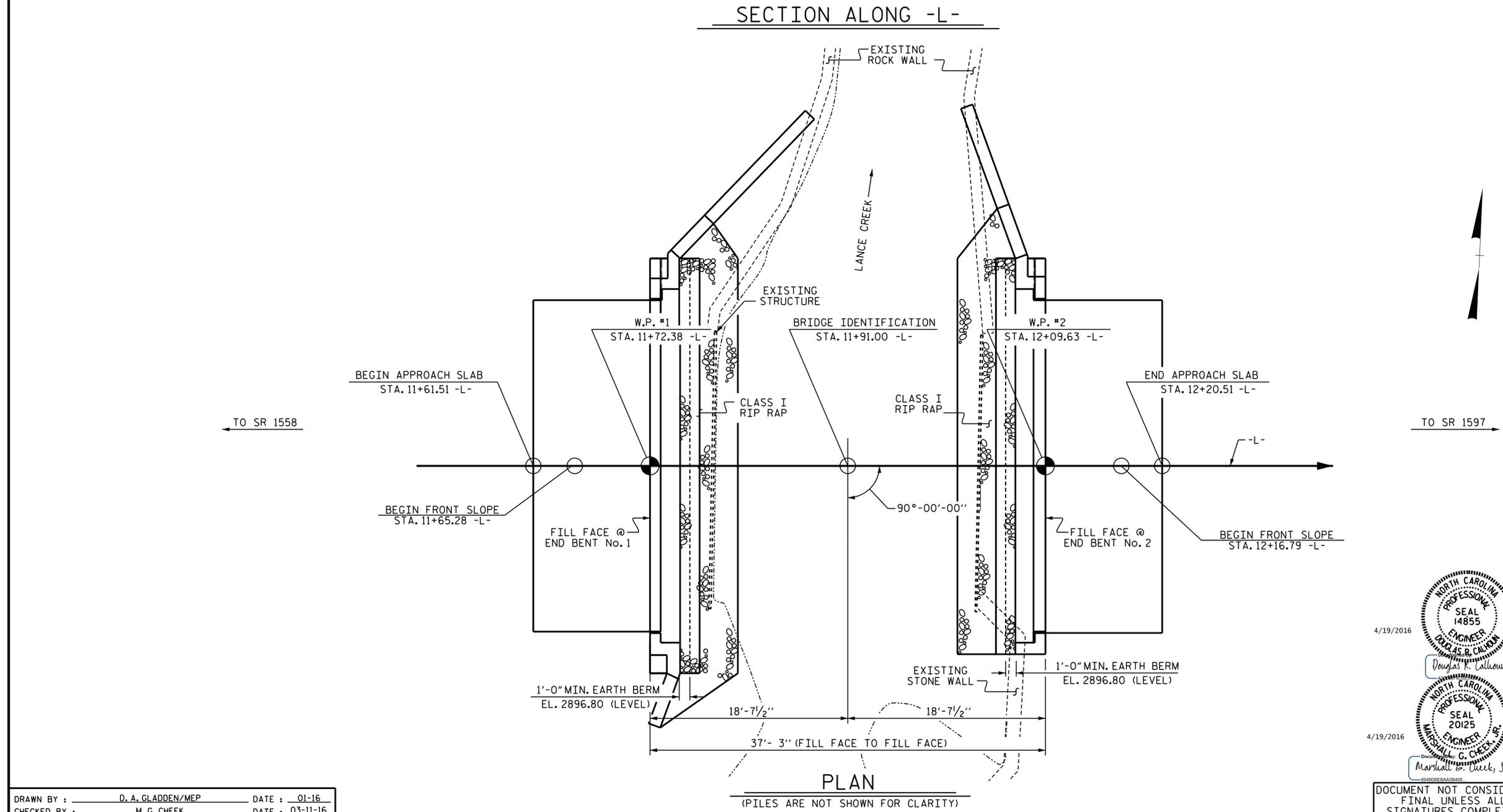
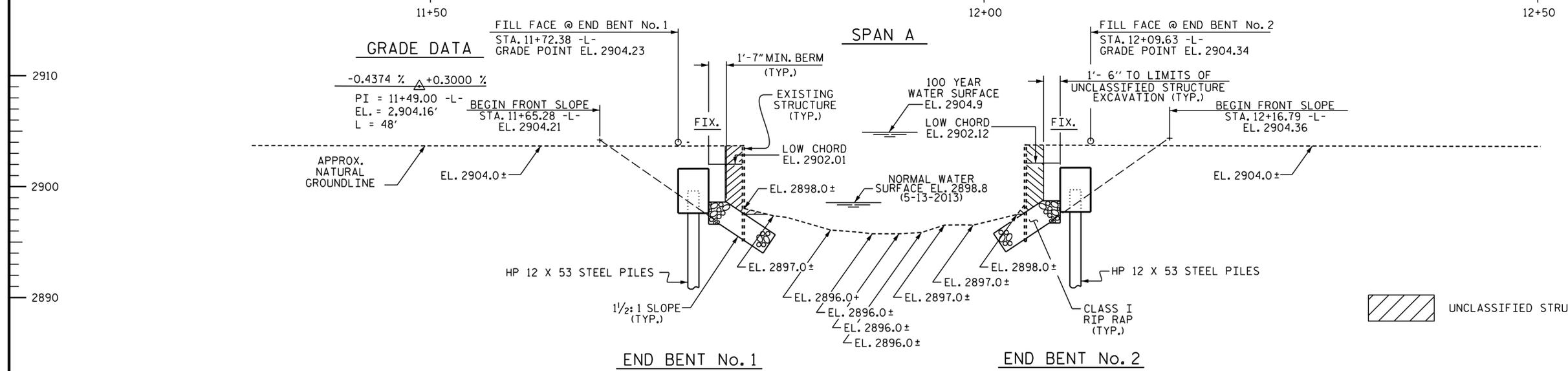


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PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-

SHEET 1 OF 2      REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER LANCE  
 CREEK ON SR 1557 BETWEEN  
 SR 1558 AND SR 1597

4/19/2016  
 NORTH CAROLINA PROFESSIONAL SEAL 14855  
 ENGINEER  
 DOUGLAS B. CALLOW

4/19/2016  
 NORTH CAROLINA PROFESSIONAL SEAL 20125  
 ENGINEER  
 MARSHALL G. CHEEK, JR.

DRAWN BY : D. A. GLADDEN/MEP      DATE : 01-16  
 CHECKED BY : M. G. CHEEK      DATE : 03-11-16

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES	RIP RAP CLASS I	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	APPLICATION OF BRIDGE COATING	ASBESTOS ASSESSMENT	BRIDGE DECK GRINDING	3'-0" X 1'-10" PRESTRESSED CONCRETE CORED SLABS	1'-7" X 9/2" CONCRETE CURB	32" ALASKA RAIL	ARCHITECTURAL CONCRETE SURFACE TREATMENT		
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SO. FT.
SUPERSTRUCTURE								LUMP SUM						LUMP SUM	LUMP SUM		LUMP SUM	11	385.00	70.00	55.00	
END BENT No. 1			LUMP SUM	60	35	LUMP SUM	24.9		2733	7	125	27	30									315
END BENT No. 2			LUMP SUM	40	35	LUMP SUM	21.6		2473	7	105	27	30									245
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	100	70	LUMP SUM	46.5	LUMP SUM	5206	14	230	54	60	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	11	385.00	70.00	55.00	560

**HYDRAULIC DATA**

DESIGN DISCHARGE ----- = 700 CFS  
 FREQUENCY OF DESIGN FLOOD ----- = 25 YEARS  
 DESIGN HIGH WATER ELEVATION ----- = 2903.5  
 DRAINAGE AREA ----- = 2.2 SQ. MI.  
 BASE DISCHARGE (Q100) ----- = 1000 CFS  
 BASE HIGH WATER ELEVATION ----- = 2904.9

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE ----- = 775 CFS  
 FREQUENCY OF OVERTOPPING FLOOD -- = 25+ YEARS  
 OVERTOPPING FLOOD ELEVATION ----- = 2904.2

**FOUNDATION NOTES**

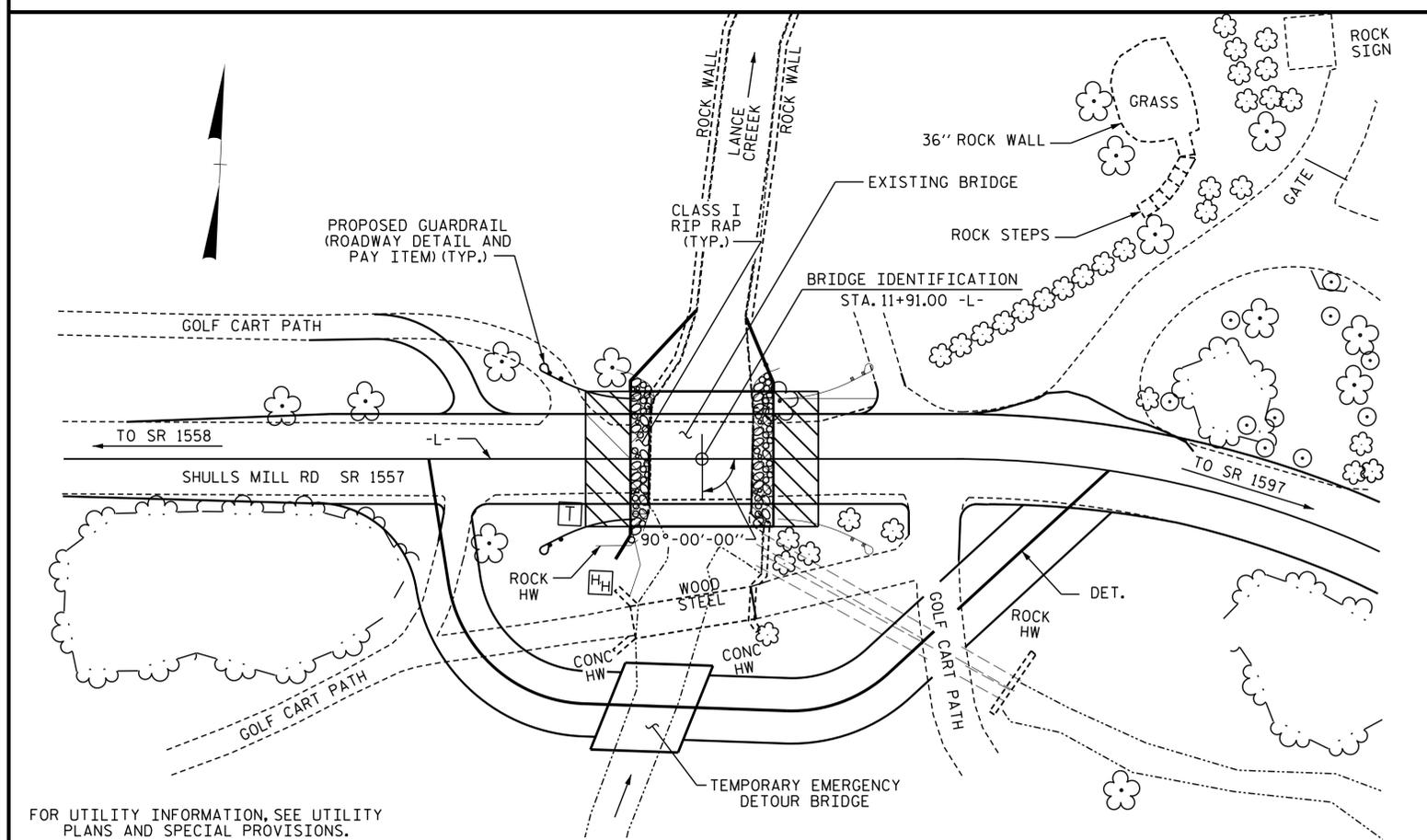
FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.  
 PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.  
 PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO.1, EXCAVATE HOLES AT PILE LOCATIONS TO 2881.2 (LT) AND 2887.4 (RT). FOR PILE EXCAVATION SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.  
 PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO.2, EXCAVATE HOLES AT PILE LOCATIONS TO 2887.1 (LT) AND 2887.4 (RT). FOR PILE EXCAVATION SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.  
 CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.1 AND END BENT NO.2.  
 THE REQUIRED BEARING CAPACITY OF END BENT NO.1 AND END BENT NO.2 WALLS IS 2000 PSF AND SHALL BE VERIFIED.

**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 SHEET SN.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED, THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.  
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE".  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT (LT) AND 20 FT (RT) OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.  
 THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 11+91.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 THE EXISTING ROCK WALLS SHALL BE REMOVED TO THE EXISTING STREAM BED ELEVATION FROM THE EXISTING BRIDGE TO THE END OF THE PROPOSED RETAINING WALLS AS DIRECTED BY THE ENGINEER. THE PROPOSED RETAINING WALLS SHALL TIE INTO THE EXISTING ROCK WALLS AS DIRECTED BY THE ENGINEER.  
 AT THE CONTRACTOR'S OPTION, CAST-IN-PLACE GRAVITY RETAINING WALLS MAY BE SUBSTITUTED IN PLACE OF THE CANTILEVER RETAINING WALLS AS DETAILED IN THE PLANS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT AND GEOTECHNICAL UNITS. THE REDESIGN WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR. ANY ADDITIONAL MATERIALS REQUIRED FOR CONSTRUCTION OF THE CAST-IN-PLACE GRAVITY WALLS WILL BE AT NO ADDITIONAL COST TO THE DEPARTMENT.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.  
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.  
 THE EXISTING SINGLE SPAN STRUCTURE (1 @ 25'-7") CONSISTING OF A TIMBER FLOOR ON STEEL I-BEAMS WITH A SUBSTRUCTURE CONSISTING OF TIMBER CAPS & TIMBER POST AND SILL ABUTMENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISIONS FOR REMOVAL OF EXISTING STRUCTURE.  
 AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.  
 FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.  
 FOR BRIDGE DECK GRINDING, SEE SPECIAL PROVISIONS.  
 FOR 3'-0" X 1'-10" PRESTRESSED CONCRETE CORED SLABS, SEE SPECIAL PROVISIONS.  
 FOR 32" ALASKA RAIL, SEE SPECIAL PROVISIONS.  
 FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

**B.M. #1 : CHISELED SQUARE IN SE HEADWALL OVER CREEK, 17' LEFT OF STA. 13+86.00 -BL4-, EL. 2908.19**



**LOCATION SKETCH**

DRAWN BY : D. A. GLADDEN/MEP DATE : 01-16  
 CHECKED BY : M.G. CHEEK DATE : 03-15-16

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER LANCE  
 CREEK ON SR 1557 BETWEEN  
 SR 1558 AND SR 1597



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

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.046	--	1.75	0.283	1.36	A	EL	17.000	0.561	1.05	A	EL	1.700	0.80	0.283	1.07	A	EL	17.000		
	HL-93(0pr)	N/A	--	1.356	--	1.35	0.283	1.77	A	EL	17.000	0.561	1.36	A	EL	1.700	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.205	42.810	1.75	0.283	1.79	A	EL	13.600	0.561	1.20	A	EL	1.700	0.80	0.283	1.41	A	EL	17.000		
	HS-20(0pr)	36.000	--	1.562	55.494	1.35	0.283	2.32	A	EL	13.600	0.561	1.56	A	EL	1.700	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.437	32.402	1.4	0.283	3.89	A	EL	17.000	0.561	3.10	A	EL	1.700	0.80	0.283	2.44	A	EL	17.000	
		SNGARBS2	20.000	--	2.080	41.044	1.4	0.283	3.29	A	EL	13.600	0.561	2.35	A	EL	1.700	0.80	0.283	2.08	A	EL	13.600	
		SNAGRIS2	22.000	--	2.081	45.174	1.4	0.283	3.26	A	EL	13.600	0.561	2.24	A	EL	1.700	0.80	0.283	2.08	A	EL	13.600	
		SNCOTTS3	27.250	--	1.220	32.744	1.4	0.283	1.95	A	EL	17.000	0.561	1.56	A	EL	1.700	0.80	0.283	1.22	A	EL	17.000	
		SNAGGRS4	34.925	--	1.128	38.816	1.4	0.283	1.80	A	EL	17.000	0.561	1.40	A	EL	1.700	0.80	0.283	1.13	A	EL	17.000	
		SNS5A	35.550	--	1.095	38.354	1.4	0.283	1.75	A	EL	17.000	0.561	1.47	A	EL	1.700	0.80	0.283	1.10	A	EL	17.000	
		SNS6A	39.950	--	1.057	41.601	1.4	0.283	1.69	A	EL	17.000	0.561	1.39	A	EL	1.700	0.80	0.283	1.06	A	EL	17.000	
	SNS7B	42.000	3	1.009	41.734	1.4	0.283	1.61	A	EL	17.000	0.561	1.42	A	EL	1.700	0.80	0.283	1.01	A	EL	17.000		
	TTST	TNAGRIT3	33.000	--	1.306	42.439	1.4	0.283	2.08	A	EL	17.000	0.561	1.62	A	EL	1.700	0.80	0.283	1.31	A	EL	17.000	
		TNT4A	33.075	--	1.305	42.512	1.4	0.283	2.08	A	EL	17.000	0.561	1.53	A	EL	1.700	0.80	0.283	1.30	A	EL	17.000	
		TNT6A	41.600	--	1.143	46.84	1.4	0.283	1.83	A	EL	17.000	0.561	1.50	A	EL	1.700	0.80	0.283	1.14	A	EL	17.000	
		TNT7A	42.000	--	1.179	48.833	1.4	0.283	1.89	A	EL	17.000	0.561	1.39	A	EL	1.700	0.80	0.283	1.18	A	EL	17.000	
		TNT7B	42.000	--	1.162	48.061	1.4	0.283	1.85	A	EL	17.000	0.561	1.35	A	EL	1.700	0.80	0.283	1.16	A	EL	17.000	
		TNAGRIT4	43.000	--	1.176	49.810	1.4	0.283	1.86	A	EL	13.600	0.561	1.29	A	EL	1.700	0.80	0.283	1.18	A	EL	17.000	
TNAGT5A		45.000	--	1.084	48.071	1.4	0.283	1.73	A	EL	17.000	0.561	1.37	A	EL	1.700	0.80	0.283	1.08	A	EL	17.000		
TNAGT5B	45.000	--	1.046	46.373	1.4	0.283	1.67	A	EL	17.000	0.561	1.22	A	EL	1.700	0.80	0.283	1.05	A	EL	17.000			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{dc}$	$\gamma_{dw}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

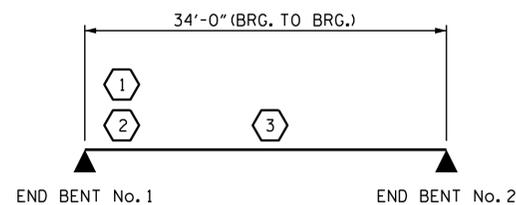
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

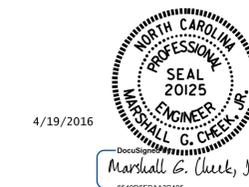
GIRDER LOCATION

I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY  
FOR SPAN 'A'

PROJECT NO. B-5118  
WATAUGA COUNTY  
STATION: 11+91.00 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
LRFR SUMMARY FOR  
35' CORED SLAB UNIT  
90° SKEW  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : W.J.HARRIS	DATE : 2/9/16
CHECKED BY : M.G.CHEEK	DATE : 3/11/16
DRAWN BY : CVC	6/10
CHECKED BY : DNS	6/10

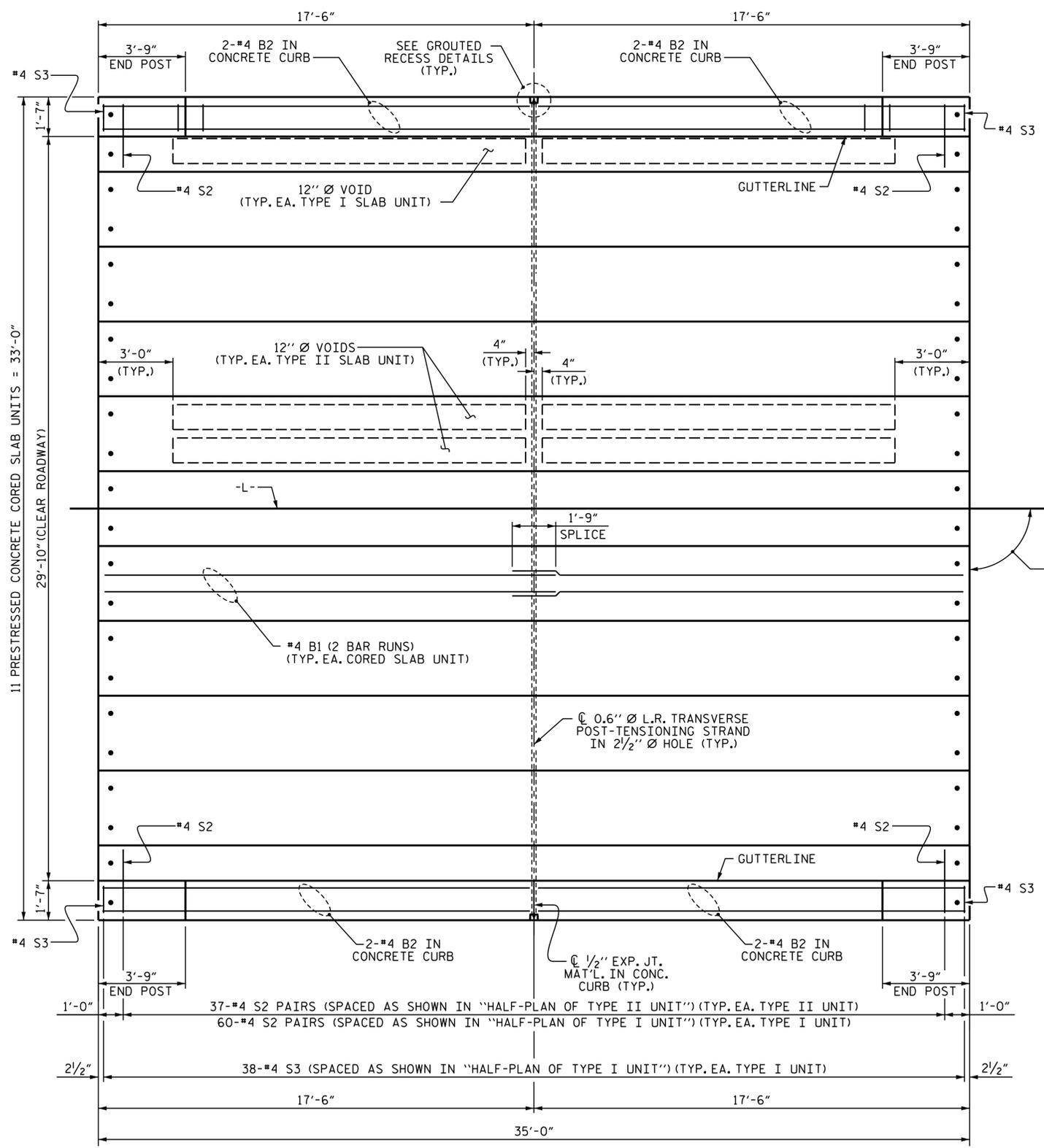
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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

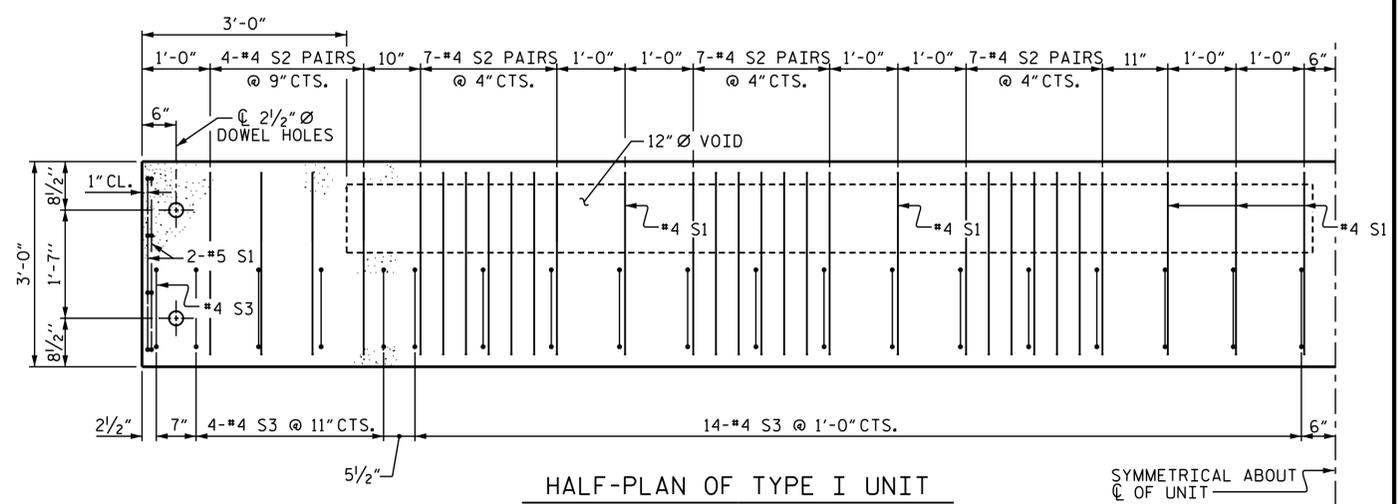


**NOTES**

FOR LOCATION OF ANCHOR BOLTS AND ANCHOR PLATES EMBEDDED IN EXTERIOR CORED SLAB UNITS, SEE "ALASKA 2 TUBE METAL RAIL" SHEET.

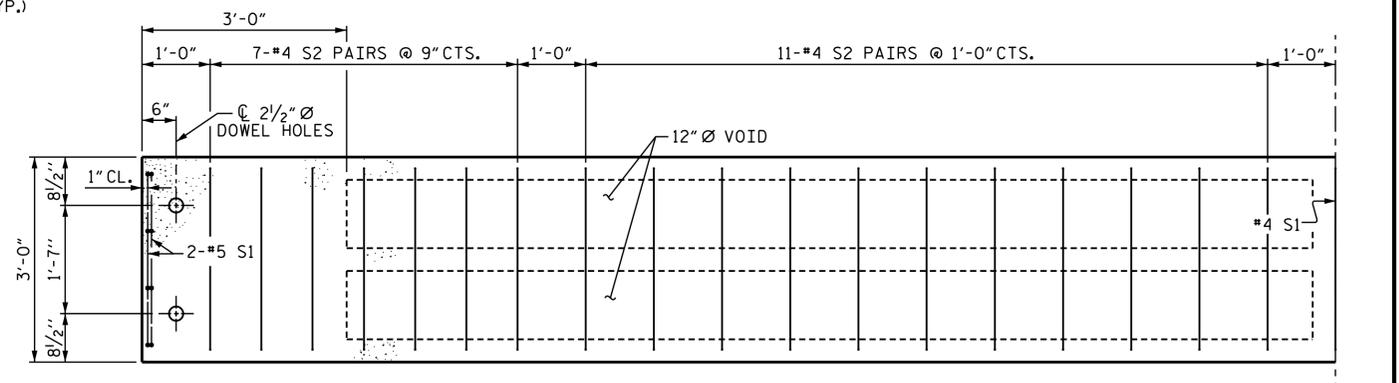


**PLAN OF UNIT**



**HALF-PLAN OF TYPE I UNIT**

SYMMETRICAL ABOUT  
CL OF UNIT



**HALF-PLAN OF TYPE II UNIT**

SYMMETRICAL ABOUT  
CL OF UNIT

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PLAN OF 35' UNIT**  
 29'-10" CLEAR ROADWAY  
 90° SKEW

DRAWN BY: W.J. HARRIS DATE: 2/2/16  
 CHECKED BY: M.G. CHEEK DATE: 2/29/16  
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 4/16

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			20

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*DGN\*\*\*\*\*  
 \*\*\*\*\*USERNAME\*\*\*\*\*

**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" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT.

THE 2" Ø BACKER ROD 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.

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 4000 PSI.

ALL REINFORCING STEEL IN CONCRETE CURB 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.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

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

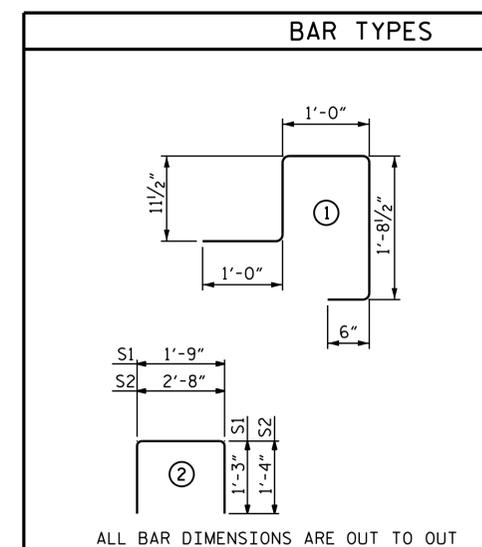
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

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.

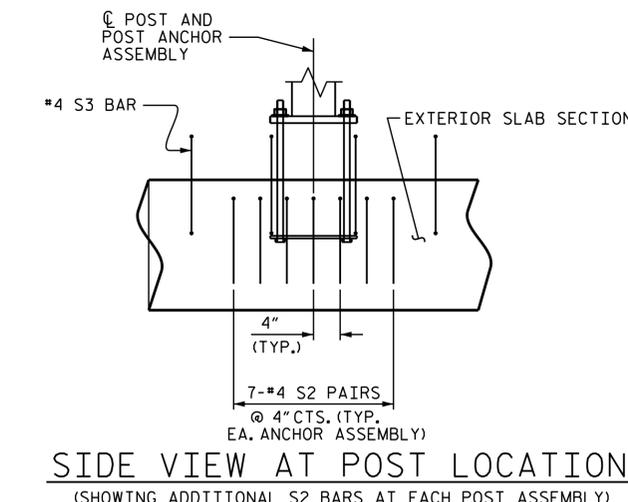
THE COST OF THE METAL RAIL ANCHOR ASSEMBLY CAST WITH THE CORED SLAB SECTIONS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA ( SQUARE INCHES )	0.217
ULTIMATE STRENGTH ( LBS. PER STRAND )	58,600
APPLIED PRESTRESS ( LBS. PER STRAND )	43,950



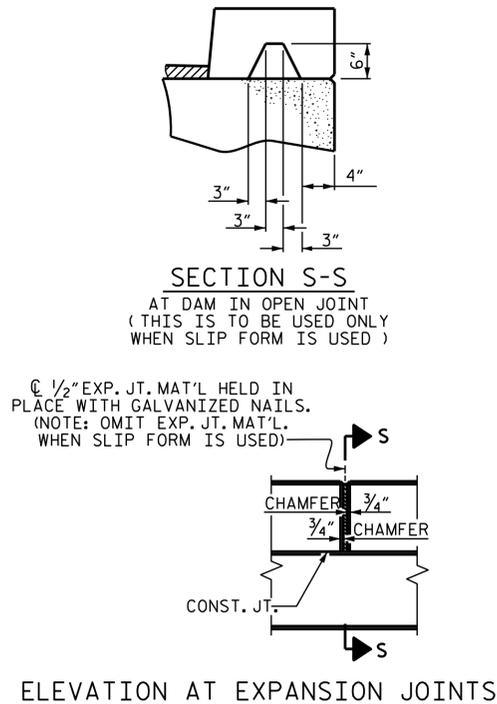
**BILL OF MATERIAL FOR ONE CORED SLAB SECTION**

TYPE I UNIT					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#4	STR	18'-3"	49
S1	8	#5	2	4'-3"	35
S2	120	#4	2	5'-4"	428
* S3	38	#4	1	5'-2"	131
REINFORCING STEEL					LBS. 512
* EPOXY COATED REINFORCING STEEL					LBS. 131
5000 P.S.I. CONCRETE					CU. YDS. 6.3
0.6" Ø L.R. STRANDS					No. 9
TYPE II UNIT					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#4	STR	18'-3"	49
S1	8	#5	2	4'-3"	35
S2	74	#4	2	5'-4"	264
REINFORCING STEEL					LBS. 348
5000 P.S.I. CONCRETE					CU. YDS. 5.5
0.6" Ø L.R. STRANDS					No. 9

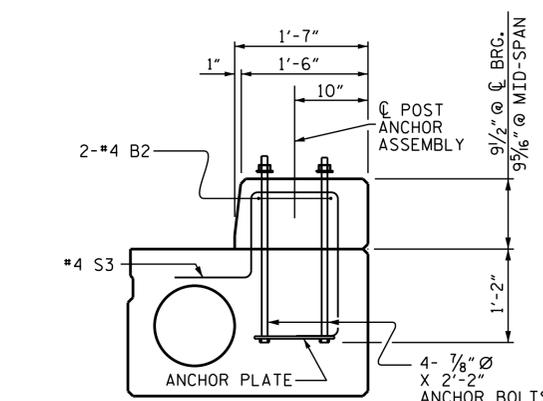


**SIDE VIEW AT POST LOCATION**  
(SHOWING ADDITIONAL S2 BARS AT EACH POST ASSEMBLY)

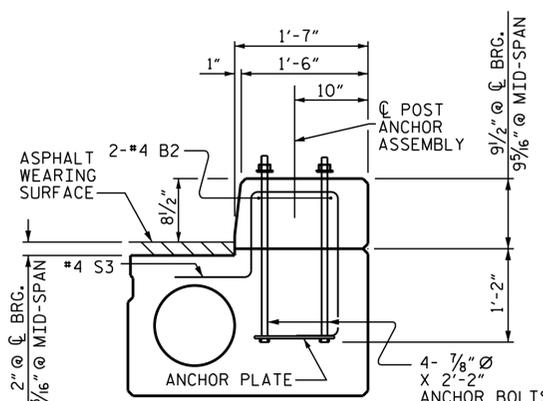
BILL OF MATERIAL FOR 2 CURBS & 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	8	#4	STR	17'-2"	92
* E1	40	#7	STR	2'-9"	225
* F1	32	#6	STR	3'-5"	164
* EPOXY COATED REINFORCING STEEL					LBS. 481
CLASS AA CONCRETE					CU.YDS. 5.1
TOTAL LIN. FT. OF 1'-7" x 9 1/2" CONCRETE CURB					70.00



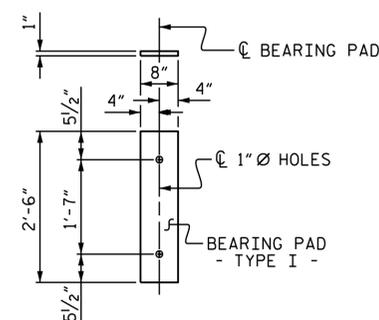
**ELEVATION AT EXPANSION JOINTS**



**ALASKA RAIL CURB SECTION**  
TEMPORARY



**ALASKA RAIL CURB SECTION**  
FINAL



**FIXED END**  
(TYPE I - 22 REQ'D)

**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN BEARINGS SHALL BE 50 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
CAMBER ( SLAB ALONE IN PLACE )	0.6" Ø L.R. STRAND 1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/16" ↓
FINAL CAMBER	3/16" ↓

\*\* INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED			
TYPE	NUMBER	LENGTH	TOTAL LENGTH
TYPE I	2	35'-0"	70'-0"
TYPE II	9	35'-0"	315'-0"
TOTAL	11		385'-0"



PROJECT NO. B-5118  
WATAUGA COUNTY  
STATION: 11+91.00 -L-

SHEET 3 OF 4

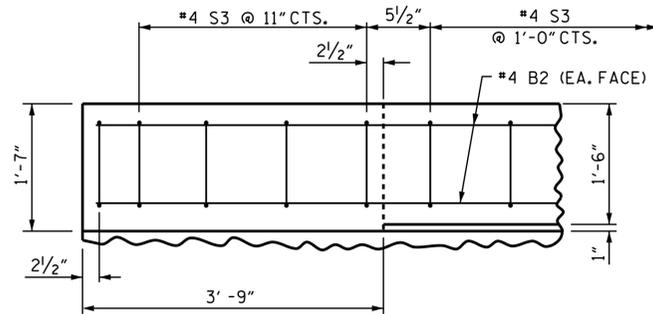
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**3'-0" X 1'-10" PRESTRESSED CONCRETE CORED SLAB UNIT**

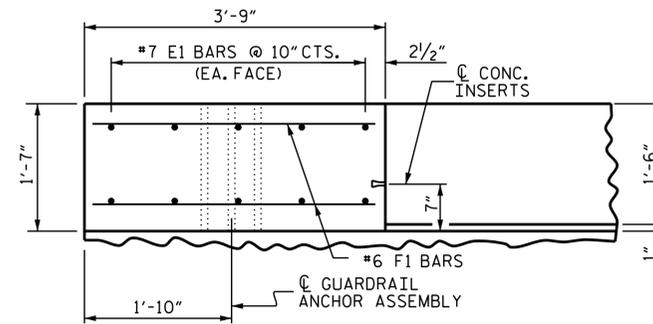
DRAWN BY :	W.J. HARRIS	DATE :	2/2/16
CHECKED BY :	M.G. CHEEK	DATE :	2/29/16
DESIGN ENGINEER OF RECORD :	S. T. CHAMPION	DATE :	4/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

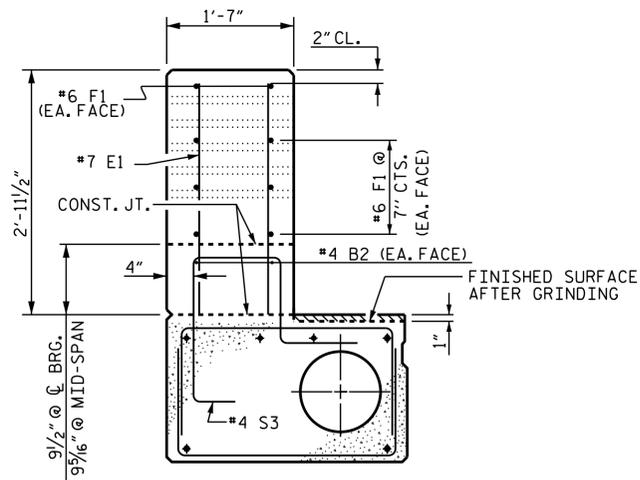
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS 20
2			4			



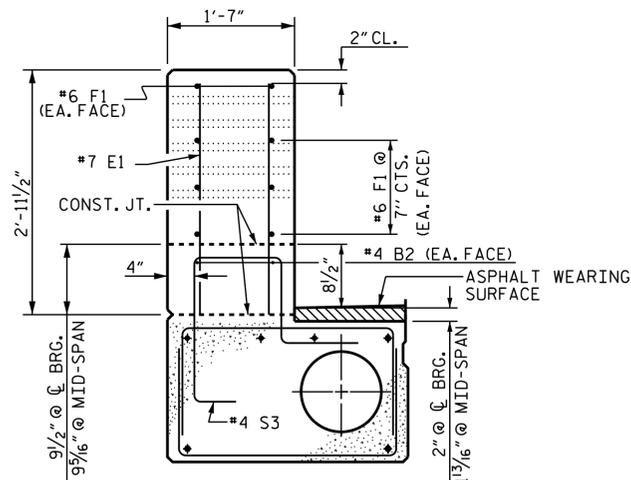
PLAN OF CURB



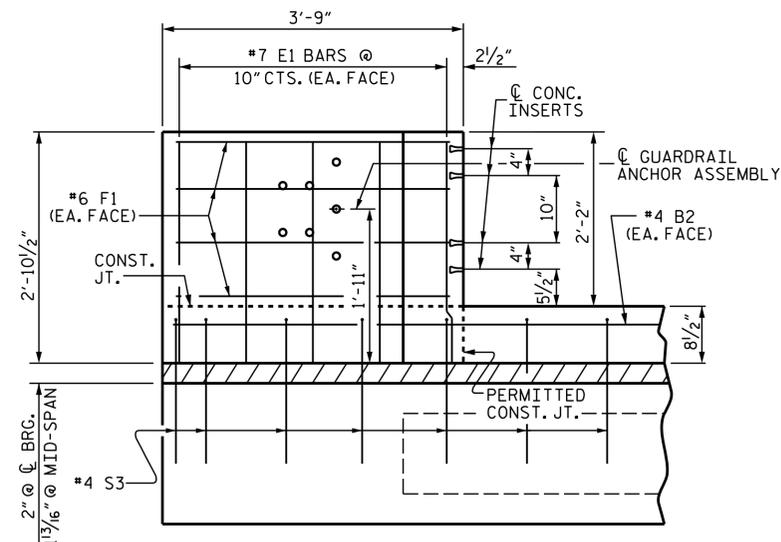
PLAN OF END POST



END VIEW - TEMPORARY



END VIEW - FINAL

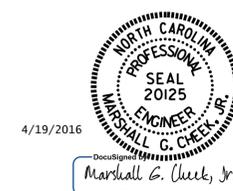


ELEVATION

CURB AND END POST FOR 32" ALASKA RAIL

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-

SHEET 4 OF 4



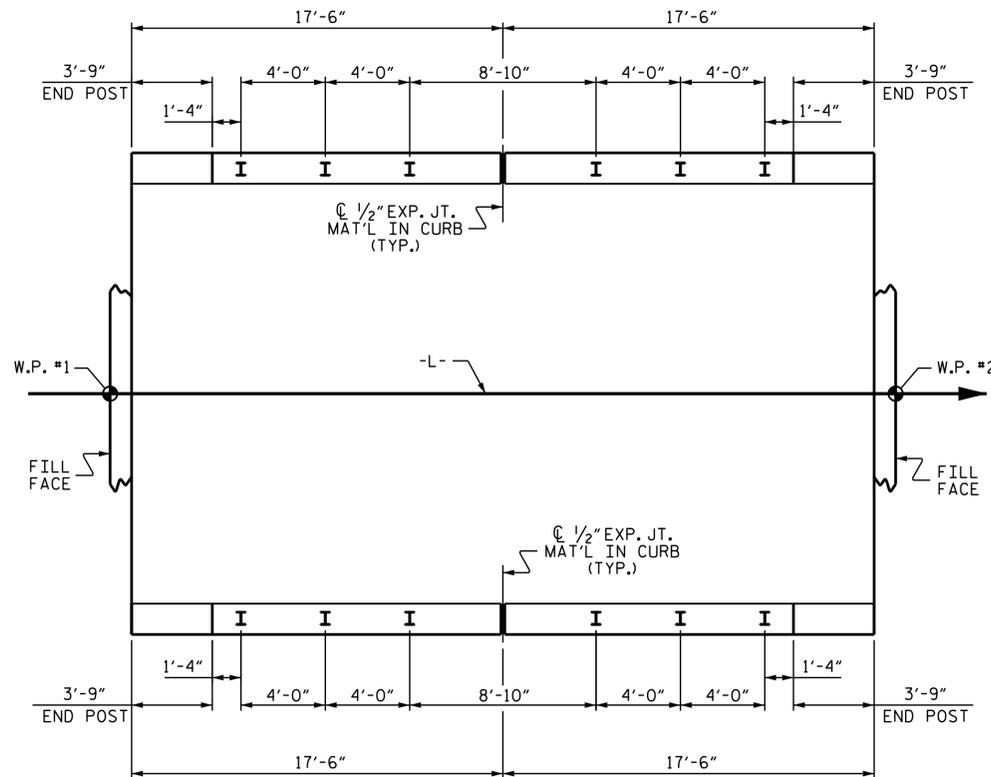
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CONCRETE CURB  
 AND END POSTS

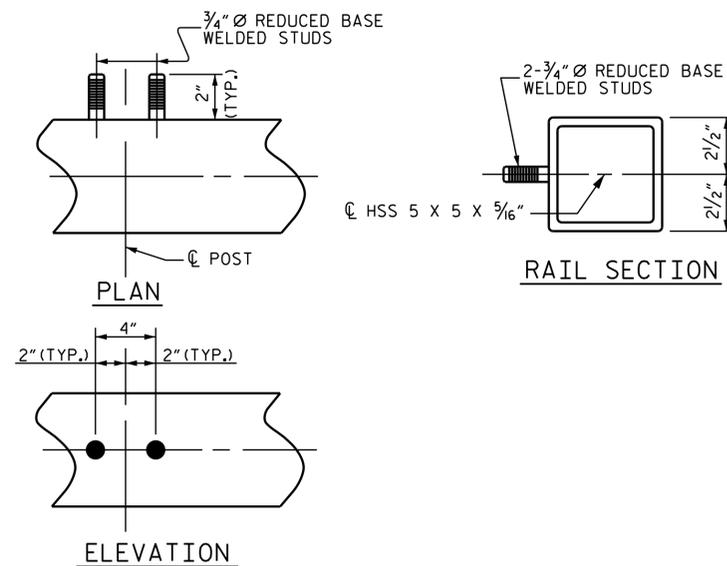
DRAWN BY : W.J.HARRIS DATE : 2/4/16  
 CHECKED BY : M.G.CHEEK DATE : 2/29/16  
 DESIGN ENGINEER OF RECORD: S.T.CHAMPION DATE : 4/16

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

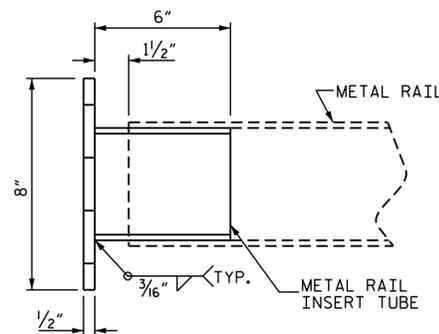
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20



PLAN OF RAIL POST SPACINGS

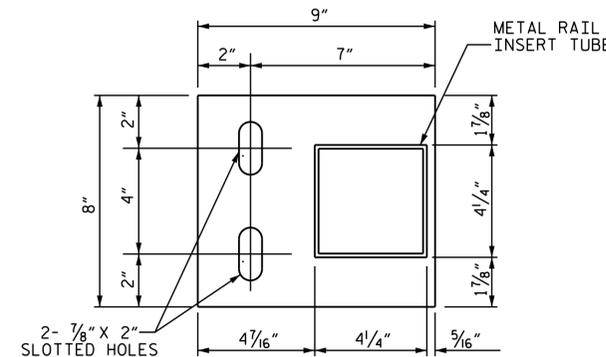


RAIL STUD DETAILS

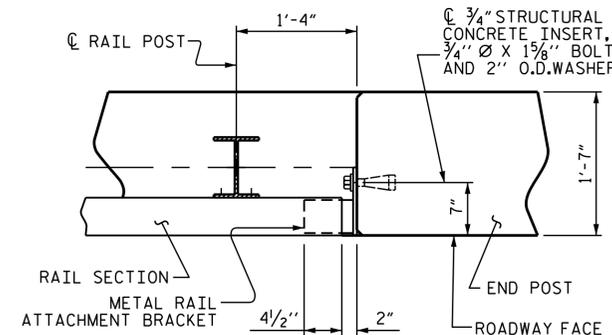


METAL RAIL ATTACHMENT BRACKET

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



PLAN - RAILS AND END POST



PLAN - RAILS AND END POST



4/19/2016

Marshall G. Cheek, Jr.  
654909EBA38405

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NO. BY: DATE: NO. BY: DATE:

1 2 3 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

PROJECT NO. B-5118  
WATAUGA COUNTY  
STATION: 11+91.00 -L-  
SHEET 1 OF 2

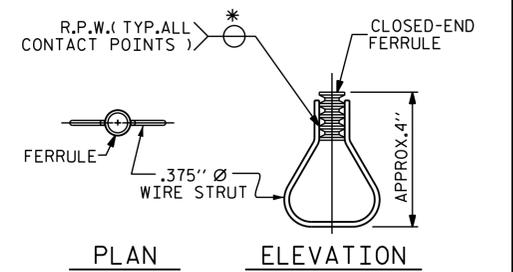
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
RAIL POST SPACINGS  
AND  
END OF RAIL DETAILS

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 1 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.
  - 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 ASSEMBLIES, 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.

NOTES

METAL RAIL SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS.

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, A501 OR A618 - GALVANIZED TO AASHTO M111. ALUMINUM WILL NOT BE ALLOWED.

REDUCED BASE WELDED STUDS: ASTM A108-GALVANIZED TO AASHTO M111.

HIGH STRENGTH ANCHOR BOLTS SHALL CONFORM TO ASTM 1554 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 SHEET 1 OF 2.

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

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.

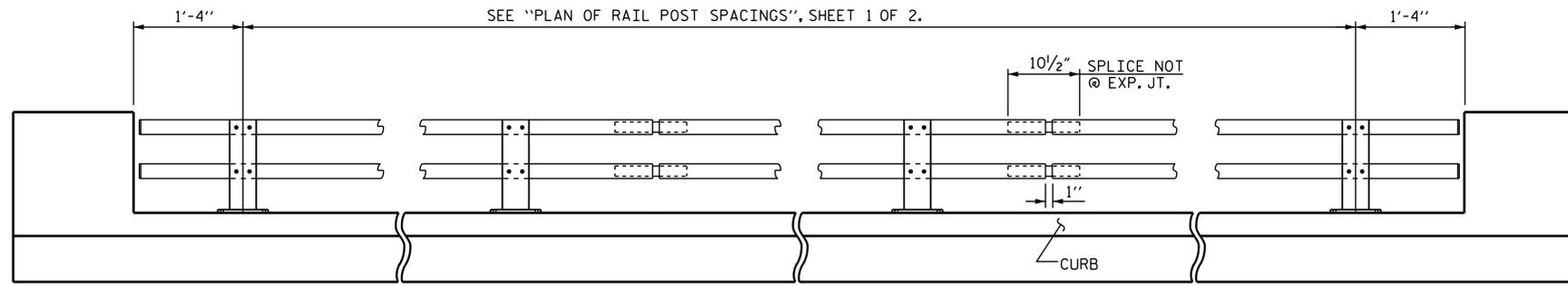
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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.

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

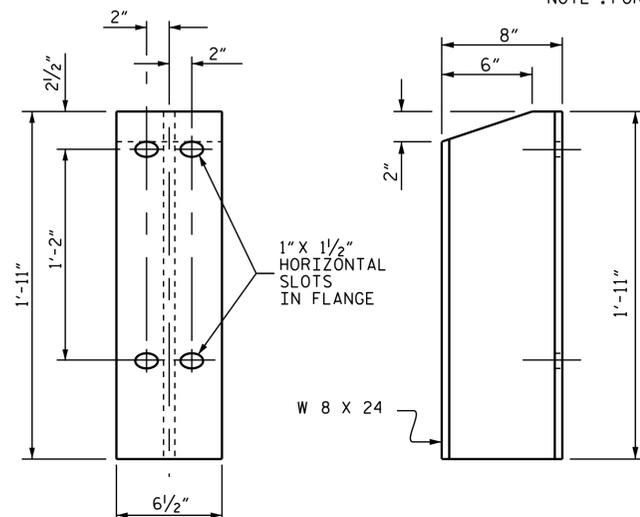
ALL METAL SURFACES, INCLUDING PROJECTING BOLTS, NUTS AND WASHERS SHALL BE PAINTED BROWN. SEE SPECIAL PROVISIONS FOR APPLICATION OF BRIDGE COATING.

PAY LENGTH 55.00 LIN. FT.



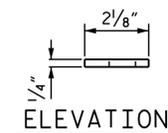
ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 1 OF 2.

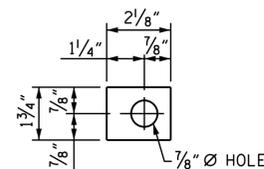


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

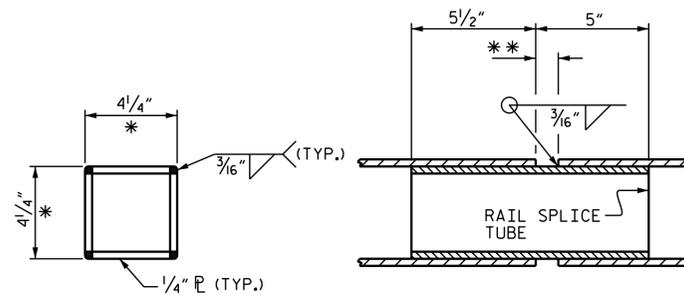


ELEVATION



PLAN

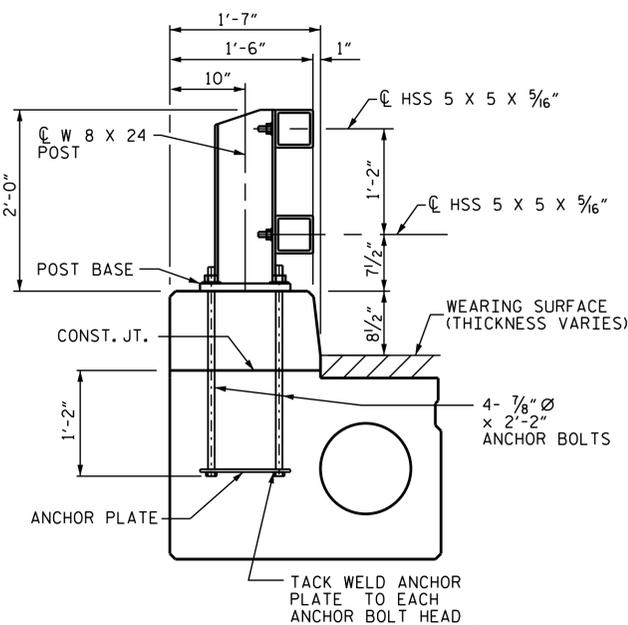
PLATE WASHER



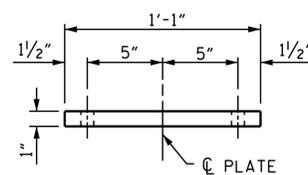
RAIL SPLICE DETAILS

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

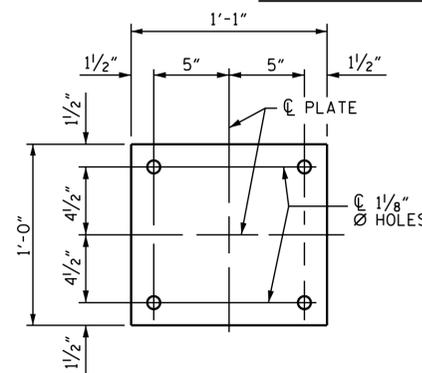
\*\* - 1" FOR SPLICE NOT AT EXPANSION JOINT



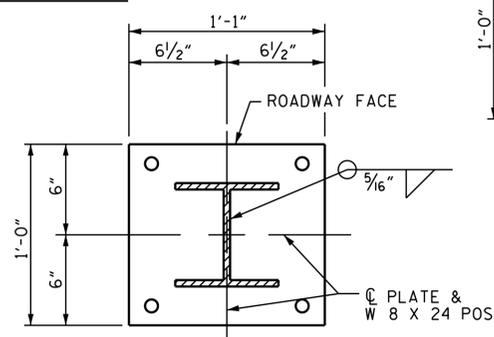
SECTION THRU RAIL



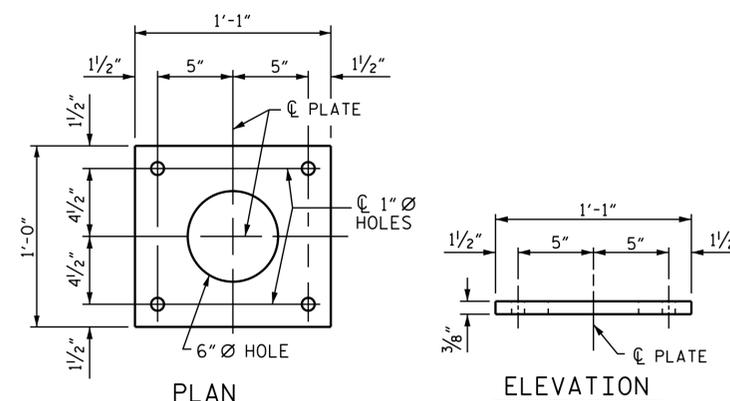
FRONT ELEVATION



PLAN



POST ATTACHMENT DETAIL



ANCHOR PLATE DETAILS

PROJECT NO. B-5118  
WATAUGA COUNTY  
STATION: 11+91.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

32" ALASKA RAIL



ASSEMBLED BY : W.J. HARRIS	DATE : 2/4/16
CHECKED BY : M.G. CHEEK	DATE : 2/29/16
DRAWN BY : RWW 7/14	
CHECKED BY : TMG 7/14	

08-APR-2016 08:07  
R:\Structures\Final Plans\B5111B\_SD\_CS.dgn  
bng Brady

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" 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 7/8" 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.

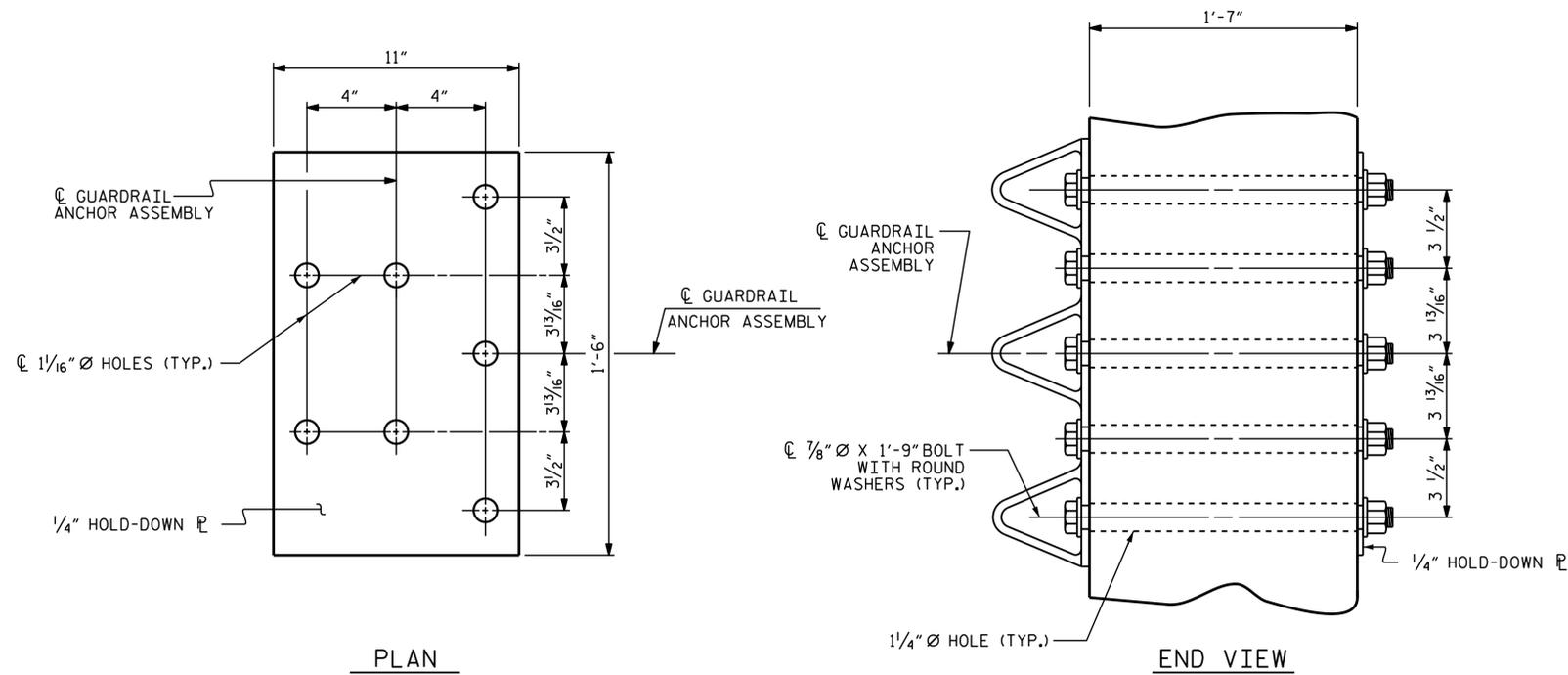
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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.

ALL METAL SURFACES INCLUDING PLATES, BOLTS, NUTS AND WASHERS SHALL BE PAINTED BROWN. SEE SPECIAL PROVISIONS FOR APPLICATION OF BRIDGE COATING.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-



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

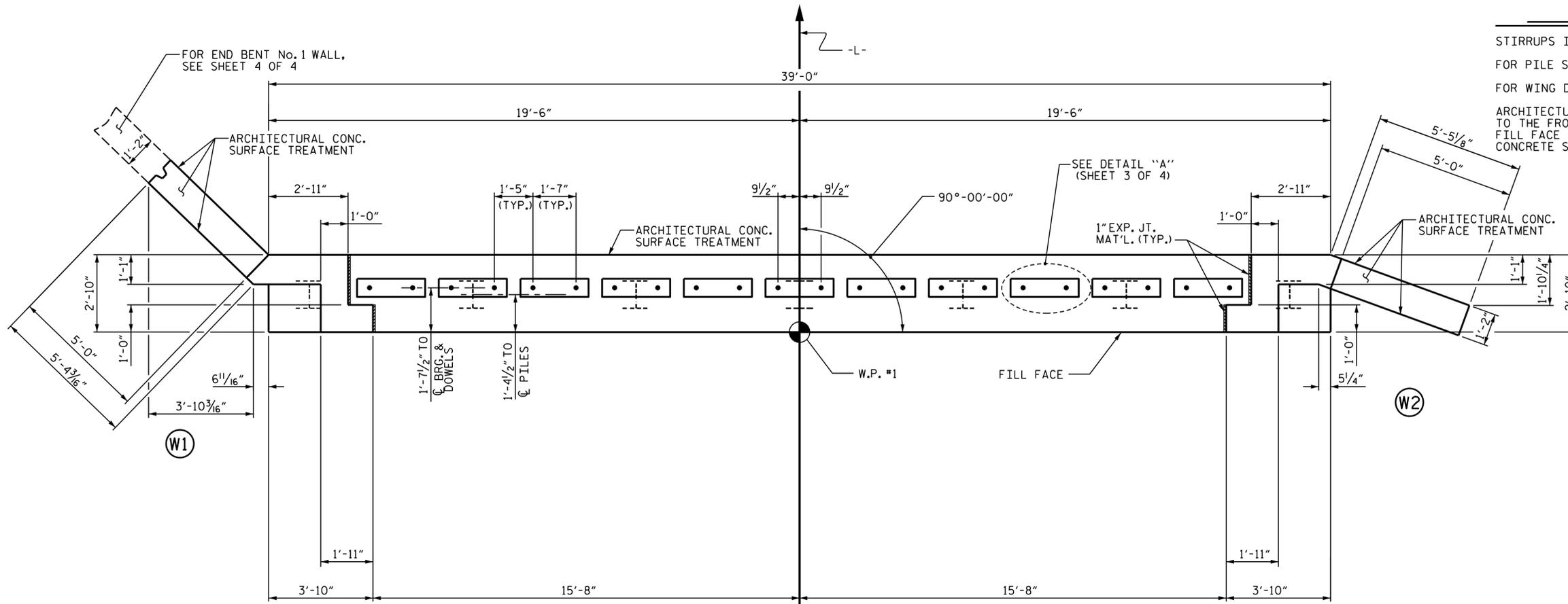
ASSEMBLED BY : W.J. HARRIS	DATE : 2/3/16
CHECKED BY : M.G. CHEEK	DATE : 2/29/16
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

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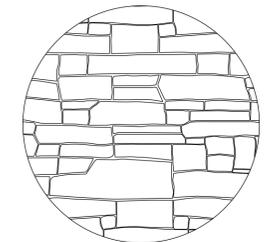
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 20
2			4			

**NOTES**

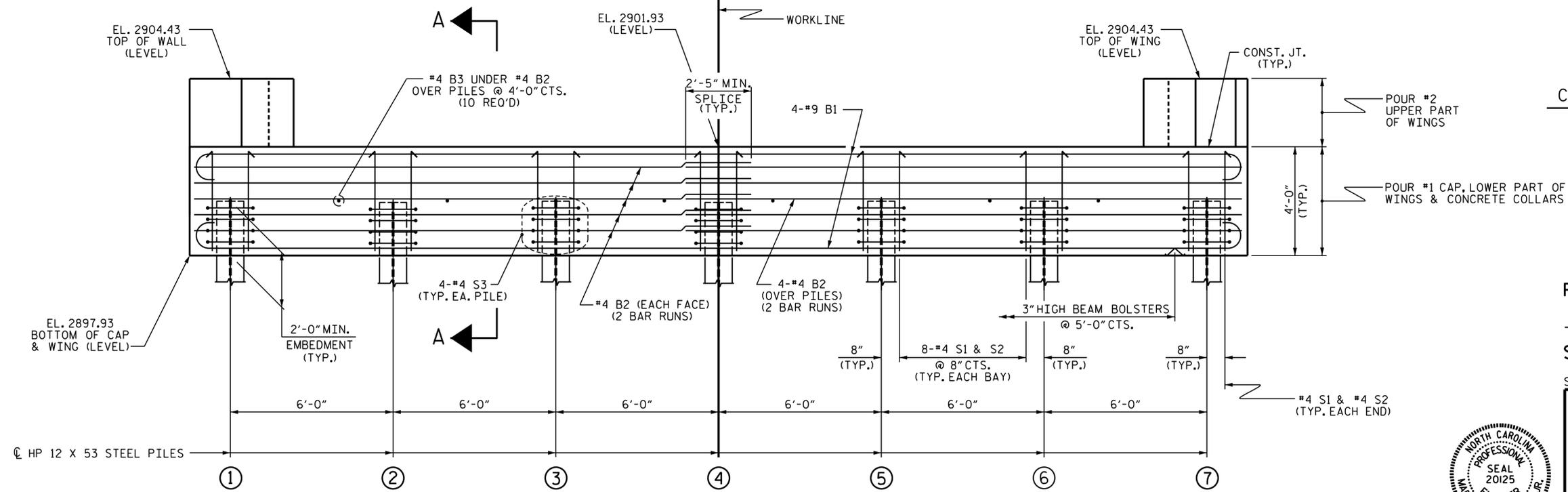
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 4.  
 FOR WING DETAILS, SEE SHEET 2 OF 4.  
 ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL BE APPLIED TO THE FRONT FACE OF THE CAP AND WINGS, TOP OF WINGS AND FILL FACE OF WINGS AS DETAILED ON THE PLANS. FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.



**PLAN**



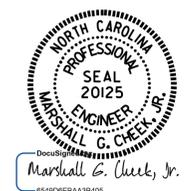
**DETAIL OF ARCHITECTURAL CONCRETE SURFACE TREATMENT**  
 SHOWING SIMULATED STONE "DRY STACK" PATTERN



**ELEVATION**

WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 3 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 4.

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-  
 SHEET 1 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

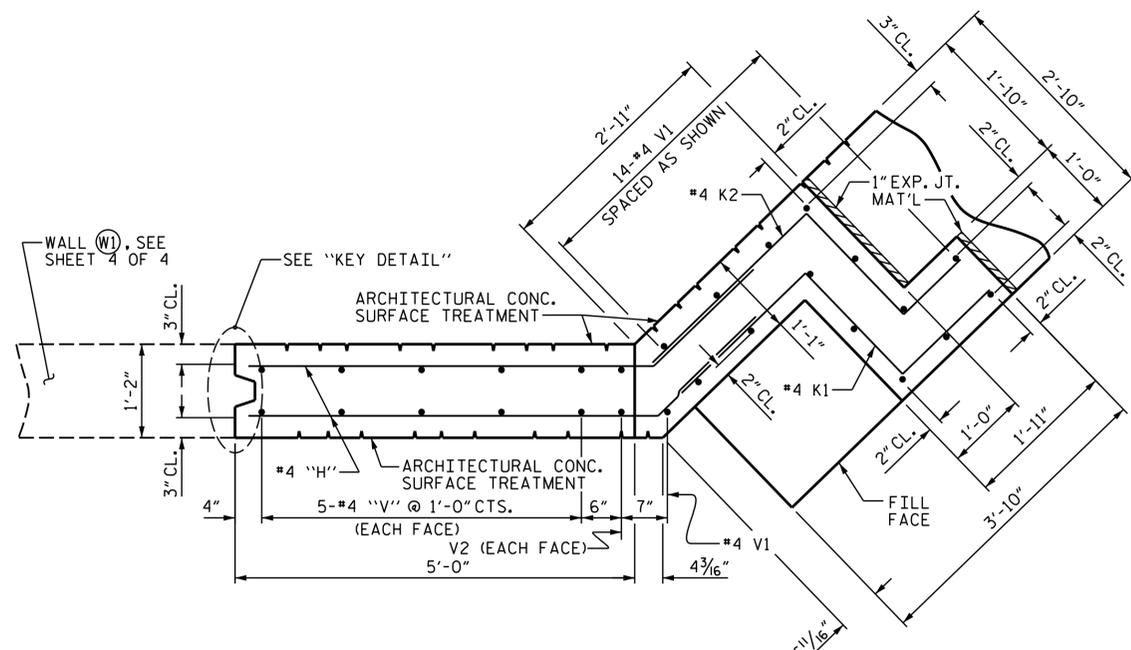
**SUBSTRUCTURE**  
**END BENT No. 1**

DRAWN BY : W.J. HARRIS DATE : 2/16  
 CHECKED BY : B.N. GRADY DATE : 2/16  
 DESIGN ENGINEER OF RECORD : W.J. HARRIS DATE : 4/16

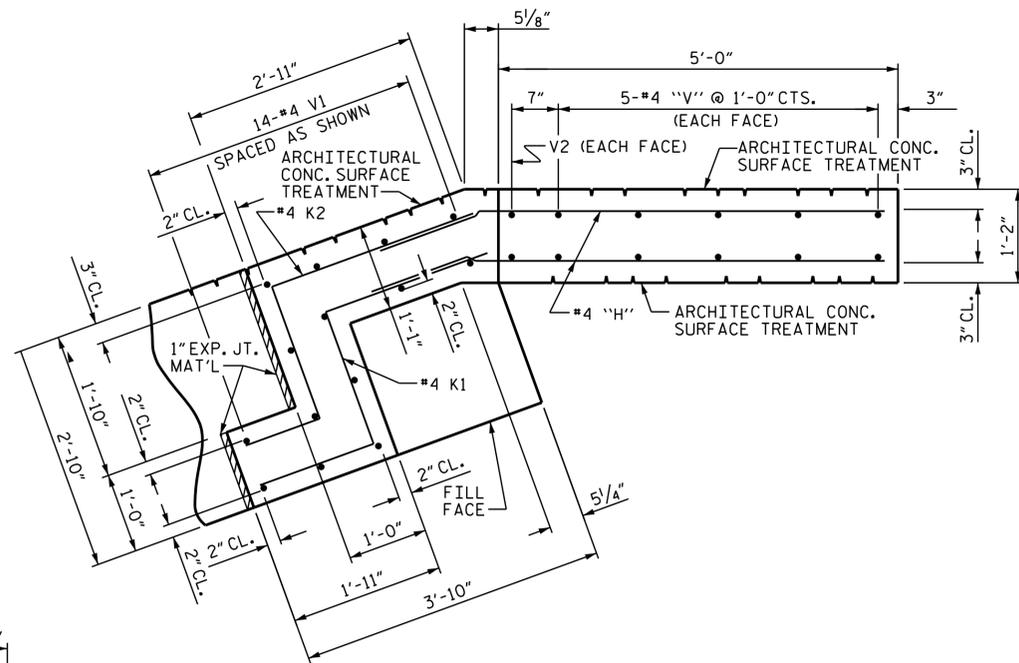
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 20
2			4			

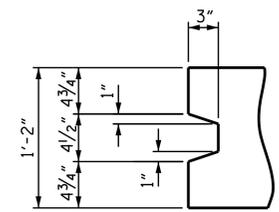
\*\*\*\*\*SYSTEM\*\*\*\*\*  
 \*\*\*\*\*DCN\*\*\*\*\*  
 \*\*\*\*\*USER\*\*\*\*\*



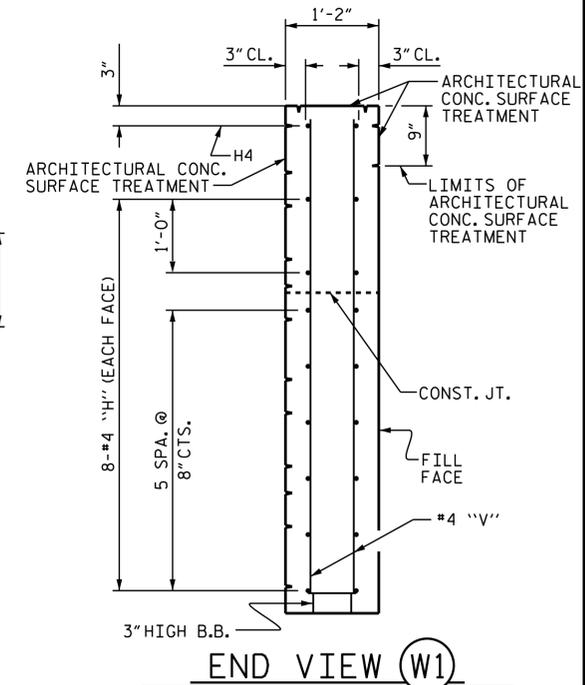
PLAN OF WING (W1)



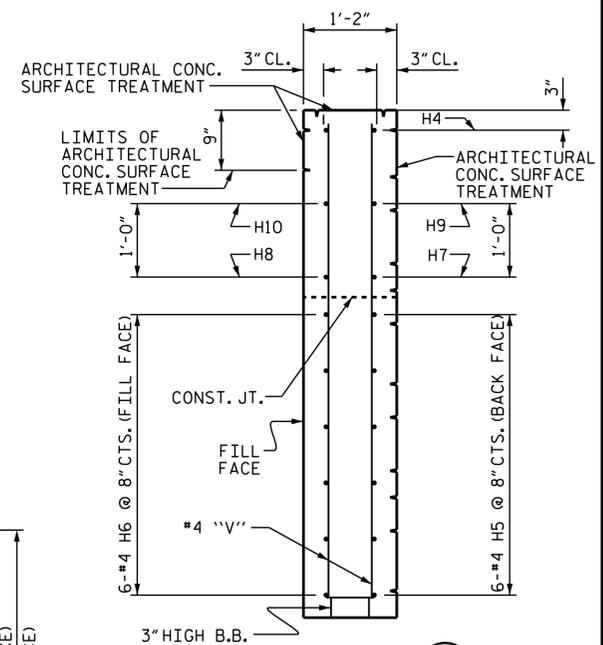
PLAN OF WING (W2)



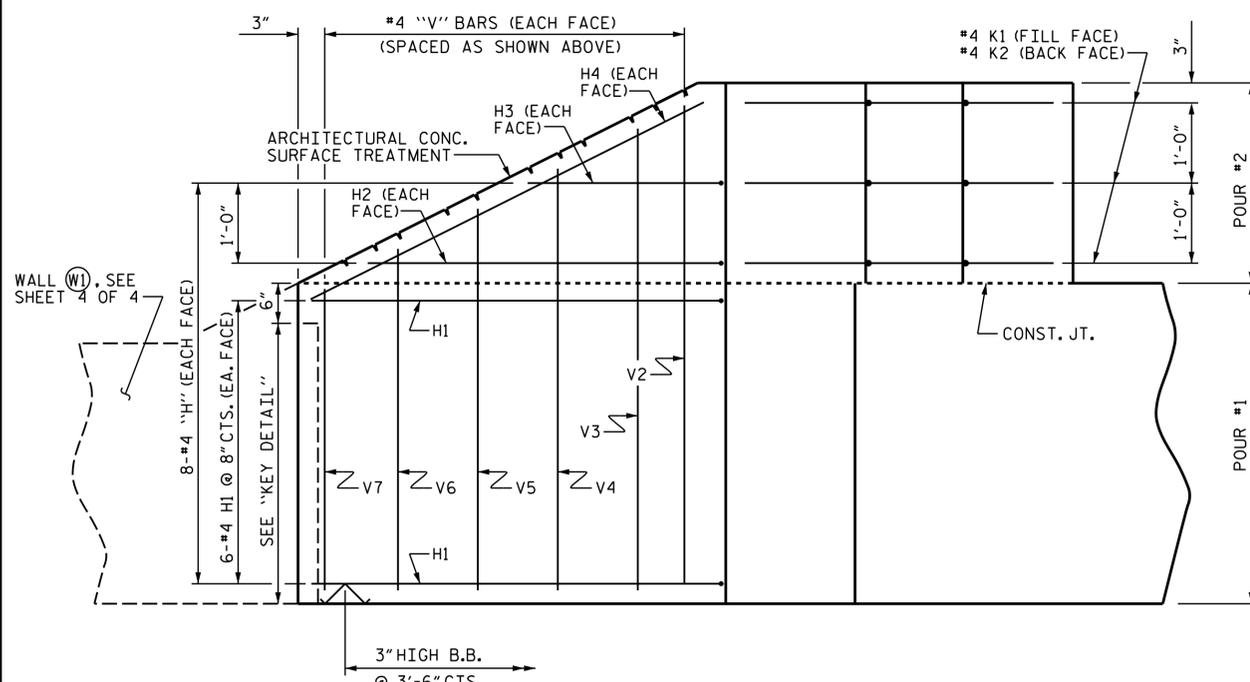
KEY DETAIL



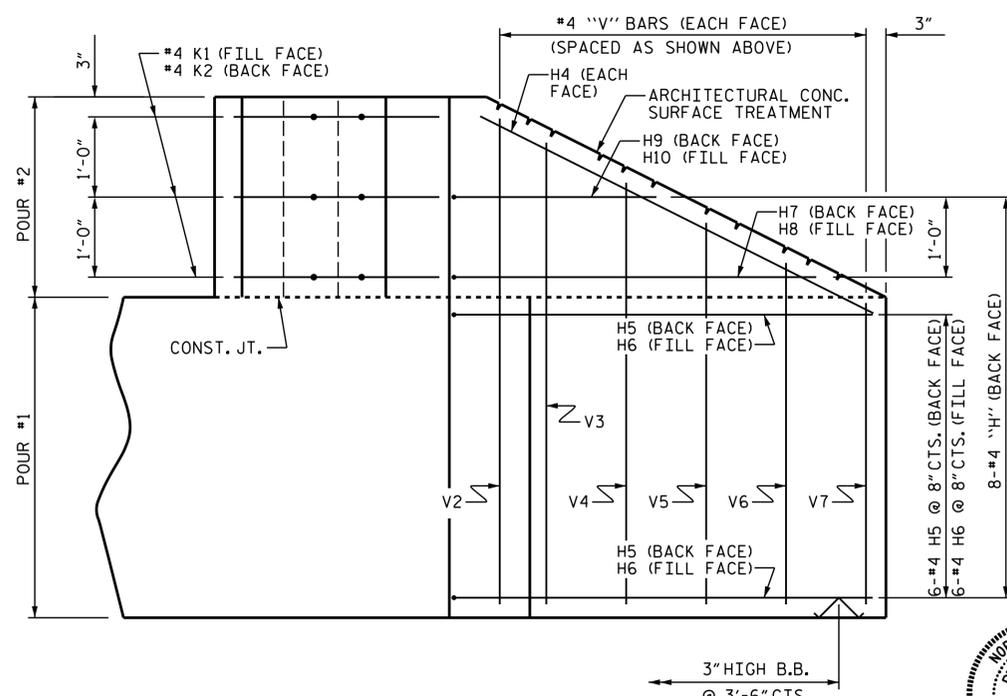
END VIEW (W1)



END VIEW (W2)



ELEVATION OF WING (W1)

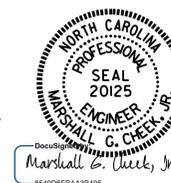


ELEVATION OF WING (W2)

WING DETAILS

DRAWN BY : W.J. HARRIS DATE : 2/16  
 CHECKED BY : B.N. GRADY DATE : 2/16  
 DESIGN ENGINEER OF RECORD: W.J. HARRIS DATE : 4/16

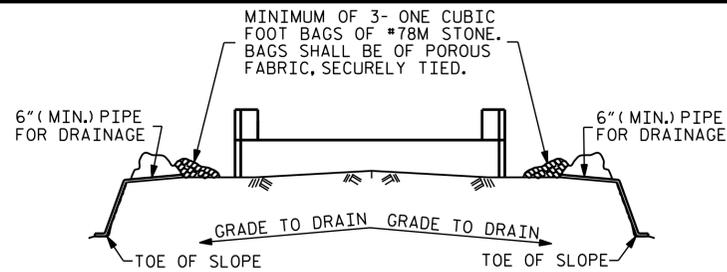
4/19/2016



PROJECT NO. B-5118  
 WATAUGA COUNTY  
 STATION: 11+91.00 -L-  
 SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-12 TOTAL SHEETS 20
SUBSTRUCTURE END BENT No. 1 WING DETAILS						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

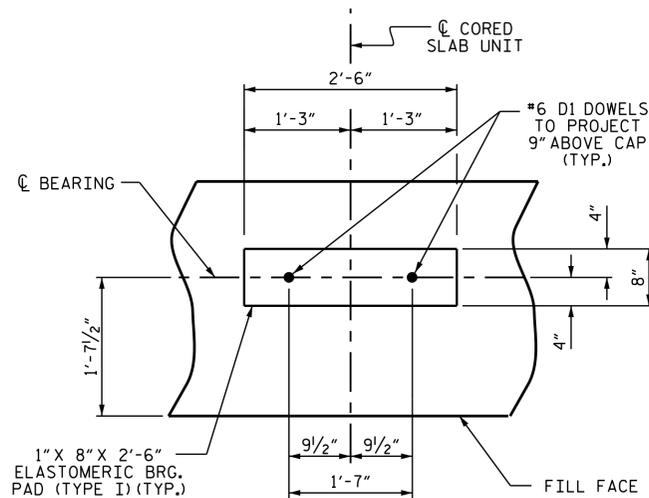


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

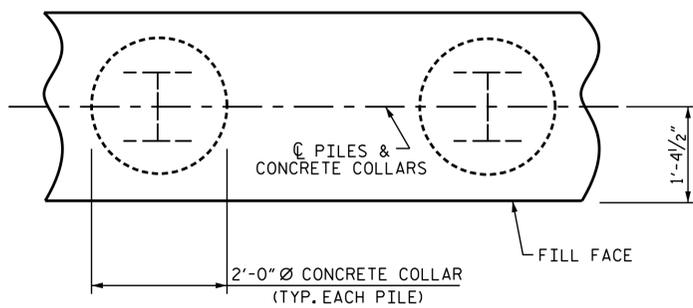
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

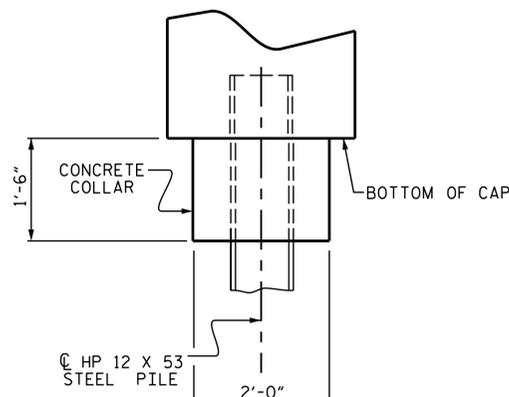
### TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

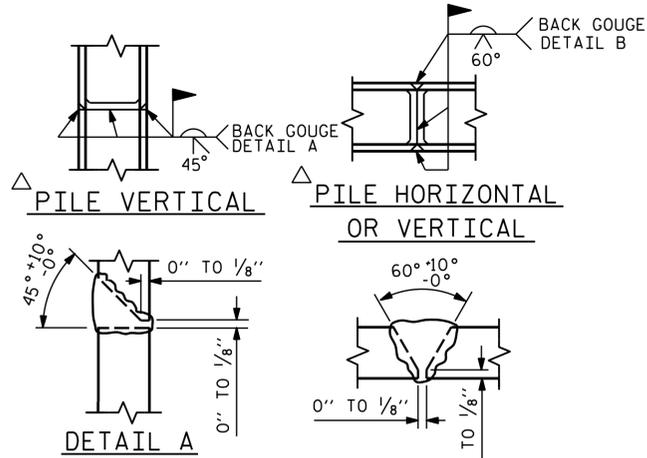


PLAN



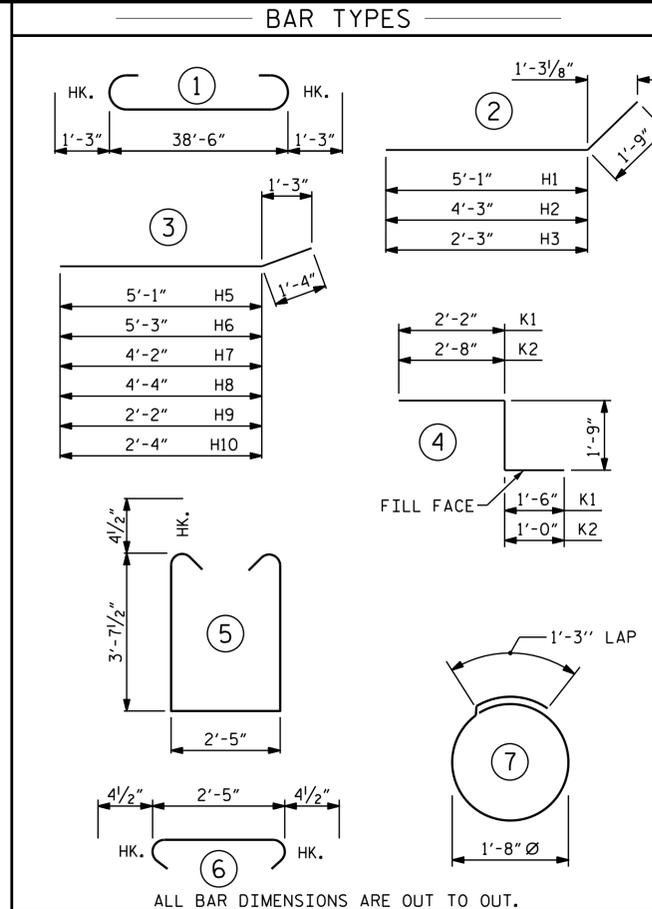
ELEVATION

### CORROSION PROTECTION FOR STEEL PILES DETAIL



POSITION OF PILE DURING WELDING.

### PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

#### END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	12	#4	2	6'-10"	55
H2	2	#4	2	6'-0"	8
H3	2	#4	2	4'-0"	5
H4	4	#4	STR	5'-6"	15
H5	6	#4	3	6'-5"	26
H6	6	#4	3	6'-7"	26
H7	1	#4	3	5'-6"	4
H8	1	#4	3	5'-8"	4
H9	1	#4	3	3'-6"	2
H10	1	#4	3	3'-8"	2
K1	6	#4	4	5'-5"	22
K2	6	#4	4	5'-5"	22
S1	50	#4	5	10'-5"	348
S2	50	#4	6	3'-2"	106
S3	28	#4	7	6'-6"	122
V1	29	#4	STR	6'-2"	119
V2	4	#4	STR	6'-0"	16
V3	4	#4	STR	5'-8"	15
V4	4	#4	STR	5'-2"	14
V5	4	#4	STR	4'-8"	12
V6	4	#4	STR	4'-2"	11
V7	4	#4	STR	3'-8"	10

REINFORCING STEEL 2530 LBS.

CLASS A CONCRETE BREAKDOWN		
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	19.5 C.Y.
POUR #2	UPPER PART OF WINGS	1.7 C.Y.
TOTAL CLASS A CONCRETE		21.2 C.Y.

HP 12 X 53 STEEL PILES	NO: 7	LIN. FT. = 125
PILE EXCAVATION		
PILE EXCAVATION IN SOIL		60 LIN. FT.
PILE EXCAVATION NOT IN SOIL		35 LIN. FT.
ARCHITECTURAL CONC. SURFACE TREATMENT		250 SQ. FT.

PROJECT NO. B-5118  
 WATAUGA COUNTY  
 STATION: 11+91.00 -L-

SHEET 3 OF 4

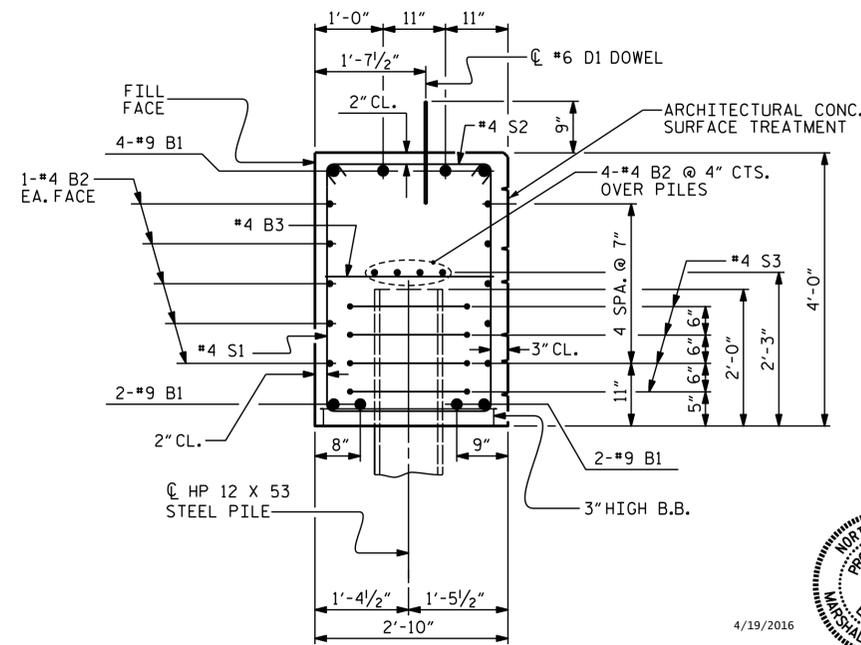
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1  
 DETAILS



4/19/2016

DocuSign  
 Marshall G. Check, Jr.  
 #64808EBA3B405



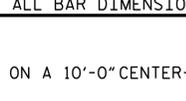
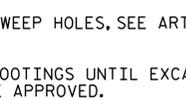
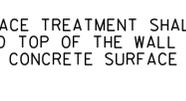
### SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

DRAWN BY: W.J. HARRIS DATE: 2/16  
 CHECKED BY: B.N. GRADY DATE: 2/16  
 DESIGN ENGINEER OF RECORD: W.J. HARRIS DATE: 4/16

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

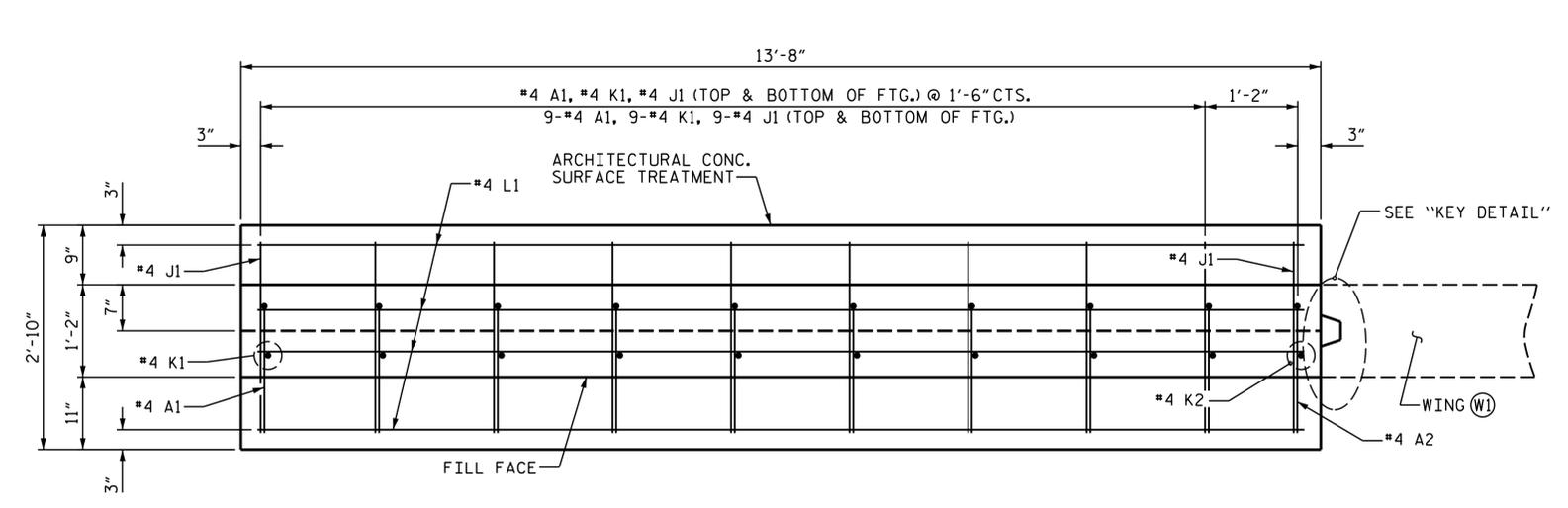
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			20

BAR TYPES	
	A1
	A2
	J1
	K1
	K2
	L1
	L2

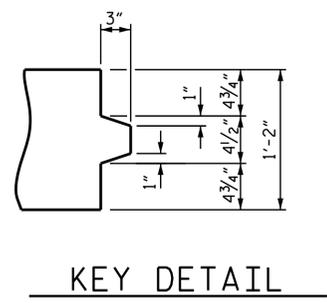
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT No. 1 WALL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	9	#4	1	5'-3"	32
A2	1	#4	1	5'-5"	4
J1	20	#4	STR	2'-4"	31
K1	9	#4	STR	4'-0"	24
K2	1	#4	STR	4'-7"	3
L1	12	#4	STR	13'-2"	106
L2	2	#4	STR	2'-0"	3
REINFORCING STEEL					203 LBS.

CLASS A CONCRETE BREAKDOWN		
POUR #1	FOOTING	1.8 C.Y.
POUR #2	WALL	1.9 C.Y.
TOTAL CLASS A CONCRETE		3.7 C.Y.
FOUNDATION EXCAVATION		LUMP SUM
ARCHITECTURAL CONC. SURFACE TREATMENT		65 SQ. FT.



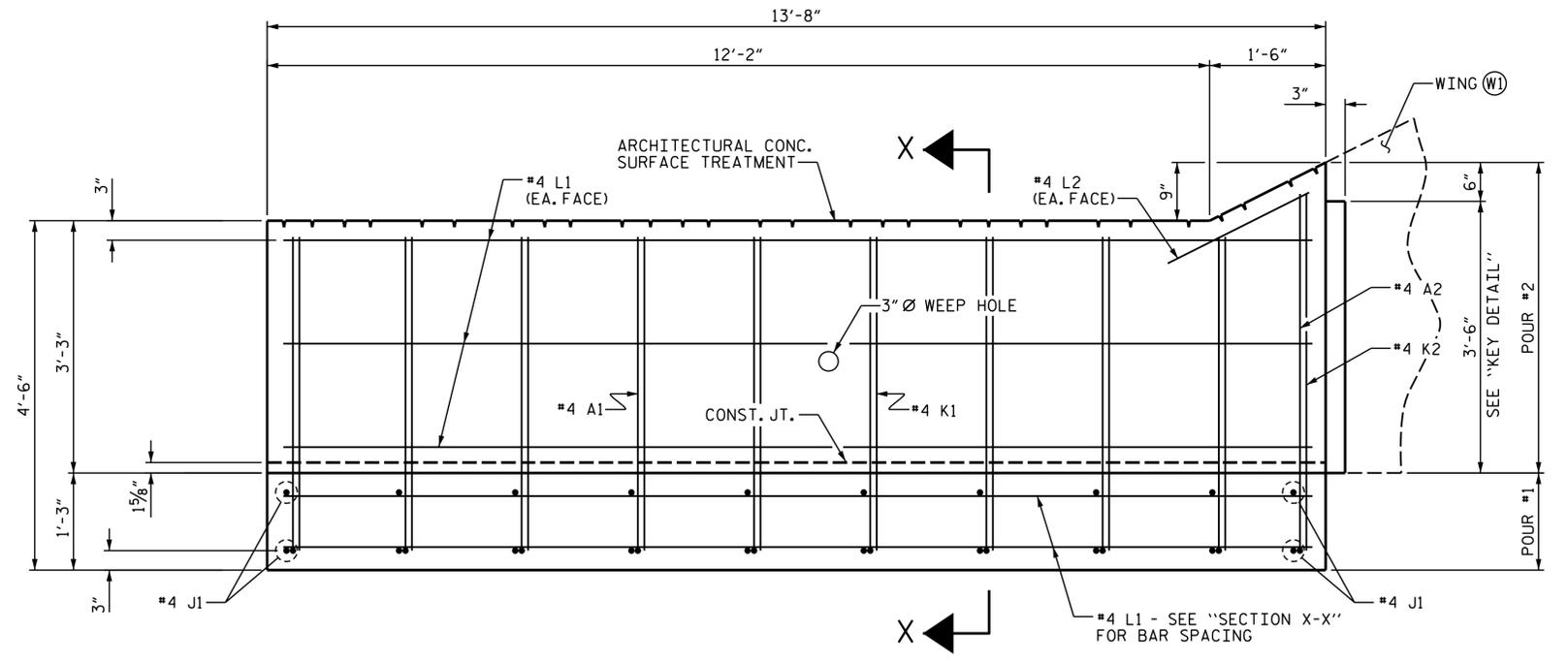
PLAN OF WALL (W1)



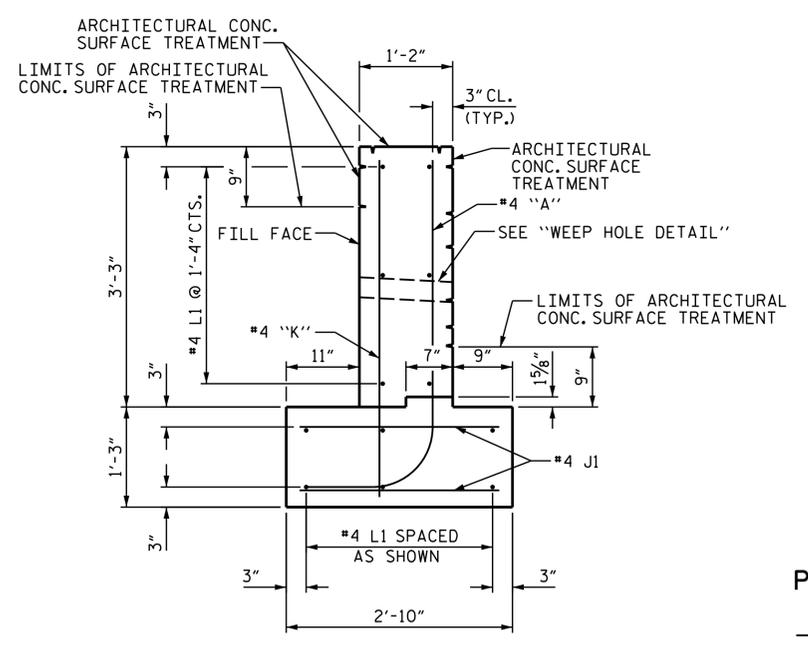
KEY DETAIL

**NOTES:**  
 PLACE 3" DIAMETER WEEP HOLES ON A 10'-0" CENTER-TO-CENTER SPACING AT ELEVATION 2900.0±.  
 FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 414-8 OF THE STANDARD SPECIFICATIONS.  
 DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.  
 ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL BE APPLIED TO THE FRONT FACE, FILL FACE AND TOP OF THE WALL AS DETAILED ON THE PLANS. FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

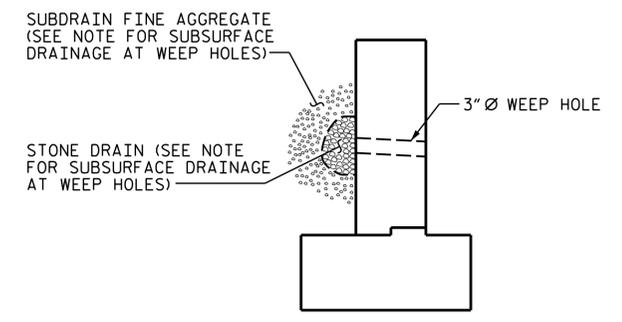
TOTAL BILL OF MATERIAL	
END BENT No. 1	
REINFORCING STEEL	2733 LBS.
CLASS A CONCRETE	24.9 C.Y.
HP 12 X 53 STEEL PILES NO: 7	125 LIN. FT.
PILE EXCAVATION IN SOIL	60 LIN. FT.
PILE EXCAVATION NOT IN SOIL	35 LIN. FT.
FOUNDATION EXCAVATION	LUMP SUM
ARCHITECTURAL CONC. SURFACE TREATMENT	315 SQ. FT.



ELEVATION OF WALL (W1)

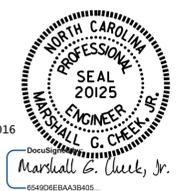


SECTION X-X



WEEP HOLE DETAIL

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-  
 SHEET 4 OF 4



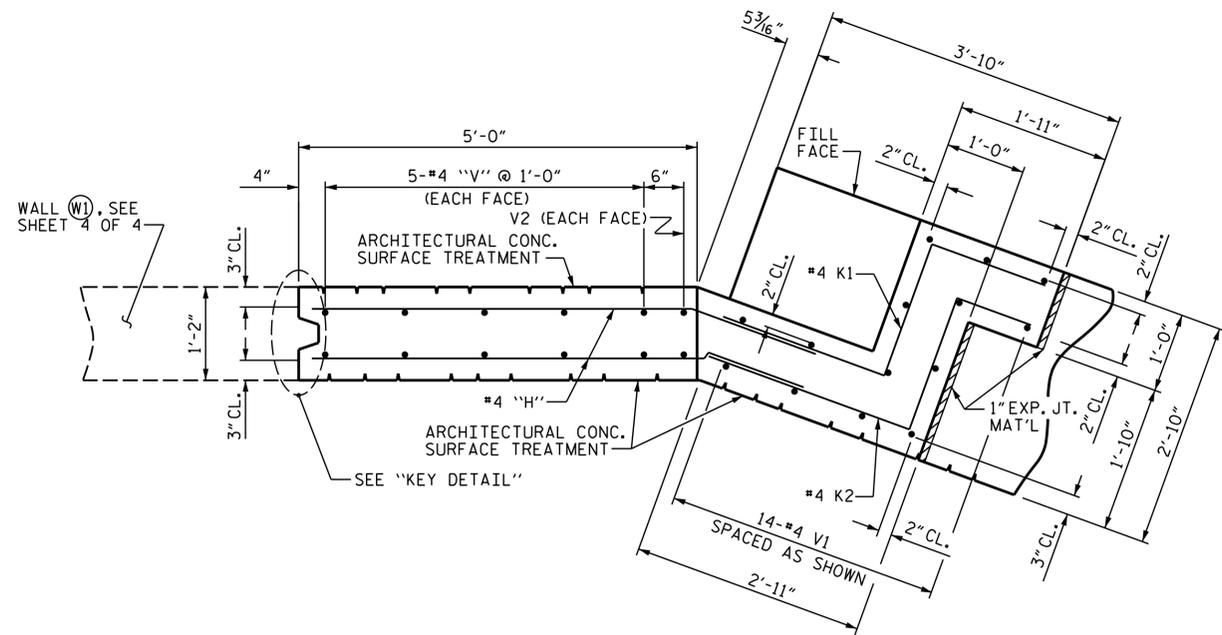
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**END BENT No. 1  
 WALL DETAILS**

DRAWN BY: W.J. HARRIS DATE: 3/16  
 CHECKED BY: B.N. GRADY DATE: 3/16  
 DESIGN ENGINEER OF RECORD: W.J. HARRIS DATE: 4/16

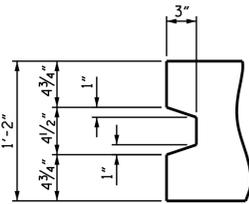
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-14
2			4			20

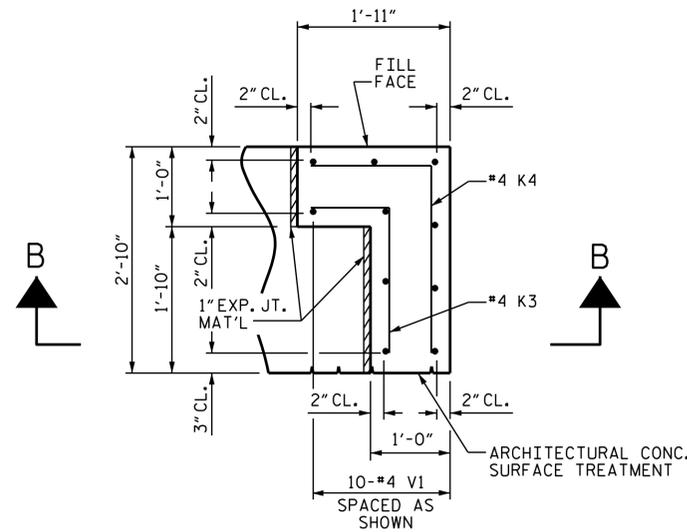




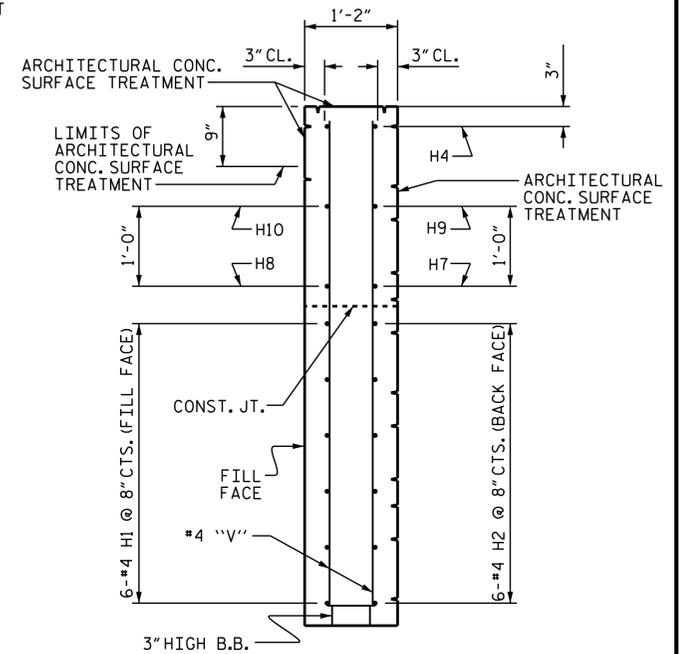
PLAN OF WING (W1)



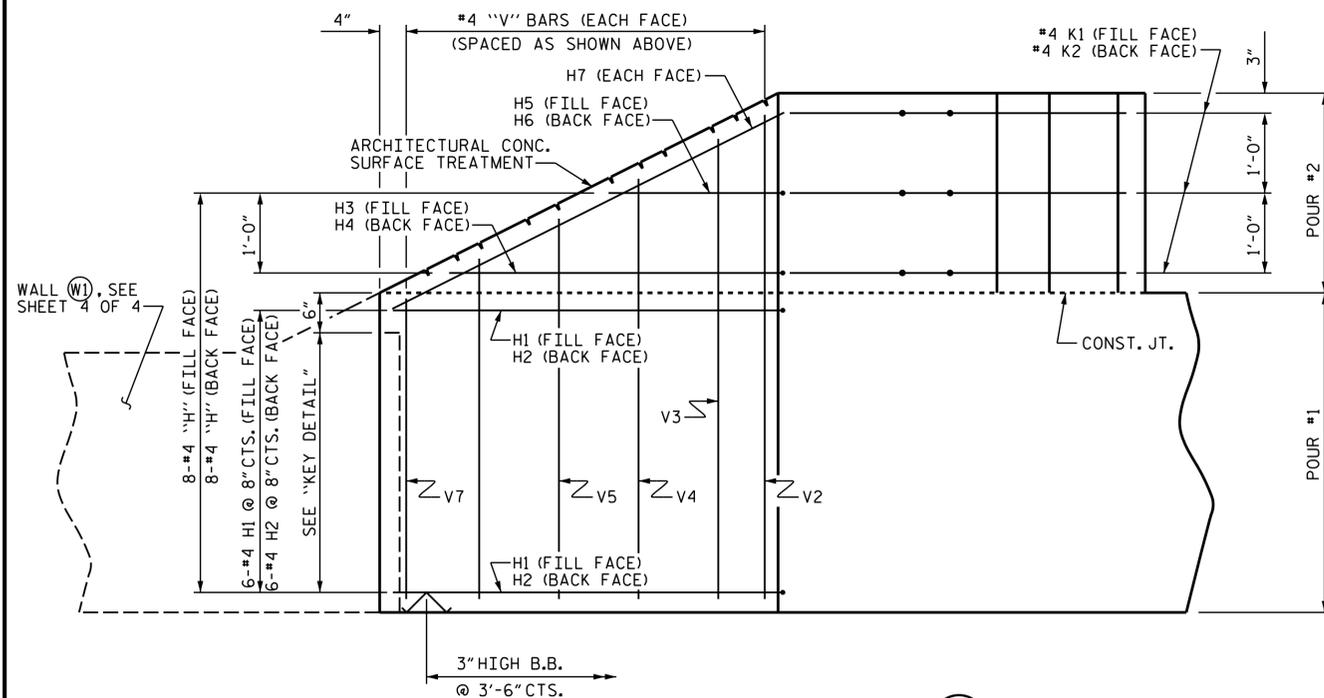
KEY DETAIL



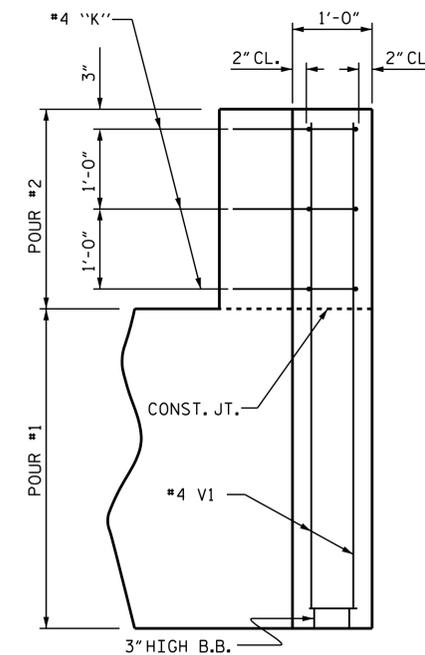
PLAN OF WING (W2)



END VIEW (W1)



ELEVATION OF WING (W1)



SECTION B-B (W2)

WING DETAILS

DRAWN BY : W.J. HARRIS DATE : 2/16  
 CHECKED BY : B.N. GRADY DATE : 2/16  
 DESIGN ENGINEER OF RECORD: W.J. HARRIS DATE : 4/16



PROJECT NO. B-5118  
 WATAUGA COUNTY  
 STATION: 11+91.00 -L-

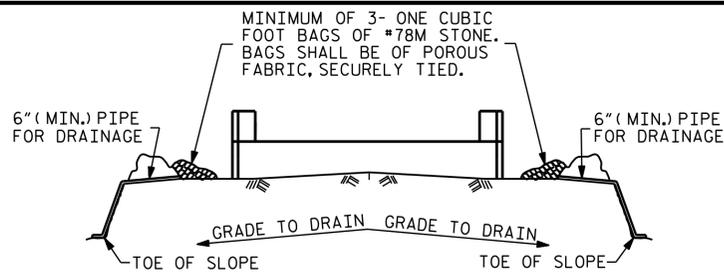
SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2  
 WING DETAILS

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			20

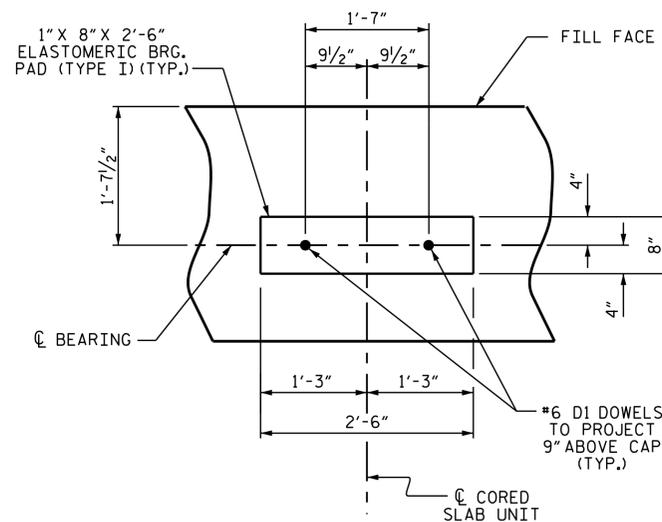


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

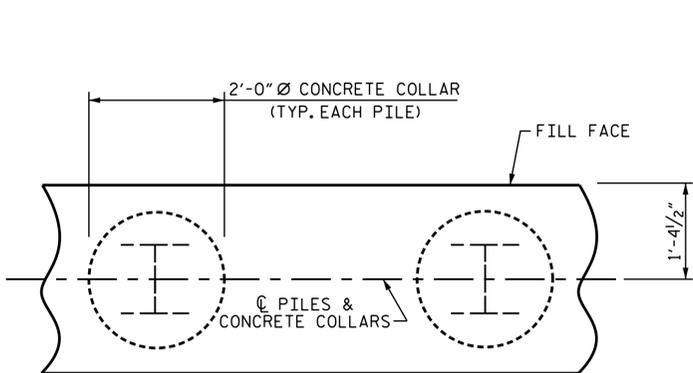
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

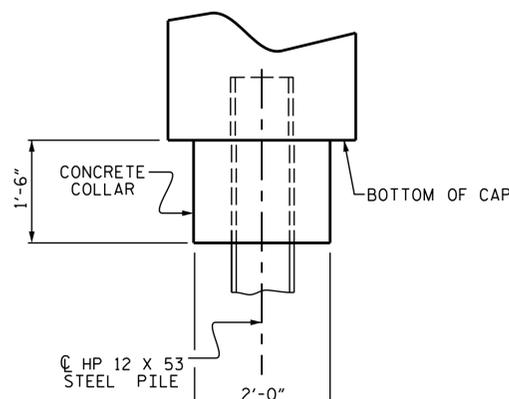


DETAIL "A"

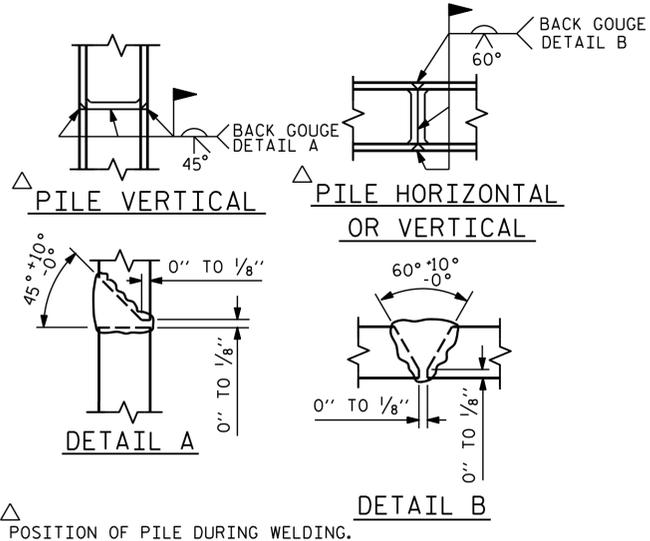


PLAN

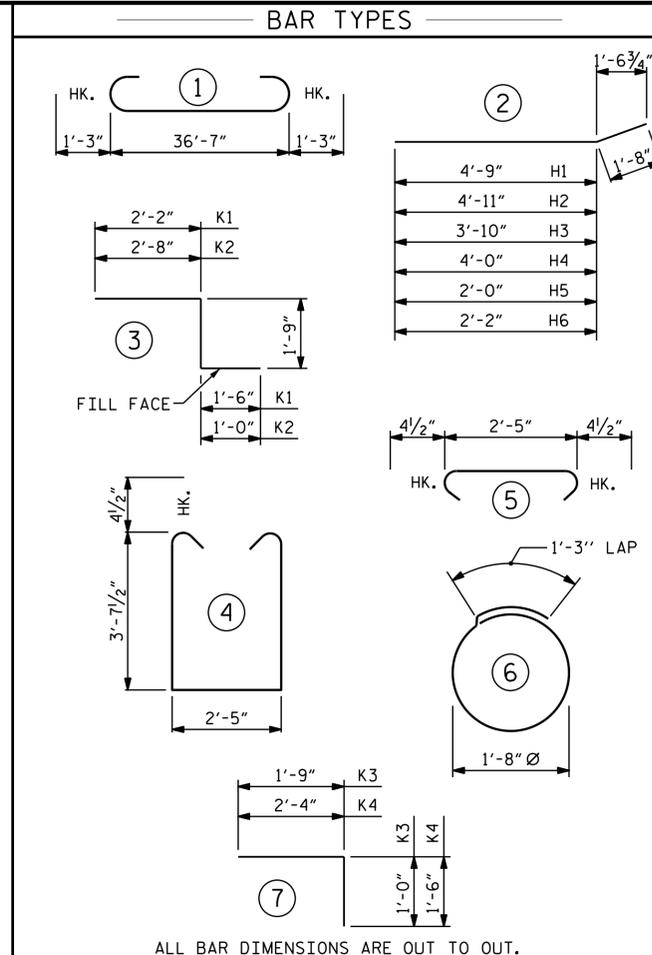
### CORROSION PROTECTION FOR STEEL PILES DETAIL



ELEVATION

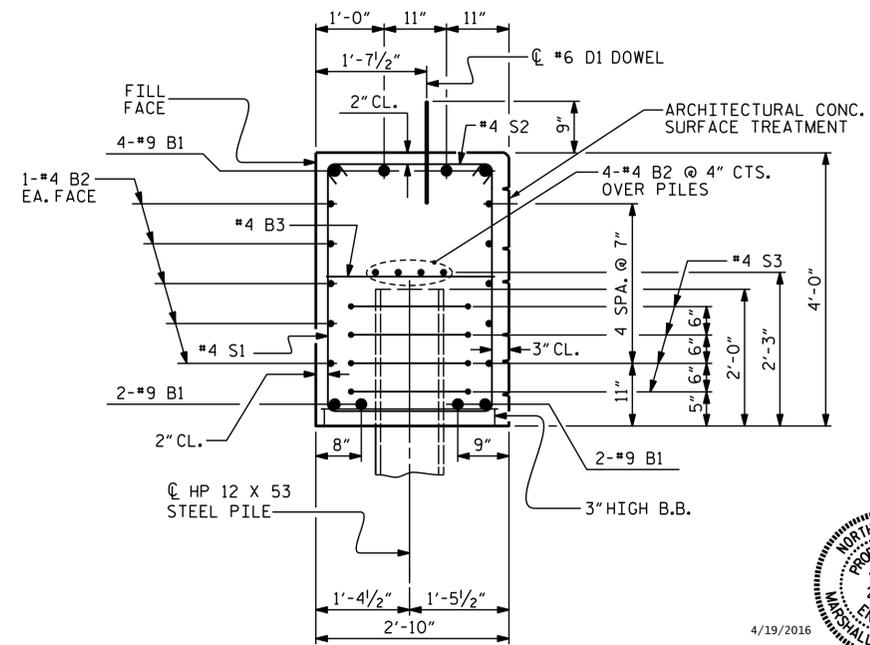


### PILE SPLICE DETAILS



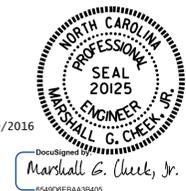
BILL OF MATERIAL					
END BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		39'-1"	1063
B2	28	#4	STR	19'-7"	366
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	6	#4	2	6'-5"	26
H2	6	#4	2	6'-7"	26
H3	1	#4	2	5'-6"	4
H4	1	#4	2	5'-8"	4
H5	1	#4	2	3'-8"	2
H6	1	#4	2	3'-10"	3
H7	2	#4	STR	5'-6"	7
K1	3	#4	3	5'-5"	11
K2	3	#4	3	5'-5"	11
K3	3	#4	7	2'-9"	6
K4	3	#4	7	3'-10"	8
S1	50	#4	4	10'-5"	348
S2	50	#4	5	3'-2"	106
S3	28	#4	6	6'-6"	122
V1	24	#4	STR	6'-2"	99
V2	2	#4	STR	6'-0"	8
V3	2	#4	STR	5'-8"	8
V4	2	#4	STR	5'-2"	7
V5	2	#4	STR	4'-8"	6
V6	2	#4	STR	4'-2"	6
V7	2	#4	STR	3'-8"	5

REINFORCING STEEL	2318 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	17.7 C.Y.
POUR #2 UPPER PART OF WINGS	1.2 C.Y.
TOTAL CLASS A CONCRETE	18.9 C.Y.
HP 12 X 53 STEEL PILES	
NO: 7	LIN. FT. = 105
PILE EXCAVATION	
PILE EXCAVATION IN SOIL	40 LIN. FT.
PILE EXCAVATION NOT IN SOIL	35 LIN. FT.
ARCHITECTURAL CONC. SURFACE TREATMENT	195 SQ. FT.



### SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PROJECT NO. B-5118

WATAUGA COUNTY

STATION: 11+91.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUBSTRUCTURE

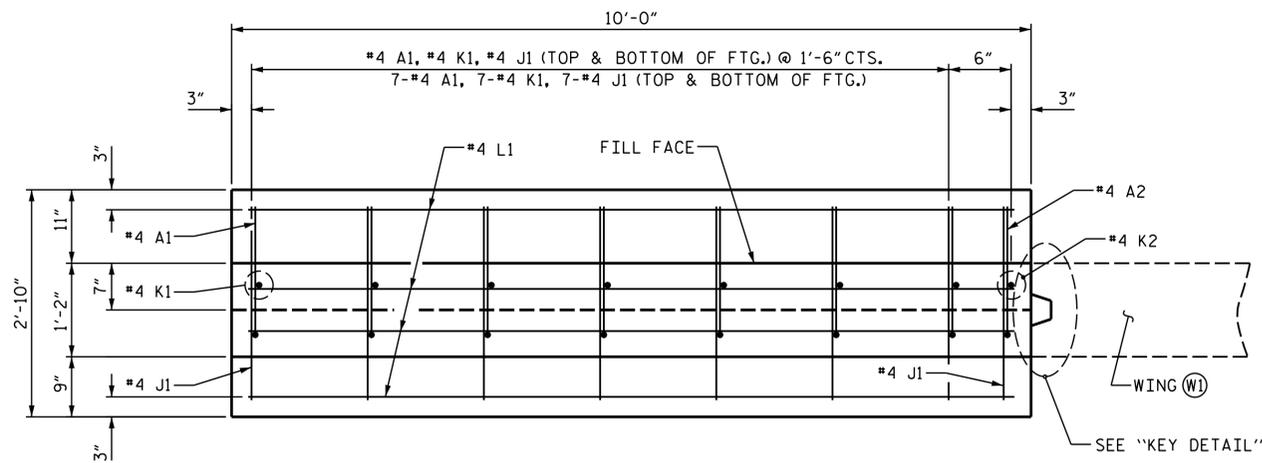
END BENT No. 2

DETAILS

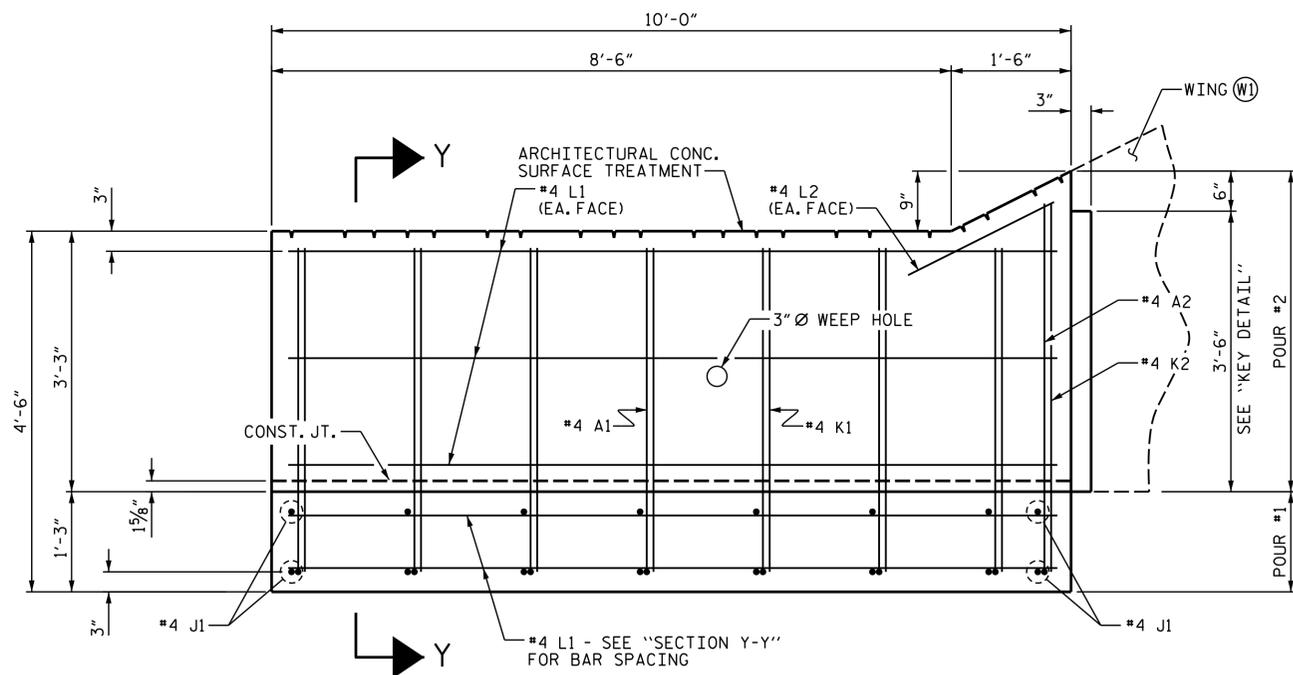
DRAWN BY :	W.J. HARRIS	DATE :	2/16
CHECKED BY :	B.N. GRADY	DATE :	2/16
DESIGN ENGINEER OF RECORD :	W.J. HARRIS	DATE :	4/16

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17	
1			3			TOTAL SHEETS	20
2			4				

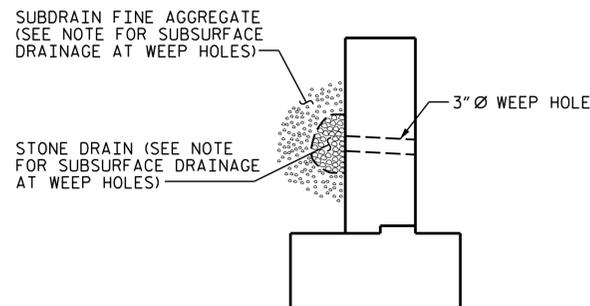
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



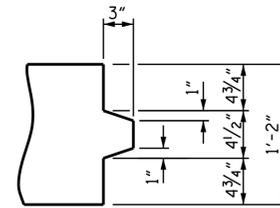
PLAN OF WALL (W1)



ELEVATION OF WALL (W1)



WEEP HOLE DETAIL



KEY DETAIL

NOTES:

PLACE 3" DIAMETER WEEP HOLES ON A 10'-0" CENTER-TO-CENTER SPACING AT ELEVATION 2900.0±.

FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 414-8 OF THE STANDARD SPECIFICATIONS.

DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL BE APPLIED TO THE FRONT FACE, FILL FACE AND TOP OF THE WALL AS DETAILED ON THE PLANS. FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

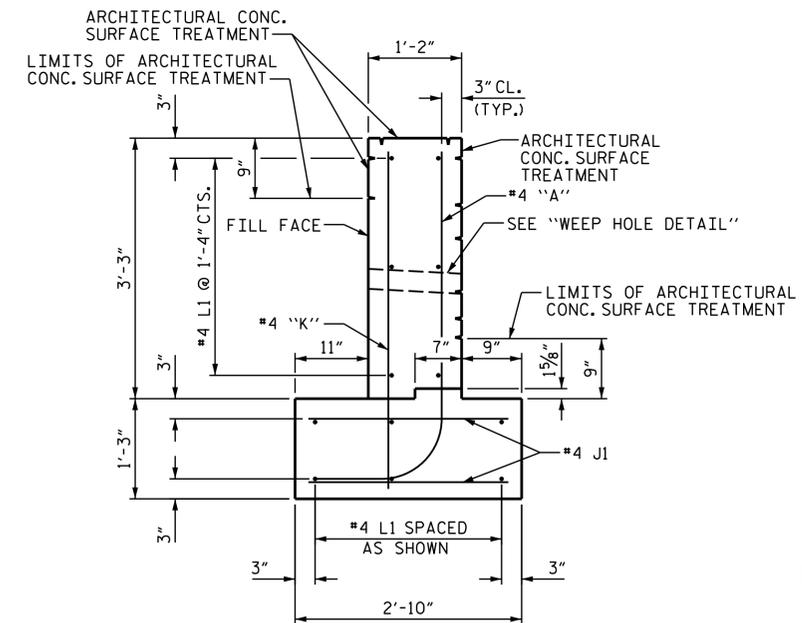
BAR TYPES	
1	9" RAD. 3'-3" A1 3'-5" A2 10" 1'-2"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT No. 2 WALL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	7	#4	1	5'-3"	25
A2	1	#4	1	5'-5"	4
J1	16	#4	STR	2'-4"	25
K1	7	#4	STR	4'-0"	19
K2	1	#4	STR	4'-7"	3
L1	12	#4	STR	9'-6"	76
L2	2	#4	STR	2'-0"	3
REINFORCING STEEL					155 LBS.

CLASS A CONCRETE BREAKDOWN		
POUR #1	FOOTING	1.3 C.Y.
POUR #2	WALL	1.4 C.Y.
TOTAL CLASS A CONCRETE		2.7 C.Y.
FOUNDATION EXCAVATION		LUMP SUM
ARCHITECTURAL CONC. SURFACE TREATMENT		45 SQ. FT.

TOTAL BILL OF MATERIAL	
END BENT No. 2	
REINFORCING STEEL	2473 LBS.
CLASS A CONCRETE	21.6 C.Y.
HP 12 X 53 STEEL PILES NO: 7	105 LIN. FT.
PILE EXCAVATION	
PILE EXCAVATION IN SOIL	40 LIN. FT.
PILE EXCAVATION NOT IN SOIL	35 LIN. FT.
FOUNDATION EXCAVATION	LUMP SUM
ARCHITECTURAL CONC. SURFACE TREATMENT	240 SQ. FT.



SECTION Y-Y

PROJECT NO. B-5118  
WATAUGA COUNTY  
 STATION: 11+91.00 -L-  
 SHEET 4 OF 4



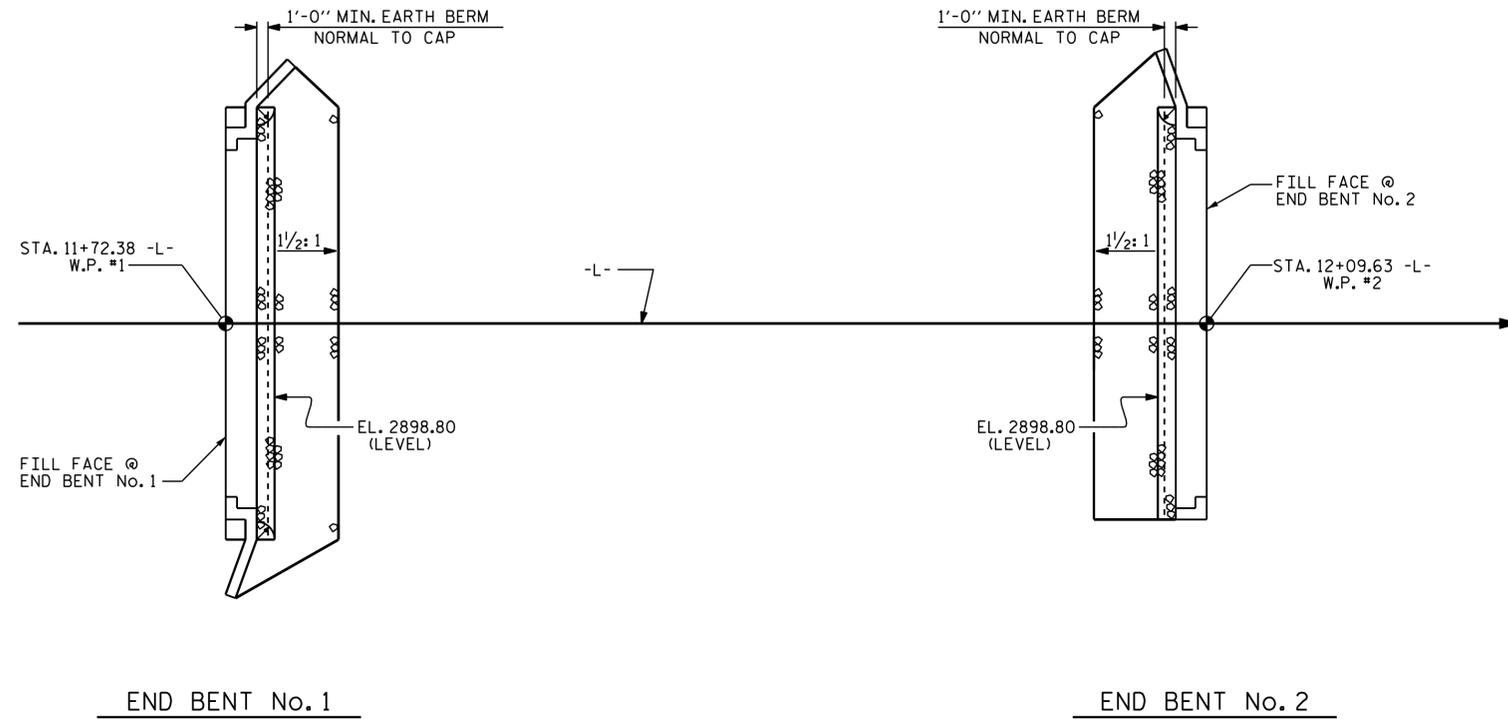
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 END BENT No. 2  
 WALL DETAILS

DRAWN BY : W.J. HARRIS DATE : 3/16  
 CHECKED BY : B.N. GRADY DATE : 3/16  
 DESIGN ENGINEER OF RECORD: W.J. HARRIS DATE : 4/16

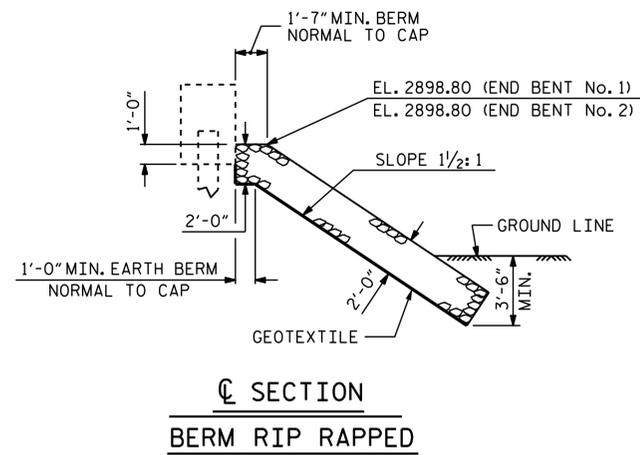
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



ESTIMATED QUANTITIES		
BRIDGE @ STA. 11+91.00 -L-	RIP RAP CLASS I	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	27	30
END BENT No. 2	27	30



PROJECT NO. B-5118  
WATAUGA COUNTY  
STATION: 11+91.00 -L-

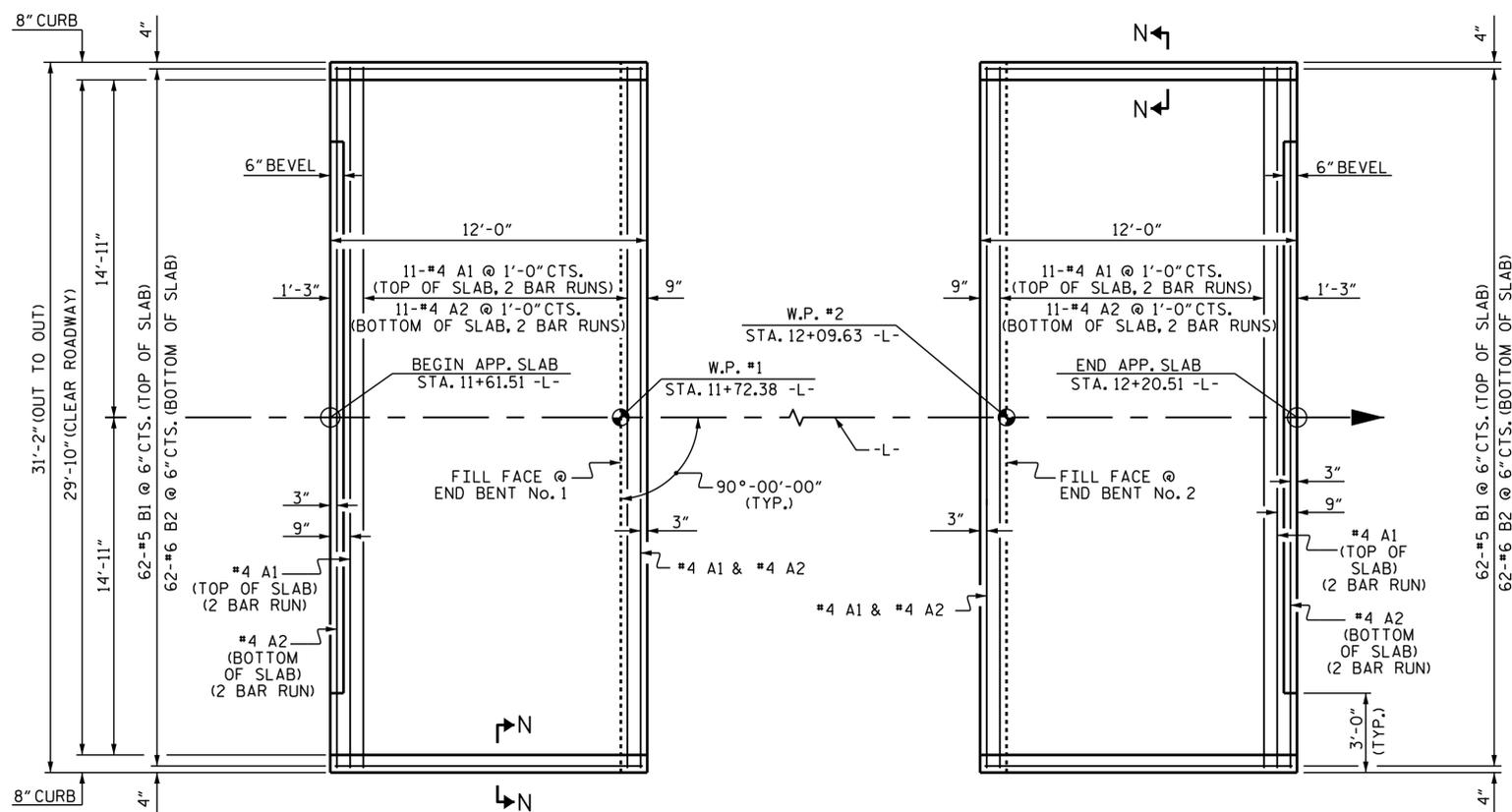


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
= RIP RAP DETAILS =

ASSEMBLED BY : W.J.HARRIS	DATE : 2/9/16
CHECKED BY : B.N. GRADY	DATE : 2/16
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : ROU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS 20
2			4			



PLAN @ END BENT No. 1      PLAN @ END BENT No. 2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

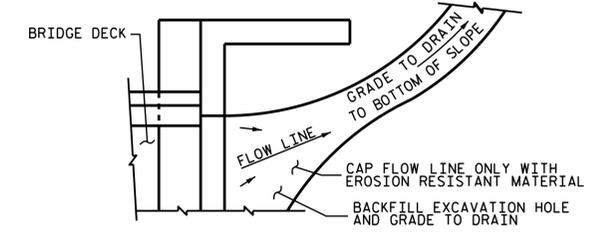
#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

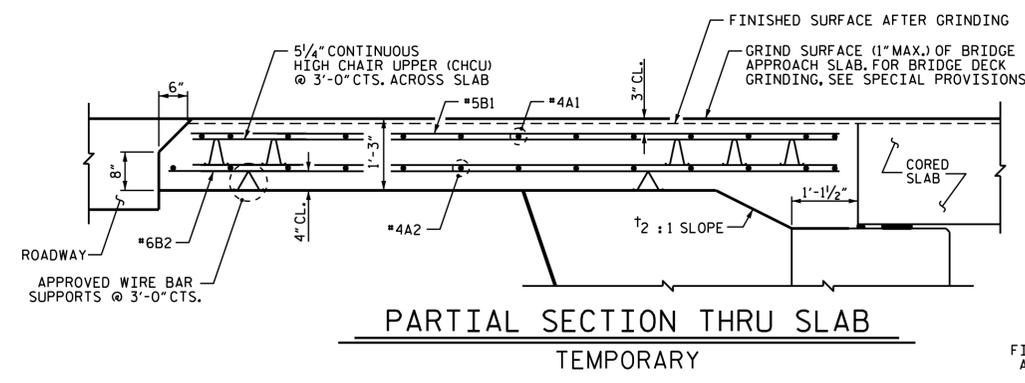
DO NOT BEGIN BRIDGE DECK GRINDING UNTIL APPROACH SLABS ARE FULLY CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, FOR GRINDING OF APPROACH SLABS, SEE SPECIAL PROVISIONS FOR "BRIDGE DECK GRINDING".



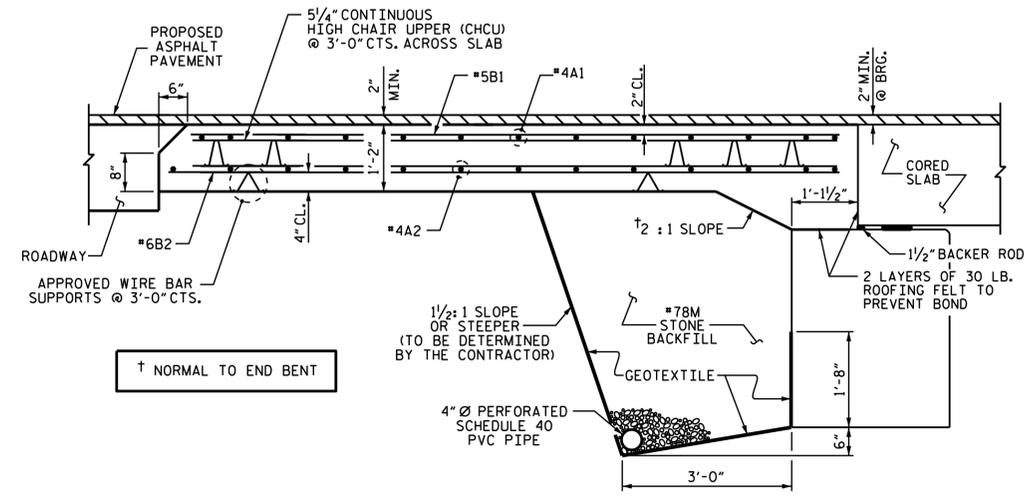
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

**TEMPORARY DRAINAGE DETAIL**

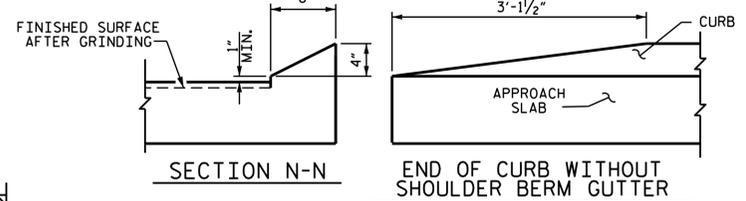
BILL OF MATERIAL						
APPROACH SLAB AT EB No. 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	16'-7"	288	
A2	26	#4	STR	16'-4"	284	
*B1	62	#5	STR	11'-4"	733	
B2	62	#6	STR	11'-8"	1086	
REINFORCING STEEL					LBS.	1370
*EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.6
APPROACH SLAB AT EB No. 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	16'-7"	288	
A2	26	#4	STR	16'-4"	284	
*B1	62	#5	STR	11'-4"	733	
B2	62	#6	STR	11'-8"	1086	
REINFORCING STEEL					LBS.	1370
*EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.6



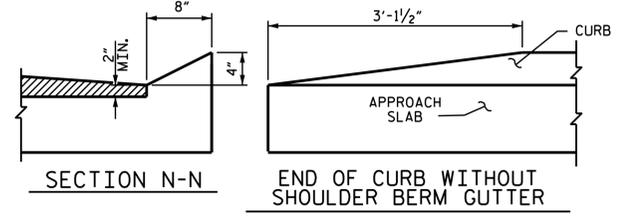
**PARTIAL SECTION THRU SLAB**  
TEMPORARY



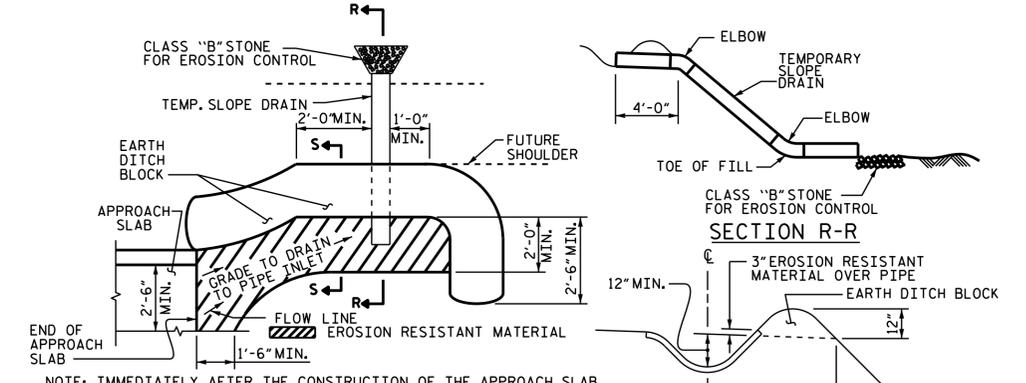
**SECTION THRU SLAB**  
FINAL



**CURB DETAILS**  
TEMPORARY



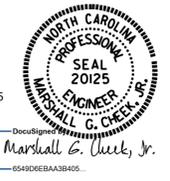
**CURB DETAILS**  
FINAL



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN, CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



PROJECT NO. B-5118  
WATAUGA COUNTY  
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR PRESTRESSED CONCRETE  
CORED SLAB UNIT  
(SUB-REGIONAL TIER)  
90° SKEW

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

ASSEMBLED BY: M. POOLE      DATE: 02-16  
CHECKED BY: M. G. CHEEK      DATE: 2-23-16  
DRAWN BY: SHS/MAA 5-09      REV. 9-15      MAA/TAG  
CHECKED BY: BCH 5-09

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT.
		(MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

# ENGLISH

JANUARY, 1990