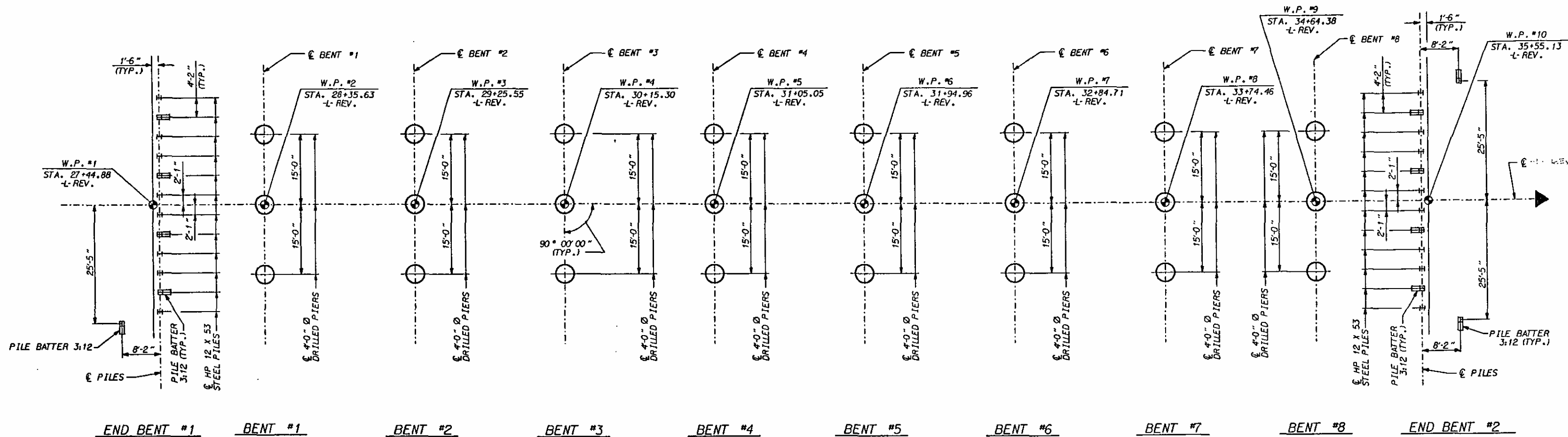




FOUNDATION LAYOUT

PROJECT NO. 8,1791801
 CATAWBA-ALEXANDER COUNTY
 STATION: 31+50.00 -L- REV.

SHEET 2 OF 3



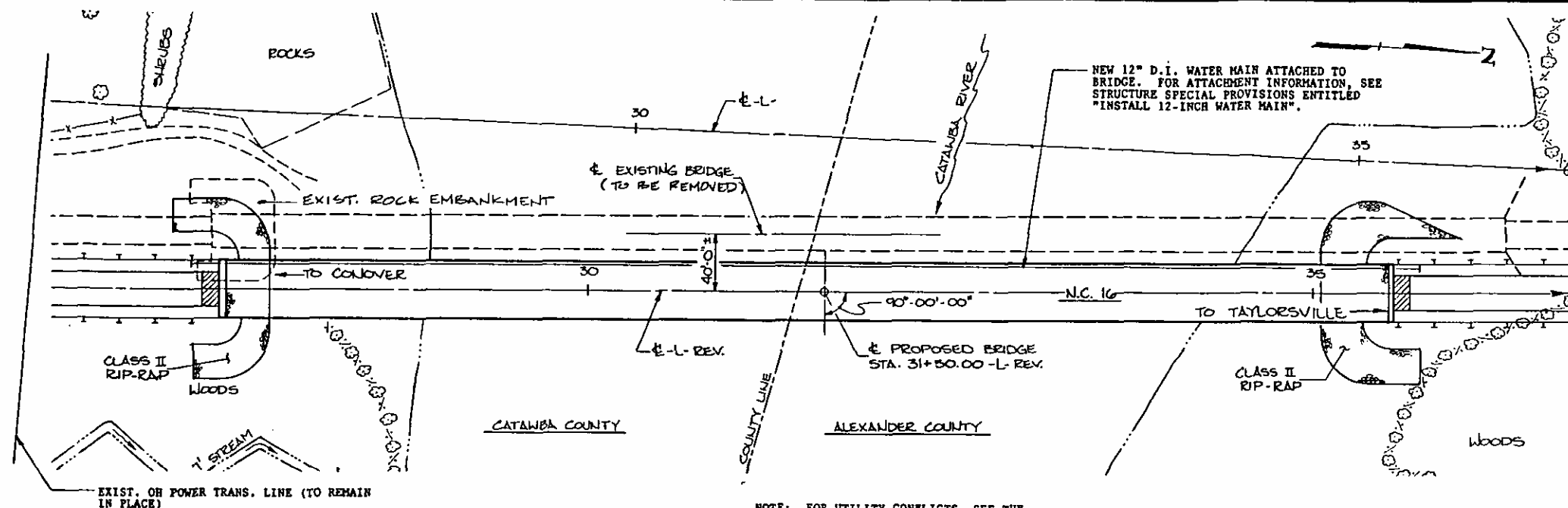
William E. Larkin
 2/15/94

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER CATAWBA RIVER
 ON -L- REV. (INC 16) BETWEEN
 CONOVER AND TAYLORSVILLE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			6-2
2			4			54

DRAWN BY: D.B. HINNANT DATE: 12-10-93
 CHECKED BY: W.E. LARKIN DATE: 1-94

BM #1 : DISK STAMPED #1 86 1935 IN TOP OF SOUTH BACKWALL OF BRIDGE 99 RT. STA. 27+10 -L- ELEVATION 881.69



NOTE: FOR UTILITY CONFLICTS, SEE THE "UTILITY SPECIAL PROVISIONS".

HYDROGRAPHIC DATA

DESIGN DISCHARGE = 169,500 CFS.
FREQUENCY OF DESIGN FLOOD = 100+ YRS.
DESIGN HIGH WATER ELEV. = 866.3
DRAINAGE AREA = 1,310 SQ. MI.
BASIC DISCHARGE (0100) = 169,500 CFS.
BASIC HIGH WATER ELEV. = 866.3

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = N/A
FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.
OVERTOPPING FLOOD ELEV. = 879.0

LOCATION SKETCH

--- NOTES ---

ASSUMED LIVE LOAD = HS 20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

FOR REINFORCED CONCRETE DECK SLAB, SEE SPECIAL PROVISIONS.

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

FOR CURING BRIDGE DECK SLABS, SEE THE SPECIAL PROVISION "REINFORCED CONCRETE DECK SLAB."

COMPUTED BEARING PRESSURE FOR BENTS #1 THRU #8 EQUALS 27.7 TONS PER SQ. FT.

FOR MINIMUM TIP ELEVATION OF DRILLED PIERS AT BENTS SEE INDIVIDUAL BENT DRAWINGS.

DRILLED PIERS SHALL HAVE A MINIMUM ROCK SOCKET DIAMETER OF 46 INCHES.

PILES FOR END BENTS #1 AND #2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 17 SPANS: 1 @ 52'-10", 15 @ 52'-6" AND 1 @ 52'-0" WITH A 7" R.C. SLAB AND A 3" ASPHALT WEARING SURFACE ON 3 LINES OF 18" X 48" R.C. DECK GIRDERS @ 8'-0" CTS. ON R.C. SPILL THRU END BENT, FULL HEIGHT ABUTMENT AND 16 ROUND NOSE POST AND WEB INTERIOR BENTS, ALL ON SPREAD FOOTINGS, WITH CLEAR ROADWAY WIDTH OF 20 FT. LOCATED 40 FT. UPSTREAM OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FHWA'S TECHNICAL ADVISORY, TSI 40.23, EVALUATING SCOUR AT BRIDGES.

THE SCOUR CRITICAL ELEVATION FOR BENT #1 IS 841.0, BENT #2 IS 834.0, BENT #3 IS 833.0, BENT #4 IS 842.0, BENT #5 IS 833.0, BENT #6 IS 832.0, BENT #7 IS 833.0, BENT #8 IS 835.0.

THESE ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES" FOR SEISMIC PERFORMANCE CATEGORY A.

FOR INSTALLATION AND ATTACHMENT OF 12 INCH WATER MAIN, SEE SPECIAL PROVISIONS.

APPROACH SLABS AT END BENTS #1 AND #2 ARE NOT TO BE CONSTRUCTED UNTIL AFTER 12" DIAMETER WATER MAIN IS LAID.

A 1 MONTH WAITING PERIOD IS REQUIRED AFTER COMPLETION OF THE APPROACH EMBANKMENT BEFORE BEGINNING CONSTRUCTION OF THE APPROACH SLAB AT END BENTS #1 AND #2.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS DIRECTED BY THE ENGINEER.

TEMPORARY SHORING WILL BE REQUIRED IN THE AREA INDICATED IN THE ELEVATION VIEW. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF DRAWINGS SHOWING DETAILS OF THE TEMPORARY SHORING TO THE ENGINEER. THE ENTIRE COST OF THE TEMPORARY SHORING SHALL BE INCLUDED IN THE COST OF THE VARIOUS PAY ITEMS FOR END BENT #1.

FOR SHAFT EXCAVATION, SEE SPECIAL PROVISIONS.

FOR TEMPORARY ROCK CAUSEWAY, SEE SPECIAL PROVISIONS.

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.

FOR HIGH STRENGTH PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

TOTAL BILL OF MATERIAL																				
	REMOVAL OF EXISTING STRUCTURE AT STATION 31+50.00 -L- REV.	4'-0" DIA. DRILLED PIERS	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	ELASTOMERIC BEARINGS	PLAIN RIP RAP CLASS II (2'-0" THK)	EXPANSION JOINT SEALS	PREFORMED COMPRESSION JOINT SEALS	INSTALL 12" WATER MAIN	TEMPORARY ROCK CAUSEWAY	SHAFT EXCAVATION	
	LUMP SUM	LIN.FT.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	LUMP SUM	TONS	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN.FT.
SUPERSTRUCTURE	LUMP SUM		34818	30608		LUMP SUM			45	4016.25			1616.29	LUMP SUM		LUMP SUM	LUMP SUM	LUMP SUM		
END BENT #1					29.4		4417				13	455			666					152.12
BENT #1		127			42.2		27640	4843												
BENT #2		91			48.3		24723	3692												
BENT #3		87			48.5		24378	3613												
BENT #4		60			48.8		21589	2972												
BENT #5		87			49.1		24537	3654												
BENT #6		90			49.3		24937	3748												
BENT #7		93			49.6		25335	3840												
BENT #8		81			49.9		24139	3566												
END BENT #2					29.7		4448				14	350			1144					
TOTAL	LUMP SUM	716	34818	30608	444.8	LUMP SUM	206143	29928	45	4016.25	27	805	1616.29	LUMP SUM	1810	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	152.12

DRAWN BY: M.D. CRUTCHER/DBH DATE: 12-7-93
CHECKED BY: W.E. LARKIN DATE: 11-94



William E. Larkin
2/15/94

PROJECT NO. 8.1791801

CATAWBA-ALEXANDER COUNTY

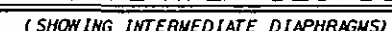
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SHEET 3 OF 3

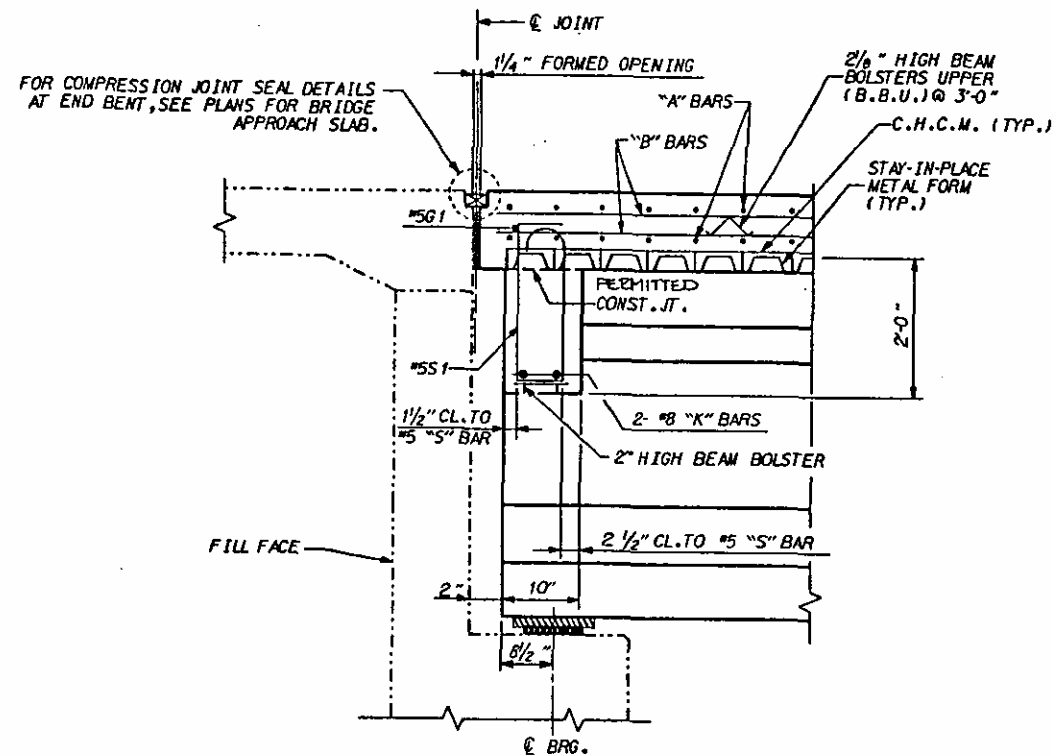
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER CATAWBA RIVER
ON C -L- REV. (INC 16) BETWEEN
CONOVER AND TAYLORSVILLE

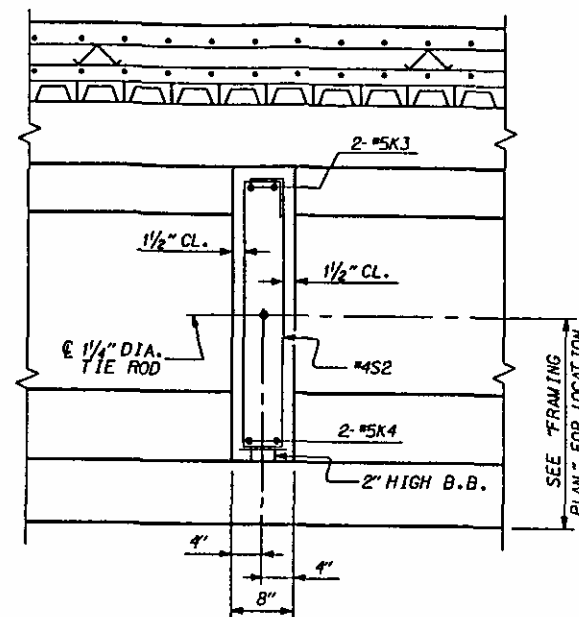
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2			4	54



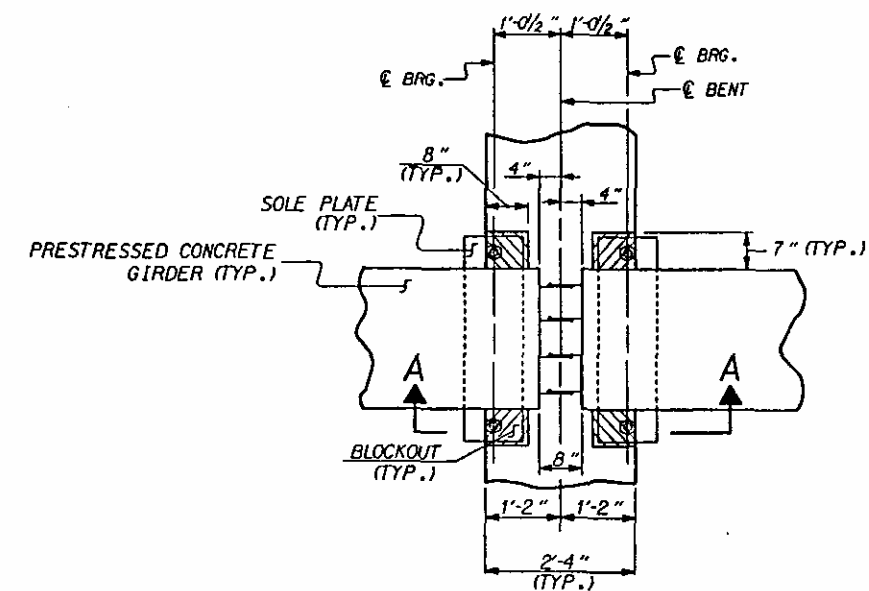
MARCH						1993
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			



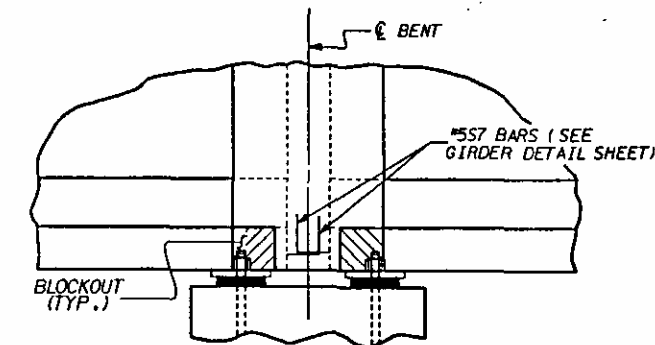
SECTION THRU END BENT DIAPHRAGM



SECTION THRU INTERMEDIATE DIAPHRAGM

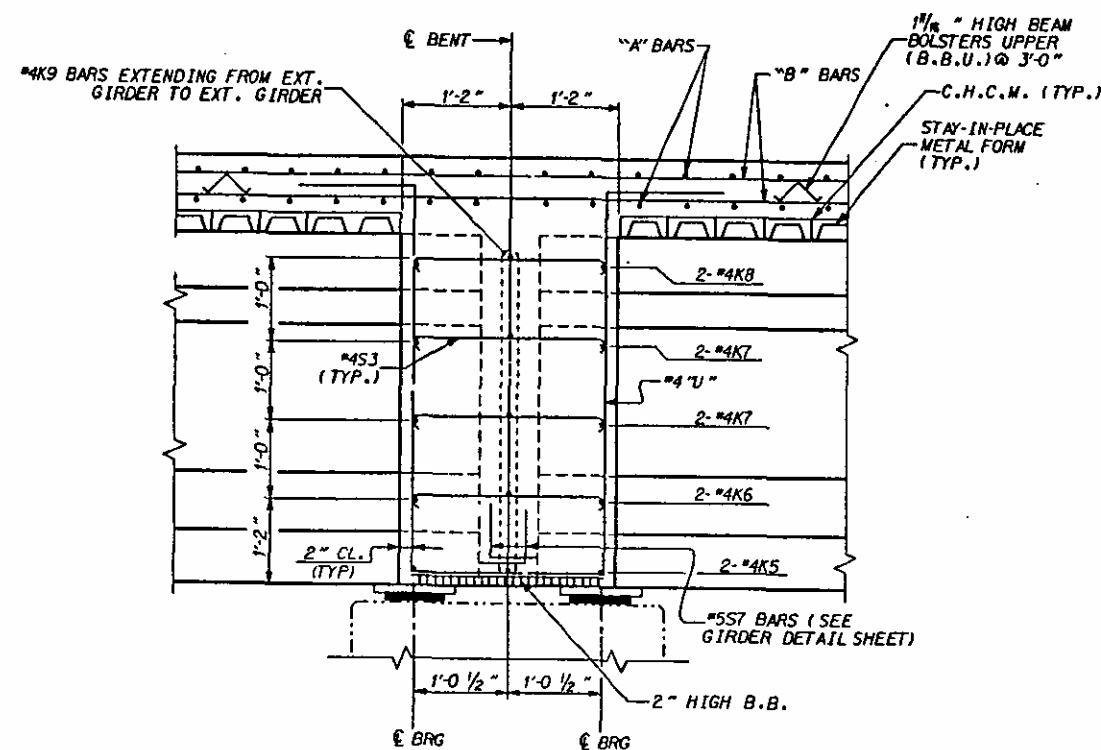


PLAN VIEW



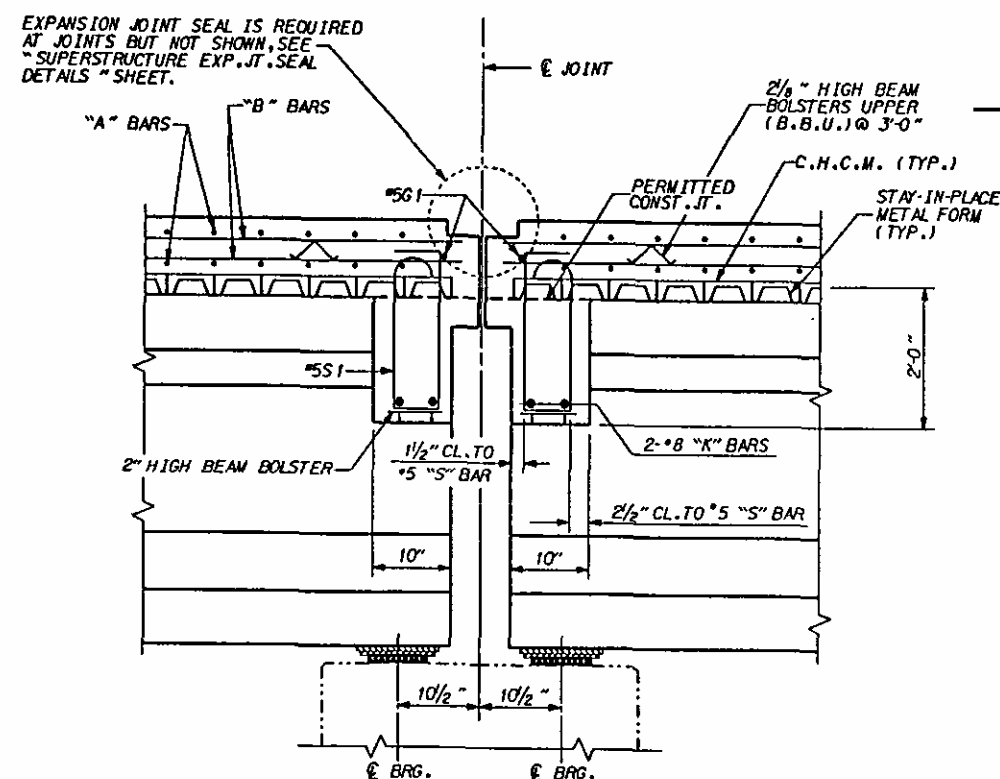
SECTION A-A

BENT DIAPHRAGM FOR CONTINUOUS DECK SLAB
BLOCKOUT DETAIL



SECTION THRU BENT DIAPHRAGM

(TYP. @ BENTS #1, #2, #4, #5, #7 & #8)



SECTION THRU BENT DIAPHRAGM

(TYP. @ BENTS #3 & #6)

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

MARCH

1993

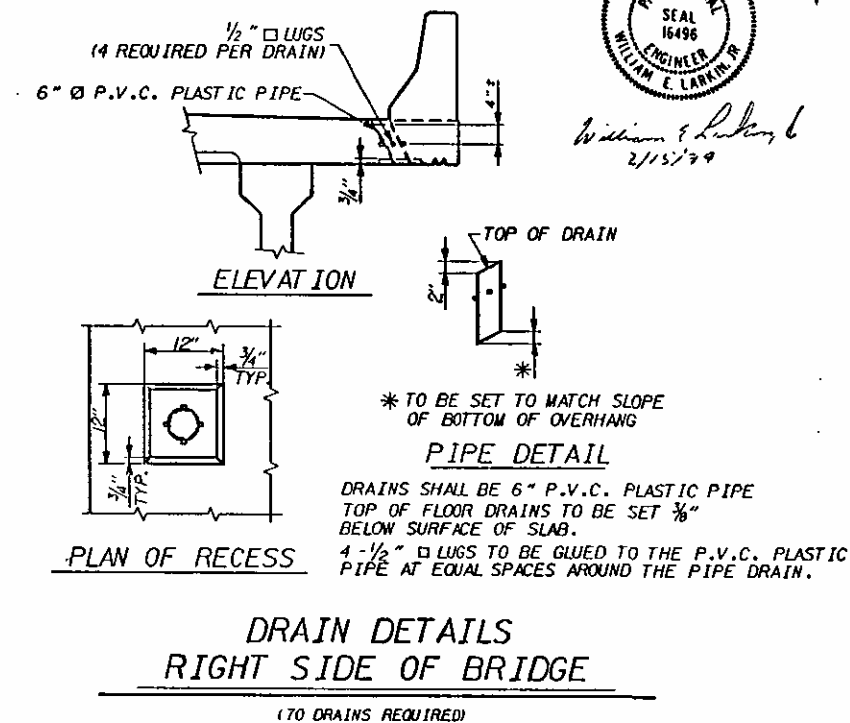
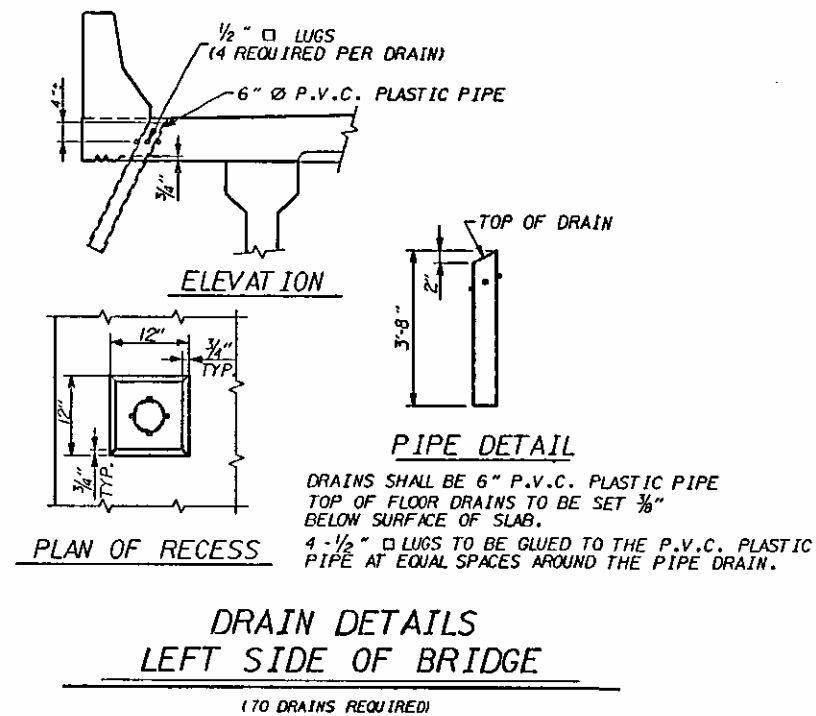


William E. Larkin
4/15/94

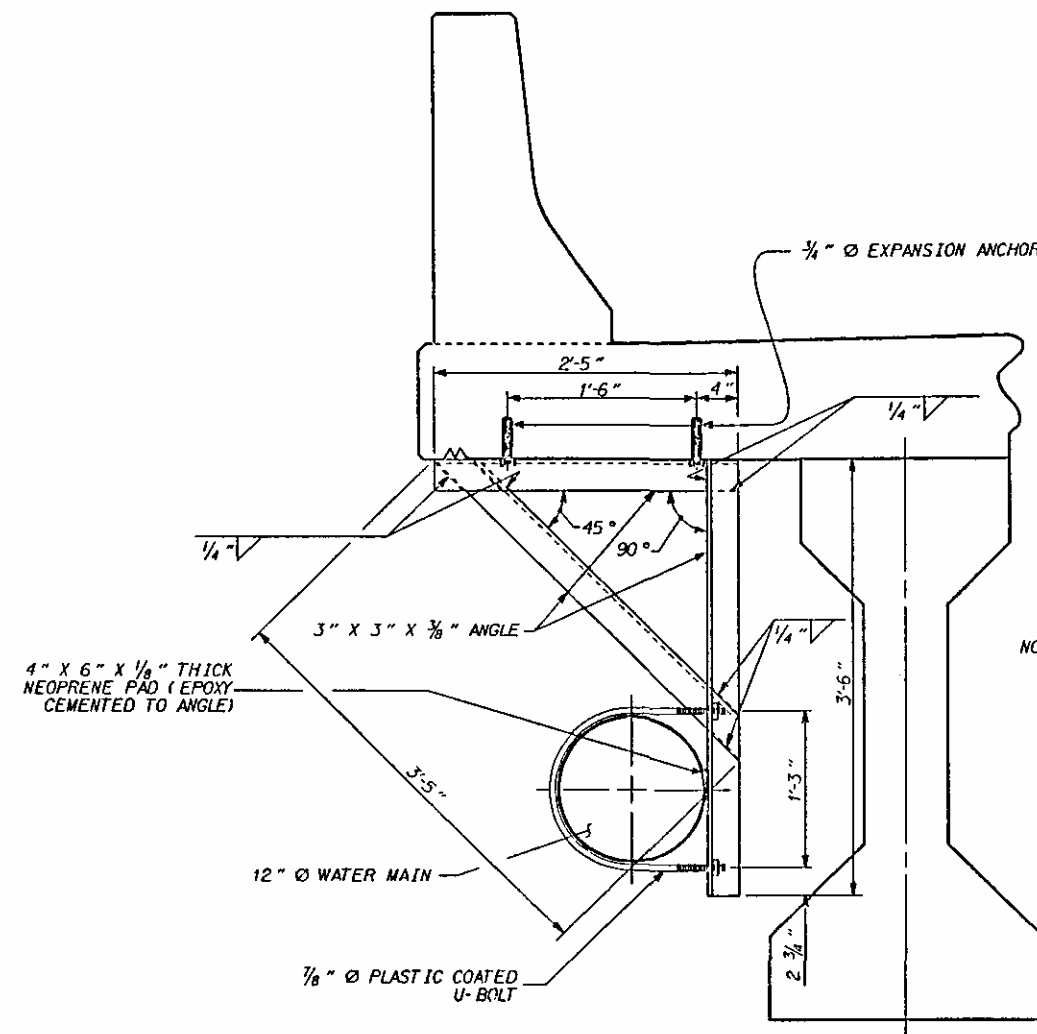
DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: A.D. MARTIN DATE: 7-93

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

TOTAL
SHEETS
54



William E. Larkin
2/15/94



- NOTES:
1. ANGLE TO BE CONNECTED BY ARC WELDING.
 2. HOLES IN ANGLE TO BE DRILLED $\frac{1}{16}$ " LARGER THAN U-BOLT, NO BURNING OF HOLES WILL BE ALLOWED.
 3. LATERAL BRACES TO BE INSTALLED ONE FOOT BACK OF EACH PIPE JOINT.
 4. FOR INSTALLATION AND ATTACHMENT OF 12" ϕ WATER MAIN, SEE SPECIAL PROVISIONS.



Feb. 14, 1994

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
TYPICAL SECTION
DETAILS**

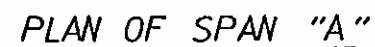
MARCH

1993

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
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DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: R.D. MARTIN DATE: 7-93

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

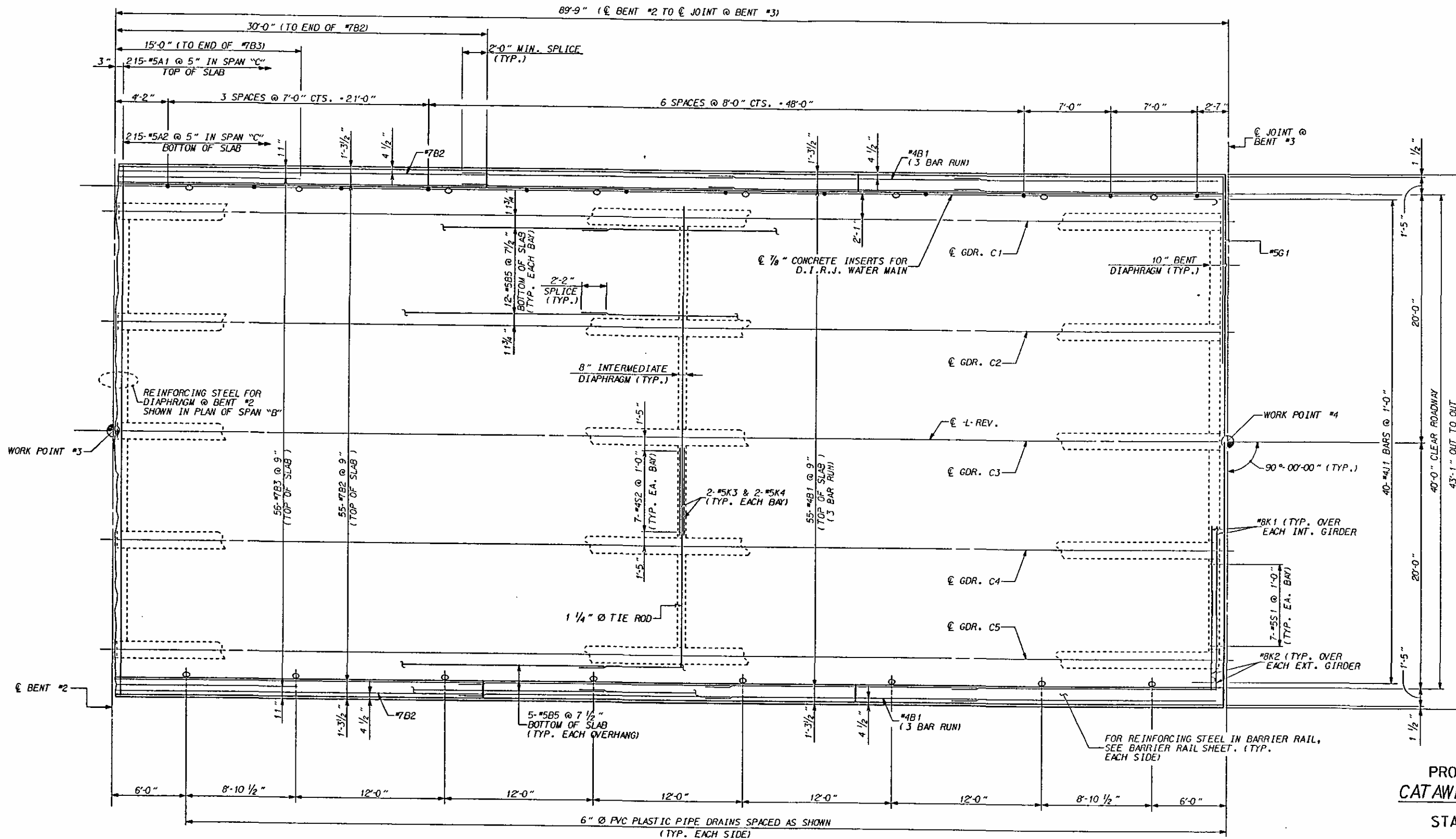
SUPERSTRUCTURE
PLAN OF SPAN "A"

MARCH

1993

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 54
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2			4			

DRAWN BY : W.D. CRUTCHER DATE : 3-93
CHECKED BY : R.D. MARTIN DATE : 7-93



PLAN OF SPAN "C"

NOTE: FOR ADDITIONAL INFORMATION ON REINFORCING, SEE "SUPERSTRUCTURE TOP AND BOTTOM 'B' BAR LAYOUT" SHEET.



William E. Larkin, Jr.
2/10/93

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

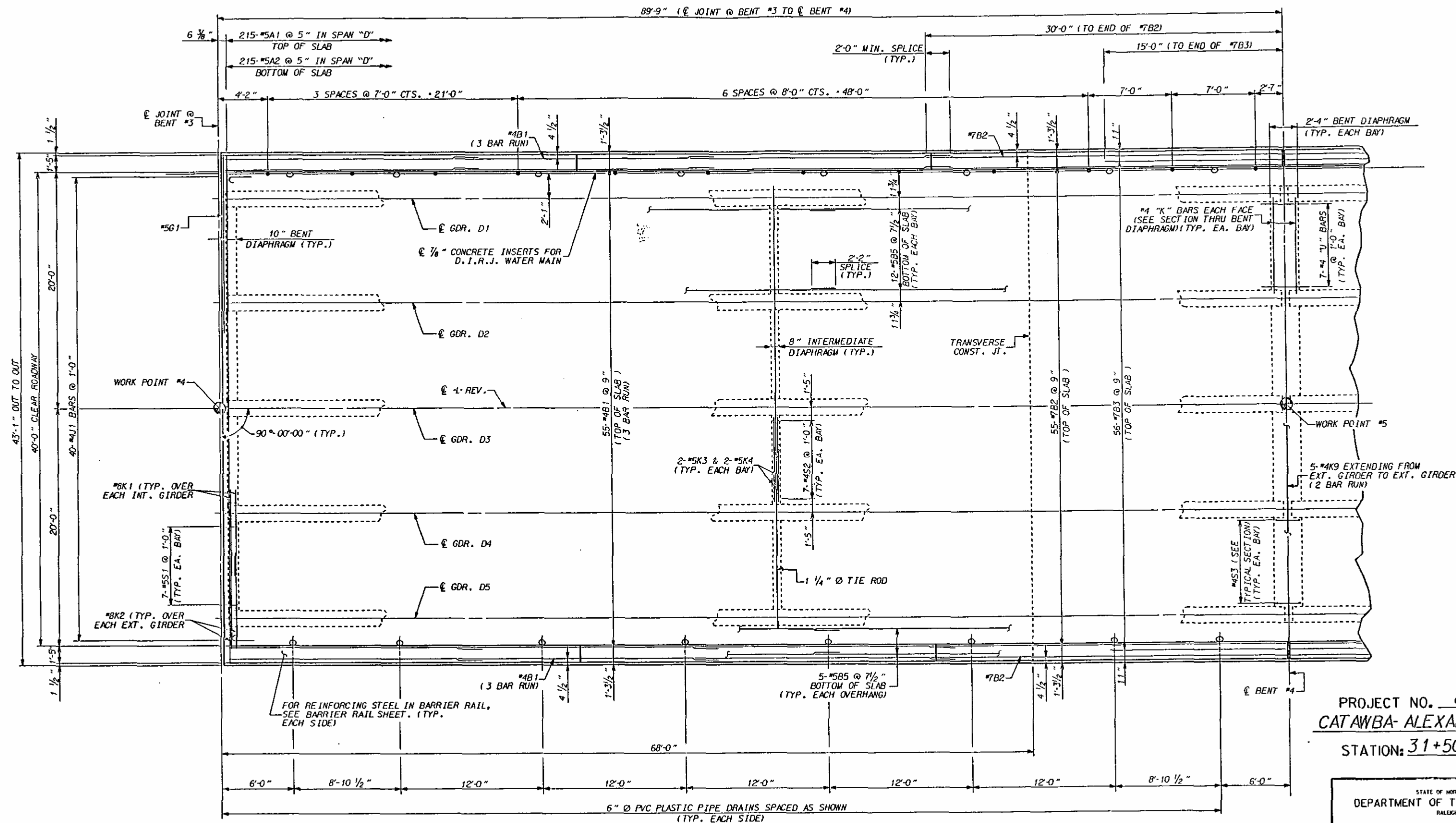
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN "C"

REVISIONS						SHEET NO.
NO.	DATE	BY	DATE	BY	DATE	
1						5-9
2						54

DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: A.D. MARTIN DATE: 7-93

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PLAN OF SPAN "D"

NOTE: FOR ADDITIONAL INFORMATION ON REINFORCING, SEE "SUPERSTRUCTURE TOP AND BOTTOM 'B' BAR LAYOUT" SHEET.



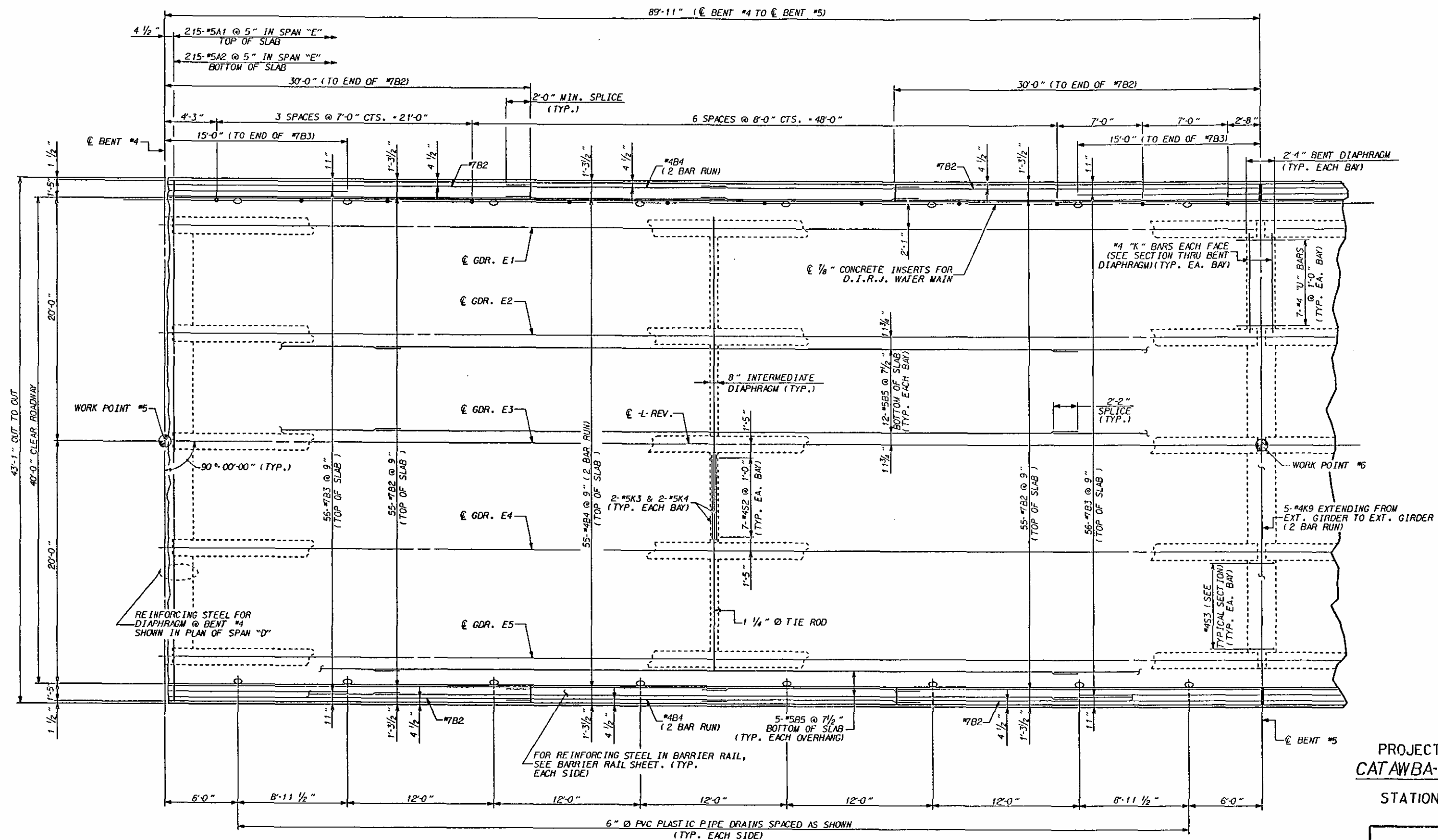
PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN "D"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			3			TOTAL SHEETS 54

DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: R.D. MARTIN DATE: 7-93



PLAN OF SPAN "E"

NOTE: FOR ADDITIONAL INFORMATION ON
REINFORCING, SEE "SUPERSTRUCTURE
TOP AND BOTTOM "B" BAR LAYOUT" SHEET.



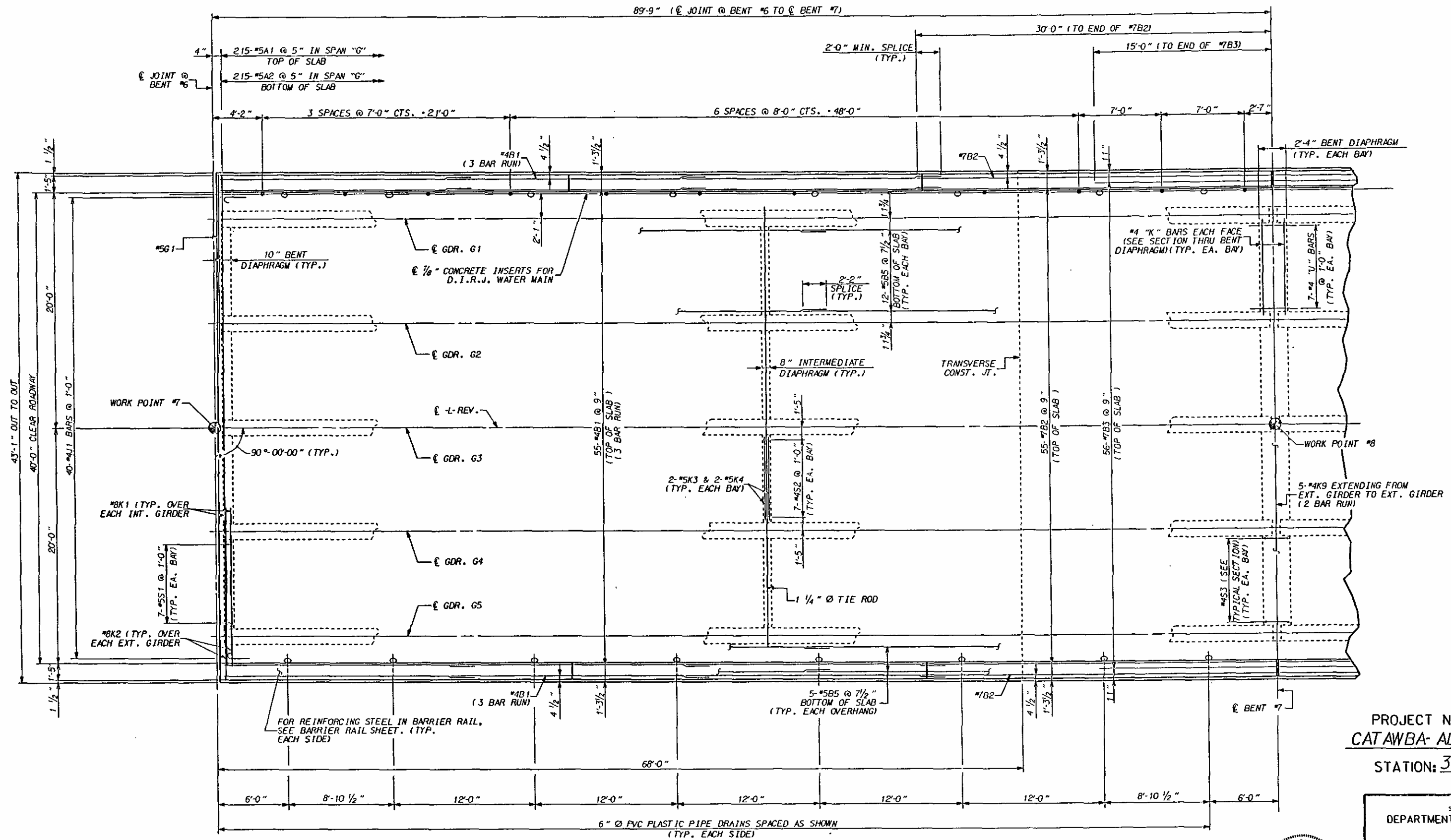
William E. Lantry,
2/15/94

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
 STATION: 31+50.00 -L-REV.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN "E"

MARCH						1993
REVISIONS						SHEET NO.
NO.	DTs	DATE	NO.	DTs	DATE	TOTAL SHEETS
1			23			5011
2			24			54



PLAN OF SPAN "G"

NOTE: FOR ADDITIONAL INFORMATION ON
REINFORCING, SEE "SUPERSTRUCTURE
TOP AND BOTTOM 'B' BAR LAYOUT" SHEET.



William E. Larkin
2/15/04

DRAWN BY : W.D. CRUTCHER DATE : 3-93
CHECKED BY : R.D. MARTIN DATE : 2-93

PROJECT NO. 8.1791801
~~CATAWBA~~-ALEXANDER COUNTY
 STATION: 31+50.00 -L-REV.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

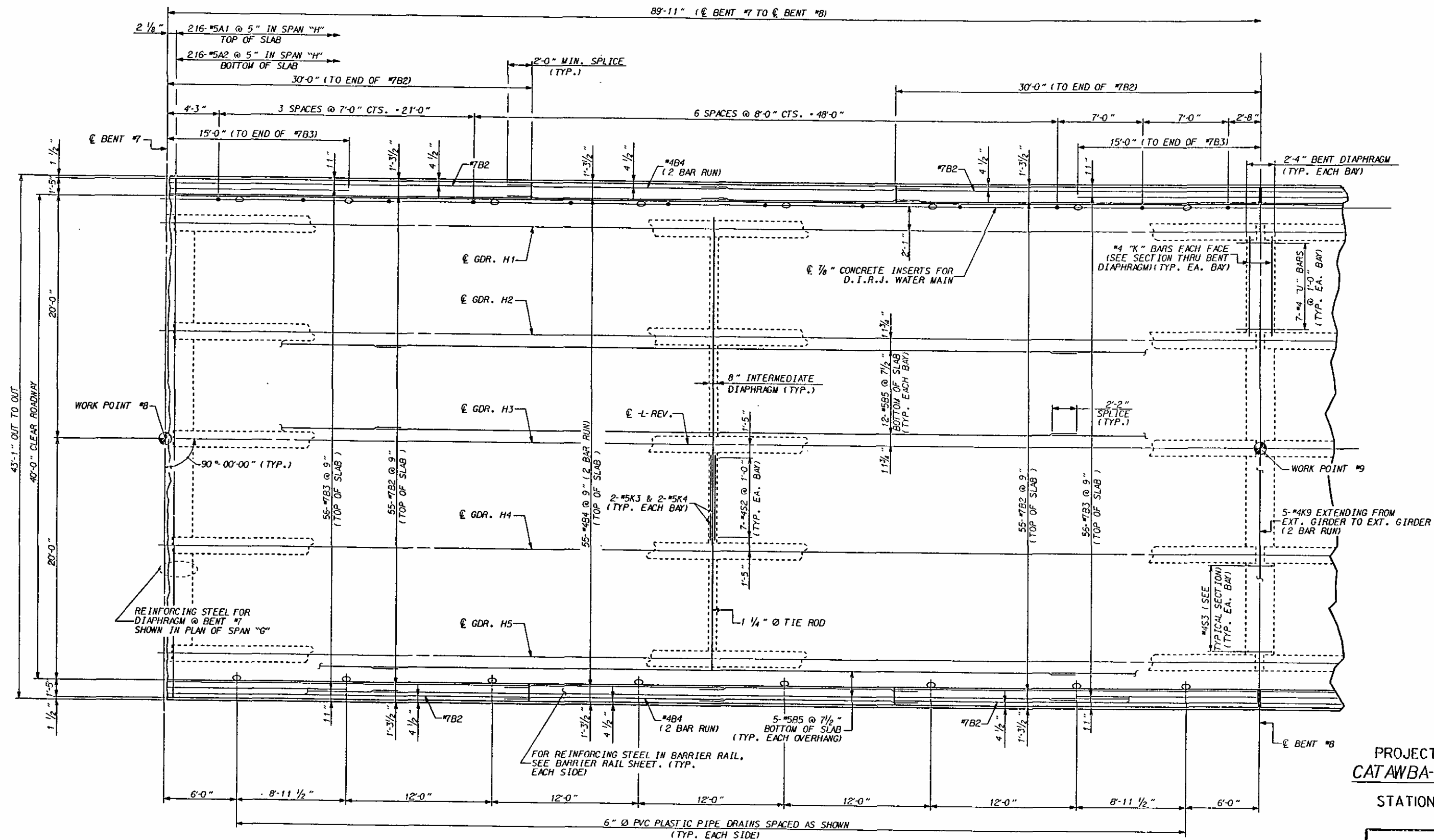
SUPERSTRUCTURE
PLAN OF SPAN "G"

MARCH

1993

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 54
2			4			

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PLAN OF SPAN "H"

NOTE: FOR ADDITIONAL INFORMATION ON REINFORCING, SEE "SUPERSTRUCTURE TOP AND BOTTOM 'B' BAR LAYOUT" SHEET.



PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

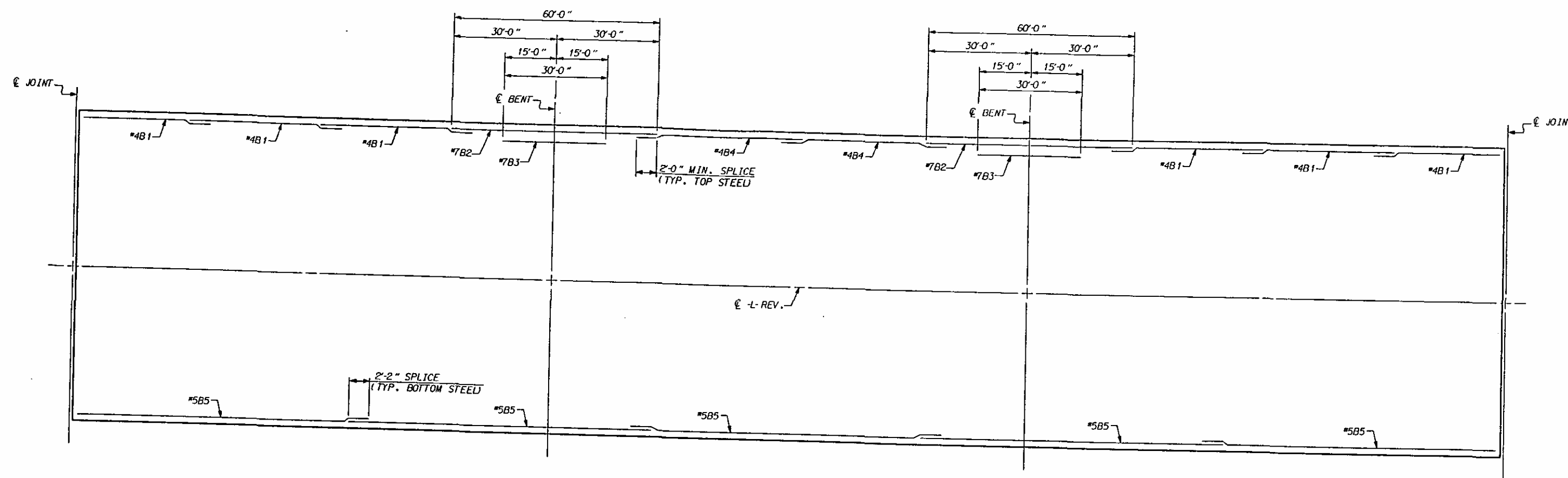
SUPERSTRUCTURE
PLAN OF SPAN "H"

MARCH

1993

DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: R.D. MARTIN DATE: 7-93

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			5-14
2			4			TOTAL SHEETS 54



TYPICAL PLAN FOR 3-SPAN CONTINUOUS UNIT

(TOP STEEL SHOWN ON LEFT SIDE OF CL L-REV., BOTTOM STEEL SHOWN ON RIGHT SIDE OF CL L-REV.) (SEE PLAN OF SPANS FOR SPACING)

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.

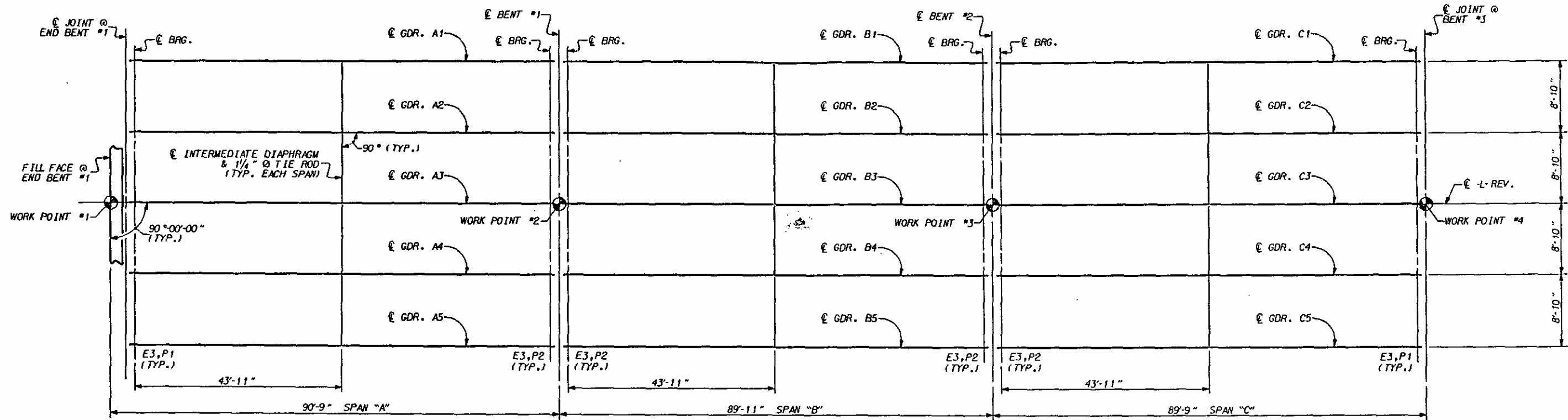


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TOP AND BOTTOM "B" BAR LAYOUT					
MARCH			1993		
REVISIONS					
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1			2		
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SHEET NO. 5-16					TOTAL SHEETS 54

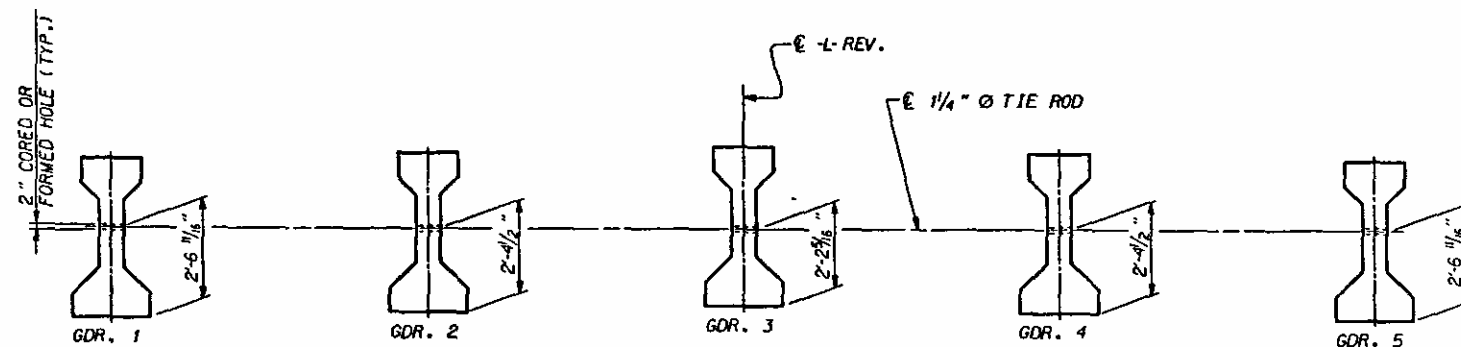
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hirnant

William E. Larkin
2/15/94



FRAMING PLAN



DETAIL SHOWING LOCATION OF HOLES IN
GIRDERS FOR 1 1/4" Ø TIE ROD

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.



William E. Larkin
2/15/94

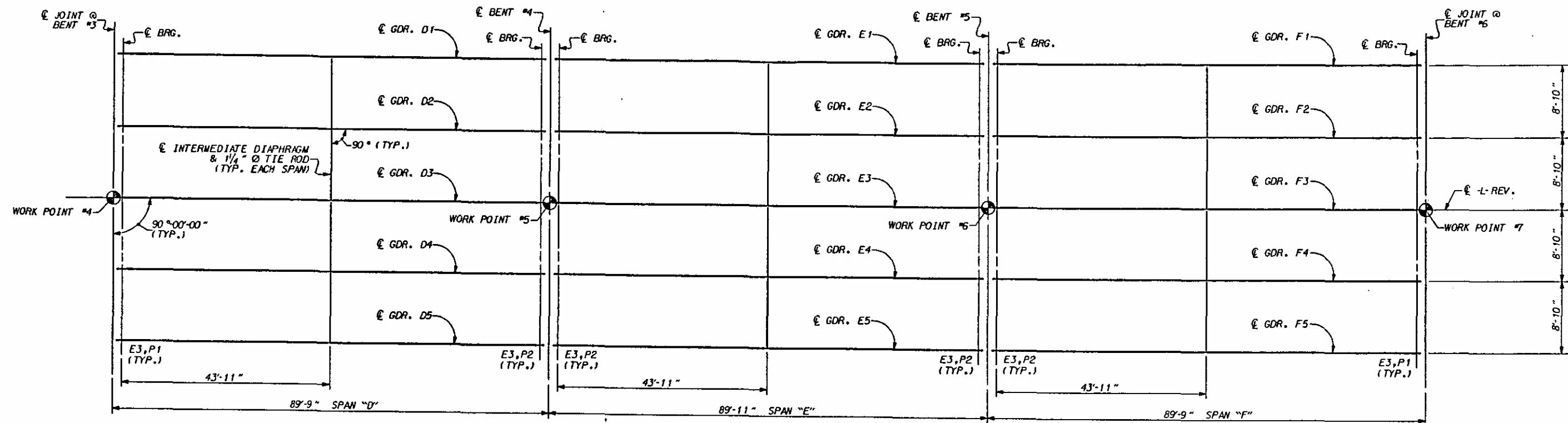
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
FRAMING PLAN**
SPANS "A", "B" & "C"

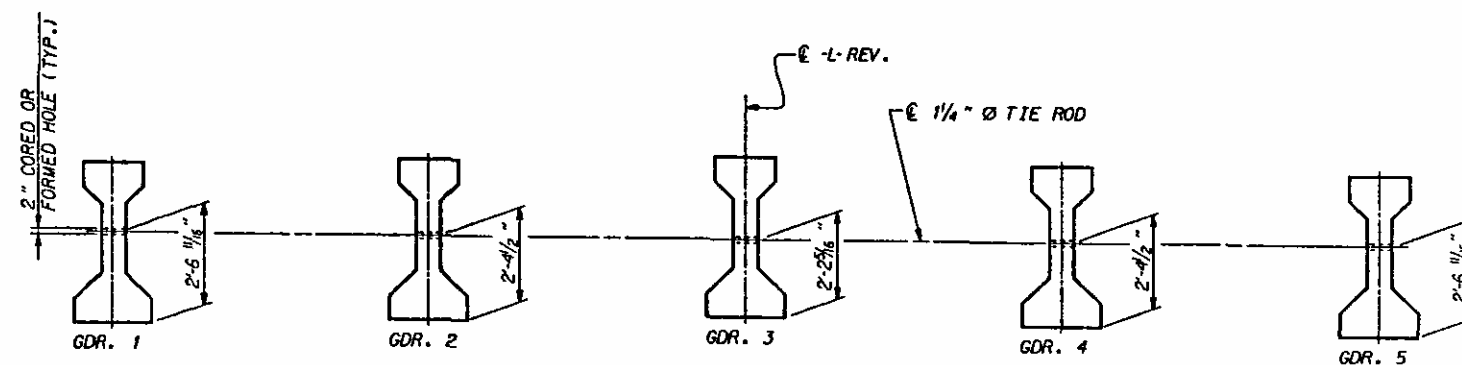
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CHECKED BY: A.D. MARTIN DATE: 7-93

09-DEC-1993 09:50
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WCRUTCHER



FRAMING PLAN



DETAIL SHOWING LOCATION OF HOLES IN
GIRDERS FOR 1/4" Ø TIE ROD

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.



William E. Larkin
2/13/99

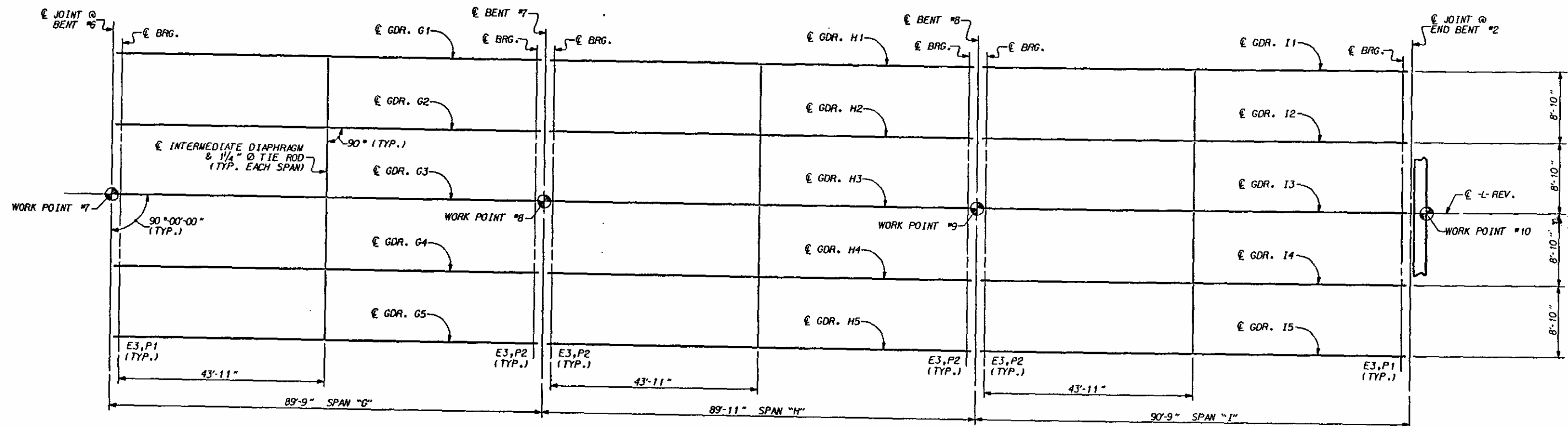
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
FRAMING PLAN**
SPANS "D", "E" & "F"

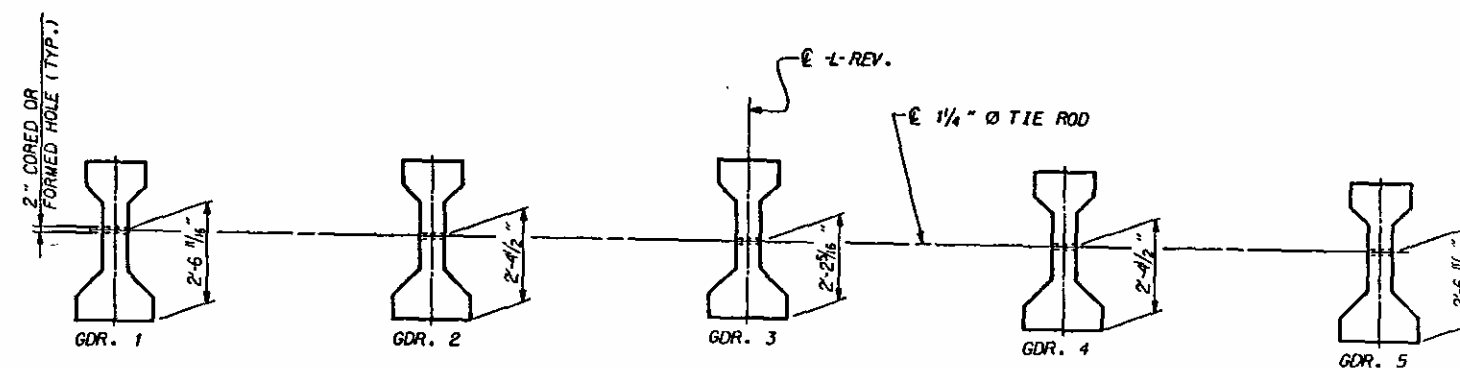
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09-DEC-1993 09:50
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WCRUTCHER



FRAMING PLAN



DETAIL SHOWING LOCATION OF HOLES IN GIRDERS FOR 1 1/4" Ø TIE ROD

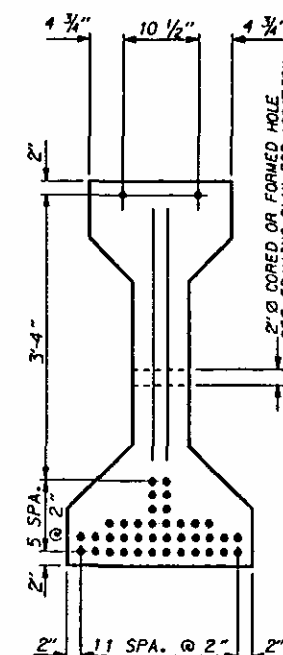
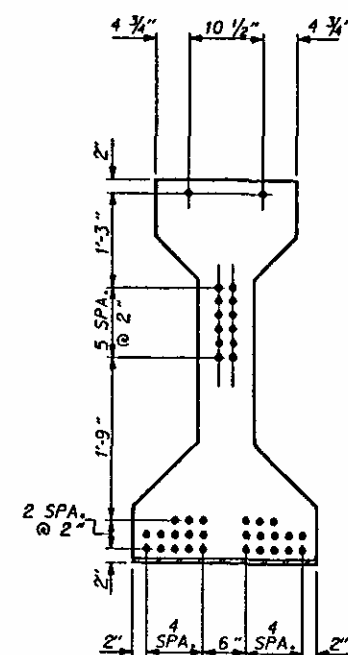
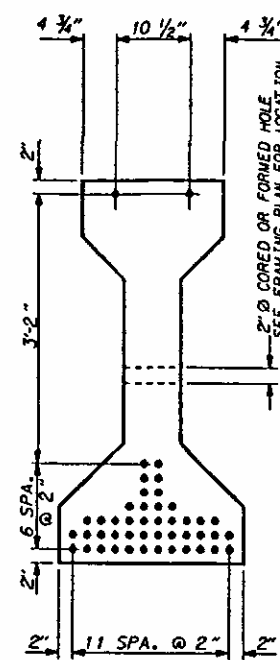
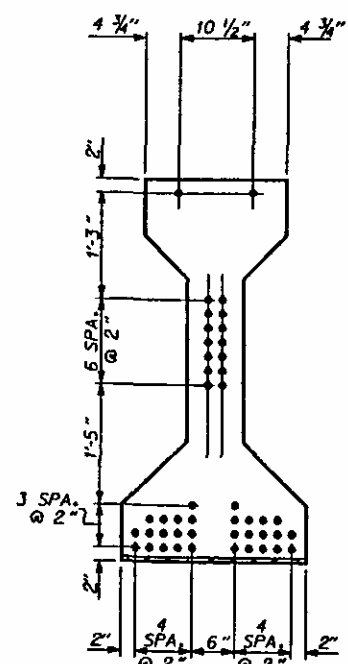
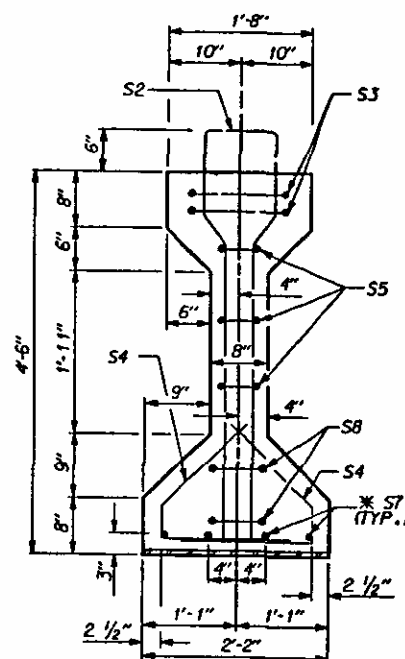
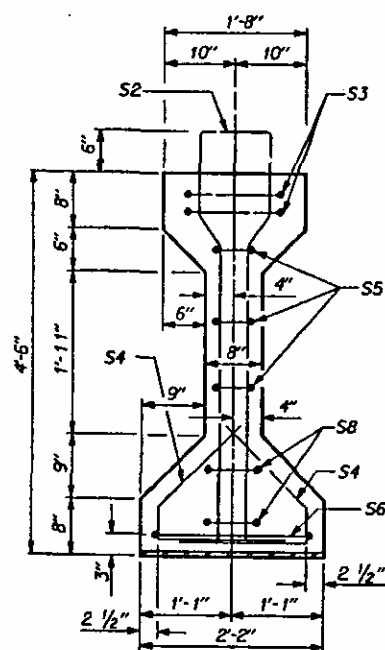
PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.



William E. Larkin, Jr.
2/15/94

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN SPANS "G", "H" & "I"					
MARCH 1993					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					5-19
TOTAL SHEETS					54

DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: A.D. MARTIN DATE: 7-93
03-DEC-1993 09:50
Z:\M205023\B220806P.DGN
WCRUTCHER



AT END OF GIRDER

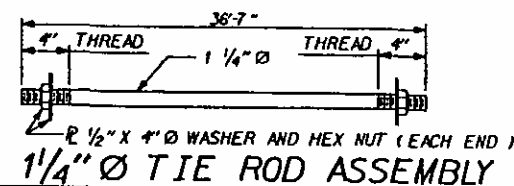
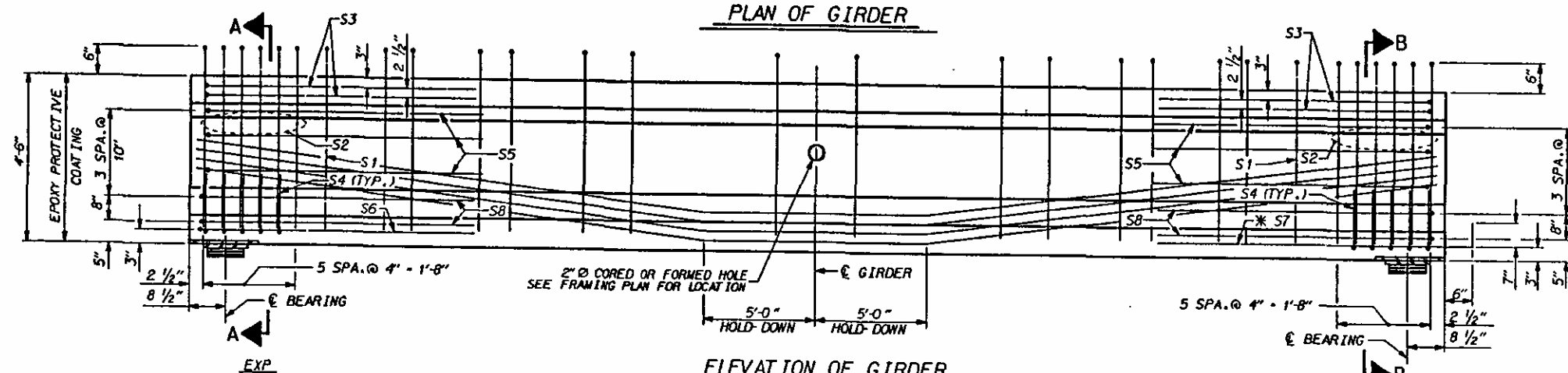
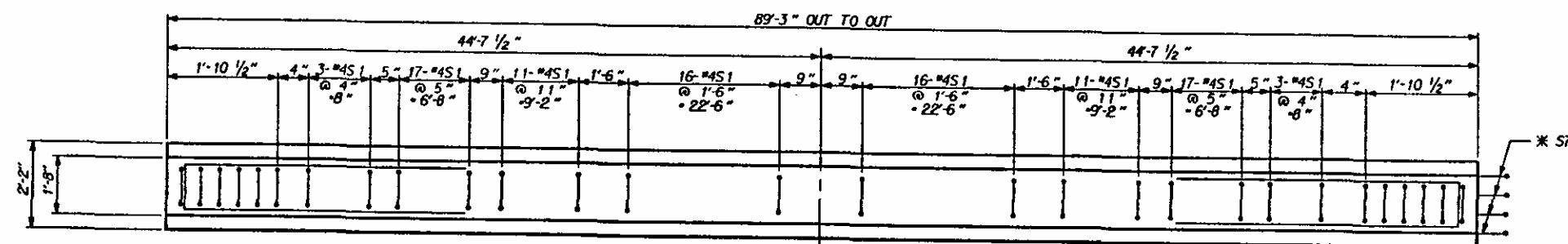
AT C OF GIRDER

AT END OF GIRDER

AT C OF GIRDER

1/2" Ø STRESS RELIEVED STRAND LAYOUT

1/2" Ø LOW RELAXATION STRAND LAYOUT



(6 COMPLETE ASSEMBLIES REQUIRED)

GRADE 270 STRANDS		
	$\frac{1}{2} \times 8$ S.R.	$\frac{1}{2} \times 8$ L.R.
AREA (SQUARE INCHES)	0.153	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	28,900	30,980

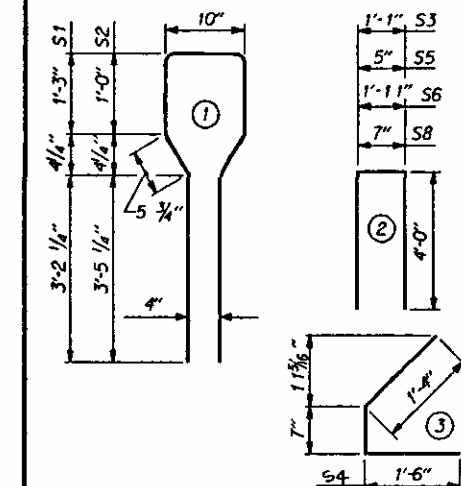
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	94	#4	1	10'-8"	670
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	20	#4	3	3'-5"	46
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	4	#5	STR	5'-3"	22
S8	4	#4	2	8'-7"	23

* NOTE: S7 BARS SHALL BE BENT AFTER GIRDER FABRICATION AND BEFORE SHIPMENT.

BAR TYPES	
1	1/2" x 1/4" x 1/4"
2	1/2" x 1/4" x 1/4"
3	1/2" x 1/4" x 1/4"
4	1/2" x 1/4" x 1/4"
5	1/2" x 1/4" x 1/4"
6	1/2" x 1/4" x 1/4"
7	1/2" x 1/4" x 1/4"
8	1/2" x 1/4" x 1/4"
9	1/2" x 1/4" x 1/4"
10	1/2" x 1/4" x 1/4"
11	1/2" x 1/4" x 1/4"
12	1/2" x 1/4" x 1/4"
13	1/2" x 1/4" x 1/4"
14	1/2" x 1/4" x 1/4"
15	1/2" x 1/4" x 1/4"
16	1/2" x 1/4" x 1/4"
17	1/2" x 1/4" x 1/4"
18	1/2" x 1/4" x 1/4"
19	1/2" x 1/4" x 1/4"
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21	1/2" x 1/4" x 1/4"
22	1/2" x 1/4" x 1/4"
23	1/2" x 1/4" x 1/4"
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86	1/2" x 1/4" x 1/4"
87	1/2" x 1/4" x 1/4"
88	1/2" x 1/4" x 1/4"
89	1/2" x 1/4" x 1/4"
90	1/2" x 1/4" x 1/4"
91	1/2" x 1/4" x 1/4"
92	1/2" x 1/4" x 1/4"
93	1/2" x 1/4" x 1/4"
94	1/2" x 1/4" x 1/4"
95	1/2" x 1/4" x 1/4"
96	1/2" x 1/4" x 1/4"
97	1/2" x 1/4" x 1/4"
98	1/2" x 1/4" x 1/4"
99	1/2" x 1/4" x 1/4"
100	1/2" x 1/4" x 1/4"

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6,500 PSI CONCRETE	1/2" Ø S.R. STRANDS	1/2" Ø L.R. STRANDS
	LB.	CY.	No.	No.
	1018	18.1	46	40

PROJECT NO. 8. 1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.

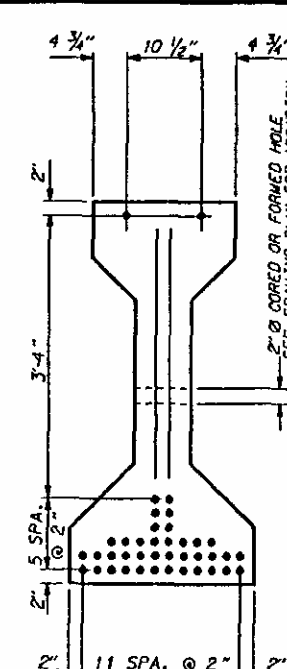
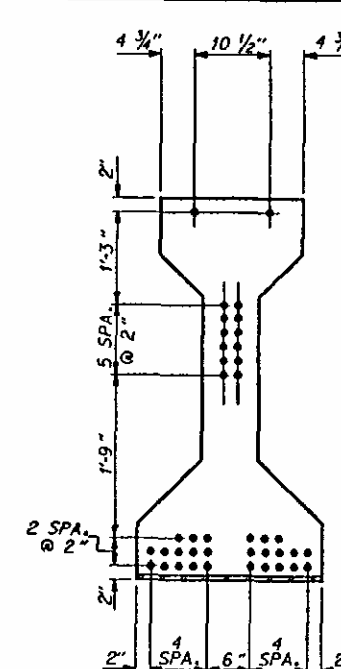
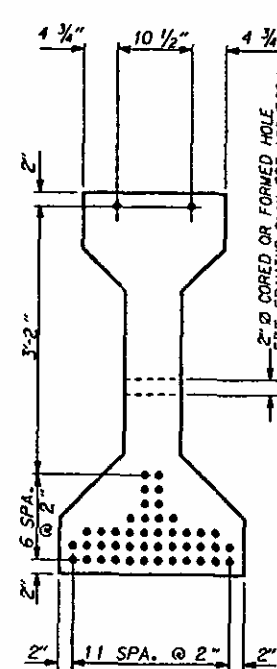
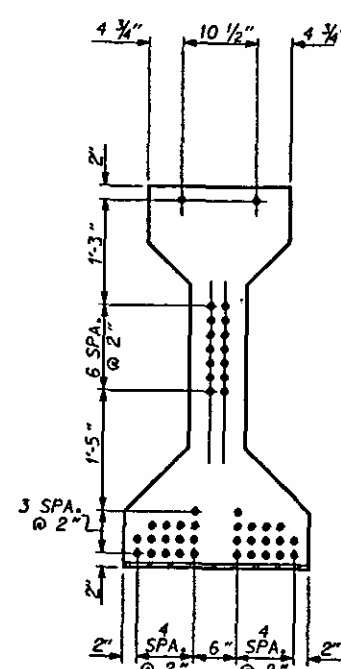
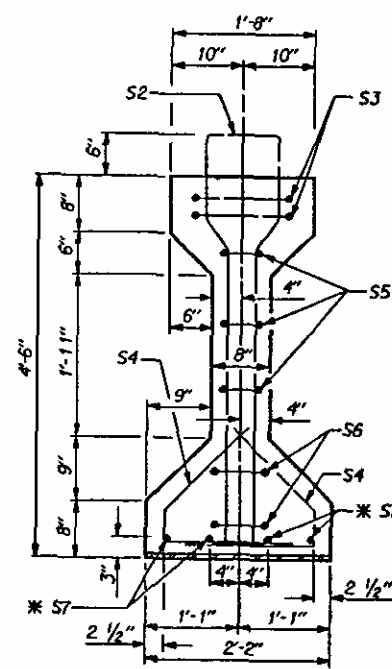
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RAILROAD
54' PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS "A", "C", "D", "F"
"G" & "I"

MARCH			1993		
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. 5-20 TOTAL SHEETS 54

BEHOLD

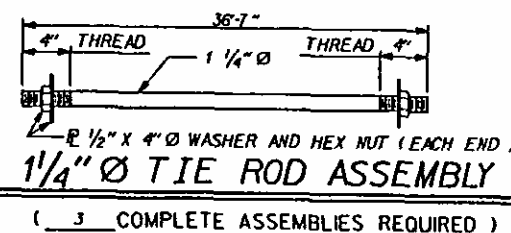
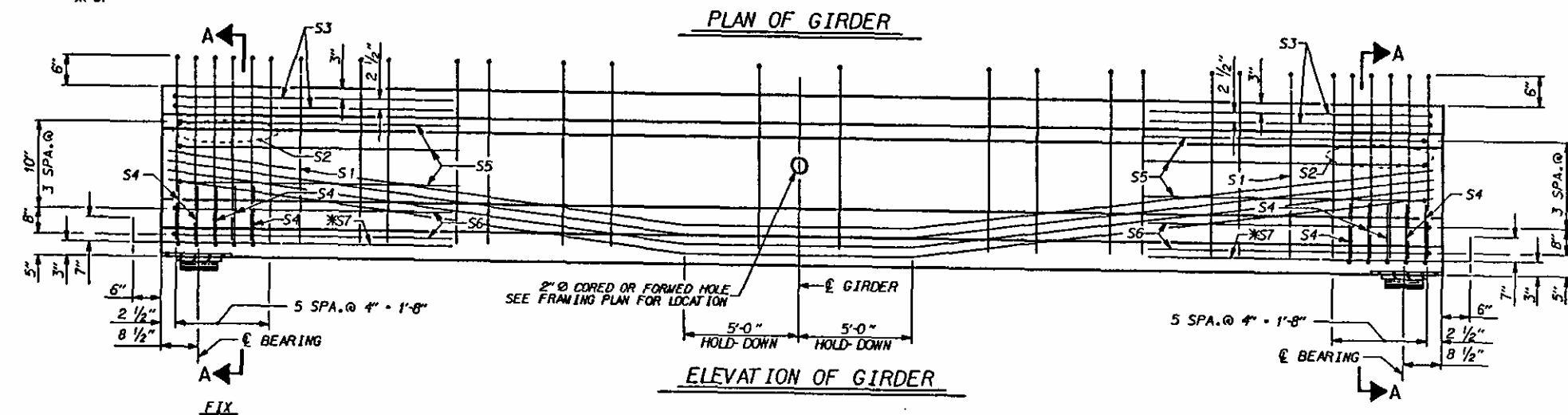
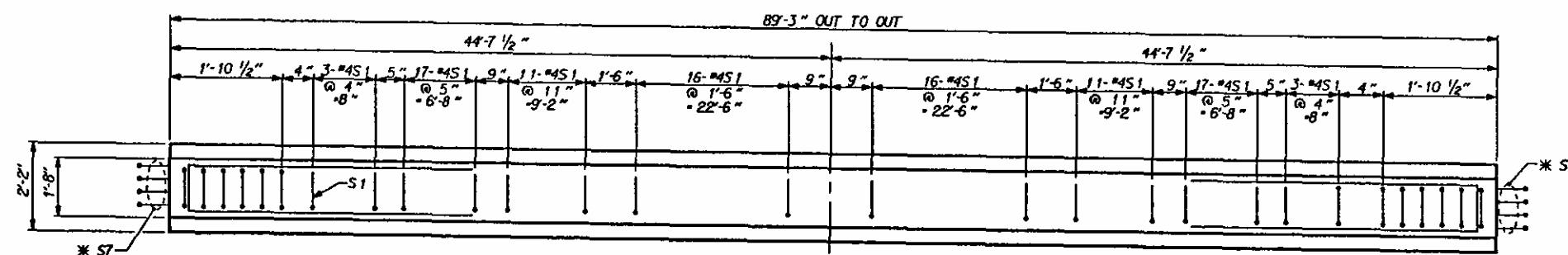
REVISÉD BY E.L.R. CHECKED BY G.R.P. 6-28-92

DRAWN BY : W.D. CRUTCHER DATE : 3-93
CHECKED BY : R.D. MARTIN DATE : 7-16-93



AT END OF GIRDER AT C OF GIRDER

1/2" Ø LOW RELAXATION STRAND LAYOUT



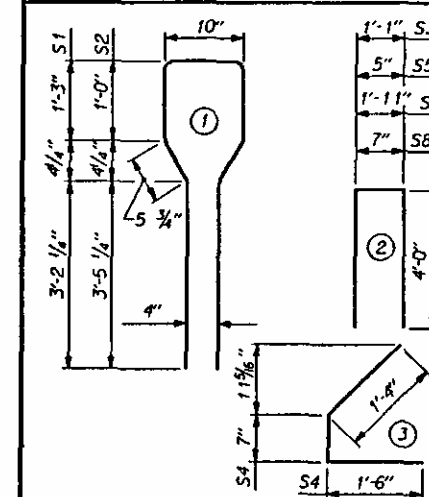
GRADE 270 STRANDS		
	$\frac{1}{2}'' \text{ S.A.}$	$\frac{1}{2}'' \text{ L.A.}$
AREA (SQUARE INCHES)	0.153	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	28,900	30,980

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	94	#4	1	10'-8"	670
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S3	4	#4	2	9'-1"	24
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S5	6	#4	2	8'-5"	34
S6	4	#4	2	8'-7"	23
*S7	8	#5	STR	5'-3"	44

* NOTE: S7 BARS SHALL BE BENT AFTER GIRDER FABRICATION AND BEFORE SHIPMENT.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER				
REINFORCING STEEL	6,500 PSI CONCRETE	3/4" Ø S.R. STRANDS	3/4" Ø L.R. STRANDS	
LB.	CY.	No.	No.	
K933	18.1	46	40	

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
15	89'-3"	1338'-9"

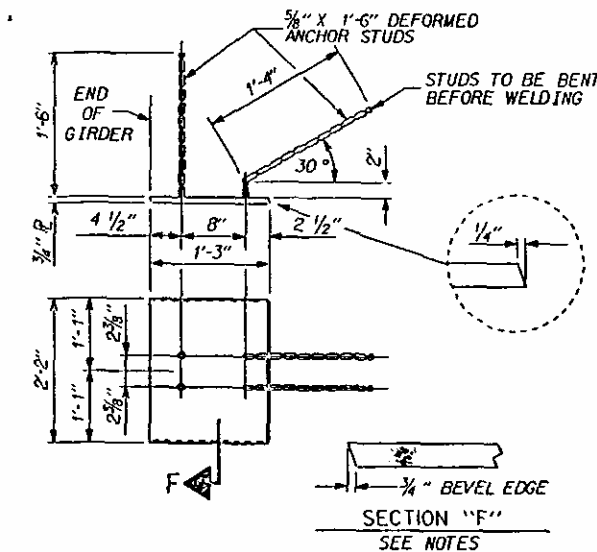
PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
 STATION: 31+50.00 -L- REV.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
54" PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS "B", "E" & "H"

MARCH						1993	
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			5-21	
2			4			54	

DRAWN BY : W.D. CRUTCHER DATE : 3-93
CHECKED BY : R.D. MARTIN DATE : 7-16-93

William F. Lusk
2/15/74



EMBEDDED PLATE "B-1" DETAILS
FOR 54" GIRDER
(2 REQ'D PER GIRDER)

NOTES

THE CONTRACTOR MAY USE EITHER 1/2" Ø STRESS RELIEVED OR 1/2" Ø LOW RELAXATION STRANDS ACCORDING TO LAYOUTS SHOWN ON THIS SHEET. THE SAME TYPE AND SAME SIZE STRANDS WILL BE USED FOR ALL GIRDERS IN THE STRUCTURE.

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE STRESS RELIEVED OR LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO ASTM A-416 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TIE ROD ASSEMBLY SHALL BE ASTM A-36 GRADE STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

STEEL SOLE PLATES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

DEFORMED ANCHOR STUDS SHALL CONFORM TO ASTM A-196. WELDING PROCEDURE QUALIFICATION TEST FOR DEFORMED ANCHOR STUDS MAY BE REQUIRED.

ENDS OF ALL PRESTRESSED STRANDS AT THE EXPANSION END OF GIRDERS SHALL BE RECESSED AND GROUTED, SEE SPECIAL PROVISIONS. NOT REQUIRED WHERE NO JOINT EXISTS.

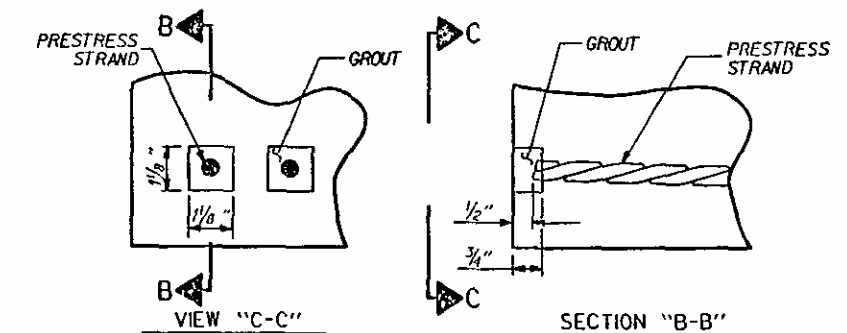
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5500 PSI.

DEPENDENT ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

FOR CONTROL OF GIRDER WEB SPLITTING, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDER WEB SPLITTING."

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

FOR HIGH STRENGTH PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



GROUTED RECESS AT
END OF PRESTRESSED STRAND

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS AND DEAD LOAD
DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			2			5-22
2			3			54

STD.No.PC67

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
TENTH POINTS	ALL SPANS																						
	GIRDERS 1 & 5											GIRDERS 2 THRU 4											
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
1/2" Ø STRESS RELIEVED																							
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	.078	.147	.202	.236	.248	.236	.202	.147	.078	0.000	0.000	.078	.147	.202	.236	.248	.236	.202	.147	.078	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	.037	.070	.096	.112	.118	.112	.096	.070	.037	0.000	0.000	.038	.073	.099	.117	.122	.117	.099	.073	.038	0.000	
FINAL CAMBER ↑	0.000	.041	.077	.106	.124	.130	.124	.106	.077	.041	0.000	0.000	.040	.074	.103	.119	.126	.119	.103	.074	.040	0.000	
1/2" Ø LOW RELAXATION																							
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	.075	.142	.194	.227	.239	.227	.194	.142	.075	0.000	0.000	.075	.142	.194	.227	.239	.227	.194	.142	.075	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	.037	.070	.096	.112	.118	.112	.096	.070	.037	0.000	0.000	.038	.073	.099	.117	.122	.117	.099	.073	.038	0.000	
FINAL CAMBER ↑	0.000	.038	.072	.098	.115	.121	.115	.098	.072	.038	0.000	0.000	.037	.069	.095	.110	.117	.110	.095	.069	.037	0.000	

* INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

ASSEMBLED BY: W.D. CRUTCHER	DATE: 3-93	SPECIAL
CHECKED BY: R.D. MARTIN	DATE: 7-93	
DRAWN BY: ED ROSE	DATE: NOV. 1991	STANDARD
CHECKED BY: GREG PERFETTI	DATE: NOV. 1991	

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1785.

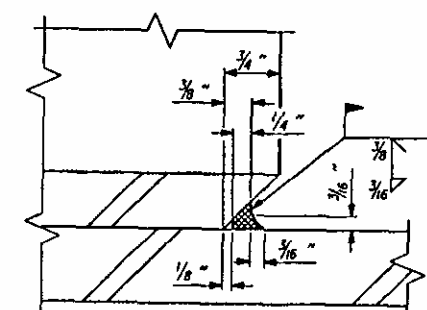
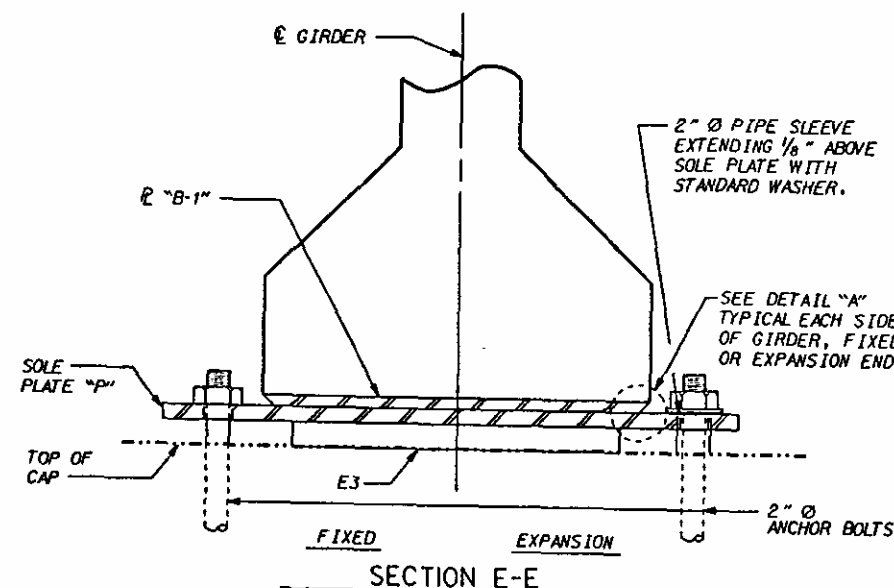
STEEL SOLE PLATES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIFICATIONS.

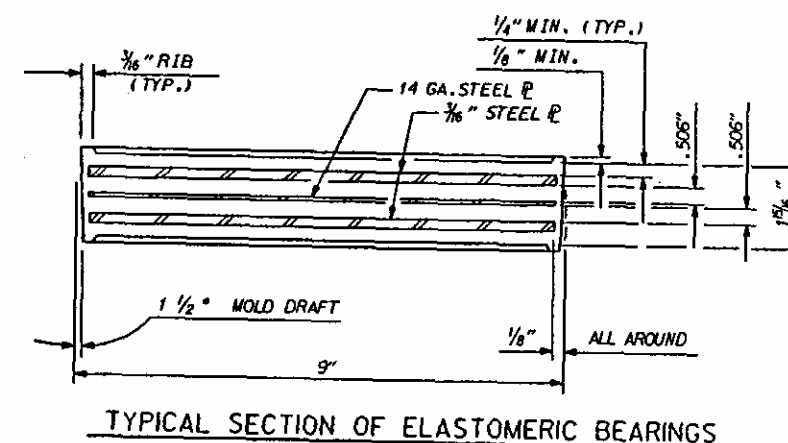
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

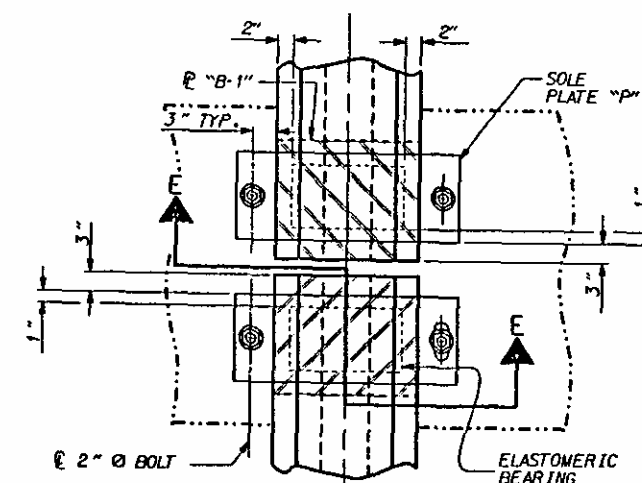
ELASTOMER IN BEARINGS SHALL HAVE A GRADE 60 DUROMETER HARDNESS.



DETAIL "A"

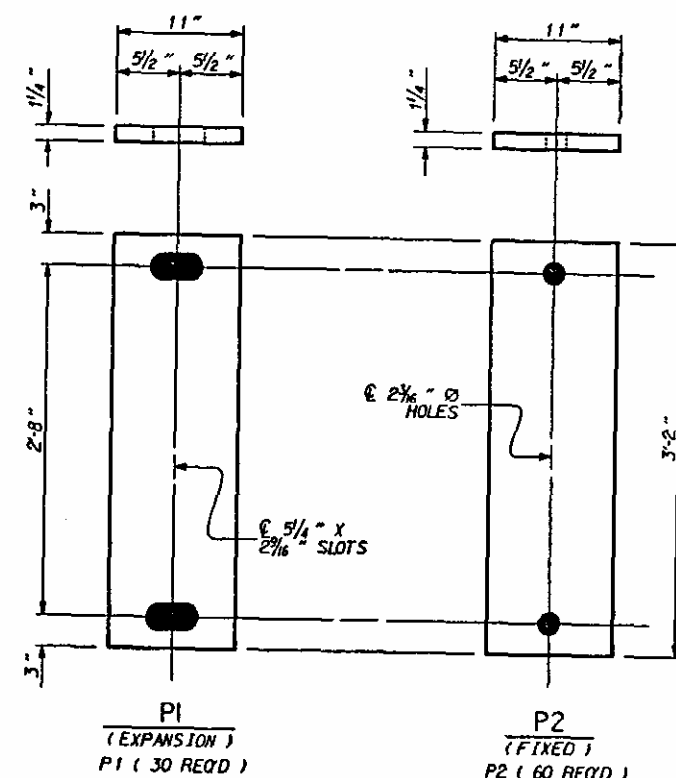


TYPICAL SECTION OF ELASTOMERIC BEARINGS

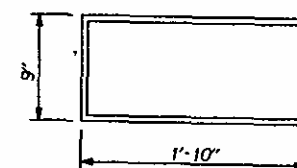


TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN
(SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS ("P")



E3 (90 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

(54" PCG)

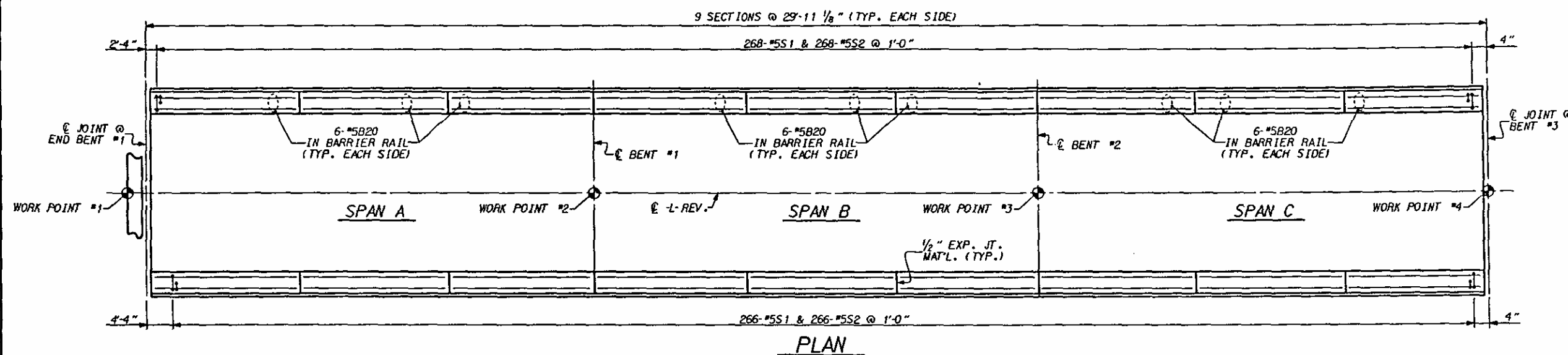


LOAD RATINGS	
MAX. D.L. + L.L.	
54" PCG - TYPE IV	166.0 K

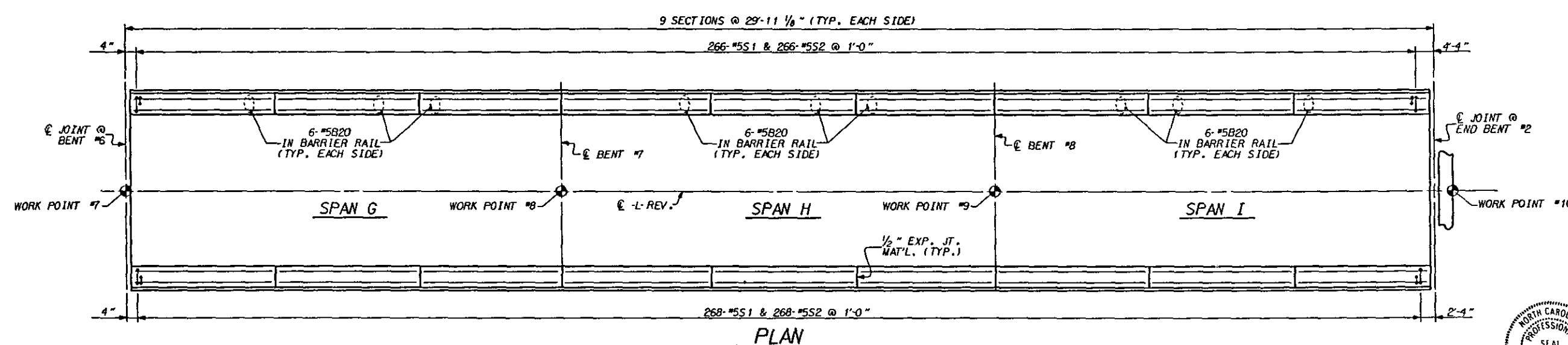
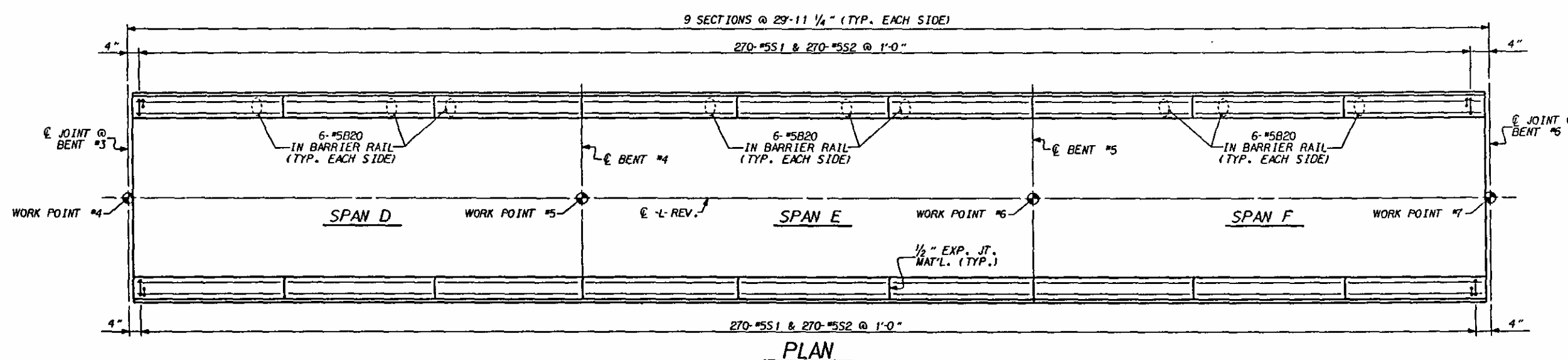
PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD ELASTOMERIC BEARING DETAILS					
PRESTRESSED CONCRETE GIRDER AUGUST SUPERSTRUCTURE 1989					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
SHEET NO. 5-23					TOTAL SHEETS 54

ASSEMBLED BY: W.D. CRUTCHER	DATE: 3-93	SPECIAL
CHECKED BY: R.D. MARTIN	DATE: 7-93	
DRAWN BY: W.J. HARRIS	DATE: 8-22-89	STANDARD
CHECKED BY: C.R. KING	DATE: 8-22-89	



NOTE: #5S1 & #5S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO EXPANSION JOINT IN RAIL.



PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE BARRIER RAIL



William E. Larkin
2/15/93

DRAWN BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: R.D. MARTIN DATE: 7-93

30-DEC-1993 07:45
/usr/hlmant/b22080br.dgn
hlmant

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			6-24
2			4			54

REVISED BY W.J.M.
REVISER BY W.J.H.
REDRAWN 10-2-87

NOTES

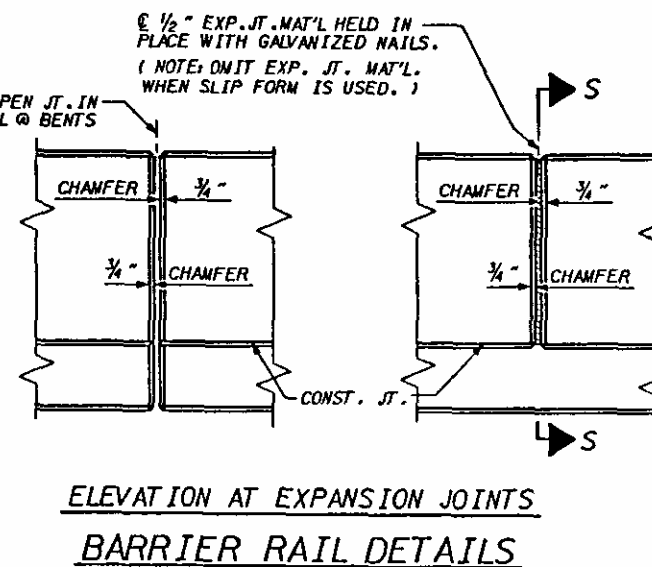
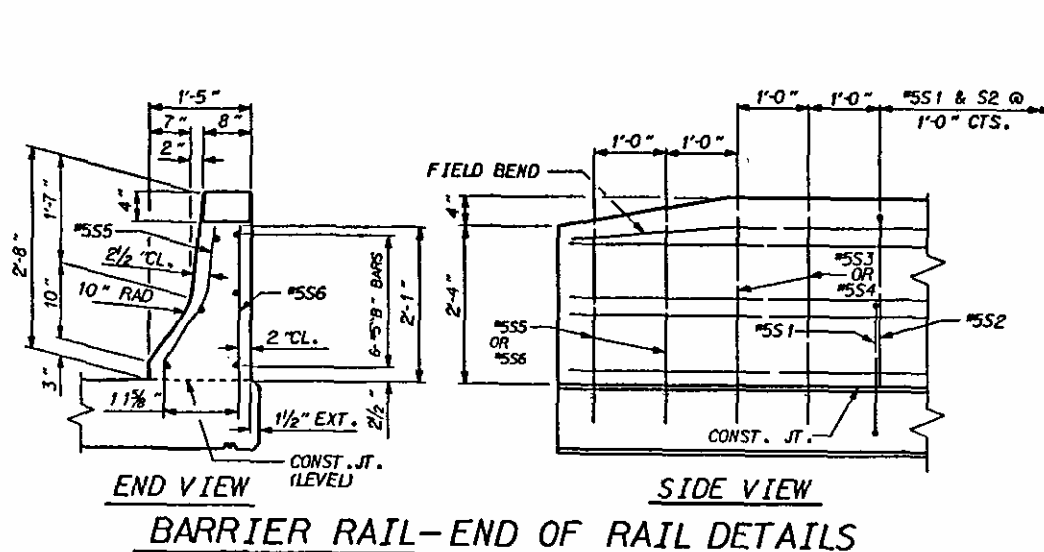
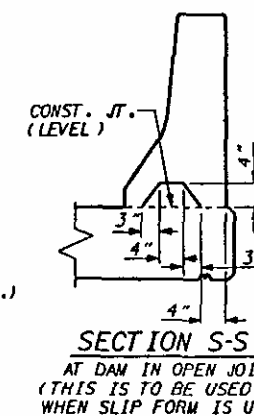
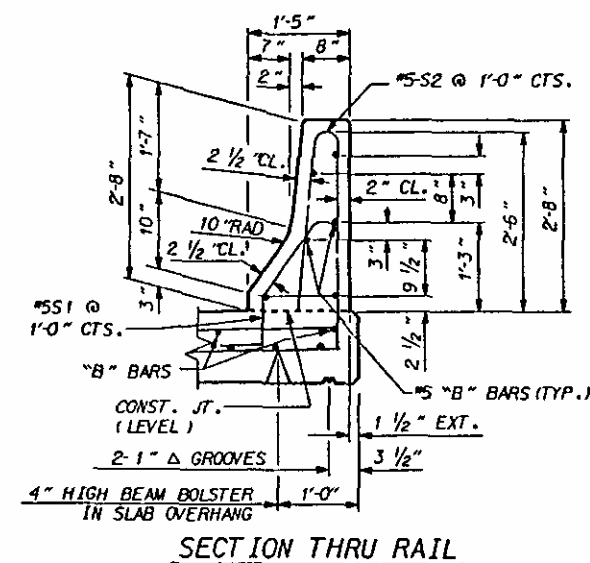
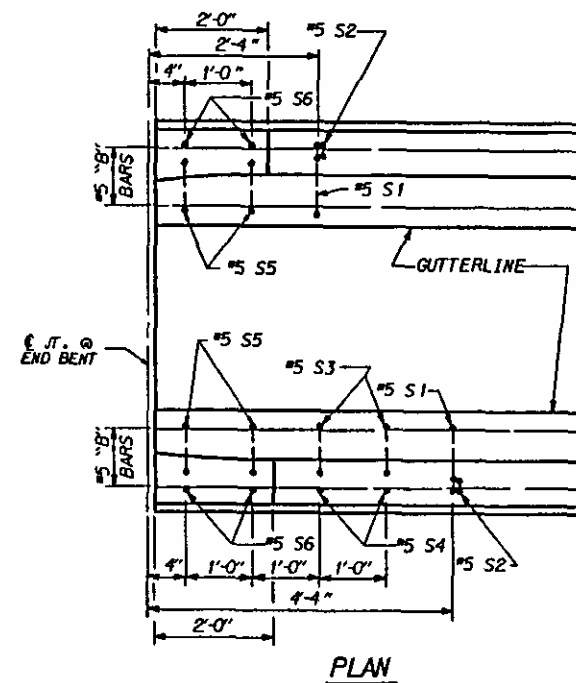
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

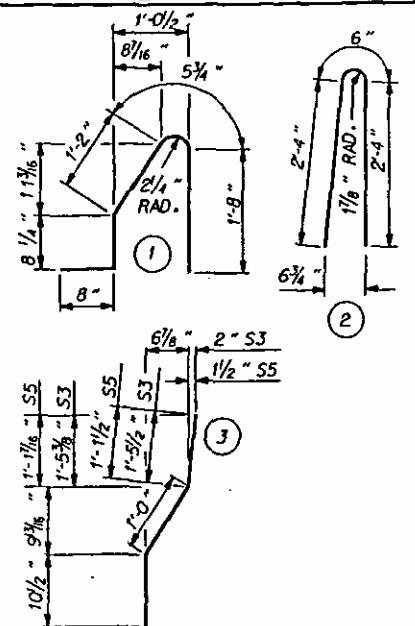
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #5S3 THRU #5S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	1608	#5	1	4'-8"	7827
S2	1608	#5	2	5'-2"	8665
S3	4	#5	3	3'-4"	14
S4	4	#5	STR	3'-2"	13
S5	8	#5	3	3'-0"	25
S6	8	#5	STR	2'-9"	23
B20	324	#5	STR	29'-6"	9969

EPOXY COATED REINFORCING STEEL	26,536 LBS.
CLASS A-A CONCRETE	148.4 CU. YDS.
CONCRETE BARRIER RAIL	1616.29 LIN. FT.

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
 STATION: 31+50.00 -L- REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE
BARRIER RAIL

OCTOBER

987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			54

STD. NO. CDRI



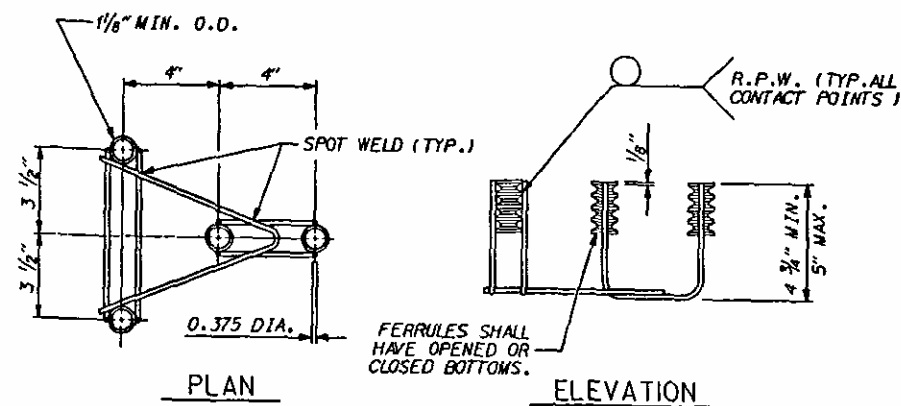
William E. Lankford
2/15/98

ASSEMBLED BY : W.D. CRUTCHER DATE : 3-93
CHECKED BY : R.D. MARTIN DATE : 7-16-93

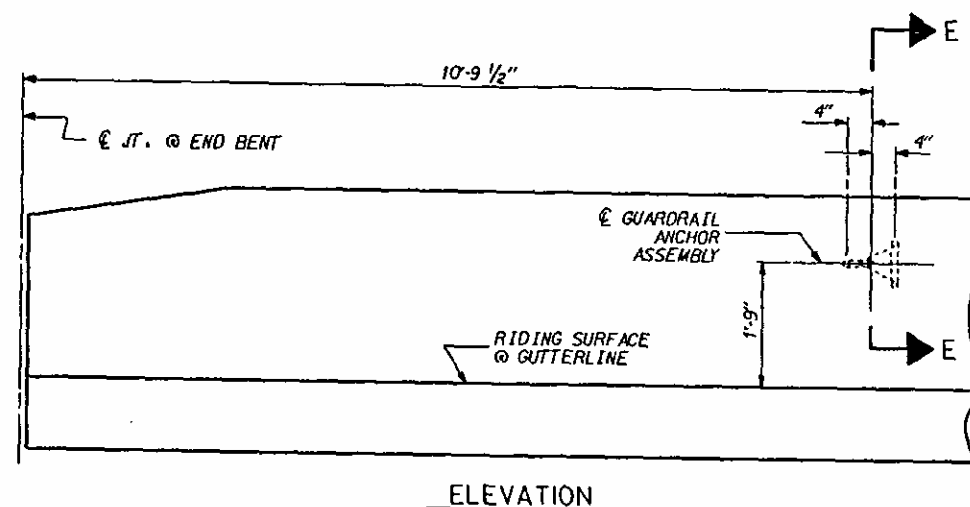
DRAWN BY : R. BISSETTE DATE : 5/28/87
CHECKED BY : S.J. DAVIS DATE : 9/3/87

**SPECIAL
STANDARD**

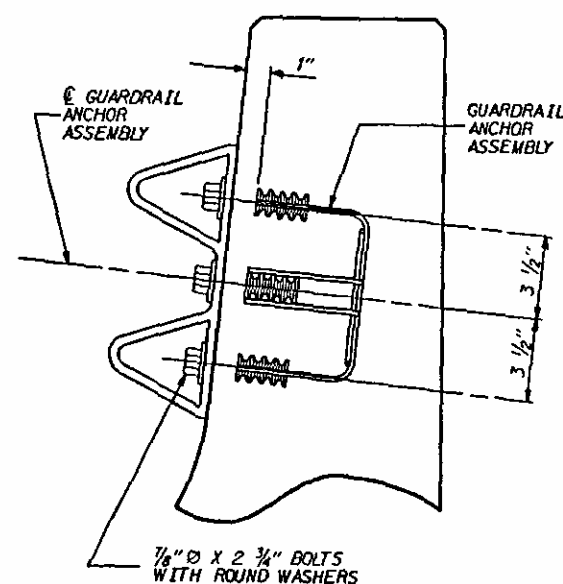
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WCRUTCHER



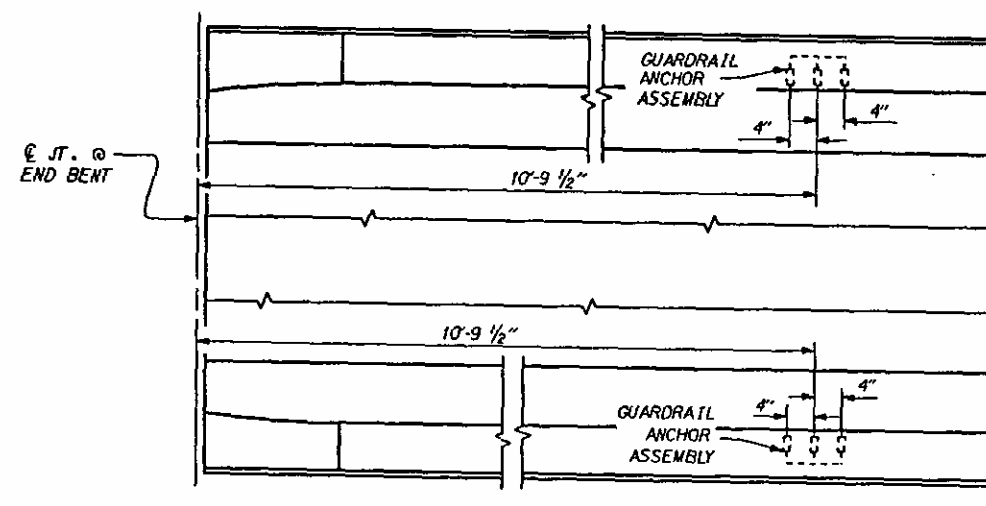
GUARDRAIL ANCHOR ASSEMBLY



ELEVATION



SECTION E-E



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

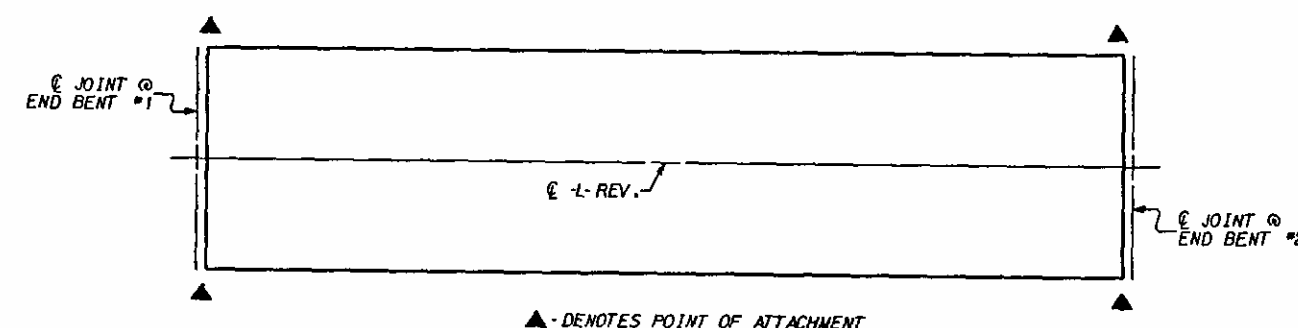
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2\".
- 4 - 7/8\" ϕ X 2 3/4\" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8\" ϕ X 2 3/4\" GALVANIZED BOLTS 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.)
- WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUR AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOMES". THE YIELD LOAD OF THE 7/8\" ϕ BOLT IS 16.6 KIPS. TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



▲ - DENOTES POINT OF ATTACHMENT

SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.



William L. Larkin, Jr.
2/15/94

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
FEB. 1988					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO.				
2-26				
TOTAL SHEETS				
54				

STD. No. G-3A1

REVISED BY E.A.R. CHECKED BY G.R.P. 11-13-91
REVISED BY W.J.H. CHECKED BY G.R.P. 10-10-90
REDESIGNED 2/29/98

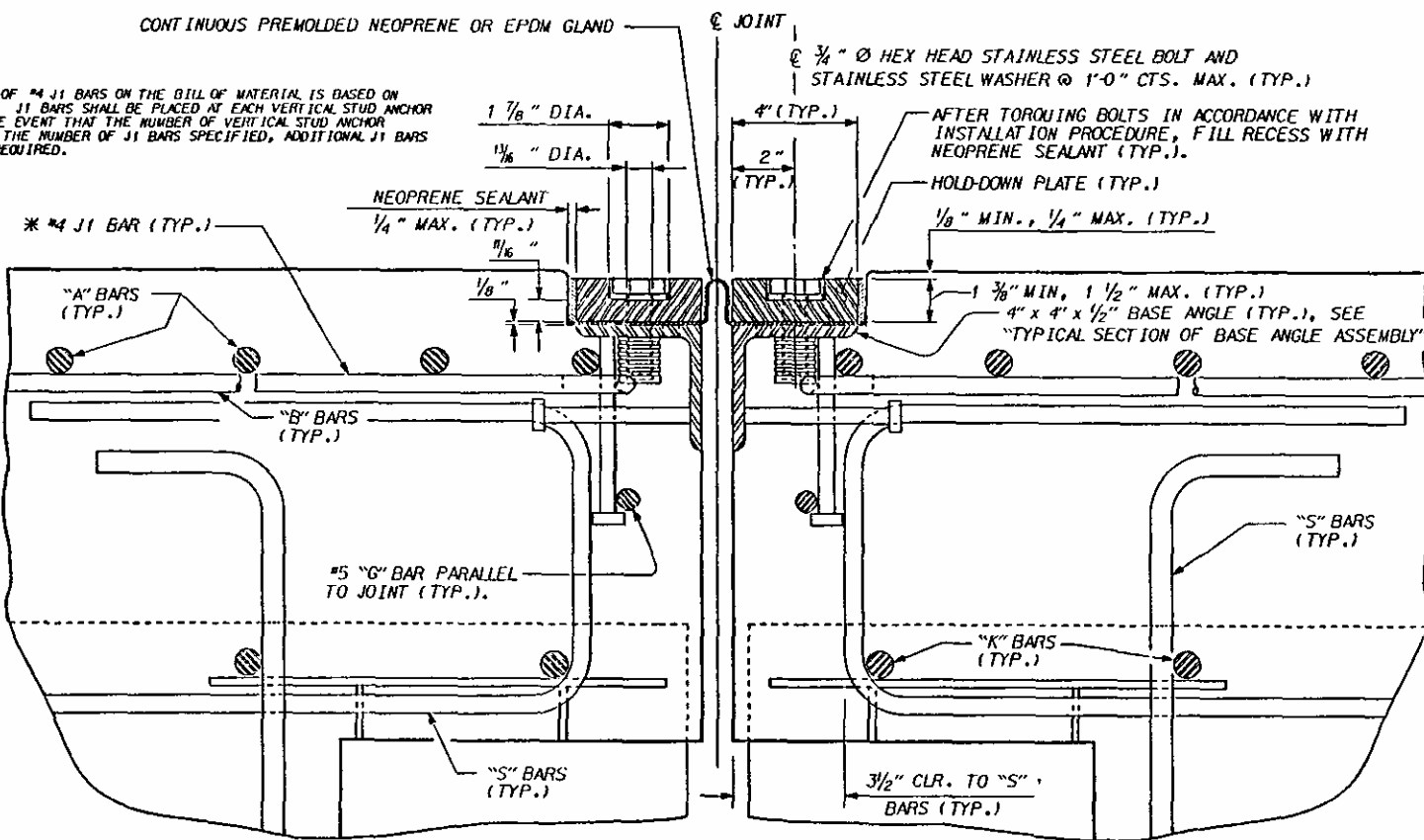
ASSEMBLED BY	W.D. CRUTCHER	DATE	3-93
CHECKED BY	R.D. MARTIN	DATE	7-93
DRAWN BY	MIKE BRITT	DATE	DEC. 1987
CHECKED BY	RANDY BISSETTE	DATE	DEC. 1987

SPECIAL
STANDARD

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/usr/ninnant/b220801gr.dgn
ninnant

CONTINUOUS PREMOLDED NEOPRENE OR EPDM GLAND

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHOR BOLTS EXCEED THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

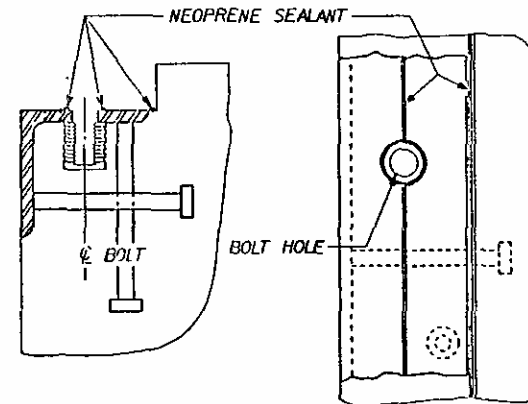


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL. DUCTOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1/4\"/>



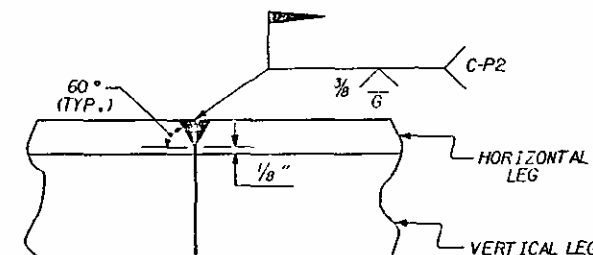
CROSS SECTION

PLAN VIEW

INSTALLATION SKETCH

GENERAL NOTES

1. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS AND WASHERS SHALL CONFORM TO TYPE 304 STAINLESS STEEL OR EQUIVALENT. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A108, GRADE 12.14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
2. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
3. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
4. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GRIND SMOOTH PRIOR TO PAINTING.
5. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIAL BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, THESE SURFACES MAY BE METALLIZED TO A MINIMUM THICKNESS OF 4 MILS. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION), PAINTED OR METALLIZED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR REPAIR OF GALVANIZING IN THE STANDARD SPECIFICATIONS.
6. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GRIND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
7. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF 1/8\"/>



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG @ RDWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
3	90°	2 1/16"	3"	2 1/16"	1 5/16"
6	90°	2 1/16"	3"	2 1/16"	1 5/16"

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.

SHEET 1 OF 2

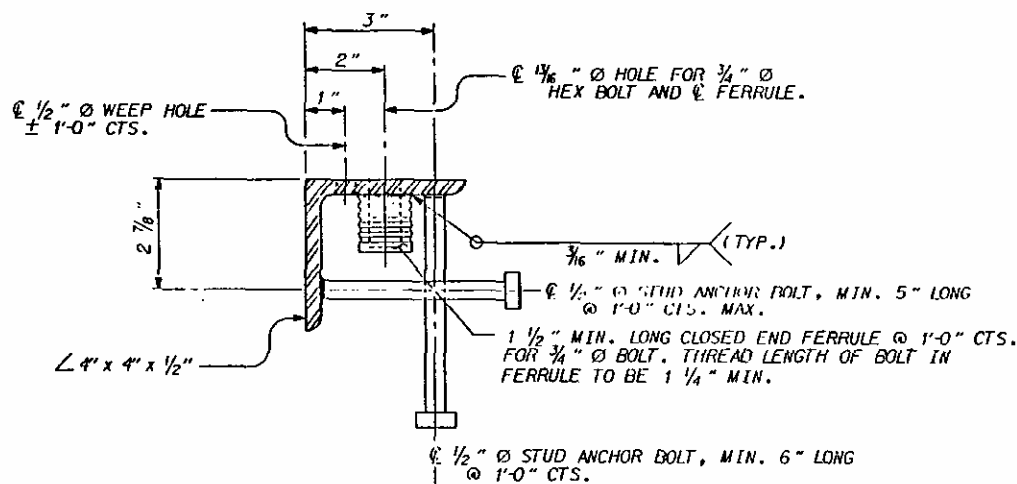
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
STANDARD
EXPANSION JOINT
SEAL DETAILS

FEBRUARY 1988

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	
1			23	5-21
2			24	



William E. Larkin

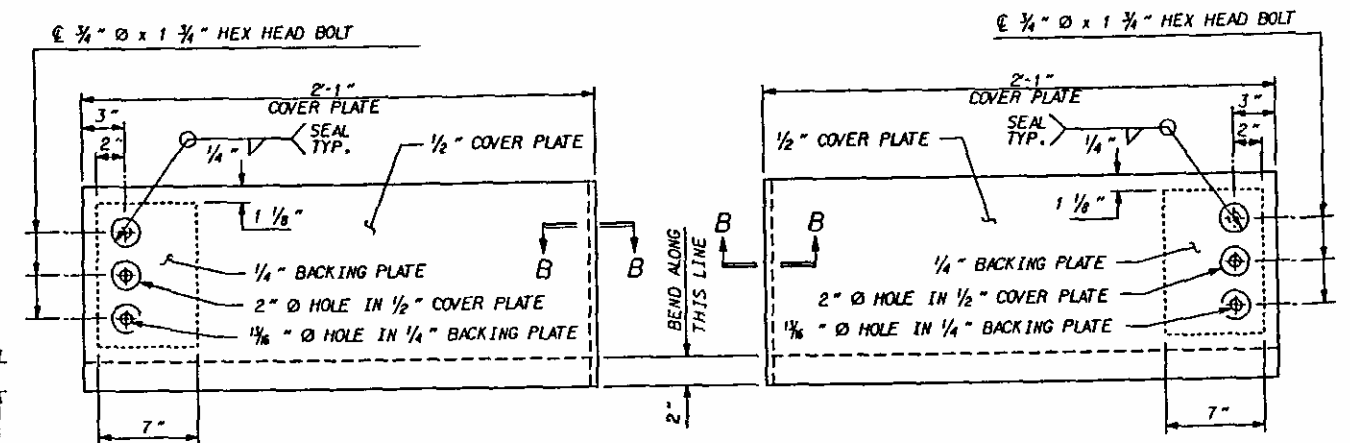


TYPICAL SECTION OF BASE ANGLE ASSEMBLY

ASSEMBLED BY: W.D. CRUTCHER	DATE: 3-93	SPECIAL
CHECKED BY: R.D. MARTIN	DATE: 7-93	
DRAWN BY: ROSS E. KUBENY	DATE: 9-18-87	STANDARD
CHECKED BY: CINDY R. KING	DATE: 10-2-87	

10-DEC-1993 09:29
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WCRUTCHER

EJSI



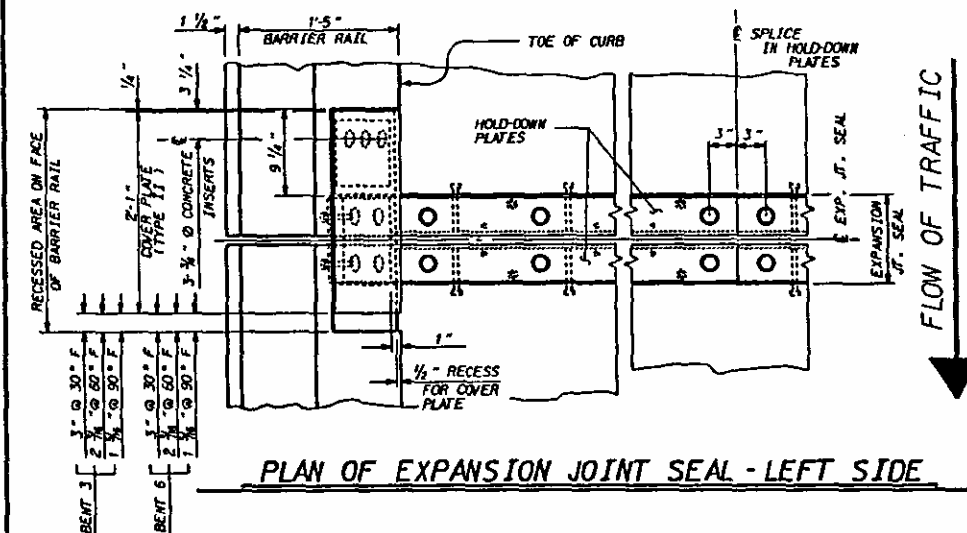
END VIEW

TYPE 1- ELEVATION VIEW

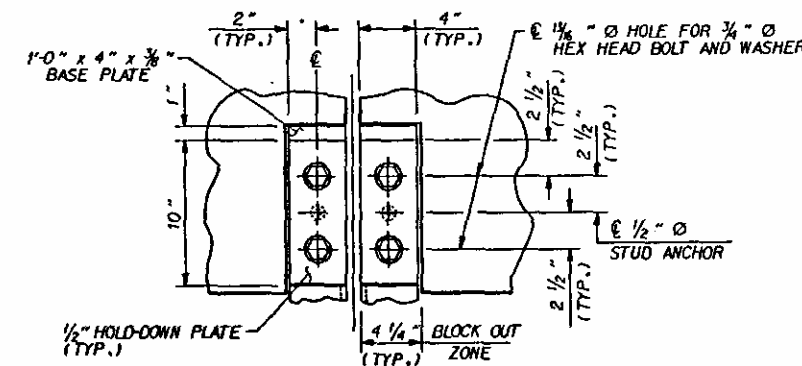
TYPE II - ELEVATION VIEW

COVER PLATE DETAILS

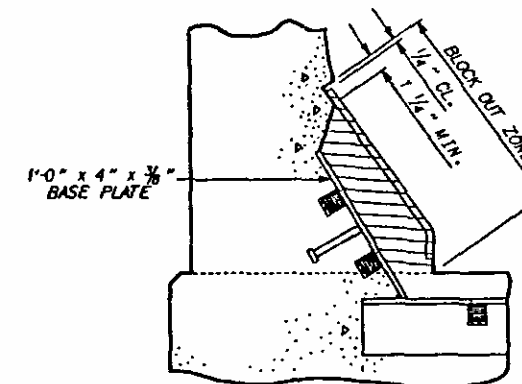
SECTION THRU RAIL NORMAL TO JOINT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

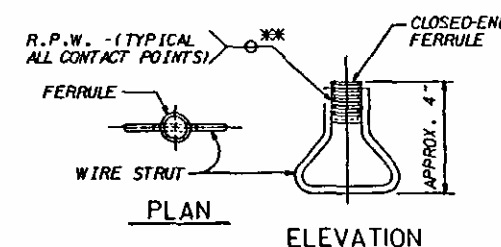


SECTION A - A



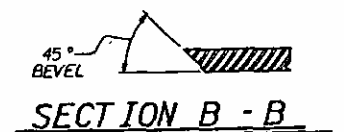
BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS

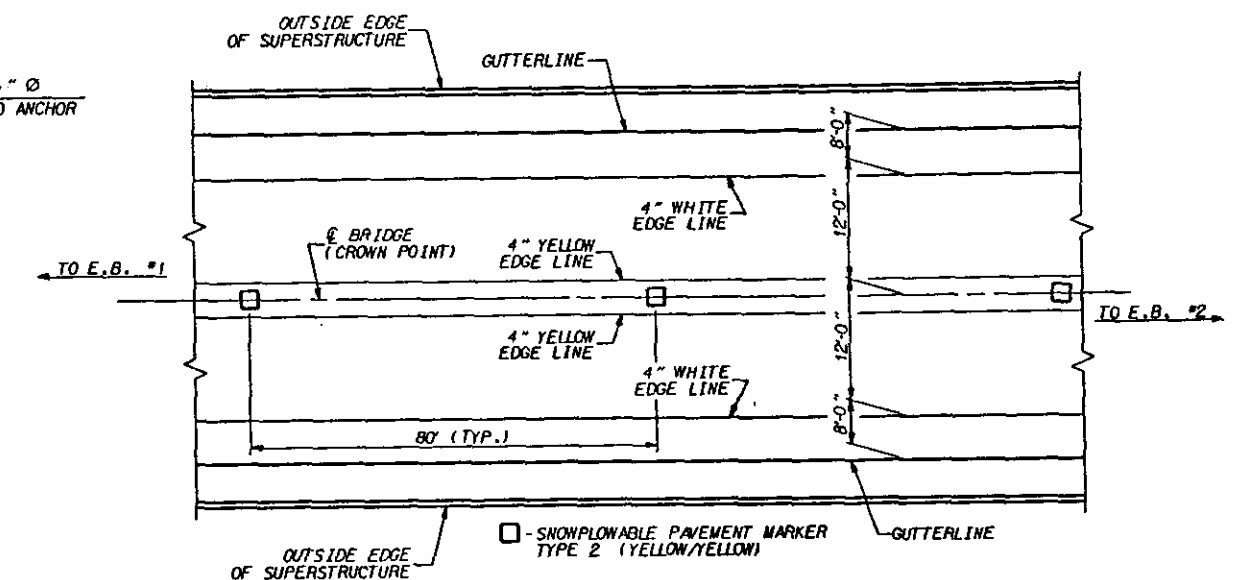


CONCRETE INSERT

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



SECTION B - B



PAVEMENT MARKING ALIGNMENT

PROJECT NO. 8.1791801
CATAWBA- ALEXANDER COUNTY
 STATION: 31+50.00 -L- REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RAIL FIRM

STANDARD EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

FEBRUARY

988

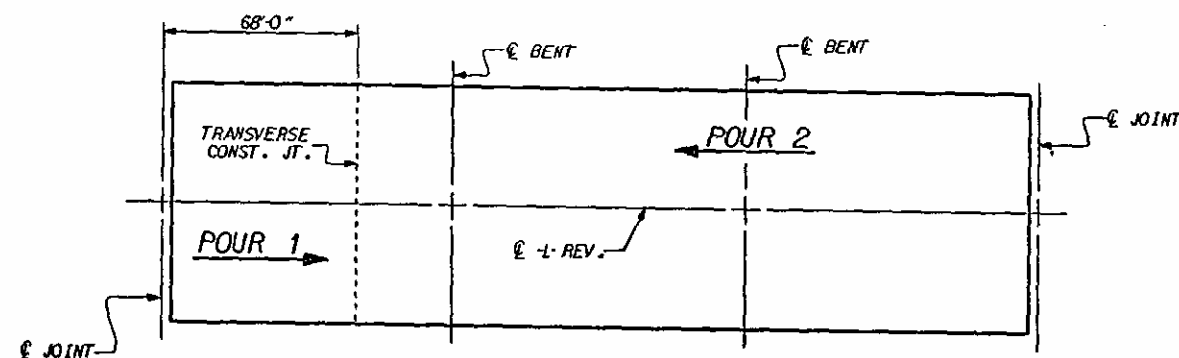
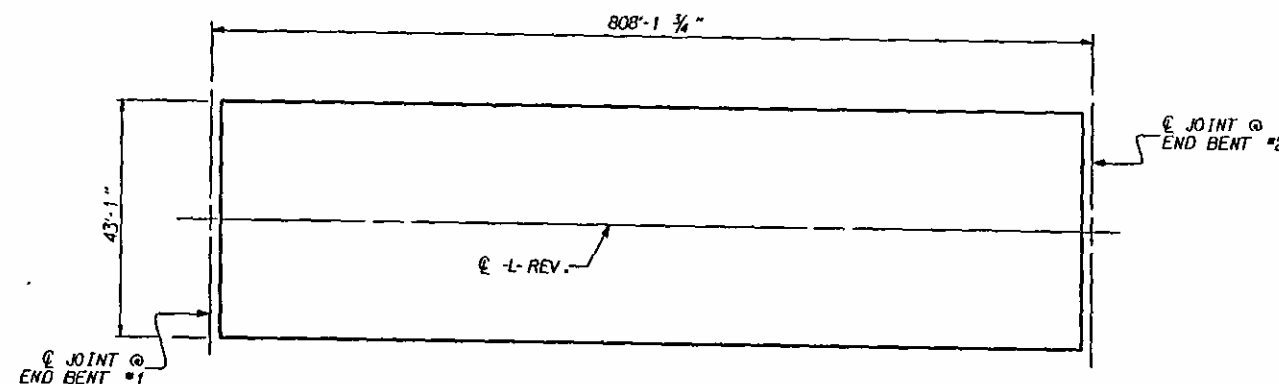
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			54



William S. Luker,
2/15/94

BILL OF MATERIAL FOR 12" Ø WATER MAIN		
NO.	UNITS	ITEMS
1	2 EA.	16" STEEL PIPE SLEEVE, 0.375" WALL THICKNESS
2	106 EA.	APPROVED 1/8" Ø SCREW CONCRETE INSERTS
3	106 EA.	APPROVED ADJUSTABLE CLEVIS HANGER FOR 12" D.I. PIPE
4	842 LIN. FT.	12" D.I.R.J. WATER PIPE, CLASS 51
5	2 EA.	EXPANSION AND CONTRACTION JOINT FOR 12" D.I. WATER PIPE
6	2 EA.	APPROVED MODULAR TYPE CASING SEAL
7	20 LBS.	JUTE
8	15 LBS.	MASTIC OR PLASTIC CAULKING COMPOUND
9	39 EA.	LATERAL BRACE ASSEMBLIES
10	78 EA.	3/4" Ø ADHESIVELY ANCHORED ANCHOR BOLTS
11	2 EA.	END PLUGS (OR CAPS) FOR 12" D.I.R.J. WATER PIPE
12	1 LOT	PAINT (AS REQUIRED)

THESE QUANTITIES FOR ESTIMATE PURPOSES ONLY.

POUR SEQUENCE
OF A TYPICAL 3-SPAN UNITLAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 34,818)

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	1937	5	STR	42- 9	86367
A2	1937	5	STR	42- 9	86367
* B1	1026	4	STR	21-10	14964
* B2	342	7	STR	60- 0	41943
* B3	342	7	STR	30- 0	20971
* B4	342	4	STR	18- 0	4112
B5	870	5	STR	55- 6	50361
* G1	6	5	STR	42- 9	268
* J1	160	4	8	1- 5	151
* K1	36	8	2	18- 3	1754
* K2	24	8	1	12- 8	812
K3	72	5	STR	7- 2	538
K4	72	5	5	8- 0	601
K5	48	4	STR	5- 2	166
K6	48	4	STR	7- 4	235
K7	96	4	STR	7-10	502
K8	48	4	STR	6-10	219
K9	60	4	STR	22- 0	882
* S1	168	5	3	6- 1	1066
S2	252	4	4	7- 3	1220
S3	768	4	7	2- 9	1411
U1	48	4	2	13- 8	438
U2	144	4	2	15- 8	1507

REINFORCING STEEL= 144,447 LBS.

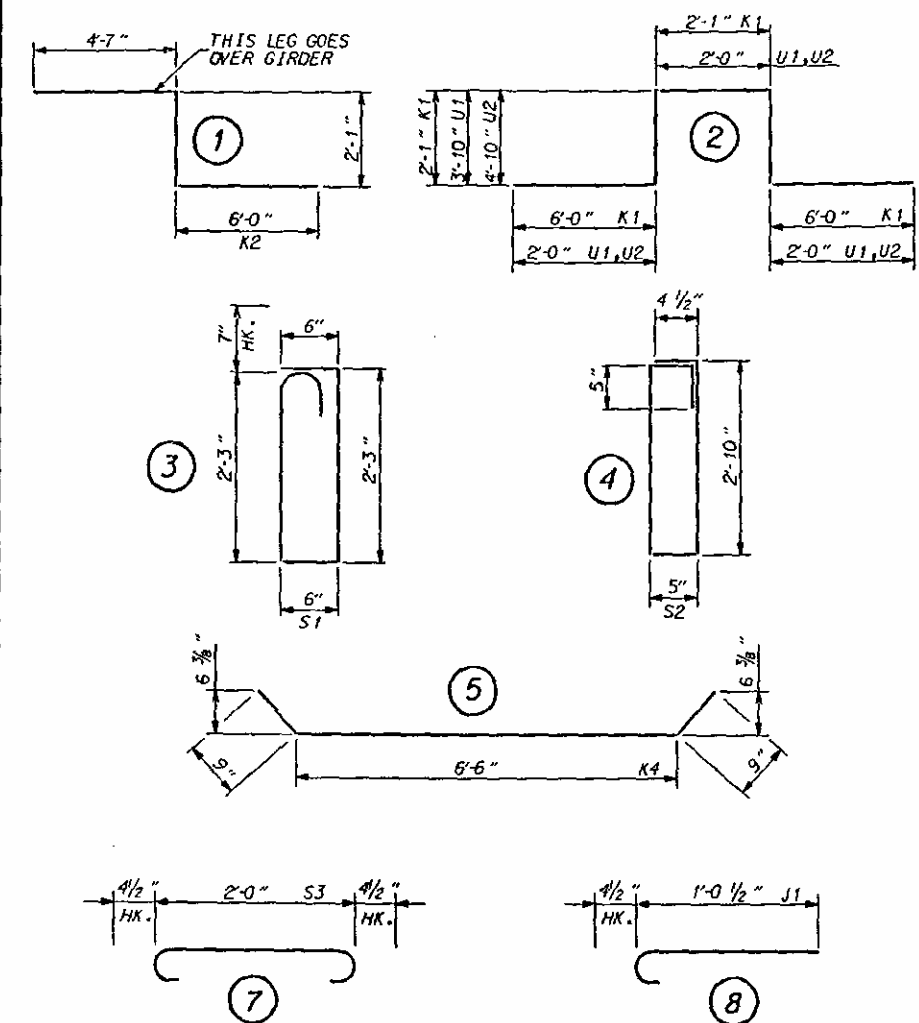
EPOXY COATED
REINFORCING STEEL= 172,488 LBS.

CLASS "AA" CONCRETE TOTAL= 1205.0 CY.

* THESE BARS ARE EPOXY COATED

QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-5"	1'-2"	1'-5"	1'-2"	1'-11"
#5	1'-8"	1'-5"	1'-8"	1'-5"	2'-4"
#6	2'-2"	1'-10"	2'-9"	1'-10"	3'-2"
#8	5'-0"	3'-4"	5'-0"	3'-4"	5'-8"

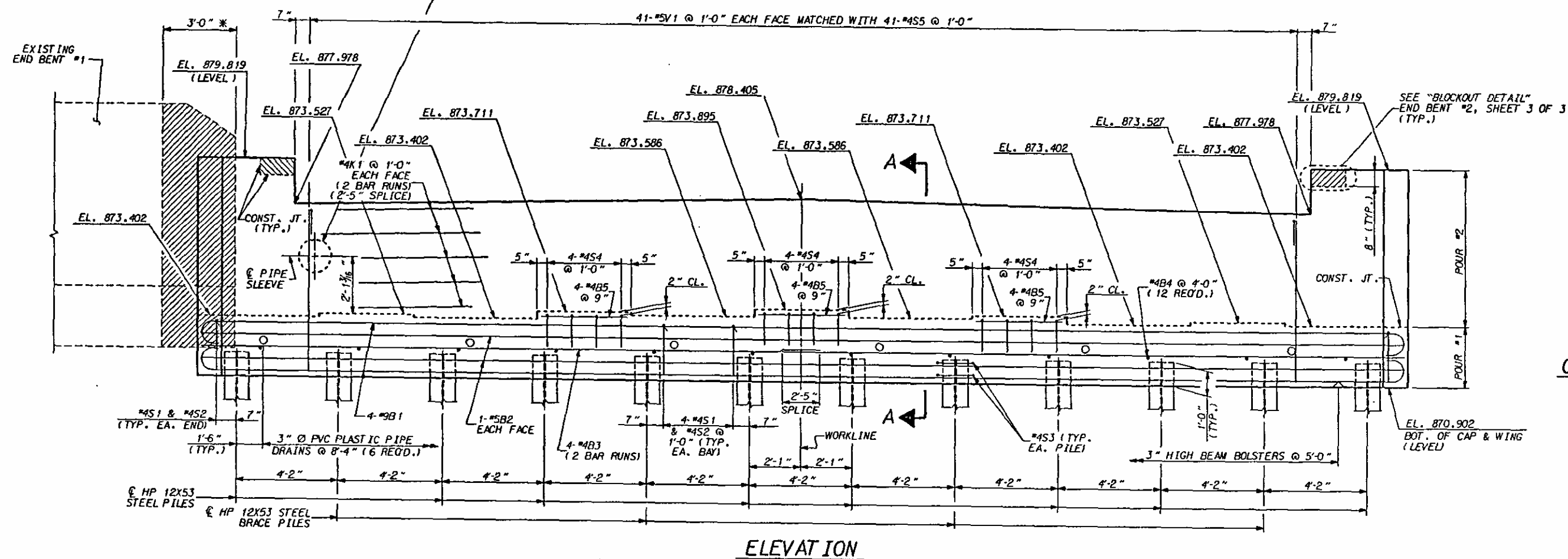
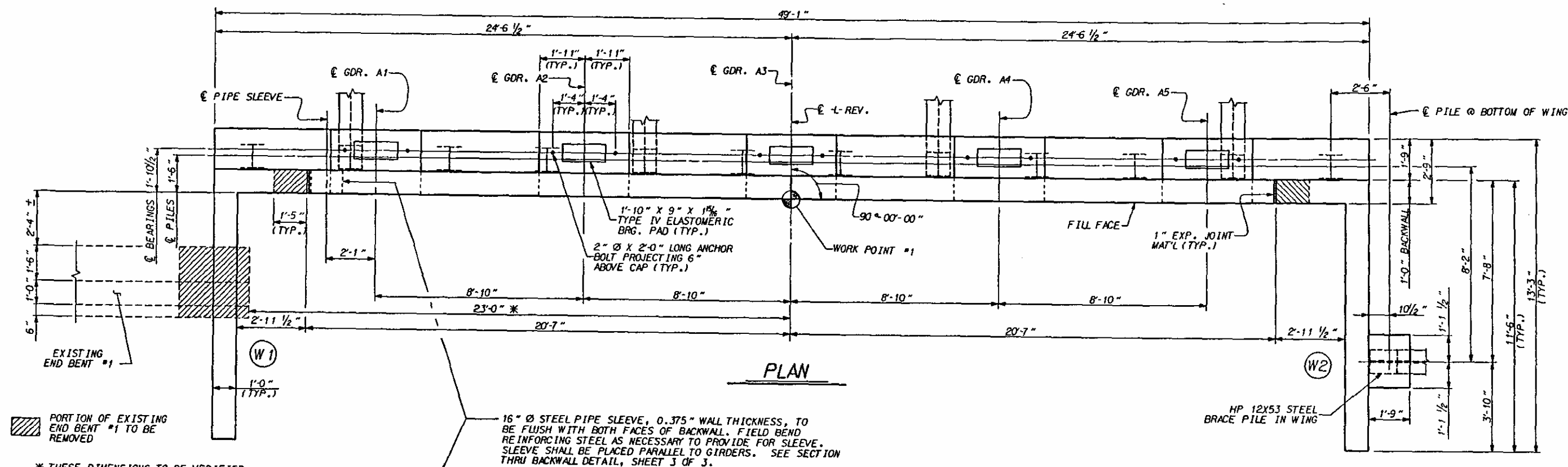
GROOVING BRIDGE FLOORS	
APPROACH SLABS	820 SQ.FT.
BRIDGE DECK	29,788 SQ.FT.
TOTAL	30,608 SQ.FT.

William E. Larkin, Jr.
2/1/93PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L- REV.STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

MARCH		REVISIONS		1993	
NO.	DATE	BY	DATE	BY	DATE
1					
2					
3					
4					
SHEET NO. 5-29					TOTAL SHEETS 54

STD. NO. FORM 2

ASSEMBLED BY: W.D. CRUTCHER DATE: 3-93
CHECKED BY: A.P. MARTIN DATE: 7-93
DRAWN BY: M. BRITT DATE: 5/28/87
CHECKED BY: S.J. DAVIS DATE: 9/3/87



William E. Larkin
2/15/14

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L- REV

SHEET 1 OF 3

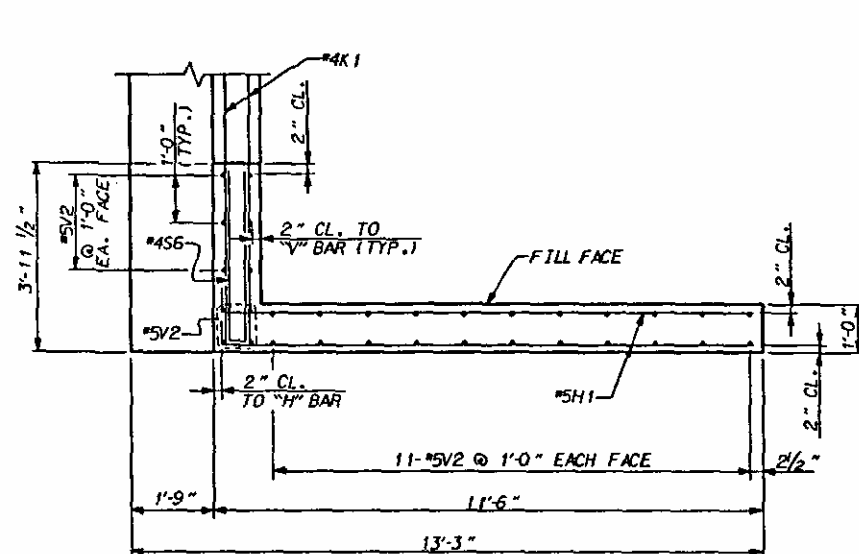
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

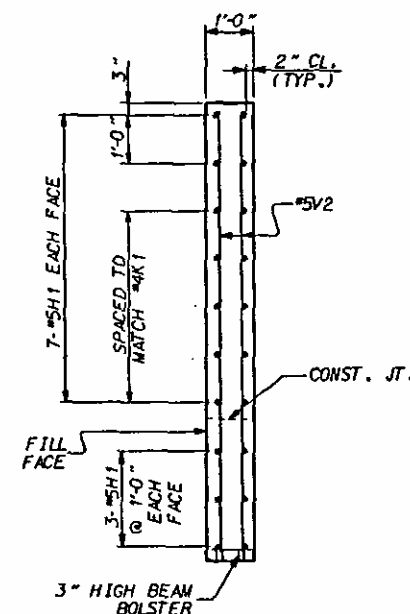
SEPTEMBER				1993			
REVISIONS				SHEET NO.			
NO.	BY	DATE	NO.	BY	DATE	5-30	
1			3			TOTAL	
2			4			54	

DRAWN BY: W.D. CRUTCHER DATE: 9-93
CHECKED BY: R.D. MARTIN DATE: 11-93

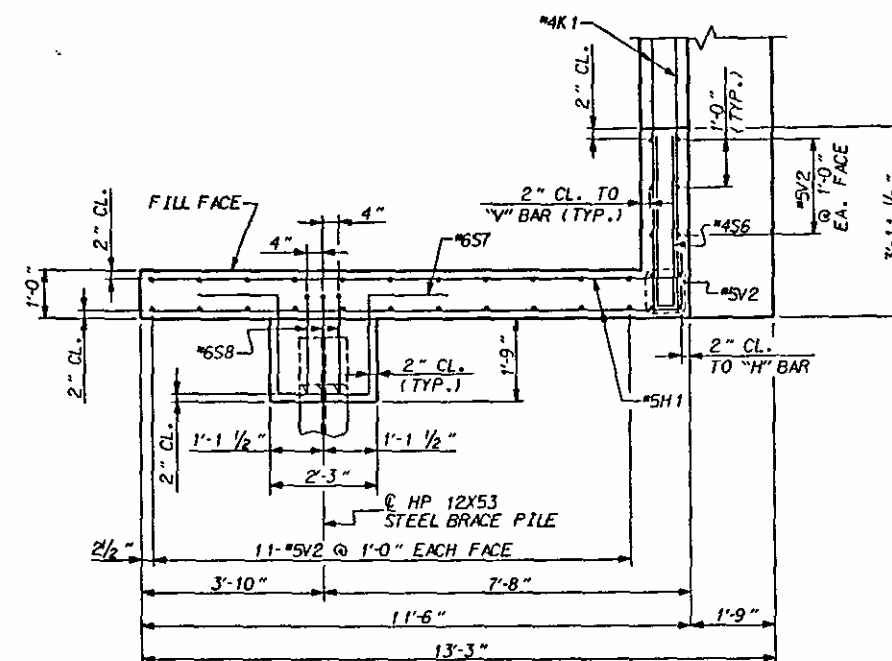
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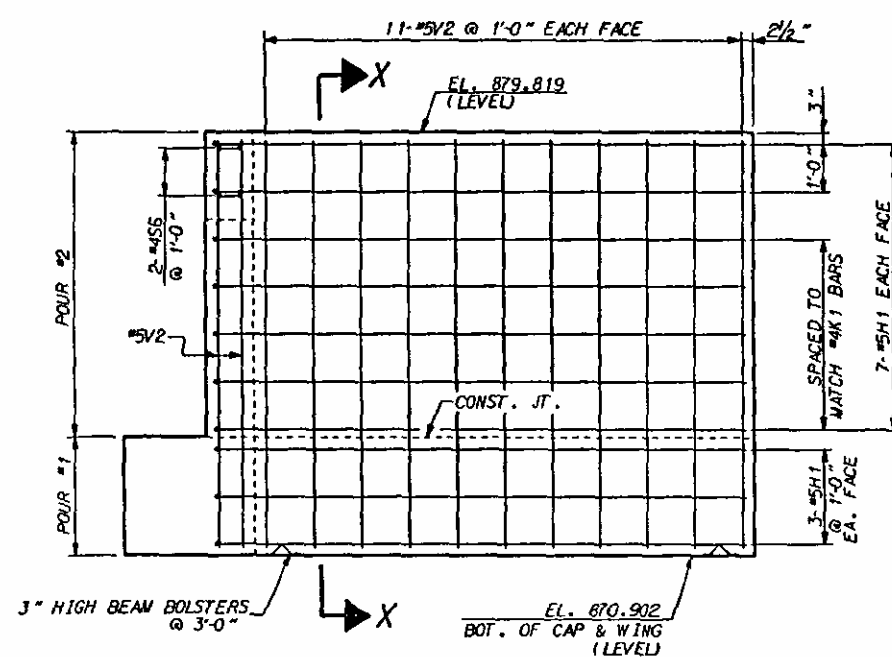
PLAN OF LEFT WING (W1)



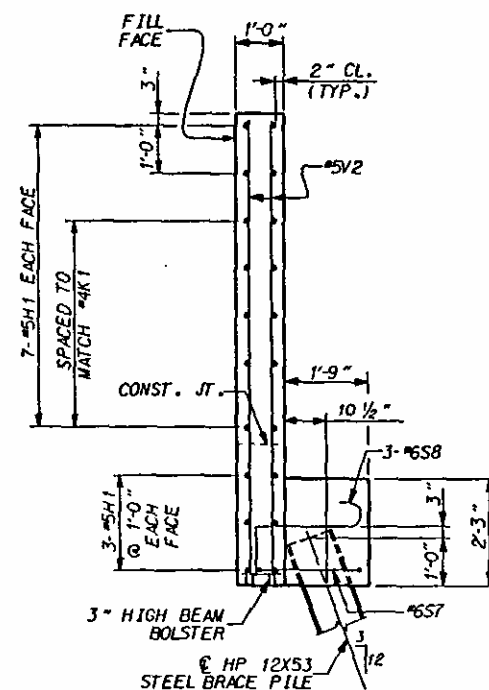
SECTION X-X



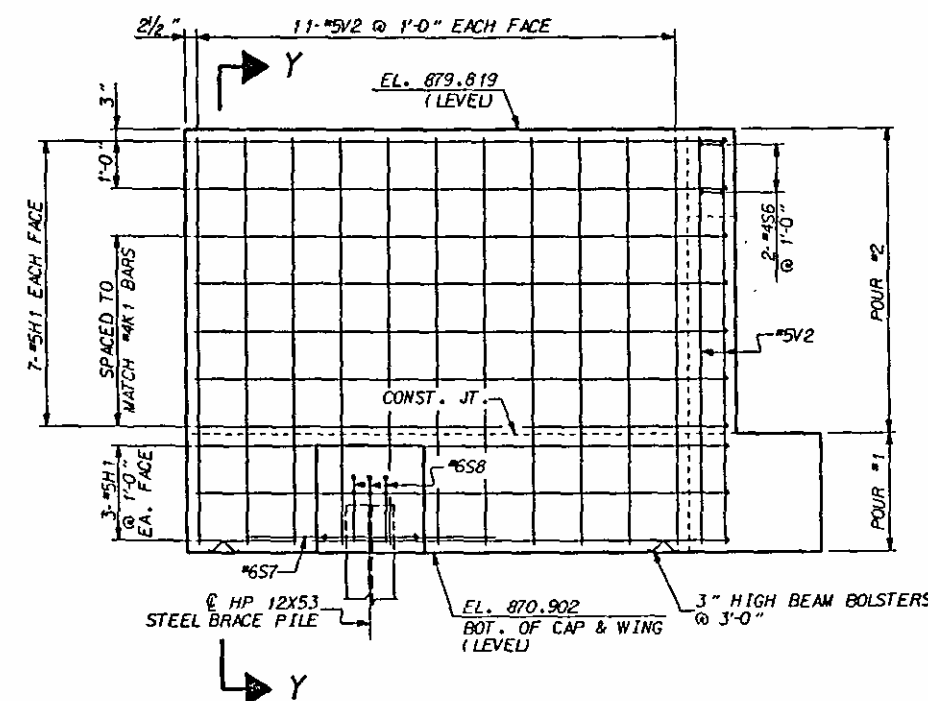
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L- REV

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

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



William E. Larkin, Jr.
2/15/74

DRAWN BY: W.D. CRUTCHER DATE: 9-93
CHECKED BY: R.D. MARTIN DATE: 11-93

30-DEC-1993 07:41
\\ncs\slim\mnt\70220801.dgn
hlmant

NOTES:

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PIPE DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF $\frac{1}{4}$ " PER FOOT.

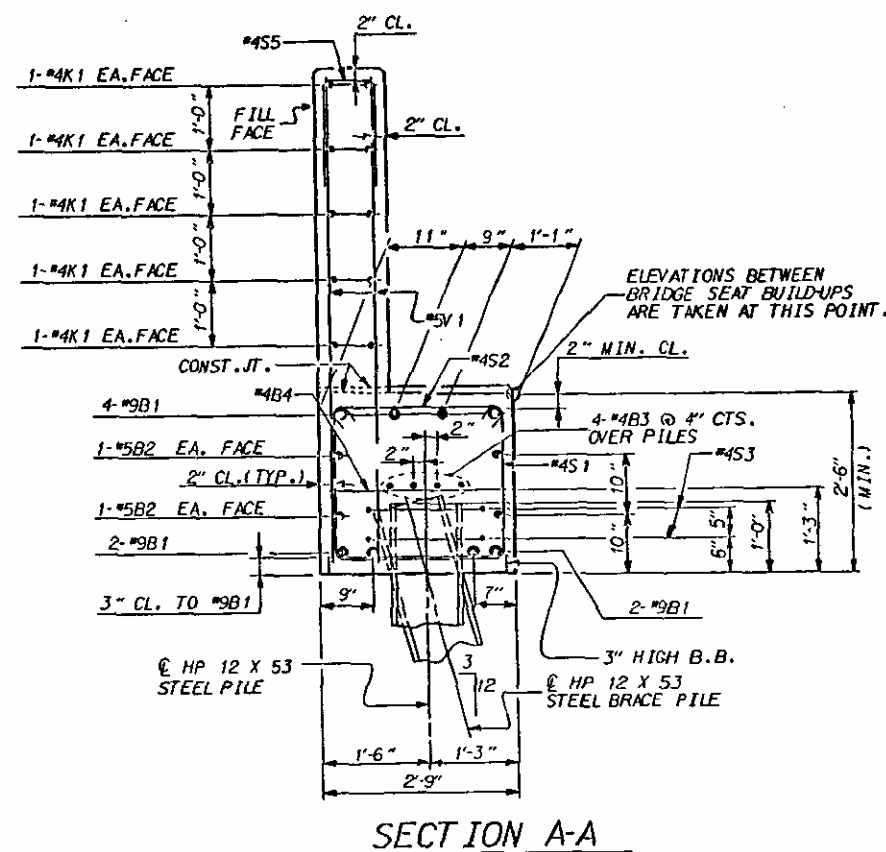
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE COST OF REMOVAL OF A PORTION OF THE EXISTING END BENT SHALL BE INCLUDED IN THE LUMP SUM PAY ITEM "REMOVAL OF EXISTING STRUCTURE".

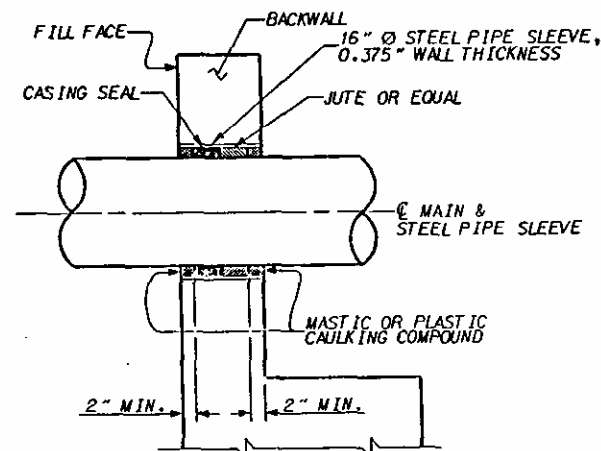
FOR TEMPORARY DRAINAGE DETAILS, SEE END BENT #2, SHEET 3 OF 3.

FOR PIPE DRAIN DETAILS, SEE END BENT #2, SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE END BENT #2, SHEET 3 OF 3.

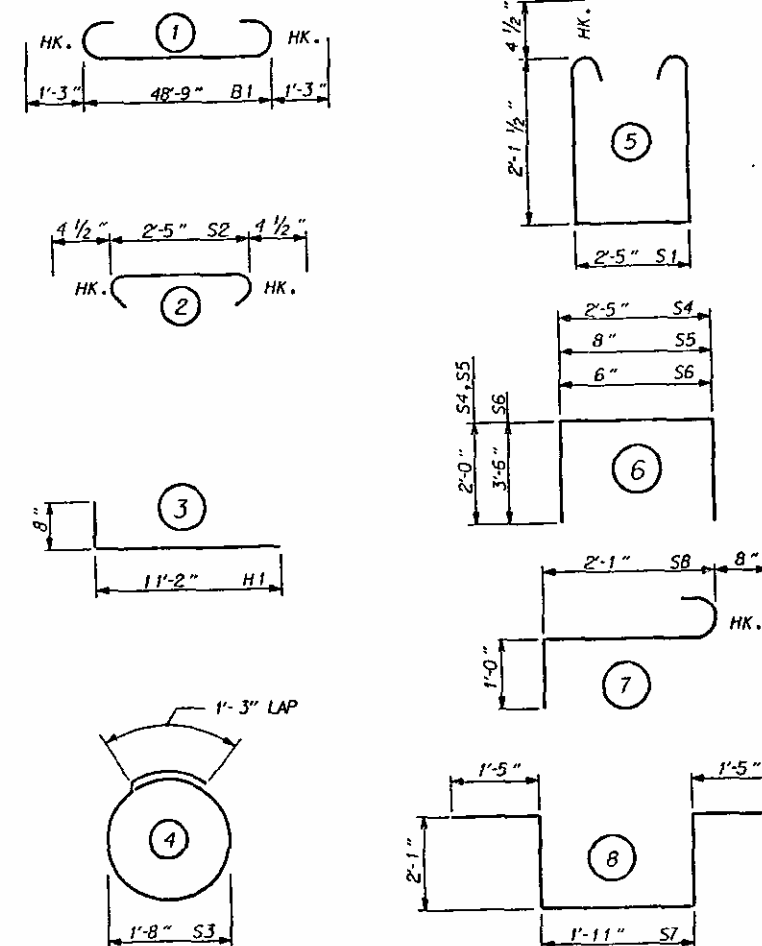


SECTION A-A



SECTION THRU BACKWALL DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT #1

DAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#3	STR	51-3	1394
B2	4	#3	STR	48-9	203
B3	8	#3	STR	25-7	137
B4	12	#3	STR	2-5	19
B5	12	#3	STR	3-5	27
H1	40	#5	3	11-10	494
K1	20	#4	STR	25-7	342
S1	46	#4	5	7-5	228
S2	46	#4	2	3-2	97
S3	24	#4	4	6-6	104
S4	12	#4	6	6-5	51
S5	41	#4	6	4-8	128
S6	4	#4	6	7-6	20
S7	1	#5	8	8-11	13
S8	3	#5	7	3-9	17
V1	82	#5	STR	6-8	570
V2	64	#5	STR	8-7	573

REINFORCING STEEL = 4417 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP & LOWER WINGS) 15.5 C.Y.

POUR #2 (BACKWALL & UPPER WINGS) 13.9 C.Y.

TOTAL CLASS A CONCRETE 29.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 13 LIN. FT. 455

SHAFT EXCAVATION LIN. FT. 152.12

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L- REV

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

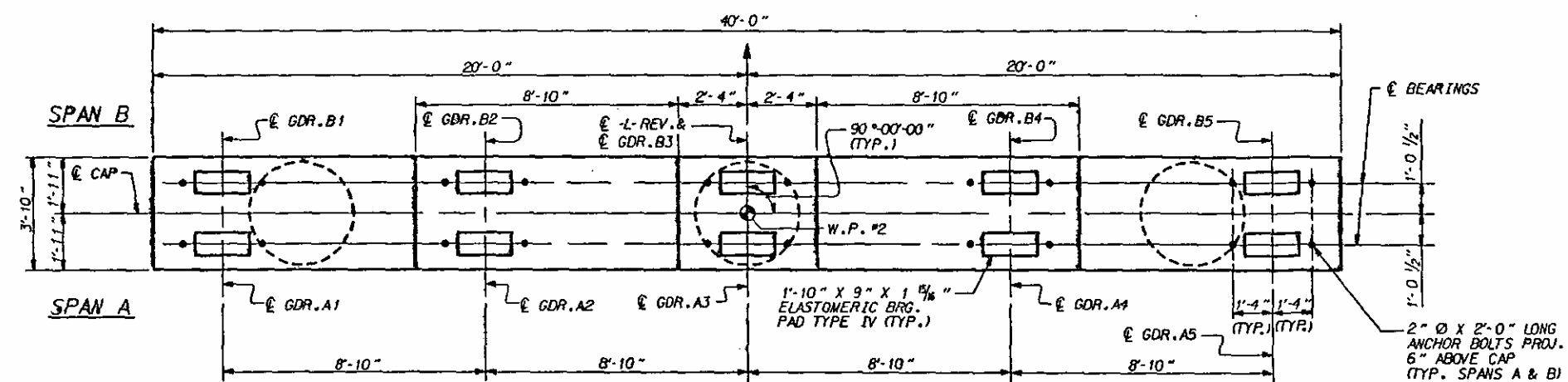
SUBSTRUCTURE
END BENT #1

REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	DATE
1			2		
3			4		
TOTAL SHEETS					54

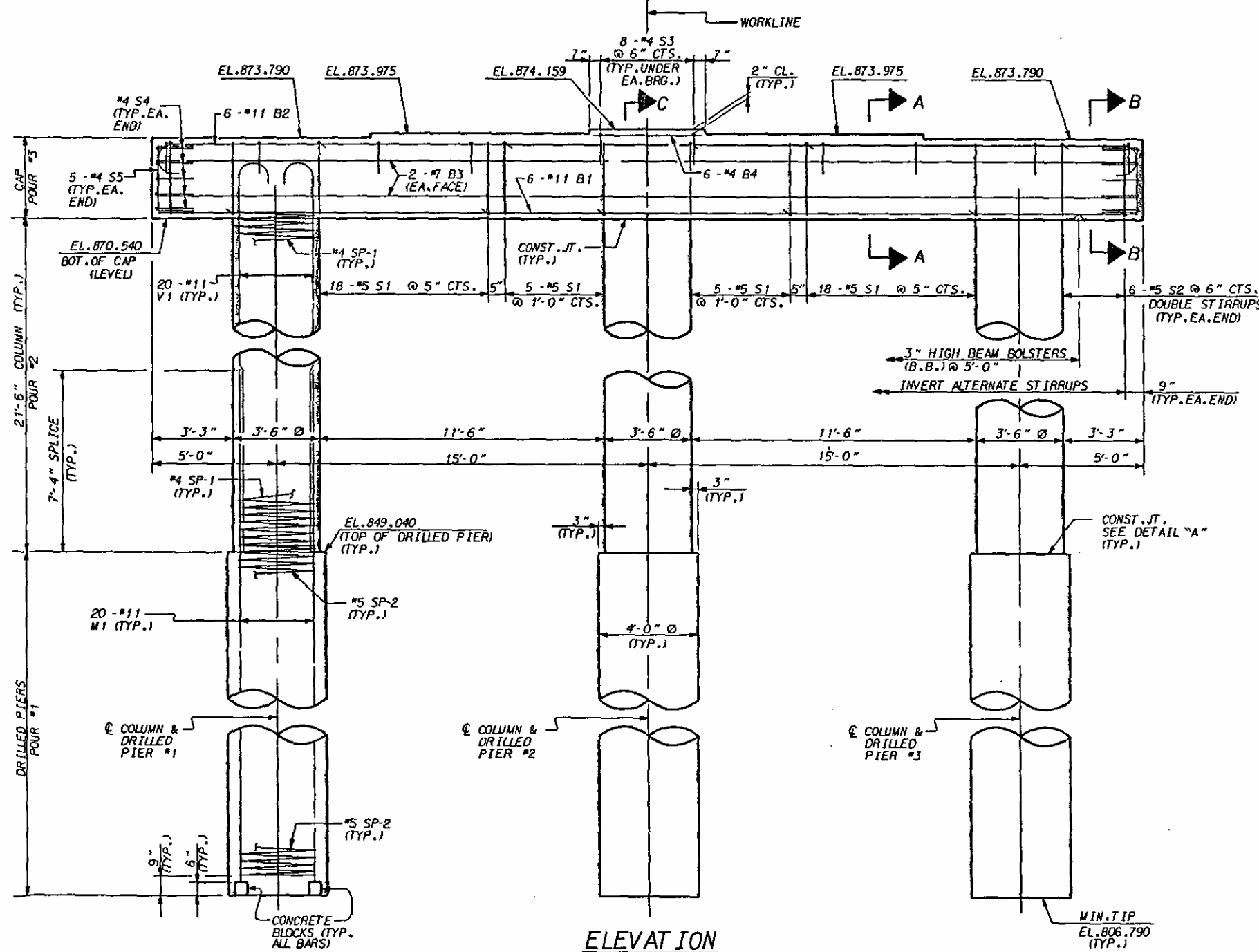


William E. Larkin
2/15/94

DRAWN BY: W.D. CRUTCHER DATE: 9-93
CHECKED BY: A.D. MARTIN DATE: 11-21-93

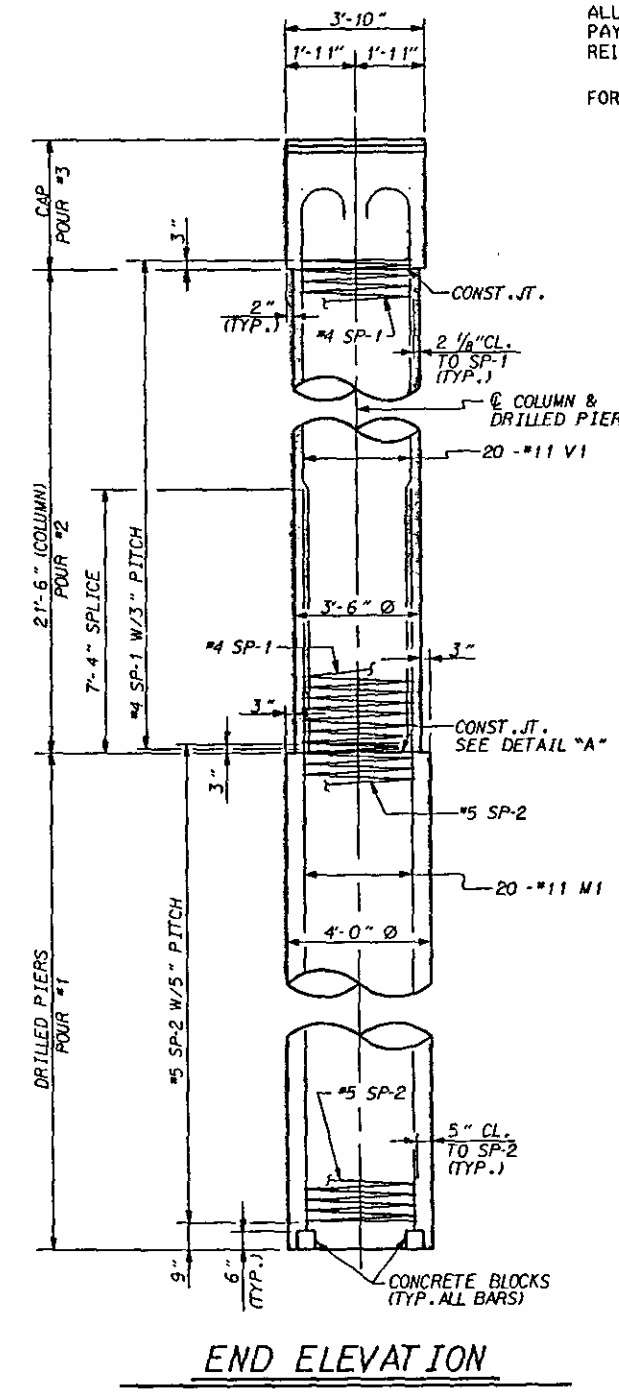


PLAN OF CAP



ELEVATION

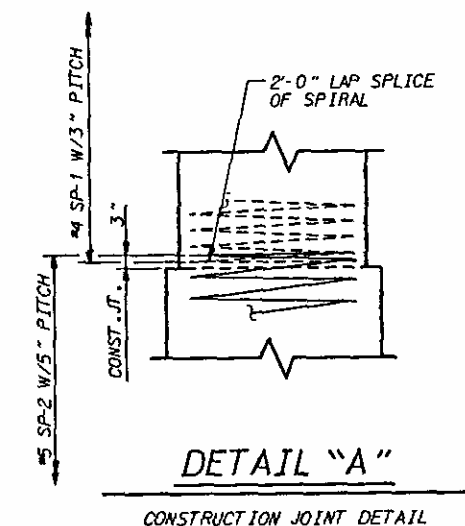
(REINFORCING STEEL SHOWN IS TYPICAL FOR EACH COLUMN & DRILLED PIER)



END ELEVATION

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON 'V' BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
- 2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4S4 AND #4S5 BARS.
- #4S4 AND #4S5 BARS MAY BE SHIFTED UP TO 2' TO CLEAR 'B' BARS.
- FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR MAY USE CLASS "AA" CONCRETE IN LIEU OF CLASS "A" IN THE COLUMNS.
- SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.
- FOR PILE INTEGRITY TESTING, SEE SPECIAL PROVISIONS.



DETAIL "A"

CONSTRUCTION JOINT DETAIL

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 -L- REV.

SHEET 1 OF 2



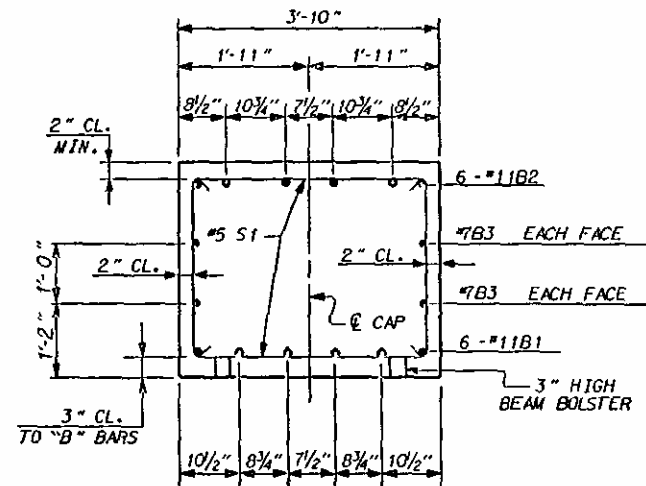
SUBSTRUCTURE
BENT #1

DRAWN BY: R. TUNG DATE: 12-1-93
CHECKED BY: W. E. PARKER DATE: 12-93

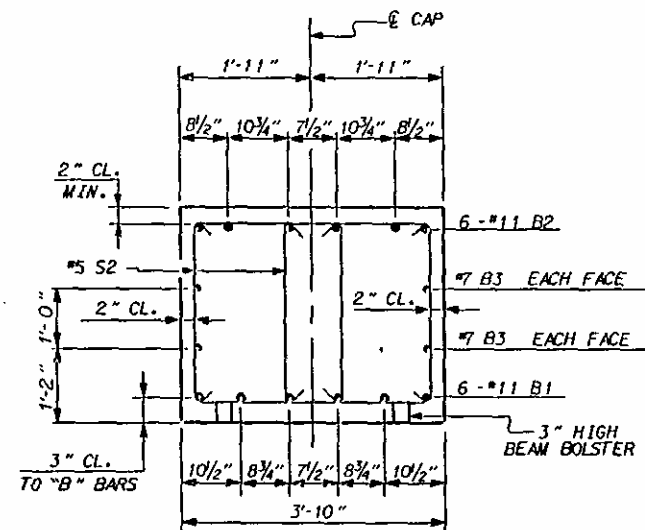
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lanning

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			5-33
2			4			54

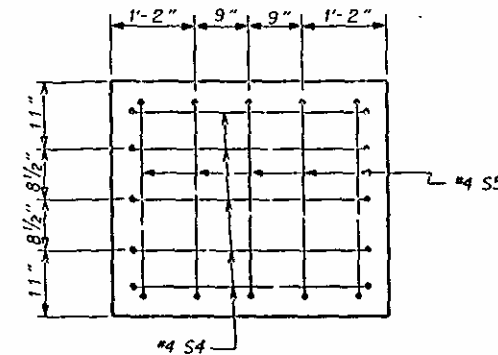
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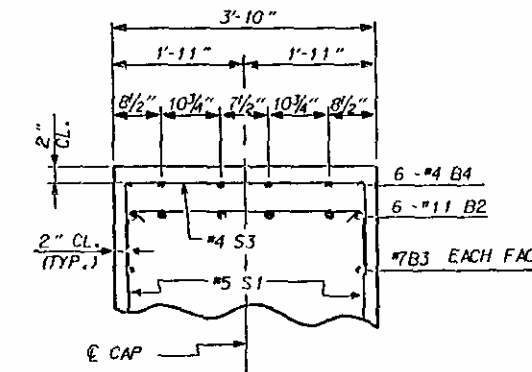
SECTION A-A



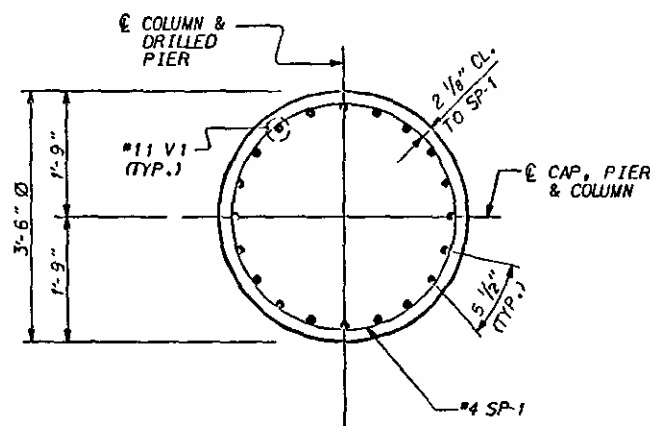
SECTION B-B



END VIEW

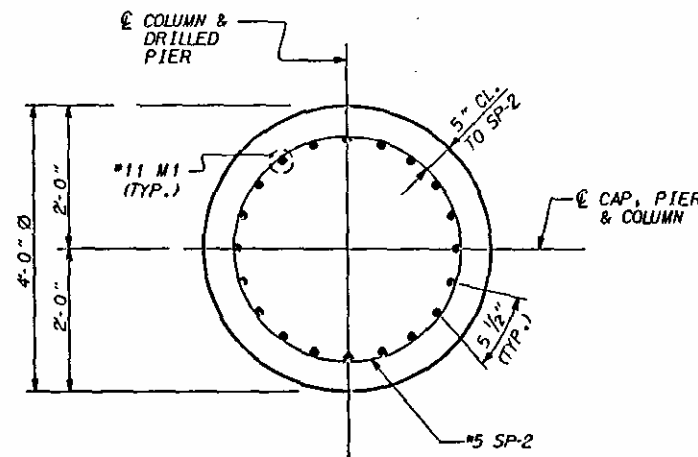


PART SECTION C



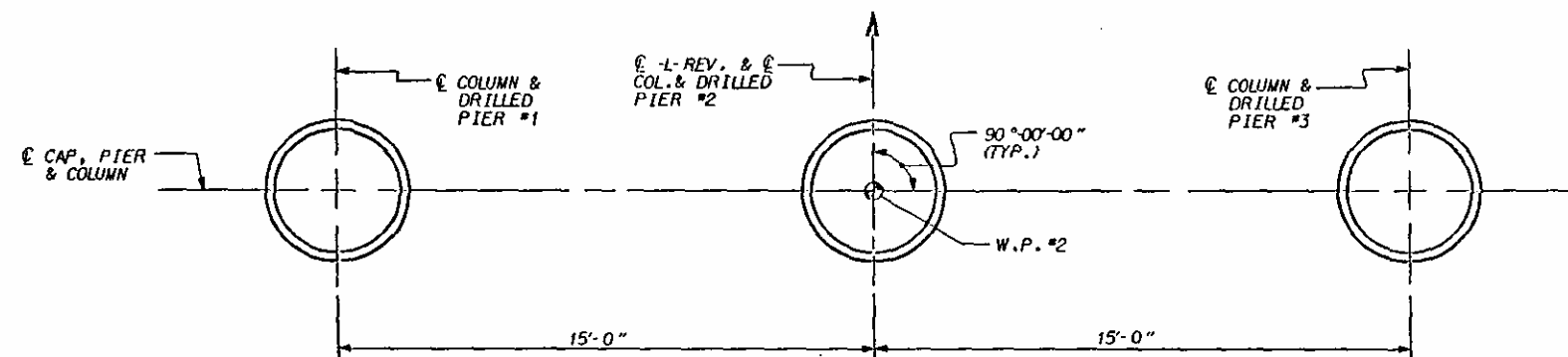
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)



SECTION THRU DRILLED PIER

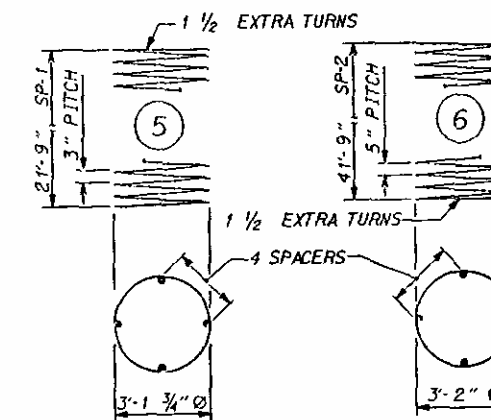
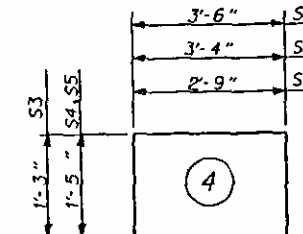
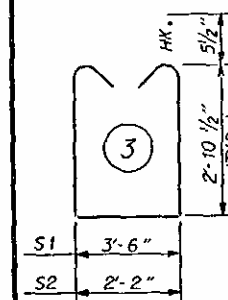
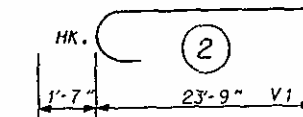
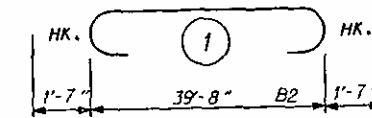
(TYPICAL FOR EACH DRILLED PIER)



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39- 8	1264
B2	6	11	1	42-10	1365
B3	4	7	STR	34- 8	324
B4	6	4	STR	4- 4	17

S1	46	5	3	10-2	488
S2	24	5	3	8-10	221
S3	46	4	4	6-0	160
S4	10	4	4	6-2	41
S5	10	4	4	5-7	37

M1	60	11	STR	49-1	15647
----	----	----	-----	------	-------

V1	60	11	2	25-4	8076
----	----	----	---	------	------

SP-1	3	4	5	863-4	1730
SP-2	3	5	6	995-0	3113

REINFORCING STEEL= 27640 LBS.

SPIRAL COLUMN
REINFORCING STEEL= 4843 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMN) ---- 23.0 C. Y.

POUR #3 (CAP) ---- 19.2 C. Y.

CLASS A CONCRETE TOTAL= 42.2 C. Y.

DRILLED PIERS

CLASS AA CONCRETE BREAKDOWN

POUR #1 (DRILLED PIER) -- 59.0 C. Y.

CLASS AA CONCRETE TOTAL= 59.0 C. Y.

4' - 0" DIA. DRILLED PIERS

NO. 3 LIN. FT. = 127 L. F.

PROJECT NO. 8.1791801

CATAWBA - ALEXANDER COUNTY

STATION: 31 + 50 -L- REV.

SHEET 2 OF 2



William S. Larkin
2/15/94

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			2			5-34
2			3			5-4

DRAWN BY: R. TUNG
CHECKED BY: J. E. PARKER
DATE: 12-1-93
DATE: 12-93

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4S4 AND #4S5 BARS.

#4S4 AND #4S5 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

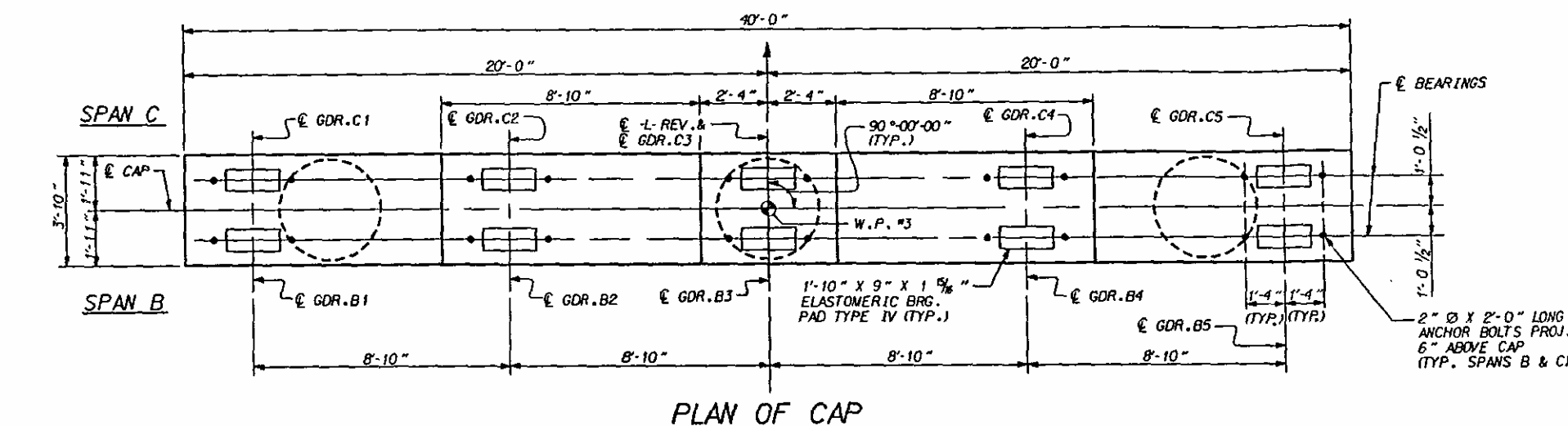
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY USE CLASS "AA" CONCRETE IN LIEU OF CLASS "A" IN THE STRUTS & COLUMNS.

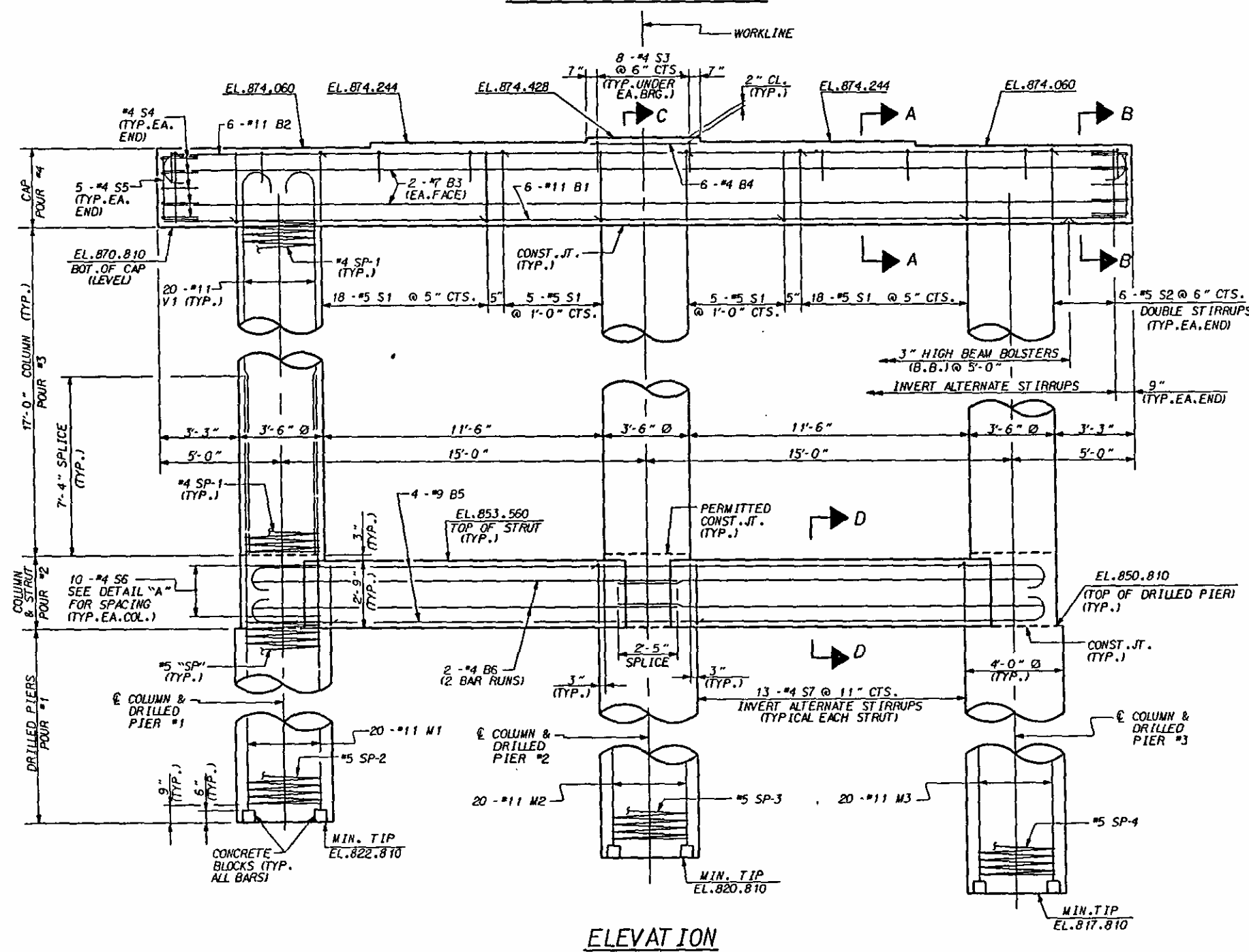
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.

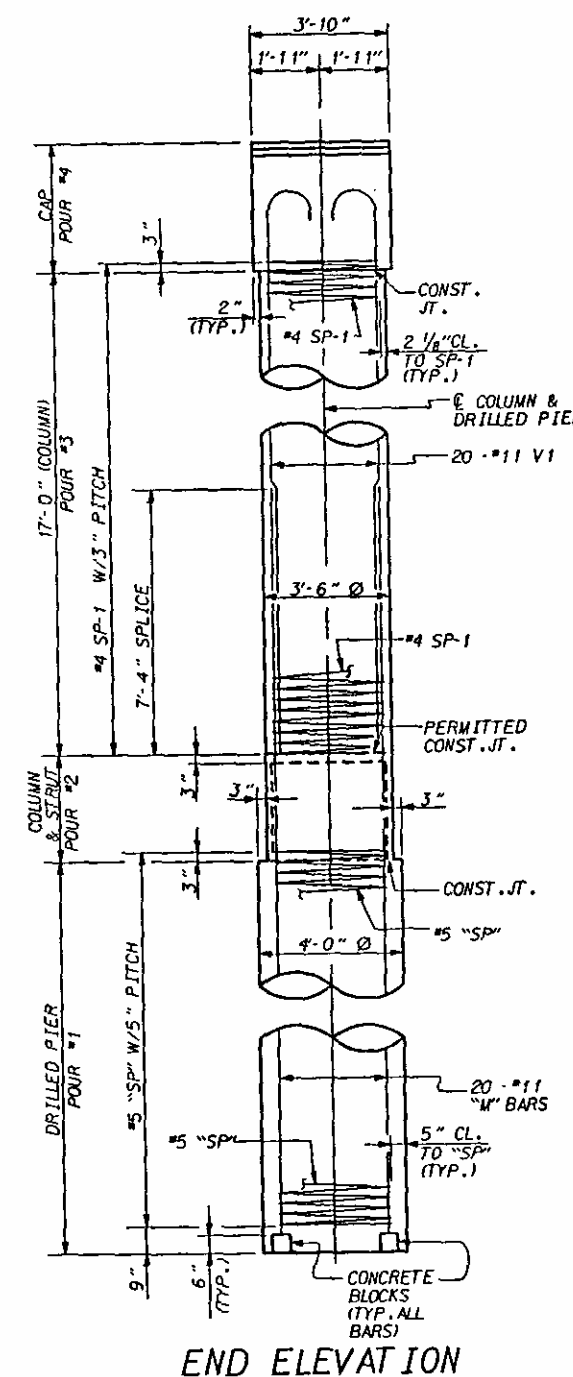
FOR PILE INTEGRITY TESTING, SEE SPECIAL PROVISIONS.



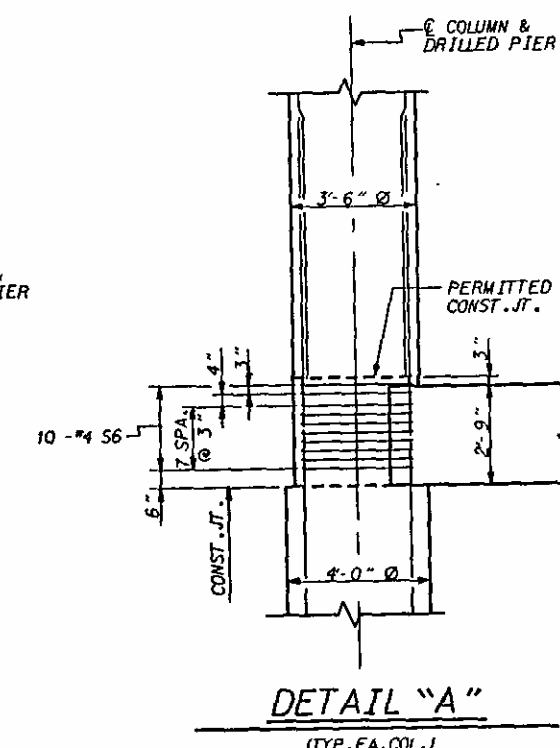
PLAN OF CAP



ELEVATION



END ELEVATION



DETAIL "A"

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 - L - REV.

SHEET 1 OF 2



William E. Larkins
2/15/99

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

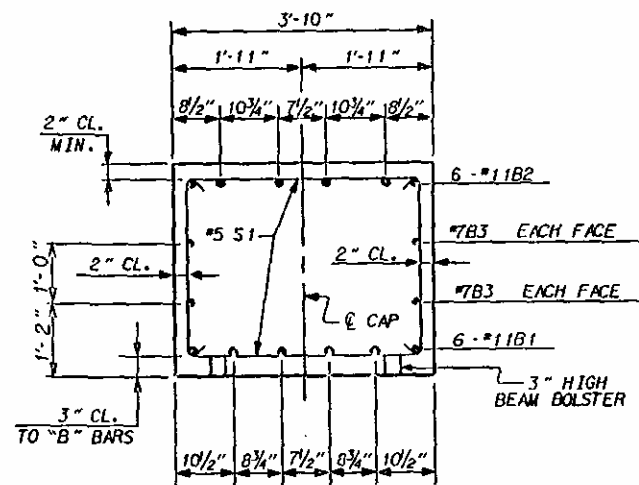
SUBSTRUCTURE
BENT #2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			5-35
2			4			5-4

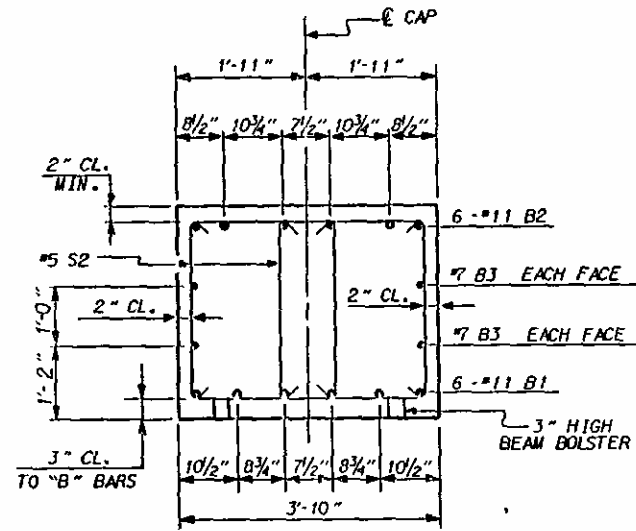
DRAWN BY: R. TUNG
CHECKED BY: W. E. PARKER
DATE: 12-2-95
DATE: 12-95

10-FEB-1994 11:50
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tanning

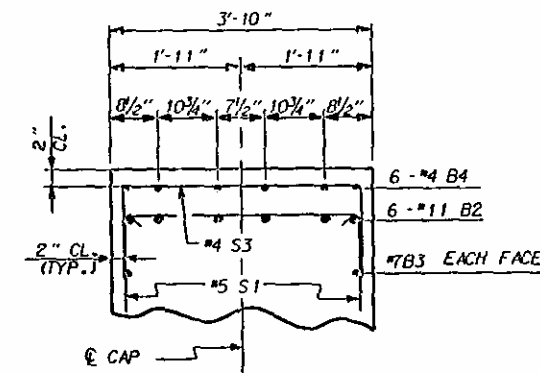
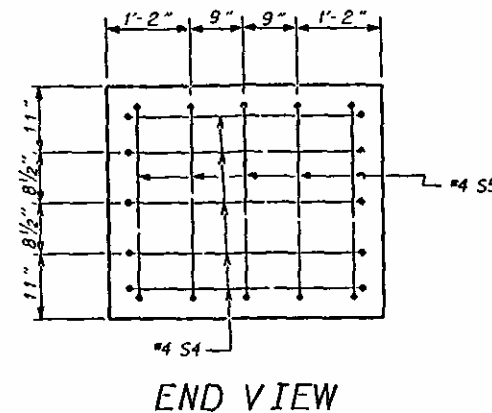
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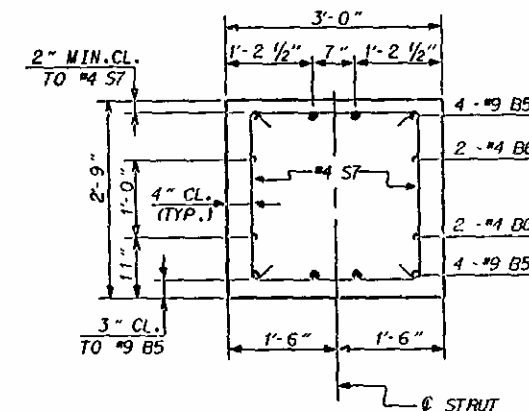
SECTION A-A



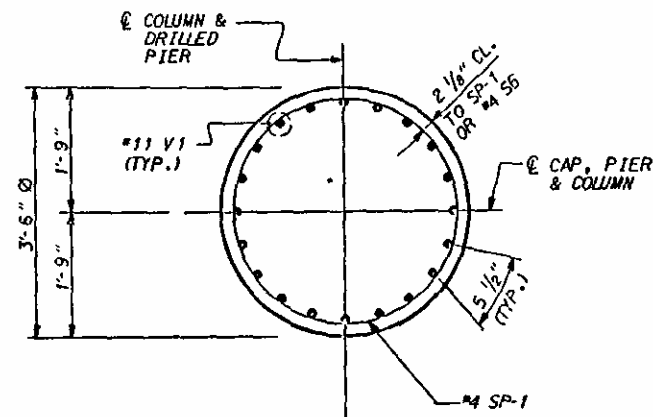
SECTION B-B



PART SECTION C

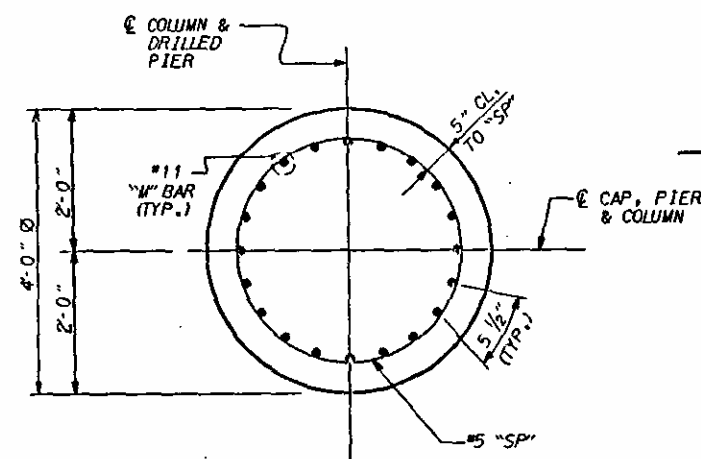


SECTION D-D



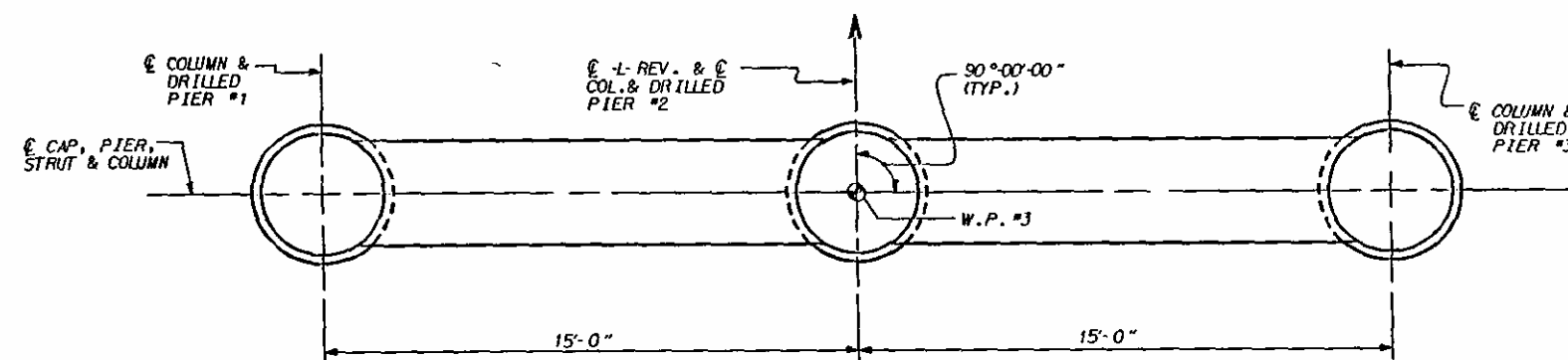
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)



SECTION THRU DRILLED PIER

(TYPICAL FOR EACH DRILLED PIER)



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

DRAWN BY: R. TUNG DATE: 12-2-93
CHECKED BY: W. F. PARKER DATE: 12-93

BAR TYPES		BILL OF MATERIAL				
		BENT #2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	11	STR	39'-8"	1264	
B2	6	11	STR	42'-10"	1365	
B3	4	7	STR	39'-8"	324	
B4	6	4	STR	4'-4"	17	
B5	8	9	STR	33'-6"	911	
B6	8	4	STR	16'-9"	90	
S1	46	5	3	10'-2"	488	
S2	24	5	3	8'-10"	221	
S3	40	4	4	6'-0"	160	
S4	10	4	4	6'-2"	41	
S5	10	4	4	5'-7"	37	
S6	30	4	7	11'-2"	224	
S7	26	4	3	7'-10"	136	
V1	60	11	2	20'-10"	6641	
M1	20	11	STR	37'-10"	4020	
M2	20	11	STR	39'-10"	4233	
M3	20	11	STR	42'-10"	4551	
SP-1	3	4	5	702'-5"	1408	
SP-2	1	5	6	675'-1"	704	
SP-3	1	5	6	722'-1"	753	
SP-4	1	5	6	792'-6"	827	
REINFORCING STEEL= 24723 LBS.						
SPIRAL COLUMN REINFORCING STEEL= 3692 LBS.						
CLASS A CONCRETE BREAKDOWN						
POUR #2 (COL. & STRUT) - 10.9 C. Y.						
POUR #3 (COLUMN) - 18.2 C. Y.						
POUR #4 (CAP) - 19.2 C. Y.						
CLASS A CONCRETE TOTAL= 48.3 C. Y.						
DRILLED PIERS						
CLASS AA CONCRETE BREAKDOWN						
POUR #1 (DRILLED PIER) - 42.4 C. Y.						
CLASS AA CONCRETE TOTAL= 42.4 C. Y.						
4' - 0" DIA. DRILLED PIERS						
NO. 3 LIN. FT. = 91 L. F.						



William E. Larkin, Jr.
2/15/74

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 - L. REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #2

REVISIONS				SHEET NO.
NO.	BY	DATE	REVISION	
1	BY	DATE	REVISION	5-36
2	BY	DATE	REVISION	TOTAL SHEETS
				54

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4S4 AND #4S5 BARS.

#4S4 AND #4S5 BARS MAY BE SHIFTED UP TO 2' TO CLEAR "B" BARS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY USE CLASS "AA" CONCRETE IN LIEU OF CLASS "A" IN THE STRUTS & COLUMNS.

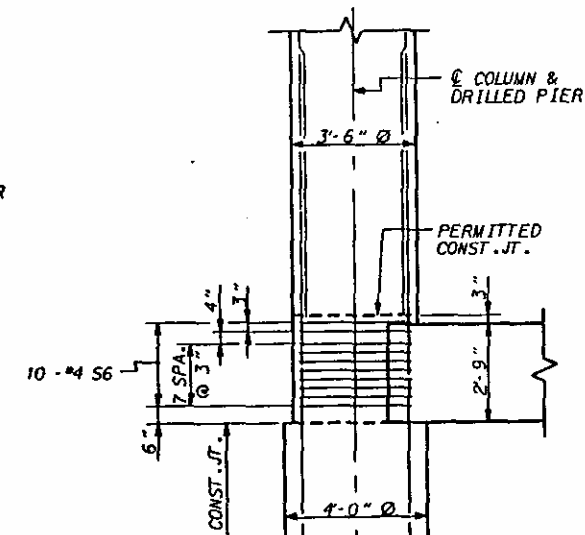
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.

THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PILE INTEGRITY TESTING, SEE SPECIAL PROVISIONS.



DETAIL "A"
(TYP. EA. COL.)

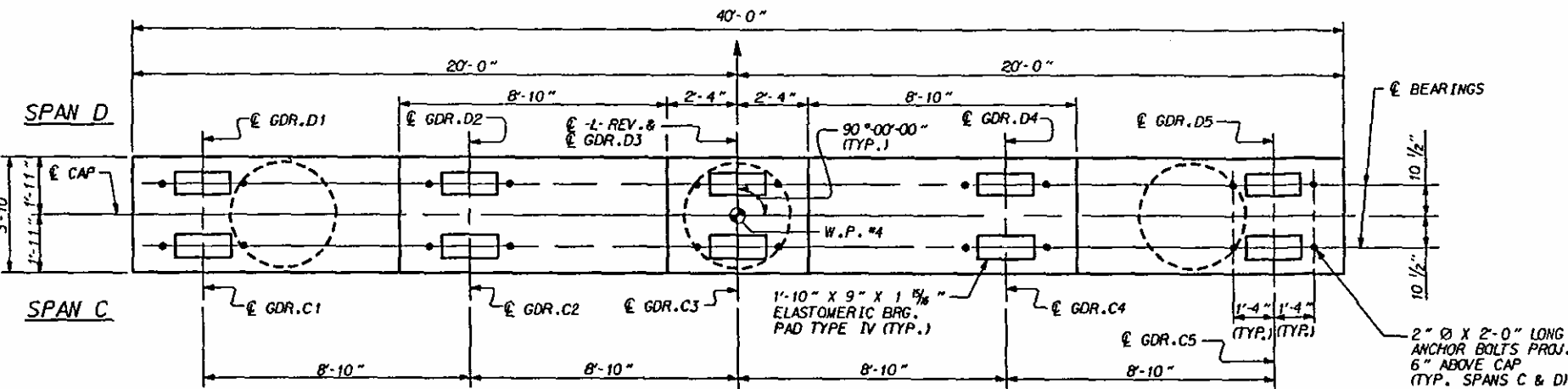
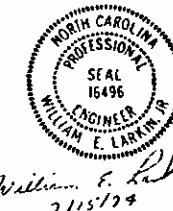
PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
 STATION: 31 + 50 -L- REV.

SHEET 1 OF 2

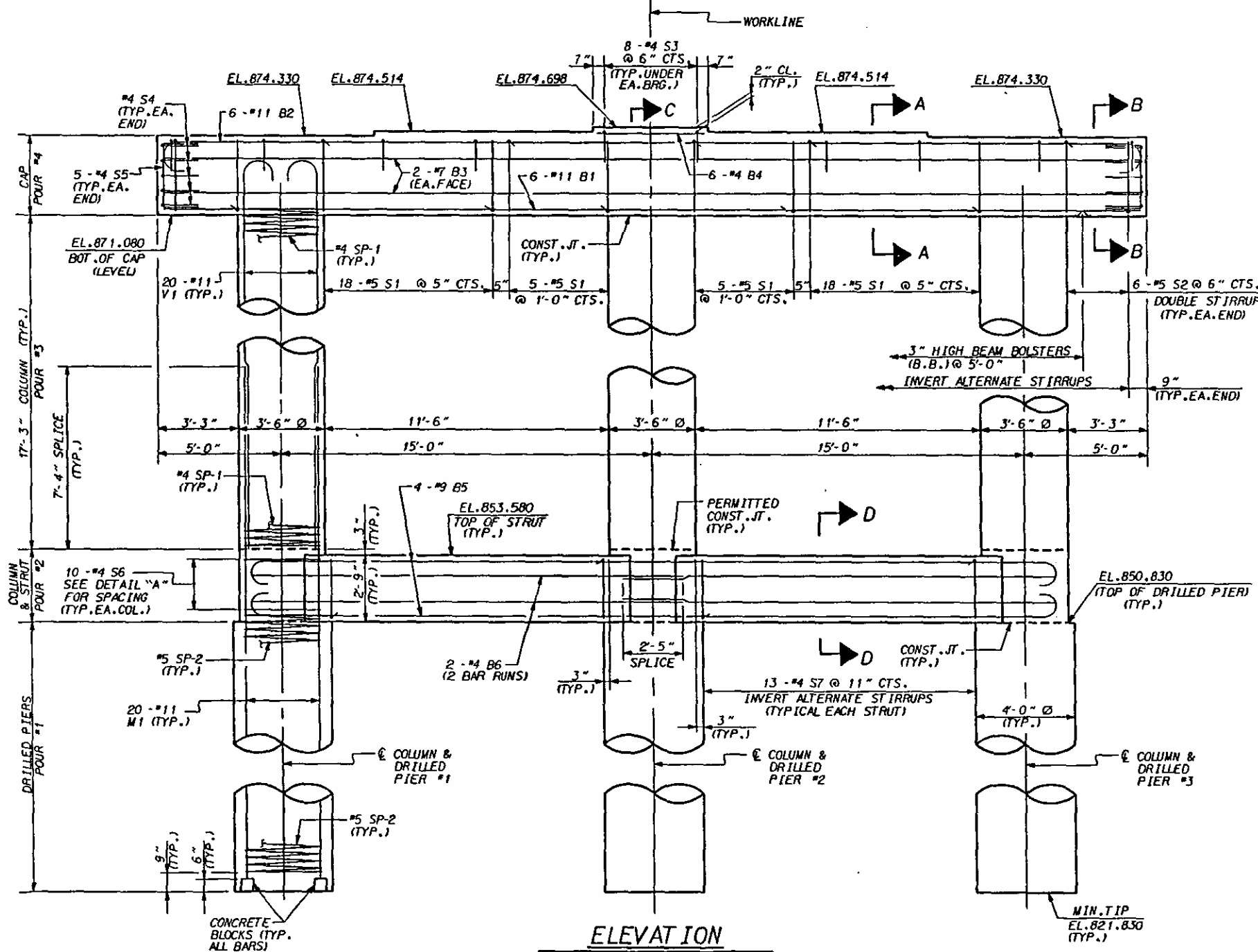
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
BENT #3

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			5-37
2			4			54



PLAN OF CAP

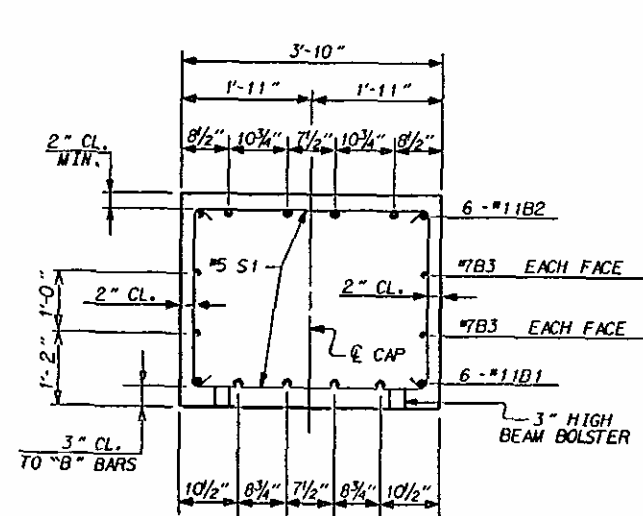


ELEVATION

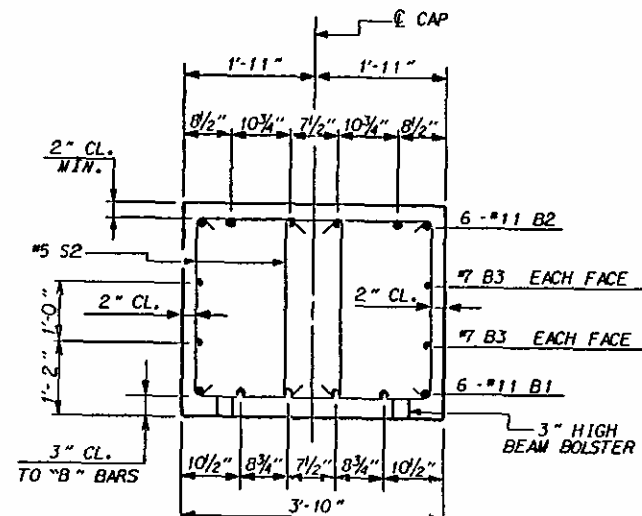
(REINFORCING STEEL SHOWN IS TYPICAL FOR EACH COLUMN & DRILLED PIER)

DRAWN BY: R. TUNG DATE: 12-3-93
 CHECKED BY: J.F. PARKER DATE: 12-93

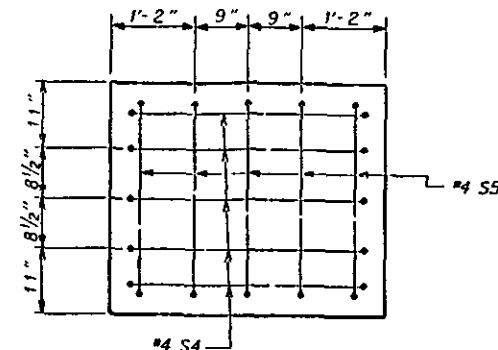
0-FEB-1994 11:50
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 lanning



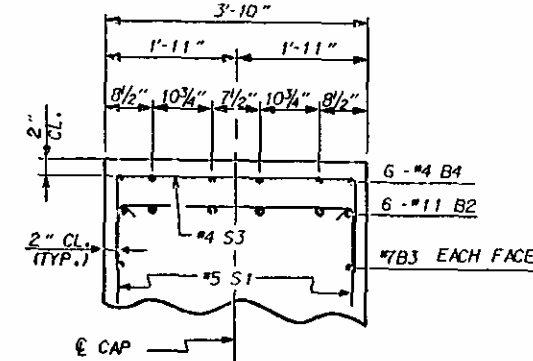
SECTION A-A



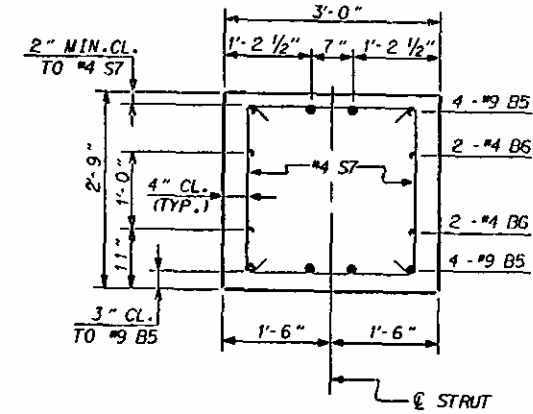
SECTION B-B



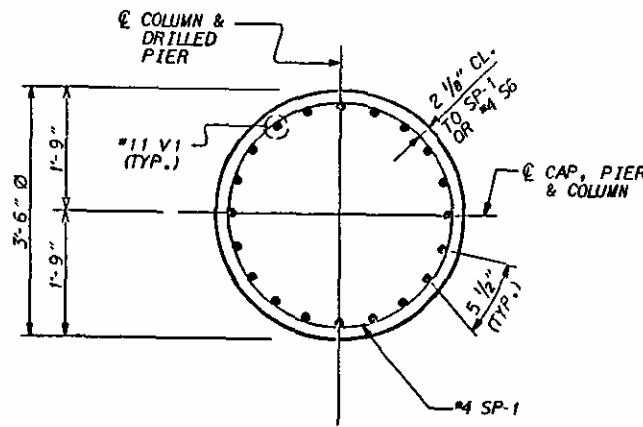
END VIEW



PART SECTION C

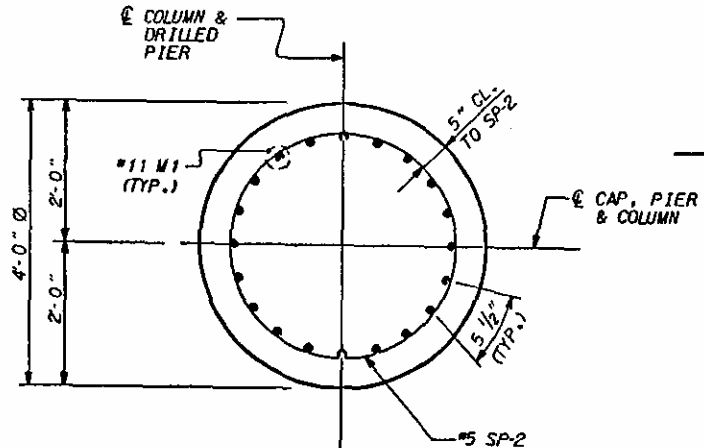


SECTION D-D



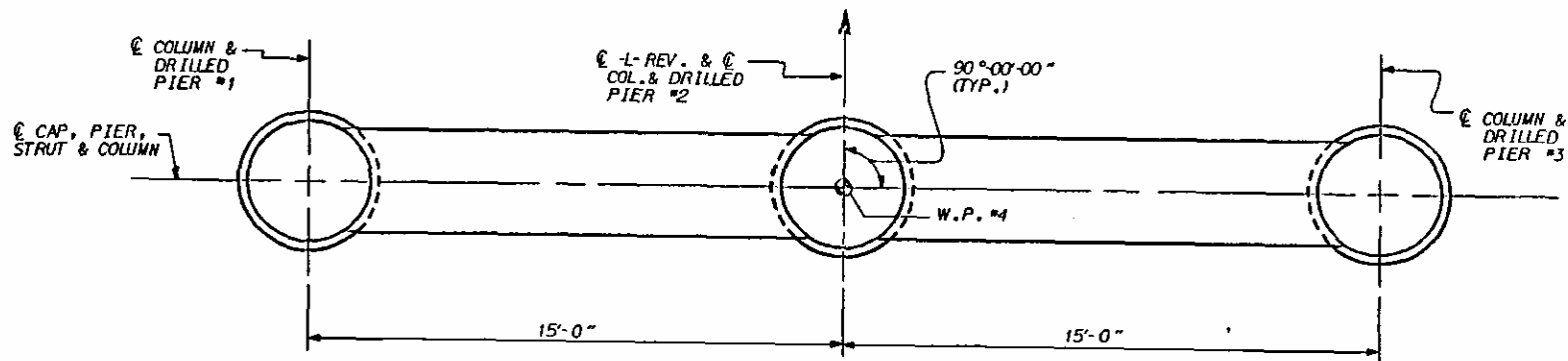
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)



SECTION THRU DRILLED PIER

(TYPICAL FOR EACH DRILLED PIER)



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES						BILL OF MATERIAL					
BENT # 3						BENT # 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39'-8"	1264	B1	6	11	STR	39'-8"	1264
B2	6	11	STR	42'-10"	1365	B2	6	11	STR	42'-10"	1365
B3	4	7	STR	39'-8"	324	B3	4	7	STR	39'-8"	324
B4	6	4	STR	4'-4"	17	B4	6	4	STR	4'-4"	17
B5	8	9	STR	33'-6"	911	B5	8	9	STR	33'-6"	911
B6	8	4	STR	16'-9"	90	B6	8	4	STR	16'-9"	90
S1	46	5	3	10'-2"	488	S1	46	5	3	10'-2"	488
S2	24	5	3	8'-10"	221	S2	24	5	3	8'-10"	221
S3	40	4	4	6'-0"	160	S3	40	4	4	6'-0"	160
S4	10	4	4	6'-2"	41	S4	10	4	4	6'-2"	41
S5	10	4	4	5'-7"	37	S5	10	4	4	5'-7"	37
S6	30	4	7	11'-2"	224	S6	30	4	7	11'-2"	224
S7	26	4	3	7'-10"	136	S7	26	4	3	7'-10"	136
MI	60	11	STR	38'-10"	12379	MI	60	11	STR	38'-10"	12379
VI	60	11	2	21'-1"	6721	VI	60	11	2	21'-1"	6721
SP-1	3	4	5	71'-2"	1427	SP-1	3	4	5	71'-2"	1427
SP-2	3	5	6	69'-8"	2186	SP-2	3	5	6	69'-8"	2186
REINFORCING STEEL = 24378 LBS.						REINFORCING STEEL = 24378 LBS.					
SPIRAL COLUMN REINFORCING STEEL = 3613 LBS.						SPIRAL COLUMN REINFORCING STEEL = 3613 LBS.					
CLASS A CONCRETE BREAKDOWN						CLASS A CONCRETE BREAKDOWN					
POUR #2 (COL. & STRUT) - 10.9 C.Y.						POUR #2 (COL. & STRUT) - 10.9 C.Y.					
POUR #3 (COLUMN) - 18.4 C.Y.						POUR #3 (COLUMN) - 18.4 C.Y.					
POUR #4 (CAP) - 19.2 C.Y.						POUR #4 (CAP) - 19.2 C.Y.					
CLASS A CONCRETE TOTAL = 48.5 C.Y.						CLASS A CONCRETE TOTAL = 48.5 C.Y.					
DRILLED PIERS						DRILLED PIERS					
CLASS AA CONCRETE BREAKDOWN						CLASS AA CONCRETE BREAKDOWN					
POUR #1 (DRILLED PIER) - 40.5 C.Y.						POUR #1 (DRILLED PIER) - 40.5 C.Y.					
CLASS AA CONCRETE TOTAL = 40.5 C.Y.						CLASS AA CONCRETE TOTAL = 40.5 C.Y.					
4' - 0" DIA. DRILLED PIERS						4' - 0" DIA. DRILLED PIERS					
NO. 3 LIN. FT. = 87 L.F.						NO. 3 LIN. FT. = 87 L.F.					

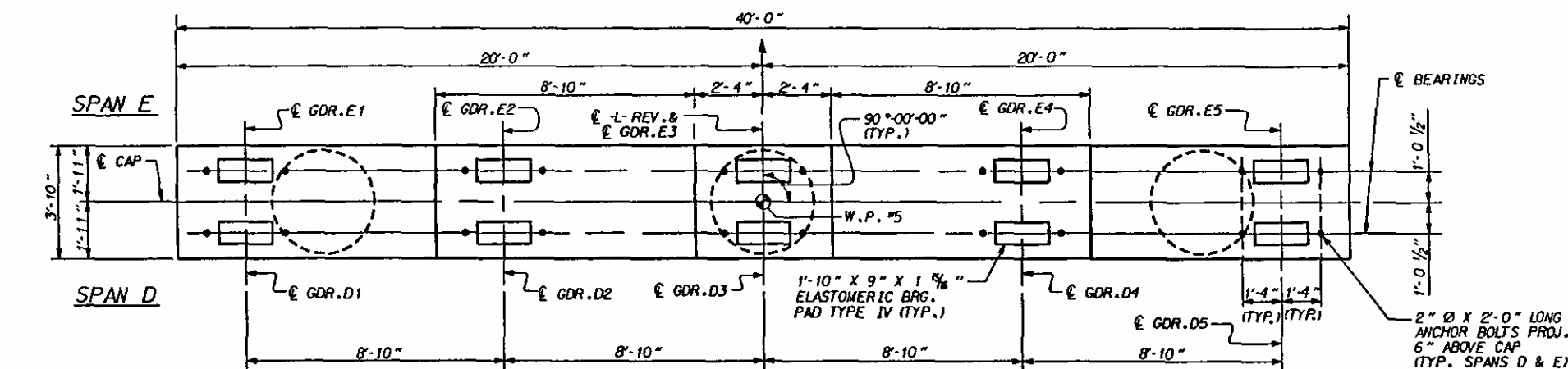


William E. Larkin
 2/15/94

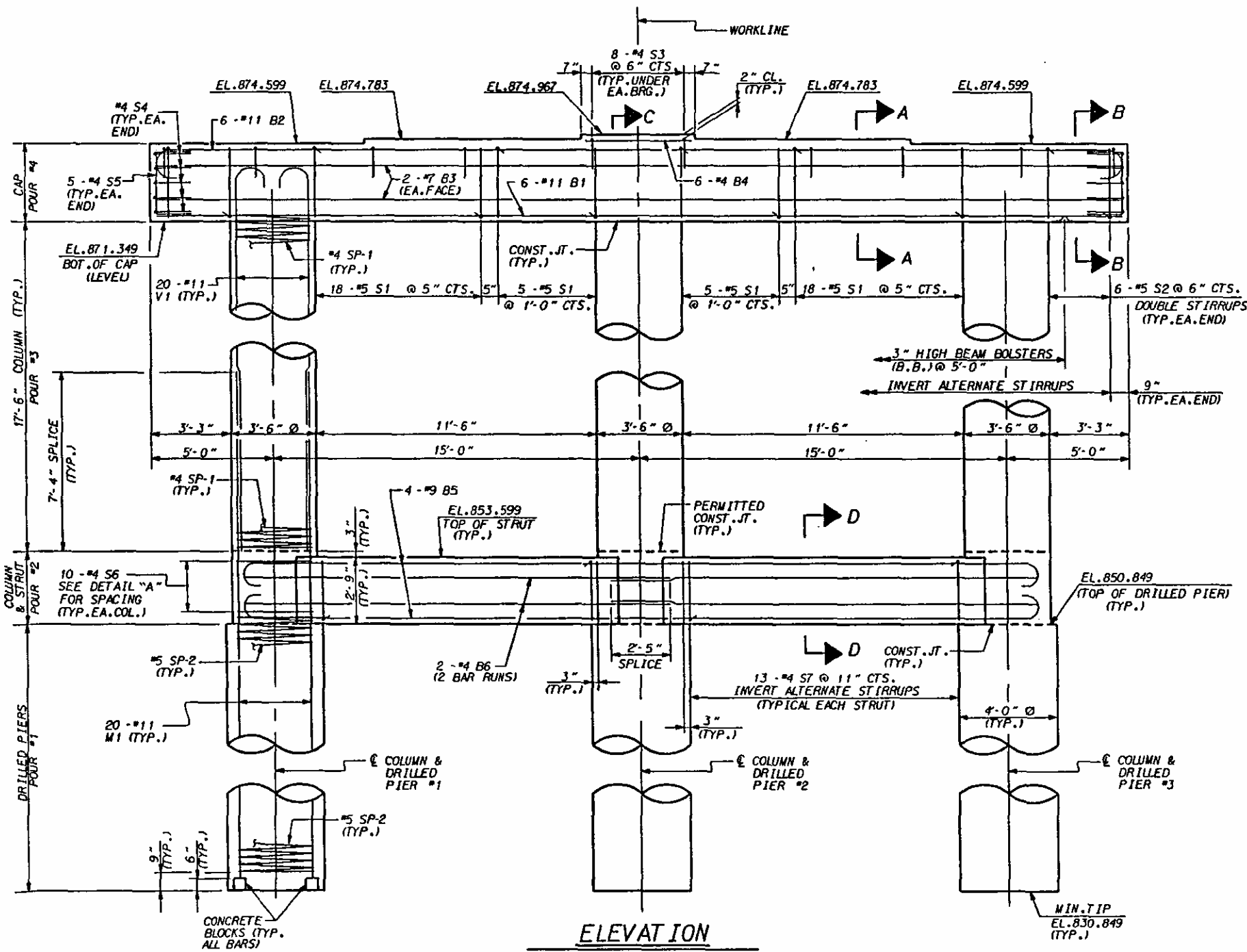
PROJECT NO. 8.1791801
 CATAWBA - ALEXANDER COUNTY
 STATION: 31 + 50 -L- REV.

SHEET 2 OF 2

REVISIONS						SHEET NO.	
NO.	DATE	BY	DATE	BY	DATE	5-38	TOTAL SHEETS
1						5-38	5-4
2							
3							

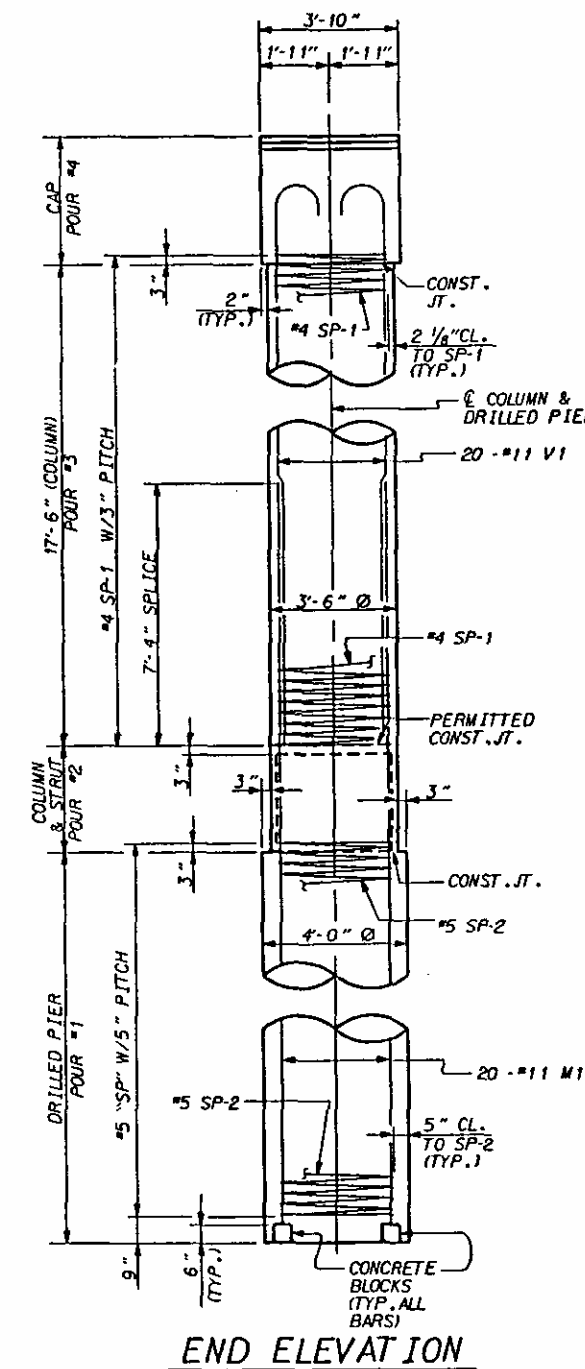


PLAN OF CAP

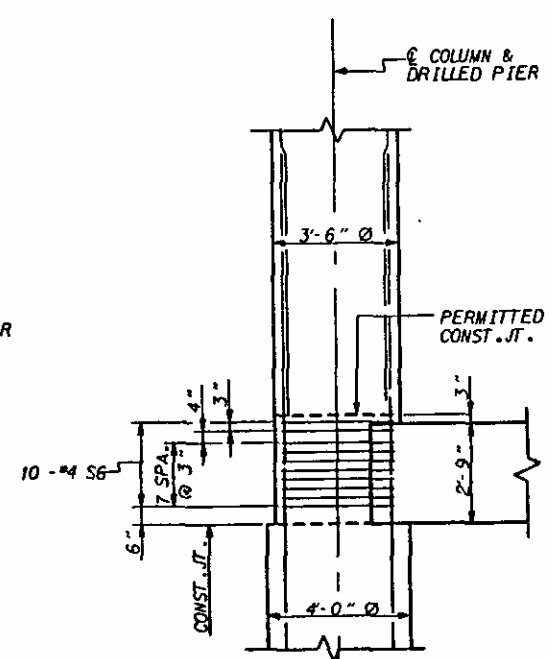


ELEVATION

(REINFORCING STEEL SHOWN IS TYPICAL FOR EACH COLUMN & DRILLED PIER)



END ELEVATION



DETAIL "A"

(TYP. EA. COL.)

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 -L- REV.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #4

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

SHEET NO.
5-39
TOTAL
54

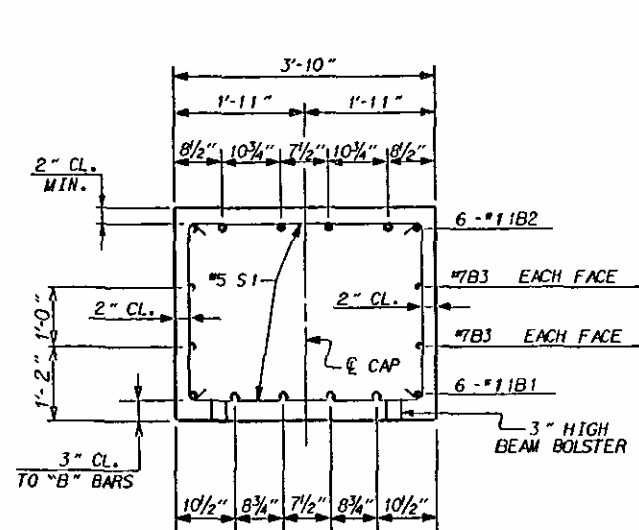


William E. Larkin
2/15/12

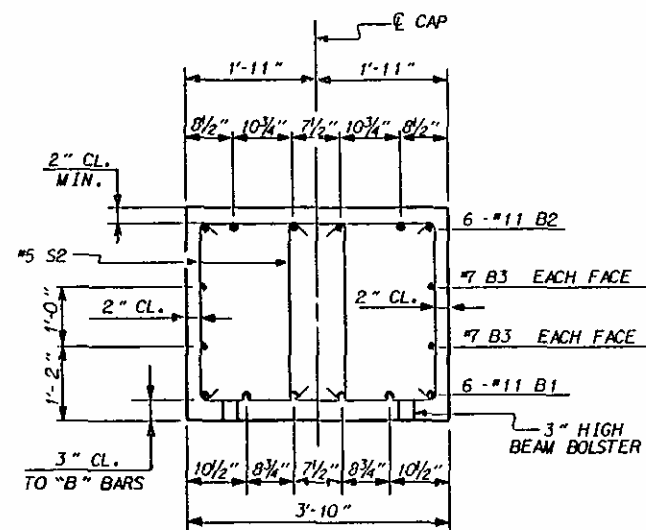
DRAWN BY: R. TUNG
CHECKED BY: W.E. PARKER
DATE: 12-3-93
DATE: 12-93

10-FEB-1994 R50
/usr/nirman/b22080b1.dgn
lanning

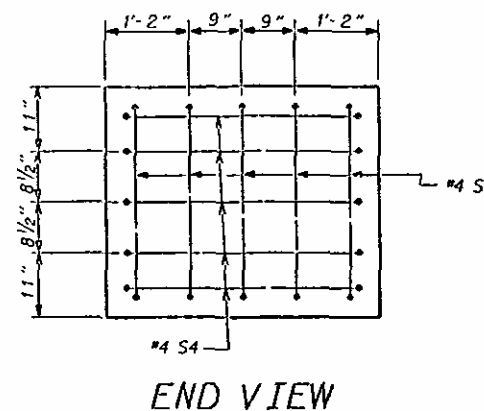
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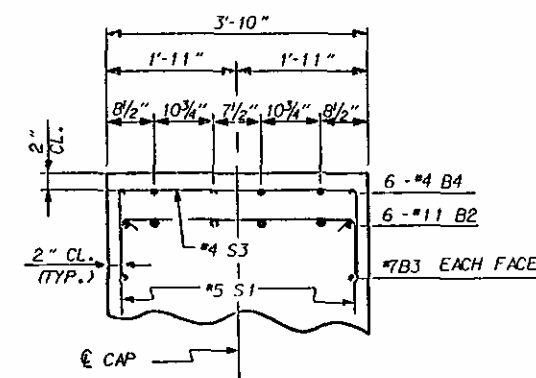
SECTION A-A



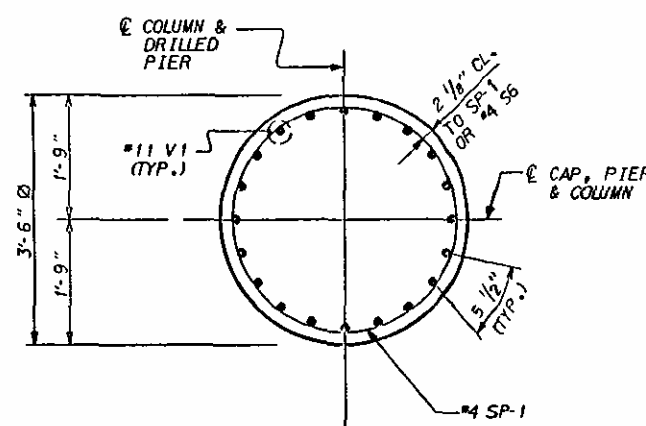
SECTION B-B



END VIEW

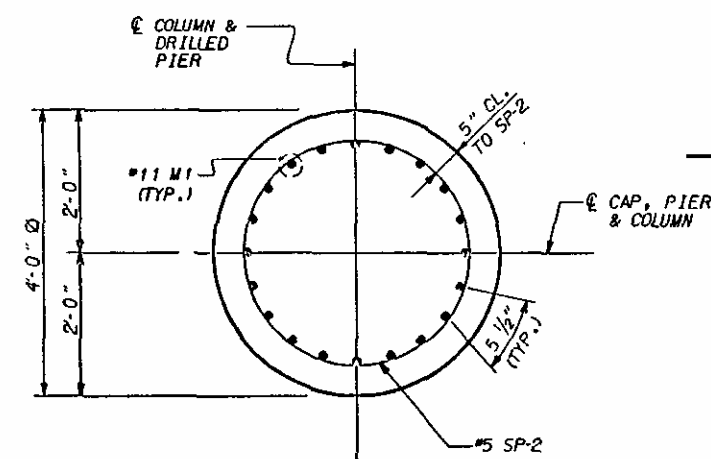


PART SECTION C



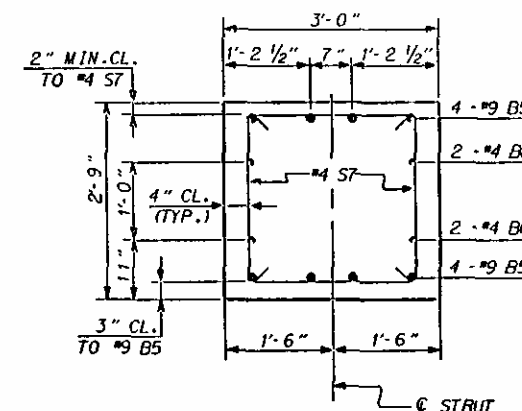
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)

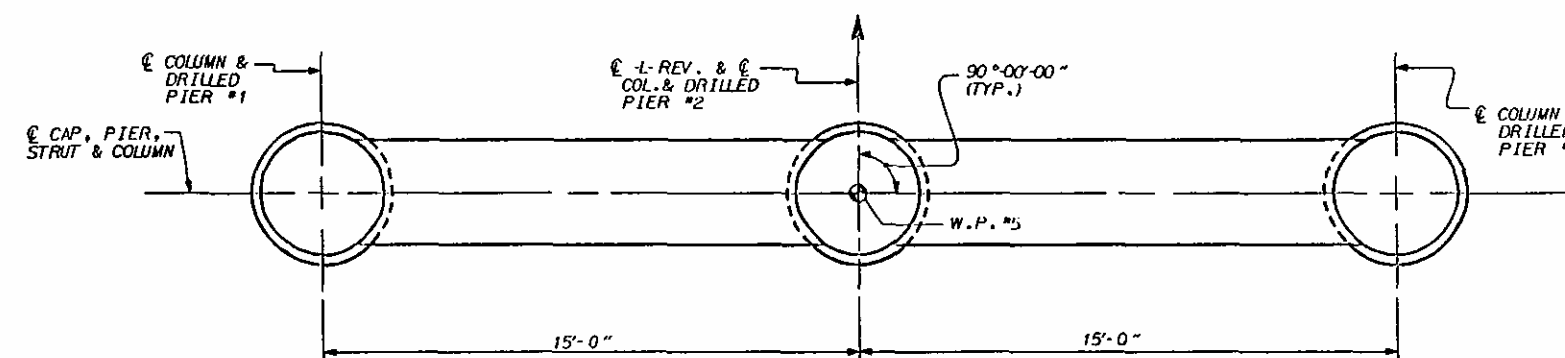


SECTION THRU DRILLED PIER

(TYPICAL FOR EACH DRILLED PIER)



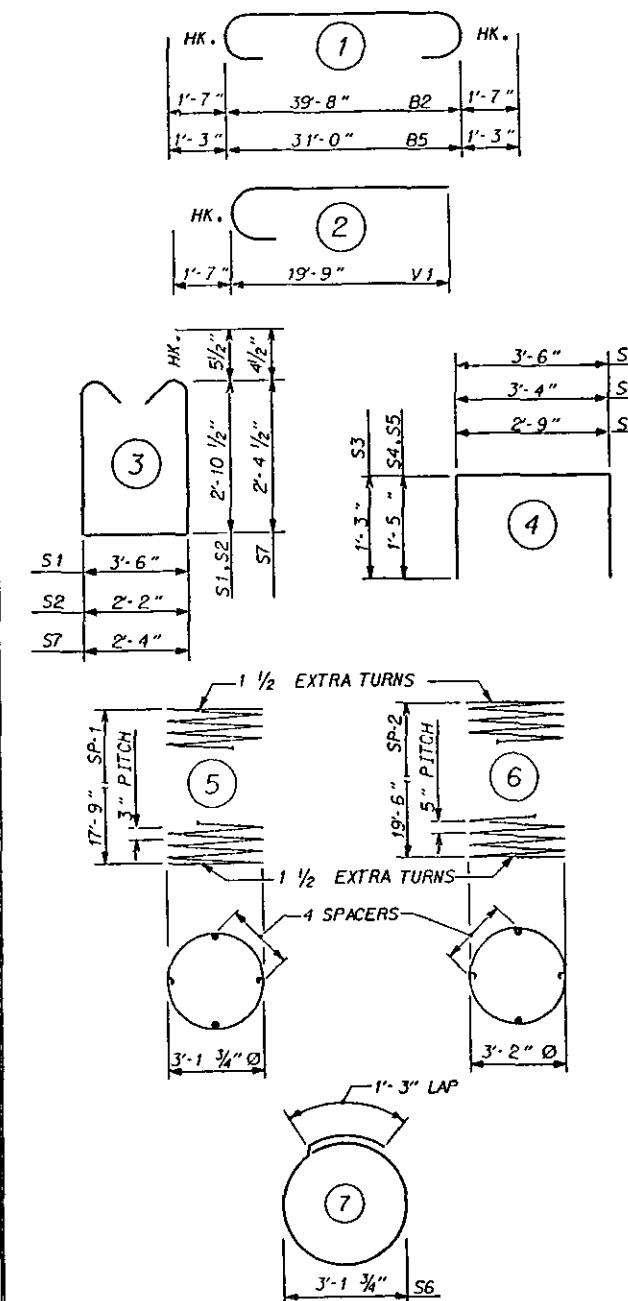
SECTION D-D



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT # 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39- 8	1264
B2	6	11	1	42-10	1365
B3	4	7	STR	39- 8	324
B4	6	4	STR	4- 4	17
B5	8	9	1	33- 6	911
B6	8	4	STR	16- 9	90

S1	46	5	3	10'-2	488
S2	24	5	3	8'-10	221
S3	40	4	4	6'-0	160
S4	10	4	4	6'-2	41
S5	10	4	4	5'-7	37
S6	30	4	7	11'-2	224
S7	26	4	3	7'-10	136

M1	60	11	STR	29'-10	9510
V1	60	11	2	21'-4	6801
SP-1	3	4	5	721'-11	1447
SP-2	3	5	6	487'-3	1525

REINFORCING STEEL= 21589 LBS.

SPIRAL COLUMN
REINFORCING STEEL= 2972 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #2 (COL. & STRUT) - 10.9 C.Y.
POUR #3 (COLUMN) - 18.7 C.Y.
POUR #4 (CAP) - 19.2 C.Y.

CLASS A CONCRETE TOTAL= 48.8 C.Y.

DRILLED PIERS

CLASS AA CONCRETE BREAKDOWN

POUR #1 (DRILLED PIER) - 27.9 C.Y.

CLASS AA CONCRETE TOTAL= 27.9 C.Y.

4' - 8" DIA. DRILLED PIERS
NO. 3 LIN. FT. = 60 L.F.

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 - L- REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #4

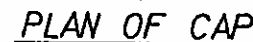


William E. Larkin
2/15/94

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

SHEET NO.
5-40
TOTAL
54

DRAWN BY: R. TUNG
CHECKED BY: W. F. PARKER
DATE: 12-3-93
DATE: 12-93



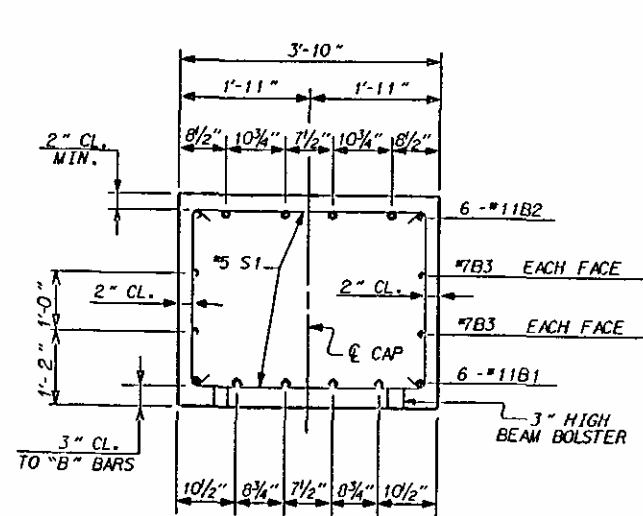
(TYP. EA. COL.)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-41
2			4			TOTAL SHEETS 54

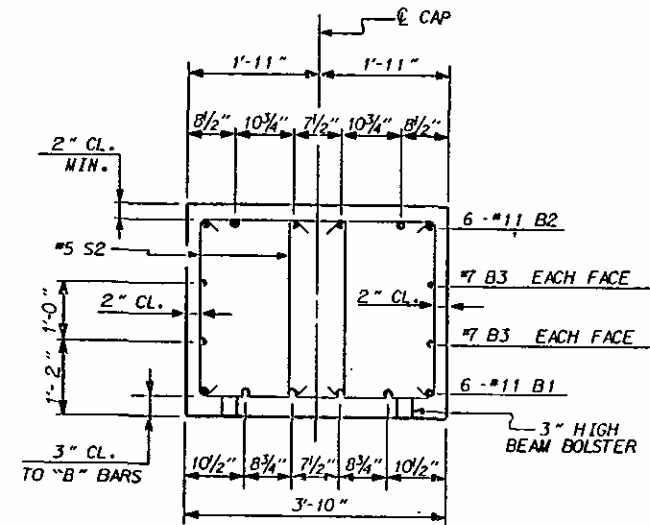
William E. Lukens, Jr.
2/15/99

DRAWN BY : R. TUNG DATE : 12-3-93
CHECKED BY : R. D. MARTIN DATE : 12-21-93

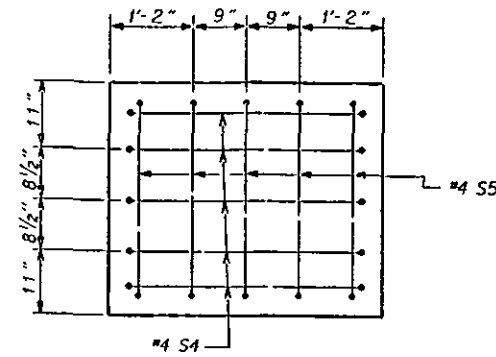
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lanning



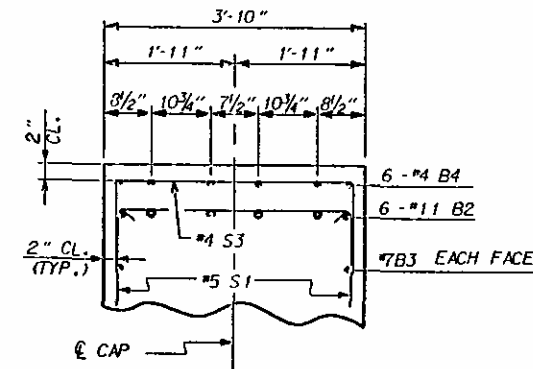
SECTION A-A



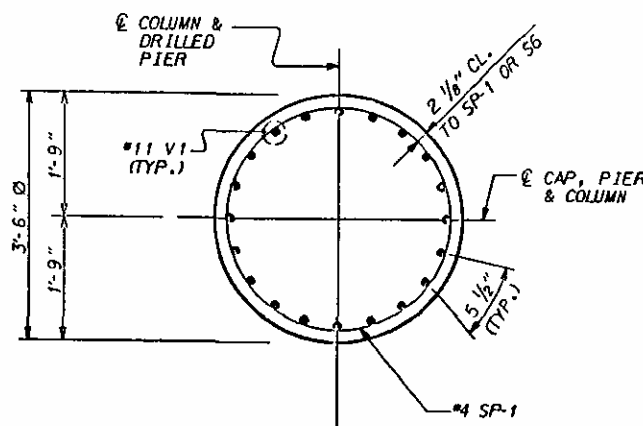
SECTION B-B



END VIEW

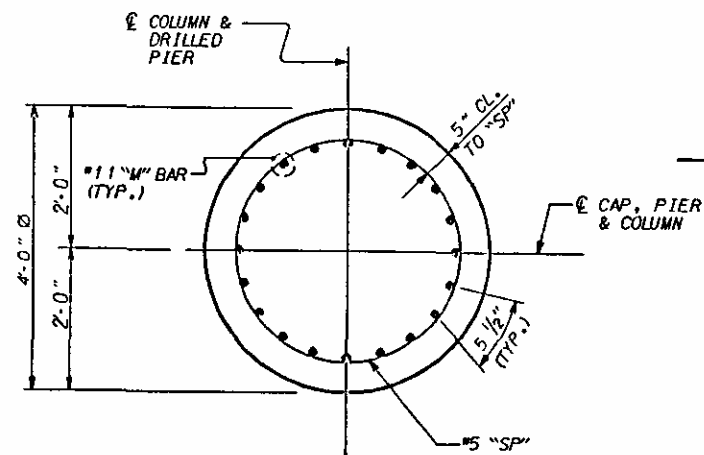


PART SECTION C



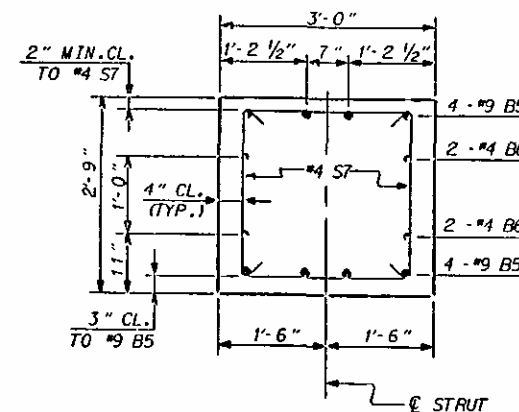
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)

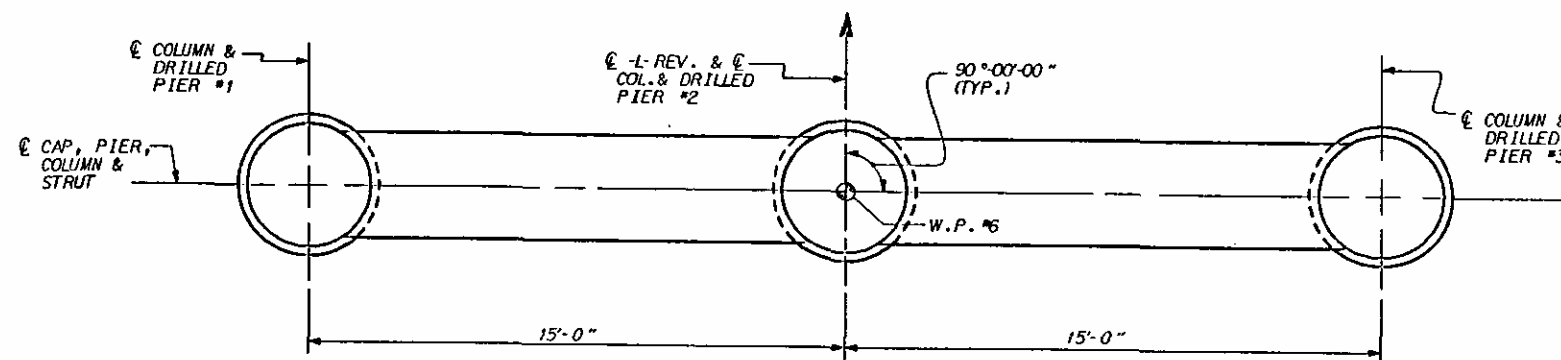


SECTION THRU DRILLED PIER

(TYPICAL FOR EACH DRILLED PIER)



SECTION D-D



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT # 5

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39'-8"	1264
B2	6	11	1	42'-10"	1365
B3	4	7	STR	39'-8"	324
B4	6	4	STR	4'-4"	17
B5	8	9	1	33'-6"	911
B6	8	4	STR	16'-9"	90
S1	46	5	3	10'-2"	488
S2	24	5	3	8'-10"	221
S3	40	4	4	6'-0"	160
S4	10	4	4	6'-2"	41
S5	10	4	4	5'-7"	37
S6	30	4	7	11'-2"	224
S7	26	4	3	7'-10"	136
M1	20	11	STR	41'-10"	4445
M2	20	11	STR	38'-10"	4126
M3	20	11	STR	35'-10"	3808
V1	60	11	2	21'-7"	6880
SP-1	3	4	5	731'-8"	1466
SP-2	1	5	6	769'-9"	803
SP-3	1	5	6	699'-3"	729
SP-4	1	5	6	628'-9"	656

REINFORCING STEEL = 24537 LBS.

SPIRAL COLUMN

REINFORCING STEEL = 3654 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #2 (COL. & STRUT) - 10.9 C.Y.
POUR #3 (COLUMN) - 19.0 C.Y.
POUR #4 (CAP) - 19.2 C.Y.

CLASS A CONCRETE TOTAL = 49.1 C.Y.

DRILLED PIERS

CLASS AA CONCRETE BREAKDOWN

POUR #1 (DRILLED PIER) - 40.5 C.Y.

CLASS AA CONCRETE TOTAL = 40.5 C.Y.

4' - 0" DIA. DRILLED PIERS

NO. 3 LIN.FT. = 87 L.F.

PROJECT NO. 8. 1791801
CATAWBA - ALEXANDER COUNTY
 STATION: 31 + 50 -L- REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

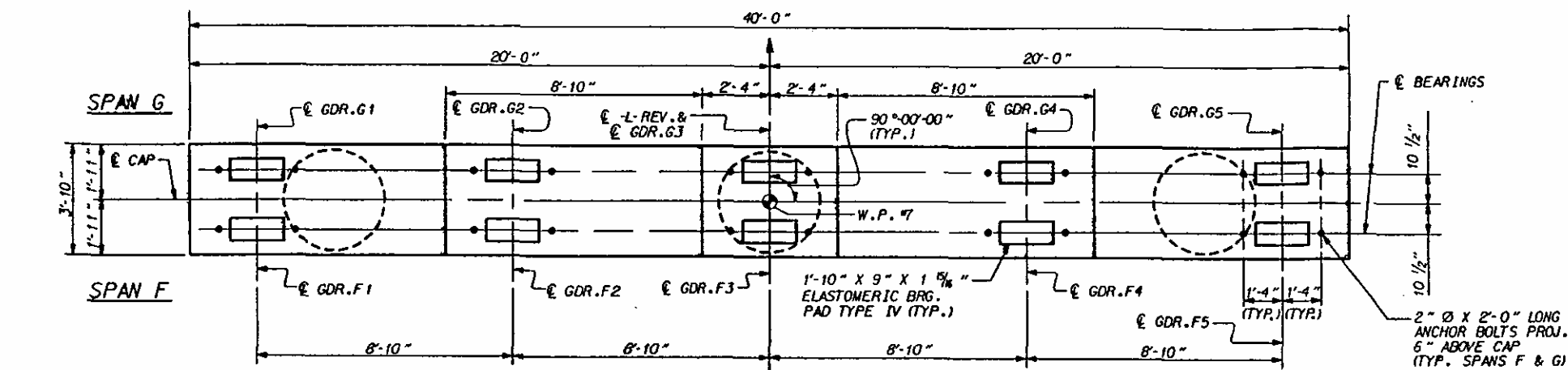
SUBSTRUCTURE
BENT #5

DRAWN BY : R. TUNG DATE : 12-3-93
CHECKED BY : R. D. MARTIN DATE : 12-21-93

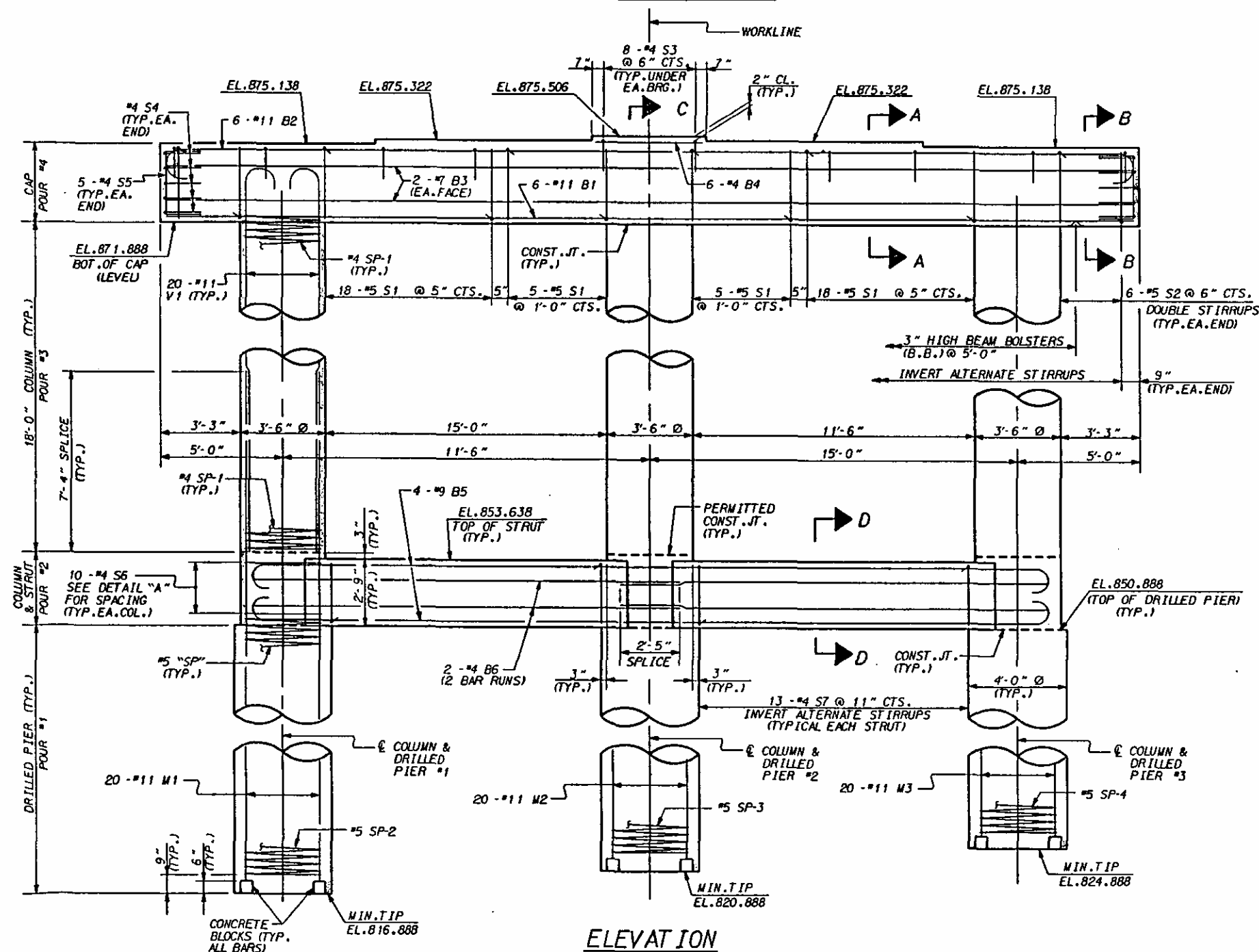


William E. Lukin, @
2/11/79

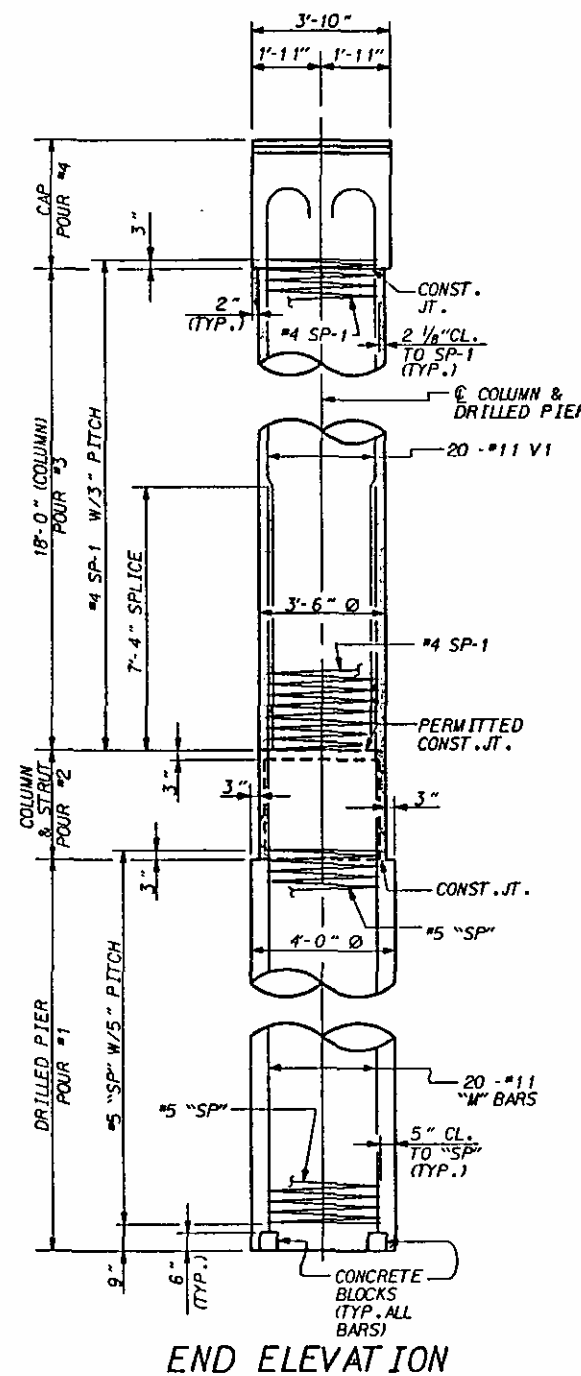
REVISIONS						SHEET NO. 5-42
NO.	BY	DATE	IN	BY	DATE	
1			3			TOTAL SHEETS 54
2			4			



PLAN OF CAP



ELEVATION



END ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4S4 AND #4S5 BARS.

#4S4 AND #4S5 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

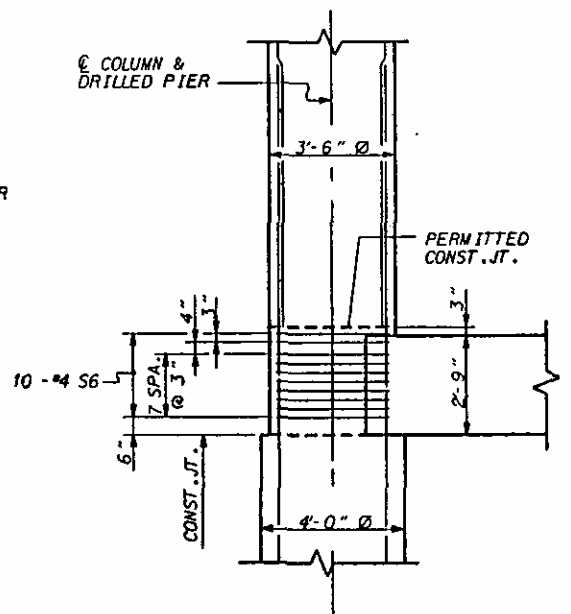
FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY USE CLASS "AA" CONCRETE IN LIEU OF CLASS "A" IN THE STRUTS & COLUMNS.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.

FOR PILE INTEGRITY TESTING, SEE SPECIAL PROVISIONS.



DETAIL "A"

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 -L- REV.

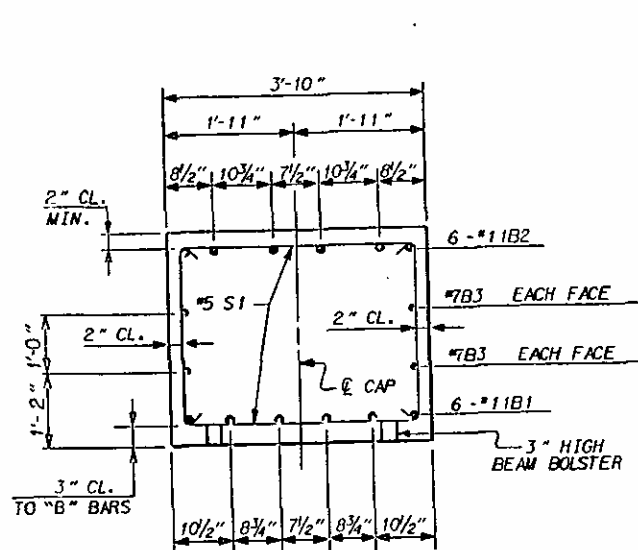
SHEET 1 OF 2



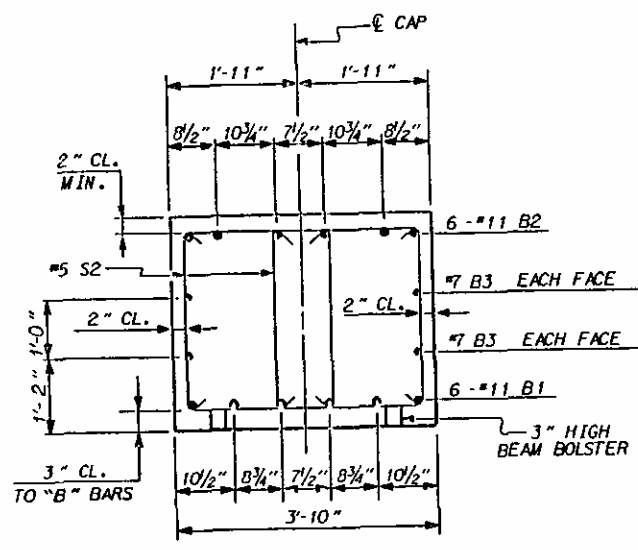
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	
1			3		5-43
2			4		54

DRAWN BY: R. TUNG
CHECKED BY: R. D. MARTIN
DATE: 12-6-93
DATE: 12-21-93

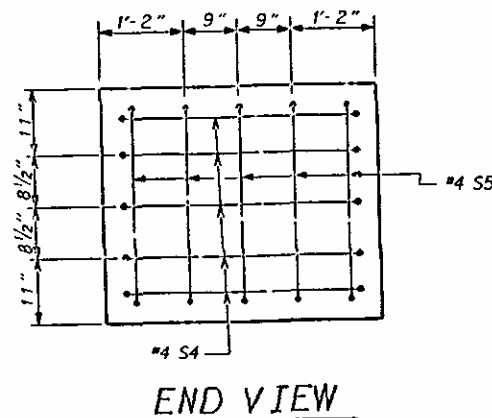
10-FEB-1994 BSI
1/20/94/linnont/b22080b1.dgn
linnont



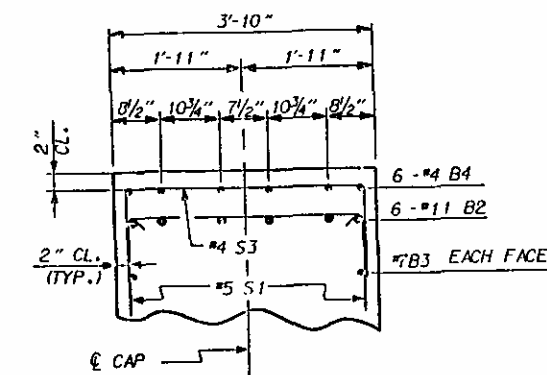
SECTION A-A



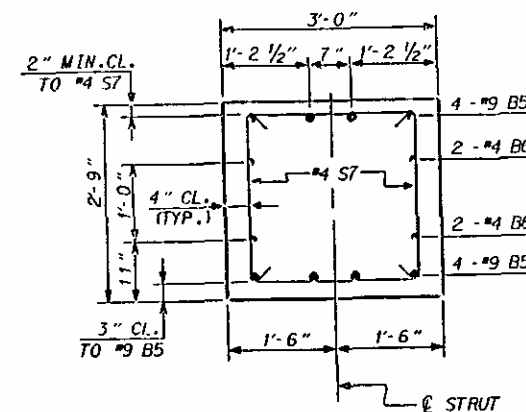
SECTION B-B



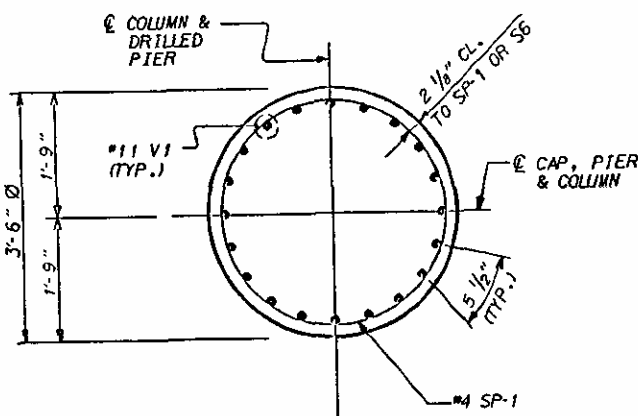
END VIEW



PART SECTION C

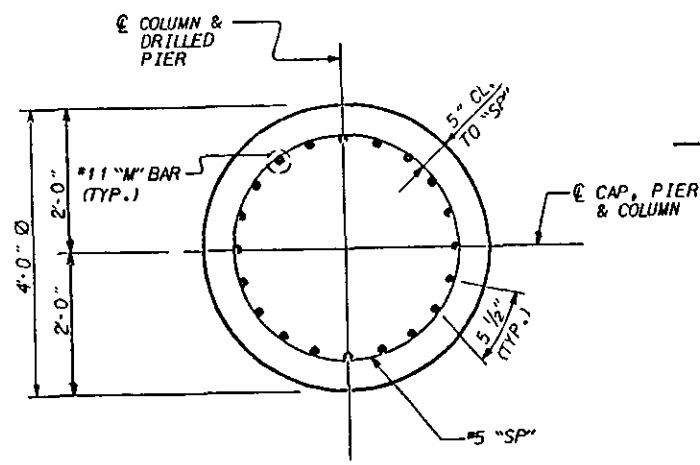


SECTION D-D



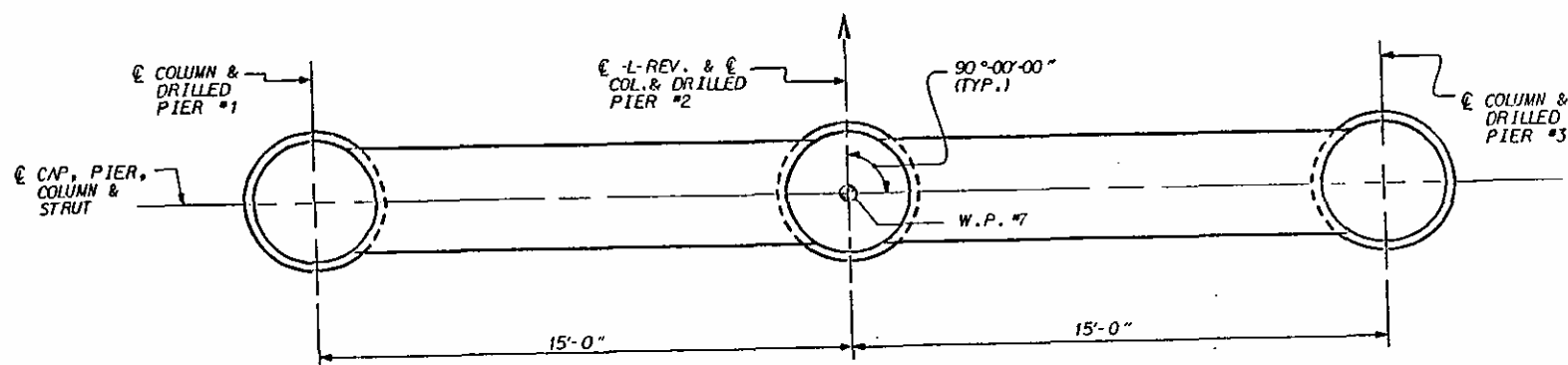
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)



SECTION THRU DRILLED PIER

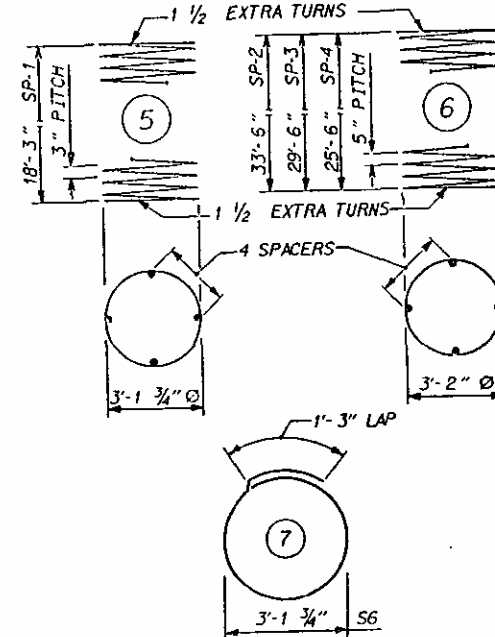
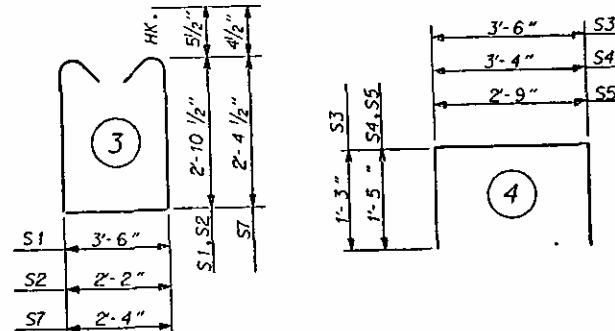
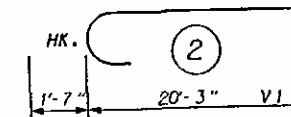
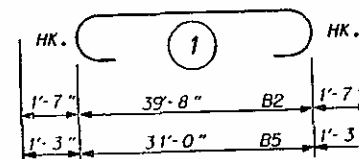
(TYPICAL FOR EACH DRILLED PIER)



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT # 6

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39'-0"	1264
B2	6	11	STR	42'-10"	1365
B3	4	7	STR	39'-8"	324
B4	6	4	STR	4'-4"	17
B5	8	9	1	33'-6"	911
B6	8	4	STR	16'-9"	90
S1	46	5	3	10'-2"	488
S2	24	5	3	8'-10"	221
S3	10	4	4	6'-0"	160
S4	10	4	4	6'-2"	41
S5	10	4	4	5'-7"	37
S6	30	4	7	11'-2"	224
S7	26	4	3	7'-10"	136
M1	20	11	STR	43'-10"	4658
M2	20	11	STR	39'-10"	4233
M3	20	11	STR	35'-10"	3808
V1	60	11	2	21'-10"	6960
SP-1	3	4	5	741'-5"	1486
SP-2	1	5	6	816'-9"	852
SP-3	1	5	6	722'-9"	754
SP-4	1	5	6	628'-9"	656

REINFORCING STEEL= 24937 LBS.

SPIRAL COLUMN REINFORCING STEEL= 3748 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #2 (COL. & STRUT) - 10.9 C.Y.
 POUR #3 (COLUMN) - 19.2 C.Y.
 POUR #4 (CAP) - 19.2 C.Y.

CLASS A CONCRETE TOTAL= 49.3 C.Y.

DRILLED PIERS

CLASS AA CONCRETE BREAKDOWN

POUR #1 (DRILLED PIER) - 41.9 C.Y.

CLASS AA CONCRETE TOTAL= 41.9 C.Y.

4'-0" DIA. DRILLED PIERS

NO. 3 LIN. FT. = 90 L.F.

PROJECT NO. 8.1791801

CATAWBA - ALEXANDER COUNTY

STATION: 31 + 50 - L-REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Raleigh

SUBSTRUCTURE

BENT #6



William E. Larnal
 2/15/99

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			2			5-44
2			3			54

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4S4 AND #4S5 BARS.

#4S4 AND #4S5 BARS MAY BE SHIFTED UP TO 2' TO CLEAR "B" BARS.

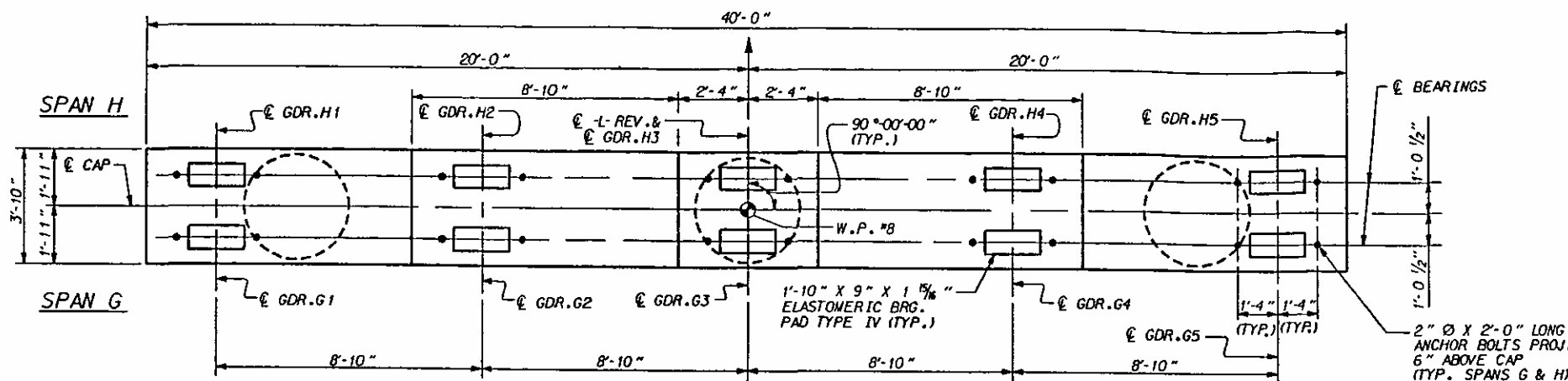
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY USE CLASS "AA" CONCRETE IN LIEU OF CLASS "A" IN THE STRUTS & COLUMNS.

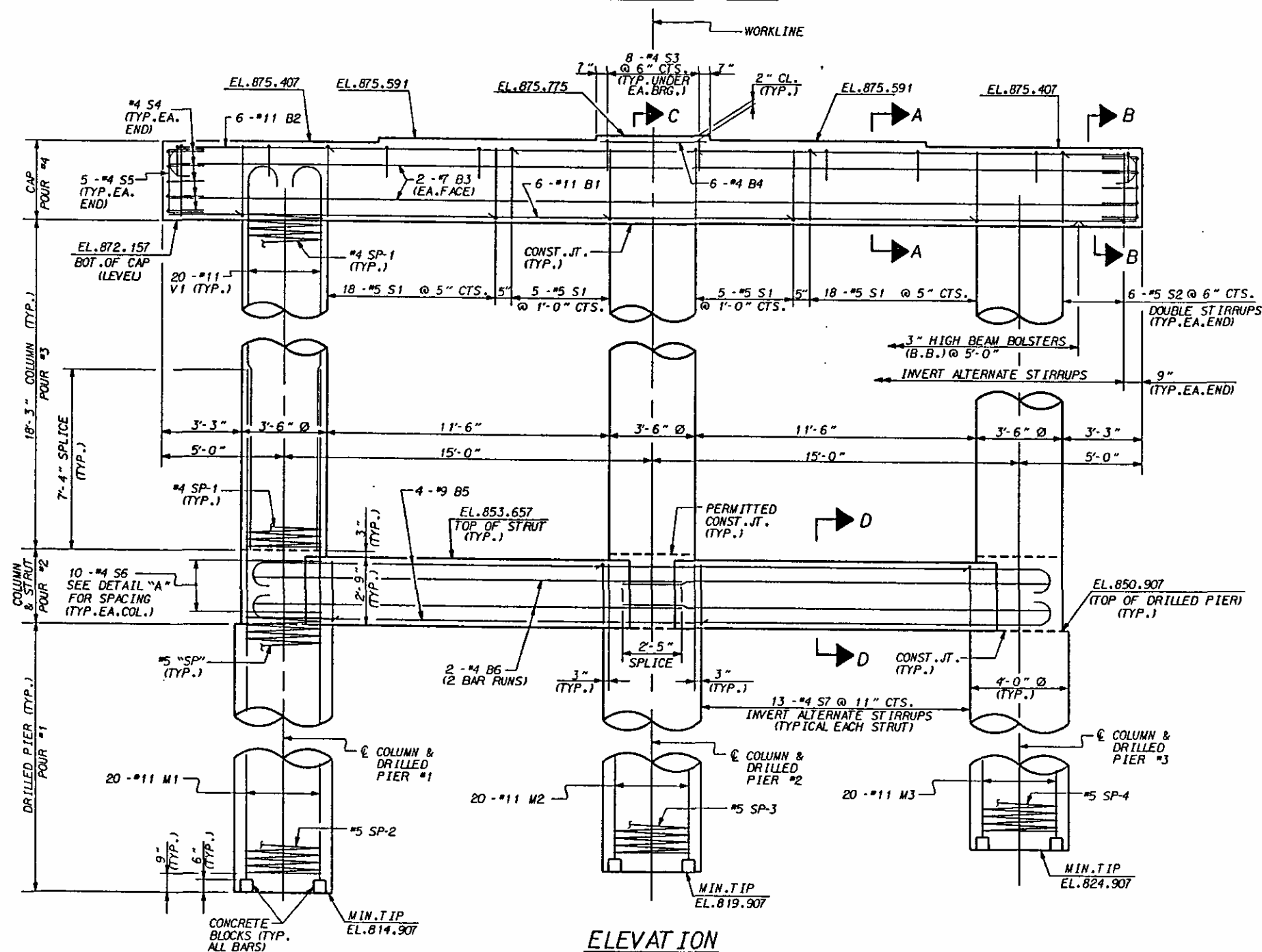
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.

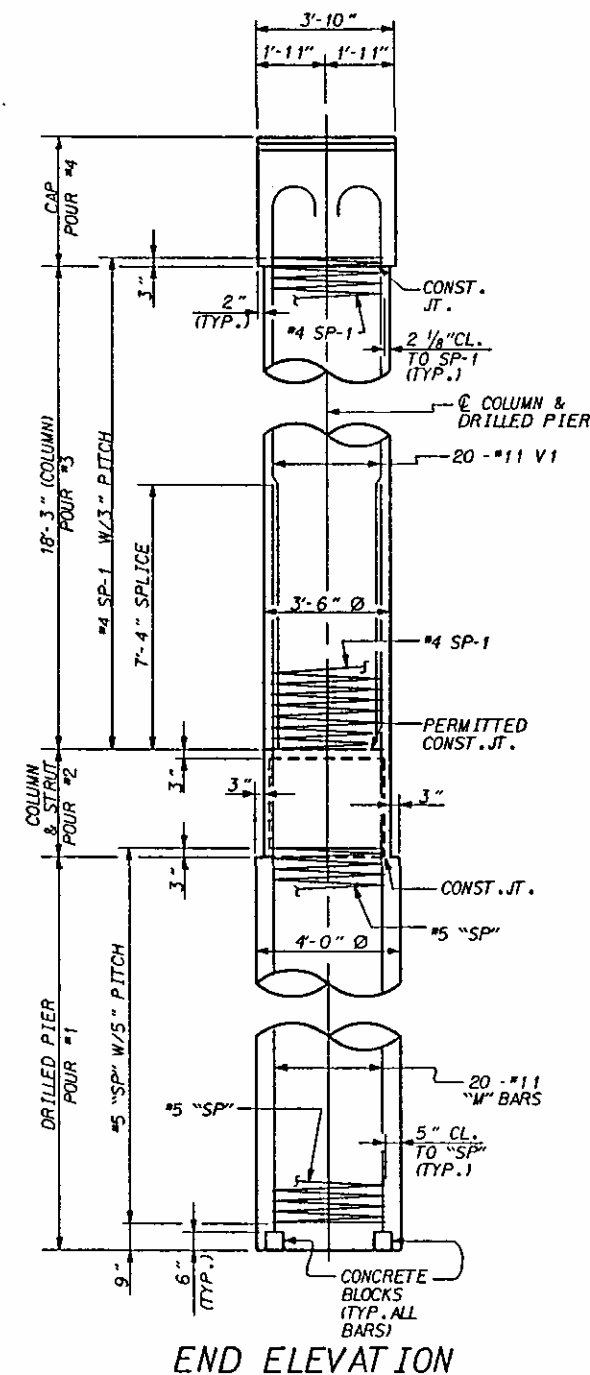
FOR PILE INTEGRITY TESTING, SEE SPECIAL PROVISIONS.



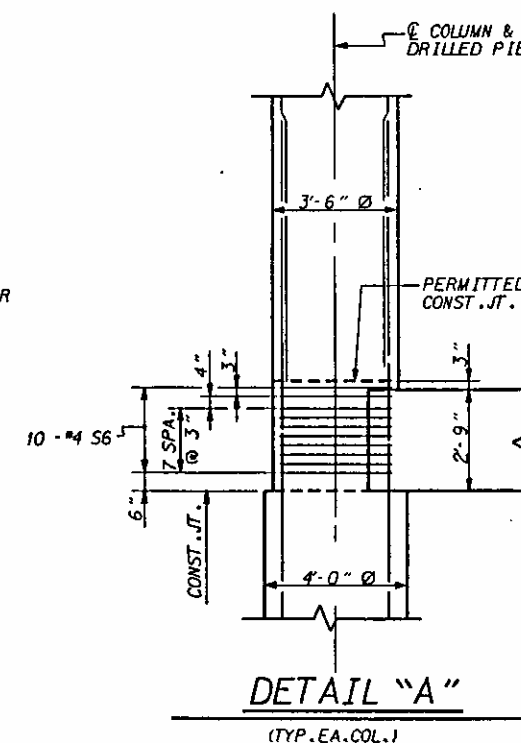
PLAN OF CAP



ELEVATION



END ELEVATION



DETAIL "A"

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 - L - REV.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #7

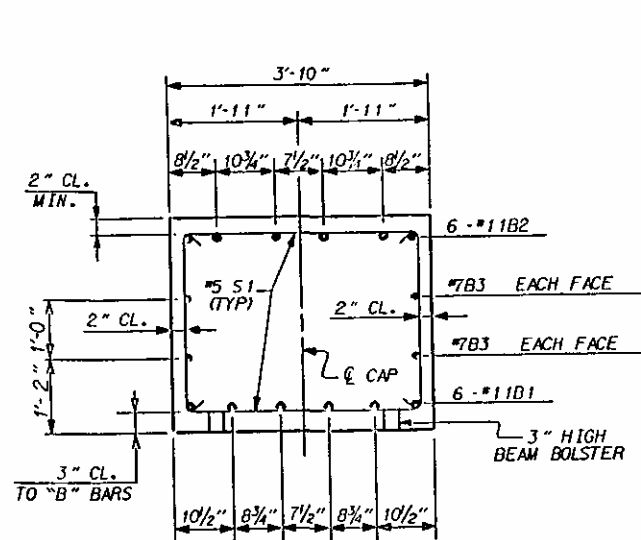


William E. Larkins
2/15/94

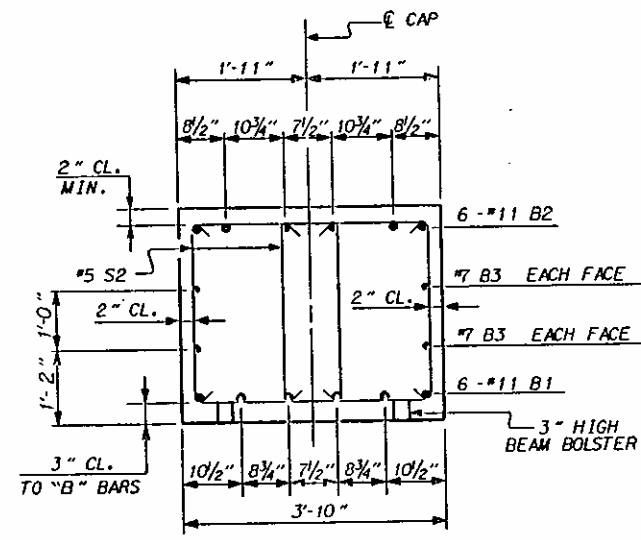
DRAWN BY: R. TUNG
CHECKED BY: R. D. MARTIN
DATE: 12-6-93
DATE: 12-21-93

10-FEB-1994 1:51
/usr/himant/b22080b1.dgn
janning

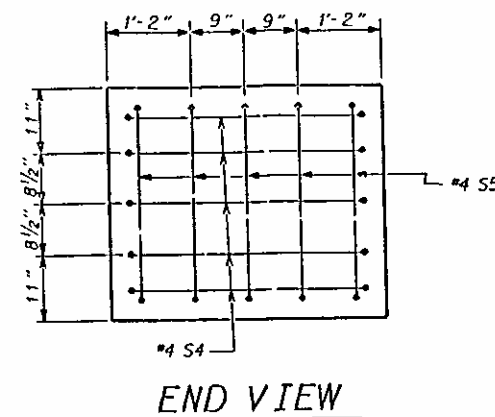
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-45
2			4			54



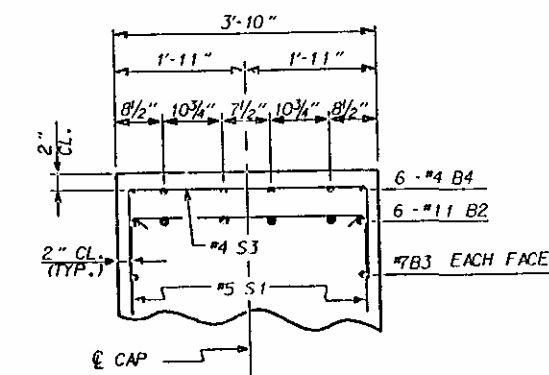
SECTION A-A



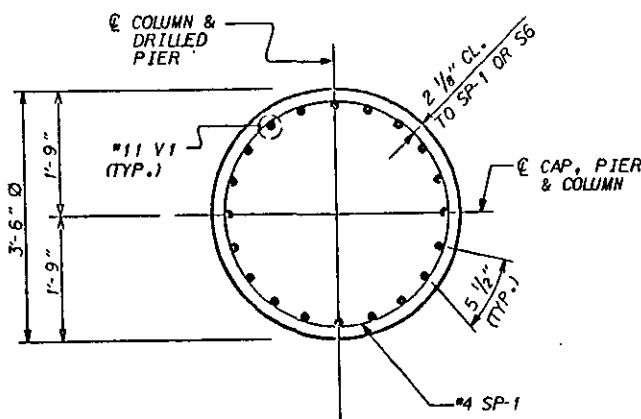
SECTION B-B



END VIEW

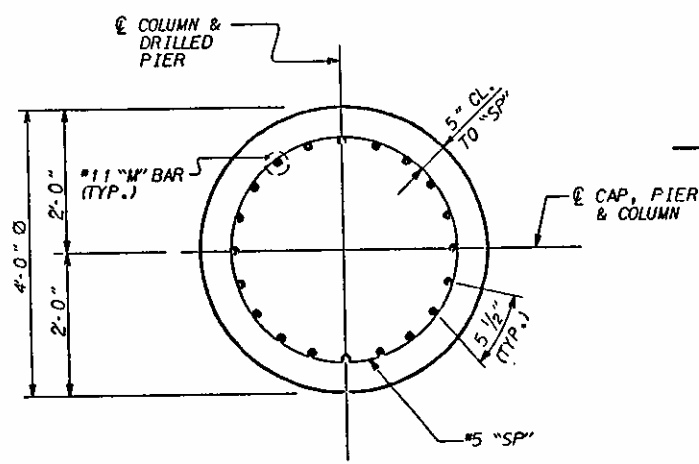


PART SECTION C



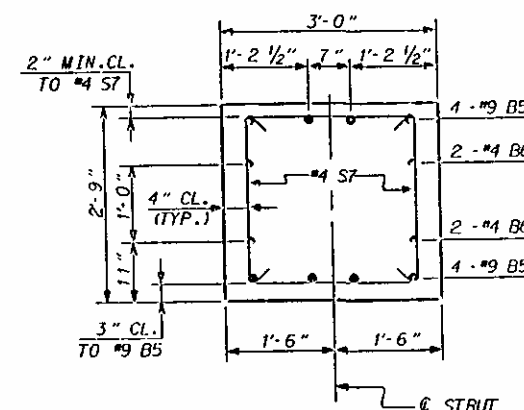
SECTION THRU COLUMN

(TYPICAL FOR EACH COLUMN)

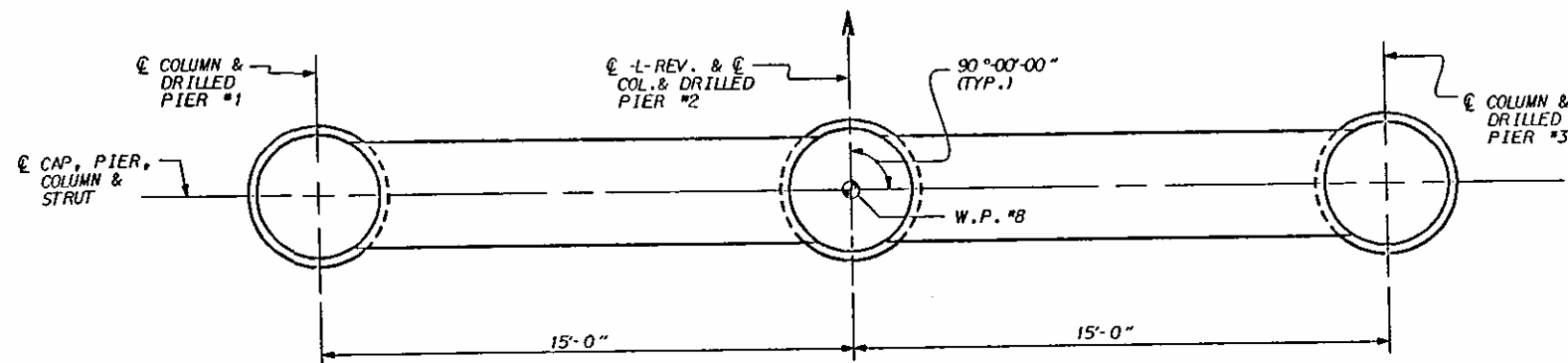


SECTION THRU DRILLED PIER

(TYPICAL FOR EACH DRILLED PIER)



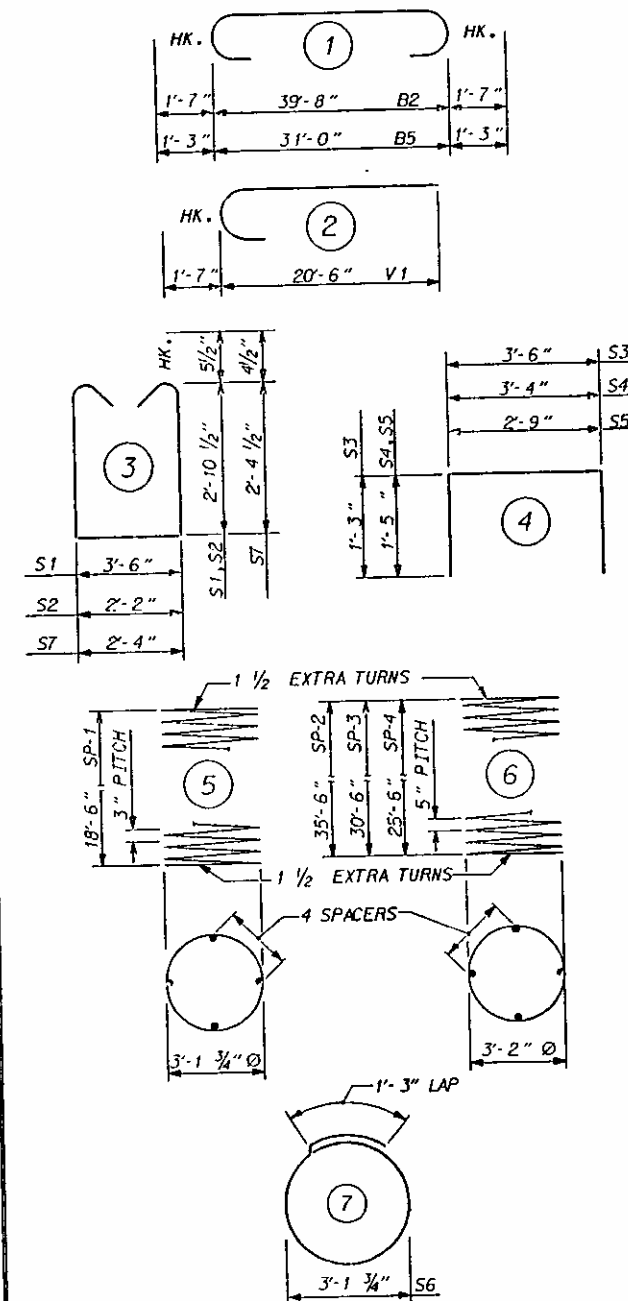
SECTION D-D



PLAN OF COLUMNS & DRILLED PIERS

(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #7

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	STR	39'-8"	1264
B2	6	11	STR	42'-10"	1365
B3	4	7	STR	39'-8"	324
B4	6	4	STR	4'-4"	17
B5	8	9	1	33'-6"	911
B6	8	4	STR	16'-9"	90
S1	46	5	3	10'-2"	488
S2	24	5	3	8'-10"	221
S3	40	4	4	6'-0"	160
S4	10	4	4	6'-2"	41
S5	10	4	4	5'-7"	37
S6	30	4	7	11'-2"	224
S7	26	4	3	7'-10"	136
M1	20	11	STR	45'-10"	4870
M2	20	11	STR	40'-10"	4339
M3	20	11	STR	35'-10"	3808
V1	60	11	2	22'-1"	7040
SP-1	3	4	5	751'-2"	1505
SP-2	1	5	6	863'-10"	901
SP-3	1	5	6	746'-3"	778
SP-4	1	5	6	628'-9"	656

REINFORCING STEEL = 25335 LBS.

SPIRAL COLUMN
REINFORCING STEEL = 3840 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #2 (COL. & STRUT) - 10.9 C. Y.
POUR #3 (COLUMN) - 19.5 C. Y.
POUR #4 (CAP) - 19.2 C. Y.

CLASS A CONCRETE TOTAL = 49.6 C. Y.

DRILLED PIERS

CLASS AA CONCRETE BREAKDOWN

POUR #1 (DRILLED PIER) - 43.3 C. Y.
CLASS AA CONCRETE TOTAL = 43.3 C. Y.

4' - 0" DIA. DRILLED PIERS
NO. 3 LIN. FT. = 93 L.F.

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50 - L - REV.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

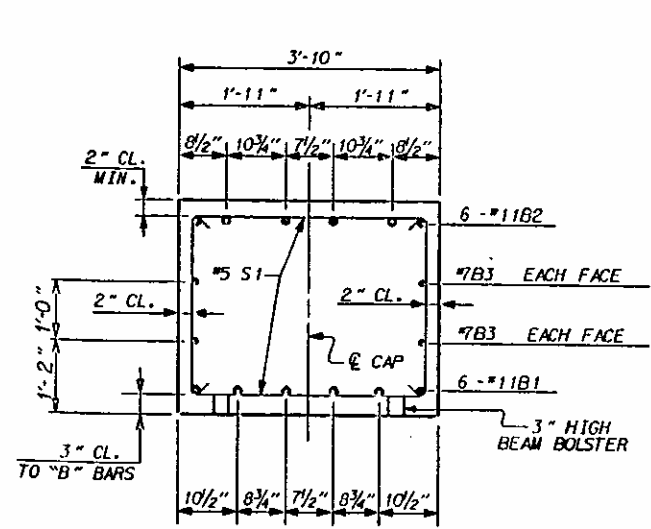
SUBSTRUCTURE
BENT #7



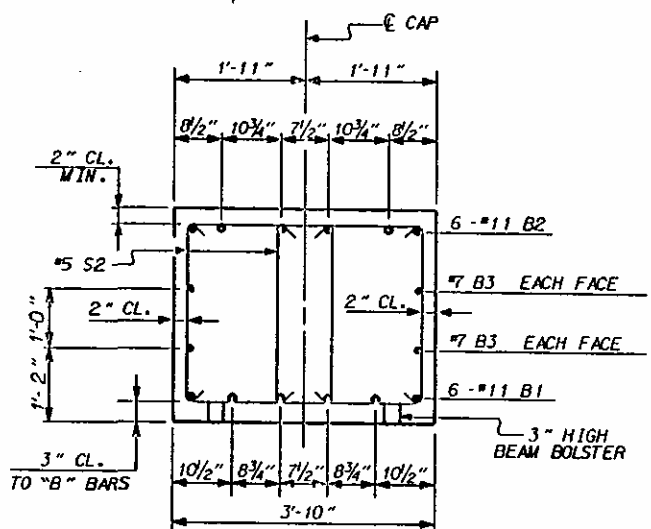
William E. Larkin
2/11/94

NO.	DATE	BY	DATE	BY	DATE	SHEET NO.
1						5-46
2						54

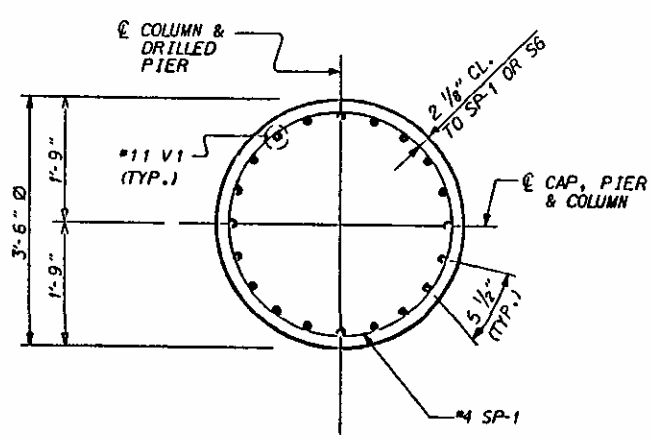
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A:\user\mment\220808b1.dgn
R:\mment



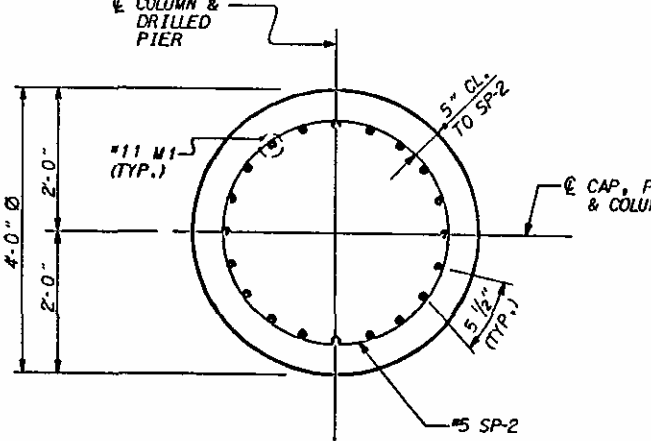
SECTION A-A



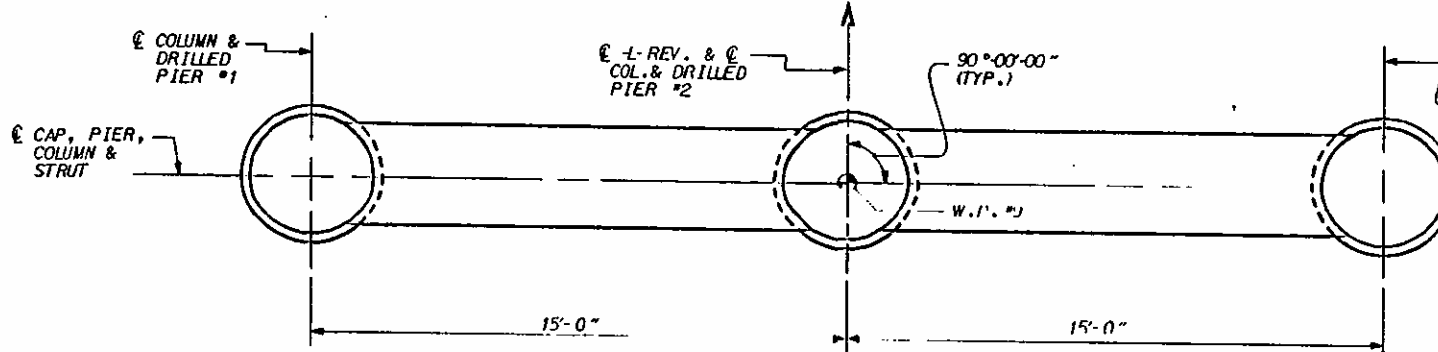
SECTION B-B



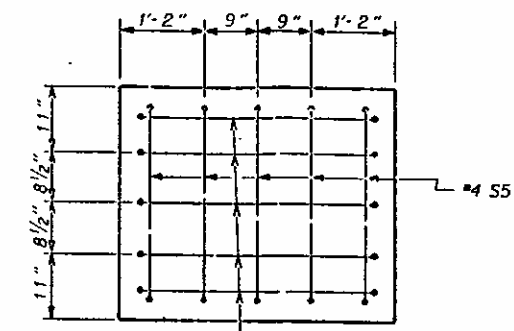
SECTION THRU COLUMN
(TYPICAL FOR EACH COLUMN)



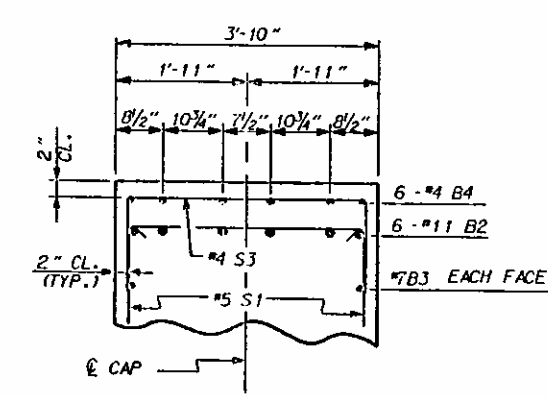
SECTION THRU DRILLED PIER
(TYPICAL FOR EACH DRILLED PIER)



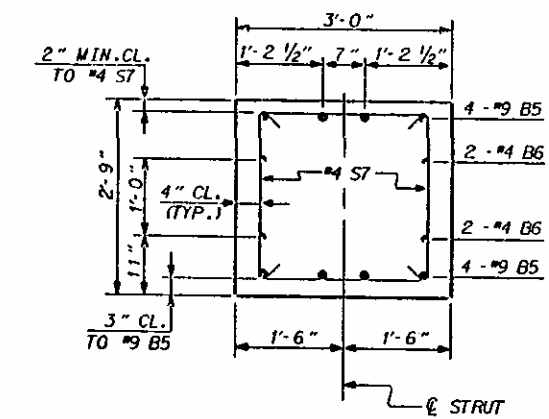
PLAN OF COLUMNS & DRILLED PIERS
(FOR REINFORCING STEEL IN COLUMNS & DRILLED PIERS, SEE SECTION VIEWS)



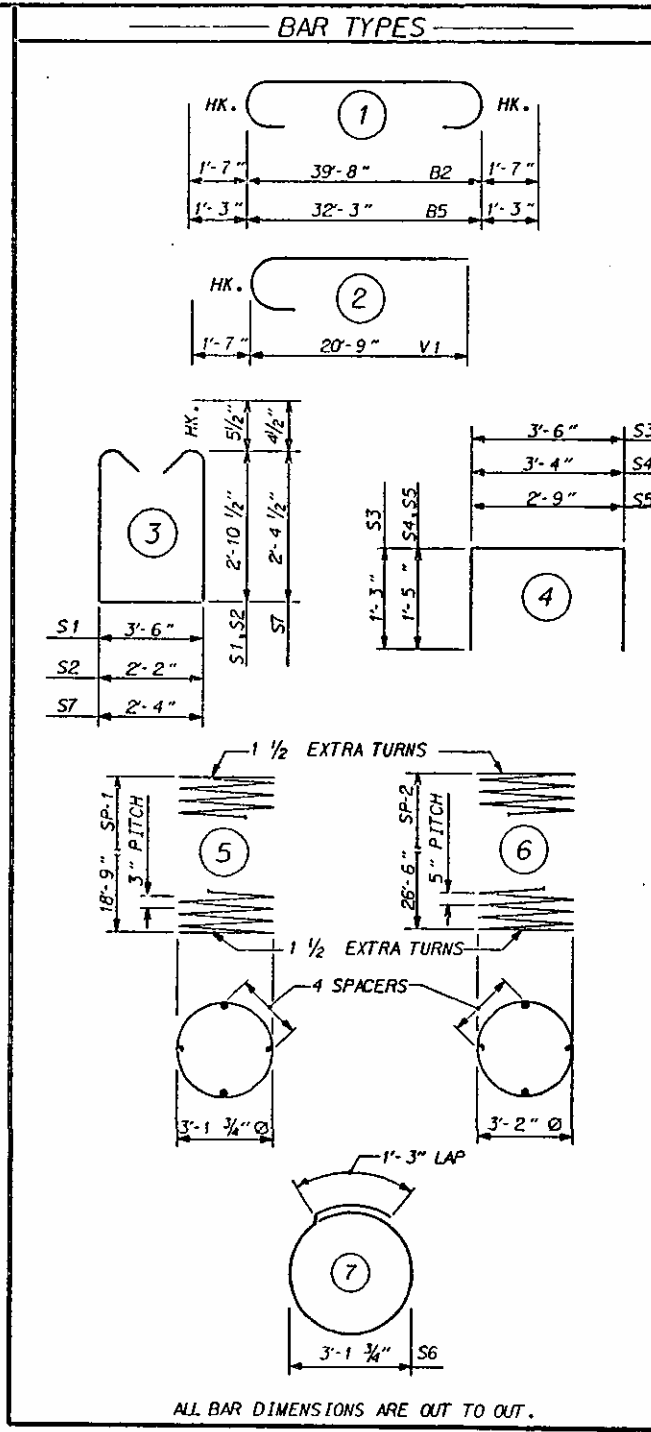
END VIEW



PART SECTION C



SECTION D-D



BILL OF MATERIAL						
BENT # 8						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	11	STR	39'-8"	1264	
B2	6	11	1	42'-10"	1365	
B3	4	7	STR	39'-8"	324	
B4	6	4	STR	4'-4"	17	
B5	8	9	1	33'-6"	911	
B6	8	4	STR	16'-9"	90	
S1	46	5	3	10'-2"	489	
S2	24	5	3	8'-10"	221	
S3	40	4	4	6'-0"	160	
S4	10	4	4	6'-2"	41	
S5	10	4	4	5'-7"	37	
S6	30	4	7	11'-2"	224	
S7	26	4	3	7'-10"	136	
M1	60	11	STR	36'-10"	11742	
V1	60	11	2	22'-4"	7119	
SP-1	3	4	5	760'-11"	1525	
SP-2	3	5	6	652'-3"	2041	
REINFORCING STEEL= 24139 LBS.						
SPIRAL COLUMN REINFORCING STEEL= 3566 LBS.						
CLASS A CONCRETE BREAKDOWN						
POUR #2 (COL. & STRUT) - 10.9 C.Y.						
POUR #3 (COLUMN) - 19.8 C.Y.						
POUR #4 (CAP) - 19.2 C.Y.						
CLASS A CONCRETE TOTAL= 49.9 C.Y.						

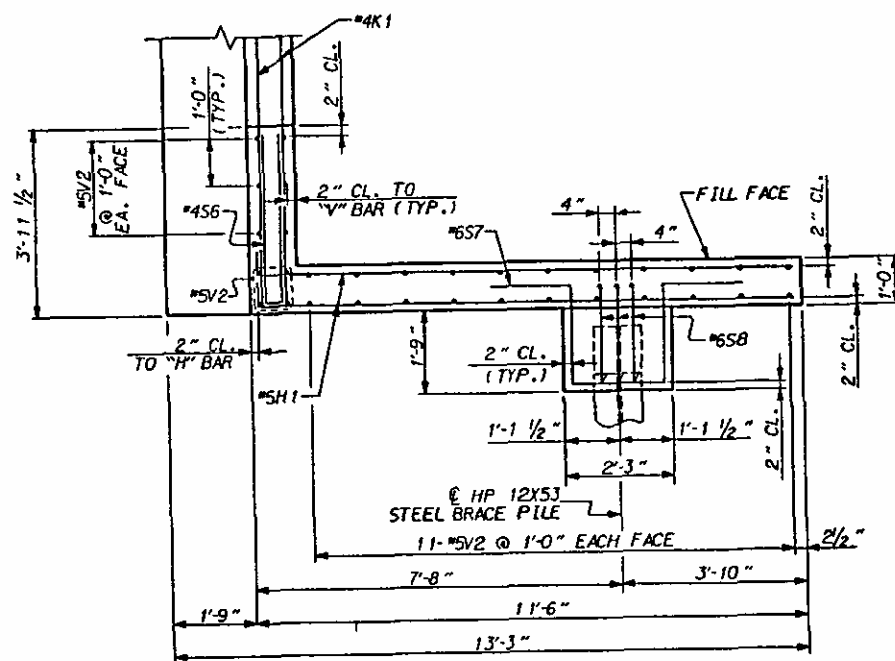
DRILLED PIERS	
CLASS AA CONCRETE BREAKDOWN	
POUR #1 (DRILLED PIER) - 37.7 C.Y.	
CLASS AA CONCRETE TOTAL= 37.7 C.Y.	
4'-0" DIA. DRILLED PIERS	
NO. 3 LIN. FT. = 81 L.F.	

PROJECT NO. 8.1791801
CATAWBA - ALEXANDER COUNTY
STATION: 31 + 50.1 - RV.
SHEET 2 OF 2

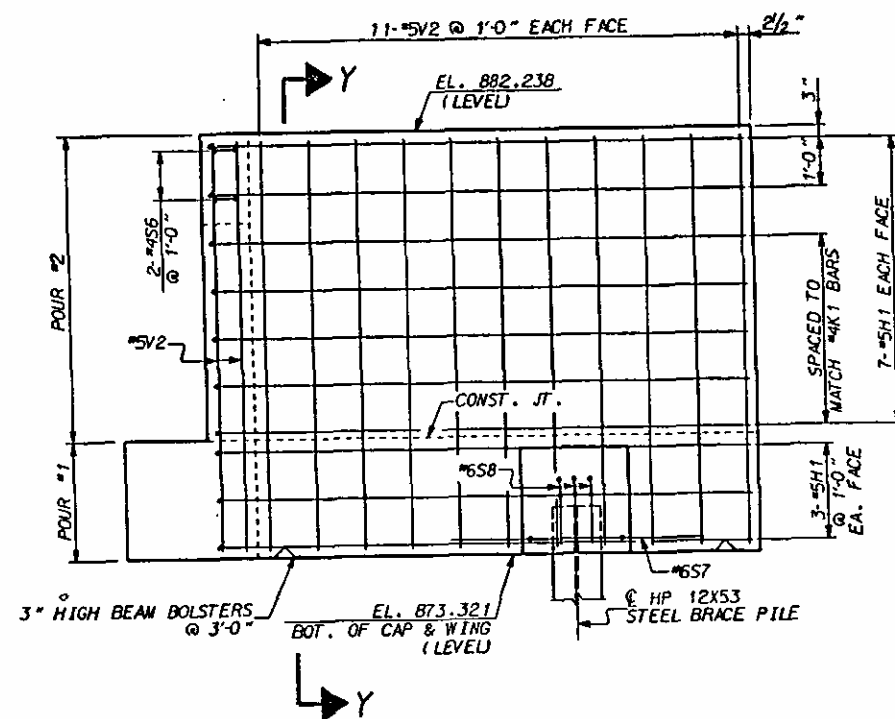
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE BENT #8	
REVISIONS		SHEET NO.	
NO.	BY	DATE	5-48
1			TOTAL
2			54

DRAWN BY: R. TUNG DATE: 12-6-93
CHECKED BY: R. P. MARTIN DATE: 12-21-93

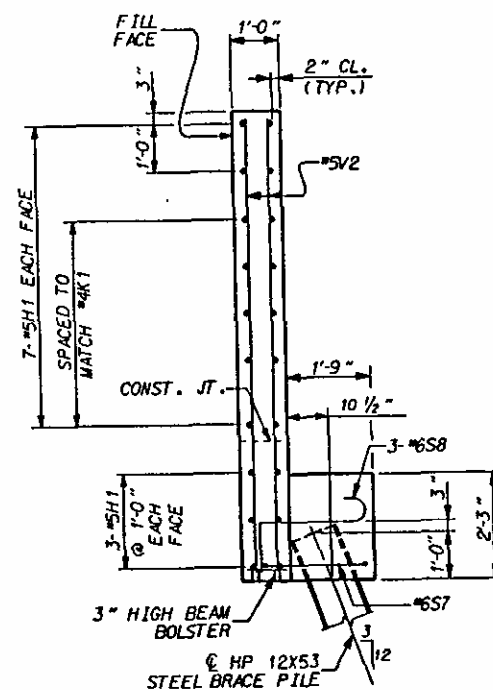
William S. L. L. L.
2/15/94



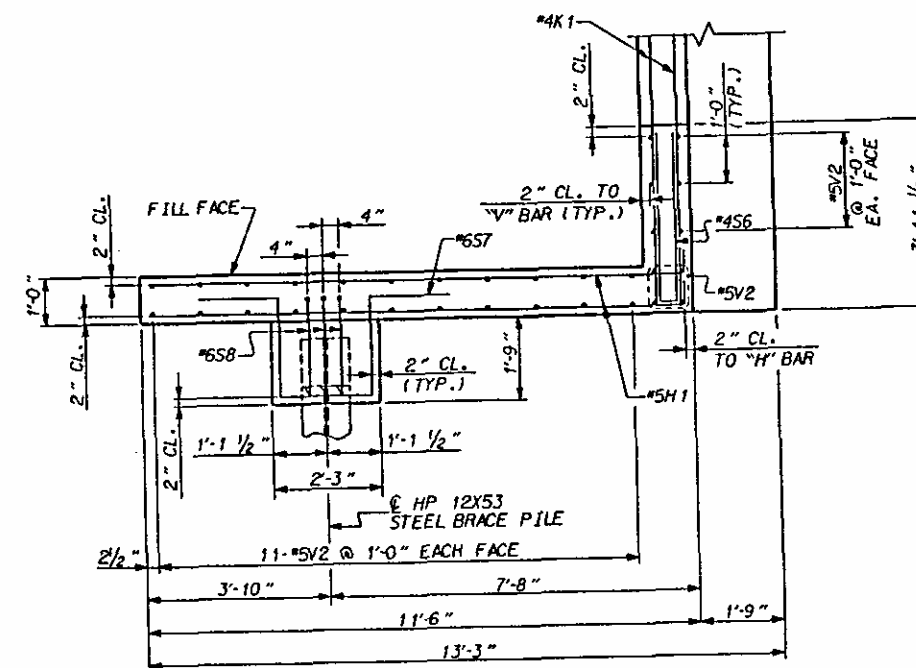
PLAN OF LEFT WING (W1)



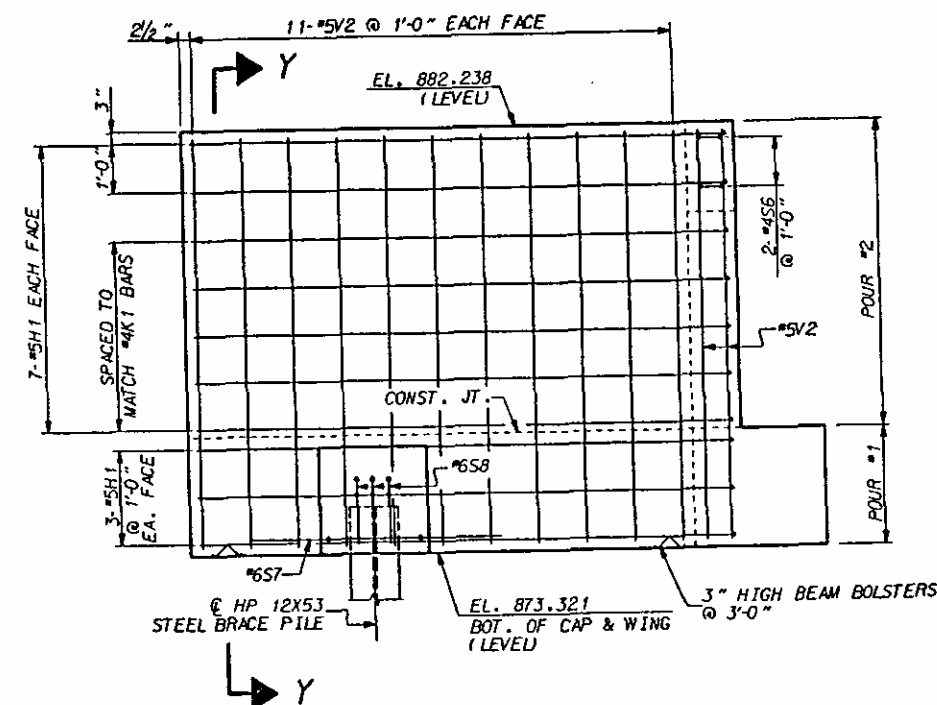
ELEVATION OF LEFT WING (W1)



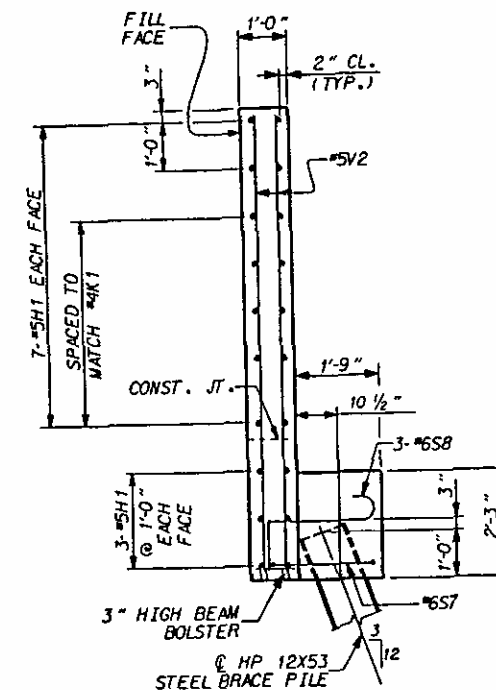
SECTION X-X



PLAN OF RIGHT WING (W2)



ELEVATION OF RIGHT WING (W2)



SECTION Y-Y

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L- REV

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

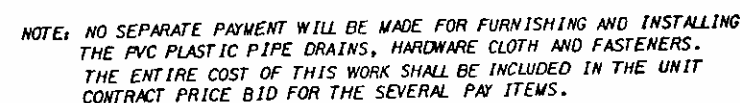
SUBSTRUCTURE
END BENT #2



William E. Larkin, E.
2/15/94

REVISIONS				SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
				5-50	1993
				54	

DRAWN BY: W.D. CRITCHER DATE: 9-93
CHECKED BY: A.D. MARTIN DATE: 11-93



*** PILE VERTICAL**

BACK GOUGE DETAIL A

45°

1/8"

1/8"

DETAIL A

*** PILE HORIZONTAL OR VERTICAL**

BACK GOUGE DETAIL B

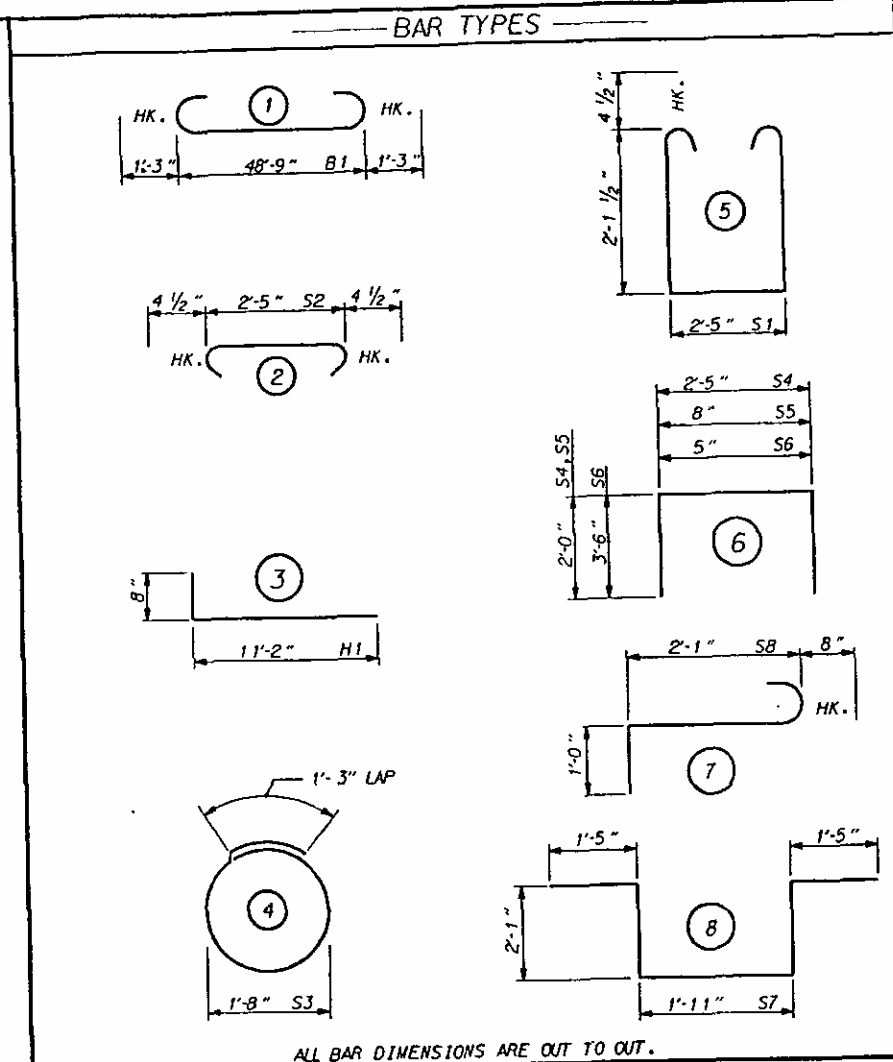
60°

1/8"

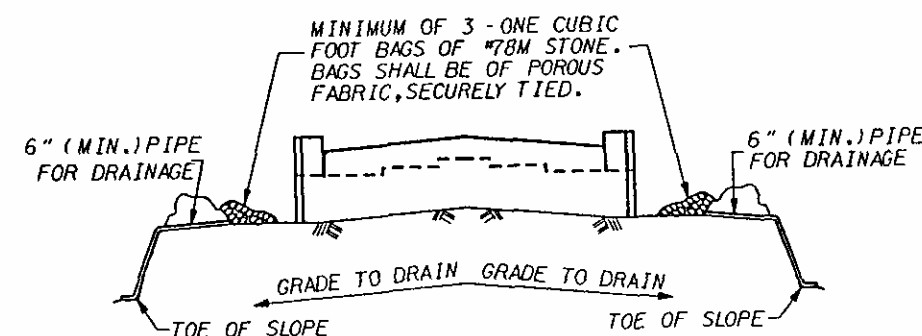
1/8"

DETAIL B

NOTE: THE CONCRETE IN THE CROSS-HATCHED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER-RAIL IS CAST. IF SELF FORMING IS USED.



BILL OF MATERIAL					
END BENT NO. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#3	1	51- 3	1394
B2	4	#3	STR	48- 9	203
B3	12	#4	STR	25- 7	137
B4	8	#4	STR	2- 5	19
B5	12	#4	STR	3- 5	27
HI	40	#5	3	11-10	494
K1	20	#4	STR	25- 7	342
S1	46	#4	5	7- 5	228
S2	24	#4	2	3- 2	97
S3	24	#4	4	6- 6	104
S4	12	#4	6	6- 8	51
S5	41	#4	6	7- 5	128
S6	4	#4	8	8-11	20
S7	2	#4	8	3- 9	27
S8	6	#6	7	6- 8	34
V1	82	#5	STR	8- 7	578
V2	64	#5	STR	8- 7	573
REINFORCING STEEL = 4448 LBS					
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP & LOWER WINGS)					15.8 C.
POUR #2 (BACKWALL & UPPER WINGS)					13.9 C.
TOTAL CLASS A CONCRETE					29.7 C.
HP 12 X 53 STEEL PILES					
NO. 14		LIN.FT. 350			



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

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

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

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. 8. 1791801
CATAWBA- ALEXANDER COUNTY
 STATION: 31+50.00 -L- REV

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

SEPTEMBER

1993

SEPTEMBER			REVISIONS			SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51	
1			3			TOTAL SHEETS	
2			4			54	



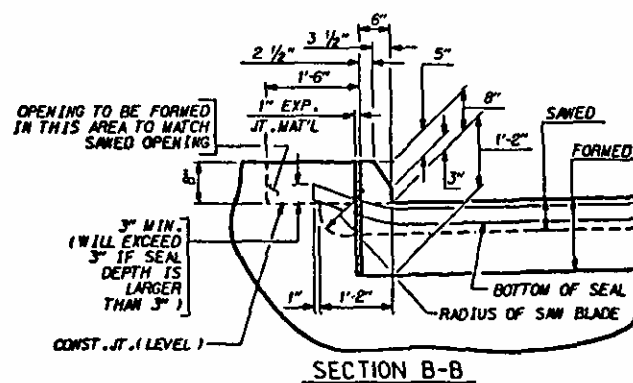
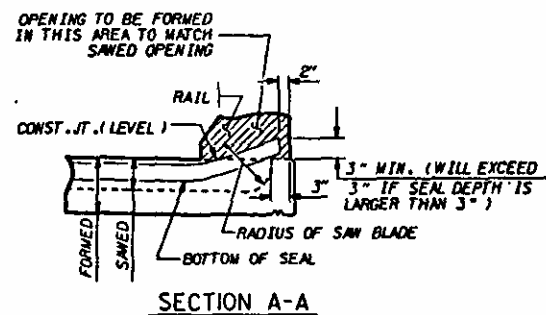
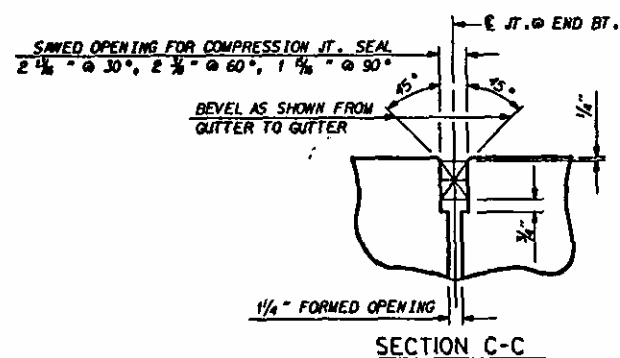
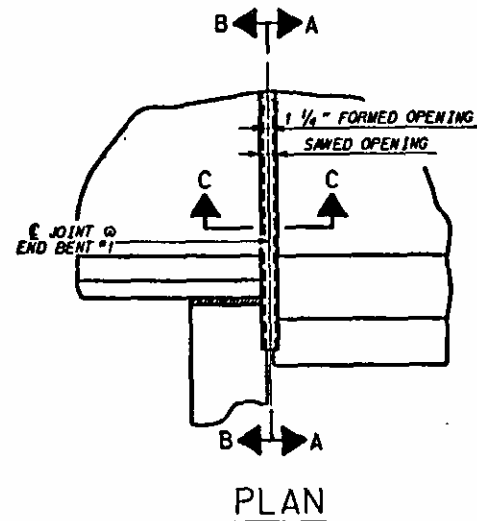
William E. Larkin, Jr.
2/15/94

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 3150.00 -L-REV.

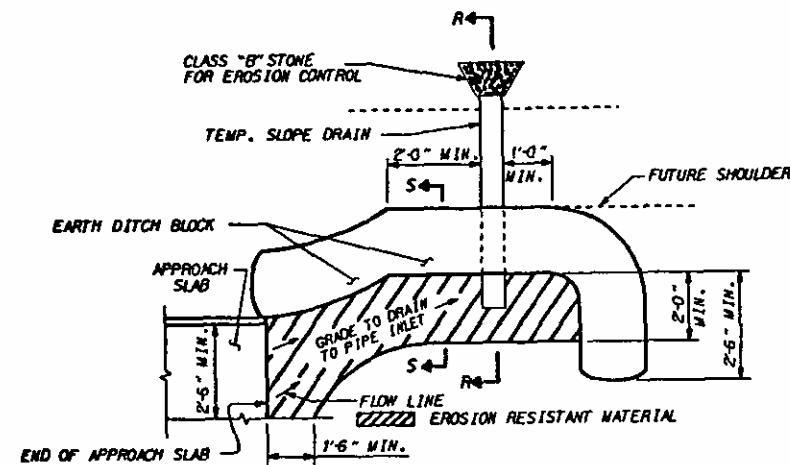
STATE OF NORTH CAROLINA						
DEPARTMENT OF TRANSPORTATION						
RALEIGH						
RIP RAP DETAILS						
AUG.				1993		
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			5-52
2			4			TOTAL SHEETS 54

DRAWN BY A.P. MARTIN DATE 8-16-93
CHECKED BY W.F. PARKER DATE 12-20-93



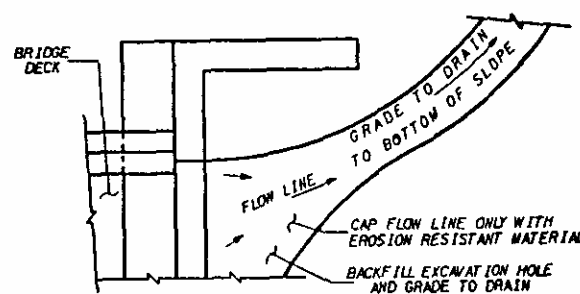
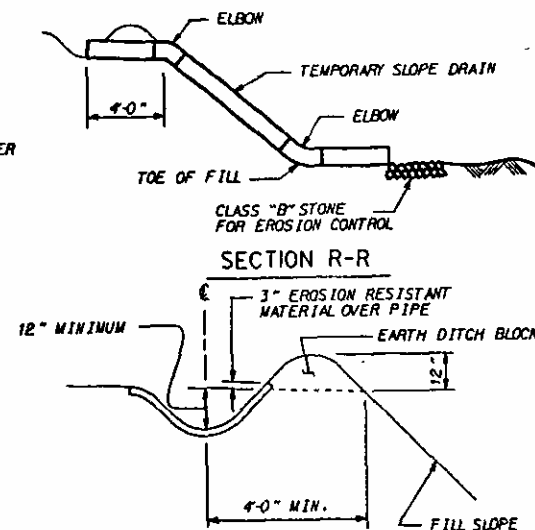


JOINT SEAL DETAILS
@ END BENT



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

PROJECT NO. 8.1791801
CATAWBA-ALEXANDER COUNTY
STATION: 31+50.00 -L-REV.

SHEET 2 OF 2



William E. Larkin, Jr.
2/15/79

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH
SLAB DETAILS

DECEMBER				1988			
REVISIONS				SHEET NO.			
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			2			5	
2			3			5	

STD. NO. PAS3

ASSEMBLED BY: W.D. CRUTCHER	DATE: 3-93	SPECIAL
CHECKED BY: A.D. MARTIN	DATE: 7-16-73	
DRAWN BY: F.C. JONES	DATE: 8/28/88	STANDARD
CHECKED BY: A.R. BISSETTE	DATE: 8/28/88	

28-MAY-1993 09:53
1200

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 - A. S. T. M. A36 GRADE - -	20,000 LBS. PER SQ. IN.
- A. S. T. M. A588 - - - - -	27,000 LBS. PER SQ. IN.
- A. S. T. M. A572, GRADE 50 - -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60 - - - - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - -	SEE A. A. S. H. T. O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS - - - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN	
OF TIMBER - - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT.
	(MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 1990 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

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. FIVE SETS OF 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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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 1" 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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