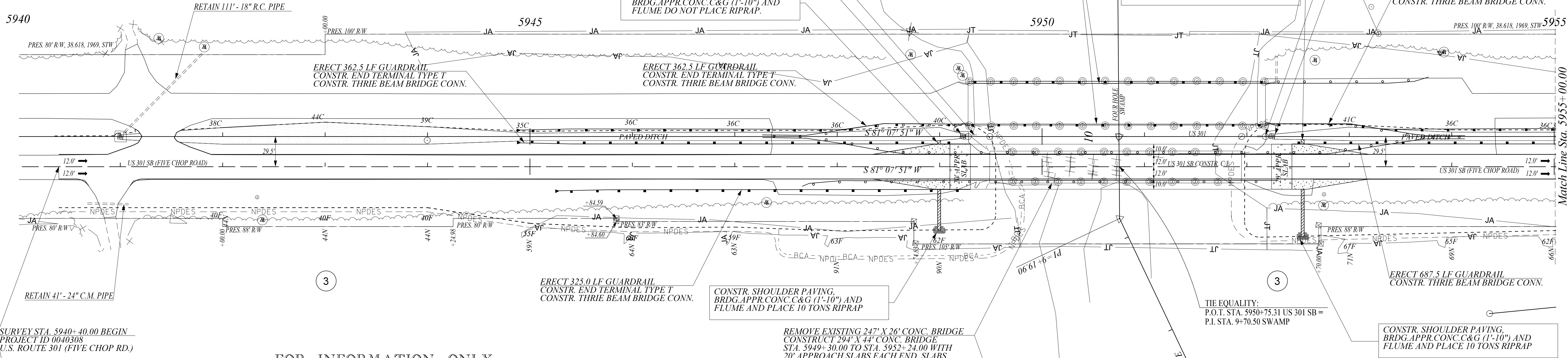
PLAN	SURVEYED	DATE
BY		
DATE		
NOTE BOOK	ALIGNED	CHECKED
NO.	RT. OF WAY	CHECKED

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

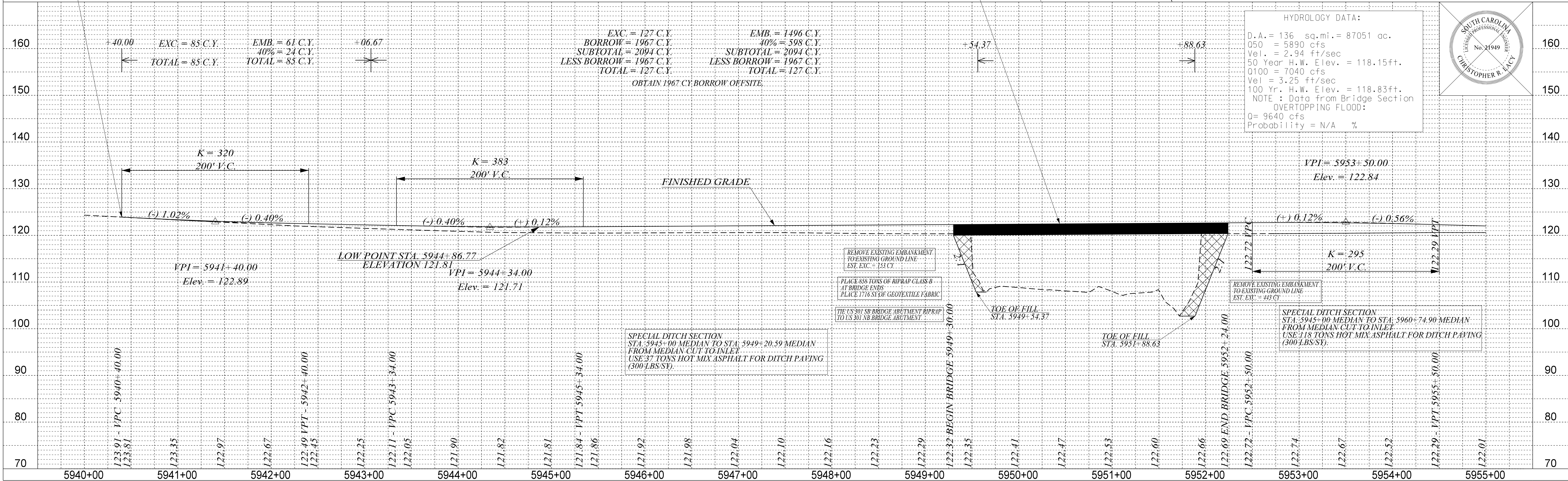
PROFILE	SURVEYED	DATE
BY		
DATE		
NOTE BOOK	GRADES CHECKED	
NO.	RAW'S NOTED	
	CONCRETE NOTATIONS CHECKED	

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	

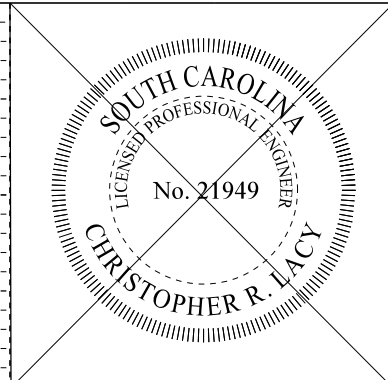
ALIGNMENT CONTROL CAN BE FOUND ON REFERENCE SHEET

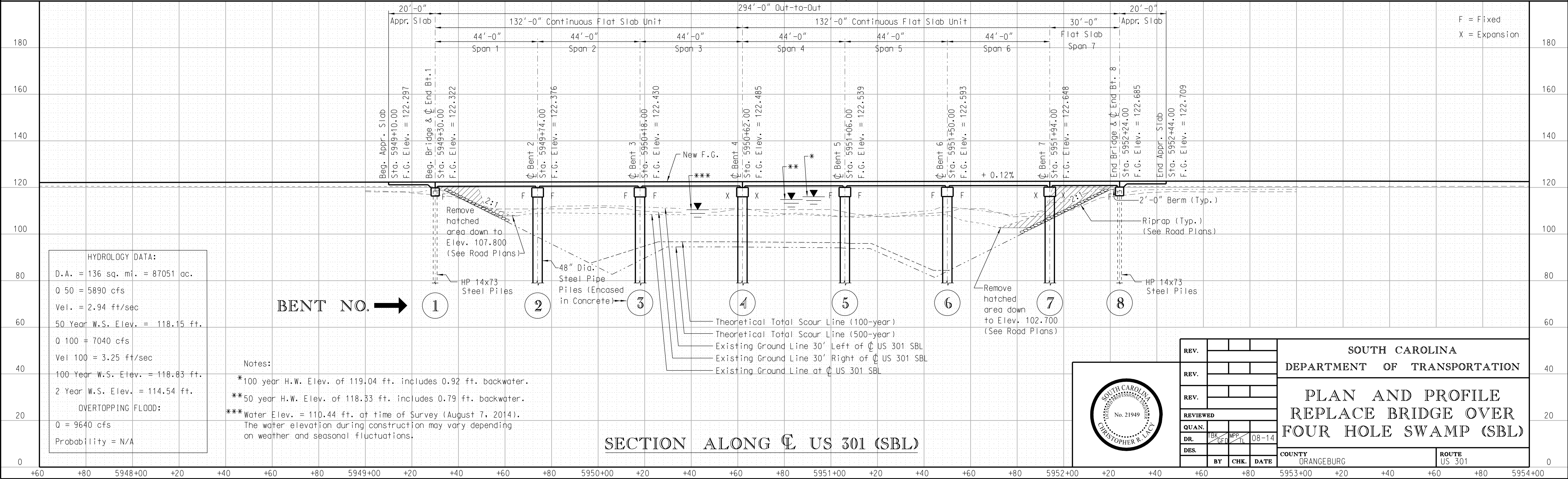
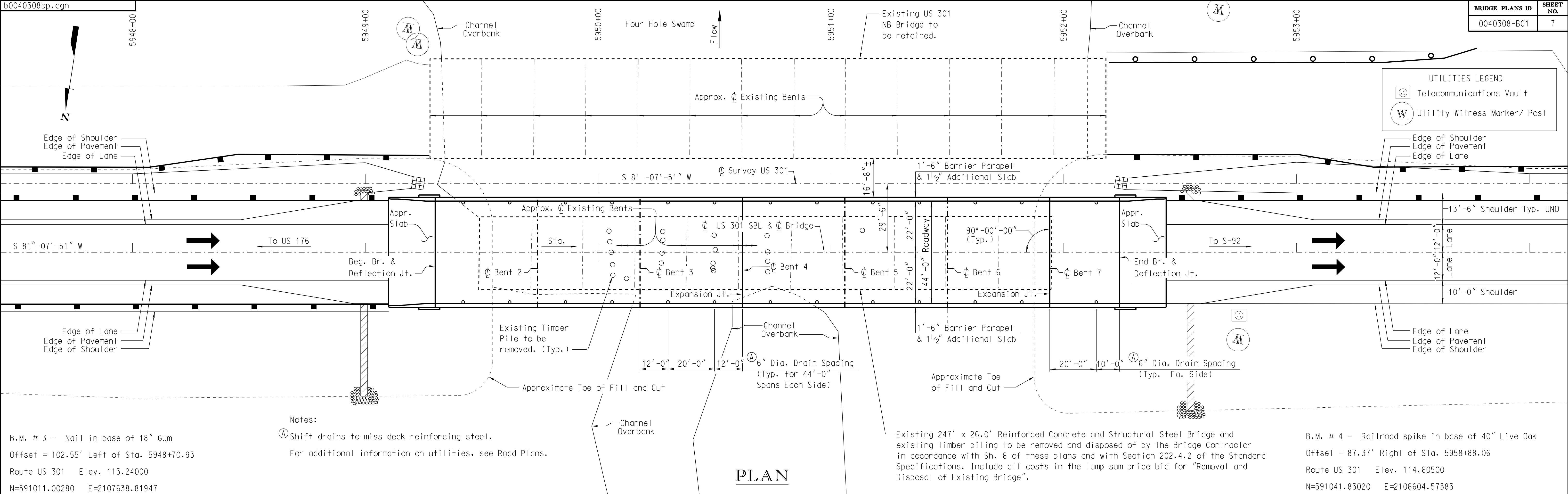


FOR INFORMATION ONLY



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 %

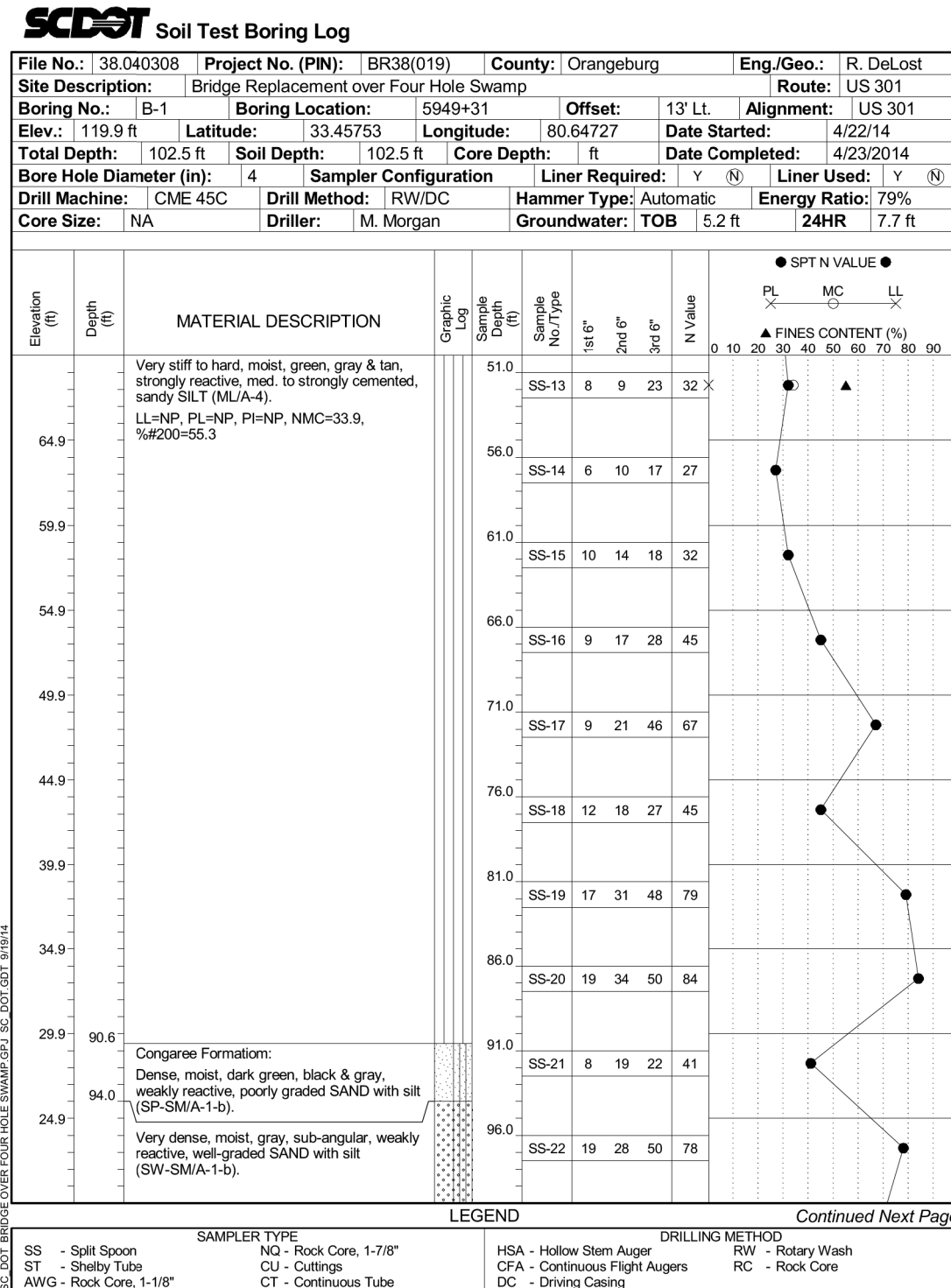
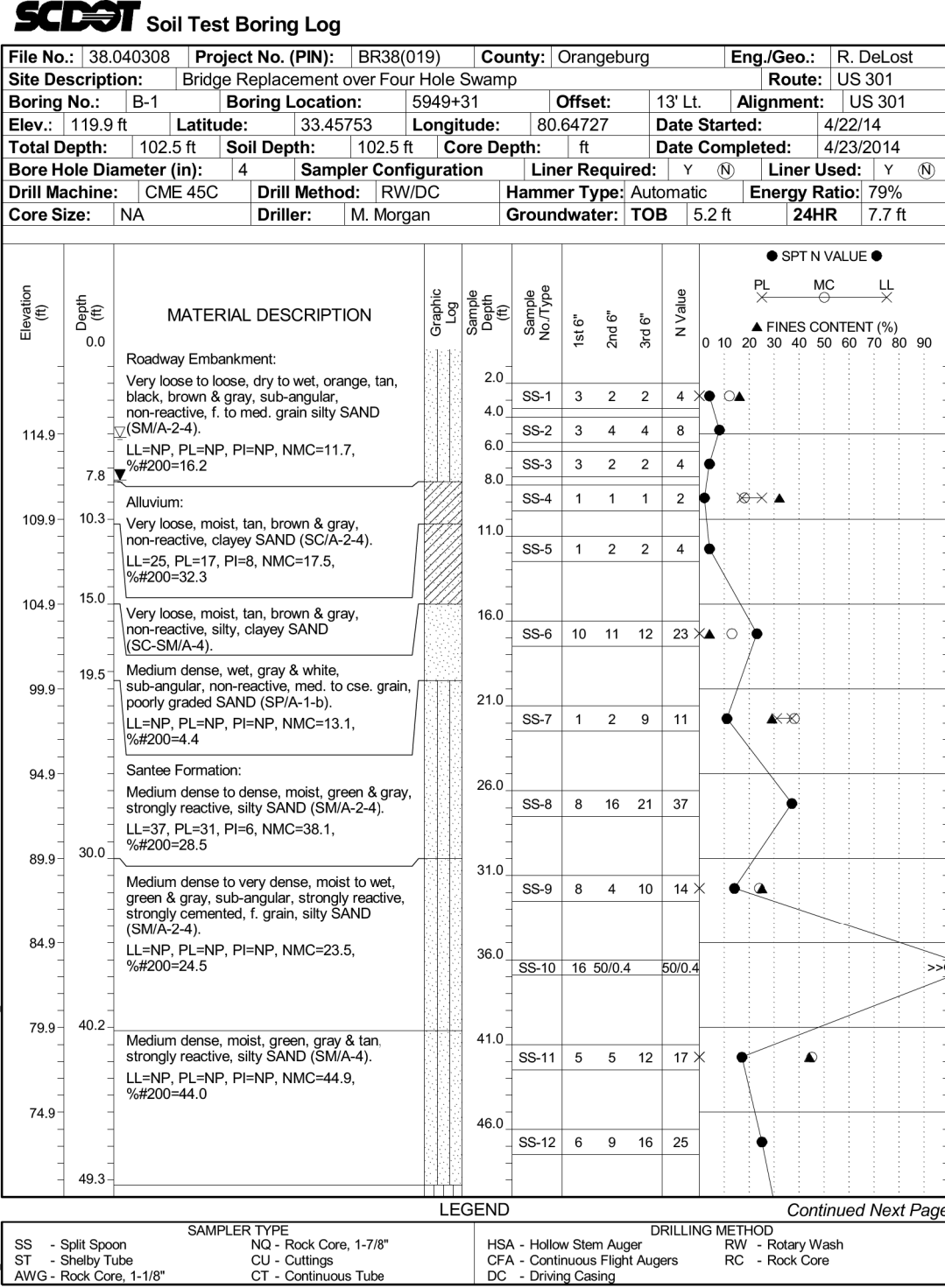


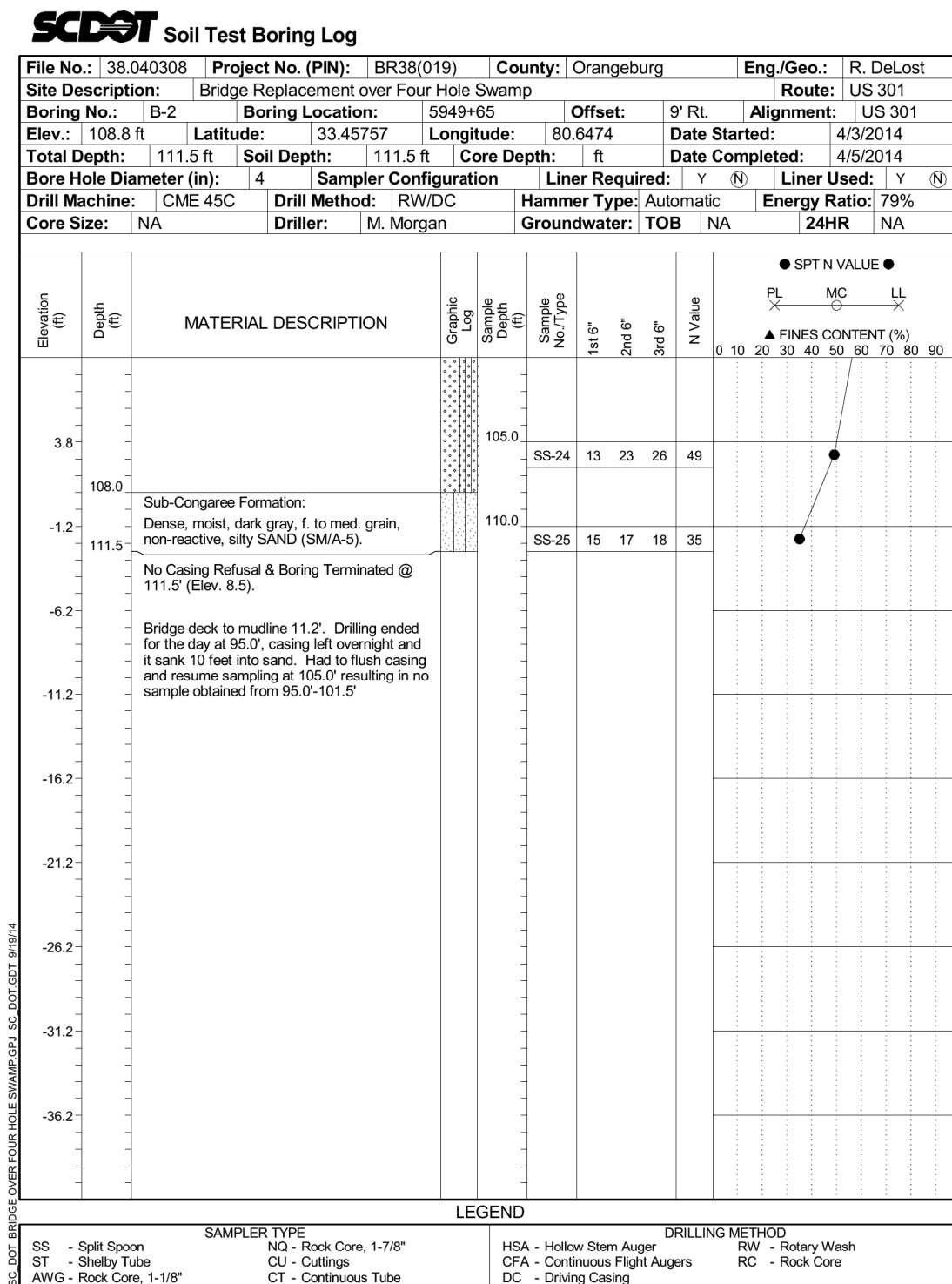
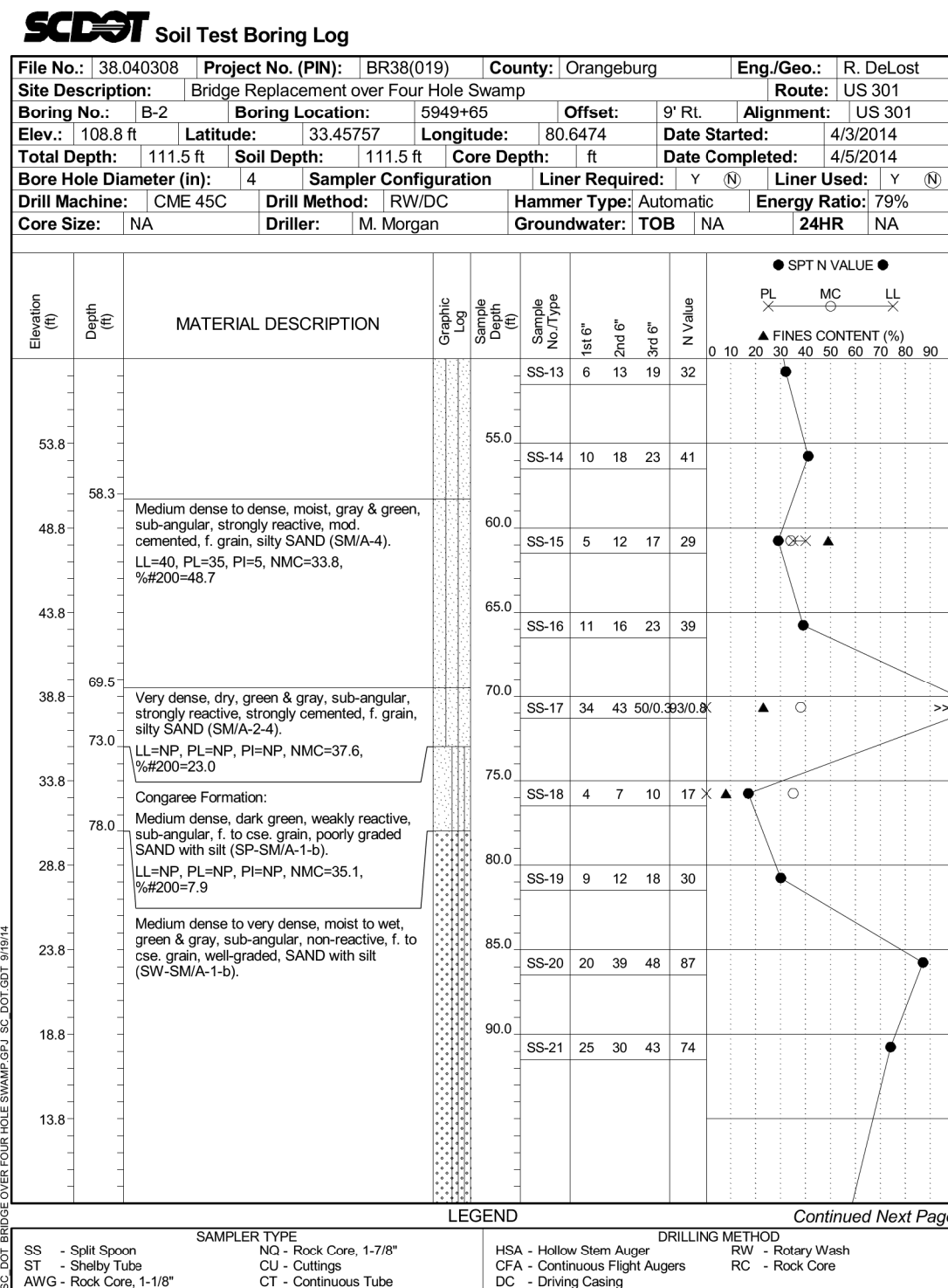




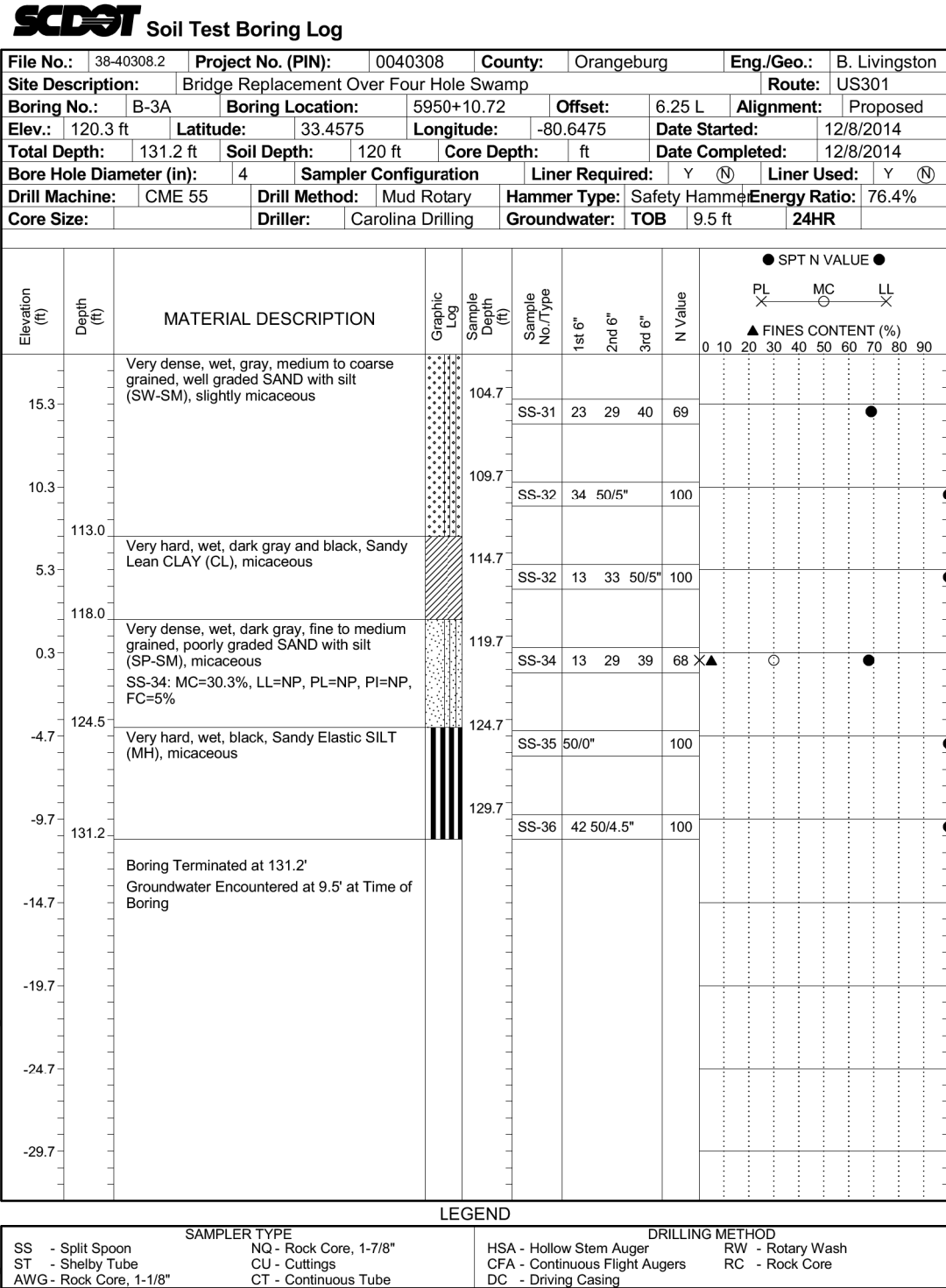
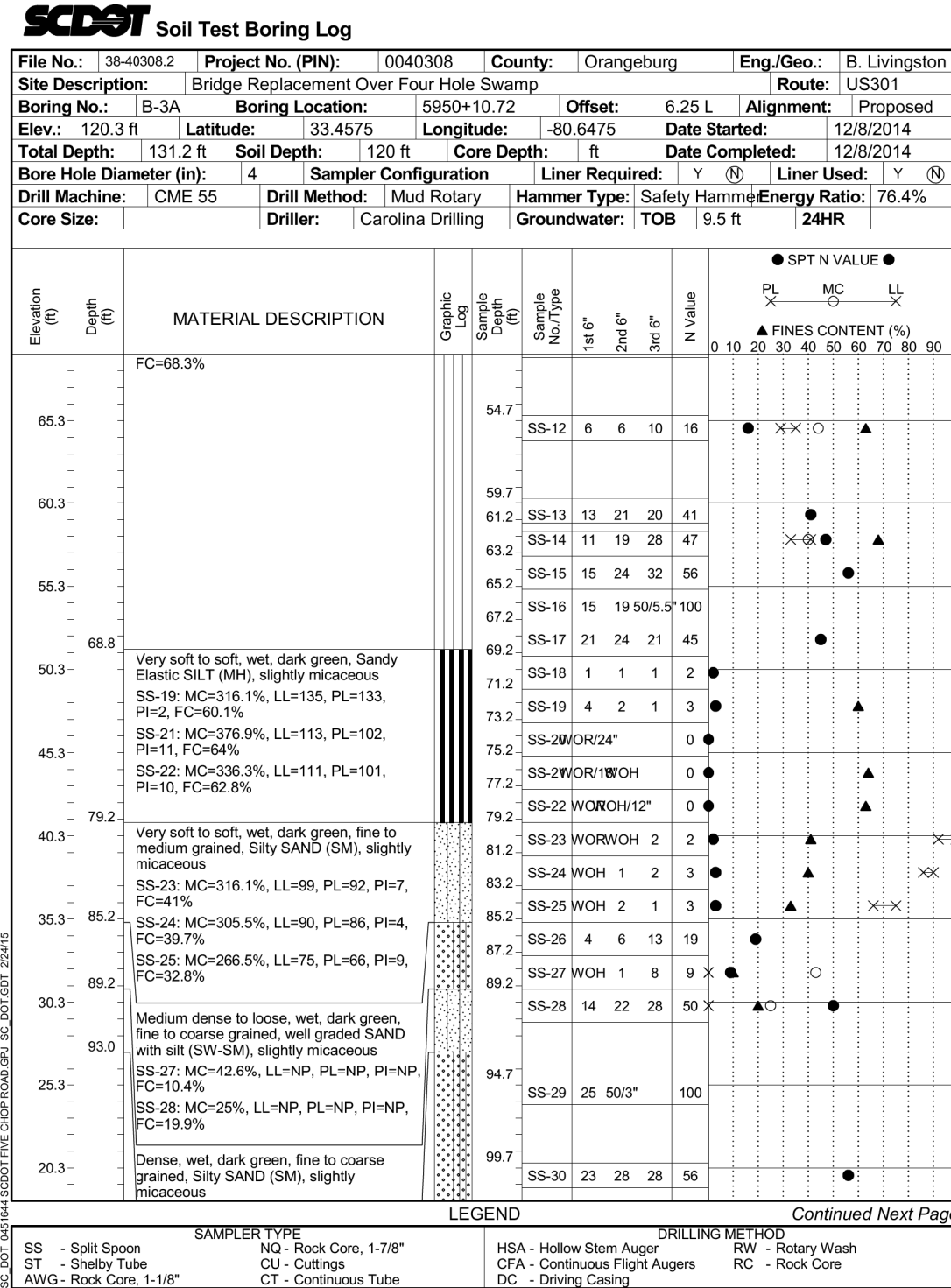
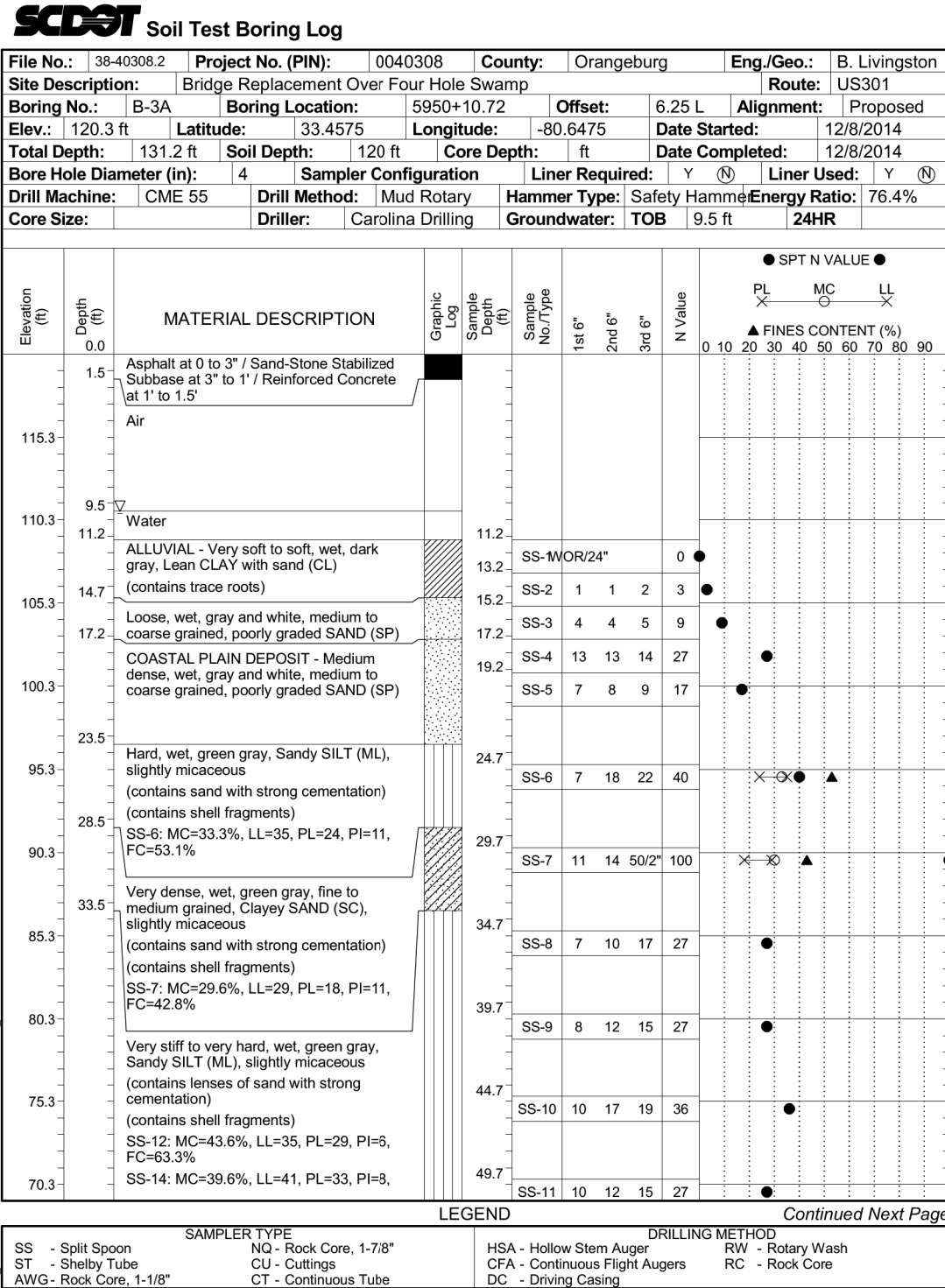
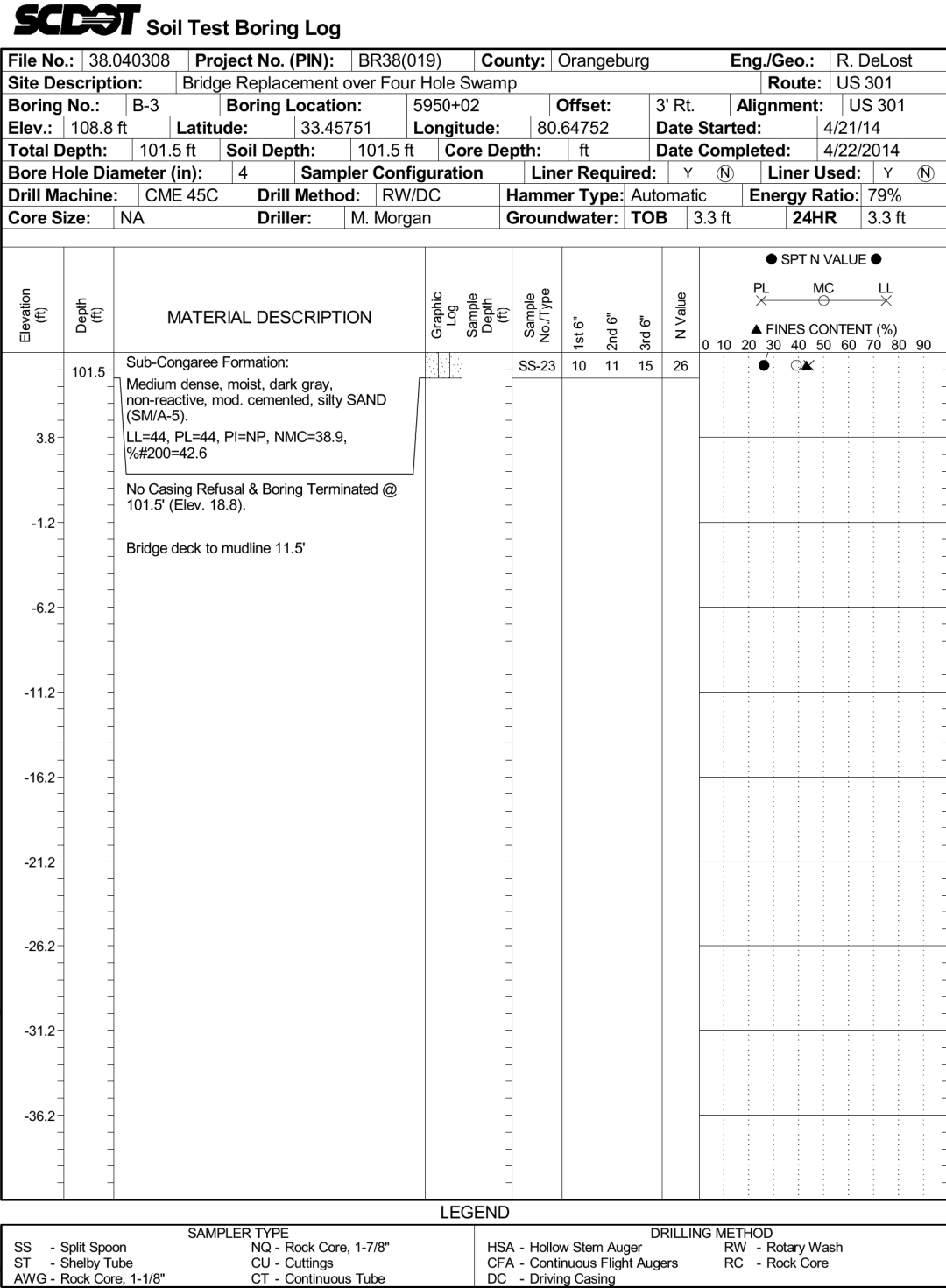
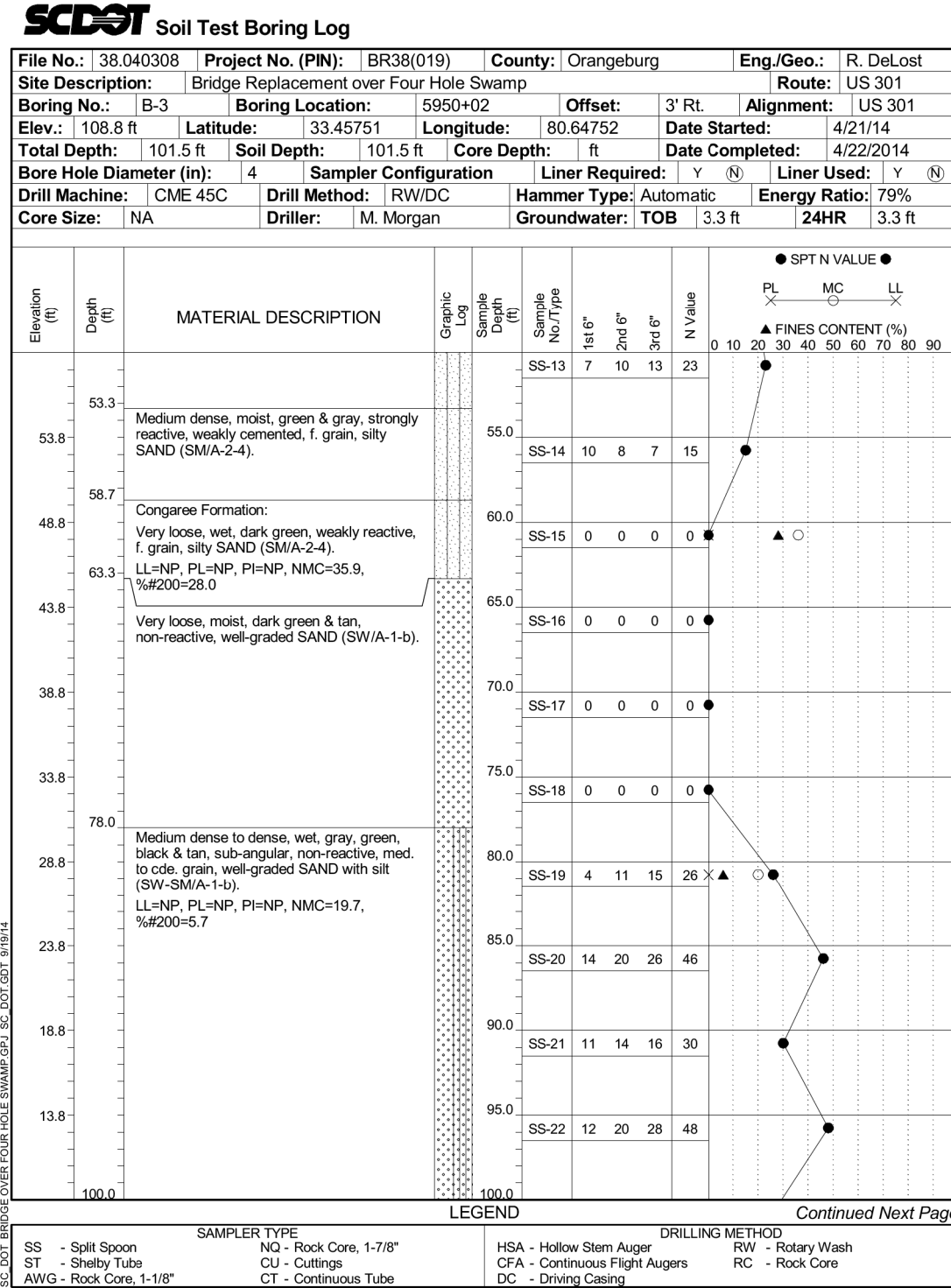
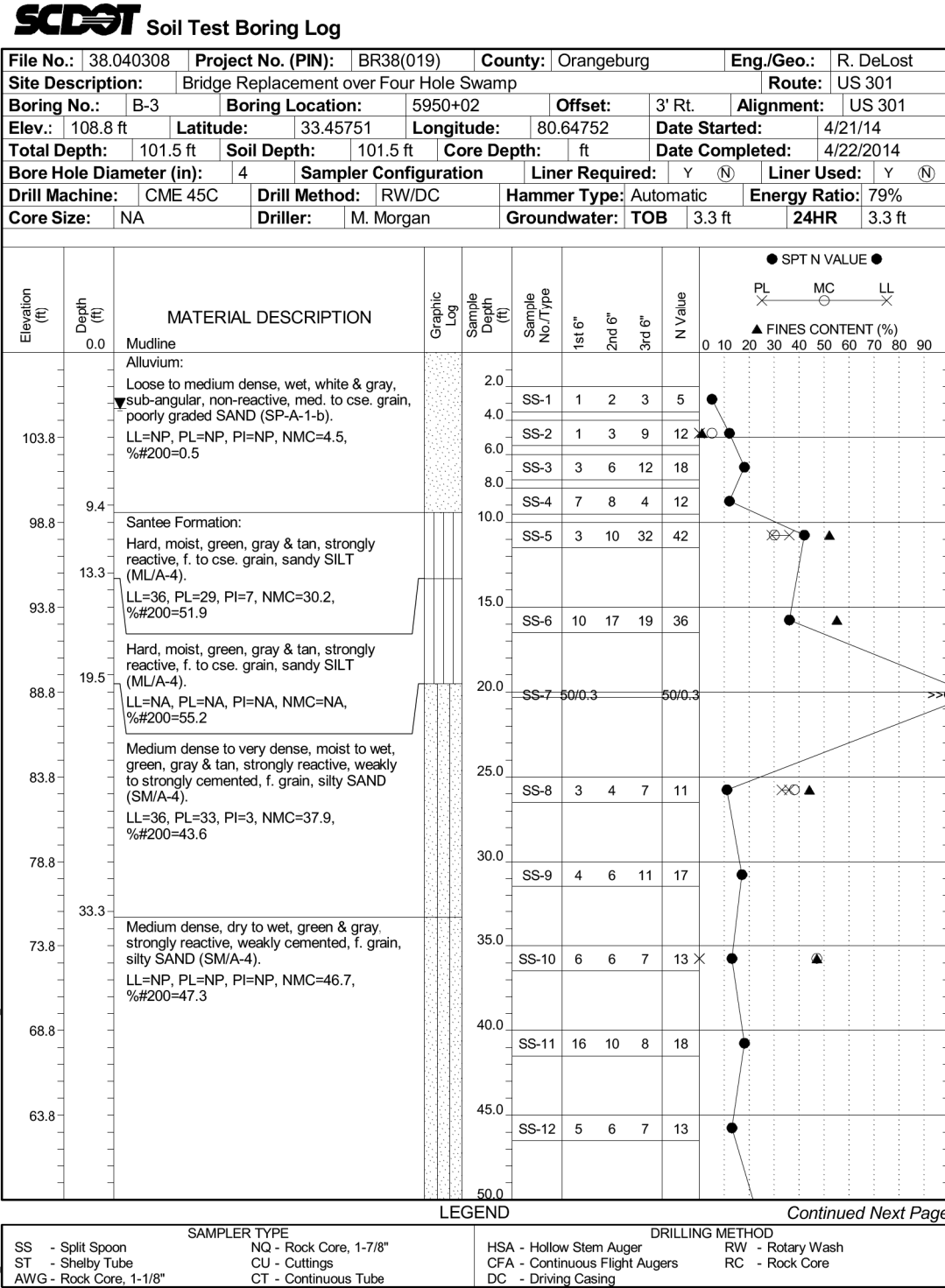
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REV.				BORING LOCATIONS			
REV.							
REVIEWED							
QUAN.							
DR.	GFD	BKB	09-16				
DES.							
	BY	CHK.	DATE	COUNTY		ROUTE	
				ORANGEBURG		US 301	





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



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QUAN.				BORING LOGS (3 OF 8)
DR.	GFD	BKB	09-16	
DES.				
BY	CHK.	DATE		
COUNTY				ORANGEBURG
ROUTE				US 301

File No.: 38.040308		Project No. (PIN): BR38(019)		County: Orangeburg		Eng./Geo.: R. Delost	
Description: Bridge Replacement over Four Hole Swamp				Route: US 301		US 301	
Boring No.: 1		Boring Location: 5950+42		Offset:	ft	Alignment:	US 301
Elev.: 107.9 ft		Latitude: 33.45754		Longitude: 80.64764		Date Started: 4/5/2014	
Total Depth: 101.5 ft		Soil Depth: 101.5 ft		Core Depth: ft		Date Completed: 4/6/2014	
Bore Hole Diameter: 4" Sampler Configuration				Liner Required: Y		Liner Used: Y	
Drill Machine: CME 45C		Drill Method: RW/DCC		Hammer Type: Automatic		Energy Ratio: 75%	
Core Size (in):		Driller: M. Morgan		Groundwater: LT		24HR	

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	SPT	N ₆₀	N ₁₀₀	N ₁₅₀	N ₂₀₀	N ₂₅₀	N ₃₀₀	N ₃₅₀	N ₄₀₀	N ₄₅₀	N ₅₀₀	N ₅₅₀	N ₆₀₀	N ₆₅₀	N ₇₀₀	N ₇₅₀	N ₈₀₀	N ₈₅₀	N ₉₀₀	N ₉₅₀	N ₁₀₀₀	N ₁₀₅₀	N ₁₁₀₀	N ₁₁₅₀	N ₁₂₀₀	N ₁₂₅₀	N ₁₃₀₀	N ₁₃₅₀	N ₁₄₀₀	N ₁₄₅₀	N ₁₅₀₀	N ₁₅₅₀	N ₁₆₀₀	N ₁₆₅₀	N ₁₇₀₀	N ₁₇₅₀	N ₁₈₀₀	N ₁₈₅₀	N ₁₉₀₀	N ₁₉₅₀	N ₂₀₀₀	N ₂₀₅₀	N ₂₁₀₀	N ₂₁₅₀	N ₂₂₀₀	N ₂₂₅₀	N ₂₃₀₀	N ₂₃₅₀	N ₂₄₀₀	N ₂₄₅₀	N ₂₅₀₀	N ₂₅₅₀	N ₂₆₀₀	N ₂₆₅₀	N ₂₇₀₀	N ₂₇₅₀	N ₂₈₀₀	N ₂₈₅₀	N ₂₉₀₀	N ₂₉₅₀	N ₃₀₀₀	N ₃₀₅₀	N ₃₁₀₀	N ₃₁₅₀	N ₃₂₀₀	N ₃₂₅₀	N ₃₃₀₀	N ₃₃₅₀	N ₃₄₀₀	N ₃₄₅₀	N ₃₅₀₀	N ₃₅₅₀	N ₃₆₀₀	N ₃₆₅₀	N ₃₇₀₀	N ₃₇₅₀	N ₃₈₀₀	N ₃₈₅₀	N ₃₉₀₀	N ₃₉₅₀	N ₄₀₀₀	N ₄₀₅₀	N ₄₁₀₀	N ₄₁₅₀	N ₄₂₀₀	N ₄₂₅₀	N ₄₃₀₀	N ₄₃₅₀	N ₄₄₀₀	N ₄₄₅₀	N ₄₅₀₀	N ₄₅₅₀	N ₄₆₀₀	N ₄₆₅₀	N ₄₇₀₀	N ₄₇₅₀	N ₄₈₀₀	N ₄₈₅₀	N ₄₉₀₀	N ₄₉₅₀	N ₅₀₀₀	N ₅₀₅₀	N ₅₁₀₀	N ₅₁₅₀	N ₅₂₀₀	N ₅₂₅₀	N ₅₃₀₀	N ₅₃₅₀	N ₅₄₀₀	N ₅₄₅₀	N ₅₅₀₀	N ₅₅₅₀	N ₅₆₀₀	N ₅₆₅₀	N ₅₇₀₀	N ₅₇₅₀	N ₅₈₀₀	N ₅₈₅₀	N ₅₉₀₀	N ₅₉₅₀	N ₆₀₀₀	N ₆₀₅₀	N ₆₁₀₀	N ₆₁₅₀	N ₆₂₀₀	N ₆₂₅₀	N ₆₃₀₀	N ₆₃₅₀	N ₆₄₀₀	N ₆₄₅₀	N ₆₅₀₀	N ₆₅₅₀	N ₆₆₀₀	N ₆₆₅₀	N ₆₇₀₀	N ₆₇₅₀	N ₆₈₀₀	N ₆₈₅₀	N ₆₉₀₀	N ₆₉₅₀	N ₇₀₀₀	N ₇₀₅₀	N ₇₁₀₀	N ₇₁₅₀	N ₇₂₀₀	N ₇₂₅₀	N ₇₃₀₀	N ₇₃₅₀	N ₇₄₀₀	N ₇₄₅₀	N ₇₅₀₀	N ₇₅₅₀	N ₇₆₀₀	N ₇₆₅₀	N ₇₇₀₀	N ₇₇₅₀	N ₇₈₀₀	N ₇₈₅₀	N ₇₉₀₀	N ₇₉₅₀	N ₈₀₀₀	N ₈₀₅₀	N ₈₁₀₀	N ₈₁₅₀	N ₈₂₀₀	N ₈₂₅₀	N ₈₃₀₀	N ₈₃₅₀	N ₈₄₀₀	N ₈₄₅₀	N ₈₅₀₀	N ₈₅₅₀	N ₈₆₀₀	N ₈₆₅₀	N ₈₇₀₀	N ₈₇₅₀	N ₈₈₀₀	N ₈₈₅₀	N ₈₉₀₀	N ₈₉₅₀	N ₉₀₀₀	N ₉₀₅₀	N ₉₁₀₀	N ₉₁
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File No.: 38.040308		Project No. (PIN): BR38(019)		County: Orangeburg		Eng./Geo.: R. DeLust	
Site Description: Bridge Replacement over Four Hole Swamp		Boring No.: 0550-42		Offset: 80.64/764		Route: US 301	
Boring No.: B-4		Boring Location:		Alignment: 115.301			
Elev.: 107.9 ft	Latitude: 33.45754	Longitude: 80.64764	Date Started: 4/5/2014				
Total Depth: 101.5 ft	Soil Depth: 101.5 ft	Core Depth: ft	Date Completed: 4/6/2014				
Bore Hole Diameter (in): 4		Sampler Configuration		Liner Required: Y (N)	Liner Used: Y (N)		
Drill Machine: CME-45C		Drill Method: HWDC		Hammer Type: Automatic	Energy Ratio: 79%		
Core Size: NA		Driller: M. Morgan		Groundwater: TQD	NA	24HR	NA

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	No. Tests	Fines Content (%)
52.9	48.6	LL=37, PL=34, PI=3, NMC=36.0, %a200=42.6		SS-13	12	15	21
47.9	53.6	Medium dense to very dense, moist, gray, tan & green, strongly reactive, weakly cemented areas, fine grain, silty SAND (SM-A2-4)		SS-16	16	18	33
63.3	38.2	LL=36, PL=33, PI=3, NMC=33.4, %a200=33.5		SS-17	6	7	13
32.9	68.6	Very dense, moist, gray, tan & green, weakly to strongly cemented, fine grain, silty SAND (SM-A2-4)		SS-18	14	16	19
27.9	73.6	LL=33, PL=30, PI=3, NMC=22.7, %a200=27.3		SS-19	23	38	50.0/28.0
22.9	78.6	Conglomerate Formation: Very dense, moist, dark green, gray & tan, sub-angular, strongly reactive, fine to med. grain, poorly graded SAND with silt (SP-SMA-1-0)		SS-20	15	25	41
17.9	83.6	Very dense, wet, gray & green, sub-angular, non to weakly reactive, med. to coarse grain, well-graded SAND with silt (SW-SMA-1-0)		SS-21	20	28	48
12.9	88.6			SS-22	17	32	40

SAMPLER TYPE		LEGEND		DRILLING METHOD	
SS - Split Spoon	CU - Rock Core, 1.75"	HSK - Hollow Stem Auger	RC - Rock Core	HW - Rotary Wash	
ST - Shelby Tube	CO - Coatings	CFA - Continuous Flight Augers			
AWG - Rock Core, 1.125"	CT - Continuous Tube	SW - Shallow Girding			

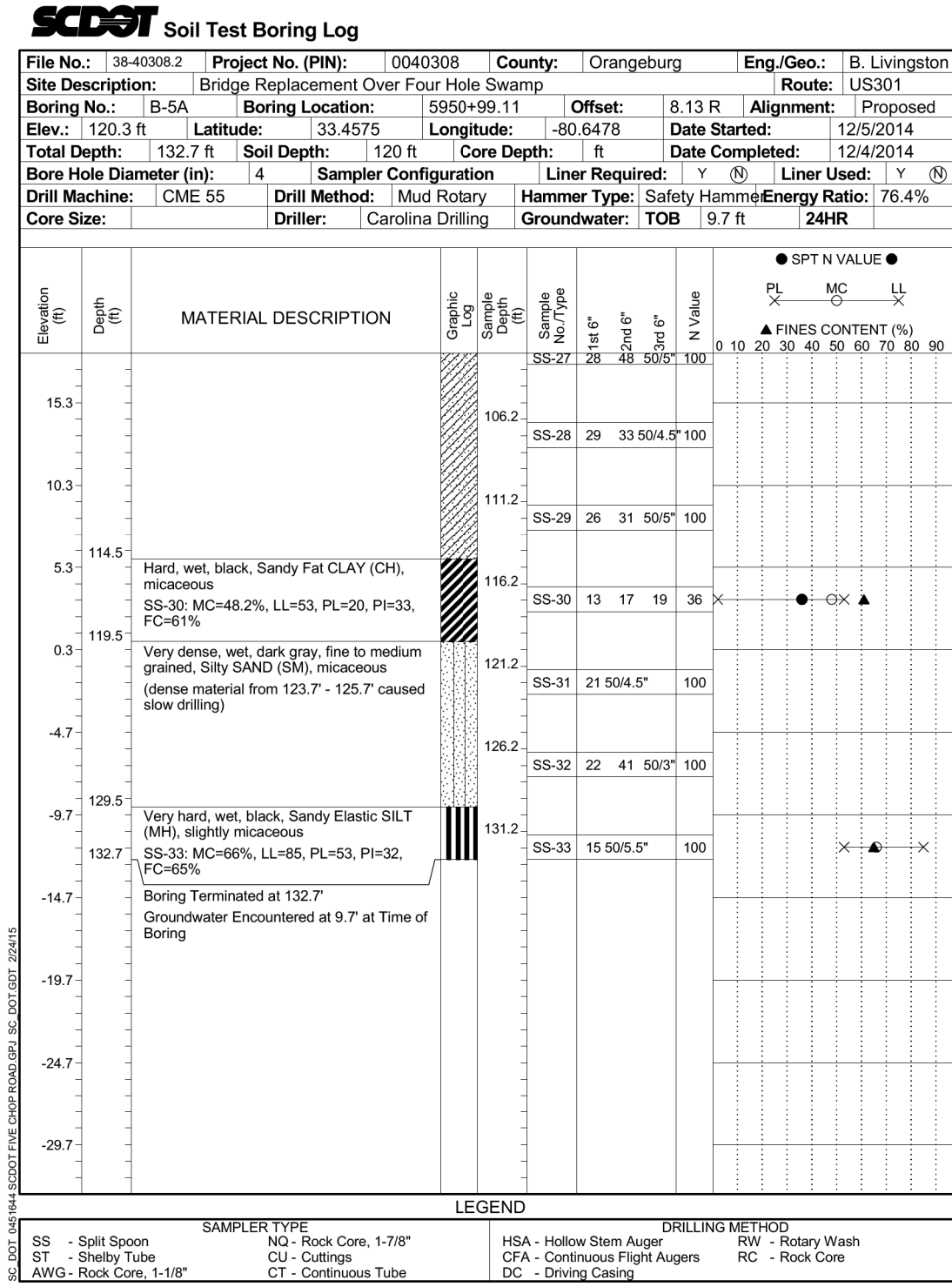
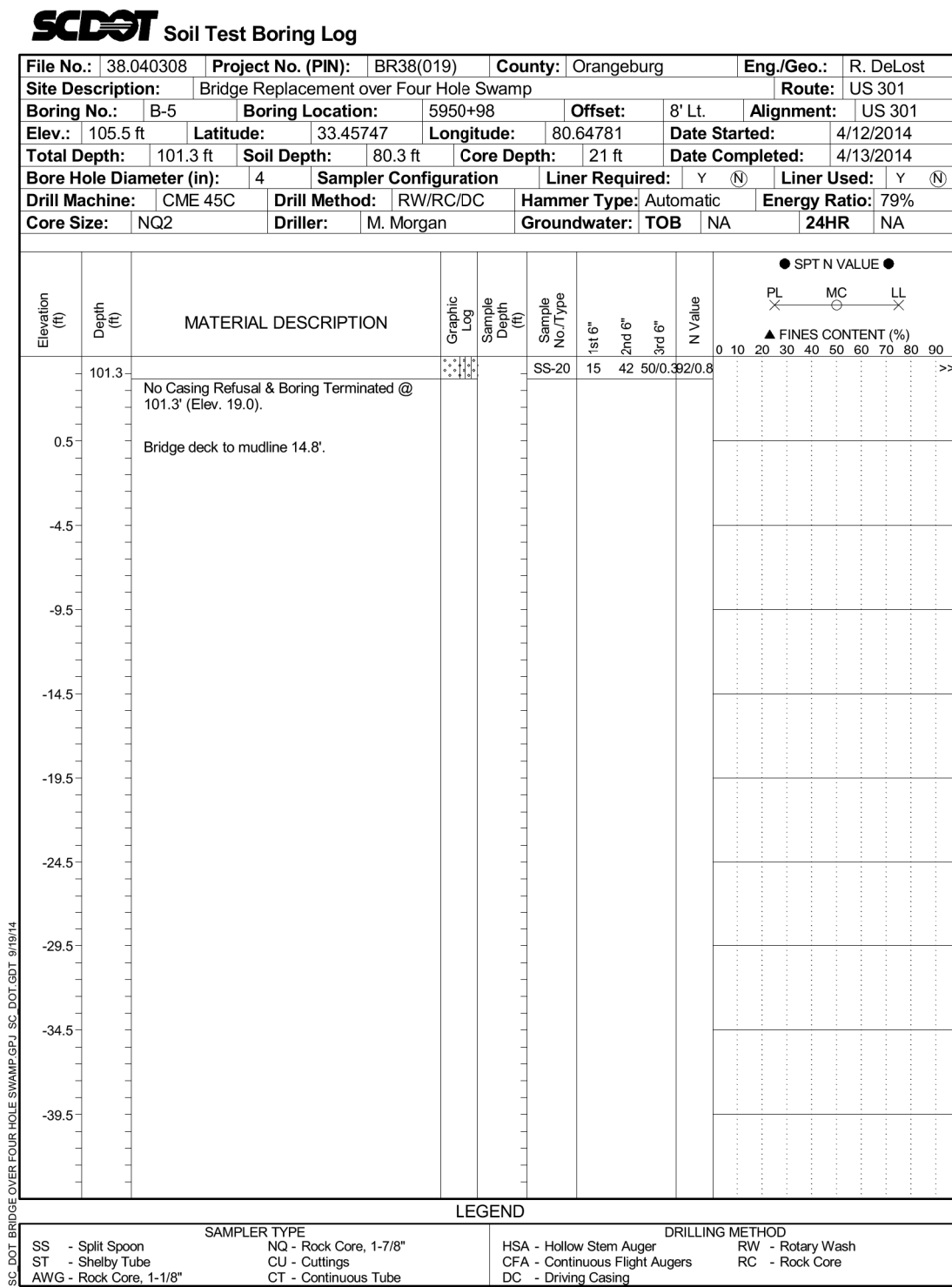
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File No.:	38.040308	Project No. (PIN):	BR38(019)	County:	Orangeburg	Eng./Geo.:	R. DeLost	
Site Description:	Bridge Replacement over Four Hole Swamp						Route:	US 301
Boring No.:	B-4	Boring Location:	5950+42	Offset:	8' R/L	Alignment:	I US 301	
Elev.:	107.9 ft	Latitude:	33.45754	Longitude:	80.64764	Date Started:	4/5/2014	
Total Depth:	101.5 ft	Soil Depth:	101.5 ft	Core Depth:	ft	Date Completed:	4/5/2014	
Bore Hole Diameter (in.):	4	Sampler Configuration		Liner Required:	Y (N)	Liner Used:	Y (N)	
Drill Machine:	CME 45C	Drill Method:	RWD/C	Hammer Type:	Automatic	Energy Ratio:	79%	
Core Size:	NA	Driller:	M. Morgan	Groundwater:	TOB NA	24HR	NA	

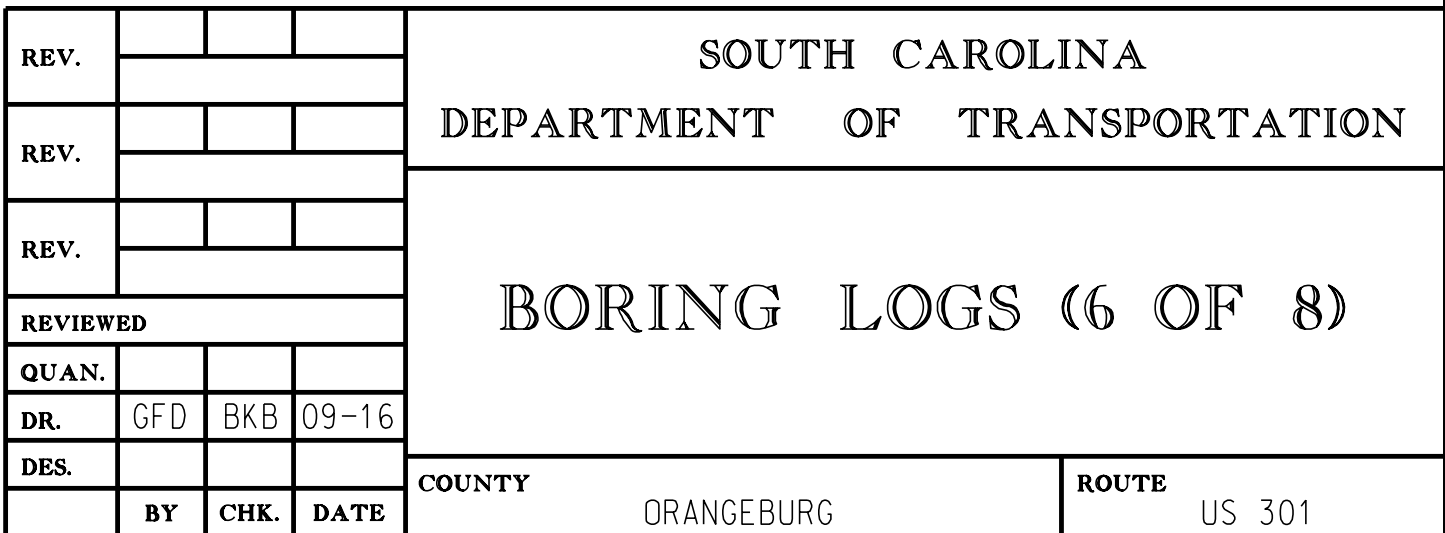
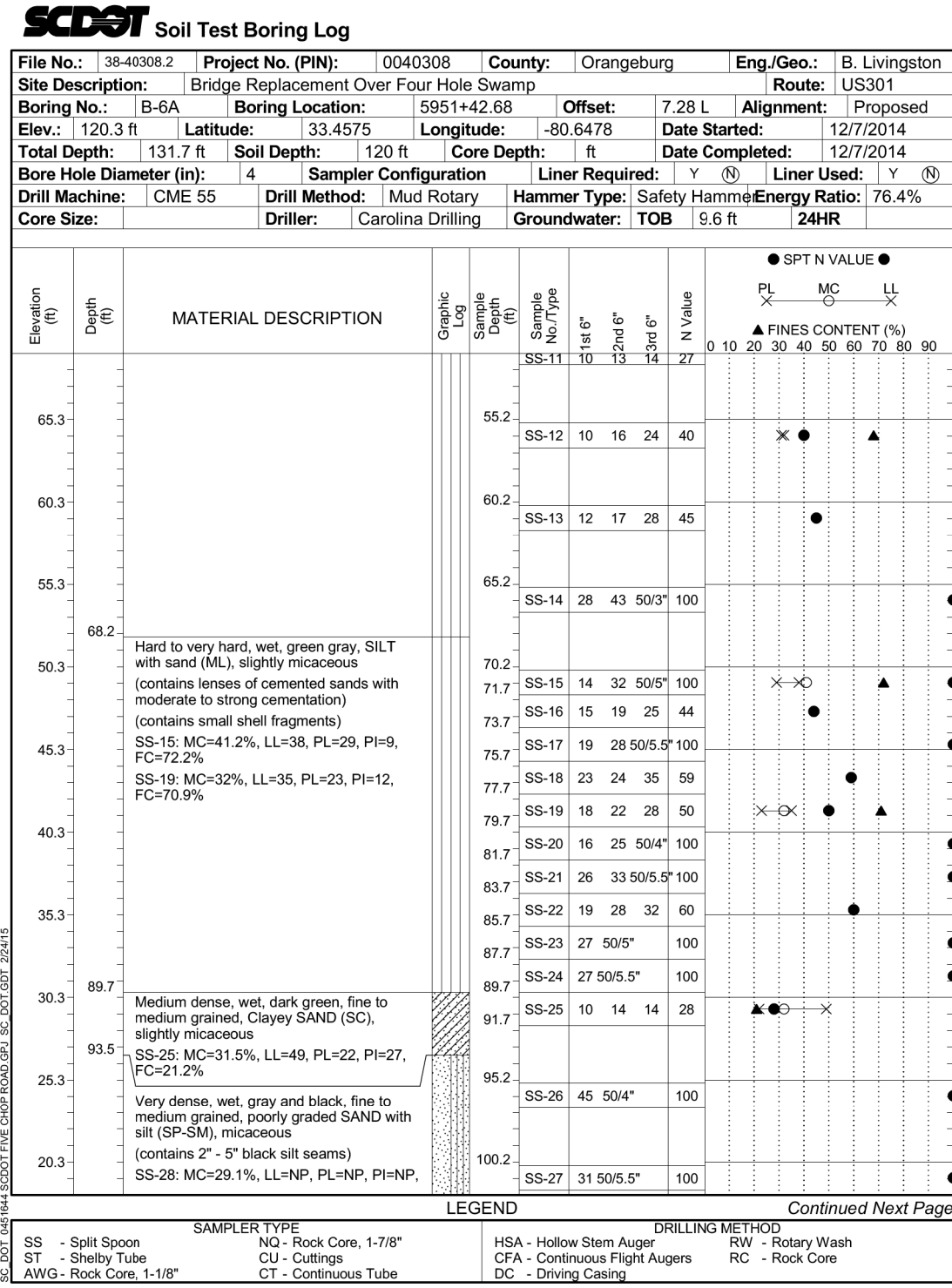
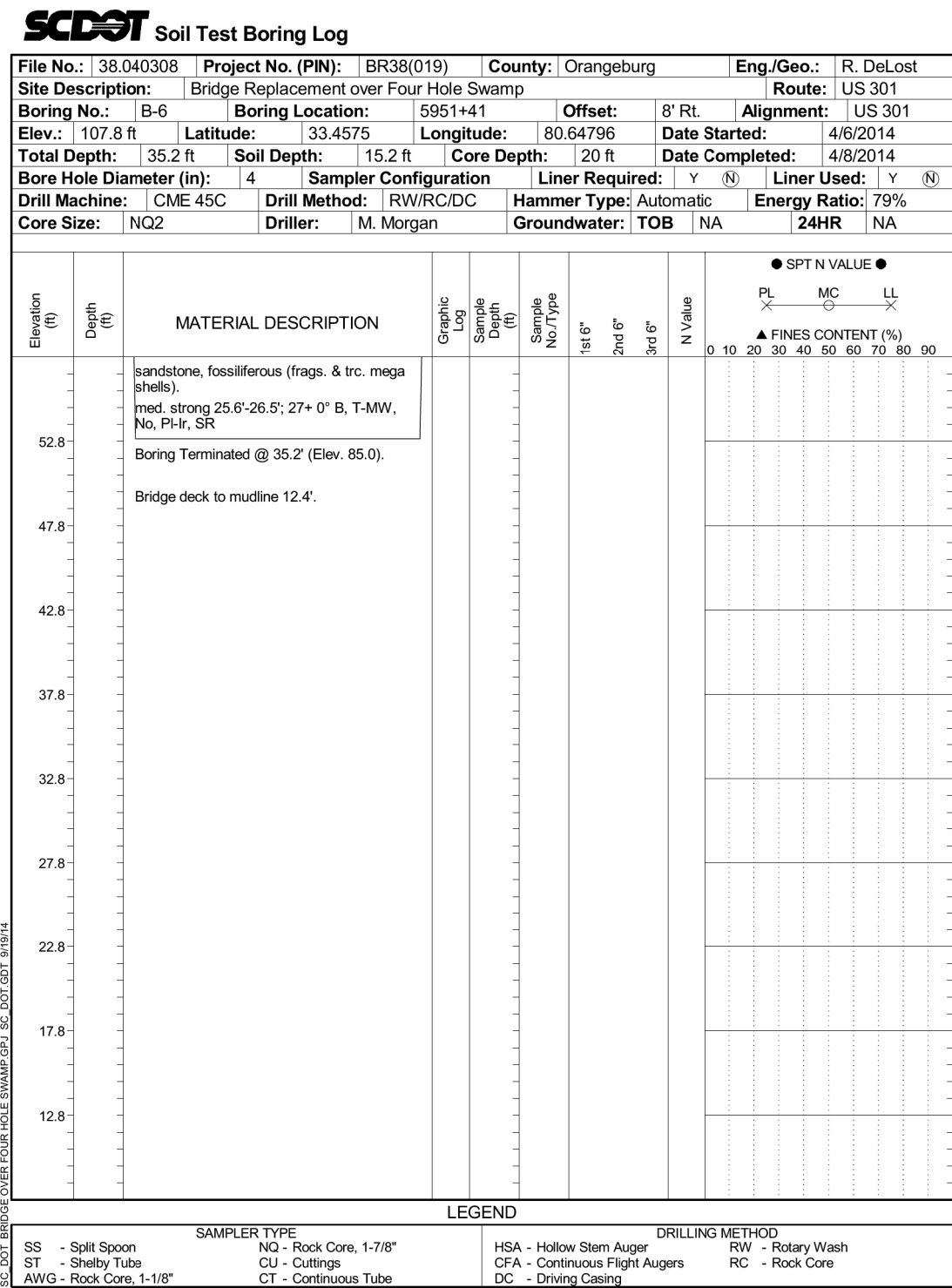
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log [Symbol]	Sample Depth (ft)	Samples No./Type	Hole # Size (")	SPT Blow (F) No./ft	N Value	FINES CONTENT (%)			
									MC %	LL %	PL %	
		No Casing Refusal & Boring Terminated @ 101.5 (Elev. 18.7).	[Symbol]		SS-23	16	31	36	66			
2.9		Bridge deck to mudline 12.3.	[Symbol]									
-2.1			[Symbol]									
-7.1			[Symbol]									
-12.1			[Symbol]									
-17.1			[Symbol]									
-22.1			[Symbol]									
-27.1			[Symbol]									
-32.1			[Symbol]									
-37.1			[Symbol]									

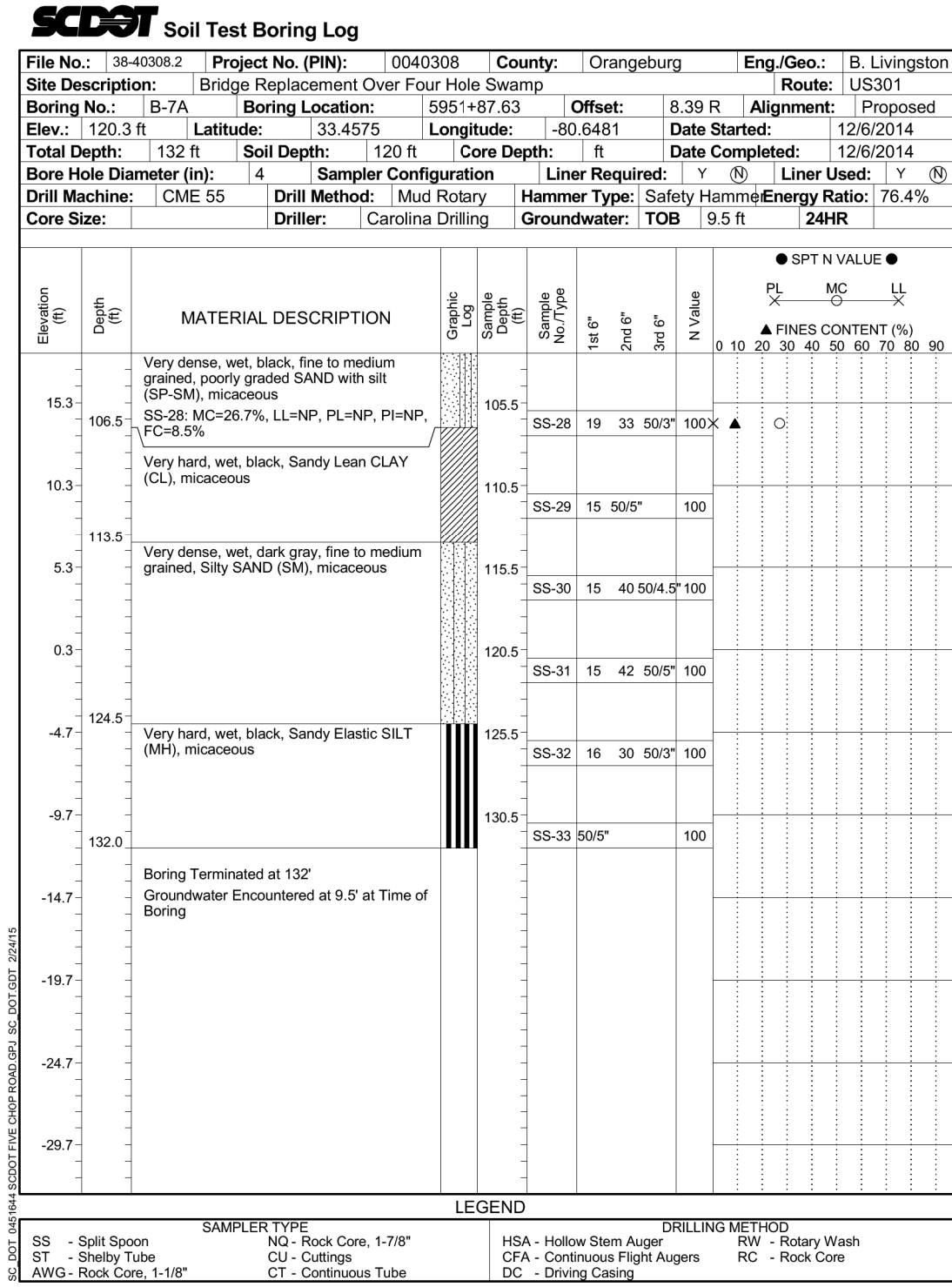
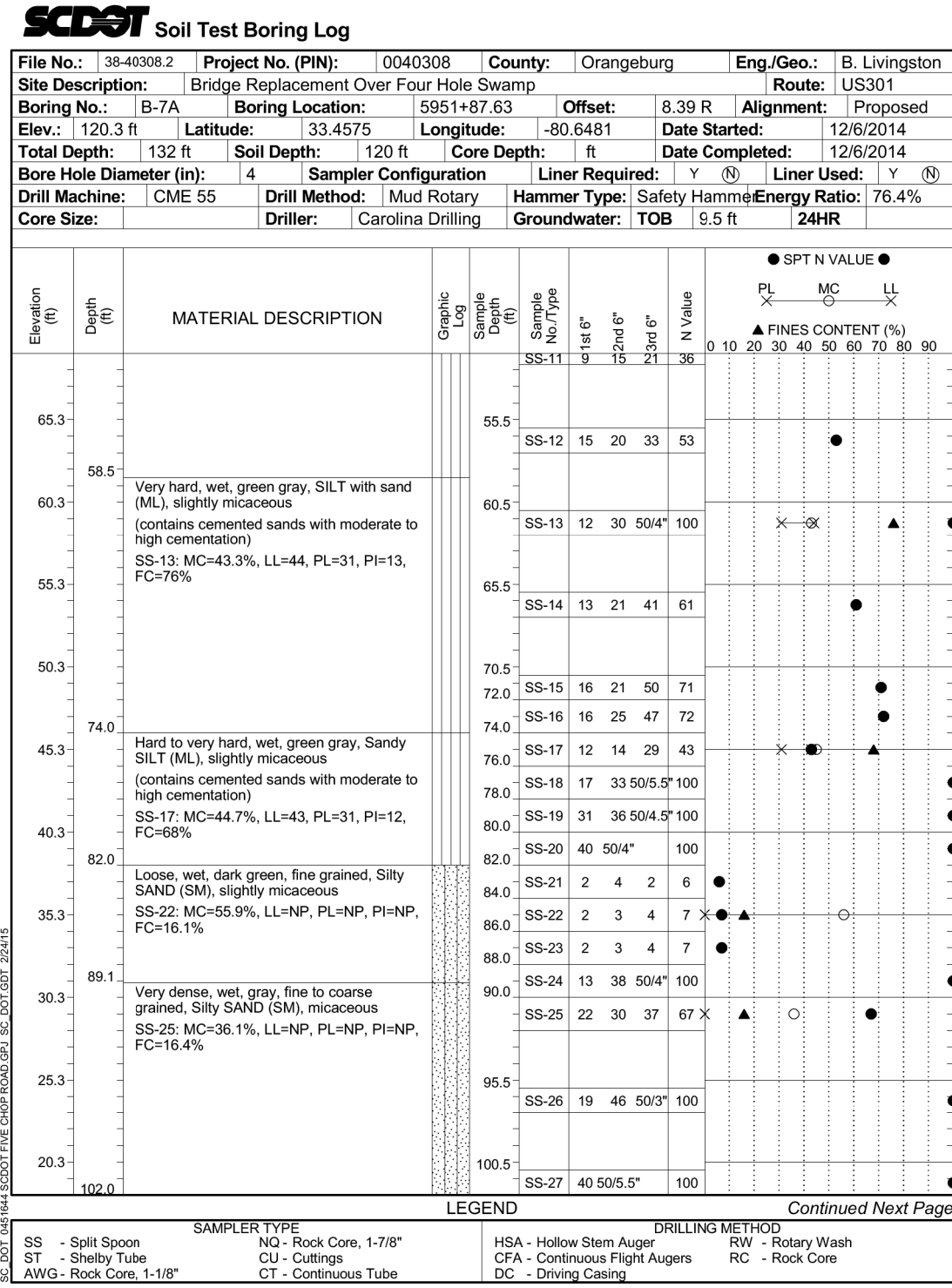
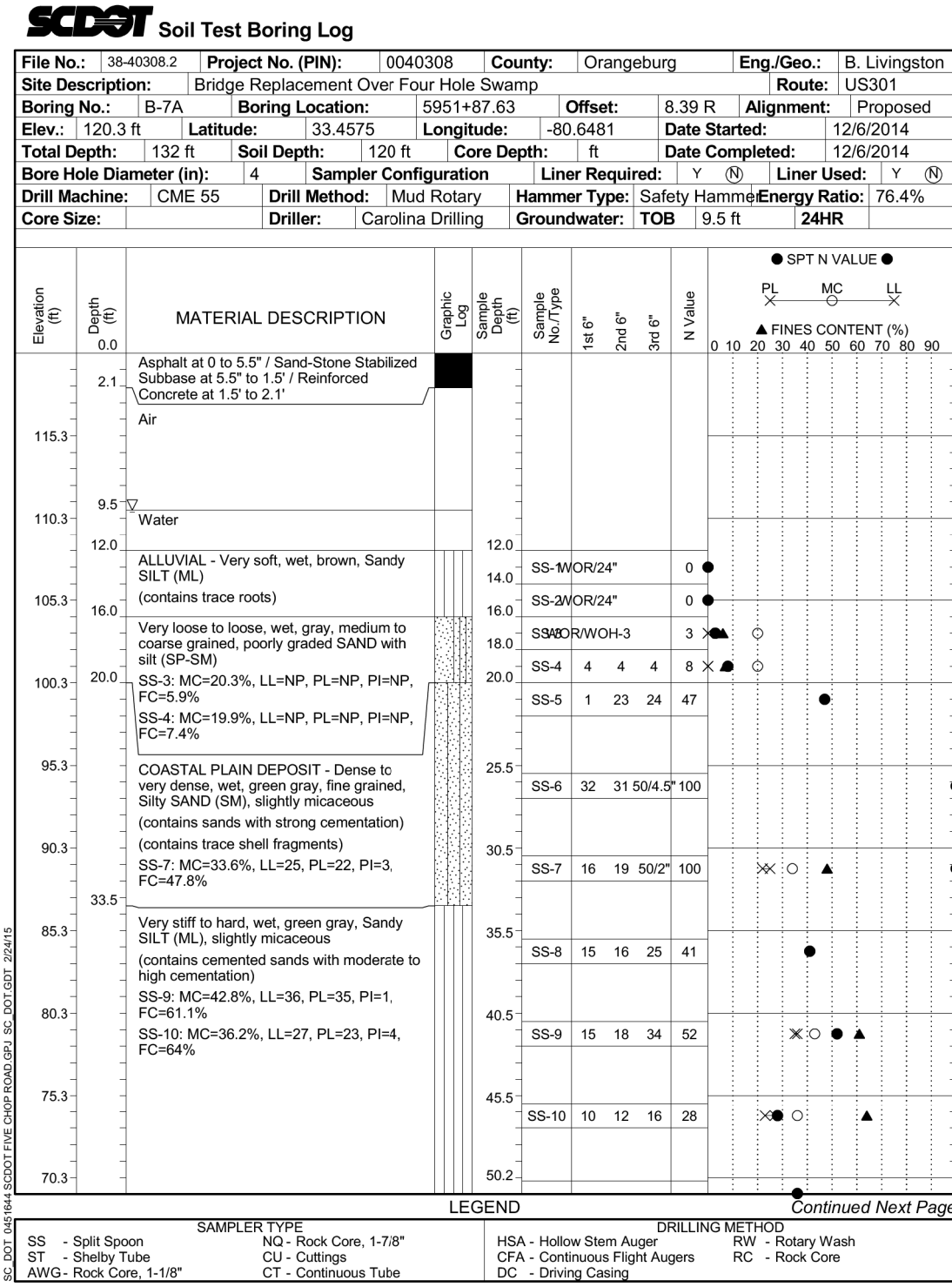
LEGEND		
SAMPLER TYPE	DRILLING METHOD	
SS - Split Spoon	HSA - Hollow Stem Auger	
SH - Shelby Tube	CFA - Continuous Flight Augers	
AWG - Rock Core, 1.18"	CS - Churn Casting	
NQ - Rock Core, 1.78"	RC - Rock Core	
CT - Continuous Tube		

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DES.							
	BY	CHK.	DATE				
				COUNTY	ORANGEBURG	ROUTE	US 301



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			ORANGEBURG	US 301

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MATERIAL DESCRIPTION

Medium Embankment:
Roadway debris, dry to moist, tan, brown & gray, sub-angular, non-reactive, 1 to coarse gran, well-sorted SAND with silts (SW SMA-2-4).
LL-NP, PL-NP, PH-NP, NMC#3.4, I_N(2000)=11.9

Alluvium:
Very loose to medium dense, dry to moist, tan, brown & gray, sub-angular, non to weakly reactive, v. to co. gran, poorly graded SAND (SPFA-1-3).
LL-NP, PL-NP, PH-NP, NMC#3.4, I_N(2000)=20.1
Very loose, moist to wet, dark gray, sub-angular, non-reactive, 1/8 gran, silty SAND (SMA-2-4).
LL-NP, PL-NP, PH-NP, NMC#15.0, I_N(2000)=1.8

Siltstone Formation:
Dense to very dense, moist, gray & green, sand strongly reactive, mod. to strongly cemented, f. to med. gran, silty SAND (SMA-4-4).

Casting Refill(s) @ 30' -4': Begin coming in as Cancellidone Sandstone.

Tan-rt grey, fl. green-tan, black-black-brown, l. to med. gran w/ilcast. sec. frags., litary to thickly bedded,
quartz-clastic-phosphate, mod. to highly weathered, v. weak to weak, friable in parts-seams mod. hardwires, VC (concretionizing, seaming calcareous), fossiliferous (frags. & mega shells), vulgarite texture in parts.
Invest. strong 30.4-30.9' & 35.2'-36.3'; 21° O'. B-T.M.W. No. II, Sr

Calcareate: Tan-gray, lt. olive green, v.l. to gran, thin to thickly bedded, calcareate, mod. to highly weathered, v. weak to weak, friable, weathering low hardness, VC discontinuity spalling, under acid peds.

LEGEND

SAMPLE TYPE		DRILLING METHOD	
SS - Split Spoon	CU - Core Tube, 1.75"	HSA - Hollow Stem Auger	RW - Rotary Wash
SH - Shallow Tube	CI - Collings	CSA - Continuous Flight Augers	RC - Rock Core
APE - Rock Core 1.18"	CR - Concrete Tube	DW - Drilling String	

Continued Next Page

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log Depth (ft)	Sample No/Time	1st F'	2nd F'	3rd F'	N Value	SPT N VALUE								
									PL	MC	LL						
									FINES CONTENT (%)								
									10	20	30	40	50	60	70	80	90
51.3		of calcareous sandstone, fossiliferous (frag. & inc. mega shells) 116+ 0" B, T-MW, No. Pl:1r, SR, med. strong S1.1'-51.3"															
55.0		End Coring @ 51.3': Return to Casing and Sample		SS-11	7	8	14	22									
60.0		Medium dense to dense, moist, green & gray, strongly reactive, weakly cemented, f. grain, silty SAND (SM-A-1)		SS-12	10	14	22	36									
65.0				SS-13	11	16	28	44									
70.0				SS-14	10	15	25	40									
75.0				SS-15	12	17	22	39									
80.0				SS-16	15	20	24	44									
85.0				SS-17	14	18	24	42									
90.0				SS-18	12	20	19	39									
95.0				SS-19	23	38	50/0.38/0.6										
100.0																	

SAMPLER TYPE

SS - Split Spoon
ST - Shelby Tube
AUG - Rock Core 1-1/8"

NOTES

N2 - Rock Core, 1-7/8"
CU - Castings
CT - Continuous Tube

LEGEND

DRILLING METHOD

HSA - Hollow Stem Auger
CPA - Continuous Flight Auger
Shrimp Casting
RW - Rotary Wash
RC - Rock Core

Continued Next Page

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	SPT Depth (ft)	SPT No./Type	1st FT	2nd FT	3rd FT	N Value	● SPT N VALUE ●								
										PL	MC	LL	LL					
										▲ FINES CONTENT (%)								
										10	20	30	40	50	60	70	80	90
101.4		No Casing Refusal & Boring Terminated @ 101.4' (Elev. 18.6).			SS-20	25	31	500-610.6										
15.0		Could not obtain sample at 15.0' due to bore backfilling w/wash rotary, switched to mud rotary drilling. Bulk Sample #2 taken at 1' to 5' deep as per boring plan.																
10.0																		
5.0																		
0.0																		
-5.0																		
-10.0																		
-15.0																		
-20.0																		
-25.0																		

LEGEND

SS - Split Spoon ST - Shelby Tube AWG - Rock Core 1-1 1/8"	SAMPLER TYPE N2 - Rock Core, 1-7/8" CU - Cuttings CT - Continuous Tube	DRILLING METHOD HSA - Hollow Stem Auger CPA - Continuous Flight Augers DS - Driving Sledge RW - Rotary Wash RC - Rock Core
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Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Graphic Log	Drum	Type	SPT N VALUE			FINES CONTENT (%)		
						1st F'	2nd F'	3rd F'	MC	LC	
		Roading Embankment:									
		Loose, wet, tan, red & gray, sub-angular non-reactive, 1 to css, grain, silty SAND (SW/A-2.4).		2.0		11	8	3	4	7	0
115.0	4.0	LL-34, PL=18, PI=2, NMC=13.3, %R200=18.9		4.0		SS-2	2	2	3	5	0
	7.8	Alloisite:		6.0		SS-3	2	2	2	4	0
		Loose, wet, gray & tan, sub-angular non-reactive, 1 to css, grain, well-graded SAND (SW/A-1.0).		10.0		SS-4	1	1	2	3	0
110.0	10.0	LL-30, PL=19, PI=6, NMC=10.5, %R200=5.6		10.0		SS-5	0	0	2	2	0
105.0	13.3	Very loose, wet, gray & tan, sub-angular non-reactive, 1 to css, grain, poorly graded SAND with silt (GP-SW/A-3).		15.0		SS-6	13	14	27	21	0
100.0	16.5	LL-30, PL=19, PI=6, NMC=10.5, %R200=5.6		20.0		SS-7	1	33	21	54	0
95.0	20.0	Very loose, wet, gray & tan, sub-angular non-reactive, 1 to css, grain, well-graded SAND (SW/A-1.0).		25.0		SS-8	31	31	20	36	0
90.0	23.3	Very loose, wet, gray & tan, sub-angular non-reactive, 1 to css, grain, silty SAND (SW/A-2.4).		30.0		SS-9	24	24	21	35	0
85.0	26.7	Medium dense, wet, gray & tan, sub-angular non-reactive, 1 to css, grain, well-graded SAND (SW/A-1.0).		35.0		SS-10	12	8	13	21	0
80.0	30.0	LL-34, PL=28, PI=6, NMC=24.1, %R200=48.4		40.0		SS-11	9	16	11	27	0
75.0	33.3	Dense, moist, green & gray, strongly reactive, 1 grain, silty, clayey SAND (SC-SW/A-4).		45.0		SS-12	7	10	14	24	0
	36.7	LL-30, PL=22, PI=5, NMC=23.3, %R200=35.7		50.0							
		Very stiff to hard, moist, green, gray & tan, strongly reactive, strongly cemented areas, f. to med. grain, sandy SILT (ML/A-5).									
		LL-41, PL=40, PI=1, NMC=41.7, %R200=59.4									

LEGEND

SS - Split Spoon

BT - Shelby Tube

WC - Rock Core 18"

N2 - Rock Core, 1-7/8"

CU - Cuttings

CT - Continuous Tube

HSA - Hollow Stem Auger

CFA - Continuous Flight Auger

CPA - Churned Cast

DRILLING METHOD

RC - Rotary Wash

RC - Rotary Core

Continued Next Page

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Drill Depth (ft)	No Type	Test F'	Sat F'	N Value	Fines Content (%) ▲ PL ● MC ○ LL
65.0				SS-13	9	13	18	31	
60.0				SS-15	16	14	29	43	
55.0				SS-17	10	12	15	27	
50.0				SS-18	8	14	20	34	
45.0				SS-19	10	19	30	49	
40.0				SS-20	8	20	23	43	
35.0				SS-21	4	4	3	7	
30.0				SS-22	22	35	50.0	45.0	
25.0									
20.0									
15.0									
10.0									
5.0									
0.0									

Continued Next Page

LEGEND

SS - Split Spoon ST - Shelby Tube AWC - Rock Core 1-1/8"	SAMPLER TYPE MC - Rock Core 1-7/8" CU - Cuttings CT - Continuous Tube	HSA - Hollow Stem Auger CPA - Continuous Flight Augers Drive Casing	DRILLING METHOD RW - Rotary Wash RC - Rock Core
--	--	---	---

[illegible]

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

FOR INFORMATION ONLY

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"		
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.

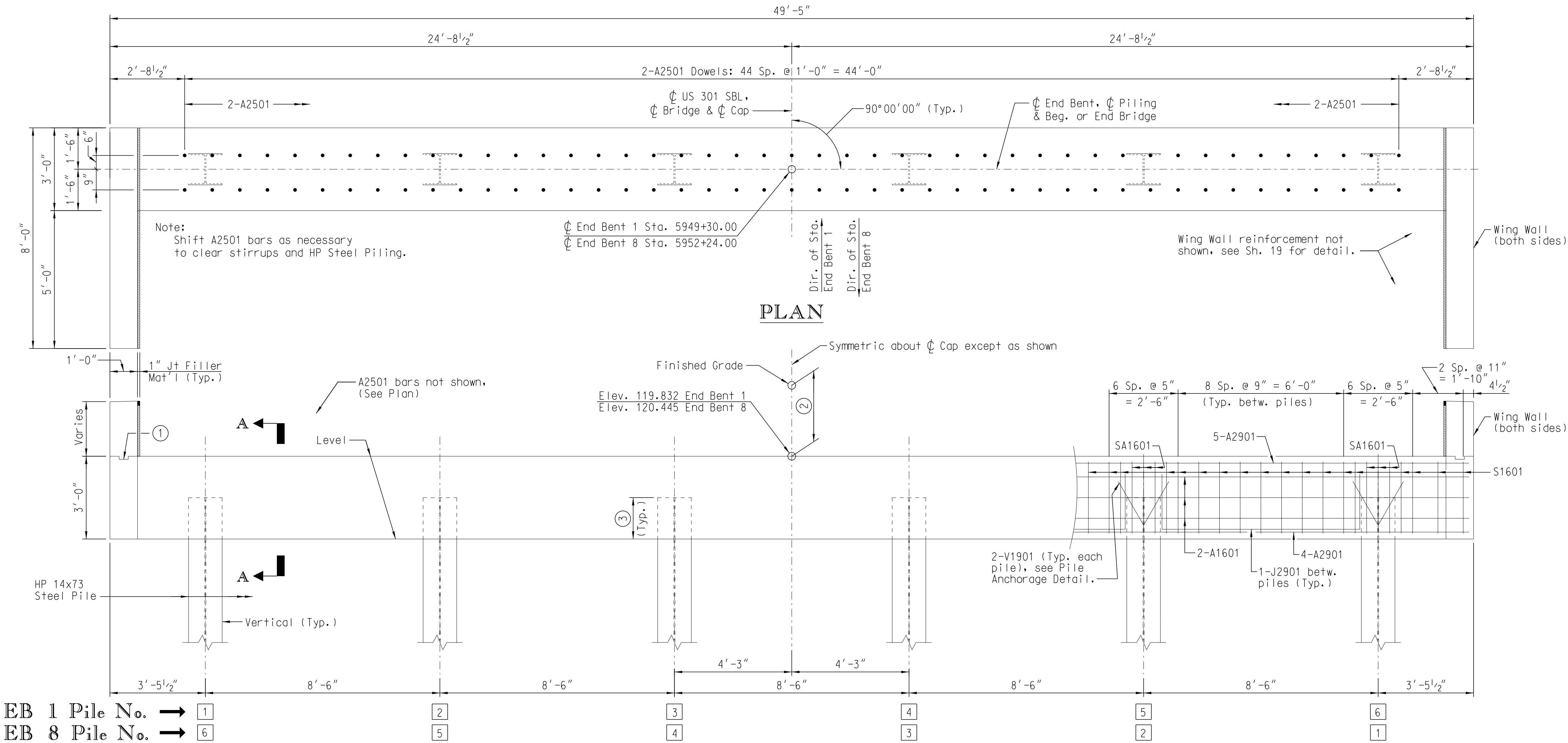
For Index Pile and pile installation requirements, see Geotechnical Notes on Sh. 19.

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

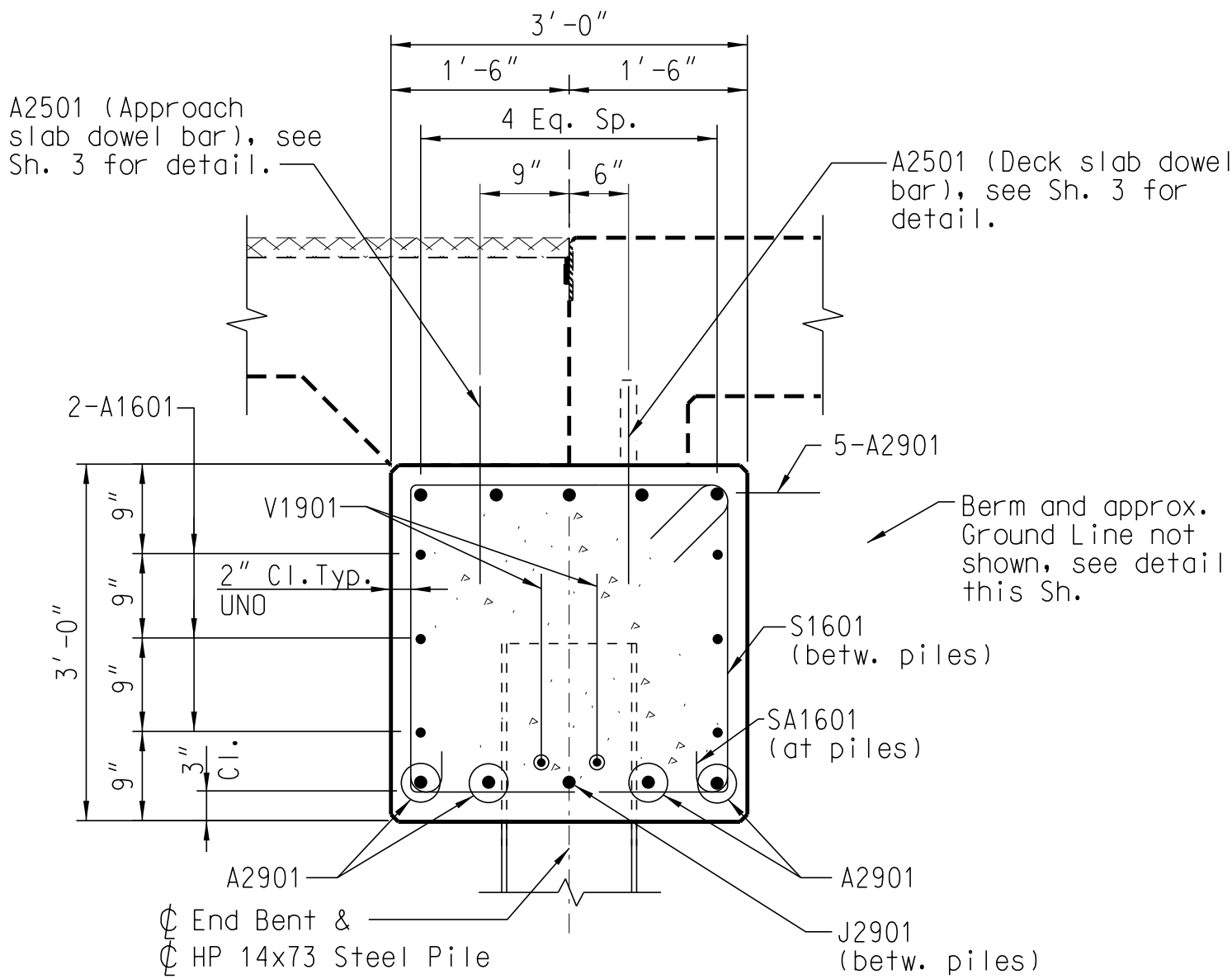
- ① Construction joint. Cast bottom portion of Wing Wall with End Bent Cap. Cast top portion of Wing Wall after Deck slab and Approach slab have been constructed. See Sh. 3 for Construction Joint detail.
- ② 2'-5 7/8" at ϕ End Bent 1, and 2'-2 7/8" at ϕ End Bent 8.
- ③ Piles to be embedded a minimum 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".



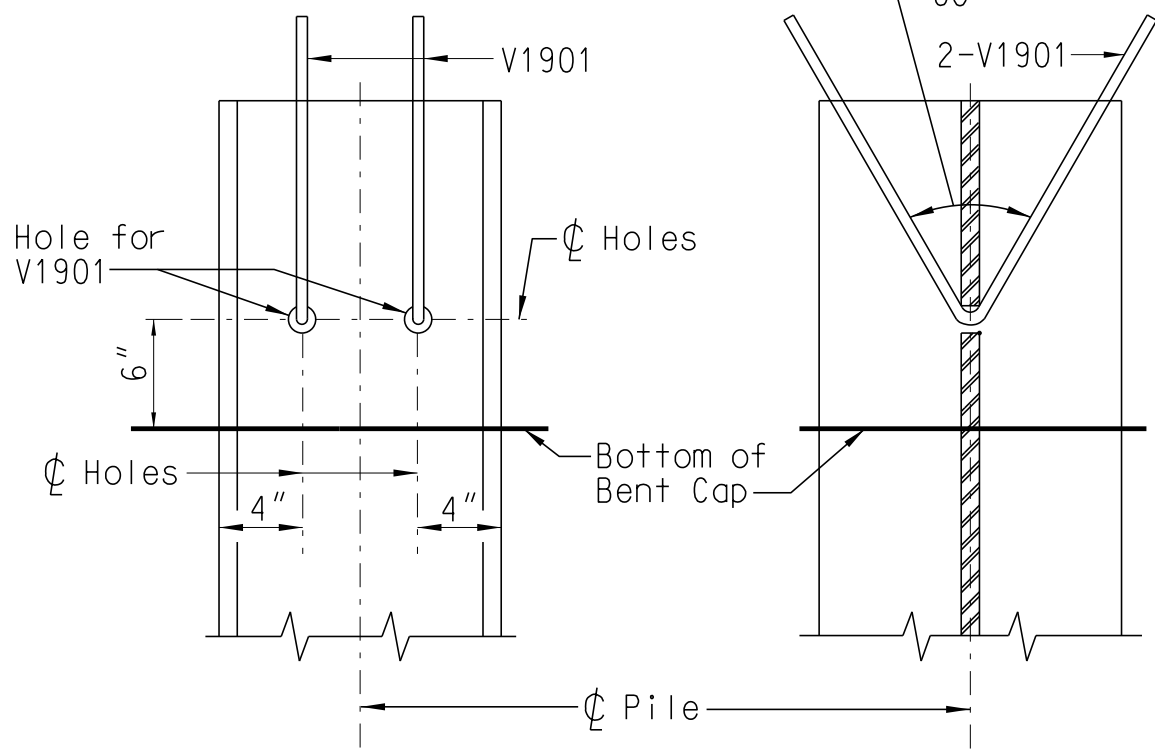
EB 1 Pile No. → 1
EB 8 Pile No. → 6

ELEVATION

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



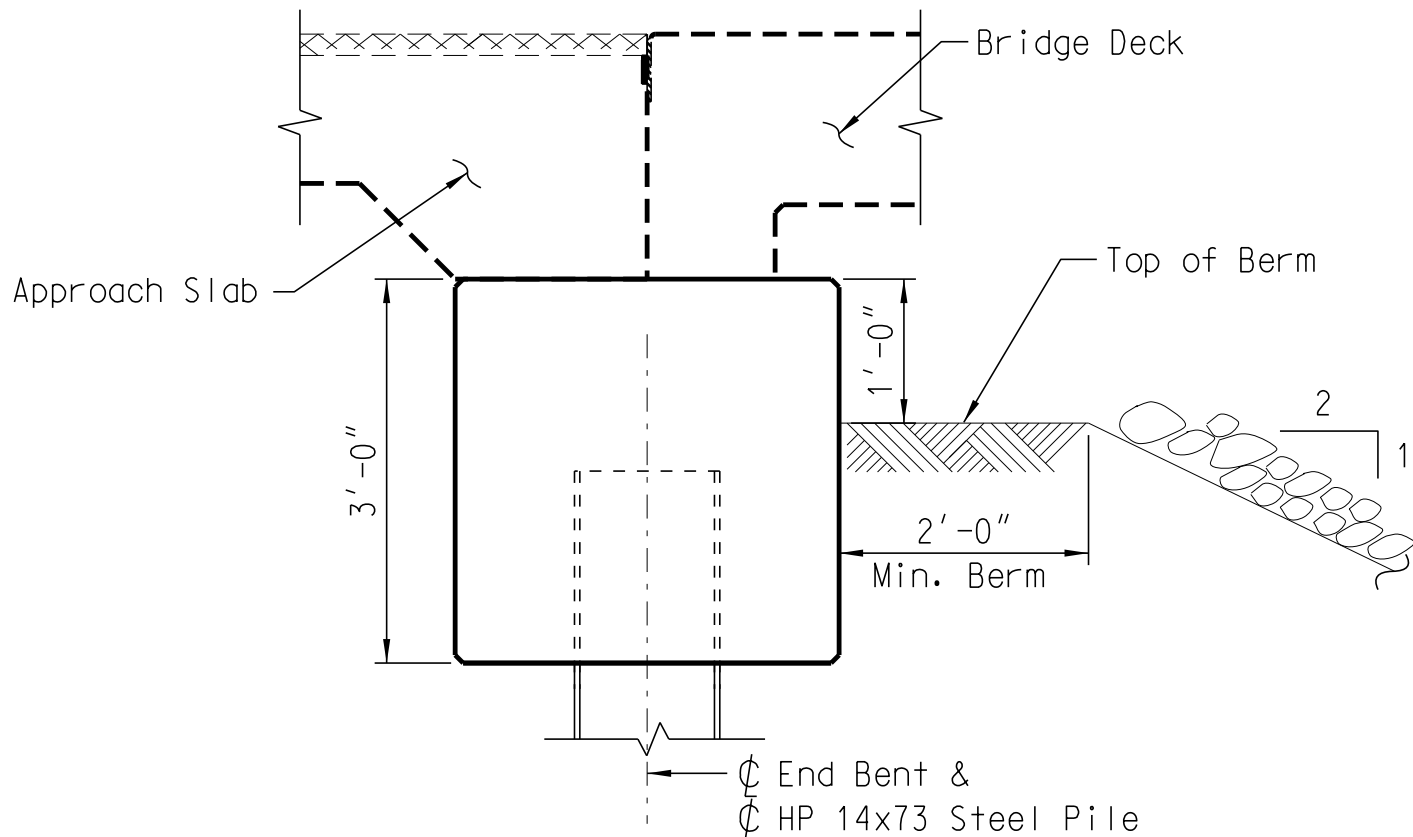
SECTION A-A



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.				END BENTS 1 AND 8			
REV.							
REVIEWED							
QUAN.	TL	GFD	10-16				
DR.	TL	GFD	10-16				
DES.	TL	GFD	10-16				
	BY	CHK.	DATE	COUNTY	ORANGEBURG	ROUTE	US 301

GEOTECHNICAL NOTES

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

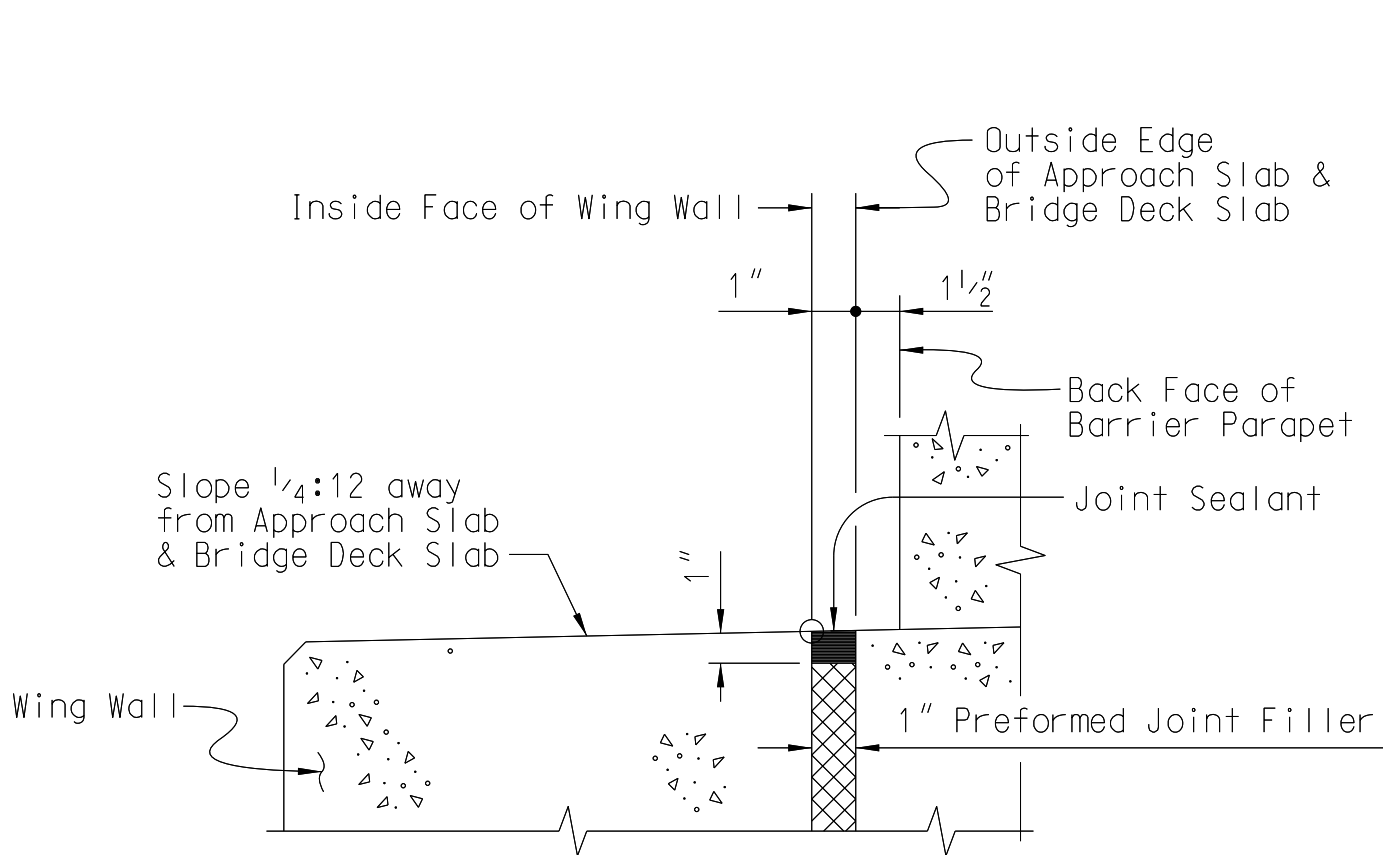
Note: GRLWEAP (2010-6) was used to perform the wave equation analysis.

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 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 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.

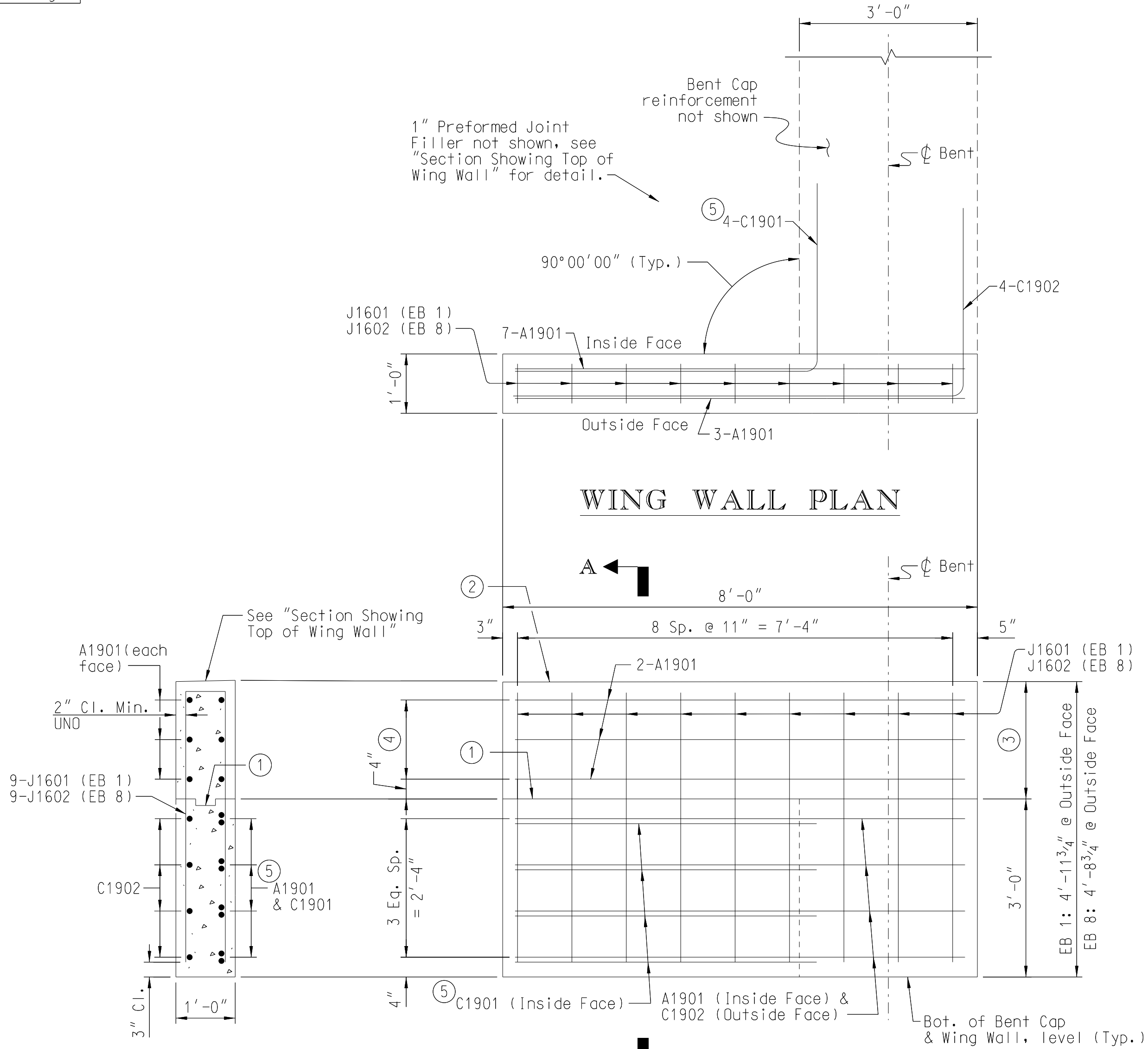
Reference the 2007 SCDOT Standard Specifications for Driven Pile Foundation (Section 711). Notes included in these plans are in addition to the requirements of the Standard Specifications.



SECTION SHOWING TOP OF WING WALL


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

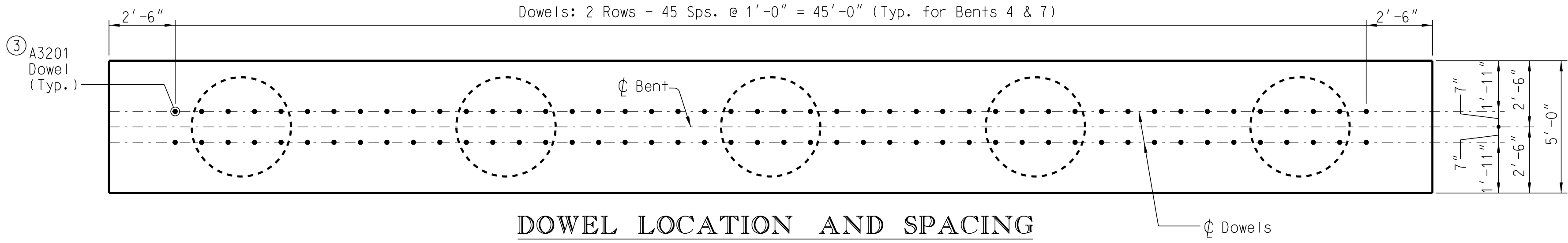
- Construction joint. Cast bottom portion of Wing Wall with End Bent Cap. Cast top portion of Wing Wall after Deck slab and Approach slab have been constructed. See Sh. 4 for Construction Joint detail.
- Level in longitudinal direction. Slope in transverse direction, see "Section Showing Top of Wing Wall" for detail.
- EB 1: 1'-11³/₄" @ Outside Face
EB 8: 1'-8³/₄" @ Outside Face
- End Bent 1: 2 Sp. @ 8" = 1'-4". End Bent 8: 2 Sp. @ 6¹/₂" = 1'-1".
- Space C1901 with A1901 (Inside Face) in bottom portion of Wing Walls (below construction joint).



SECTION A-A

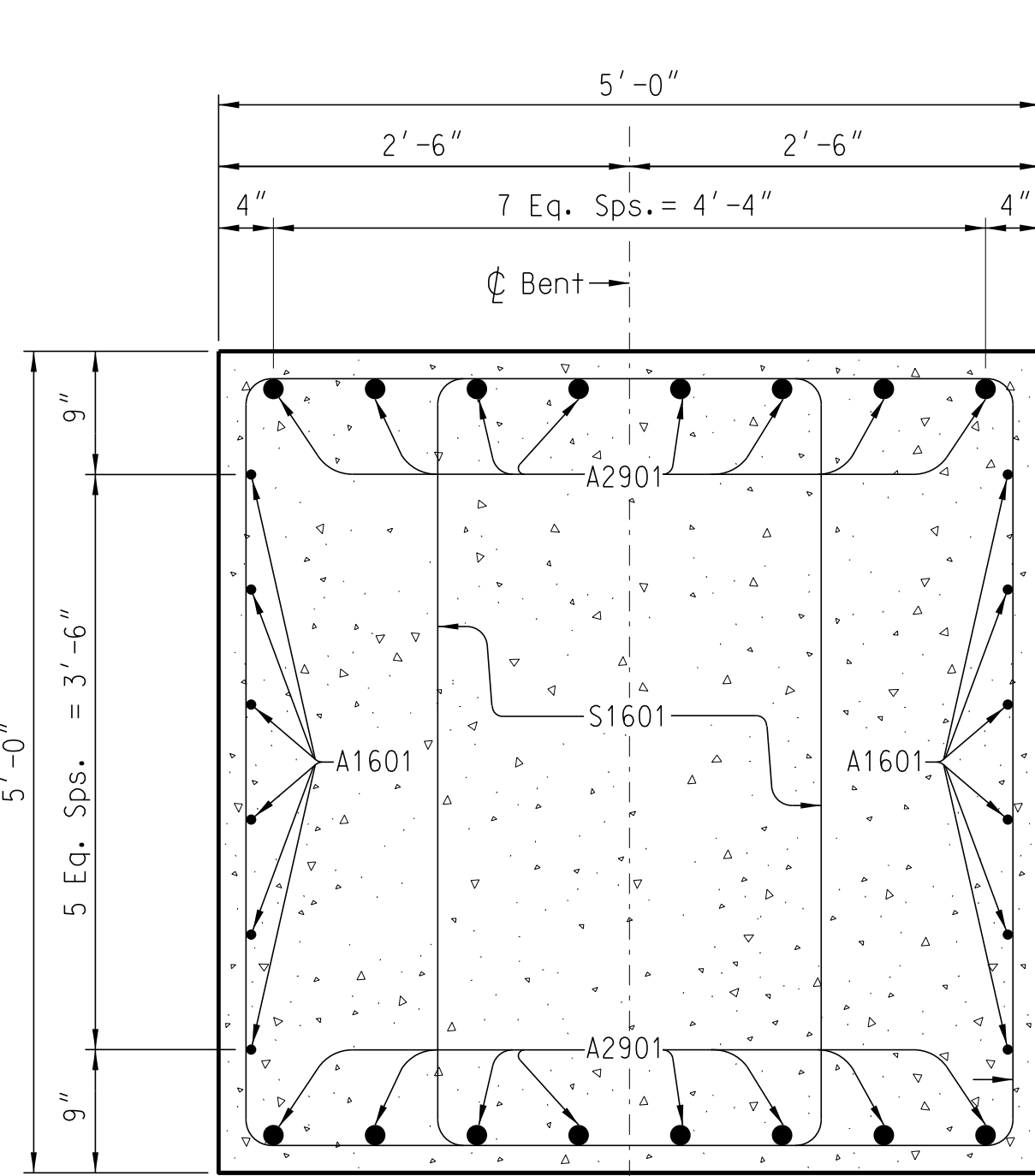
WING WALL ELEVATION

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



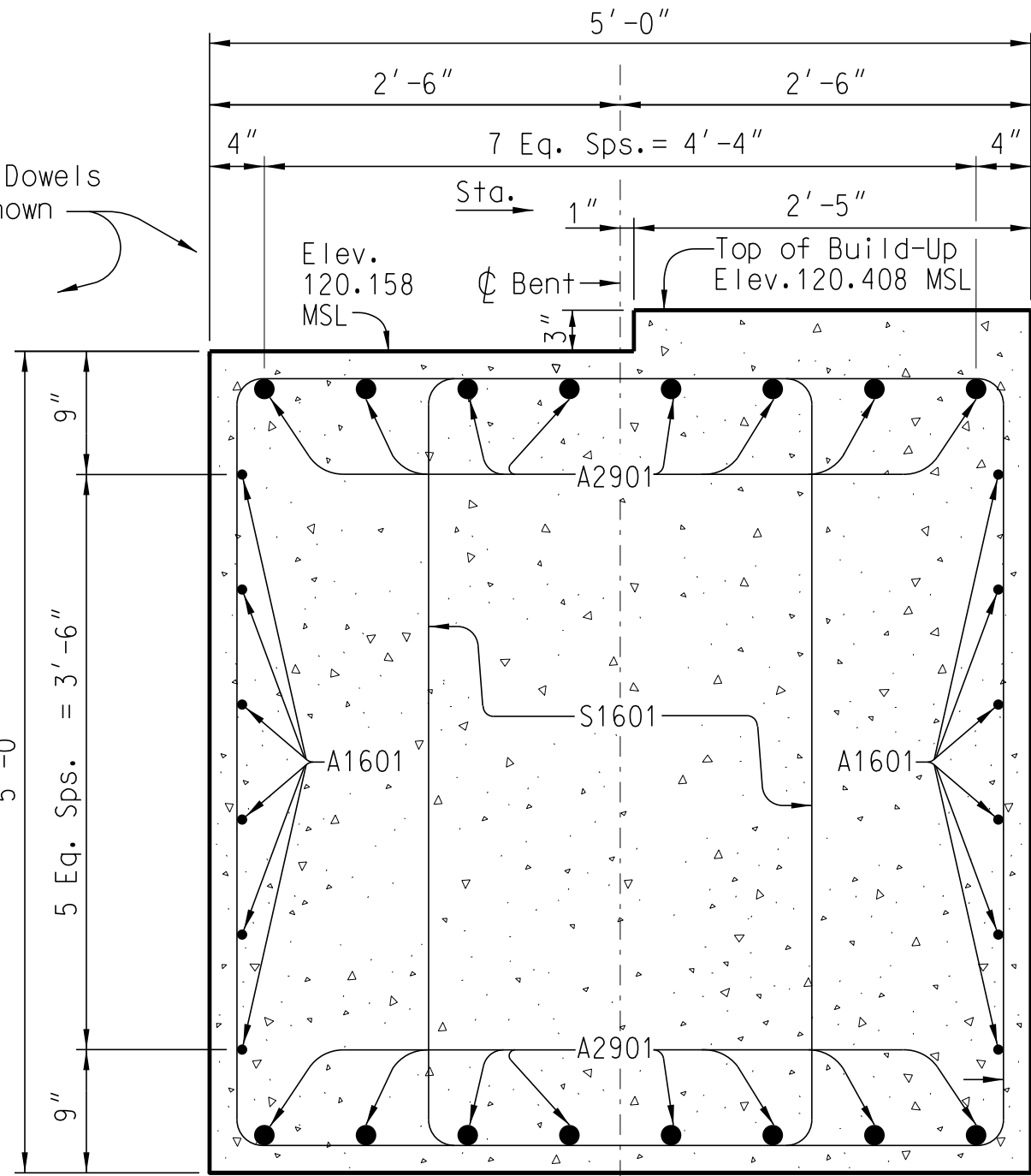
DOWEL LOCATION AND SPACING

(Typ. for Bents 4 & 7)



SECTION THRU CAP

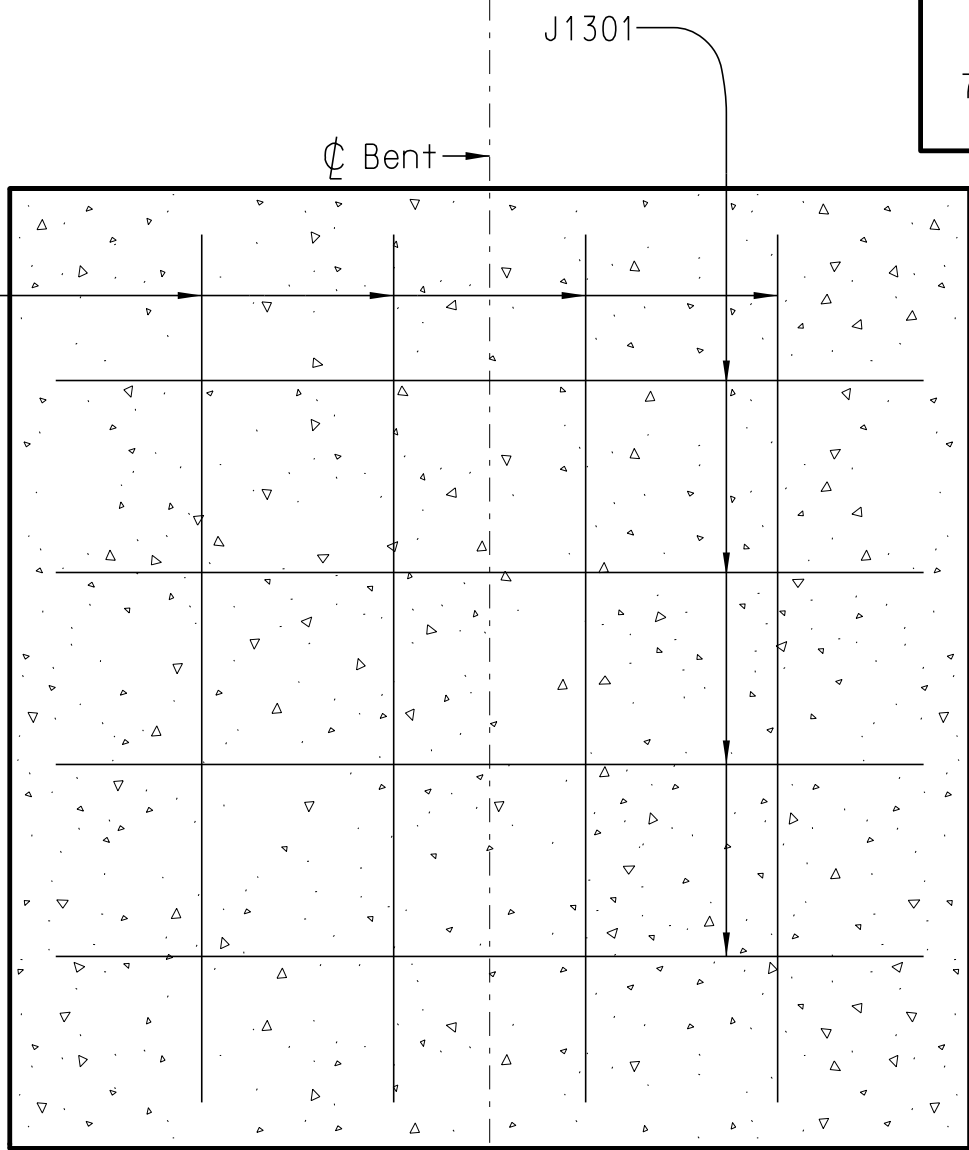
(Bents 2 thru 6 - Shown between piles)



SECTION THRU CAP

(Bent 7 only - Shown between piles)

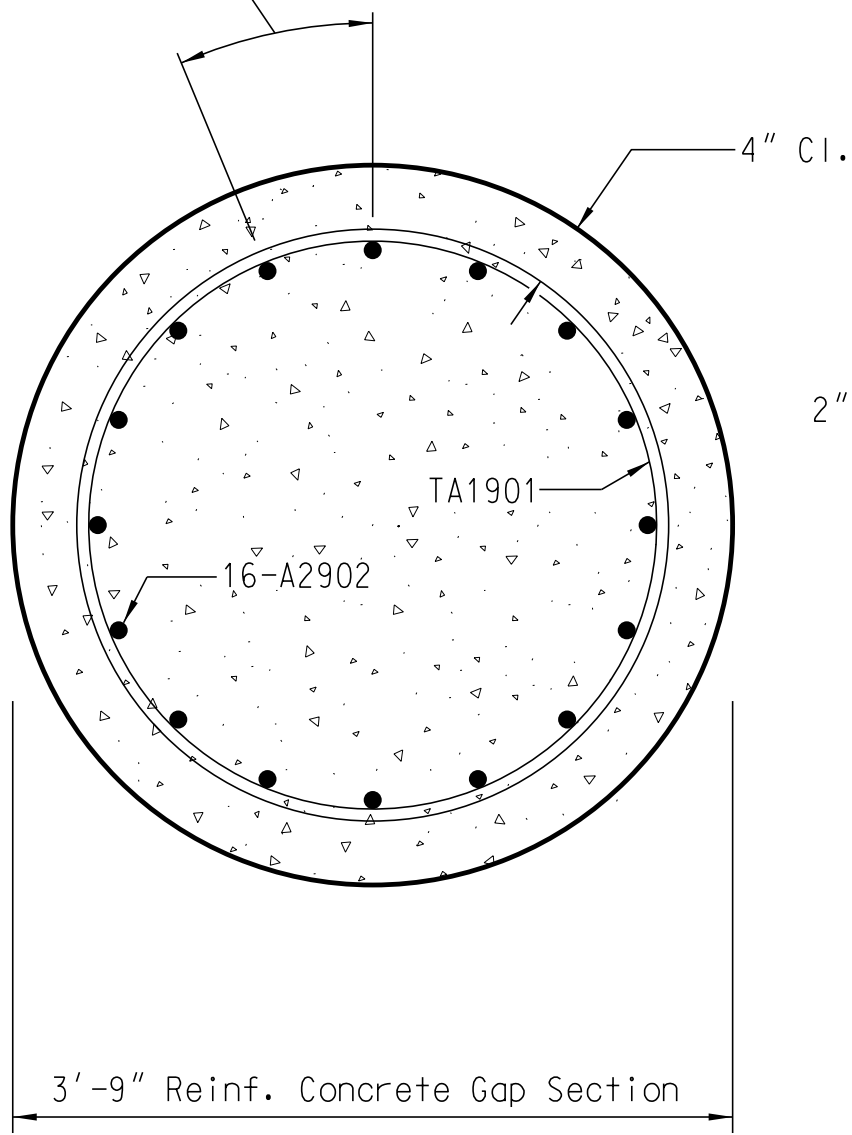
Build-Up for Bent 7 not shown.



END CAP ELEVATION

(Showing J1301 bars)

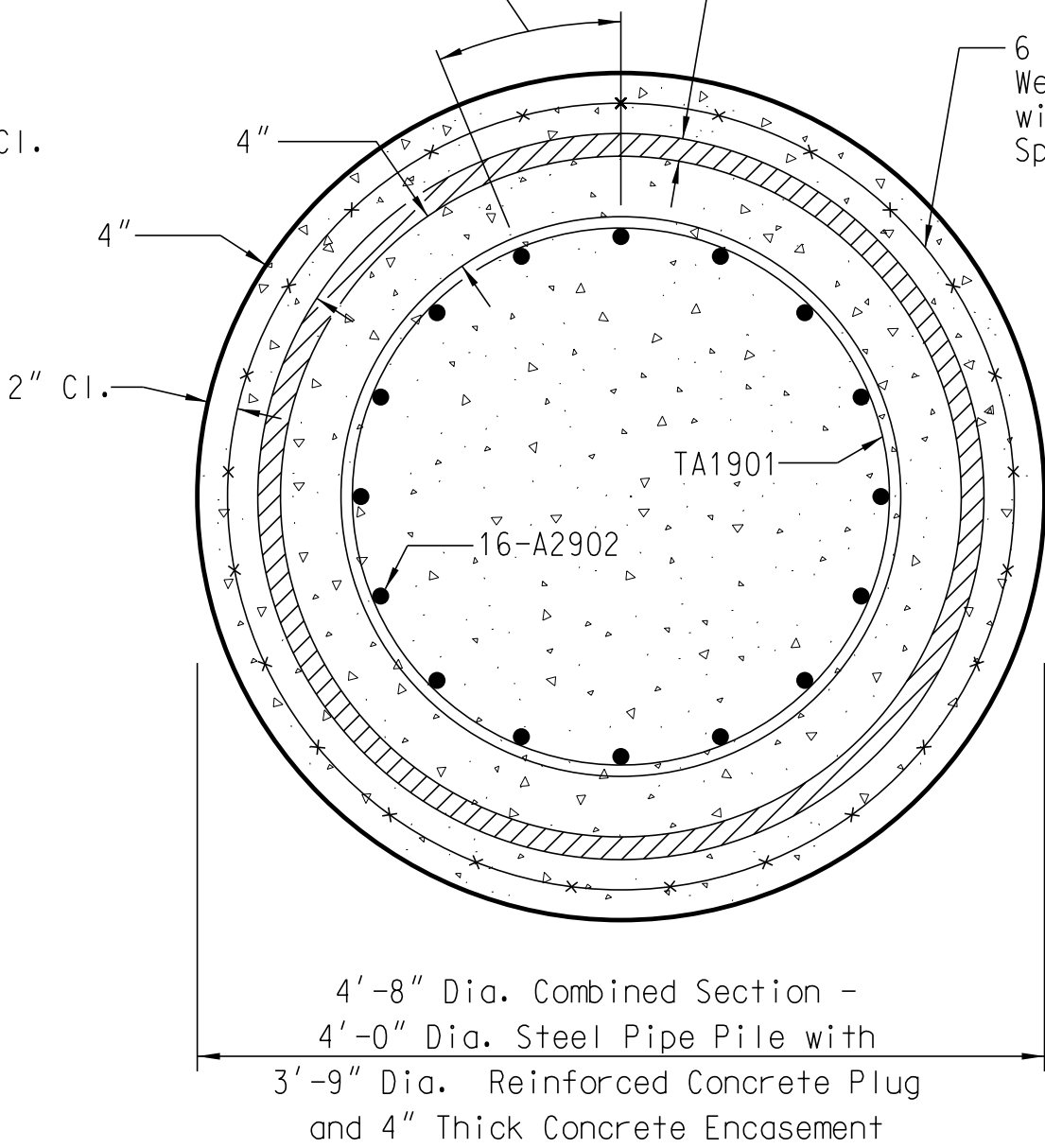
Equally spaced
@ 6 5/16" centers (±)
along the inside edge
of the TA1901 bars.



SECTION A-A

(See Sh. 20)

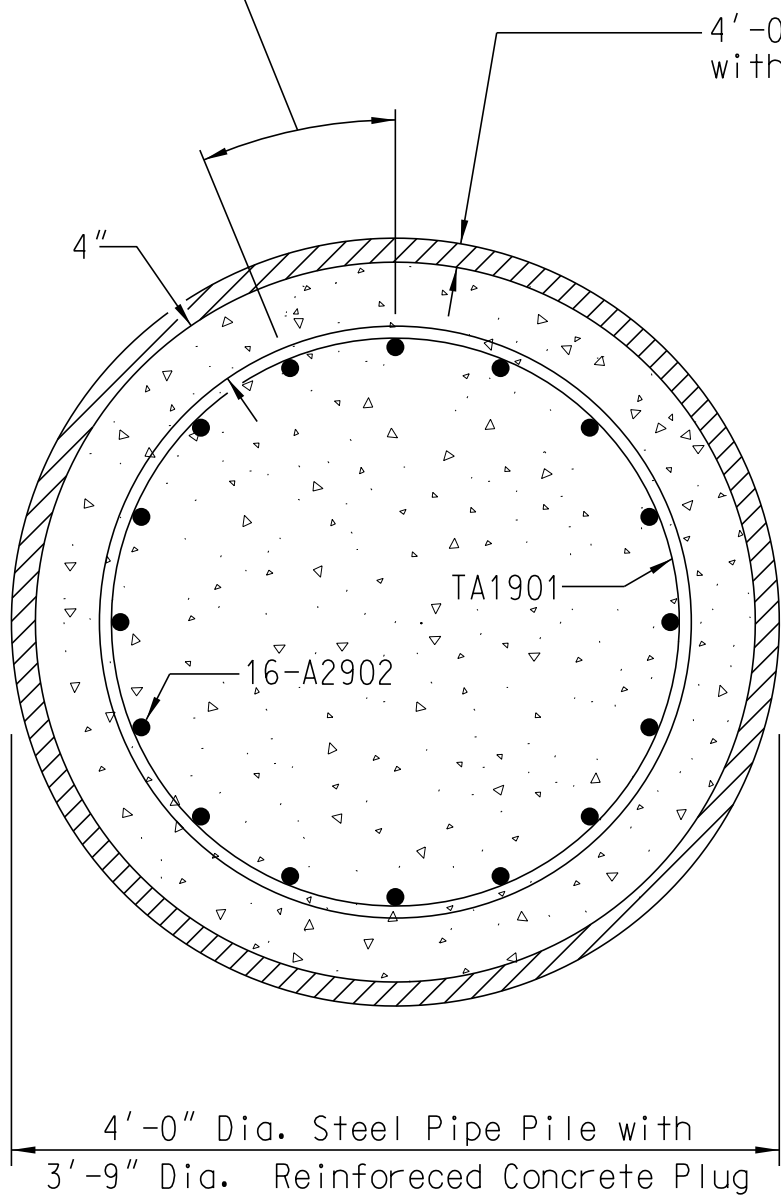
Equally spaced
@ 6 5/16" centers (±)
along the inside edge
of the TA1901 bars.



SECTION B-B

(See Sh. 20)

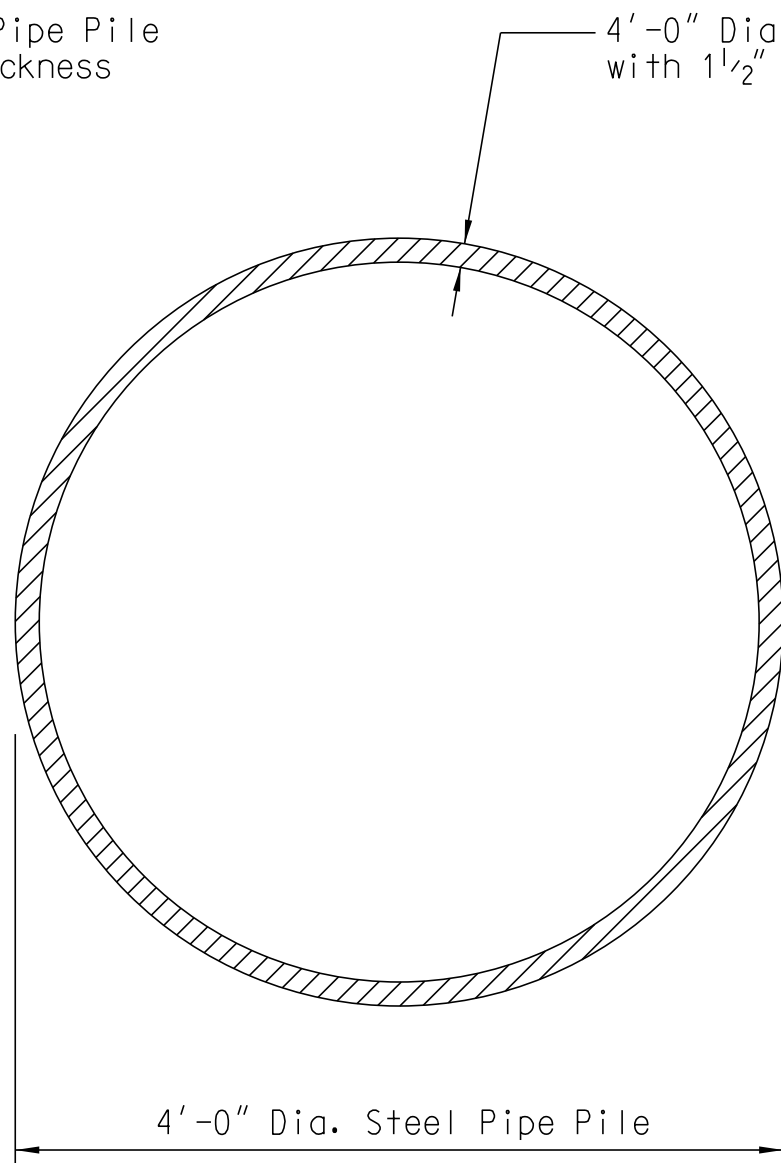
Equally spaced
@ 6 5/16" centers (±)
along the inside edge
of the TA1901 bars.



SECTION C-C

(See Sh. 20)

4'-0" Dia. Steel Pipe Pile
with 1 1/2" Wall Thickness



SECTION D-D

(See Sh. 20)

CONSTRUCTION SEQUENCE FOR STEEL PIPE PILES

- Construct cofferdam.
- Remove existing bridge foundations as required.
- Install pipe piles.
- Excavate existing soil or backfill with loose sand in pipe piles as required.
- Field paint top 1'-0" of pipe piles.
- Construct reinforced concrete plug and 4" reinforced concrete encasement for pipe piles.
- Construct bent cap.

REINF. STEEL SCHED. FOR ONE BENT

MARK	BENTS 2, 3, 5 & 6 NO. REQ'D	BENTS 4 & 7 NO. REQ'D	DIMENSION				LENGTH
			"a"	"b"	"c"	"d"	
A1601	12	12	49'-8"	---	---	---	49'-8"
A2901	16	16	49'-8"	---	---	---	49'-8"
A2902	80	80	17'-5"	---	---	---	17'-5"
A3201	46	92	1'-11"	---	---	---	1'-11"
J1301	16	16	4'-6 3/4"	8"	---	---	5'-11"
S1601	88	88	3'-6"	4'-8"	8"	---	17'-8"
SD1601	20	20	4'-8"	4'-8"	10"	---	15'-8"
TA1901	155	155	3'-1"	---	---	---	9'-6"

QUANTITIES FOR ONE BENT

I T E M	UNIT	BENTS 2, 3, 5 & 6	BENTS 4 & 7
Concrete, Class 5000	CY	*	*
Reinforcing Steel	LB	*12,467	*12,846
Hoop Reinforcing Steel	LB	2,212	2,212
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

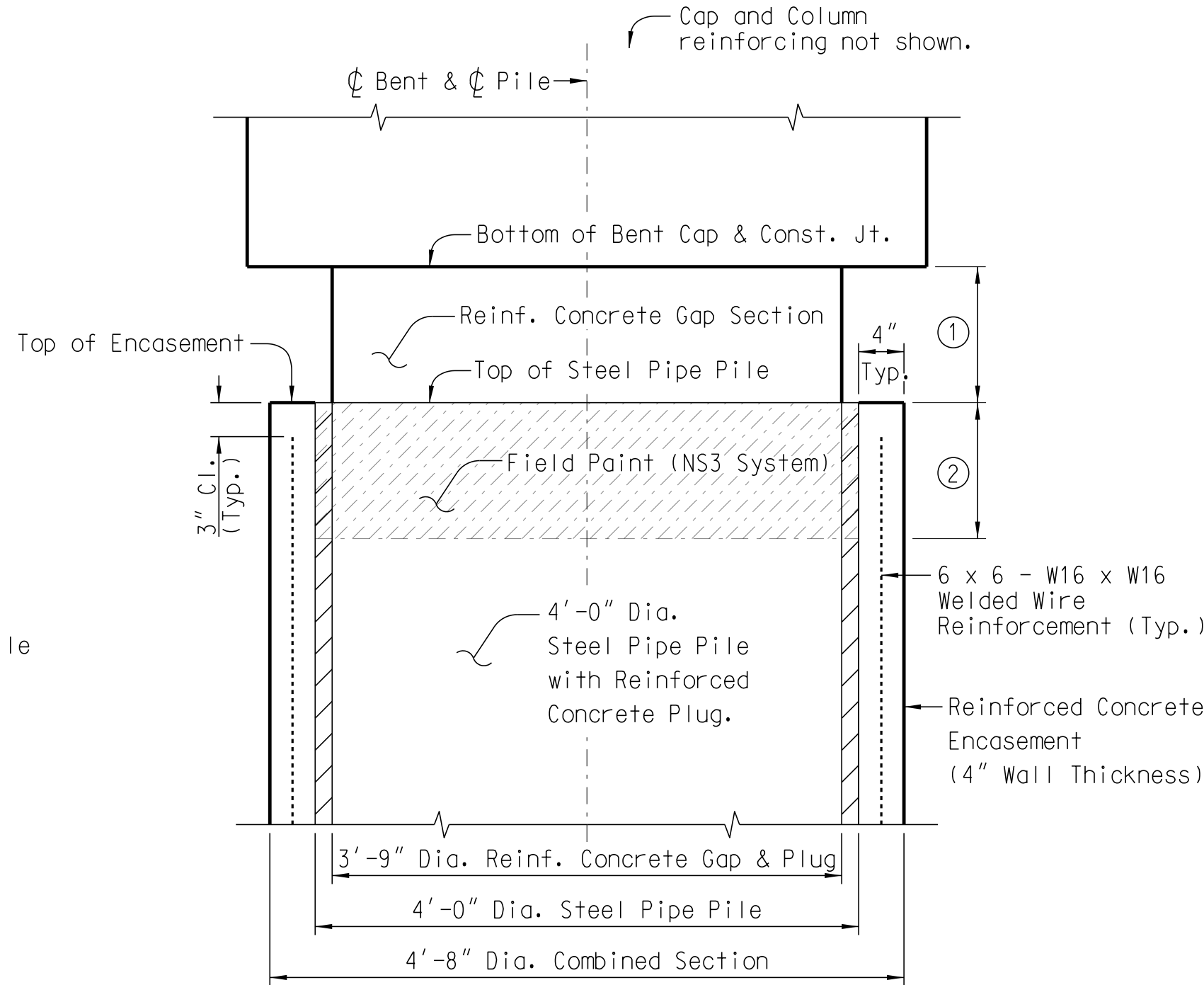
Notes:

*Concrete quantity for Bents 2 thru 6 = 84.5 CY, Bent 7 = 85.7 CY.

*Reinforcing steel quantities also includes 2,015 LB for Welded Wire Reinforcement.

③ Shift A3201 dowels as needed to clear stirrups. See Sh. 3 for dowel detail.

④ Steel Pipe Pile length calculated based on assumed distance of 3" from bottom of bent cap.



DETAIL "A"

Notes:

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	
REV.					
REV.					
REV.					
REVIEWED				INTERIOR BENTS 2 THRU 7	
QUAN.	GFD	TL	10-16		
DR.	GFD	TL	5-16		
DES.	GFD	TL	5-16		
BY	CHK.	DATE		COUNTY	ORANGEBURG
				ROUTE	US 301



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

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

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

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

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.

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

Once the pipe pile is driven to the final bearing stratum any soils removed to facilitate driving shall be backfilled with loose sand classified as A-1-a to 104.25 feet-msl. If the pipe pile plugs resulting in the internal soil elevation being below 104.25 feet-msl without any removal of soils the pipe pile shall be backfilled with loose sand classified as A-1-a to 104.25 feet-msl. If no soils are removed during driving and pipe pile does not plug resulting in a soil elevation within the pipe pile above 104.25 feet-msl, any remaining soils from within the 48-inch pipe piles shall be removed to elevation 104.25 feet-msl. This soil shall be removed in order to construct the 13-foot 3-inch composite section at the top of the pile for connection to the pile cap.

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.

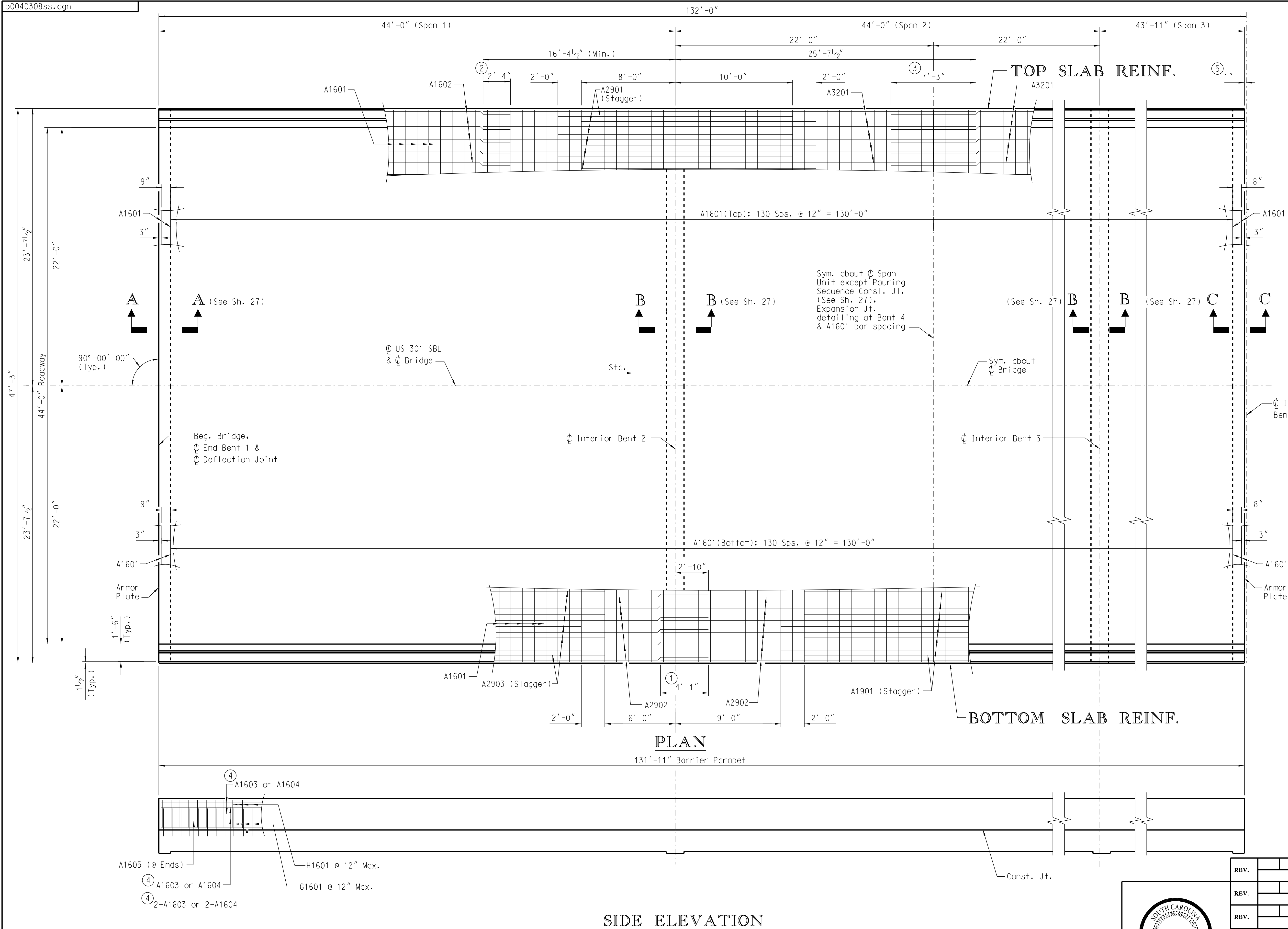
For all soils, buoyant unit weights shall be used in computations for soils below the water level. The designer shall consider all unbalanced water forces. The designer is responsible for determining a design water level. The designer shall use the following soil strength parameters for determining earth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

Depth (ft)	IB3 (B-3)		
	c (psf)	ϕ	γ_{sat} (pcf)
0-5	-	31	120
5-9	-	36	120
9-20	1700	-	110
20-59	-	36	115
59-78	-	24	120
78-	-	36	120

Depth (ft)	IB5 (B-5A)		
	c (psf)	ϕ	γ_{sat} (pcf)
0-6	-	35	115
6-9	-	32	120
9-21	-	36	115
21-76	-	30	110
76-101	-	36	115
101-	4000		110

Depth (ft)	IB7 (B-7A)		
	c (psf)	ϕ	γ_{sat} (pcf)
0-3	-	24	110
3-7	-	29	120
7-21	-	36	115
21-47	-	30	110
47-61	-	34	110
61-69	2320	-	110
69-76	-	30	115
76	-	36	115

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
INTERIOR BENT GEOTECHNICAL & COFFERDAM PLAN NOTES	
COUNTY ORANGEBURG	ROUTE US 301



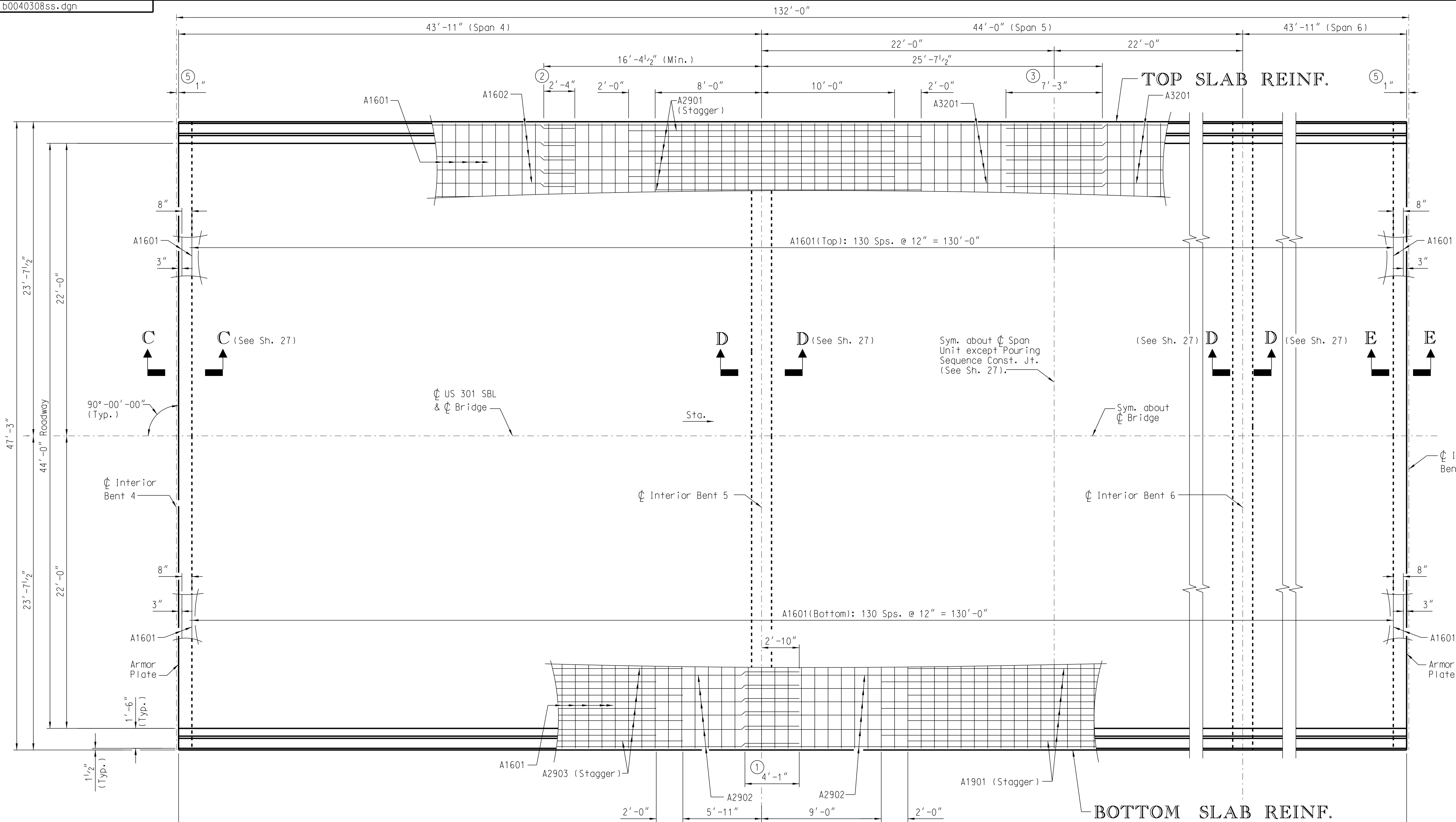
REINF. STEEL SCHED.						
MARK	NO. REQ'D	DIMENSION				LENGTH
		"a"	"b"	"c"	"d"	
A1601	266	46'-9"	—	—	—	46'-9"
A1602	94	29'-10"	—	—	—	29'-10"
A1603	12	60'-0"	—	—	—	60'-0"
A1604	24	38'-10"	—	—	—	38'-10"
A1605	4	7'-0"	—	—	—	7'-0"
A1607	8	30'-2"	—	—	—	30'-2"
A1901	48	24'-0"	—	—	—	24'-0"
A2901	96	20'-0"	—	—	—	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 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.

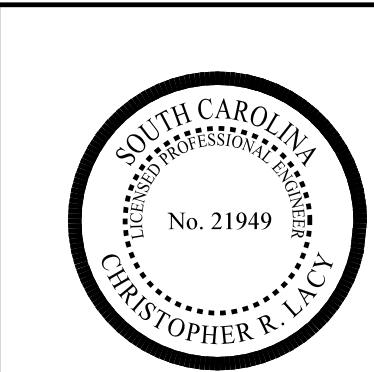
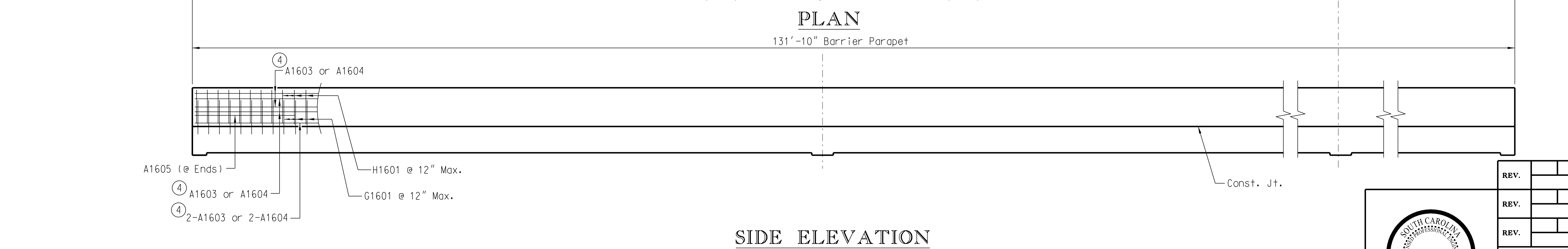
REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION				
REV.				3 SPAN- 132'-0" UNIT SUPERSTRUCTURE (SPANS 1 - 3) (44'-0" ROADWAY)				
REV.								
REVIEWED								
QUAN.	DRF	GFD	TL					9-16
DR.	DRF	GFD	TL	9-16				
DES.	DRF	GFD	5-13					
BY				COUNTY				
CHK.				ORANGEBURG				
DATE				ROUTE				
				US 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.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION				
REV.				3 SPAN- 132'-0" UNIT SUPERSTRUCTURE (SPANS 4 - 6) (44'-0" ROADWAY)				
REV.								
REVIEWED				COUNTY ORANGEBURG ROUTE US 301				
QUAN.	DRF	GFD	TL					9-16
DR.	DRF	GFD	TL					9-16
DES.	DRF	GFD	5-13					
BY	CHK.	DATE						

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 ⁷ / 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.

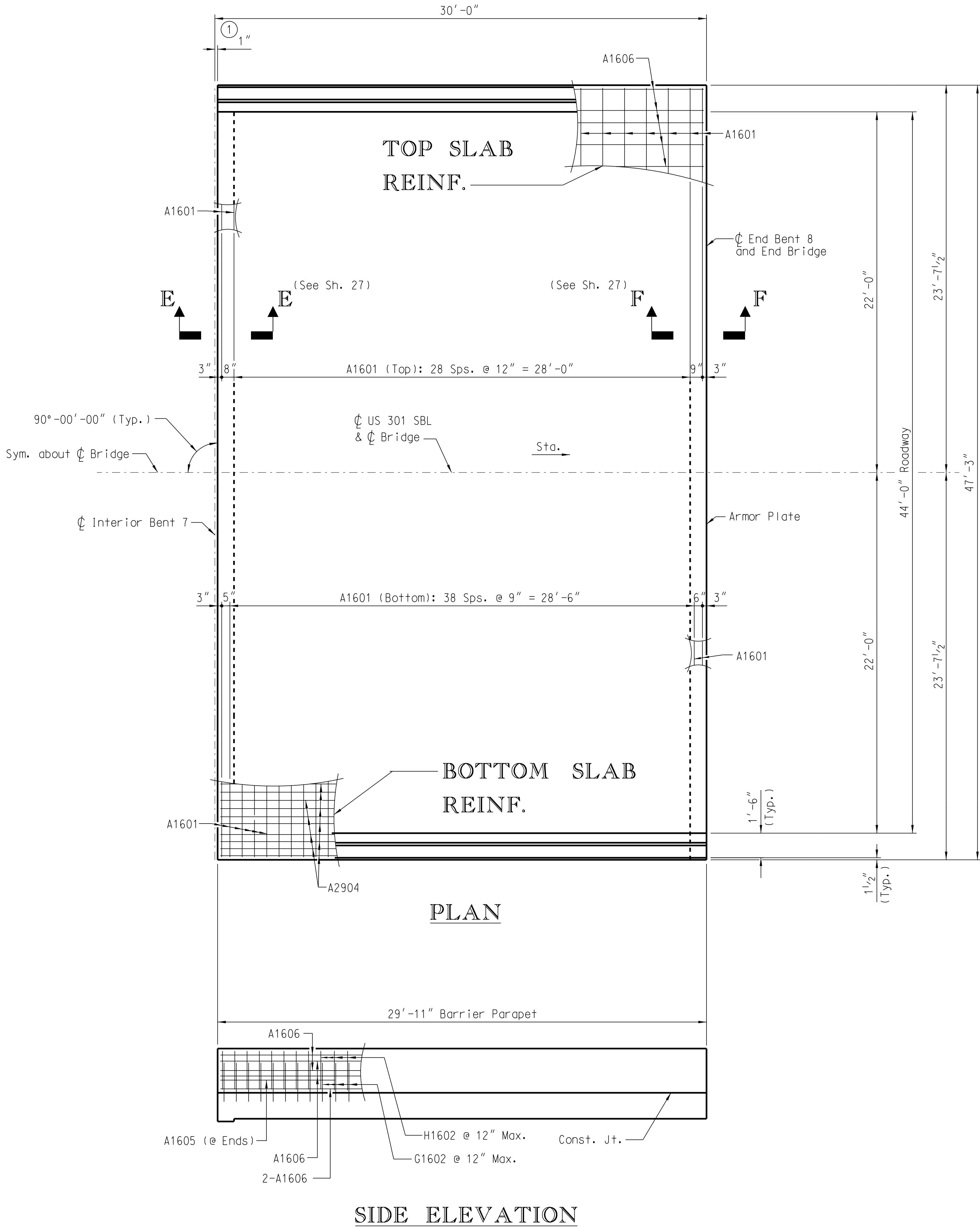
For Slab Drain Locations, see Sh. 7.

For Section thru Span, see Sh. 26.

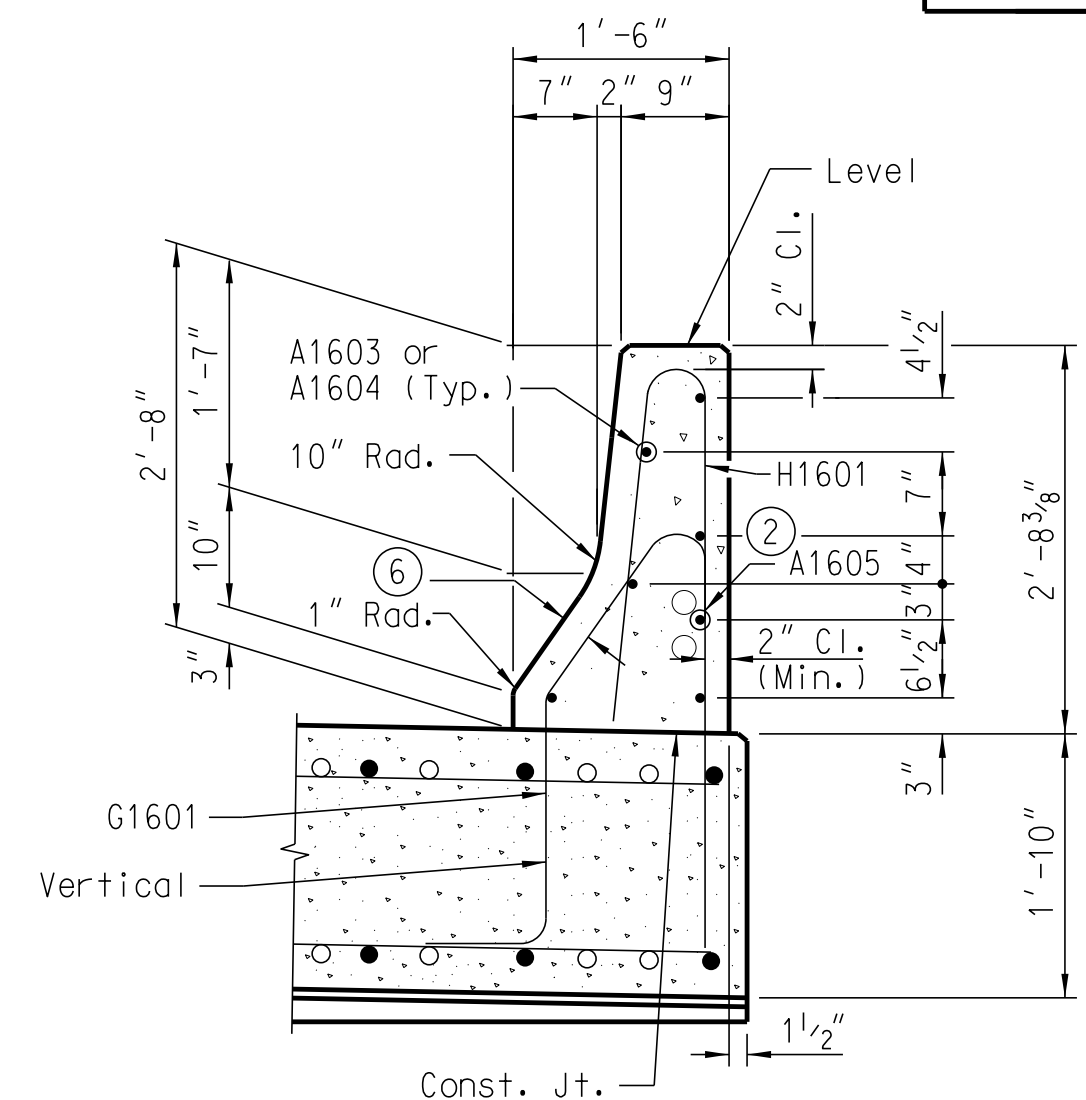
For Deck Pouring Sequence, See Sh. 27.

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.

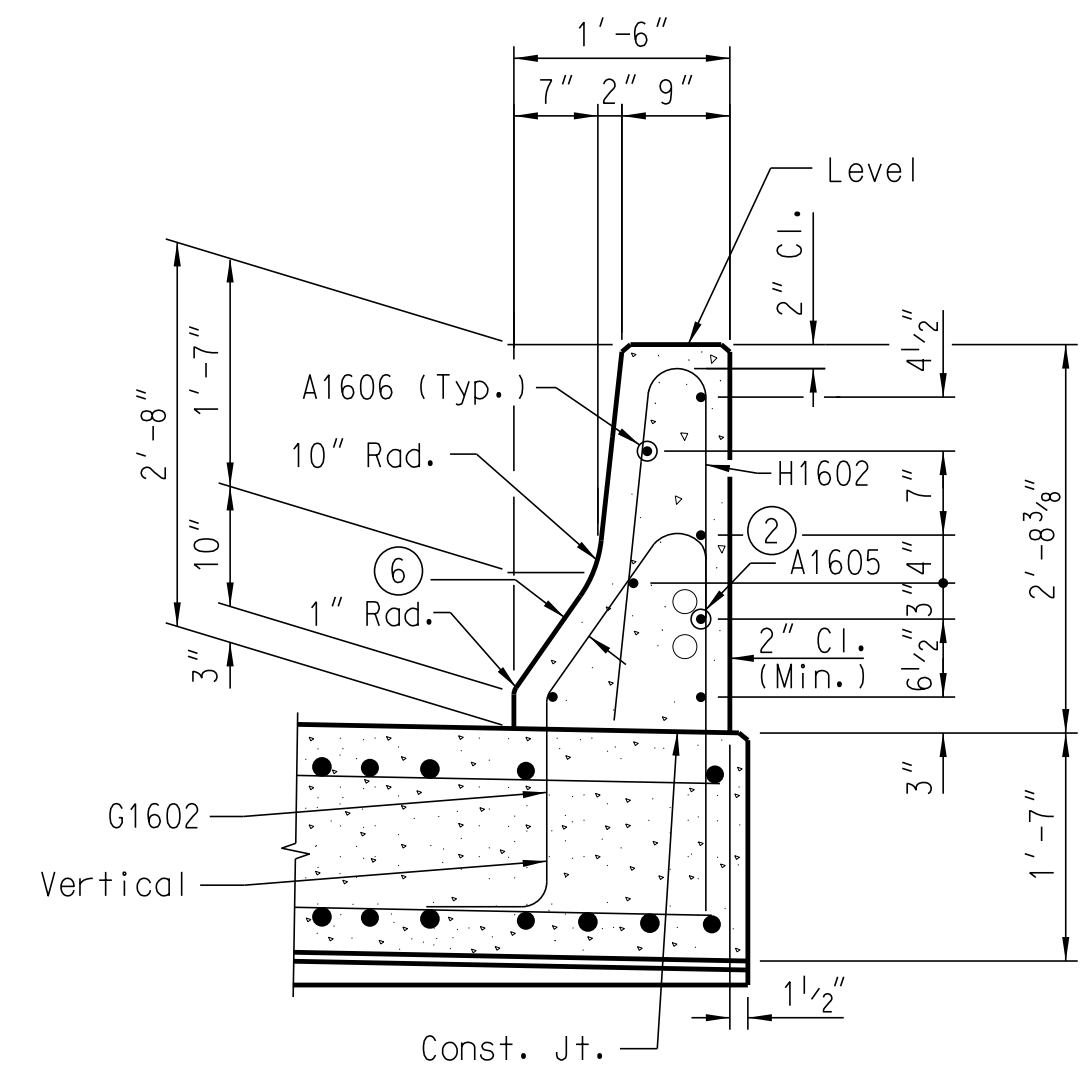


REV.				SOUTH CAROLINA			
REV.				DEPARTMENT OF TRANSPORTATION			
REV.				30'-0" END SPAN SUPERSTRUCTURE (SPAN 7) (44'-0" ROADWAY)			
REVIEWED							
QUAN.	ASC	GFD	TL				
DR.	ASC	GFD	TL	9-16			
DES.	DRF	GFD	5-13				
BY		CHK.	DATE	COUNTY	ROUTE		
				ORANGEBURG	US 301		



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

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



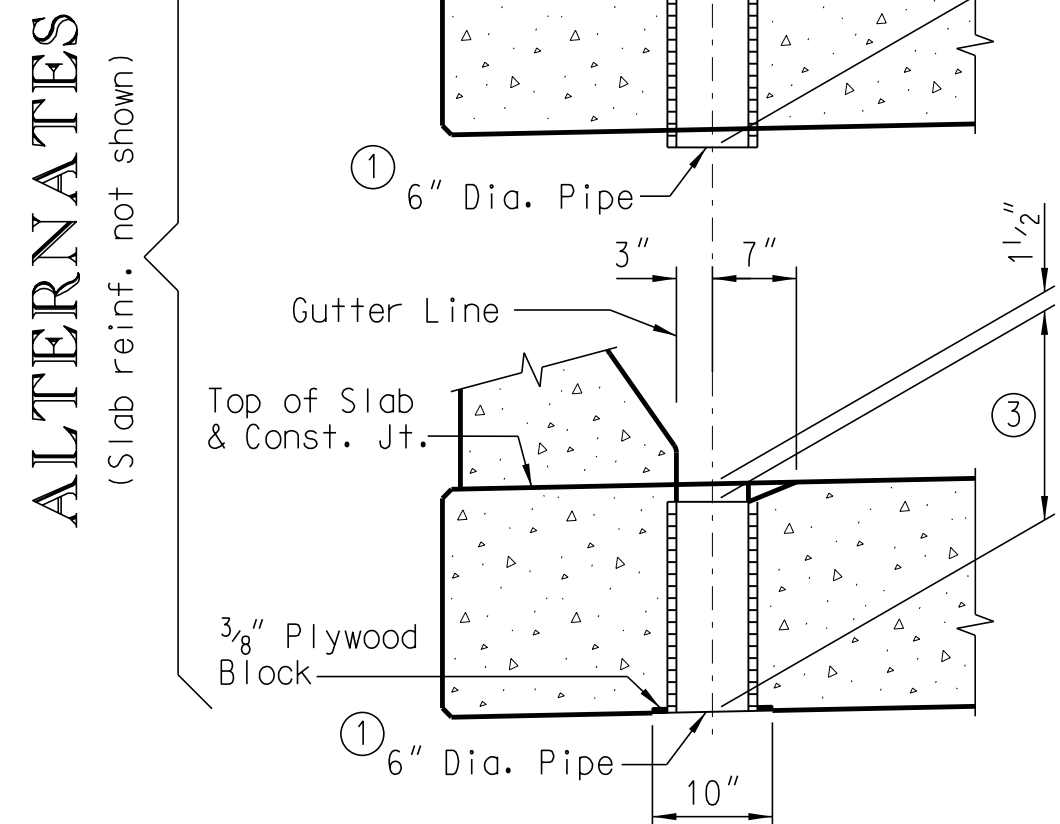
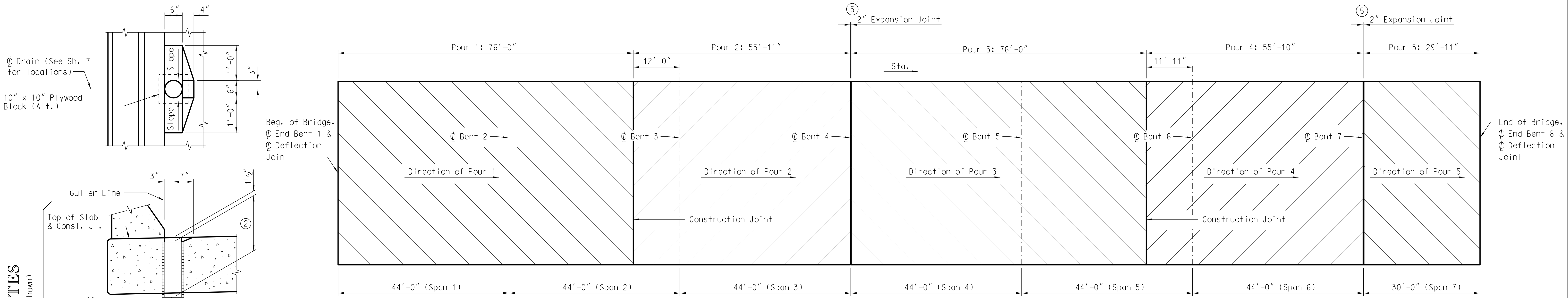
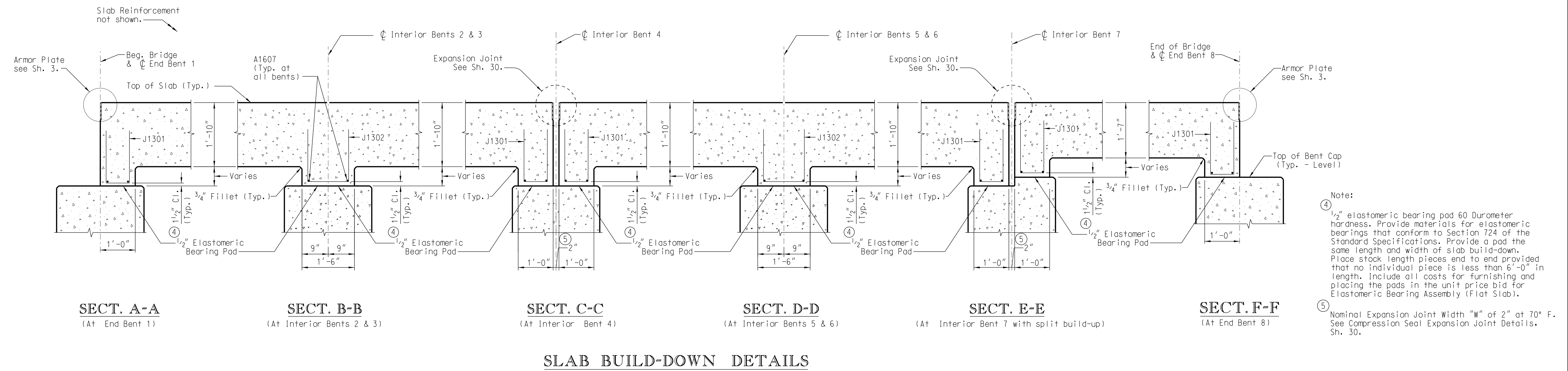
(Span 7)
(Deck Drains Not Shown)


(Span 7)
(Deck Drains Not Shown)

- ① For slab build-down details, see Sh. 27.
- ② At ends of parapet only.
- ③ At $\frac{1}{4}$ Bent.
- ④ Includes $\frac{1}{2}$ " elastomeric bearing pad.
- ⑤ 3 eq. sp. = 1' - 3 $\frac{1}{2}$ "
- ⑥ 2 $\frac{1}{2}$ " Cl. (Min.)

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







REV.		
REV.		
REV.		
REVIEWED		
QUAN.		
DR.	GFD	TL 9-16
DES.	DRF	5-13
BY	CHK.	DATE

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

COUNTY
ORANGEBURG

ROUTE
US 301



DEFLECTION JOINT DETAIL

Form or saw cut the deflection joint.

Apply one coat of asphaltic paint 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:

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.

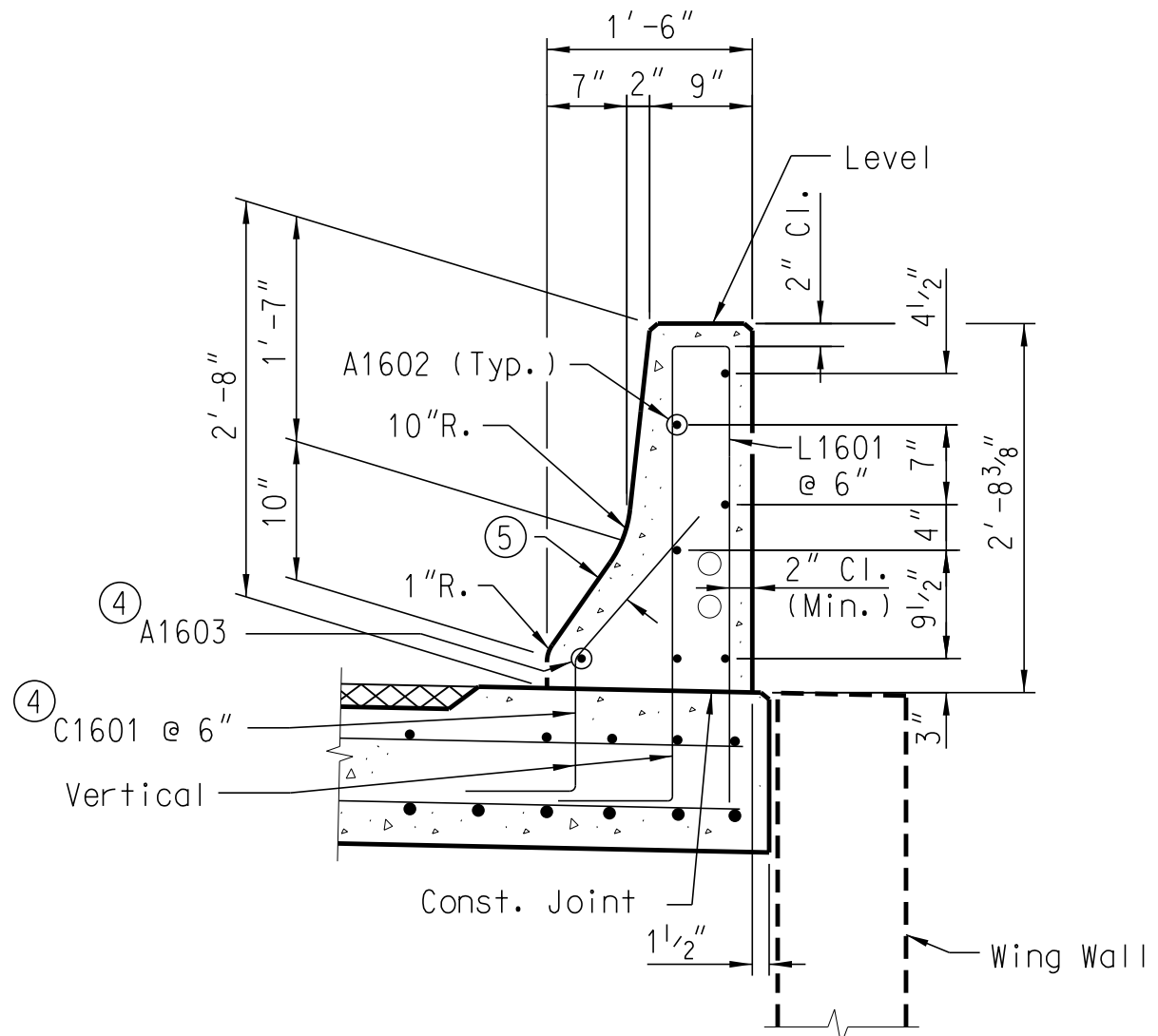
Support the bottom mat of reinforcing steel using concrete block or similar material. Provide a minimum concrete cover of 3" below the bottom reinforcing steel.

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.

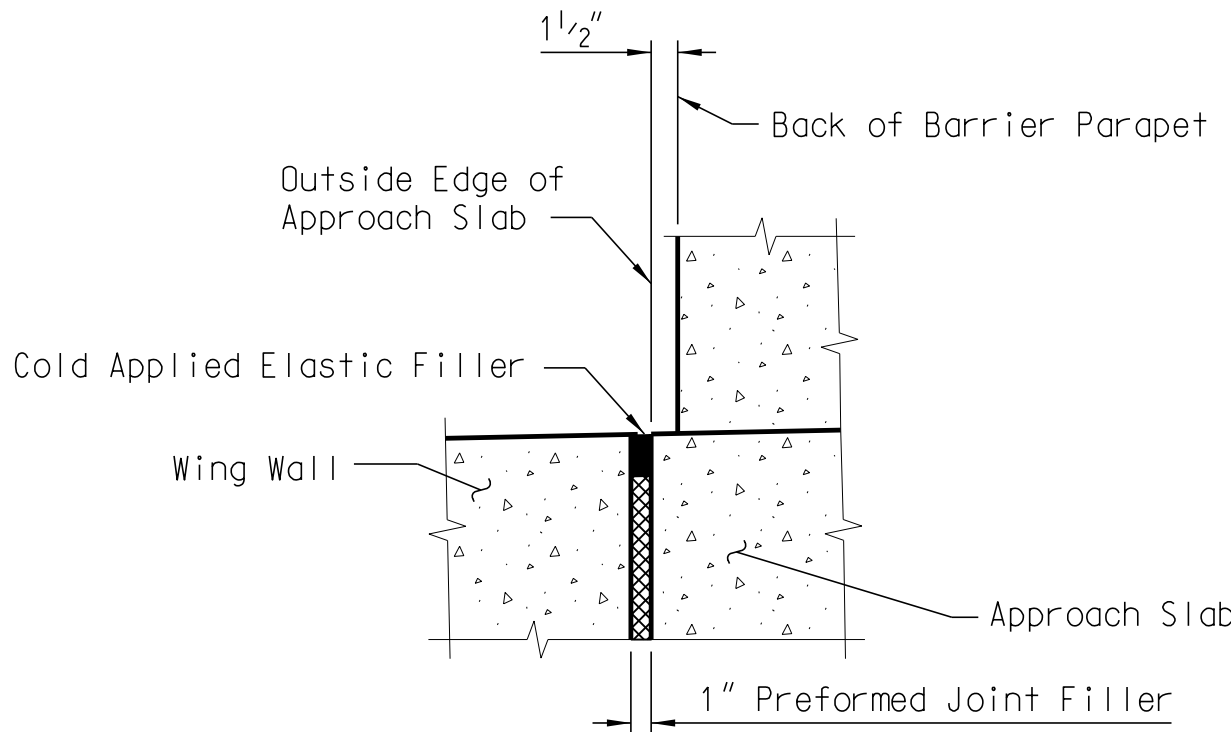
- ① Set this dimension in accordance with the Manufacturer's recommendations.



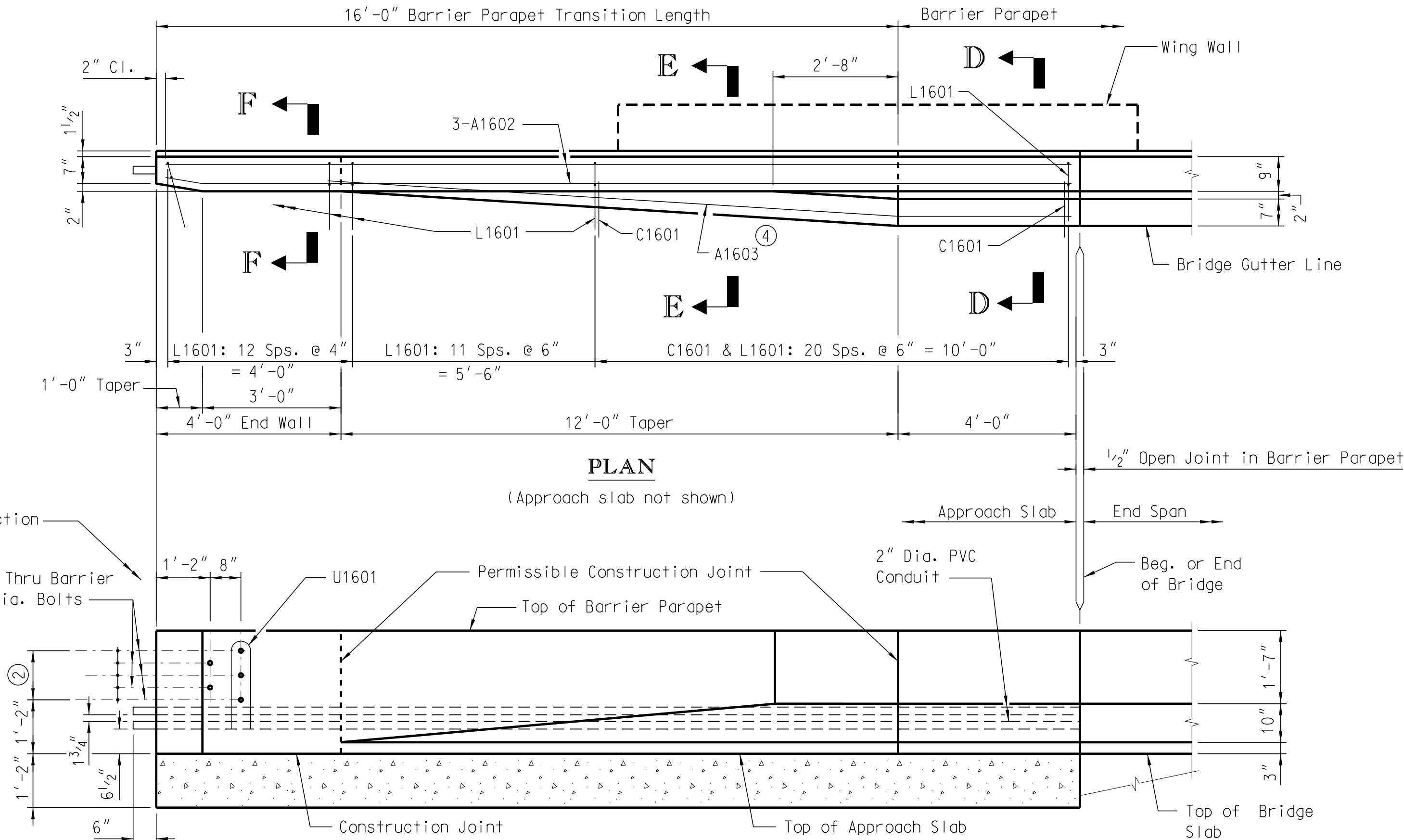
REV.	DMG	GFD	7-16	SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
	From Dwg. & Def.				
REV.	JXY	SAN	3-14	APPROACH SLAB (44' ROADWAY)	
	New Border				
REV.	MRW	SAN	1-12	COUNTY ORANBURG ROUTE US-301	
	Section A-A				
REVIEWED					
QUAN.	DMG	GFD	7-16		
DR.	PNP	SAN	11-07		
DES.	MRW	JDC	1-12		
	BY	CHK.	DATE		



SECTION D-D



SECTION THROUGH JOINT



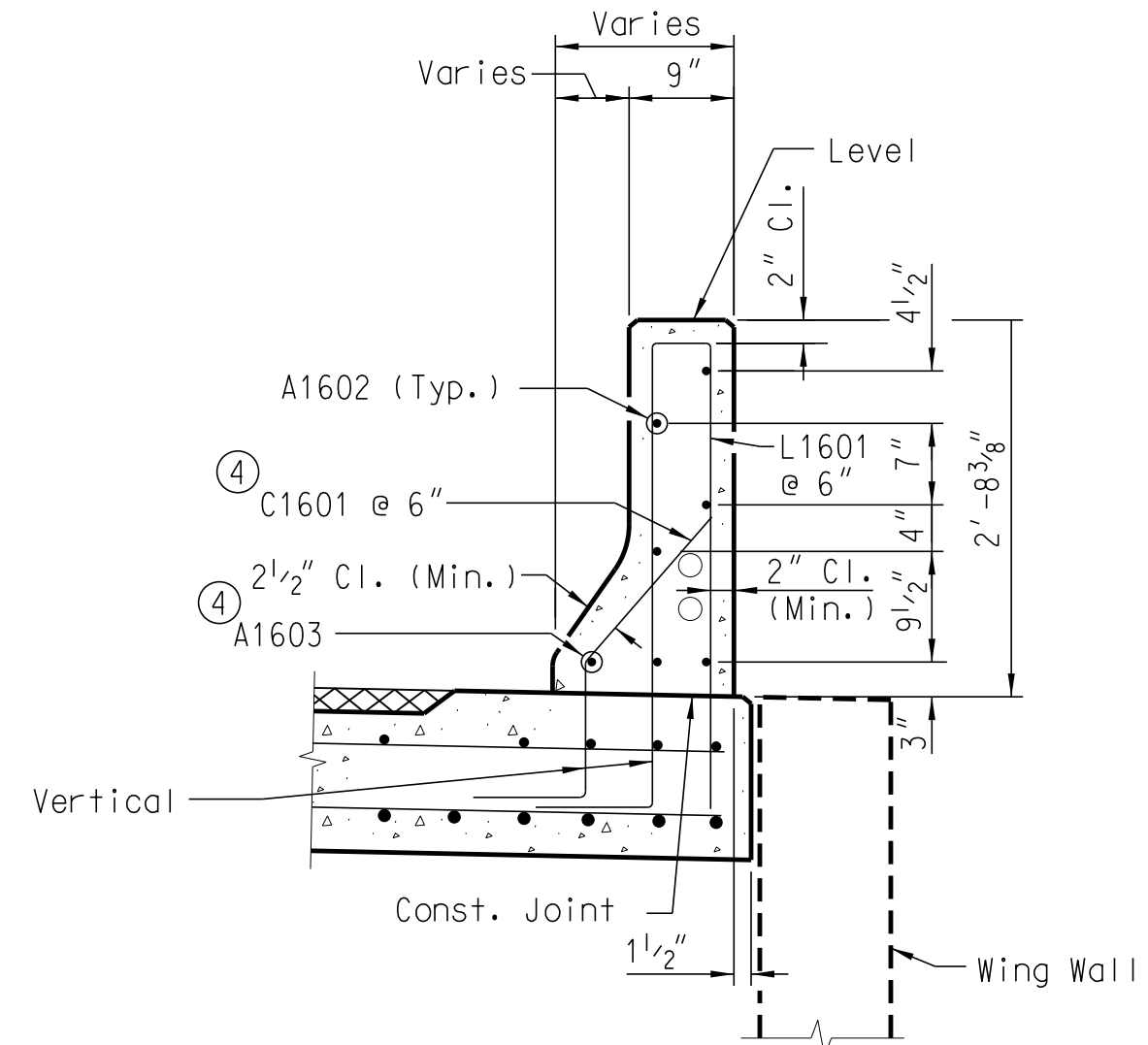
ELEVATION

BARRIER TRANSITION DETAILS

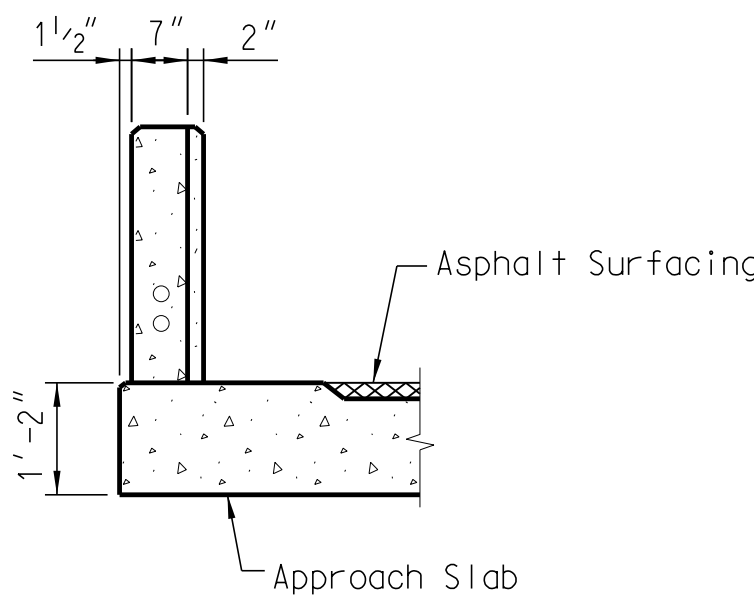
Provide Concrete Bridge Barrier Parapet Transition conforming to the requirements of Section 705 of the Standard Specifications. Include all costs of furnishing, preparing and placing concrete, expansion joint material, and all of the materials required in the finished railing transition, except for 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.

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

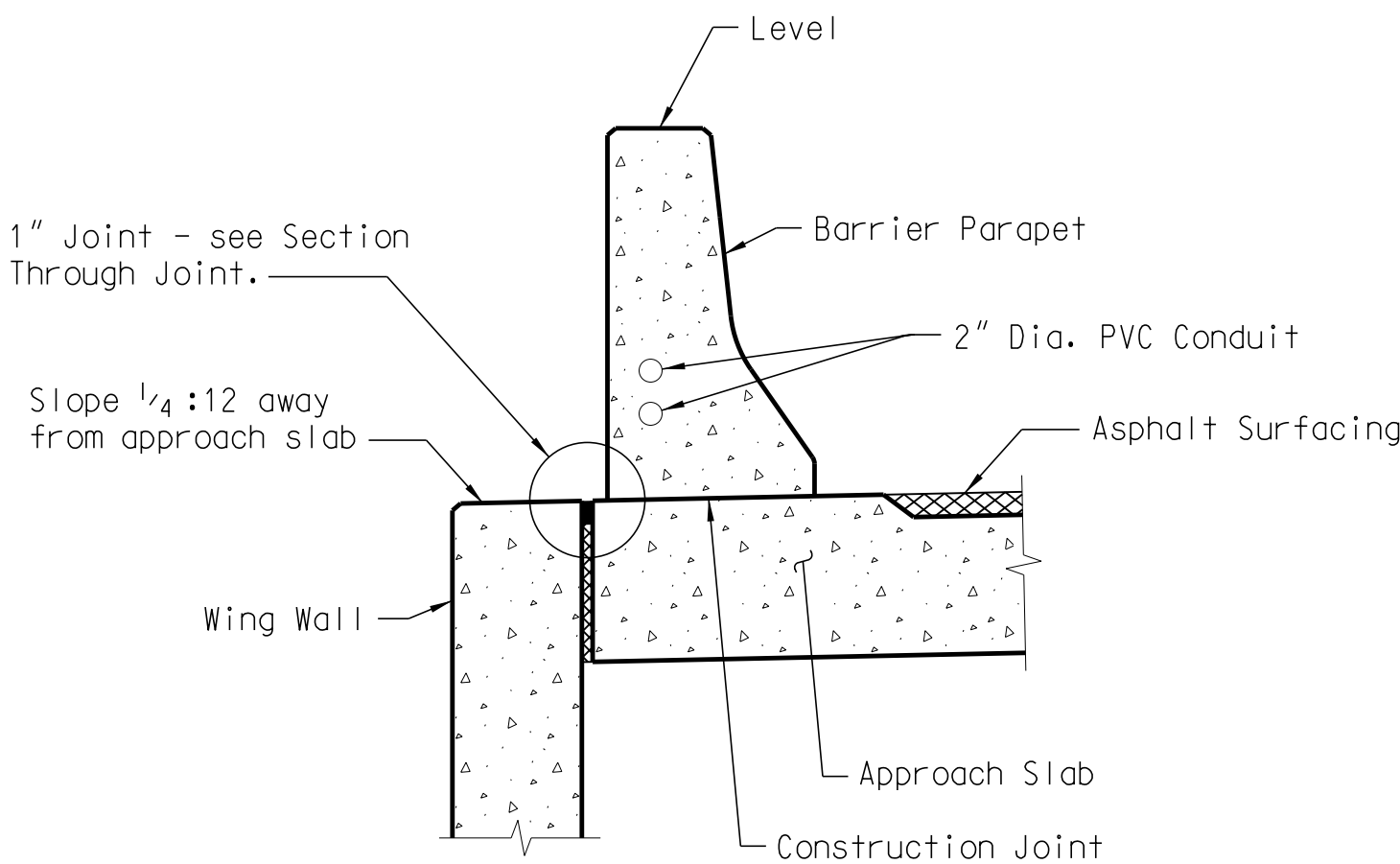
- ① Form the 1" Dia. holes with plastic, PVC, or galvanized standard weight steel pipe having an ID of 1". Include all cost of pipe and installation in the unit price bid for Reinforcing Steel. All pipe to remain in place when forms are removed. RCE to verify the location of the holes to ensure the guardrail shoe will fit properly when installed.
- ② 4 spaces @ 3 13 16 " = 1'-3 1 4 "
- ③ Rotate as required for clearance at the 7" transition.
- ④ Field Bend as necessary for clearance.
- ⑤ 2 1 2 " Cl. (Min.)



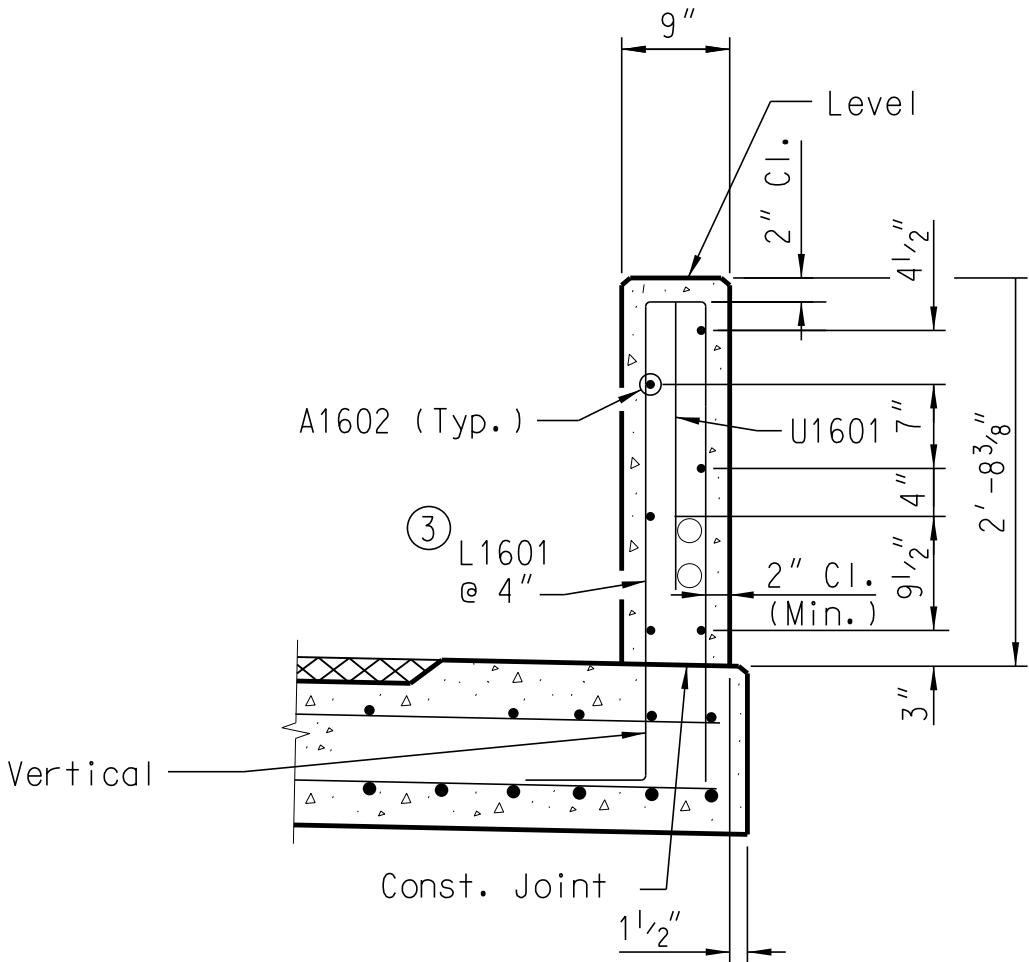
SECTION E-E



END ELEVATION



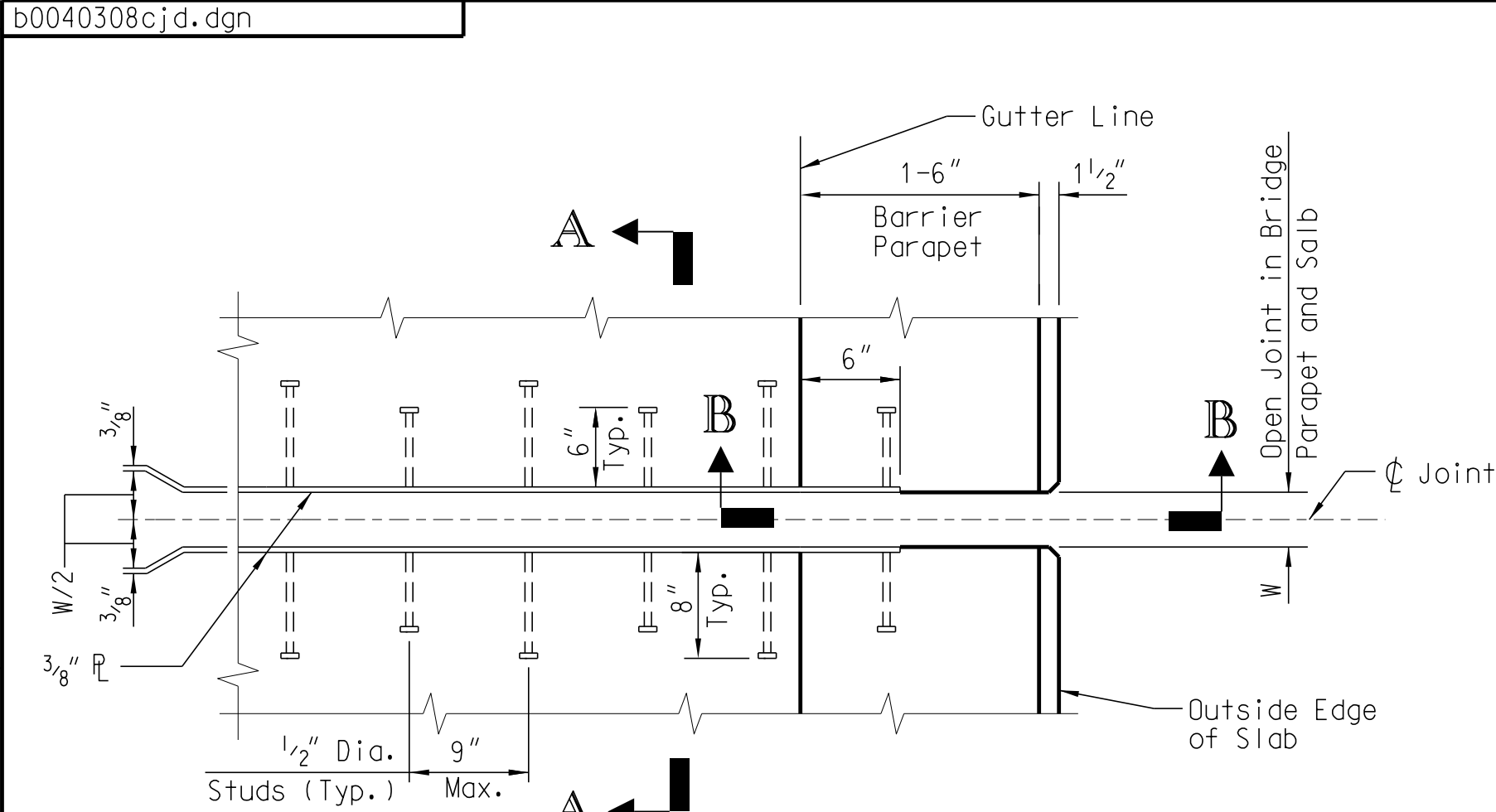
SECTION THROUGH WING WALL / APPROACH SLAB



SECTION F-F

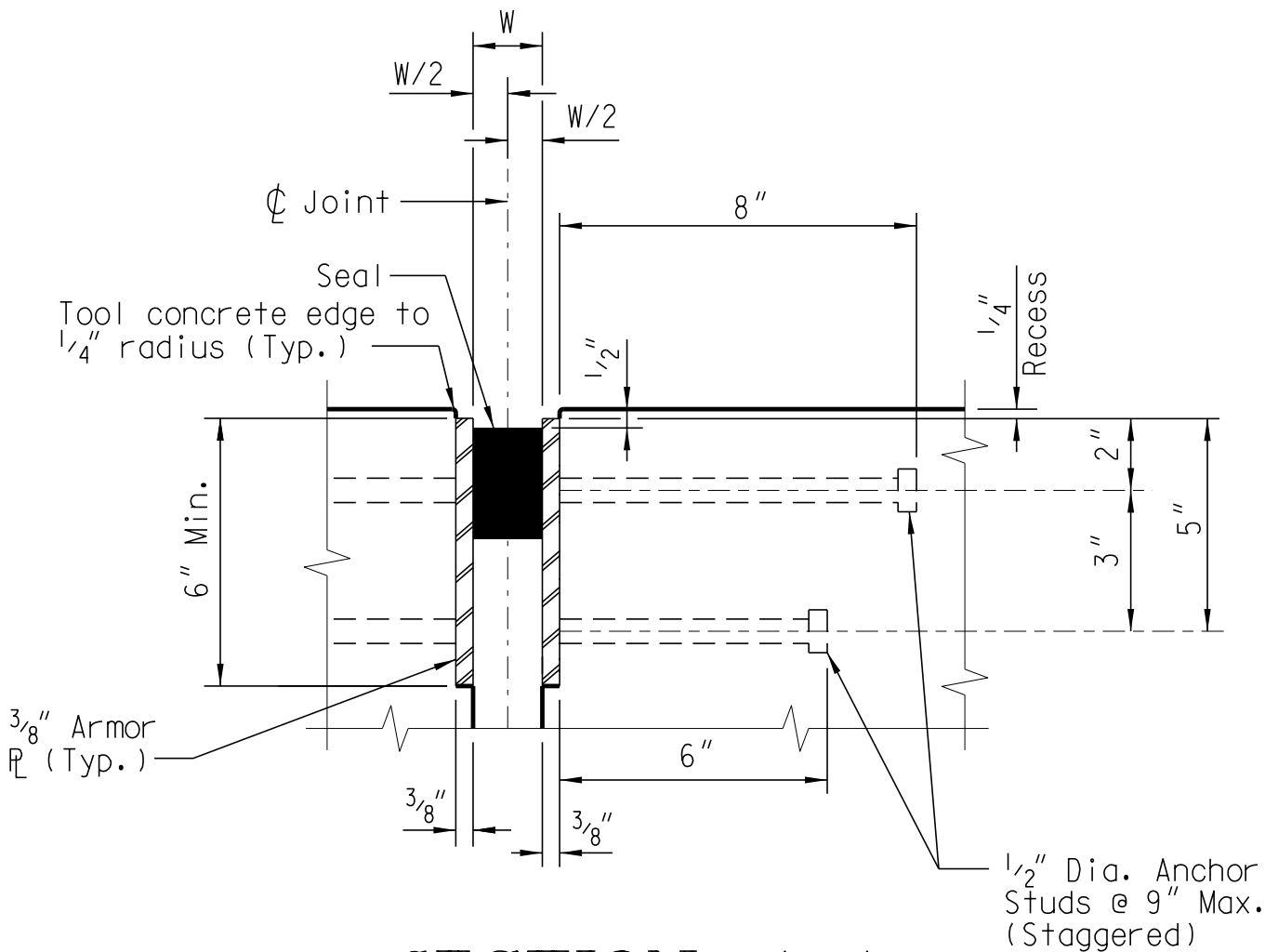


REV.	DMG	GFD	7-16	SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION			
	From Dwg. & Def.						
REV.	JXY	SAN	3-14	APPROACH SLAB DETAILS			
	New Border						
REV.	MRW	SAN	1-12				
	Border Sheet						
REVIEWED				COUNTY ORANGEBURG ROUTE US-301			
QUAN.	DMG	GFD	7-16				
DR.	PNP	SAN	12-07				
DES.	MRW	JDC	1-12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

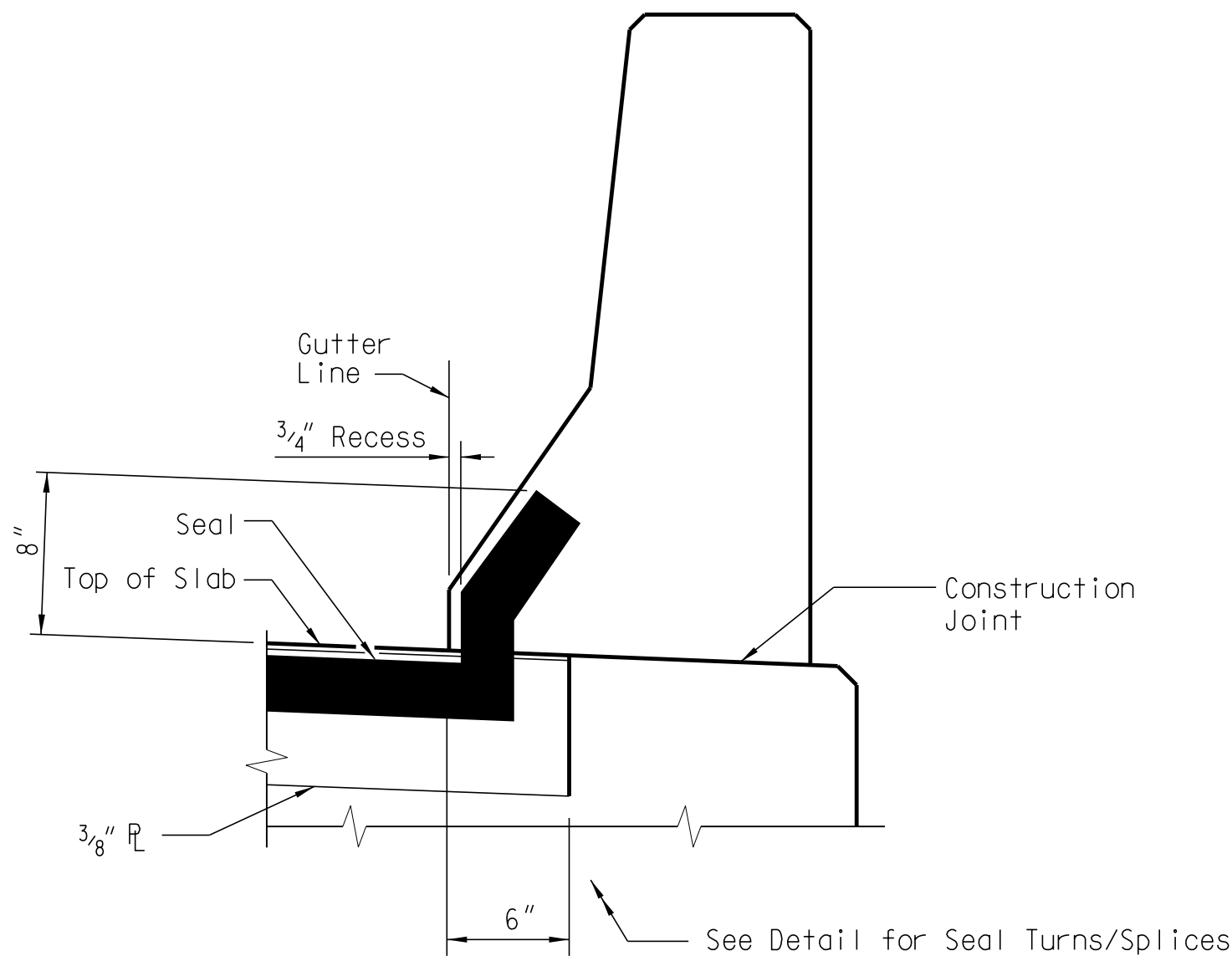


PART PLAN - EXPANSION JOINT

(Seal Not Shown)



SECTION A-A



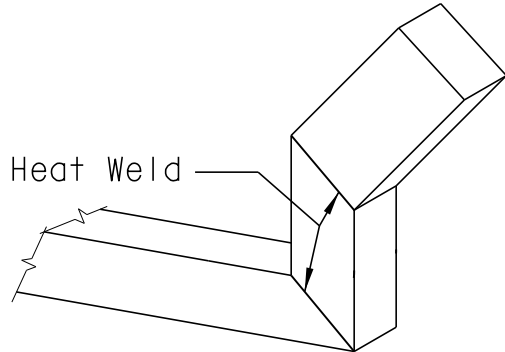
SECTION B-B

Seal Installation:

Have the manufacturer's representative present for the first installation to insure proper installation. Follow the manufacturer's installation procedures and the instructions below.

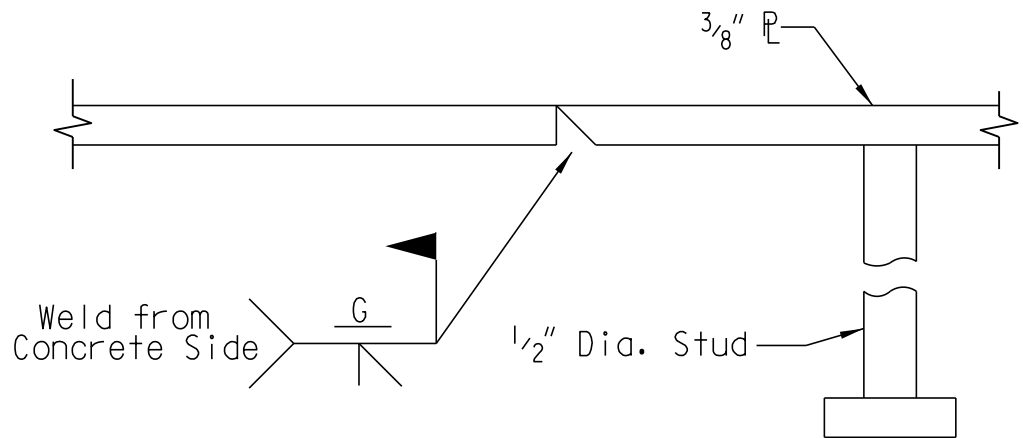
Begin seal installation at the low end of the joint. Apply mixed epoxy to both sides of the seal and joint. Ensure epoxy completely fills the grooves in the sides of the seal. With gloved hands, compress the seal and install seal into the joint recessing the seal 1/4" below the top of the steel plate. If assistance is needed in installing the seal, use a blunt probe to push down on the seal. Do not push the seal at any angle that will stretch the seal material. Once seal installation has begun on a joint, do not stop until the installation is completed. Clean the excess epoxy from the surface of the seal material quickly and thoroughly in accordance with the seal manufacturer's recommendations. Do not use solvents to clean or remove excess epoxy. Excess epoxy remaining on the joint seal may be cause for rejection of the joint.

Provide a watertight joint and seal. The joint will not be tested, but the RCE will observe the joint condition and performance until final inspection.



DETAIL FOR SEAL TURNS / SPLICES

- 1) Preheat the Teflon heating iron to 350° for approximately 30 minutes before welding the seal.
- 2) Using a sharp instrument such as a hacksaw, cut the seal to form the shape shown in Section B-B. This shape not necessary for welding seal at other approved splice locations.
- 3) Place the ends of seal to be welded against the Teflon heating iron at 350°F. Hold for a minimum of 10 seconds but no more than 20 seconds, depending on the ambient temperature. Then, quickly place these ends together tightly and hold for 20 seconds. Do not check the welded seal until the material has completely cooled.
- 4) If the edges do not seal completely, use a thin blade, such as a hacksaw blade to transfer heat into the edge to be sealed. Hold the heated blade between the edges of the material approximately 5 seconds, then remove and press the edge together quickly and hold for 10 to 20 seconds. Keep the blade on the heating iron under the Teflon cover between each use.



FIELD WELD DETAIL

Provide adhesive that complies with the requirements in the Table below.

TEST	TEST METHOD	REQUIREMENT
Tensile Strength	ASTM D 638	3500 psi Min.
Compressive Strength	ASTM D 695	7000 psi Min.
Shore D Hardness	ASTM D 2240	75 Min.
Water Absorption	ASTM D 570	0.25% by Weight
Bond Strength	ASTM C 882	430 psi Min.

Provide seal that complies with the requirements in the Table below.

TEST	TEST METHOD	REQUIREMENT
Elongation at Break	ASTM D 3575, Suffix T	≥ 180%
Tensile Strength	ASTM D 3575, Suffix T	≥ 110 psi
Tear Resistance	ASTM D 3575, Suffix G	≥ 14 pli
Density	ASTM D 3575, Suffix W - Method A	2.0 pcf to 3.4 pcf
Water Absorption	ASTM D 3575, Suffix L	< 0.03 psf
Compression Set	ASTM D 3575, Suffix B, 2 hour recovery	< 15%

Notes:

For each joint location as shown in the Joint Table below, provide seal having a normal uncompressed width as shown in the Joint Table. Set the nominal joint width "W" to the value shown in the Joint Table at 70° F. Use the actual air temperature, measured in the shade and averaged over the preceding 24 hour period, as the setting temperature. At the time of construction, decrease the joint opening by Dim "A" for each 10°F that the setting temperature is above 70°F or increase the joint opening by Dim "A" for each 10°F that the setting temperature is below 70°F.

JOINT TABLE			
LOCATION	NOMINAL JOINT WIDTH "W" @ 70° F.	DIM "A"	Seal Uncompressed Width
Interior Bent 4	2"	1/8"	2 1/2"
Interior Bent 7	2"	1/16"	2 1/2"

Ensure three copies of certifications are signed by an authorized agent of the manufacturer or supplier and submitted to the RCE prior to the installation of the seal. The required certifications are a copy of the manufacturer's test reports, or a statement by the supplier accompanied by the test results, certifying that the materials have been sampled, tested and inspected. Failure to provide the required certifications for seals and lubricant/adhesive is grounds for rejection of the materials.

Mark all seals with die markings that indicate the lot number and manufacturer. Mark each container of lubricant/adhesive with the manufacturer, lot number, and shelf life expiration date.

Provide preformed seals that are compatible with steel and concrete and resistant to abrasion, oxidation, oils, gasoline, salt, and other materials that may be spilled on or applied to the surface. Provide seal material that is resistant to weathering and ultra-violet rays. Provide a seal having a working movement range of 30% tension and 60% compression. Manufacture the seal from a low-density closed cell, cross-linked ethylene vinyl acetate polyethylene copolymer nitrogen blown material.

Manufacture seals with grooves along the bond surface running the length of the joint. The grooves shall be 1/8" wide by 1/8" deep and spaced between 1/2" and 1/2" apart. Provide seals with a minimum depth at least 70% of the uncompressed width and meeting the manufacturer's recommendations. Design the seal so that, when compressed, the center portion of the top does not extend upward above the original height of the seal by more than 1/4".

Shop mark the seal to indicate the top side of the seal in such a way as to be clearly visible upon installation.

Install seals in accordance with the manufacturer's instructions unless stipulated otherwise in these plans or the Special Provisions.

Provide a watertight seal along the entire length including the ends of the seal.

Adhesives:

Provide a two component, 100% solid, modified epoxy adhesive meeting the requirements of ASTM C 881, Type I, Grade 2, Class B & C and in accordance with testing requirements shown on this sheet.

Provide adhesive that is workable to 40°F. For installation temperatures below 40°F or for application on moist, hard to dry concrete surfaces, provide adhesive as specified by the manufacturer of the joint material.

Joint Preparation:

Clean the armored joint opening in accordance with the manufacturer's recommendations. Bond the seal to the cleaned surface on the same day the cleaning is done.

Provide steel armor plates that conform to the requirements of the latest AASHTO M 270, Grade 50W (ASTM A 709, Gr. 50W) and are of weldable quality.

Provide 3/8" plates that conform to the crown of the finished roadway and have smooth edges. Fabricate the 3/8" plates in reasonable lengths and connect them at the job site using partial penetration groove welds. Grind welds at the exposed surfaces of plates flush. Perform welding of splices prior to bonding seals. If necessary to bolt the 3/8" plates to the forms, provide 3/6" Dia. holes at approximately 2' on center in the lower portion of the plates.

Provide 1/2" Dia. headed studs that meet the requirements of Section 709 of the Standard Specifications. Electrically weld all studs.

Field bend top slab reinforcing as required to clear anchor studs.

For payment purposes, measure along the centerline of the joint from the edge of slab to the edge of slab. Include all costs associated with furnishing labor, materials, fabrication, and installation of armor plates, cover plates, and seals complete and in place in the unit price bid per linear foot of Compression Seal Joint.



REV.	GFD	TL	9-16
	From Dwg. & Det.		
REV.	GAR	JXY	2-16
	Sidewalk		
REV.	BMH	SAN	7-14
	Notes		
REVIEWED			
QUAN.			
DR.	PNP	SAN	11-08
DES.			
BY	CHK.	DATE	

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

COMPRESSION SEAL
EXPANSION JOINT
DETAILS

COUNTY ORANGEBURG ROUTE US 301