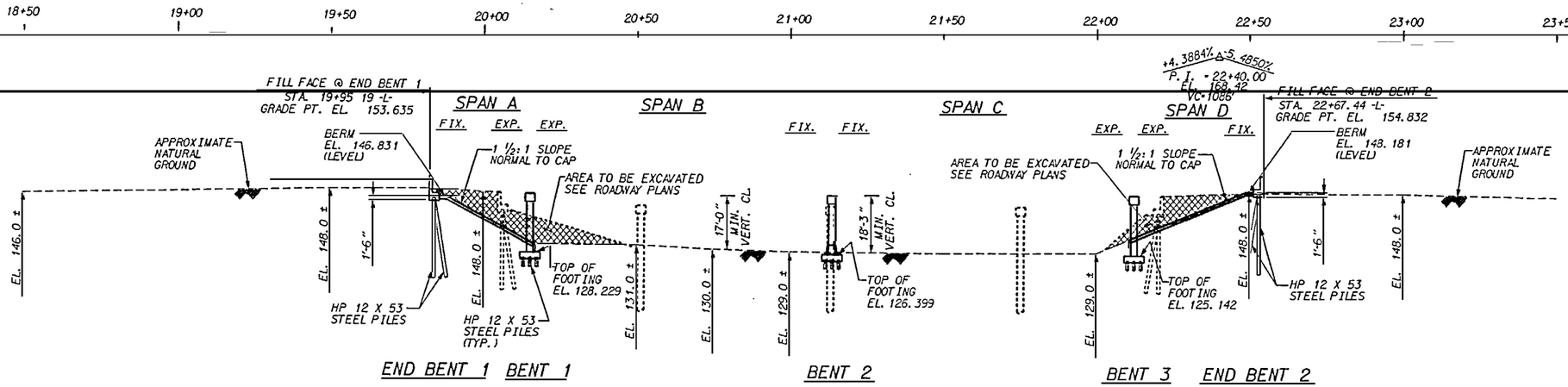
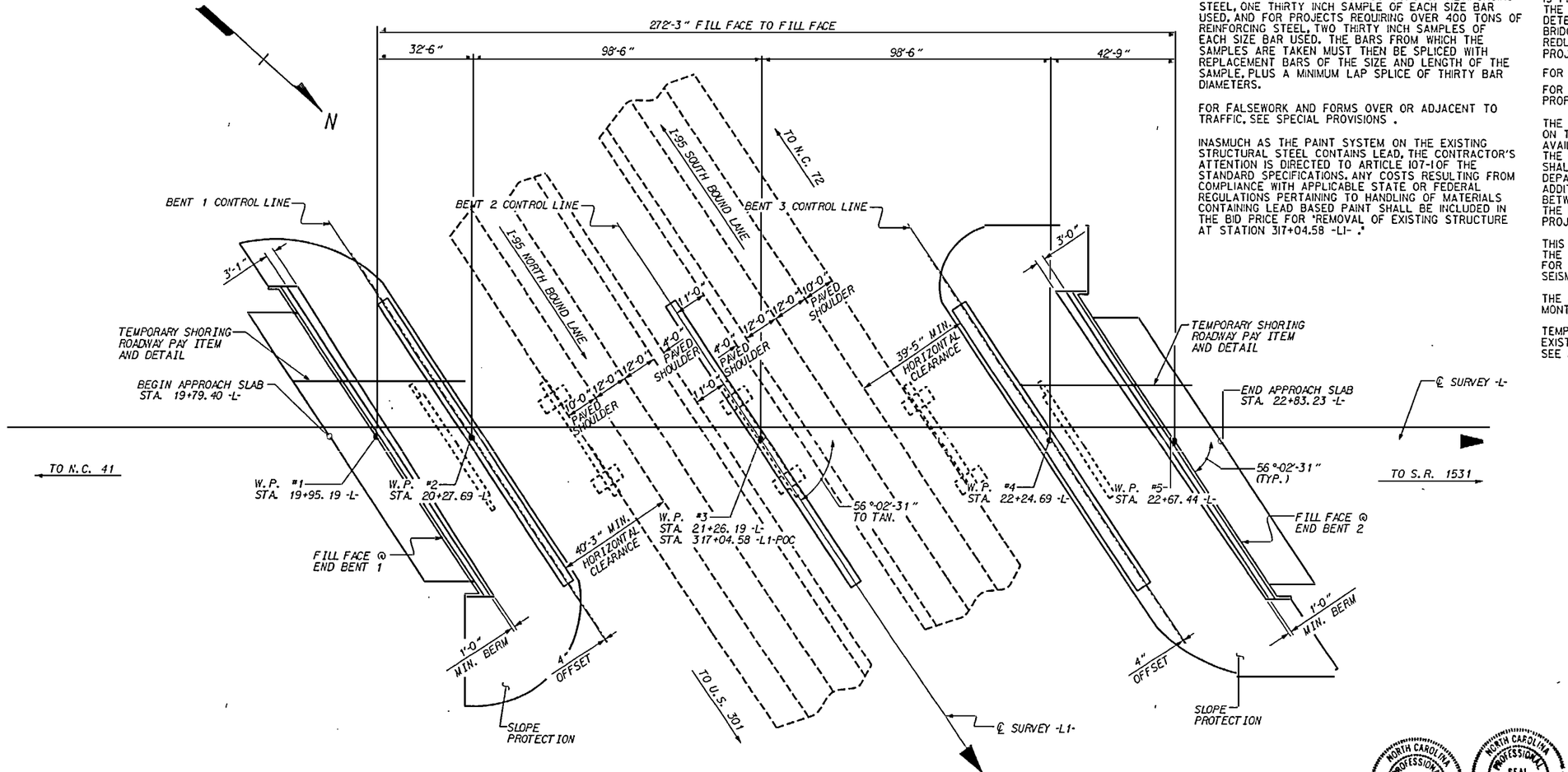
F. A. PROJECT NO. STP-NHF-7761(3)



SECTION ALONG ℄ SURVEY -L-

SECTION AT END BENTS TAKEN AT RIGHT ANGLES



PLAN

PILES NOT SHOWN FOR CLARITY

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 PRESTRESSED CONCRETE PANELS, SEE SPECIAL PROVISIONS.

FABRICATED METAL STAY-IN-PLACE FORMS MAY BE USED IN LIEU OF PRESTRESSED CONCRETE PANELS, SEE SPECIAL PROVISION "OPTIONAL FABRICATED METAL STAY-IN-PLACE FORMS."

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

PILES FOR END BENTS AND BENTS SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS EACH.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 35'-0", 2 @ 65'-0", 1 @ 35'-0") WITH A CLEAR ROADWAY WIDTH OF 28'-0" (31.2 OUT TO OUT) AND HAVING A CONCRETE DECK ON I-BEAMS SUPPORTED BY A CONCRETE SUBSTRUCTURE 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.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, 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.

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.

THE APPROACH SLAB WAITING PERIOD SHALL BE THREE MONTHS.

TEMPORARY SHORING WILL BE REQUIRED ADJACENT TO THE EXISTING BRIDGE. FOR SHORING LIMITS AND PAY ITEM, SEE ROADWAY PLANS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE THIRTY INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO THIRTY INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

FOR FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC, SEE SPECIAL PROVISIONS .

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 317+04.58 -L1- ."

8.1461602

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

REPLACES BRIDGE NO. 102 SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON N.C. 211 OVER I-95 BETWEEN N.C. 41 AND S.R. 1531

REVISIONS						SHEET NO.
NO.	BYs	DATEs	NO.	BYs	DATEs	S-203
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 8/7/95
CHECKED BY : V.X. Nguyen DATE : 11/30/97

NORTH CAROLINA PROFESSIONAL SEAL 9804 ENGINEER — 2-11-97

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER — 2-3-97

30-JAN-1997 09:10
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mike

04-DEC-1996 23:07
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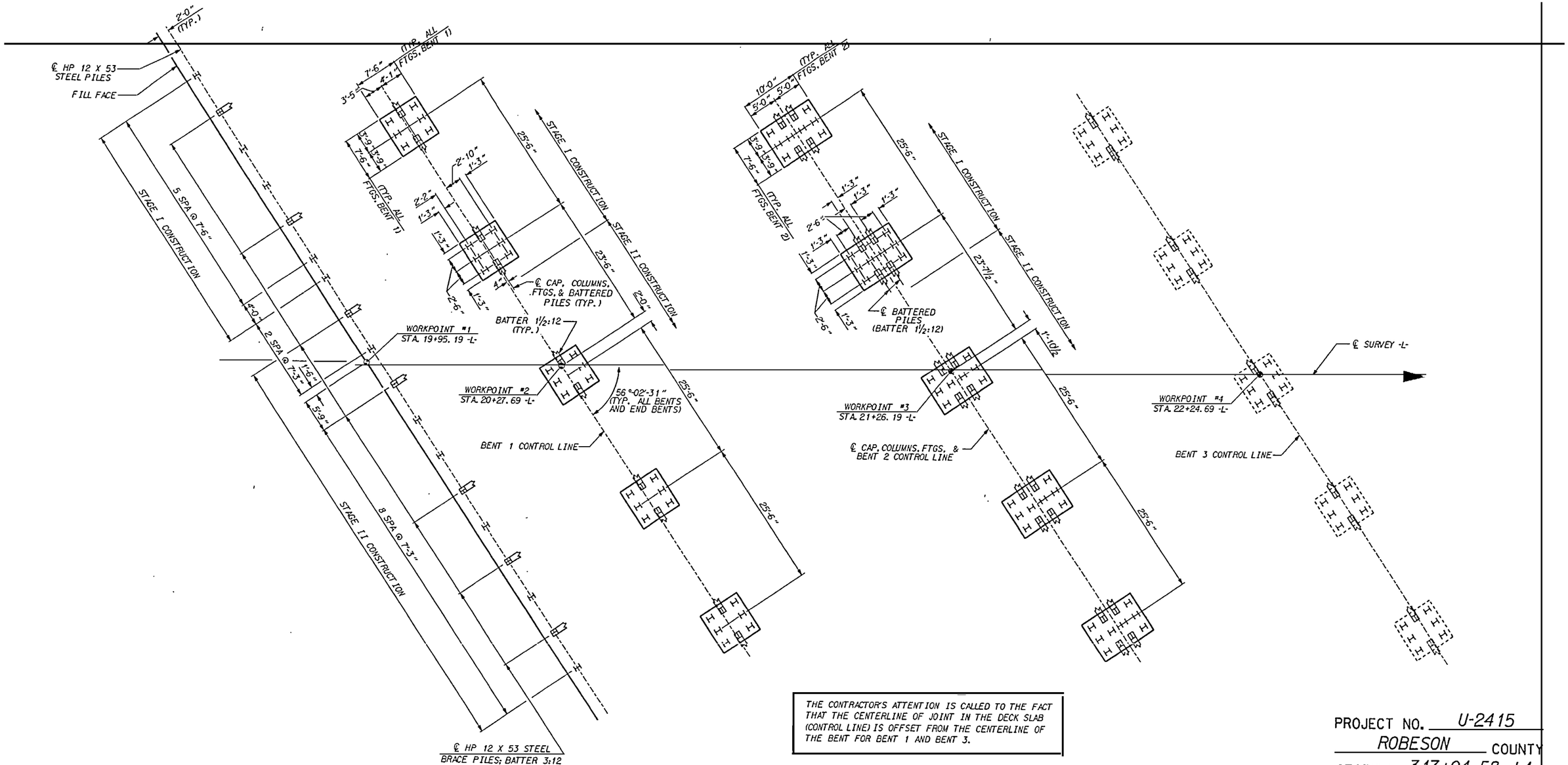
steve



END BENT 1 BENT 1 BENT 2 BENT 3

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE OF JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE OF THE BENT FOR BENT 1 AND BENT 3.

FOUNDATION LAYOUT PLAN

NOTE: ALL END BENTS AND BENTS ARE PARALLEL. PILE SPACINGS ARE SHOWN TO PILE CENTERLINE.

DRAWN BY : S.T. CHAMPION DATE : 8/15/96
CHECKED BY : B.C.Hunt DATE : 12-2-96

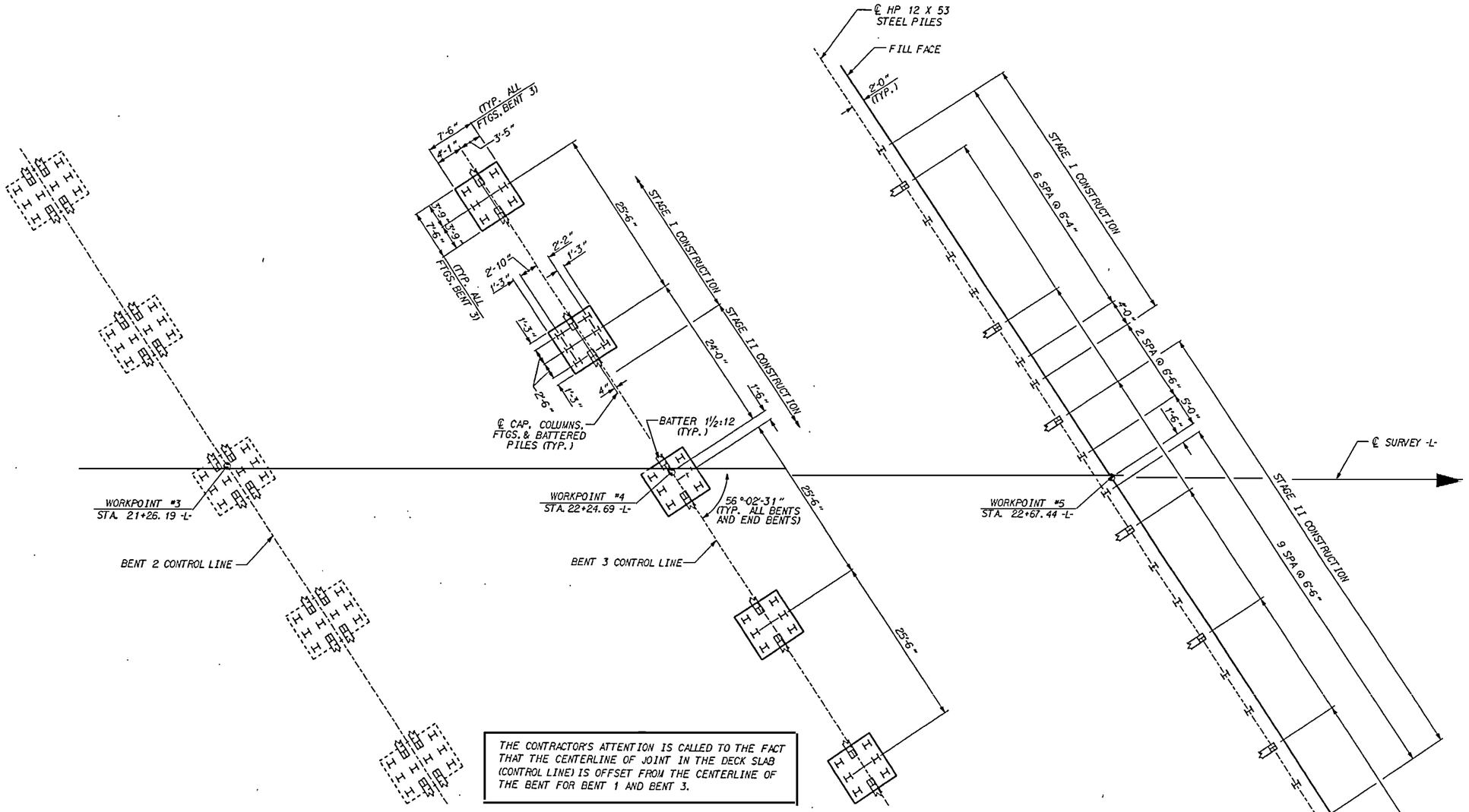
NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BRUCE CHARLES HUNT 2-3-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-204
1			3			TOTAL SHEETS
2			4			204



THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE OF JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE OF THE BENT FOR BENT 1 AND BENT 3.

BENT 2

BENT 3

END BENT 2

FOUNDATION LAYOUT PLAN

NOTE: ALL END BENTS AND BENTS ARE PARALLEL
PILE SPACINGS ARE SHOWN TO PILE CENTERLINE

DRAWN BY : S.T. CHAMPION DATE : 8/15/96
CHECKED BY : B.C. HUNT DATE : 1-30-97

NORTH CAROLINA PROFESSIONAL SEAL 14072 ENGINEER BUCK CHARLES HUNT
1-3-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

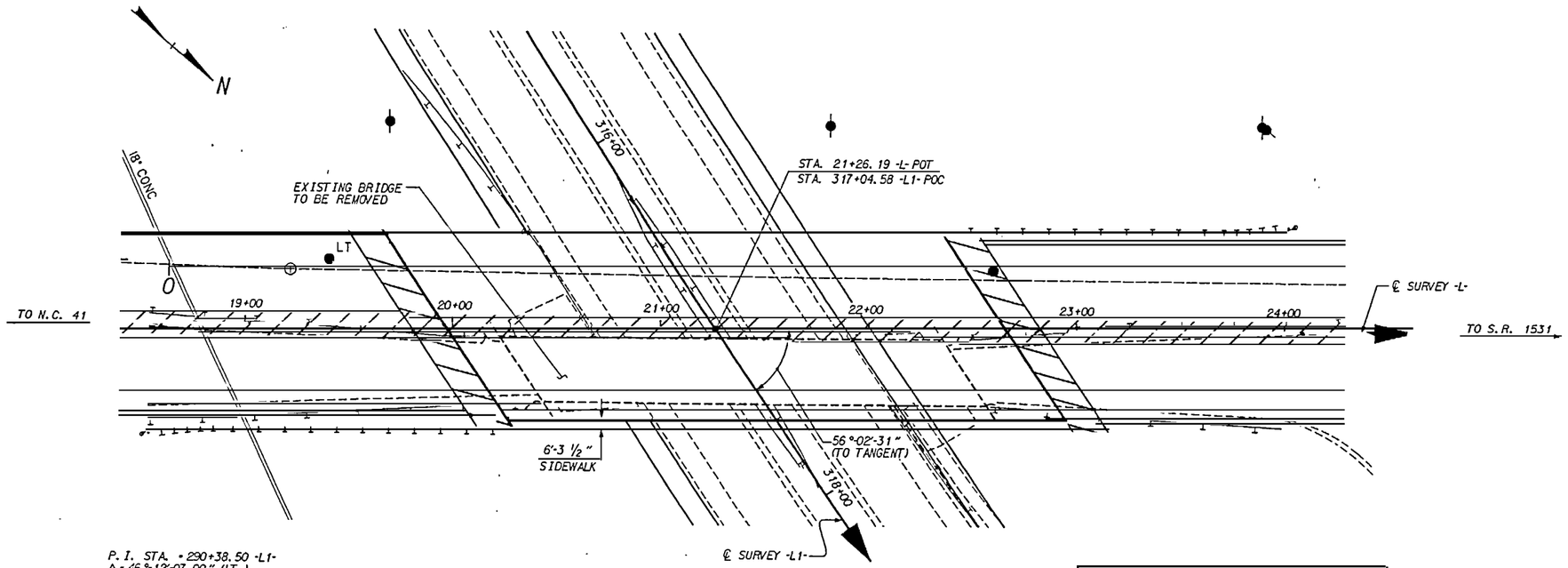
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-205
1			3			TOTAL SHEETS
2			4			264

B.M. STANDARD DISK STAMPED "GREEN" 1965, 17' RT. OF -L- STA. 22+60.00 EL. 147.57



P.I. STA. = 290+38.50 -L1-
Δ = 46°-12'-07.00" (LT.)
D = 0°-45'-00.00"
L = 6,160.2593'
T = 3,258.6494'
R = 7,639.4373'
P.C. STA. = 257+79.85 -L1-
P.T. STA. = 319+40.11 -L1-

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF ~~EXISTING~~ STRUCTURE	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS		54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	ELECTRICAL CONDUIT SYSTEM
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			26,389	23,310		~~LUMP SUM~~				24	849.88	24	2352.00			261.38	269.70		LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1					73.1		~~10,146~~ VOID														
BENT NO. 1		LUMP SUM			140.8		20,180	~~2,701~~	~~1,708~~					18	1,350			657			
BENT NO. 2		LUMP SUM			227.7		31,939	3,596	1,653					40	2,600						
~~BENT NO. 3~~		~~LUMP SUM~~			~~142.4~~		21,037	2,778	2,177					60	3,900						
~~END BENT NO. 2~~			~~VOID~~		69.5		9,985							~~40~~	~~2,600~~						
														20	1,500			651			
~~TOTAL~~	~~LUMP SUM~~	~~LUMP SUM~~	~~26,389~~	~~23,310~~	~~833.5~~	~~LUMP SUM~~	~~93,287~~	9,075	5,538	24	849.88	24	2352.00	~~178~~	~~11,950~~	261.38	269.70	1,308	LUMP SUM	LUMP SUM	~~LUMP SUM~~

DRAWN BY : M. GOINS DATE : 8/14/95
CHECKED BY : V. X. Nguyen DATE : 1/30/97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LOCATION SKETCH AND TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-206
1			3			TOTAL SHEETS
2			4			264

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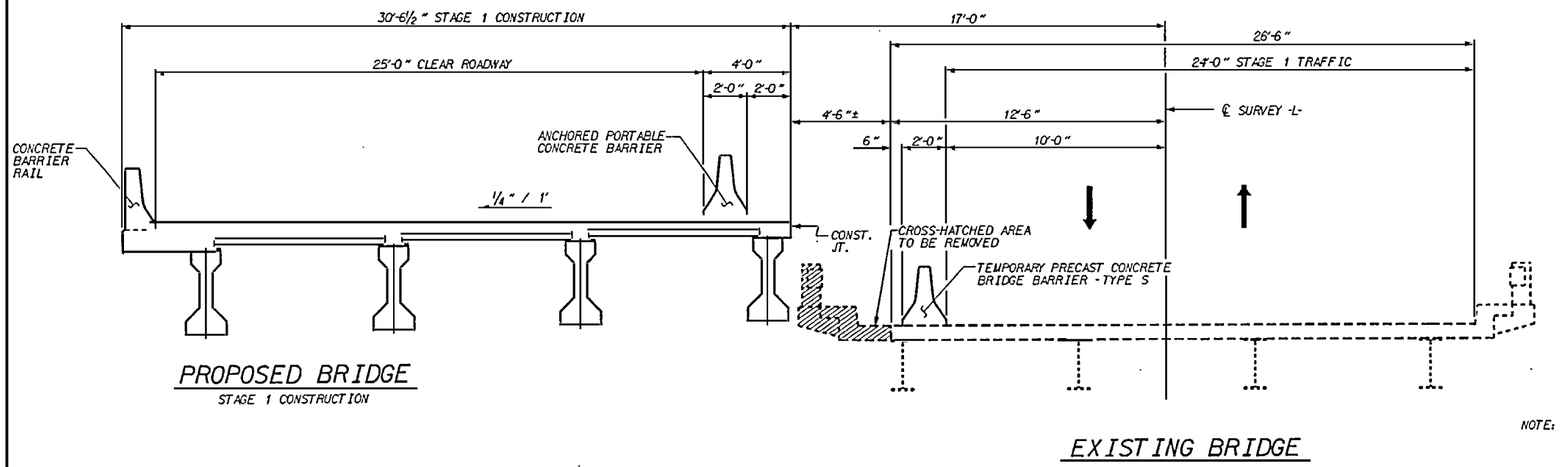
mike

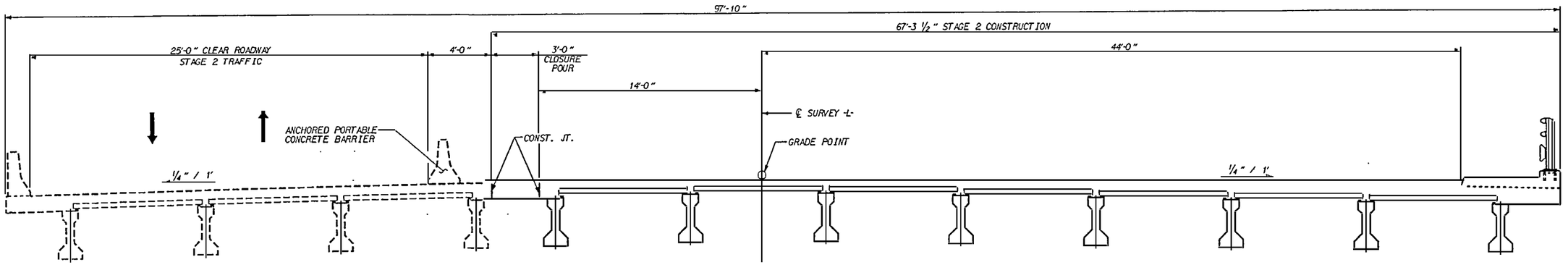


PROPOSED BRIDGE
STAGE 1 CONSTRUCTION

EXISTING BRIDGE

NOTE: SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

NOTE: EXISTING STRUCTURE TO BE REMOVED.



PROPOSED BRIDGE
STAGE 2 TRAFFIC

PROPOSED BRIDGE
STAGE 2 CONSTRUCTION

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE OF BRIDGE ON NC 211 OVER I-95

NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER BUCK CHARLES HUNTER
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-207
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 11/6/96
CHECKED BY : V. X. Nguyen DATE : 2/3/97

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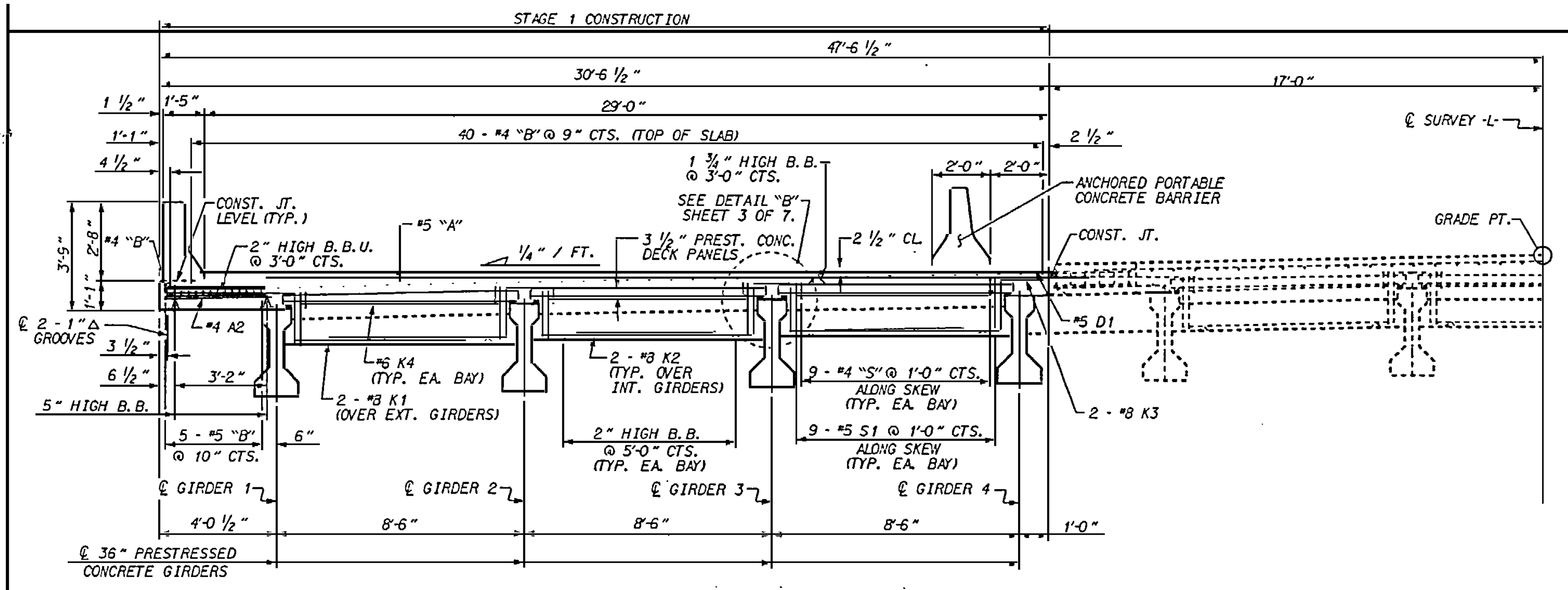
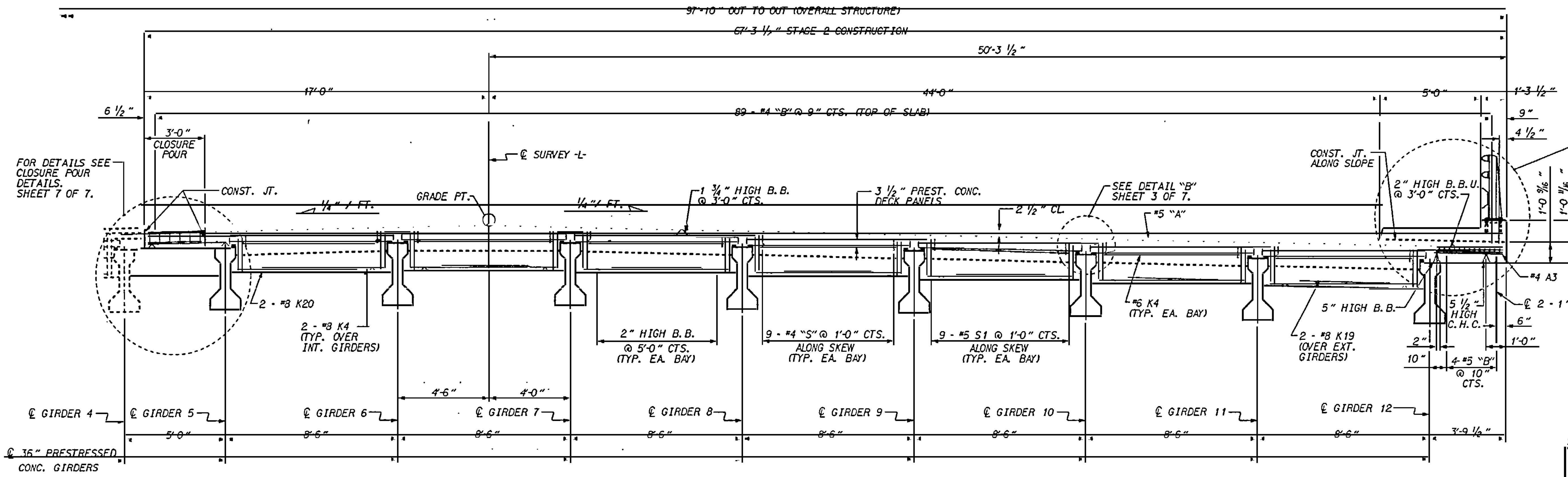
mike



PART TYPICAL SECTION - STAGE 1
(SHOWING END BENT AND BENT DIAPHRAMS)



PART TYPICAL SECTION - STAGE 2
(SHOWING END BENT AND BENT DIAPHRAMS)

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS
SPANS A AND D

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14097 BUCK CHARLES HURT
2-3-97

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-208
1			3				TOTAL SHEETS
2			4				264

DRAWN BY : D. G. VESTER DATE : 3-19-96
CHECKED BY : V. X. Nguyen DATE : 1-2-97

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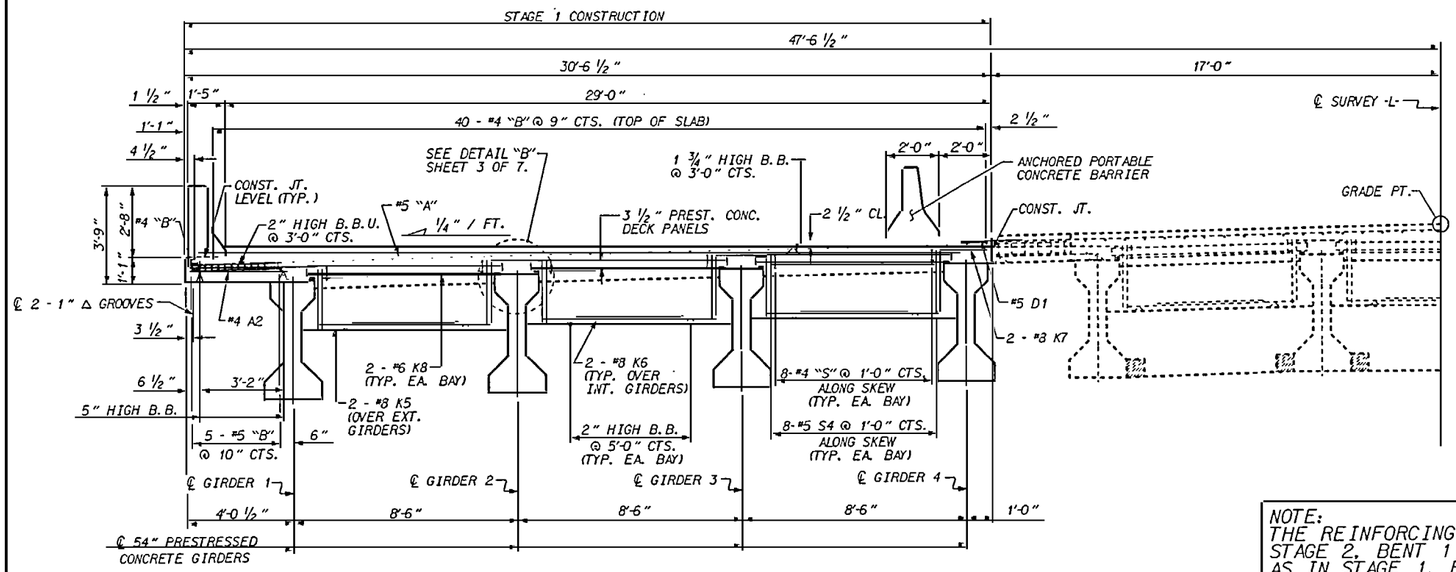
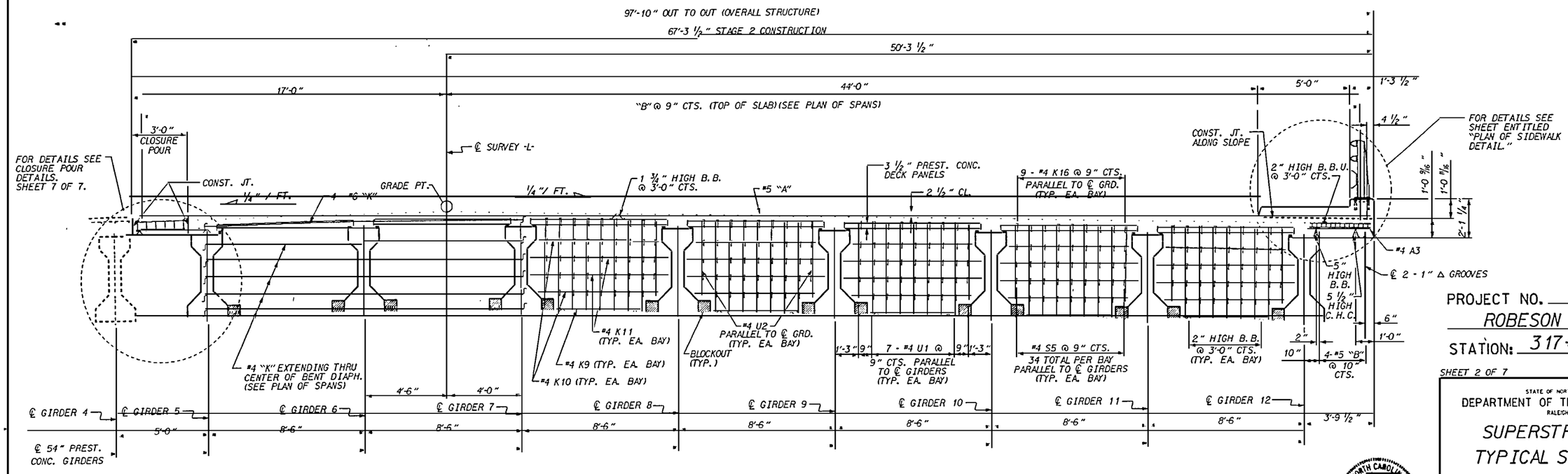


PART TYPICAL SECTION - STAGE 1

(SHOWING BENT DIAPHRAMS AT BENTS 1 AND 3)

NOTE:
THE REINFORCING STEEL AND BAR SPACING FOR STAGE 2, BENT 1 AND 3 DIAPHRAGMS ARE THE SAME AS IN STAGE 1. FOR DECK REINFORCING STEEL, SEE PART TYPICAL SECTION - STAGE 2.



PART TYPICAL SECTION - STAGE 2

(SHOWING CONTINUOUS BENT DIAPHRAMS AT BENT 2)

NOTE:
THE REINFORCING STEEL AND BAR SPACING FOR STAGE 1 CONTINUOUS BENT DIAPHRAGMS ARE THE SAME AS IN STAGE 2.

DRAWN BY : D. G. VESTER DATE : 3-20-96
CHECKED BY : V. X. Nguyen DATE : 1-31-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTIONS SPANS B AND C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-209
1			3			TOTAL SHEETS
2			4			26

NORTH CAROLINA PROFESSIONAL SEAL 14004 ENGINEER BRICK CHARLES HUNT
2-3-97

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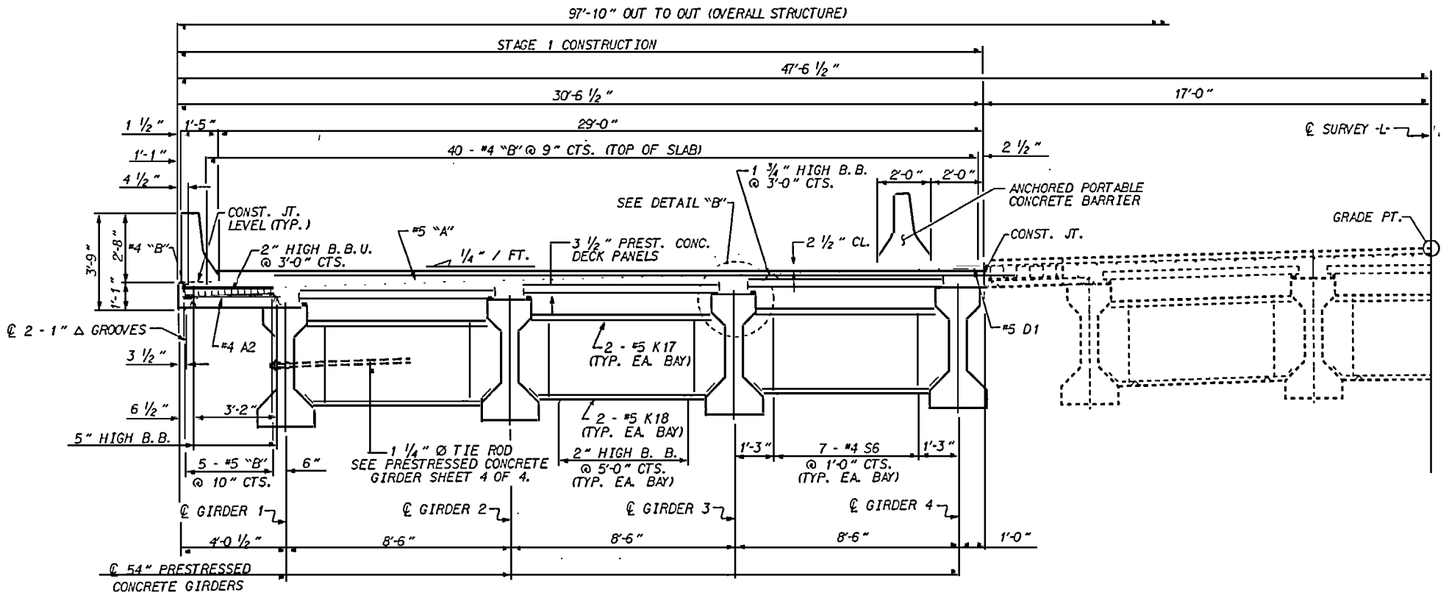
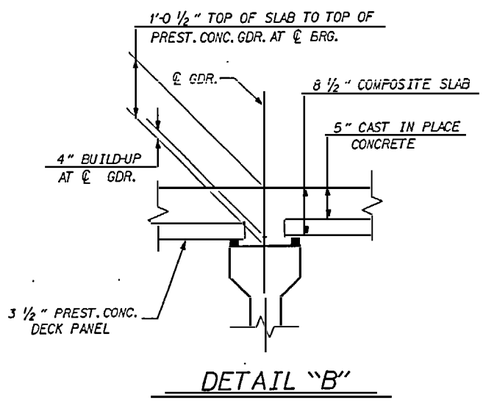


PART TYPICAL SECTION - STAGE 1

(SHOWING INTERMEDIATE DIAPHRAMS AT SPANS B & C)

NOTE:
THE REINFORCING STEEL AND BAR SPACING FOR STAGE 2 INTERMEDIATE DIAPHRAGMS ARE THE SAME AS IN STAGE 1.



DETAIL "B"

--- NOTES ---

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN SLAB REINFORCING STEEL.

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

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE NUTS ON THE 1 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE THREE (3) DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RETIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE BID FOR REINFORCED CONCRETE DECK SLAB.

FOR REMOVAL OF FALSEWORK ON BENT DIAPHRAGMS, SEE SPECIAL PROVISIONS FOR PRESTRESSED CONCRETE PANELS.

#5G BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

FOR DETAILS OF CONCRETE INSERTS, GUARDRAIL, AND RUBRAIL ANCHOR ASSEMBLIES, SEE " RAIL POST SPACING AND END OF RAIL DETAIL " SHEETS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3 7/16" AT BENTS 1 AND 3. SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

THE SKEWED END CONDITIONS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSIBEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

DRAWN BY : D. G. VESTER DATE : 3-20-96
CHECKED BY : V. V. Nguyen DATE : 12-2-96

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTIONS SPANS B AND C

NORTH CAROLINA PROFESSIONAL SEAL 14095 ENGINEER BUCK CHARLES NUR 2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-210
1			3			TOTAL SHEETS
2			4			264

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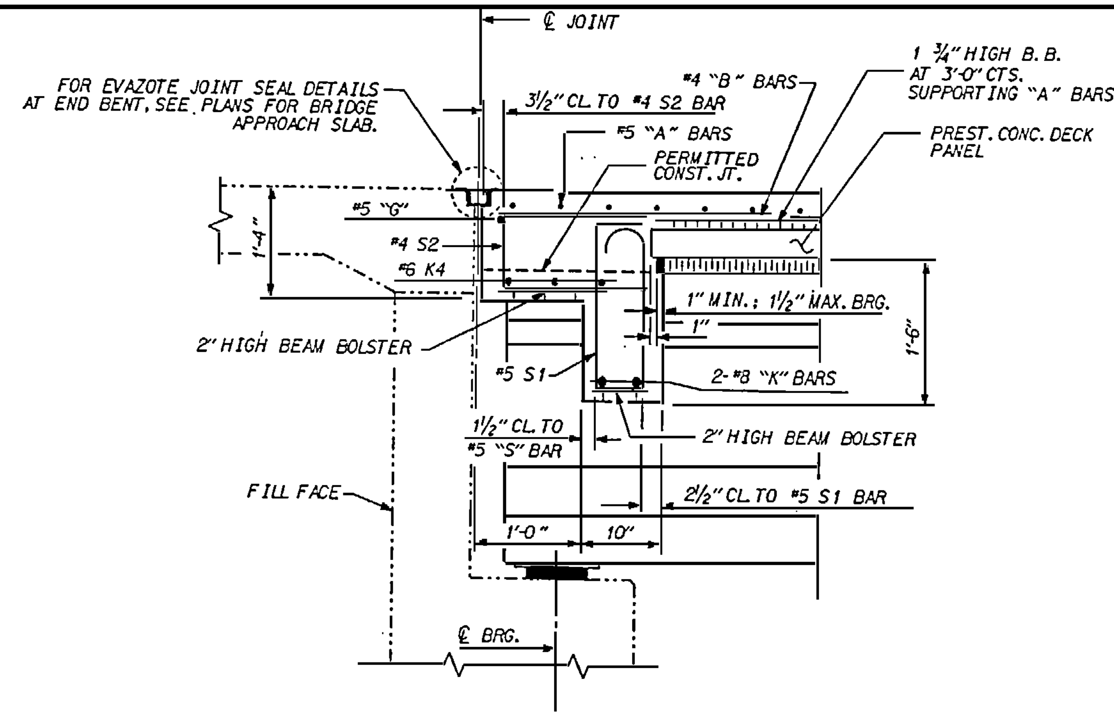
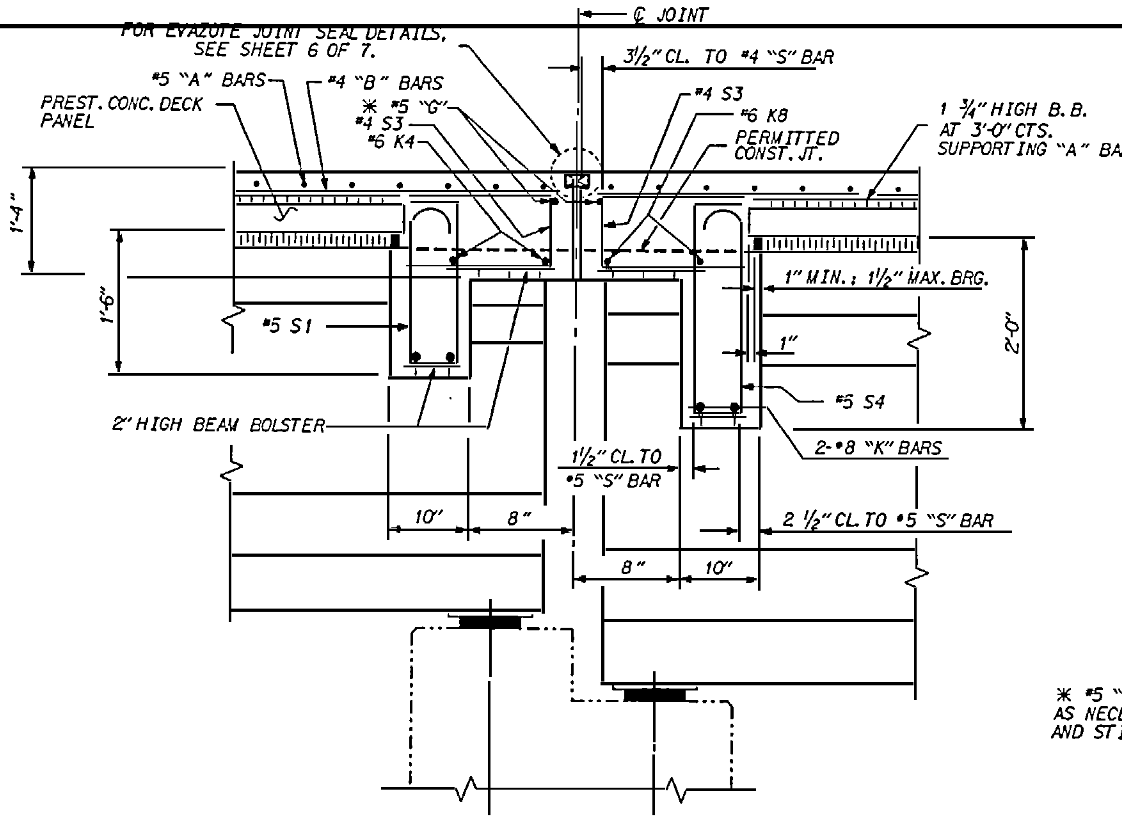
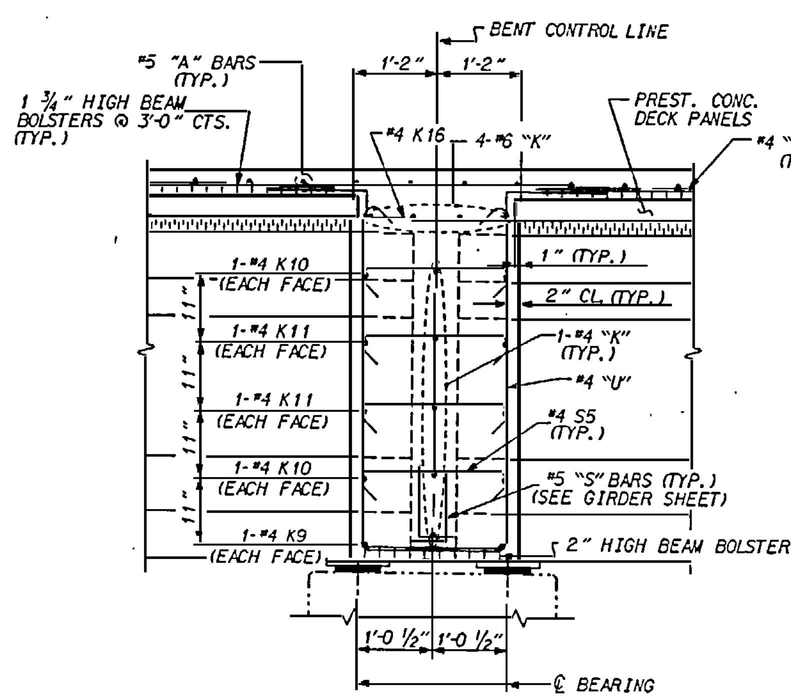


SECTION THRU END BENT DIAPHRAGM
FOR END BENTS 1 AND 2

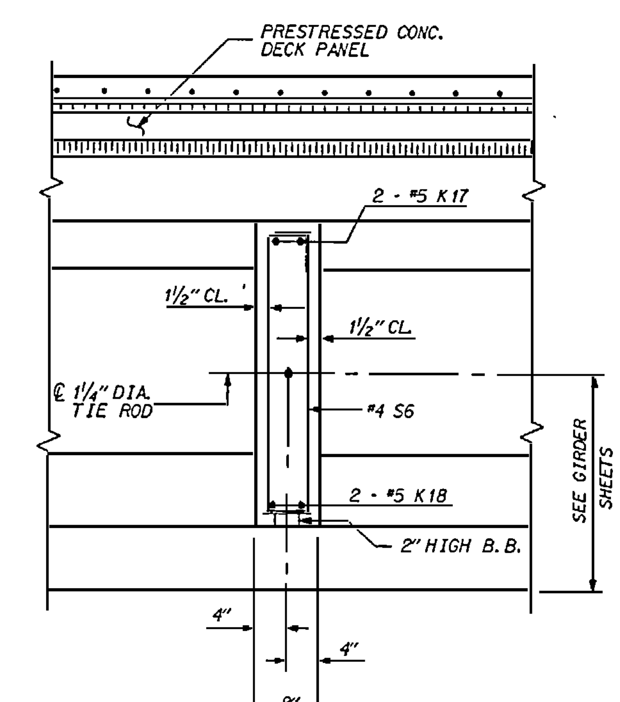


✱ #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

SECTION THRU BENT DIAPHRAGM



SECTION THRU CONTINUOUS BENT DIAPHRAGM
FOR BENT 2



SECTION THRU INTERMEDIATE DIAPHRAGM
FOR SPANS B AND C

DRAWN BY : D. G. VESTER DATE : 3-25-96
CHECKED BY : V. X. Nguyen DATE : 1-31-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-211
1			3				TOTAL SHEETS
2			4				264

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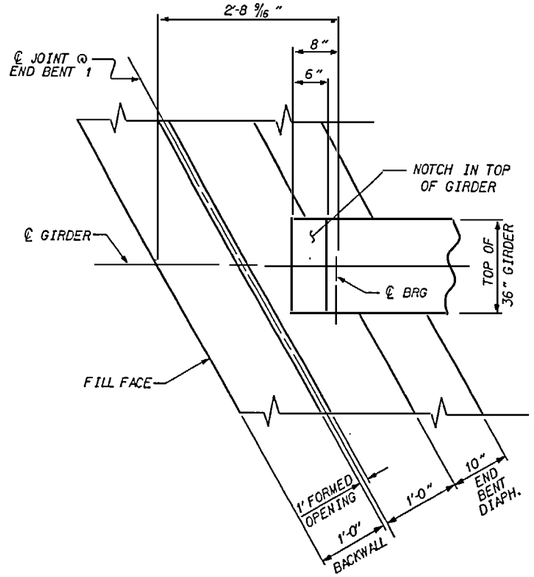
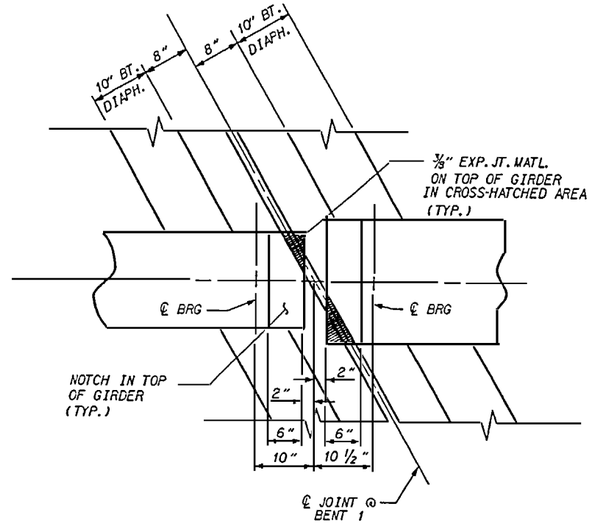


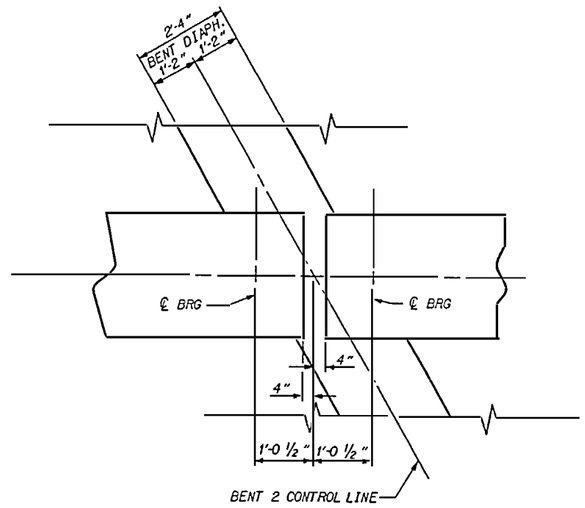
END BENT DIAPHRAGM

END BENT 1 SHOWN
END BENT 2 SIMILAR BY ROTATION



BENT DIAPHRAGM

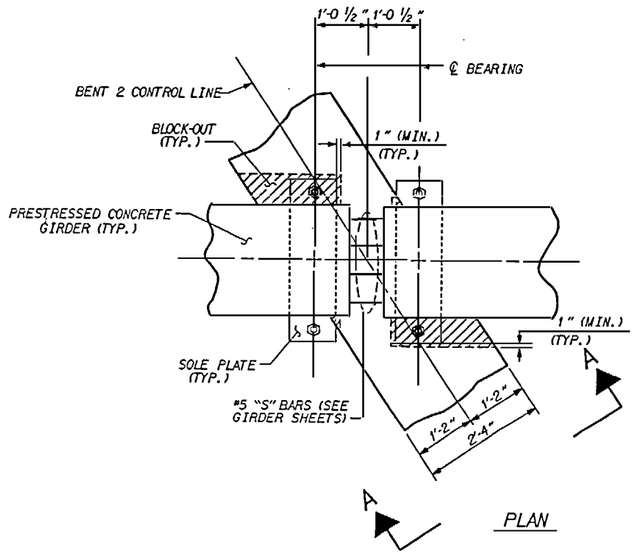
BENT 1 SHOWN
BENT 3 SIMILAR BY ROTATION



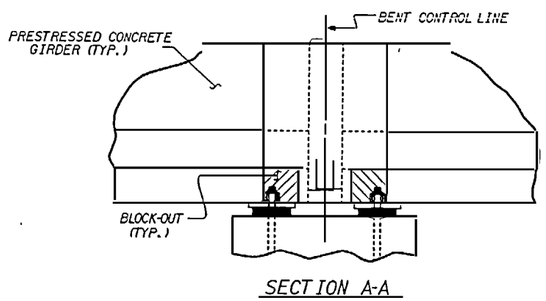
BENT DIAPHRAGM

BENT 2 ONLY

PLAN



PLAN



SECTION A-A

BENT DIAPHRAGM FOR CONTINUOUS DECK SLAB BLOCK-OUT DETAIL

(BENT 2)

DRAWN BY : D. G. VESTER DATE : 3-25-96
CHECKED BY : V. X. Nguyen DATE : 2-19-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-2A
1			3			TOTAL SHEETS
2			4			264

19-FEB-1997 09:53
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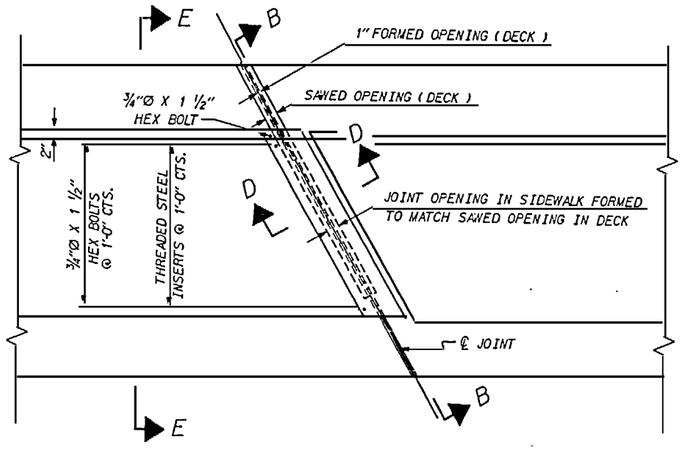
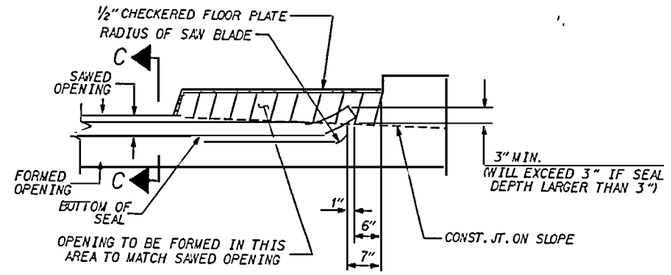
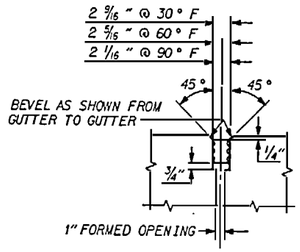
dottie



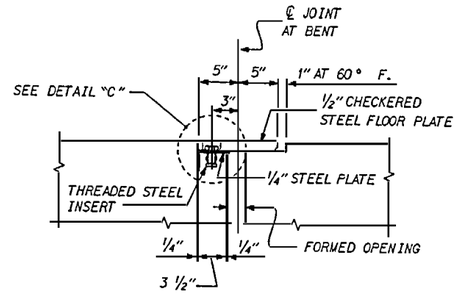
PLAN OF EVAZOTE JOINT SEAL WITH COVER PLATE



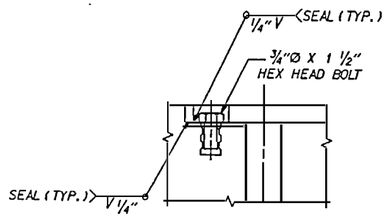
SECTION B-B



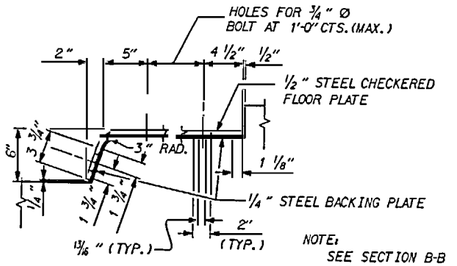
SECTION C-C



SECTION D-D



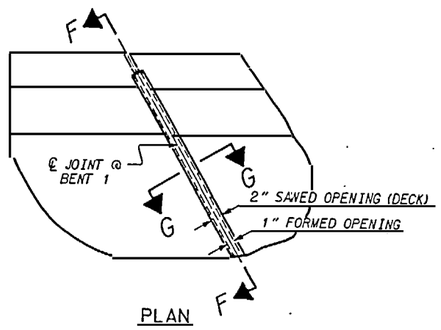
DETAIL "C"



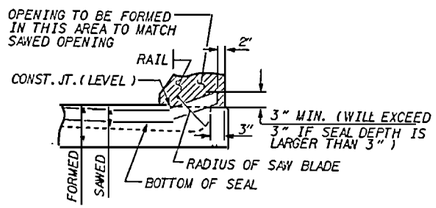
SECTION E-E

NOTE:
SEE SECTION B-B FOR JOINT SEAL PLACEMENT DETAIL

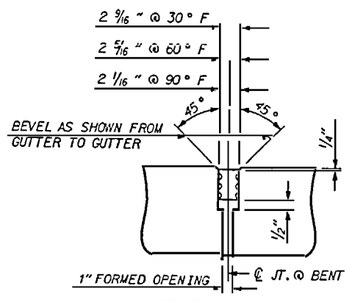
EVAZOTE JOINT SEAL DETAILS @ BENT 1 AND BENT 3 FOR SIDEWALK



PLAN



SECTION F-F



SECTION G-G
(FOR EVAZOTE JOINT SEAL, SEE SPECIAL PROVISIONS)

EVAZOTE JOINT SEAL DETAILS @ BENT 1 AND BENT 3 FOR BARRIER RAIL

DRAWN BY : D. G. VESTER DATE : 3-21-96
CHECKED BY : V. V. Nguyen DATE : 12-2-96

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-213
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER VUONG CHARLES NGUYEN
2-1-97

27-NOV-1996 10:14
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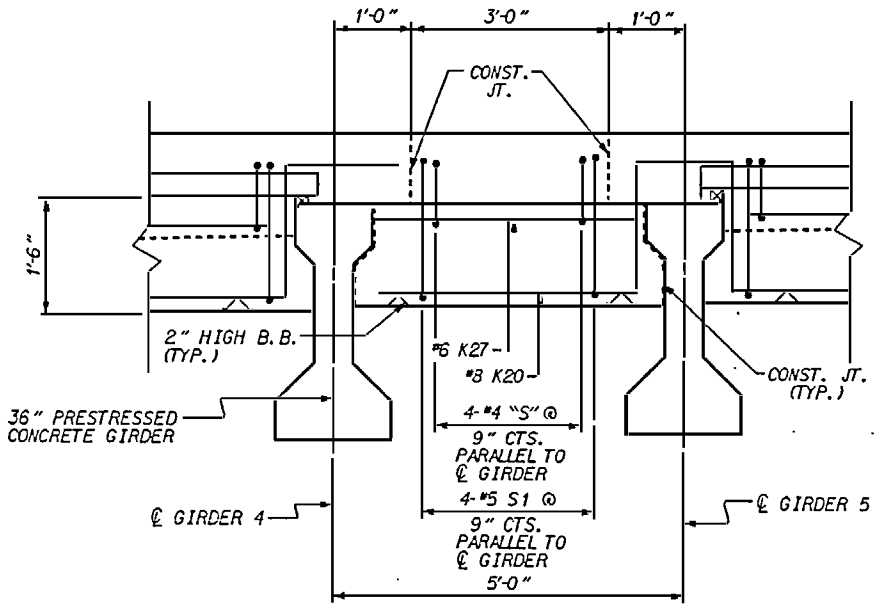
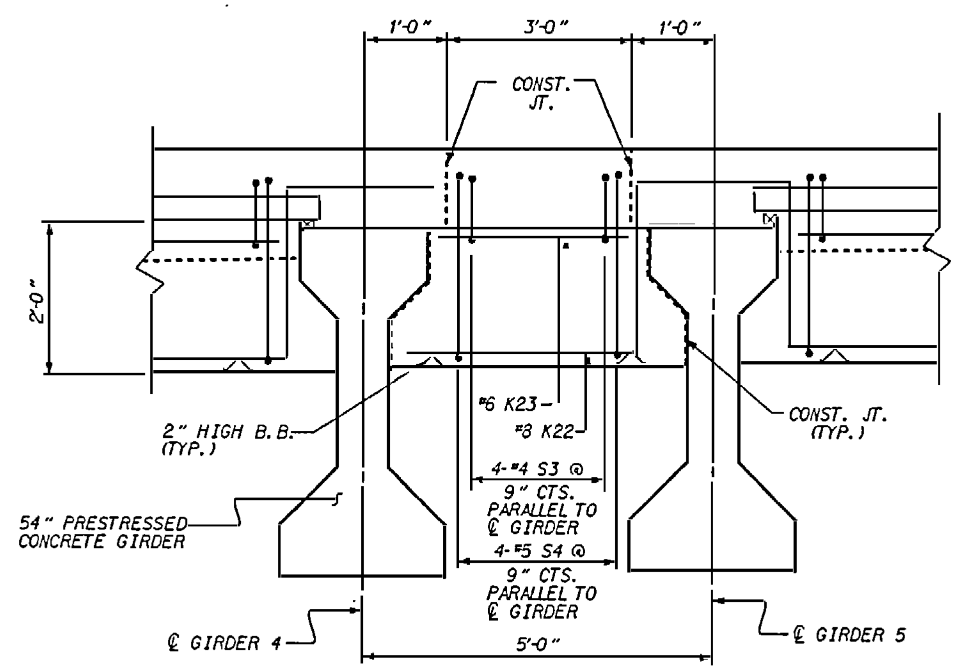
dottie



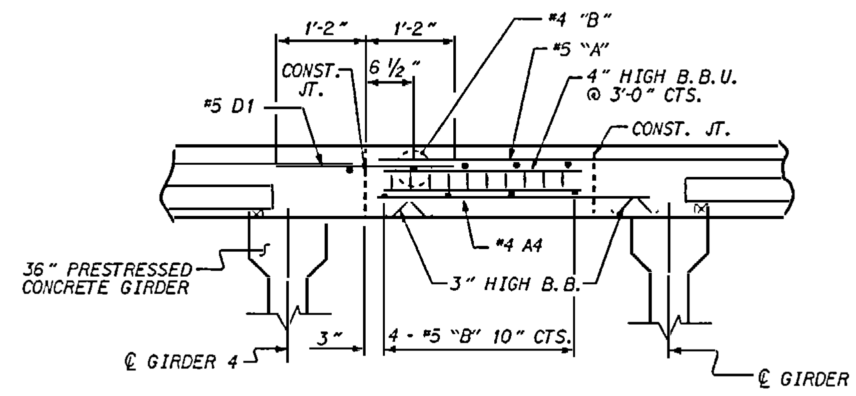
TYPICAL SECTION

SHOWING END BENTS AND BENT DIAPHRAGMS @ SPANS A AND D
FOR ADDITIONAL BARS IN THE DECK, SEE DETAIL "E".



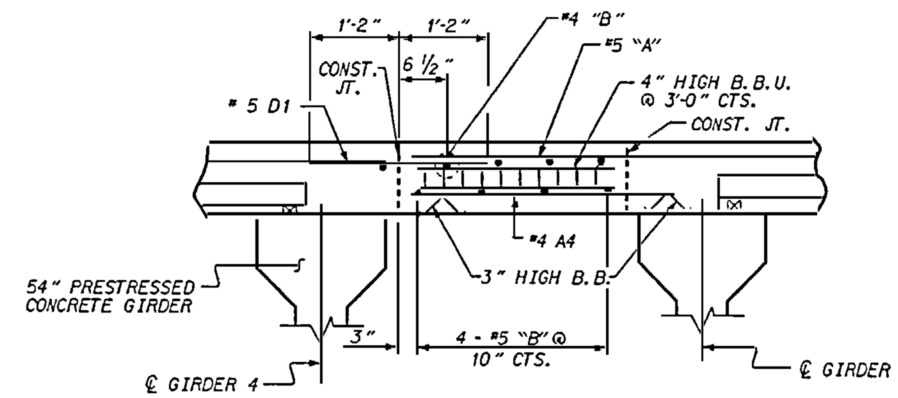
TYPICAL SECTION

SHOWING BENT 1 & 3 DIAPHRAGMS @ SPANS B AND C
FOR ADDITIONAL BARS IN THE DECK, SEE DETAIL "F".



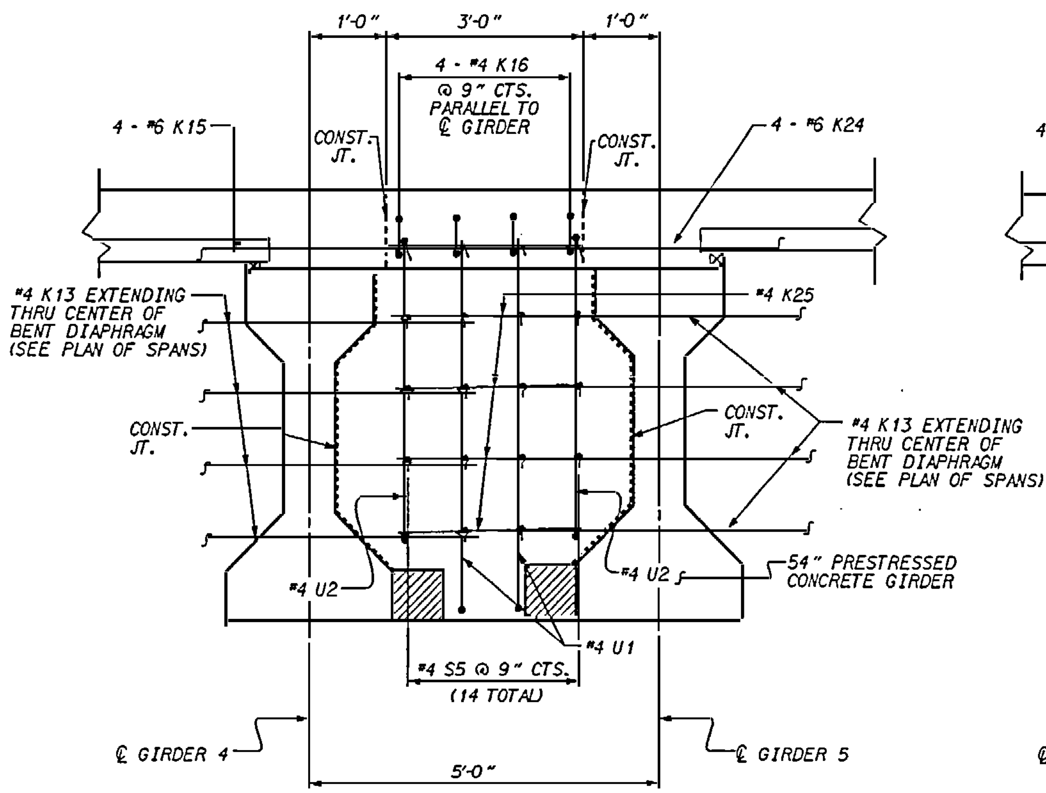
DETAIL "E"

END BENTS AND BENTS 1 AND 3 @ SPANS A AND D



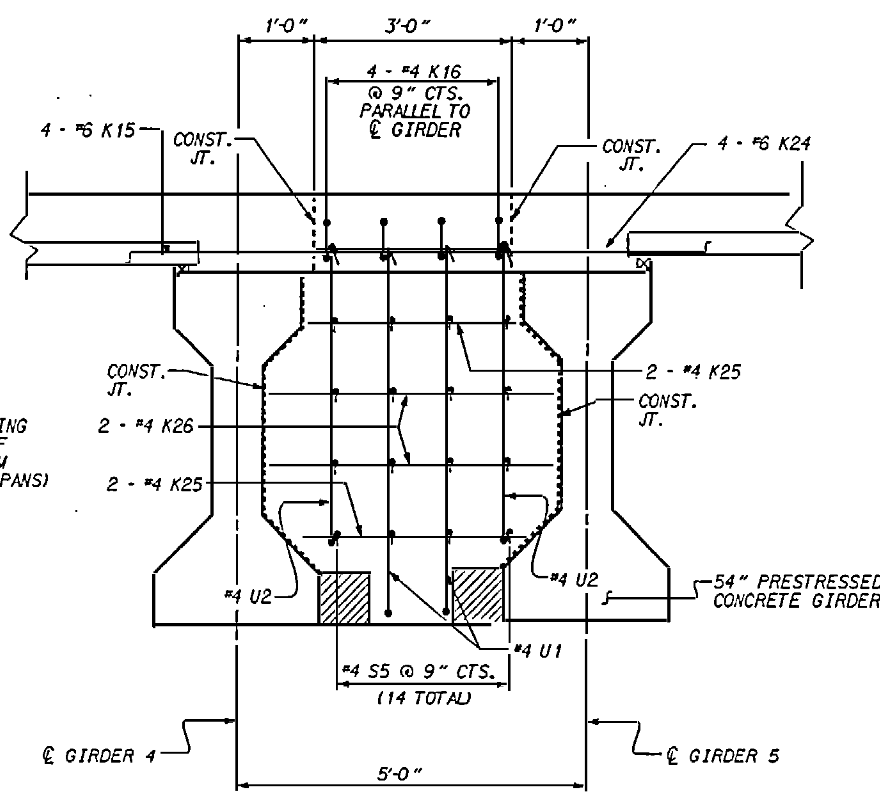
DETAIL "F"

BENTS 1 AND 3 @ SPANS B AND C



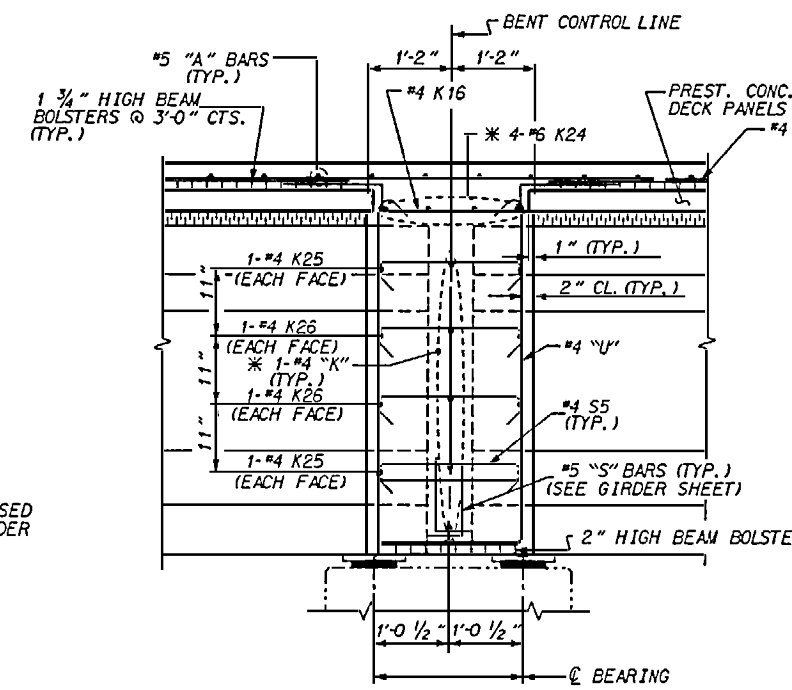
TYPICAL SECTION

SHOWING BENT 2 DIAPHRAGMS
SEE DETAIL "D" FOR ADDITIONAL BARS



DETAIL "D"

SHOWING BENT 2 DIAPHRAGMS



SECTION THRU BENT DIAPHRAGM

NOTE: ✱ THESE "K" BARS ARE POSITIONED BY THEIR LOCATION IN THE BENT DIAPHRAGM OF THE ADJACENT GIRDER BAY.

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER BUCK CHARLES HUNT 2-3-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION SHOWING CLOSURE POUR DETAILS

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		S-214
1				3				TOTAL SHEETS
2				4				264

DRAWN BY : D. G. VESTER DATE : 3-21-96
CHECKED BY : V. X. Nguyen DATE : 12-2-96

27-NOV-1996
dottle

DECK PANEL SUPPORTS

PRESTRESSED CONCRETE DECK PANELS SHALL BE SUPPORTED ON THE END BENT DIAPHRAGM BY LAYERS OF 1/2" THICK BITUMINOUS TYPE MATERIAL. THE BITUMINOUS TYPE MATERIAL SHALL HAVE A MINIMUM WIDTH OF 1" AND A MAXIMUM WIDTH OF 1 1/2". THE DECK PANEL SHALL OVERHANG THE BITUMINOUS TYPE MATERIAL BY 1". FOR REMOVAL OF FALSEWORK ON BENT DIAPHRAGMS, SEE SPECIAL PROVISIONS FOR PRESTRESSED CONCRETE PANELS.

BITUMINOUS TYPE MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M213.

THE CONTRACTOR MAY SELECT ONE OF THE TWO DECK PANEL SUPPORT SYSTEMS SHOWN, UNLESS OTHERWISE INDICATED, OR HE MAY SUBMIT A DECK PANEL SUPPORT SYSTEM OF HIS OWN DESIGN TO THE ENGINEER FOR APPROVAL.

A. GROUT BED SUPPORT SYSTEM

1. THE GROUT BED SHALL HAVE A MINIMUM WIDTH OF 1 1/2" AND A MAXIMUM WIDTH OF 2". THE VERTICAL FACES OF THE GROUT BED SHALL BE FORMED. ONE LAYER OF 1/2" THICK BITUMINOUS TYPE MATERIAL OF THE SAME WIDTH AS THE GROUT BED SHALL BE GLUED TO THE TOP OF THE GROUT BED; MORE THAN ONE LAYER IS NOT ALLOWED. THE ADHESIVE SHALL BE APPROVED BY THE ENGINEER. THE BITUMINOUS TYPE MATERIAL SHALL HAVE 1/2" SLOTS LOCATED AT 4'-0" CENTERS. THE GROUT BED SHALL HAVE 1/2" X 1/2" WIDE SLOTS OR OTHER EQUIVALENT SIZE OPENINGS @ 4'-0" CENTERS ALONG THE BOTTOM STAGGERED WITH THE SLOTS IN THE TOP.

2. THE GROUT SHALL BE NON-SHRINK, NON-METALLIC GROUT HAVING A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2500 PSI. THE GROUT SHALL BE APPROVED BY THE ENGINEER.

B. POLYSTYRENE SUPPORT SYSTEM

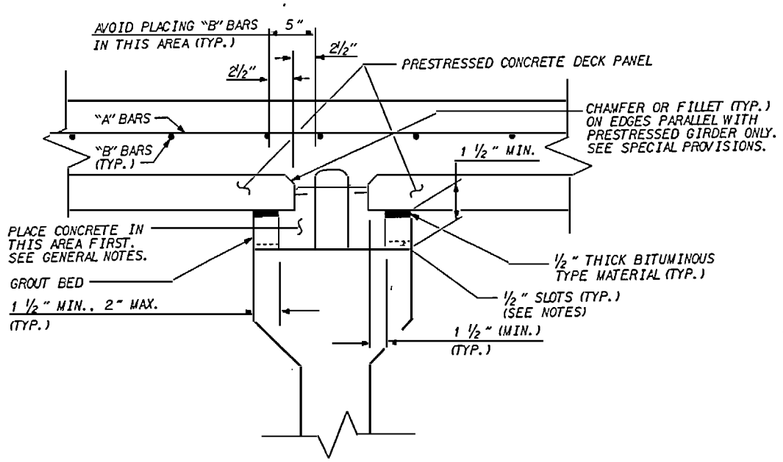
1. ALL POLYSTYRENE SHALL BE DOW STYROFOAM 60 HIGH-LOAD, UC INDUSTRIES FOAMULAR 600 OR APPROVED EQUAL.

2. THE POLYSTYRENE SUPPORT SYSTEM SHALL CONSIST OF ONE LAYER WITH A MINIMUM WIDTH OF 1 1/2" AND A MAXIMUM WIDTH OF 2". THE POLYSTYRENE SHALL HAVE 1/2" X 1/2" WIDE SLOTS OR 1/2" DIAMETER HOLES AT 4'-0" CENTERS STAGGERED ALONG THE TOP AND BOTTOM.

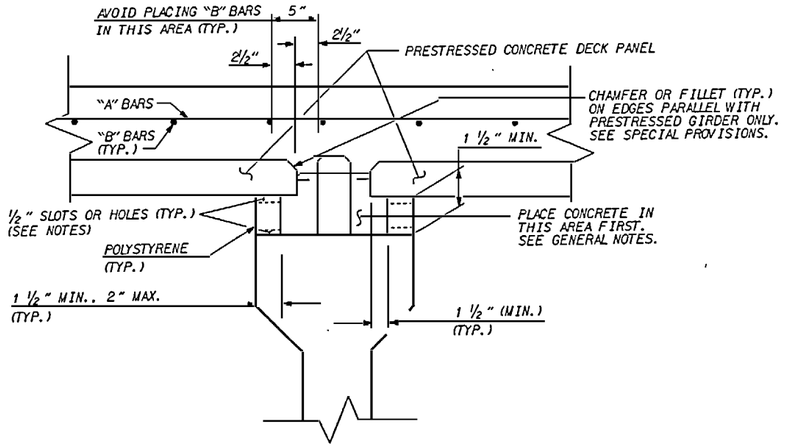
3. THE POLYSTYRENE MAY BE CUT AND PLACED ON EDGE AS NECESSARY TO MATCH THE REQUIRED BUILDUP PROFILE ALONG THE GIRDER.

4. ADHESIVE, AS APPROVED BY THE ENGINEER, SHALL BE APPLIED TO THE TOP OF THE GIRDER IN A CONTINUOUS BEAD AND IN SUFFICIENT AMOUNT TO PREVENT THE POLYSTYRENE FROM BLOWING OUT AND TO PREVENT GAPS FROM FORMING BETWEEN THE POLYSTYRENE AND THE GIRDER. PRIOR TO PLACEMENT OF THE DECK PANELS, THE ADHESIVE SHALL ALSO BE APPLIED TO THE TOP OF THE POLYSTYRENE.

5. CONCRETE-FILLED BUCKETS, STACKS OF DECK PANELS, BUNDLED REINFORCING BARS OR OTHER HEAVY CONCENTRATED LOADS WILL NOT BE PERMITTED ON THE DECK PANEL ONCE THE PANEL HAS BEEN PLACED ON THE POLYSTYRENE SUPPORT SYSTEM.



GROUT BED SUPPORT



POLYSTYRENE SUPPORT

GENERAL NOTES

1. FOR PRESTRESSED CONCRETE PANELS, SEE SPECIAL PROVISIONS.
2. SHIFT LONGITUDINAL "B" BARS AS NECESSARY TO OBTAIN A MINIMUM CLEAR DISTANCE OF 2 1/2" TO THE RIGHT OR LEFT OF THE EDGE OF THE DECK PANEL. IF, IN SHIFTING TO OBTAIN THIS CLEARANCE, THE "B" BAR INTERFERES WITH THE STIRRUP IN THE TOP OF THE GIRDER THE "B" BAR MAY BE ELIMINATED.
3. WHEN CASTING THE DECK, PLACE CONCRETE FIRST OVER THE GIRDERS IN CONTINUOUS STRIPS A MINIMUM OF THREE PANEL LENGTHS AHEAD OF THE REST OF THE CONCRETE. CAREFULLY VIBRATE THE CONCRETE OVER THE GIRDERS SO THAT CONCRETE COMPLETELY FILLS THE AREA UNDER THE DECK PANEL OVERHANGS. THEN PLACE AND VIBRATE THE REMAINING DECK CONCRETE.

REVISED BY E.L.R. 3-3-93
REVISED BY E.L.R. CHECKED BY G.H.P. 8-28-92
REDRAWN 1-28-92

ASSEMBLED BY : D. G. VESTER	DATE : 5-17-96		SPECIAL
CHECKED BY : THEO BEACH	DATE : 8-27-96		
DRAWN BY : E.L. ROSE	DATE : 1-28-92		STANDARD
CHECKED BY : G.R. PERFETTI	DATE : 4-16-92		

13-AUG-1996 14:44
dottie

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

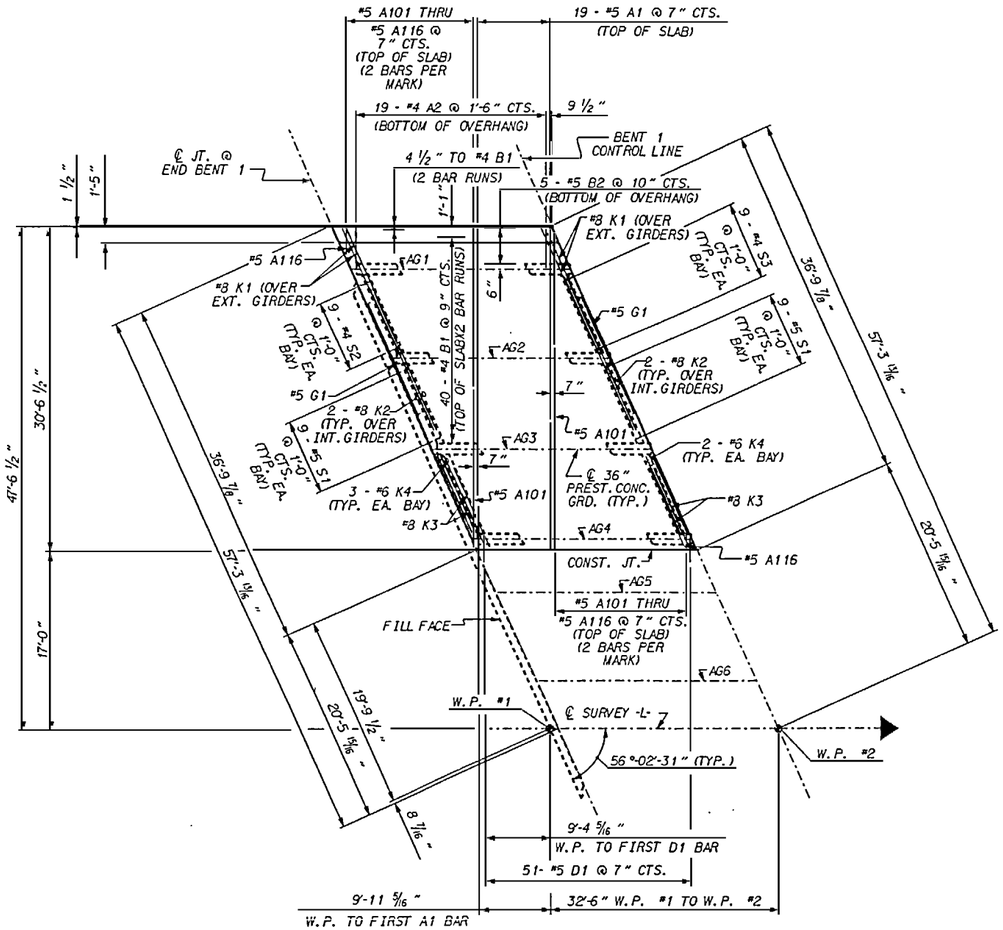
STANDARD PRECAST PRESTRESSED CONCRETE DECK PANELS

NORTH CAROLINA PROFESSIONAL SEAL 14990 ENGINEER CHARLES RUFF 2-1-97

AUG. 1992

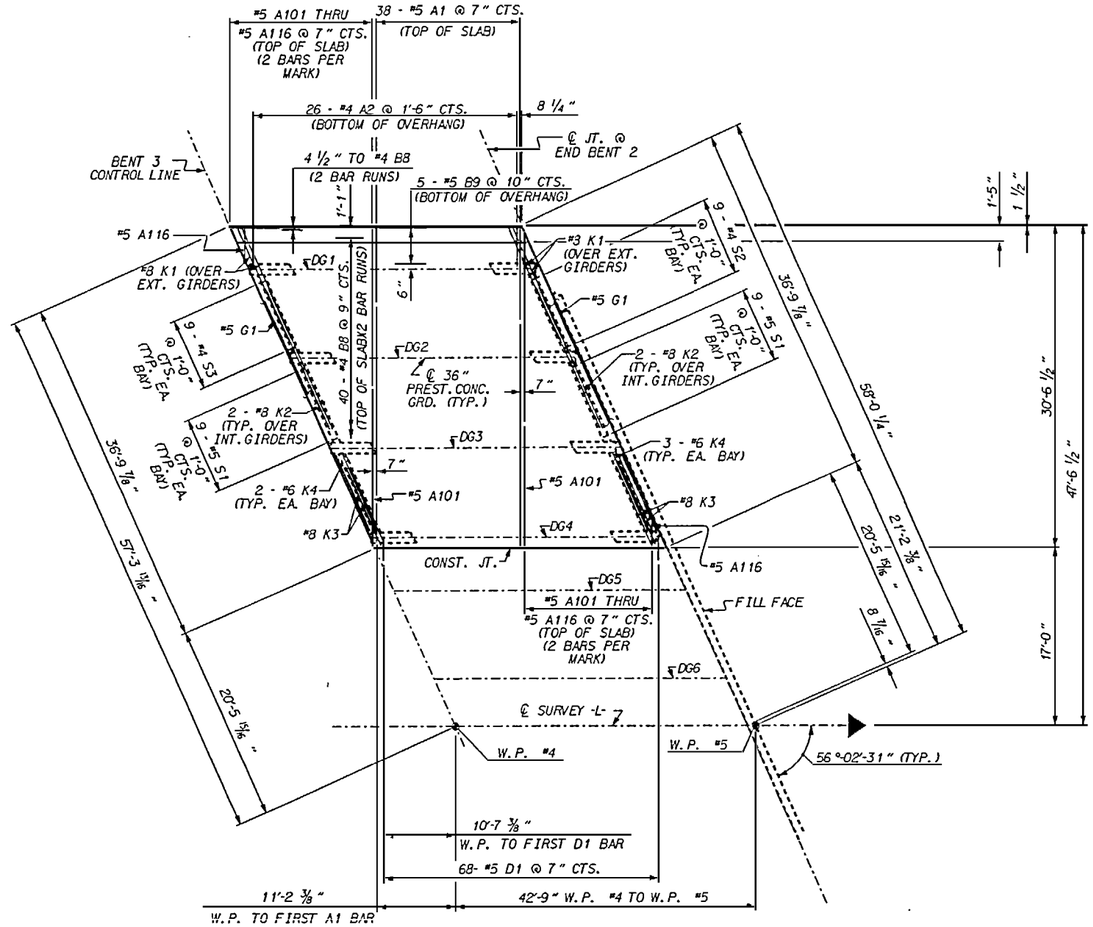
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-215
1			3			TOTAL SHEETS
2			4			264

STD. NO. PDP1



SPAN A

STAGE 1



SPAN D

STAGE 1

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN A AND SPAN D STAGE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2116
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 024054 ENGINEER HUGH CHARLES HUNT 2-3-97

DRAWN BY : D. G. VESTER DATE : 4-9-96
CHECKED BY : V. X. Nguyen DATE : 1-31-97

31-JAN-1997 11:47
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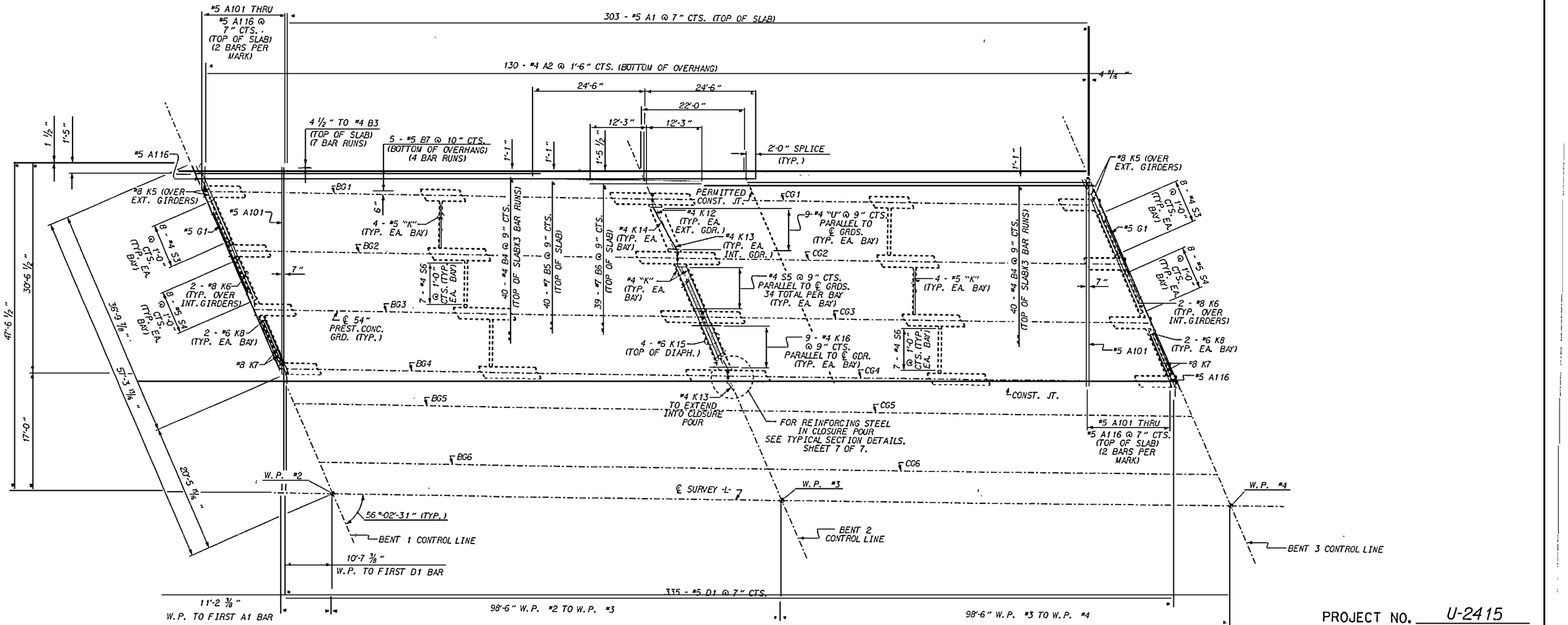

SPAN B AND SPAN C
STAGE 1

DRAWN BY : D. G. VESTER DATE : 4-15-96
CHECKED BY : V. X. Nguyen DATE : 1.31.97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN B AND SPAN C STAGE 1

NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER MUCK CHARLES HUNT
2-5-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-217
1			3			TOTAL SHEETS
2			4			264

31-JAN-1997 12:00
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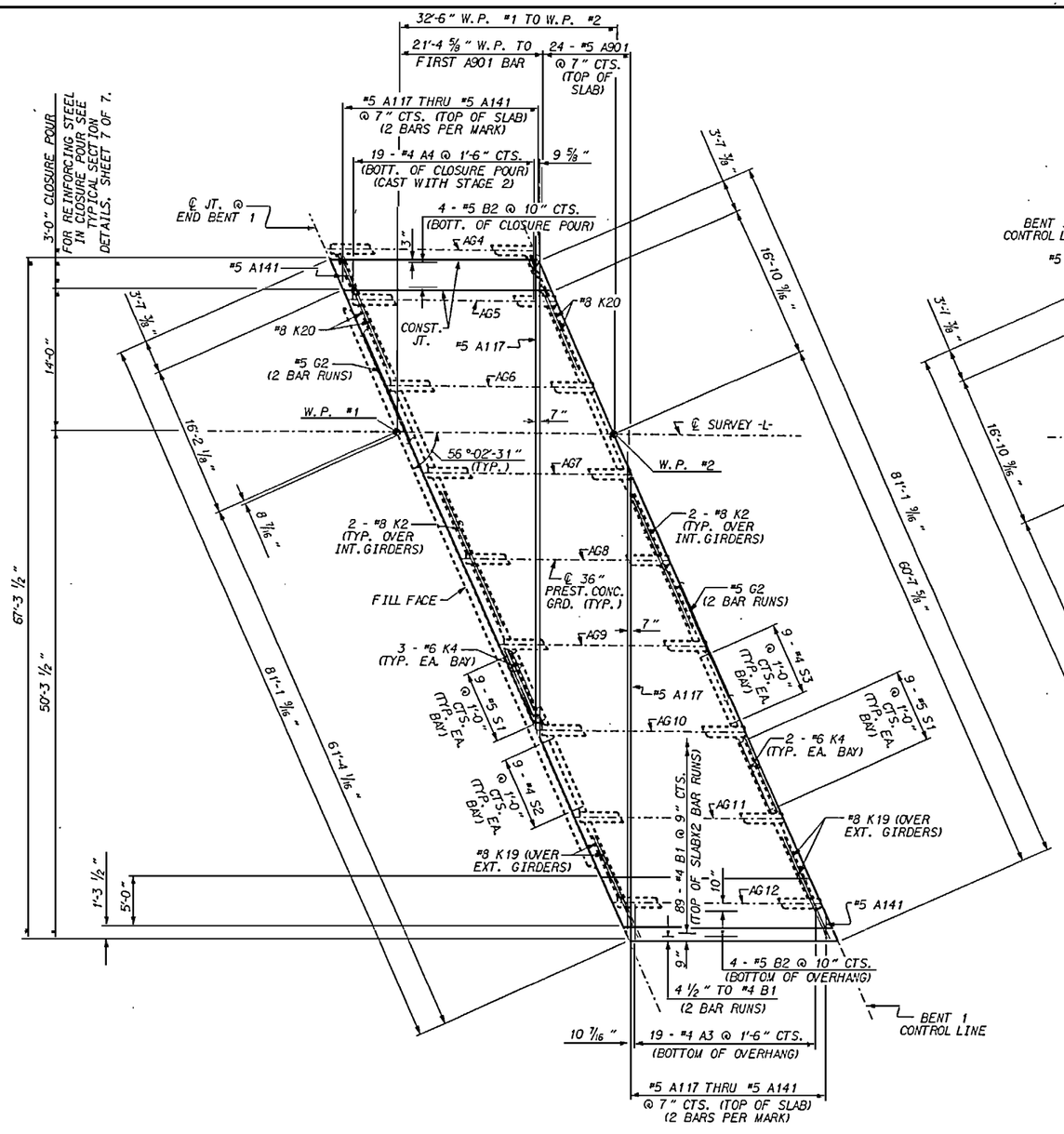
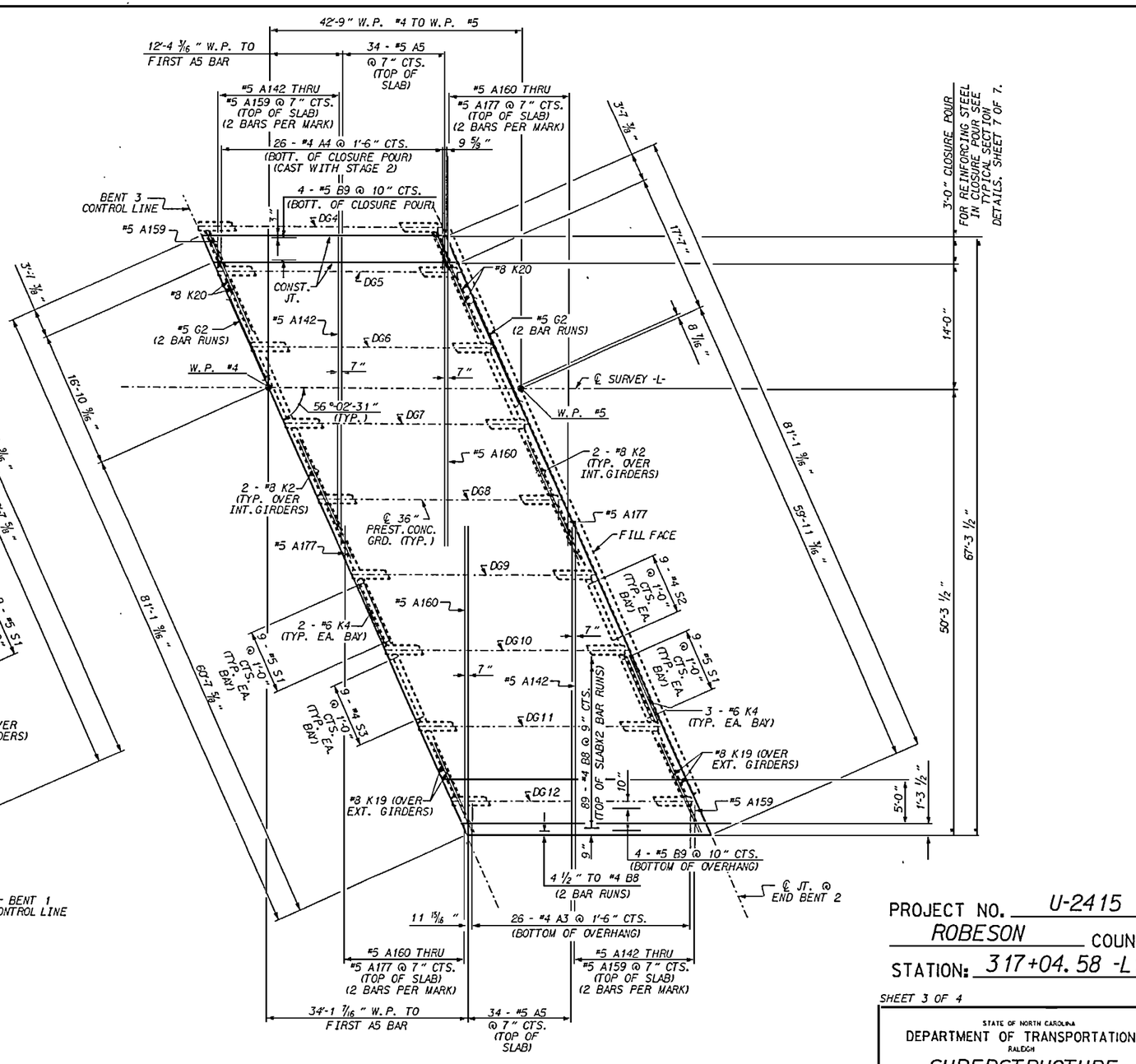


SPAN A
STAGE 2



SPAN D
STAGE 2

FOR REINFORCING STEEL IN SIDEWALK SEE SHEET ENTITLED "PLAN OF SIDEWALK DETAIL STAGE 2".

DRAWN BY : D. G. VESTER DATE : 4-22-96
CHECKED BY : V. K. Nawun DATE : 1.31-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 3 OF 4

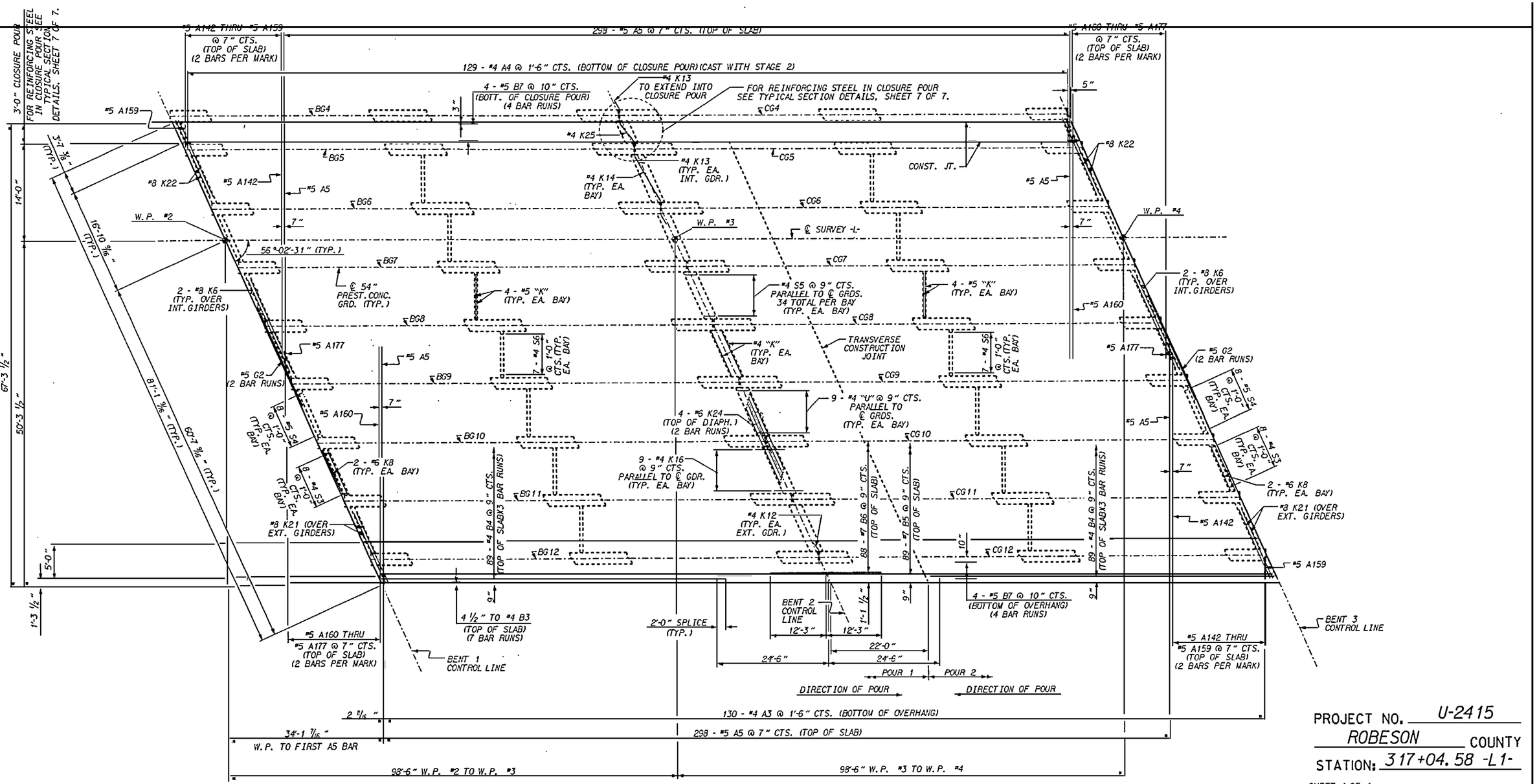
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN A AND SPAN D STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-218
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14094 ENGINEER CHARLES RUNK 2-3-97

31-JAN-1997 12:07
dottie



SPAN B AND SPAN C
STAGE 2

FOR REINFORCING STEEL IN SIDEWALK SEE SHEET ENTITLED "PLAN OF SIDEWALK DETAIL STAGE 2".

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN B AND SPAN C STAGE 2

NORTH CAROLINA PROFESSIONAL SEAL 14034 ENGINEER PATRICK CHARLES HUNT
2-5-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-219
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : D. G. VESTER DATE : 4-19-96
CHECKED BY : V. X. Nguyen DATE : 1-31-97

31-JAN-1997 12:07
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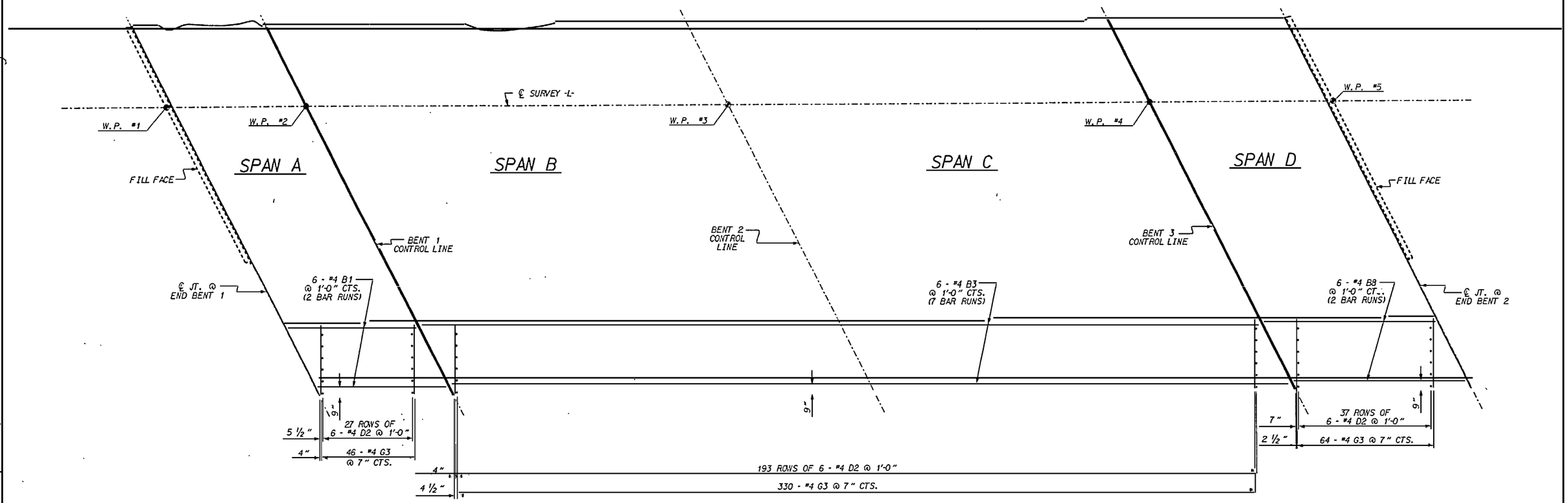
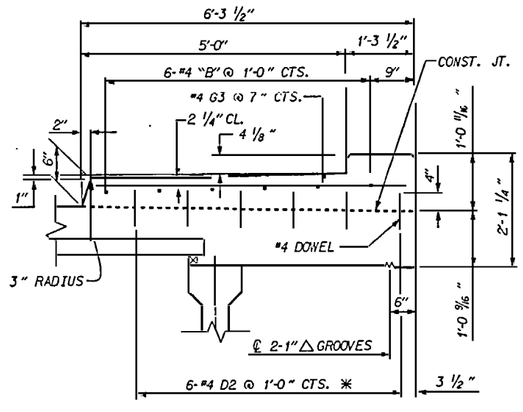


PLAN OF SIDEWALK



SECTION THRU SIDEWALK

*DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF

NOTES:
FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 2 OF 2 (STAGE 2).

ALL COSTS FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB".

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SIDEWALK DETAIL STAGE 2

NORTH CAROLINA PROFESSIONAL SEAL 014091 ENGINEER BUCK CHARLES HUNT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-220
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : D. G. VESTER DATE : 4-25-96
CHECKED BY : V. X. Nguyen DATE : 1-31-97

31-JAN-1997 12:14
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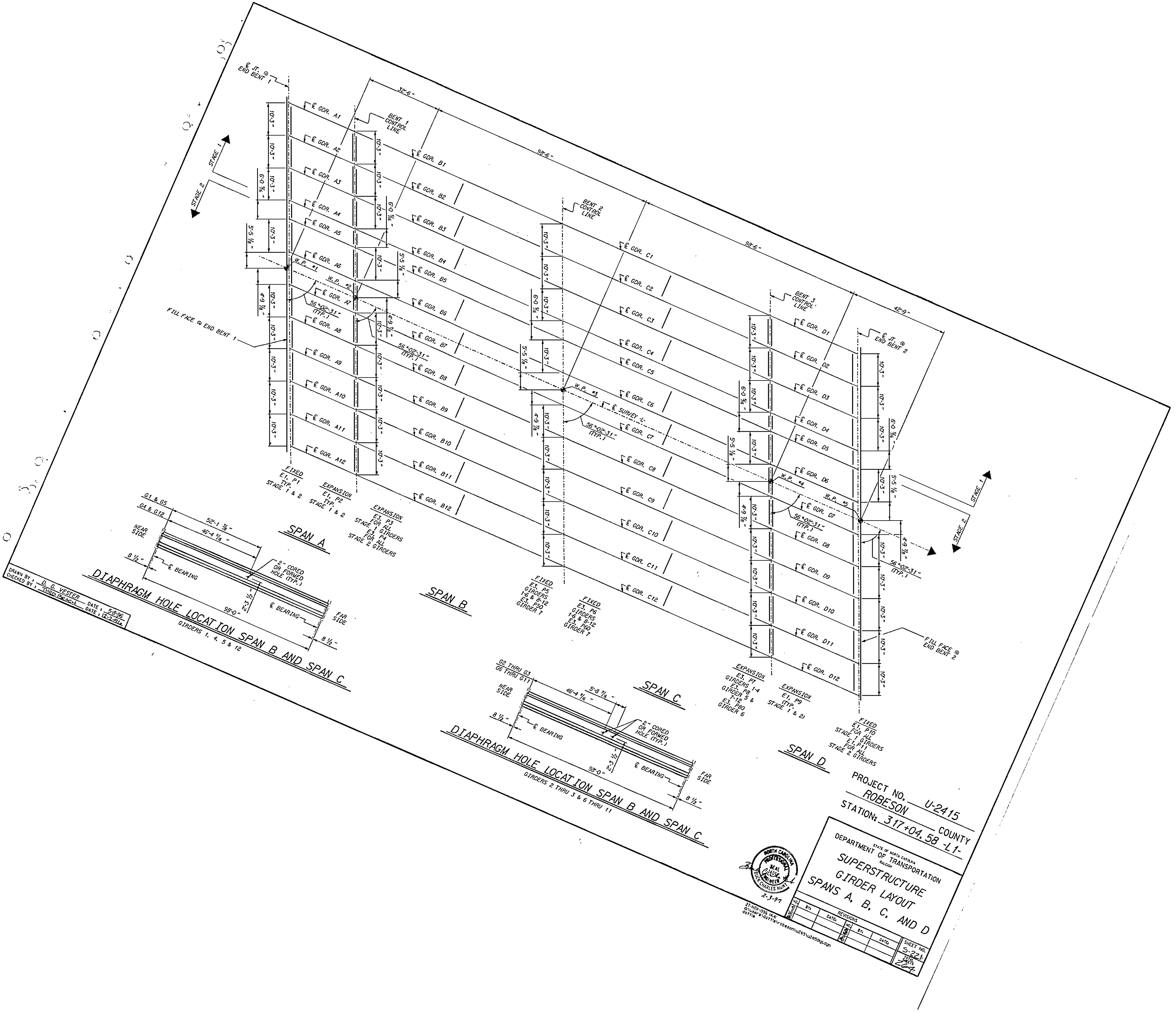
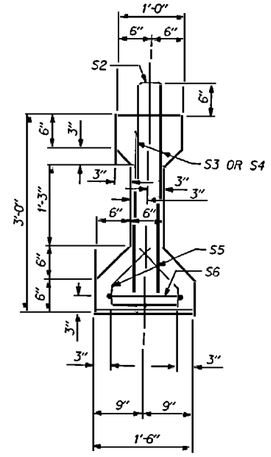
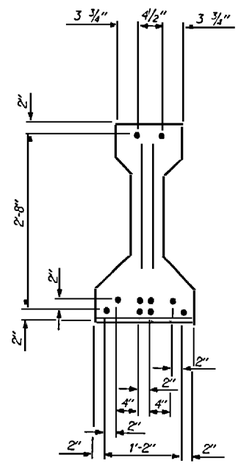


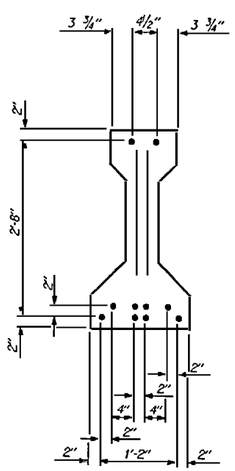
℄ JT. @ END BENT 1
BENT 1 CONTROL LINE
BENT 2 CONTROL LINE
BENT 3 CONTROL LINE
℄ JT. @ END BENT 2
STAGE 1
STAGE 2
FILL FACE @ END BENT 1
FILL FACE @ END BENT 2
℄ SURVEY -L-
W.P. #1
W.P. #2
W.P. #4
W.P. #5
56°02'31" (TYP.)
32'-6"
98'-6"
98'-6"
42'-9"
℄ GDR. A1
℄ GDR. A2
℄ GDR. A3
℄ GDR. A4
℄ GDR. A5
℄ GDR. A6
℄ GDR. A7
℄ GDR. A8
℄ GDR. A9
℄ GDR. A10
℄ GDR. A11
℄ GDR. A12
℄ GDR. B1
℄ GDR. B2
℄ GDR. B3
℄ GDR. B4
℄ GDR. B5
℄ GDR. B6
℄ GDR. B7
℄ GDR. B8
℄ GDR. B9
℄ GDR. B10
℄ GDR. B11
℄ GDR. B12
℄ GDR. C1
℄ GDR. C2
℄ GDR. C3
℄ GDR. C4
℄ GDR. C5
℄ GDR. C6
℄ GDR. C7
℄ GDR. C8
℄ GDR. C9
℄ GDR. C10
℄ GDR. C11
℄ GDR. C12
℄ GDR. D1
℄ GDR. D2
℄ GDR. D3
℄ GDR. D4
℄ GDR. D5
℄ GDR. D6
℄ GDR. D7
℄ GDR. D8
℄ GDR. D9
℄ GDR. D10
℄ GDR. D11
℄ GDR. D12
FIXED E1, P1 TYP. STAGE 1 & 2
EXPANSION E1, P2 TYP. STAGE 1 & 2
EXPANSION E3, P3 FOR ALL STAGE 1 GIRDERS E3, P4 FOR ALL STAGE 2 GIRDERS
FIXED E3, P5 GIRDERS 1-6 & 8-12 E3, P50 GIRDER 7
FIXED E3, P6 GIRDERS 1-6 & 8-12 E3, P60 GIRDER 7
EXPANSION E3, P7 GIRDERS 1-4 E3, P8 GIRDER 5 & 7-12 E3, P80 GIRDER 6
EXPANSION E1, P9 (TYP. STAGE 1 & 2)
FIXED E1, P10 FOR ALL STAGE 1 GIRDERS E1, P11 FOR ALL STAGE 2 GIRDERS
SPAN A
SPAN B
SPAN C
SPAN D
G1 & G5
G4 & G12
NEAR SIDE
FAR SIDE
52'-1 3/4"
46'-4 11/16"
2" CORED OR FORMED HOLE (TYP.)
℄ BEARING
98'-0"
8 1/2"
2'-3 1/2"
DIAPHRAGM HOLE LOCATION SPAN B AND SPAN C
GIRDERS 1, 4, 5 & 12
G2 THRU G3
G6 THRU G11
5'-8 11/16"
46'-4 11/16"
DIAPHRAGM HOLE LOCATION SPAN B AND SPAN C
GIRDERS 2 THRU 3 & 6 THRU 11
DRAWN BY: D. G. VESTER DATE: 5-8-96
CHECKED BY:
PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GIRDER LAYOUT
SPANS A, B, C, AND D
REVISIONS
SHEET NO. S-22



SECTION A-A

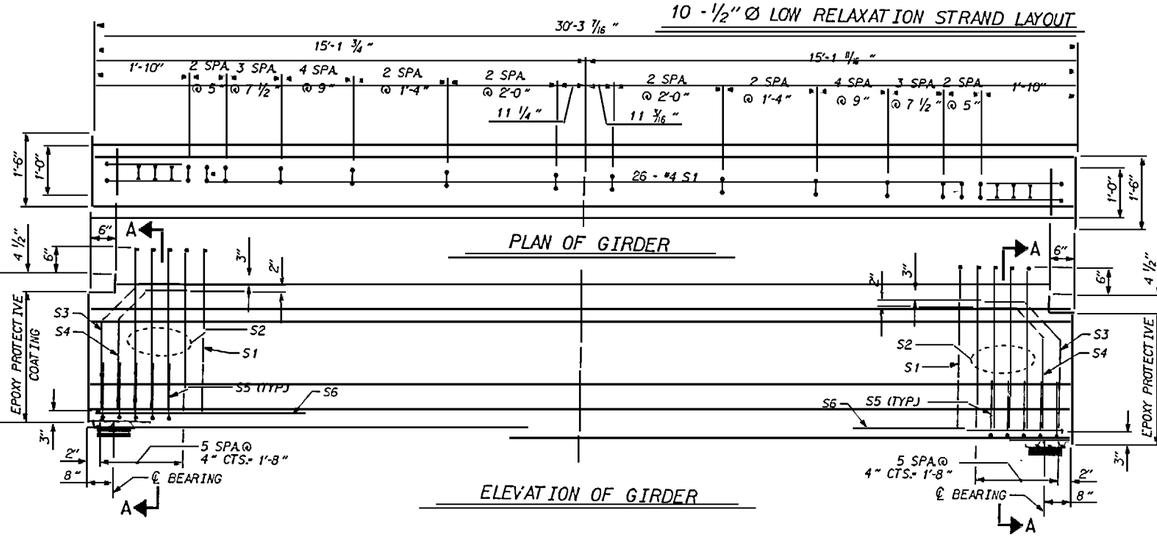


AT END OF GIRDER



AT ℄ OF GIRDER

10 - 1/2" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

ELEVATION OF GIRDER

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE 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.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

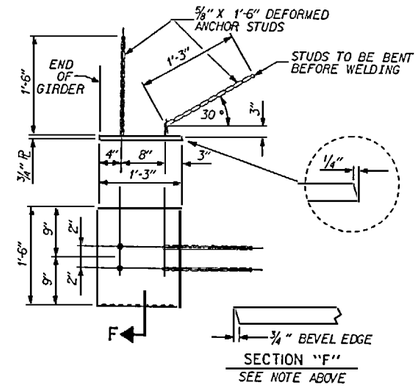
DEFORMED ANCHOR STUDS SHALL CONFORM TO ASTM A-496. WELDING PROCEDURE QUALIFICATION TEST FOR DEFORMED ANCHOR STUDS MAY BE REQUIRED.

ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

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

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.



EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

NORTH CAROLINA PROFESSIONAL SEAL 14092 ENGINEER BRUCE CHARLES HUNT

6-16-99

1/2" • L. R. GRADE 270 STRANDS

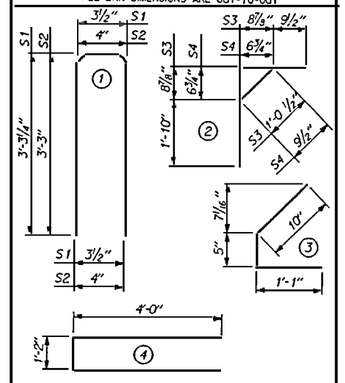
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	26	#4	1	6'-10"	119
S2	8	#5	1	6'-10"	57
S3	4	#6	2	3'-8"	22
S4	4	#6	2	3'-5"	21
S5	20	#4	3	2'-4"	31
S6	2	#4	4	9'-2"	12

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	1/2" • L.R. STRANDS No.
INTERIOR GIRDER	262	2.9	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
12	30'-3 7/16"	363'-5 1/4"

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 36" PRESTRESSED CONCRETE GIRDER SPAN A

FEB. 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-222
1	BCH	6-15-99	3			TOTAL SHEETS
2			4			264

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2" Ø LOW RELAXATION	SPAN A GIRDERS 1 AND 12										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.008	0.015	0.020	0.023	0.024	0.023	0.020	0.015	0.008	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.003	0.005	0.007	0.008	0.008	0.008	0.007	0.005	0.003	0.000
FINAL CAMBER	0.000	0.005	0.010	0.013	0.015	0.016	0.015	0.013	0.010	0.005	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2" Ø LOW RELAXATION	SPAN A GIRDERS 2 THRU 11										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.008	0.015	0.020	0.023	0.024	0.023	0.020	0.015	0.008	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.002	0.005	0.006	0.008	0.008	0.008	0.006	0.005	0.002	0.000
FINAL CAMBER	0.000	0.006	0.010	0.014	0.015	0.016	0.015	0.014	0.010	0.006	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

ASSEMBLED BY: D.G.VESTER DATE: 5-9-96
CHECKED BY: T.J.PEACH DATE: 6/16/99 — SPECIAL

DRAWN BY: MIKE BRITT DATE: NOV. 1987
CHECKED BY: RANDY BISSETTE DATE: NOV. 1987 — STANDARD

REV. 6/1/94 EEM (A) GRP
REV. 6-16-95 EEM (A) RGW

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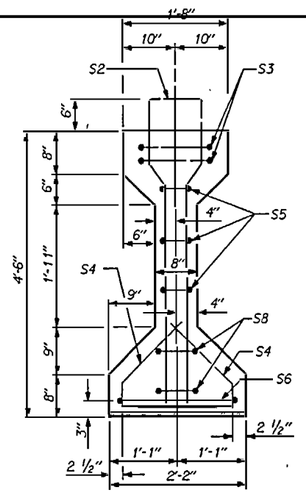
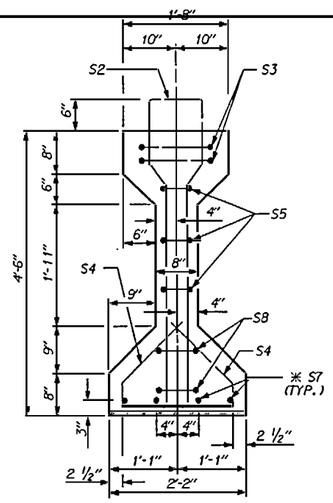
REVISION #1: REVISED TO ADD DEAD LOAD DEFLECTION TABLES, BY: BCH 6-15-99, CK. BY: TJP 6/16/99

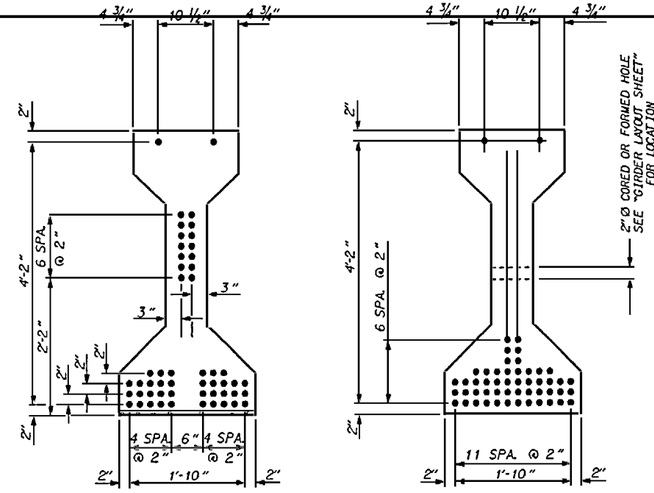
STD.No.PCG1



SECTION A-A



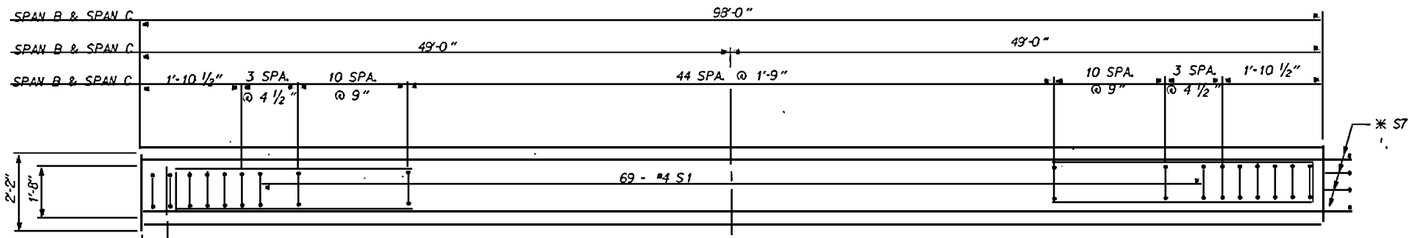
SECTION B-B



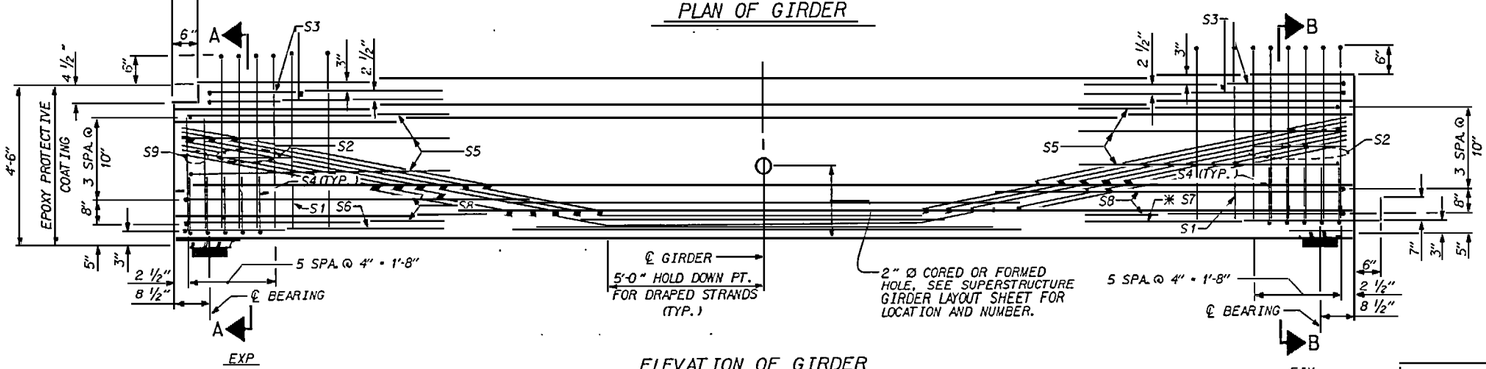
AT END OF GIRDER

AT ℄ OF GIRDER

52 - ½" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

FOR NOTES SEE "STANDARD PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET 3 OF 4.

½" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

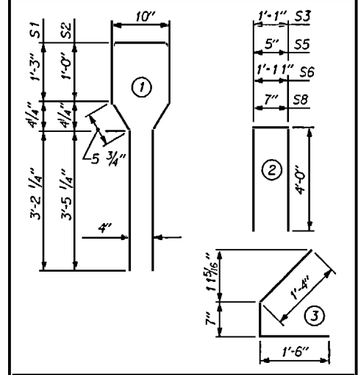
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	69	#4	1	10'-8"	492
S2	10	#6	1	10'-8"	160
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
S9	4	#6	STR	3'-7"	22

* 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 LB.	8,000 PSI CONCRETE C.Y.	½" Ø L.R. STRANDS No.
SPAN B	830	19.9	52
SPAN C	830	19.9	52

GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN B	12	98'-0"	1176'-0"
SPAN C	12	98'-0"	1176'-0"

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 54" PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPANS B & C

NOVEMBER 1991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-223
1			3			TOTAL SHEETS
2			4			264

STD. No. PCG6

NORTH CAROLINA PROFESSIONAL SEAL 14031 ENGINEER BUCK CHARLES HUNT 2-3-97

ASSEMBLED BY: D. G. VESTER DATE: 5-10-96	CHECKED BY: THEO BEACH DATE: 12-2-96	SPECIAL
DRAWN BY: ED ROSE DATE: AUG. 1991	CHECKED BY: GREG PERFETTI DATE: AUG. 1991	STANDARD

REV. 6/1/94 EEM (N GRP

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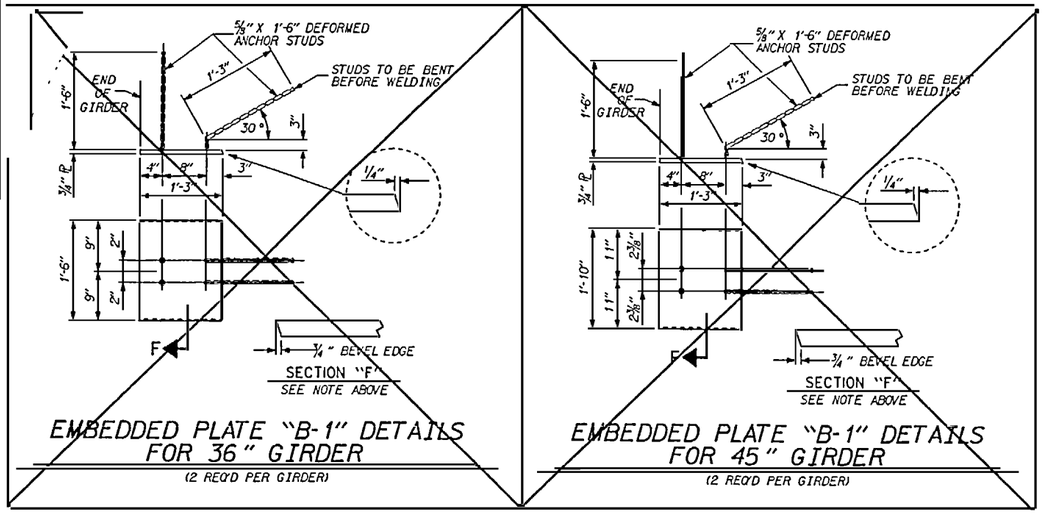
dottie

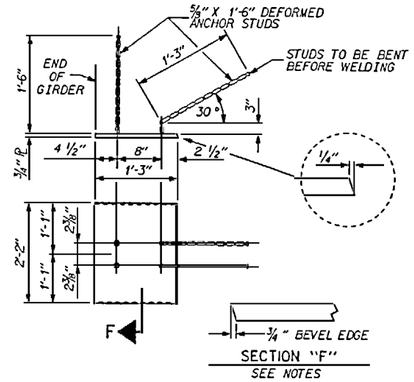


EMBEDDED PLATE "B-1" DETAILS FOR 36" GIRDER

(2 REQ'D PER GIRDER)

EMBEDDED PLATE "B-1" DETAILS FOR 45" GIRDER

(2 REQ'D PER GIRDER)



EMBEDDED PLATE "B-1" DETAILS FOR 54" GIRDER

(2 REQ'D PER GIRDER)

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE 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 AASHTO M270 GRADE 36 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-496. WELDING PROCEDURE QUALIFICATION TEST FOR DEFORMED ANCHOR STUDS MAY BE REQUIRED.

AT FIXED ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER END. EXPOSED PRESTRESSING STRANDS AT EXPANSION ENDS OF GIRDERS SHALL BE CUT FLUSH WITH GIRDER END.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5400 PSI.

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

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.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

FOR HIGH STRENGTH PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

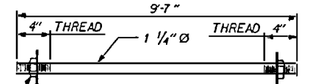
1/2"Ø LOW RELAXATION	SPAN B GIRDER 1										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.120	0.228	0.312	0.365	0.384	0.365	0.312	0.228	0.120	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.053	0.101	0.138	0.161	0.169	0.161	0.138	0.101	0.053	0.000
FINAL CAMBER	0.000	0.067	0.127	0.174	0.204	0.215	0.204	0.174	0.127	0.067	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2"Ø LOW RELAXATION	SPAN B GIRDERS 10 AND 11										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.120	0.228	0.312	0.365	0.384	0.365	0.312	0.228	0.120	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.052	0.099	0.136	0.159	0.167	0.159	0.136	0.099	0.052	0.000
FINAL CAMBER	0.000	0.068	0.129	0.176	0.206	0.217	0.206	0.176	0.129	0.068	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)



℄ 1/2" X 4"Ø WASHER AND HEX NUT (EACH END)

1 1/4"Ø TIE ROD ASSEMBLY

(20 COMPLETE ASSEMBLIES REQUIRED)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2"Ø LOW RELAXATION	SPAN B GIRDERS 2 THRU 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.120	0.228	0.312	0.365	0.384	0.365	0.312	0.228	0.120	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.051	0.097	0.133	0.155	0.163	0.155	0.133	0.097	0.051	0.000
FINAL CAMBER	0.000	0.069	0.131	0.179	0.210	0.221	0.210	0.179	0.131	0.069	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2"Ø LOW RELAXATION	SPAN B GIRDERS 12										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.120	0.228	0.312	0.365	0.384	0.365	0.312	0.228	0.120	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.047	0.089	0.122	0.143	0.150	0.143	0.122	0.089	0.047	0.000
FINAL CAMBER	0.000	0.073	0.139	0.190	0.222	0.234	0.222	0.190	0.139	0.073	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2"Ø LOW RELAXATION	SPAN B GIRDERS 5 THRU 9										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.120	0.228	0.312	0.365	0.384	0.365	0.312	0.228	0.120	0.000
*DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.049	0.092	0.126	0.147	0.155	0.147	0.126	0.092	0.049	0.000
FINAL CAMBER	0.000	0.071	0.136	0.186	0.218	0.229	0.218	0.186	0.136	0.071	0.000

*INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NOVEMBER 1991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-224
1	BCH	6-15-99	3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER CHARLES HUNT
6-16-99

ASSEMBLED BY: D.G.VESTER	DATE: 5-10-96	SPECIAL
CHECKED BY: T.J. BEACH	DATE: 6/16/99	
DRAWN BY: ED ROSE	DATE: NOV. 1991	STANDARD
CHECKED BY: GREG PERFETTI	DATE: NOV. 1991	

REVISION #1: REVISED TO ADD DEAD LOAD DEFLECTION TABLES, BY: BCH 6-15-99, CK. BY: TJB 6/16/99

REV. 6/1/94 EEM (A) GRP
REV. 6-16-95R EEM (A) RGW

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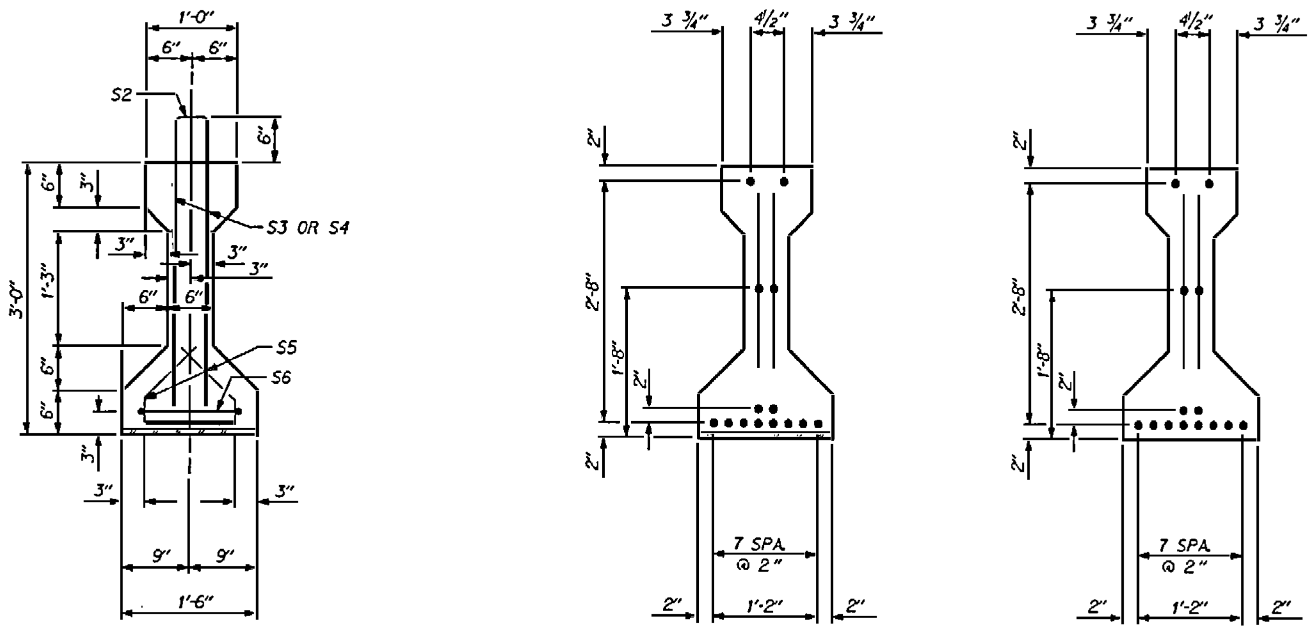
STD.NO. PCG7

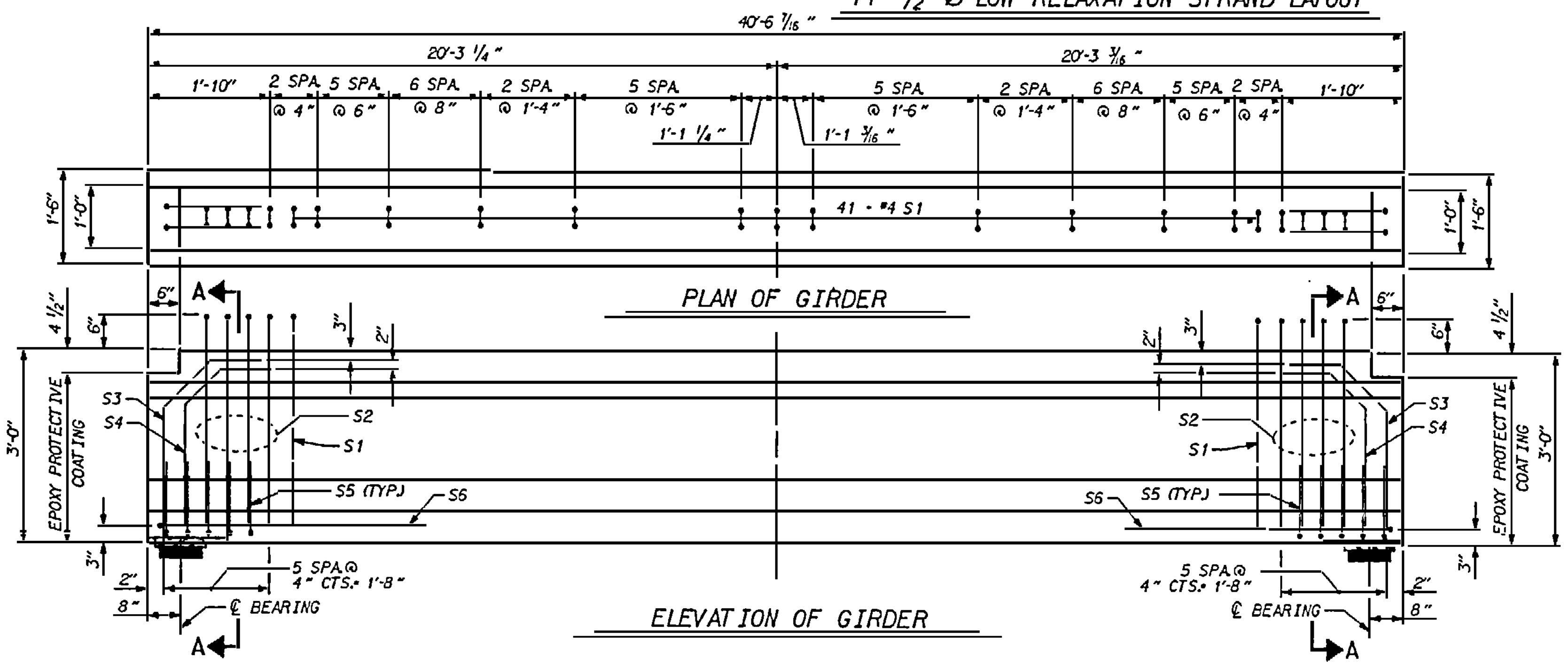


SECTION A-A

AT END OF GIRDER

AT ℄ OF GIRDER

14 - 1/2" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

ELEVATION OF GIRDER

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE 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.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

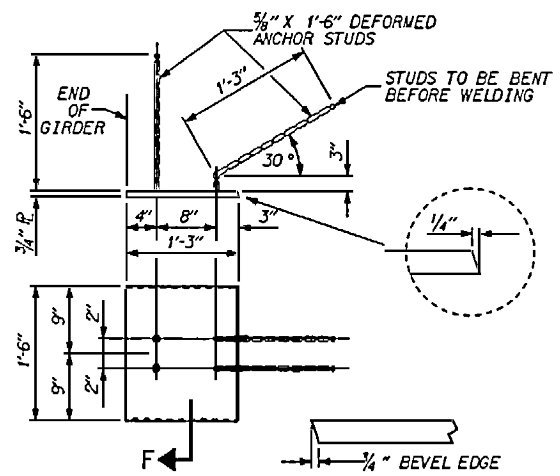
DEFORMED ANCHOR STUDS SHALL CONFORM TO ASTM A-496.WELDING PROCEDURE QUALIFICATION TEST FOR DEFORMED ANCHOR STUDS MAY BE REQUIRED.

ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

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

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.



SECTION "F"
SEE NOTE ABOVE

EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

6-16-99

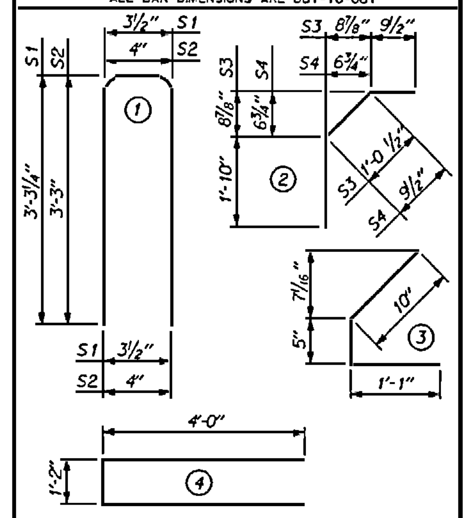
1/2" • L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	41	#4	1	6'-10"	187
S2	8	#5	1	6'-10"	57
S3	4	#6	2	3'-8"	22
S4	4	#6	2	3'-5"	21
S5	20	#4	3	2'-4"	31
S6	2	#4	4	9'-2"	12

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	1/2" • L.R. STRANDS No.
INTERIOR GIRDER	330	3.8	14

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
12	40'-6 7/16"	486'-5 1/4"

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
36" PRESTRESSED
CONCRETE GIRDER
SPAN D

FEB. 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-225
1	BCH	6-15-99	3			TOTAL SHEETS 264
2			4			

STD.No.PCG1

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2" Ø LOW RELAXATION	SPAN D GIRDERS 1 AND 12										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.017	0.032	0.044	0.051	0.054	0.051	0.044	0.032	0.017	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.009	0.017	0.023	0.027	0.028	0.027	0.023	0.017	0.009	0.000
FINAL CAMBER	0.000	0.008	0.015	0.021	0.024	0.026	0.024	0.021	0.015	0.008	0.000

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

1/2" Ø LOW RELAXATION	SPAN D GIRDERS 2 THRU 11										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.017	0.032	0.044	0.051	0.054	0.051	0.044	0.032	0.017	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.008	0.016	0.022	0.025	0.027	0.025	0.022	0.016	0.008	0.000
FINAL CAMBER	0.000	0.009	0.016	0.022	0.026	0.027	0.026	0.022	0.016	0.009	0.000

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM)

ASSEMBLED BY: D.G.VESTER	DATE: 5-9-96	SPECIAL
CHECKED BY: T.J. BEACH	DATE: 6/16/99	
DRAWN BY: MIKE BRITT	DATE: NOV. 1987	STANDARD
CHECKED BY: RANDY BISSETTE	DATE: NOV. 1987	

REV. 6/1/94 EEM (✓) GRP
REV. 6-16-95 EEM (✓) RGW

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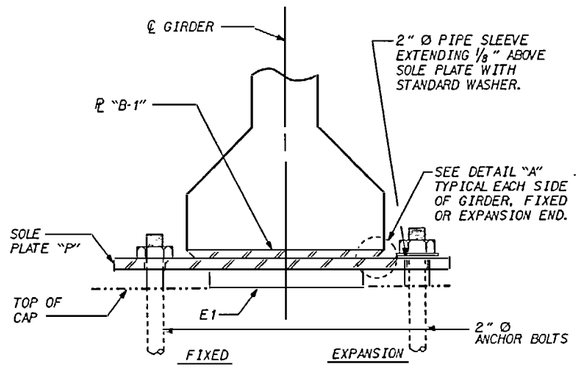
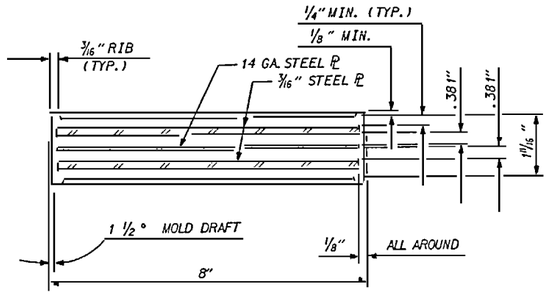
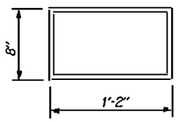
REVISION #1: REVISED TO ADD DEAD LOAD DEFLECTION TABLES, BY: BCH 6-15-99, CK. BY: TJB 6/16/99



SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS

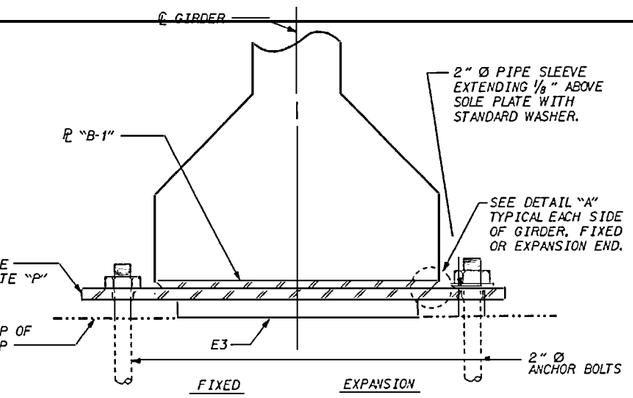


E1 (48 REQ'D)

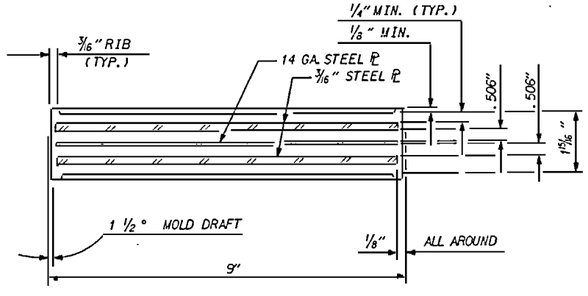
PLAN VIEW OF ELASTOMERIC BEARING

TYPE II

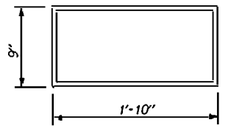
(36" PCG)



SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS

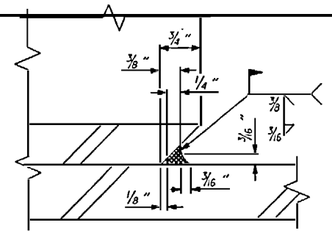


E3 (48 REQ'D)

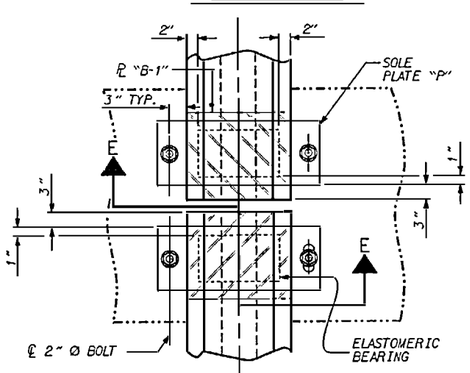
PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

(54" PCG)

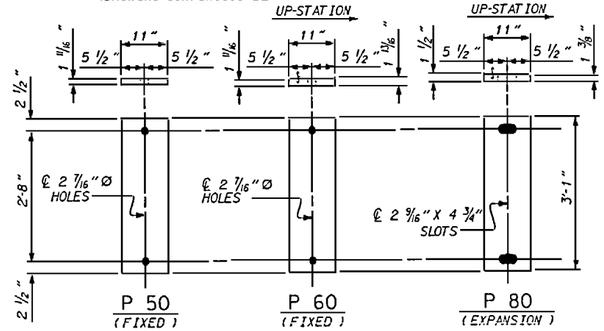


DETAIL "A"



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

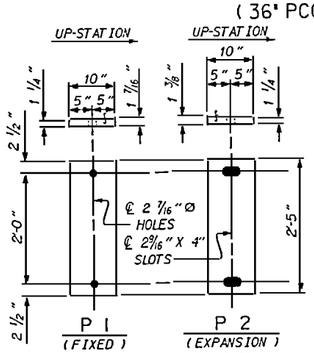
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



P 50 (FIXED) P50 (1 REQ'D)

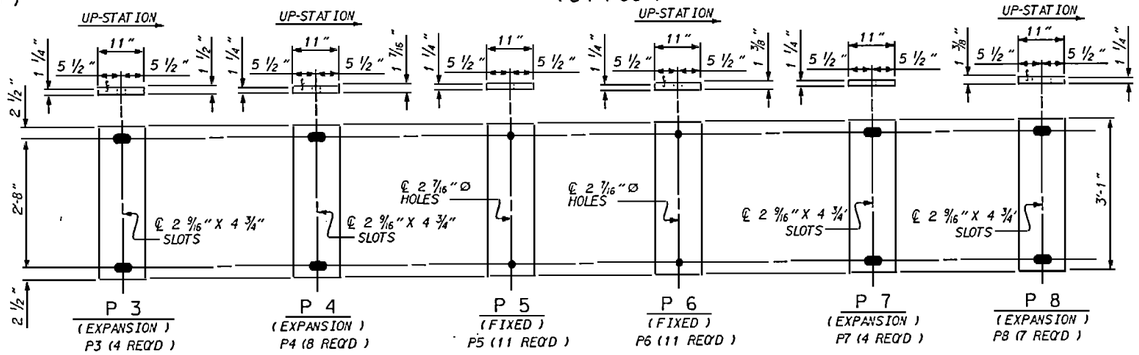
P 60 (FIXED) P60 (1 REQ'D)

P 80 (EXPANSION) P80 (1 REQ'D)



P 1 (FIXED) P1 (12 REQ'D)

P 2 (EXPANSION) P2 (12 REQ'D)



P 3 (EXPANSION) P3 (4 REQ'D)

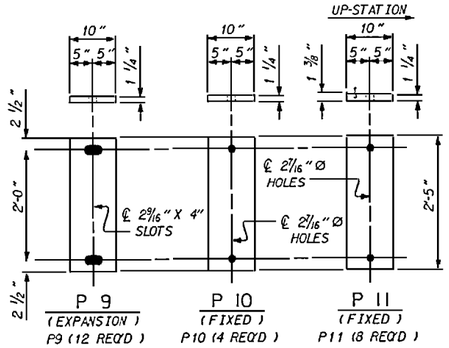
P 4 (EXPANSION) P4 (8 REQ'D)

P 5 (FIXED) P5 (11 REQ'D)

P 6 (FIXED) P6 (11 REQ'D)

P 7 (EXPANSION) P7 (4 REQ'D)

P 8 (EXPANSION) P8 (7 REQ'D)



P 9 (EXPANSION) P9 (12 REQ'D)

P 10 (FIXED) P10 (4 REQ'D)

P 11 (FIXED) P11 (8 REQ'D)

SOLE PLATE DETAILS ("P")

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.

FOR TYPE II & IV ELASTOMERIC BEARINGS USE 60 DUROMETER HARDNESS, SEE SPECIAL PROVISIONS.

— LOAD RATINGS —	
	MAX. D.L. + L.L.
36" PCG -TYPE II	112.0 K
~~45" PCG -TYPE III~~	~~144.0 K~~
54" PCG -TYPE IV	193.7 K

NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER JACK CHARLES HUNT 2-3-97

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER

AUGUST SUPERSTRUCTURE 1989

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-226
1			3			TOTAL SHEETS
2			4			264

STD. No. EB2

ASSEMBLED BY : D. G. VESTER	DATE : 5-13-96	SPECIAL
CHECKED BY : [illegible]	DATE : 1-2-97	
DRAWN BY : W.J. HARRIS	DATE : 8-22-89	STANDARD
CHECKED BY : C.R. KING	DATE : 8-22-89	

REVISED BY W.J.H. CHECKED BY T.R.P. 3-1-90
REVISED BY W.J.H. CHECKED BY T.R.P. 10-03-90
REVISED BY E.L.R. CHECKED BY G.R.P. 3-31-92
REVISED BY E.L.R. CHECKED BY G.R.P. 8-28-92

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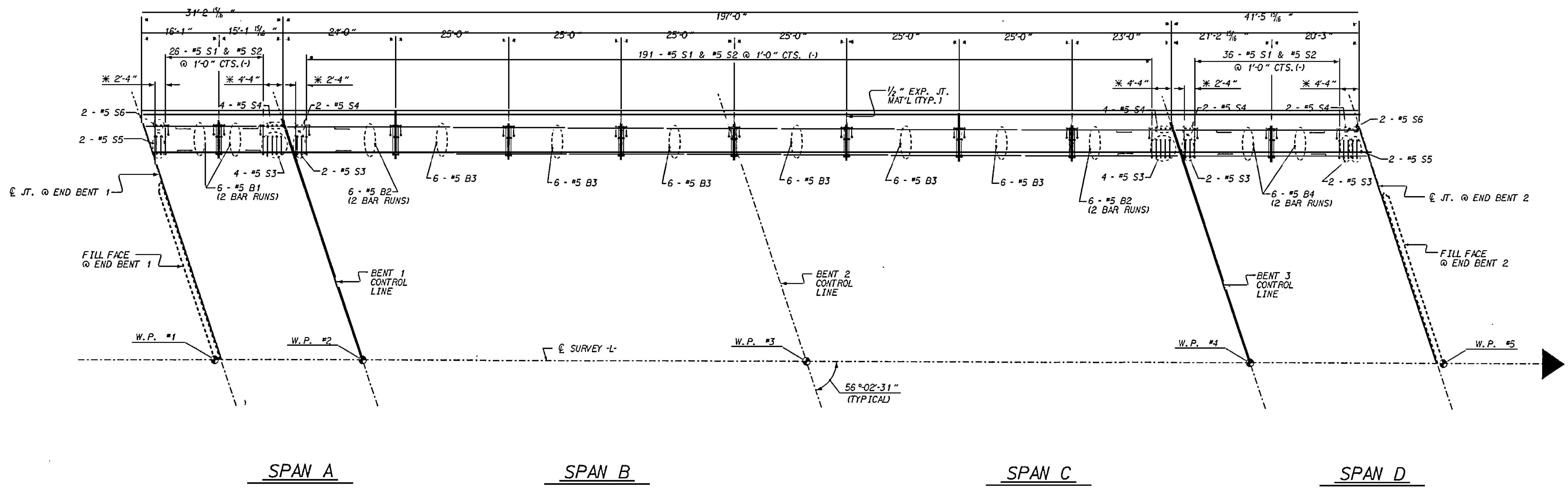
* SEE "PLAN VIEW AT JOINTS", SHEET 2 OF 2, FOR LOCATION OF BARS.



PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE
BARRIER RAIL
STAGE 1

REVISIONS						SHEET NO
NO.	BY:	DATE:	NO.	BY:	DATE:	S-227
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14031 ENGINEER BUCK CHARLES HUNT 2-7-97

DRAWN BY: D. G. VESTER DATE: 5-15-96
CHECKED BY: THEO BEACH DATE: 8-27-96

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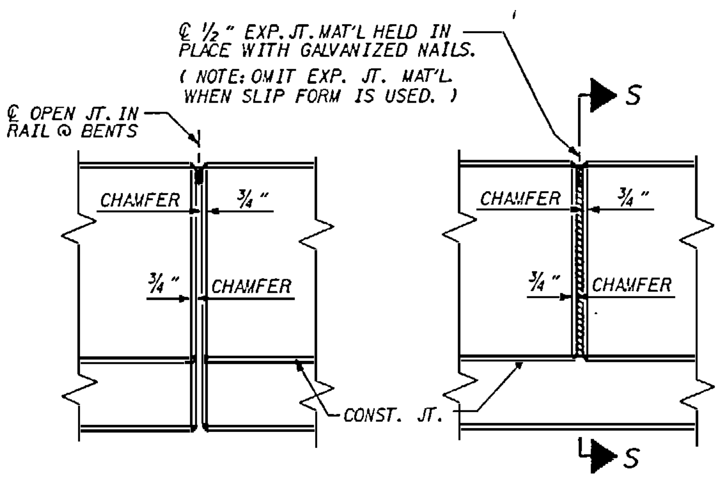
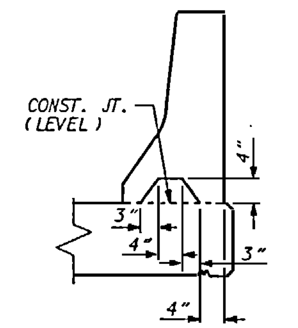
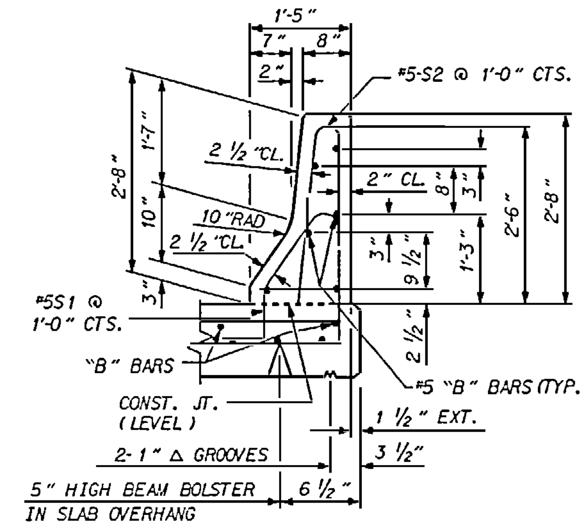
dottie



ELEVATION AT EXPANSION JOINTS



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



SECTION THRU RAIL

BARRIER RAIL DETAILS

NOTES

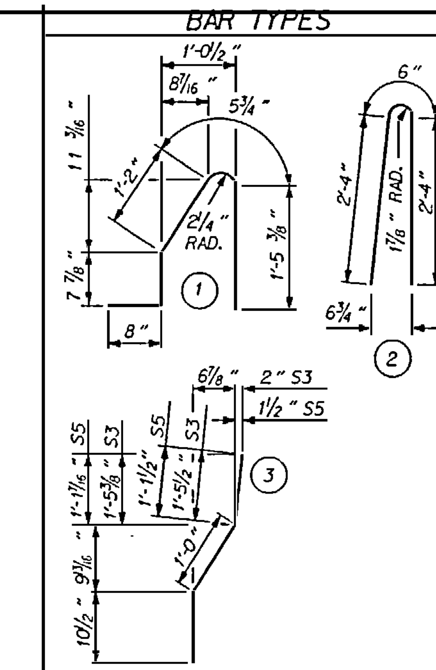
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL OR EVAZOTE 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.

THE #5S3 THRU #5S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. THE YIELD LOAD FOR THE #5 S3 THRU #5 S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BAR TYPES

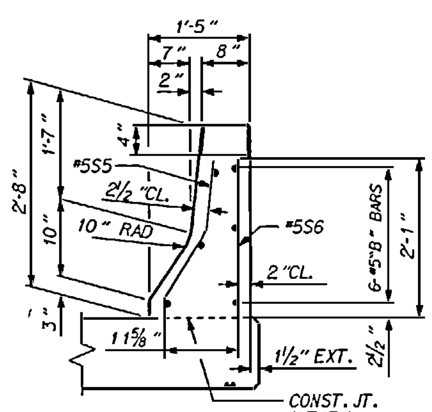


ALL BAR DIMENSIONS ARE OUT TO OUT

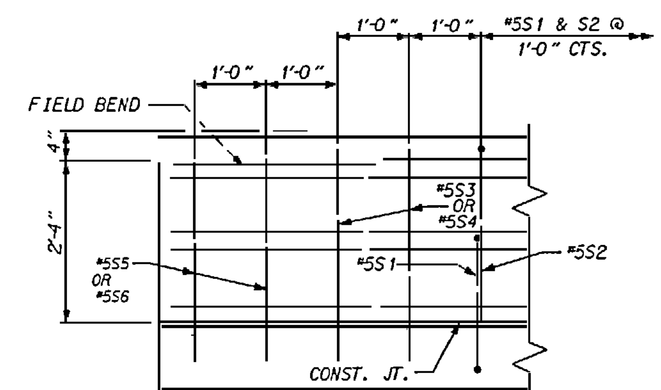
BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY
STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#5	STR	9'-7"	240
B2	24	#5	STR	13'-6"	338
B3	36	#5	STR	24'-7"	923
B4	24	#5	STR	12'-1"	302
S1	253	#5	1	4'-5"	1165
S2	253	#5	2	5'-2"	1363
S3	14	#5	3	3'-4"	49
S4	14	#5	STR	3'-2"	46
S5	4	#5	3	3'-0"	13
S6	4	#5	STR	2'-9"	11

EPOXY COATED REINFORCING STEEL	4450 LBS.
CLASS A-A CONCRETE	24.8 CU. YDS.
CONCRETE BARRIER RAIL	269.700 LIN. FT.

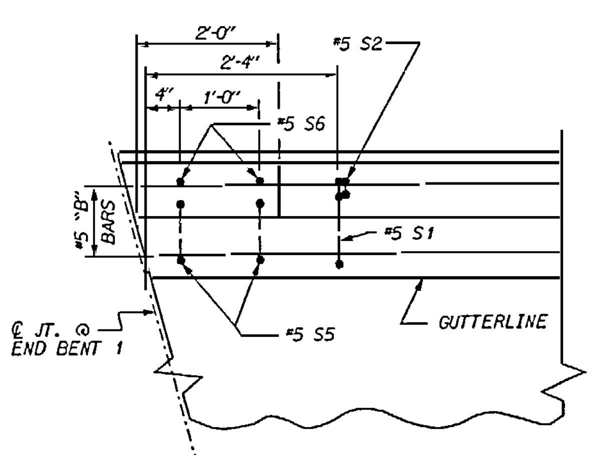


END VIEW

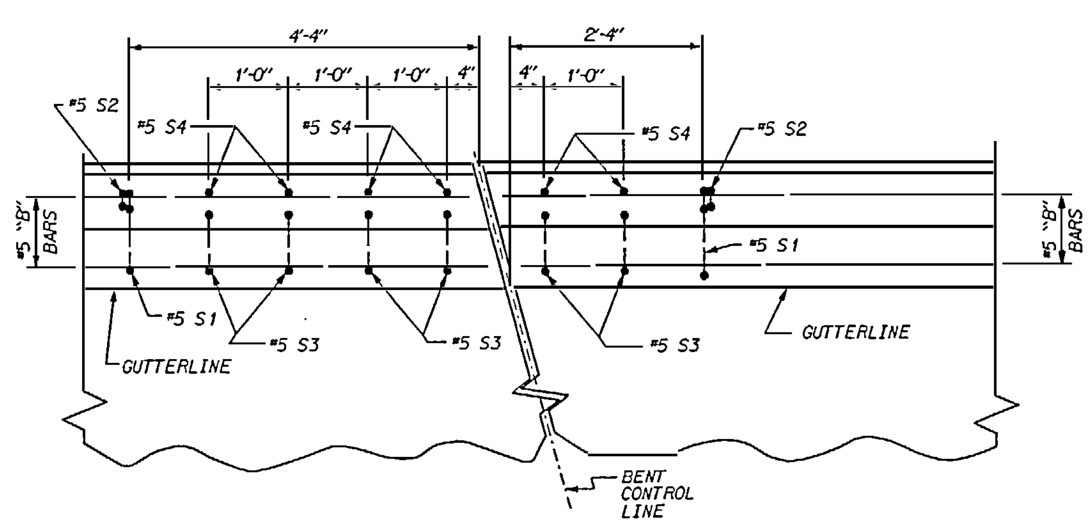


SIDE VIEW

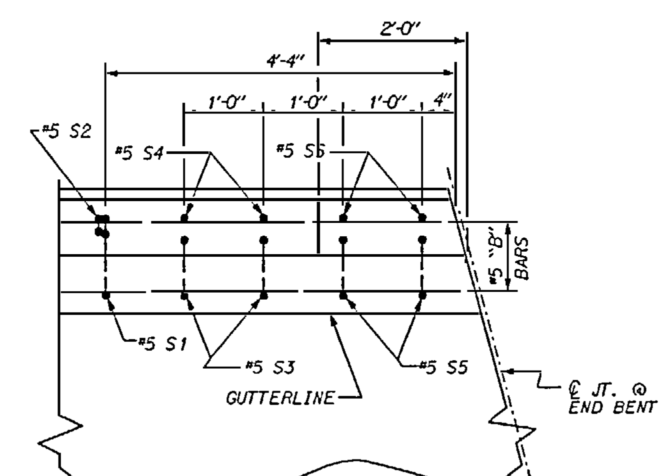
BARRIER RAIL- END OF RAIL DETAILS



PLAN @ END BENT 1



PLAN @ BENT 1 AND BENT 3



PLAN @ END BENT 2

PLAN VIEW AT JOINTS

2-3-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL

OCTOBER 1987

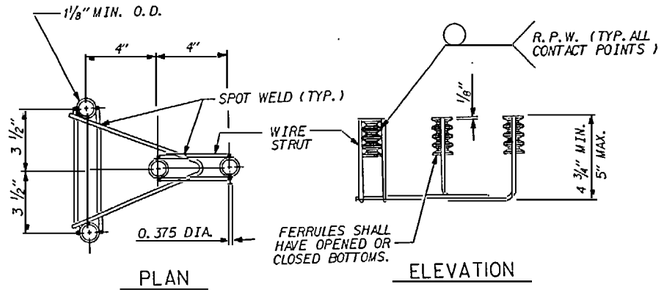
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-228
1			3			TOTAL SHEETS
2			4			264

STD. NO. CBR1

ASSEMBLED BY : D. G. VESTER DATE : 5-16-96 CHECKED BY : THD BEACH DATE : 12-7-96	SPECIAL
DRAWN BY : R. BISSETTE DATE : 5/28/87 CHECKED BY : S.J. DAVIS DATE : 9/3/87	STANDARD

REV. 6/1/94 EEM /4 GRP
REV. 6-16-95 EEM /4 RGW

27-NOV-1996 15:06



GUARDRAIL ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 4 - ⅞" Ø X 2 ¾" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø X 2 ¾" 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.)

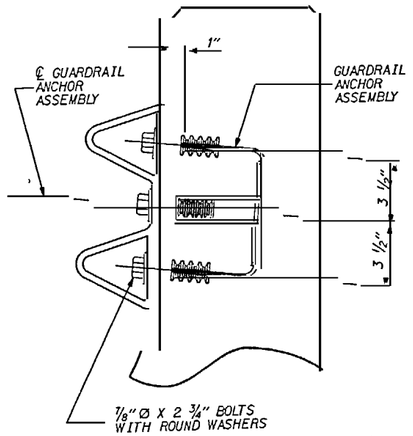
C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

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

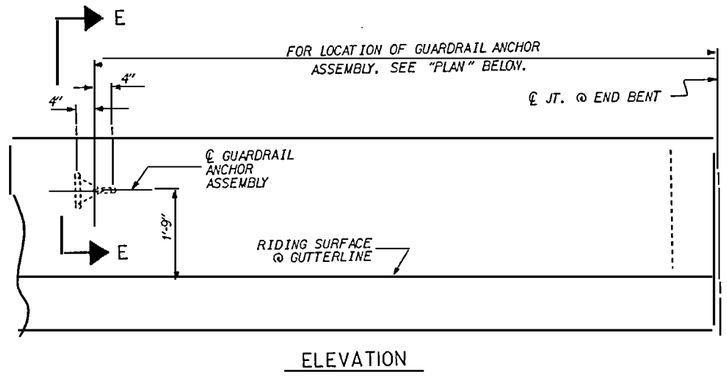
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

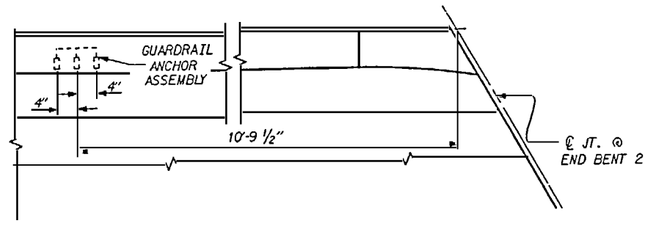
THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS". THE YIELD LOAD OF THE ⅞" Ø BOLT IS 16.6 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



SECTION E-E

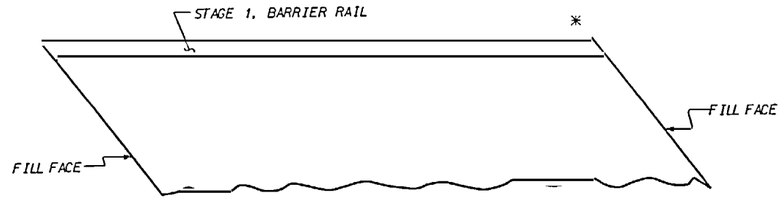


ELEVATION



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL



* DENOTES GUARDRAIL ANCHOR ASSEMBLY

SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL STAGE 1

FEB. 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-229
1			3			TOTAL SHEETS
2			4			264

STD. No. GRA1

NORTH CAROLINA PROFESSIONAL SEAL 14031 ENGINEER BUCK CHARLES HUNT
2-3-97

ASSEMBLED BY : D. G. VESTER	DATE : 5-17-96	SPECIAL
CHECKED BY : THEO BEACH	DATE : 8-21-96	
DRAWN BY : MIKE BRITT	DATE : DEC. 1987	STANDARD
CHECKED BY : RANDY BISSETTE	DATE : DEC. 1987	

REV. 6/1/94 EEM to GRP

13-AUG-1996 14:54
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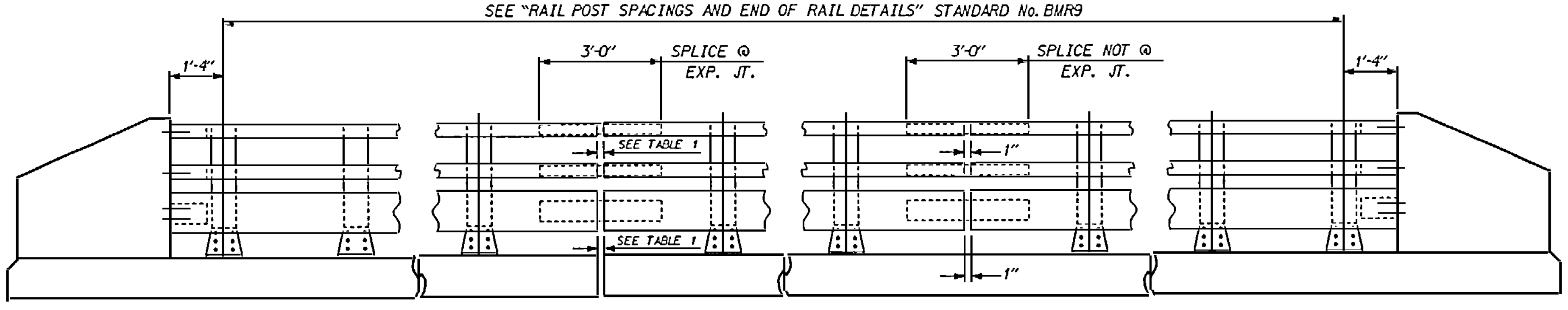
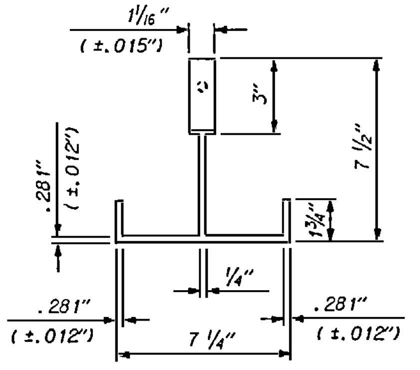
dottie



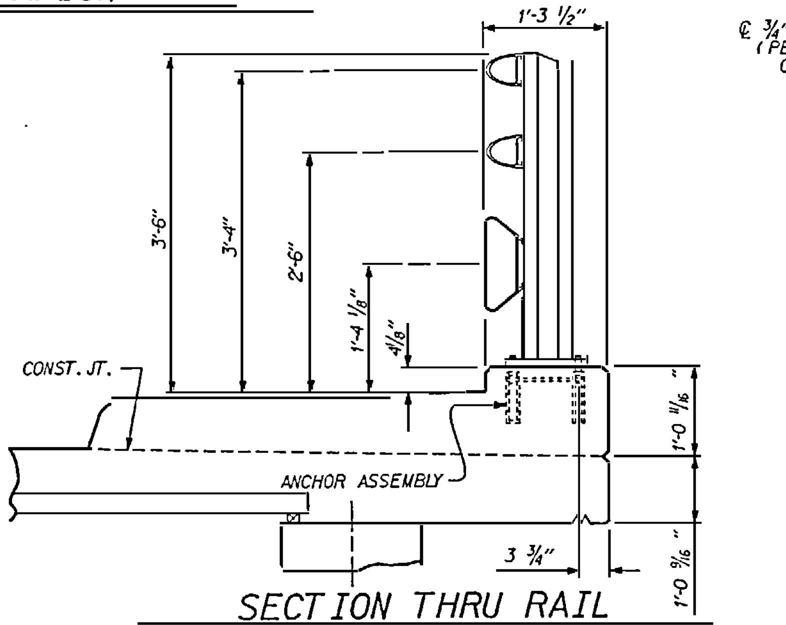
NOTE :
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" STD. No. BMR8

ELEVATION

TABLE 1	
℄ EXP. JT. @ BENT	RAIL OPENING
BENT No. 1	2 ½"
BENT No. 3	2 ½"

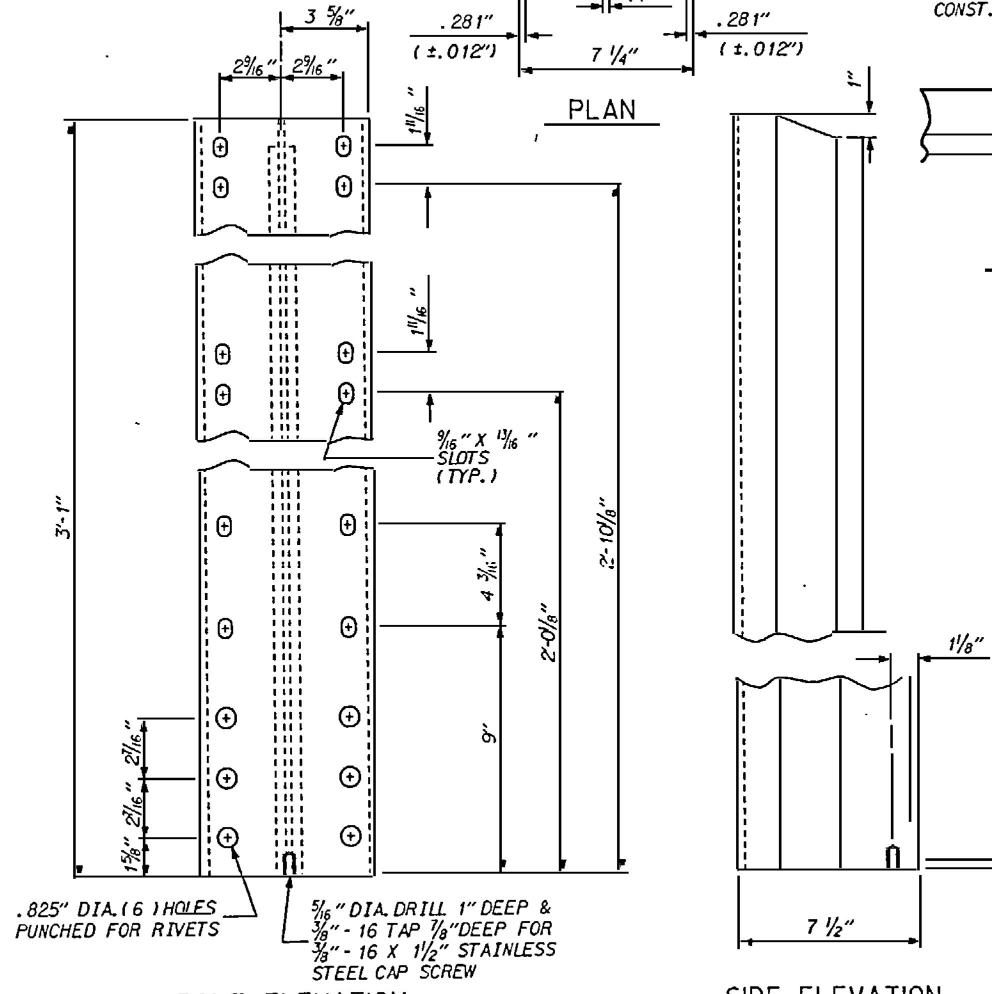


PLAN



SECTION THRU RAIL

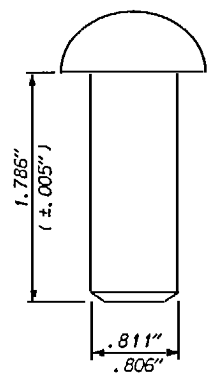
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD. No. BMR7



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B-316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

MATERIAL FOR SHIMS TO BE ASTM B-209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS :

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO ASTM A-123.

RIVETS : RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A-502 FOR GRADE 1 RIVETS.

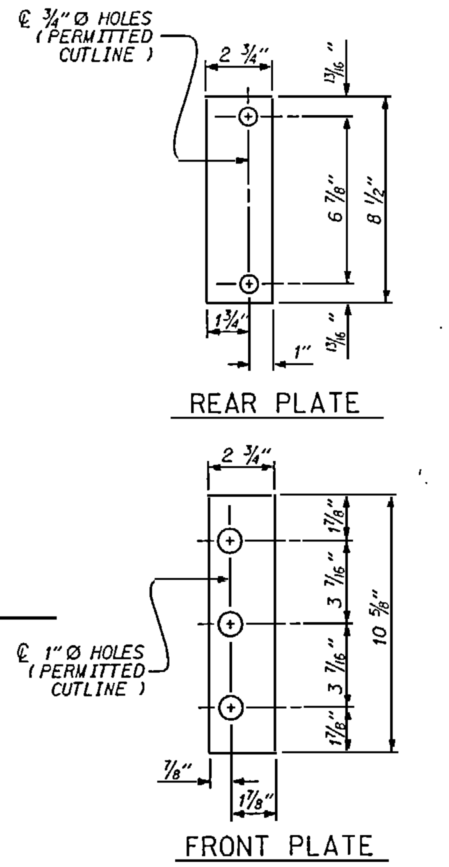
THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS : SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-570 FOR GRADE 33 OR A-611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.

RAIL CAPS : RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A-245 GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.

GENERAL NOTES

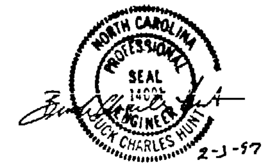
1. RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, GENERALLY APPROXIMATLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.
2. FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD No. BMR8.
3. CAP SCREWS SHALL BE ASTM F593 TYPE 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIRMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
4. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.
5. METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.
6. METHOD OF MEASUREMENT FOR METAL RAILS : FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.
7. CURVED RAIL USAGE : WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.
8. TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.
9. SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.
10. ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.
11. MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

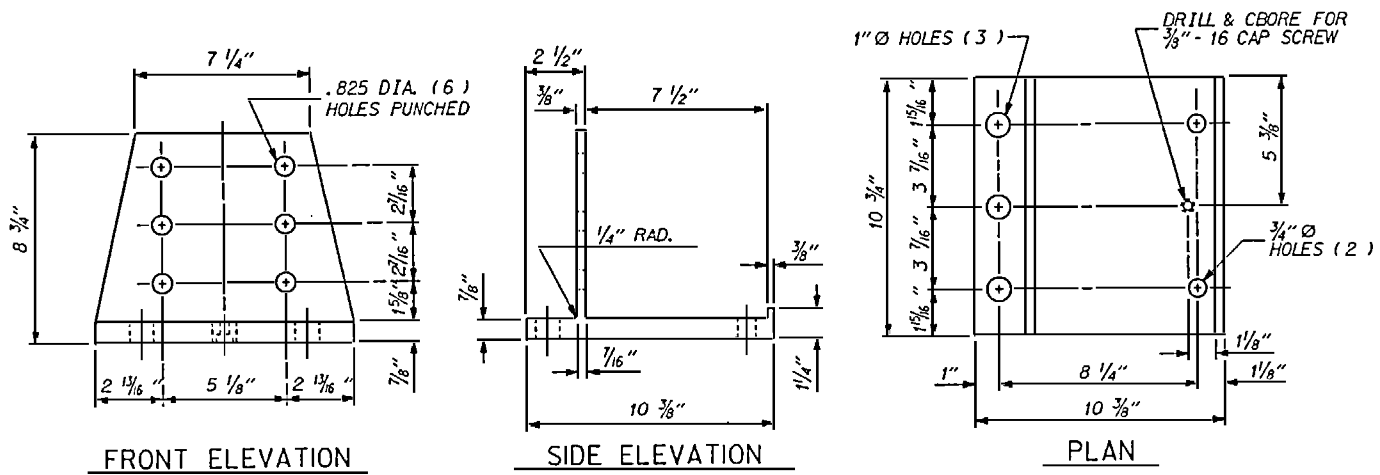


SHIM DETAILS

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

PAY LENGTH = 261.380 LIN.FT.





FRONT ELEVATION

SIDE ELEVATION

PLAN

POST BASE DETAILS

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-230
1			3			TOTAL SHEETS
2			4			264

STD. No. BMR6

ASSEMBLED BY : D. G. VESTER DATE : 5-17-96 CHECKED BY : T.J. BEACH DATE : 1-31-97	SPECIAL
DRAWN BY : MIKE BRITT DATE : JAN. 1988 CHECKED BY : G. G. HARPER DATE : JAN. 1988	STANDARD

REV. 6/1/94 EEM GRP
REV. 6-16-95R EEM RCW

31-JAN-1997 12:36
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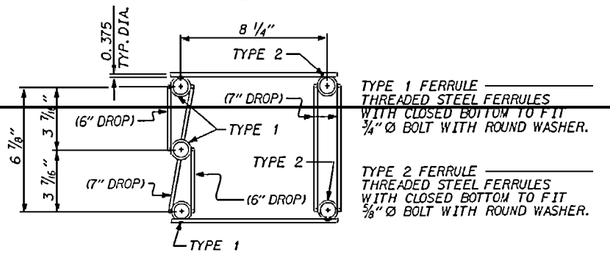
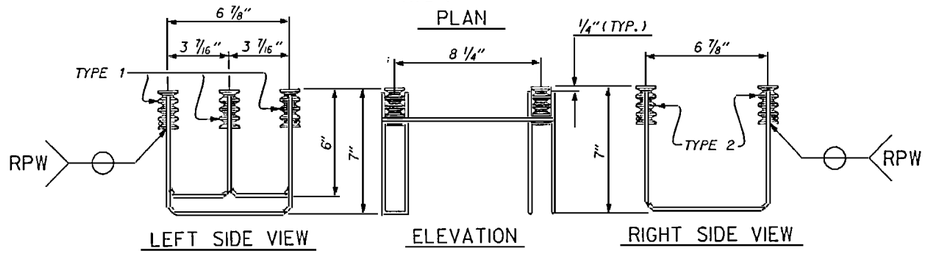
dottie



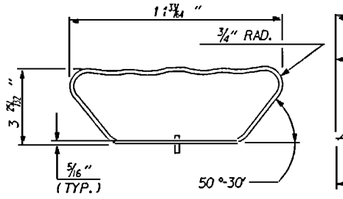
PLAN



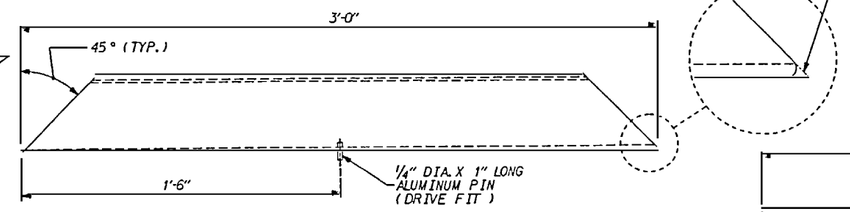
LEFT SIDE VIEW ELEVATION RIGHT SIDE VIEW

5-BOLT METAL RAIL ANCHOR ASSEMBLY

(44 ASSEMBLIES REQUIRED)

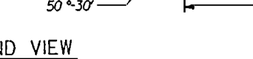


END VIEW

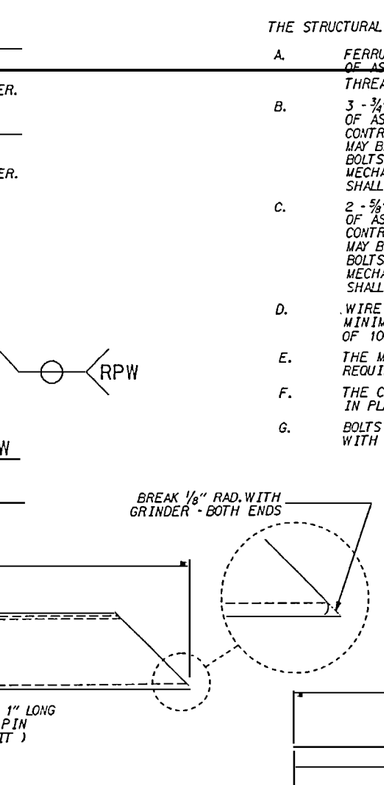


PLAN VIEW

BOTTOM RAIL EXPANSION BAR



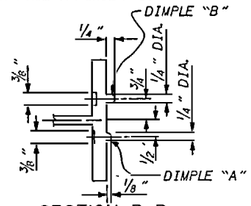
ELEVATION



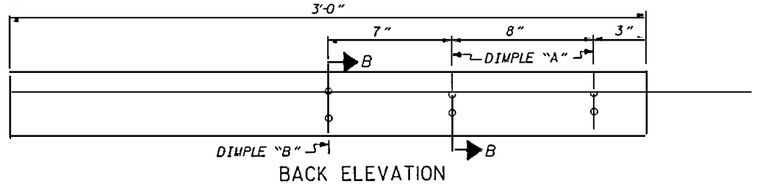
SECTION X-X

CLAMP BAR DETAIL

(6 REQUIRED PER POST)

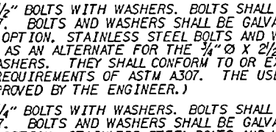


SECTION B=B

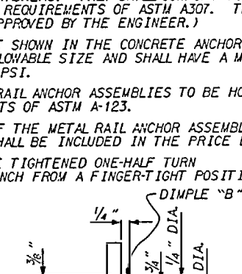


BACK ELEVATION

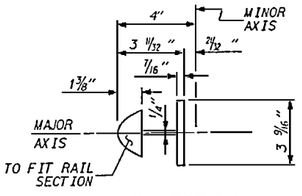
TOP & MIDDLE RAIL EXPANSION BAR



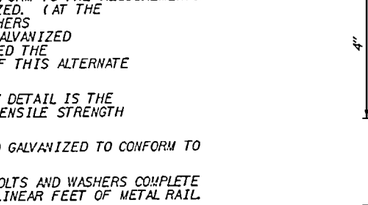
TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP

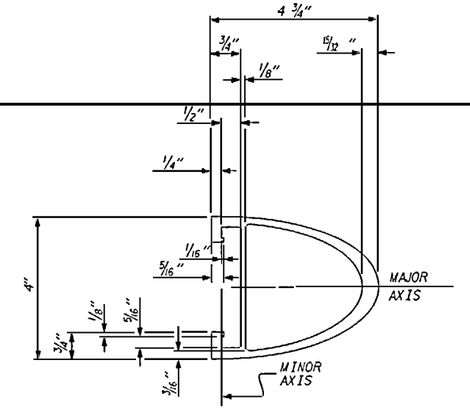


BAR SECTION

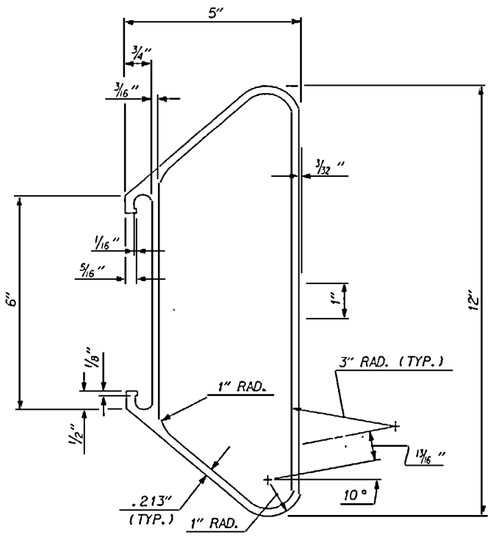


CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)



TOP & MIDDLE RAIL SECTION



BOTTOM RAIL SECTION

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.

B. 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" 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.)

C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" 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.)

D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF ASTM A-123.

F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-231
1			3			TOTAL SHEETS
2			4			264

STD. No. BMR7

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER ROBERT CHARLES HUNT 2-3-97

ASSEMBLED BY : D. G. VESTER	DATE : 5-17-96	SPECIAL
CHECKED BY : THEO BEACH	DATE : 8-21-96	
DRAWN BY : MIKE BRITT	DATE : JAN. 1988	STANDARD
CHECKED BY : G. G. HARPER	DATE : JAN. 1988	

REV. 6/1/94 EEM & GRP

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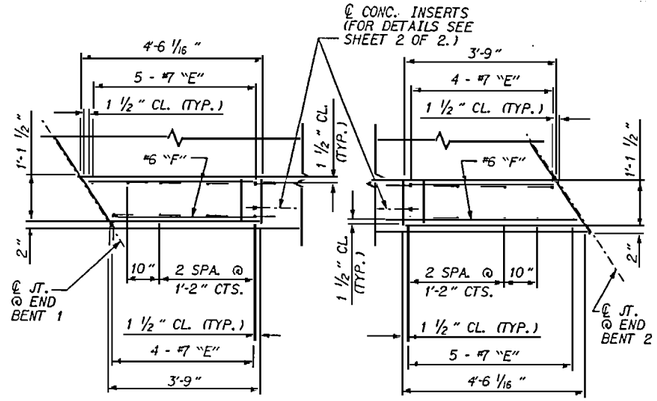
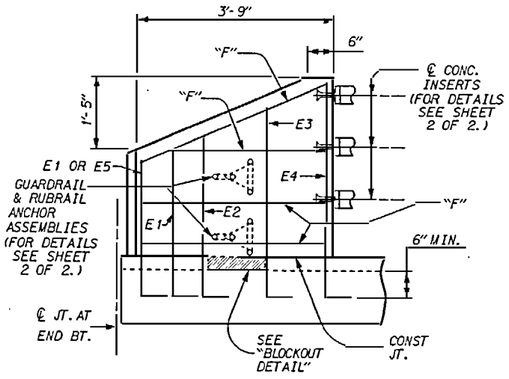
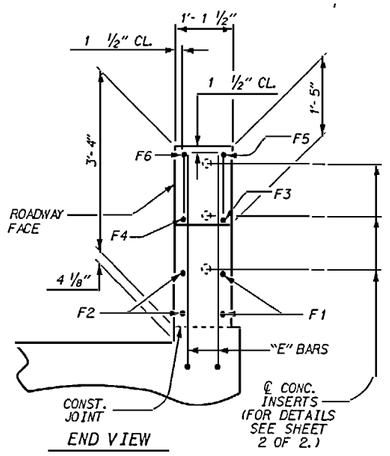
dottie



PLAN



ELEVATION



END VIEW

END VIEW SHOWN FOR END BENT 1
END BENT 2 SIMILAR BY ROTATION

NOTES

METAL RAIL TO END POST CONNECTION

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

A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 TYPE 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

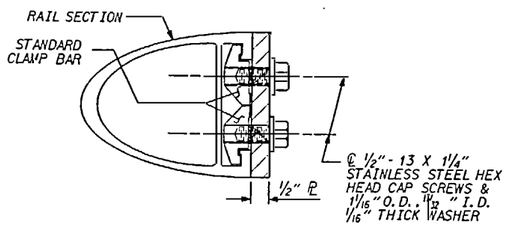
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

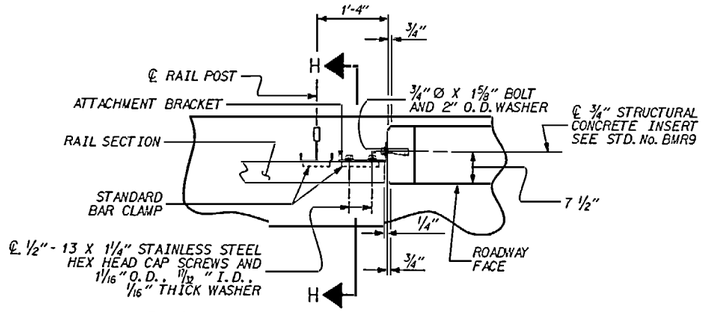
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS WHICH APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS". THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

REINFORCING STEEL AND CLASS AA CONCRETE FOR 3-BAR METAL RAIL END POST ARE INCLUDED IN THE "SUPERSTRUCTURE BILL OF MATERIAL", SHEET 2 OF 2.

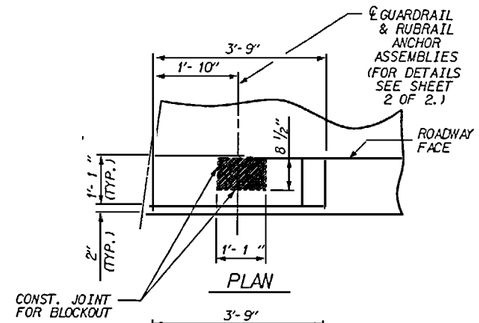
END POST DETAILS

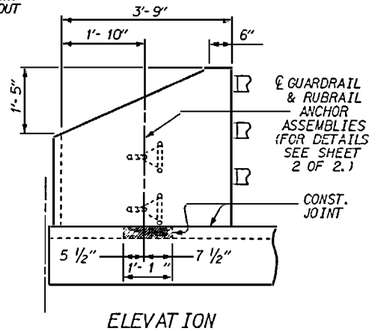


SECTION H-H
(FOR TOP & MIDDLE RAIL)



PLAN OF RAIL AND END POST
(STIFFENER ON 1/2" R NOT SHOWN FOR CLARITY)

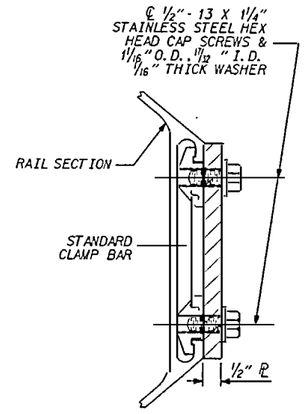




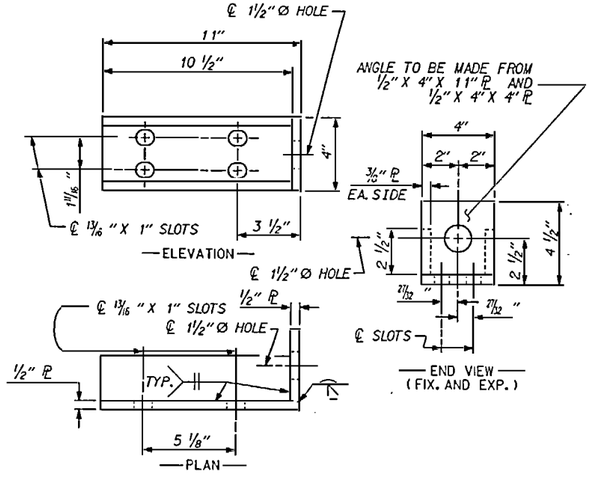
ELEVATION

BLOCKOUT DETAIL

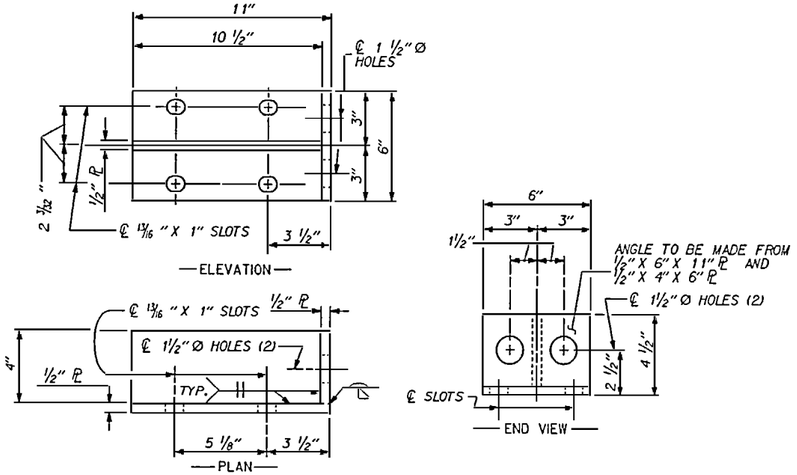
FOR LOCATION OF BLOCKOUTS, SEE "END POST DETAILS"



SECTION H-H
(FOR BOTTOM RAIL)



DETAILS FOR ATTACHMENT BRACKET
(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET
(BOTTOM RAIL ONLY)

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR THREE BAR METAL RAILS

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-232
1			3			TOTAL SHEETS
2			4			264

STD. No. BMR8

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BUCK CHARLES HUNTER 12-9-97

ASSEMBLED BY : D. G. VESTER	DATE : 5-21-96	SPECIAL
CHECKED BY : BCHunter	DATE : 12-2-97	
DRAWN BY : MIKE BRITT	DATE : JAN. 1988	STANDARD
CHECKED BY : G. G. HARPER	DATE : JAN. 1988	

REV. 6/1/94 EEM (J GRP
REV. 6-16-95 EEM (J RGW

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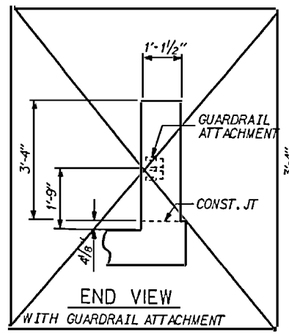
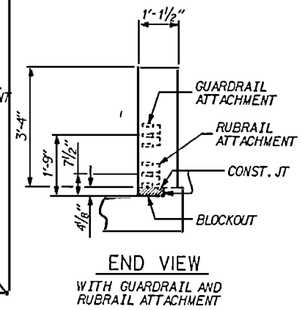
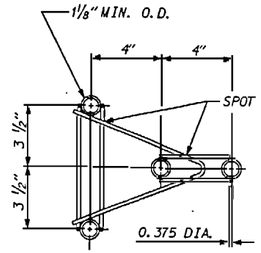
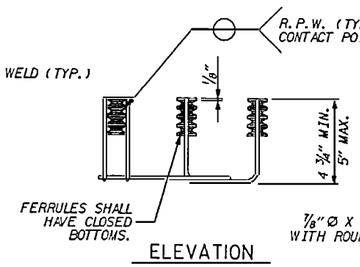
dottie

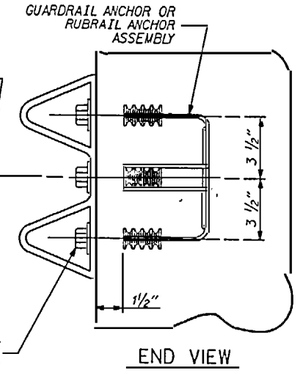




LOCATION OF GUARDRAIL AND RUBRAIL ANCHOR AT END POST







GUARDRAIL ANCHOR ASSEMBLY DETAILS
AND RUBRAIL ANCHOR ASSEMBLY DETAILS

NOTES
GUARDRAIL ANCHOR ASSEMBLY AND RUBRAIL ANCHOR ASSEMBLY

THE GUARDRAIL ANCHOR ASSEMBLY AND RUBRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

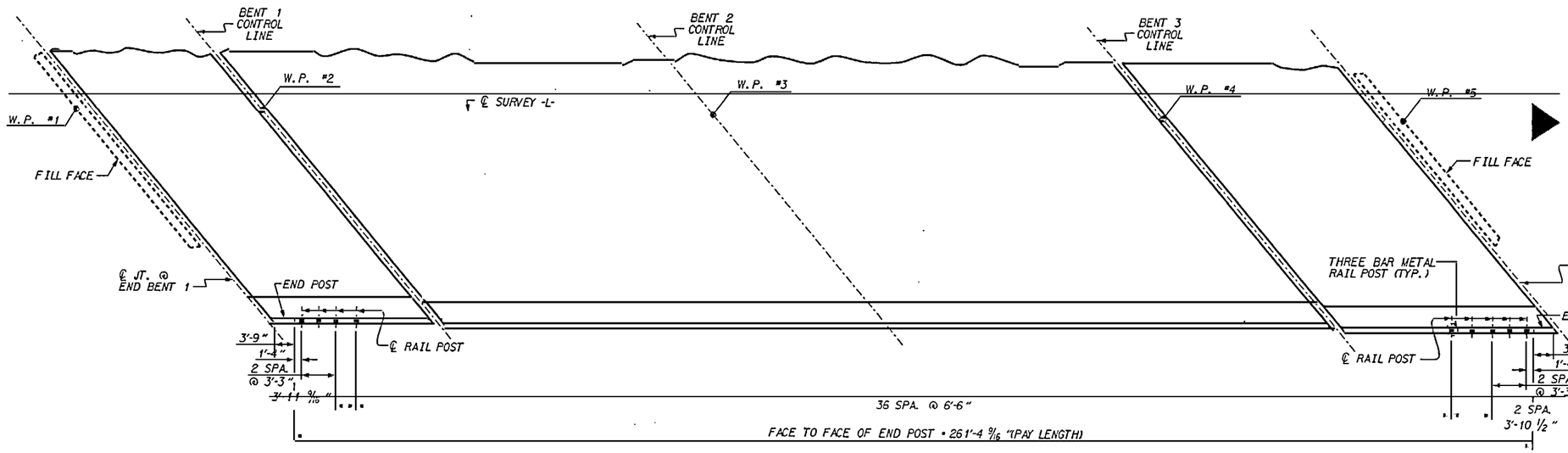
B. 4 - ⅞" Ø X 2 ¾" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø X 2 ¾" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY DETAIL ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

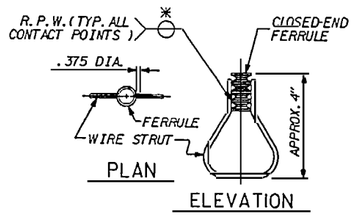
THE GUARDRAIL ANCHOR ASSEMBLY AND RUBRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

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

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



PLAN OF RAIL POST SPACING



STRUCTURAL CONCRETE INSERT

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

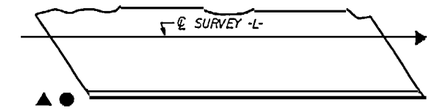
NOTES
STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.



SKETCH SHOWING LOCATION OF GUARDRAIL ATTACHMENTS AND RUBRAIL ATTACHMENTS

● DENOTES GUARDRAIL ATTACHMENT
▲ DENOTES RUBRAIL ATTACHMENT

ASSEMBLED BY : D. G. VESTER DATE : 5-20-96	CHECKED BY : THEO BEACH DATE : 12-2-96	SPECIAL
DRAWN BY : MIKE BRITT DATE : JAN. 1988	CHECKED BY : C. C. HARPER DATE : JAN. 1988	STANDARD

REV. 6/1/94 EEM (4 GRP

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NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER BUCK CHARLES HUNT 2-3-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR THREE BAR METAL RAILS

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2335
1			3			TOTAL SHEETS
2			4			264

STD. No. BMR9

REINFORCING BAR SCHEDULE

SPAN A STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	19	5	STR	30- 2	598
A2	19	4	STR	3- 8	47
✱A101	4	5	STR	28- 6	119
✱A102	4	5	STR	26- 9	112
✱A103	4	5	STR	25- 1	105
✱A104	4	5	STR	23- 4	97
✱A105	4	5	STR	21- 7	90
✱A106	4	5	STR	19-10	83
✱A107	4	5	STR	18- 1	75
✱A108	4	5	STR	16- 5	68
✱A109	4	5	STR	14- 8	61
✱A110	4	5	STR	12-11	54
✱A111	4	5	STR	11- 2	47
✱A112	4	5	STR	9- 6	40
✱A113	4	5	STR	7- 9	32
✱A114	4	5	STR	6- 0	25
✱A115	4	5	STR	4- 3	18
✱A116	4	5	STR	2- 6	10
✱B1	82	4	STR	16- 4	895
B2	5	5	STR	30- 7	159
✱D1	51	5	STR	2- 4	124
✱G1	2	5	STR	36- 3	76
✱K1	4	8	1	14- 4	153
✱K2	8	8	2	19- 7	418
✱K3	4	8	1	10- 8	114
✱K4	15	6	STR	8- 7	193
✱S1	54	5	3	5- 1	286
✱S2	27	4	4	3- 6	63
✱S3	27	4	4	2-10	51
REINFORCING STEEL				LBS.	206
EPOXY COATED REINFORCING STEEL				LBS.	4,007

SPANS B AND C STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	303	5	STR	30- 2	9534
A2	130	4	STR	3- 8	318
✱A101	4	5	STR	28- 6	119
✱A102	4	5	STR	26- 9	112
✱A103	4	5	STR	25- 1	105
✱A104	4	5	STR	23- 4	97
✱A105	4	5	STR	21- 7	90
✱A106	4	5	STR	19-10	83
✱A107	4	5	STR	18- 1	75
✱A108	4	5	STR	16- 5	68
✱A109	4	5	STR	14- 8	61
✱A110	4	5	STR	12-11	54
✱A111	4	5	STR	11- 2	47
✱A112	4	5	STR	9- 6	40
✱A113	4	5	STR	7- 9	32
✱A114	4	5	STR	6- 0	25
✱A115	4	5	STR	4- 3	18
✱A116	4	5	STR	2- 6	10
✱B3	7	4	STR	29-10	140
✱B4	240	4	STR	26- 7	4262
✱B5	40	7	STR	49- 0	4006
✱B6	39	7	STR	24- 6	1953
B7	20	5	STR	50- 7	1055
✱D1	335	5	STR	2- 4	815
✱G1	2	5	STR	36- 3	76
✱K5	4	8	1	14-10	158
✱K6	8	8	2	20- 7	440
✱K7	4	8	1	11- 3	120
✱K8	12	6	STR	7-10	141
K9	6	4	STR	5-11	24
K10	12	4	STR	7-10	63
K11	12	4	STR	9- 0	72
K12	5	4	5	4- 6	15
K13	15	4	6	6- 6	65
K14	15	4	STR	7- 3	73
K15	4	6	STR	36- 3	218
✱K16	27	4	2	7- 2	129
K17	12	5	STR	6- 6	81
K18	12	5	7	7- 2	90
✱S3	48	4	4	2-10	91
✱S4	48	5	3	6- 1	305
S5	102	4	8	3- 2	216
S6	42	4	9	7- 3	203
U1	21	4	10	12- 4	173
U2	6	4	10	10- 6	42
REINFORCING STEEL				LBS.	2,708
EPOXY COATED REINFORCING STEEL				LBS.	23,206

SPAN D STAGE 1

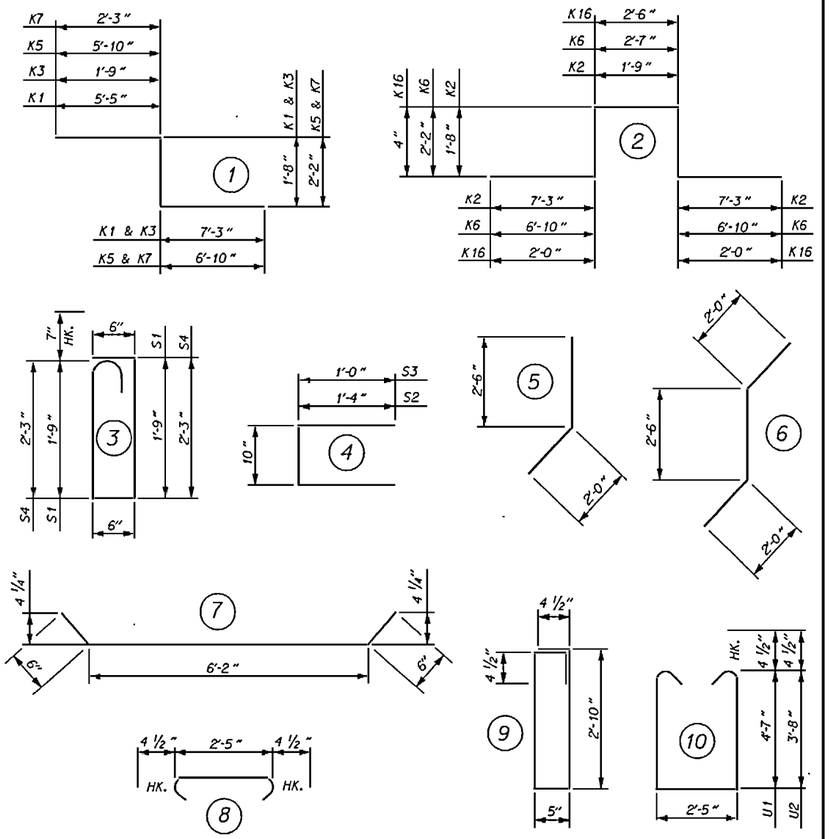
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	38	5	STR	30- 2	1196
A2	26	4	STR	3- 8	64
✱A101	4	5	STR	28- 6	119
✱A102	4	5	STR	26- 9	112
✱A103	4	5	STR	25- 1	105
✱A104	4	5	STR	23- 4	97
✱A105	4	5	STR	21- 7	90
✱A106	4	5	STR	19-10	83
✱A107	4	5	STR	18- 1	75
✱A108	4	5	STR	16- 5	68
✱A109	4	5	STR	14- 8	61
✱A110	4	5	STR	12-11	54
✱A111	4	5	STR	11- 2	47
✱A112	4	5	STR	9- 6	40
✱A113	4	5	STR	7- 9	32
✱A114	4	5	STR	6- 0	25
✱A115	4	5	STR	4- 3	18
✱A116	4	5	STR	2- 6	10
✱B8	82	4	STR	21- 6	1178
B9	5	5	STR	40-10	213
✱D1	68	5	STR	2- 4	165
✱G1	2	5	STR	36- 3	76
✱K1	4	8	1	14- 4	153
✱K2	8	8	2	19- 7	418
✱K3	4	8	1	10- 8	114
✱K4	15	6	STR	8- 7	193
✱S1	54	5	3	5- 1	286
✱S2	27	4	4	3- 6	63
✱S3	27	4	4	2-10	51
REINFORCING STEEL				LBS.	277
EPOXY COATED REINFORCING STEEL				LBS.	4,929

✱ *THESE BARS ARE EPOXY COATED.*

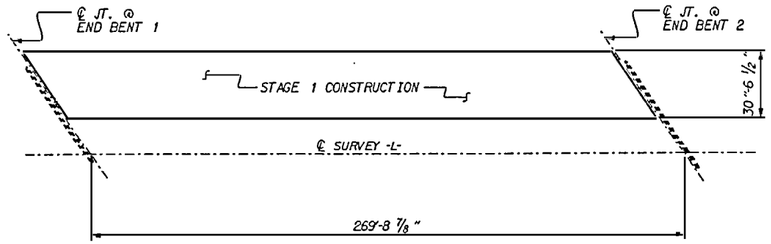
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#8	6'-0"	4'-0"	6'-0"	4'-0"	6'-10"

GROOVING BRIDGE FLOORS	
BRIDGE DECK	7,368 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 8,238)

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPAN 'A'	23.7	206	4,007
SPAN 'B' & 'C'	170.0	2,708	23,206
SPAN 'D'	29.9	277	4,929
TOTALS ✱✱	223.6	3,191	32,142

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL STAGE 1

OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-234
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14409 ENGINEER BUCK CHARLES HUNT 3-11

STD. NO. BOM2

ASSEMBLED BY : D. G. VESTER DATE : 4-29-96
CHECKED BY : V. X. Nguyen DATE : 12-2-96
DRAWN BY : M. BRITT DATE : 5/28/87
CHECKED BY : S.J. DAVIS DATE : 9/3/87

REV. 6/1/94 EEM

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REINFORCING BAR SCHEDULE

SPAN A STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3	19	4	STR	3- 5	43
A4	19	4	STR	4- 0	51
*A901	24	5	STR	45- 5	1137
*A117	4	5	STR	44- 6	186
*A118	4	5	STR	42- 9	178
*A119	4	5	STR	41- 0	171
*A120	4	5	STR	39- 4	164
*A121	4	5	STR	37- 7	157
*A122	4	5	STR	35-10	149
*A123	4	5	STR	34- 1	142
*A124	4	5	STR	32- 4	135
*A125	4	5	STR	30- 8	128
*A126	4	5	STR	28-11	121
*A127	4	5	STR	27- 2	113
*A128	4	5	STR	25- 5	106
*A129	4	5	STR	23- 8	99
*A130	4	5	STR	22- 0	92
*A131	4	5	STR	20- 3	84
*A132	4	5	STR	18- 6	77
*A133	4	5	STR	16- 9	70
*A134	4	5	STR	15- 1	63
*A135	4	5	STR	13- 4	56
*A136	4	5	STR	11- 7	48
*A137	4	5	STR	9-10	41
*A138	4	5	STR	8- 1	34
*A139	4	5	STR	6- 5	27
*A140	4	5	STR	4- 8	19
*A141	4	5	STR	2-11	12
*B1	192	4	STR	16- 4	2095
B2	8	5	STR	30- 7	255
*D2	162	4	STR	0- 8	72
*E1	2	7	11	2-11	12
*E2	2	7	11	3- 6	14
*E3	2	7	11	4- 1	17
*E4	2	7	11	4- 7	19
*E5	1	7	11	2- 7	5
*F1	2	6	STR	3- 7	11
*F2	2	6	STR	4- 2	13
*F3	1	6	STR	2-11	4
*F4	1	6	STR	3- 4	5
*F5	1	6	STR	3- 9	6
*F6	1	6	STR	4- 5	7
*G2	4	5	STR	41- 7	173
*G3	46	4	STR	5- 9	177
*K2	24	8	2	19- 7	1255
*K4	35	6	STR	8- 7	451
*K19	4	8	1	14- 0	150
*K20	4	8	2	16-11	181
*K27	4	6	STR	4- 5	27
*S1	134	5	3	5- 1	710
*S2	67	4	4	3- 6	157
*S3	67	4	4	2-10	127
REINFORCING STEEL				LBS.	349
EPOXY COATED REINFORCING STEEL				LBS.	9,297

SPANS B AND C STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3	130	4	STR	3- 5	297
A4	129	4	STR	4- 0	345
*A5	596	5	STR	34- 7	21498
*A142	4	5	STR	32- 9	137
*A143	4	5	STR	31- 0	129
*A144	4	5	STR	29- 3	122
*A145	4	5	STR	27- 6	115
*A146	4	5	STR	25-10	108
*A147	4	5	STR	24- 1	100
*A148	4	5	STR	22- 4	93
*A149	4	5	STR	20- 7	86
*A150	4	5	STR	18-10	79
*A151	4	5	STR	17- 2	72
*A152	4	5	STR	15- 5	64
*A153	4	5	STR	13- 8	57
*A154	4	5	STR	11-11	50
*A155	4	5	STR	10- 2	42
*A156	4	5	STR	8- 6	35
*A157	4	5	STR	6- 9	28
*A158	4	5	STR	5- 0	21
*A159	4	5	STR	3- 3	14
*A160	4	5	STR	32-11	137
*A161	4	5	STR	31- 2	130
*A162	4	5	STR	29- 5	123
*A163	4	5	STR	27- 8	115
*A164	4	5	STR	26- 0	108
*A165	4	5	STR	24- 3	101
*A166	4	5	STR	22- 6	94
*A167	4	5	STR	20- 9	87
*A168	4	5	STR	19- 0	79
*A169	4	5	STR	17- 4	72
*A170	4	5	STR	15- 7	65
*A171	4	5	STR	13-10	58
*A172	4	5	STR	12- 1	50
*A173	4	5	STR	10- 4	43
*A174	4	5	STR	8- 8	36
*A175	4	5	STR	6-11	29
*A176	4	5	STR	5- 2	22
*A177	4	5	STR	3- 5	14

SPANS B AND C STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B3	49	4	STR	29-10	977
*B4	534	4	STR	26- 7	9483
*B5	89	7	STR	49- 0	8914
*B6	88	7	STR	24- 6	4407
B7	32	5	STR	51- 0	1702
*D2	1158	4	STR	0- 8	516
*G2	4	5	STR	41- 7	173
*G3	330	4	STR	5- 9	1268
*K6	24	8	2	20- 7	1319
*K8	28	6	STR	7-10	329
K9	14	4	STR	5-11	55
K10	28	4	STR	7-10	147
K11	28	4	STR	9- 0	168
K12	5	4	5	4- 6	15
K13	40	4	6	6- 6	174
K14	35	4	STR	7- 3	170
*K16	67	4	2	7- 2	321
K17	28	5	STR	6- 6	190
K18	28	5	7	7- 2	209
*K21	4	8	1	14- 6	155
*K22	4	8	2	17-10	190
*K23	4	6	STR	3- 8	22
*K24	8	6	STR	41-10	503
K25	8	4	STR	3- 8	20
K26	4	4	STR	4-10	13
*S3	120	4	4	2-10	227
*S4	120	5	3	6- 1	761
S5	252	4	8	3- 2	533
S6	98	4	9	7- 3	475
U1	51	4	10	12- 4	420
U2	16	4	10	10- 6	112
REINFORCING STEEL				LBS.	5,045
EPOXY COATED REINFORCING STEEL				LBS.	53,778

SPAN D STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3	26	4	STR	3- 5	59
A4	26	4	STR	4- 0	69
*A5	68	5	STR	34- 7	2453
*A142	4	5	STR	32- 9	137
*A143	4	5	STR	31- 0	129
*A144	4	5	STR	29- 3	122
*A145	4	5	STR	27- 6	115
*A146	4	5	STR	25-10	108
*A147	4	5	STR	24- 1	100
*A148	4	5	STR	22- 4	93
*A149	4	5	STR	20- 7	86
*A150	4	5	STR	18-10	79
*A151	4	5	STR	17- 2	72
*A152	4	5	STR	15- 5	64
*A153	4	5	STR	13- 8	57
*A154	4	5	STR	11-11	50
*A155	4	5	STR	10- 2	42
*A156	4	5	STR	8- 6	35
*A157	4	5	STR	6- 9	28
*A158	4	5	STR	5- 0	21
*A159	4	5	STR	3- 3	14
*A160	4	5	STR	32-11	137
*A161	4	5	STR	31- 2	130
*A162	4	5	STR	29- 5	123
*A163	4	5	STR	27- 8	115
*A164	4	5	STR	26- 0	108
*A165	4	5	STR	24- 3	101
*A166	4	5	STR	22- 6	94
*A167	4	5	STR	20- 9	87
*A168	4	5	STR	19- 0	79
*A169	4	5	STR	17- 4	72
*A170	4	5	STR	15- 7	65
*A171	4	5	STR	13-10	58
*A172	4	5	STR	12- 1	50
*A173	4	5	STR	10- 4	43
*A174	4	5	STR	8- 8	36
*A175	4	5	STR	6-11	29
*A176	4	5	STR	5- 2	22
*A177	4	5	STR	3- 5	14
*B8	192	4	STR	21- 6	2758
B9	8	5	STR	40-10	341
*D2	222	4	STR	0- 8	99
*E1	2	7	11	2-11	12
*E2	2	7	11	3- 6	14
*E3	2	7	11	4- 1	17
*E4	2	7	11	4- 7	19
*E5	1	7	11	2- 7	5
*F1	2	6	STR	3- 7	11
*F2	2	6	STR	4- 2	13
*F3	1	6	STR	2-11	4
*F4	1	6	STR	3- 4	5
*F5	1	6	STR	3- 9	6
*F6	1	6	STR	4- 5	7
*G2	4	5	STR	41- 7	173
*G3	64	4	STR	5- 9	246
*K2	24	8	2	19- 7	1255
*K4	35	6	STR	8- 7	451
*K19	4	8	1	14- 0	150
*K20	4	8	2	16-11	181
*K27	4	6	STR	4- 5	27
*S1	134	5	3	5- 1	710
*S2	67	4	4	3- 6	157
*S3	67	4	4	2-10	127
REINFORCING STEEL				LBS.	469
EPOXY COATED REINFORCING STEEL				LBS.	11,615

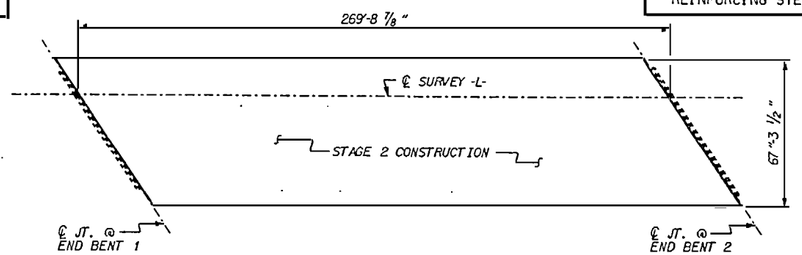
* THESE BARS ARE EPOXY COATED.

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	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#8	6'-0"	4'-0"	6'-0"	4'-0"	6'-10"

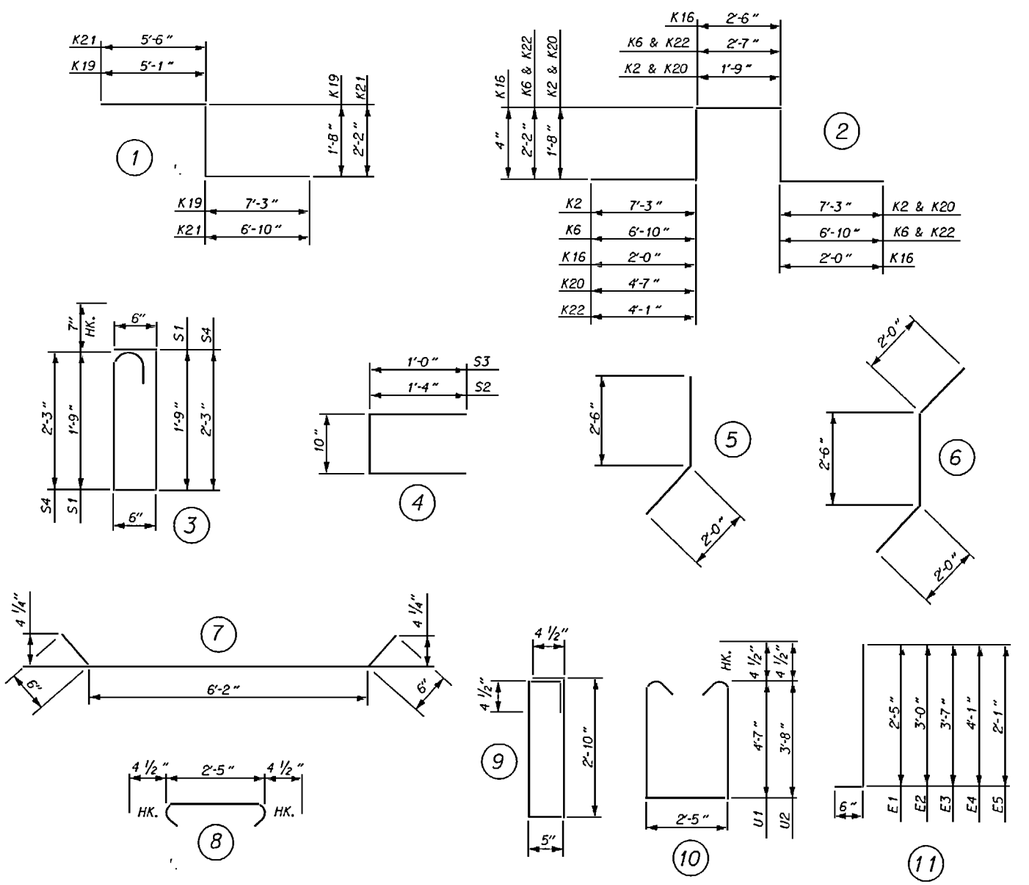
GROOVING BRIDGE FLOORS

BRIDGE DECK	15,942 SQ.FT.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 18,151)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS A-A CONCRETE					REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	DECK SLAB POUR 1	DECK SLAB POUR 2	CLOSURE POUR	SIDEWALK	END POST		
	(CU. YDS.)	(CU. YDS.)	(CU. YDS.)	(CU. YDS.)	(CU. YDS.)	(LBS.)	(LBS.)
SPAN "A"	48.3		4.0	5.0	0.5	349	9,297
SPAN "B" & "C"	194.1	109.2	25.4	31.8		5,045	53,778
SPAN "D"	60.4		5.1	6.7	0.5	469	11,615
TOTALS **	302.8	109.2	34.5	43.5	1.0	5,863	74,690

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

NORTH CAROLINA PROFESSIONAL SEAL 14409 ENGINEER CHUCK CHARLES HUNT 2-3-97

PROJECT NO. U - 2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL STAGE 2

OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-235
1			3			TOTAL SHEETS
2			4			264

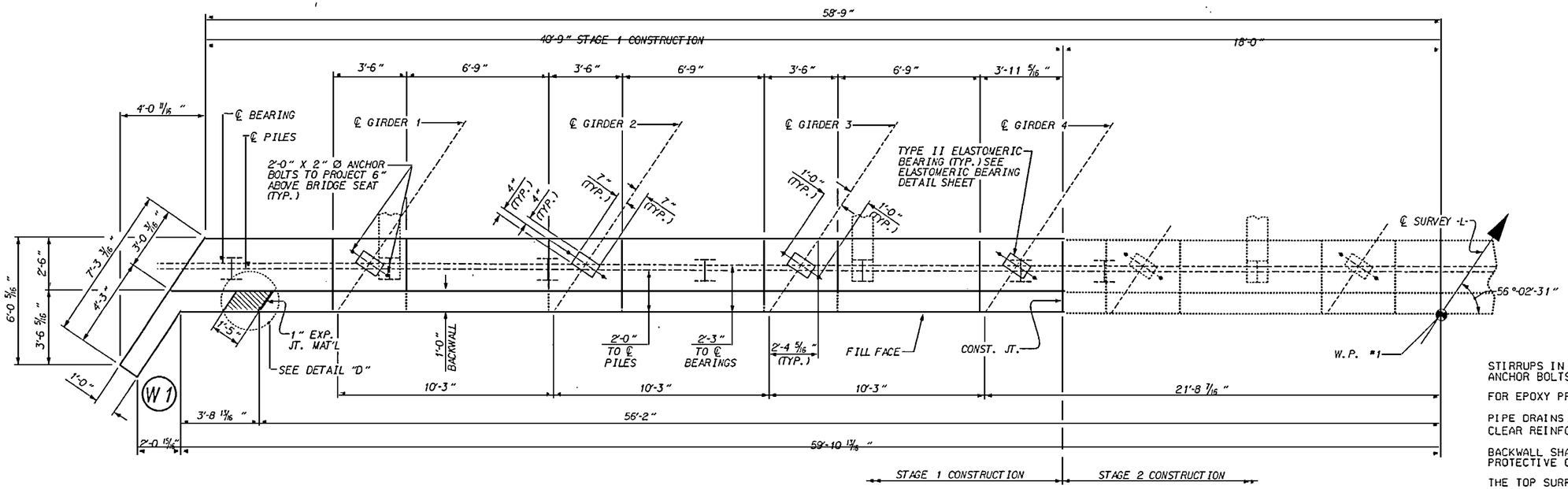
STD. NO. BOM2

ASSEMBLED BY : D. G. VESTER DATE : 5-2-96
CHECKED BY : V. K. Nguyen DATE : 1-2-97
DRAWN BY : M. BRITT DATE : 5/28/87
CHECKED BY : S.J. DAVIS DATE : 9/3/87

REV. 6/1/94 EEM 10 CRP

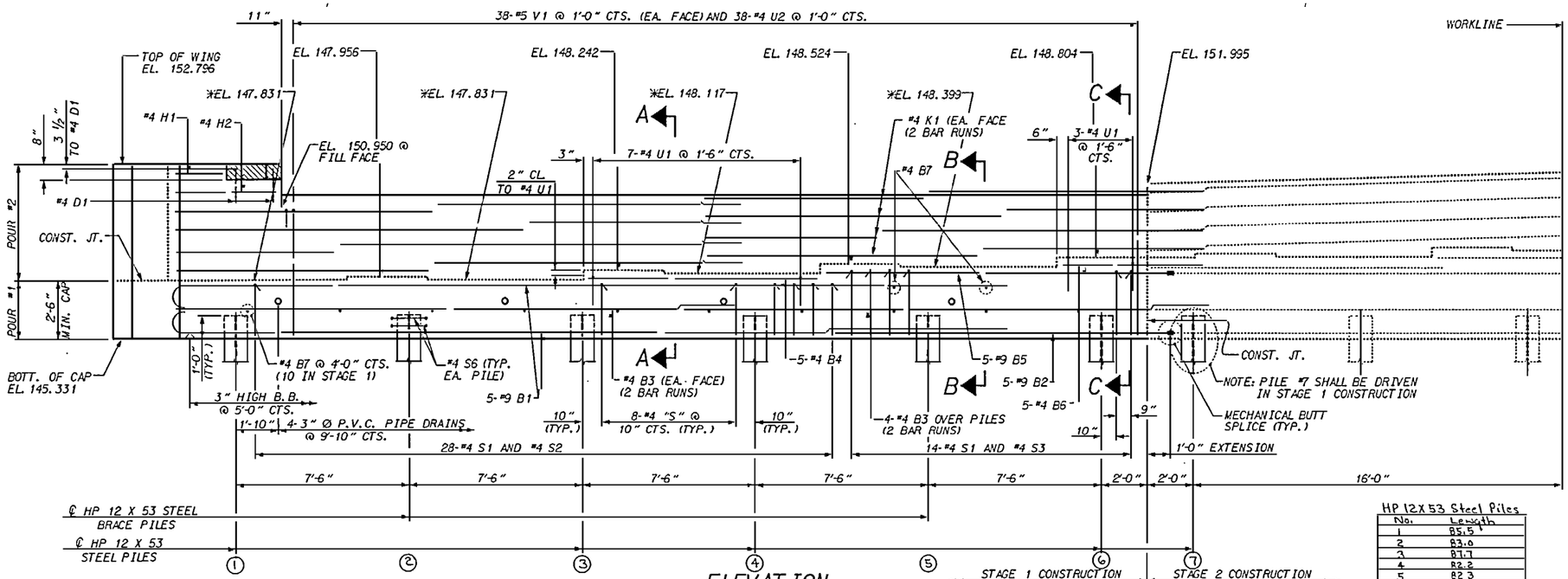
31-DEC-1996 09:44
d:\users\dottie\robeson\u2415\u2415101bm.dgn
dottie

30-JAN-1997 09:21
d:\users\mlke\rcbeson\u-2415\u2450el.dgn
mlke



PLAN

#4 B3 SPLICE = 2'-5"
#4 K1 SPLICE = 2'-5"



ELEVATION

HP 12X53 Steel Piles

No.	Length
1	85.5'
2	83.0
3	81.7
4	82.2
5	82.3
6	81.9
7	82.2
Total	584.8 L.F.

NOTES

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

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 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 1/4" PER FOOT.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT IN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

#4 D1 BARS SHALL BE GROUTED INTO WING PRIOR TO POURING THE BLOCKOUT.

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTIONS THRU CAP SHEETS 3 OF 5 AND 4 OF 5.

FOR TEMPORARY DRAINAGE @ END BENT, SEE END BENT 1, SHEET 5 OF 5.

FOR MECHANICAL BUTT SPLICES, SEE SPECIAL PROVISIONS.

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

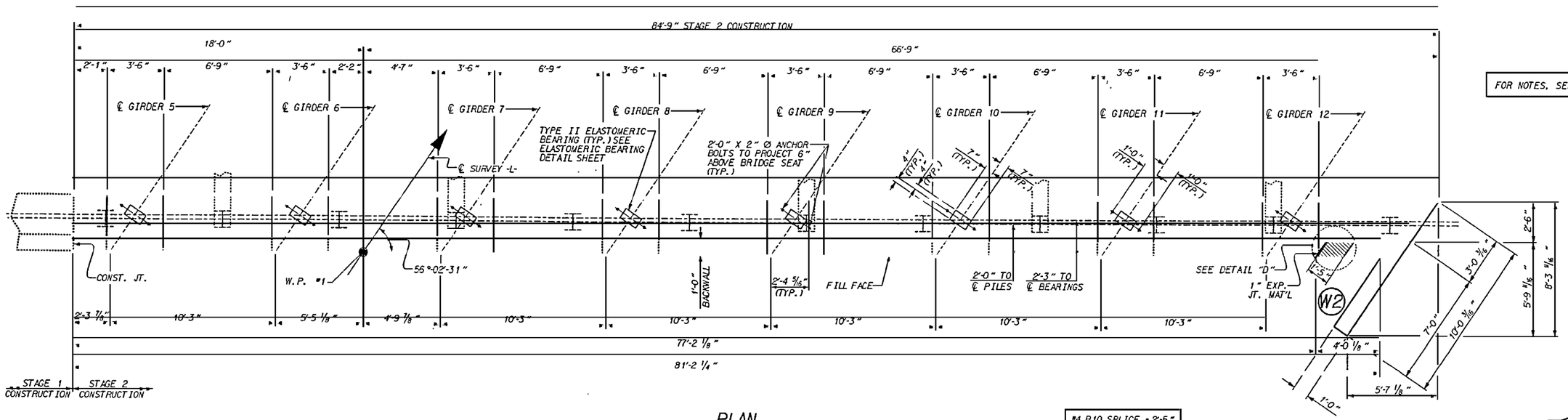
SUBSTRUCTURE
END BENT 1
STAGE 1

NORTH CAROLINA PROFESSIONAL SEAL 13931 ENGINEER BUCK CHARLES HUNT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23b
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 8/30/96
CHECKED BY : V. X. Nguyen DATE : 11/30/97

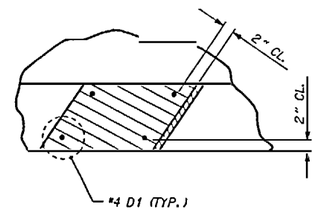
06-DEC-1996 09:01
c:\users\mike\robeson\u-2415\u2415elev.dgn
MKE



PLAN

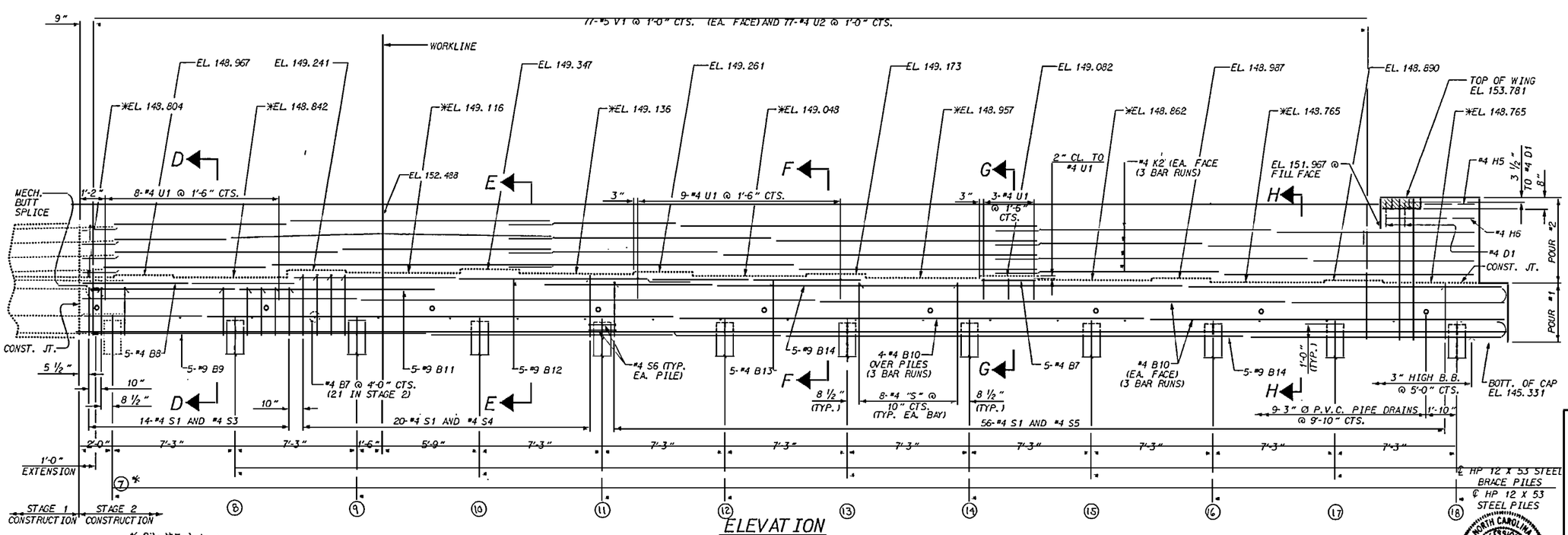
FOR NOTES, SEE END BENT 1 SHEET 1 OF 5

*4 B10 SPLICE = 2'-5"
*4 K2 SPLICE = 2'-5"



DETAIL "D"

HP 12X	
No.	Length
8	83.5
9	82.9
10	79.4
11	79.5
12	78.4
13	78.4
14	78.7
15	78.2
16	77.5
17	77.6
18	77.2
Total	872.5 L.F.



ELEVATION

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

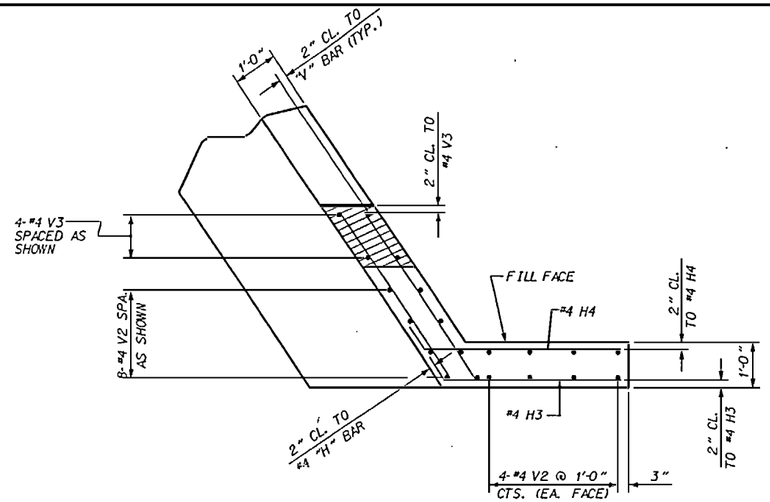
SUBSTRUCTURE
END BENT 1
STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-237
1			3			TOTAL SHEETS
2			4			264

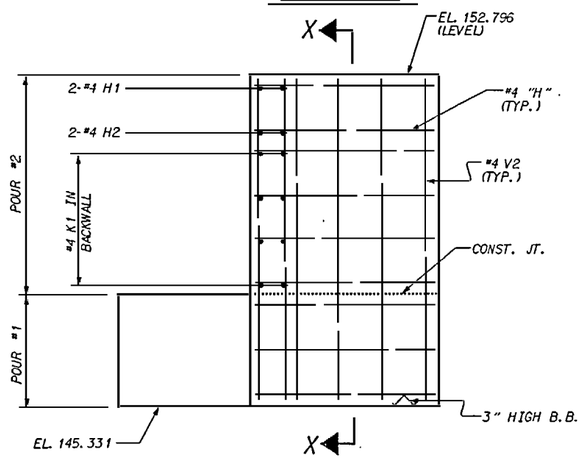
DRAWN BY : M. GOINS DATE : 9/12/96
CHECKED BY : V. X. Nguyen DATE : 12/6/96

NORTH CAROLINA PROFESSIONAL SEAL 14054 ENGINEER BUCK CHARLES HUNT
12-3-97

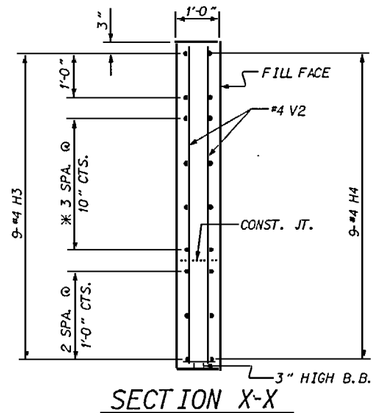
06-DEC-1996 08:59
d:\users\mike\robeson\u-2415\u2415e1.dgn
MKE



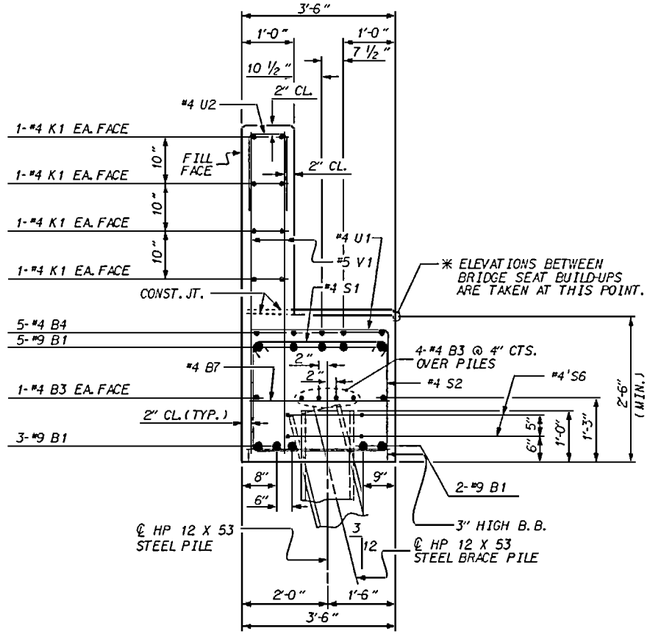
PLAN W1



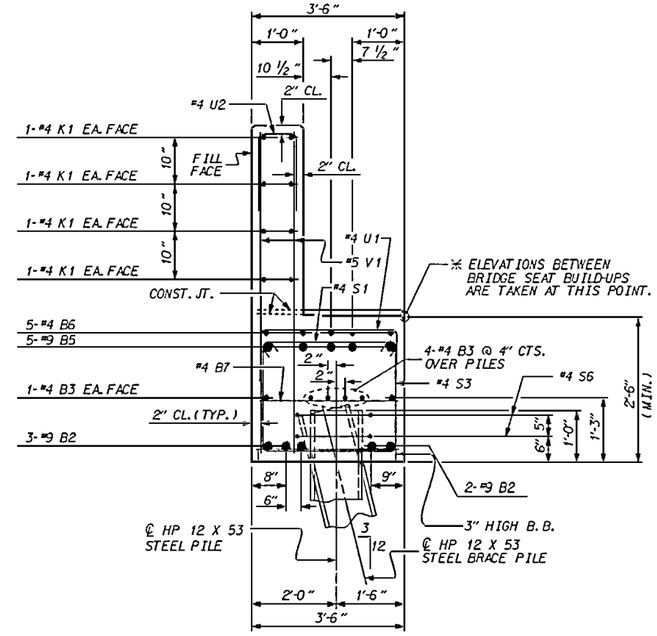
ELEVATION W1



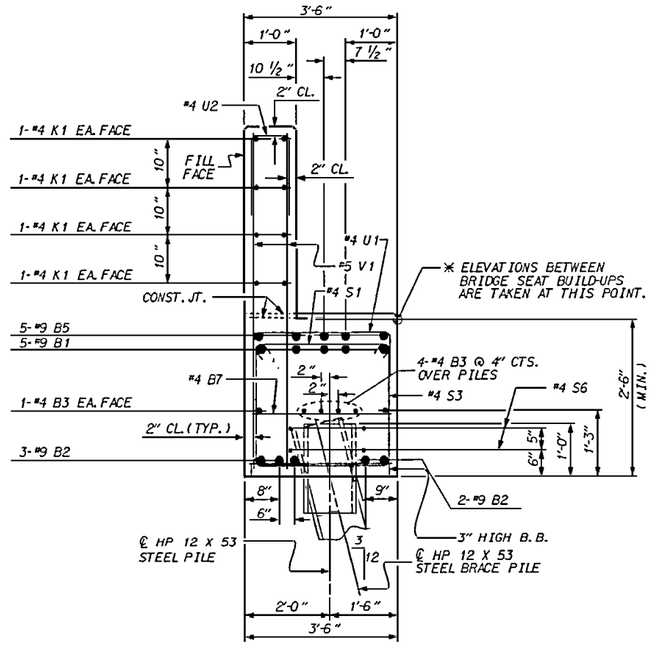
SECTION X-X



SECTION A-A



SECTION C-C



SECTION B-B

* MATCH THESE BARS TO THE K1 BARS IN THE BACKWALL

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 3 OF 5

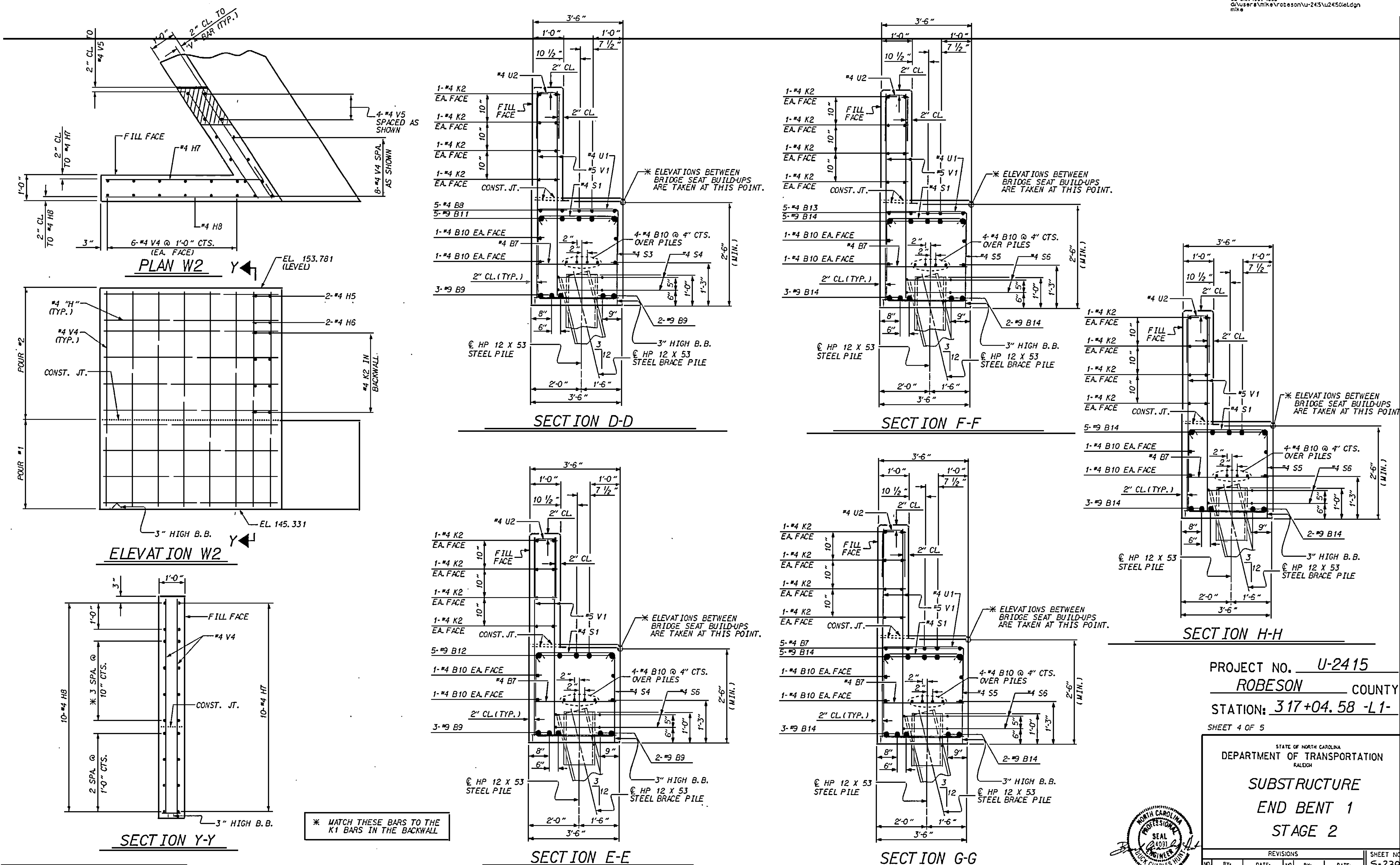
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
STAGE 1

NORTH CAROLINA PROFESSIONAL SEAL 10910 ENGINEER BUCK CHARLES HURT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-238
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 9/5/96
CHECKED BY : V. K. Nawjee DATE : 12/19/96



PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

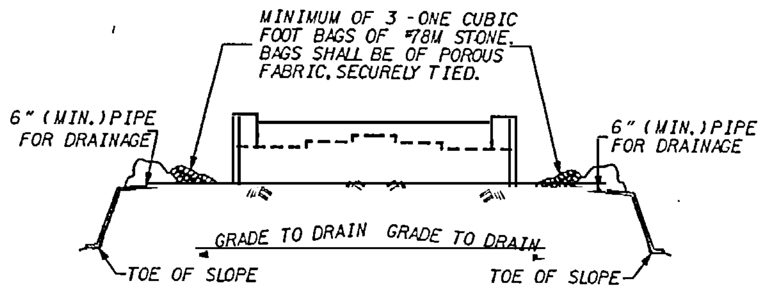
SUBSTRUCTURE
END BENT 1
STAGE 2

REVISIONS

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

SHEET NO. S-239
TOTAL SHEETS 264

DRAWN BY : M. GOINS DATE : 9/16/96
CHECKED BY : V. X. Nguyen DATE : 1/3/97



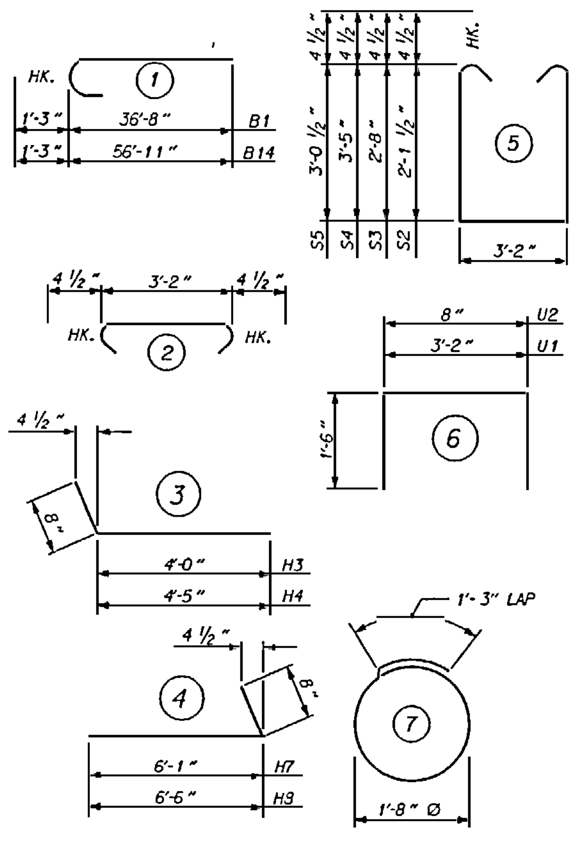
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT NO. 1 - STAGE 1 (VOID)

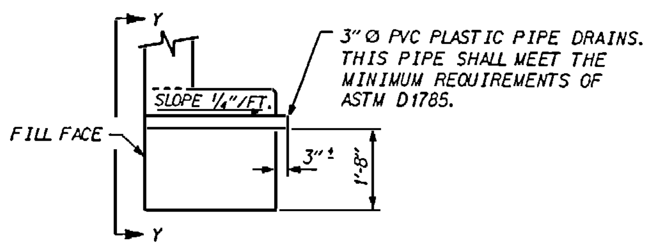
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	37-11	1,289
B2	5	9	STR	15- 3	259
B3	12	4	STR	23- 7	189
B4	5	4	STR	10- 1	34
B5	5	9	STR	15- 3	259
B6	5	4	STR	6- 3	21
B7	12	4	STR	3- 2	25
D1	4	4	STR	1- 6	4
H1	2	4	STR	2-10	4
H2	2	4	STR	4- 7	6
H3	9	4	3	4- 8	28
H4	9	4	3	5- 1	31
K1	16	4	STR	23-10	255
S1	42	4	2	3-11	110
S2	28	4	5	8- 2	153
S3	14	4	5	9- 3	87
S6	12	4	7	6- 6	52
U1	10	4	6	6- 2	41
U2	38	4	6	3- 8	93
V1	76	5	STR	5- 3	416
V2	16	4	STR	7- 1	76
V3	4	4	STR	6- 5	17
REINFORCING STEEL				LBS.	3,449
CLASS "A" CONC. BREAKDOWN					
POUR #1				C.Y.	15.4
POUR #2				C.Y.	6.2
CLASS "A" CONC. TOTAL				C.Y.	21.6
HP 12 X 53 STEEL PILES NO. 7				LIN. FT.	525

VOID VOID

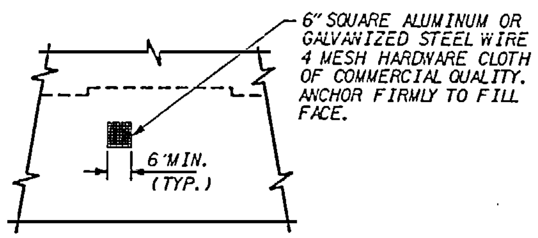
BILL OF MATERIAL
END BENT NO. 1 - STAGE 2 (VOID)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7	26	4	STR	3- 2	85
B8	5	4	STR	12- 4	41
B9	5	9	STR	34- 5	585
B10	24	4	STR	29- 9	477
B11	5	9	STR	20- 1	341
B12	5	9	STR	24- 0	408
B13	5	4	STR	12- 6	42
B14	10	9	1	58- 2	1,978
D1	4	4	STR	1- 6	4
H5	2	4	STR	3- 2	4
H6	2	4	STR	4-10	6
H7	10	4	4	6- 9	45
H8	10	4	4	7- 2	48
K2	24	4	STR	29- 9	477
S1	90	4	2	3-11	235
S3	14	4	5	9- 3	87
S4	20	4	5	10- 9	144
S5	56	4	5	10- 0	374
S6	24	4	7	6- 6	104
U1	20	4	6	6- 2	82
U2	77	4	6	3- 8	189
V1	154	5	STR	5- 3	843
V4	20	4	STR	8- 1	108
V5	4	4	STR	7- 5	20
REINFORCING STEEL				LBS.	6,697
CLASS "A" CONC. BREAKDOWN					
POUR #1				C.Y.	40.3
POUR #2				C.Y.	11.2
CLASS "A" CONC. TOTAL				C.Y.	51.5
HP 12 X 53 STEEL PILES NO. 11				LIN. FT.	825

VOID VOID



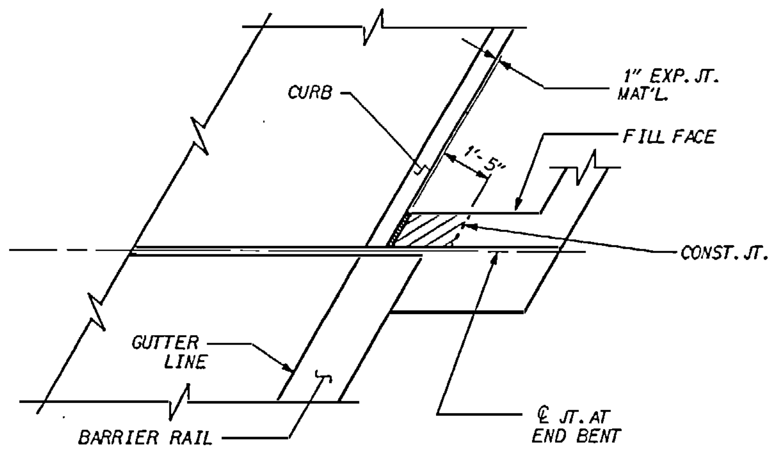
SECTION THRU CAP



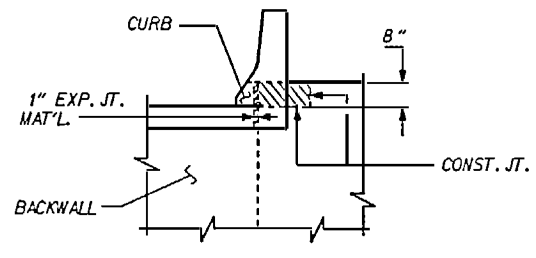
VIEW Y-Y

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS



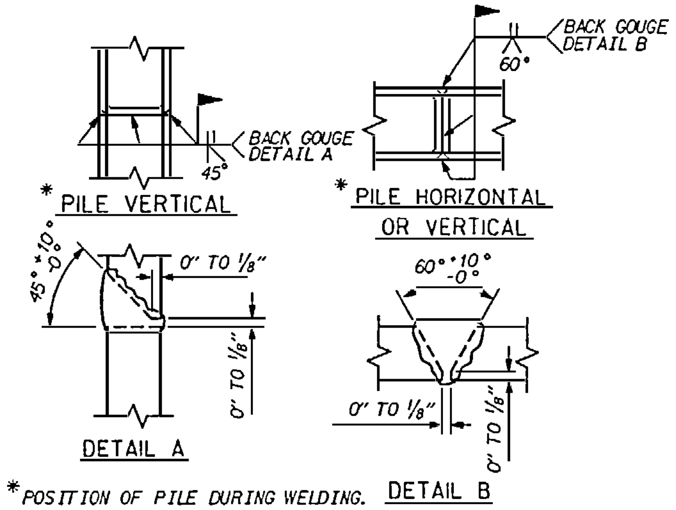
PLAN



ELEVATION

BLOCKOUT IN WING WALL FOR FITTING EVAZOTE JOINT SEAL

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 SLIP FORMING IS USED.



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

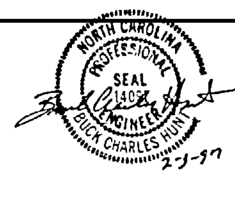
PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1



REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-240
1			3					TOTAL SHEETS
2			4					264

DRAWN BY: M. GOINS DATE: 9/17/96
CHECKED BY: V.X. Nguyen DATE: 1/13/97

31-JAN-1997 13:02
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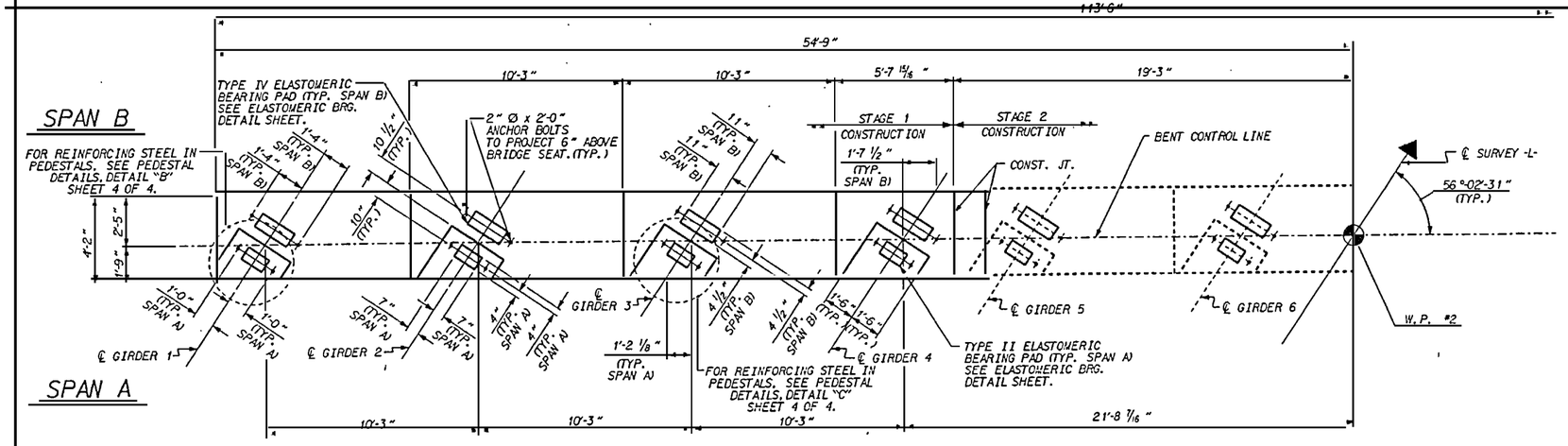
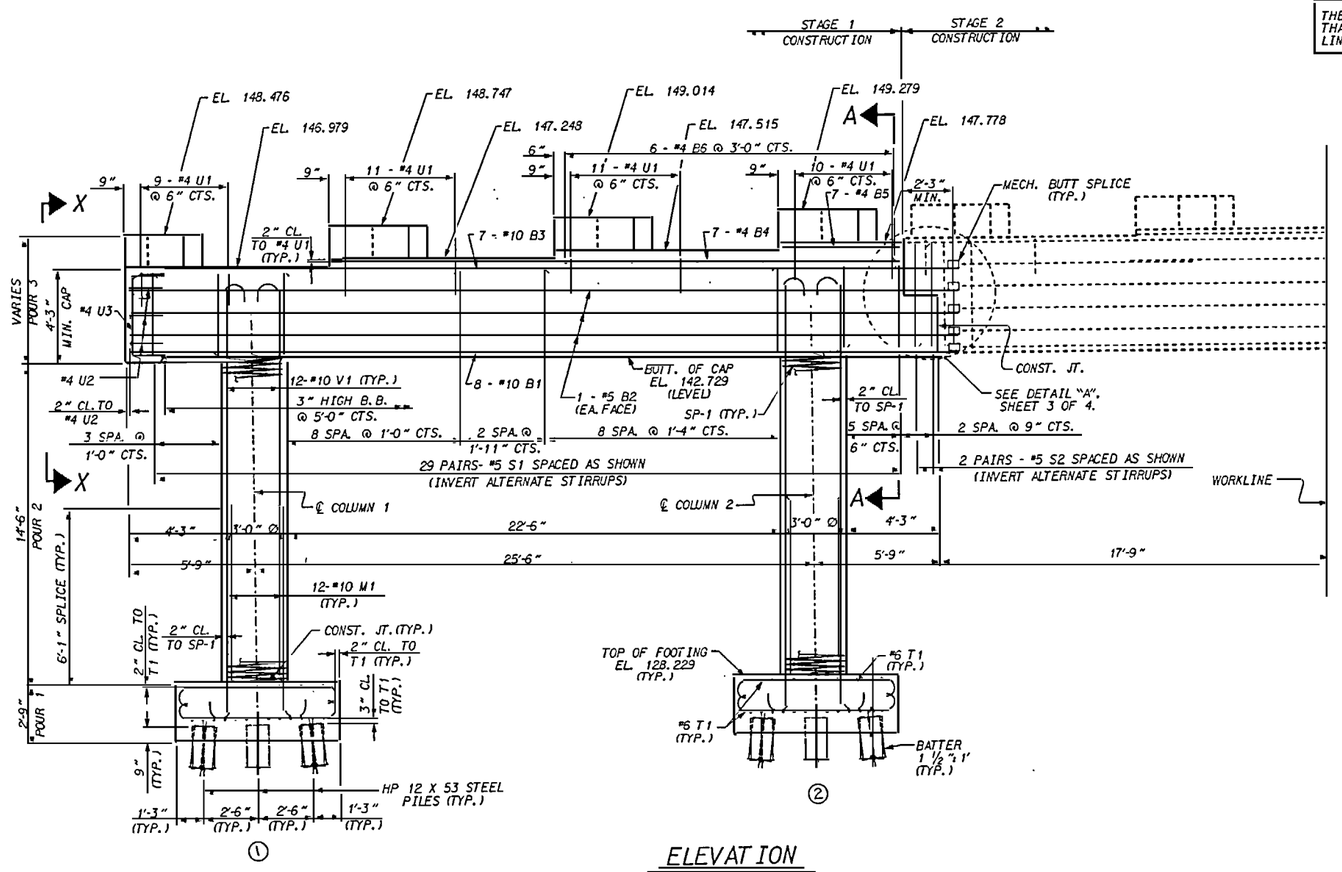
dottie

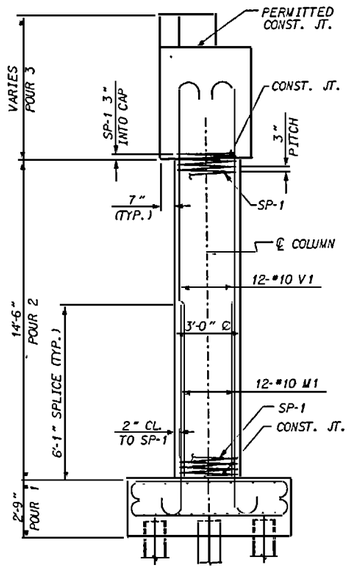


PLAN



ELEVATION

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.



END ELEVATION

NOTES

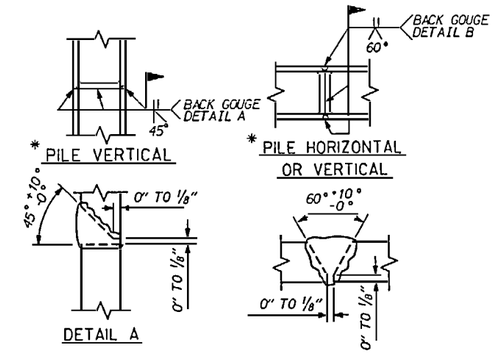
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR MECHANICAL BUTT SPLICE, SEE SPECIAL PROVISIONS.



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

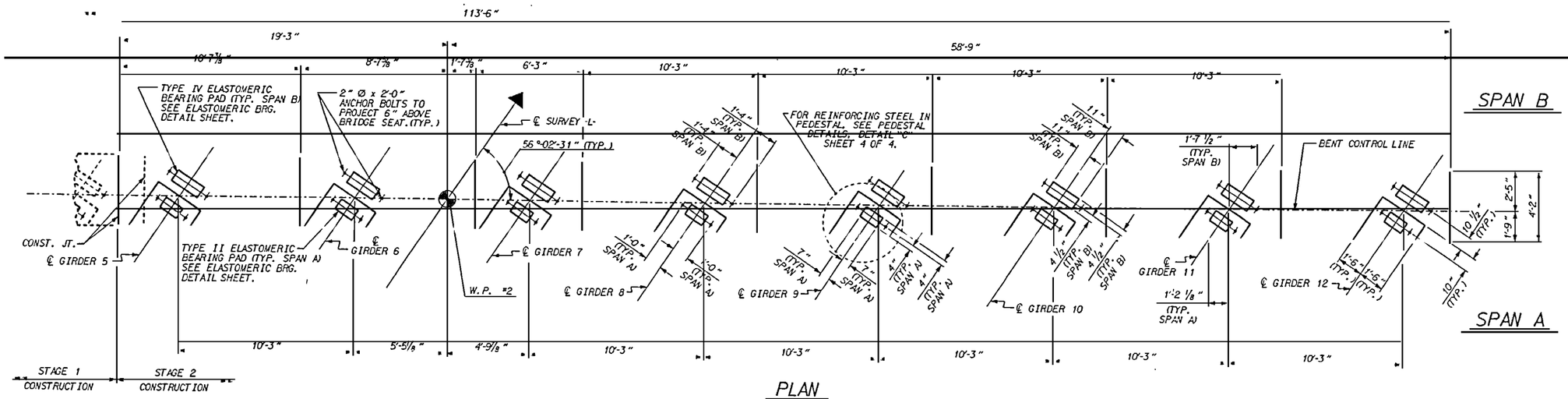
SUBSTRUCTURE
BENT 1
STAGE 1

NORTH CAROLINA PROFESSIONAL SEAL 14095 ENGINEER BUCK CHARLES HUNT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-241
1			3			TOTAL SHEETS
2			4			264

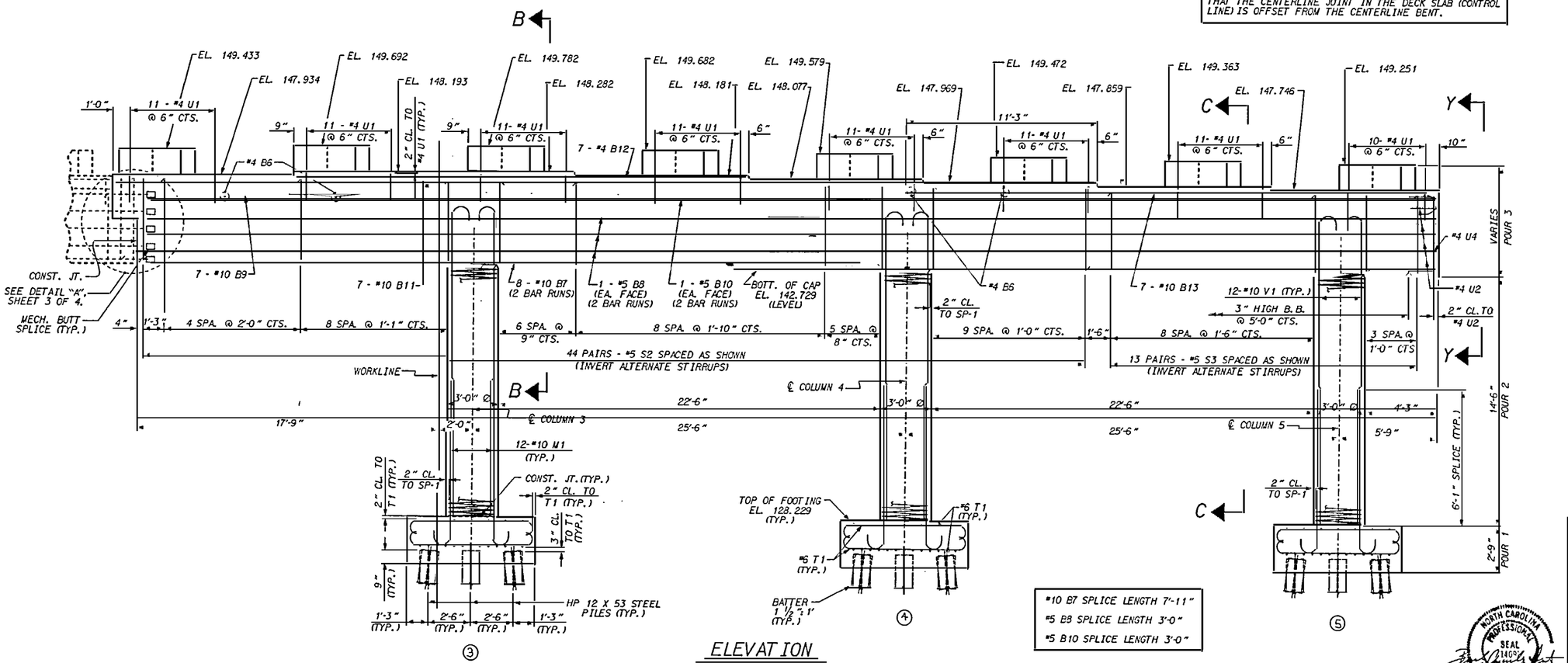
DRAWN BY : D. G. VESTER DATE : 10-16-96
CHECKED BY : BC Hunt DATE : 1-31-97

31-DEC-1996 09:55
dgn\users\dottie\robeson\u2415\u2415502bLdgn
dottie



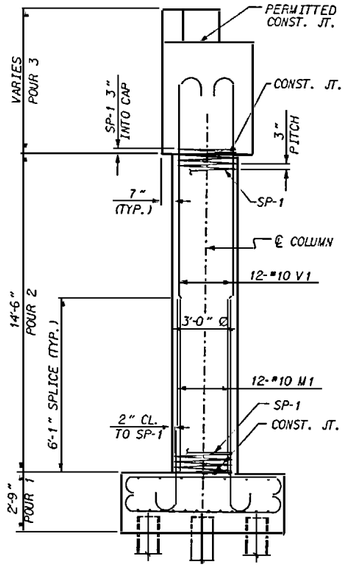
PLAN

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.



ELEVATION

#10 B7 SPLICE LENGTH 7'-11"
#5 B8 SPLICE LENGTH 3'-0"
#5 B10 SPLICE LENGTH 3'-0"



END ELEVATION

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

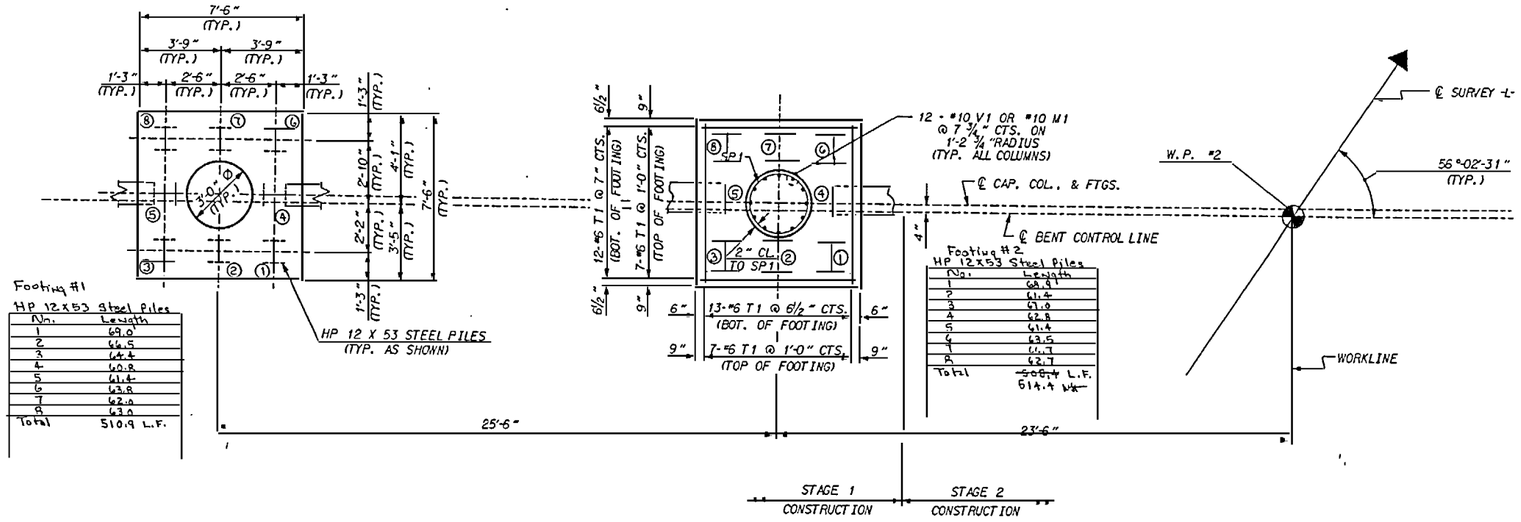
SUBSTRUCTURE
BENT 1
STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-242
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : D. G. VESTER DATE : 10-16-96
CHECKED BY : B C Hunt DATE : 1-2-97

NORTH CAROLINA PROFESSIONAL SEAL 14609 ENGINEER BUCK CHARLES HUNT
2-3-97

04-DEC-1996 09:08
d:\users\dottie\robeson\u2415\u24150201.dgn
dottie



Footing #1
HP 12x53 Steel Piles

No.	Length
1	69.0
2	66.5
3	64.4
4	60.8
5	61.6
6	63.8
7	62.0
8	63.0
Total	510.9 L.F.

Footing #2
HP 12x53 Steel Piles

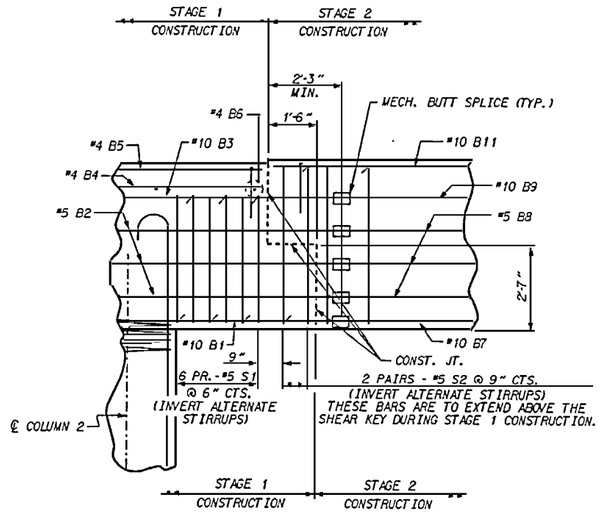
No.	Length
1	68.9
2	61.4
3	61.0
4	62.8
5	61.4
6	63.5
7	64.9
8	62.7
Total	~~509.4~~ L.F. 514.4 Wt.

ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.

PLAN OF FOOTINGS

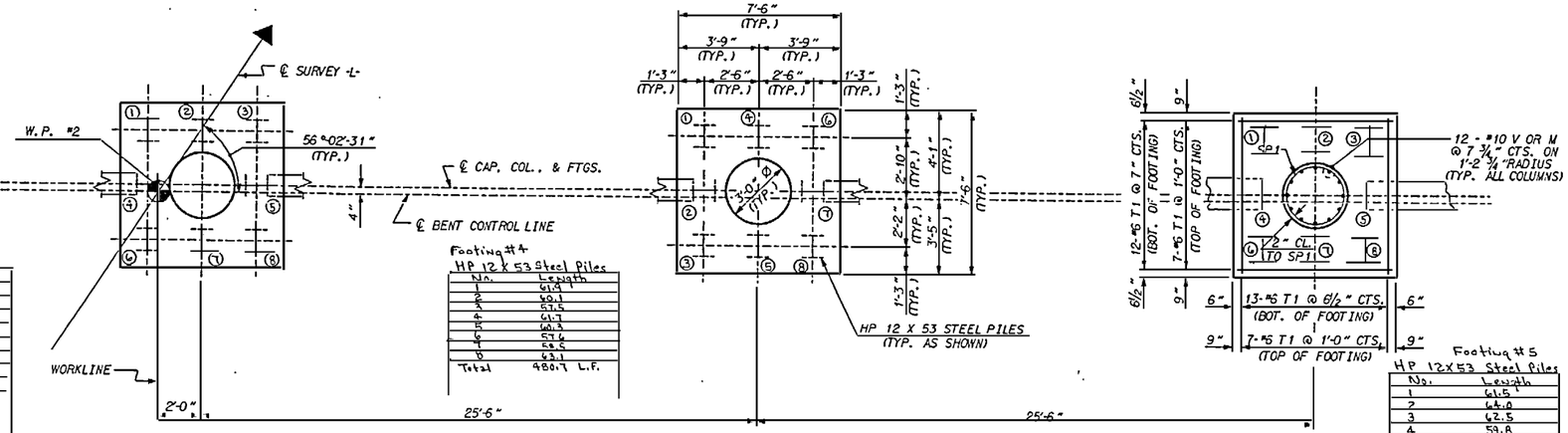
STAGE 1 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.



DETAIL "A"

(PEDESTALS NOT SHOWN)



Footing #3
HP 12x53 Steel Piles

No.	Length
1	59.8
2	61.5
3	62.6
4	64.6
5	62.4
6	61.0
7	61.9
8	62.1
Total	500.9 L.F.

Footing #4
HP 12 x 53 Steel Piles

No.	Length
1	61.4
2	60.1
3	57.5
4	61.7
5	60.3
6	57.6
7	59.5
8	62.1
Total	480.7 L.F.

Footing #5
HP 12x53 Steel Piles

No.	Length
1	61.5
2	64.0
3	62.5
4	59.8
5	60.0
6	59.3
7	61.5
8	60.0
Total	487.6 L.F.

PLAN OF FOOTINGS

STAGE 2 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'

ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.

NORTH CAROLINA PROFESSIONAL SEAL 14094 ENGINEER BUCK CHARLES HUNT 2-3-97

DRAWN BY : D. G. VESTER DATE : 10-18-96
CHECKED BY : B.C. Hunt DATE : 12-4-96

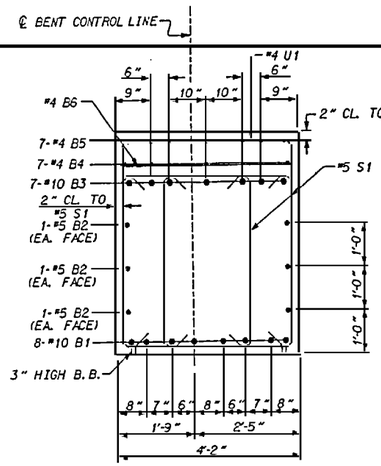
PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

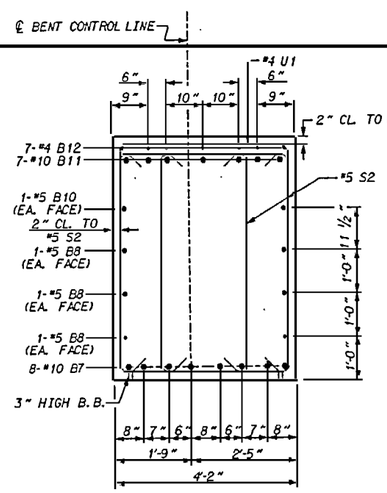
SUBSTRUCTURE
BENT 1
STAGE 1 AND STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-243
1			3			TOTAL SHEETS
2			4			264



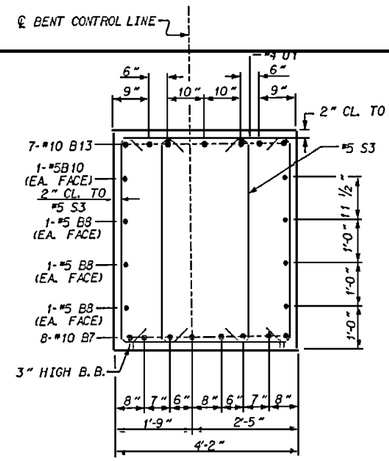
SECTION A-A

PEDESTAL NOT SHOWN



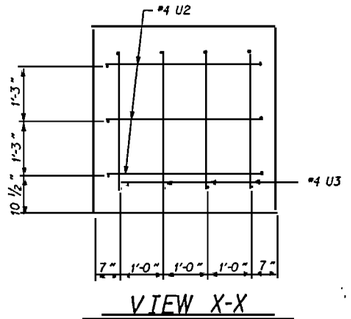
SECTION B-B

PEDESTAL NOT SHOWN

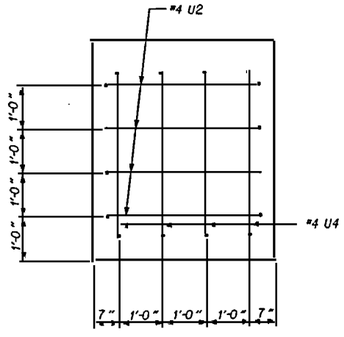


SECTION C-C

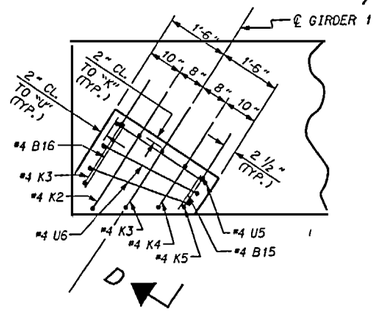
PEDESTAL NOT SHOWN



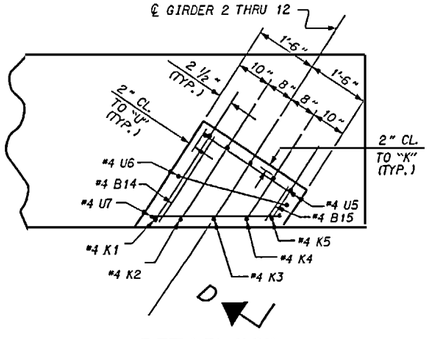
VIEW X-X



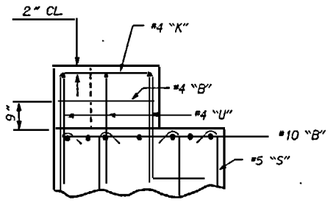
VIEW Y-Y



DETAIL "B"



DETAIL "C"

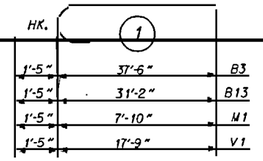


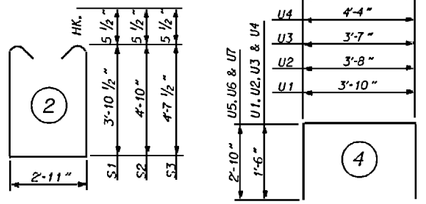
SECTION D-D

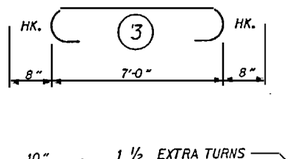
PEDESTAL DETAILS

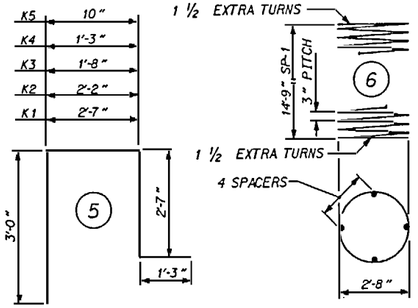
DRAWN BY : D. G. VESTER DATE : 10-24-96
CHECKED BY : B.C. Hunt DATE : 12-97

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT NO. 1 , STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	10	STR	37- 7	1231
*B2	6	5	STR	37- 7	235
*B3	7	10	1	38-11	1172
B4	7	4	STR	25- 9	120
B5	7	4	STR	5- 3	25
B6	6	4	STR	3-10	15
B12	3	4	STR	2- 7	5
B15	4	4	STR	1- 0	3
B16	1	4	STR	1- 8	1
K1	3	4	5	9- 5	19
K2	4	4	5	9- 0	24
K3	5	4	5	8- 6	28
K4	4	4	5	8- 1	22
K5	4	4	5	7- 8	20
M1	24	10	1	9- 3	955
S1	58	5	2	11- 7	701
S2	4	5	2	13- 6	56
T1	78	6	3	8- 4	976
U1	41	4	4	6-10	187
U2	3	4	4	6- 8	13
U3	4	4	4	6- 7	18
U5	4	4	4	8- 4	22
U6	5	4	4	8- 6	28
U7	3	4	4	8-10	18
V1	24	10	1	19- 2	1979

EPOXY COATED REINFORCING STEEL — LBS. 2,701

REINFORCING STEEL — LBS. 5,235

SP-1	2		6	511- 7	683

SPIRAL COLUMN REINFORCING STEEL — LBS. 683

CLASS "A" CONC. BREAKDOWN	
POUR #1 (FOOTINGS)	C.Y. 11.5
POUR #2 (COLUMNS)	C.Y. 7.6
POUR #3 (CAP)	C.Y. 27.2
CLASS "A" CONCRETE	C.Y. 46.3
FOUNDATION EXCAVATION	LUMP SUM
HP 12 X 53 STEEL PILES NO. 16	1040 LIN. FT.

* THESE BARS ARE EPOXY COATED

BILL OF MATERIAL
BENT NO. 1 , STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	4	4	STR	3-10	10
B7	16	10	STR	41- 9	2874
B8	12	5	STR	39- 4	492
B9	7	10	STR	10- 2	306
B10	4	5	STR	35- 9	149
B11	7	10	STR	57- 6	1732
B12	7	4	STR	26- 4	123
B13	7	10	1	32- 7	981
B14	8	4	STR	2- 7	14
B15	8	4	STR	1- 0	5
K1	8	4	5	9- 5	50
K2	8	4	5	9- 0	48
K3	8	4	5	8- 6	45
K4	8	4	5	8- 1	43
K5	8	4	5	7- 8	41
M1	36	10	1	9- 3	1433
S2	82	5	2	13- 6	1239
S3	26	5	2	13- 1	355
T1	117	6	3	8- 4	1464
U1	87	4	4	6-10	397
U2	4	4	4	6- 8	18
U4	4	4	4	7- 4	20
U5	8	4	4	8- 4	45
U6	8	4	4	8- 6	45
U7	8	4	4	8-10	47
V1	36	10	1	19- 2	2969

REINFORCING STEEL — LBS. 14,945

SP-1	3		6	511- 7	1025

SPIRAL COLUMN REINFORCING STEEL — LBS. 1025

CLASS "A" CONC. BREAKDOWN	
POUR #1 (FOOTINGS)	C.Y. 17.2
POUR #2 (COLUMNS)	C.Y. 11.4
POUR #3 (CAP)	C.Y. 65.9
CLASS "A" CONCRETE	C.Y. 94.5
FOUNDATION EXCAVATION	LUMP SUM
HP 12 X 53 STEEL PILES NO. 24	1560 LIN. FT.

VOID VOID VOID VOID

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
STAGE 1 AND STAGE 2

NORTH CAROLINA PROFESSIONAL SEAL 11031 ENGINEER BUCK CHARLES HUNT 12-5-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-244
1			3			TOTAL SHEETS
2			4			264

31-JAN-1997 14:22
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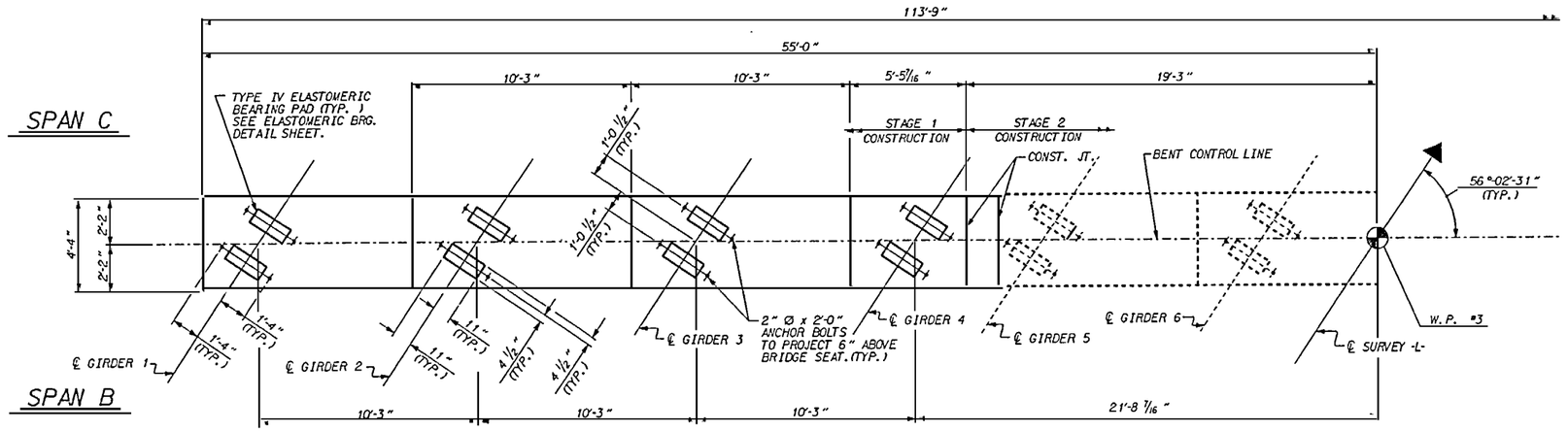
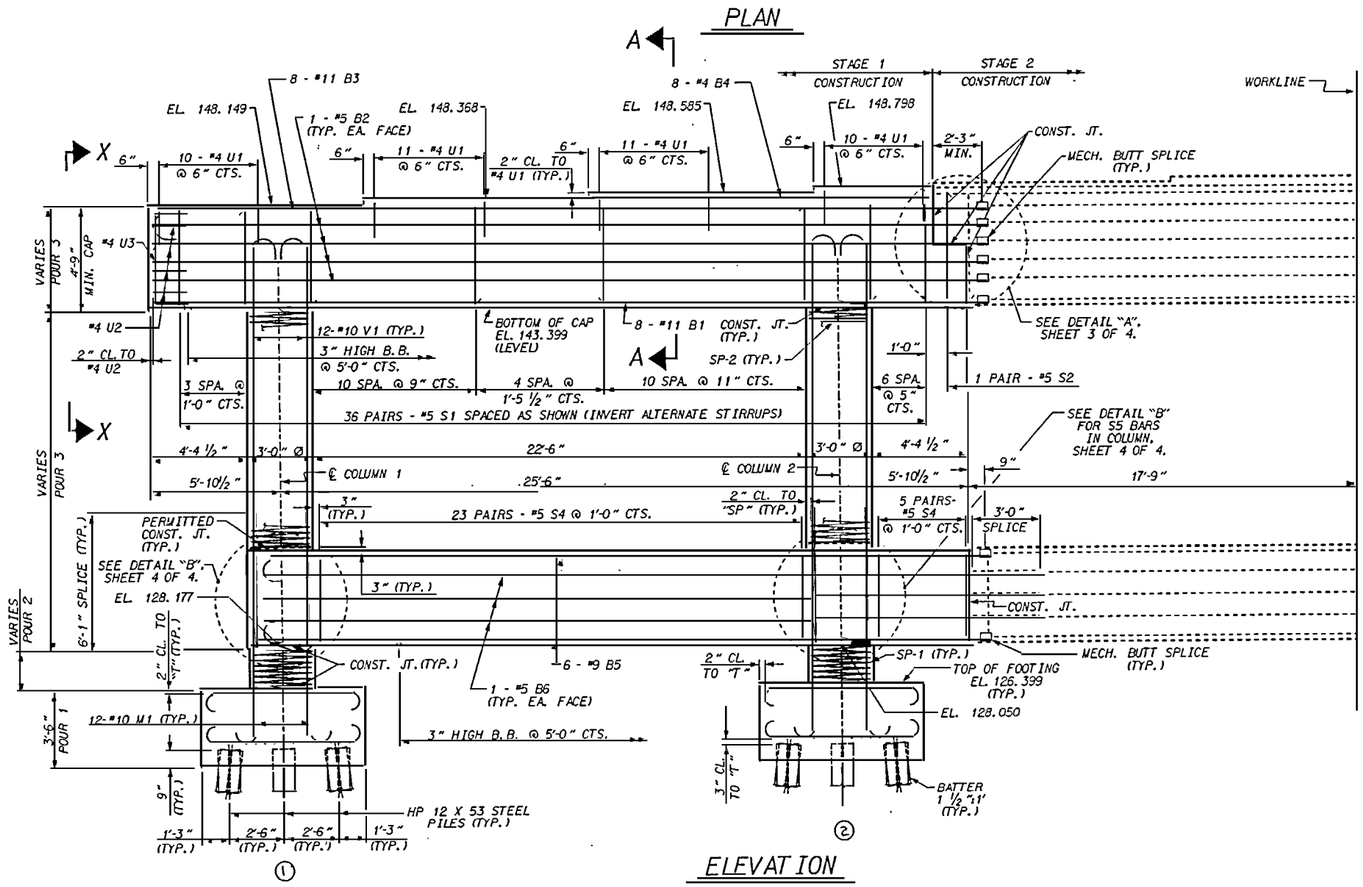
dottie





ELEVATION

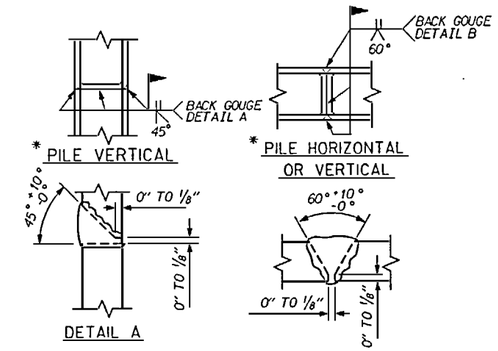
NOTES

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.

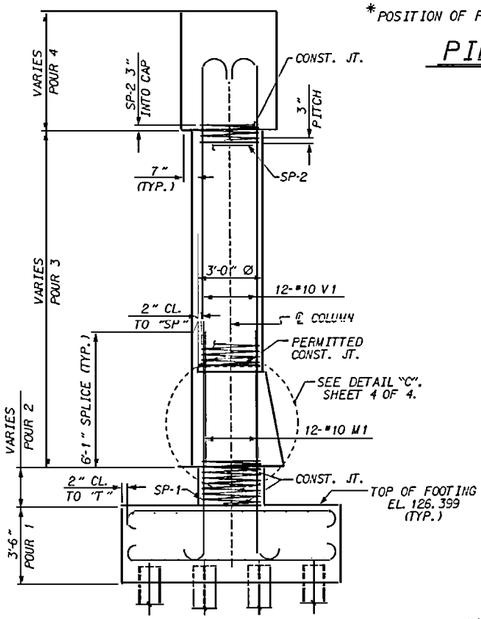
FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

FOR MECHANICAL BUTT SPLICE, SEE SPECIAL PROVISIONS.



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



END ELEVATION

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-245
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14402 ENGINEER BUCK CHARLES HUNT
2-7-97

DRAWN BY : D. G. VESTER DATE : 11-4-96
CHECKED BY : B.C. Hunt DATE : 1-31-97

31-JAN-1997 14:23
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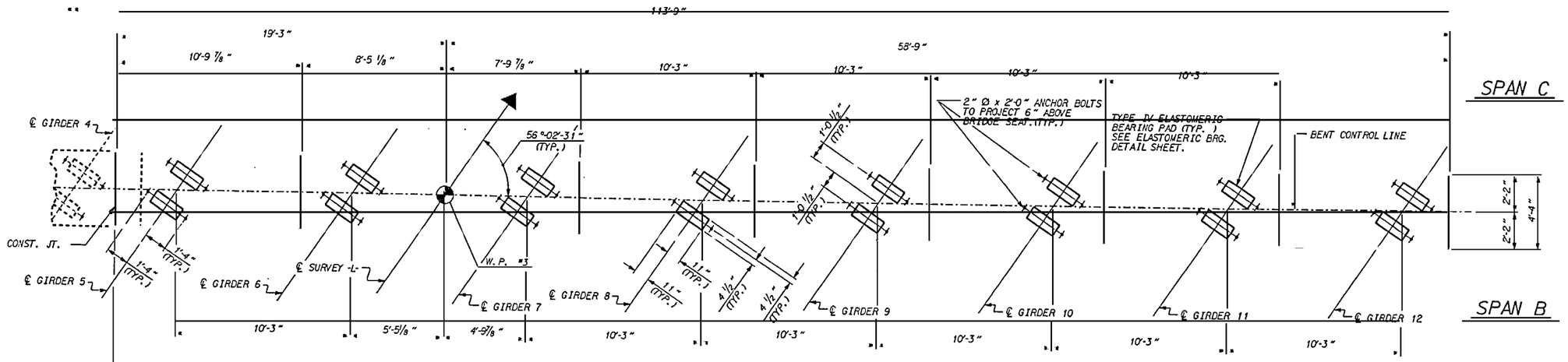
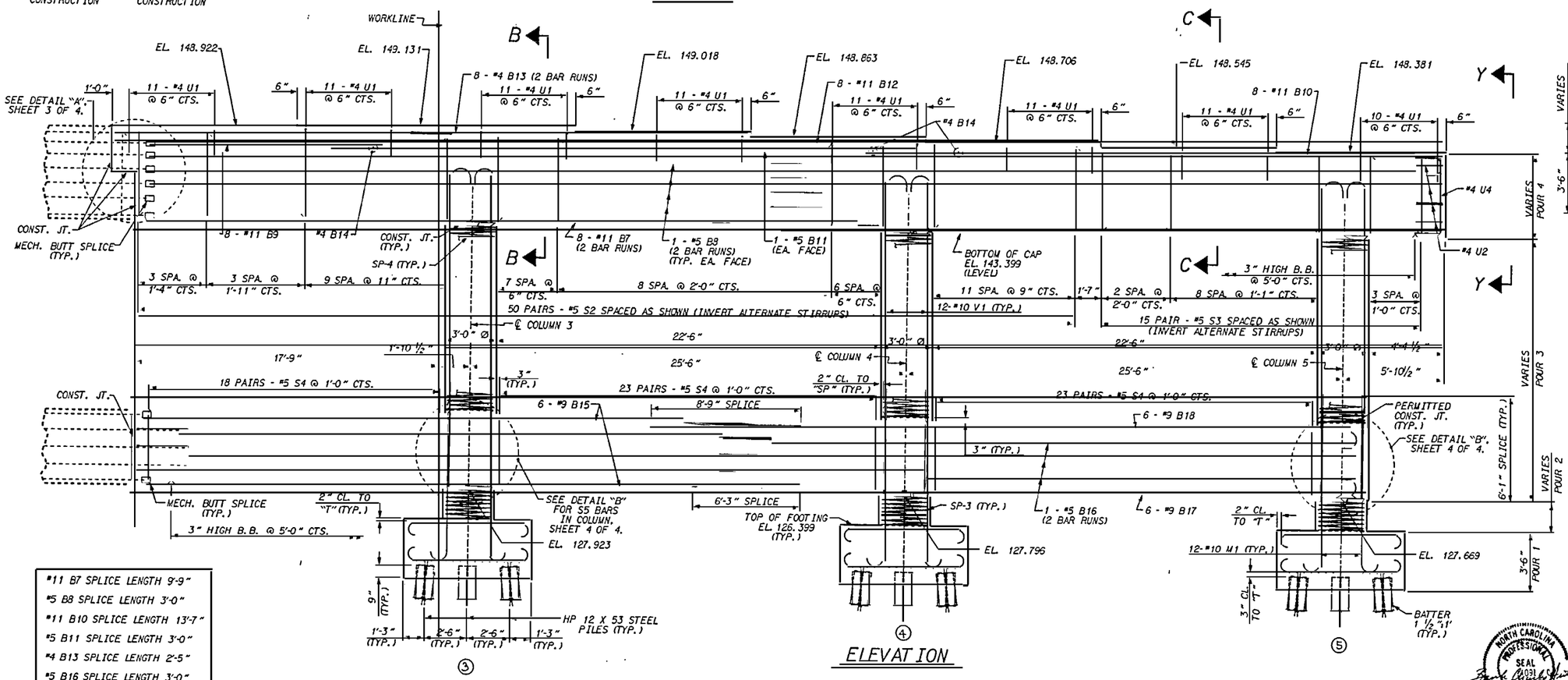
dottie



PLAN



③ ④ ⑤

ELEVATION

END ELEVATION

#11 B7 SPLICE LENGTH 9'-9"
#5 B8 SPLICE LENGTH 3'-0"
#11 B10 SPLICE LENGTH 13'-7"
#5 B11 SPLICE LENGTH 3'-0"
#4 B13 SPLICE LENGTH 2'-5"
#5 B16 SPLICE LENGTH 3'-0"

DRAWN BY : D. G. VESTER DATE : 11-5-96
CHECKED BY : BC HUNT DATE : 1-31-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 2

NORTH CAROLINA PROFESSIONAL SEAL 019021 ENGINEER BUCK CHARLES HUNT
1-31-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2416
1			3			TOTAL SHEETS
2			4			264

04-DEC-1996 10:29
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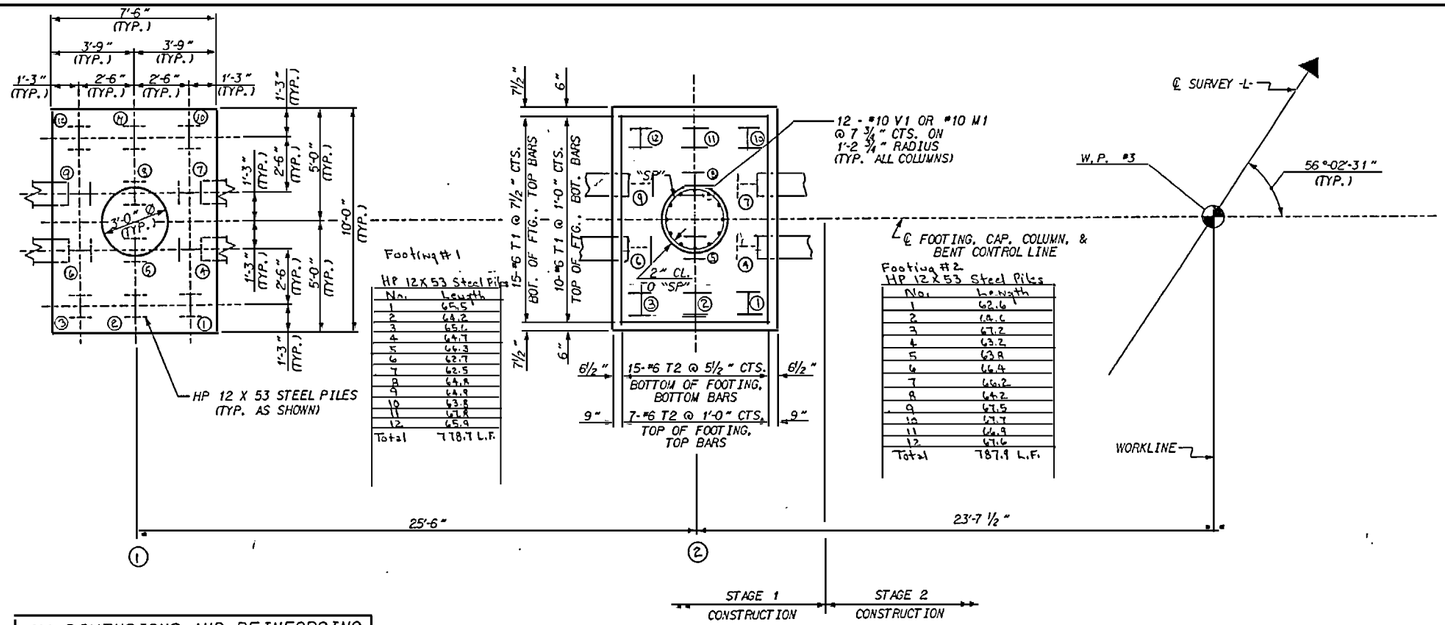
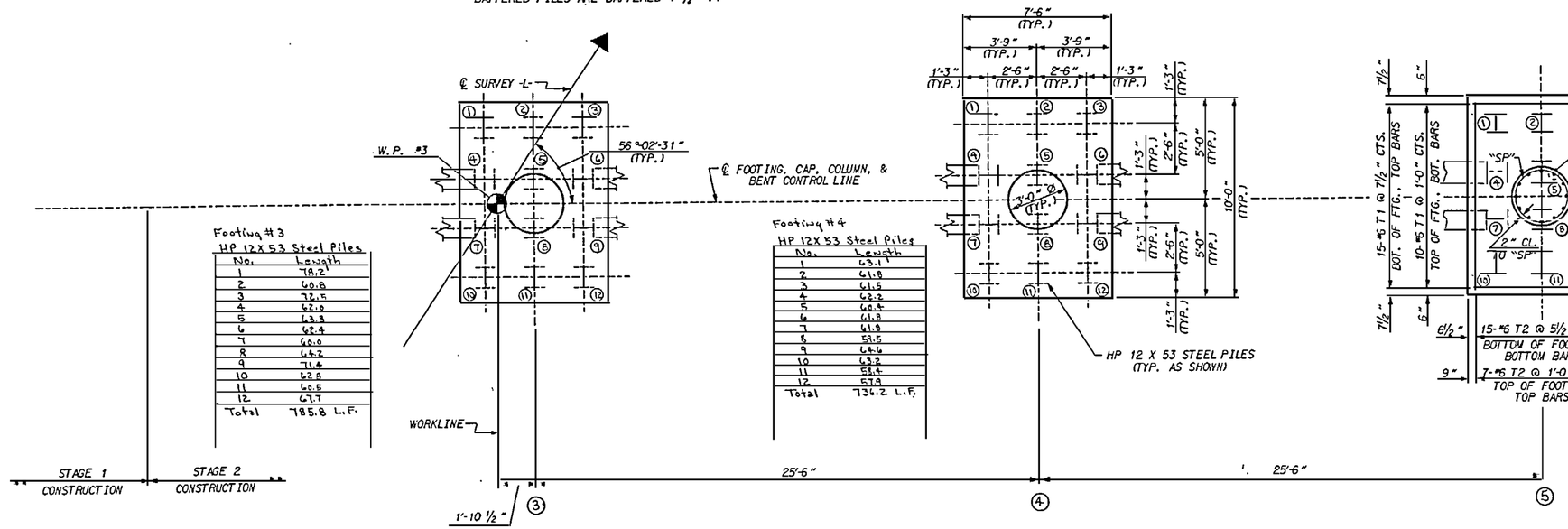


ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.

PLAN OF FOOTINGS

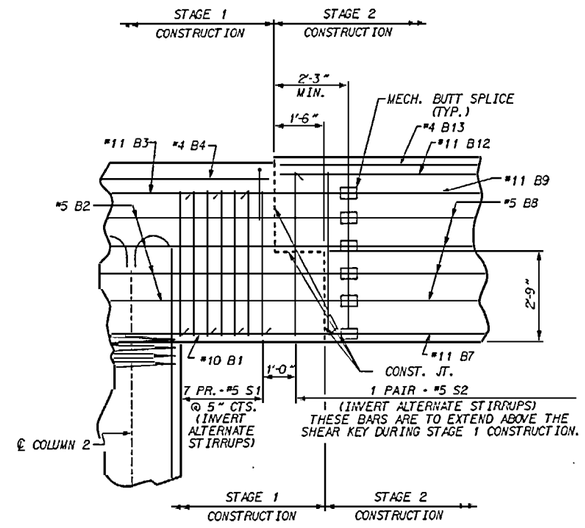
STAGE 1 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'



PLAN OF FOOTINGS

STAGE 2 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'

ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.



DETAIL "A"

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 3 OF 4

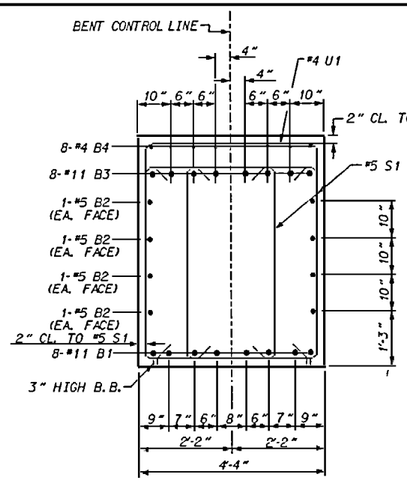
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 1 AND STAGE 2

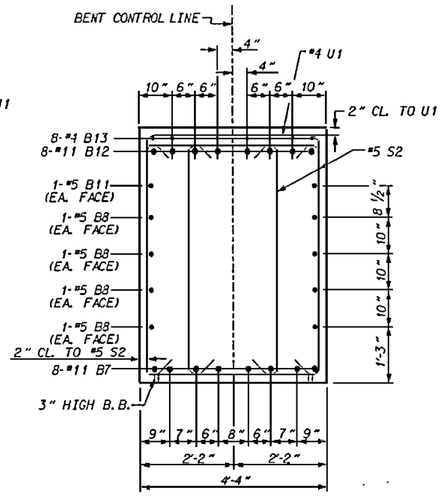
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-247
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BUCK CHARLES HUNT
2-3-97

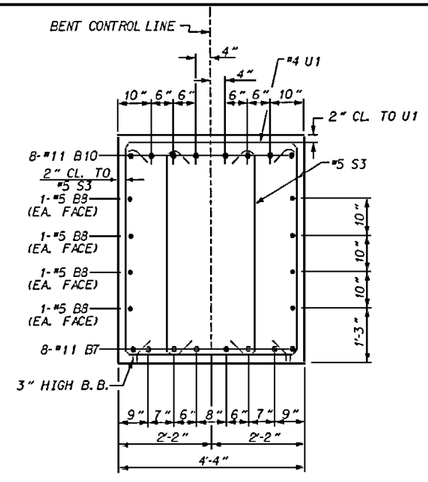
DRAWN BY : D. G. VESTER DATE : 11-5-96
CHECKED BY : B C Hunt DATE : 12-4-96



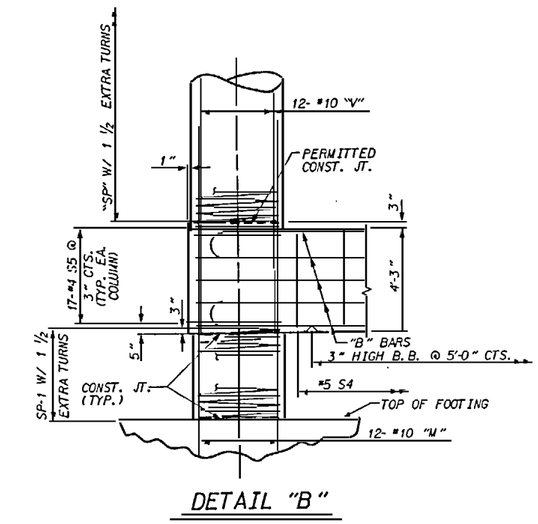
SECTION A-A



SECTION B-B



SECTION C-C



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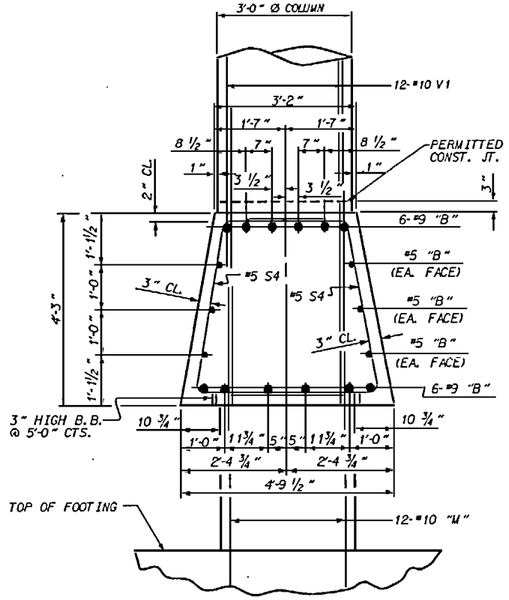
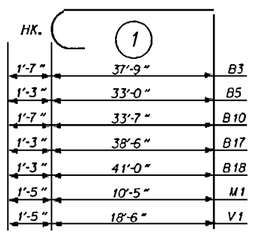
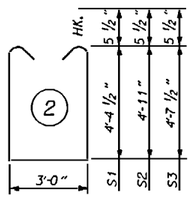
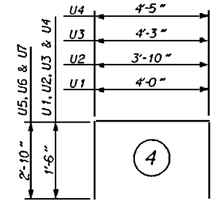


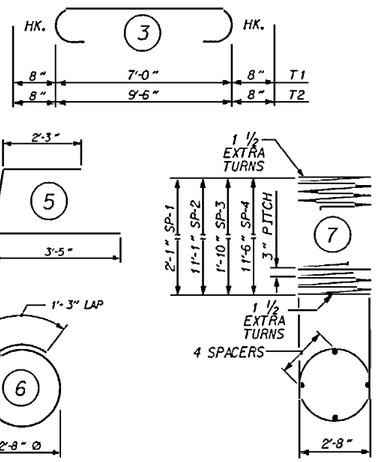
DETAIL "C"

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT NO. 2 , STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	11	STR	37-10	1608
*B2	8	5	STR	37-10	316
*B3	8	11	1	39- 4	1672
B4	8	4	STR	15- 4	82
B5	12	9	1	34- 3	1397
B6	6	5	STR	35- 5	222
M1	24	10	1	11-10	1222
S1	72	5	2	12- 8	951
S2	2	5	2	13- 9	29
S4	56	5	5	9- 2	560
S5	34	4	6	9- 8	220
T1	50	6	3	8- 4	626
T2	44	6	3	10-10	716
U1	42	4	4	7- 0	196
U2	4	4	4	6-10	18
U3	4	4	4	7- 3	19
V1	24	10	1	19-11	2057

EPOXY COATED REINFORCING STEEL LBS. 3,596

REINFORCING STEEL LBS. 8,315

SP-1	2	7	99- 1	132
SP-2	2	Void	7	396- 1	529

SPIRAL COLUMN REINFORCING STEEL LBS. 661

CLASS "A" CONC. BREAKDOWN

POUR #1 (FOOTINGS)	C.Y.	19.4
POUR #2 (COLUMNS)	C.Y.	0.9
POUR #3 (COLUMN & BARRIER)	C.Y.	26.4
POUR #4 (CAP)	C.Y.	29.6
CLASS "A" CONCRETE	C.Y.	76.3

FOUNDATION EXCAVATION LUMP SUM

HP 12 X 53 STEEL PILES NO. 24 1560 LIN. FT

BILL OF MATERIAL
BENT NO. 2 , STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7	16	11	STR	42- 8	3627
B8	16	5	STR	39- 4	656
B9	8	11	STR	13- 7	577
B10	8	11	1	35- 2	1495
B11	2	5	STR	34- 3	72
B12	8	11	STR	57- 5	2446
B13	16	4	STR	19- 8	210
B14	3	4	STR	4- 0	8
B15	12	9	STR	38- 6	1571
B16	12	5	STR	37- 2	465
B17	6	9	1	39- 9	811
B18	6	9	1	42- 3	862
M1	36	10	1	11-10	1833
S2	100	5	2	13- 9	1434
S3	30	5	2	13- 2	412
S4	128	5	5	9- 7	1279
S5	51	4	6	9- 8	329
T1	75	6	3	8- 4	939
T2	66	6	3	10-10	1074
U1	87	4	4	7- 0	407
U2	4	4	4	6-10	18
U4	4	4	4	7- 5	20
V1	36	10	1	19-11	3085

REINFORCING STEEL LBS. 23,624

SP-3	3	Void	7	330-10	182
SP-4	3	Void	7	404- 4	810

SPIRAL COLUMN REINFORCING STEEL LBS. 992

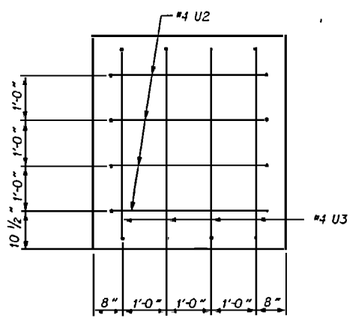
CLASS "A" CONC. BREAKDOWN

POUR #1 (FOOTINGS)	C.Y.	29.2
POUR #2 (COLUMNS)	C.Y.	1.1
POUR #3 (COLUMN & BARRIER)	C.Y.	53.9
POUR #4 (CAP)	C.Y.	67.2
CLASS "A" CONCRETE	C.Y.	151.4

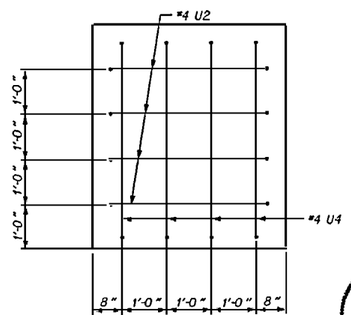
FOUNDATION EXCAVATION LUMP SUM

HP 12 X 53 STEEL PILES NO. 36 2340 LIN. FT

* THESE BARS ARE EPOXY COATED



VIEW X-X



VIEW Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 14032 ENGINEER BRUCK CHARLES HUNT 2-1-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 1 AND STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-248
1			3			TOTAL SHEETS
2			4			204

DRAWN BY : D. G. VESTER DATE : 11-5-96
CHECKED BY : B C Hunt DATE : 1-2-97

31-JAN-1997 14:29
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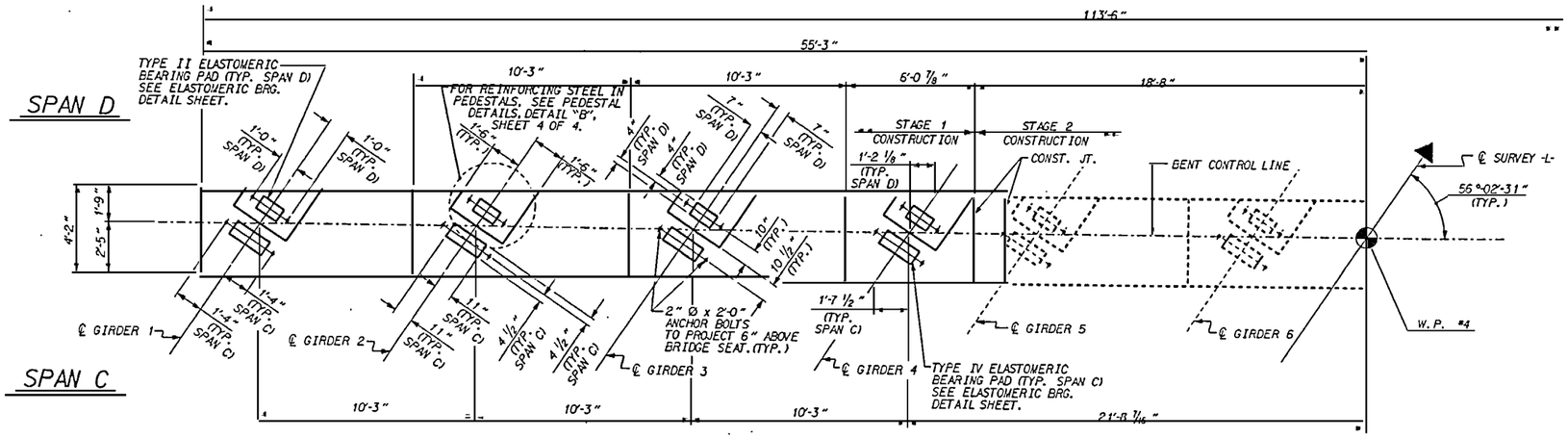
doffie



NOTES

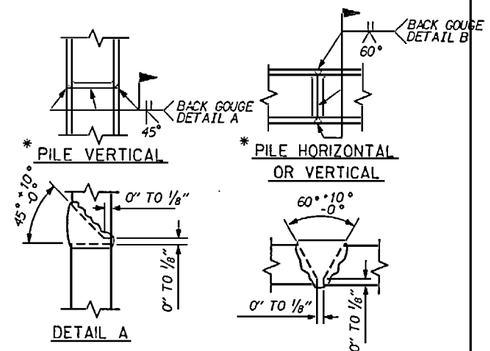
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

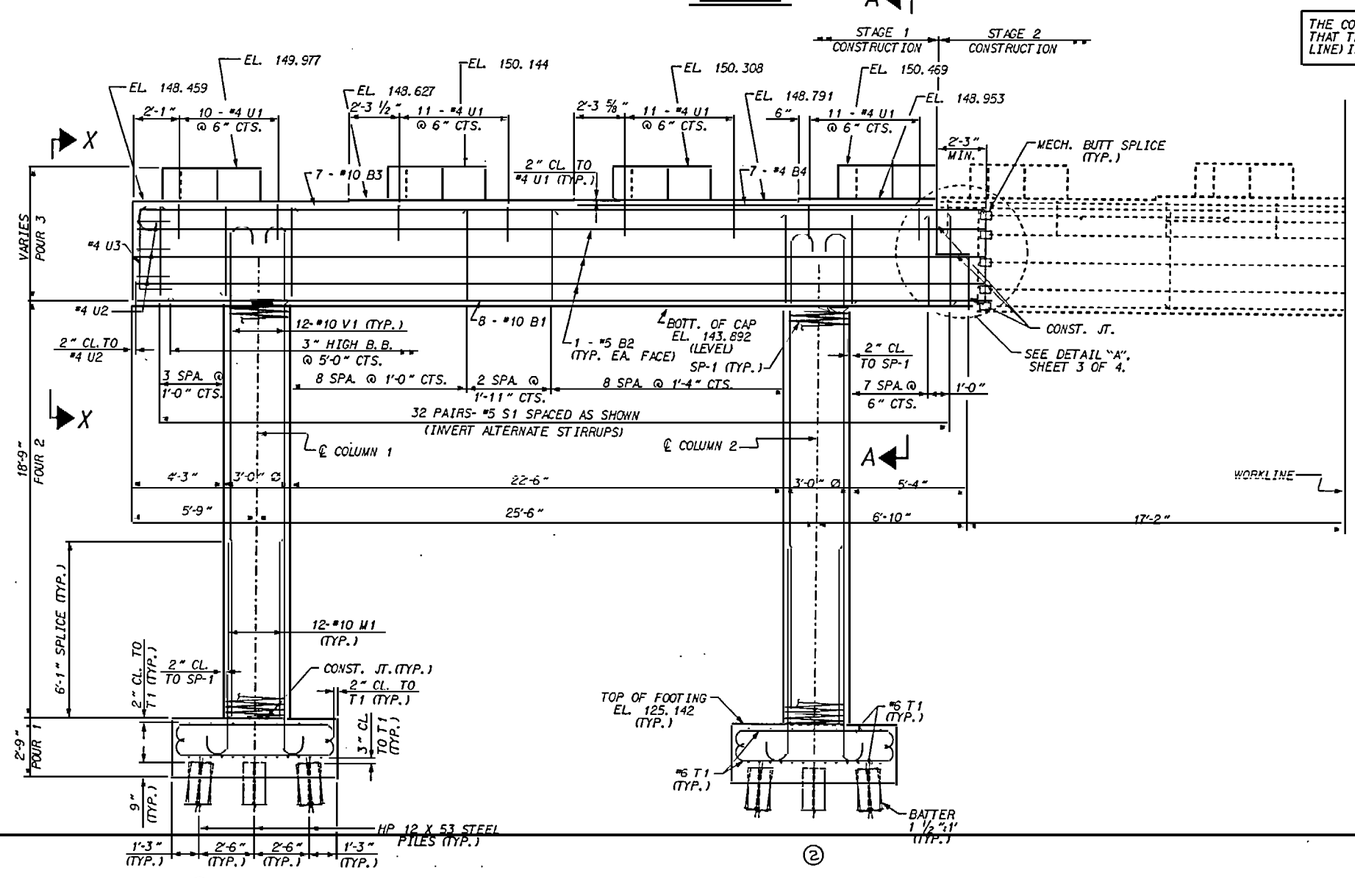
FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR MECHANICAL BUTT SPLICE SEE SPECIAL PROVISIONS.

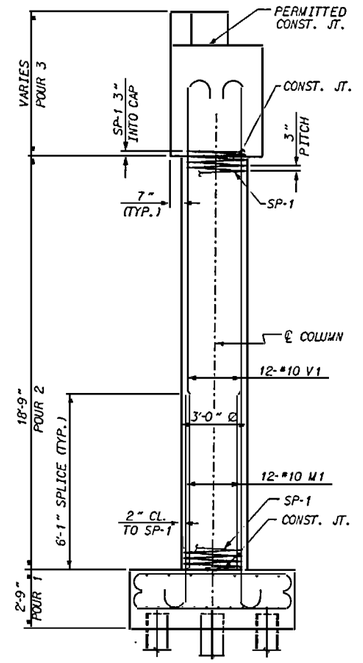


PILE SPLICE DETAILS

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.



ELEVATION



END ELEVATION

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3
STAGE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-249
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : D. G. VESTER DATE : 10-25-96
CHECKED BY : B. C. Hunt DATE : 1-31-97

04-DEC-1996 14:37
d:\users\dottie\robeson\u2415\u2415502b3.dgn
dottie

113'-6"

18'-8" | 58'-3"

10'-2 7/8" | 8'-5 5/8" | 8'-0 3/8" | 10'-3" | 10'-3" | 10'-3" | 10'-3"

TYPE II ELASTOMERIC BEARING PAD (TYP. SPAN D) SEE ELASTOMERIC BRG. DETAIL SHEET.

2" Ø x 2'-0" ANCHOR BOLTS TO PROJECT 6" ABOVE BRIDGE SEAT. (TYP.)

W.P. #4

℄ SURVEY -L-

56°-02'-31" (TYP.)

FOR REINFORCING STEEL IN PEDESTALS, SEE PEDESTAL DETAILS, DETAIL "B", SHEET 4 OF 4.

1'-6" (TYP.) | 1'-6" (TYP.)

1'-0" (TYP. SPAN D) | 1'-0" (TYP. SPAN D) | 4" (TYP. SPAN D) | 4" (TYP. SPAN D) | 7" (TYP. SPAN D) | 7" (TYP. SPAN D)

1'-2 1/8" (TYP. SPAN D)

BENT CONTROL LINE

FOR REINFORCING STEEL IN PEDESTALS, SEE PEDESTAL DETAILS, DETAIL "C", SHEET 4 OF 4.

SPAN D

1'-9" | 4'-2" | 2'-5"

10" (TYP.)

CONST. JT.

℄ GIRDER 5

℄ GIRDER 6

TYPE IV ELASTOMERIC BEARING PAD (TYP. SPAN C) SEE ELASTOMERIC BRG. DETAIL SHEET.

℄ GIRDER 7

11" (TYP. SPAN C) | 11" (TYP. SPAN C)

4 1/2" (TYP. SPAN C) | 4 1/2" (TYP. SPAN C)

℄ GIRDER 8

℄ GIRDER 9

1'-4" (TYP. SPAN C) | 1'-4" (TYP. SPAN C)

℄ GIRDER 10

℄ GIRDER 11

1'-7 1/2" (TYP. SPAN C)

10 1/2" (TYP.)

℄ GIRDER 12

SPAN C

10'-3" | 5'-5 1/8" | 4'-9 7/8" | 10'-3" | 10'-3" | 10'-3" | 10'-3" | 10'-3"

STAGE 1 CONSTRUCTION | STAGE 2 CONSTRUCTION

PLAN

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.

B ◄ | C ◄ | Y ◄

EL. 149.042 | EL. 149.187 | EL. 148.984 | EL. 148.778 | EL. 148.569 | EL. 148.357 | EL. 148.142

EL. 150.562 | EL. 150.719 | EL. 150.705 | EL. 150.502 | EL. 150.295 | EL. 150.085 | EL. 149.872 | EL. 149.656

6" | 6" | 9" | 9" | 9" | 9" | 9" | 8"

11 - #4 U1 @ 6" CTS. | 11 - #4 U1 @ 6" CTS. | 11 - #4 U1 @ 6" CTS. | 11 - #4 U1 @ 6" CTS. | 11 - #4 U1 @ 6" CTS. | 11 - #4 U1 @ 6" CTS. | 9 - #4 U1 @ 6" CTS.

WORKLINE

7 - #10 B10

2" CL. TO #4 U1 (TYP.)

CONST. JT.

MECH. BUTT SPLICE (TYP.)

SEE DETAIL "A", SHEET 3 OF 4.

7 - #10 B7

#4 B13

3'-0"

1 - #5 B8 (EA. FACE)

7 - #4 B11

8 - #10 B5 (2 BAR RUNS)

1 - #5 B6 (EA. FACE) (2 BAR RUNS)

3'-0"

#4 B13

SP-1 (TYP.)

7 - #10 B9

2" CL. TO SP-1

7 - #4 B12

BUTT. OF CAP EL. 143.892 (LEVEL)

C ◄ 3" HIGH B.B. @ 5'-0" CTS.

Y ◄ 2" CL. TO #4 U2

#4 U4

#4 U2

4'-3" MIN. CAP | POUR 3 VARIES

18'-9" POUR 2

6'-1" SPLICE (TYP.)

2'-9" POUR 1

5 SPA. @ 1'-9" CTS. | 8 SPA. @ 1'-0" CTS. | 6 SPA. @ 9" CTS. | 8 SPA. @ 1'-10" CTS. | 5 SPA. @ 8" CTS. | 9 SPA. @ 1'-0" CTS. | 9 SPA. @ 1'-6" CTS. | 3 SPA. @ 1'-0" CTS.

34 PAIRS - #5 S2 SPACED AS SHOWN (INVERT ALTERNATE STIRRUPS)

23 PAIRS - #5 S3 SPACED AS SHOWN (INVERT ALTERNATE STIRRUPS)

℄ COLUMN 3 | ℄ COLUMN 4 | ℄ COLUMN 5

B ◄

3'-0" Ø | 22'-6" | 3'-0" Ø | 22'-6" | 3'-0" Ø | 4'-3"

1'-6" | 17'-2" | 25'-6" | 25'-6" | 5'-9"

12-#10 M1 (TYP.)

2" CL. TO T1 (TYP.) | 2" CL. TO SP-1

CONST. JT. (TYP.)

3" CL. TO T1 (TYP.)

9" (TYP.)

HP 12 X 53 STEEL PILES (TYP.)

1'-3" (TYP.) | 2'-6" (TYP.) | 2'-6" (TYP.) | 1'-3" (TYP.)

#6 T1 (TYP.)

BATTER 1 1/2":1' (TYP.)

TOP OF FOOTING EL. 125.142 (TYP.)

③ ④ ⑤

#10 B5 SPLICE LENGTH 1'-11"
#5 B6 SPLICE LENGTH 3'-0"
#5 B8 SPLICE LENGTH 3'-0"
#10 B9 SPLICE LENGTH 11'-1"

ELEVATION

PERMITTED CONST. JT.

VARIES POUR 3

SP-1 3" INTO CAP

CONST. JT.

3" PITCH

7" (TYP.)

SP-1

18'-9" POUR 2

℄ COLUMN

12-#10 V1

3'-0" Ø

6'-1" SPLICE (TYP.)

12-#10 M1

2" CL. TO SP-1

SP-1

CONST. JT.

2'-9" POUR 1

END ELEVATION

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

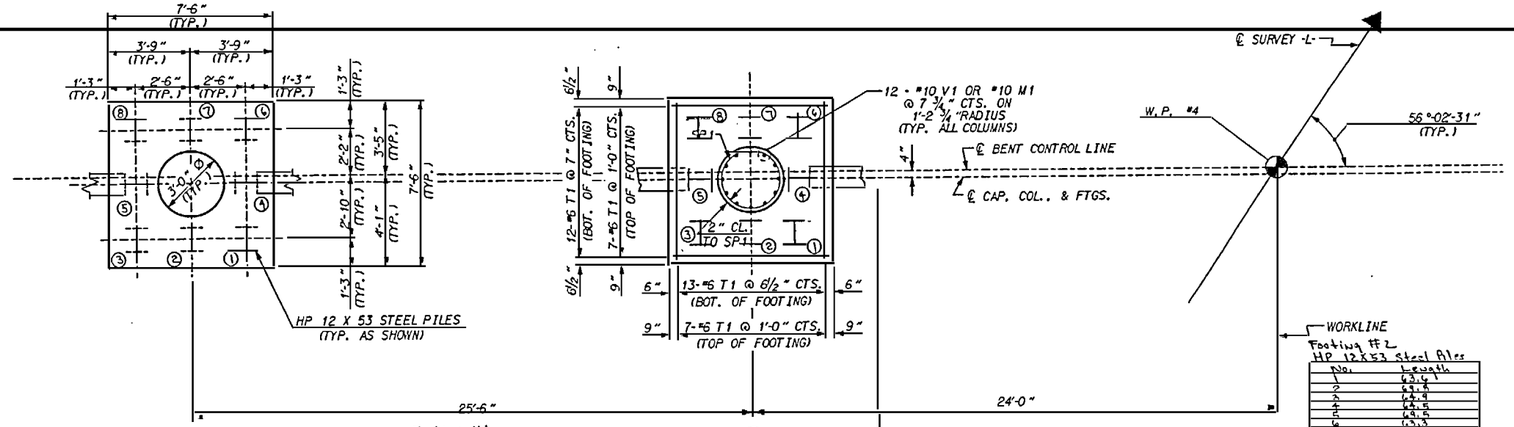
SUBSTRUCTURE
BENT 3
STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-250
1			3			TOTAL SHEETS
2			4			264

NORTH CAROLINA PROFESSIONAL SEAL 14031 ENGINEER JOHN CHARLES HUNT 2-7-97

DRAWN BY : D. G. VESTER DATE : 10-28-96
CHECKED BY : B C Hunt DATE : 2-7-97

31-DEC-1936 10:40
G:\users\dottie\robeson\u2415\u2415502b3.dgn
dottie



Footing #1
HP 12X53 Steel Piles

No.	Length
1	72.2'
2	68.9
3	72.1
4	61.7
5	69.3
6	71.5
7	72.4
8	73.9
Total	558.7 L.F.

Footing #2
HP 12X53 Steel Piles

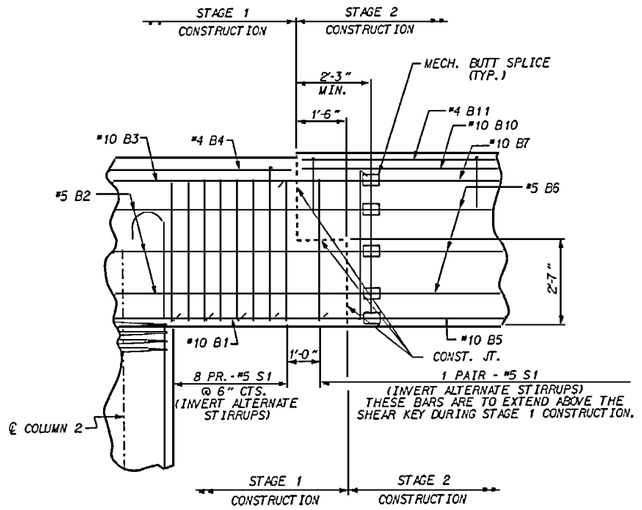
No.	Length
1	63.6
2	63.8
3	64.9
4	64.5
5	64.5
6	63.3
7	62.2
8	71.5
Total	529.3 L.F.

ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.

PLAN OF FOOTINGS

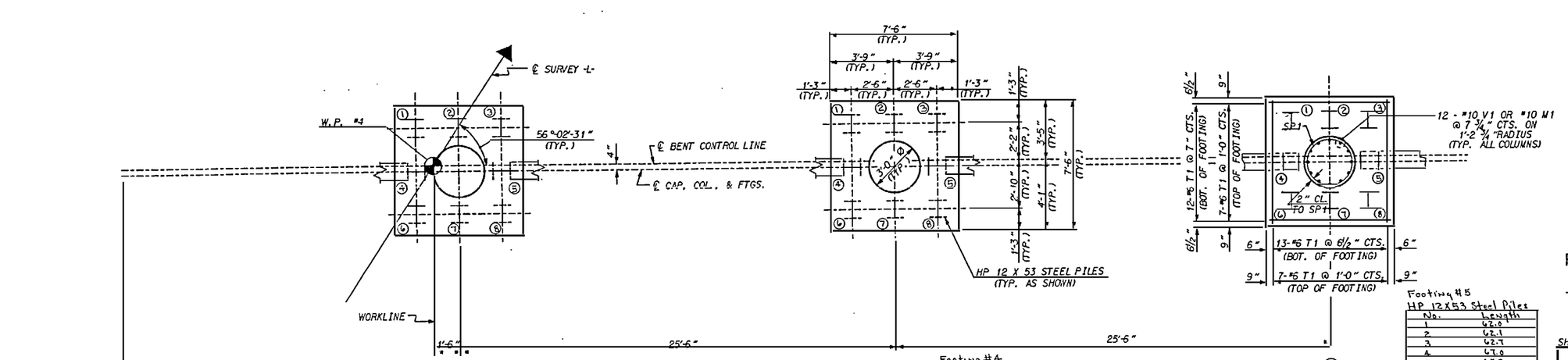
STAGE 1 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.



DETAIL "A"

(PEDESTALS NOT SHOWN)



Footing #3
HP 12X53 Steel Piles

No.	Length
1	59.0
2	58.8
3	58.5
4	62.4
5	60.2
6	59.3
7	60.0
8	60.5
Total	478.7 L.F.

Footing #4
HP 12X53 Steel Piles

No.	Length
1	58.4'
2	58.6
3	58.8
4	60.2
5	60.6
6	58.6
7	58.8
8	59.1
Total	473.6 L.F.

Footing #5
HP 12X53 Steel Piles

No.	Length
1	62.0
2	62.1
3	62.7
4	63.0
5	63.2
6	63.0
7	61.6
8	63.4
Total	506.4 L.F.

ALL DIMENSIONS AND REINFORCING STEEL TYPICAL FOR EACH FOOTING.

PLAN OF FOOTINGS

STAGE 2 CONSTRUCTION
BATTERED PILES ARE BATTERED 1 ½" : 1'

STAGE 1 CONSTRUCTION | STAGE 2 CONSTRUCTION

DRAWN BY : D. G. VESTER DATE : 10-29-96
CHECKED BY : B. C. HUNT DATE : 1-2-97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

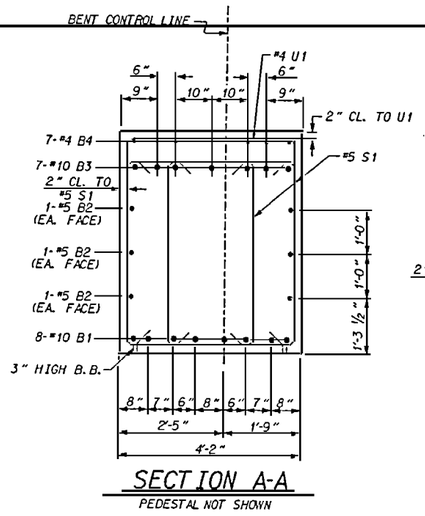
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3
STAGE 1 AND STAGE 2

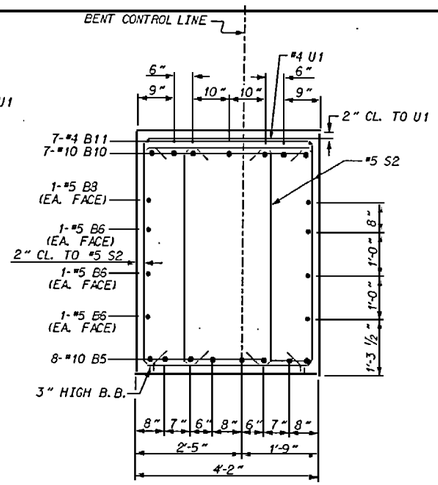
NORTH CAROLINA PROFESSIONAL SEAL 14036 ENGINEER JACK CHARLES HUNT 1-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-251
1			3			TOTAL SHEETS
2			4			4



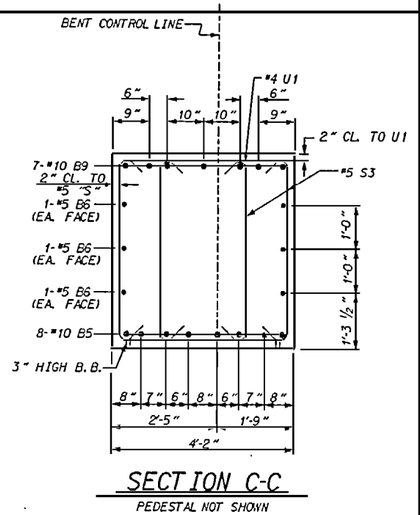
SECTION A-A

PEDESTAL NOT SHOWN



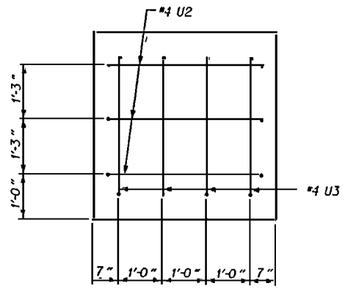
SECTION B-B

PEDESTAL NOT SHOWN

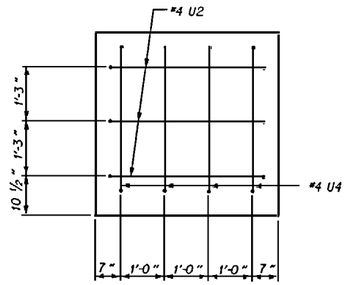


SECTION C-C

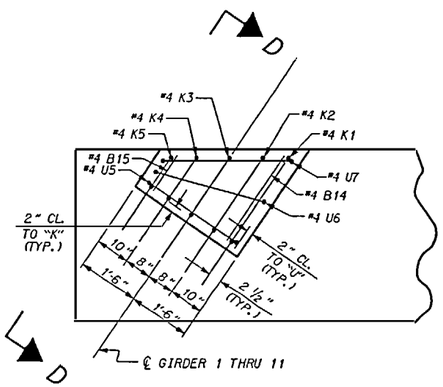
PEDESTAL NOT SHOWN



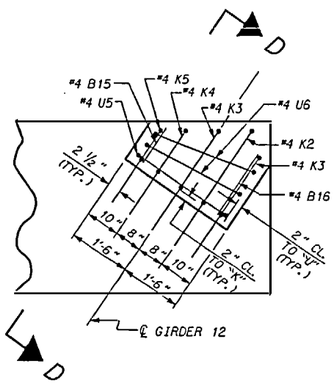
VIEW X-X



VIEW Y-Y

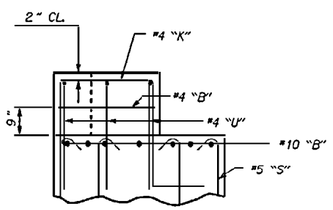


DETAIL "B"



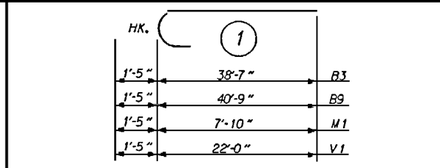
DETAIL "C"

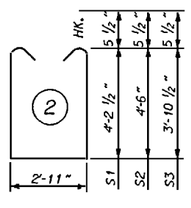
PEDESTAL DETAILS

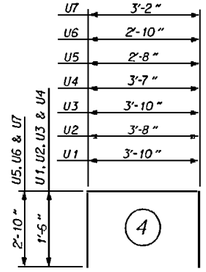


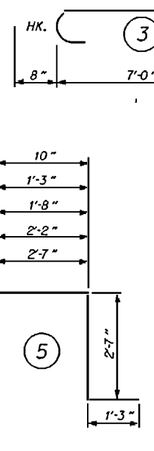
SECTION D-D

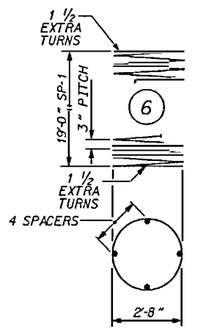
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT NO. 3 , STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	10	STR	38- 8	1331
*B2	6	5	STR	38- 8	242
*B3	7	10	1	40- 0	1205
B4	7	4	STR	15-11	74
B14	4	4	STR	2- 7	7
B15	4	4	STR	1- 0	3
K1	4	4	5	9- 5	25
K2	4	4	5	9- 0	24
K3	4	4	5	8- 6	23
K4	4	4	5	8- 1	22
K5	4	4	5	7- 8	20
M1	24	10	1	9- 3	955
S1	64	5	2	12- 3	818
T1	78	6	3	8- 4	976
U1	43	4	4	6-10	196
U2	3	4	4	6- 8	13
U3	4	4	4	6-10	18
U5	4	4	4	8- 4	22
U6	4	4	4	8- 6	23
U7	4	4	4	8-10	24
V1	24	10	1	23- 5	2418

EPOXY COATED REINFORCING STEEL — LBS. 2,778

REINFORCING STEEL — LBS. 5,661

SP-1	2		6	651-10	871

SPIRAL COLUMN REINFORCING STEEL — LBS. 871

CLASS "A" CONC. BREAKDOWN

POUR #1 (FOOTINGS)	C.Y.	11.5
POUR #2 (COLUMNS)	C.Y.	9.8
POUR #3 (CAP)	C.Y.	29.1

CLASS "A" CONCRETE — C.Y. 50.4

FOUNDATION EXCAVATION — LUMP SUM

HP 12 X 53 STEEL PILES NO. 16 — 1040 LIN. FT.

* THESE BARS ARE EPOXY COATED

BILL OF MATERIAL
BENT NO. 3 , STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	16	10	STR	41- 3	2840
B6	12	5	STR	38- 9	483
B7	7	10	STR	11- 1	334
B8	2	5	STR	28- 8	60
B9	7	10	1	42- 2	1270
B10	7	10	STR	46-10	1411
B11	7	4	STR	26- 4	123
B12	7	4	STR	10- 1	47
B13	4	4	STR	3-10	10
B14	7	4	STR	2- 7	12
B15	8	4	STR	1- 0	5
B16	1	4	STR	1- 8	1
K1	7	4	5	9- 5	44
K2	8	4	5	9- 0	48
K3	9	4	5	8- 6	51
K4	8	4	5	8- 1	43
K5	8	4	5	7- 8	41
M1	36	10	1	9- 3	1433
S2	68	5	2	12-10	910
S3	46	5	2	11- 7	556
T1	117	6	3	8- 4	1464
U1	86	4	4	6-10	393
U2	3	4	4	6- 8	13
U4	4	4	4	6- 7	18
U5	8	4	4	8- 4	45
U6	9	4	4	8- 6	51
U7	7	4	4	8-10	41
V1	36	10	1	23- 5	3627

REINFORCING STEEL — LBS. 15,376

SP-1	3		6	651-10	1306

SPIRAL COLUMN REINFORCING STEEL — LBS. 1306

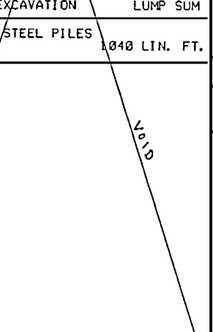
CLASS "A" CONC. BREAKDOWN

POUR #1 (FOOTINGS)	C.Y.	17.2
POUR #2 (COLUMNS)	C.Y.	14.7
POUR #3 (CAP)	C.Y.	60.1

CLASS "A" CONCRETE — C.Y. 92.0

FOUNDATION EXCAVATION — LUMP SUM

HP 12 X 53 STEEL PILES NO. 24 — 1560 LIN. FT.



PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 4 OF 4

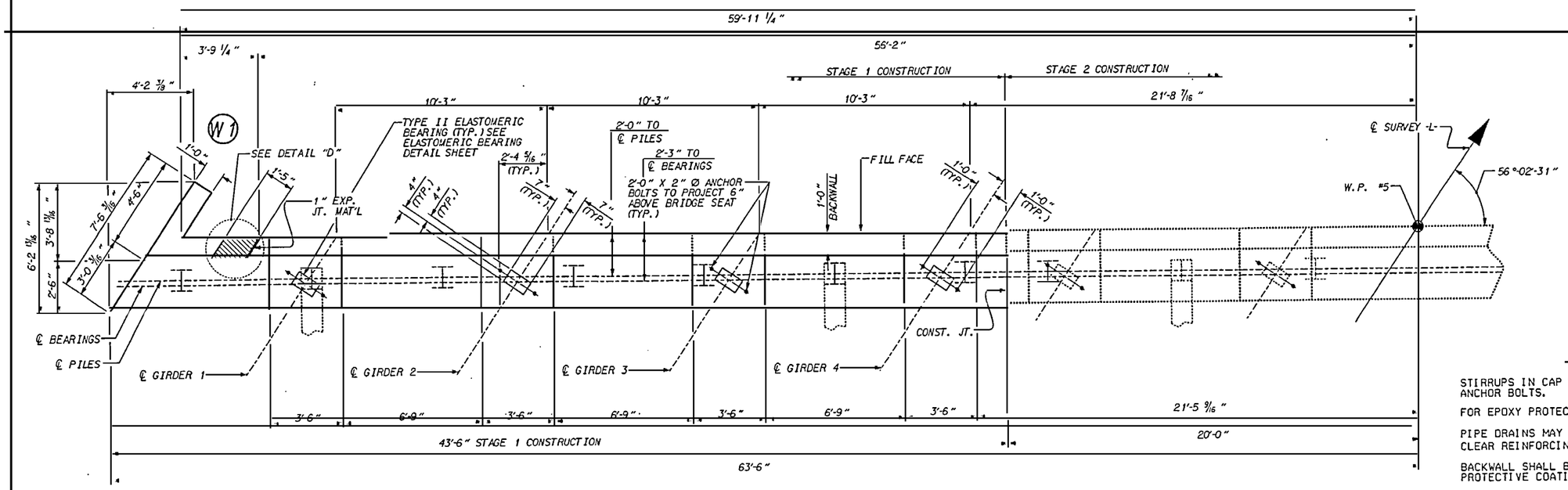
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3
STAGE 1 AND STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-252
1			3			TOTAL SHEETS
2			4			264

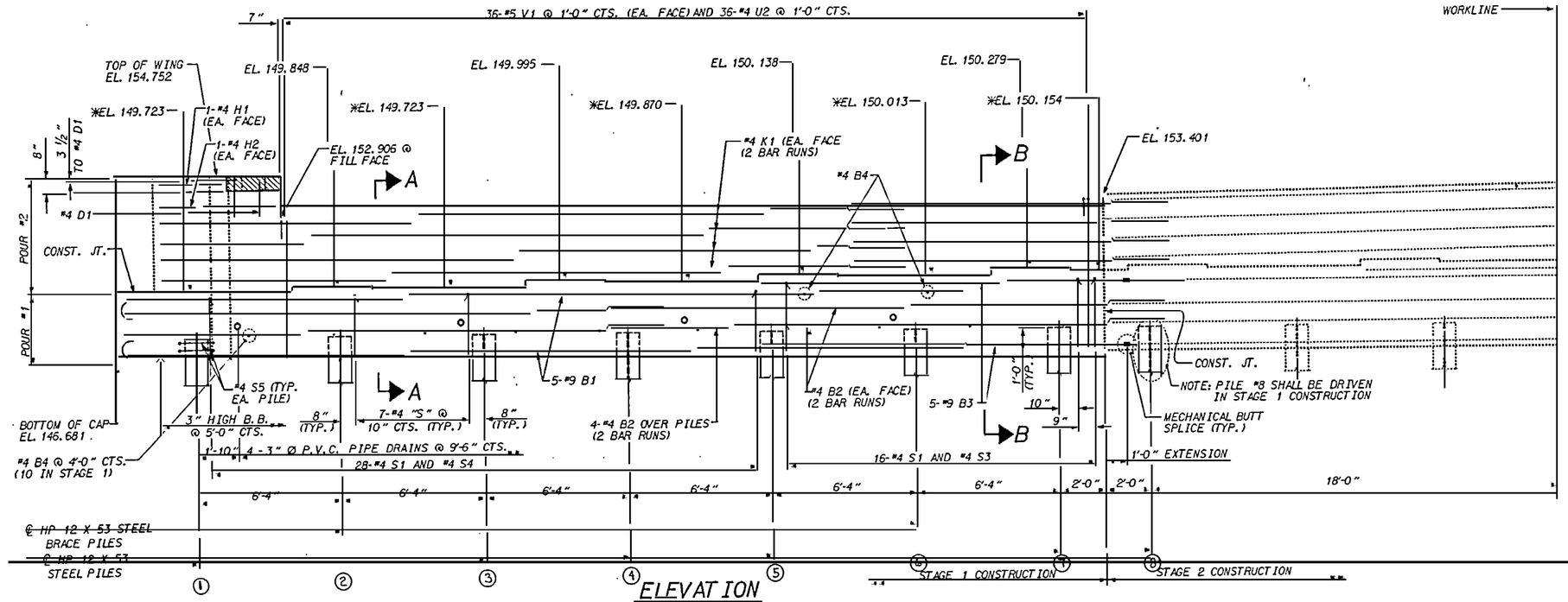
DRAWN BY : D. G. VESTER DATE : 10-30-96
CHECKED BY : BC Hunt DATE : 12-4-96

30-JAN-1997 09:23
g:\users\mike\robeson\u-2415\u2415de2.dgn
mike



PLAN

*4 B2 SPLICE - 2'-5"
*4 K1 SPLICE - 2'-5"



ELEVATION

NOTES

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

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 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 1/4" PER FOOT.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT IN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

#4 D1 BARS SHALL BE GROUTED INTO WING PRIOR TO POURING THE BLOCKOUT.

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTIONS THRU CAP SHEETS 3 OF 5 AND 4 OF 5.

FOR TEMPORARY DRAINAGE @ END BENT, SEE END BENT 1, SHEET 5 OF 5.

FOR MECHANICAL BUTT SPLICES, SEE SPECIAL PROVISIONS.

HP 12X53 Steel Piles

No.	Length
1	73.8
2	70.7
3	89.2
4	80.5
5	69.7
6	66.7
7	68.1
8	81.0
Total	609.7 L.F.

DRAWN BY : M. GOINS DATE : 9/20/96
CHECKED BY : V. K. Nguyen DATE : 1/30/97

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

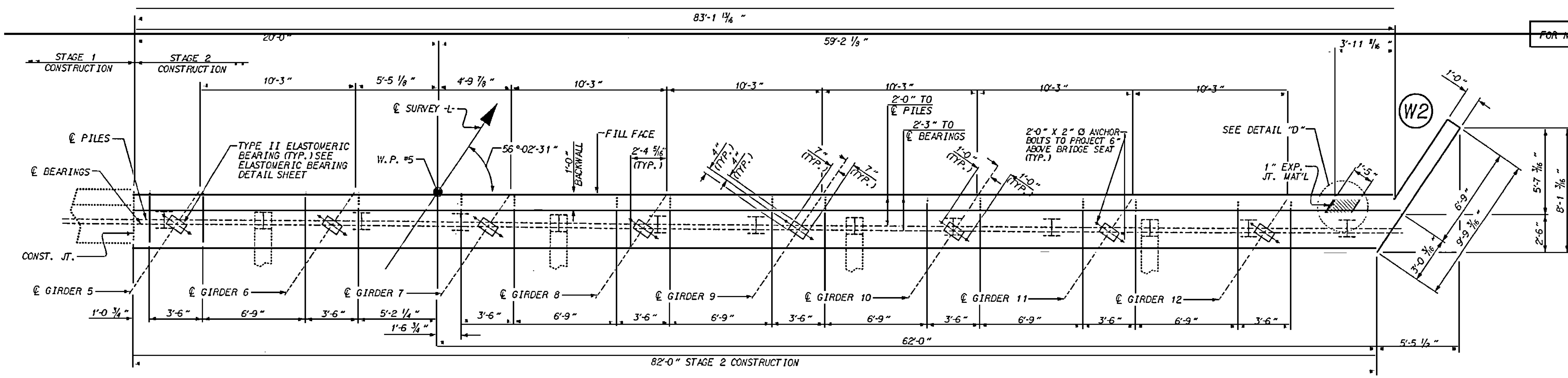
SUBSTRUCTURE
END BENT 2
STAGE 1

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BUCK CHARLES HUNT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-253
1			3			TOTAL SHEETS
2			4			264

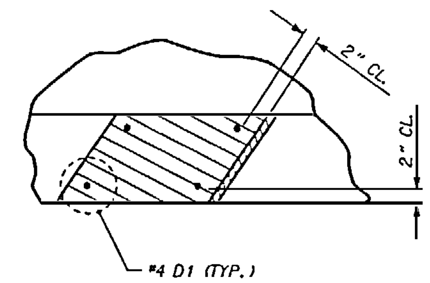
02-JAN-1997 15:21
d:\users\mike\robeson\u-2415\u2415012.dgn
mike

FOR NOTES, SEE END BENT 2 SHEET 1 OF 5

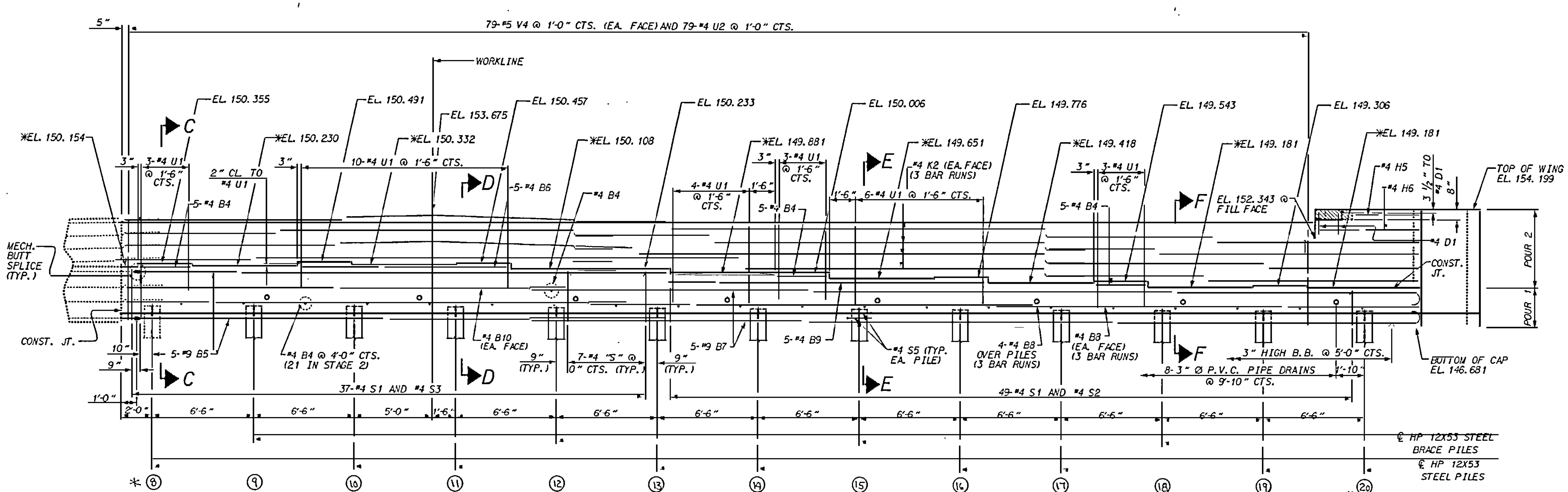


PLAN

#4 B8 SPLICE = 2'-5"
#4 K2 SPLICE = 2'-5"



DETAIL "D"



* Pile No. 8 driven in Stage I Construction

ELEVATION

HP 12X53 Steel H Piles

No.	Length
9	80.5'
10	82.3
11	85.7
12	72.2
13	86.4
14	67.2
15	86.3
16	77.7
17	72.9
18	88.7
19	89.0
20	89.3
Total	978.2 L.F.

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE 2

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BUCK CHARLES HUNT
2-3-97

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

SHEET NO. S-254
TOTAL SHEETS 264

DRAWN BY: M. GOINS DATE: 9/25/96
CHECKED BY: V.X. Nguyen DATE: 1/3/97

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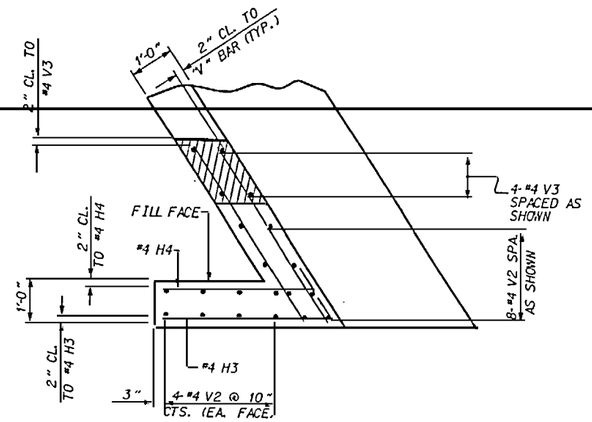
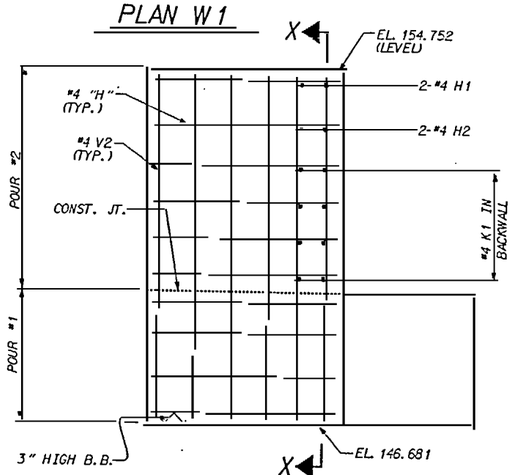
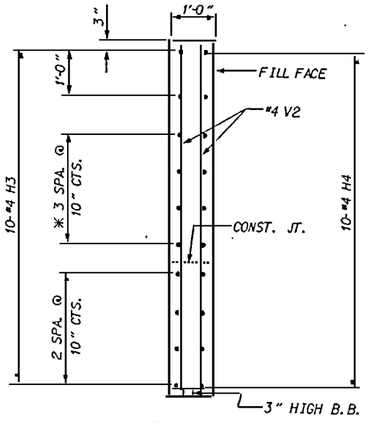
MKE



PLAN W1

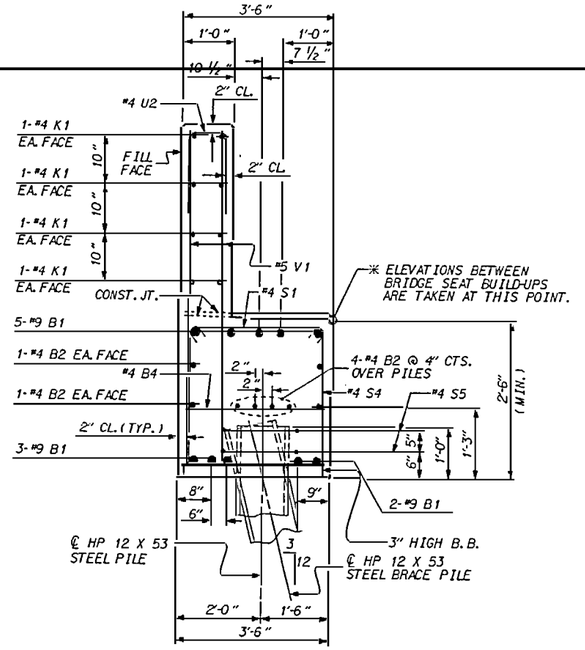


ELEVATION W1

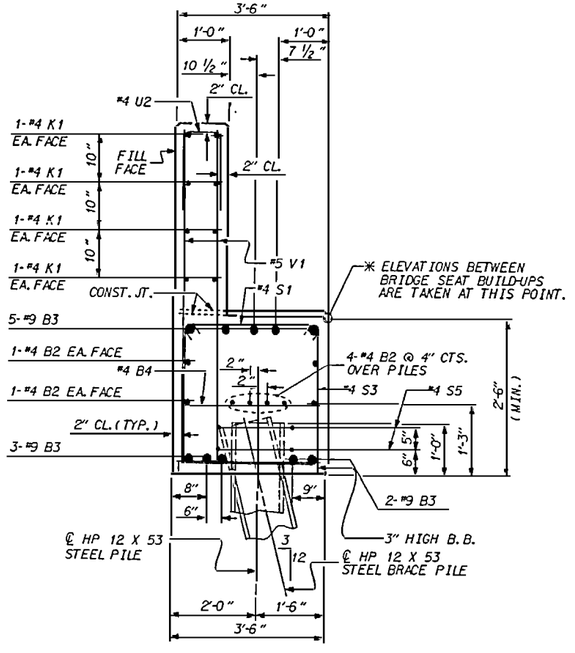


SECTION X-X

* MATCH THESE BARS TO THE K1 BARS IN THE BACKWALL



SECTION A-A



SECTION B-B

DRAWN BY : M. GOINS DATE : 9/16/96
CHECKED BY : V. X. Nguyen DATE : 12/6/96

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 3 OF 5

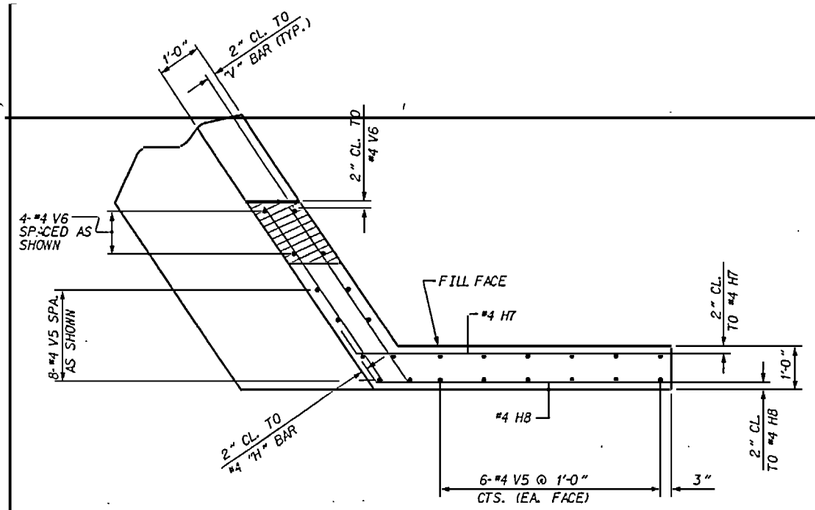
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

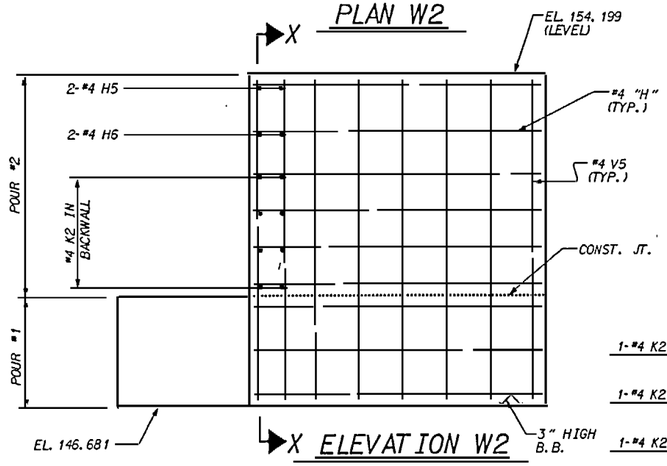
SUBSTRUCTURE
END BENT 2
STAGE 1

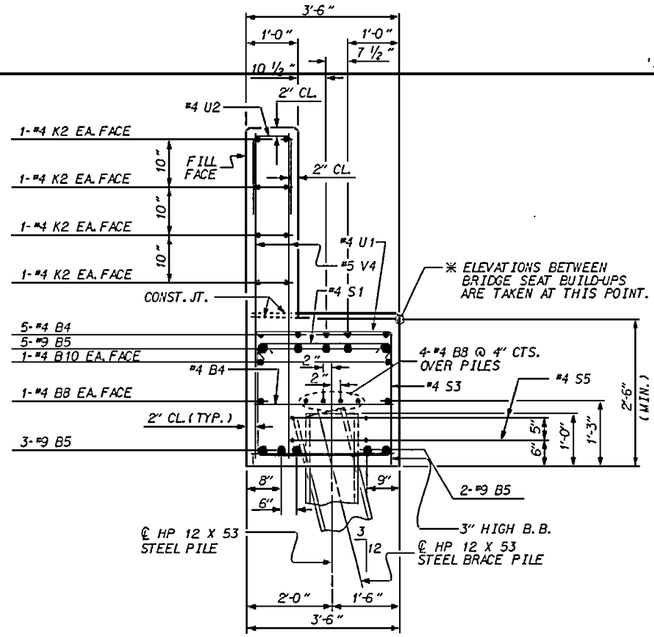
NORTH CAROLINA PROFESSIONAL SEAL 11094 ENGINEER JOHN CHARLES PUNT
2-5-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-255
1			3			TOTAL SHEETS
2			4			264

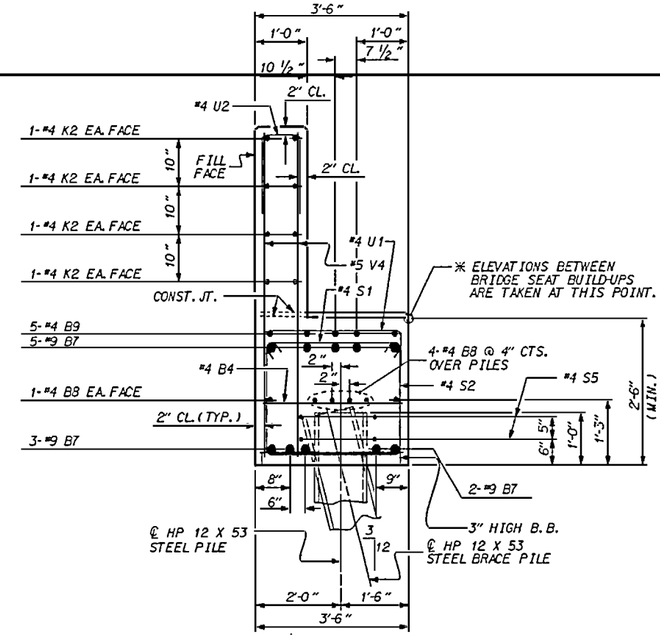
02-JAN-1997 15:24
c:\users\mike\robeson\u-2415\u2415bl2.dgn
mike



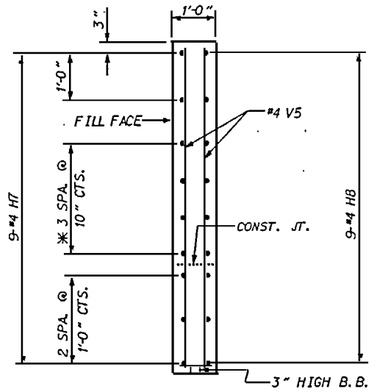




SECTION C-C

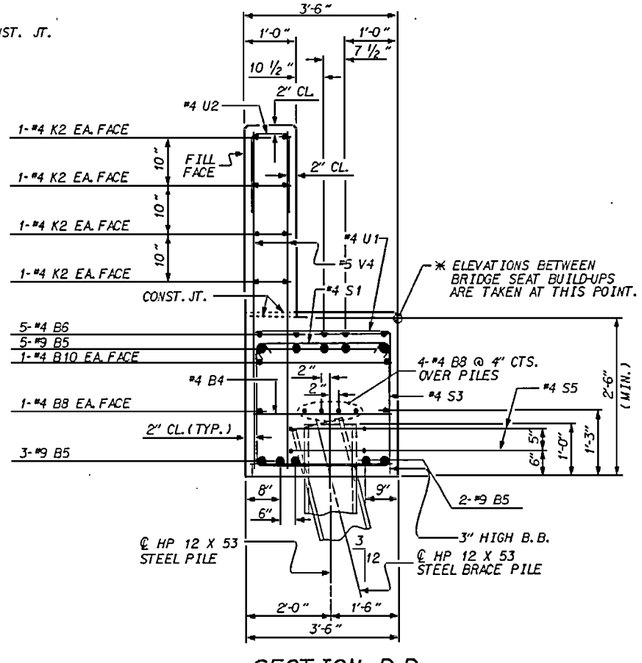


SECTION E-E

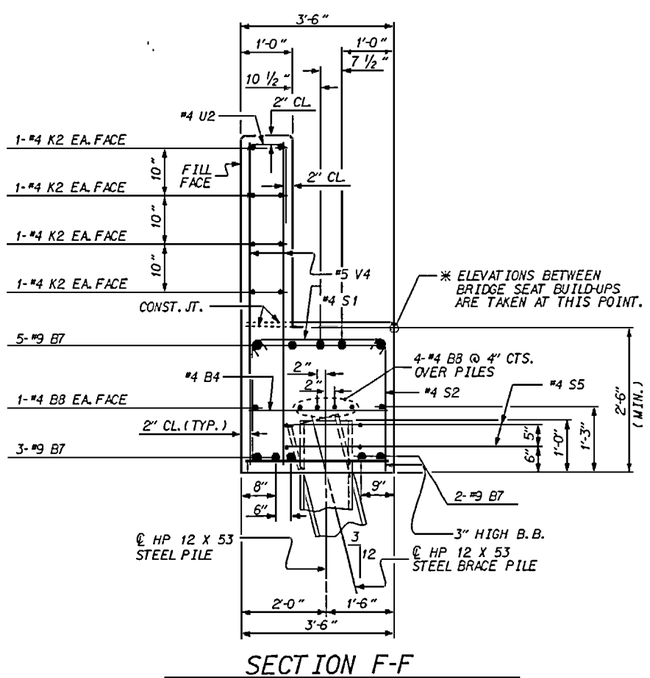


* MATCH THESE BARS TO THE K1 BARS IN THE BACKWALL

SECTION X-X



SECTION D-D



SECTION F-F

NORTH CAROLINA PROFESSIONAL SEAL 4405 ENGINEER BUCK CHARLES HUNT
2-3-97

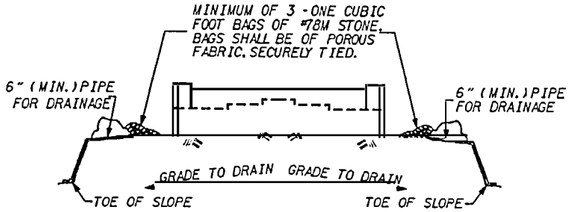
PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-256
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 9/5/96
CHECKED BY : V.X. Nguyen DATE : 1/3/97

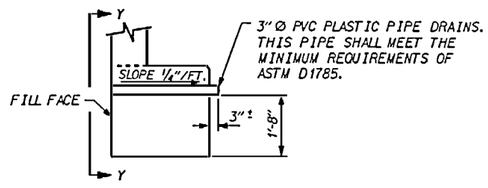


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

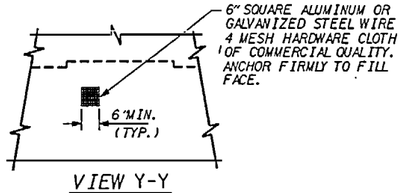
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



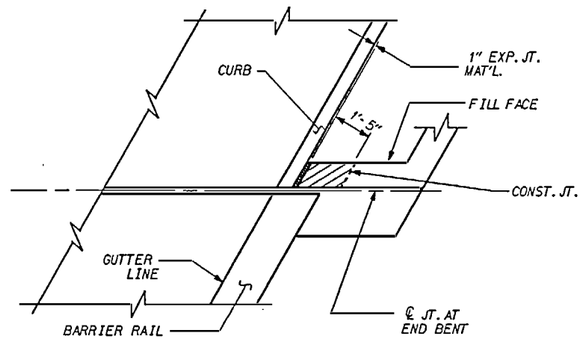
SECTION THRU CAP



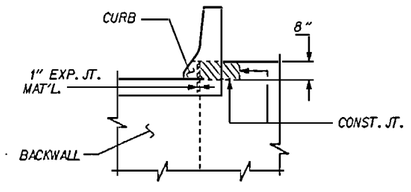
VIEW Y-Y

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS



PLAN

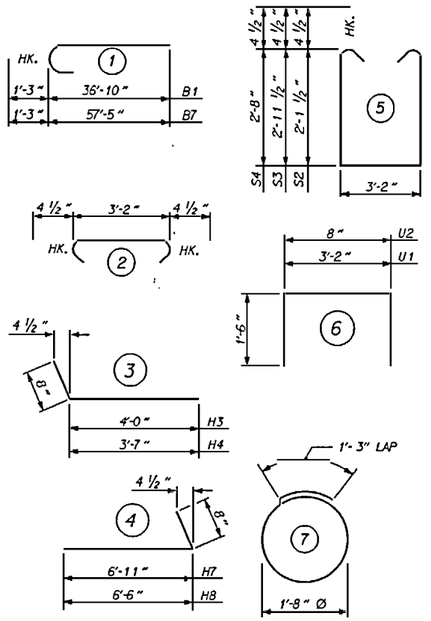


ELEVATION

BLOCKOUT IN WING WALL FOR FITTING EVAZOTE JOINT SEAL

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 SLIP FORMING IS USED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT NO. 2 - STAGE 1

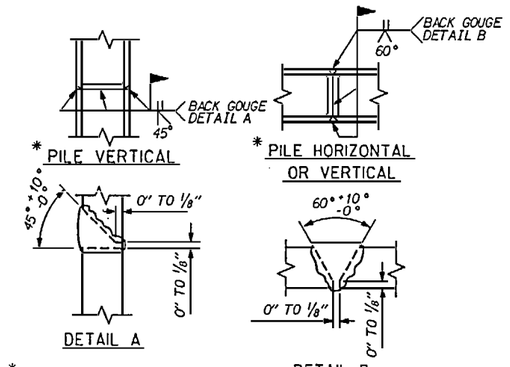
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	38- 1	1,295
B2	16	4	STR	24- 0	257
B3	10	9	STR	16- 0	544
B4	12	4	STR	3- 2	25
D1	4	4	STR	1- 6	4
H1	2	4	STR	2-11	4
H2	2	4	STR	4- 7	6
H3	10	4	4	4- 8	31
H4	10	4	4	4- 3	28
K1	16	4	STR	23- 4	249
S1	44	4	2	3-11	115
S3	16	4	5	9-10	105
S4	28	4	5	9- 3	173
S5	14	4	7	6- 6	61
U2	36	4	6	3- 8	88
V1	72	5	STR	5-10	438
V2	16	4	STR	7- 8	82
V3	4	4	STR	7- 0	19
REINFORCING STEEL				LBS.	3,524
CLASS "A" CONC. BREAKDOWN POUR #1				C.Y.	17.8
POUR #2				C.Y.	5.8
CLASS "A" CONC. TOTAL				C.Y.	23.6
HP 12 X 53 STEEL PILE NO. 8				LIN. FT.	600

VOID VOID

BILL OF MATERIAL
END BENT NO. 2 - STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	37	4	STR	3- 2	78
B5	10	9	STR	34- 1	1,159
B6	10	4	STR	13- 5	180
B7	10	9	1	58- 8	1,935
B8	18	4	STR	26- 3	316
B9	5	4	STR	20- 6	68
B10	2	4	STR	28- 8	38
D1	4	4	STR	1- 6	4
H5	2	4	STR	3- 2	4
H6	2	4	STR	4-10	6
H7	9	4	3	7- 7	46
H8	9	4	3	7- 2	43
K2	24	4	STR	29- 8	476
S1	66	4	2	3-11	225
S2	49	4	5	8- 2	267
S3	37	4	5	9-10	243
S5	26	4	7	6- 6	113
U1	29	4	6	6- 2	119
U2	79	4	6	3- 8	193
V4	158	5	STR	5- 3	865
V5	20	4	STR	7- 2	96
V6	4	4	STR	6- 6	17
REINFORCING STEEL				LBS.	6,461
CLASS "A" CONC. BREAKDOWN POUR #1				C.Y.	35.1
POUR #2				C.Y.	10.8
CLASS "A" CONC. TOTAL				C.Y.	45.9
HP 12 X 53 STEEL PILE NO. 12				LIN. FT.	900

VOID VOID



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

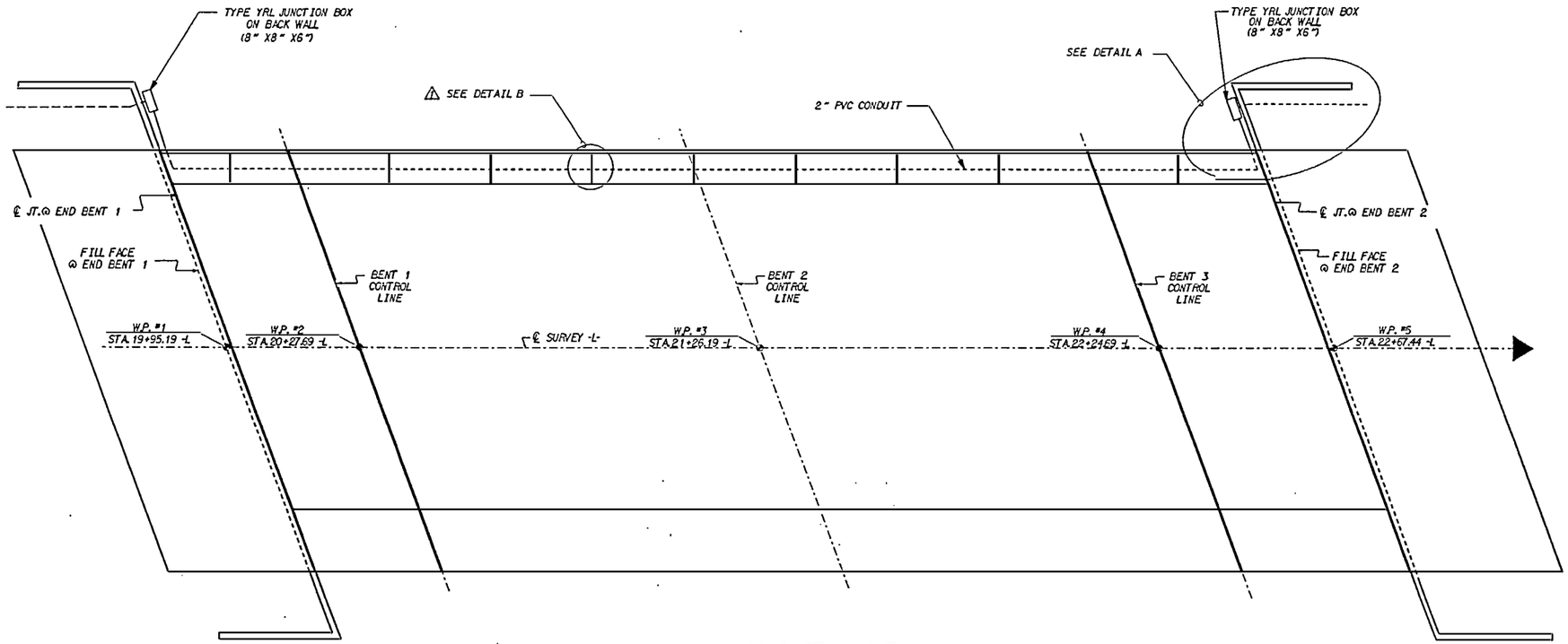
SUBSTRUCTURE

END BENT 2

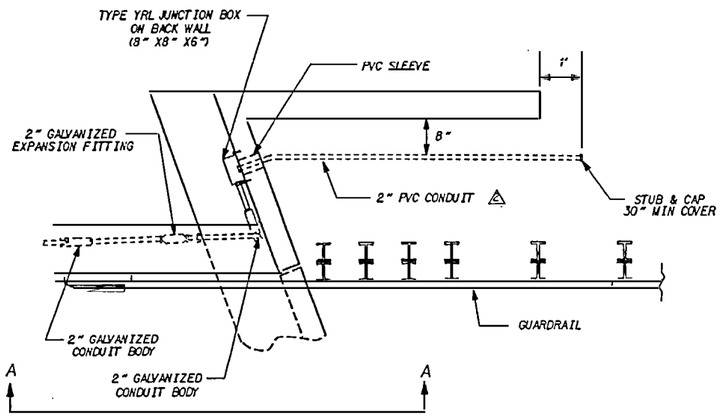
NORTH CAROLINA PROFESSIONAL SEAL 14054 ENGINEER BUICK CHARLES HUNT
2-1-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-257
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : M. GOINS DATE : 9/17/96
CHECKED BY : V.X. Nguyen DATE : 1/6/97

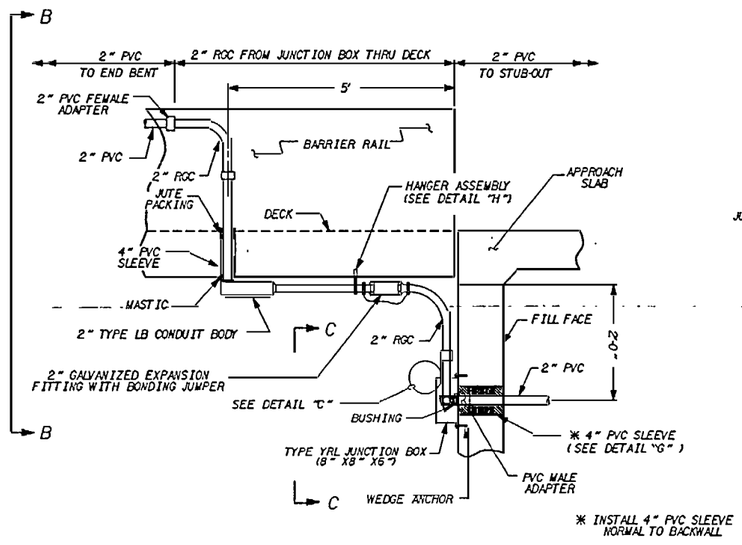


CONDUIT LAYOUT



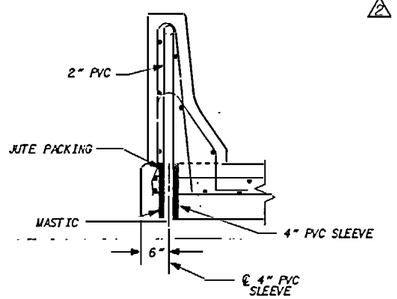
DETAIL A

INSTALLATION SIMILAR AT EACH END BENT



VIEW A-A

INSTALLATION SIMILAR AT BOTH END BENTS



SECTION B-B

△ NOTES

1. PROVIDE EXPANSION FITTING FOR EACH CONDUIT AT ALL LOCATIONS WHERE CONDUIT CROSSES AN EXPANSION/COMPRESSION JOINT.
2. ROUTE CONDUIT TO AVOID DAMAGE DURING GUARDRAIL INSTALLATION. FIELD BEND OR INSTALL STANDARD ELBOWS AS REQUIRED.

SEE PROJECT SPECIAL PROVISIONS TITLED "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS CONSTRUCTION METHODS AND PAYMENT.

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

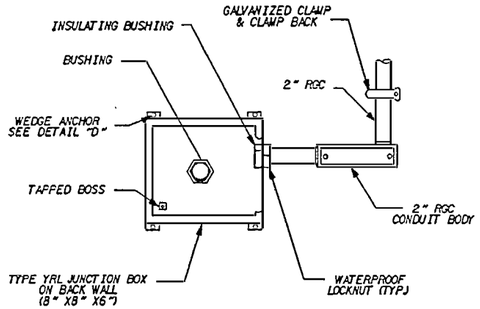
ELECTRICAL CONDUIT SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-258
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : J.A.STANCIL DATE : 12-17-96
CHECKED BY : D.S. WAYE DATE : 12-17-96

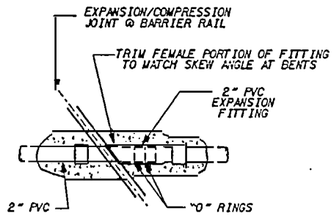
ds35\u2415\ec4

Thursday December 19 1996



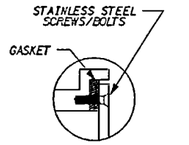
VIEW C-C

COVER NOT SHOWN



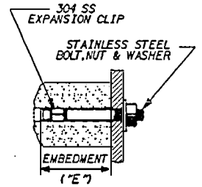
DETAIL B ⚠

PVC EXPANSION FITTING



DETAIL C

JUNCTION BOX COVER ATTACHMENT



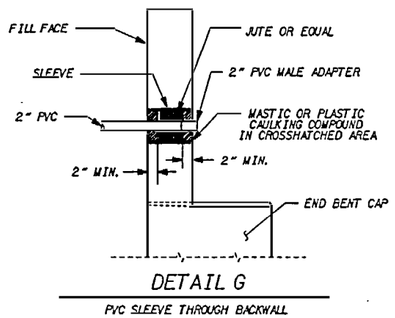
DETAIL D

WEDGE ANCHOR

WEDGE ANCHORS		
SIZE	MIN "E"	PULLOUT FORCE
1/4"	1 1/2"	2600 lb
3/8"	2"	5000 lb
1/2"	2 1/2"	6300 lb
5/8"	3"	8300 lb

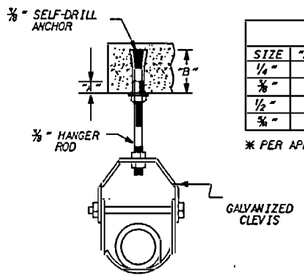
ESTIMATED BILL OF MATERIALS

QTY	UNIT	DESCRIPTION
300	LF	2" PVC SCHEDULE 40 CONDUIT
11	EA	2" PVC EXPANSION FITTING
4	EA	4" PVC SLEEVE
2	EA	2" PVC END CAPS
2	EA	TYPE YRL JUNCTION BOX (8"X8"X6")
20	LF	2" RIGID GALV.CONDUIT
4	EA	2" RGC 90° ELBOWS
4	EA	2" GALV.CONDUIT BODIES
2	EA	2" GALV.EXP.FITTINGS W/BONDING JUMPERS
2	EA	GALV.HANGER ASSEMBLIES W/ GALV.STL RODS
320	LF	POLYETHYLENE PULL LINE
2	EA	SELF DRILL ANCHORS
10	EA	WEDGE ANCHORS



DETAIL G

PVC SLEEVE THROUGH BACKWALL



SELF - DRILL ANCHORS			
SIZE	"A" MIN.	* "B" TYP.	PULLOUT FORCE
1/4"	3/8"	1 3/32"	2713 lb
3/8"	5/16"	1 17/32"	4200 lb
1/2"	13/16"	2 1/32"	7350 lb
5/8"	15/16"	2 15/32"	10250 lb

* PER APPROVED MANUFACTURER'S SPECIFICATIONS

DETAIL G

HANGER ASSEMBLY

SEE PROJECT SPECIAL PROVISIONS TITLED "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS CONSTRUCTION METHODS AND PAYMENT.

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

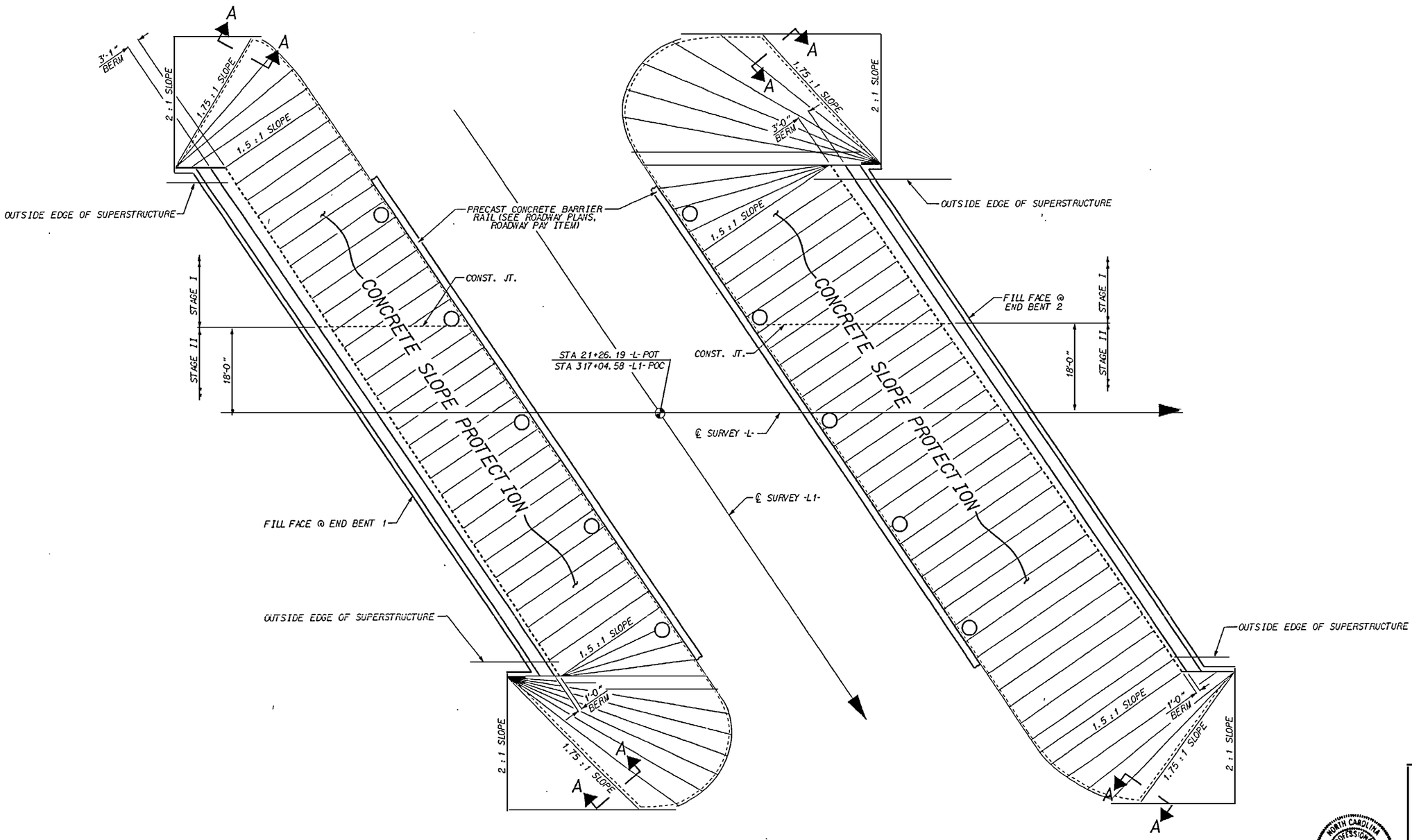
ELECTRICAL CONDUIT SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-259
1			3			TOTAL SHEETS
2			4			264

DRAWN BY : J.A.STANCIL DATE : 12-17-96
CHECKED BY : [illegible] DATE : 12/17/96

cs35\joy\u-2415\ec4

3:18 Thursday December 19 1996



PLAN

DRAWN BY : S.T. CHAMPION DATE : 10/17/96
CHECKED BY : V.X. Nguyen DATE : 11/6/96

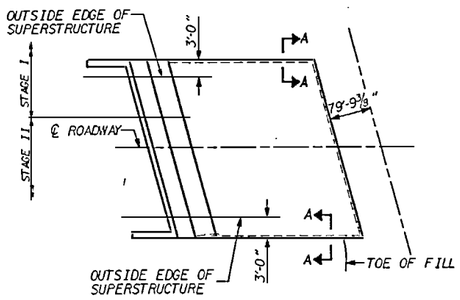
PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

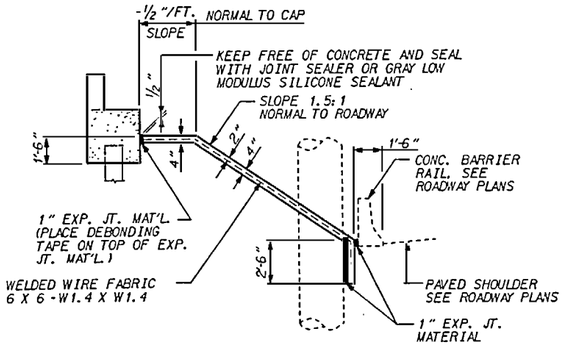
SLOPE PROTECTION

NORTH CAROLINA PROFESSIONAL SEAL 16231 ENGINEER BUCK CHARLES HUNT
27-97

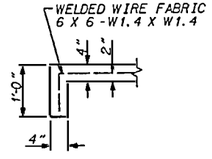
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-260
1			3			TOTAL SHEETS
2			4			264



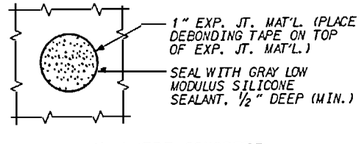
PLAN



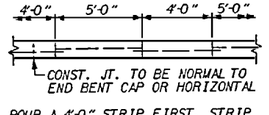
SECTION ALONG ℄ ROADWAY WITH SHOULDER PIER



SECTION A-A



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF 4 INCH POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60 INCHES WIDE. ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST SIX INCHES. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE FOUR AND FIVE FOOT STRIPS AS SHOWN IN THE POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

	4 INCH SLOPE PROTECTION SQUARE YARDS				WELDED WIRE FABRIC 60 INCHES WIDE APPROX. L.F.			
	END BENT 1		END BENT 2		END BENT 1		END BENT 2	
BRIDGE @ STA. 317+04.58 -L1-	STAGE I	STAGE II	STAGE I	STAGE II	STAGE I	STAGE II	STAGE I	STAGE II
VOID	226	431	239	412	452	862	478	824

ASSEMBLED BY : S.T. CHAMPION	DATE : 10/15/96	SPECIAL
CHECKED BY : V.K. Nguyen	DATE : 12/30/96	
DRAWN BY : E.L. ROSE	DATE : 5/12/92	STANDARD
CHECKED BY : G.R. PERFETTI	DATE : 6/8/92	

REV. 6/1/94 EEM (M GRP

04-DEC-1996 22:37
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steve

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

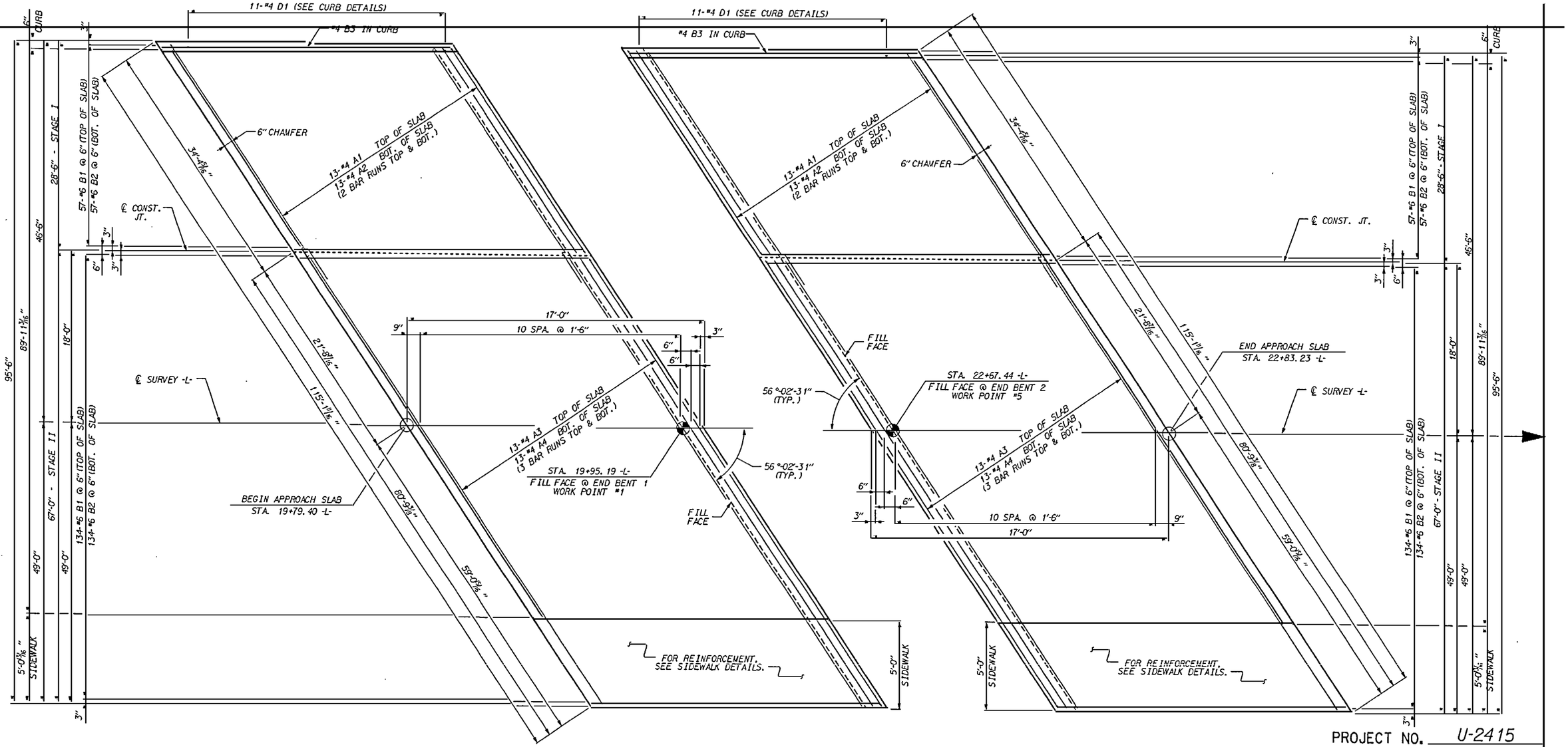
STANDARD SLOPE PROTECTION DETAILS

AUG. 1992

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2641
1			3			TOTAL SHEETS
2			4			2654

STD. NO. SP1

NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER RICK CHARLES HUNT
2-3-97



#4 A1 & #4 A3	SPLICE LENGTH =	2'-0"
#4 A2 & #4 A4	SPLICE LENGTH =	1'-9"

PLAN OF APPROACH SLABS

DRAWN BY : W. T. Parker DATE : 03/2496
CHECKED BY : V. X. Nguyen DATE : 08/20/96

PROJECT NO. U-2415
ROBESON COUNTY
STATION: 317+04.58 -L1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLABS FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 14034 ENGINEER DERICK CHARLES HUNT
2-3-97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-262
1			3			TOTAL SHEETS
2			4			264

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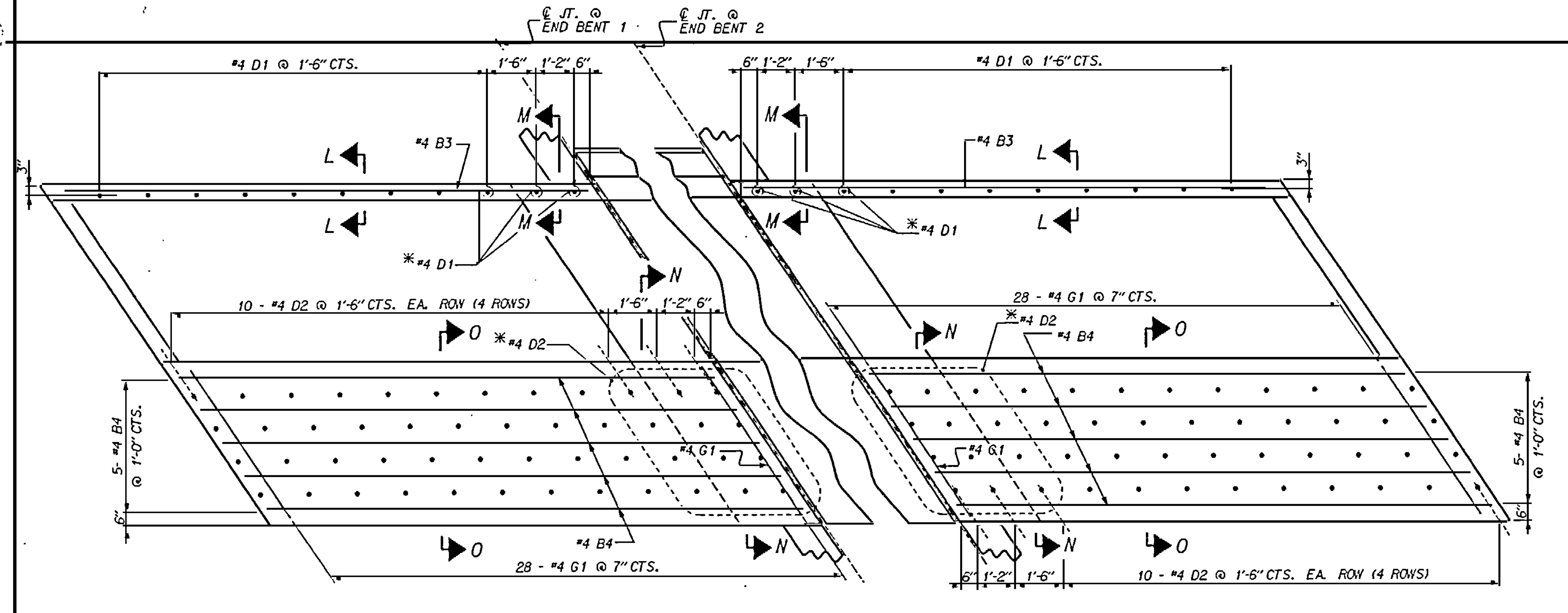


PLAN OF CURB AND SIDEWALK

NOTES

SUBDRAIN FINE AGGREGATE IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL AND END BENT FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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

THE AREAS BETWEEN THE WINGWALLS AND THE APPROACH SLAB SHALL BE PAVED. SEE ROADWAY PLANS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY, AT HIS OPTION, USE EITHER 4" TYPE HB ASPHALT CONCRETE BASE COURSE OR 5" CLASS 'A' CONCRETE IN LIEU OF 6" A.B.C. IF 5" CLASS 'A' CONCRETE IS USED, THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB. ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE WIDTH OF THE CONCRETE BASE SHALL BE THE SAME WIDTH AS THE APPROACH SLAB. THE APPROACH SLABS SHALL NOT BE CAST UNTIL THE CONCRETE HAS REACHED AN AGE OF THREE CURING DAYS.

DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE SLAB HAS BEEN SCREEDED AND FLOAT FINISHED EXCEPT AS NOTED ON THE PLANS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

PAYMENT FOR EVAZOTE JOINT SEALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½".

* THESE DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND GROUTED IN PLACE.

BILL OF MATERIAL

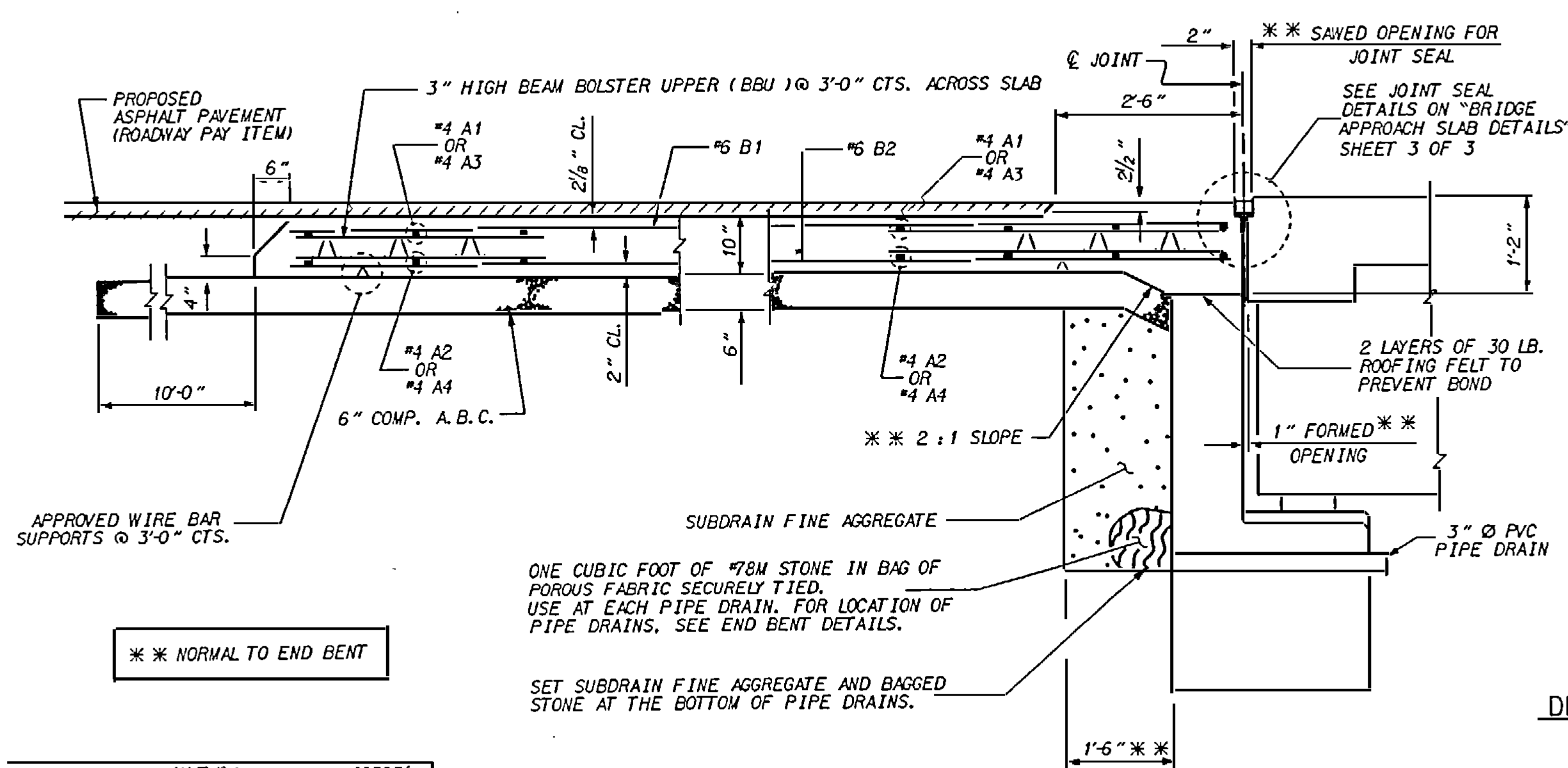
NOTE: BILL OF MATERIAL IS FOR ONE APPROACH SLAB. (TWO REQUIRED)

STAGE I

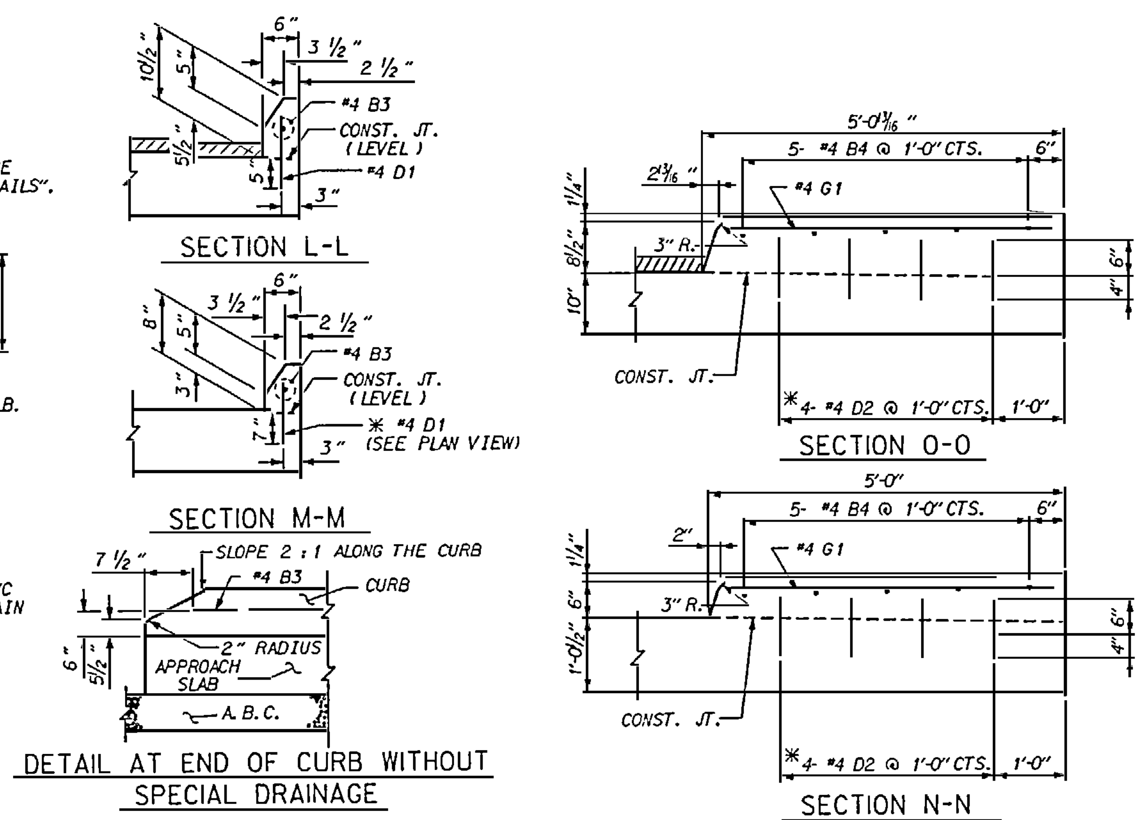
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	4	STR	19- 1	331
A2	26	4	STR	18-10	327
* B1	57	6	STR	16- 2	1384
B2	57	6	STR	16- 8	1427
* B3	1	4	STR	16- 2	11
* D1	11	4	STR	1- 0	7
REINFORCING STEEL - LBS. =					1754
* EPOXY COATED REINFORCING STEEL - LBS. =					1733
CLASS AA CONCRETE - C.Y. =					15.9

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	39	4	STR	28- 2	734
A4	39	4	STR	28- 0	729
* B1	134	6	STR	16- 2	3254
B2	134	6	STR	16- 8	3354
* B4	5	4	STR	16- 7	55
* D2	48	4	STR	0-10	27
* G1	28	4	STR	5- 5	101
REINFORCING STEEL - LBS. =					4083
* EPOXY COATED REINFORCING STEEL - LBS. =					4171
CLASS AA CONCRETE - C.Y. =					39.0



SECTION THRU SLAB



CURB AND SIDEWALK DETAILS

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

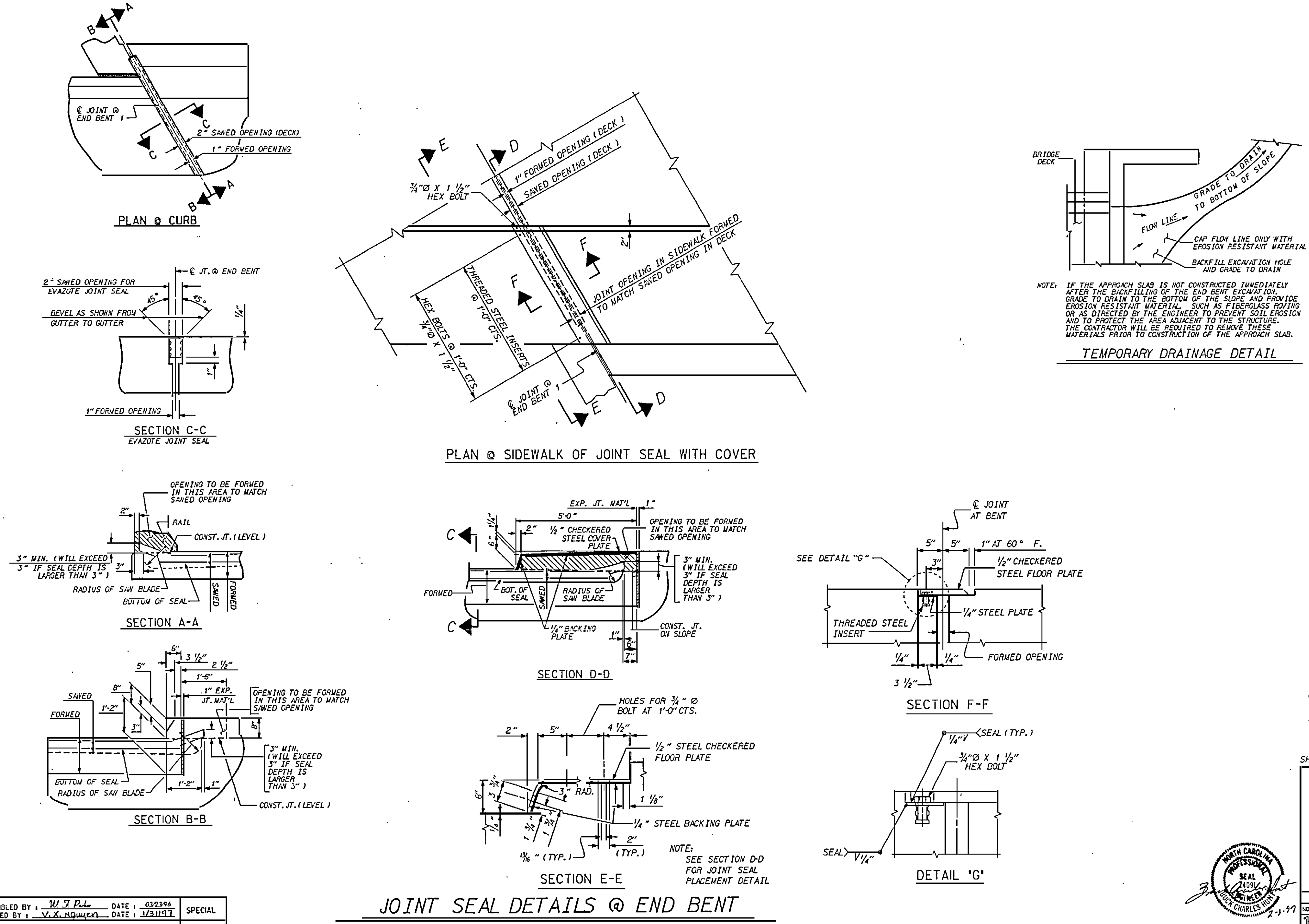
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-263
1			3					TOTAL SHEETS 264
2			4					

STD. NO. BAS2

ASSEMBLED BY: W T P.L. DATE: 03/22/96
CHECKED BY: V.X. Nguyen DATE: 08/20/96
STD. DRAWN BY: F. C. JONES DATE: 6/10/87
STD. CHECKED BY: E. G. ALLEN DATE: 6/25/87
REV. 6/1/94 EEM (A) GRP
REV. 6-16-95RR EEM (A) RCW

28-JUN-1996 16:48



PLAN @ CURB
℄ JOINT @ END BENT 1
2" SAWED OPENING (DECK)
1" FORMED OPENING
SECTION C-C
EVAZOTE JOINT SEAL
2± SAWED OPENING FOR EVAZOTE JOINT SEAL
BEVEL AS SHOWN FROM GUTTER TO GUTTER
℄ JT. @ END BENT
1" FORMED OPENING
PLAN @ SIDEWALK OF JOINT SEAL WITH COVER
1" FORMED OPENING (DECK)
SAWED OPENING (DECK)
¾"Ø X 1 ½" HEX BOLT
THREADED STEEL INSERTS @ 1'-0" CTS.
HEX BOLTS @ 1'-0" CTS. ¾"Ø X 1 ½"
JOINT OPENING IN SIDEWALK FORMED TO MATCH SAWED OPENING IN DECK
℄ JOINT @ END BENT 1
SECTION A-A
OPENING TO BE FORMED IN THIS AREA TO MATCH SAWED OPENING
RAIL
CONST. JT. (LEVEL)
3" MIN. (WILL EXCEED 3" IF SEAL DEPTH IS LARGER THAN 3")
RADIUS OF SAW BLADE
BOTTOM OF SEAL
SAWED
FORMED
SECTION B-B
OPENING TO BE FORMED IN THIS AREA TO MATCH SAWED OPENING
1" EXP. JT. MAT'L
3" MIN. (WILL EXCEED 3" IF SEAL DEPTH IS LARGER THAN 3")
BOTTOM OF SEAL
RADIUS OF SAW BLADE
CONST. JT. (LEVEL)
SECTION D-D
EXP. JT. MAT'L
½" CHECKERED STEEL COVER PLATE
OPENING TO BE FORMED IN THIS AREA TO MATCH SAWED OPENING
3" MIN. (WILL EXCEED 3" IF SEAL DEPTH IS LARGER THAN 3")
BOT. OF SEAL
RADIUS OF SAW BLADE
½" BACKING PLATE
CONST. JT. ON SLOPE
SECTION E-E
HOLES FOR ¾" Ø BOLT AT 1'-0" CTS.
½" STEEL CHECKERED FLOOR PLATE
¼" STEEL BACKING PLATE
3" RAD.
NOTE: SEE SECTION D-D FOR JOINT SEAL PLACEMENT DETAIL
SECTION F-F
℄ JOINT AT BENT
SEE DETAIL "G"
1" AT 60° F.
½" CHECKERED STEEL FLOOR PLATE
¼" STEEL PLATE
THREADED STEEL INSERT
FORMED OPENING
DETAIL 'G'
SEAL (TYP.)
¾"Ø X 1 ½" HEX BOLT
TEMPORARY DRAINAGE DETAIL
BRIDGE DECK
GRADE TO DRAIN TO BOTTOM OF SLOPE
FLOW LINE
CAP FLOW LINE ONLY WITH EROSION RESISTANT MATERIAL
BACKFILL EXCAVATION HOLE AND GRADE TO DRAIN
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.

JOINT SEAL DETAILS @ END BENT

PROJECT NO. U-2415

ROBESON COUNTY

STATION: 317+04.58 -L1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-264
1			3					TOTAL SHEETS
2			4					264

STD. NO. BAS5

ASSEMBLED BY: W. F. P.	DATE: 03/23/96	SPECIAL
CHECKED BY: V. X. NGUYEN	DATE: 1/31/97	
DRAWN BY: F. C. JONES	DATE: 11/28/88	STANDARD
CHECKED BY: A. R. BISSETTE	DATE: 11/28/88	

REV. 6/1/94 EEM (4) GRP

30-JAN-1997 09:16