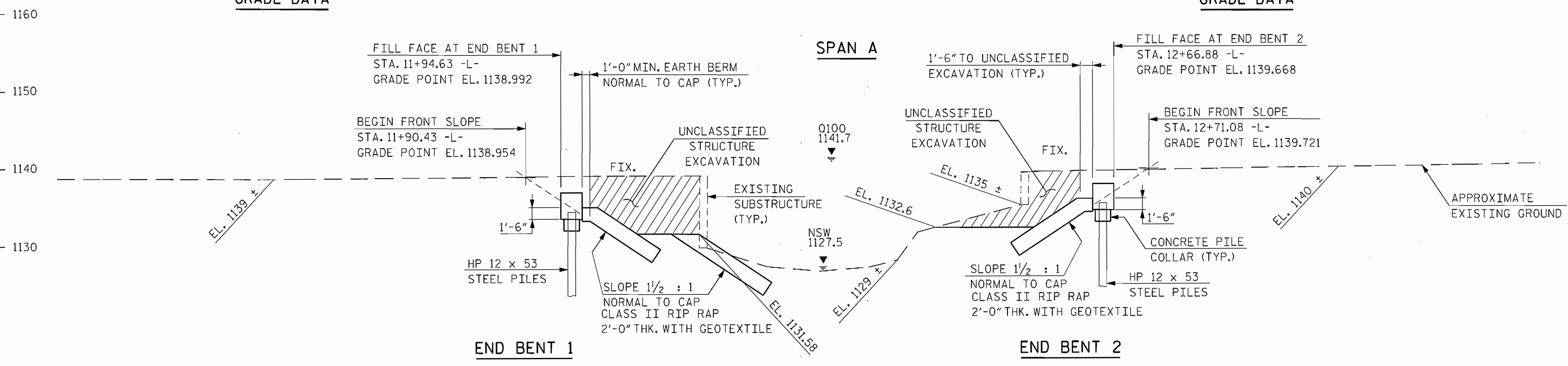


BRIDGE NO. 316 CALDWELL COUNTY

BD-5111L

PI = 11+50.00 -L-  
EL = 1138.59'  
VC = 80'  
(-)0.4000% (+)0.9000%

PI = 12+95.00 -L-  
EL = 1139.89'  
VC = 90'  
(+)0.9000% (+)2.5688%



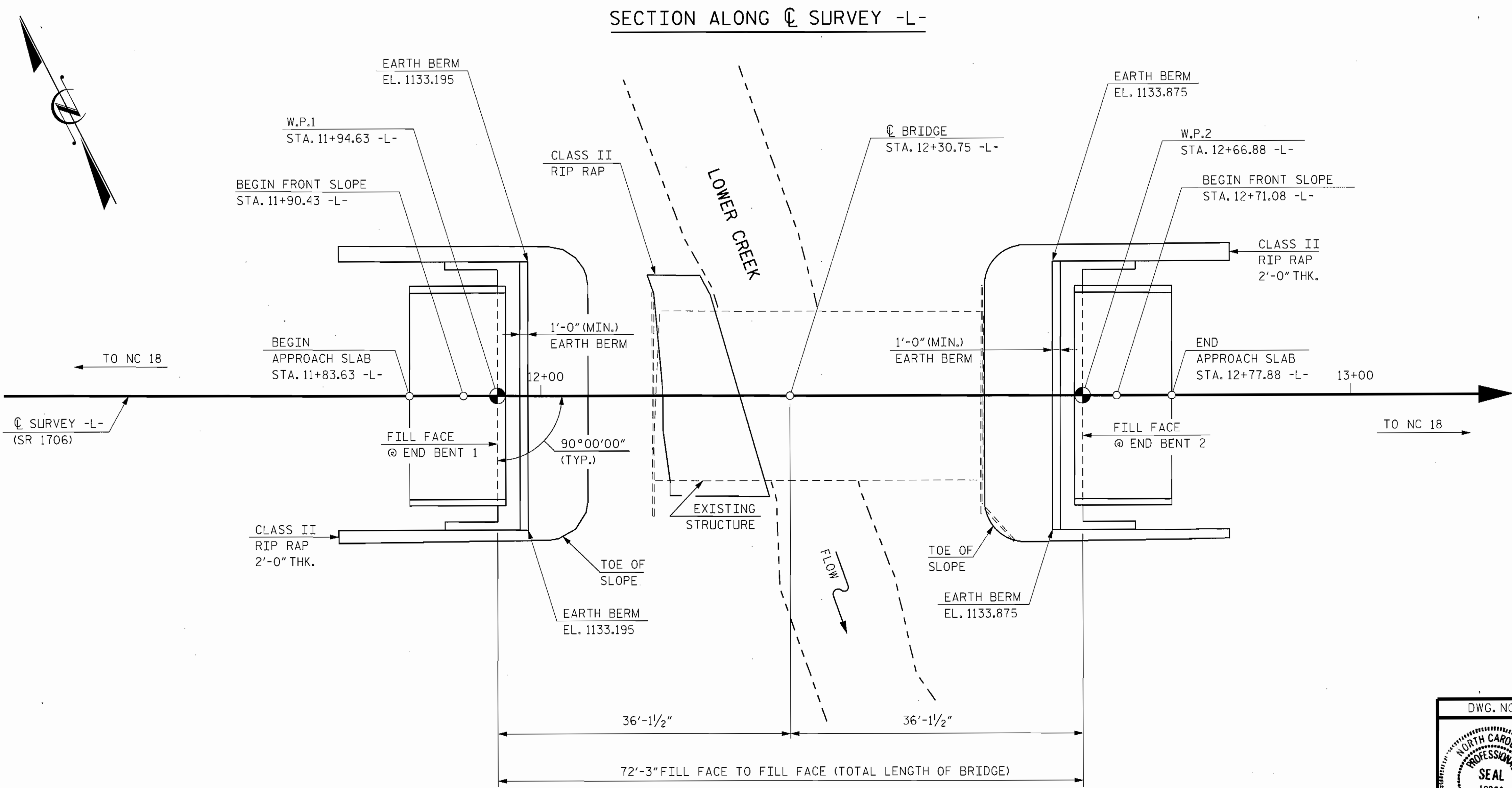
**HYDRAULIC DATA**

DESIGN DISCHARGE = 480 cfs  
DESIGN FREQUENCY = 5 yr.  
DESIGN HIGH WATER ELEVATION = 1134.5'  
DRAINAGE AREA = 6.5 sq. mi.  
BASIC DISCHARGE (0 100) = 3160 cfs  
BASIC HIGH WATER ELEVATION = 1142.1'

**OVERTOPPING FLOOD DATA**

EL = 1138.7' \*  
FREQUENCY = 10 yr. ±  
DISCHARGE = 1250 cfs

\* OVERTOPPING ELEVATION IS AT STA. 11+34.62 -L- LEFT (LOW POINT ON ROADWAY, APPROX. 61' FROM END BRIDGE.)



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
STATION: STA. 12+30.75 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 316

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE OVER LOWER CREEK  
ON SR 1706 CEDAR ROCK CIRCLE  
BETWEEN NC 18 AND NC 18

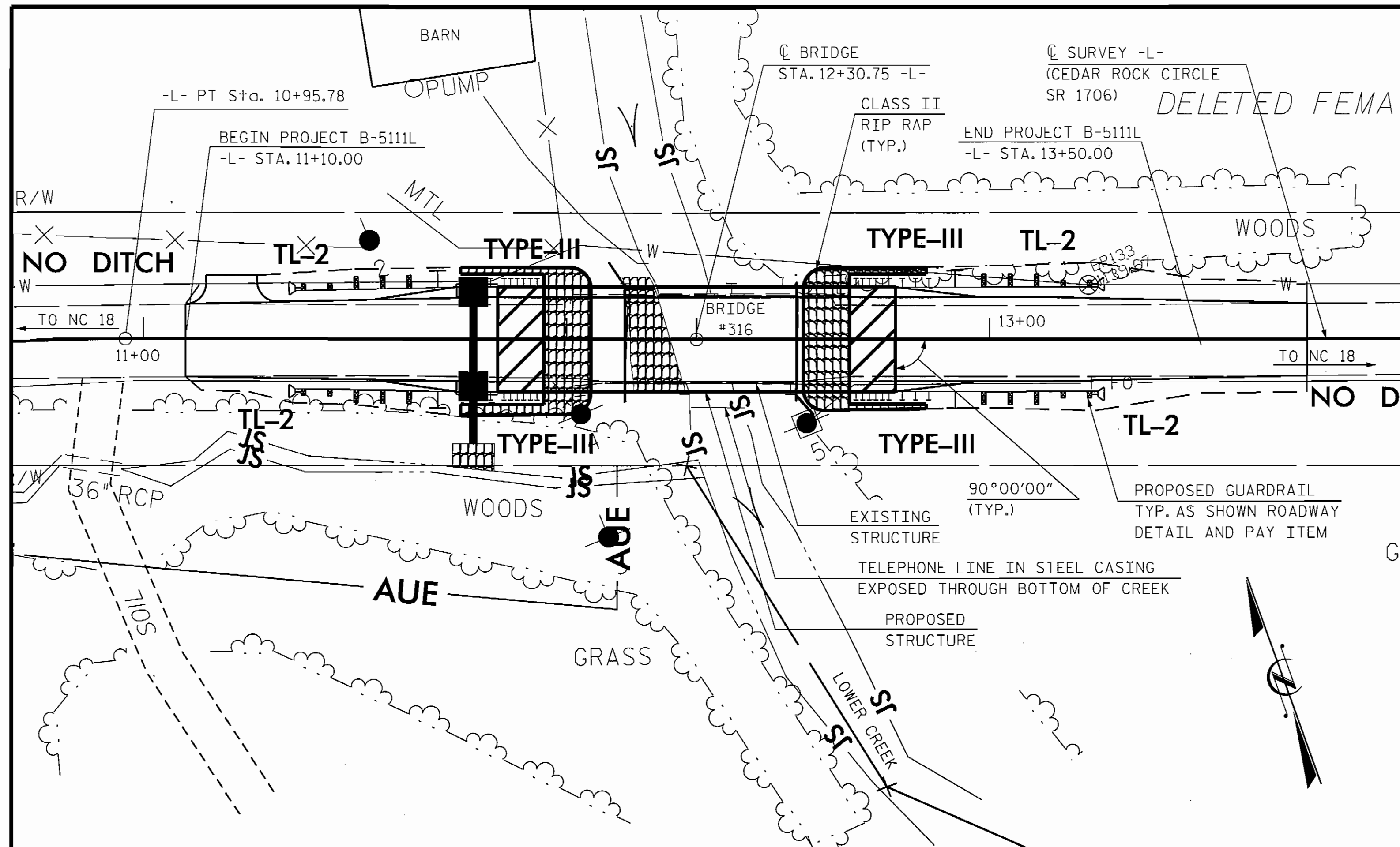
DWG. NO. 1

**RK&K**  
RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NUMBER: F-0112

DRAWN BY: F.D. WEEDEN DATE: APR. 2012  
CHECKED BY: R.V. KEITH DATE: APR. 2012

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

BENCH MARK : EL. 1137.66' -L- STA. 10+55.66, 17.27' LEFT (5/8 "REBAR AND CAPS)



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

**LOCATION SKETCH**

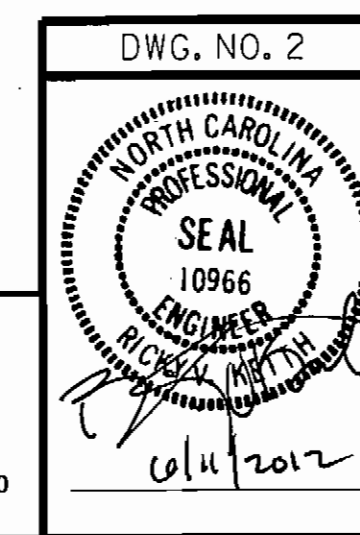
**TOTAL BILL OF MATERIALS**

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES	ONE BAR METAL RAIL	1'-0" X 1'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS		
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	
SUPERSTRUCTURE				LUMP SUM			124.50	140.00				9	630.0	
END BENT NO. 1		LUMP SUM	12.6		1,847	5	125.0		150	165				
END BENT NO. 2		LUMP SUM	12.6		1,847	5	165.0		105	115				
TOTAL	LUMP SUM	LUMP SUM	25.2	LUMP SUM	3,694	10	290.0	124.50	140.00	255	280	LUMP SUM	9	630.0

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: STA. 12+30.75 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER LOWER CREEK  
 ON SR 1706 CEDAR ROCK CIRCLE  
 BETWEEN NC 18 AND NC 18



**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NUMBER: F-0112

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

DRAWN BY : F.D. WEEDEN DATE : APR. 2012  
 CHECKED BY : R.V. KEITH DATE : APR. 2012

**NOTES:**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 40'-7" WITH AN ASPHALT WEARING SURFACE OVER A TIMBER FLOOR ON I-BEAM SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 20.8' ON A SUBSTRUCTURE CONSISTING OF TIMBER CAPS/TIMBER POST & SILLS AND LOCATED AT THE PROPOSED STRUCTURE LOCATION SHALL BE REMOVED. SEE SPECIAL PROVISION FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 12+30.75 -L-".

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET EACH SIDE 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 SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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 AT STATION 12+30.75 -L-".

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.

**FOUNDATION NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

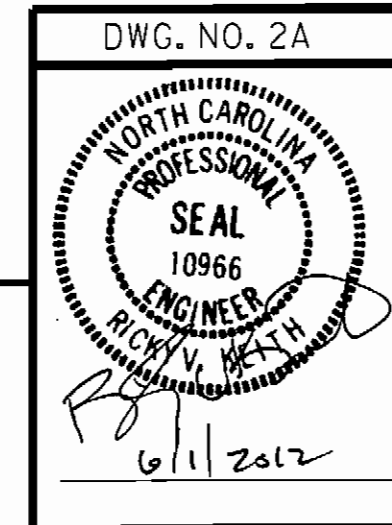
PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 158 TONS PER PILE.

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: STA. 12+30.75 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER NORTH DEEP CRK.  
 ON SR 1368  
 BETWEEN SR 1331 AND SR 1370



**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NUMBER: F-0112

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

DRAWN BY : F.D. WEEDEN DATE : APR. 2012  
 CHECKED BY : R.V. KEITH DATE : APR. 2012

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			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.006	--	1.75	0.273	1.03	70'	EL	34.5	0.507	1.32	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5		
	HL-93(0pr)	N/A	--	1.341	--	1.35	0.273	1.34	70'	EL	34.5	0.507	1.72	70'	EL	6.9	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.306	47.02	1.75	0.273	1.34	70'	EL	34.5	0.507	1.65	70'	EL	6.9	0.80	0.273	1.31	70'	EL	34.5		
	HS-20(0pr)	36.000	--	1.74	62.64	1.35	0.273	1.74	70'	EL	34.5	0.507	2.14	70'	EL	6.9	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.917	39.379	1.4	0.273	3.75	70'	EL	34.5	0.507	4.87	70'	EL	6.9	0.80	0.273	2.92	70'	EL	34.5	
		SNGARBS2	20.000	--	2.187	43.741	1.4	0.273	2.81	70'	EL	34.5	0.507	3.47	70'	EL	6.9	0.80	0.273	2.19	70'	EL	34.5	
		SNAGRIS2	22.000	--	2.077	45.69	1.4	0.273	2.67	70'	EL	34.5	0.507	3.23	70'	EL	6.9	0.80	0.273	2.08	70'	EL	34.5	
		SNCOTTS3	27.250	--	1.452	39.565	1.4	0.273	1.87	70'	EL	34.5	0.507	2.43	70'	EL	6.9	0.80	0.273	1.45	70'	EL	34.5	
		SNAGGRS4	34.925	--	1.218	42.554	1.4	0.273	1.57	70'	EL	34.5	0.507	2.03	70'	EL	6.9	0.80	0.273	1.22	70'	EL	34.5	
		SNS5A	35.550	--	1.191	42.346	1.4	0.273	1.53	70'	EL	34.5	0.507	2.06	70'	EL	6.9	0.80	0.273	1.19	70'	EL	34.5	
		SNS6A	39.950	--	1.095	43.747	1.4	0.273	1.41	70'	EL	34.5	0.507	1.88	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
	SNS7B	42.000	--	1.043	43.801	1.4	0.273	1.34	70'	EL	34.5	0.507	1.85	70'	EL	6.9	0.80	0.273	1.04	70'	EL	34.5		
	TTST	TNAGRIT3	33.000	--	1.336	44.087	1.4	0.273	1.72	70'	EL	34.5	0.507	2.23	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5	
		TNT4A	33.075	--	1.342	44.401	1.4	0.273	1.72	70'	EL	34.5	0.507	2.17	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5	
		TNT6A	41.600	--	1.1	45.746	1.4	0.273	1.41	70'	EL	34.5	0.507	1.98	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
		TNT7A	42.000	--	1.106	46.462	1.4	0.273	1.42	70'	EL	34.5	0.507	1.94	70'	EL	6.9	0.80	0.273	1.11	70'	EL	34.5	
		TNT7B	42.000	--	1.147	48.18	1.4	0.273	1.47	70'	EL	34.5	0.507	1.8	70'	EL	6.9	0.80	0.273	1.15	70'	EL	34.5	
		TNAGRIT4	43.000	--	1.089	46.838	1.4	0.273	1.4	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.09	70'	EL	34.5	
TNAGT5A		45.000	--	1.026	46.175	1.4	0.273	1.32	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.03	70'	EL	34.5		
TNAGT5B	45.000	3	1.013	45.579	1.4	0.273	1.3	70'	EL	34.5	0.507	1.66	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5			

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)

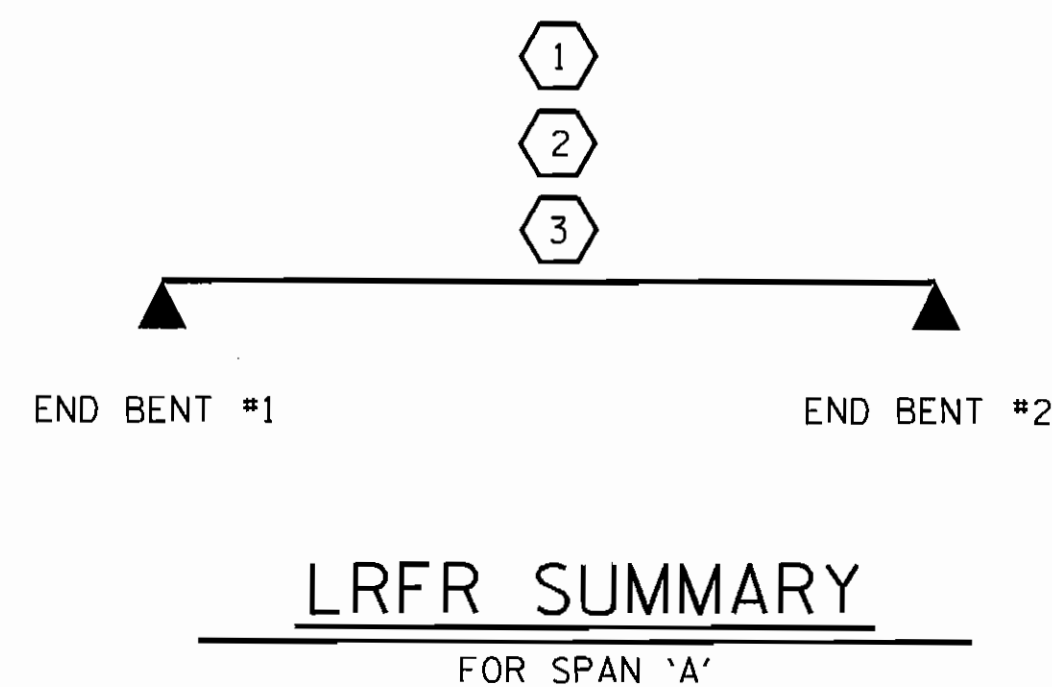
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

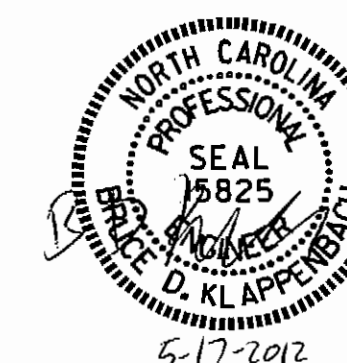
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

ASSEMBLED BY : D. A. GLADDEN DATE : 4-10-12  
 CHECKED BY : B. KLAPPENBACH DATE : 5-11-12  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

17-MAY-2012 11:53  
 R:\Structures\FINAL PLANS\BD5111L.SD.AB.dgn  
 bklappenbach

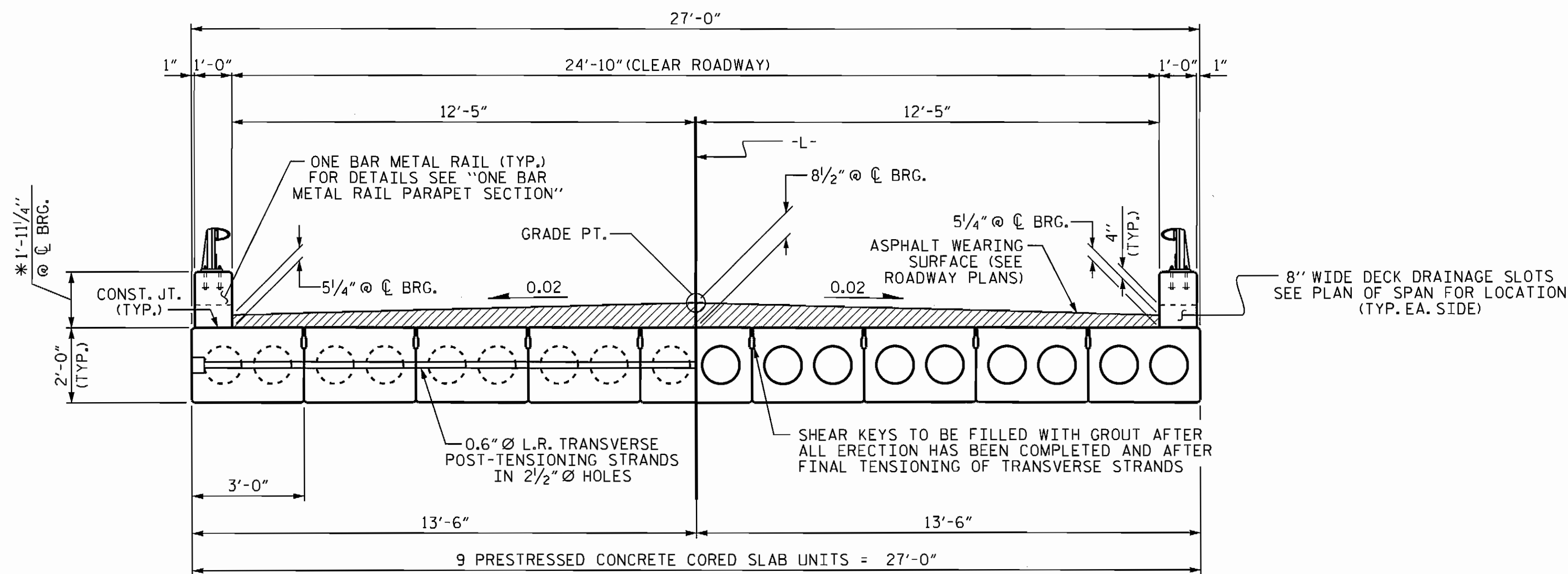


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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

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

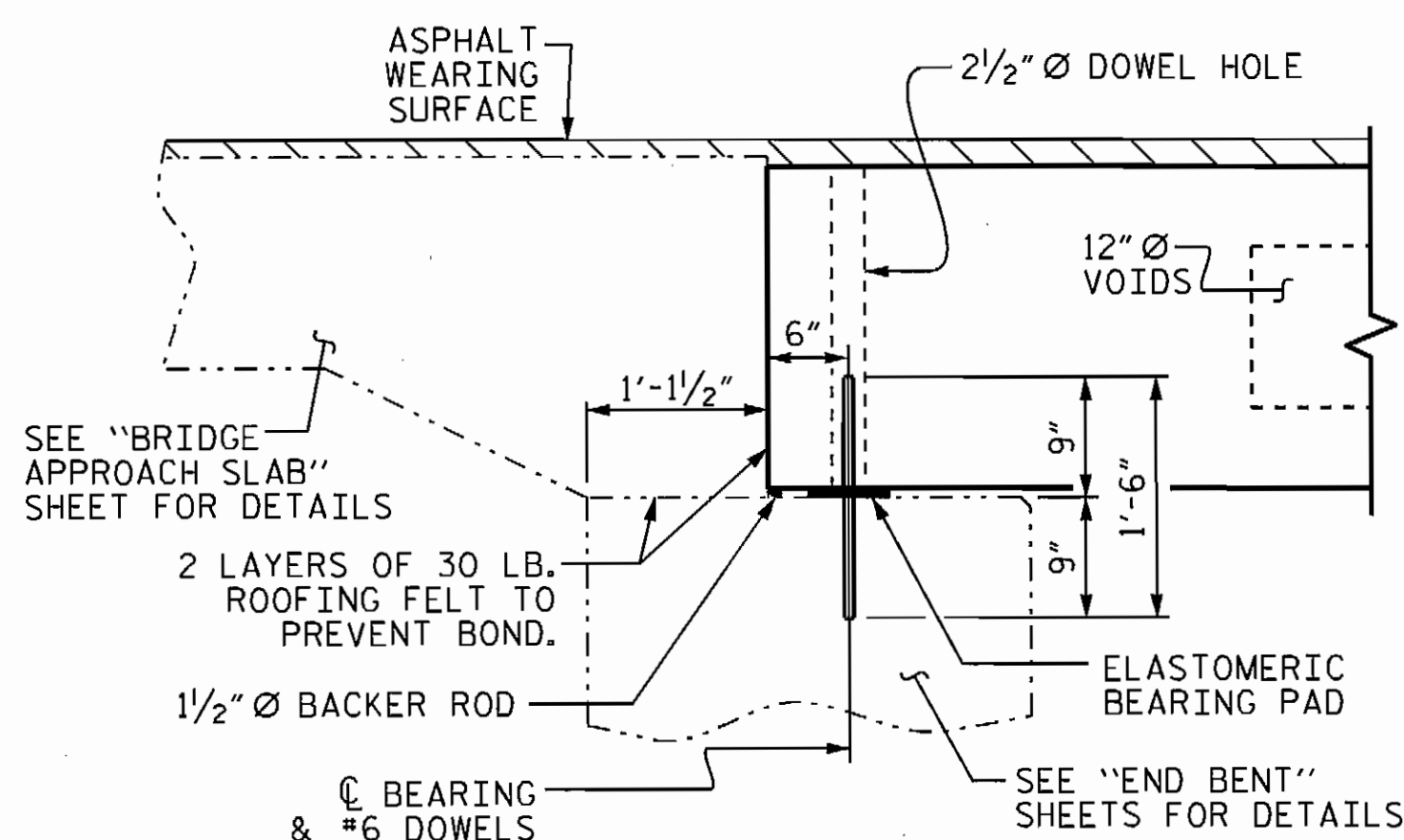
STD. NO. 24LRFR1\_90S\_70L



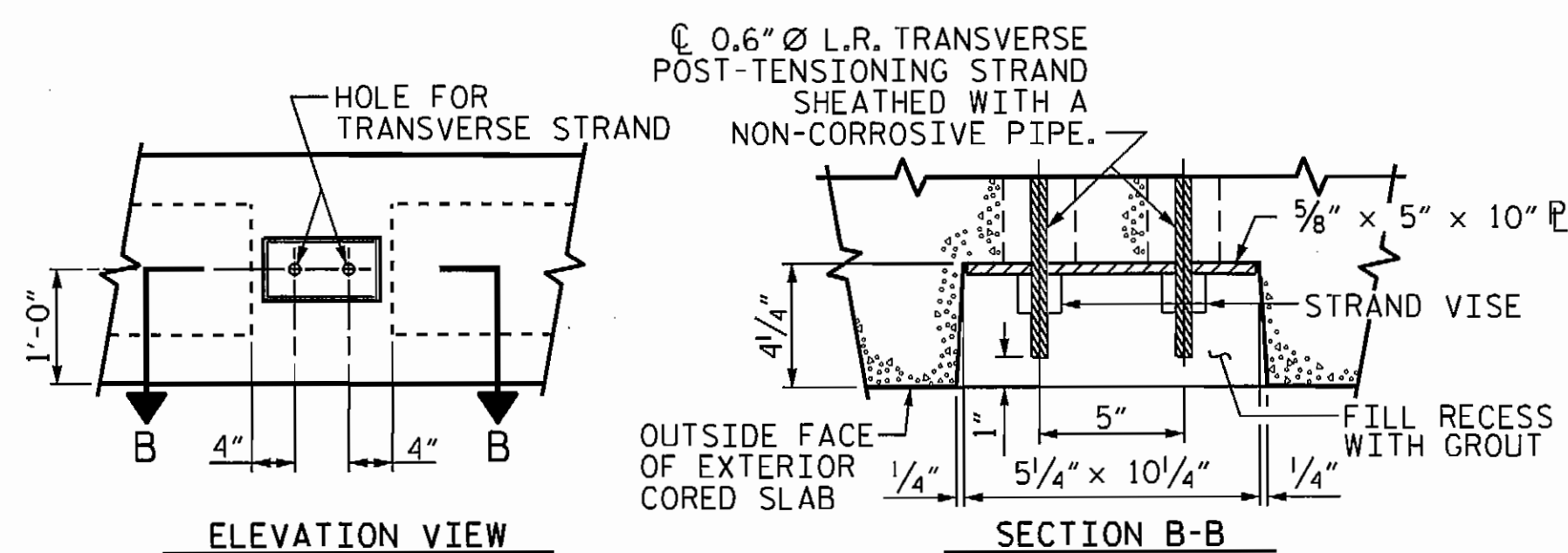
HALF SECTION AT INTERMEDIATE DIAPHRAGMS      **TYPICAL SECTION**      HALF SECTION THROUGH VOIDS

\* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "ONE BAR METAL RAIL PARAPET SECTION" ON SHEET 5 OF 7.

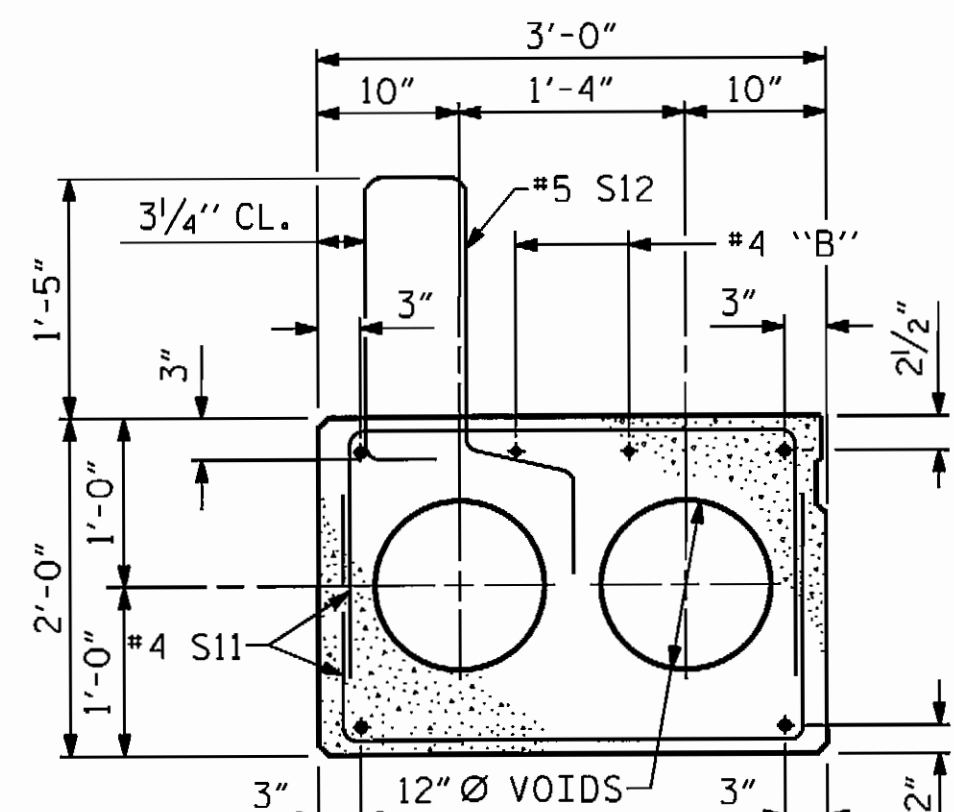
**FIXED END**



**SECTION AT END BENT**

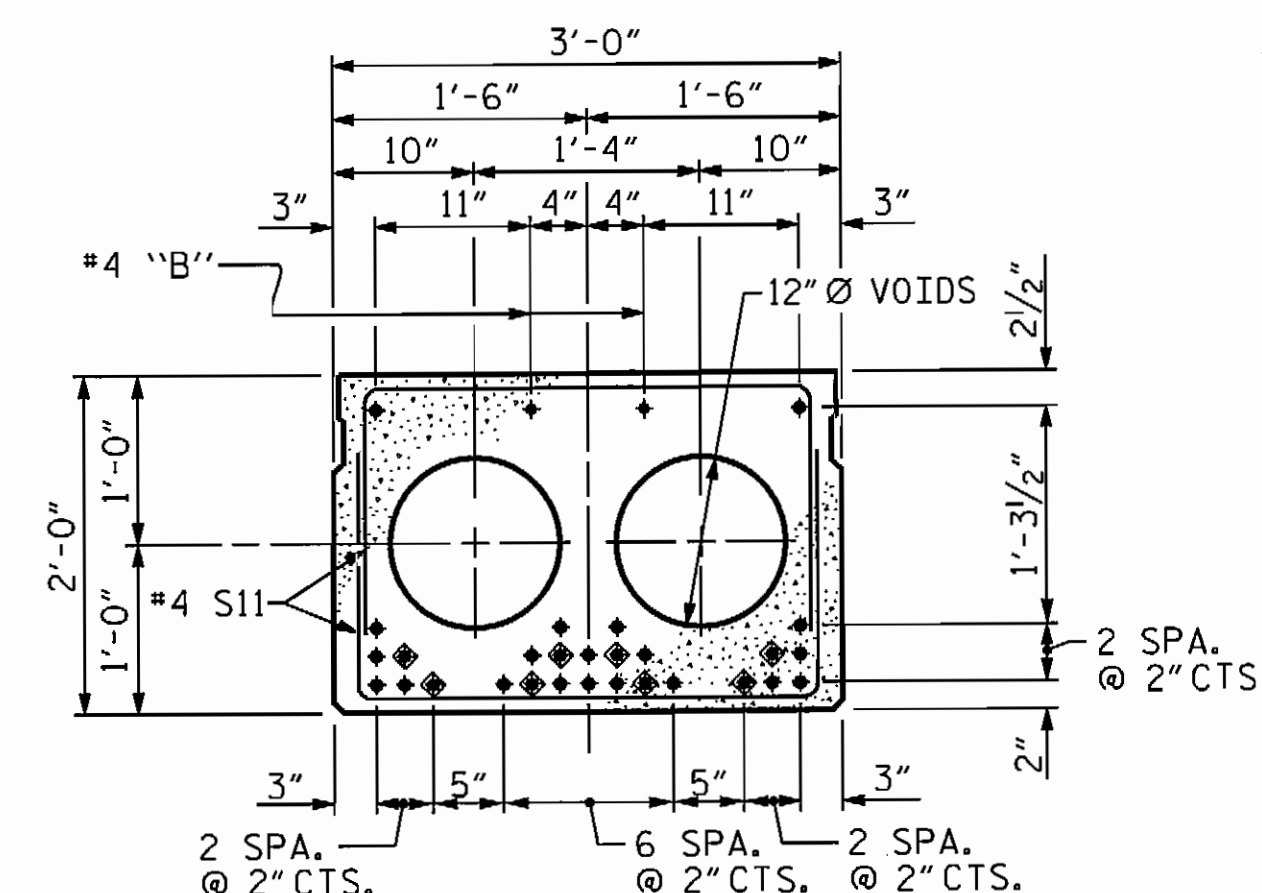


**GRAUDED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS**



**EXTERIOR SLAB SECTION**

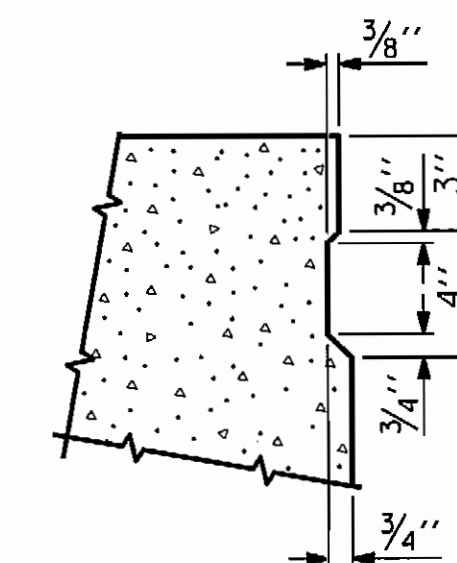
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



**INTERIOR SLAB SECTION (70' UNIT)**  
(28 STRANDS REQUIRED)  
**0.6" Ø LOW RELAXATION STRAND LAYOUT**

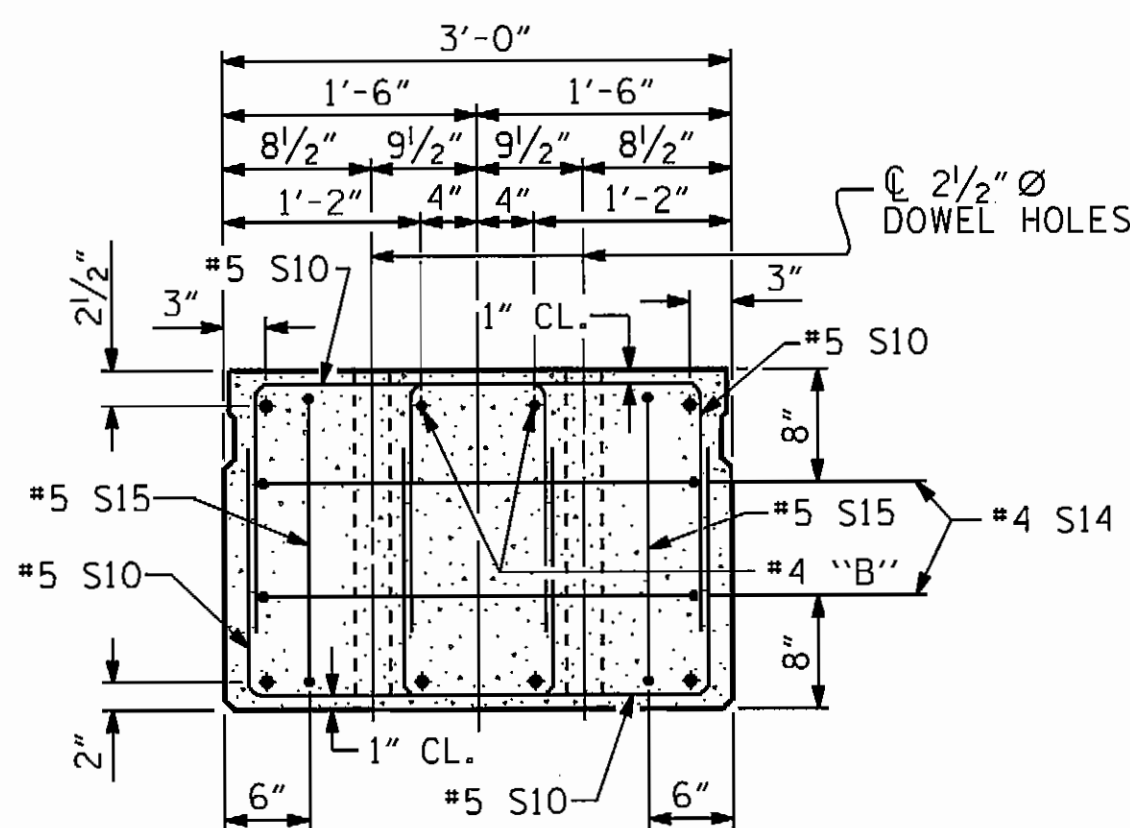
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

**DEBONDING LEGEND**



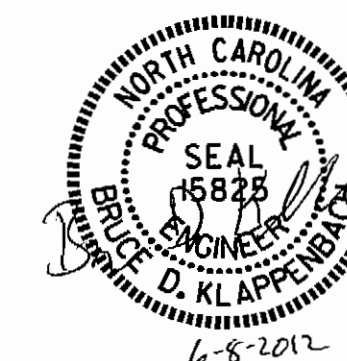
**SHEAR KEY DETAIL**

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



**END ELEVATION**

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



PROJECT NO. BD-5111L  
CALDWELL COUNTY  
STATION: 12+30.75 -L-

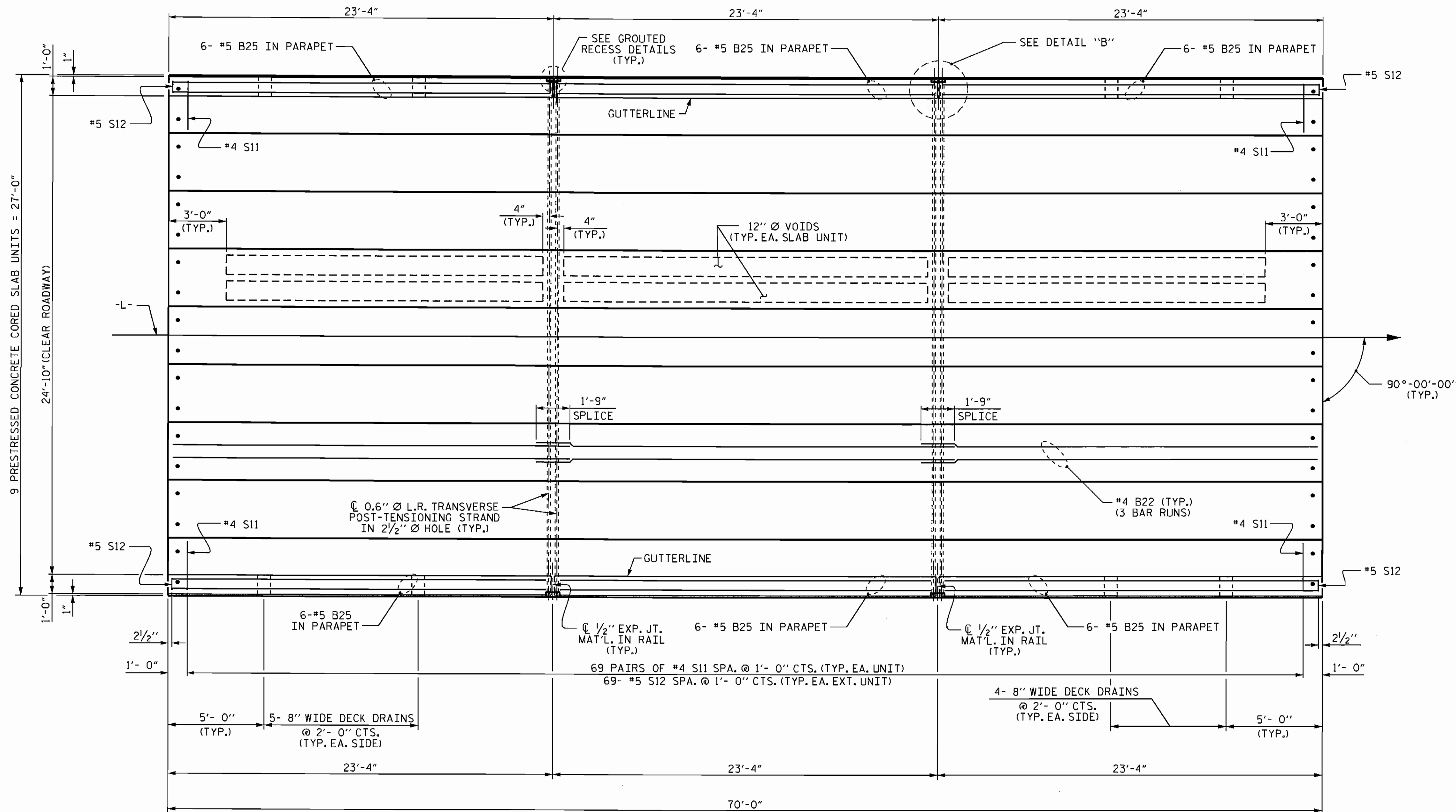
SHEET 1 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 2'-0"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

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

S-4  
TOTAL SHEETS 16

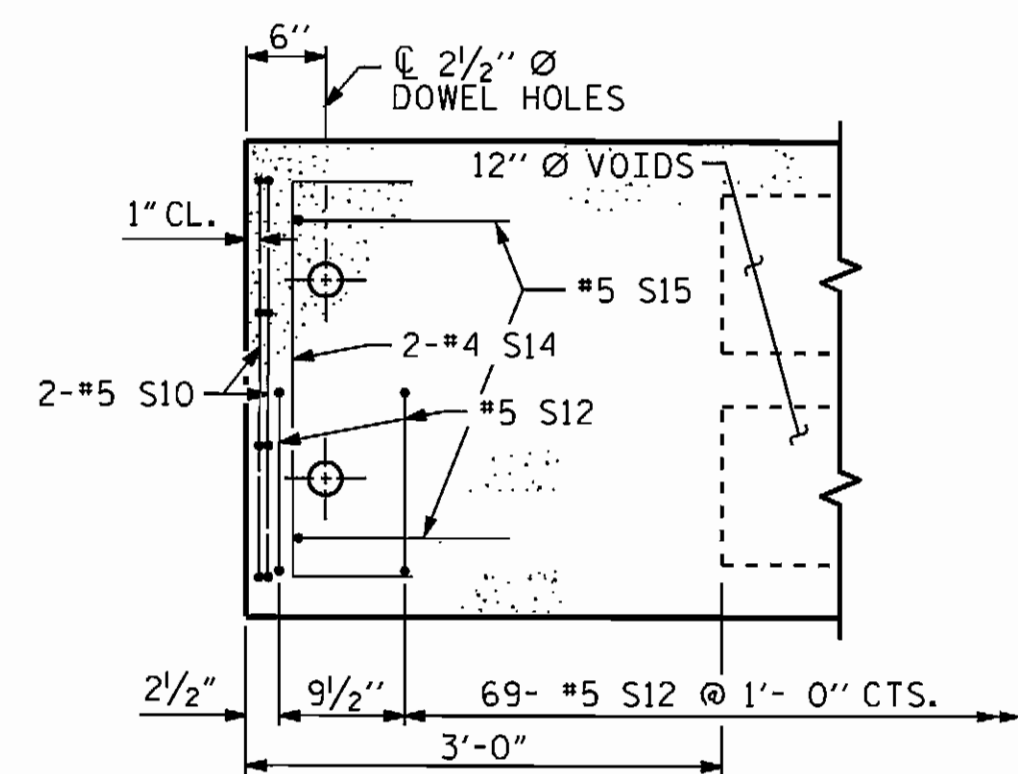
ASSEMBLED BY: D. A. GLADDEN DATE: 4-10-12  
CHECKED BY: B. KLAPPENBACH DATE: 5-11-12  
DRAWN BY: MAA 6/10 REV. 12/11 MAA/AAC  
CHECKED BY: MKT 7/10



8" WIDE DECK DRAINS PLACED AT THE FOLLOWING LOCATIONS

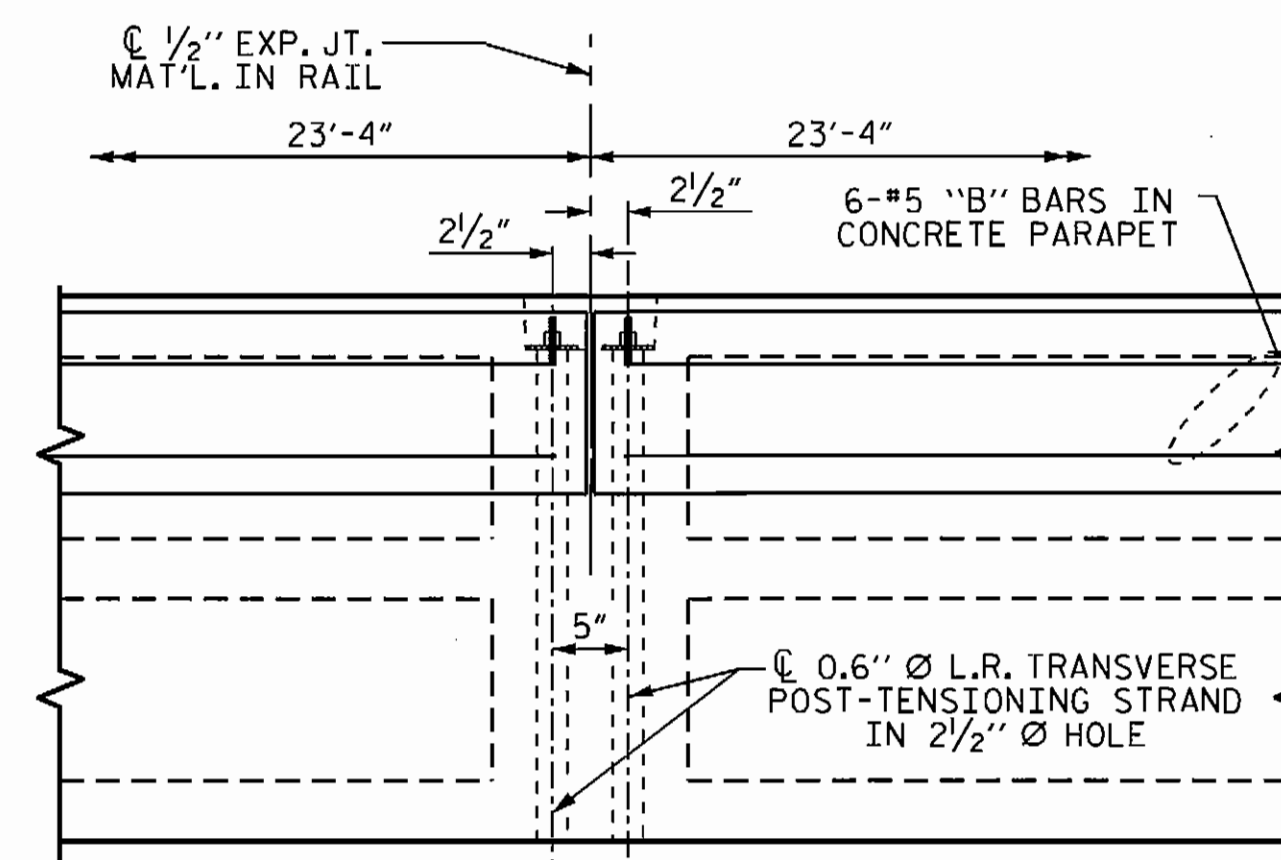
STA. 12+00.75 -L- LT. & RT.  
 STA. 12+02.75 -L- LT. & RT.  
 STA. 12+04.75 -L- LT. & RT.  
 STA. 12+06.75 -L- LT. & RT.  
 STA. 12+08.75 -L- LT. & RT.  
 STA. 12+54.75 -L- LT. & RT.  
 STA. 12+56.75 -L- LT. & RT.  
 STA. 12+58.75 -L- LT. & RT.  
 STA. 12+60.75 -L- LT. & RT.

PLAN OF UNIT



PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S12 BARS.



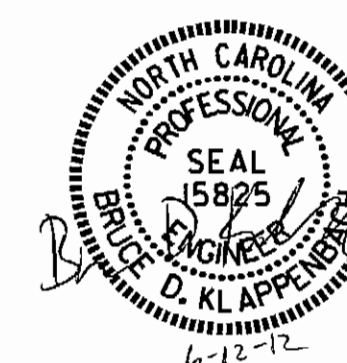
DETAIL "B"

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 70' UNIT  
 24'-10" CLEAR ROADWAY  
 90° SKEW



ASSEMBLED BY: D. A. GLADDEN DATE: 4-10-12  
 CHECKED BY: B. KLAPPENBACH DATE: 5-11-12  
 DRAWN BY: MAA 6/10 REV. 12/5/11 MAA/AAC  
 CHECKED BY: MKT 7/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

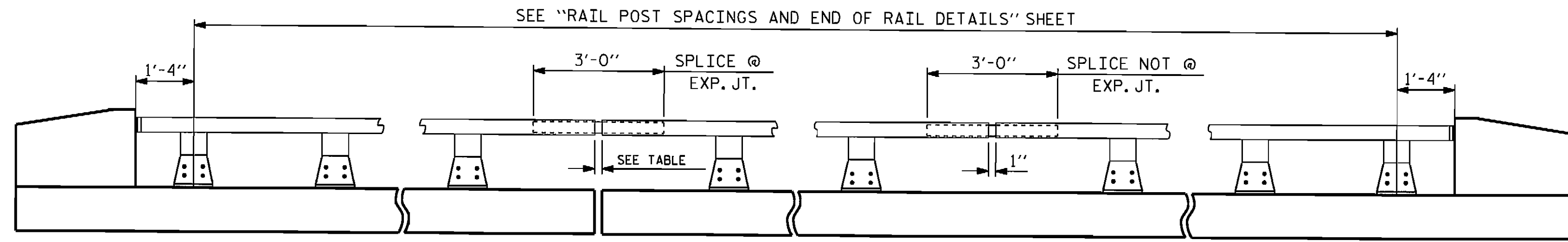


TABLE	
EXP. JT. @	RAIL OPENING
BENT No. 1	N/A

### NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

#### ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

#### GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

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.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

CLOSURE PLATES: CLOSURE PLATES SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH 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. BMR2.

MATERIAL FOR ANCHOR STUDS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ANCHOR PLATE SHALL BE AASHTO M270 GRADE 36.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL.

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.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

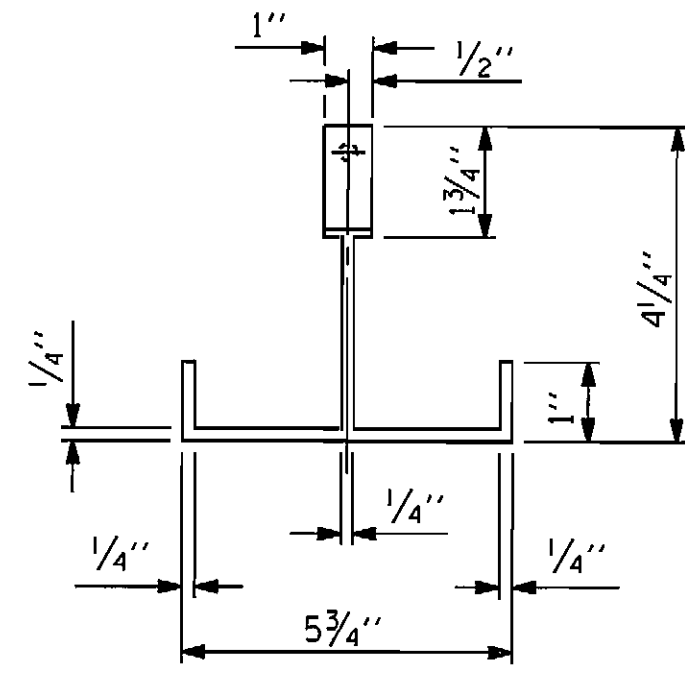
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS, NUTS AND WASHERS SHALL MEET THE SAME REQUIREMENTS AS THE ANCHOR STUDS, NUTS AND WASHERS FOR USE WITH THE ANCHOR ASSEMBLY.

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

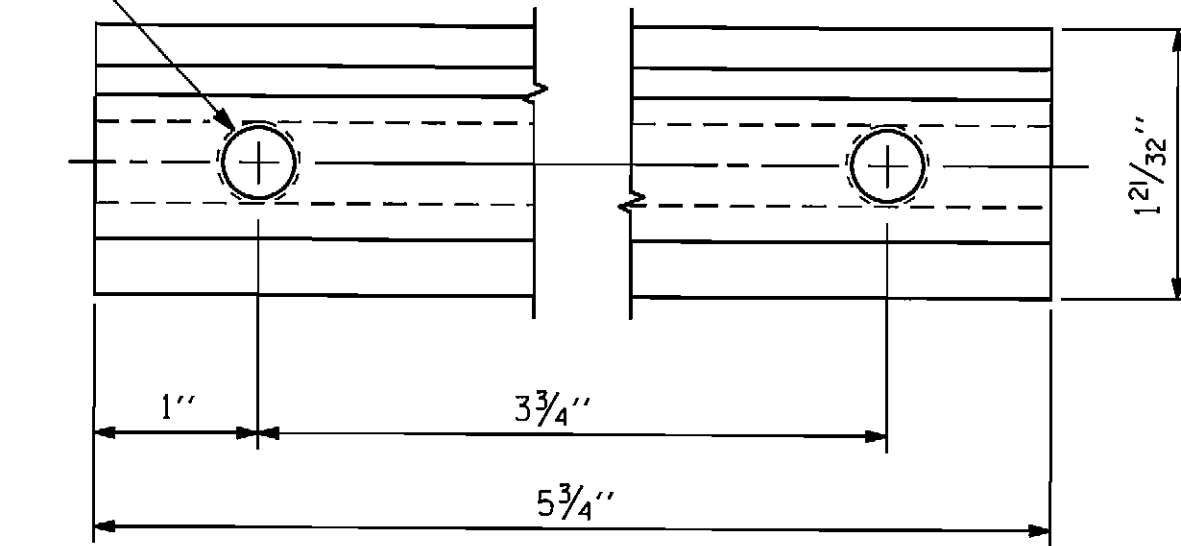
NOTE:  
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 4 OF 7.

### ELEVATION

1/2" Ø [13 THREAD] HOLE FOR 1/2" Ø X 1" STAINLESS STEEL HEX HEAD CAP SCREW & 1 1/16" O.D., 1 7/32" I.D., 1/16" THICK WASHER (TYP.)

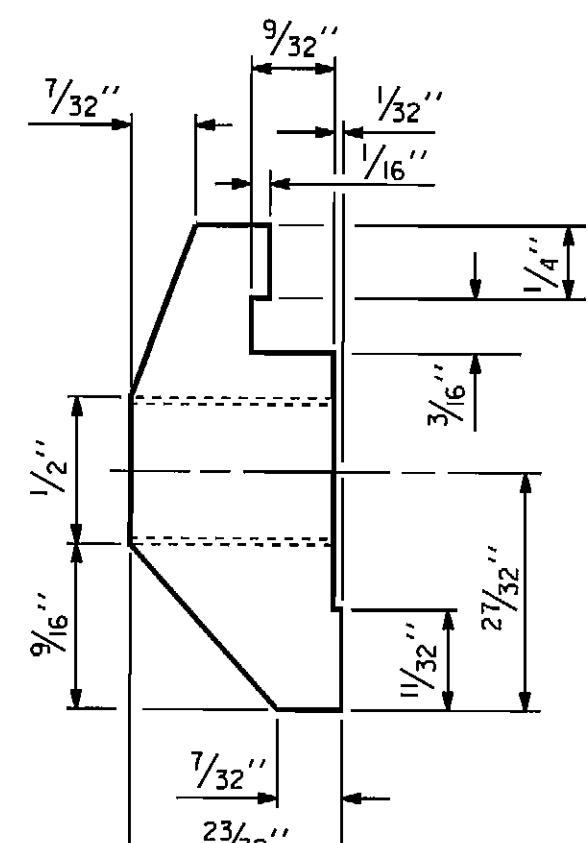


PLAN



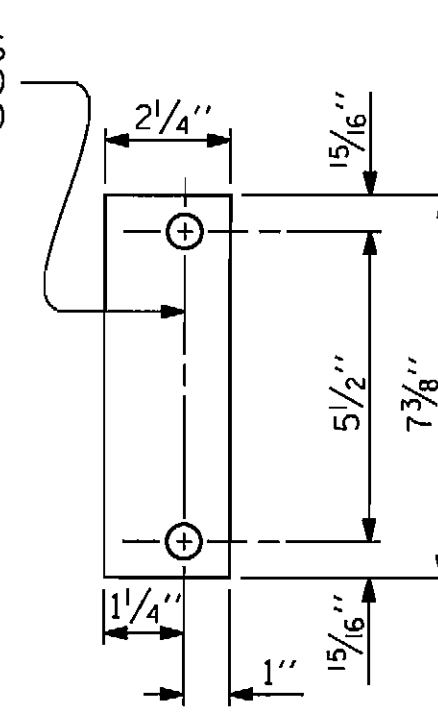
CLAMP BAR DETAIL

(2 REQUIRED PER POST)

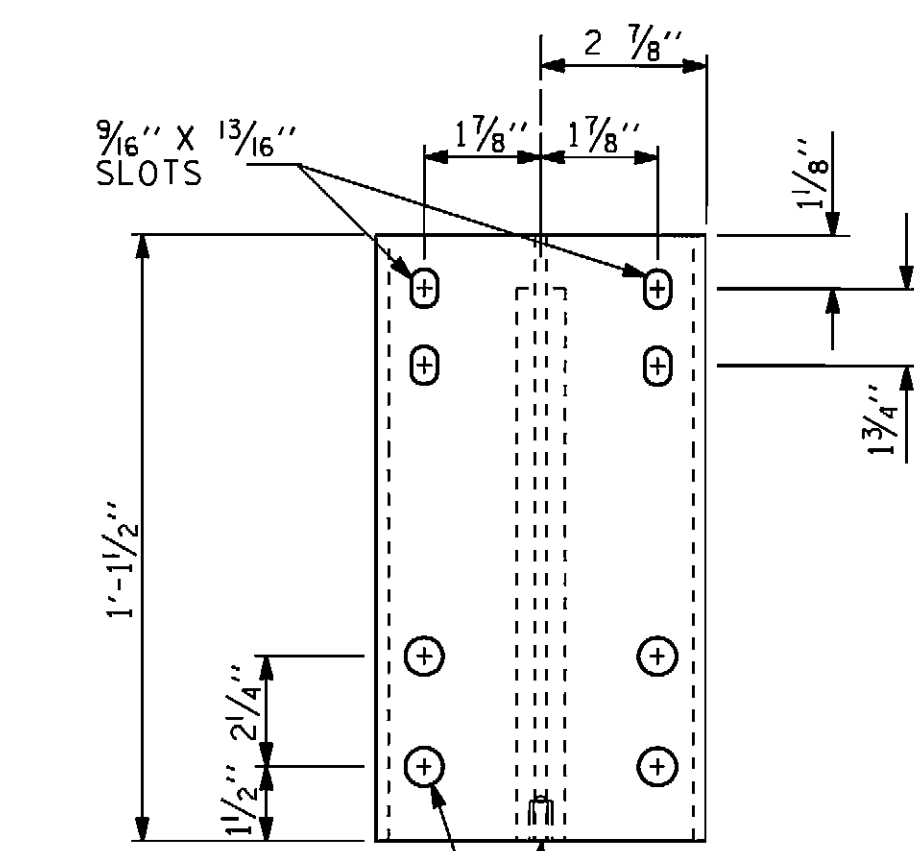


RIVET DETAIL

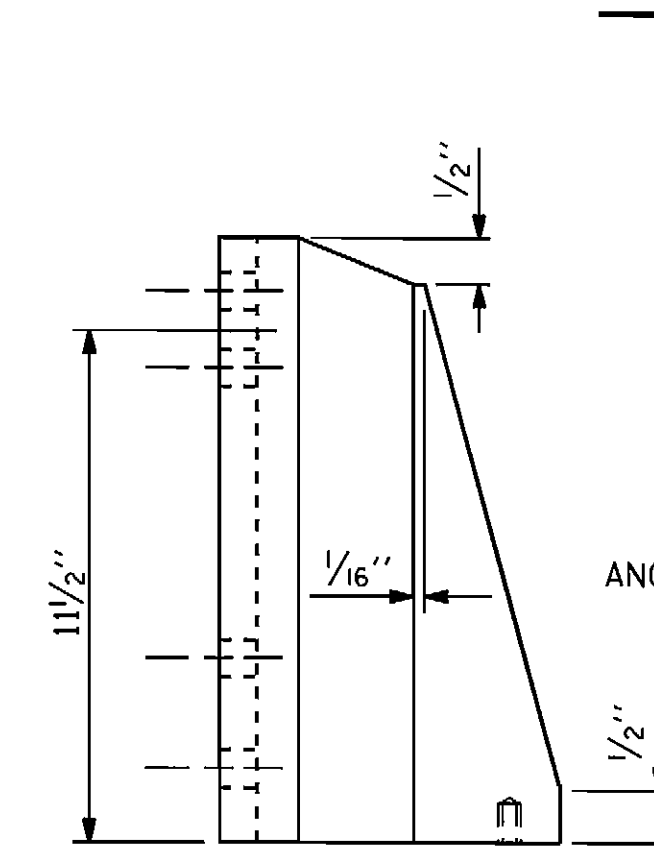
7/8" Ø HOLES (PERMITTED OUTLINE)



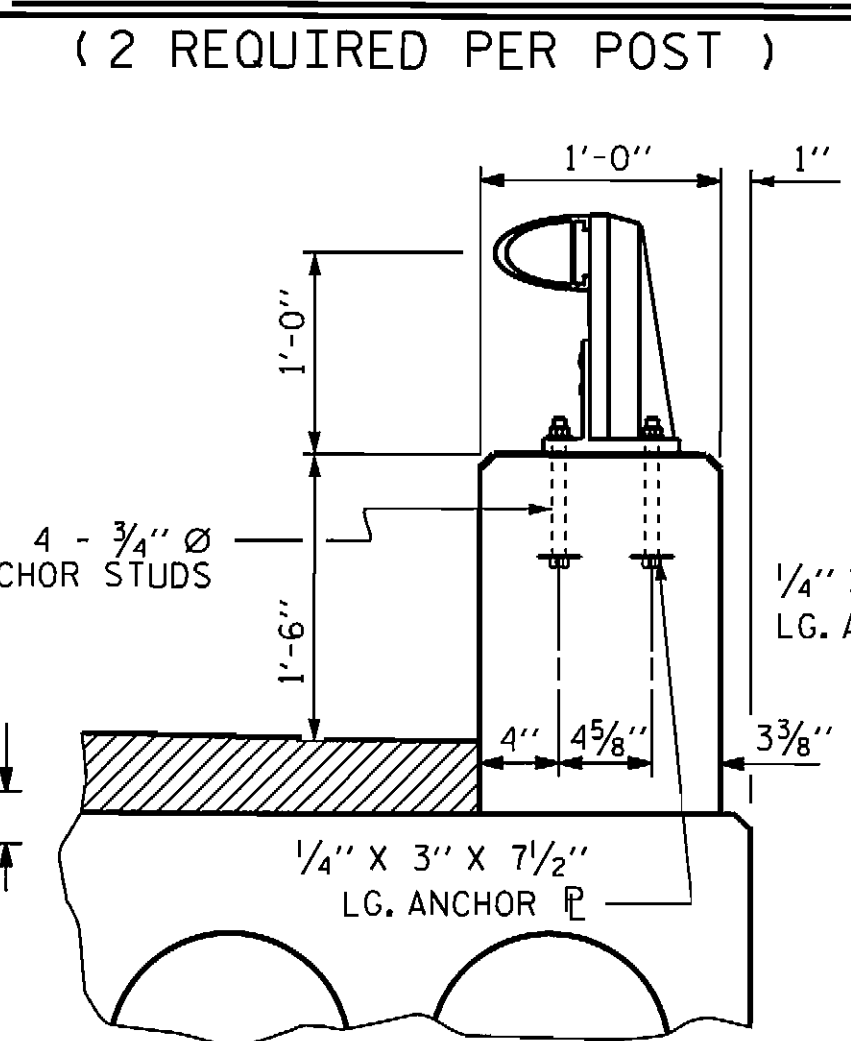
REAR PLATE



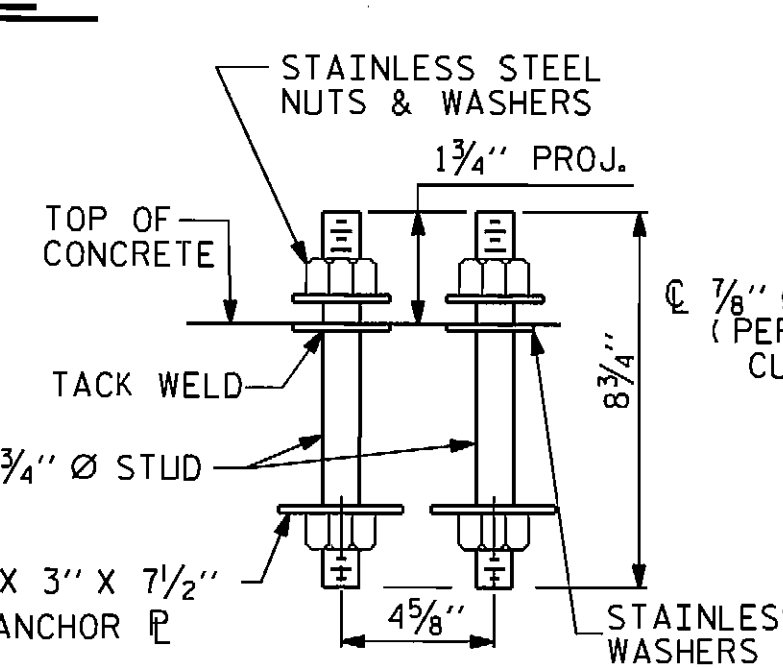
FRONT ELEVATION



SIDE ELEVATION



SECTION THRU PARAPET AND RAIL

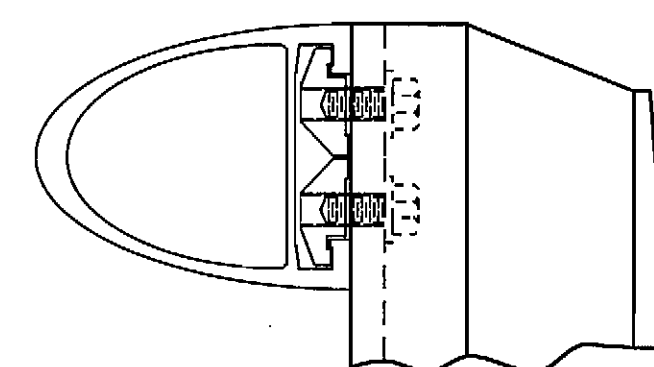


ANCHOR ASSEMBLY

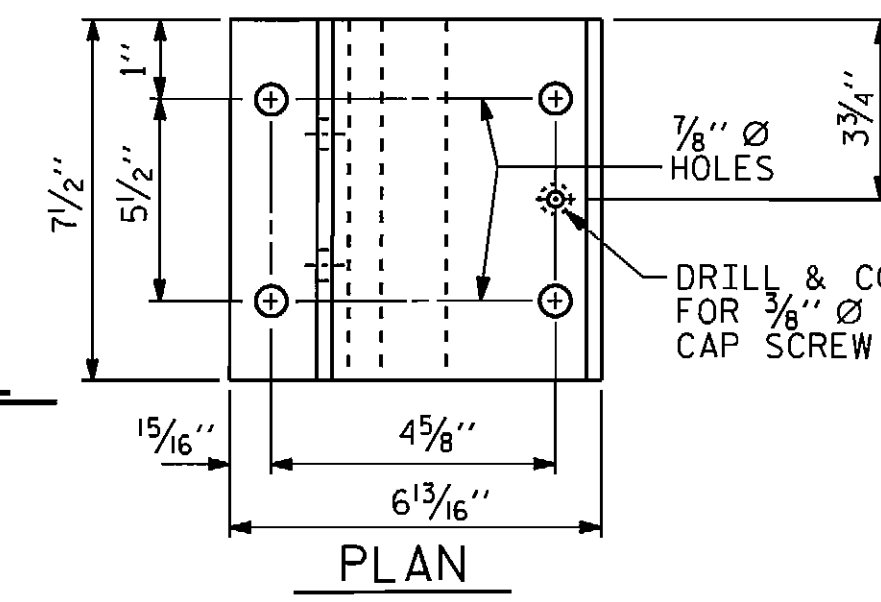
FRONT PLATE

SHIM DETAILS

NOTE: SHIMS MAY BE CUT ALONG PERMITTED OUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

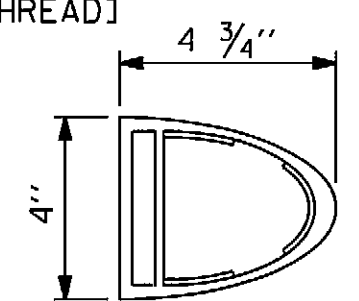


CLAMP & RAIL ASSEMBLY



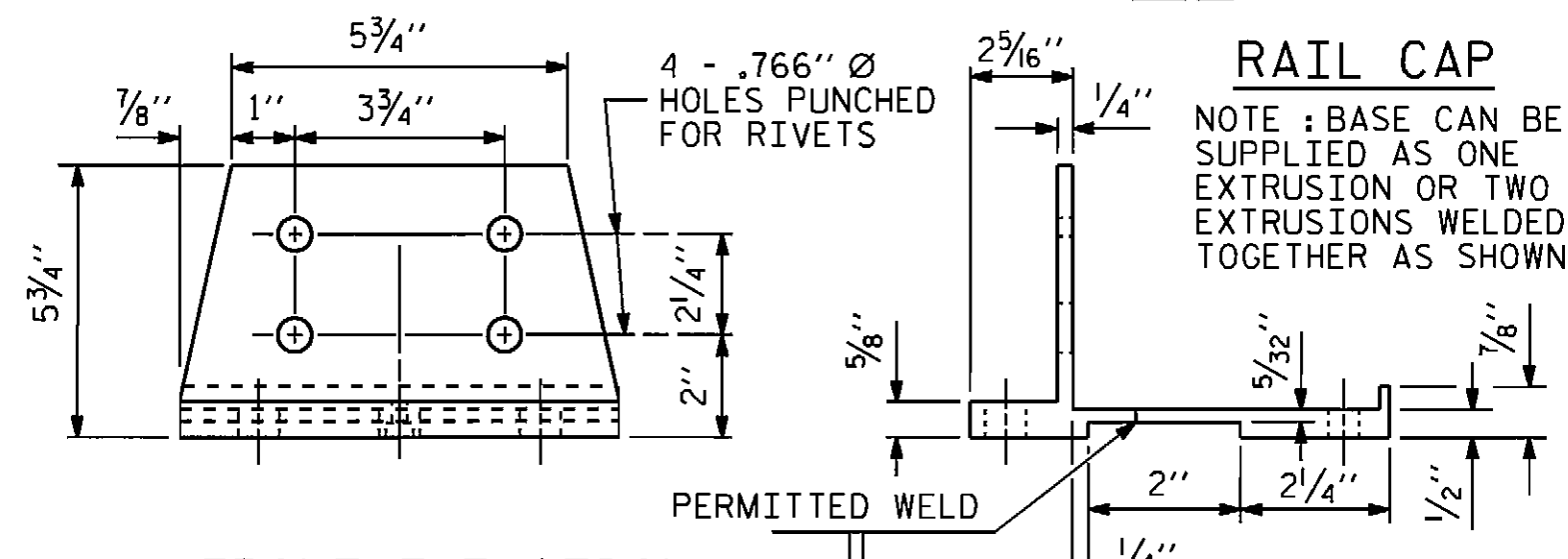
PLAN

PAY LENGTH = 124.50 LIN. FT.



RAIL CAP

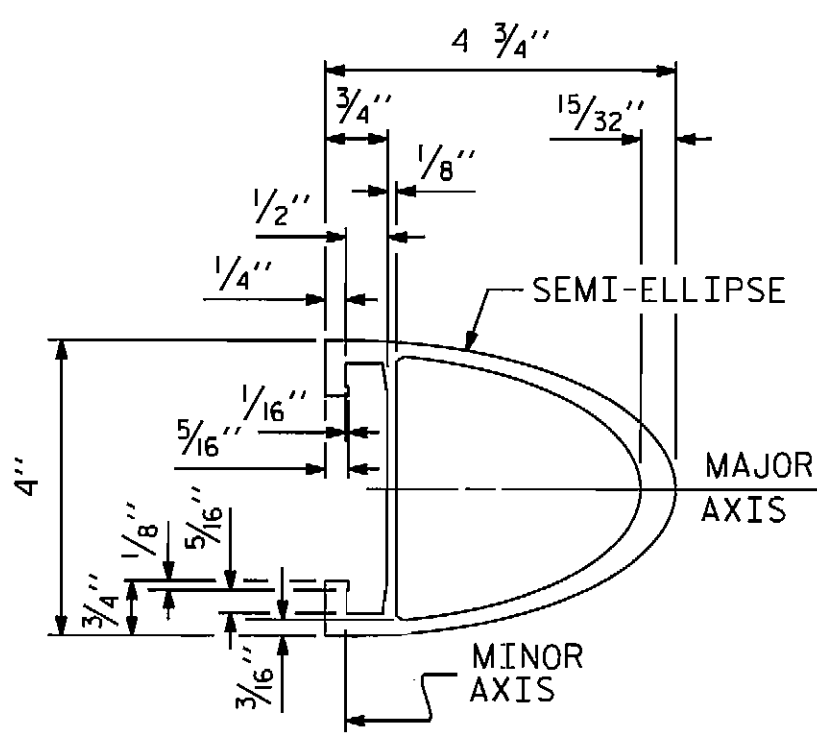
NOTE: BASE CAN BE SUPPLIED AS ONE EXTRUSION OR TWO EXTRUSIONS WELDED TOGETHER AS SHOWN.



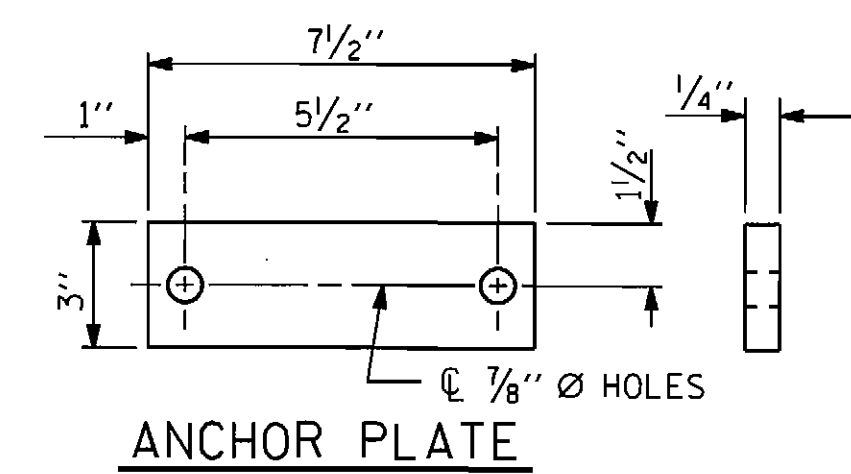
FRONT ELEVATION

SIDE ELEVATION

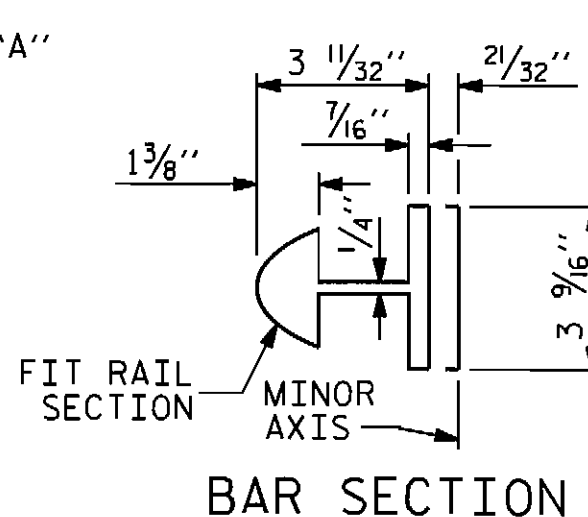
POST BASE DETAILS



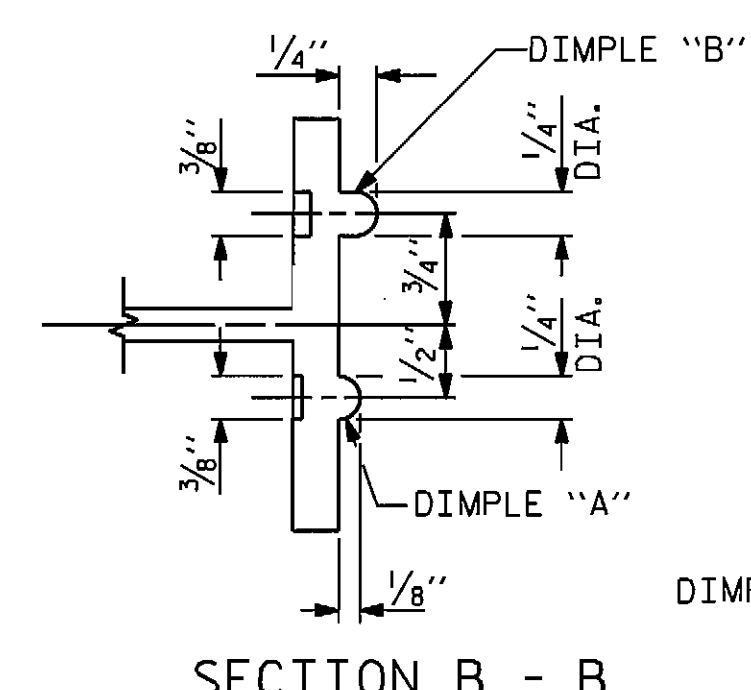
RAIL SECTION



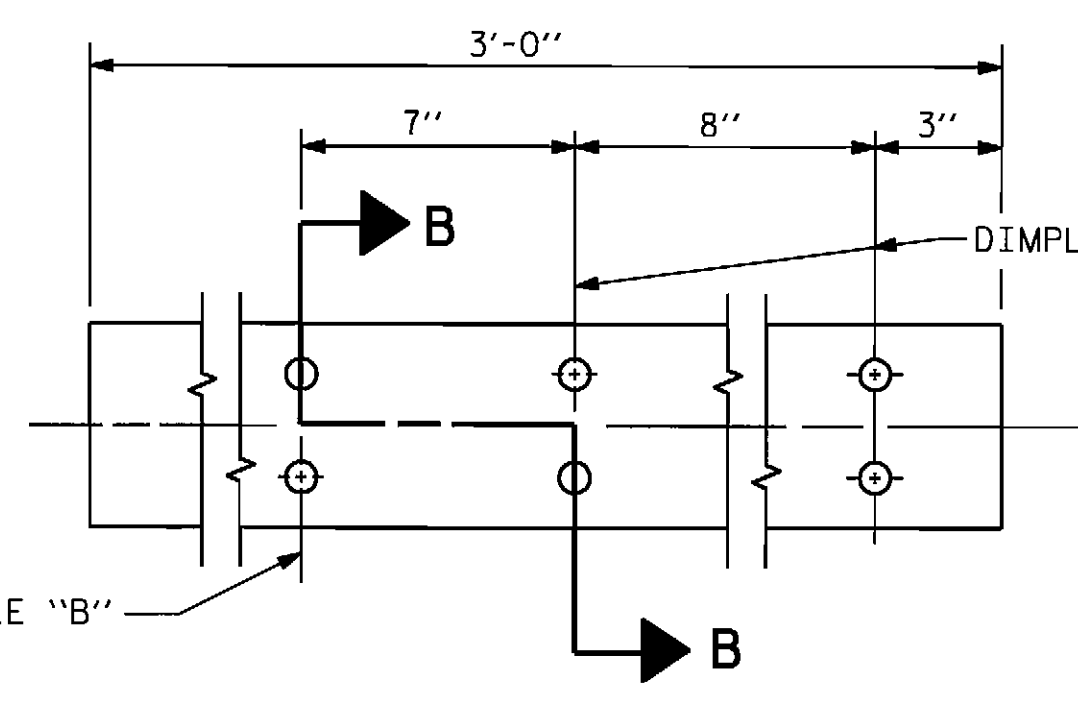
ANCHOR PLATE



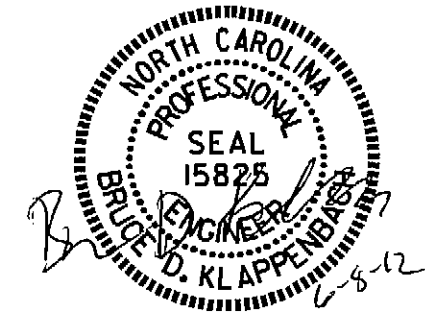
BAR SECTION



SECTION B - B



EXPANSION BAR DETAILS



PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

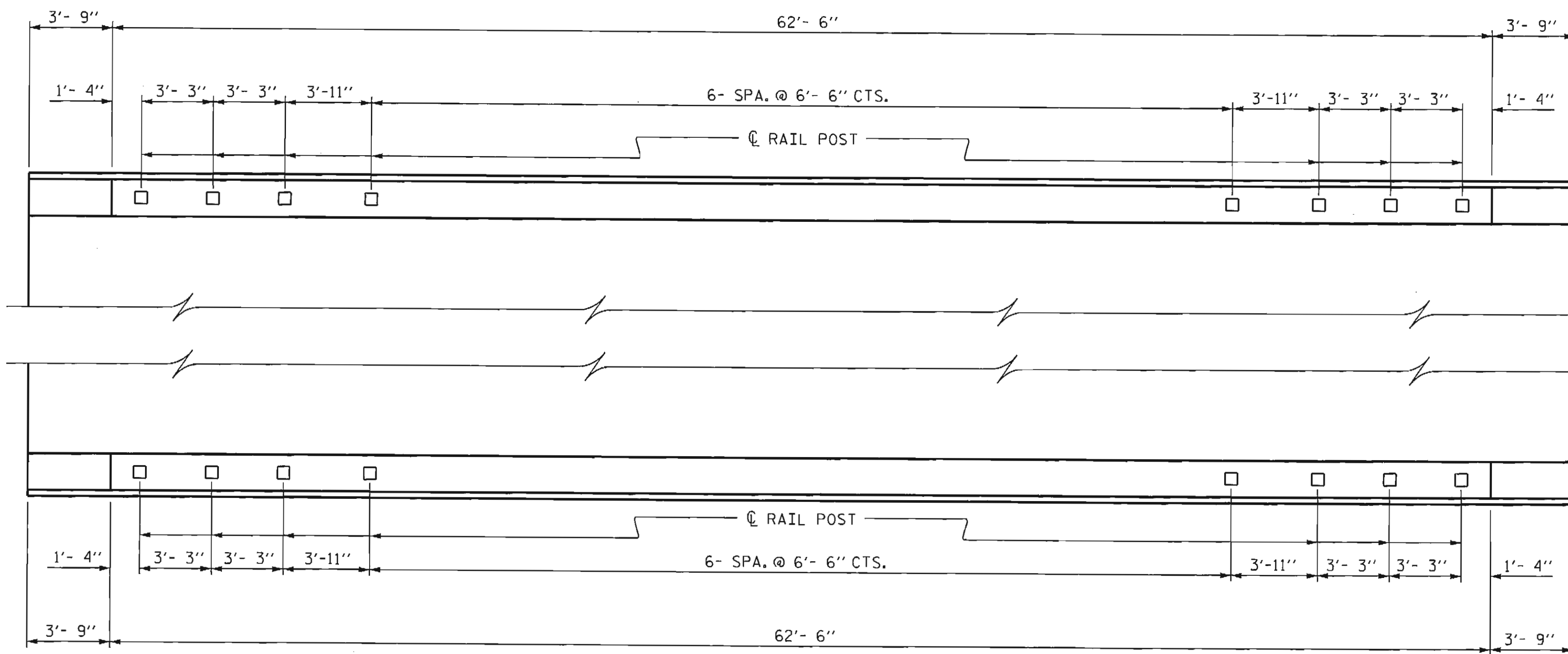
SHEET 3 OF 7

REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

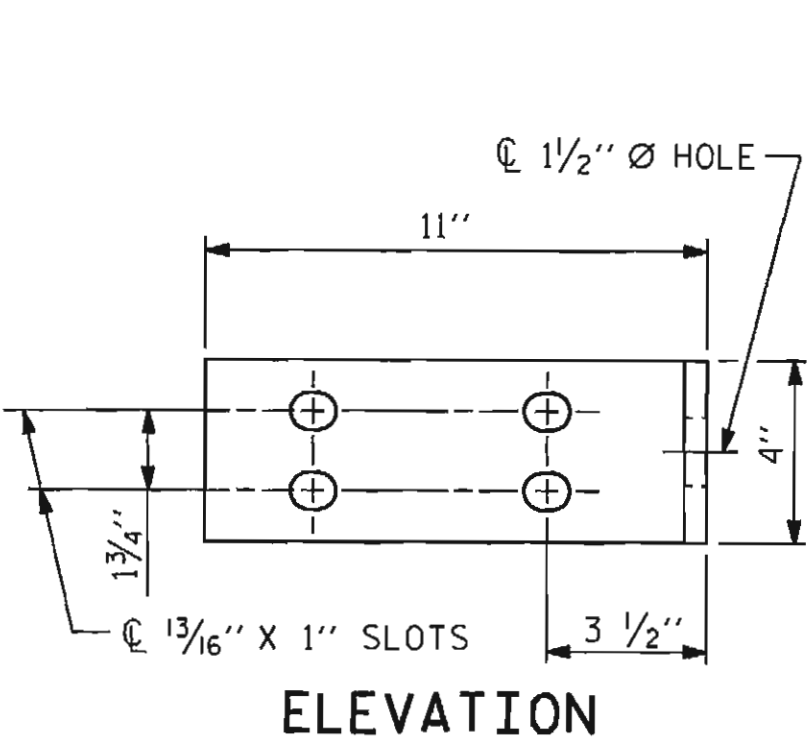
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 1 BAR METAL RAIL

STD. NO. BMR1

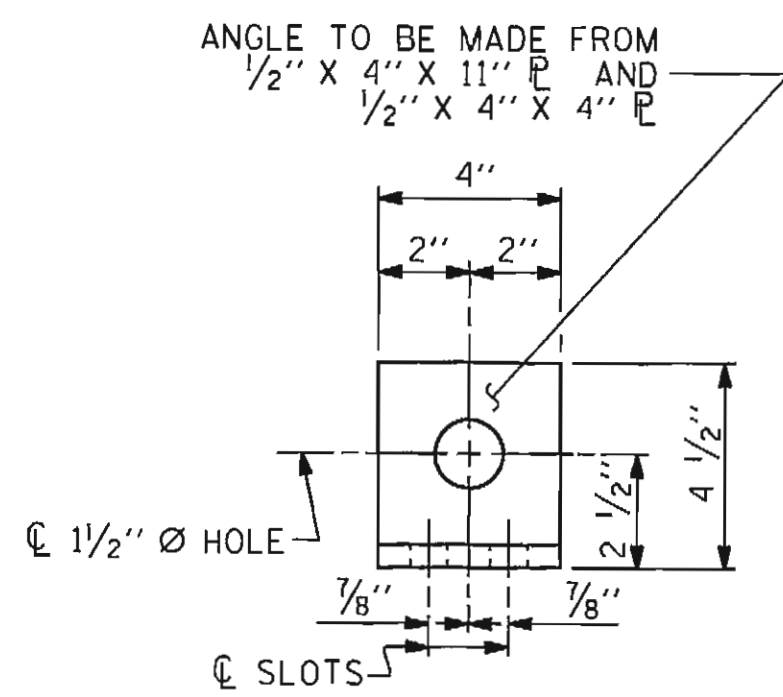
ASSEMBLED BY: <u>D. A. GLADDEN</u>	DATE: <u>4-10-12</u>
CHECKED BY: <u>B. KLAPPENBACH</u>	DATE: <u>5-11-12</u>
DRAWN BY: <u>FCJ 1/88</u>	REV. 5/7/03R <u>RWW/JTE</u>
CHECKED BY: <u>CRK 3/89</u>	REV. 5/1/06R <u>KMM/GM</u>
	REV. 10/1/11 <u>MAA/GM</u>



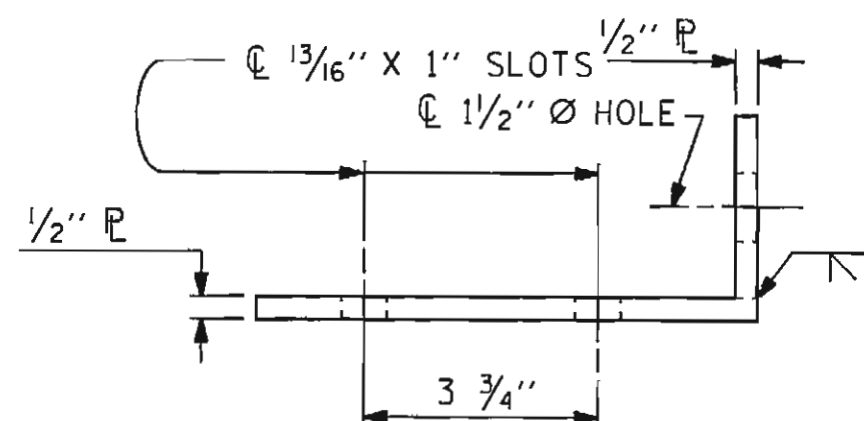
**PLAN OF RAIL POST SPACINGS**



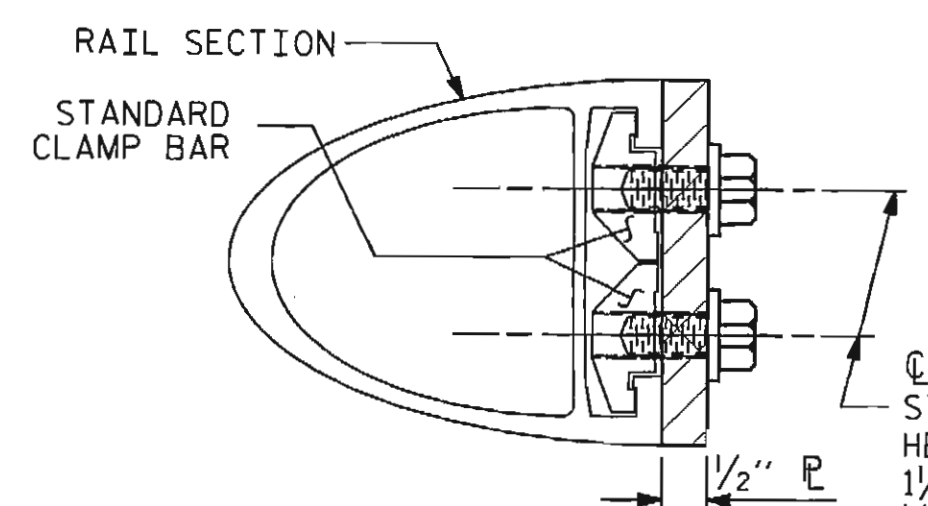
**ELEVATION**



**END VIEW (FIX AND EXP.)**

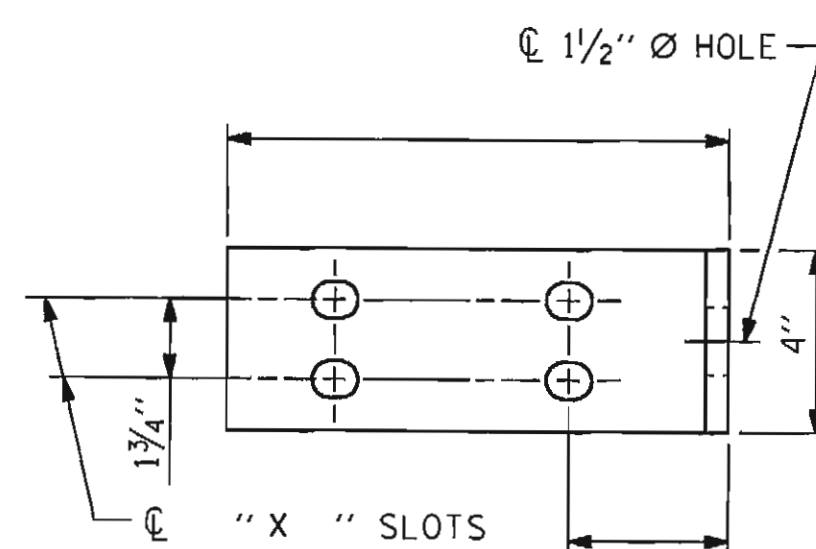


**TOP VIEW**

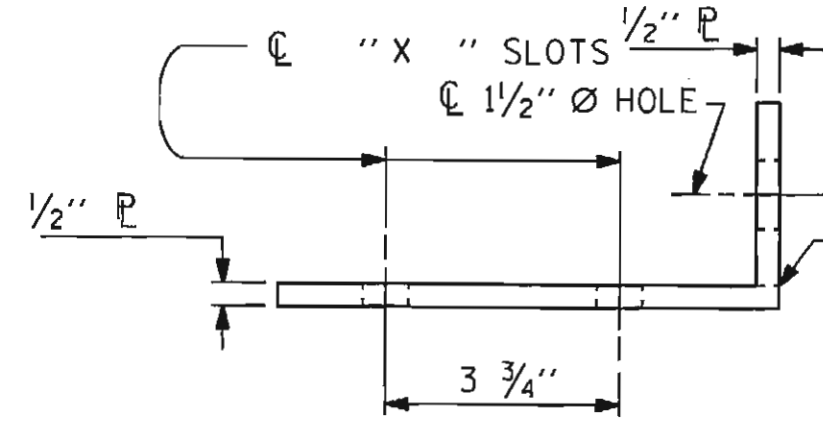


**SECTION H-H (FIX)**

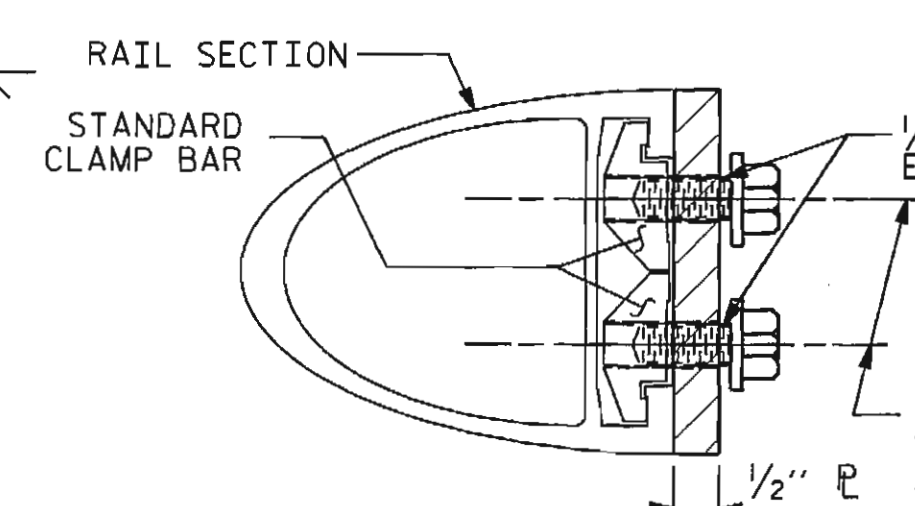
**FIXED**



**ELEVATION**



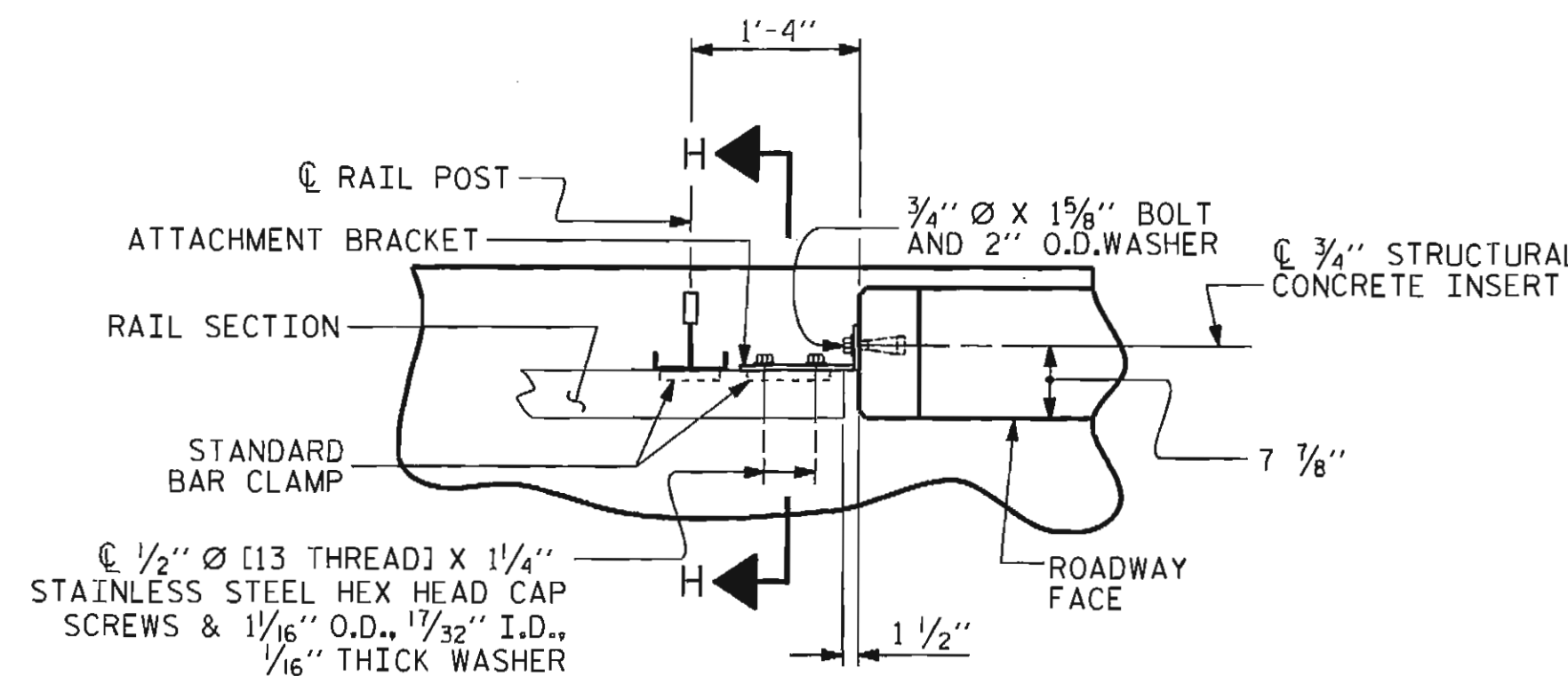
**TOP VIEW**



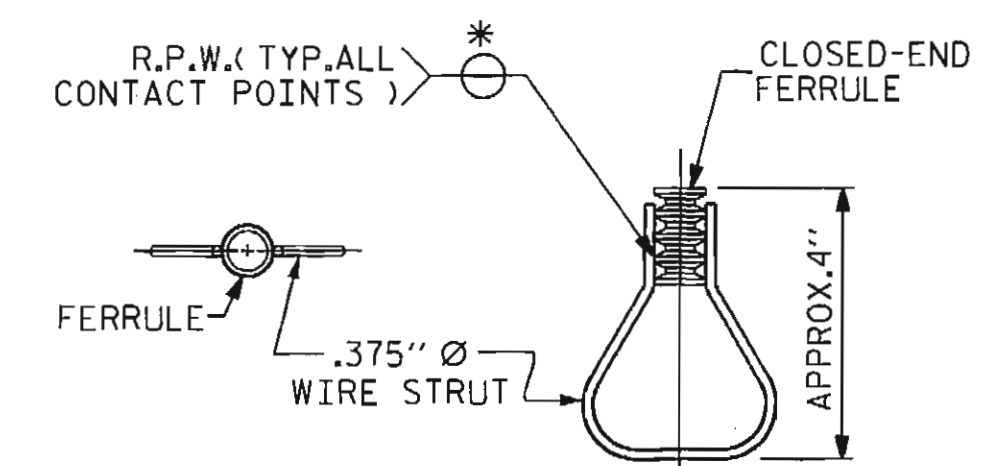
**SECTION H-H (EXP.)**

**EXPANSION**

**DETAILS FOR ATTACHING METAL RAIL TO END POST**



**PLAN - RAIL AND END POST**



**STRUCTURAL CONCRETE INSERT**

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

**NOTES**

**STRUCTURAL CONCRETE INSERT**

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS 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 CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - 3/4" STRUCTURAL CONCRETE INSERT 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.
  - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.
  - STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

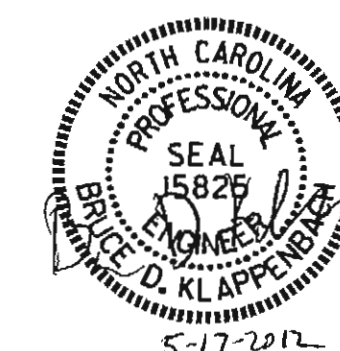
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

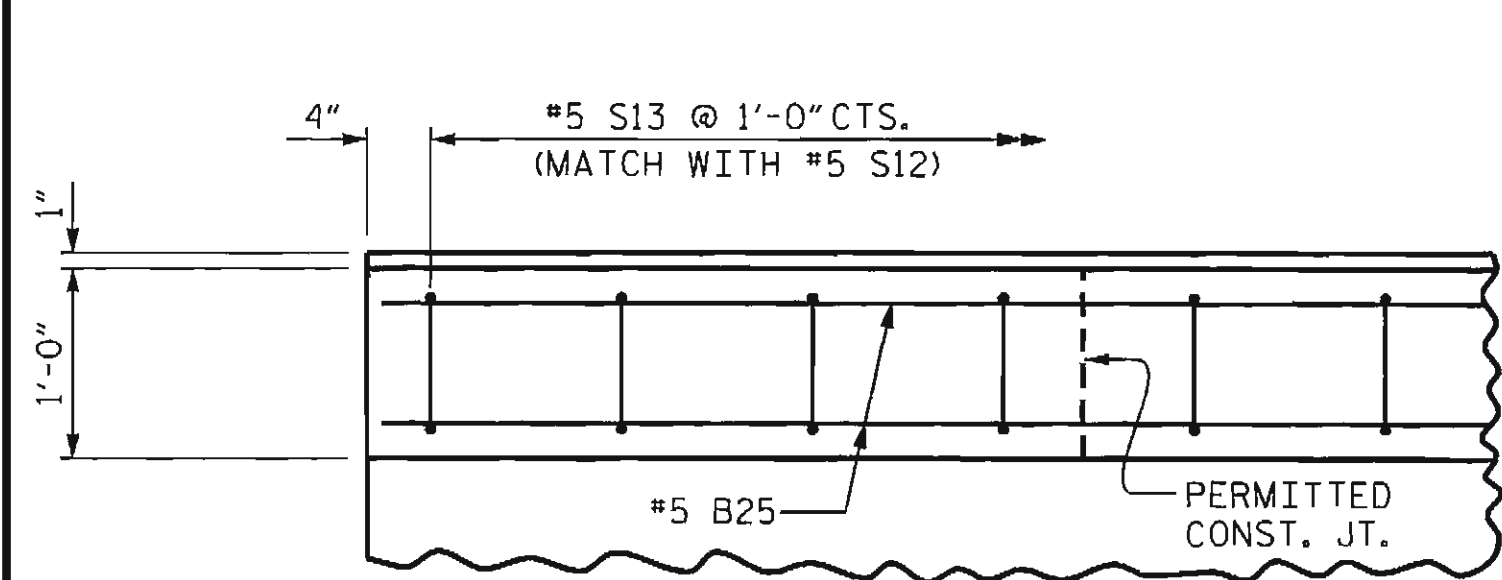
**RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS**  
 FOR ONE OR TWO BAR METAL RAILS



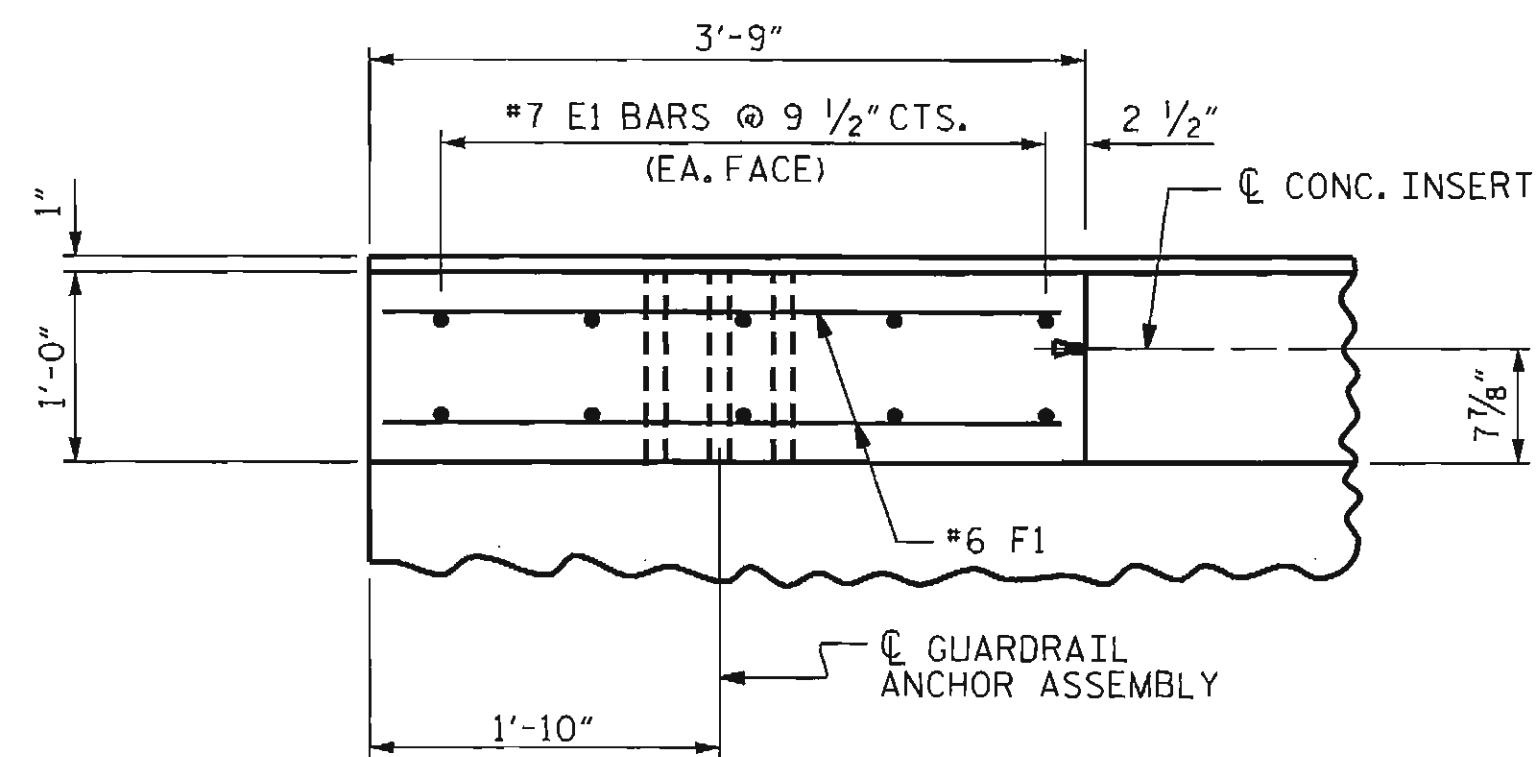
ASSEMBLED BY : D. A. CLADDEN	DATE : 4-10-12
CHECKED BY : B. KLAPPENBACH	DATE : 5-11-12
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

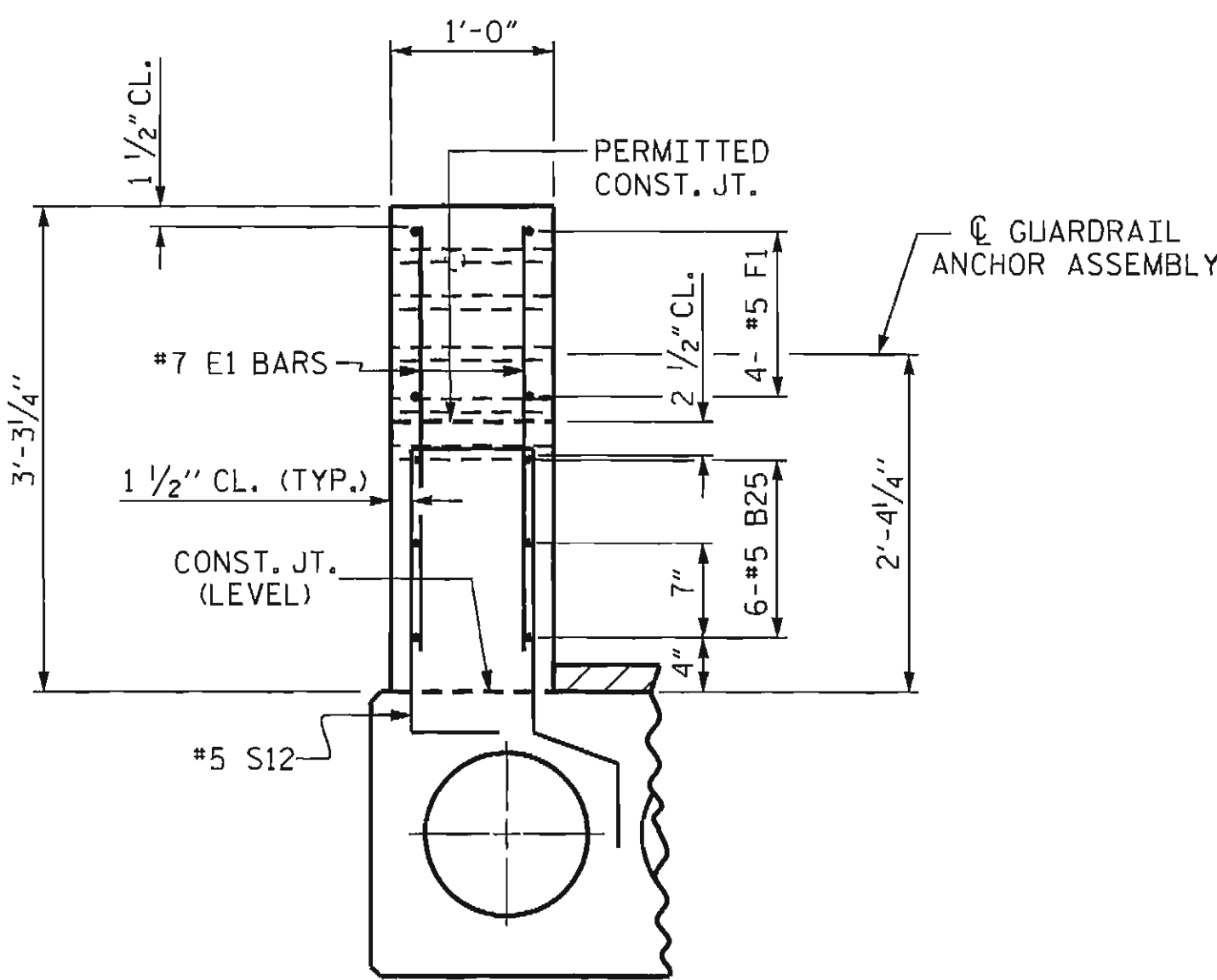




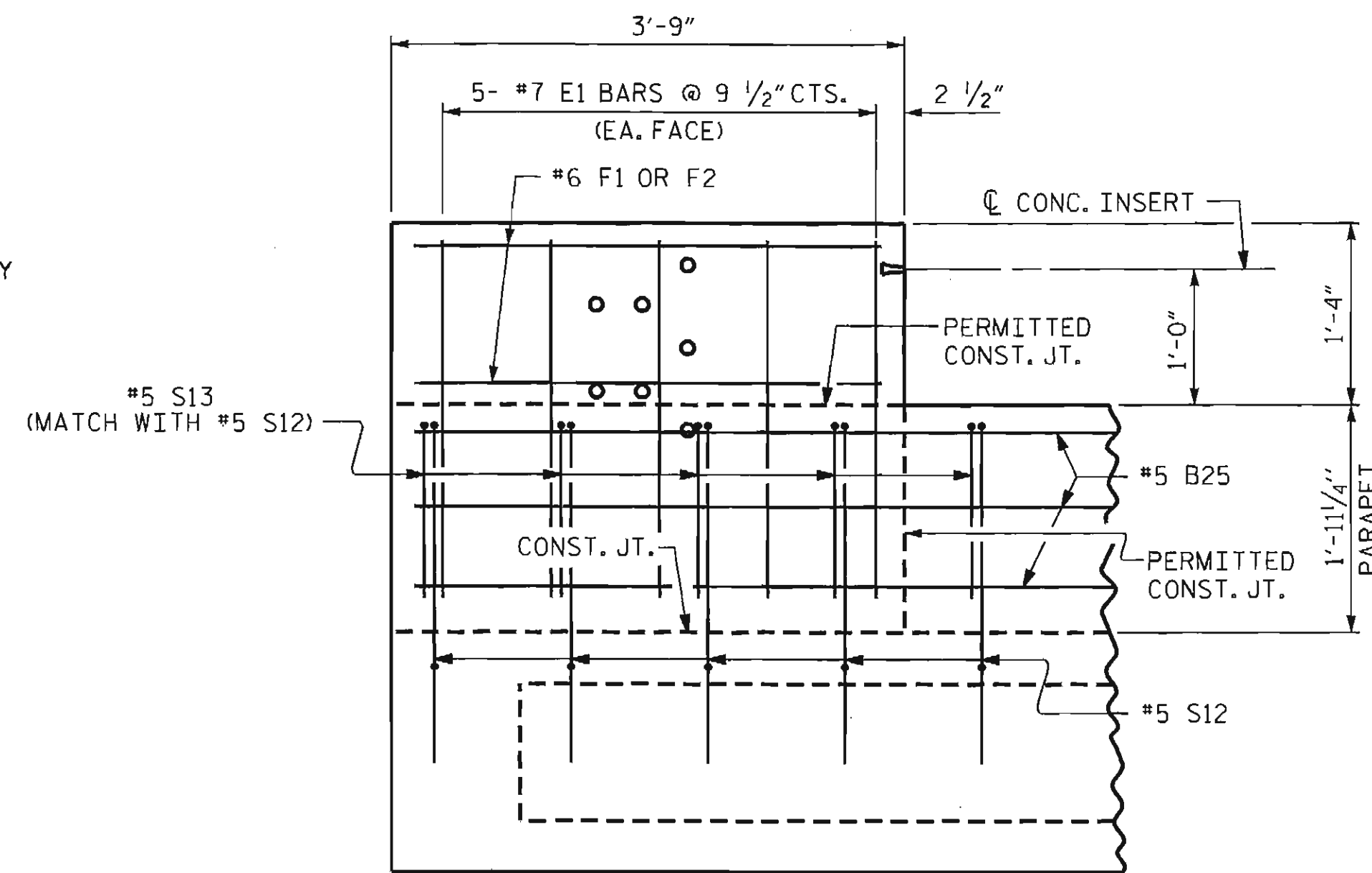
PLAN OF PARAPET



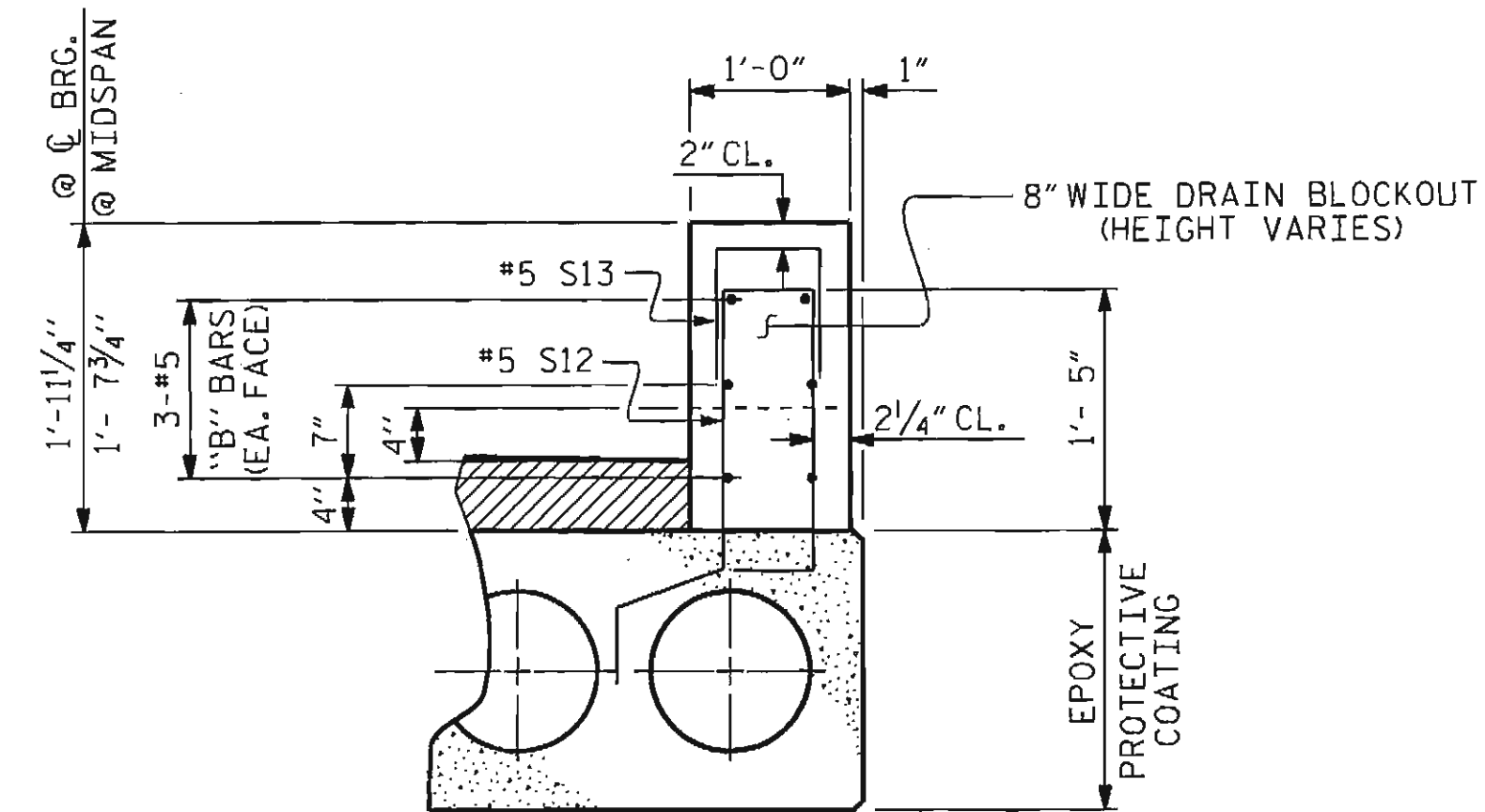
PLAN OF END POST



END VIEW



ELEVATION



ONE BAR METAL RAIL PARAPET SECTION

**BAR TYPES**

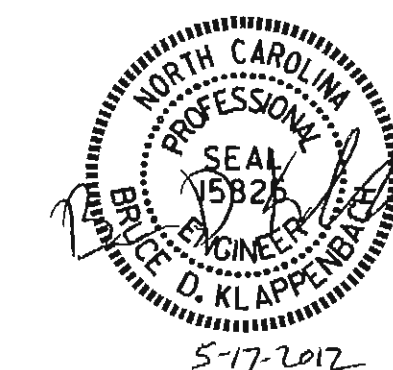
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL FOR PARAPET & END POSTS**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B25	36	# 5	STR	22'-10"	857
* E1	40	# 7	STR	2'-7"	211
* F1	16	# 6	STR	3'-5"	82
* S13	71	# 5	2	3'-8"	272
* EPOXY COATED REINFORCING STEEL					LBS. 1422
CLASS AA CONCRETE					CU.YDS. 10.8
TOTAL LIN. FT. OF CONCRETE PARAPET					140.00

ASSEMBLED BY: D. A. GLADDEN DATE: 4-10-12  
 CHECKED BY: B. KLAPPENBACH DATE: 5-11-12  
 DRAWN BY: MAA 6/10 REV. 12/11 MAA/AAC  
 CHECKED BY: MKT 7/10

17-MAY-2012 11:53  
 R:\Structures\FINAL PLANS\BD5111L.SD.AB.dgn  
 bklappenbach



PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 CONCRETE PARAPET  
 AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

STD. NO. 24PCS3-27-90S

NOTES

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

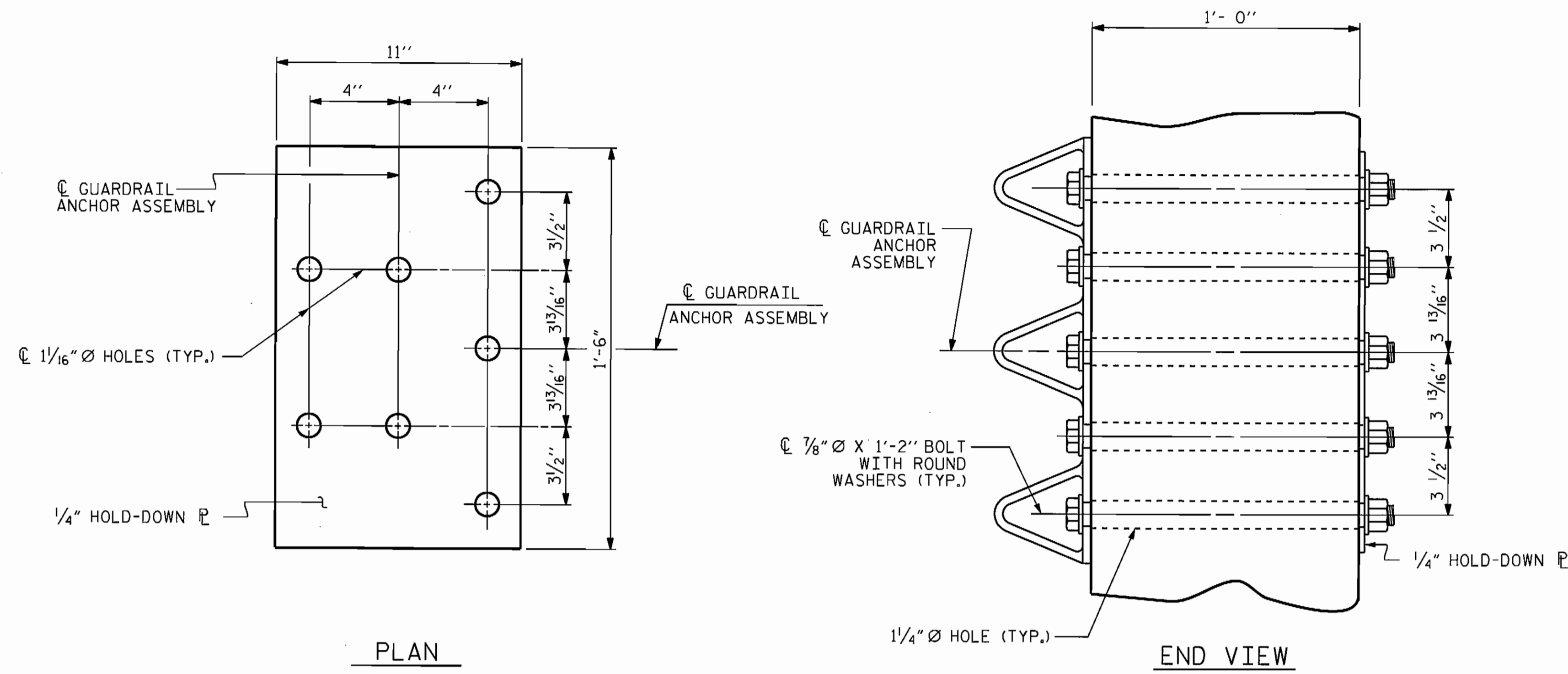
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

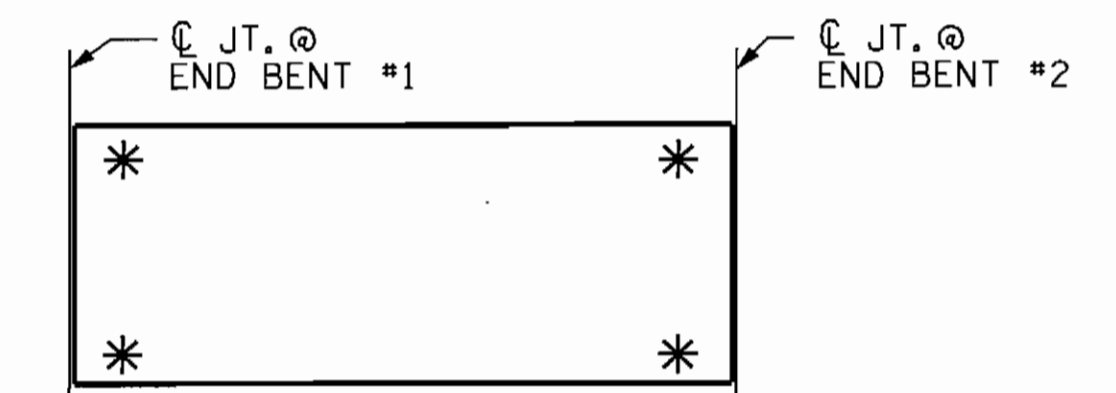
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

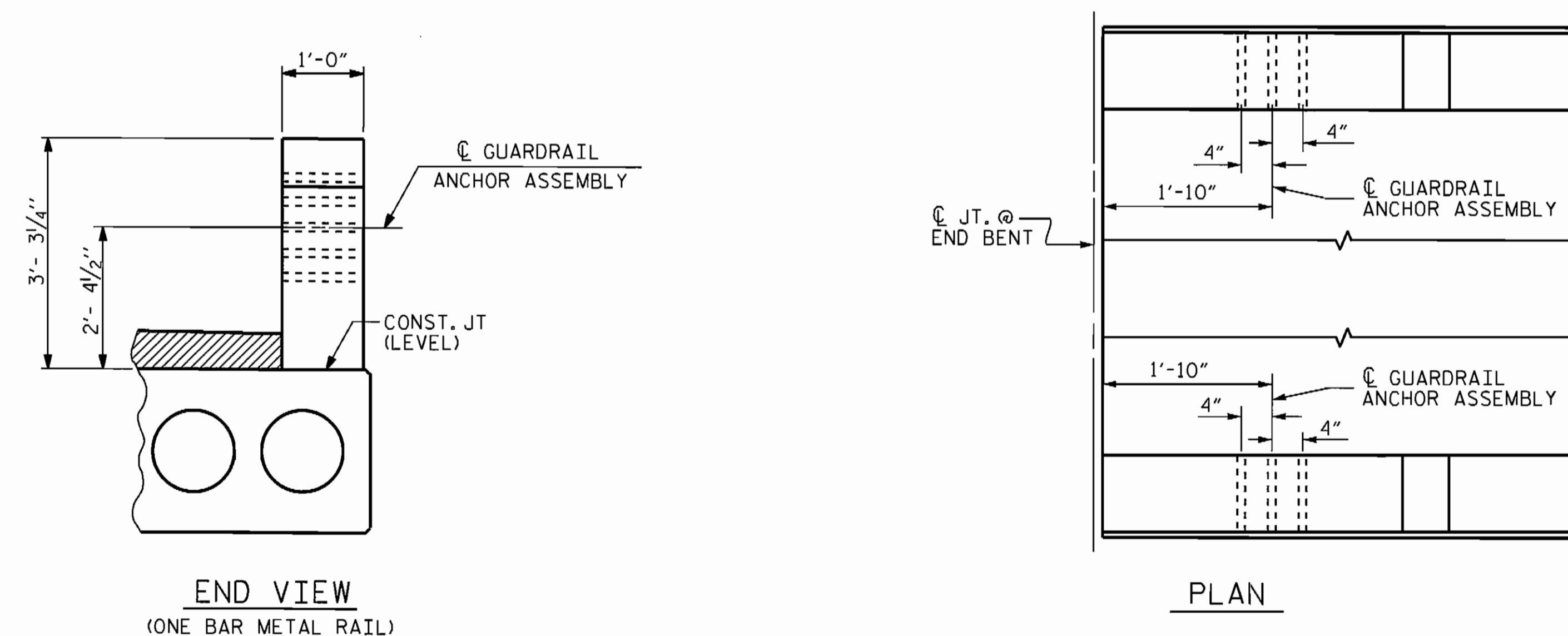


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT

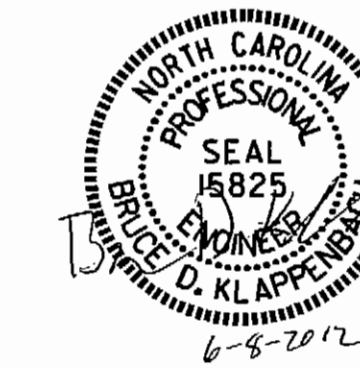


LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

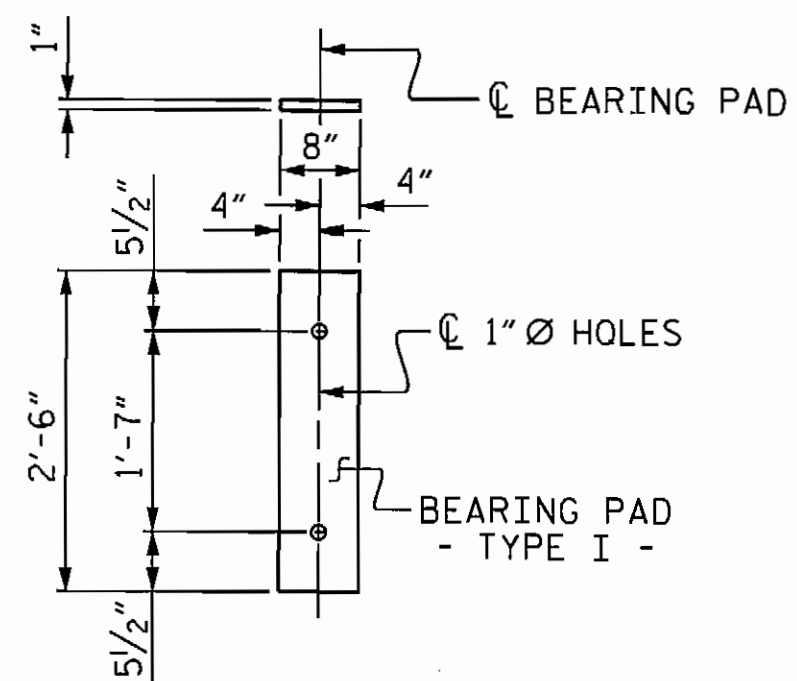
SHEET 6 OF 7

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

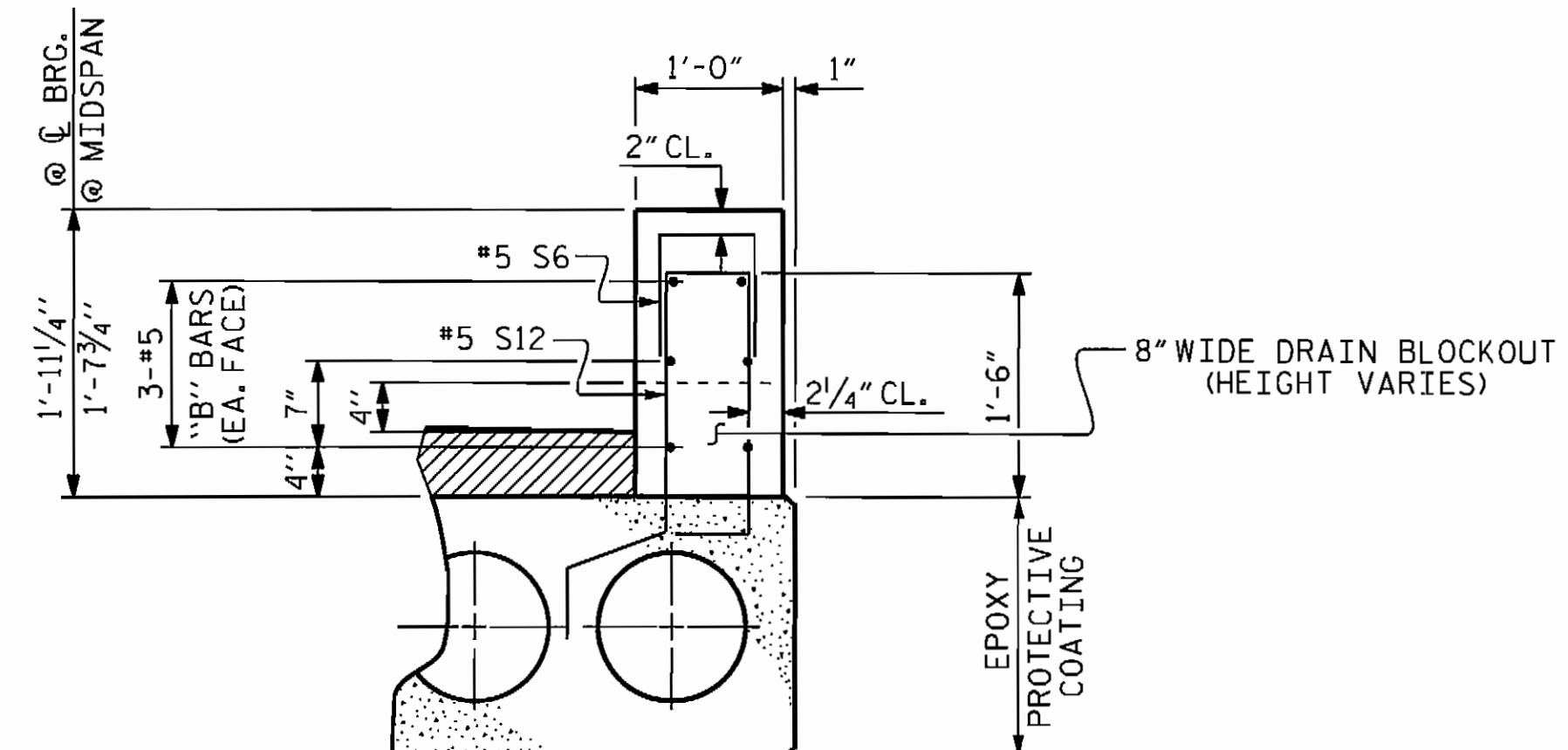
ASSEMBLED BY : D. A. GLADDEN	DATE : 4-10-12			
CHECKED BY : B. KLAPPENBACH	DATE : 5-11-12			
DRAWN BY : MAA	5/10	ADDED	5/6/10	
CHECKED BY : GM	5/10	REV.	10/1/11	MAA/GM
		REV.	12/5/11	MAA/GM



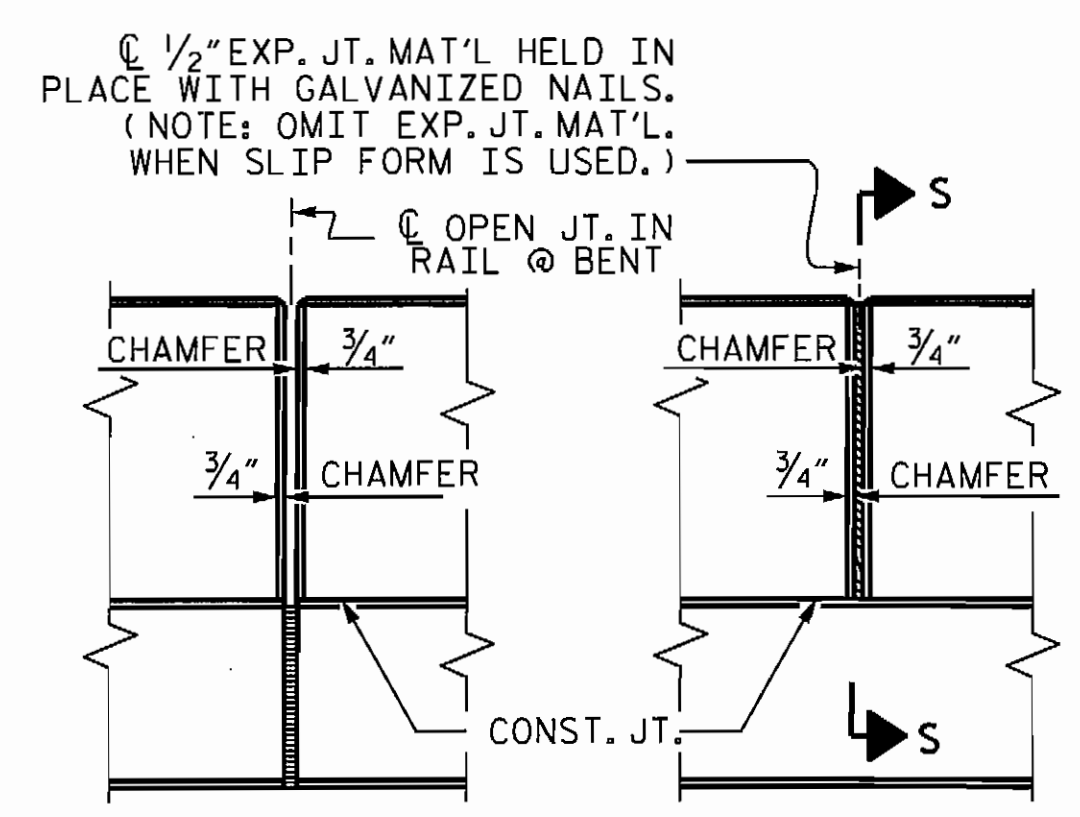
FIXED END  
(TYPE I - 18 REQ'D)

**ELASTOMERIC BEARING DETAILS**

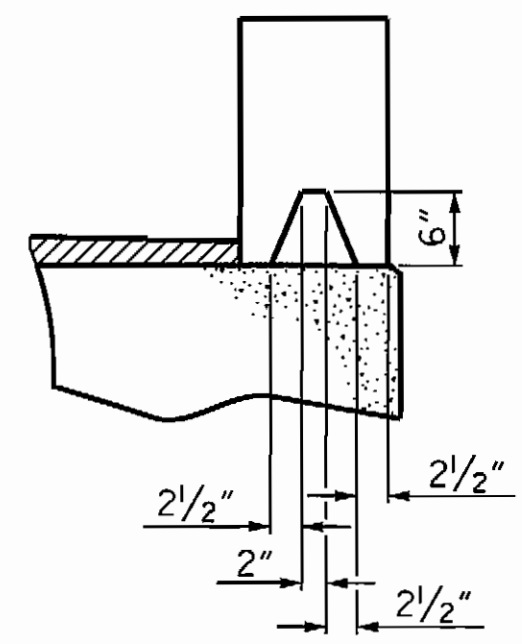
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



**ONE BAR METAL RAIL PARAPET SECTION**

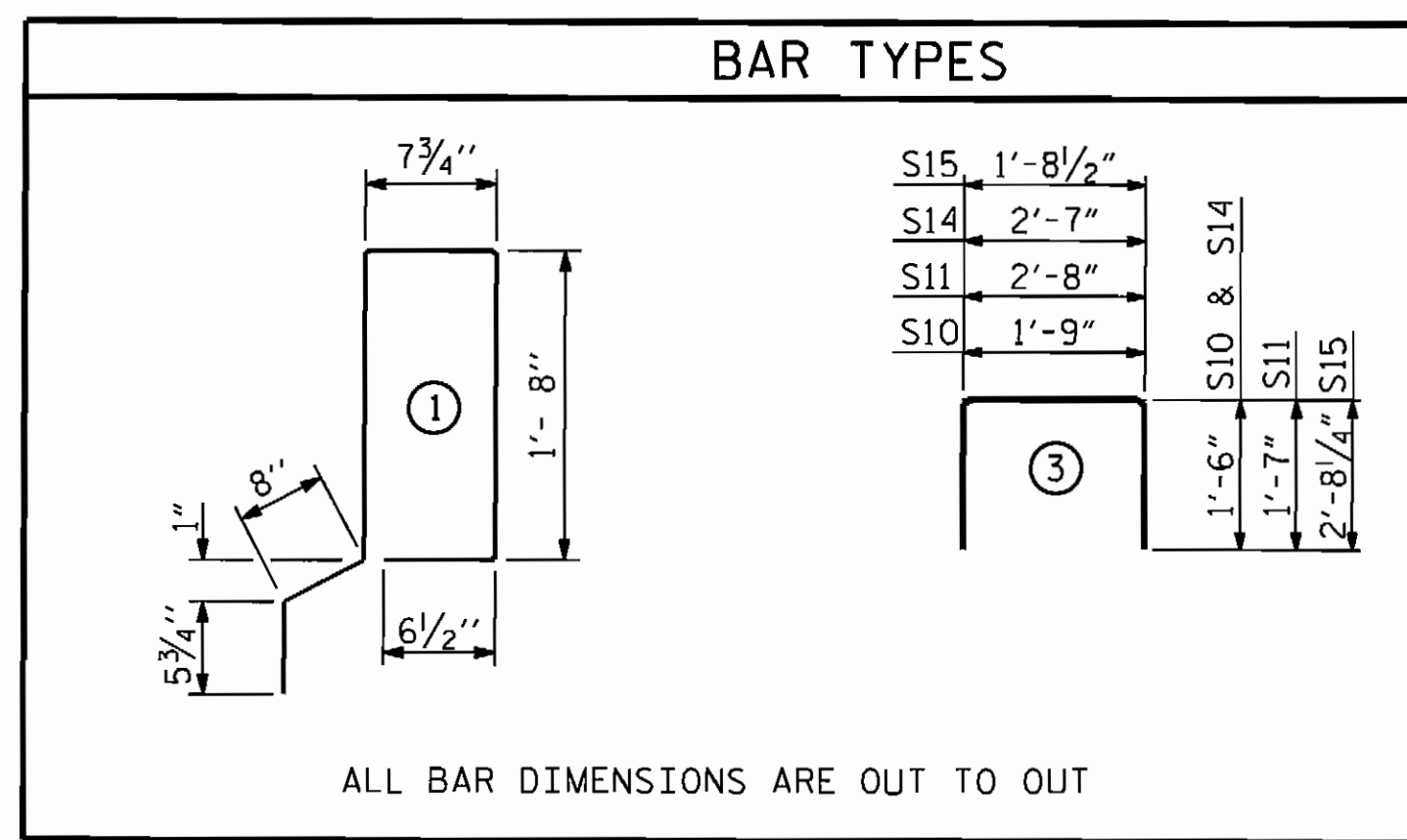


ELEVATION AT EXPANSION JOINTS



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

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



ALL BAR DIMENSIONS ARE OUT TO OUT

CORED SLABS REQUIRED			
70' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	7	70'-0"	490'-0"
TOTAL	9		630'-0"

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	138	#4	3	5'-10"	538	5'-10"	538
*S12	71	#5	1	5'-8"	420		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL				LBS.	721		721
* EPOXY COATED REINFORCING STEEL				LBS.	420		
7000 P.S.I. CONCRETE				CU. YDS.	11.8		11.8
0.6" Ø L.R. STRANDS				No.	28		28

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
70' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	4 5/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1 3/16" ↓
FINAL CAMBER	3 1/2" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
70' UNITS	1 3/4"	1'- 7 3/4"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
70' UNITS	5500

**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 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.

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.

ALL REINFORCING STEEL IN THE CONCRETE PARAPET AND END POST 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 PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL 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.

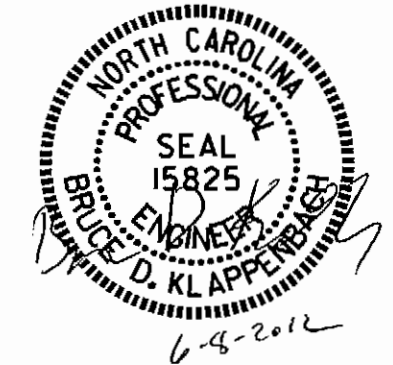
MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 7 OF 7



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 2'-0"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT

ASSEMBLED BY : D. A. GLADDEN	DATE : 4-10-12
CHECKED BY : B. KLAPPENBACH	DATE : 5-11-12
DRAWN BY : MAA	6/10
CHECKED BY : MKT	7/10
REV. 12/11	MAA/AAC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

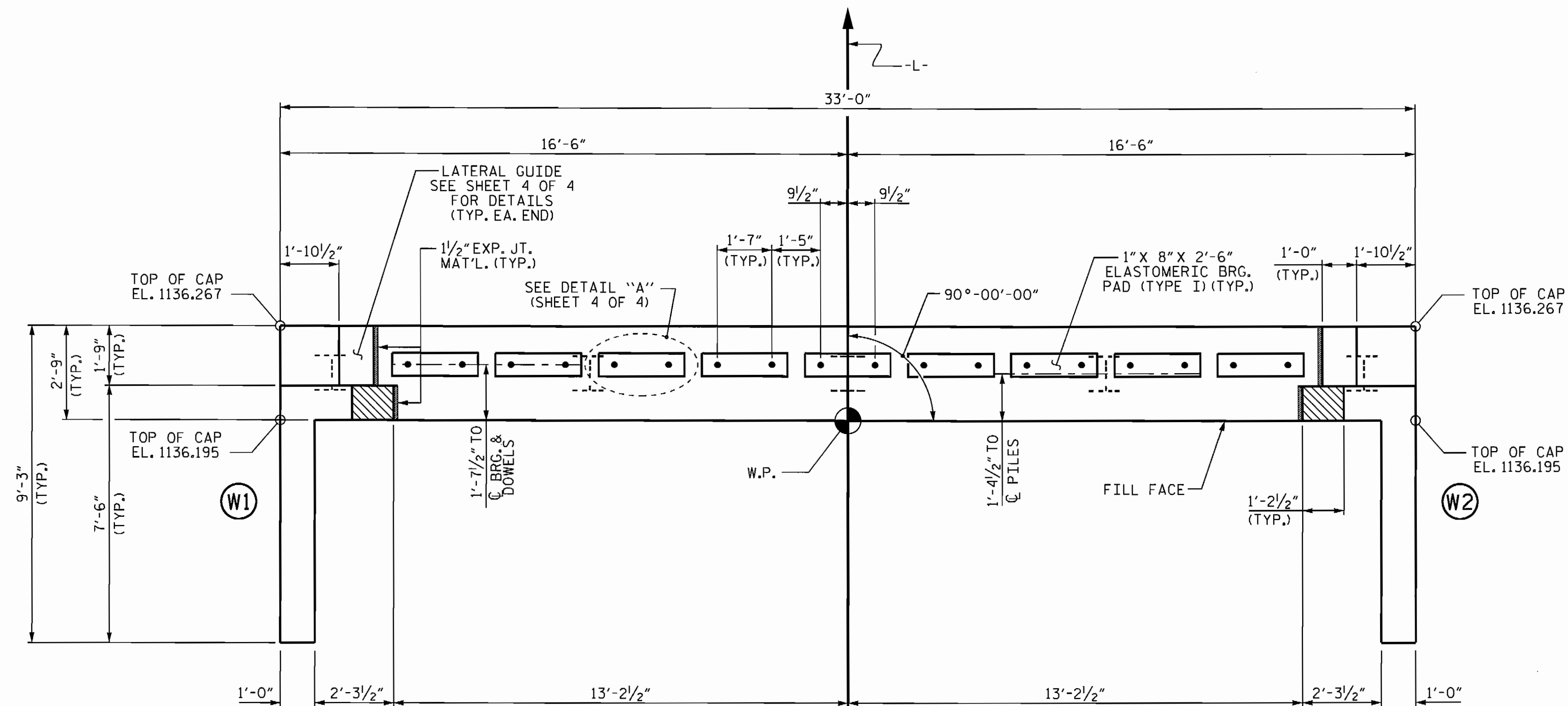
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

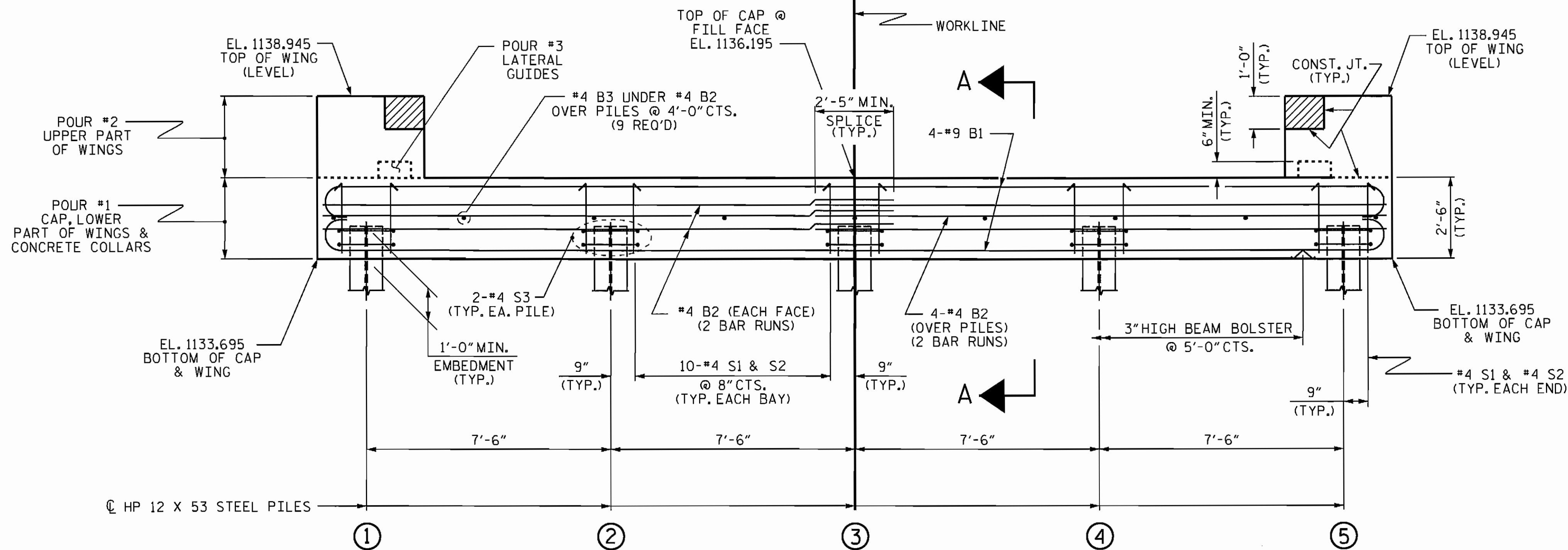
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PLAN



ELEVATION

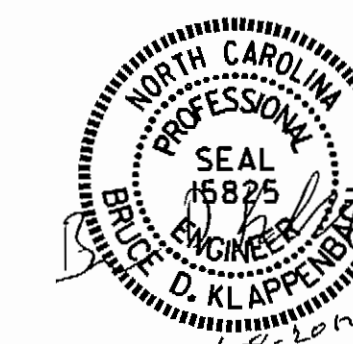
WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
STATION: 12+30.75 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY : D. A. GLADDEN DATE : 4-10-12  
CHECKED BY : B. KLAPPENBACH DATE : 5-11-12

DRAWN BY : DGE 02/10  
CHECKED BY : MKT 02/10

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

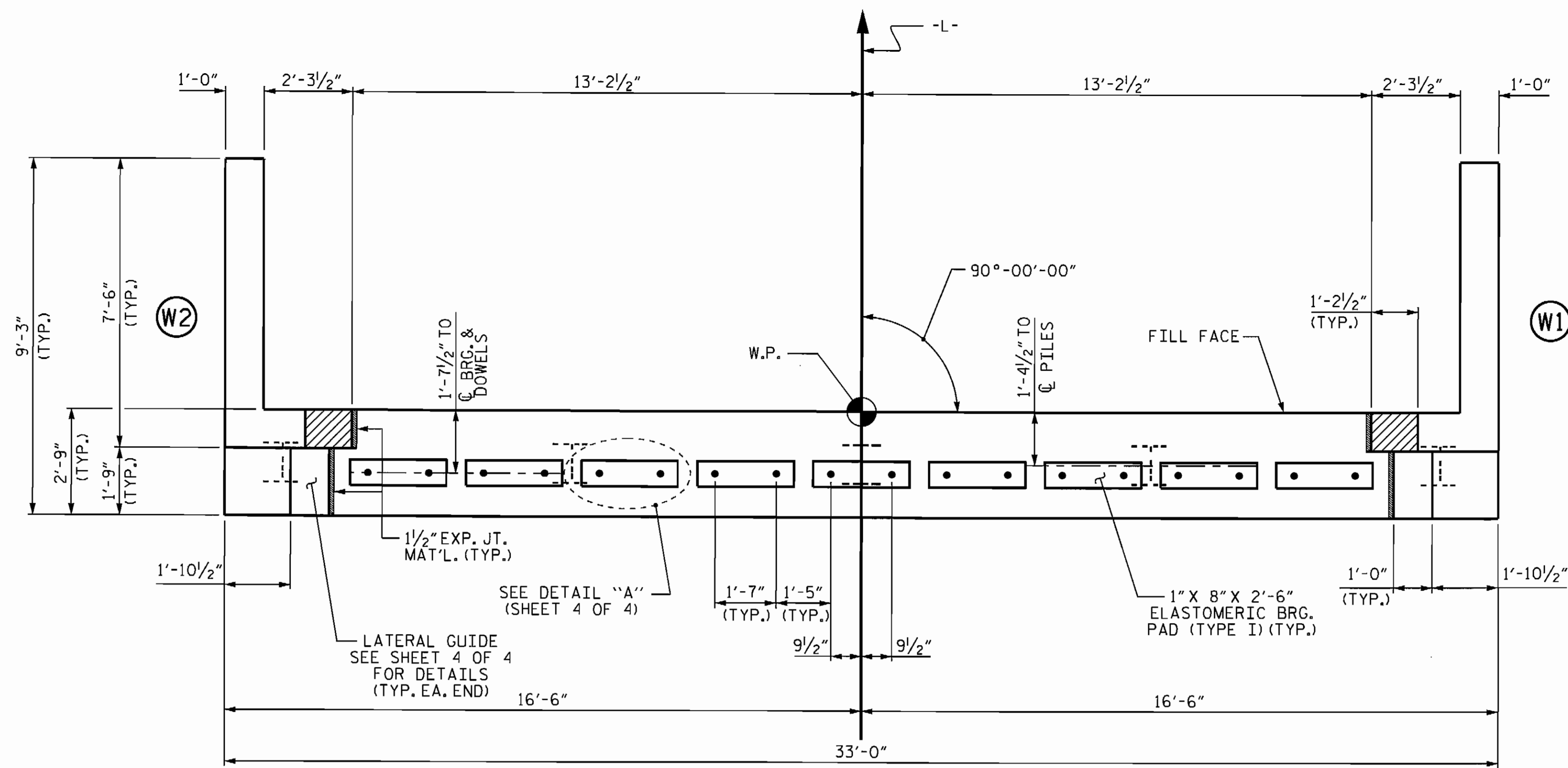
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

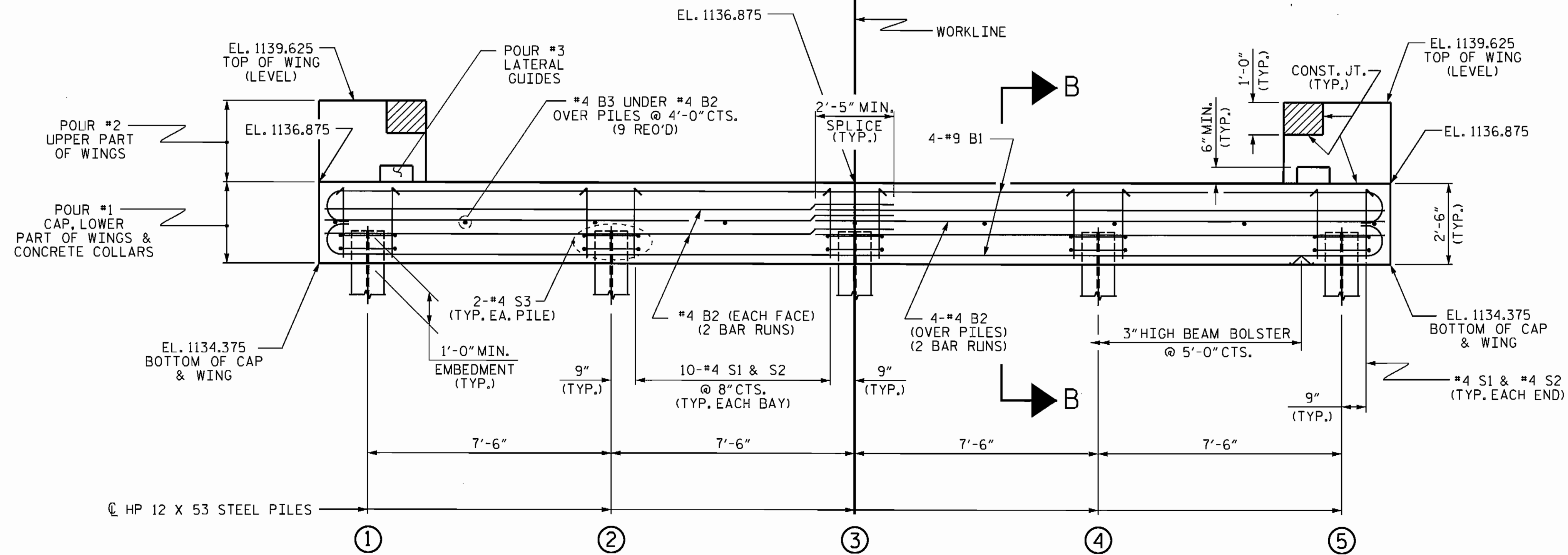
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PLAN



ELEVATION

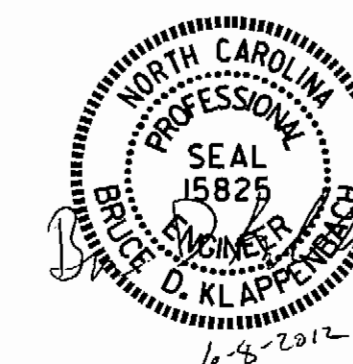
WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
STATION: 12+30.75 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 2



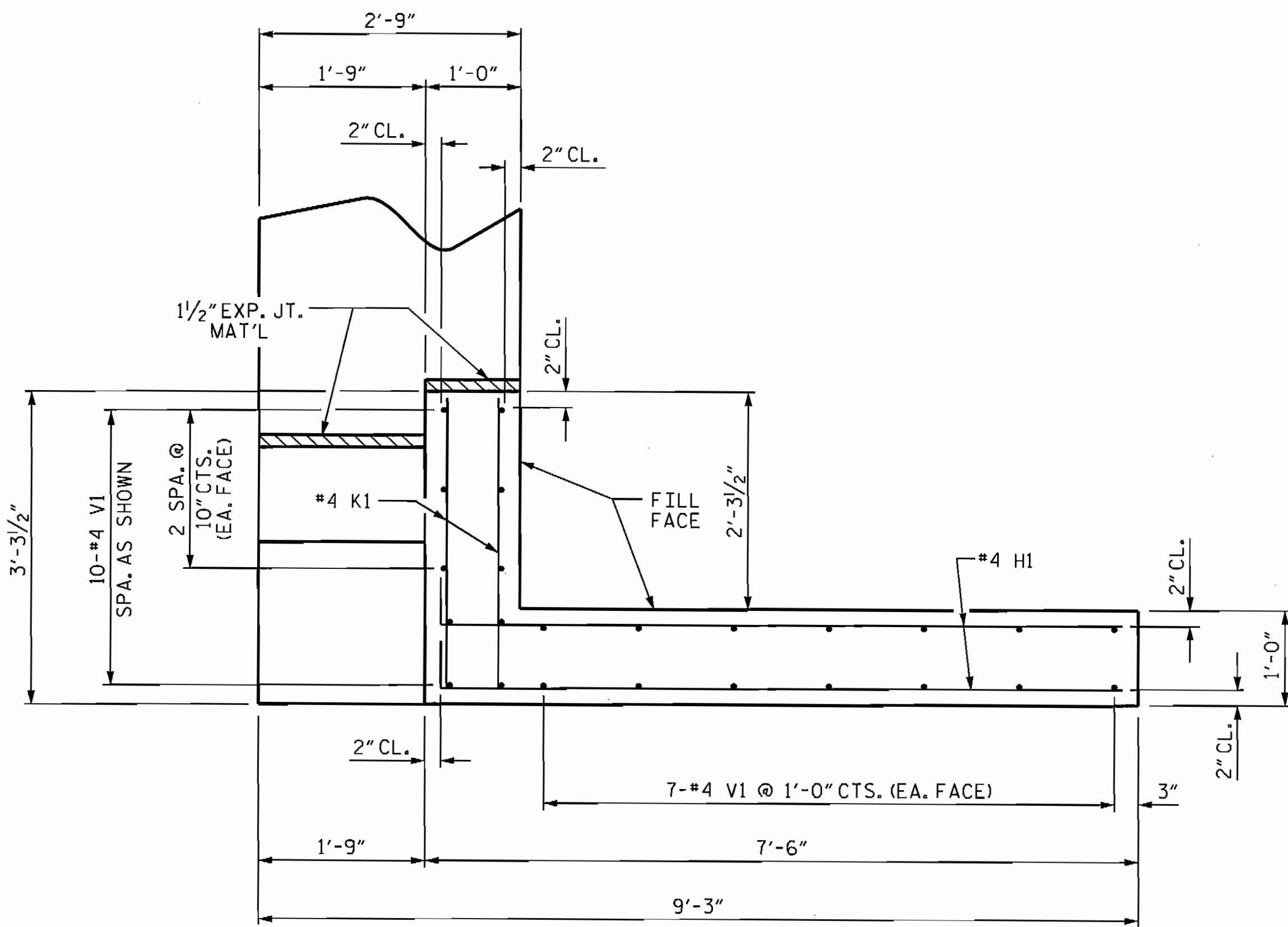
ASSEMBLED BY : D. A. GLADDEN DATE : 4-10-12  
CHECKED BY : B. KLAPPENBACH DATE : 5-11-12

DRAWN BY : DGE 02/10  
CHECKED BY : MKT 02/10

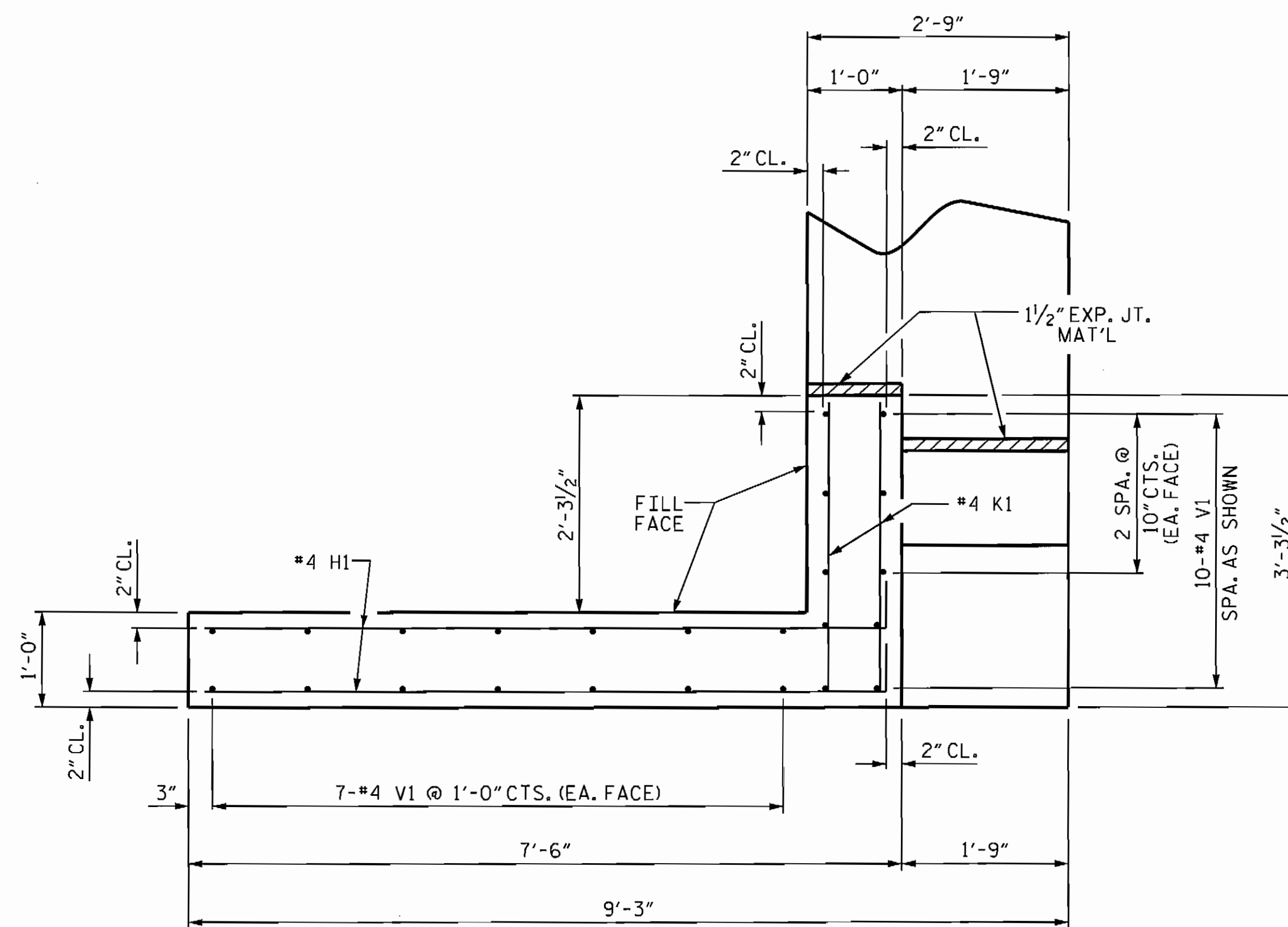
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bklappenbach

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

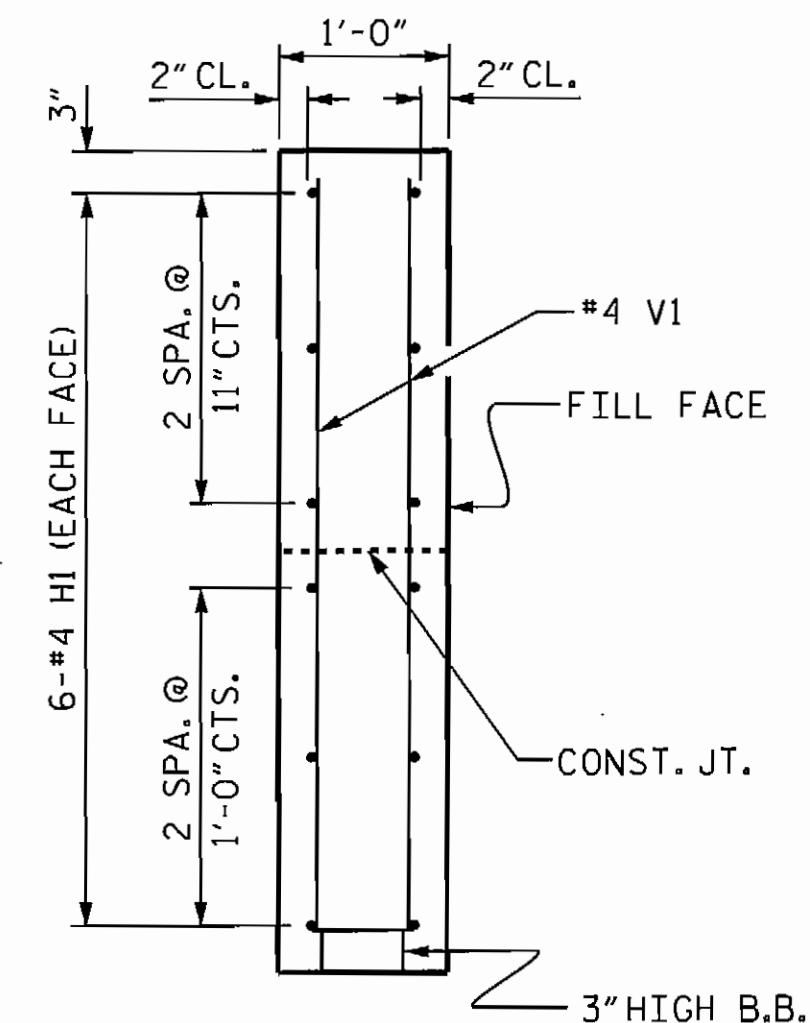
STD. NO. EB\_27\_90S



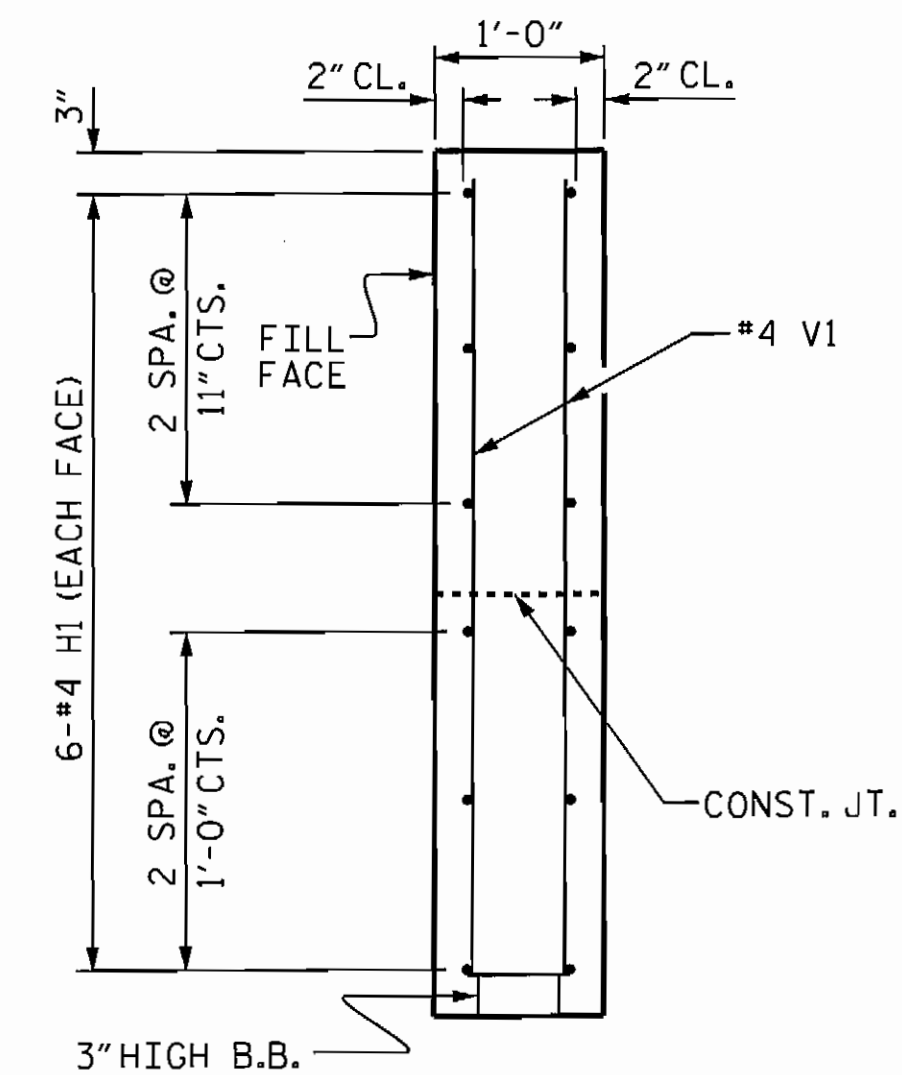
PLAN OF WING (W1)



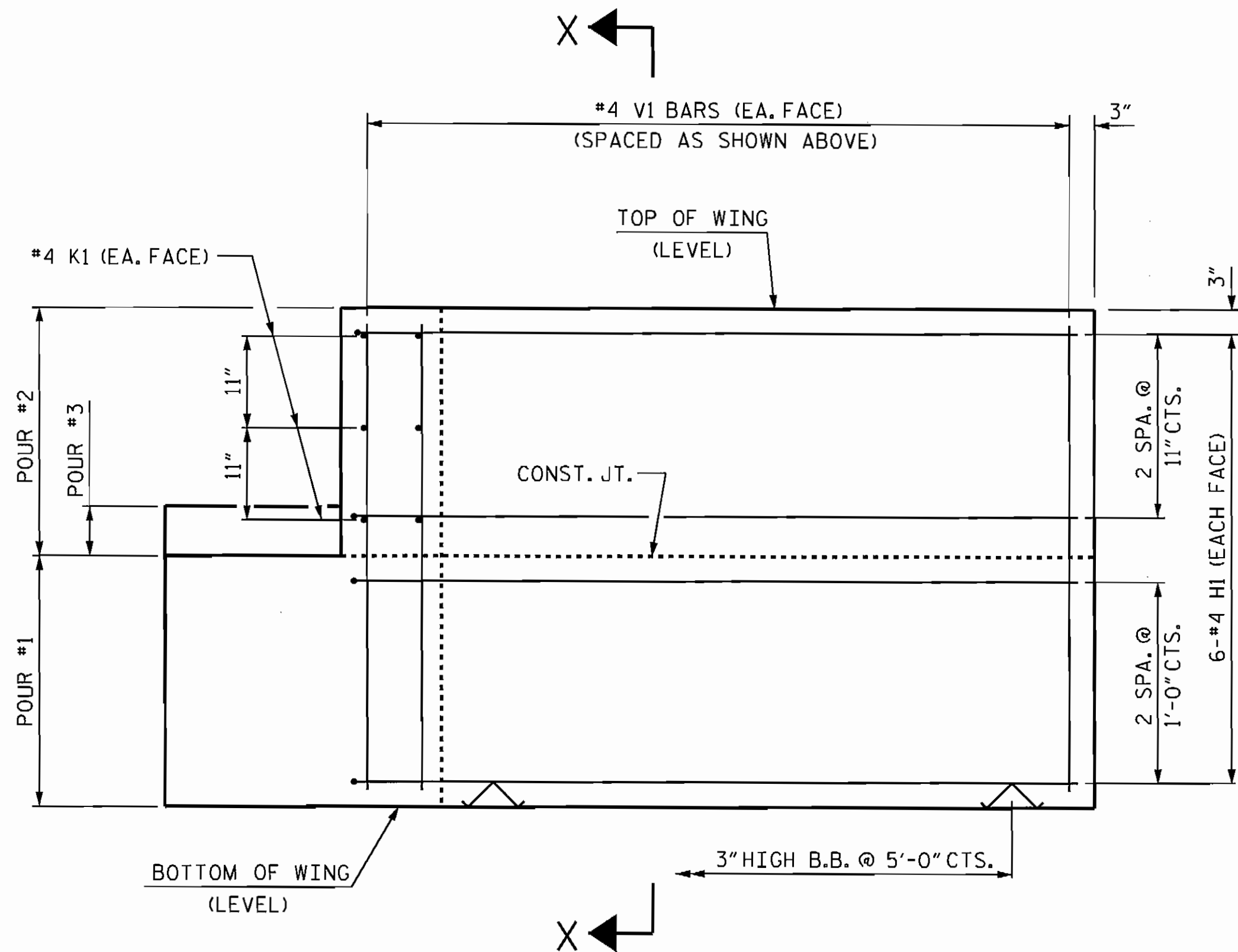
PLAN OF WING (W2)



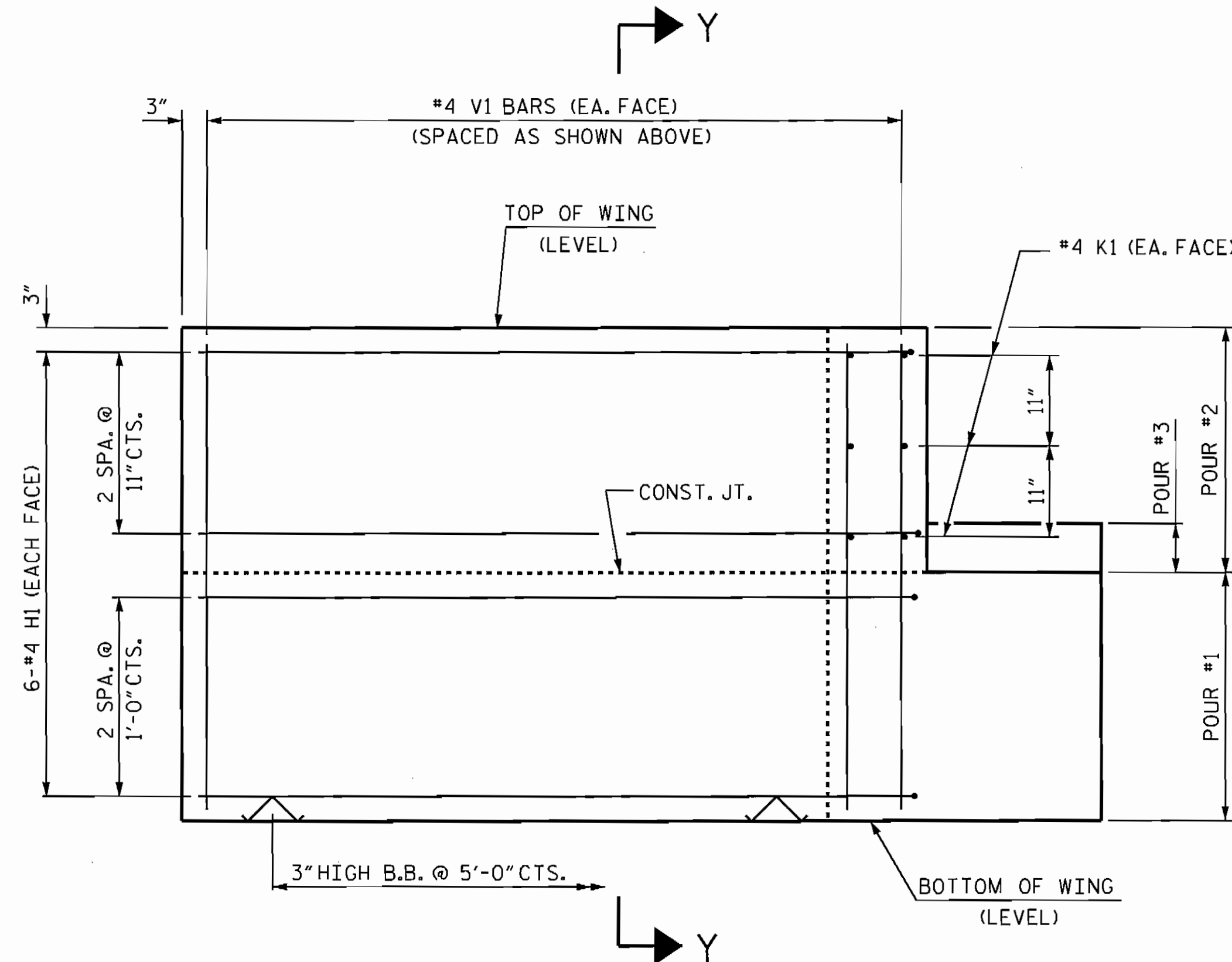
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

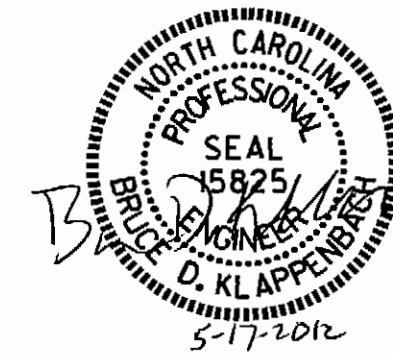


ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : D. A. GLADDEN DATE : 4-10-12  
 CHECKED BY : B. KLAPPENBACH DATE : 5-11-12  
 DRAWN BY : DGE 02/10  
 CHECKED BY : MKT 02/10

17-MAY-2012 11:53  
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 bkloppenbach



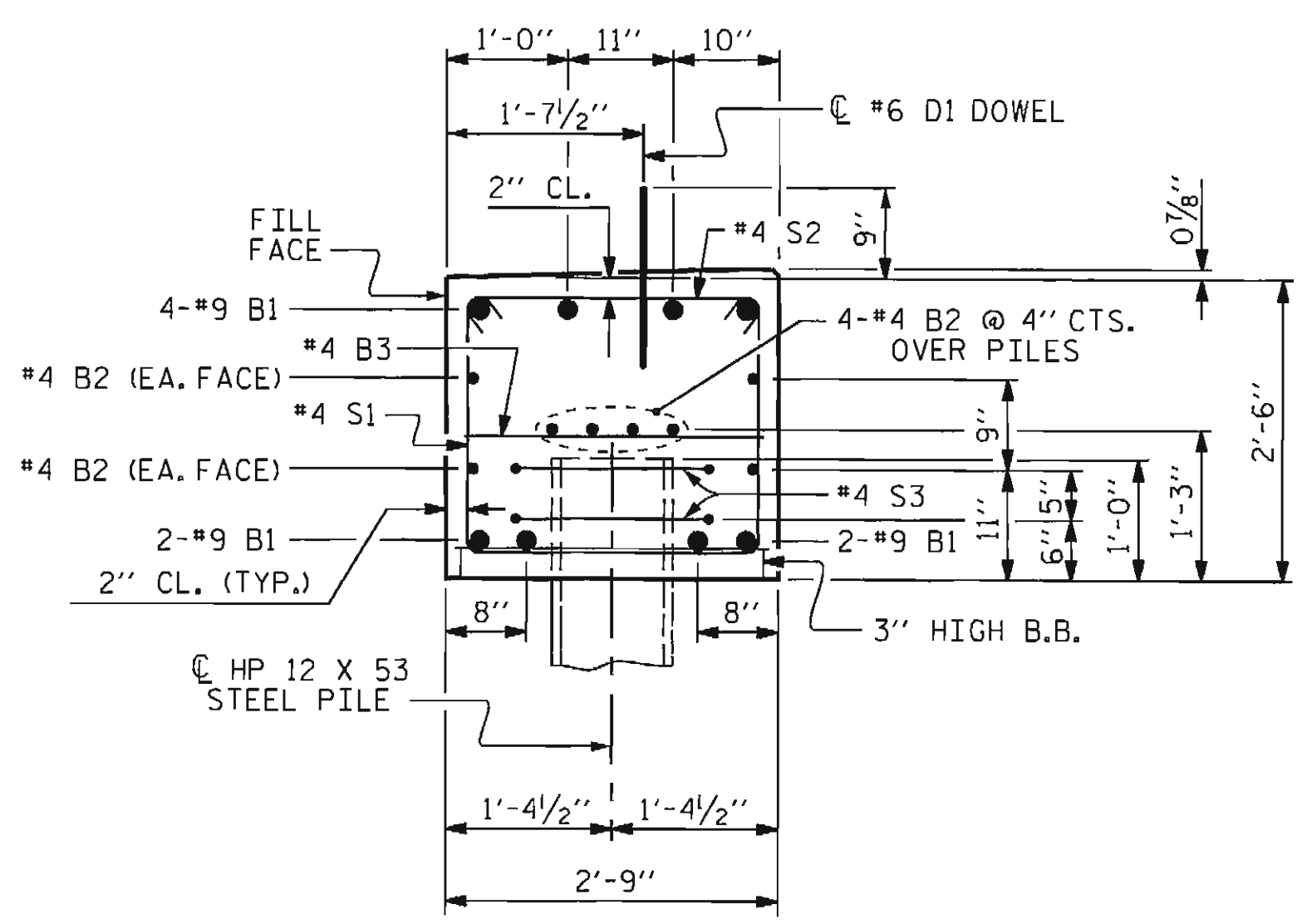
PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

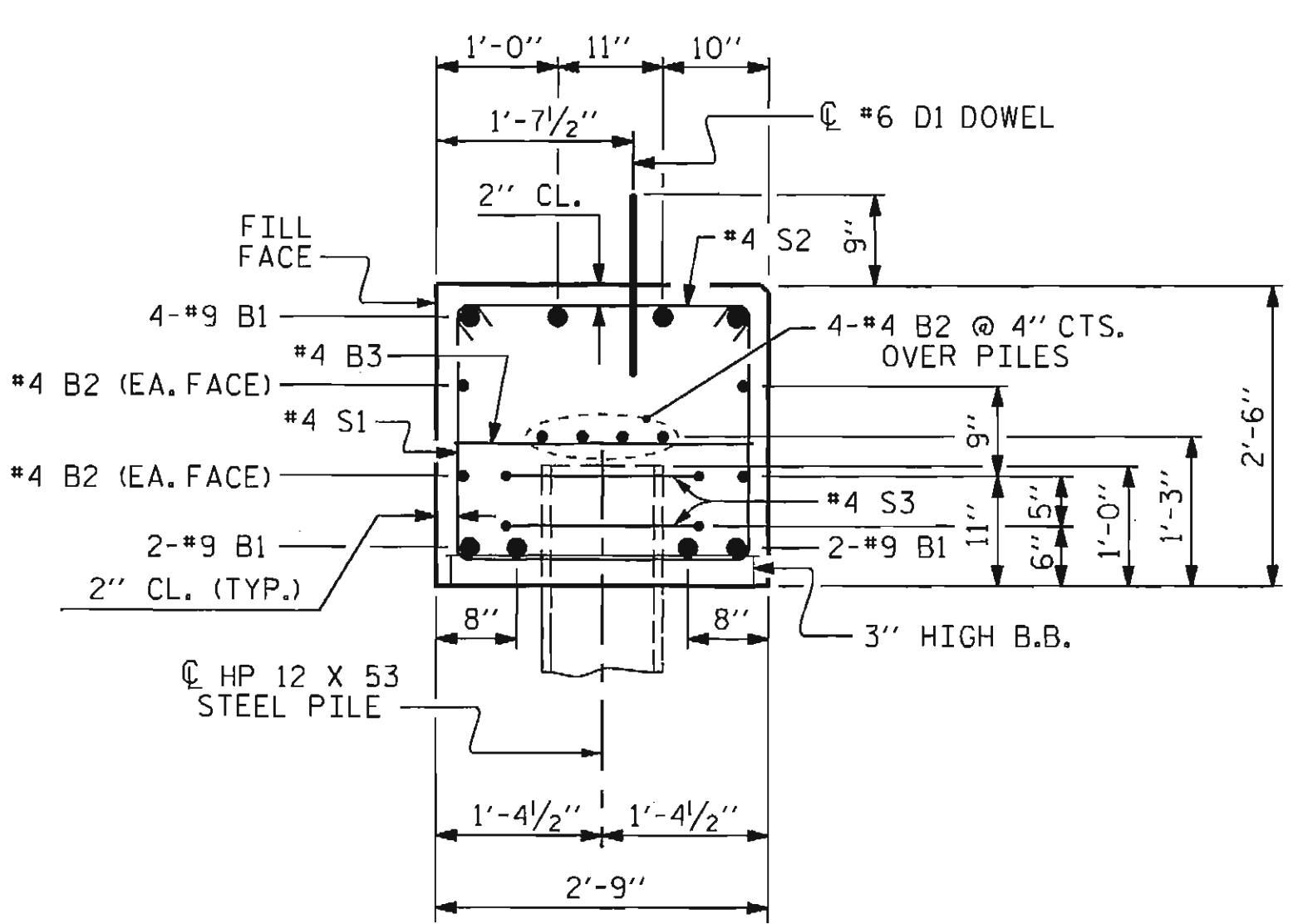
SHEET NO.  
S-13  
TOTAL SHEETS  
16

STD. NO. EB-27-90S



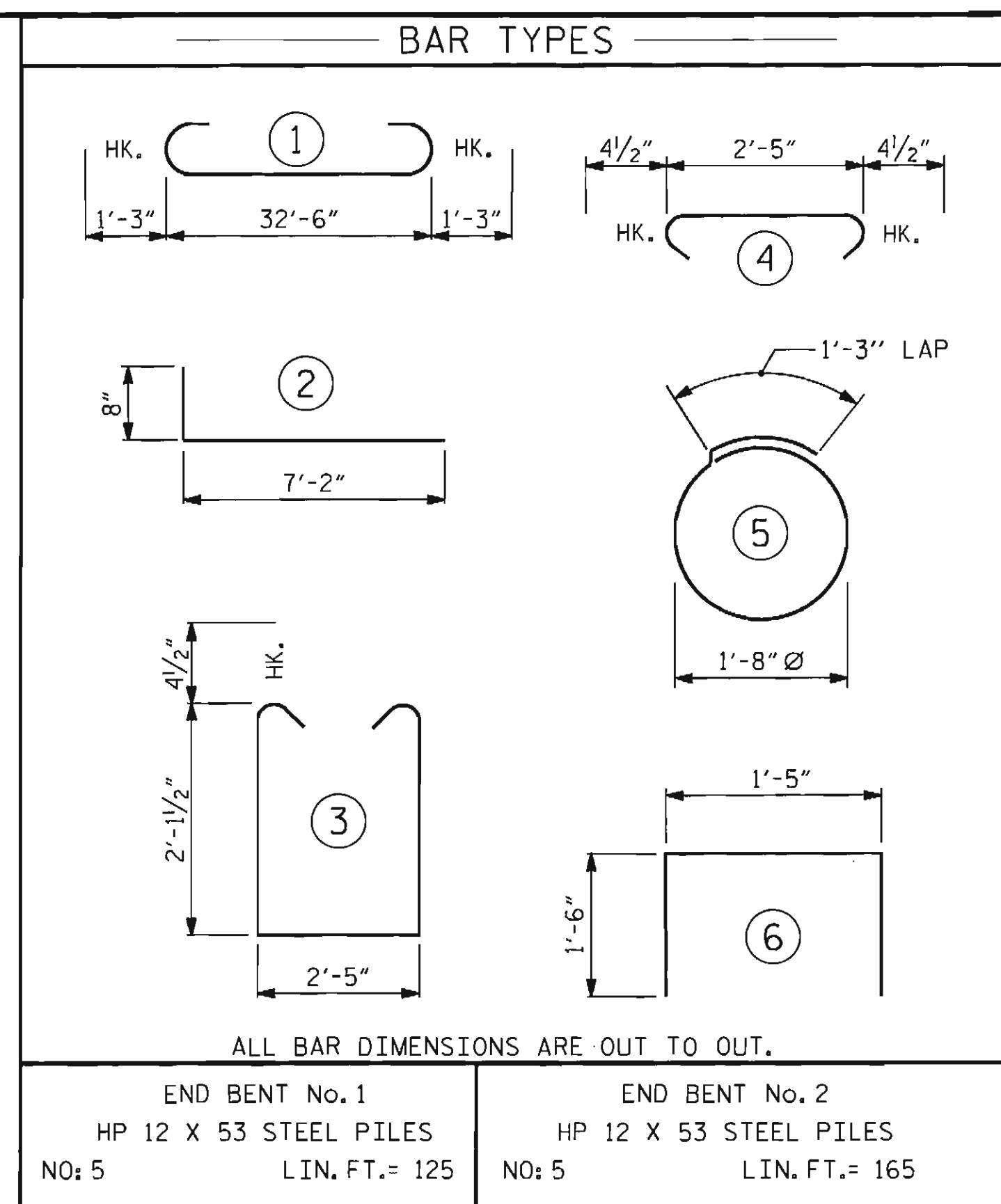
**SECTION A-A**

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



**SECTION B-B**

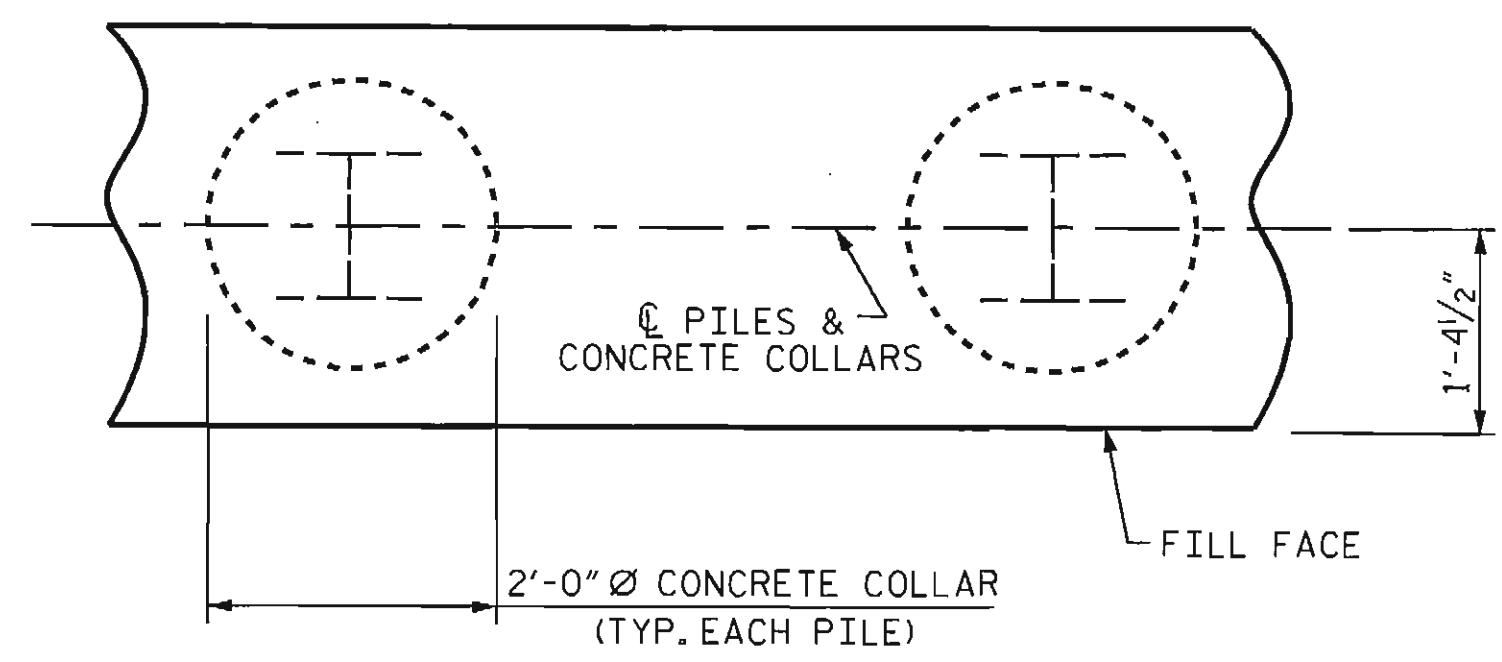
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1 HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 125	END BENT No. 2 HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 165
---	---

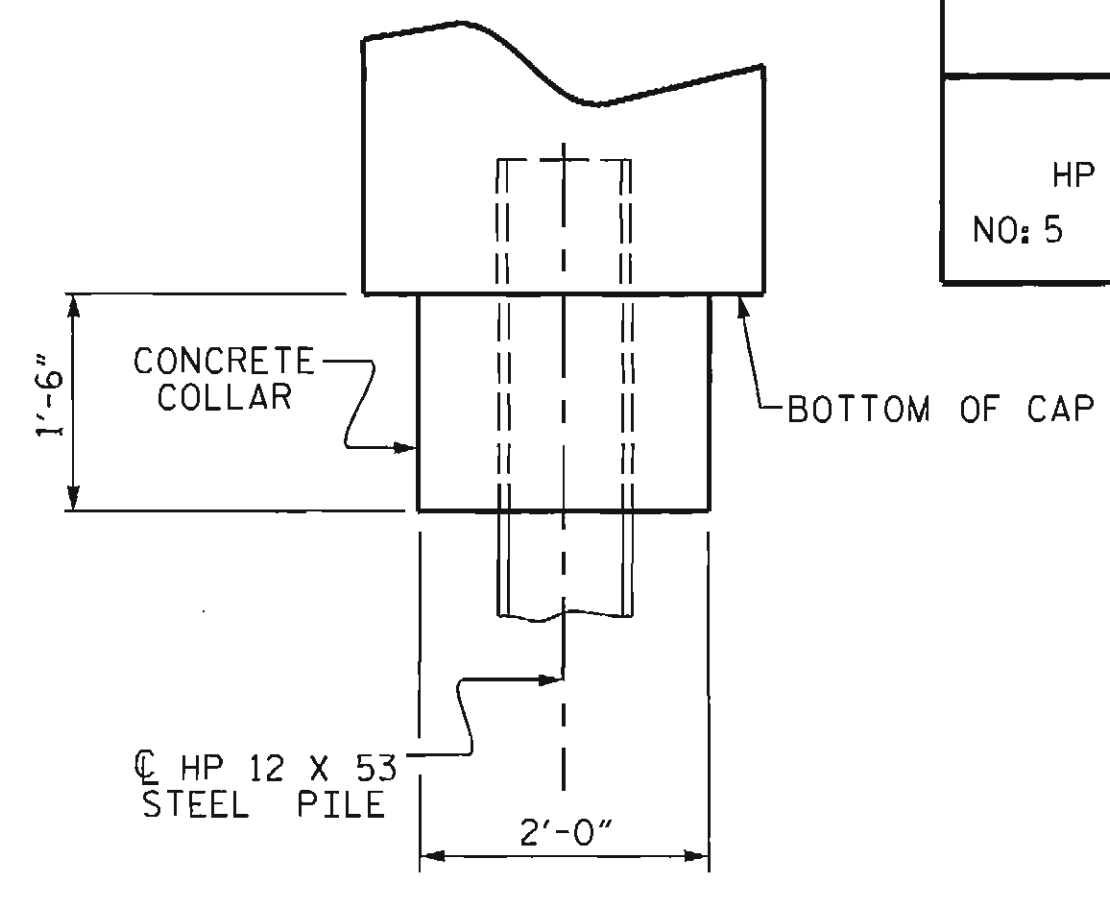
BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	16	#4	STR	17'-7"	188
B3	9	#4	STR	2'-5"	15
D1	18	#6	STR	1'-6"	41
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	42	#4	3	7'-5"	208
S2	42	#4	4	3'-2"	89
S3	10	#4	5	6'-6"	43
S4	4	#4	6	4'-5"	12
V1	48	#4	STR	4'-8"	150
REINFORCING STEEL (FOR ONE END BENT)					1847 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					10.5 C.Y.
POUR #2 UPPER PART OF WINGS					2.0 C.Y.
POUR #3 LATERAL GUIDES					0.1 C.Y.
TOTAL CLASS A CONCRETE					12.6 C.Y.



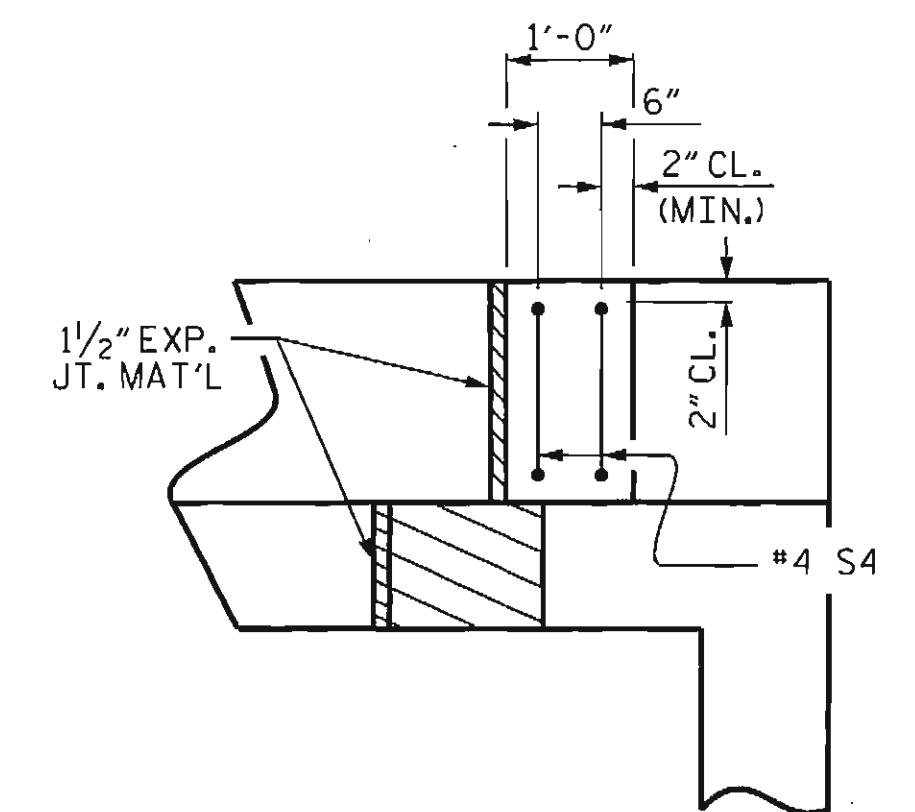
**PLAN**

**CORROSION PROTECTION FOR STEEL PILES DETAIL**

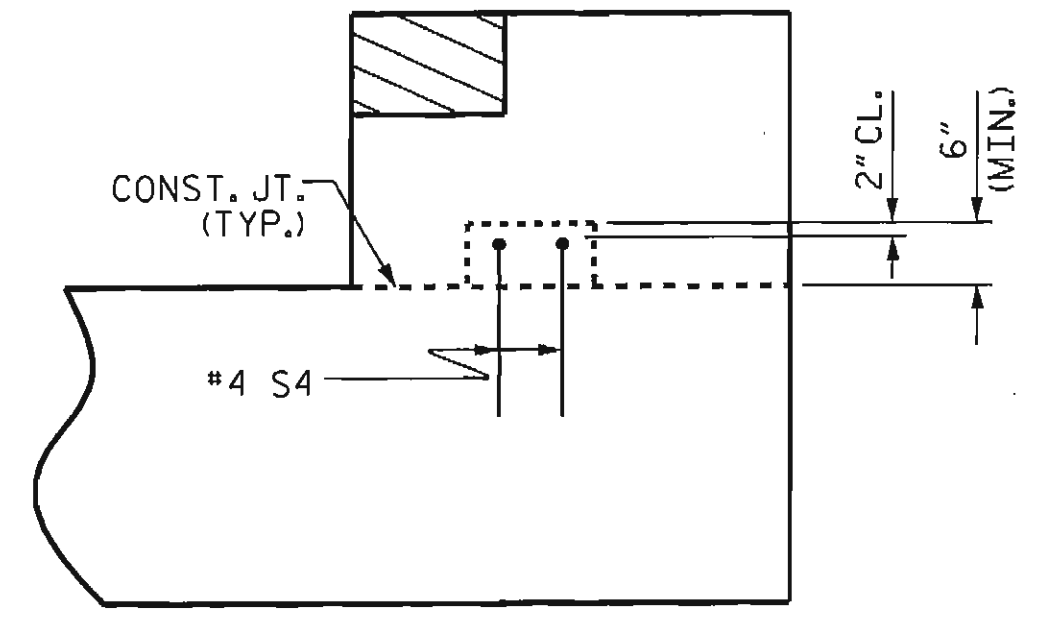
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



**ELEVATION**



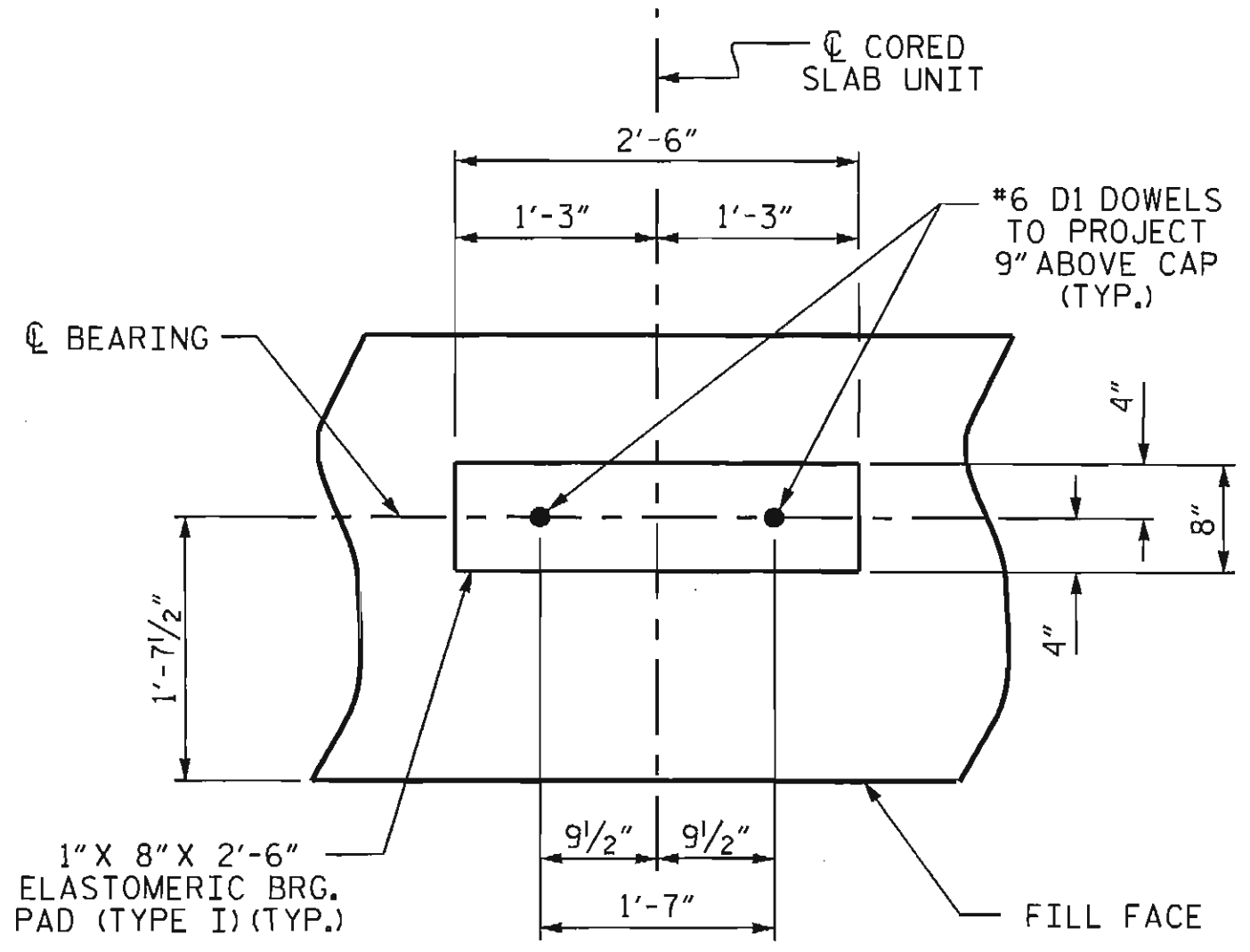
**PLAN**



**ELEVATION**

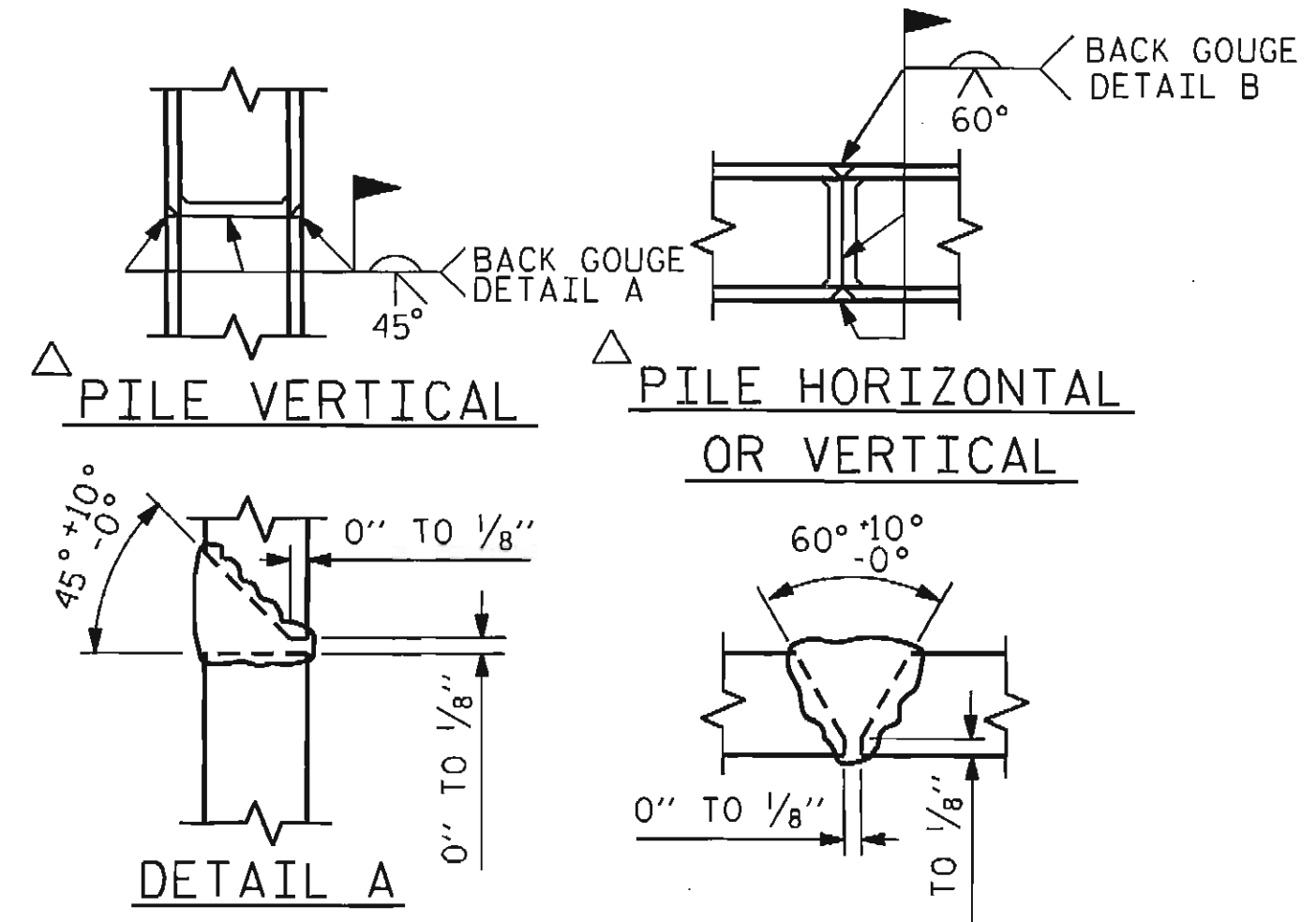
**LATERAL GUIDE DETAILS**

(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)

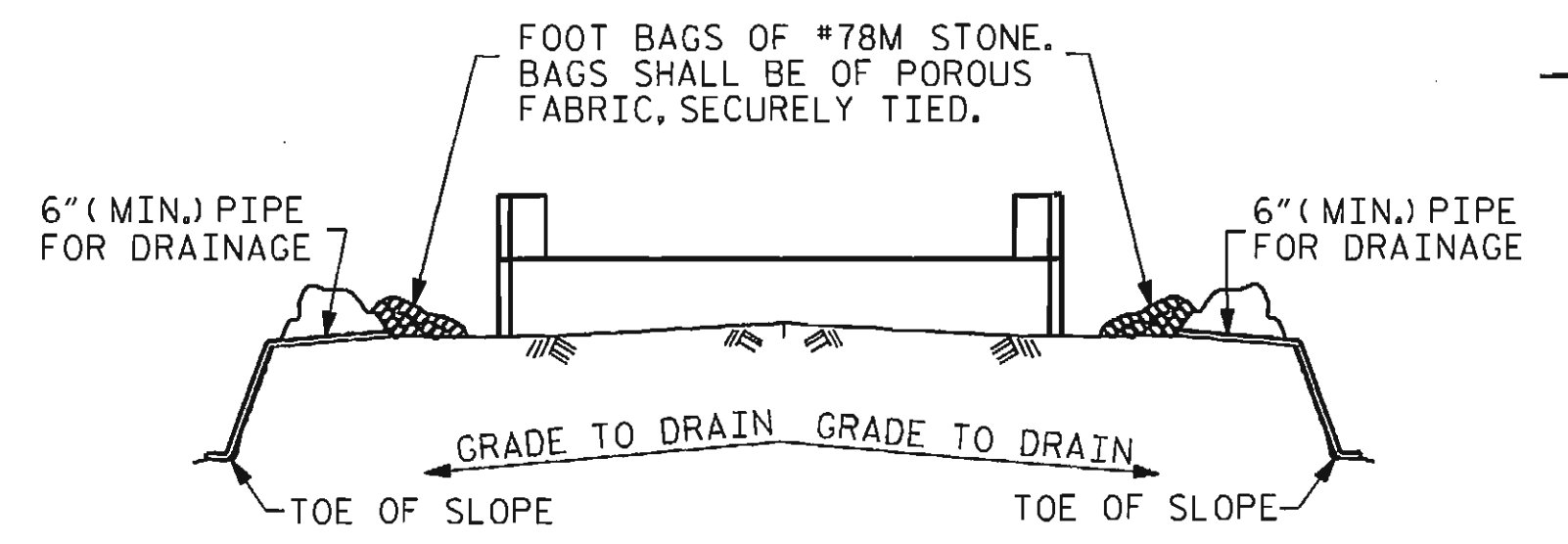


**DETAIL "A"**

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION) MINIMUM OF 3- ONE CUBIC



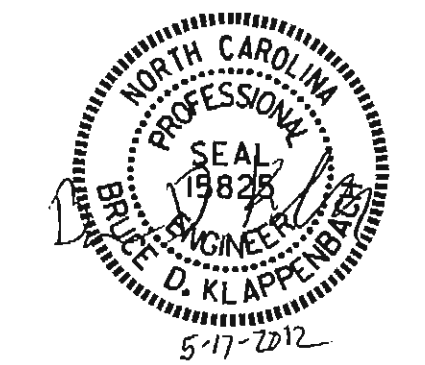
**PILE SPLICE DETAILS**



**TEMPORARY DRAINAGE AT END BENT**

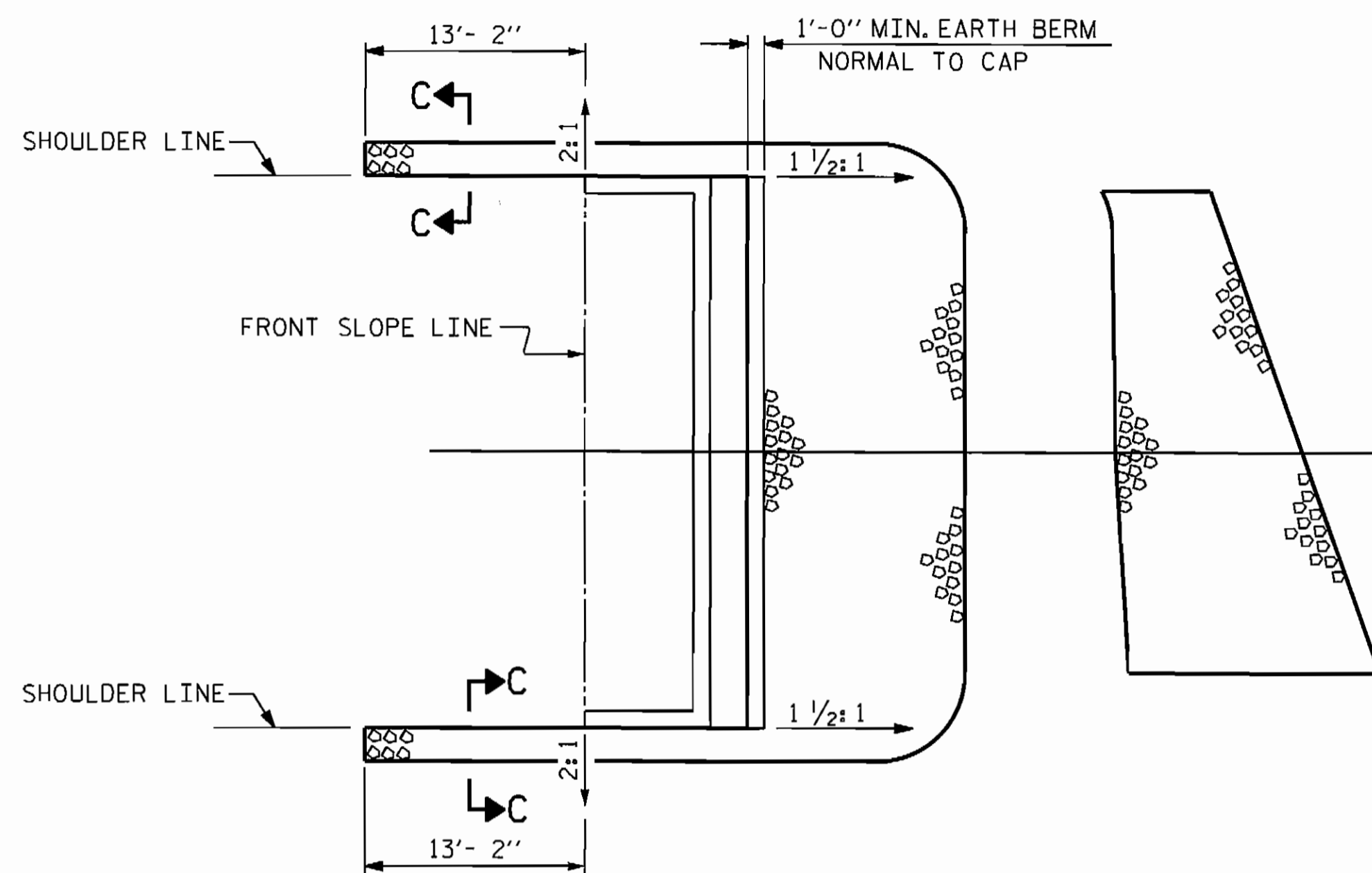
ASSEMBLED BY: D. A. GLADDEN	DATE: 4-10-12
CHECKED BY: B. KLAPPENBACH	DATE: 5-11-12
DRAWN BY: DGE	02/10
CHECKED BY: MKT	02/10

17-MAY-2012 11:53 R:\Structures\FINAL PLANS\BD5111L.SD\_AB.dgn bklappenbach

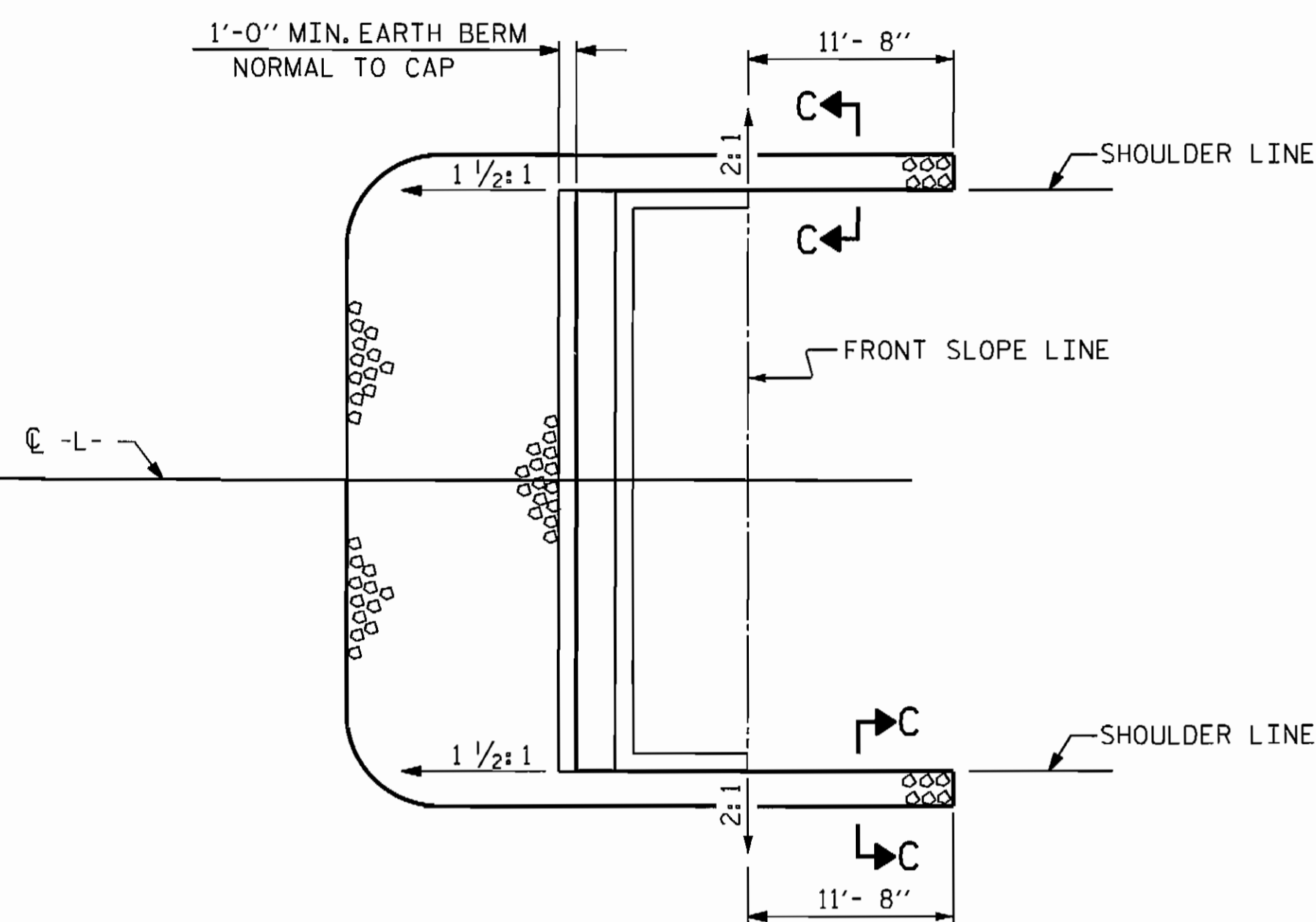


PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

SHEET 4 OF 4					
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1 & 2 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					16

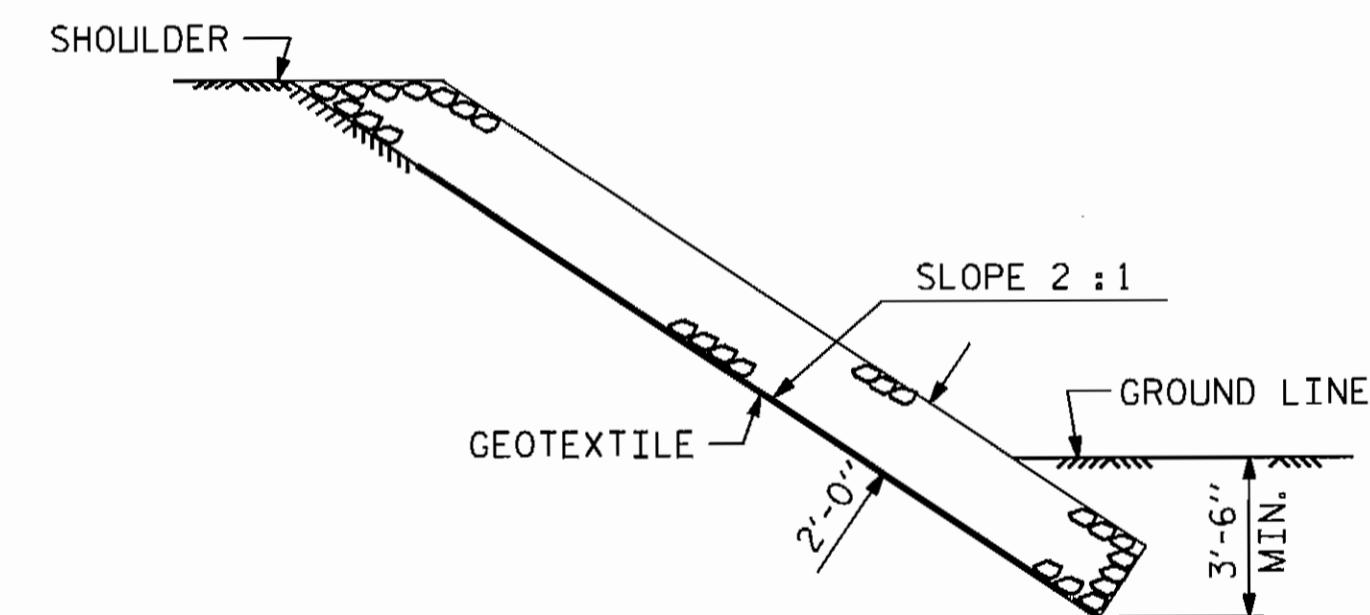


PLAN OF RIP RAP AT END BENT 1

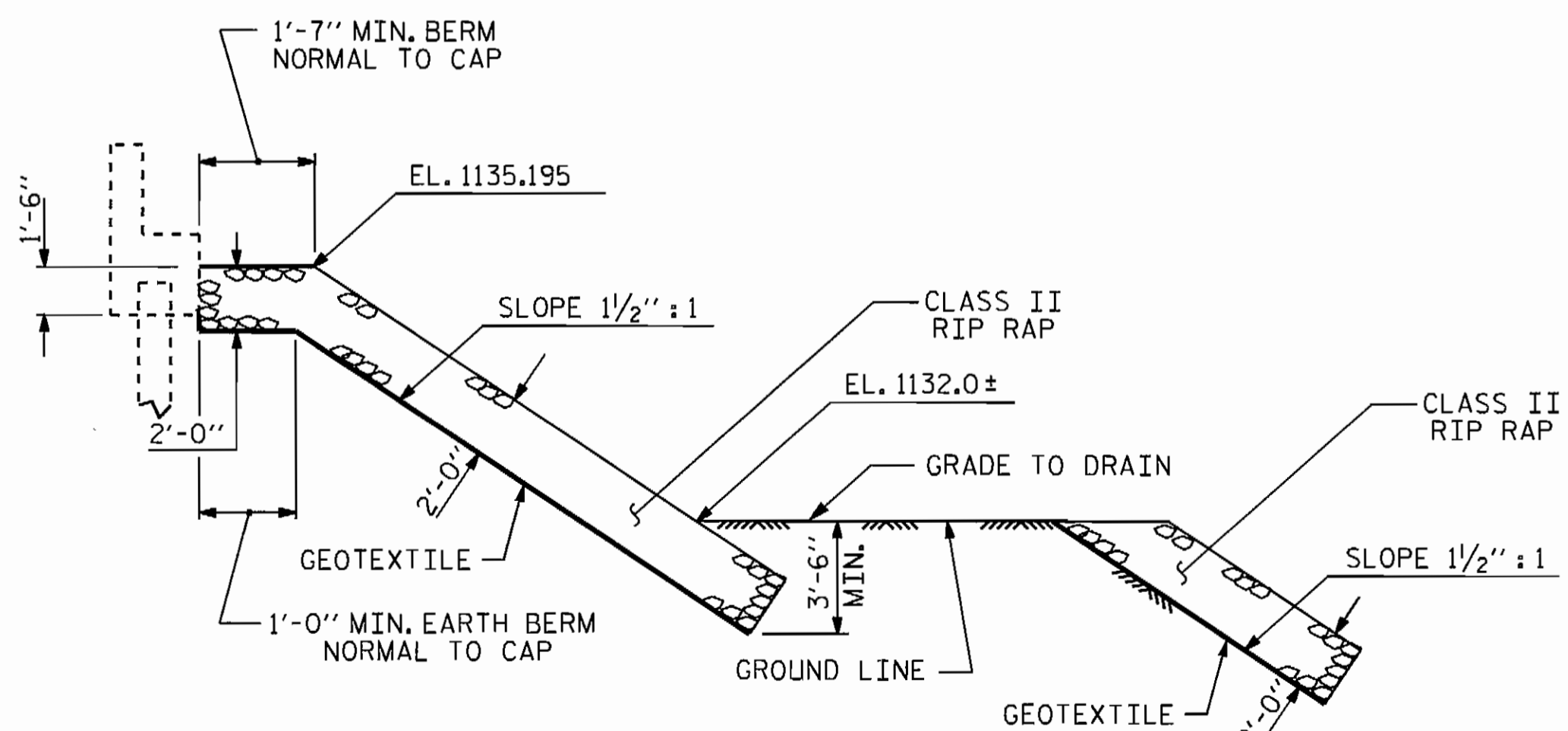


PLAN OF RIP RAP AT END BENT 2

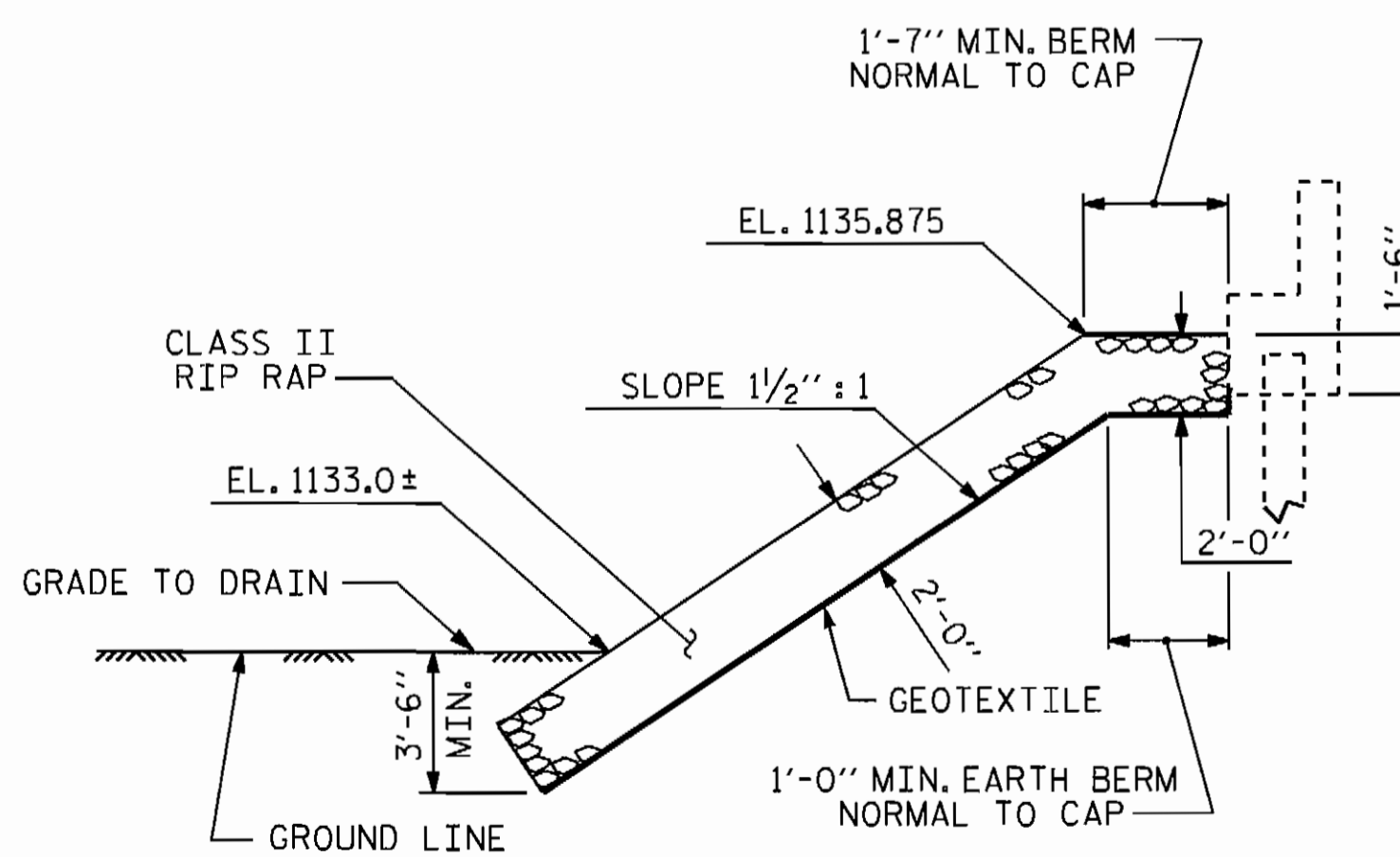
ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+30.75 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	150	165
END BENT 2	105	115
TOTAL	255	280



SECTION C-C



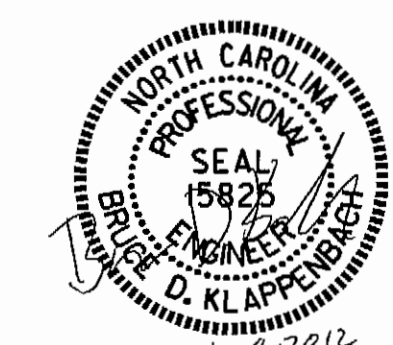
SECTION AT END BENT #1



SECTION AT END BENT #2

PROJECT NO. BD-5111L  
CALDWELL COUNTY  
 STATION: 12+30.75 -L-

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



ASSEMBLED BY : D. A. GLADDEN DATE : 4-19-12  
 CHECKED BY : B. KLAPPENBACH DATE : 5-11-12  
 DRAWN BY : REK 1/84  
 CHECKED BY : RDU 1/84

REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM  
 REV. 12/21/11 MAA/GM



NOTES

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

GEOTEXTILE SHALL BE TYPE I 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.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	25'-10"	224
A2	13	#4	STR	25'-10"	224
*B1	52	#5	STR	11'-2"	606
B2	52	#6	STR	11'-8"	911

REINFORCING STEEL	LBS.	1135
* EPOXY COATED REINFORCING STEEL	LBS.	830

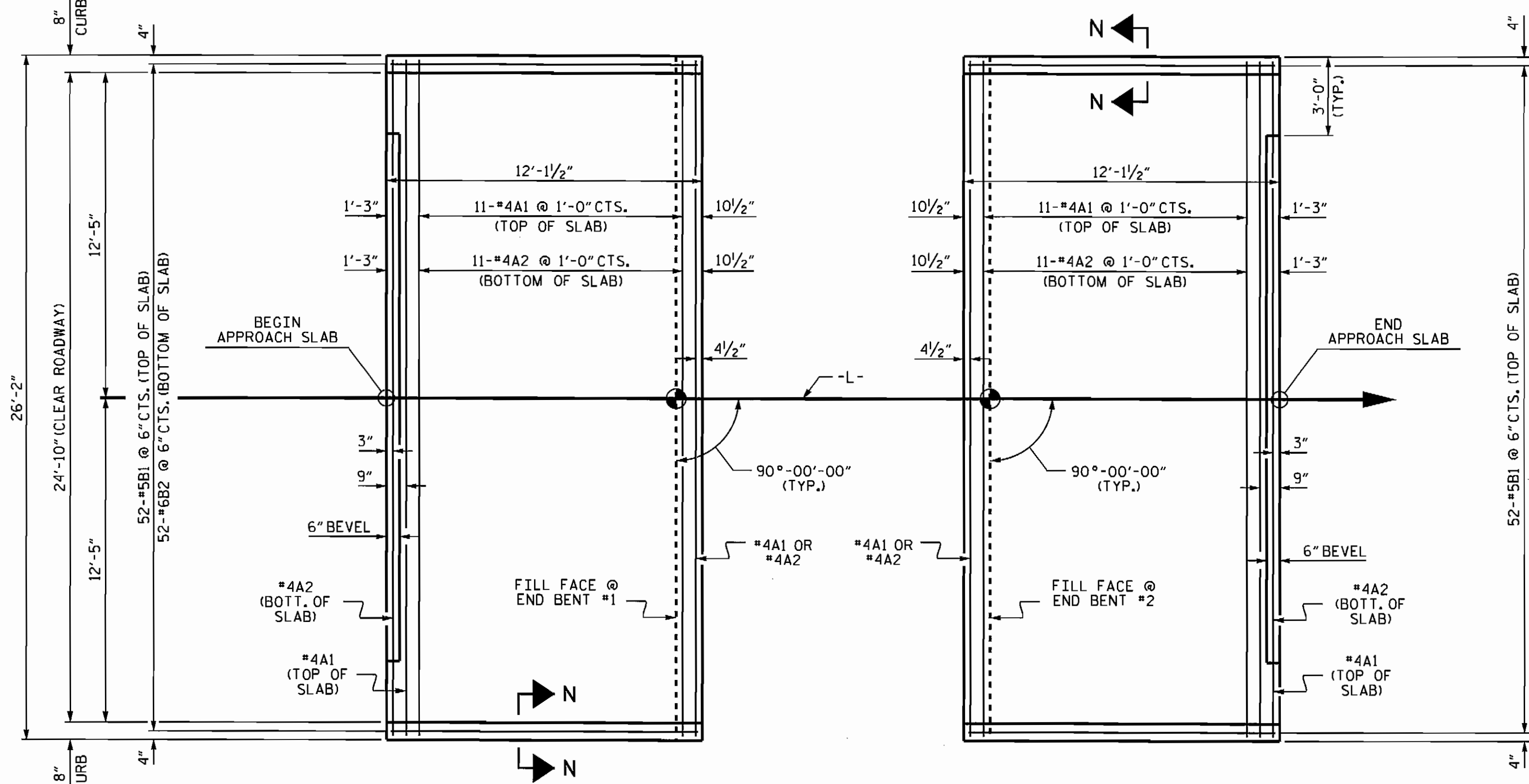
CLASS AA CONCRETE	C. Y.	16.3
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APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	25'-10"	224
A2	13	#4	STR	25'-10"	224
*B1	52	#5	STR	11'-2"	606
B2	52	#6	STR	11'-8"	911

REINFORCING STEEL	LBS.	1135
* EPOXY COATED REINFORCING STEEL	LBS.	830

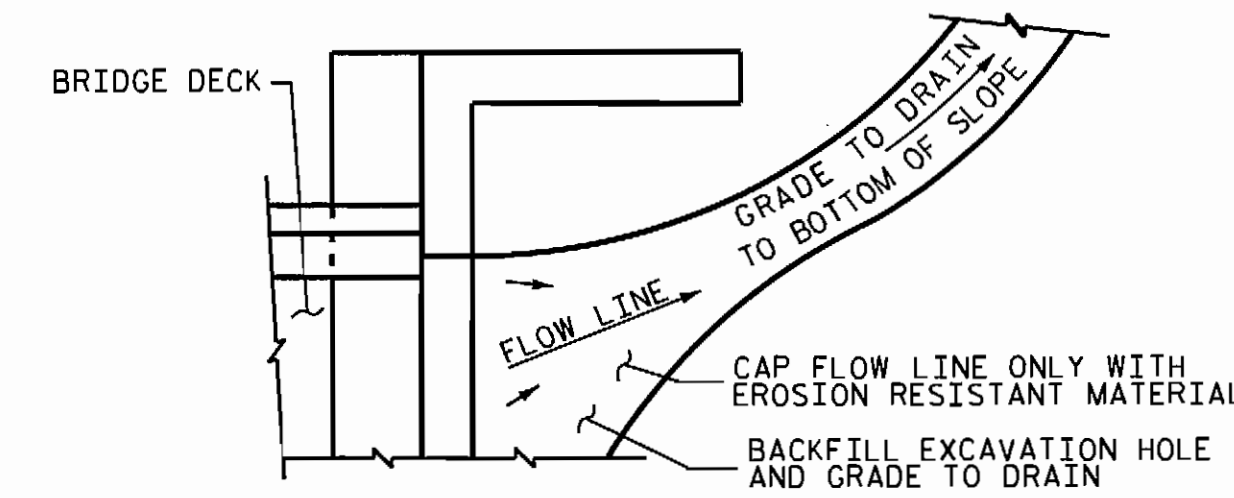
CLASS AA CONCRETE	C. Y.	16.3
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PLAN @ END BENT #1

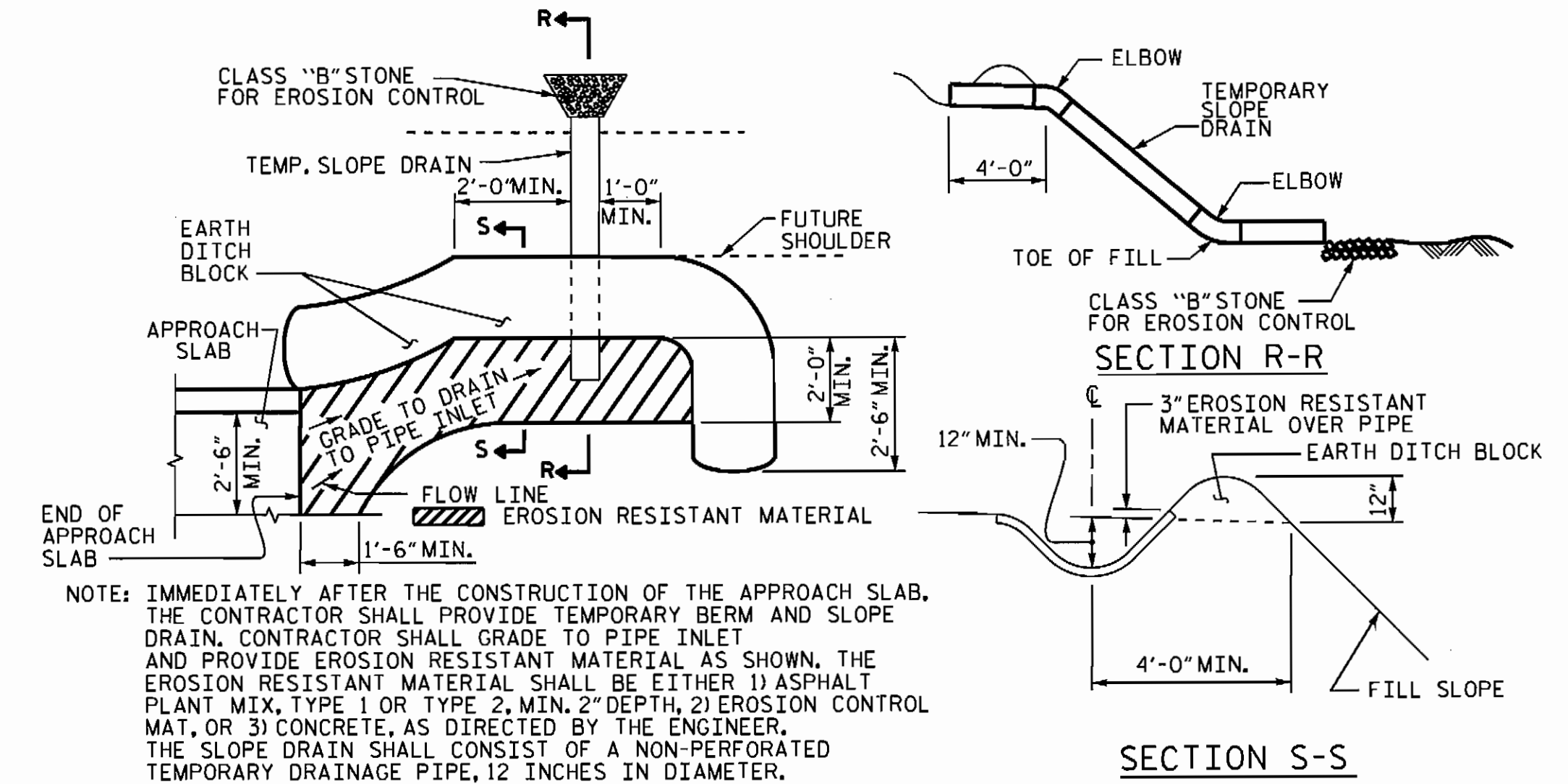
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



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.

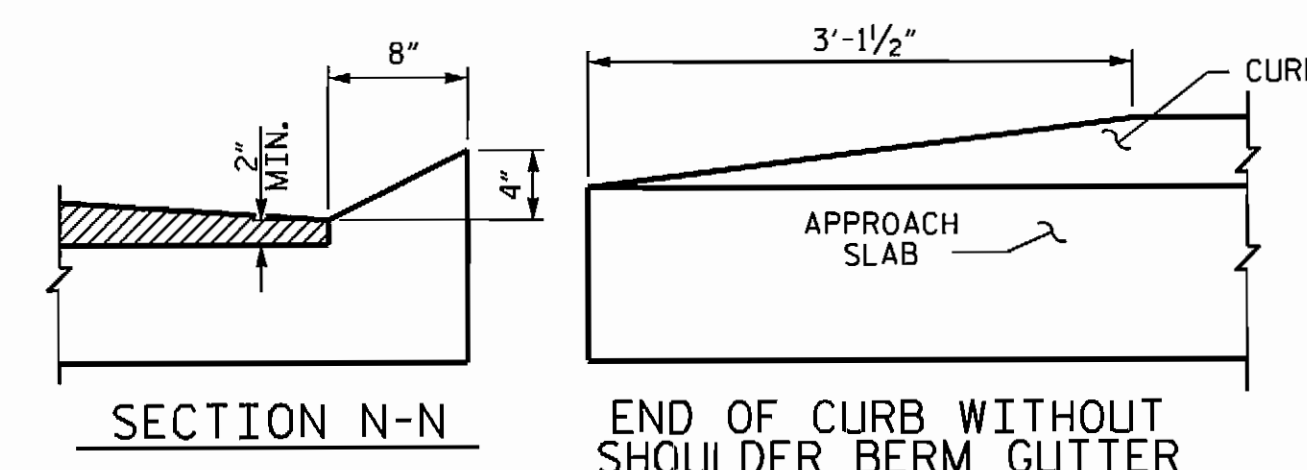
TEMPORARY DRAINAGE DETAIL



PLAN VIEW

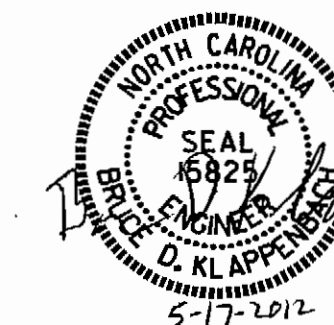
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

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



PROJECT NO. BD-5111L  
 CALDWELL COUNTY  
 STATION: 12+30.75 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 (SUB-REGIONAL TIER)  
 90° SKEW

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

ASSEMBLED BY : D. A. CLADDEN DATE : 4-18-12  
 CHECKED BY : B. KLAPPENBACH DATE : 5-11-12  
 DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC  
 CHECKED BY : BCH 5-09

## 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 SO. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SO. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SO. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SO. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SO. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SO. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SO. 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. FINIS 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.

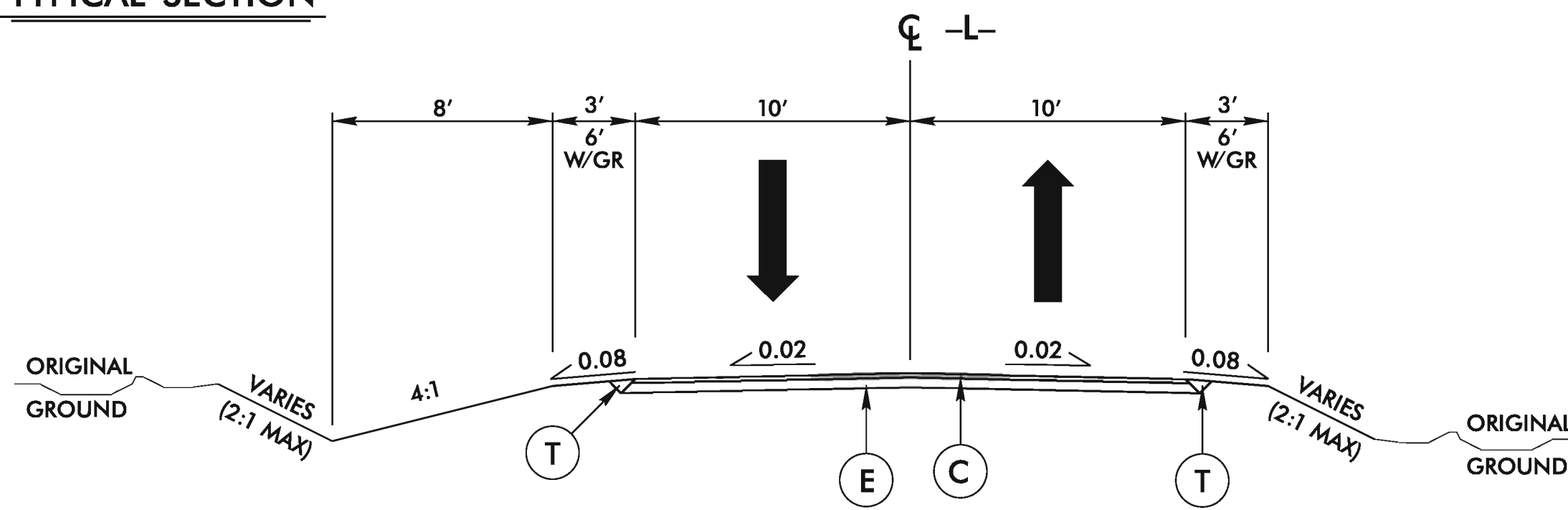
ENGLISH

JANUARY, 1990

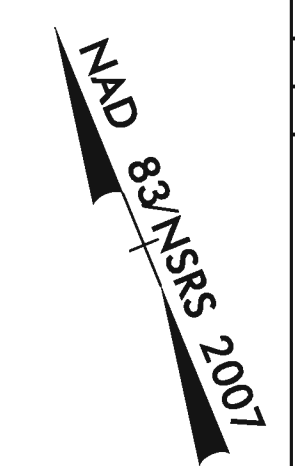
STD. NO. SN

8/17/99

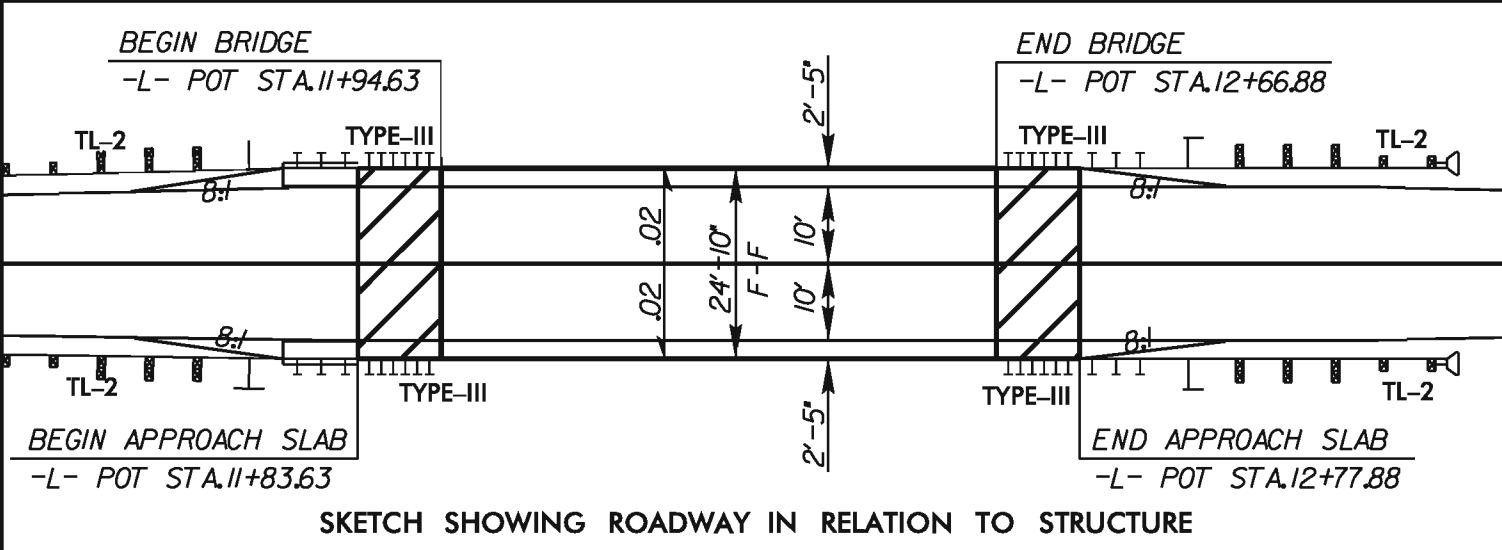
TYPICAL SECTION



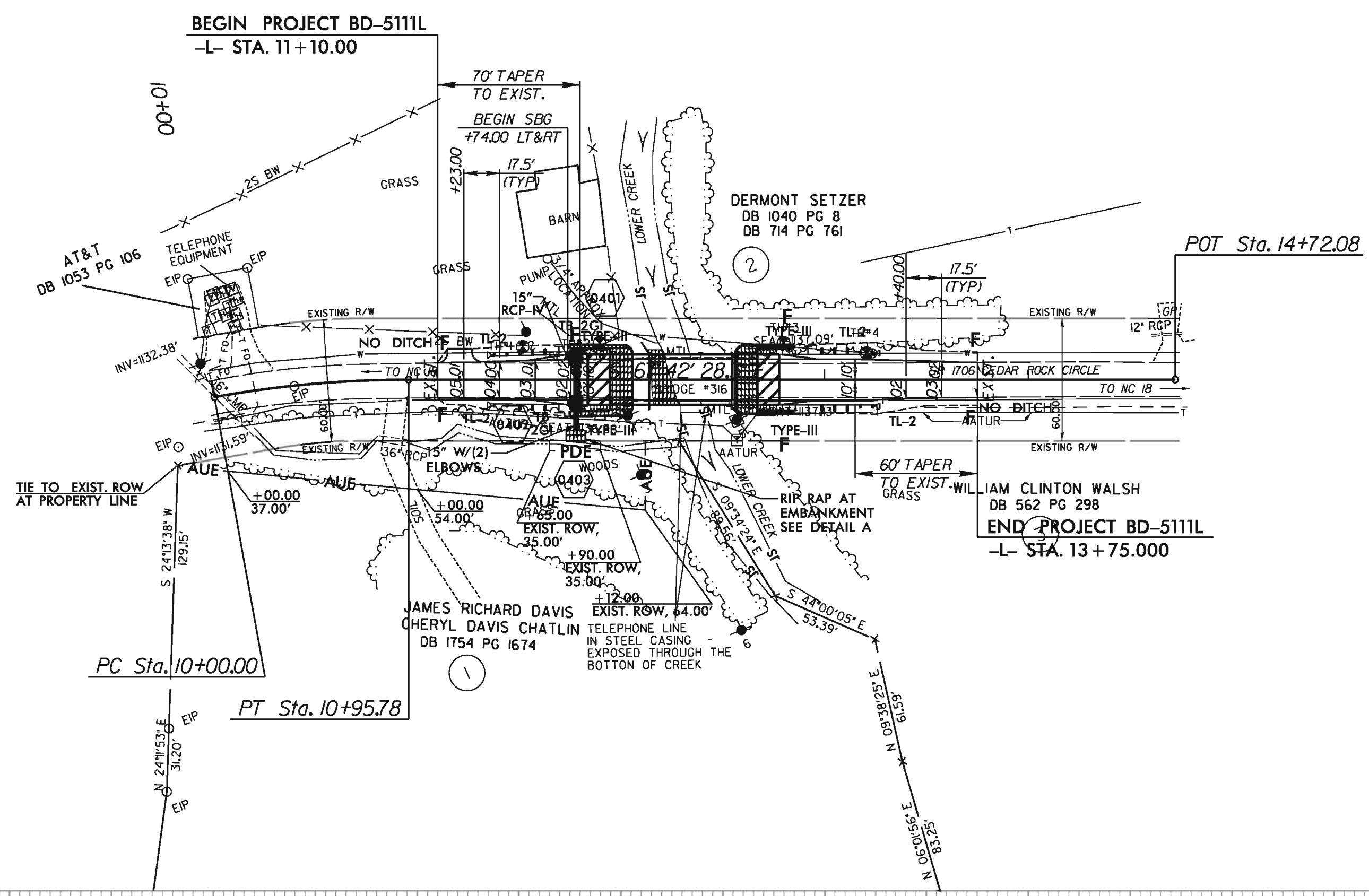
-L-  
 PI Sta 10+48.02  
 $\Delta = 10^\circ 15' 27.5''$  (RT)  
 $D = 10^\circ 42' 34.2''$   
 $L = 95.78'$   
 $T = 48.02'$   
 $R = 535.00'$



PROJECT REFERENCE NO. BD-5111L	SHEET NO. RDY-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Step 2 7/13/12	Elem ML 7/13/12



PAVEMENT SCHEDULE	
C	1 1/2" SURFACE COURSE, TYPE SF9.5A
E	5 1/2" BASE COURSE, TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT.
W	WEDGING



GRAPHIC SCALES

50 0 50 100  
PLANS

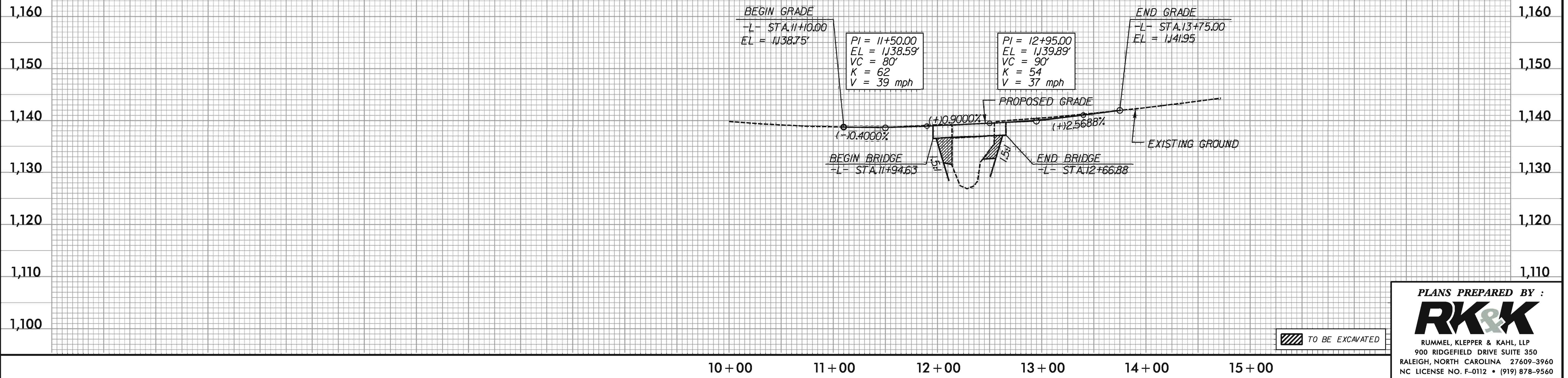
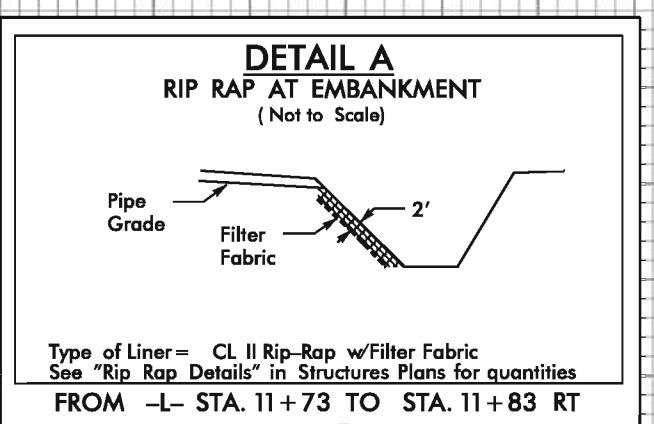
50 0 50 100  
PROFILE (HORIZONTAL)

10 0 10 20  
PROFILE (VERTICAL)

REASONABLE SPEED = 40mph  
 ADT = 210 (1999)

RIGHT-OF-WAY AREAS

PARCEL #	PROPERTY OWNER'S NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTRUCTION EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT	AERIAL UTILITY EASEMENT
1	JAMES RICHARD DAVIS	N/A	0 Ac.	N/A	N/A	0 Ac.	125 SF	0 Ac.	0.11 Ac.
2	DERMONT SETZER	N/A	0 Ac.	N/A	N/A	0 Ac.	0 Ac.	0 Ac.	0 Ac.
3	WILLIAM CLINTON WALSH	N/A	0 Ac.	N/A	N/A	0 Ac.	0 Ac.	0 Ac.	0 Ac.
4	AT&T	N/A	0 Ac.	N/A	N/A	0 Ac.	0 Ac.	0 Ac.	0 Ac.



TO BE EXCAVATED

PLANS PREPARED BY :

**RK&K**

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

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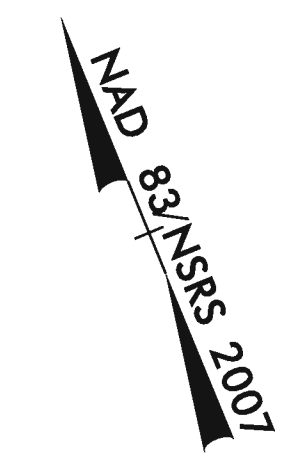
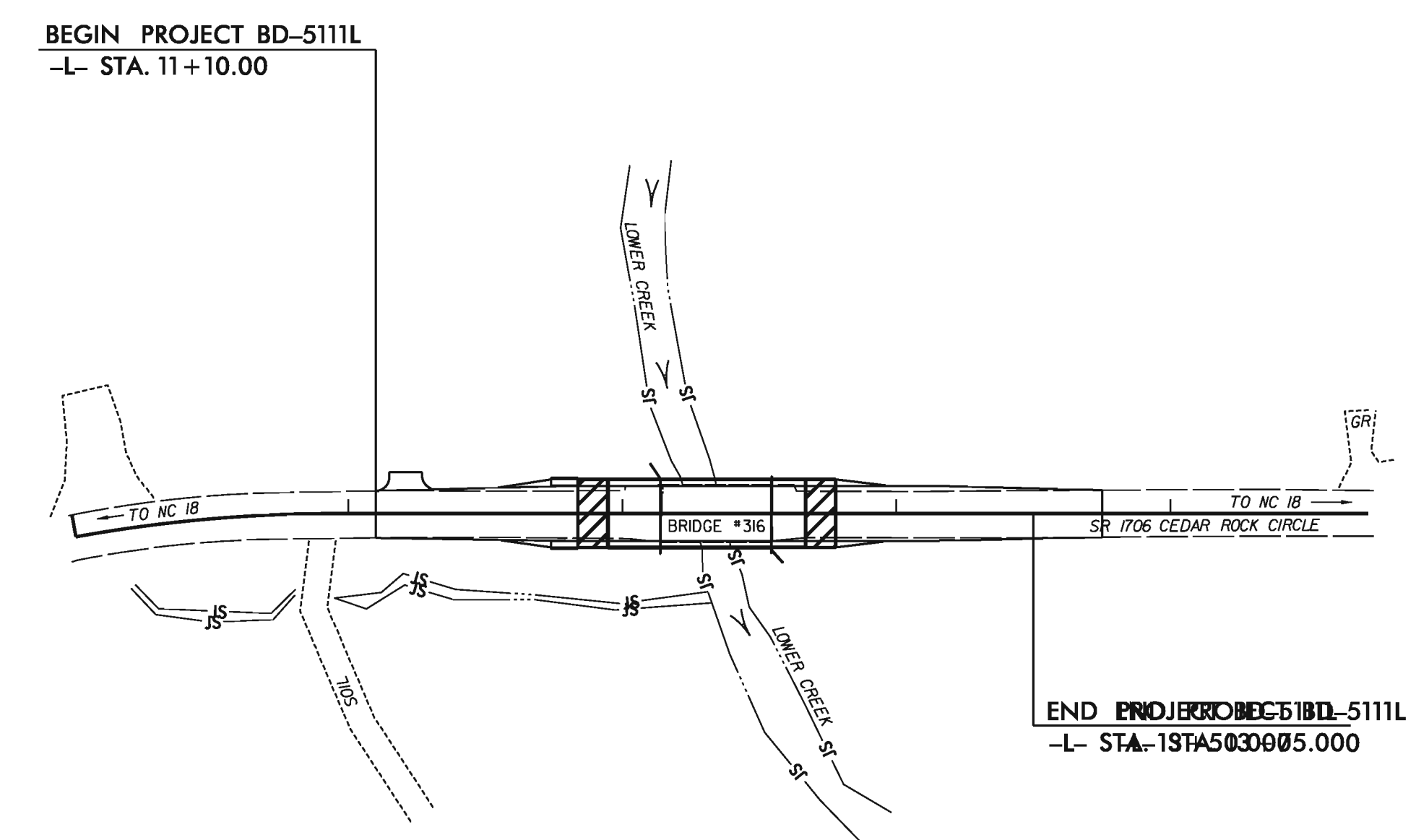
09/28/09

TIP PROJECT: BD-5111L

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL

CALDWELL COUNTY

BRIDGE NO. 316 ON SR 1706 OVER LOWER CREEK



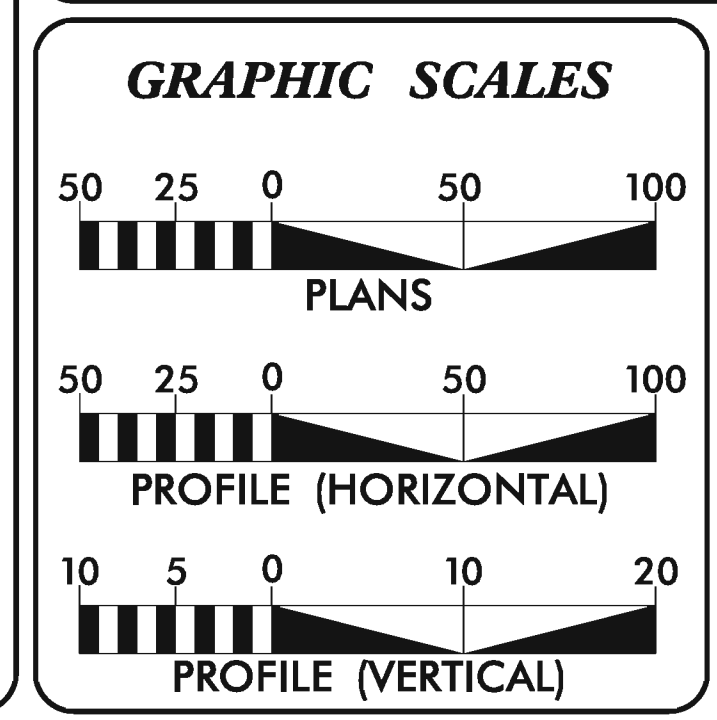
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5111L	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	—
	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▩
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▩
	Temporary Rock Silt Check Type-B	▩
	Wattle / Coir Fiber Wattle	—
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	—
1654.01	Temporary Rock Sediment Dam Type-A	▩
1654.02	Temporary Rock Sediment Dam Type-B	▩
1635.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.



**Stephen E. Roberts, P.E.**  
ROADWAY DESIGN ENGINEER

**Audrey B. Burnette, P.E.**  
HYDRAULICS ENGINEER

**Audrey B. Burnette, P.E.**  
EROSION CONTROL DESIGN ENGINEER

431  
LEVEL IIIA CERTIFICATION NUMBER

**RK&K**  
RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE, SUITE 350  
RALEIGH, NORTH CAROLINA 27609  
NC LICENSE NO. F-0112  
1-888-521-4455 OR 919-878-9560

**FOR DIVISION OF HIGHWAYS**

2012 STANDARD SPECIFICATIONS

**B. Keith Skinner, P.E.**  
PROJECT ENGINEER

**Stephen E. Roberts, P.E.**  
PROJECT DESIGN ENGINEER

LETTING DATE:

Roadway Standard Drawings

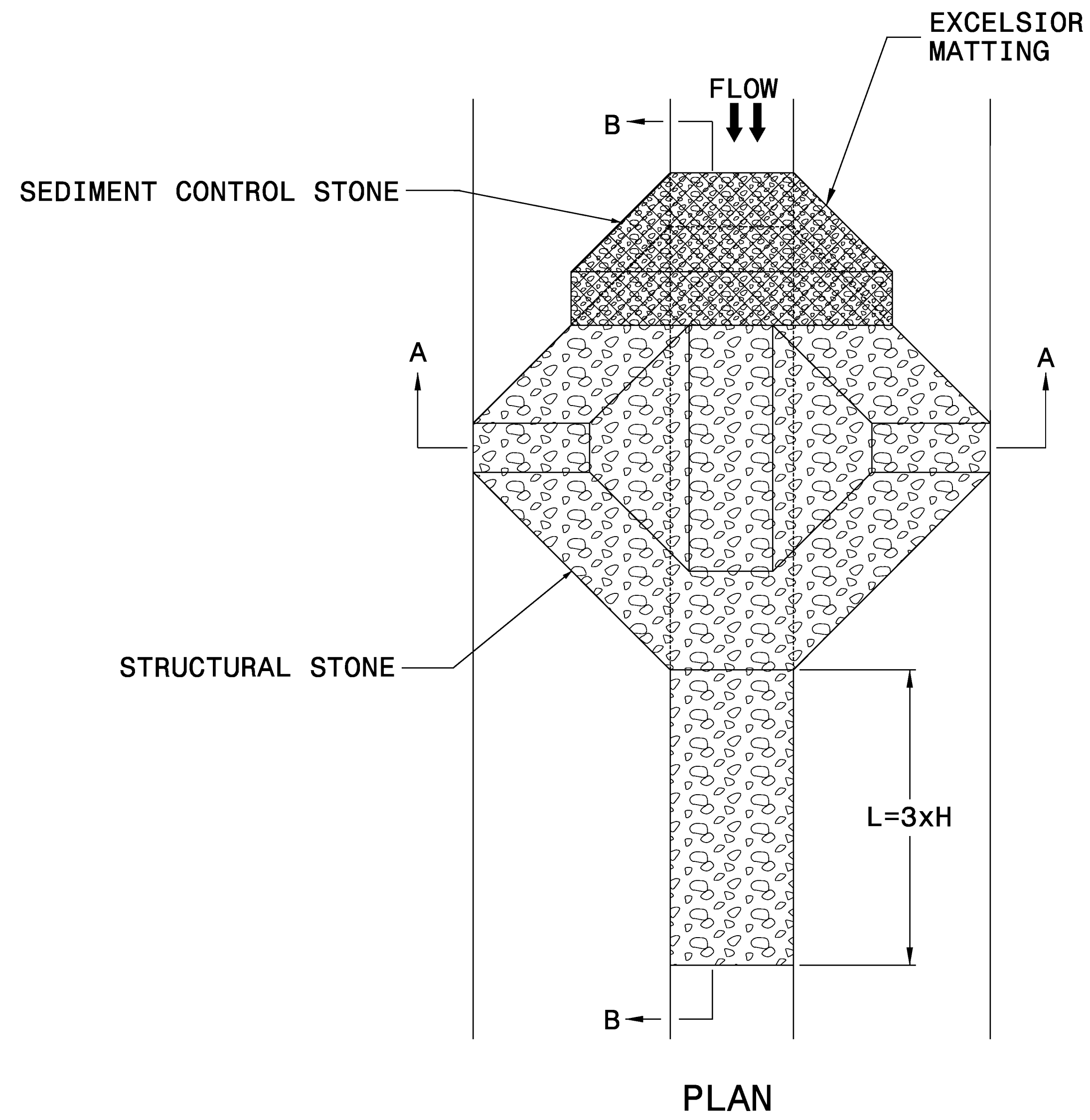
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01 Temporary Silt Fence  
1606.01 Special Sediment Control Fence  
1632.03 Rock Inlet Sediment Trap Type C  
1633.01 Temporary Rock Silt Check Type A

6/22/2012 R:\Hydraulics\CADD\PSH\bd5111l.ec\_title sht.dgn erlfgs

PROJECT REFERENCE NO. <i>BD-5111L</i>	SHEET NO. <i>EC-2</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)

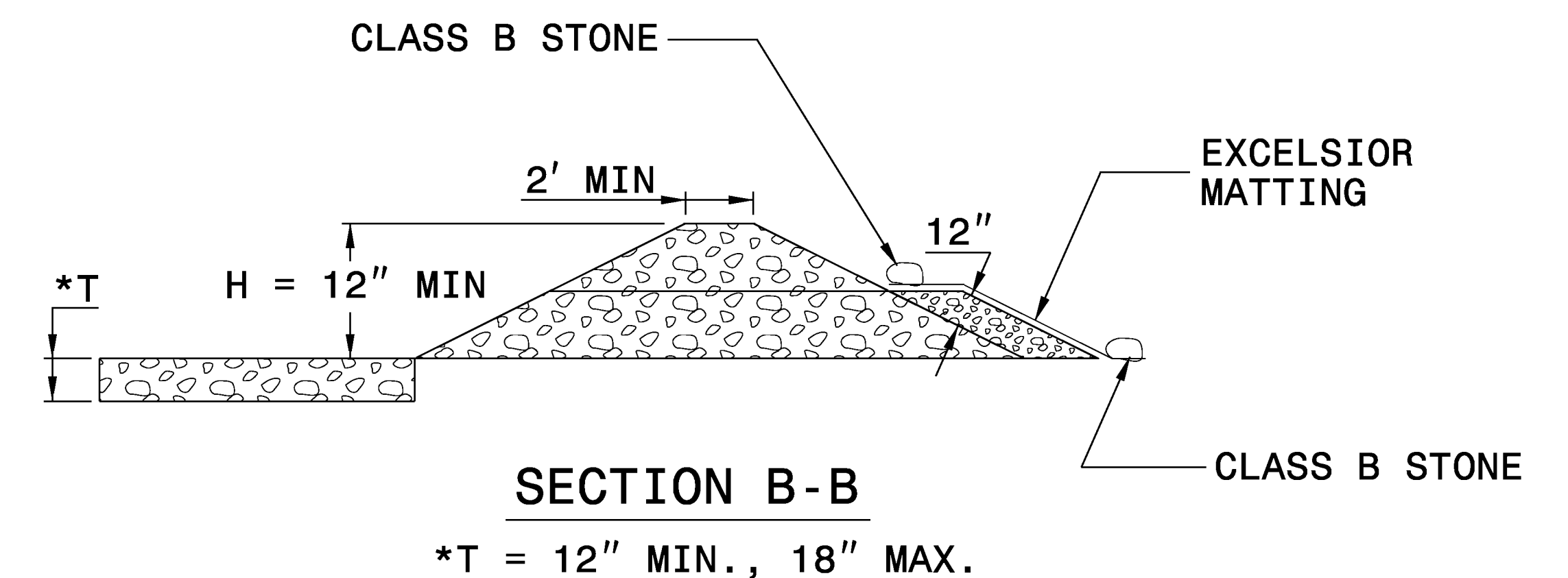
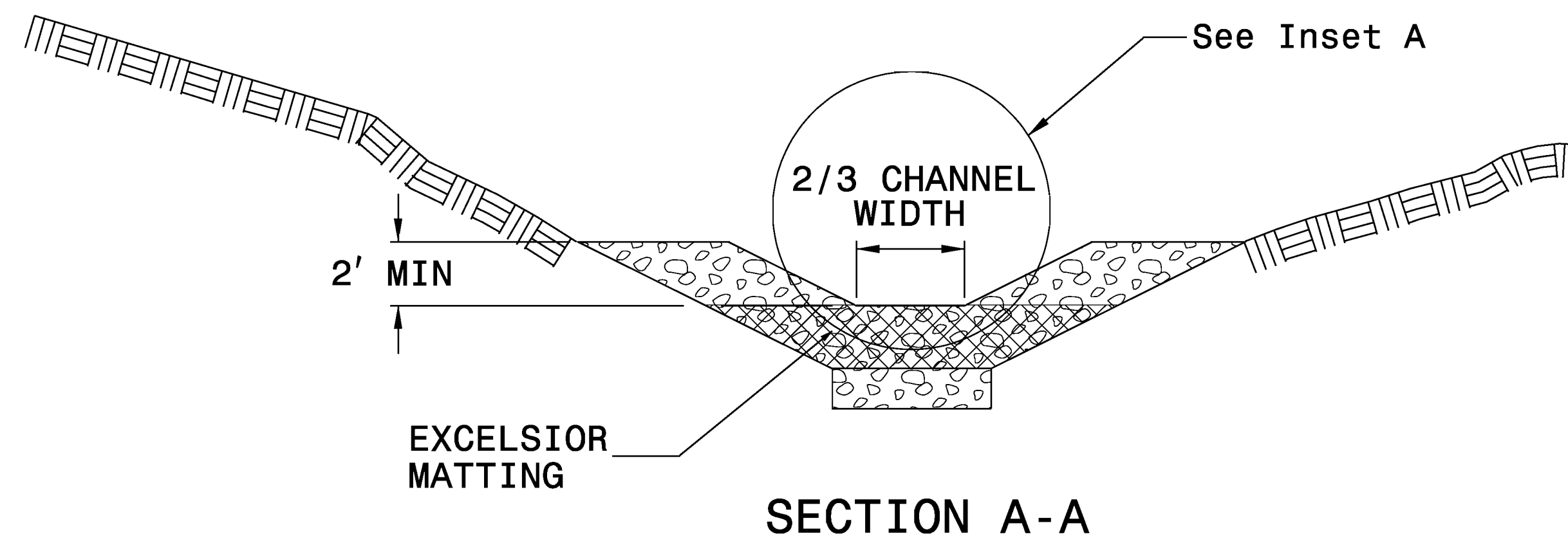
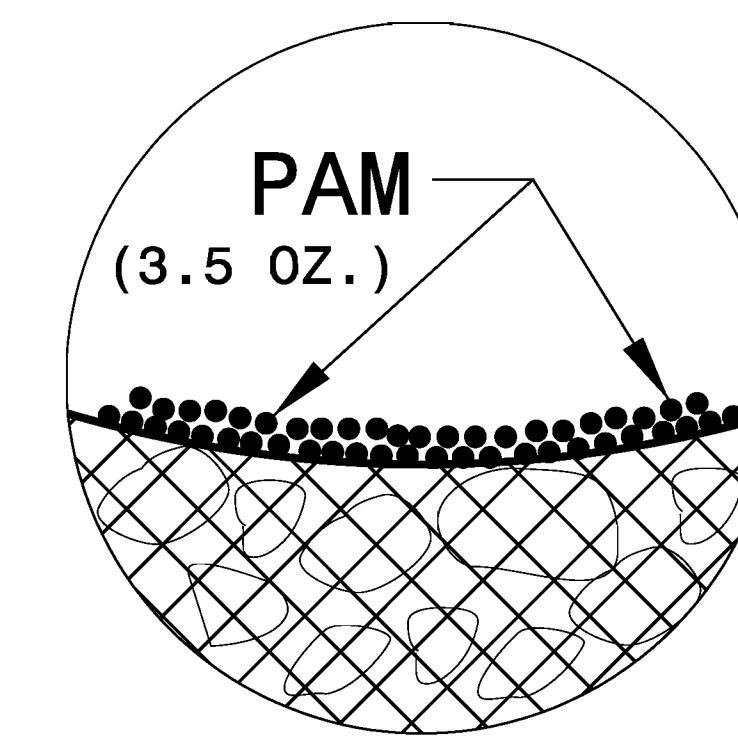


## NOTES

USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

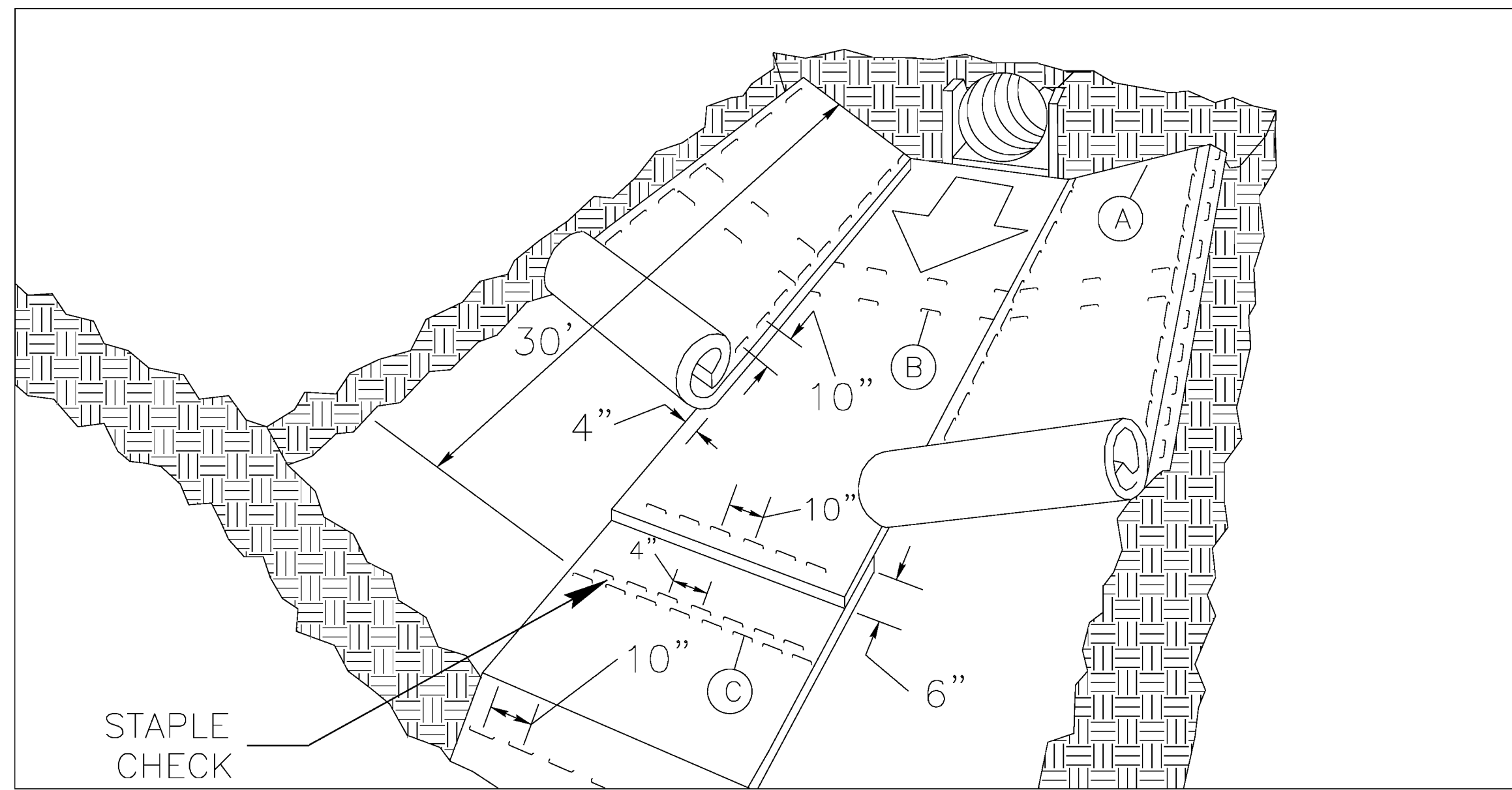
INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



NOT TO SCALE

PROJECT REFERENCE NO. <i>BD-5111L</i>	SHEET NO. <i>EC-2A</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# MATTING INSTALLATION DETAIL



**MATTING IN DITCHES**

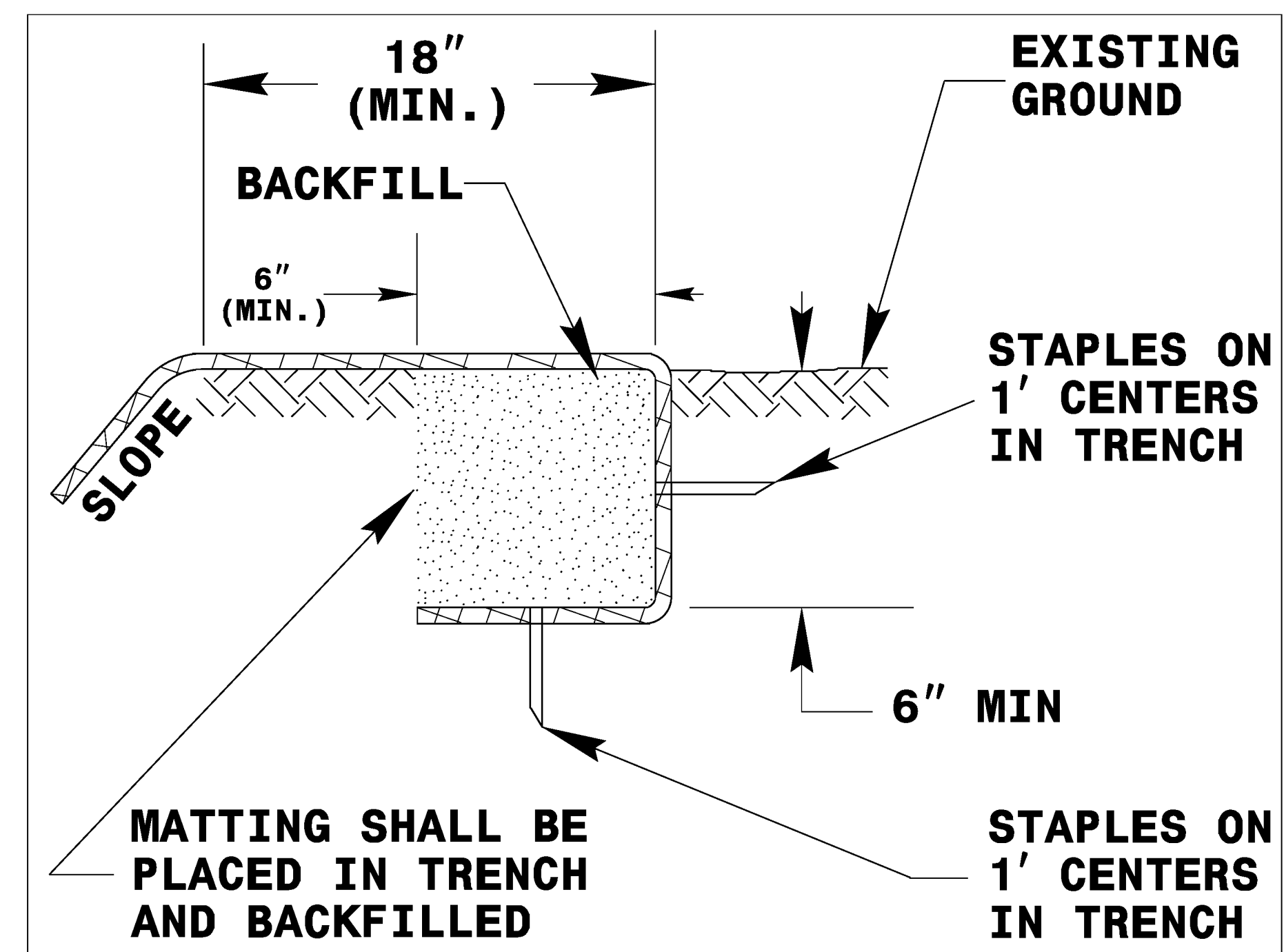
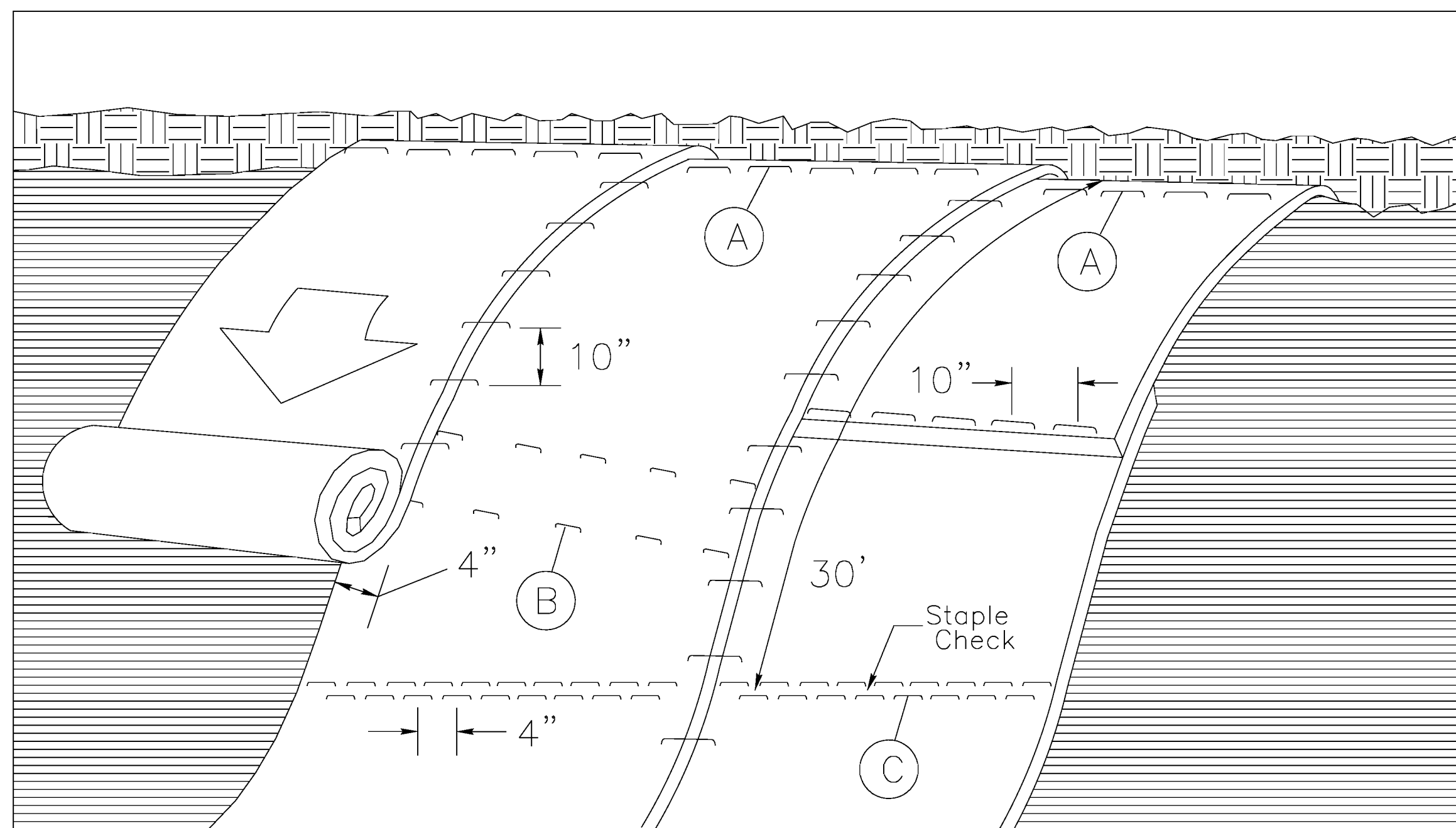


DIAGRAM (A)



**MATTING ON SLOPES**

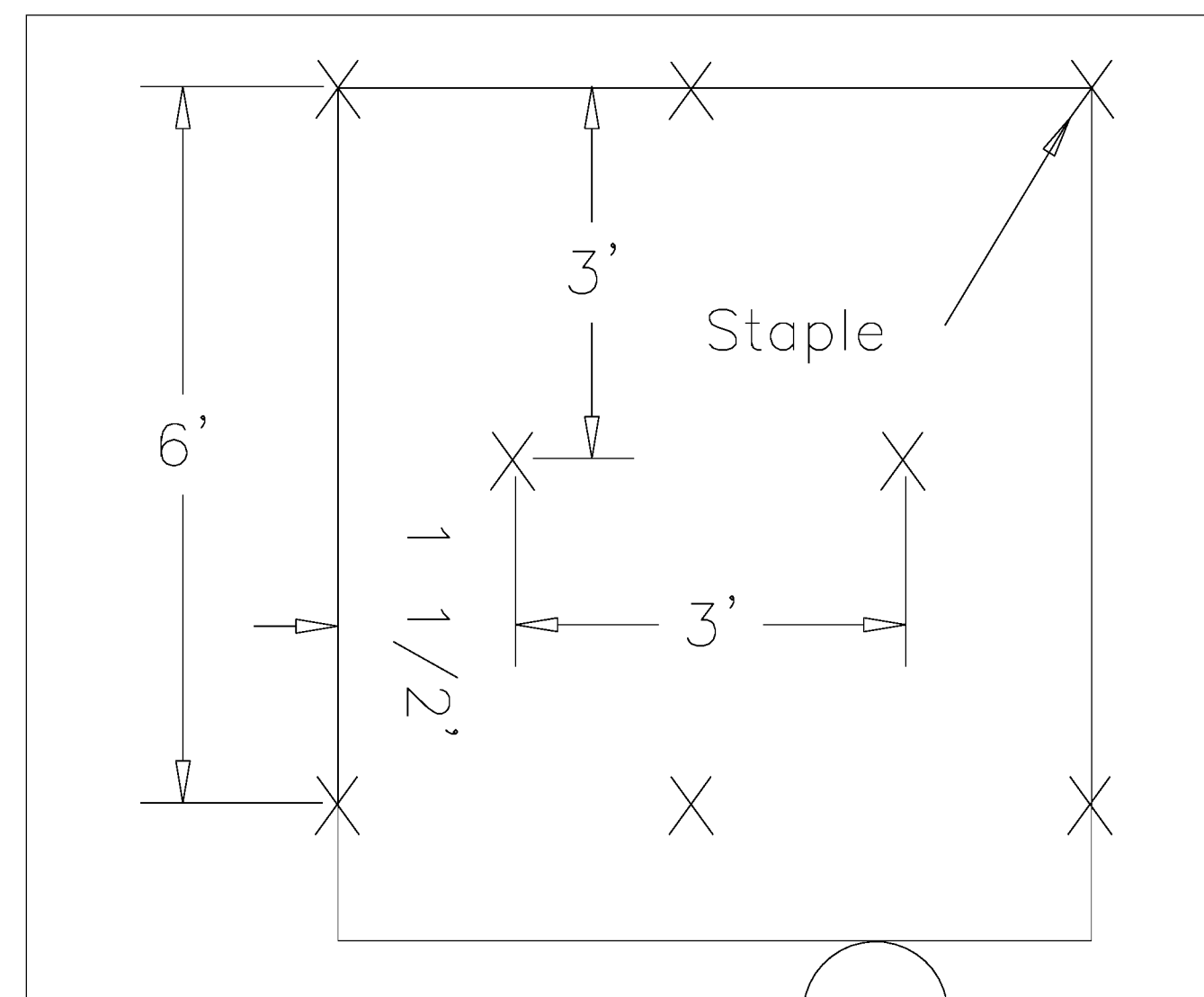


DIAGRAM (B)

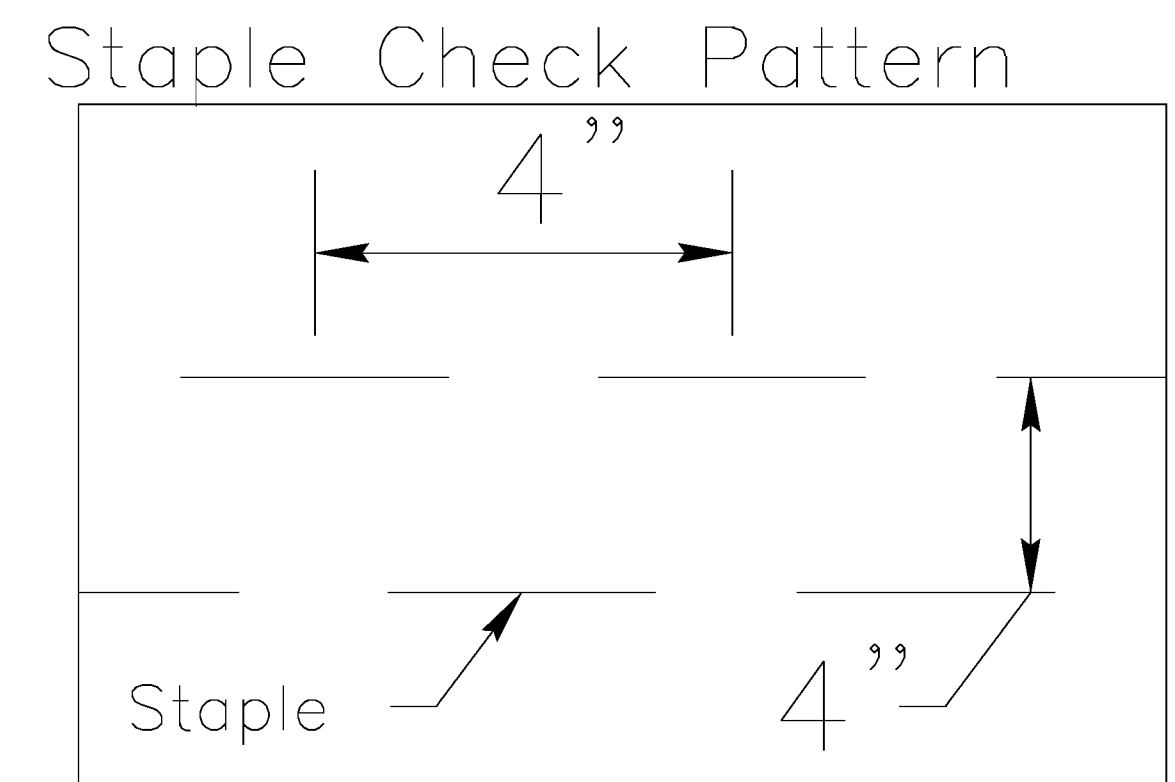


DIAGRAM (C)

**NOTES:**

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.  
 STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>BD-5111L</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

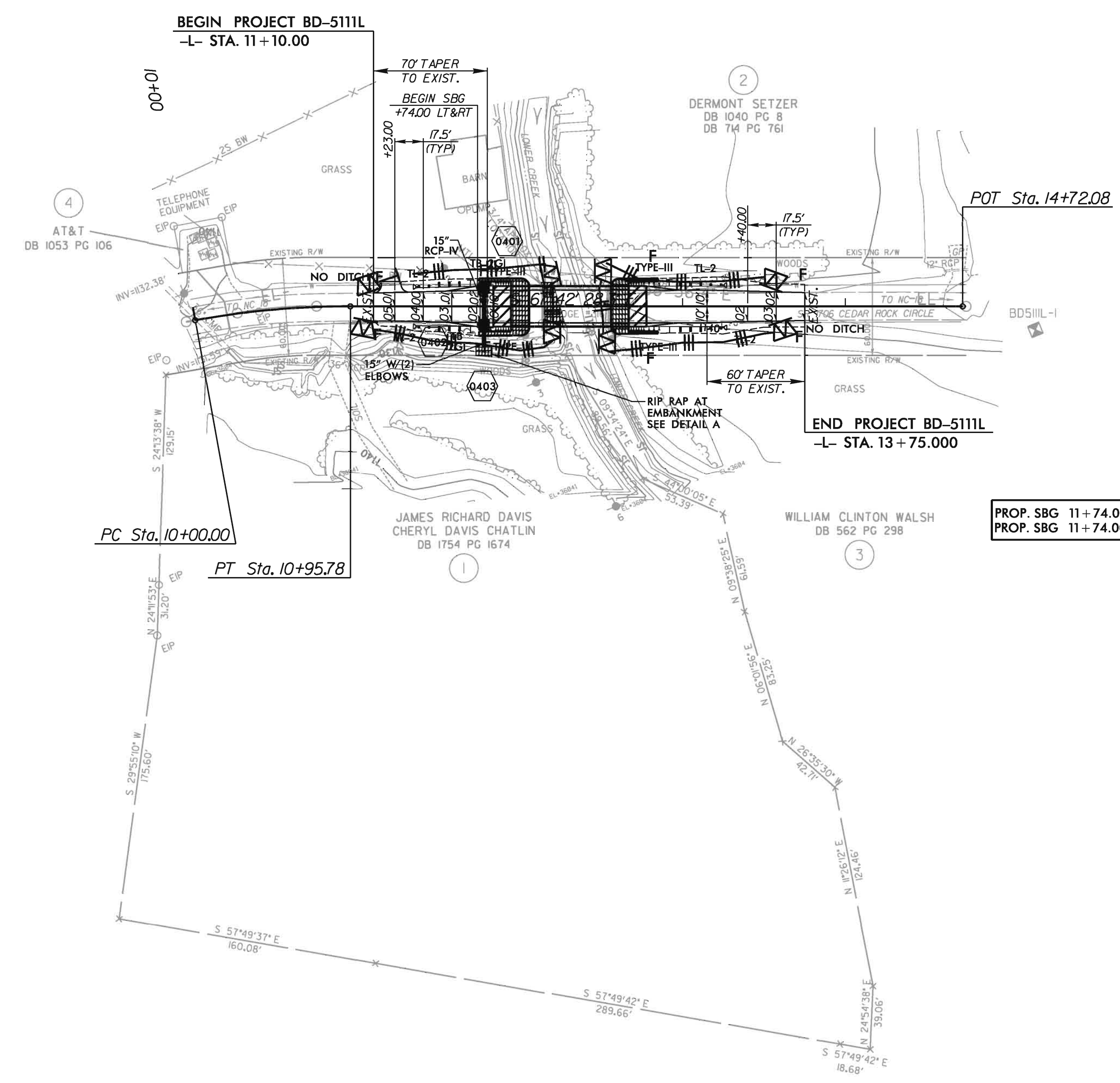
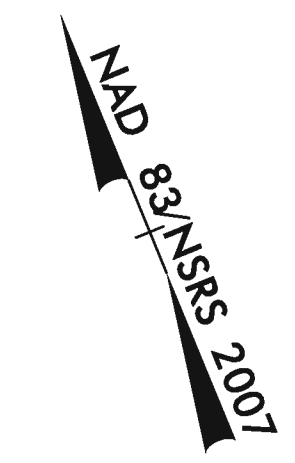
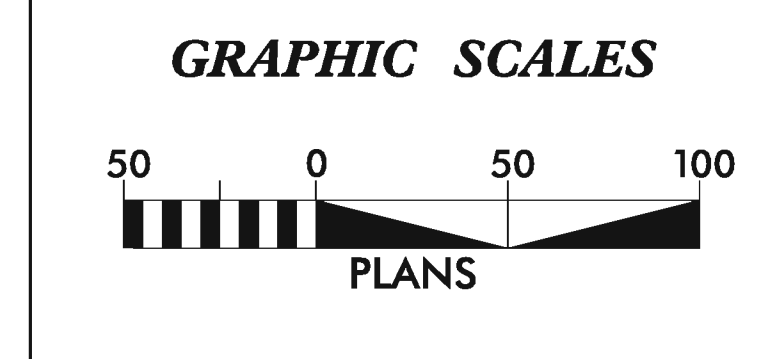


PROJECT REFERENCE NO.	SHEET NO.
BD-5111L	EC-4
RW SHEET NO.	
EROSION CONTROL DESIGN ENGINEER	

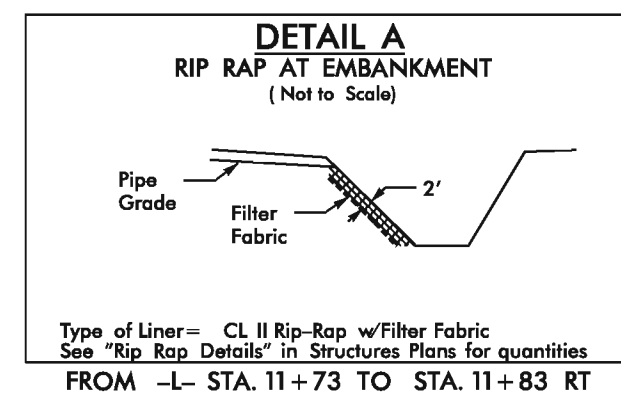
NOTE:  
PLACE TEMPORARY ROCK SILT CHECKS TYPE - A  
AT DRAINAGE OUTLETS.

NOTE:  
PERIMETER EROSION CONTROL MEASURES SHALL BE  
INSTALLED DURING CLEARING AND GRUBBING PHASE.

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4



PROP. SBG 11+74.00 TO BEGIN BRIDGE LT  
PROP. SBG 11+74.00 TO BEGIN BRIDGE RT



NOTES:  
ANY DEVIATION FROM OPTIONS WILL REQUIRE PRIOR APPROVAL BY ENGINEER.  
ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS  
DIRECTED BY THE ENGINEER.

PLANS PREPARED BY :

**RK&K**

RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

6/27/2012  
R:\Hydr-suites\CADD\PSH\bd51111...ec\_psh04\_C&L.dgn

PROJECT REFERENCE NO.	SHEET NO.
BD-5111L	EC-5/SHT.4
RW SHEET NO.	
EROSION CONTROL DESIGN ENGINEER	

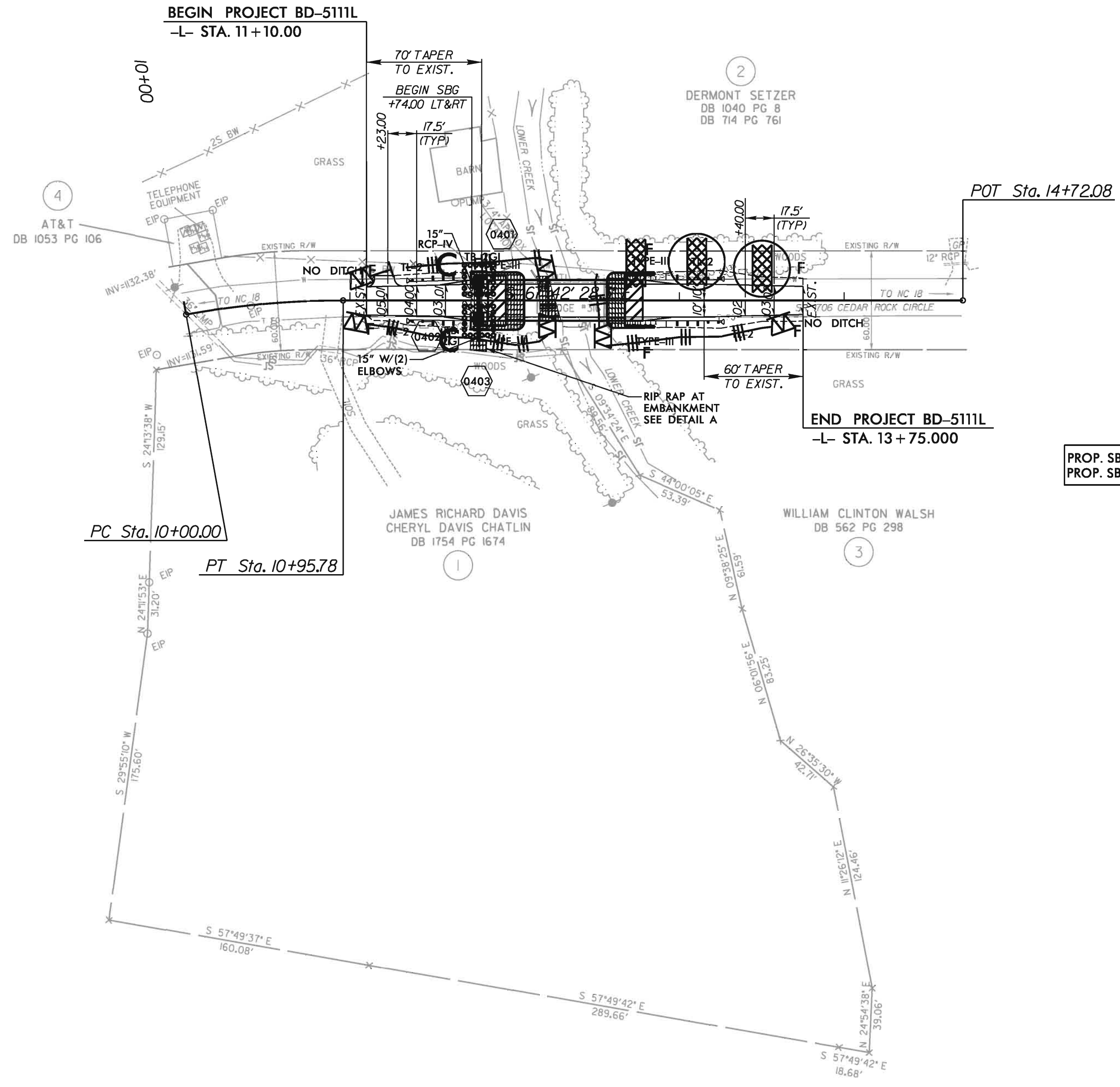
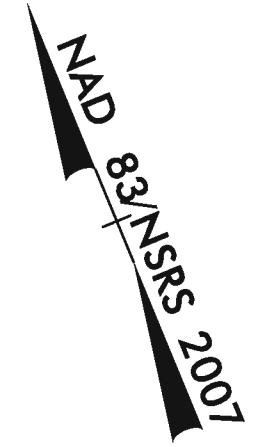
  

**GRAPHIC SCALES**

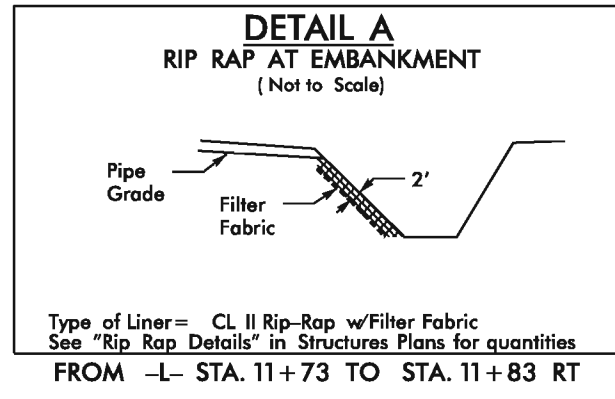
PLANS

**Place Matting for Erosion Control  
on Slope as Work Allows.**

FINAL EROSION  
CONTROL FOR  
CONSTRUCTION SHEET 4



PROP. S.B.G. 11+74.00 TO BEGIN BRIDGE LT  
PROP. S.B.G. 11+74.00 TO BEGIN BRIDGE RT



**NOTES:**  
ANY DEVIATION FROM OPTIONS WILL REQUIRE PRIOR APPROVAL BY ENGINEER.  
ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

**PLANS PREPARED BY :**  
**RK&K**  
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RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

6/27/2012  
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**TIP PROJECT: BD-5111L**

**CONTRACT:**

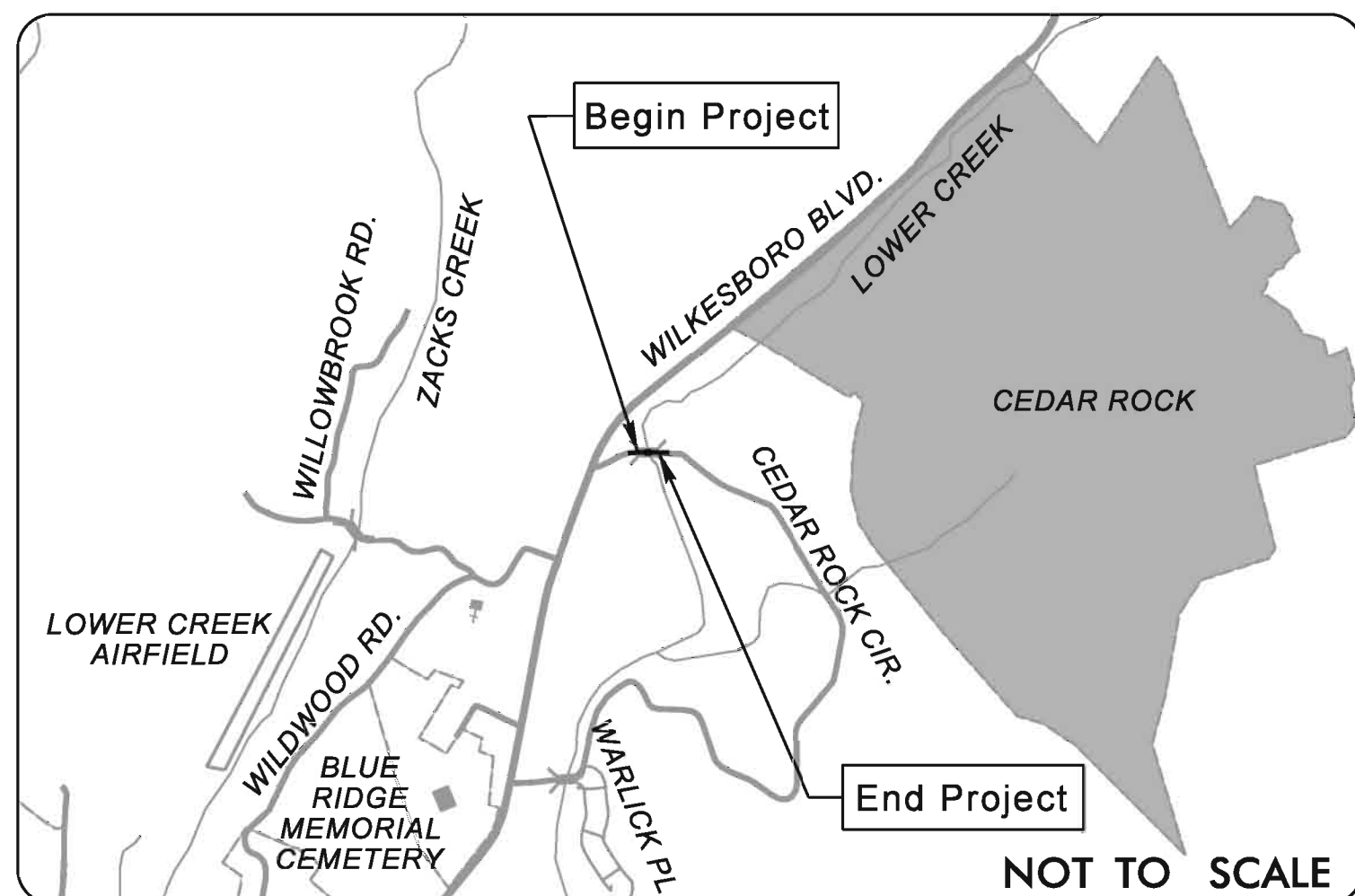
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CALDWELL COUNTY  
UTILITY CONSTRUCTION PLANS**

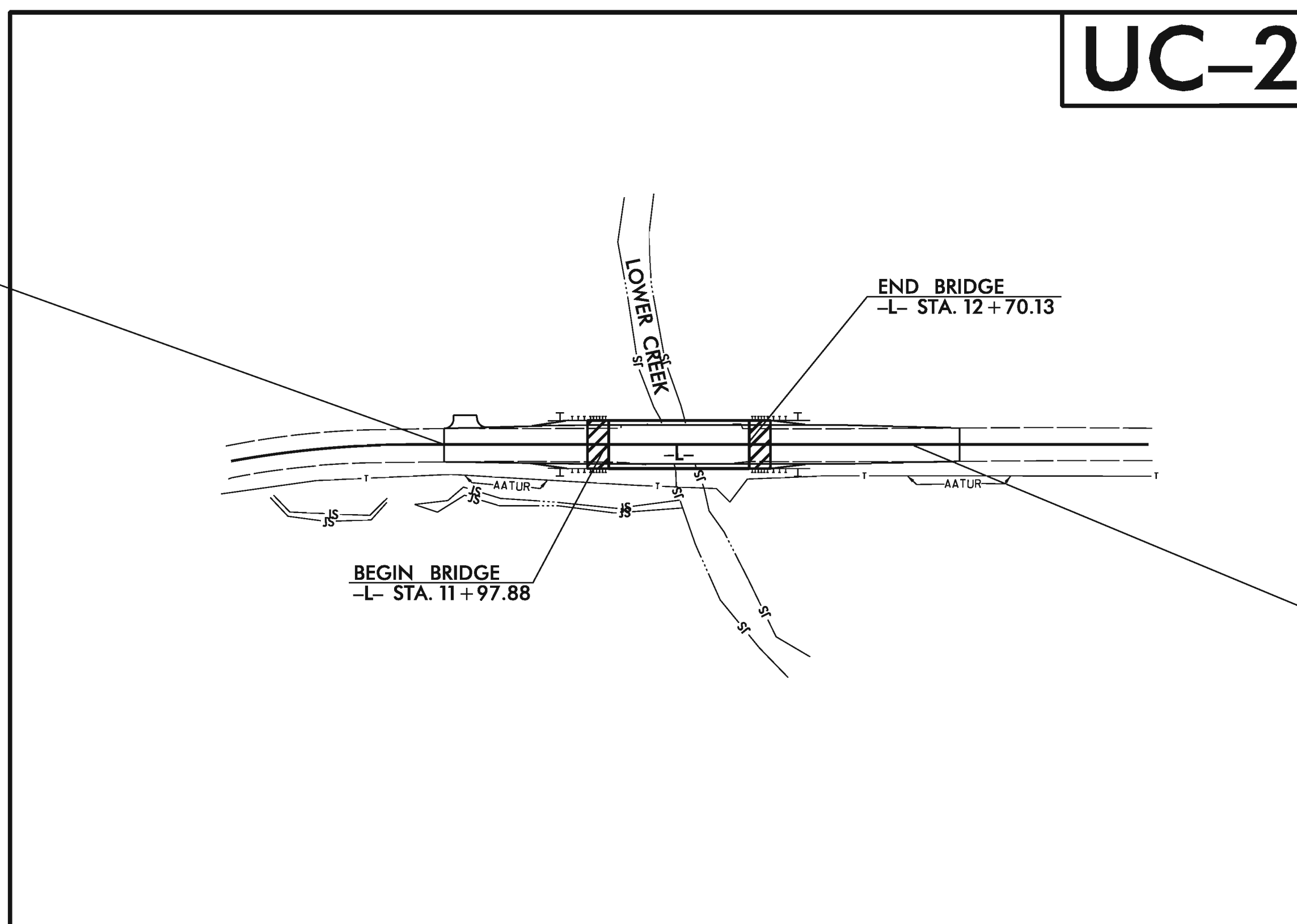
**LOCATION: SR 1706 (CEDAR ROCK CIR.) OVER LOWER CREEK**

**TYPE OF WORK: WATER LINE RELOCATION**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.		UC-1	3
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	



**VICINITY MAP**

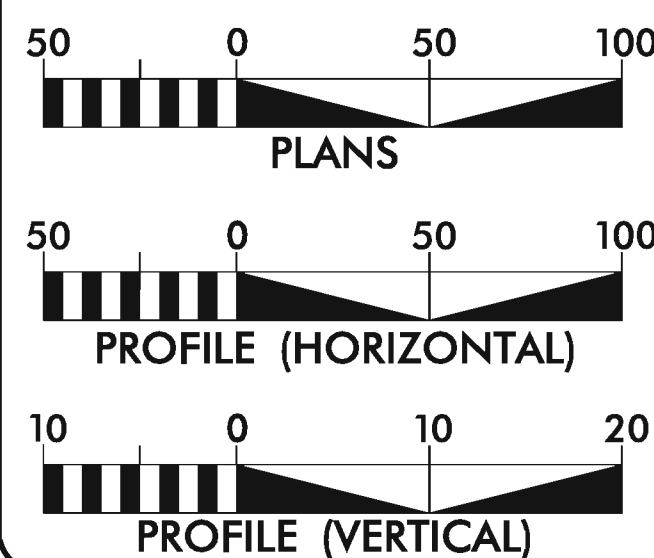


**BEGIN PROJECT BD-5111L  
-L- STA. 11+10.00**

**END PROJECT BD-5111L  
-L- STA. 13+50.00**

NAD 83/NSRS 2007

**GRAPHIC SCALES**



**DESIGN DATA**

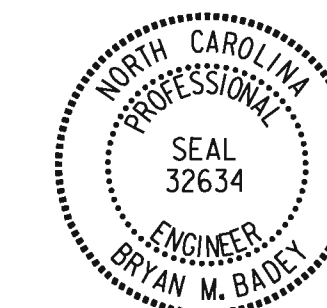
REASONABLE SPEED = 40mph  
ADT = 210 (1999)

**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY PLAN SHEET AND PROFILE
UC-3	DETAIL SHEET

**UTILITY OWERS ON PROJECT**

(1) CALDWELL COUNTY - WATER



*Bryan Bades 7/6/12*

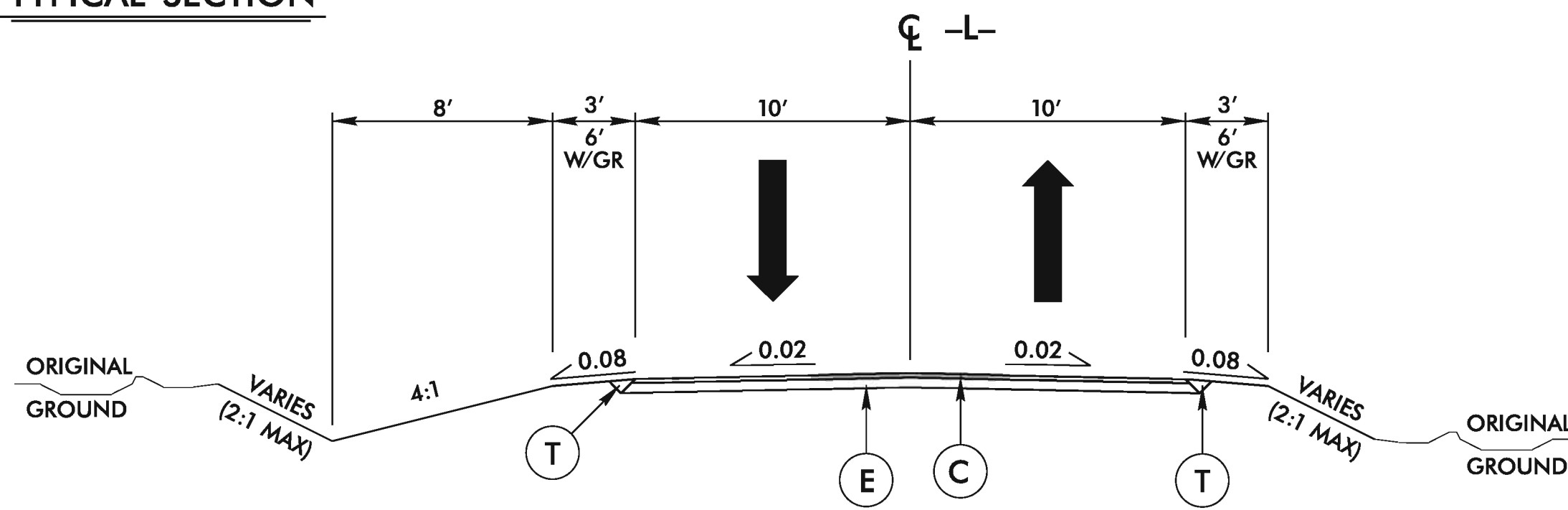
**PLANS PREPARED BY:**



RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE, SUITE 350  
RALEIGH, NORTH CAROLINA 27609  
NC LICENSE NO. F-0112  
1-888-521-4455 OR 919-878-9560

8/17/99

### TYPICAL SECTION



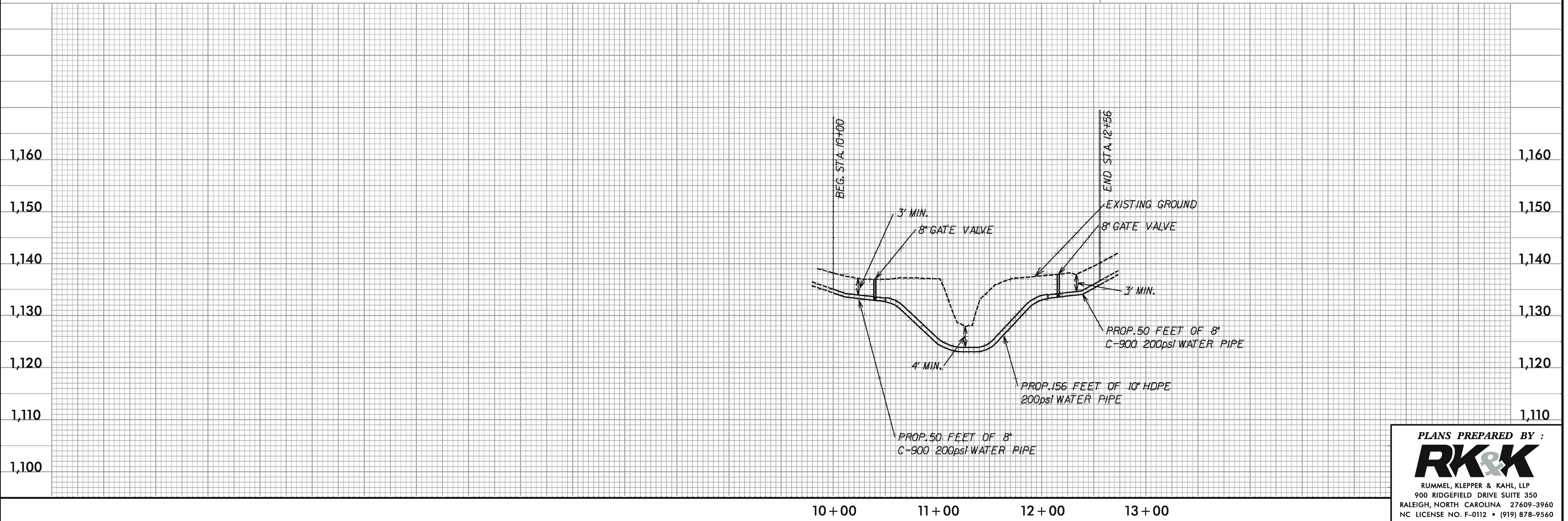
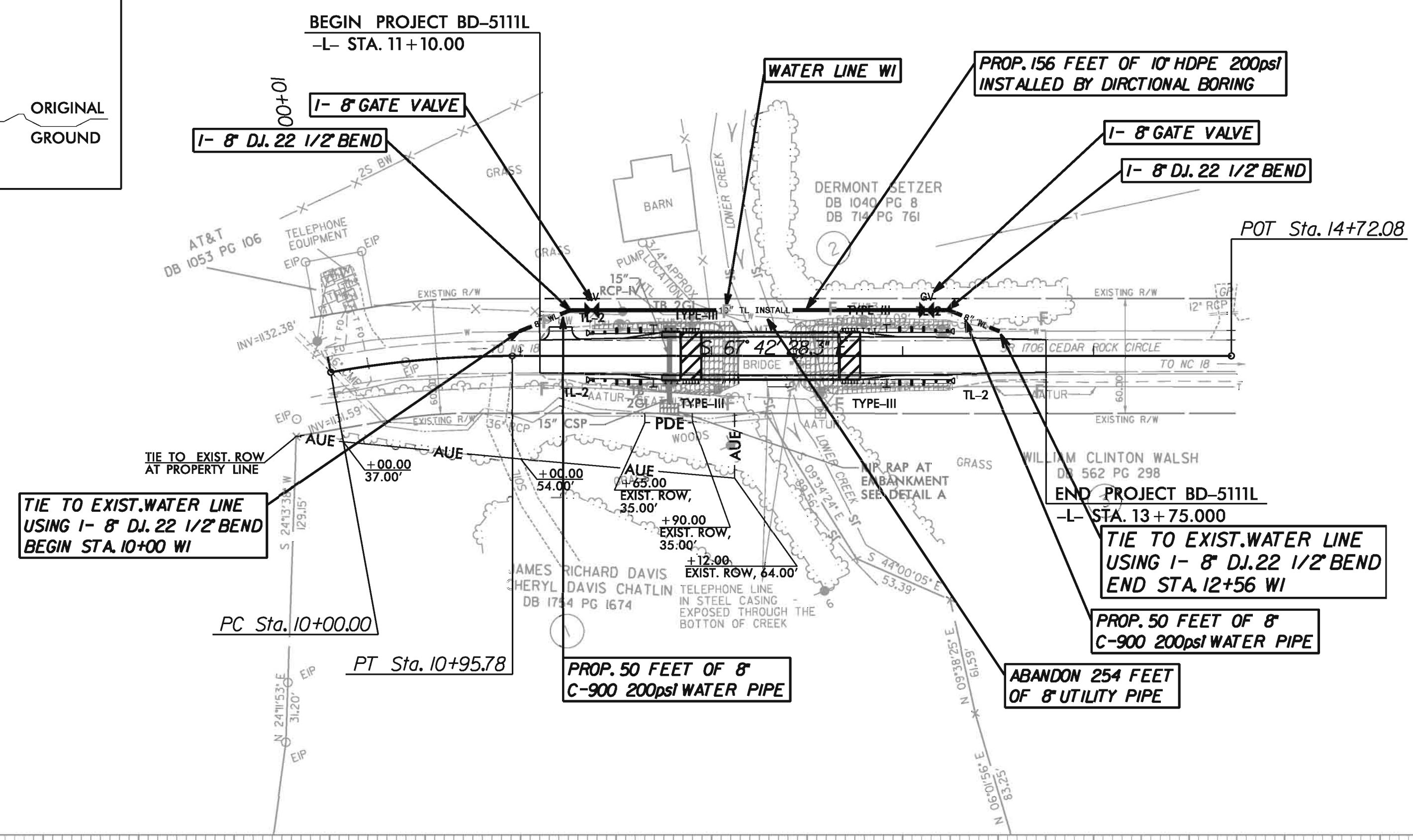
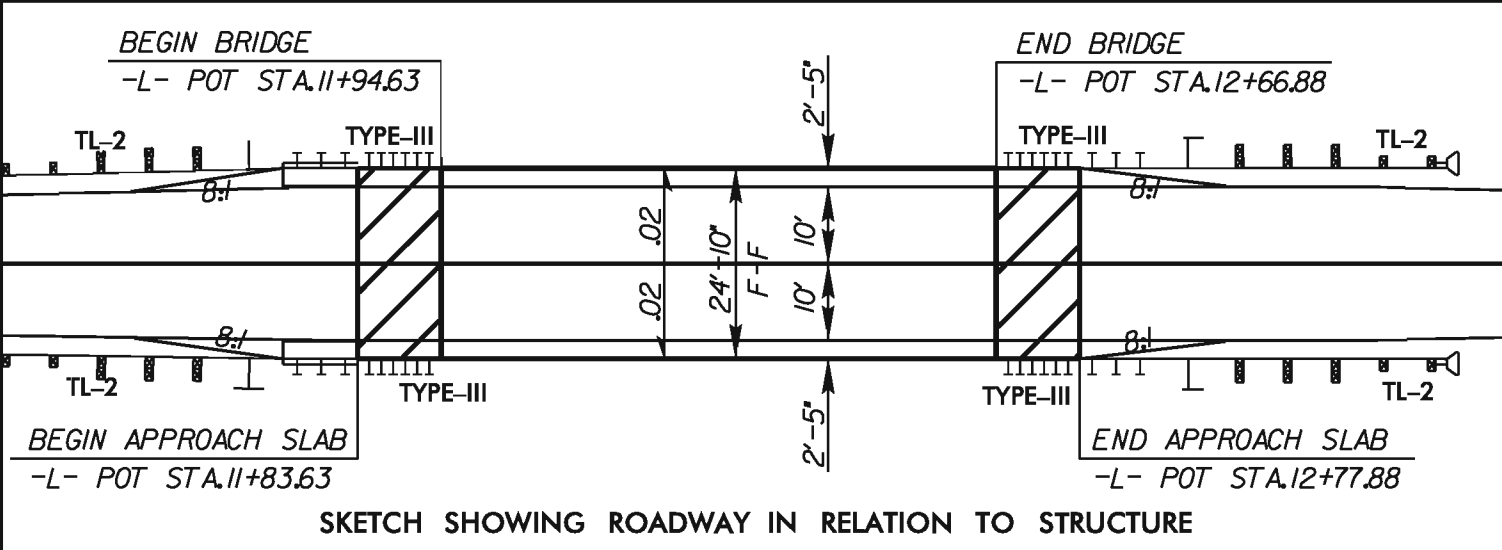
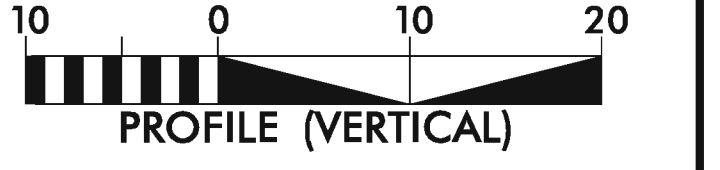
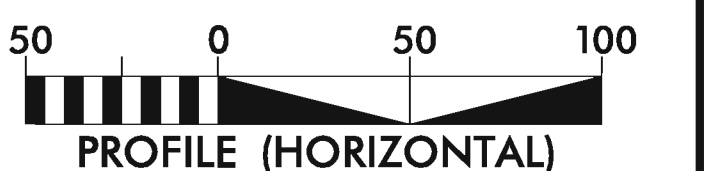
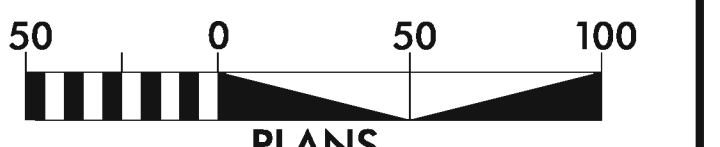
-L-  
 PI Sta 10+48.02  
 $\Delta = 10^\circ 15' 27.5''$  (RT)  
 $D = 10^\circ 42' 34.2''$   
 $L = 95.78'$   
 $T = 48.02'$   
 $R = 535.00'$

NAD 83/NSRS 2007

PROJECT REFERENCE NO. **BD-5111L** SHEET NO. **UC-2**

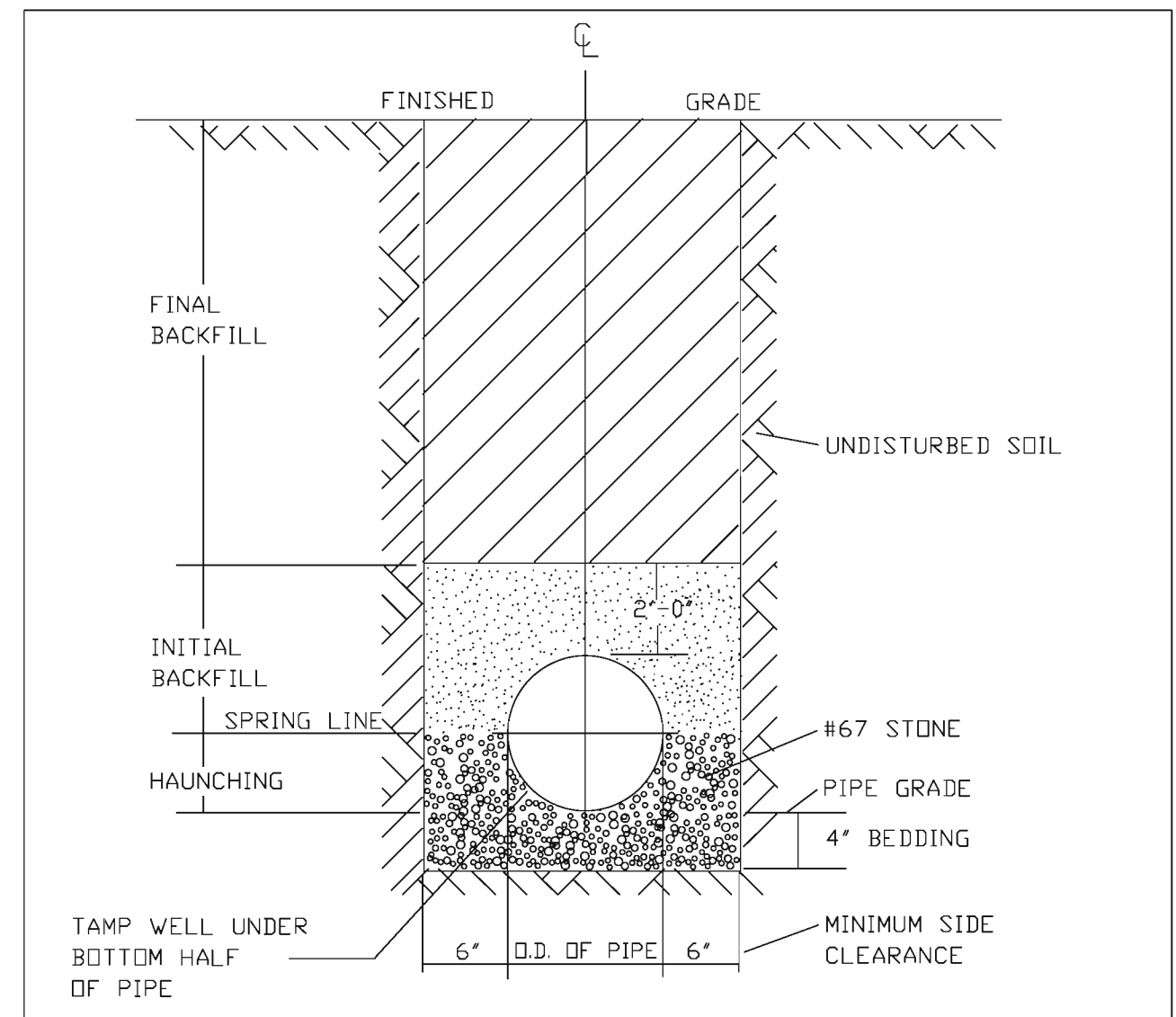


### GRAPHIC SCALES



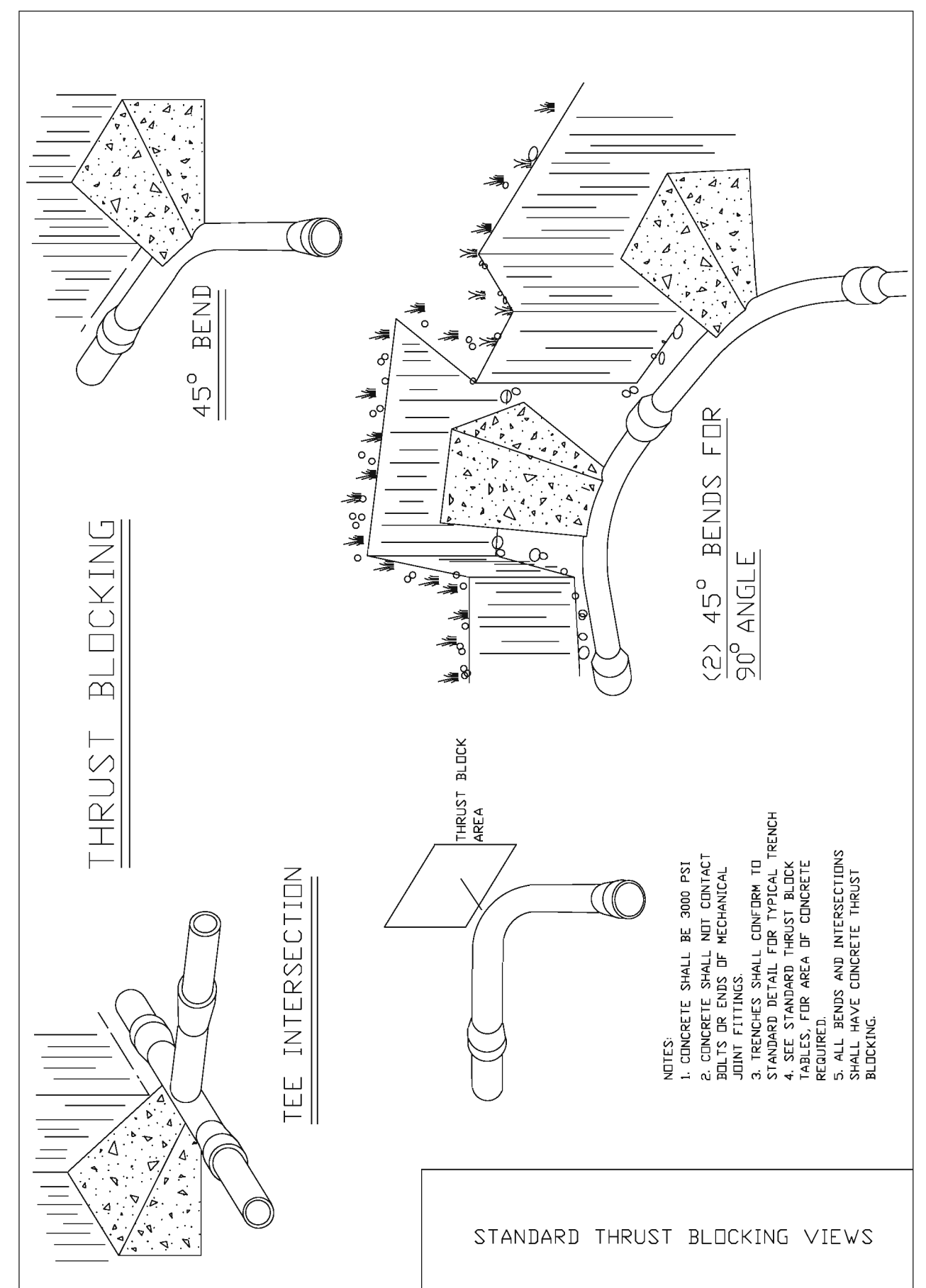
PLANS PREPARED BY:  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
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 NC LICENSE NO. F-0112 • (919) 878-9560

6/25/2012  
 C:\Users\jstiles\OneDrive\Projects\BD-5111L\UC.psh2.dgn



- NOTES:
1. For trenches requiring shoring and bracing, dimensions shall be taken from the inside face of the shoring and bracing.
  2. No rocks or boulders 4' or larger to be used in initial backfill.
  3. All backfill material shall be suitable native material.
  4. Backfill shall be tamped in 6" lifts in traffic areas, 12" in non-traffic areas.

TYPICAL TRENCH DETAIL



REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS  
BASED ON TEST PRESSURE OF 200 P.S.I.  
ALL AREAS GIVEN IN SQUARE FEET.

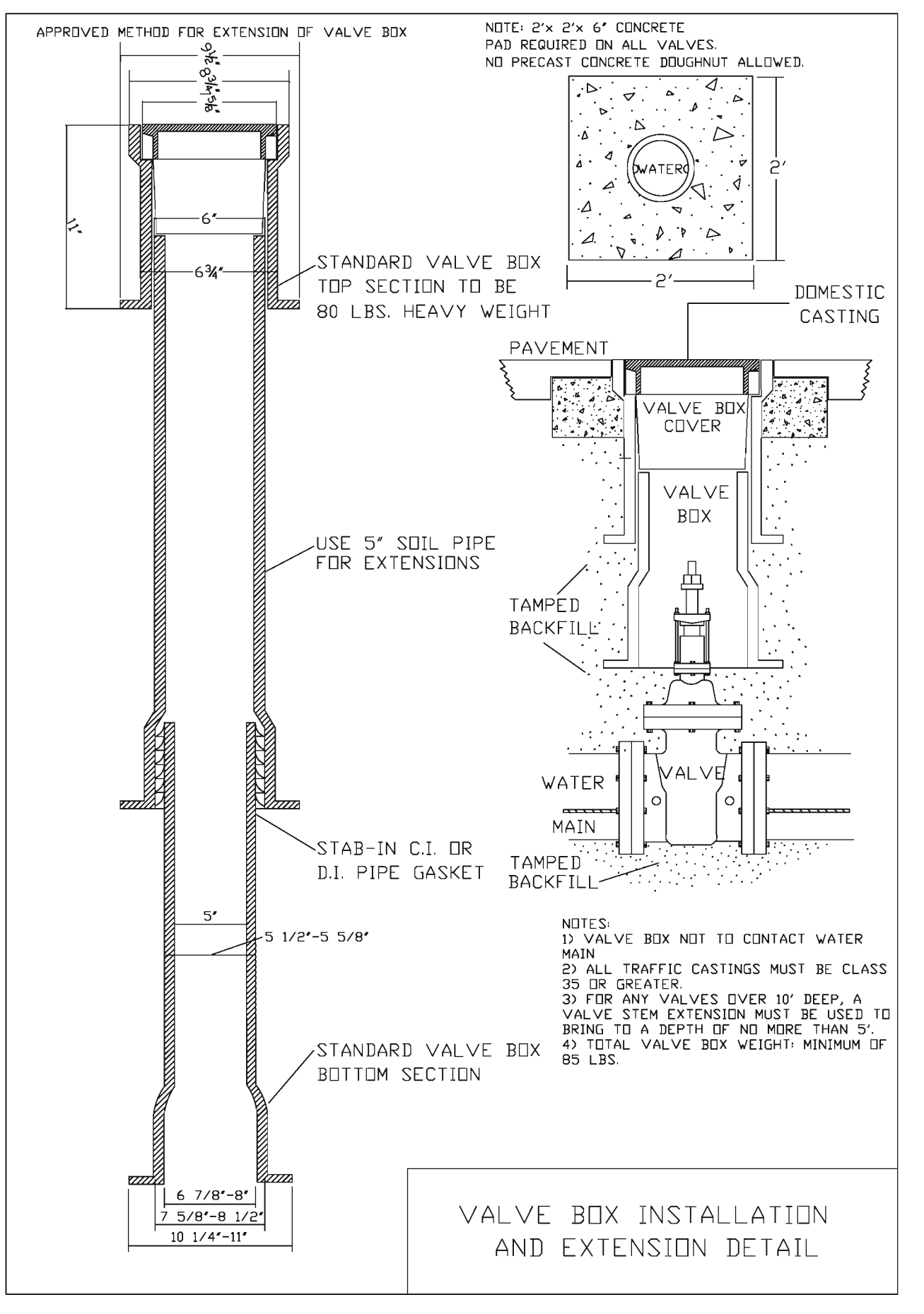
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS./F.F.	SOFT CLAY 2000 LBS./F.F.	GRAVEL / COARSE SAND 1000 LBS./F.F.	DRY CLAY - ALWAYS DRY 6000 LBS./F.F.	SAND COMPACT FIRM 8000 LBS./F.F.	SAND - CLEAN DRY 4000 LBS./F.F.	QUICKSAND - VERY POOR SOIL 1000 LBS./F.F.	ROCK - RUBBER 10,000 LBS./F.F.
6"									
11 1/4°	1,108	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	3	1	
45°	4,328	2	3	3	1	1	5	1	
90°	7,996	2	4	5	1	1	8	1	
PLUG	5,655	2	3	4	1	1	6	1	
8"									
11 1/4°	1,970	1	1	2	1	1	2	1	
22 1/2°	3,922	1	2	3	1	1	4	1	
45°	7,694	2	4	5	1	1	8	1	
90°	14,215	4	8	9	2	2	15	2	
PLUG	10,053	3	5	6	2	2	10	1	
12"									
11 1/4°	4,433	2	3	3	1	1	5	1	
22 1/2°	8,826	3	5	6	2	2	9	1	
45°	17,312	5	9	11	3	3	18	2	
90°	31,983	8	16	19	4	4	32	4	
PLUG	22,619	6	12	14	3	3	23	3	
16"									
11 1/4°	7,881	2	4	5	1	1	8	1	
22 1/2°	15,691	4	8	10	2	2	16	2	
45°	30,779	8	16	19	4	4	31	4	
90°	56,861	15	29	35	8	8	57	6	
PLUG	40,213	10	21	25	5	5	41	5	

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.  
USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

THRUST BLOCKING DESIGN QUANTITY TABLE

PROJECT REFERENCE NO. **BD-5111L** SHEET NO. **UC-3**

NORTH CAROLINA PROFESSIONAL SEAL 32634  
 [Signature]  
 J. M. BAIRD  
 7/6/12



VALVE BOX INSTALLATION AND EXTENSION DETAIL

**TIP PROJECT: BD-5111L**

**CONTRACT:**

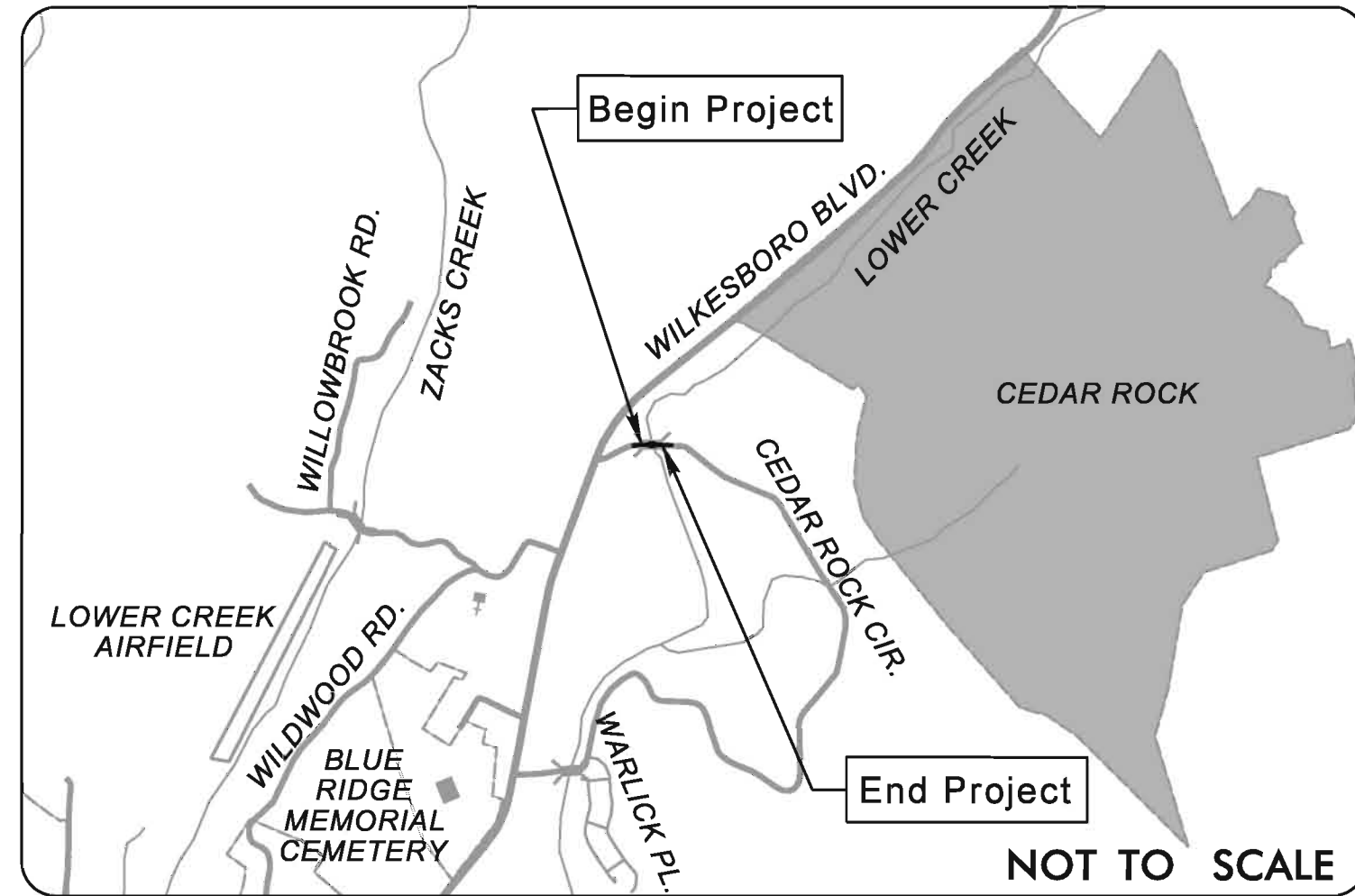
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CALDWELL COUNTY**

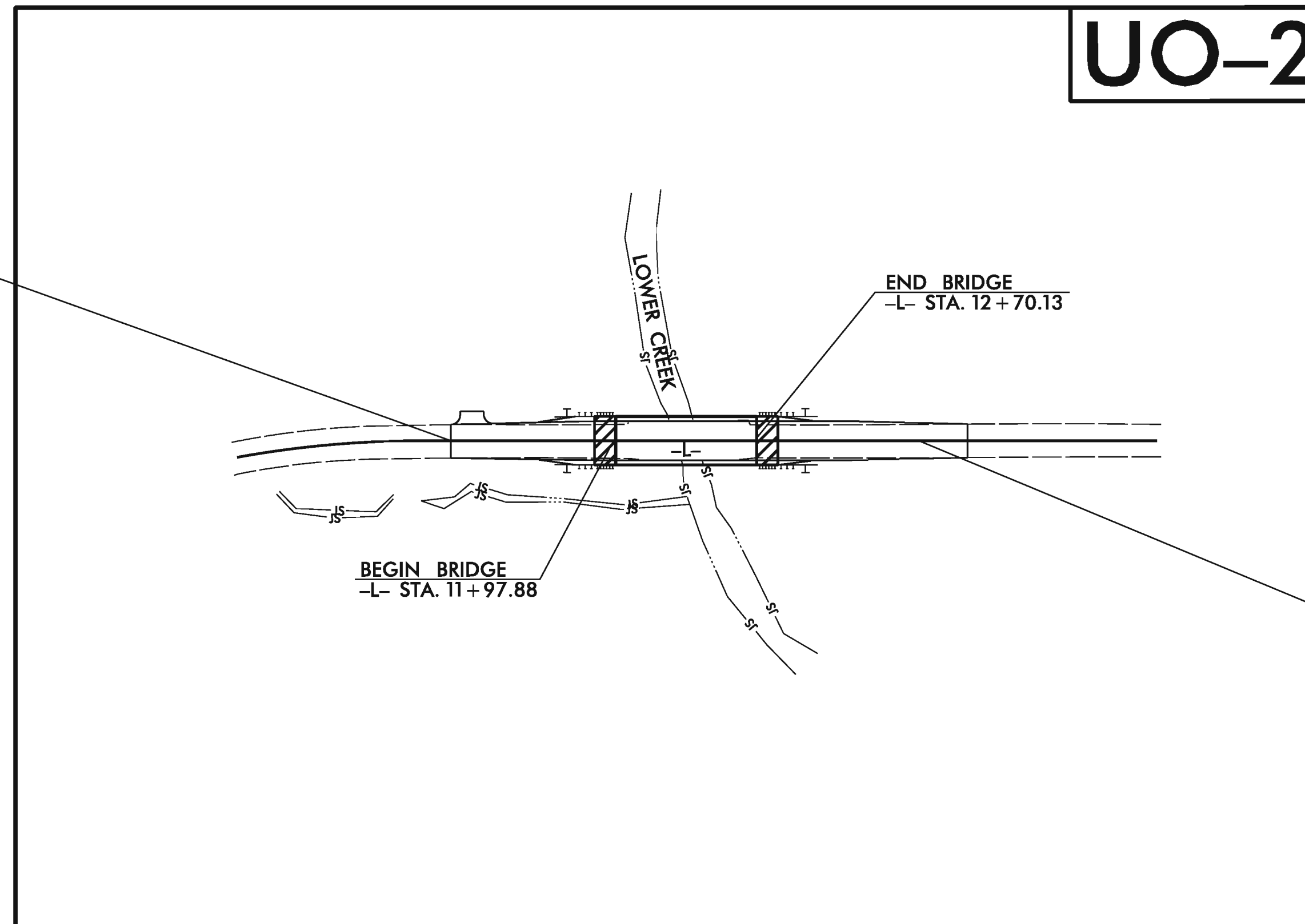
**LOCATION: SR 1706 (CEDAR ROCK CIR.) OVER LOWER CREEK**

**TYPE OF WORK: UTILITIES BY OTHERS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.		UO-1	2
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



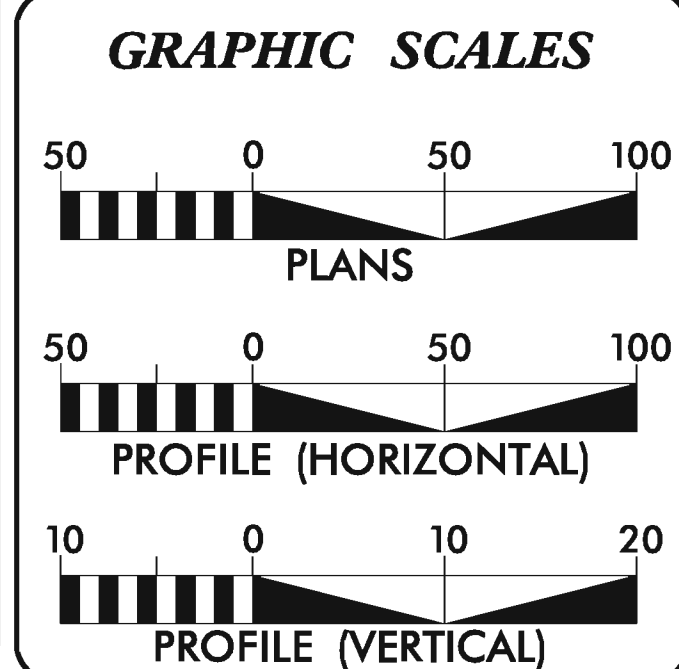
**VICINITY MAP**



**BEGIN PROJECT BD-5111L**  
**-L- STA. 11+10.00**

**END PROJECT BD-5111L**  
**-L- STA. 13+50.00**

NAD 83/NSRS 2007



**DESIGN DATA**

REASONABLE SPEED = 40mph  
ADT = 210 (1999)

**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITIES BY OTHERS PLAN SHEETS

**UTILITY OWNERS ON PROJECT**

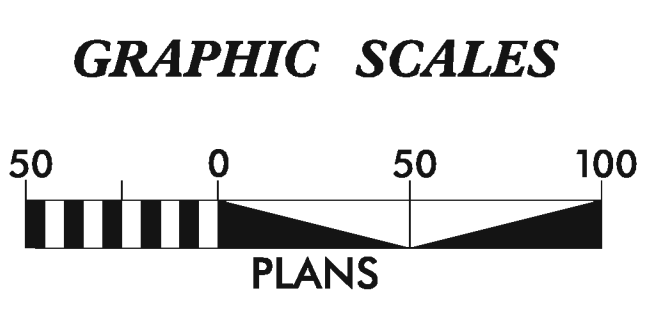
- (1) DUKE ENERGY – POWER
- (2) CHARTER COMMUNICATIONS – CATV
- (3) AT&T – TELEPHONE

**PLANS PREPARED BY:**

**RK&K**

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RALEIGH, NORTH CAROLINA 27609  
NC LICENSE NO. F-0112  
1-888-521-4455 OR 919-878-9560

PROJECT REFERENCE NO.	SHEET NO.
BD-5111L	U0-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

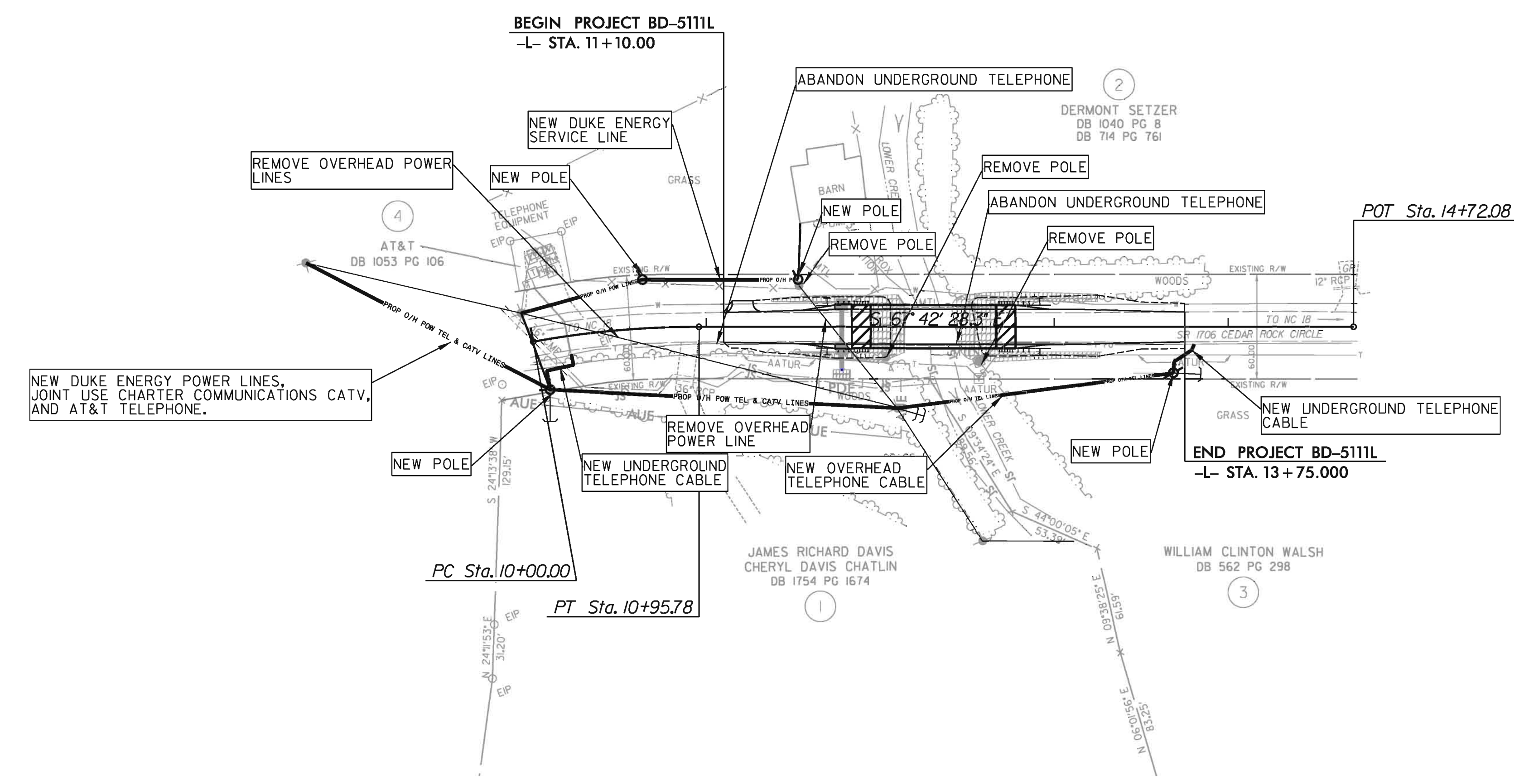
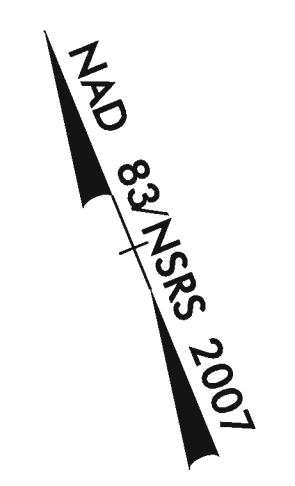


REASONABLE SPEED = 40mph  
ADT = 210 (1999)

**UTILITIES BY OTHERS**

**NOTE:**  
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS.

-L-  
PI Sta 10+48.02  
 $\Delta = 10' 15' 27.5" (RT)$   
 $D = 10' 42' 34.2"$   
 $L = 95.78'$   
 $T = 48.02'$   
 $R = 535.00'$



- NOTES:**
1. DUKE ENERGY TO REMOVE POLE AND OH POWER LINES AS NOTED ON PLAN. DUKE ENERGY TO SET NEW POLES AND RELOCATE POWER LINES.
  2. CHARTER COMMUNICATIONS TO COORDINATE WITH DUKE ENERGY DURING CATV RELOCATION.
  3. AT&T TO REMOVE AERIAL TELEPHONE CABLE AND POLES AS NOTED ON PLAN. COORDINATE WITH DUKE ENERGY DURING TELEPHONE RELOCATION.

**UTILITY OWNERS ON PROJECT**

- DUKE ENERGY - POWER
- CHARTER COMMUNICATIONS - CATV
- AT&T - TELEPHONE

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B05111L-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 808,448.0301(ft) EASTING: 1,267,934.1524(ft) ELEVATION: 1,144.83(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998963755

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B05111L-1" TO -L- STATION 10+00.00 IS S 67°03'12.84"E 516.46 (ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES. VERT. DATUM USED IS BASED ON MONUMENT "B05111L-1" (NAVD 88)

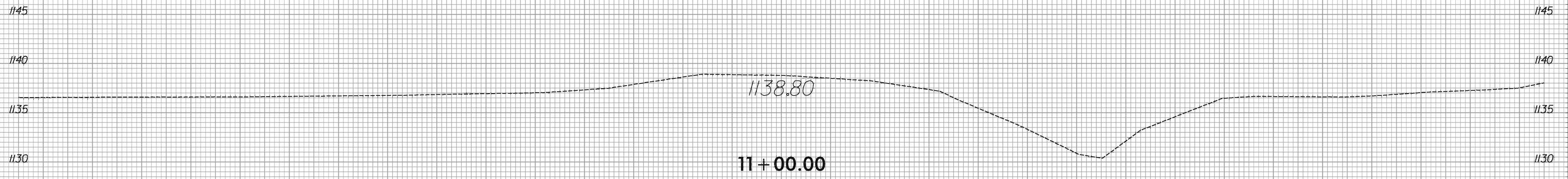
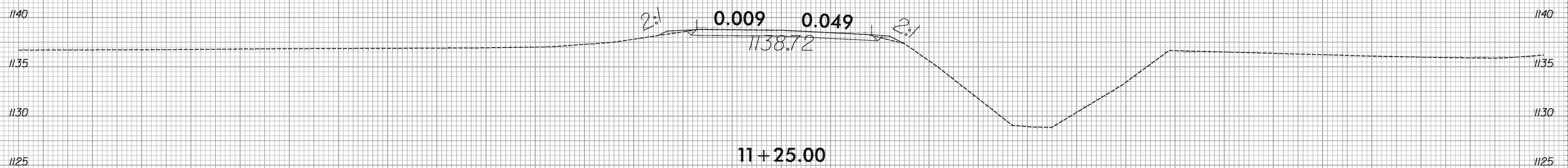
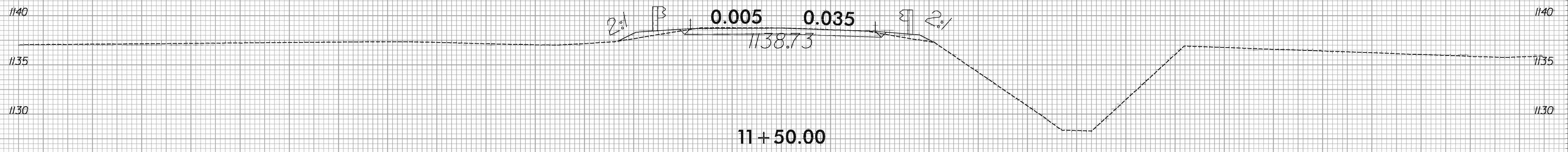
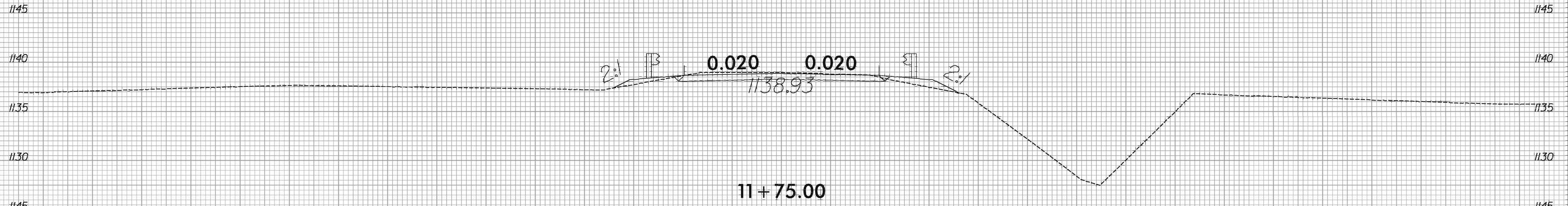
**PLANS PREPARED BY :**

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NC LICENSE NO. F-0112 • (919) 878-9560



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



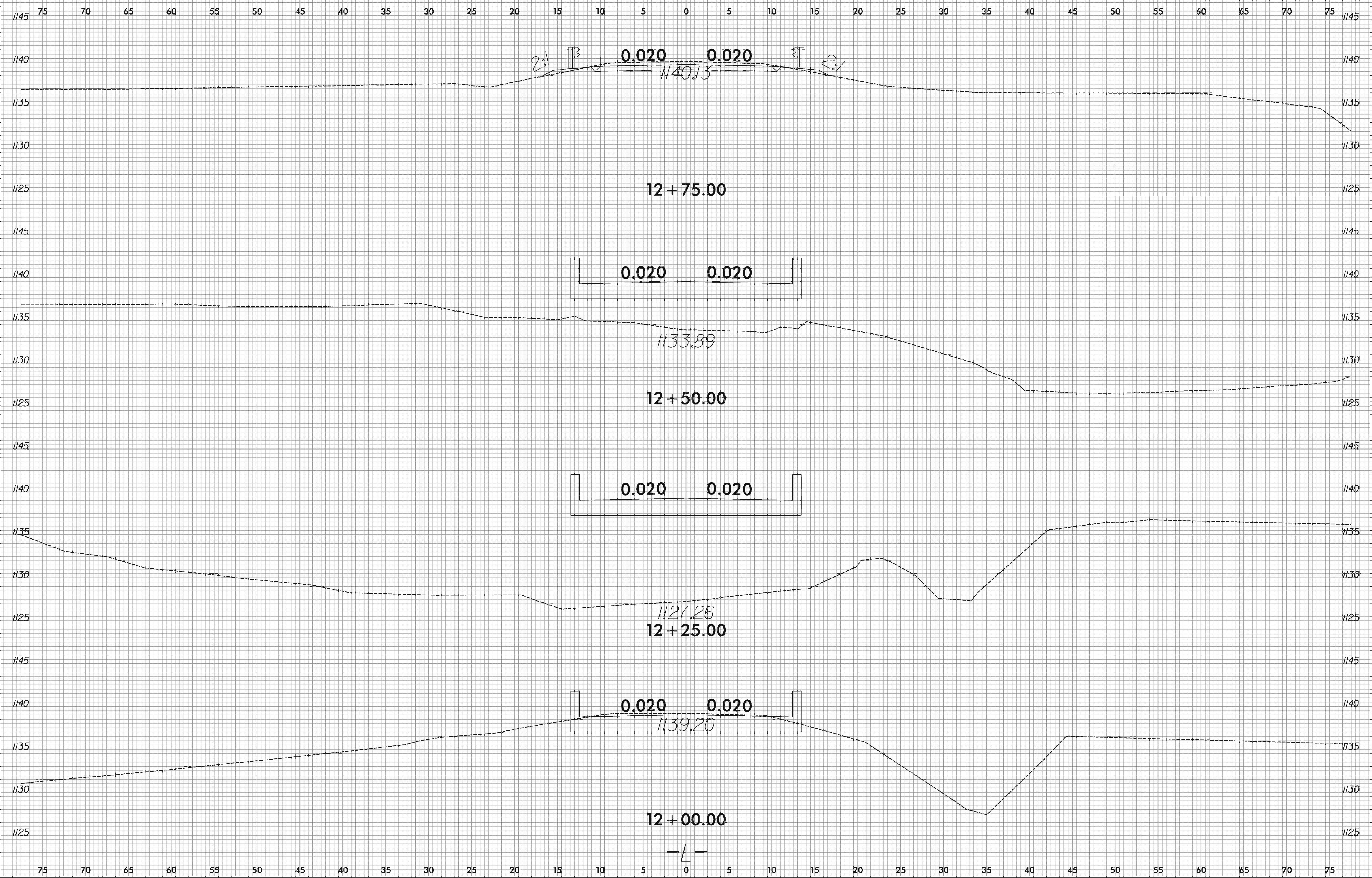
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
BD-5111L	X-2



2/23/2012  
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