

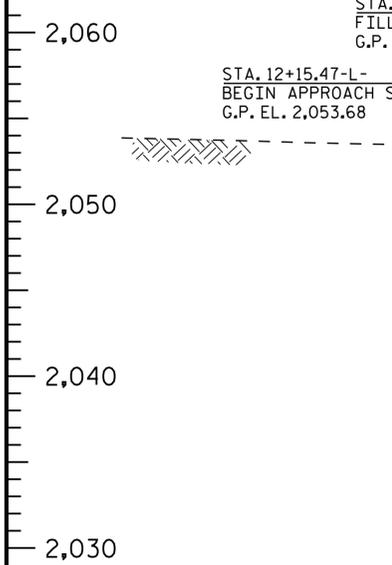
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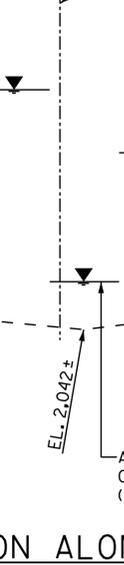
12+00
VERTICAL GRADE DATA -L-

$(-).5.6571\%$ $(+).0.5000\%$
PI = 11+85.00-L-
EL = 2,053.53'
VC = 65'



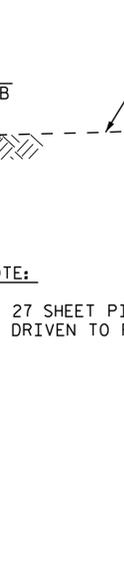
12+50
SPAN A

BRIDGE ID
STA. 12+50.00-L-
C BRIDGE

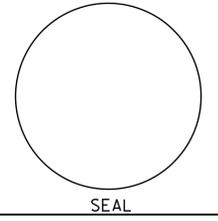


13+00
VERTICAL GRADE DATA -L-

$(+).0.5000\%$ $(+).6.4516\%$
PI = 13+19.00-L-
EL = 2,054.20'
VC = 60'



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.



HYDRAULIC DATA:

DESIGN DISCHARGE	2300 CFS
FREQUENCY OF DESIGN FLOOD	10 YRS.
DESIGN HIGH WATER ELEVATION	2053.1'
DRAINAGE AREA	16.9 SQ. MI.
BASE DISCHARGE	4370 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	2056.67'

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	2700 CFS
FREQUENCY OF OVERTOPPING FLOOD	10+ YRS.
OVERTOPPING FLOOD ELEVATION	2053.9' *

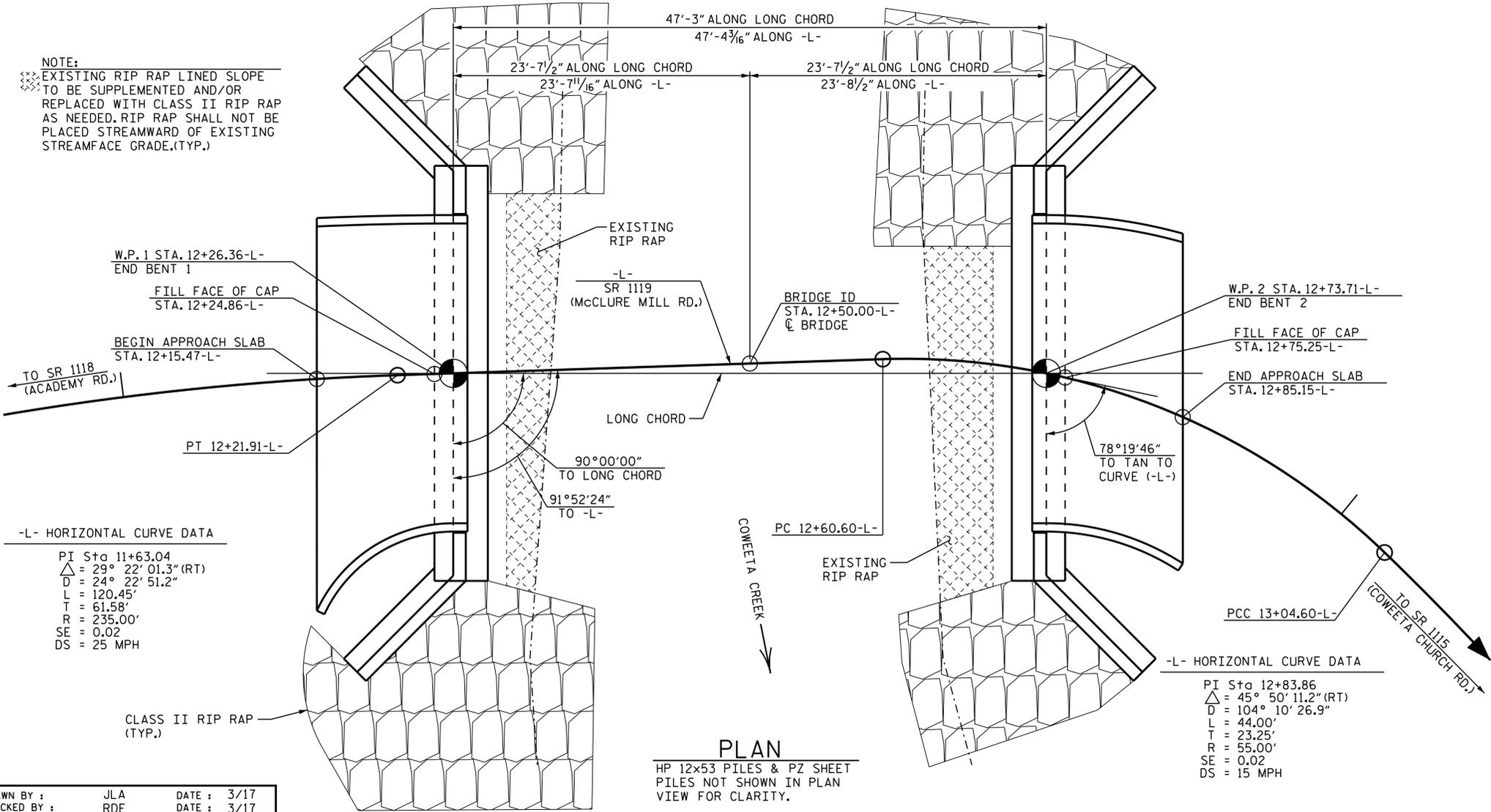
* OVERTOPPING ELEVATION REPRESENTS LOWEST HIGH POINT ON DECK/ROADWAY WHICH OCCURS AT @ STA. 12+12.00-L- LT.

LOW CHORD ELEVATION	
EB1	2,051.64'
EB2	2,051.88'

NOTE:
PZ 27 SHEET PILE (GALVANIZED) SHALL BE DRIVEN TO REFUSAL ON ROCK.

SECTION ALONG -L-
(SECTION TAKEN AT RIGHT ANGLES TO SUBSTRUCTURE)

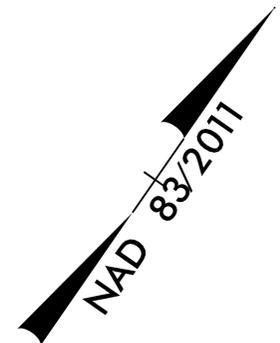
NOTE:
EXISTING RIP RAP LINED SLOPE TO BE SUPPLEMENTED AND/OR REPLACED WITH CLASS II RIP RAP AS NEEDED. RIP RAP SHALL NOT BE PLACED STREAMWARD OF EXISTING STREAMFACE GRADE.(TYP.)



PLAN
HP 12x53 PILES & PZ SHEET PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.

-L- HORIZONTAL CURVE DATA
PI Sta 11+63.04
 $\Delta = 29^\circ 22' 01.3''$ (RT)
D = 24' 22' 51.2"
L = 120.45'
T = 61.58'
R = 235.00'
SE = 0.02
DS = 25 MPH

-L- HORIZONTAL CURVE DATA
PI Sta 12+83.86
 $\Delta = 45^\circ 50' 11.2''$ (RT)
D = 104' 10' 26.9"
L = 44.00'
T = 23.25'
R = 55.00'
SE = 0.02
DS = 15 MPH



PROJECT NO. 14.B.205624.1
MACON COUNTY
STATION: 12+50.00-L-
SHEET 1 OF 4 REPLACES BRIDGE NO. 550053

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
COWEETA CREEK ON SR1119
BETWEEN SR1118 AND SR 1115

9/27/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			24

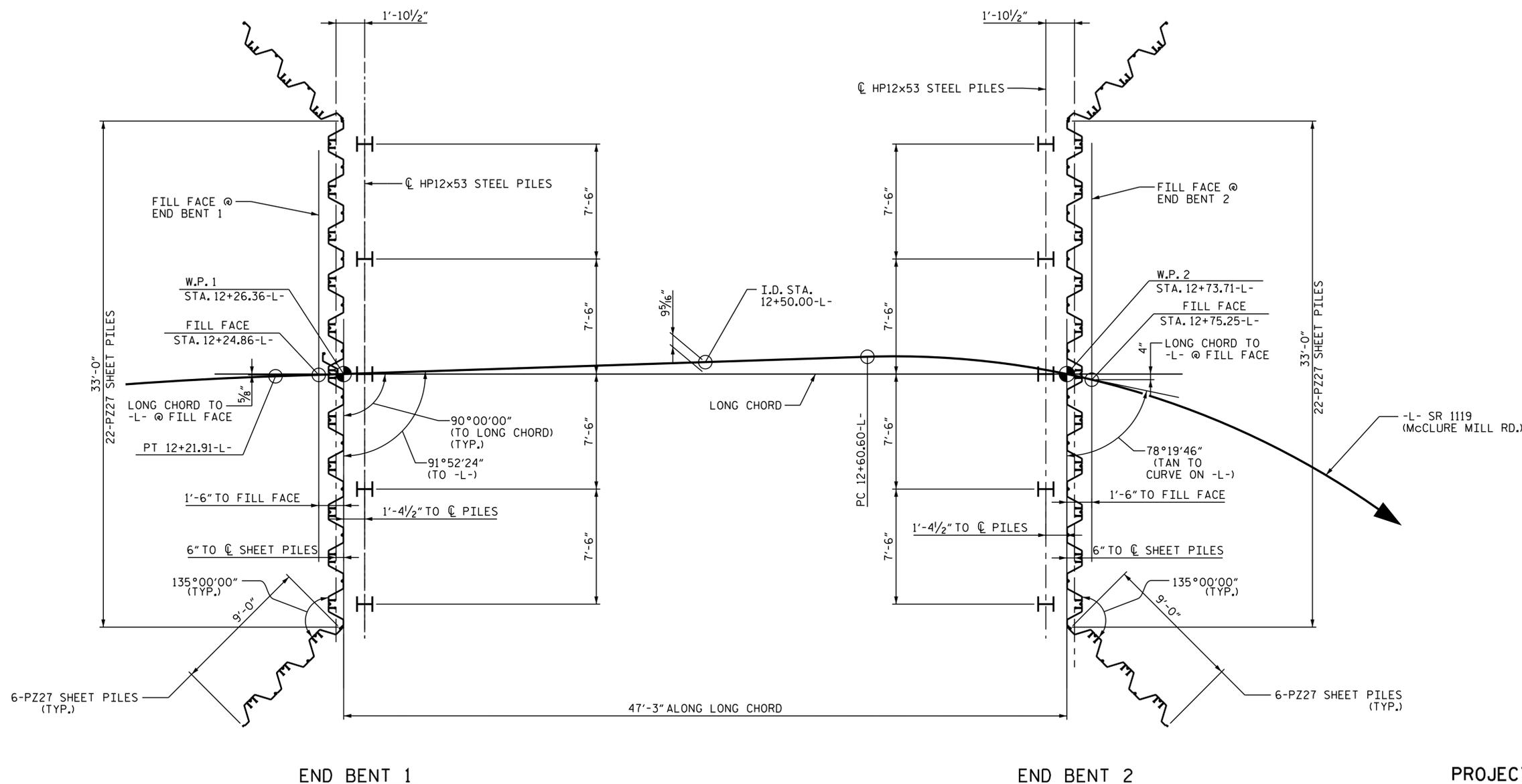
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 D = 24° 22' 51.2"
 L = 120.45'
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 R = 235.00'

-L- HORIZONTAL CURVE DATA

PI Sta 12+83.86
 $\Delta = 45^\circ 50' 11.2''$ (RT)
 D = 104° 10' 26.9"
 L = 44.00'
 T = 23.25'
 R = 55.00'



LONG CHORD AND FOUNDATION LAYOUT

- NOTES:**
- DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ORIENT PILES AS SHOWN.
 - HP12x53 PILES SHALL BE GALVANIZED.
 - PZ27 SHEET PILING SHALL BE GALVANIZED.
 - FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
 - PILES AT END BENT No.1 AND END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.
 - DRIVE PILES AT END BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.
 - DRILLED-IN PILES ARE REQUIRED FOR END BENT No.1 AND END BENT No.2. EXCAVATE HOLES AT PILE LOCATIONS TO A DEPTH OF 10 FEET BELOW PILE CAP OR MINIMUM 5 FEET INTO CRYSTALLINE ROCK, WHICHEVER IS DEEPER. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 - CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATIONS AT END BENT No.1 AND END BENT No.2.

PROJECT NO. 14.B.205624.1

MACON COUNTY

STATION: 12+50.00-L-

SHEET 2 OF 4

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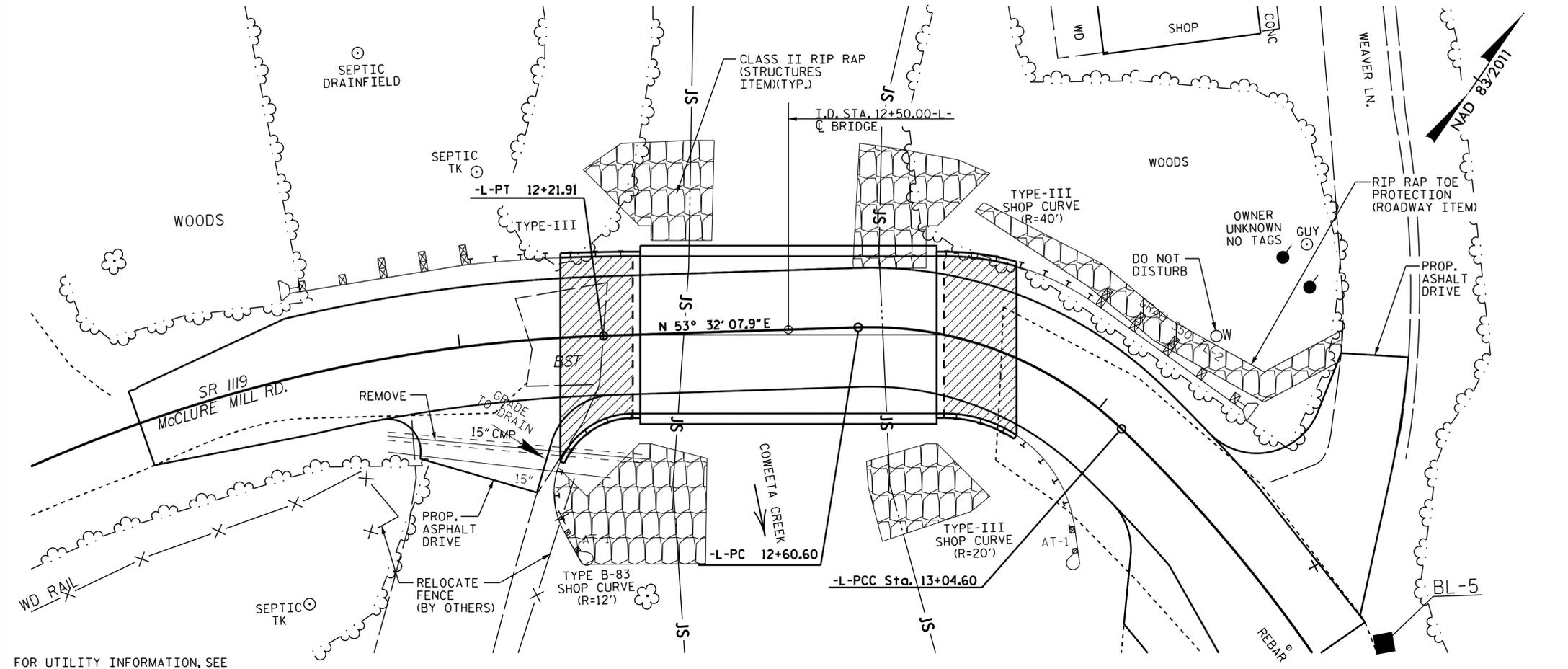
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOUNDATION LAYOUT
 FOR BRIDGE OVER
 COWEETA CREEK ON SR1119
 BETWEEN SR1118 AND SR 1115

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BENCH MARK #1: RR SPIKE IN BASE OF 20" WHITE PINE, 25.27' LT. OF -L- STA. 11+54.97, ELEV. 2,054.89' (NAVD 88)



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE NOTES SHEET, SN.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFTY, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGE."
- ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR 32" ALASKA RAIL, SEE SPECIAL PROVISIONS.
- FOR 19" x 12 1/2" CONCRETE CURB, SEE SPECIAL PROVISIONS.
- FOR STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

PROJECT NO. 14.B.205624.1
MACON COUNTY
 STATION: 12+50.00-L-

SHEET 3 OF 4

9/27/2017

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 LOCATION SKETCH
 FOR BRIDGE OVER
 COWEETA CREEK ON SR1119
 BETWEEN SR1118 AND SR 1115

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
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DRAWN BY : JLA DATE : 3/17
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TOTAL BILL OF MATERIAL

ITEM	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	CLASS "A" CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS	REINFORCING STEEL (BRIDGE)	HP12x53 GALVANIZED STEEL PILES		PZ27 GALVANIZED STEEL SHEET PILING	32" ALASKA RAIL	19"x12 1/2" CONCRETE CURB	RIP RAP, CLASS II (2'-0" THK.)	GEOTEXTILE	ELASTOMERIC BEARINGS	3'-0" x 1'-6" PRESTRESSED CORED SLABS	
	LIN. FT.	LIN. FT.	C.Y.	LUMP SUM	LBS.	NO.	LIN. FT.	SO. FT.	LIN. FT.	LIN. FT.	TON	S.Y.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				LUMP SUM					75.0	90.0			LUMP SUM	9	405
END BENT 1	22	36	49.2		3,801	5	75	678			120	100			
END BENT 2	16	39	50.1		3,801	5	75	492			90	80			
TOTALS	38	75	99.3	LUMP SUM	7,602	10	150	1170	75.0	90.0	210	180	LUMP SUM	9	405

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MACON COUNTY
 STATION: 12+50.00-L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

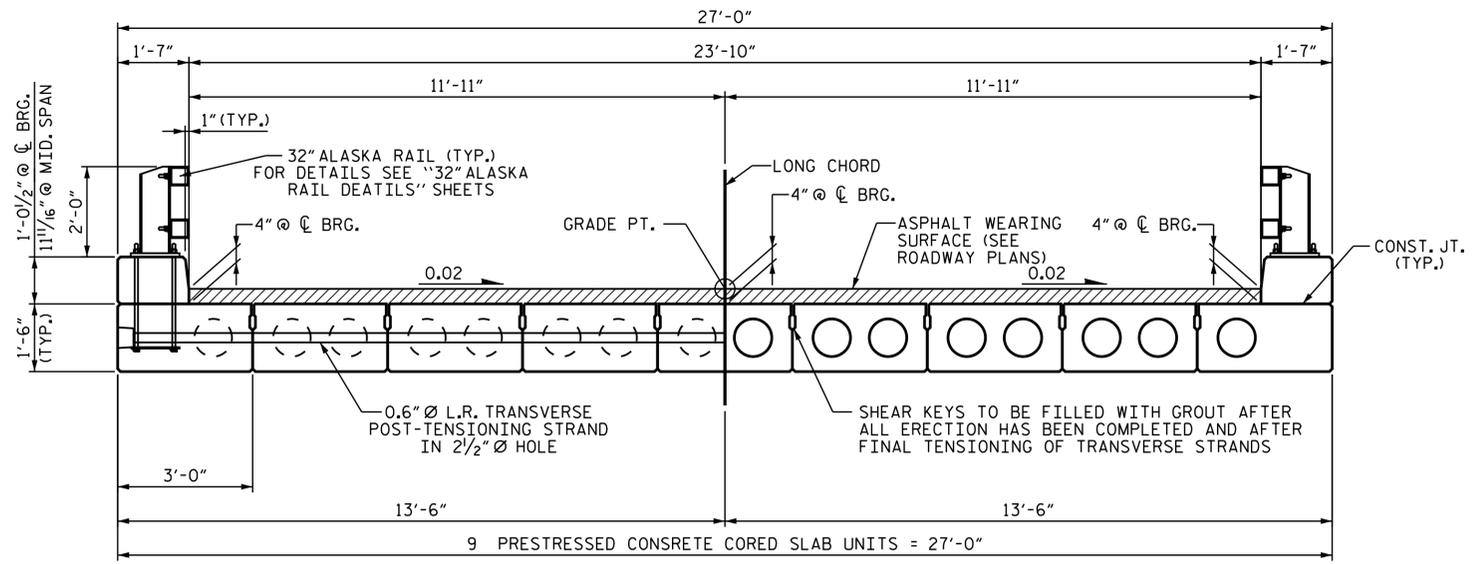
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 BILL OF MATERIAL**

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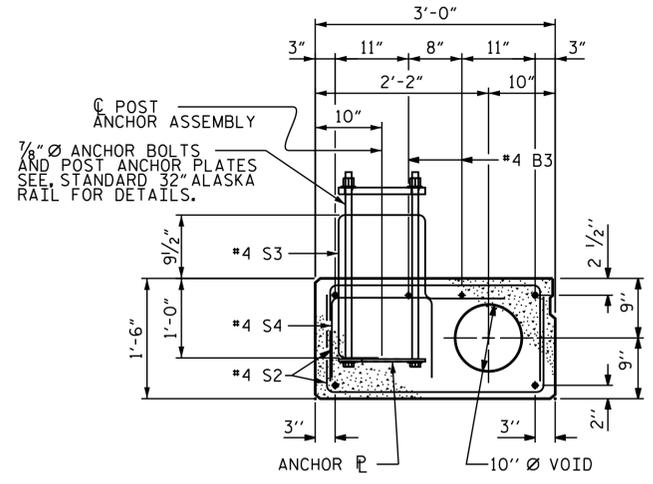
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2			4			TOTAL SHEETS 24

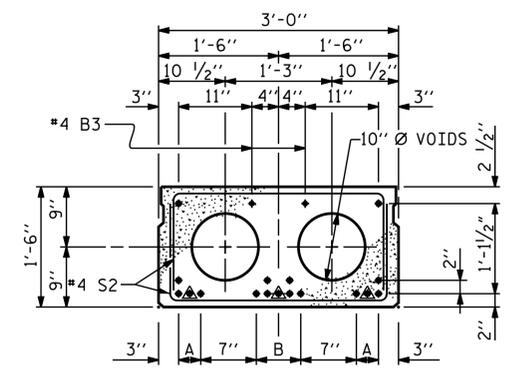


TYPICAL SECTION
ONE SIMPLE SPAN WITH 18" PCCS UNITS

* - THE MAXIMUM CURB HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE CURB AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "32" ALASKA RAIL" DETAIL.



EXTERIOR SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION) (17 STRANDS REQUIRED) (TYPE 1)



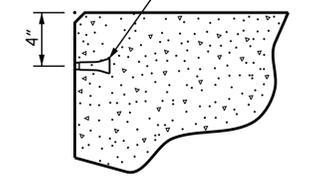
INTERIOR SLAB SECTION
(17 STRANDS REQUIRED) (TYPE 2)

0.6" Ø LOW RELAXATION STRAND LAYOUT

▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

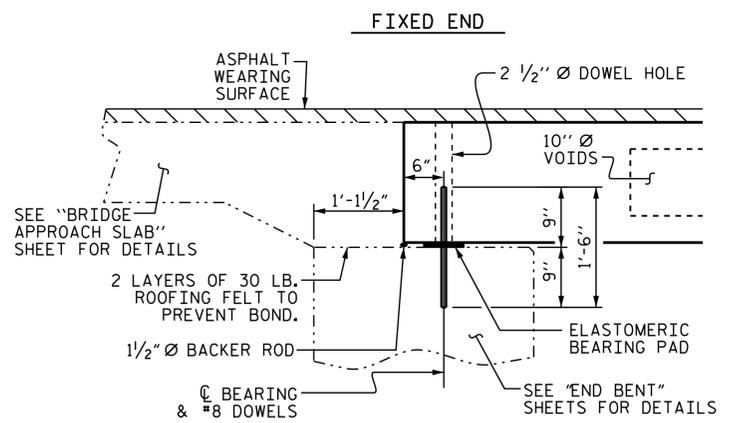
PERMITTED 1/2" THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



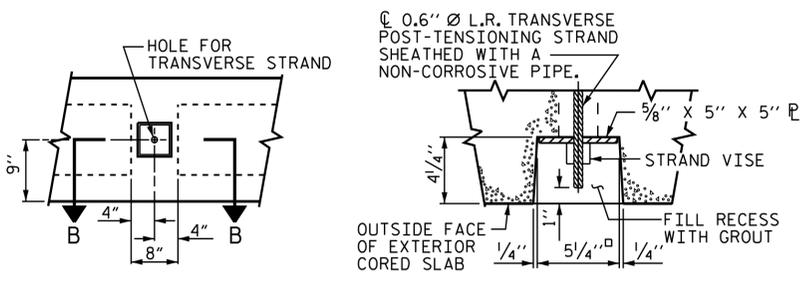
THREADED INSERT DETAIL

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MACON COUNTY
STATION: 12+50.00-L-

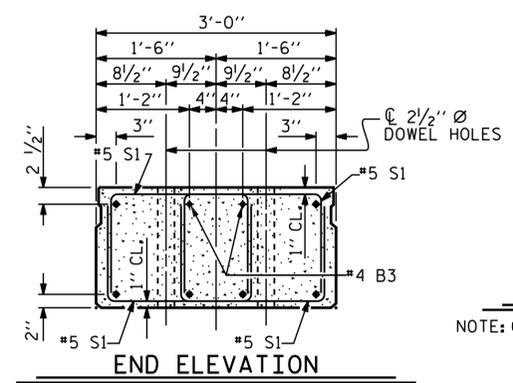
SHEET 1 OF 3



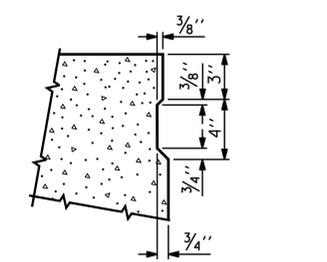
SECTION AT END BENT



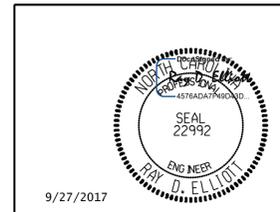
GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



END ELEVATION
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES (STRAND LAYOUT NOT SHOWN) INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

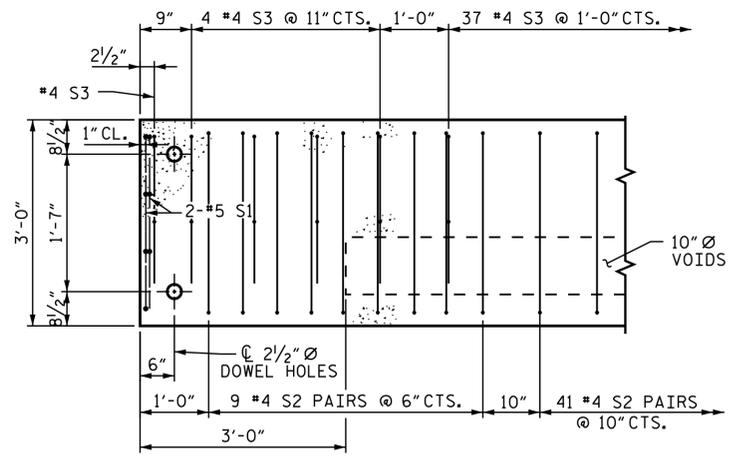
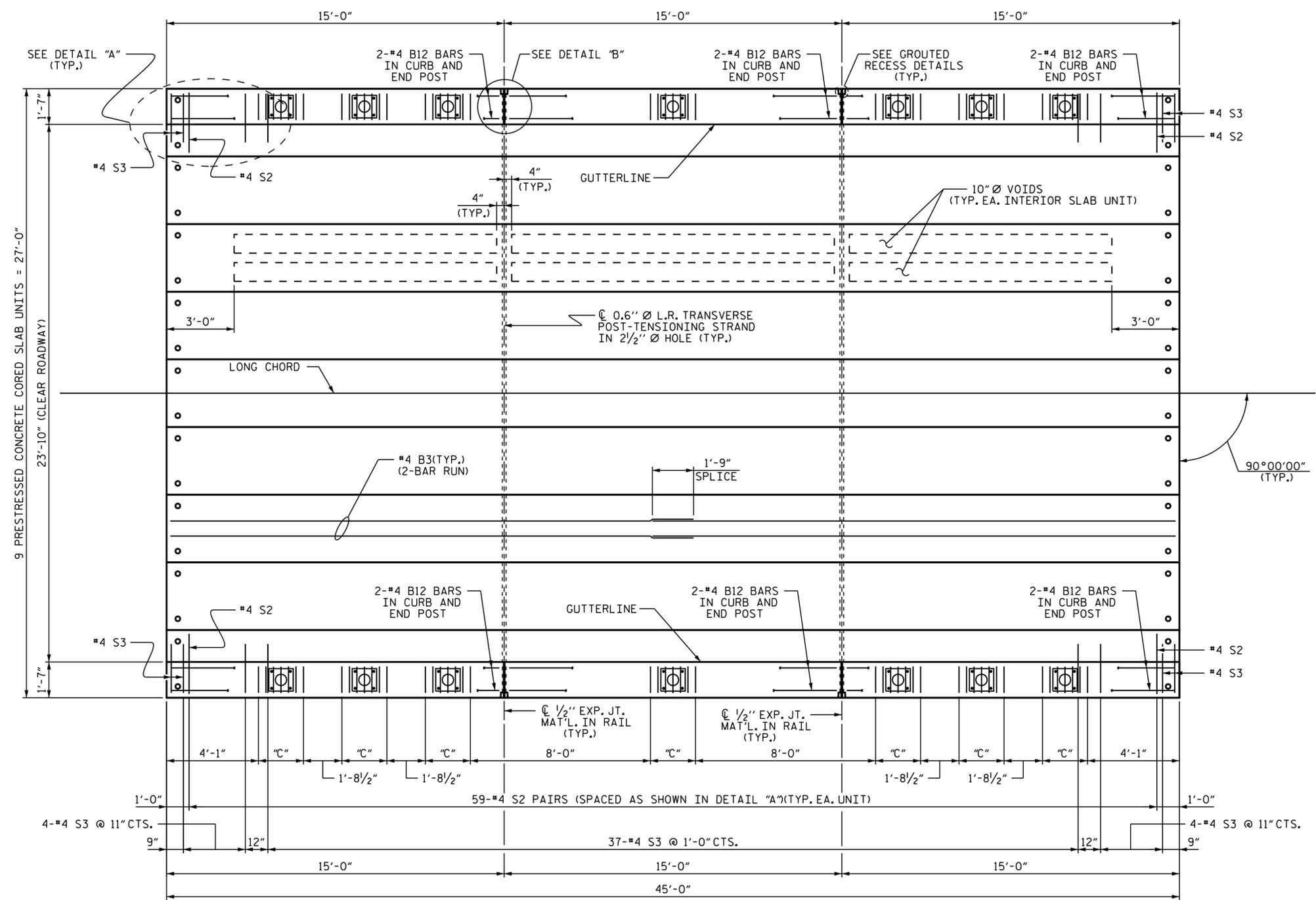


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

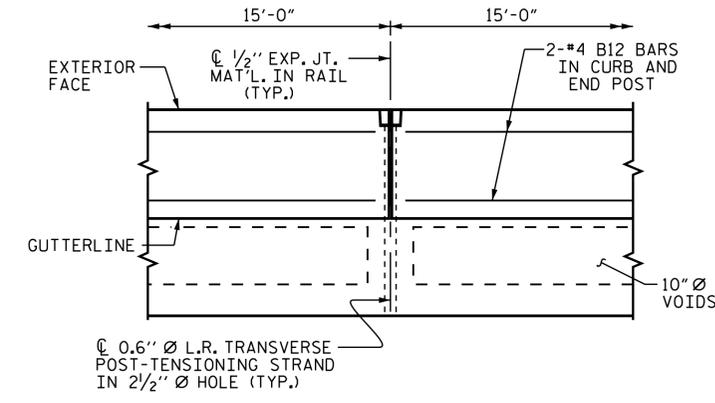
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DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #4 S3 BARS.



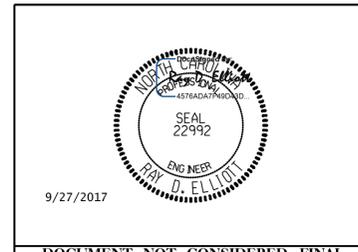
DETAIL "B"
 #4 S2 & #4 S3 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PLAN OF UNIT

"C" = 7 #4 S4 @ 4" CTS.
 (TYP. AT EA. RAIL
 POST ANCHOR ASSEMBLY)

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 2 OF 3

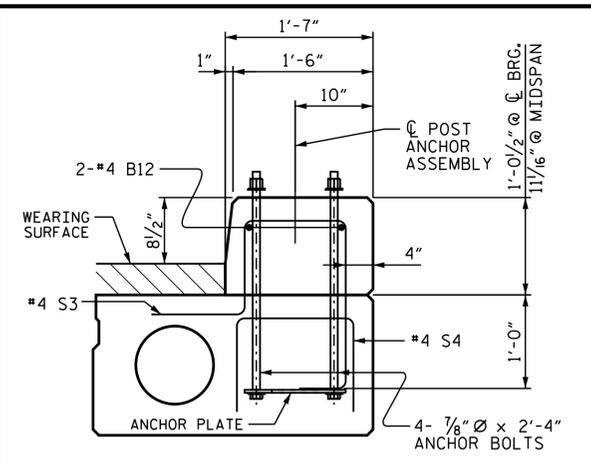


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
PLAN OF 45' UNIT
23'-10" CLEAR ROADWAY
90° SKEW

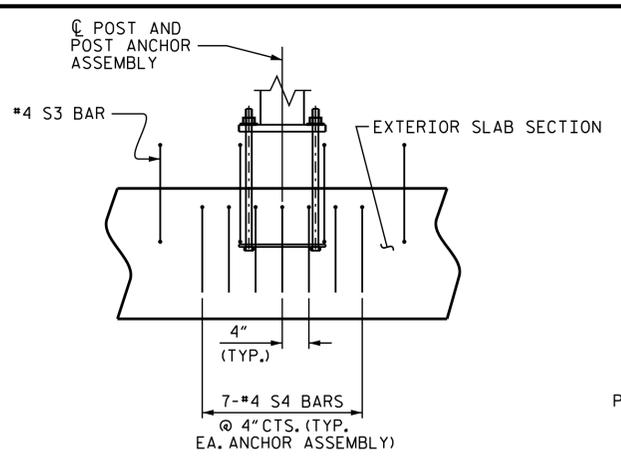
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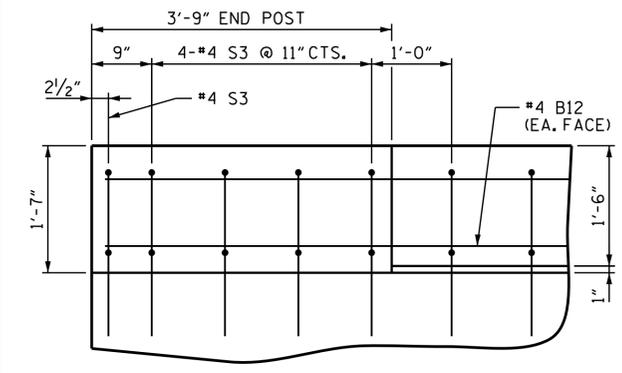
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-7
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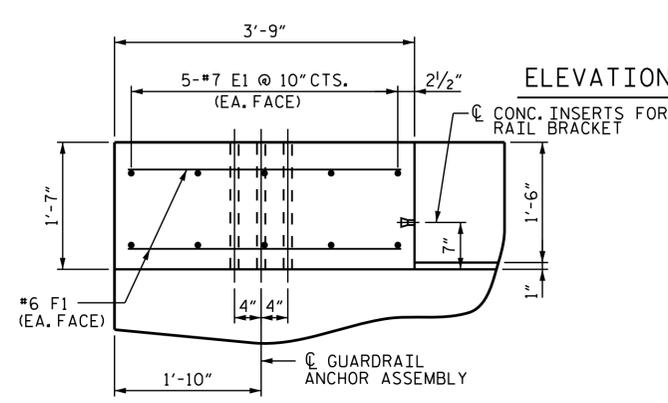
ALASKA RAIL CURB SECTION



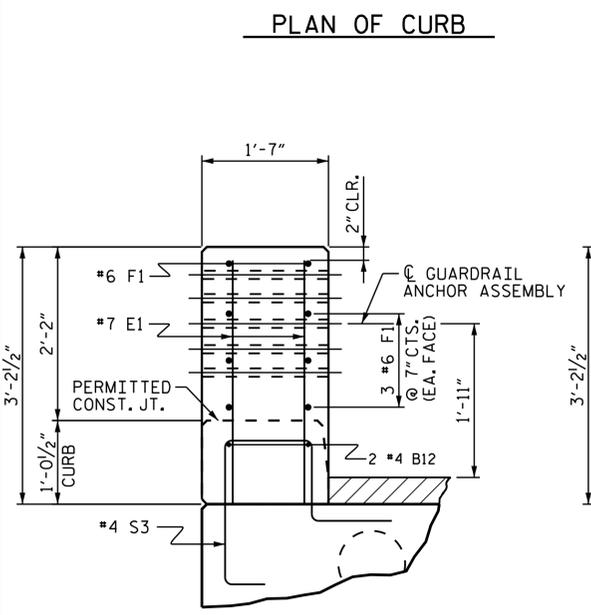
SIDE VIEW AT POST LOCATION
(SHOWING ADDITIONAL S4 BARS AT EACH POST ASSEMBLY)



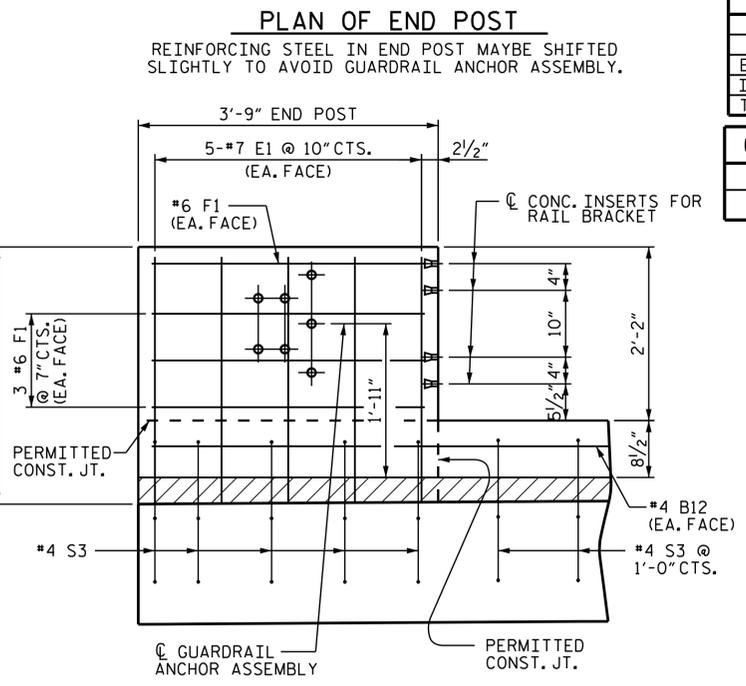
PLAN OF CURB



ELEVATION AT EXPANSION JOINTS



END VIEW

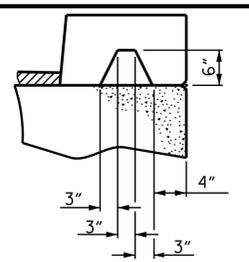


ELEVATION

CURB AND END POST FOR 32" ALASKA RAIL

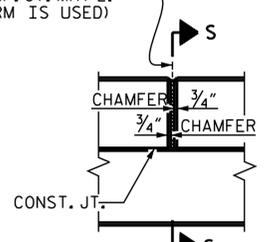
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REINFORCING STEEL IN END POST MAYBE SHIFTED SLIGHTLY TO AVOID GUARDRAIL ANCHOR ASSEMBLY.



SECTION S-S
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



CORED SLABS REQUIRED

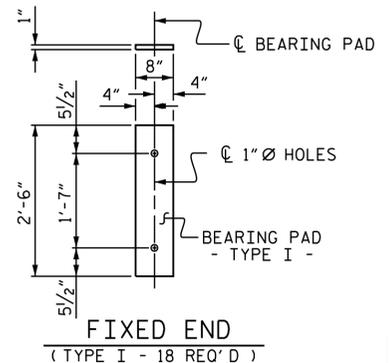
UNIT	NUMBER	LENGTH	TOTAL LENGTH
45' UNIT			
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	7	45'-0"	315'-0"
TOTAL	9		405'-0"

CONCRETE RELEASE STRENGTH

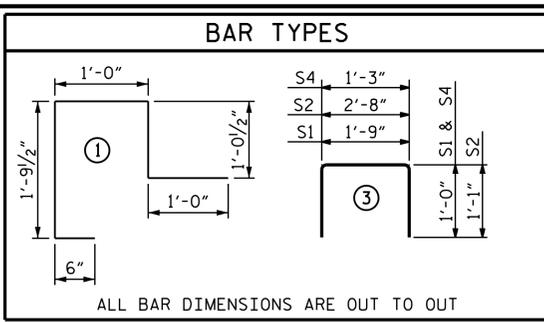
UNIT	PSI
45' UNITS	6,000

GUTTERLINE ASPHALT THICKNESS & CURB HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	CURB HEIGHT @ MID-SPAN
45' UNITS	3 3/16"	11 1/16"



ELASTOMERIC BEARING DETAILS
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 45' CORED SLAB UNIT

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B3	#4	STR	23'-3"	62	23'-3"	62
S1	#5	3	3'-9"	31	3'-9"	31
S2	#4	3	4'-10"	381	4'-10"	381
*S3	#4	1	5'-4"	167		
S4	#4	3	3'-3"	106		
REINFORCING STEEL		LBS.		580		474
* EPOXY COATED REINFORCING STEEL		LBS.		167		
8,000 P.S.I. CONCRETE		CU. YDS.		6.5		5.6
0.6" L.R. STRANDS		No.		17		17

BILL OF MATERIAL FOR END POSTS AND CURB

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
45' UNIT						
*B12	12	12	#4	STR	14'-7"	117
*E1	40	40	#7	STR	3'-0"	245
*F1	32	32	#6	STR	3'-5"	164
* EPOXY COATED REINFORCING STEEL				LBS.		526
CLASS AA CONCRETE				CU.YDS.		7.3

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-6"
45' CORED SLAB UNIT	0.6" L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/16" ↓
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/4" ↓
FINAL CAMBER	13/16" ↑

** INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS

	0.6" L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN THE 32" ALASKA RAIL SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CURB AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CURB EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CURB SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

PROJECT NO. 14.B.205624.1
MACON COUNTY
STATION: 12+50.00-L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-6"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

9/27/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-8
1			3			TOTAL SHEETS 24
2			4			

NOTES

METAL RAIL SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS. ALUMINUM RAIL WILL NOT BE AN OPTION.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, ANCHOR PLATES AND RAIL SPLICE TUBES: AASHTO M270 GRADE 36 STRUCTURAL STEEL-GALVANIZED TO AASHTO M111.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

RAILS: ASTM A500 GRADE B - GALVANIZED TO AASHTO M111.

WELDED RAIL STUDS: ASTM A108-GALVANIZED TO AASHTO M111.

HIGH STRENGTH ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 105. HEAVY HEX NUTS SHALL CONFORM TO ASTM A563 DH, AND WASHERS TO ASTM F436, TYPE 1. NUTS AND WASHERS SHALL BE GALVANIZED TO AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR9.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

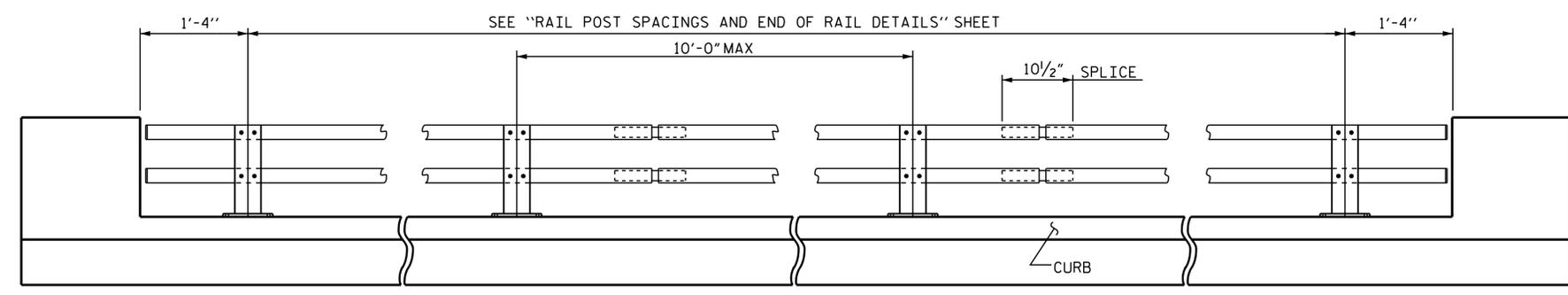
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CURB AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BRIDGE ENDS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CURB SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

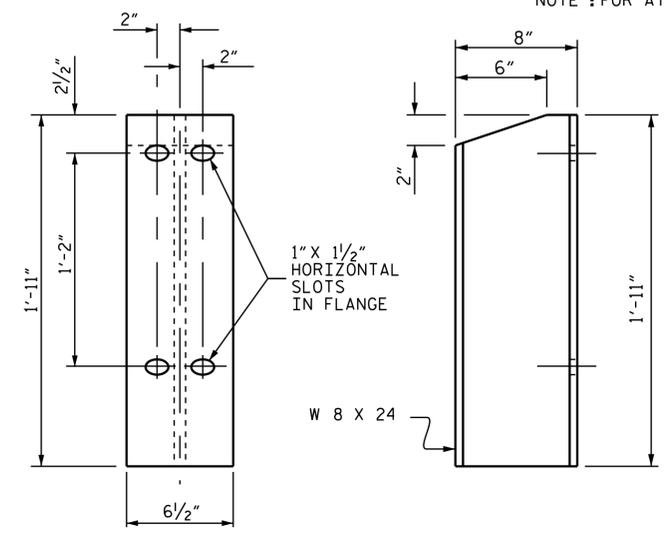
THE RAIL SECTIONS SHALL BE ATTACHED TO THE POSTS BY TWO THREADED 3/4" Ø WELDED STUDS, PLATE WASHERS, LOCKWASHERS, AND NUTS.

FOR 32" ALASKA RAIL, SEE THE SPECIAL PROVISIONS.



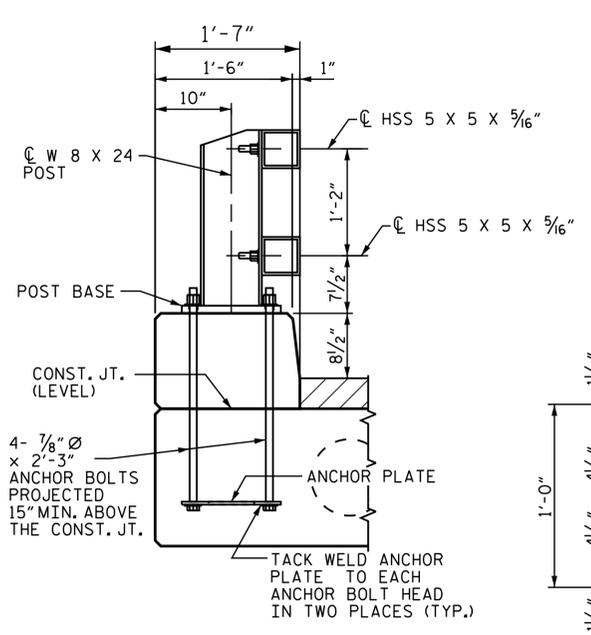
ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET S-10.

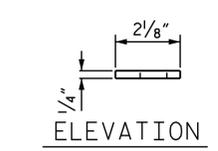


FRONT ELEVATION SIDE ELEVATION

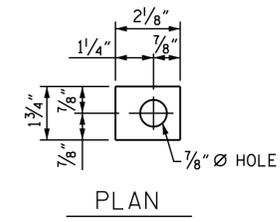
DETAILS OF POST



SECTION THRU RAIL

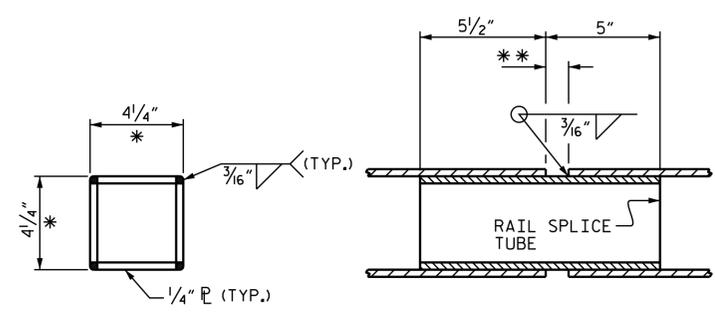


ELEVATION



PLAN

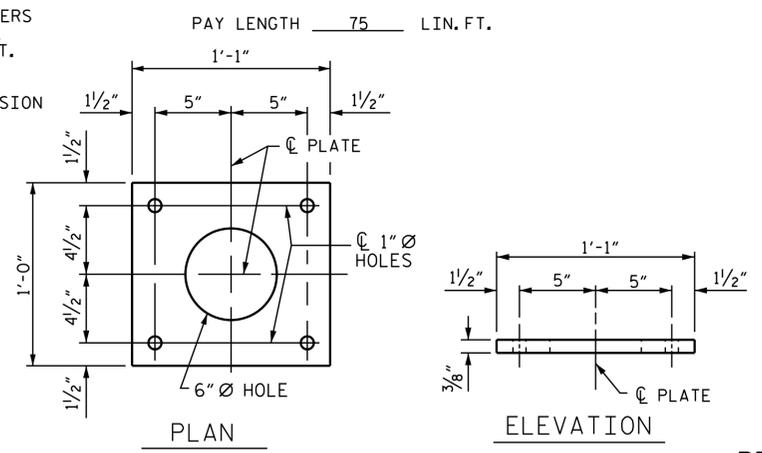
PLATE WASHER



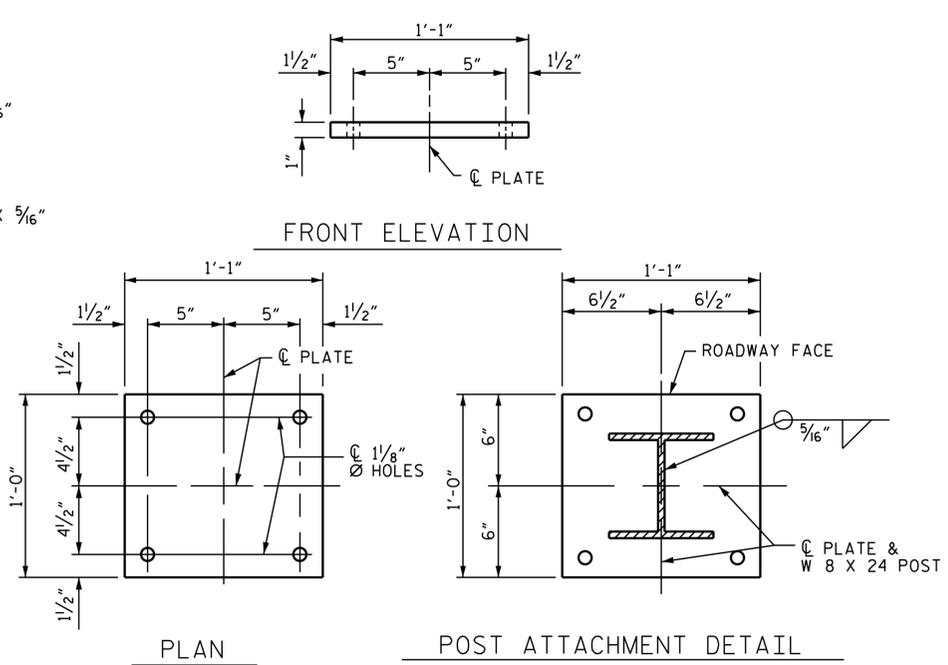
RAIL SPLICE DETAILS

* - DIMENSION AFTER GRINDING RADIUS ON CORNERS TO MATCH INSIDE OF METAL RAIL. GRIND ALL EDGES PRIOR TO GALVANIZING TO ASSURE FIT.

** - 1" FOR SPLICE NOT AT EXPANSION JOINT; SEE TABLE 1 FOR OPENING FOR SPLICES AT EXPANSION JOINTS.



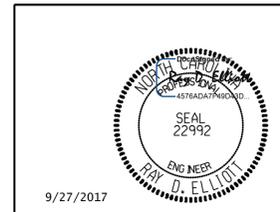
ANCHOR PLATE DETAILS



POST BASE DETAILS

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

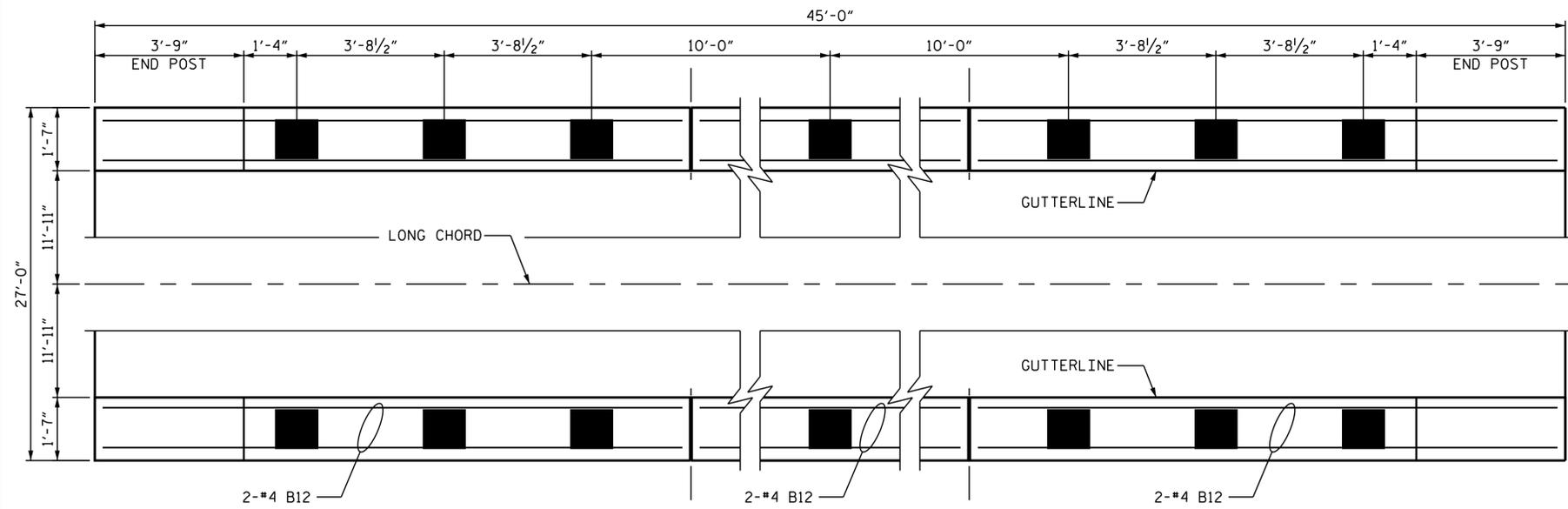
SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 32" ALASKA RAIL

ASSEMBLED BY : JLA	DATE : 3/17
CHECKED BY : RDE	DATE : 3/17
DRAWN BY : RWW 7/14	ADDED 1/15
CHECKED BY : TMG 7/14	

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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-9
TOTAL SHEETS					24



PLAN OF RAIL POST SPACINGS

NOTES
STRUCTURAL CONCRETE INSERT
 EACH STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

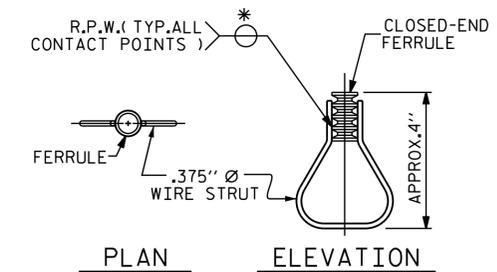
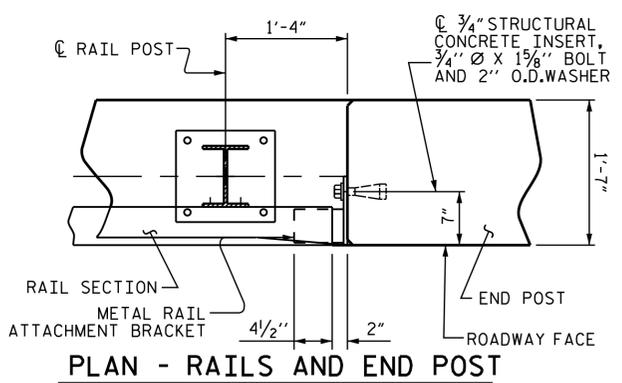
- FERRULE SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
- 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- WIRE STRUT SHOWN IN THE STRUCTURAL CONCRETE INSERT DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES
METAL RAIL TO END POST CONNECTION
 EACH METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 1/2" METAL BRACKET PLATE AND 1/4" METAL RAIL INSERT TUBE SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION TO AASHTO M111.
- 3/4" STRUCTURAL CONCRETE INSERTS SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.

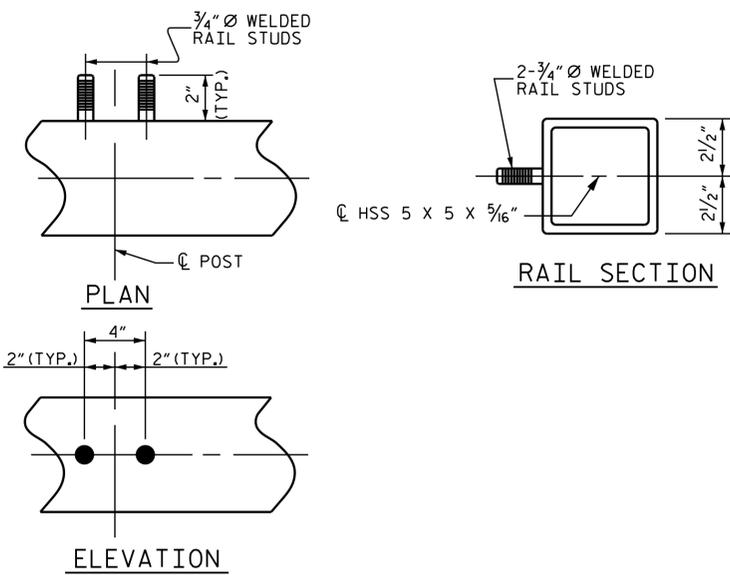
THE 3/4" STRUCTURAL CONCRETE INSERTS WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP.
 THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT, THE 1/2" BRACKET PLATES, AND THE RAIL INSERT TUBES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLTS WITH WASHERS SHALL BE REPLACED WITH 3/4" Ø X 6 1/2" BOLTS AND 2" O.D. WASHERS. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLTS SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLTS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

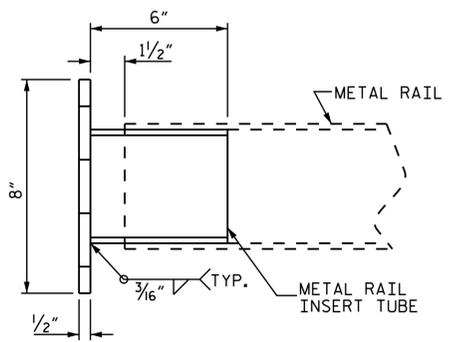


STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

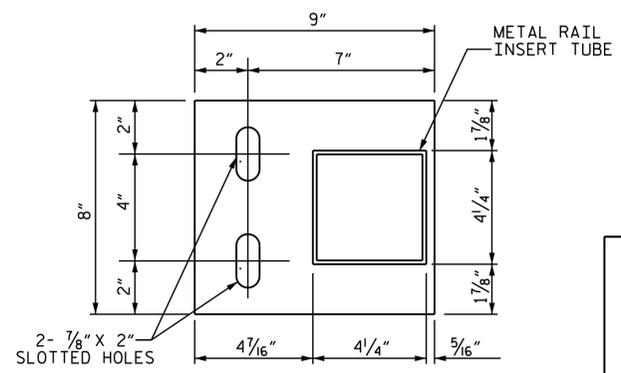


RAIL STUD DETAILS



METAL RAIL ATTACHMENT BRACKET

THE METAL RAIL INSERT TUBE SHALL BE FABRICATED FROM 1/4" PLATES.



PROJECT NO. 14.B.205624.1
MACON COUNTY
 STATION: 12+50.00-L-

SHEET 2 OF 2

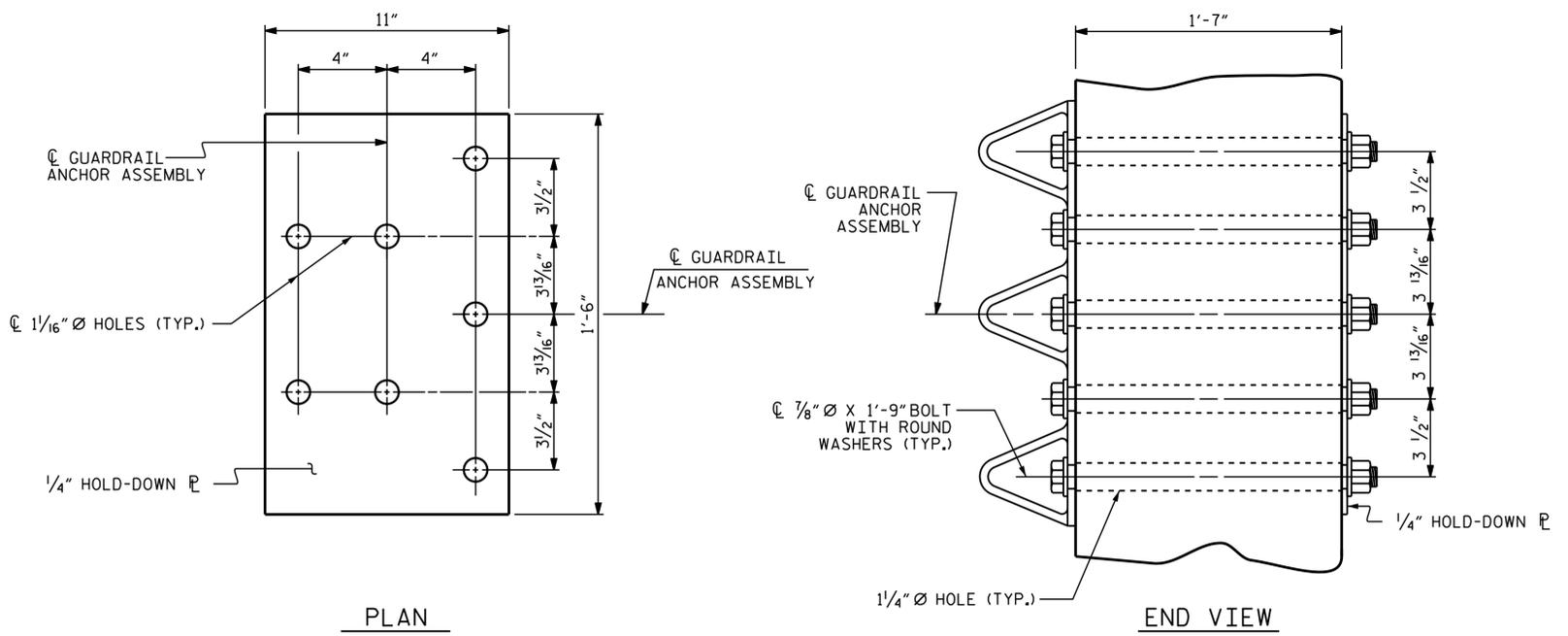
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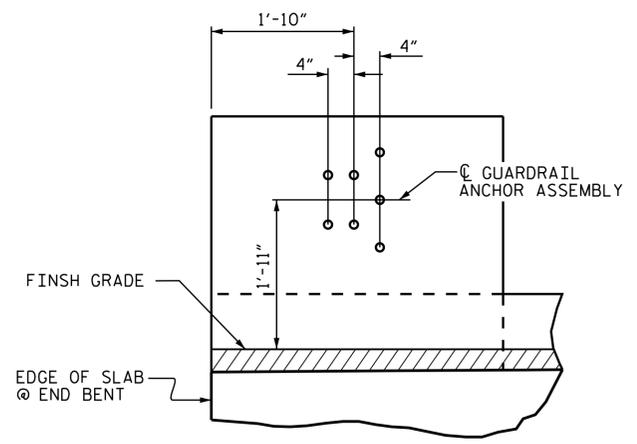
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 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS FOR 32" ALASKA RAIL						S-10
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	24
1			3			
2			4			

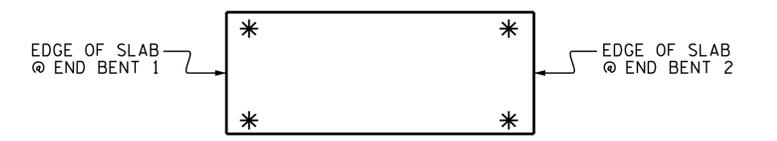
ASSEMBLED BY :	JLA	DATE :	3/17
CHECKED BY :	RDE	DATE :	3/17
DRAWN BY :	RWW 7/14		
CHECKED BY :	TMG 7/14		



GUARDRAIL ANCHOR ASSEMBLY DETAILS

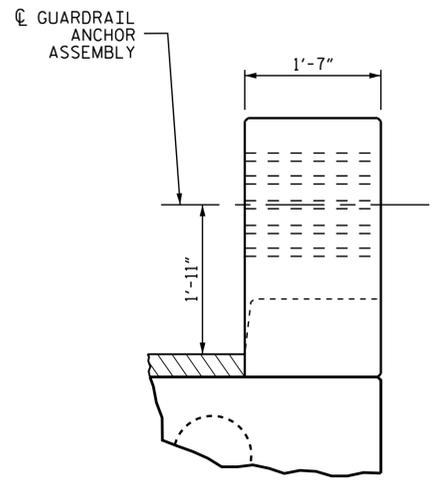


ELEVATION

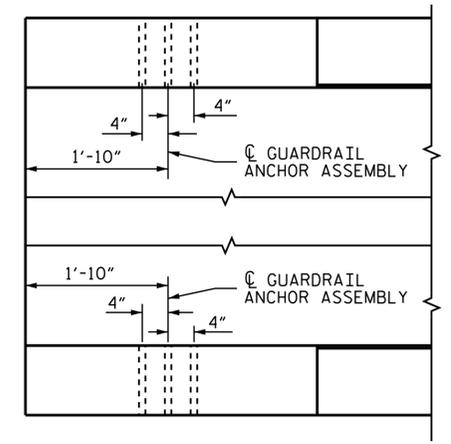


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(32" ALASKA RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 3/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36, AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

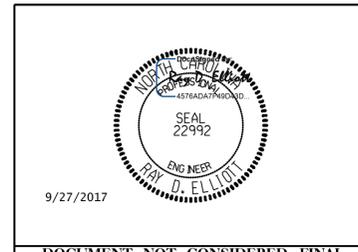
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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MACON COUNTY
 STATION: 12+50.00-L-



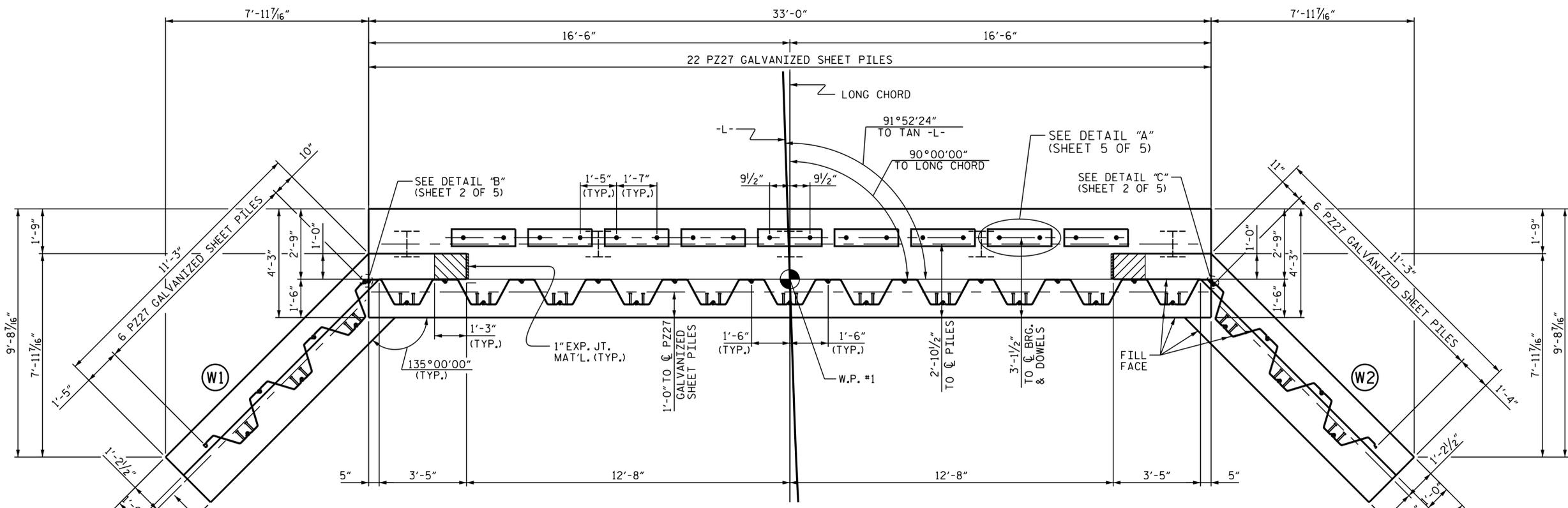
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL TUBE RAILS**

ASSEMBLED BY : JLA	DATE : 3/17
CHECKED BY : RDE	DATE : 3/17
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : CM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

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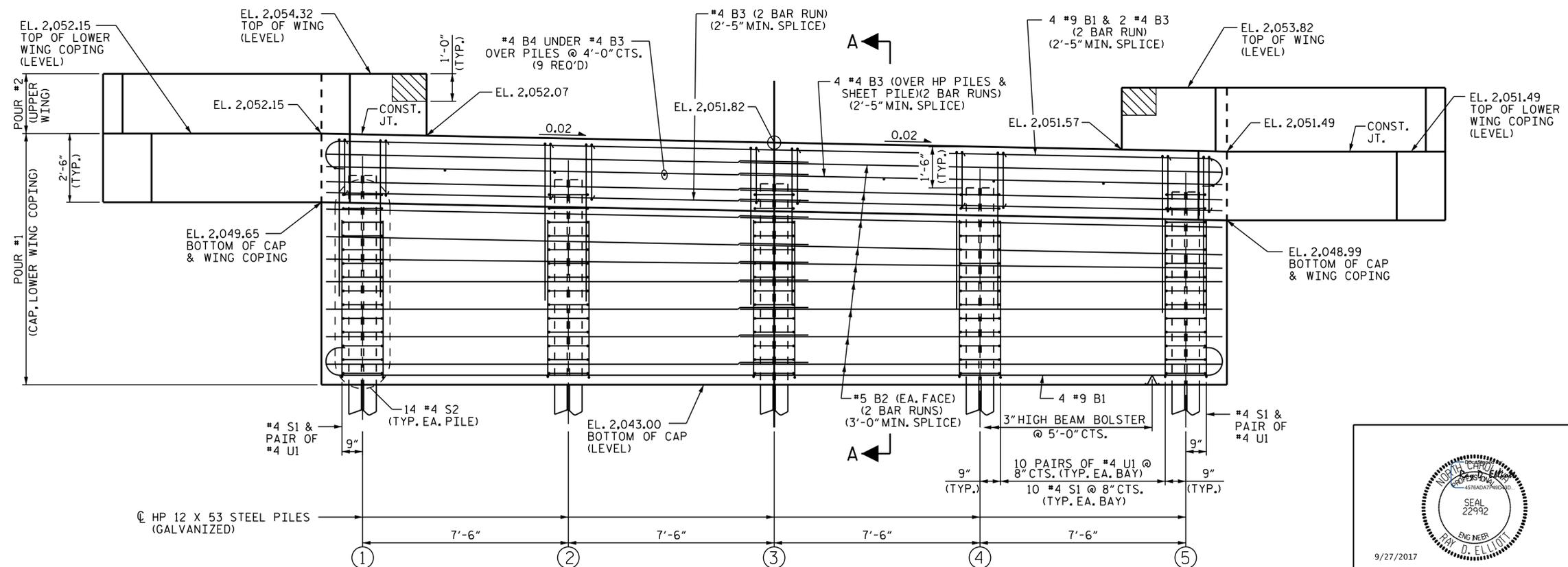
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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			24



PLAN

TOP OF PILE ELEVATIONS	
①	2,050.62
②	2,050.47
③	2,050.32
④	2,050.17
⑤	2,050.02



ELEVATION

GALVANIZED SHEET PILES IN CAP NOT SHOWN FOR CLARITY.
 FOR GALVANIZED SHEET PILES, SEE SHEET 2 OF 5.
 REINFORCING STEEL AND SHEET PILES IN WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 5 OF 5.

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-
 SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 22992
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 FAY D. ELLIOTT

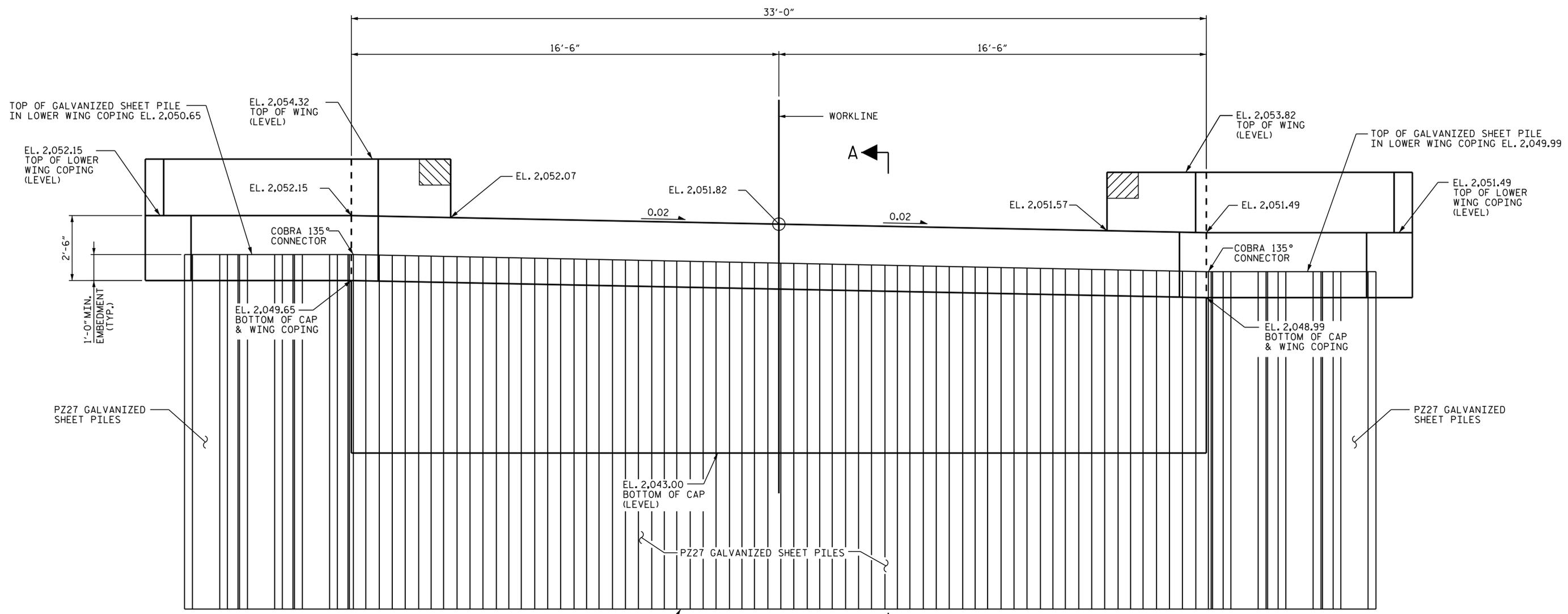
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			24

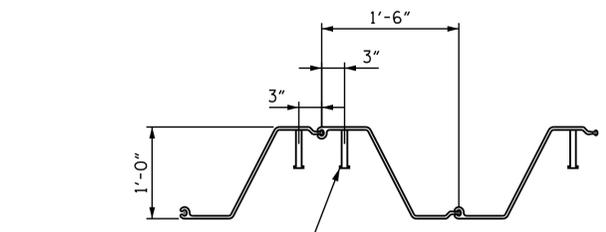
DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



SHEET PILE TIP ELEVATION VARIES FROM EL. 2037.2'± TO EL. 2039.5'±. SHEET PILE SHALL BE DRIVEN TO REFUSAL ON ROCK.

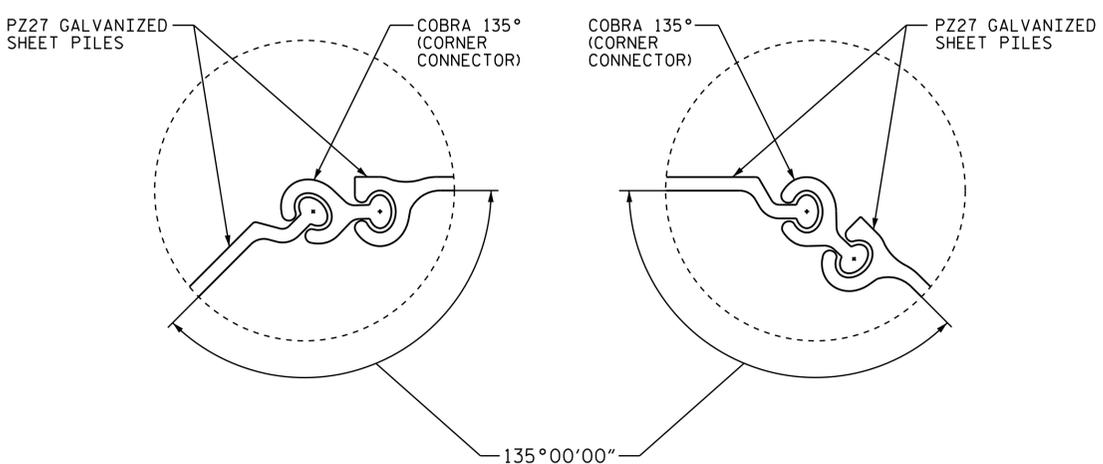
ELEVATION

HP PILE AND REINFORCING STEEL NOT SHOWN FOR CLARITY. FOR GALVANIZED STEEL SHEET PILES, SEE SPECIAL PROVISION. FOR SECTION A-A, SEE SHEET 5 OF 5.



3/4" DIA. x 5" ANCHOR STUDS WELDED TO SHEET PILES. (1 STUDS PER SHEET PILE ALONG FACE ADJACENT TO HP12x53 PILES)

ANCHOR STUD DETAILS



DETAIL "B"

DETAIL "C"

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 2 OF 5

9/27/2017

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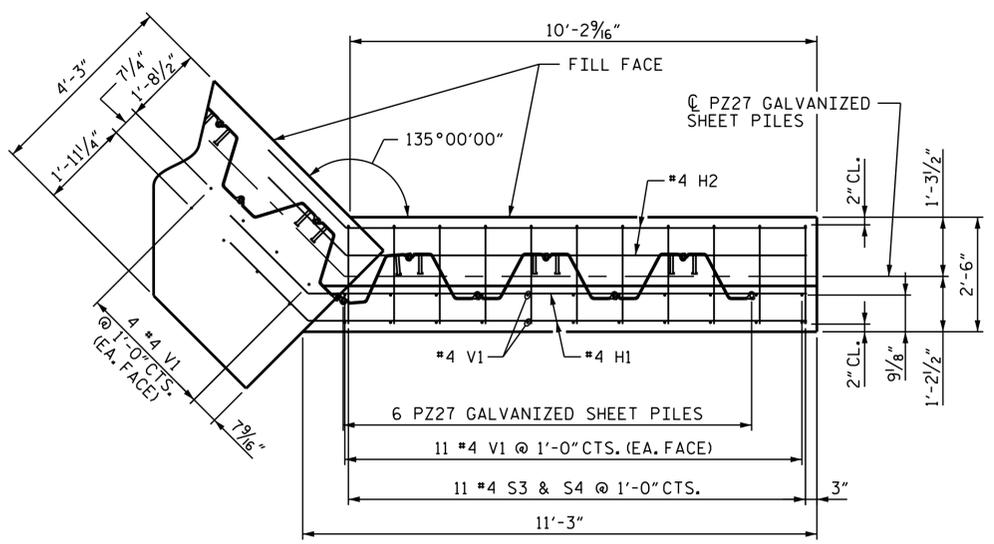
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

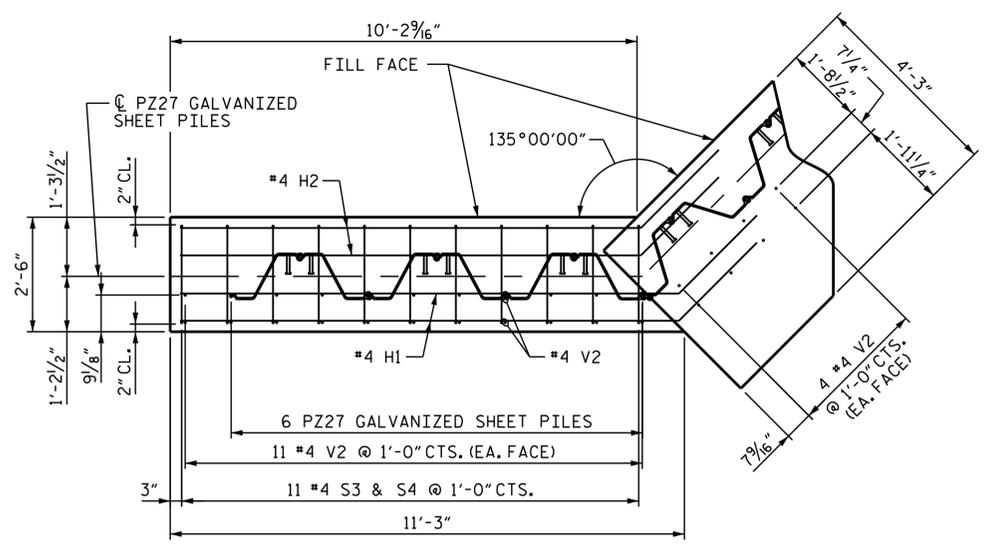
SUBSTRUCTURE
 END BENT No. 1
 SHEET PILE
 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-13
1			3			TOTAL SHEETS
2			4			24

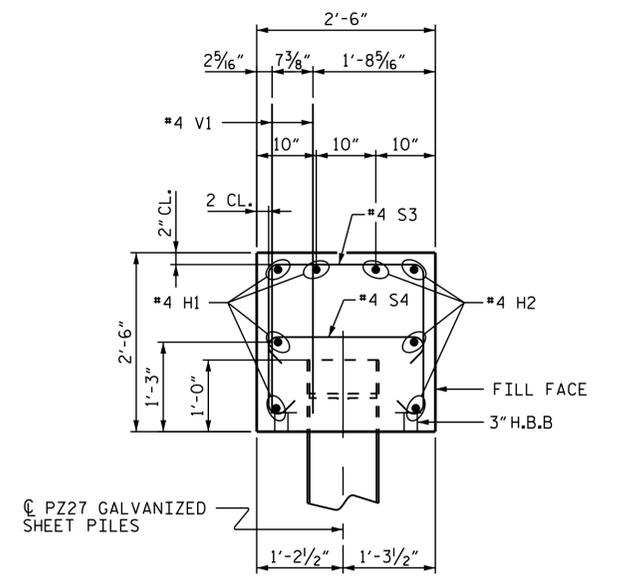
DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



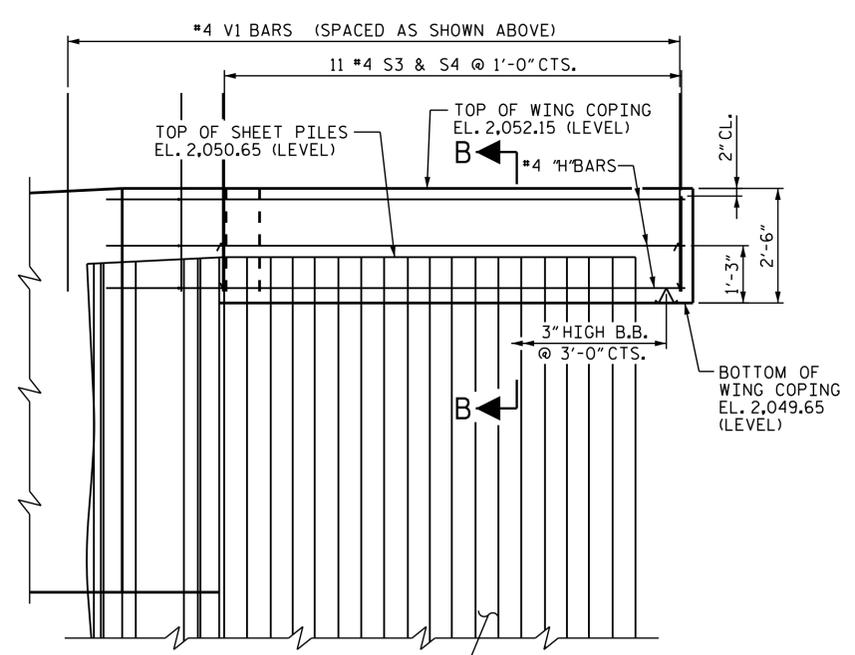
PLAN OF (W1) COPING



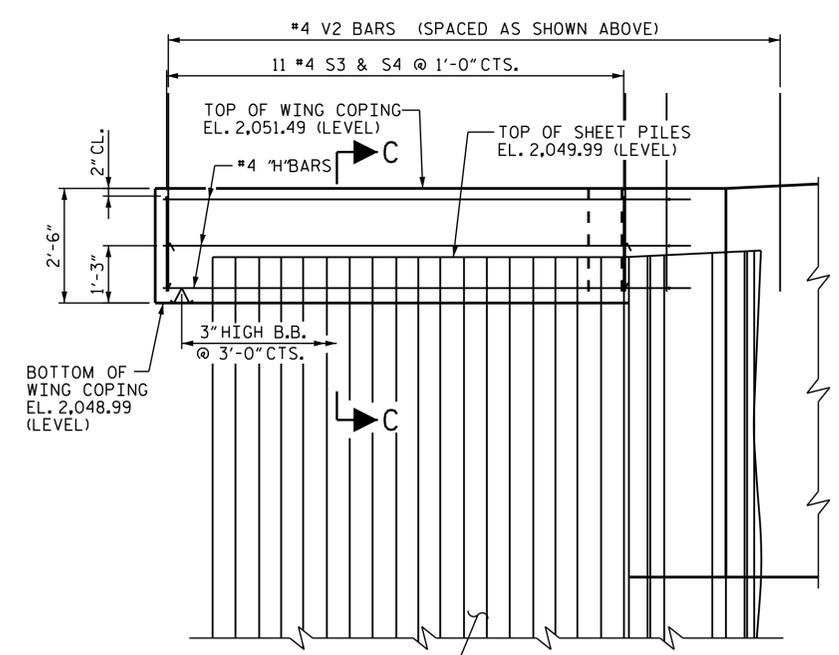
PLAN OF (W2) COPING



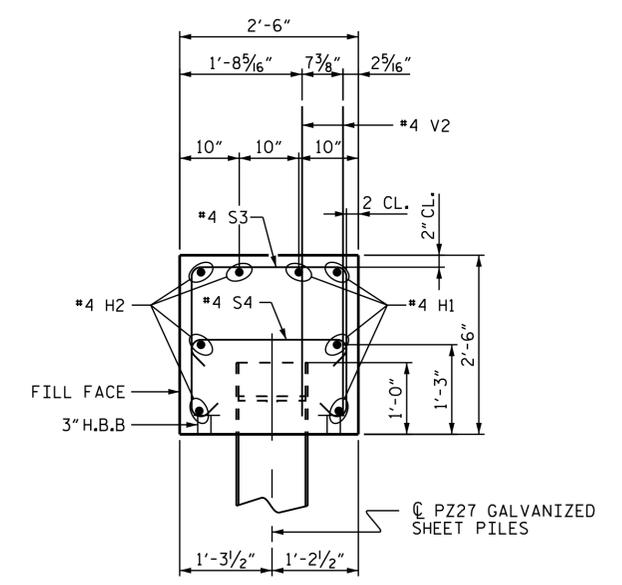
SECTION B-B



ELEVATION OF (W1) COPING



ELEVATION OF (W2) COPING



SECTION C-C

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

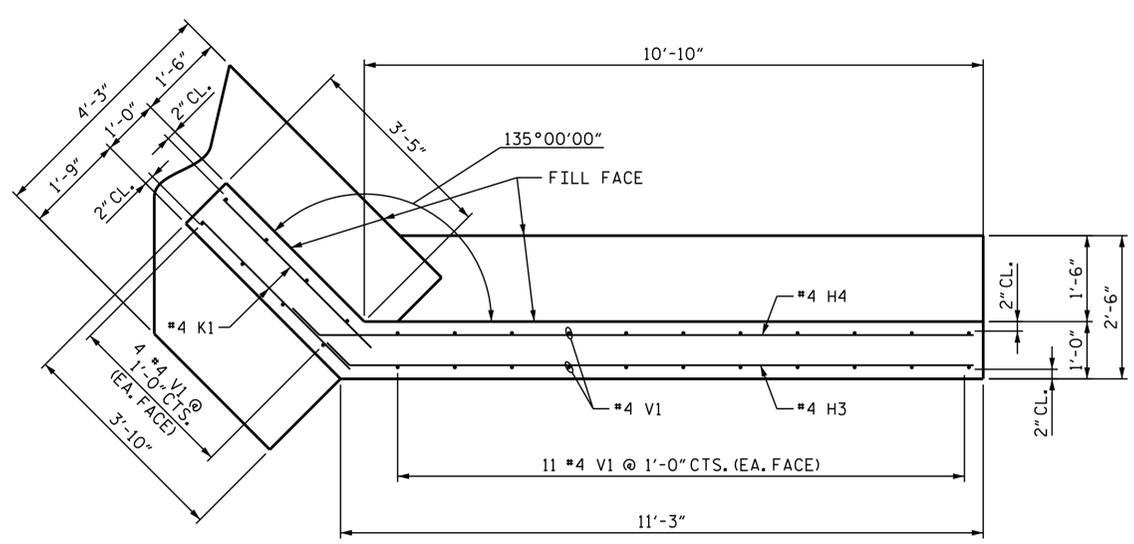
SHEET 3 OF 5



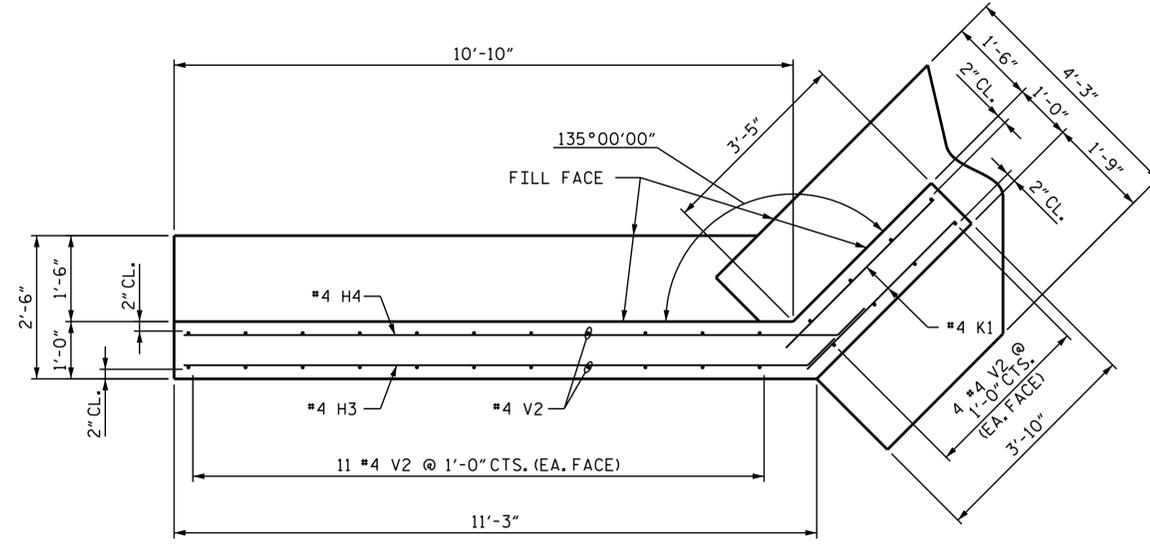
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1
 WING COPING
 DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.			
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
						1			3			TOTAL SHEETS
						2			4			24

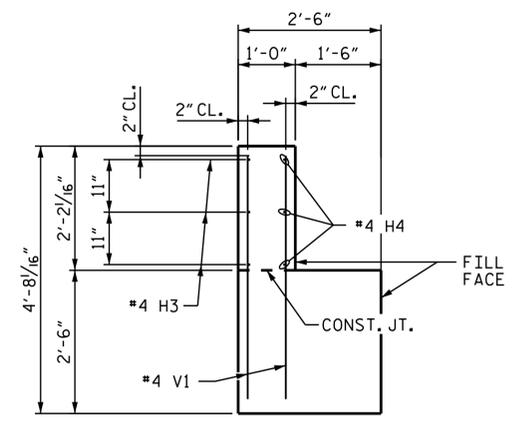
DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



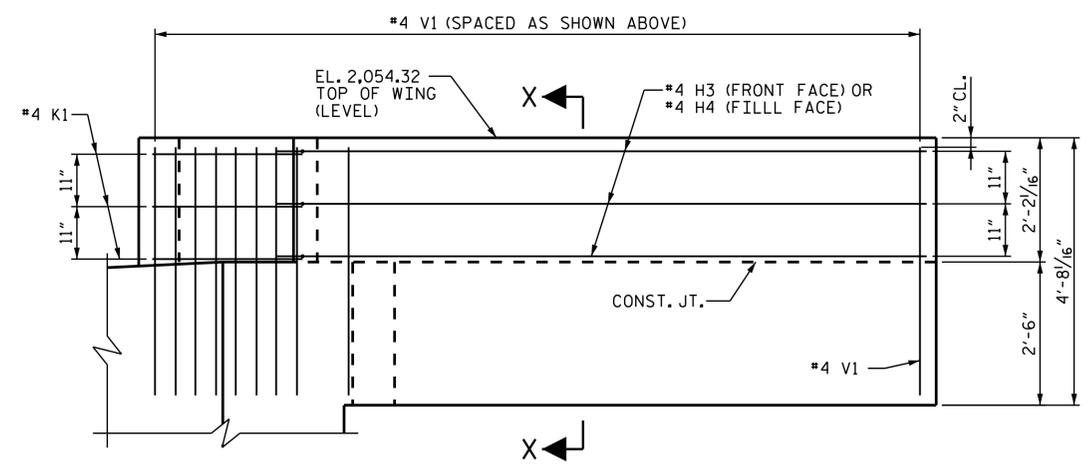
PLAN OF (W1)



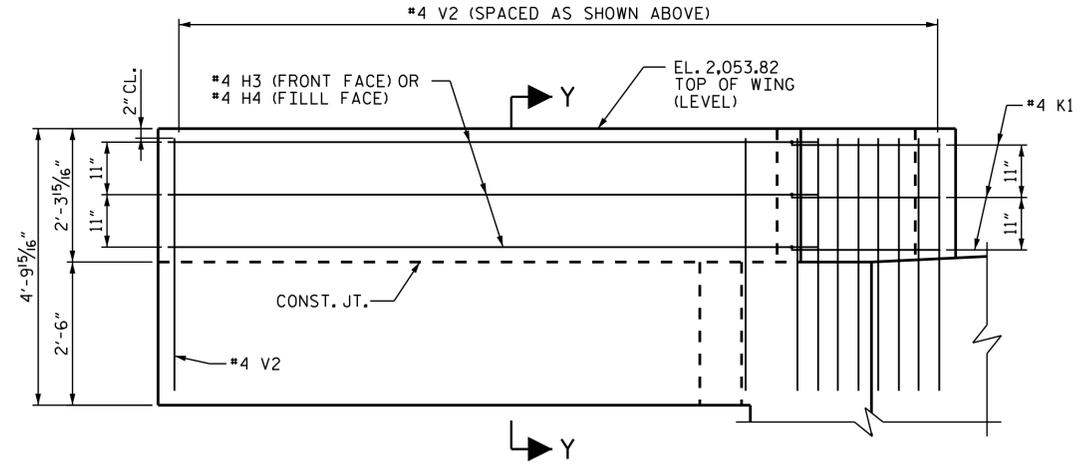
PLAN OF (W2)



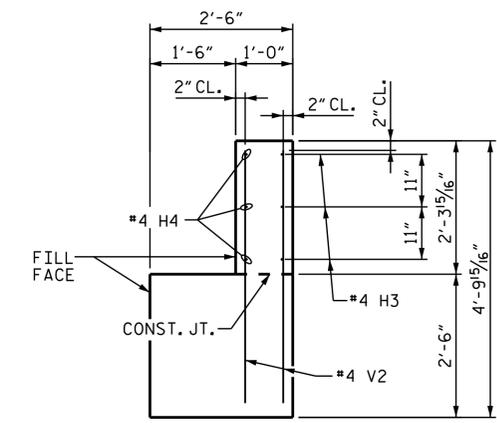
SECTION X-X



ELEVATION OF (W1)



ELEVATION OF (W2)



SECTION Y-Y

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 4 OF 5

9/27/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

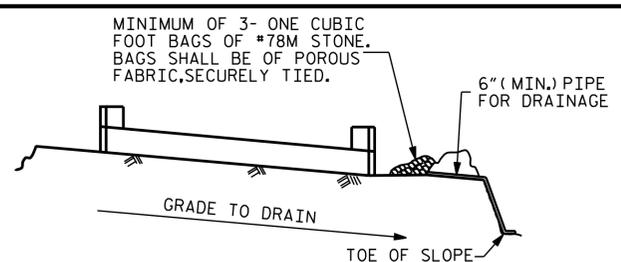
TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17

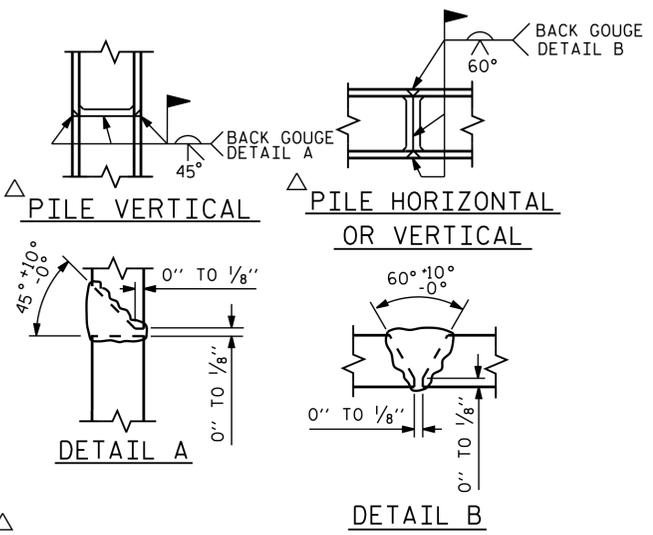


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

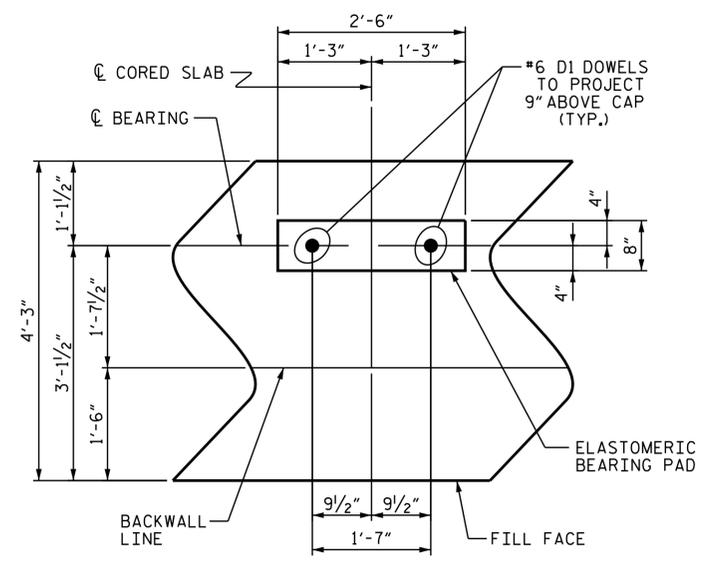
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

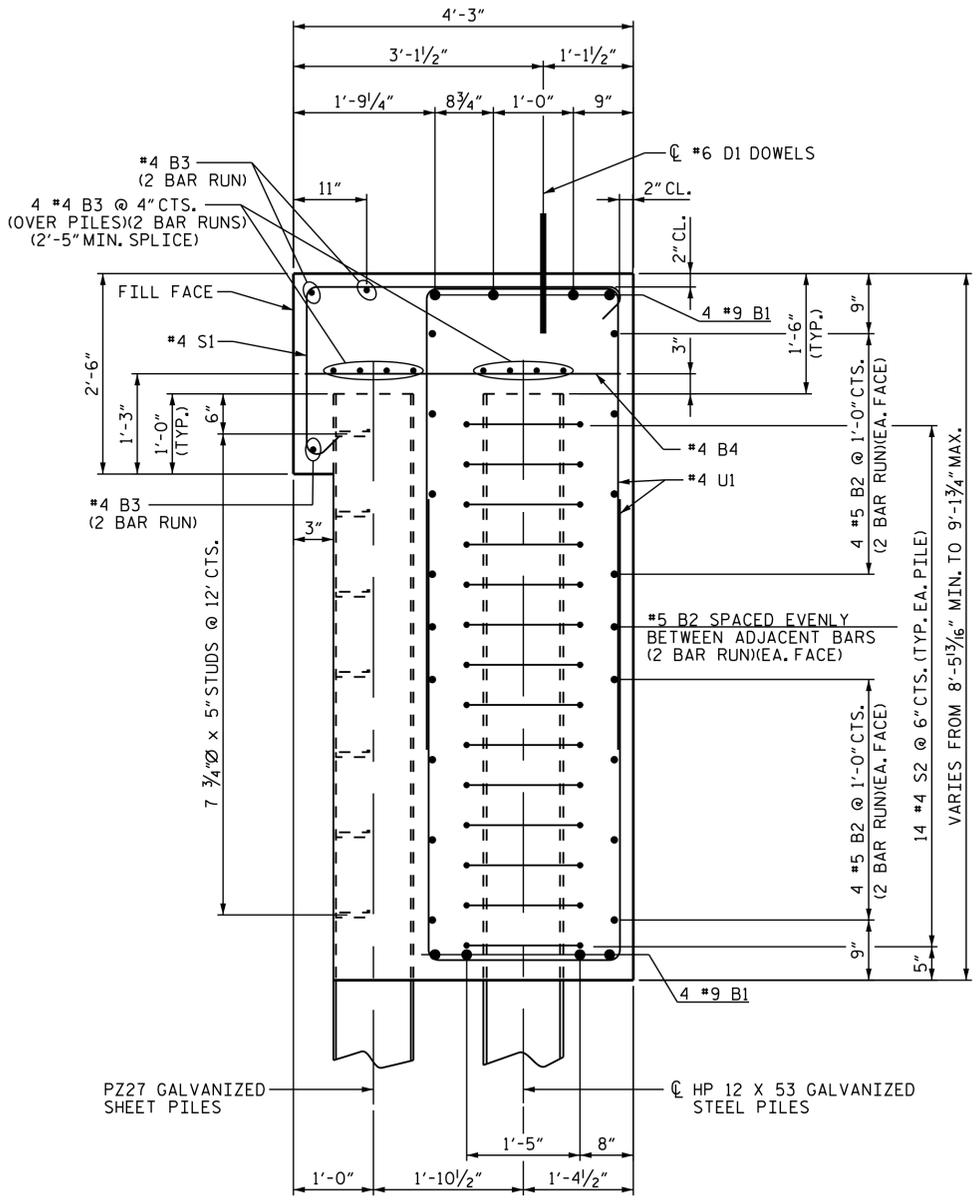


PILE SPLICE DETAILS

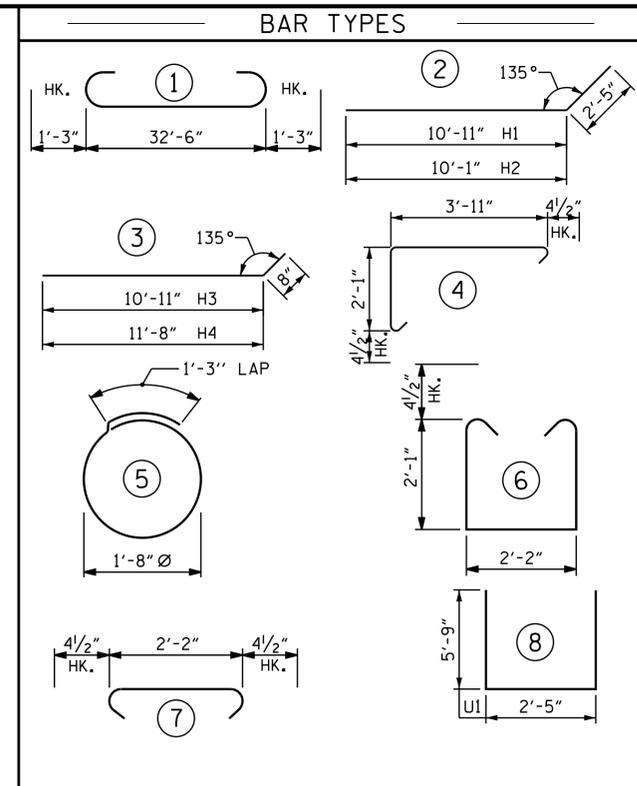


DETAIL "A"

DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12 X 53 GALVANIZED STEEL PILES	GALVANIZED STEEL SHEET PILES
NO: 5 LIN. FT. = 75	NO: PZ27 = 34
	NO: PZ135 COBRA = 2
	TOTAL NO. = 36 SQ. FT. = 678

PILE EXCAVATION	
IN SOIL	NOT IN SOIL
LIN. FT. = 22	LIN. FT. = 36

BILL OF MATERIAL FOR END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	36	#5	STR	17'-10"	670
B3	22	#4	STR	17'-7"	258
B4	9	#4	STR	3'-11"	24
D1	18	#6	STR	1'-6"	41
H1	8	#4	2	13'-4"	71
H2	8	#4	2	12'-6"	67
H3	6	#4	3	11'-7"	46
H4	6	#4	3	12'-4"	49
K1	12	#4	STR	3'-6"	28
S1	42	#4	4	6'-9"	189
S2	70	#4	5	6'-6"	304
S3	22	#4	6	7'-1"	104
S4	22	#4	7	2'-11"	43
U1	84	#4	8	13'-11"	781
V1	30	#4	STR	4'-3"	85
V2	30	#4	STR	4'-5"	89

REINFORCING STEEL (FOR ONE END BENT)	3,801 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)	
POUR #1 CAP & LOWER WING COPING	46.8 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	2.4 C.Y.
TOTAL CLASS A CONCRETE	49.2 C.Y.

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-
 SHEET 5 OF 5

9/27/2017

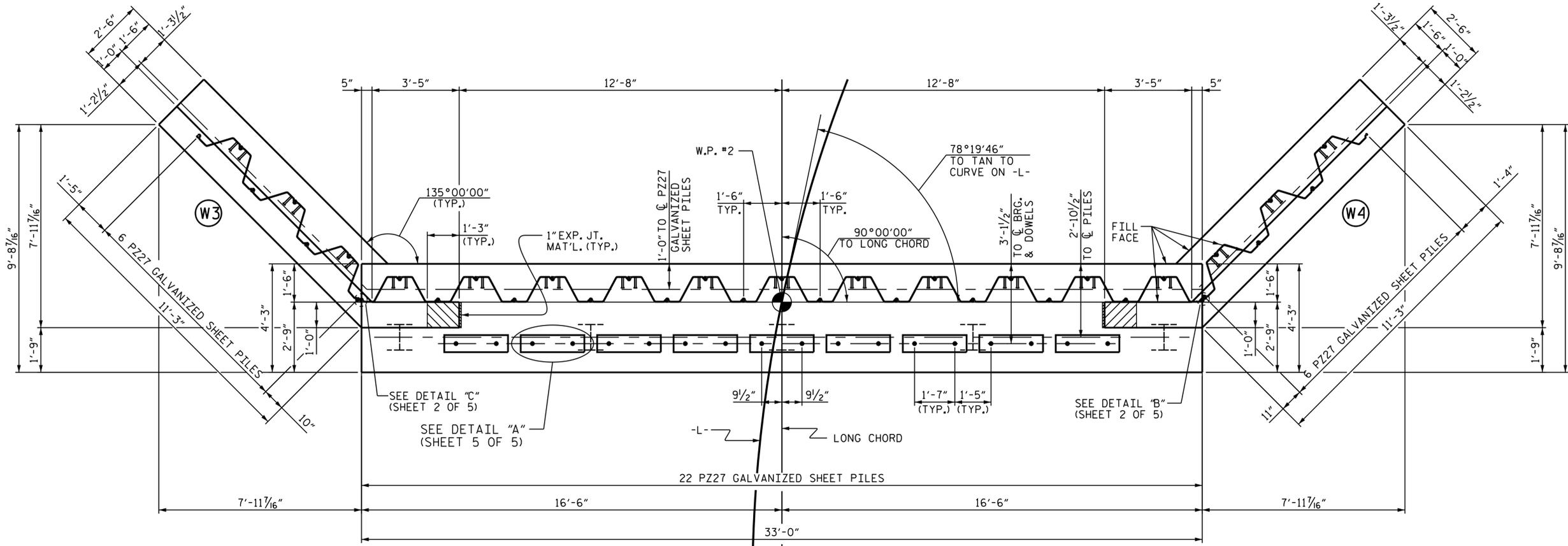
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

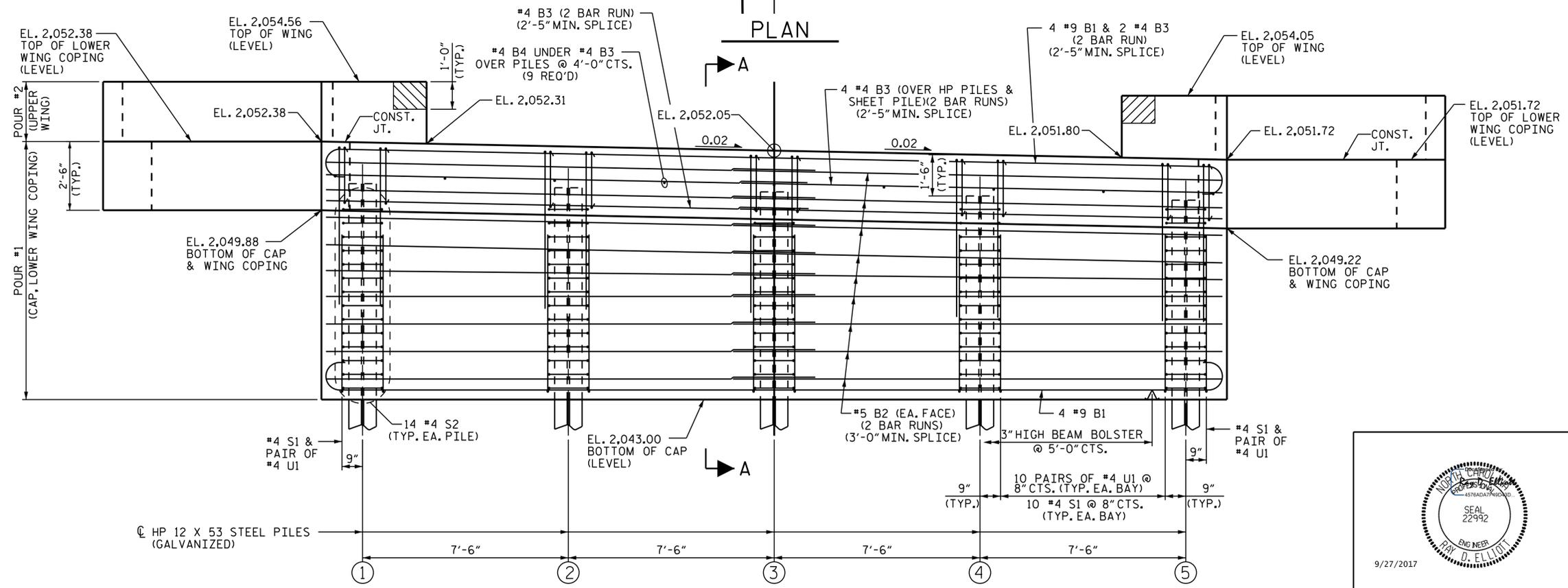
SUBSTRUCTURE
 END BENT No. 1
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS 24
2			4			



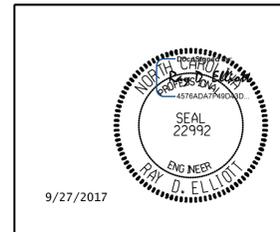
PLAN

TOP OF PILE ELEVATIONS	
①	2,050.85
②	2,050.70
③	2,050.55
④	2,050.40
⑤	2,050.25



ELEVATION

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-
 SHEET 1 OF 5

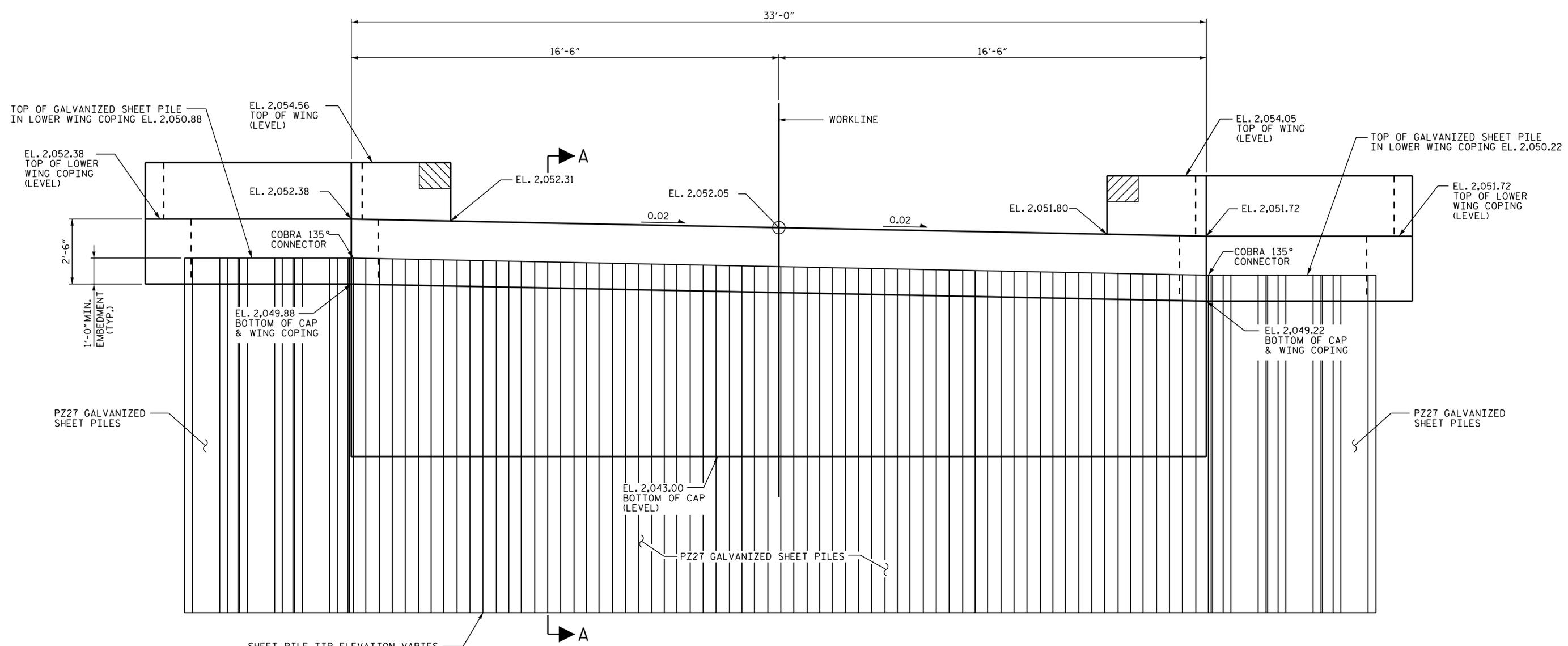


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			24

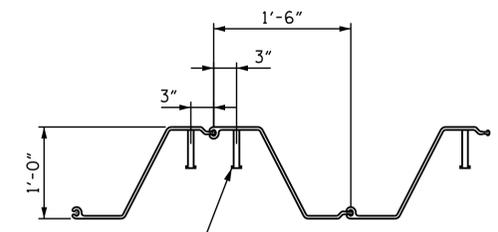
GALVANIZED SHEET PILES IN CAP NOT SHOWN FOR CLARITY.
 FOR GALVANIZED SHEET PILES, SEE SHEET 2 OF 5.
 REINFORCING STEEL AND SHEET PILES IN WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 5 OF 5.

DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



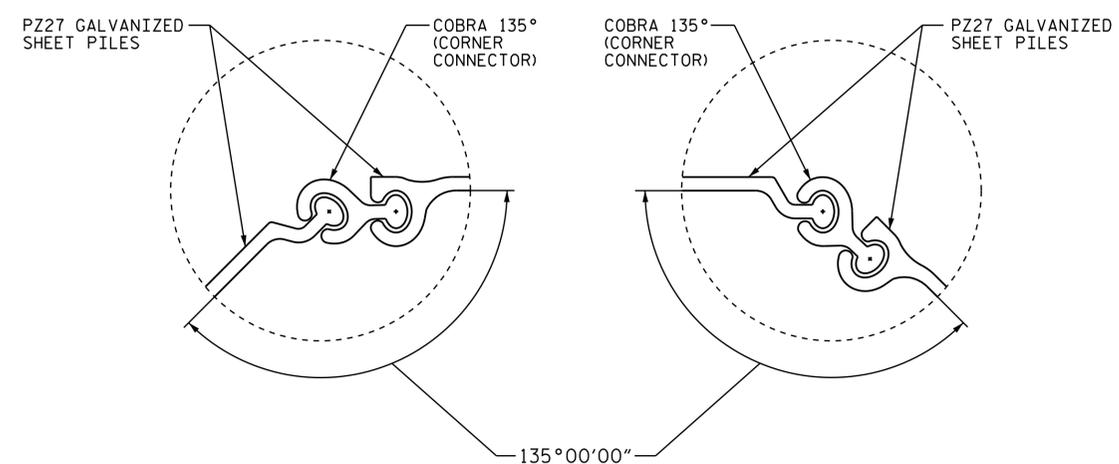
ELEVATION

HP PILE AND REINFORCING STEEL NOT SHOWN FOR CLARITY. FOR GALVANIZED STEEL SHEET PILES, SEE SPECIAL PROVISION. FOR SECTION A-A, SEE SHEET 5 OF 5.



3/4" DIA. x 5" ANCHOR STUDS WELDED TO SHEET PILES. (1 STUDS PER SHEET PILE ALONG FACE ADJACENT TO HP12x53 PILES)

ANCHOR STUD DETAILS



DETAIL "B"

DETAIL "C"

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 2 OF 5

9/27/2017

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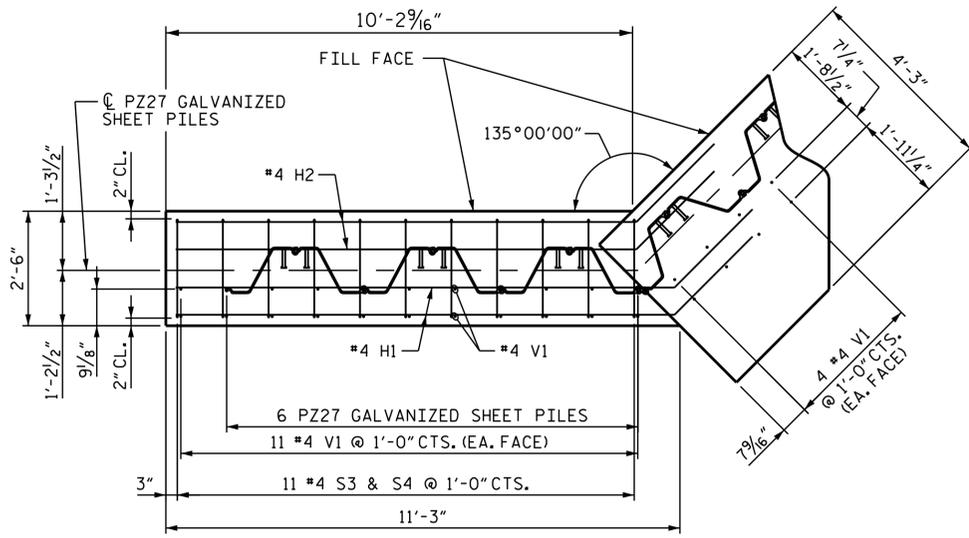
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 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

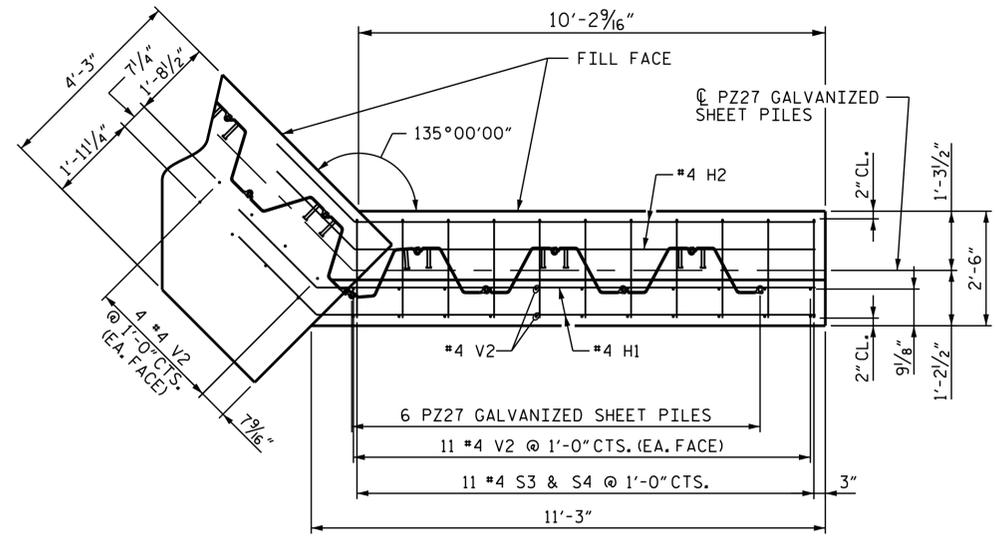
SUBSTRUCTURE
 END BENT No. 2
 SHEET PILE
 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			S-18
2			4			24

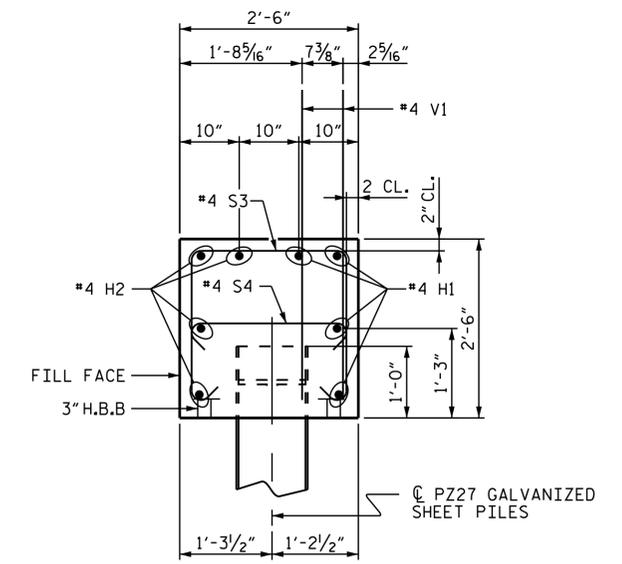
DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



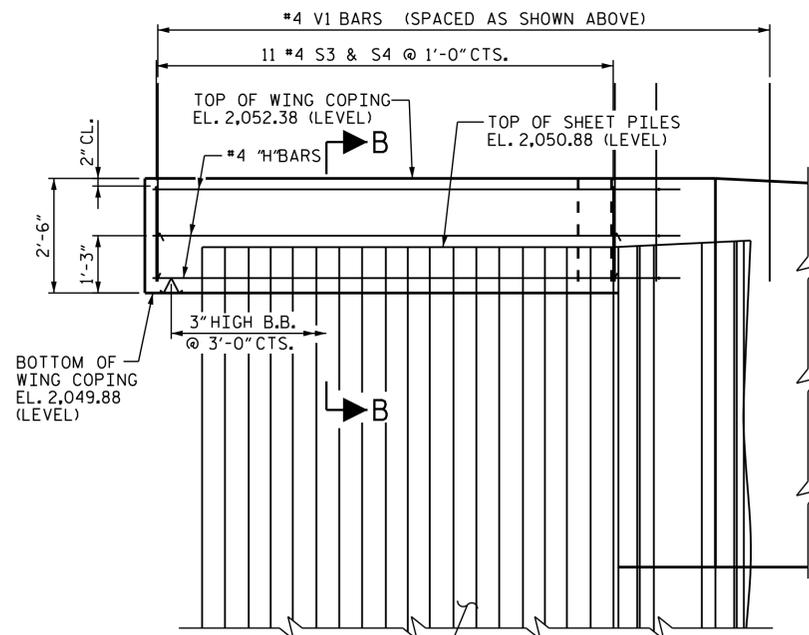
PLAN OF (W3) COPING



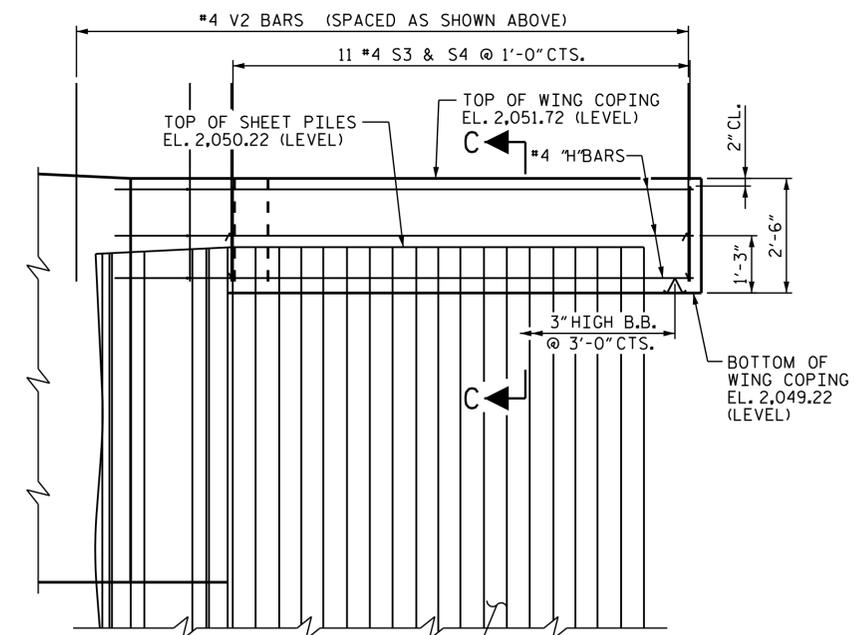
PLAN OF (W4) COPING



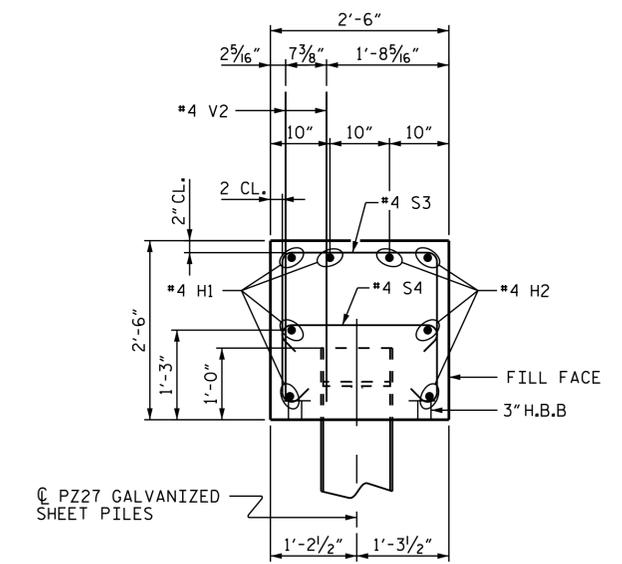
SECTION B-B



ELEVATION OF (W3) COPING



ELEVATION OF (W4) COPING



SECTION C-C

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 3 OF 5

9/27/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

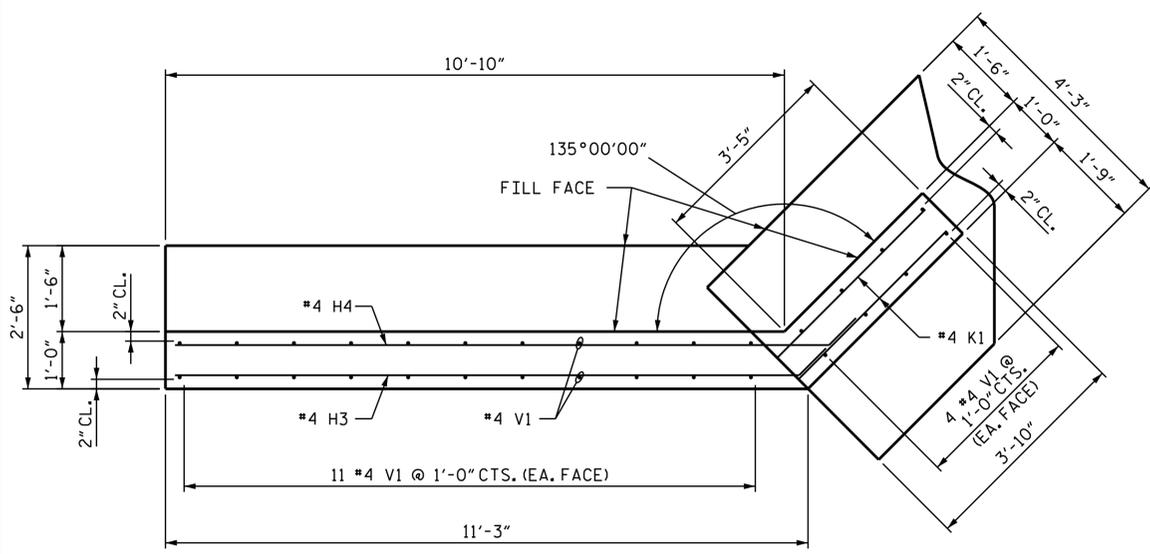
TGS ENGINEERS
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 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

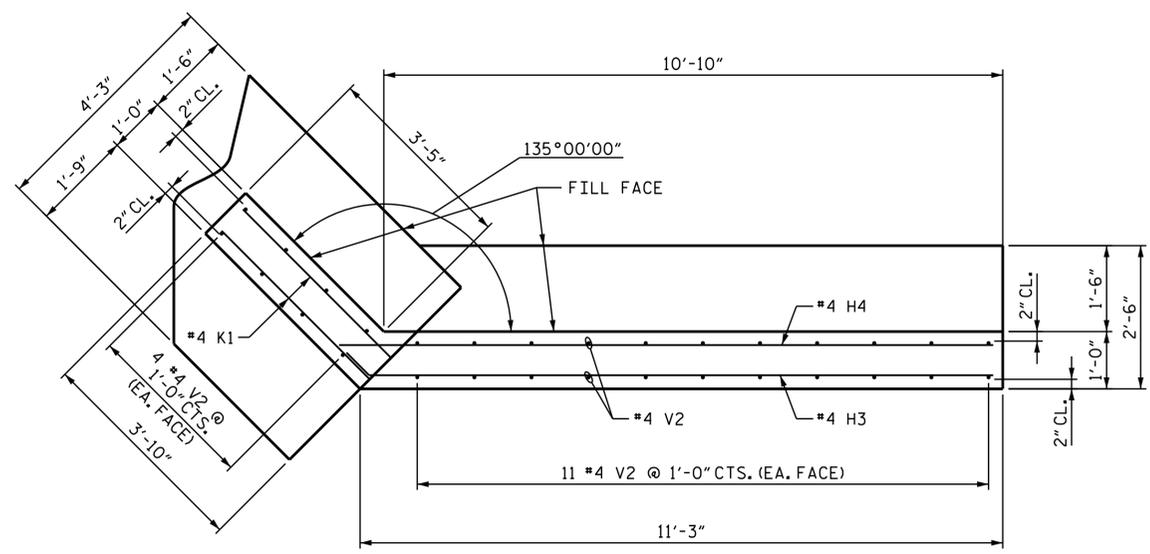
SUBSTRUCTURE
 END BENT No. 2
 WING COPING
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			24

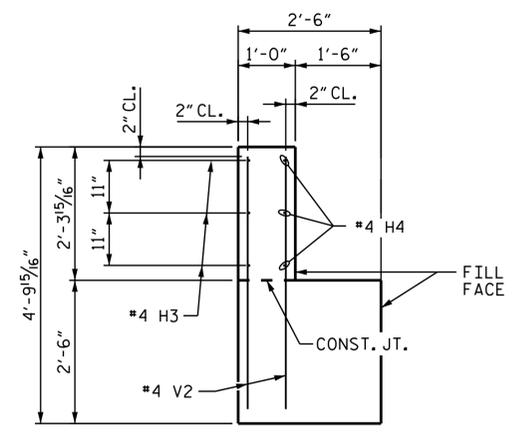
DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17



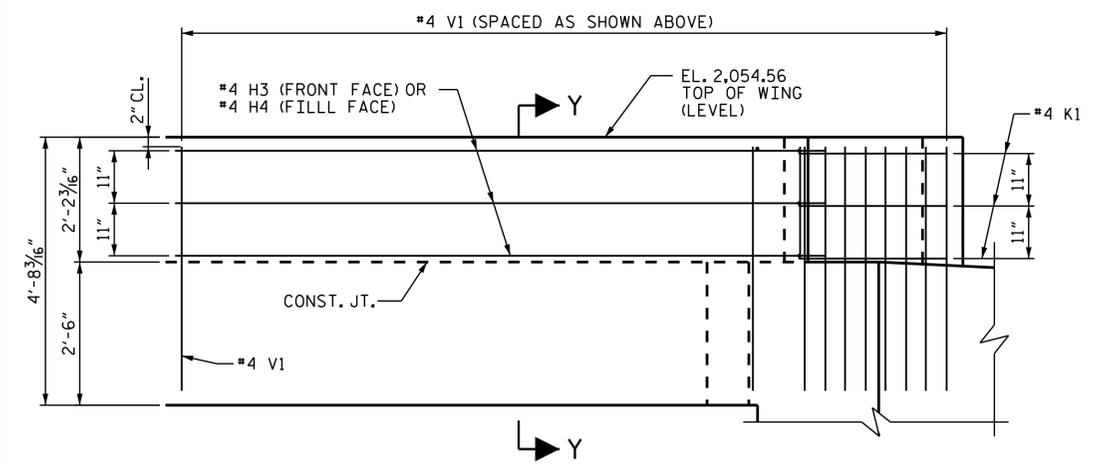
PLAN OF (W3)



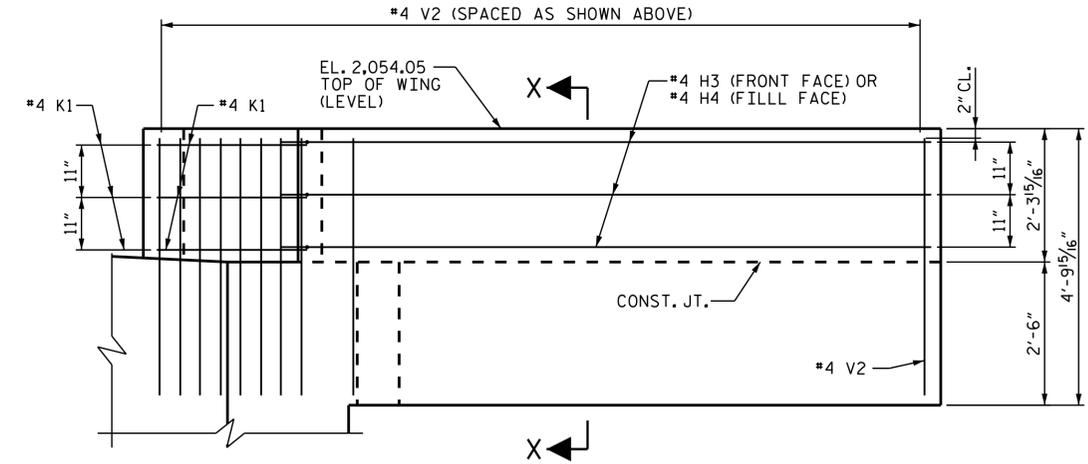
PLAN OF (W4)



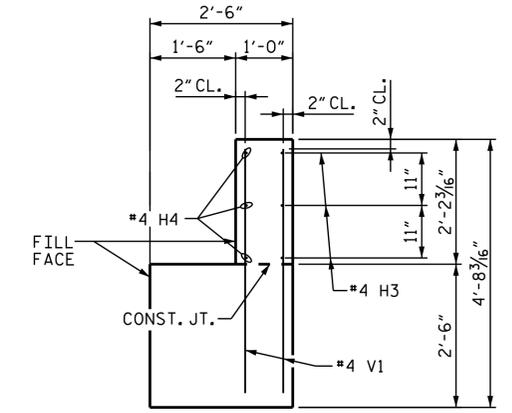
SECTION X-X



ELEVATION OF (W3)



ELEVATION OF (W4)



SECTION Y-Y

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-

SHEET 4 OF 5

9/27/2017

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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

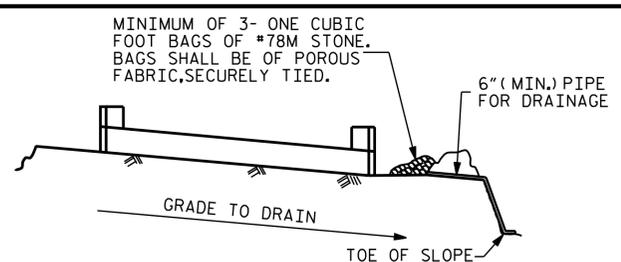
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT No. 2
 WING DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-20
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17

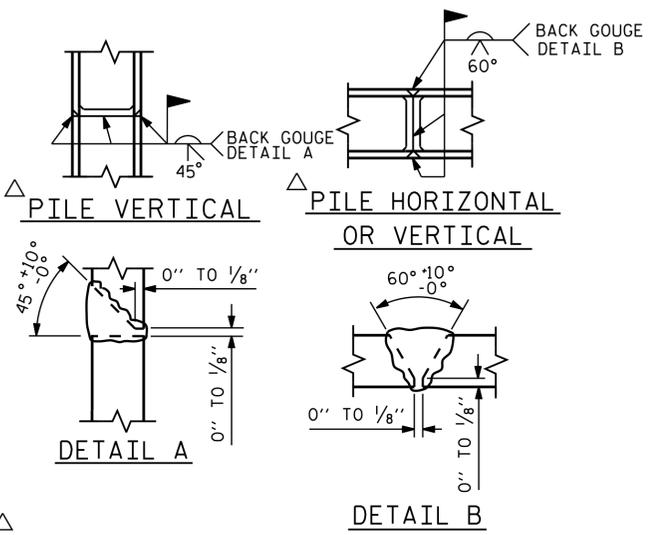


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

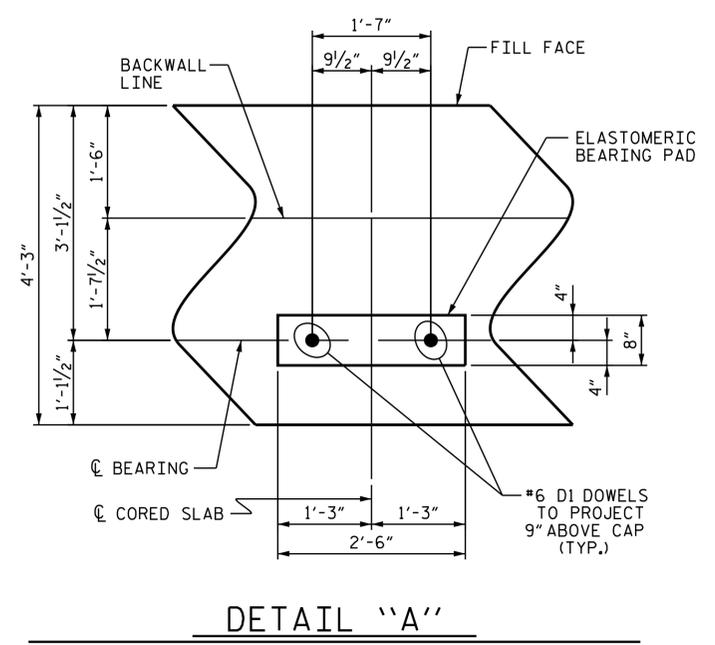
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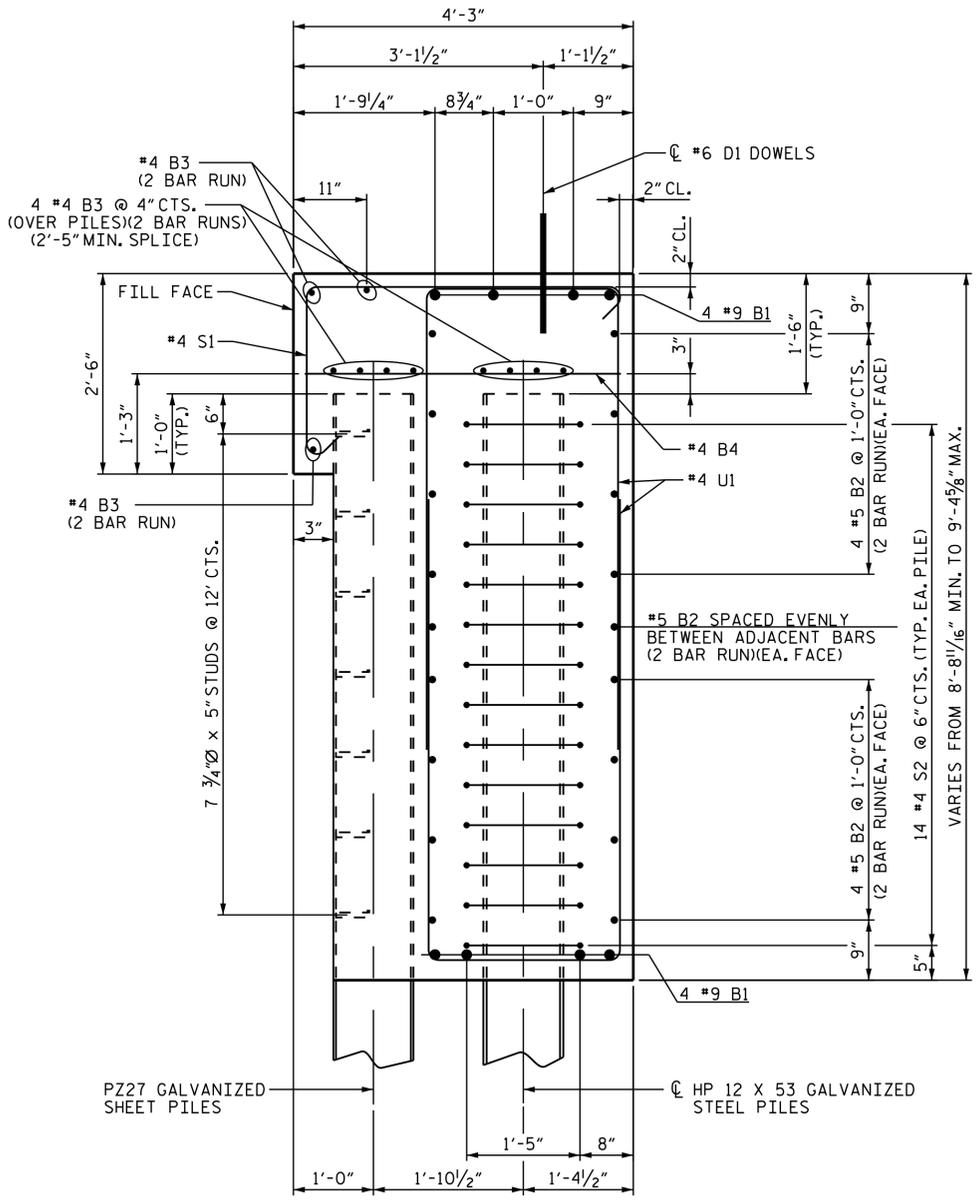
TEMPORARY DRAINAGE AT END BENT



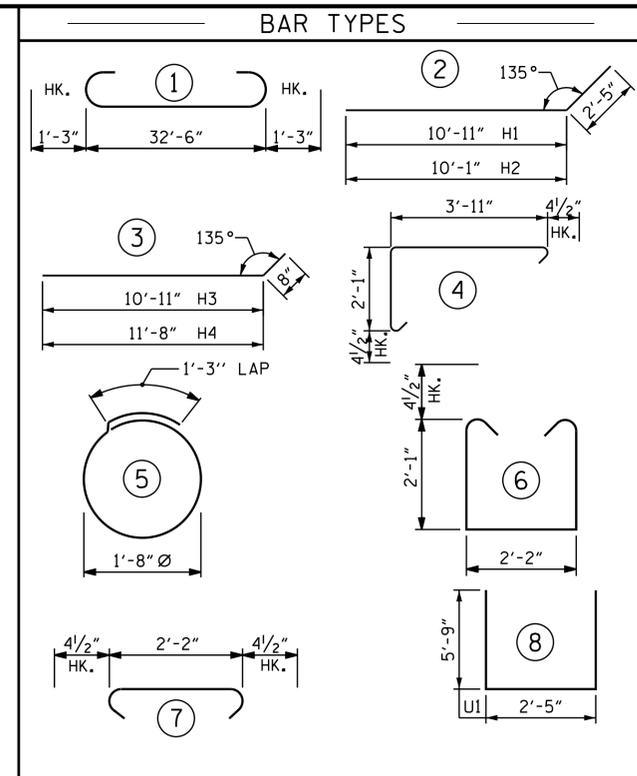
PILE SPLICE DETAILS



DETAIL "A"



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12 X 53 GALVANIZED STEEL PILES	GALVANIZED STEEL SHEET PILES
NO: 5	NO: PZ27 = 34
LIN. FT. = 75	NO: PZ135 COBRA = 2
	TOTAL NO. = 36
	SQ. FT. = 492

PILE EXCAVATION	
IN SOIL	NOT IN SOIL
LIN. FT. = 16	LIN. FT. = 39

BILL OF MATERIAL FOR END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	36	#5	STR	17'-10"	670
B3	22	#4	STR	17'-7"	258
B4	9	#4	STR	3'-11"	24
D1	18	#6	STR	1'-6"	41
H1	8	#4	2	13'-4"	71
H2	8	#4	2	12'-6"	67
H3	6	#4	3	11'-7"	46
H4	6	#4	3	12'-4"	49
K1	12	#4	STR	3'-6"	28
S1	42	#4	4	6'-9"	189
S2	70	#4	5	6'-6"	304
S3	22	#4	6	7'-1"	104
S4	22	#4	7	2'-11"	43
U1	84	#4	8	13'-11"	781
V1	30	#4	STR	4'-3"	85
V2	30	#4	STR	4'-5"	89

REINFORCING STEEL (FOR ONE END BENT)	3,801 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)	
POUR #1 CAP & LOWER WING COPING	47.7 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	2.4 C.Y.
TOTAL CLASS A CONCRETE	50.1 C.Y.

PROJECT NO. 14.B.205624.1
 MACON COUNTY
 STATION: 12+50.00-L-
 SHEET 5 OF 5

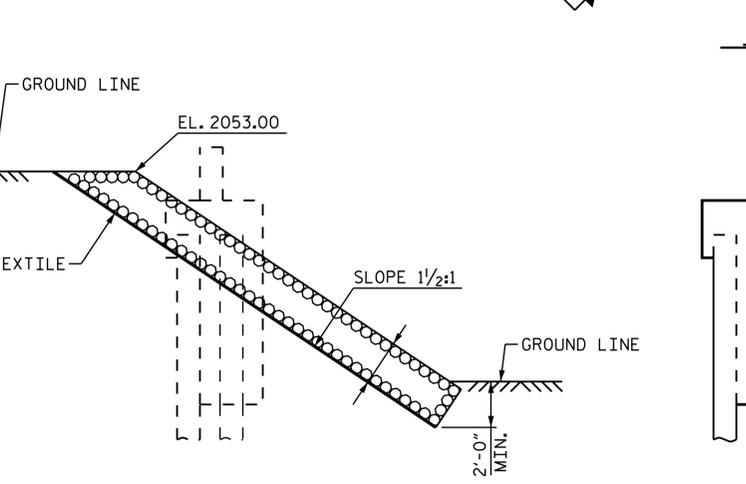
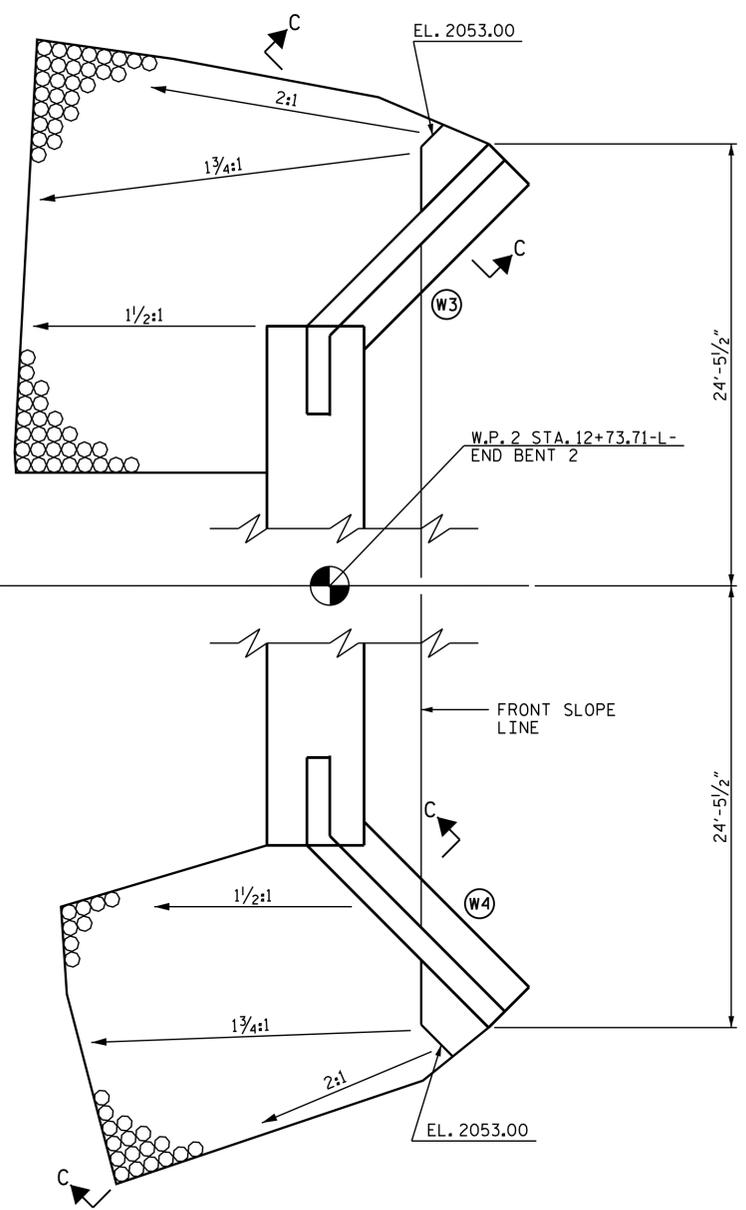
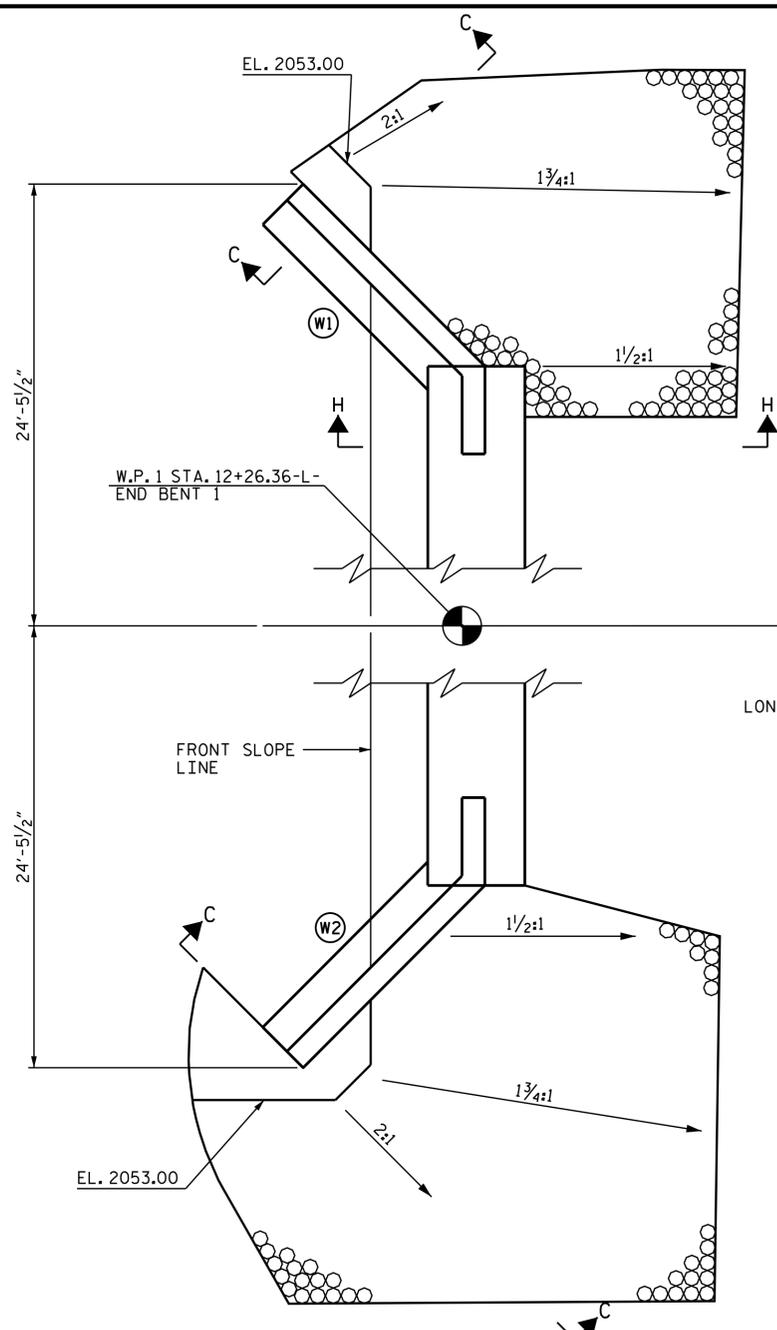
9/27/2017

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TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

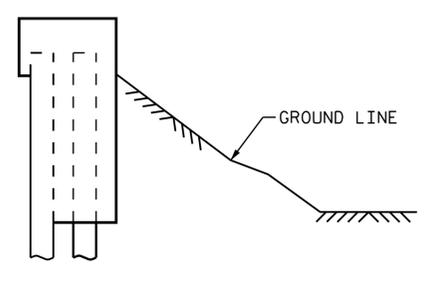
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT No. 2 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 24

DRAWN BY: JLA DATE: 3/17
 CHECKED BY: RDE DATE: 3/17

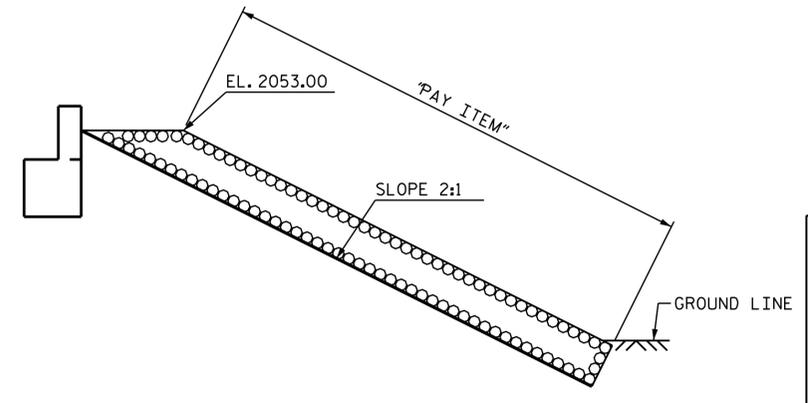


SECTION H-H

PLAN OF RIP RAP
* ALL RIP RAP SHALL BE CLASS II



SECTION C-C
BERM RIP RAPPED



SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+50.00-L-	RIP RAP CLASS II (2'-0" THINK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	100
END BENT 2	90	80

PROJECT NO. 14.B.205624.1
MACON COUNTY
 STATION: 12+50.00-L-

9/27/2017

DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RIP RAP DETAILS					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-22
TOTAL SHEETS 24

DRAWN BY : JLA DATE : 3/17
 CHECKED BY : RDE DATE : 3/17

