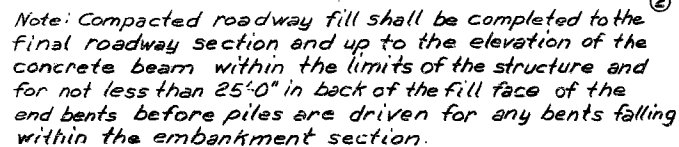
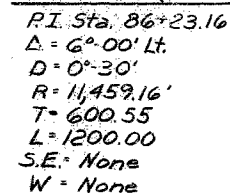


STATE	PROJ. NO.	SHEET NO.
MO.		23
SEC./SUR 22 TWP. 43N RGE. 5E		



Note: For bottom of footing elevations at Bents No. 2 & 3 see sheets No. 4 & 5



Note: Base line N.B. Lane (On Bridge) shall be along a chord from Fill Face of End Bent No. 1 to Fill Face of End Bent No. 4.  
All bents are skewed with respect to Base Line N.B. Lane (On Bridge).  
All Horizontal Clearance dimensions shown are radial dimensions For Boring Data see Sheet No. 2.  
"O" Indicates location of boring For Location Sketch see Sheet No. 2.

Note: The table of Estimated Quantities for Alternate Slabs represents the quantities used by the state in preparing the cost estimate for concrete slabs. Variations may be encountered in the estimated quantities but these variations cannot be used for an adjustment in the Contract Unit Price per square yard of Alternate Slab used. See Special Provisions for alternate methods of forming slabs. Precast Panel quantities based on skewed end panels.

\*Based on minimum top flange thickness and minimum joint filler thickness.

Minimum energy requirement of hammer based on plan length and design bearing value of piles.  
All pile shall be driven to practical refusal.  
Manufactured pile point reinforcement shall be used on all piles in this structure. See Special Provisions.

Sheet No. 1 of 16

H520-44, 15\*/sq.ft. Future Wearing Surface  
Earth 120\*/cu.ft. Equivalent Fluid Pressure 30\*/cu.ft.  
Superstructure: Simply supported non-composite for Dead Load.  
Continuous composite for Live Load.

Class B Concrete (Substructure)  $f'_c = 3,000$  psi.  
Class B1 Concrete (Safety Barrier Curb)  $f'_c = 4,000$  psi.  
Class B2 Concrete (Substructure except Prestressed Girders  
and Safety Barrier Curb)  $f'_c = 4,000$  psi.  
Reinforcing Steel (Grade 60)  $f_y = 60,000$  psi.  
Steel Pile  $f_b = 9,000$  psi.  
For Prestressed Girder Stress  $s_n$  see Girder Sheets.

Minimum clearance to reinforcing steel shall be  $1\frac{1}{2}$ " unless otherwise shown.

All joint filler shall meet the requirements of Std. Spec. 1057.2.4, except as noted.

Bearing shall be 60 durometer Neoprene Pads.

A minimum vertical clearance of 14'-0" from existing lanes and a minimum lateral clearance 28'-0" centered on existing lanes shall be maintained during construction.

*Note: Cost of furnishing, fabricating and installing Neoprene Bearing Pads complete in place, will be paid for at the contract unit price for Plain Neoprene Bearing Pads per each.*

All concrete between the upper and lower construction joints in end bents is included in the estimated superstructure quantities for Slab on Concrete T-Girders, see Special Provisions.

All reinforcement in the end bents is included with superstructure quantities.

B.M. #117-80d Spike in Power Pole @ Ground Level  
710' ± Rt. of Sta. 87+65 ± R. N.B.L. - Elev. 626.95

## STATE ROAD RTE. 21 N.B.L. FROM OTTO TO RTE. 141

ABOUT 1 MILE SOUTH OF RTE. 141

PROJECT NO.

JOB NO. 6-U-21-256B

JEFFERSON

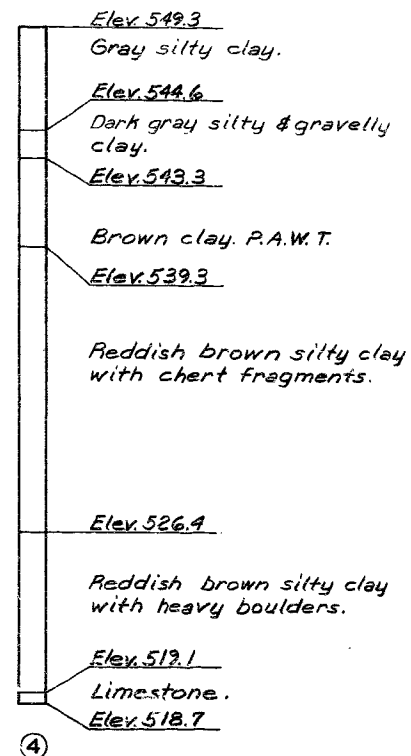
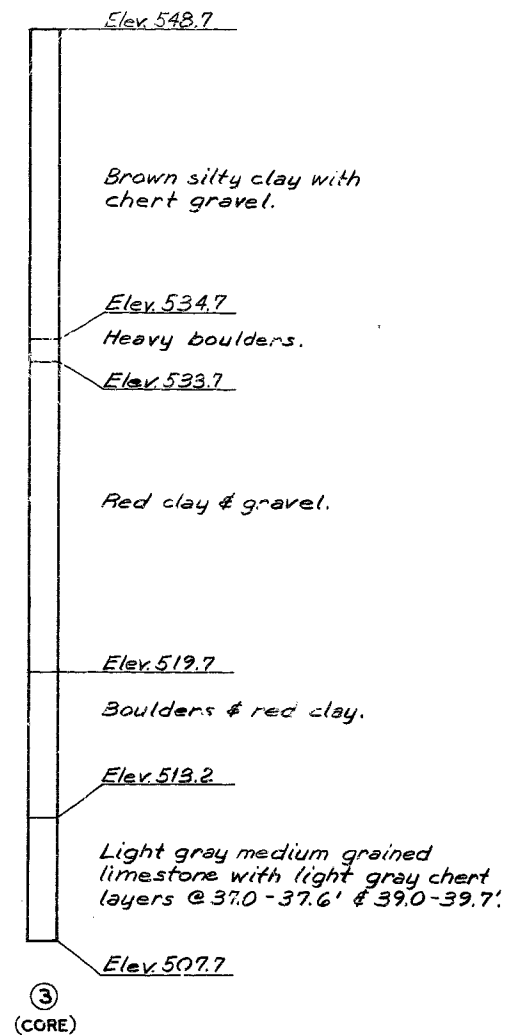
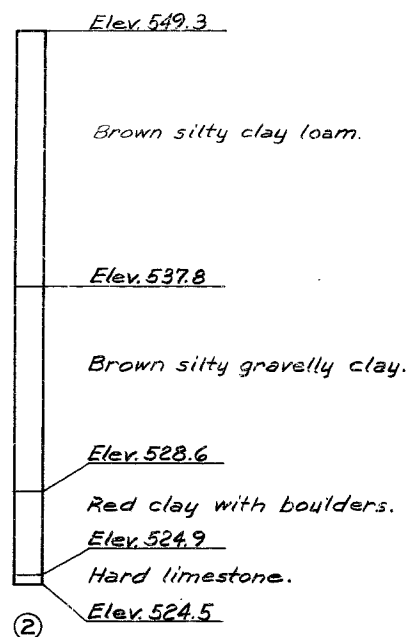
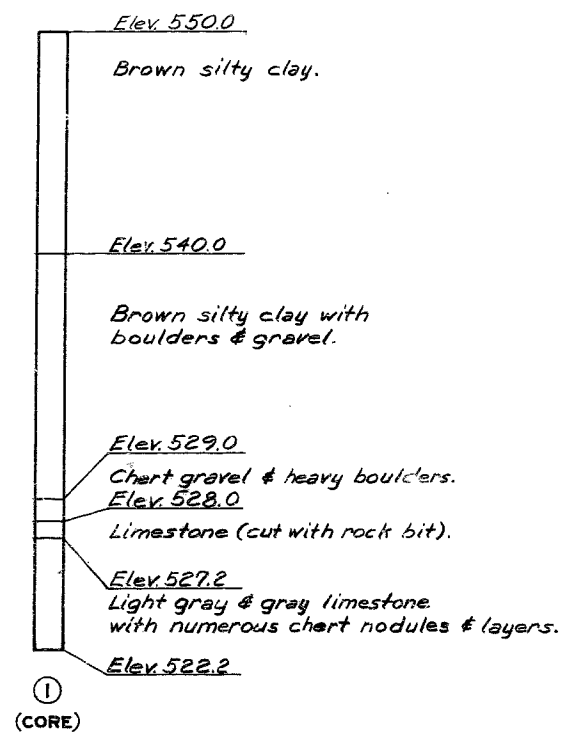
STA. 87+88.35 N.B.L.

RTE. 21

COUNTY

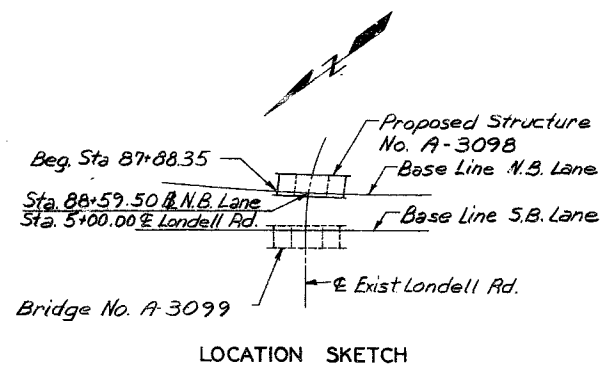
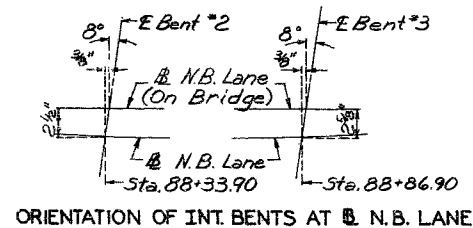
DATE 3/12/87

STD.  
STD.706.35  
A-3098



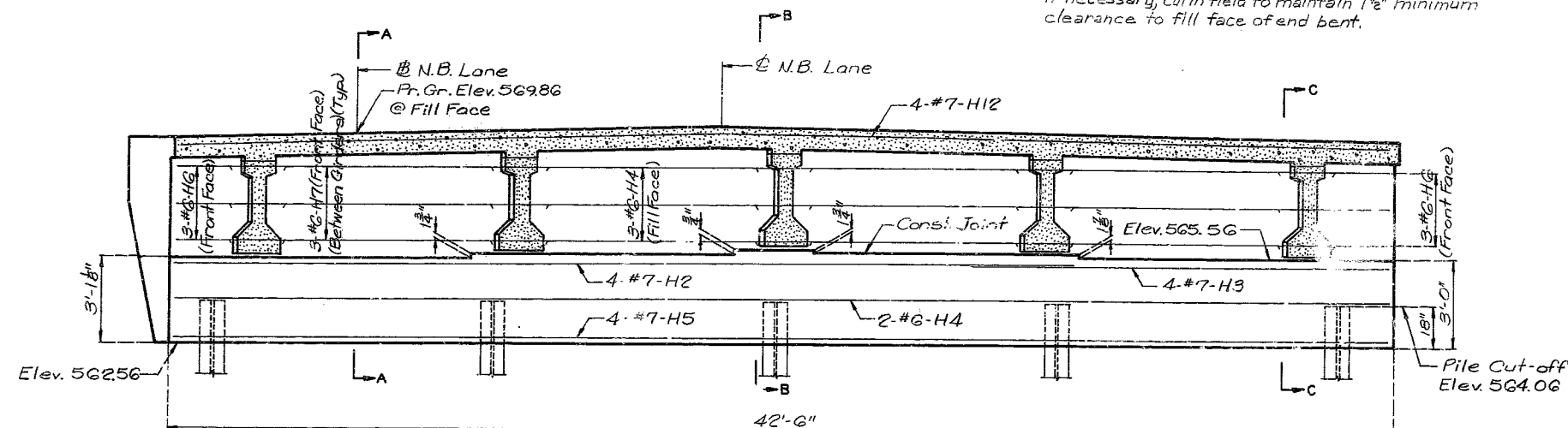
#### BORING DATA

Note: See sheet No. 1 for location of borings.

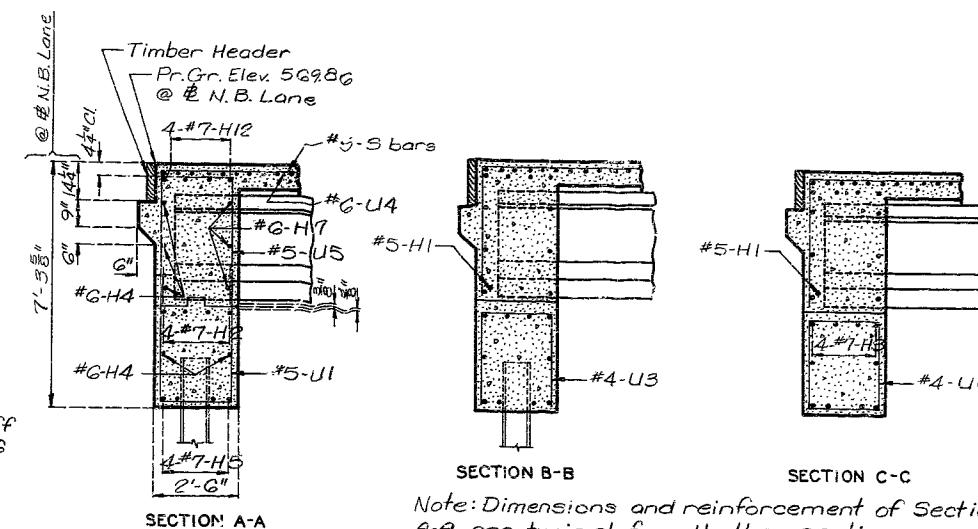


FILE NO.	ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	5	MO.		19	25	

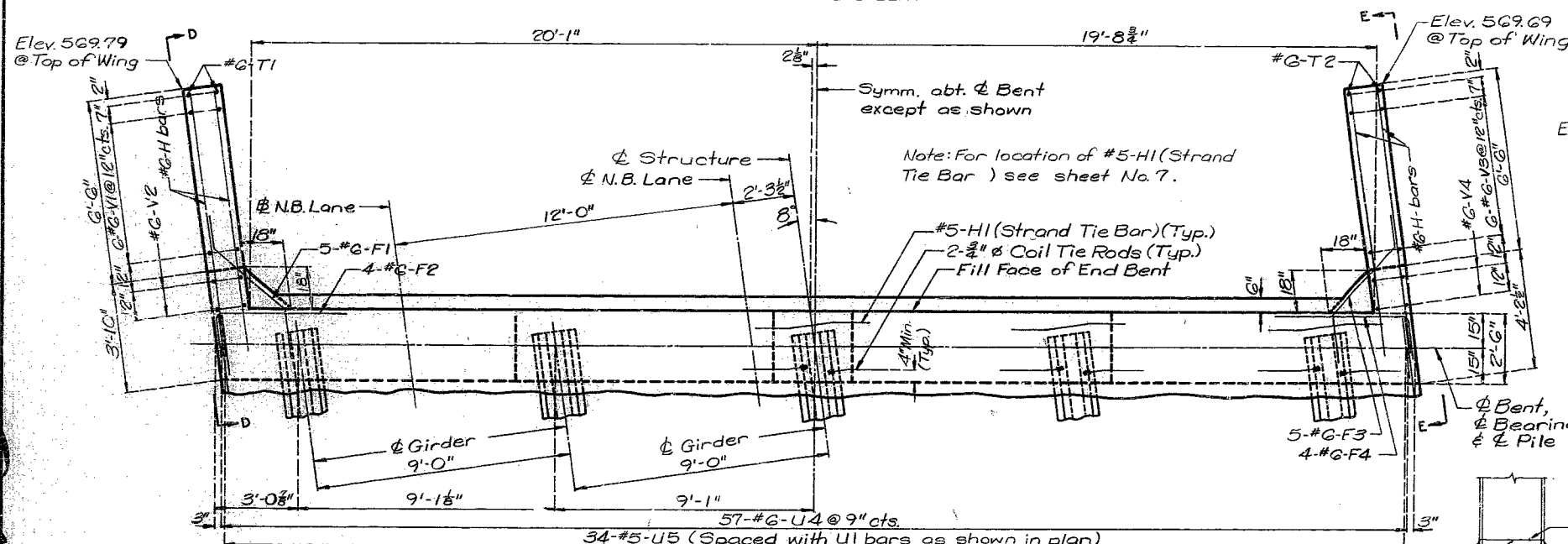
Note: All concrete in the end bent above top of beam and below top of slab shall be Class B2.  
Strand at end of girder shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.



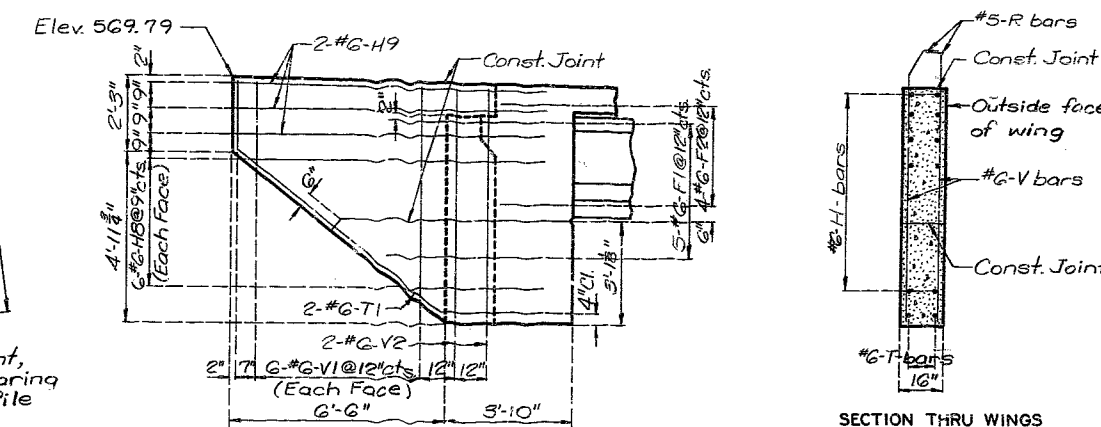
SECTION NEAR END BENT



Note: Dimensions and reinforcement of Section A-A are typical for all other sections except as shown.

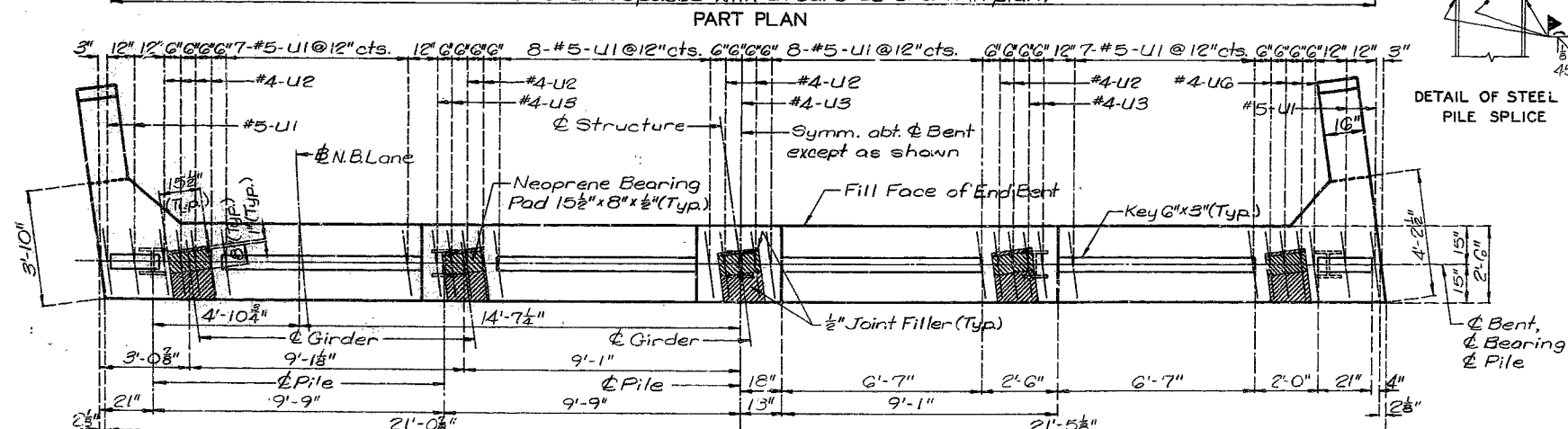


PART PLAN

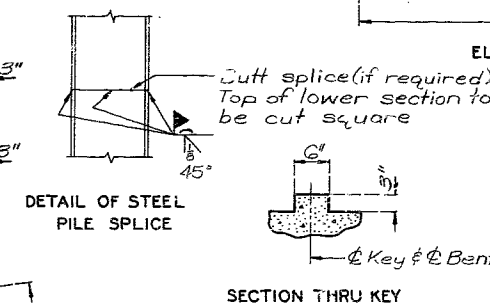


ELEVATION D-D

SECTION THRU WINGS



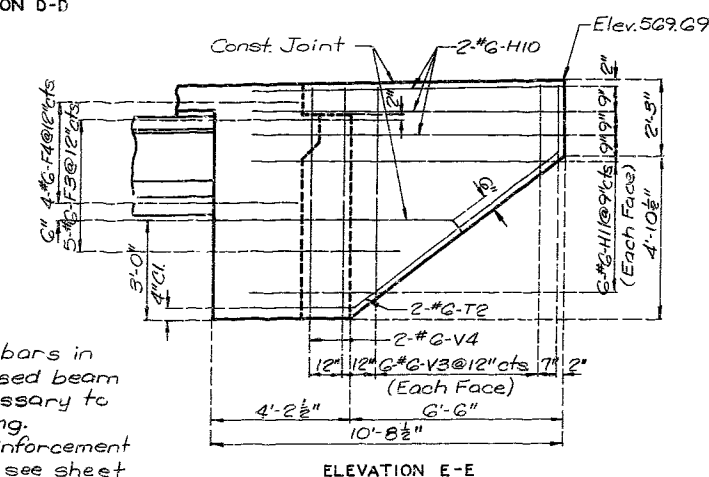
PLAN OF BEAM



DETAIL OF STEEL PILE SPLICE

SECTION THRU KEY

Note: Bend #6-F1 & F3 bars in field to clear prestressed beam flange and when necessary to conform to slope of wing.  
For details and reinforcement of safety barrier curb see sheet No. 13.  
All U-bars in end bent are to be placed parallel to N.B. Lane.



ELEVATION E-E

DETAILED JAN. 1980  
CHECKED MAY 1980

Note: This drawing is not to scale. Follow dimensions.

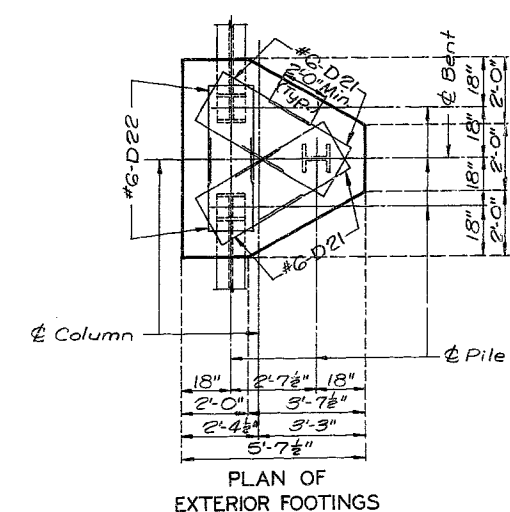
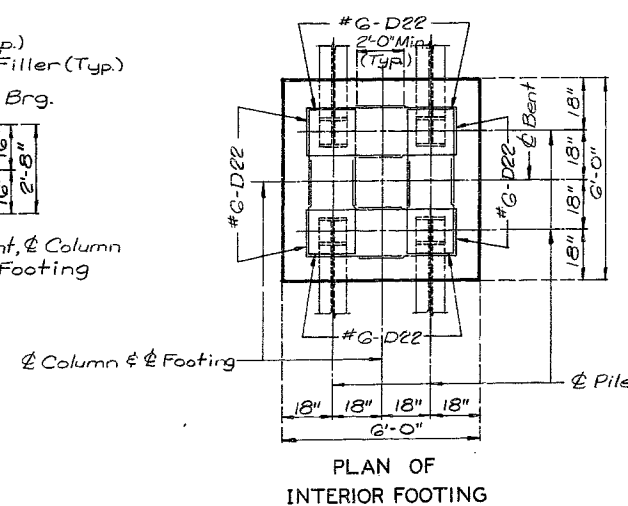
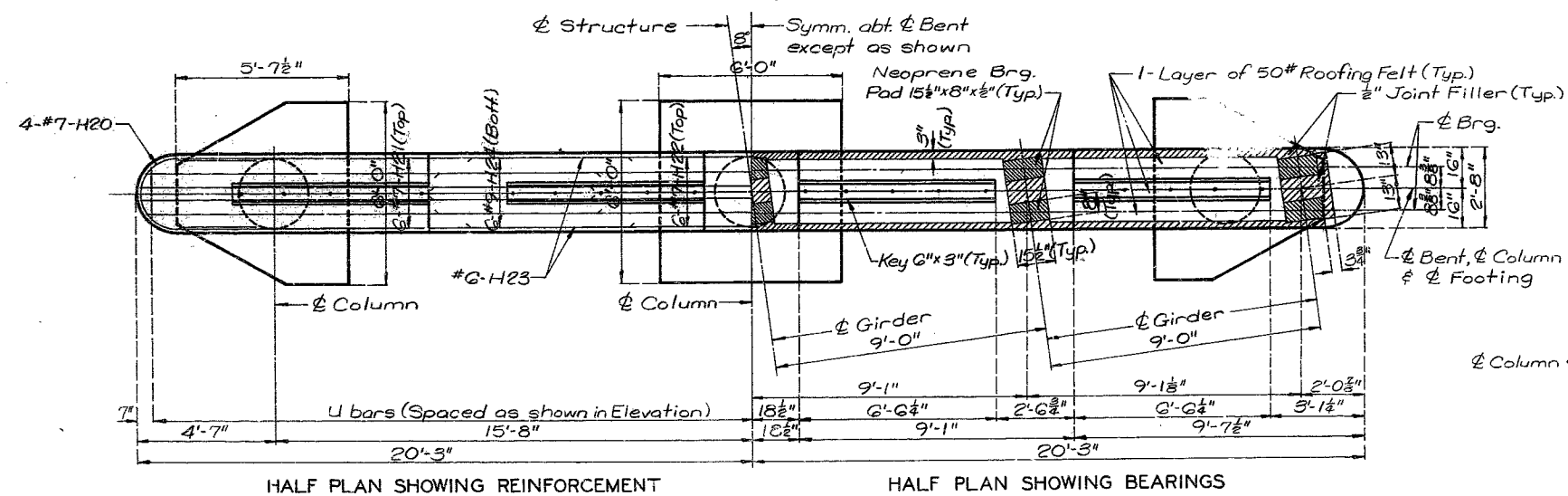
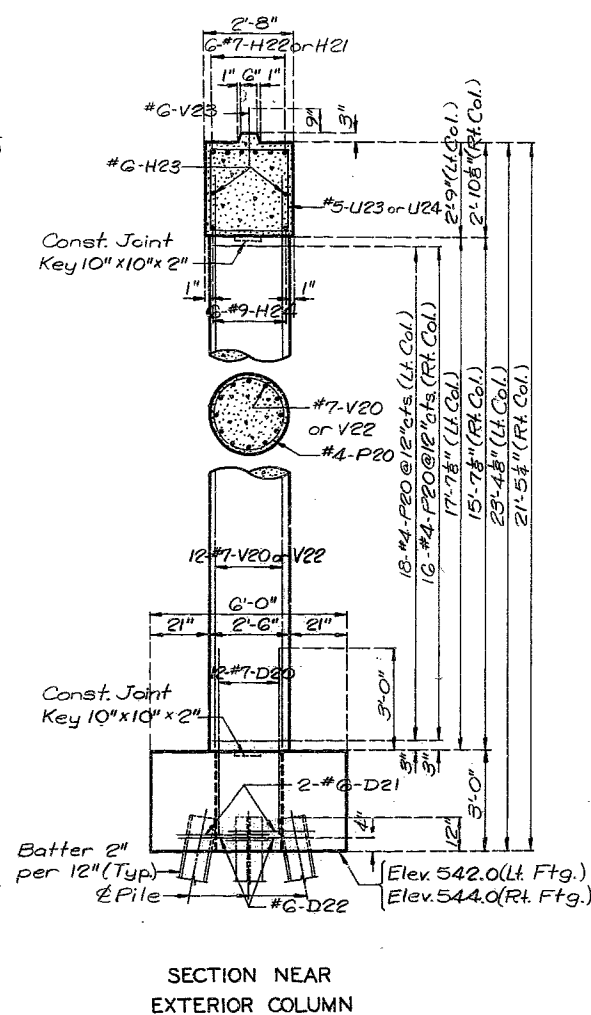
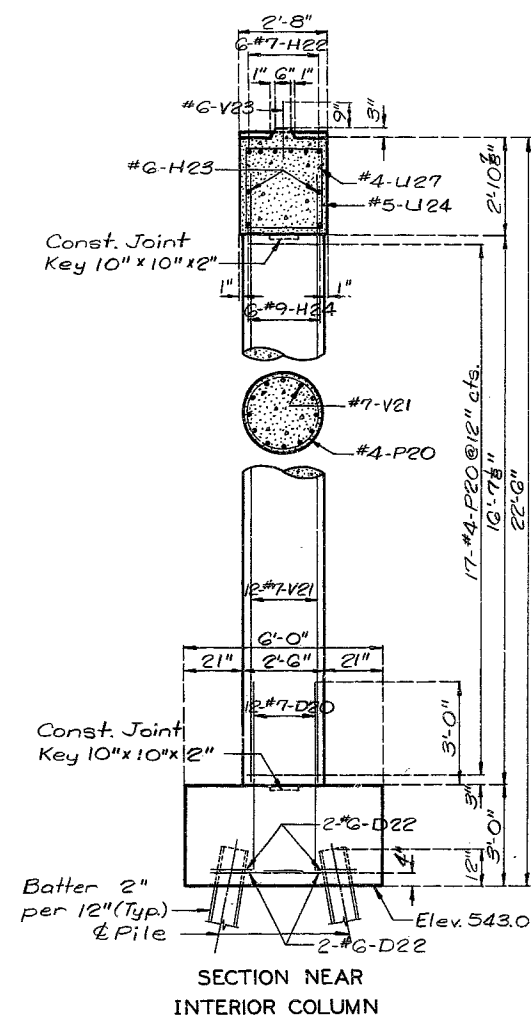
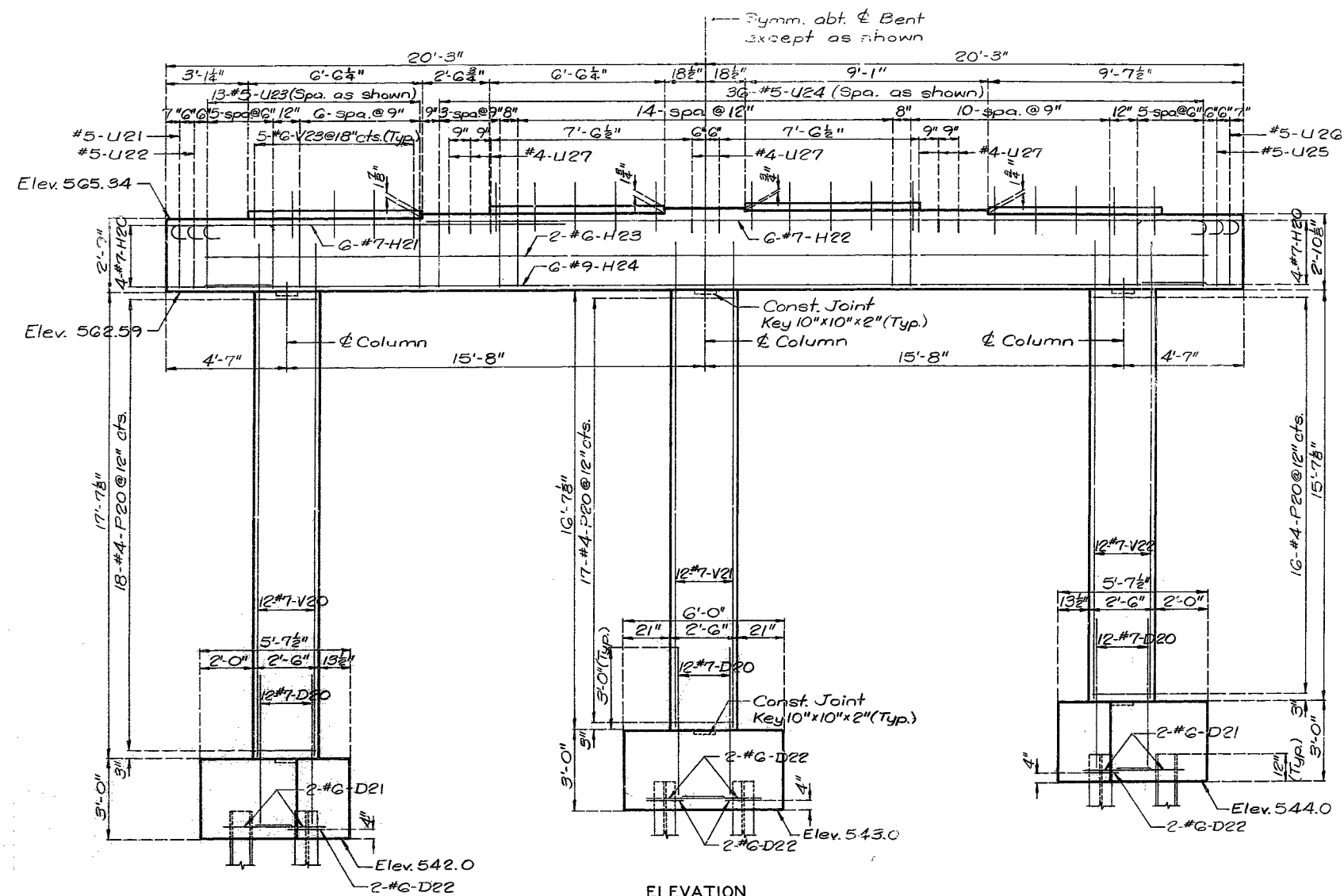
DETAILS OF END BENT NO. 1

Sheet No. 3 of 16.

JEFFERSON COUNTY

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	26	



# DETAILS OF INTERMEDIATE BENT NO. 2

Sheet No. 4 of 16.

JEFFERSON COUNTY

A-3098

DETAILED JAN. 1980  
CHECKED MAY 1980

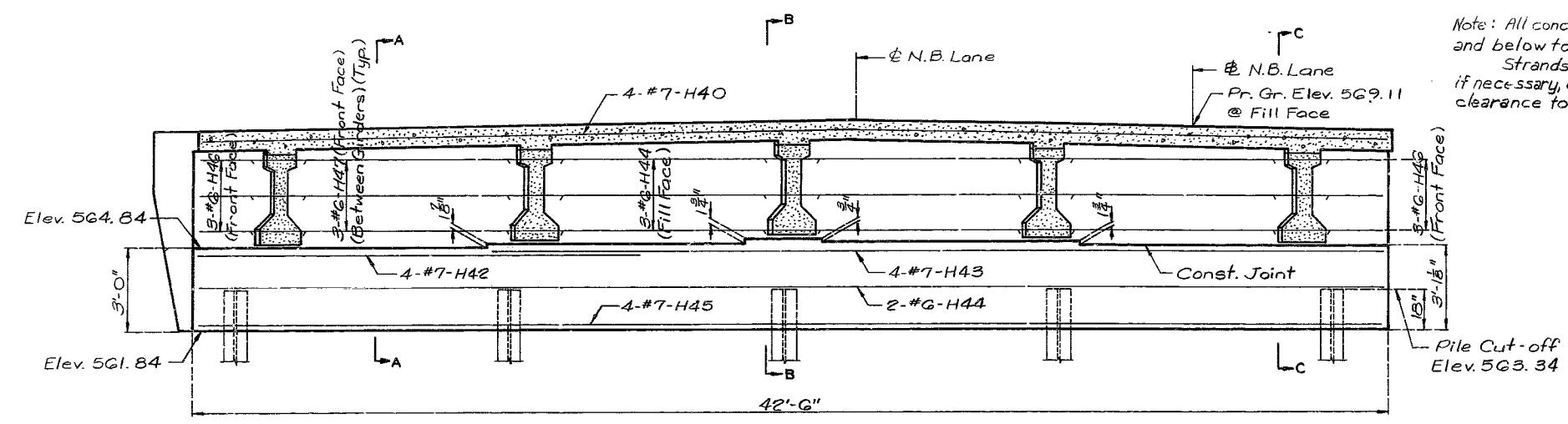
Note: This drawing is not to scale. Follow dimensions.

316/141

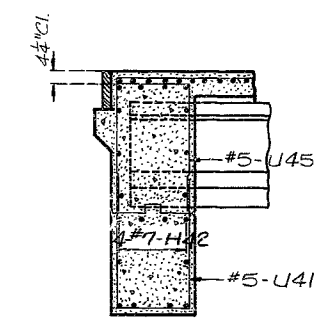


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		88	28	

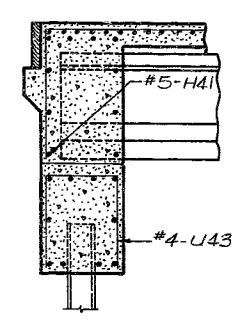
Note: All concrete in the end bent above top of beam and below top of slab shall be Class B2.  
Strands at end of girder shall be field bent or, if necessary, cut in field to maintain 1/2" minimum clearance to fill face of end bent.



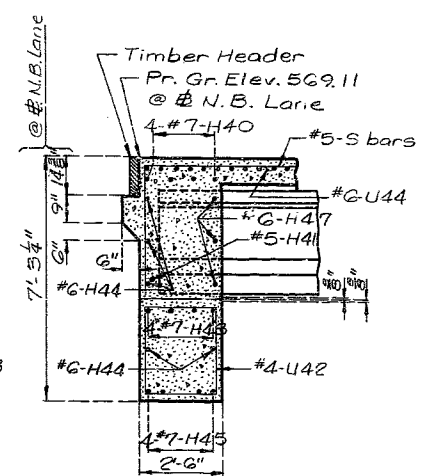
SECTION NEAR END BENT



SECTION A-A

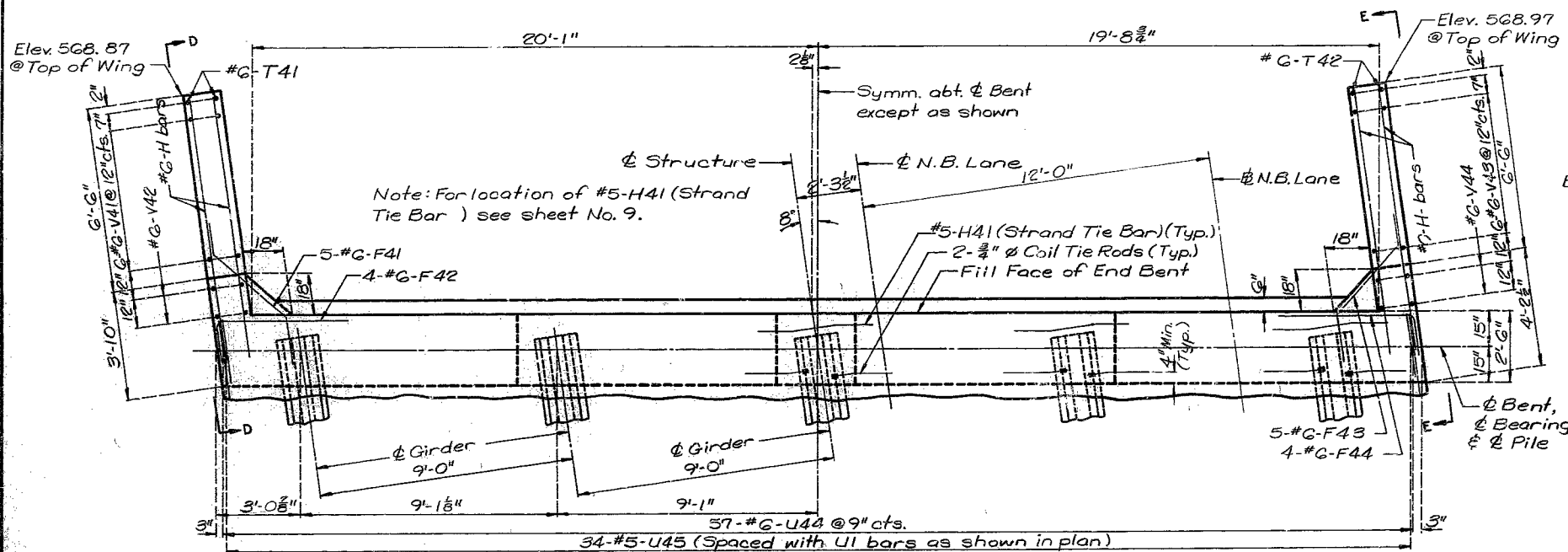


SECTION B-B

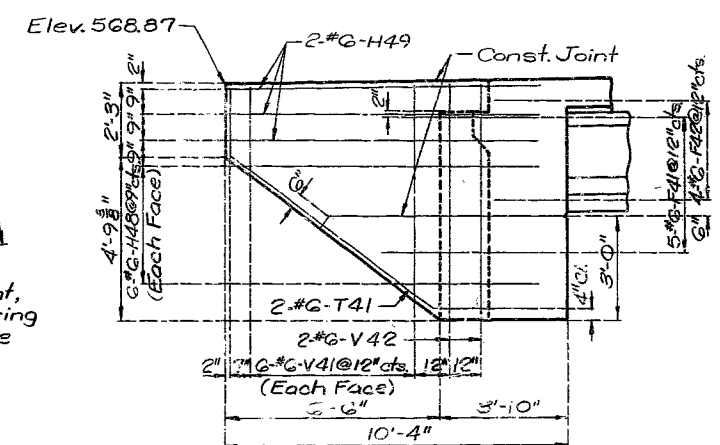


SECTION C-C

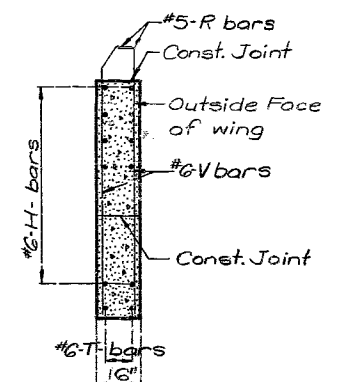
Note: Dimensions and reinforcement of Section C-C are typical for all other sections except as shown.



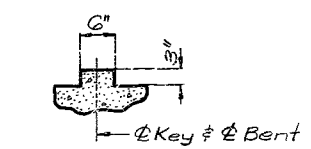
PART PLAN



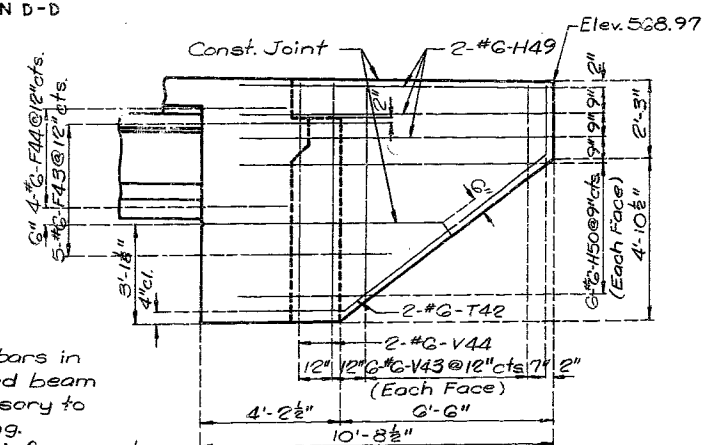
ELEVATION D-D



SECTION THRU WINGS

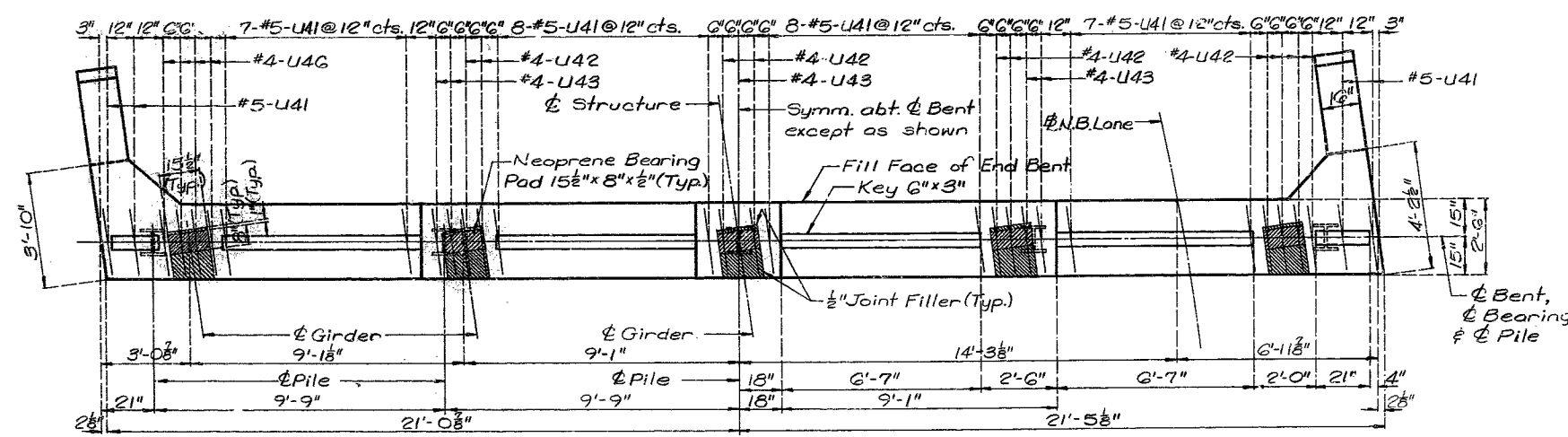


SECTION THRU KEY



ELEVATION E-E

Note: Bend #6-F41 & F43 bars in field to clear prestressed beam flange and when necessary to conform to slope of wing.  
For details and reinforcement of safety barrier curb see sheet No. 13.  
All U-bars in end bent are to be placed parallel to N.B. Lane.



PLAN OF BEAM

DETAILS OF END BENT NO. 4

Note: This drawing is not to scale. Follow dimensions.

DETAILED FEB. 1980  
CHECKED MAY 1980

Sheet No. 6 of 16.

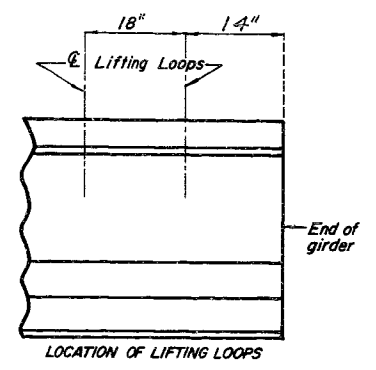
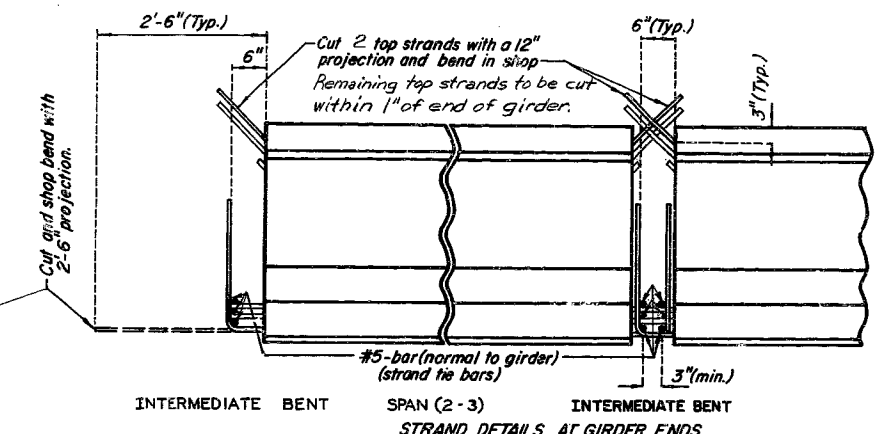
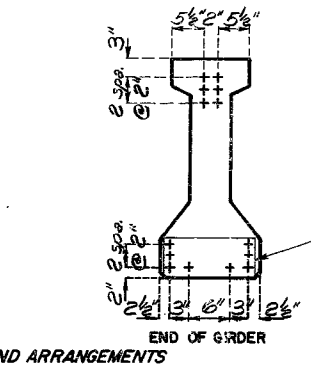
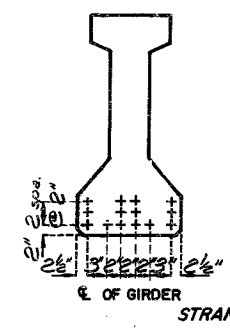
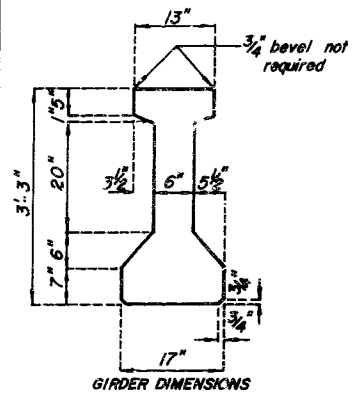
JEFFERSON COUNTY

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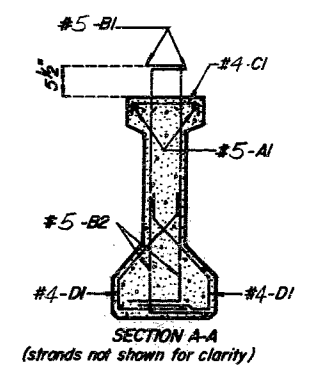
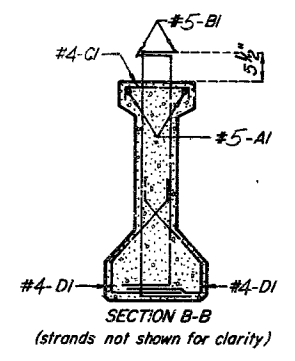
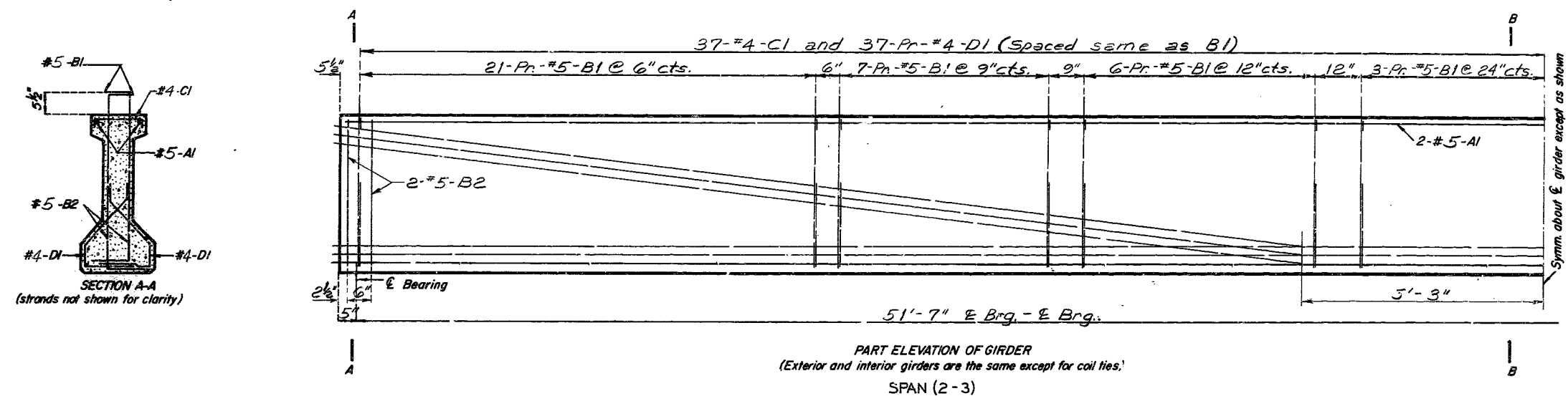


NOTES:  
CONCRETE FOR PRESTRESSED GIRDERS SHALL BE CLASS A1 WITH  $f'_c = 5,000$  psi.  
(+) INDICATES PRESTRESSED STRAND.  
USE 14 STRANDS WITH AN INITIAL PRESTRESS FORCE OF 405 KIPS.  
COIL TIES SHALL BE HELD IN PLACE IN THE FORMS BY SLOTTED WIRE-SETTING-STUDS PROJECTING THRU FORMS. STUDS ARE TO BE LEFT IN PLACE OR REPLACED WITH TEMPORARY PLUG UNTIL GIRDERS ARE ERECTED AND THEN REPLACED BY COIL TIE RODS.

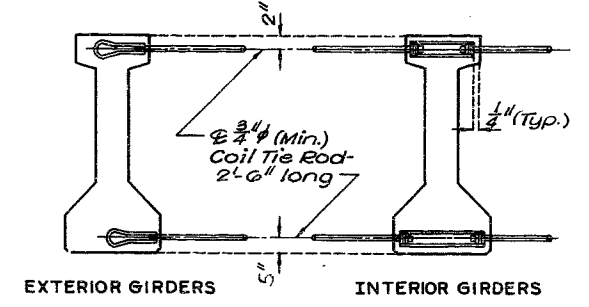
Note: Prestressing tendons shall be uncoated seven-wire 1/2 inch diameter conforming to A.A.S.H.T.O. M203, Grade 270.

BILL OF REINFORCING STEEL - EACH GIRDER					
NO.	SIZE & MARK	LENGTH	SHAPE	BENDING DIAGRAMS	
2	5 A1	52'-2"	20	SHAPE 11	
146	5 B1	4'-9"	11	SHAPE 12	
8	5 B2	3'-9"	19	SHAPE 13	
73	4 C1	13"	10	SHAPE 14	
146	4 D1	2'-11"	9	SHAPE 15	

NOTE: ALL DIMENSIONS ARE OUT TO OUT.  
WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.  
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures stirrup and tie dimensions.  
Actual lengths are measured along centerline bar to the nearest inch.  
Minimum clearance to reinforcing shall be 1".  
All reinforcement shall be Grade 60.



Note: The 1/2"  $\phi$  holes shall be cast in web. Drilling is not allowed.  
For details of Intermediate Diaphragms see Sheet No. 10.  
Cost of 3/4"  $\phi$  coil tie rods placed in diaphragms is included in contract unit price for prestressed concrete members.  
For location of coil ties see Sheet No. 10.



DETAILS OF COIL TIES AT INT. BENTS

Note: This drawing is not to scale. Follow dimensions.

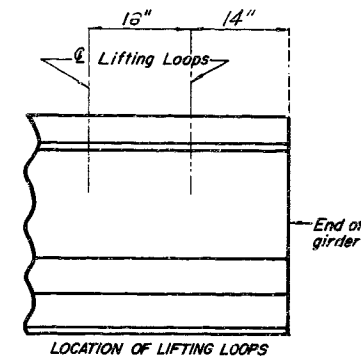
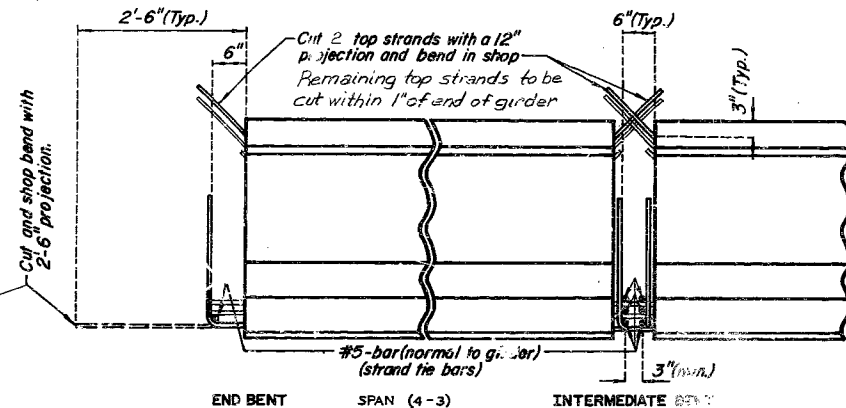
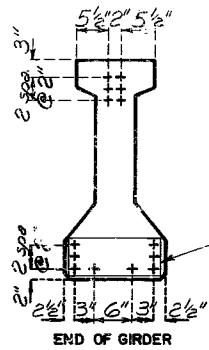
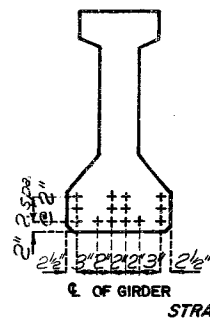
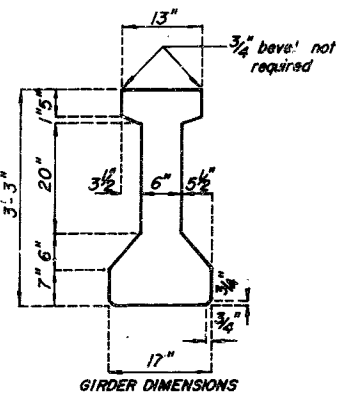
Sheet No. 8 of 16.

380-145

Revised  
APR 1980  
JAN 1980  
APR 1979  
SPS 553.6

DETAILED FEB 1980  
CHECKED MAY 1980



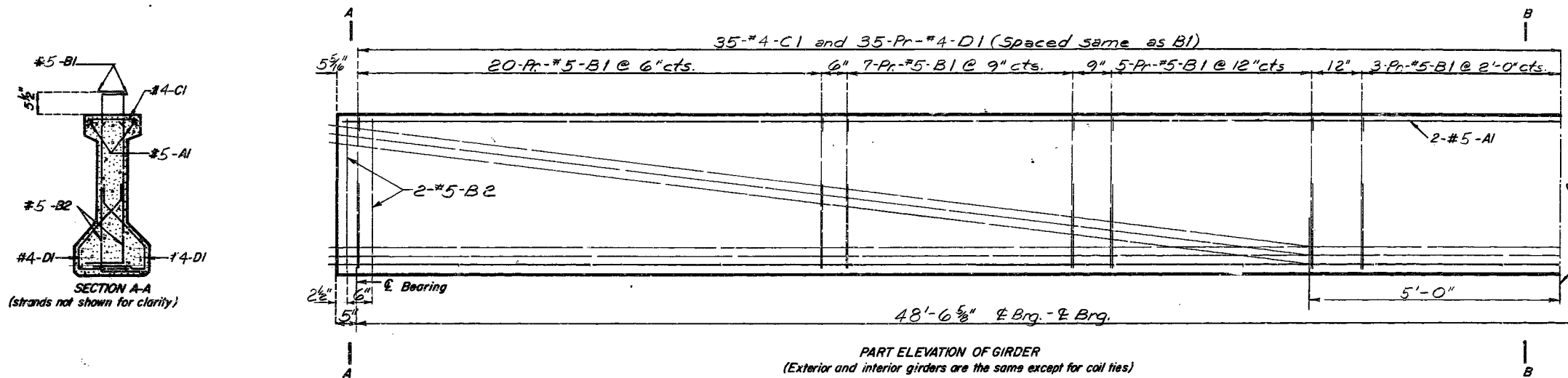


NOTES:  
CONCRETE FOR PRESTRESSED GIRDERS SHALL BE CLASS A1 WITH  $f'c = 5,000$  psi.  
(+) INDICATES PRESTRESSED STRAND.  
USE 1/4 STRANDS WITH AN INITIAL PRESTRESS FORCE OF 405 KIPS.  
COIL TIES SHALL BE HELD IN PLACE IN THE FORMS BY SLOTTED WIRE-SETTING-STUDS PROJECTING THRU FORMS. STUDS ARE TO BE LEFT IN PLACE OR REPLACED WITH TEMPORARY PLUG UNTIL GIRDERS ARE ERECTED AND THEN REPLACED BY COIL TIE RODS.

Note: Prestressing tendons shall be uncoated seven-wire 1/2 inch diameter conforming to A.A.S.H.T.O. M203, Grade 270.

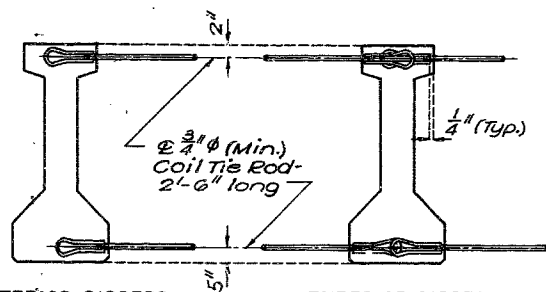
BILL OF REINFORCING STEEL - EACH GIRDER					
NO.	SIZE & MARK	LENGTH	SHAPE	BENDING DIAGRAMS	
2	5 A1	49'-1"	20		SHAPE 11
138	5 B1	4'-9"	11		SHAPE 12
8	5 B2	3'-9"	19		SHAPE 13
69	4 C1	13"	10		SHAPE 14
138	4 D1	2'-11"	9		SHAPE 15

NOTE: ALL DIMENSIONS ARE OUT TO OUT.  
WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.  
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures stirrup and tie dimensions.  
Actual lengths are measured along centerline bar to the nearest inch.  
Minimum clearance to reinforcing shall be 1".  
All reinforcement shall be Grade 60.



PART ELEVATION OF GIRDER  
(Exterior and interior girders are the same except for coil ties)  
SPAN (3-4)

Cost of 3/4" coil tie rods placed in diaphragms is included in contract unit price for prestressed concrete members.



EXTERIOR GIRDERS AT INT. BENTS  
INTERIOR GIRDERS AT ALL BENTS  
EXTERIOR GIRDERS AT END BENTS  
DETAILS OF COIL TIES

Note: For location of coil ties see Sheets No. 6 & 10.

DETAILED FEB. 1980  
CHECKED MAY 1980

Note: This drawing is not to scale. Follow dimensions.

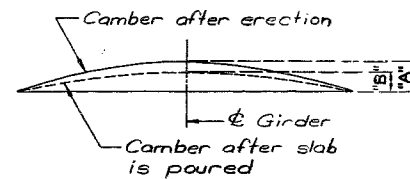
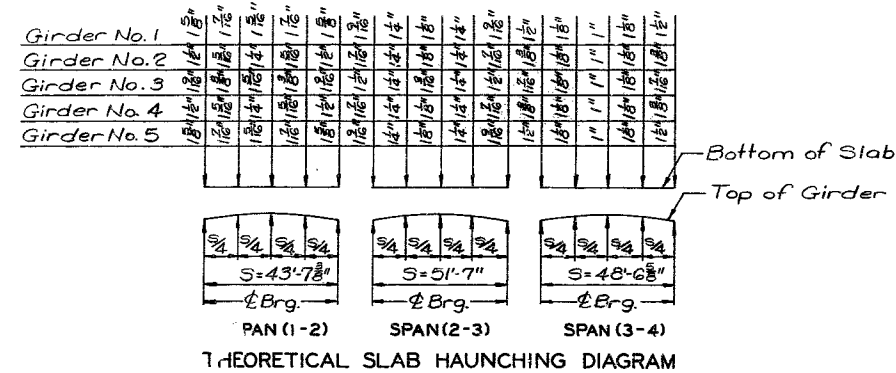
Sheet No. 9 of 16.

JEFFERSON COUNTY

A-3098

321/146

Revised  
JAN 1980  
SPS 553.6  
April 1979



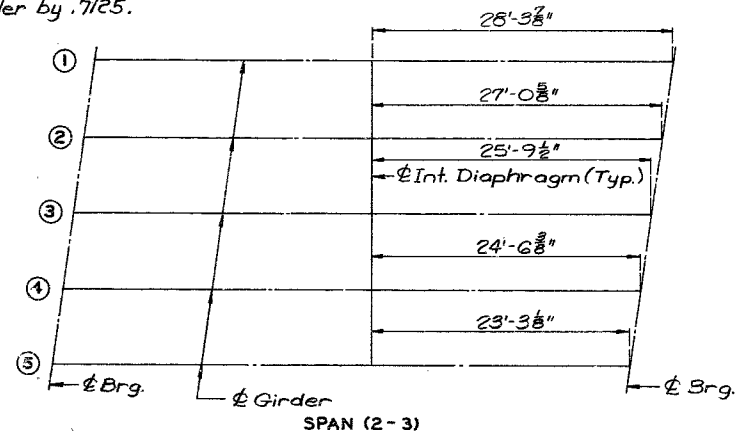
GIRDER CAMBER DIAGRAM

Note: If girder camber is different from that shown in the Camber Diagram, it shall be necessary to adjust the slab haunches, increase the slab thickness or to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

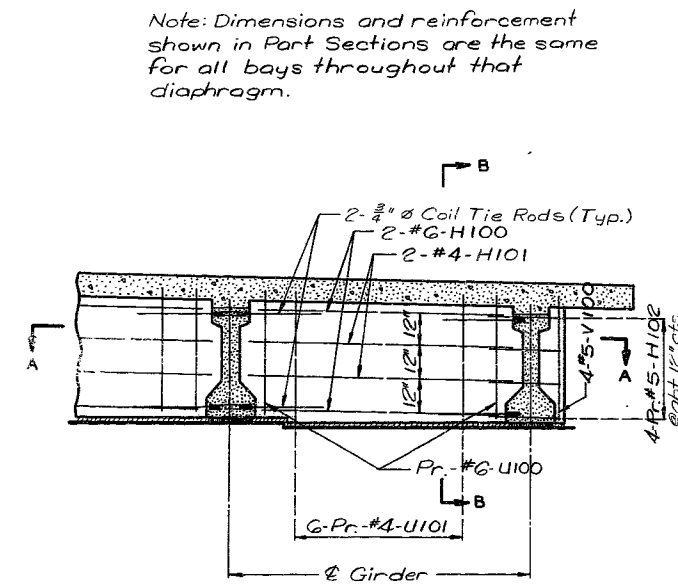
Concrete in the slab haunches is included in the Estimated Quantities for Alternate Slabs as Class B2 Concrete.

The slab is to be built parallel to grade and to the minimum thickness indicated.

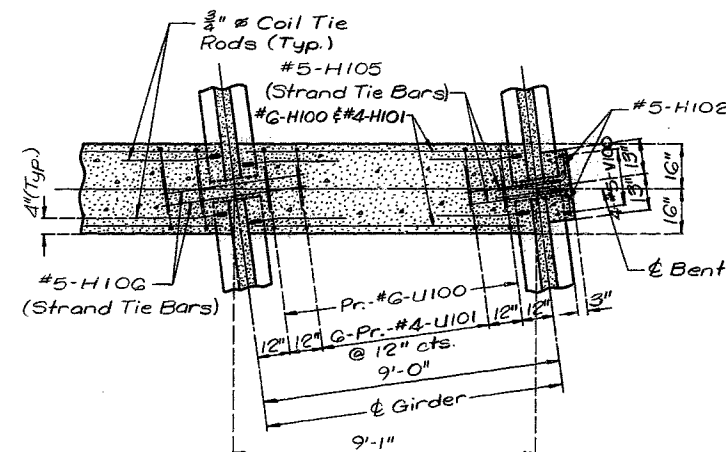
To determine camber at quarter point multiply camber at Φ girder by .7125.



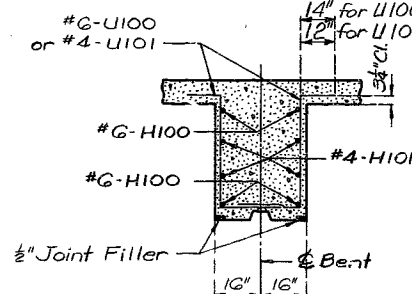
PLAN OF GIRDERS SHOWING LOCATION OF INTERMEDIATE DIAPHRAGMS



PART SECTION NEAR INT. BENTS NO. 2 & 3

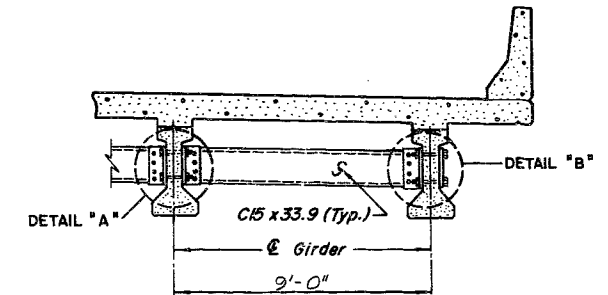


SECTION A-A

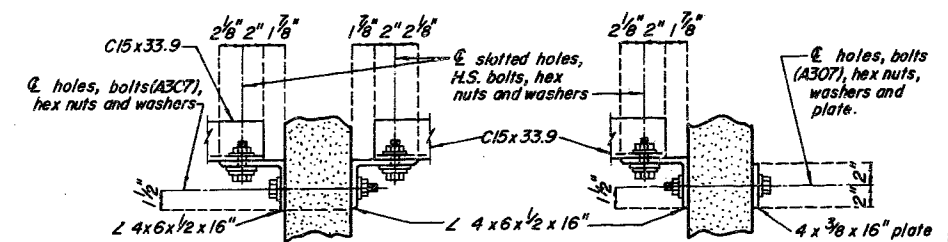
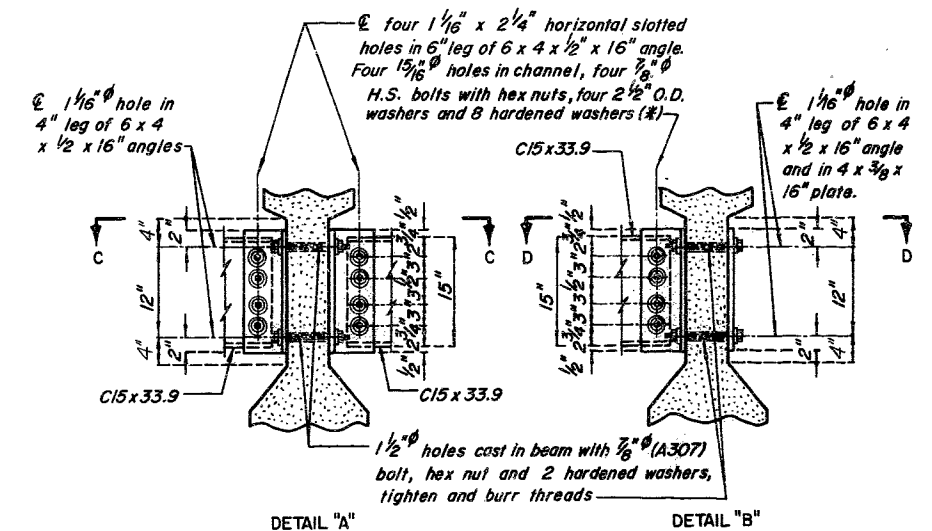


SECTION B-B

Note: For number and location of #5-H105 and #5-H106 (Strand Tie Bars) at intermediate bents, see girder sheets.  
Diaphragms at Intermediate Bents are vertical.



PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS



#### STEEL DIAPHRAGM NOTES:

- (\*) IN LIEU OF 2 1/2" O.D. WASHERS, CONTRACTOR MAY SUBSTITUTE A 3/16" (MIN. THICKNESS) PLATE WITH FOUR 15/16" HOLES AND 1 HARDENED WASHER PER BOLT.
- ALL H.S. BOLTS MAY BE TENSIONED BY TURN-OF-NUT METHOD.
- ALL DIAPHRAGM MATERIALS INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
- FABRICATED STRUCTURAL STEEL SHALL BE A36 EXCEPT AS NOTED.
- PAYMENT FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN CONTRACT UNIT PRICE FOR PRESTRESSED CONCRETE I-GIRDERS.
- Shop drawings will not be required for Steel Intermediate Diaphragms and Angle Connections.

SEE FINAL PLANS

Sheet No. 10 of 16

JEFFERSON

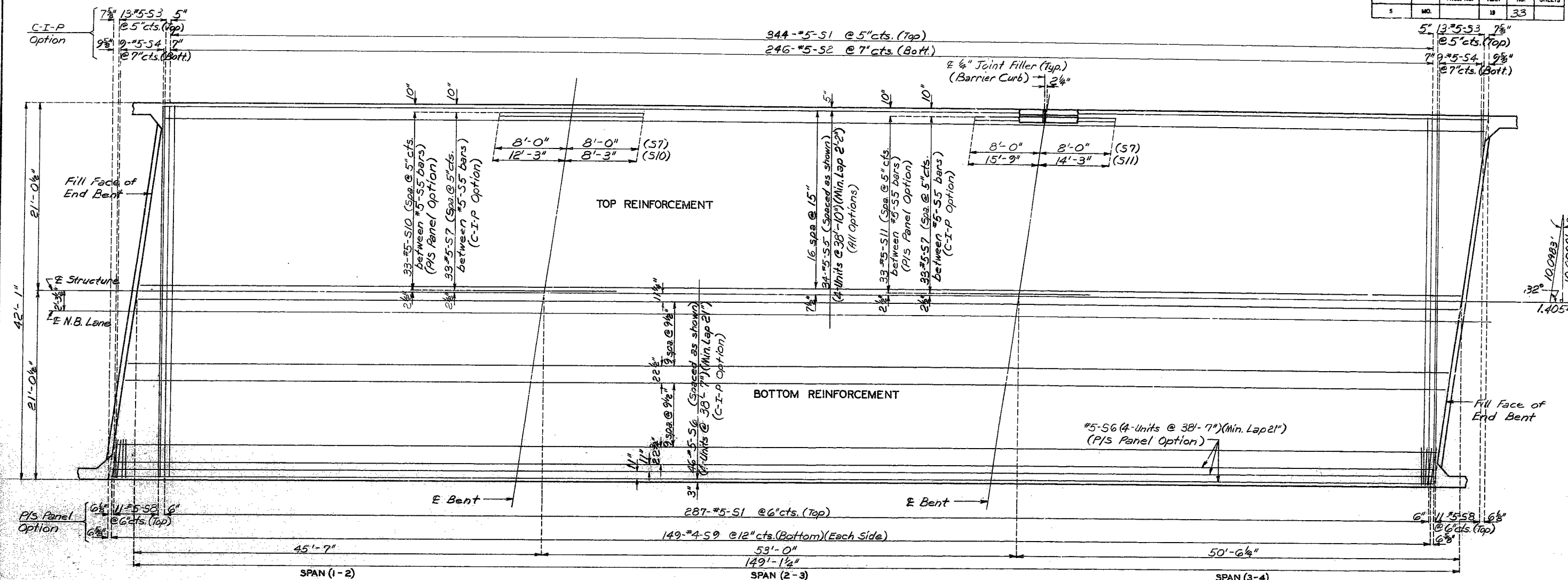
COUNTY

A-3098

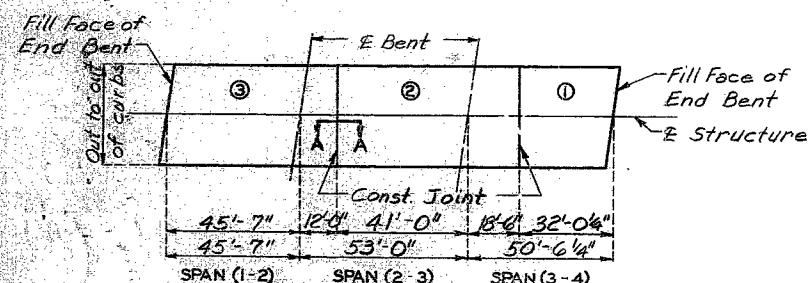
DETAILED MAY 1985  
CHECKED MAY 1985

Note: This drawing is not to scale. Follow dimensions.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	33	



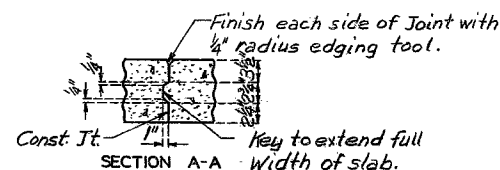
PLAN OF SLAB SHOWING REINFORCEMENT  
Note: Longitudinal dimensions shown are horizontal.



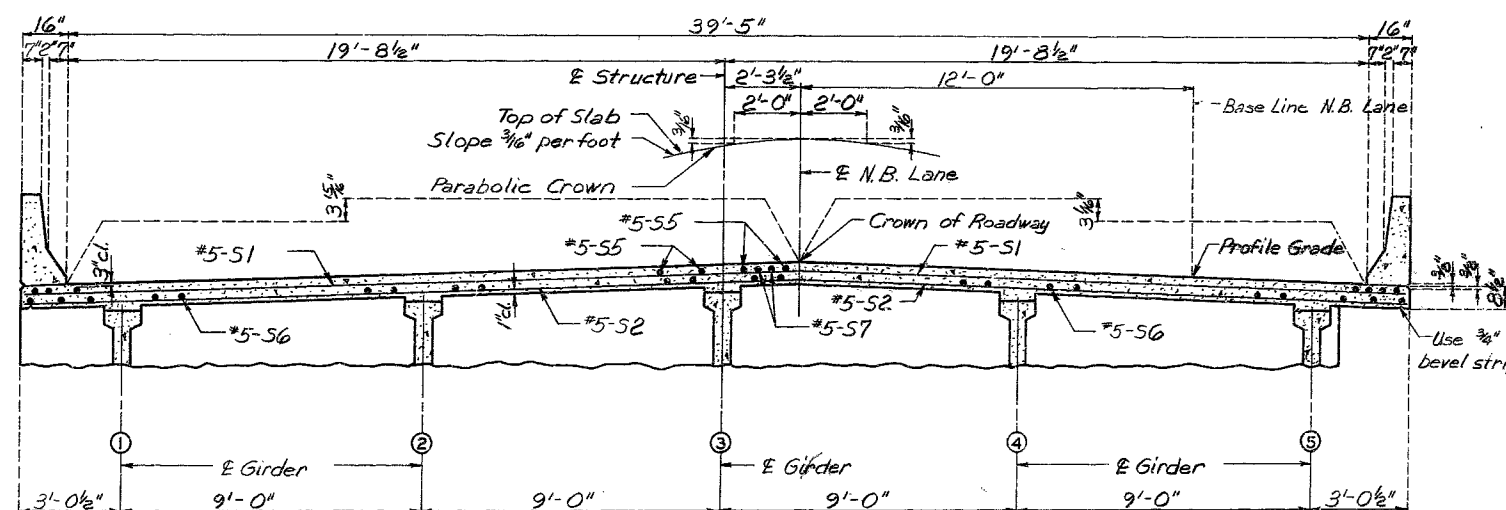
	Sequence of Pours			Min. Rate of Pour Cu. Yds./Hour
	1	2	3	
Basic Sequence	End to 2	1 to 3	2 to End	25
Alternate "A" Pours	1+2	3		25
Alternate "B" Pours	End to 3	2 to End		25
	1+2+3	End to End		25

Note: The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours and shall pour and satisfactorily finish the slab pours at the rate given. Alternate pours to the basic sequence are subject to the approval of the engineer in accordance with section 703.3.12.4 of Missouri Standard Specifications. The diaphragm at the intermediate bents and integral end bents shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

SLAB POURING SEQUENCE



Note: For Theoretical Slab Haunching Diagram and Girder Camber Diagram, see Sheet No. 10.



HALF SECTION NEAR END BENT

Note: For details and reinforcement of safety barrier curb not shown see Sheet No. 13.

HALF SECTION NEAR INT. BENT

(C-I-P Option)

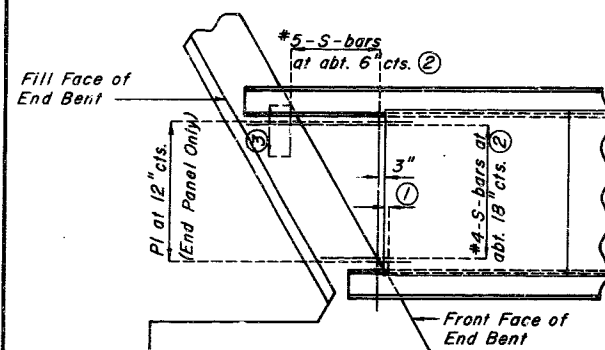
DETAILED JAN. 1980  
CHECKED MAY 1980

Note: This drawing is not to scale. Follow dimensions.

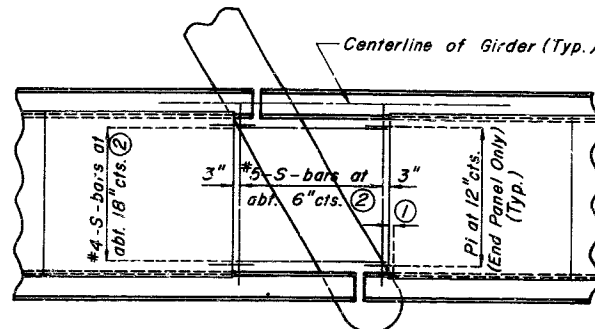
Sheet No. 11 of 16.

JEFFERSON COUNTY

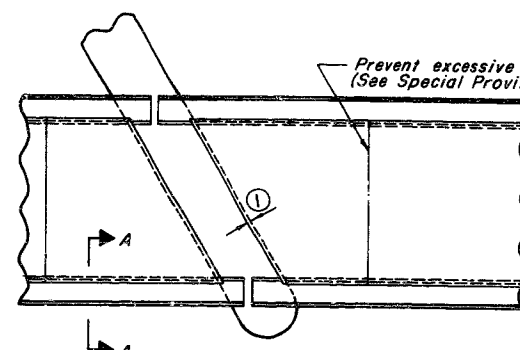
A-3098



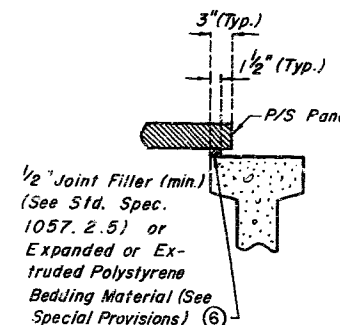
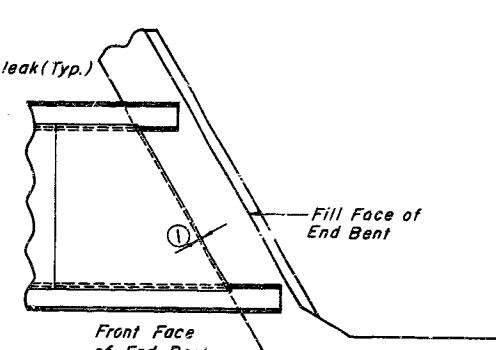
PANELS - SQUARED ENDS



PLAN OF PRECAST PRESTRESSED PANELS PLACEMENT



PANELS - SKEWED ENDS



SECTION A-A

NOTE:  
USE SLAB HAUNCHING DIAGRAM ON SHEET NO. 10 FOR DETERMINING THICKNESS OF JOINT FILLER OR POLYSTYRENE BEDDING MATERIAL WITHIN THE LIMITS NOTED BELOW.

#### GENERAL NOTES:

**PRESTRESSED PANELS:**  
CONCRETE FOR PRESTRESSED PANELS SHALL BE CLASS A1 WITH  $F'_c = 5,000$  PSI,  $F_{ci} = 3,500$  PSI.

THE TOP SURFACE OF ALL PANELS SHALL RECEIVE A SCORED FINISH WITH A DEPTH OF SCORING OF 1/8 INCH PERPENDICULAR TO THE PRESTRESSING STRANDS IN THE PANELS (SEE SPECIAL PROVISIONS).

PRESTRESSING TENDON SHALL BE HIGH-TENSILE STRENGTH UNCOATED SEVEN-WIRE (7) LOW RELAXATION STRANDS FOR PRESTRESSED CONCRETE CONFORMING TO AASHTO M203 EXCEPT THAT NOMINAL DIAMETER OF STRAND - 3/4 INCH AND NOMINAL AREA = 0.865 SQ. IN. AND MINIMUM ULTIMATE STRENGTH = 23,000 LBS. (270 KSI). LARGER STRANDS MAY BE USED WITH THE SAME SPACING AND INITIAL TENSION.

INITIAL PRESTRESSING FORCE = 17.2 KIPS/STRAND.

THE METHOD AND SEQUENCE OF RELEASING THE STRANDS SHALL BE SHOWN ON THE SHOP DRAWINGS.

SUITABLE ANCHORAGE DEVICES FOR LIFTING PANELS MAY BE CAST IN PANELS PROVIDED THEY ARE SHOWN ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER. PANEL LENGTHS SHALL BE DETERMINED BY THE CONTRACTOR AND SHOWN ON THE SHOP DRAWINGS.

WHEN SQUARE END PANELS ARE USED AT SKEWED BENTS IT IS REQUIRED THAT THE SKEWED PORTION BE CAST FULL DEPTH. NO SEPARATE PAYMENT WILL BE MADE FOR THE ADDITIONAL CONCRETE AND REINFORCING REQUIRED.

MINIMUM JOINT FILLER OR POLYSTYRENE BEDDING MATERIAL THICKNESS SHALL BE 1/2 INCH. THICKER JOINT FILLER OR POLYSTYRENE BEDDING MATERIAL MAY BE USED ON ONE OR BOTH SIDES OF THE GIRDER TO REDUCE CAST-IN-PLACE CONCRETE THICKNESS, WITHIN TOLERANCES. NO MORE THAN 2 INCHES TOTAL THICKNESS OF JOINT FILLER OR POLYSTYRENE BEDDING MATERIAL SHALL BE USED.

THE SAME THICKNESS OF JOINT FILLER MATERIAL SHALL BE USED UNDER ANY ONE EDGE OF ANY PANEL AND THE MAXIMUM CHANGE IN THICKNESS BETWEEN ADJACENT PANELS SHALL BE 1/4 INCH. THE POLYSTYRENE BEDDING MATERIAL MAY BE CUT TO MATCH HAUNCH HEIGHT ABOVE TOP OF FLANGE.

AT THE CONTRACTOR'S OPTION THE VARIATION IN SLAB THICKNESS OVER PRESTRESSED PANELS MAY BE ELIMINATED OR REDUCED BY INCREASING AND VARYING THE GIRDER TOP FLANGE THICKNESS. DIMENSIONS SHALL BE SHOWN ON THE SHOP DRAWINGS.

#### NOTE:

1. END PANEL TO BE DIMENSIONED 1 1/2 INCH INSIDE FACE OF DIAPHRAGM.

2. S-BARS SHOWN ARE BOTTOM STEEL IN SLAB BETWEEN PANELS AND USED WITH SQUARED END PANELS ONLY.

COST OF S-BARS SHALL BE INCLUDED IN PRICE BID FOR SLAB PER SQ. YD.

S-BARS ARE NOT LISTED IN BILL OF REINFORCING.

SUPPORT FROM DIAPHRAGM FORMS REQUIRED UNDER OPTIONAL SKEWED END UNTIL CAST-IN-PLACE CONCRETE HAS REACHED 1,000 PSI COMPRESSIVE STRENGTH.

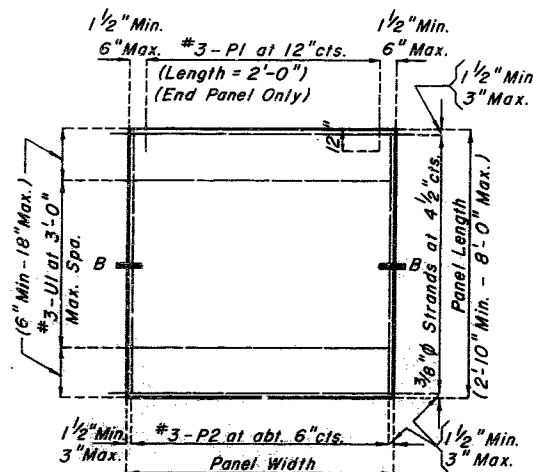
3. EXTEND S-BARS 18 INCHES BEYOND FRONT FACE OF END BENT ONLY. SLAB EXTERIOR GIRDER HAUNCH TO BE THE SAME AS CAST-IN-PLACE.

SLAB THICKNESS OVER PRESTRESSED PANELS VARIES DUE TO GIRDER CAMBER.

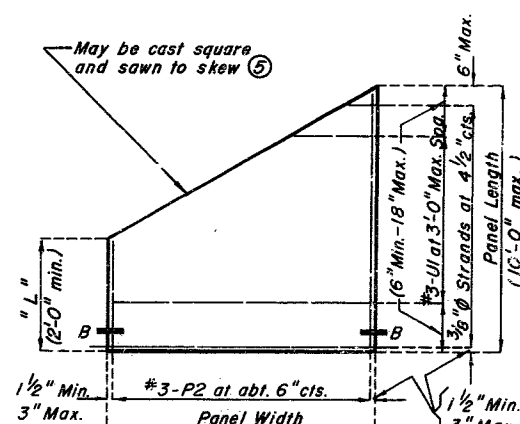
4. IN ORDER TO MAINTAIN MINIMUM SLAB THICKNESS IT MAY BE NECESSARY TO RAISE THE GRADE UNIFORMLY THROUGHOUT THE STRUCTURE. NO PAYMENT WILL BE MADE FOR ADDITIONAL LABOR OR MATERIALS REQUIRED FOR NECESSARY GRADE ADJUSTMENT.

5. ANY STRAND 2'-0" OR SHORTER SHALL HAVE A #4 REINFORCING BAR ON EACH SIDE OF IT CENTERED BETWEEN STRANDS. STRANDS 2'-0" OR SHORTER MAY BE DEBONDED AT FABRICATOR'S OPTION.

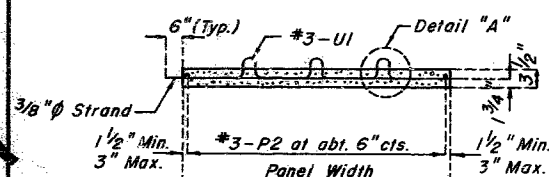
6. ALL PANEL SUPPORT PADS SHALL BE GLUED TO THE GIRDER WHEN SUPPORT THICKNESS EXCEEDS 1 1/2 INCH THE PADS SHALL BE GLUED TOP AND BOTTOM. THE GLUE USED SHALL BE THE TYPE RECOMMENDED BY THE PANEL SUPPORT PADS MANUFACTURER.



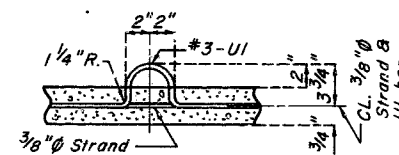
PLAN OF PRECAST PRESTRESSED PANEL



PLAN OF PRECAST PRESTRESSED PANEL (SKEWED END-OPTIONAL)



SECTION B-B



DETAIL "A"

#### REINFORCING STEEL:

ALL DIMENSIONS ARE OUT TO OUT.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 INCH UNLESS OTHERWISE SHOWN.

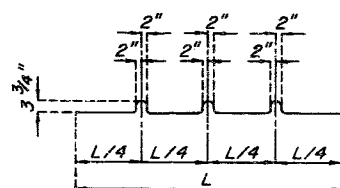
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE C.R.S.I. MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, STIRRUP AND TIE DIMENSIONS.

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

THE PRESTRESSED PANEL QUANTITIES ARE NOT INCLUDED IN THE TABLE OF ESTIMATED QUANTITIES FOR ALTERNATE SLABS.

IF U1 BARS INTERFERE WITH PLACEMENT OF SLAB STEEL, U1 LOOPS MAY BE BENT OVER AS NECESSARY TO CLEAR SLAB STEEL.

WELDED WIRE FABRIC OR WELDED DEFORMED BAR MATS PROVIDING A MINIMUM AREA OF REINFORCING PERPENDICULAR TO STRANDS OF 0.22 SQ. IN./FT. WITH SPACING PARALLEL TO STRANDS SUFFICIENT TO INSURE PROPER HANDLING MAY BE USED IN LIEU OF THE #3-P2 BARS SHOWN. WIRE OR BAR DIAMETER SHALL NOT BE LARGER THAN 0.375 INCHES.



BENDING DIAGRAM FOR U1 BAR

#3-U1 BARS MAY BE ORIENTED AT RIGHT ANGLES TO LOCATION AND SPACING SHOWN. U1 BARS SHALL BE PLACED BETWEEN P1 BARS.

## DETAILS OF PRECAST PRESTRESSED PANELS

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 12 of 16

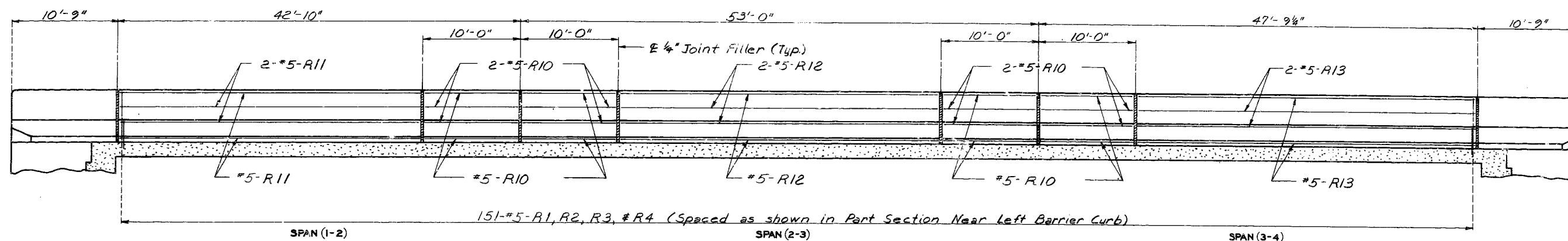
JEFFERSON COUNTY

A-3093

DETAILED SEPT. 1985  
CHECKED SEPT. 1985

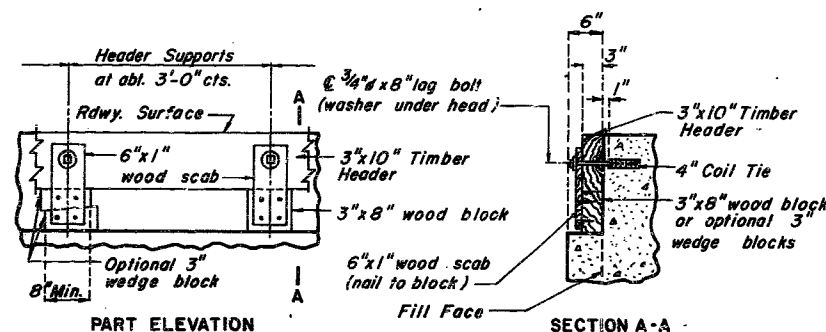
PRESTRESS  
P/C - P/S PANEL (3/12)  
REVISED  
JULY 1985  
JAN. 1980

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		18	35	



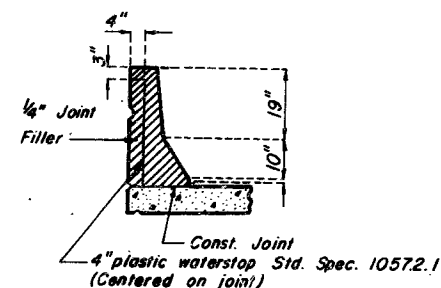
SECTION NEAR LEFT BARRIER CURB

Note: Longitudinal dimensions shown are horizontal.



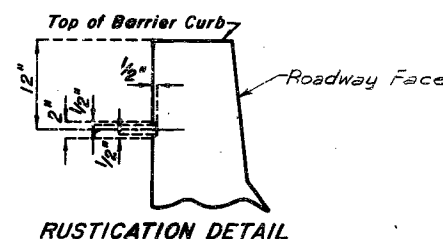
Note: Cost of timber headers complete in place to be included in price bid for concrete.

DETAILS OF TIMBER HEADER AT END BENTS



Note: Plastic waterstop shall be placed in all safety barrier curb filled joints.

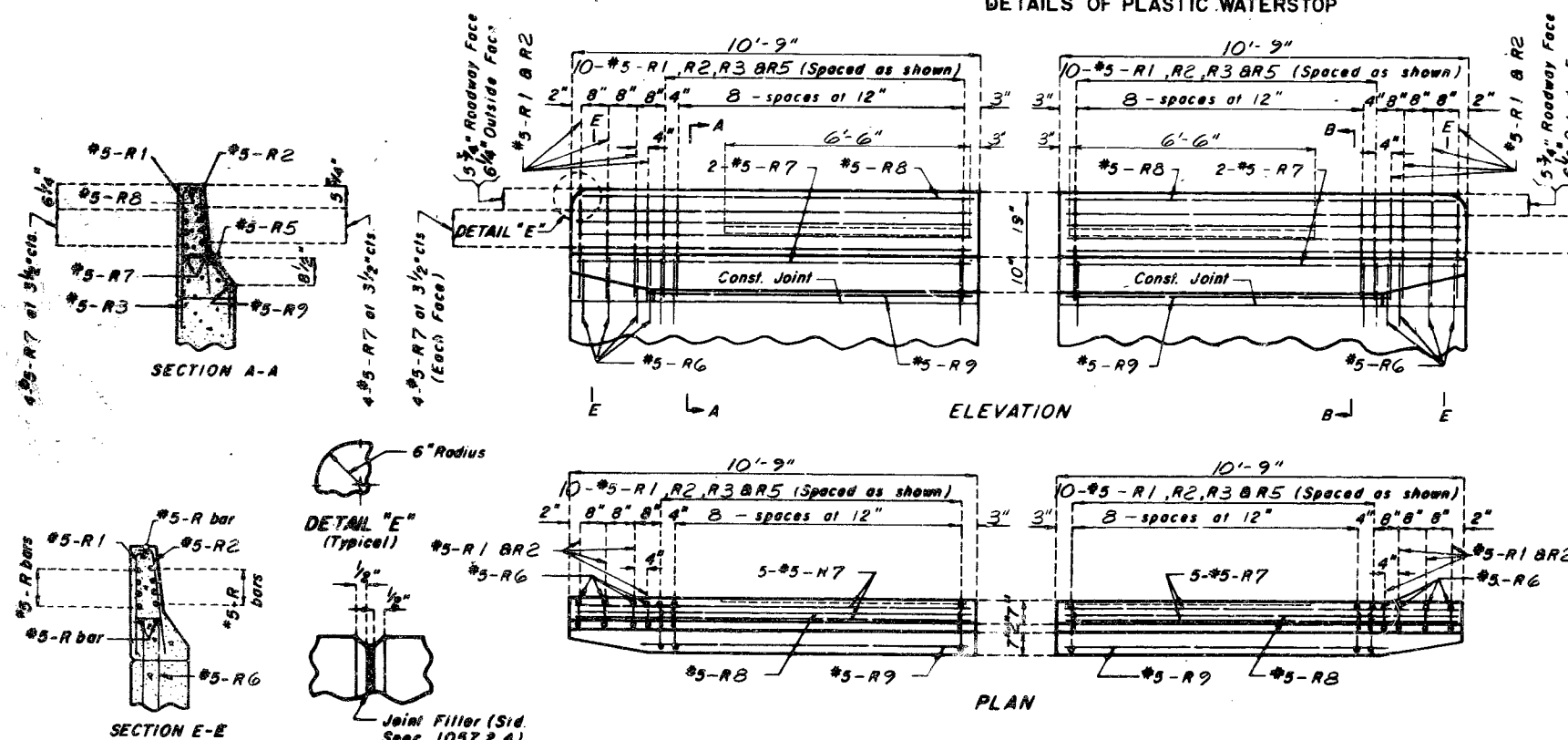
DETAILS OF PLASTIC WATERSTOP



RUSTICATION DETAIL

#### NOTES:

- Top of barrier curb to be built parallel to grade with barrier curb joints (except at end bents) normal to grade.
- All exposed edges of barrier curb shall have 1/2" radius or 3/8" bevel unless otherwise noted.
- When the barrier curb is bid by linear feet, the contract unit price shall include the cost of all concrete and reinforcement, complete in place.
- Concrete in the safety barrier curb shall be Class B1.
- Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

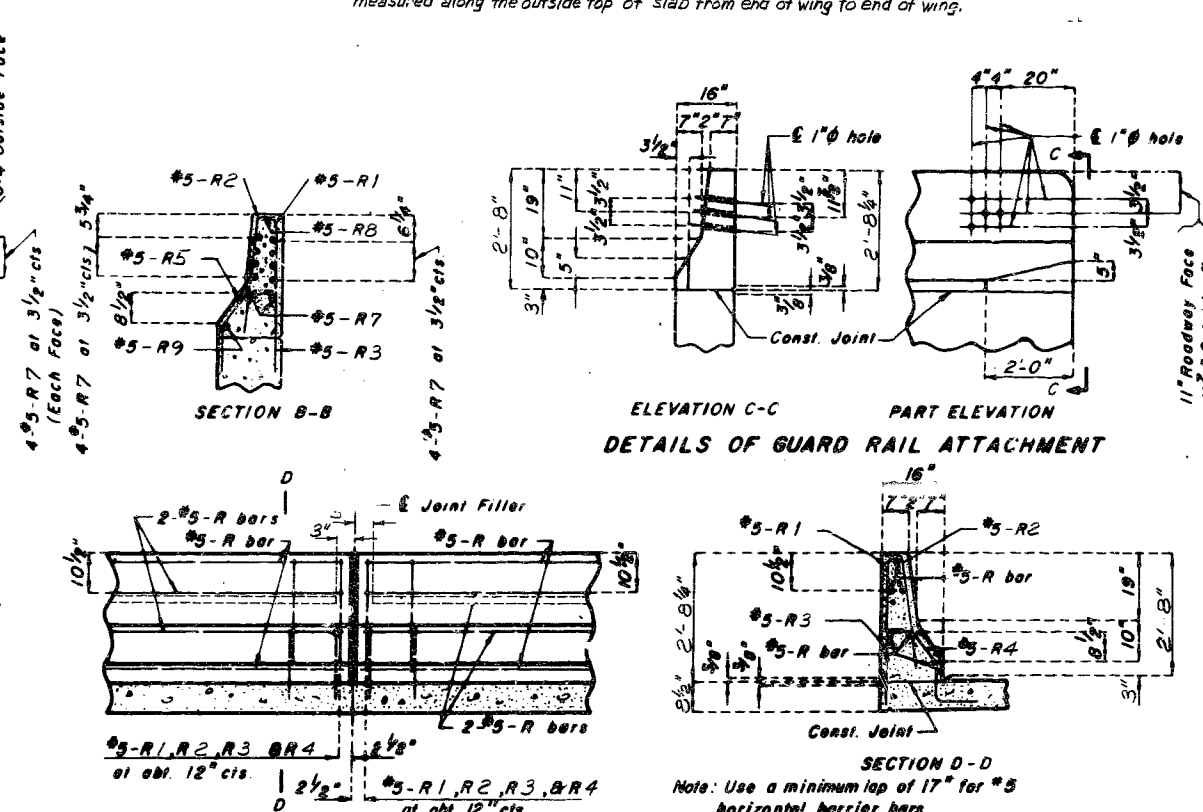


DETAILS OF BARRIER CURB AT END BENTS

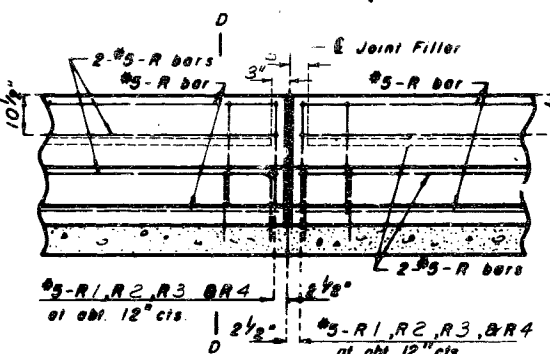
Note: This drawing is not to scale. Follow dimensions.

DETAILED FEB. 1980  
CHECKED MAY 1980

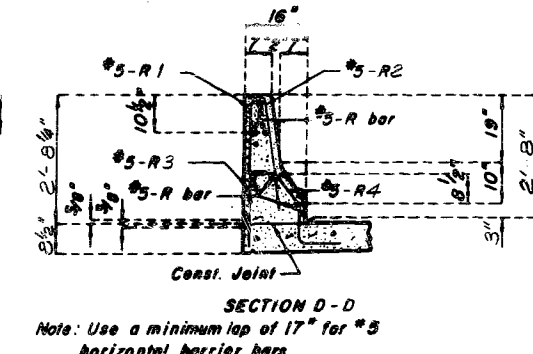
FILLED JOINT DETAIL



DETAILS OF GUARD RAIL ATTACHMENT



PART SECTION NEAR LEFT BARRIER CURB

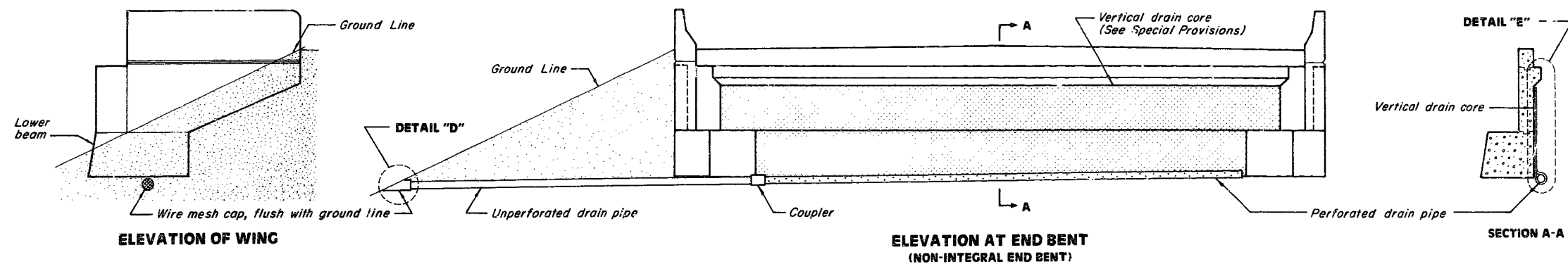


SECTION D-D

Note: Use a minimum lap of 17" for #5 horizontal barrier bars.

JEFFERSON COUNTY

A-3098

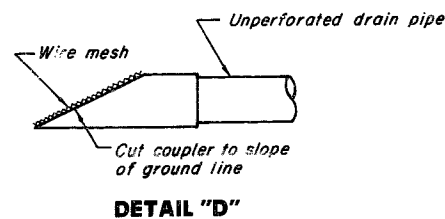
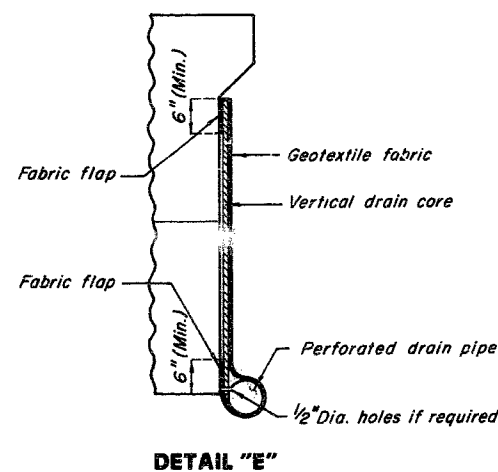
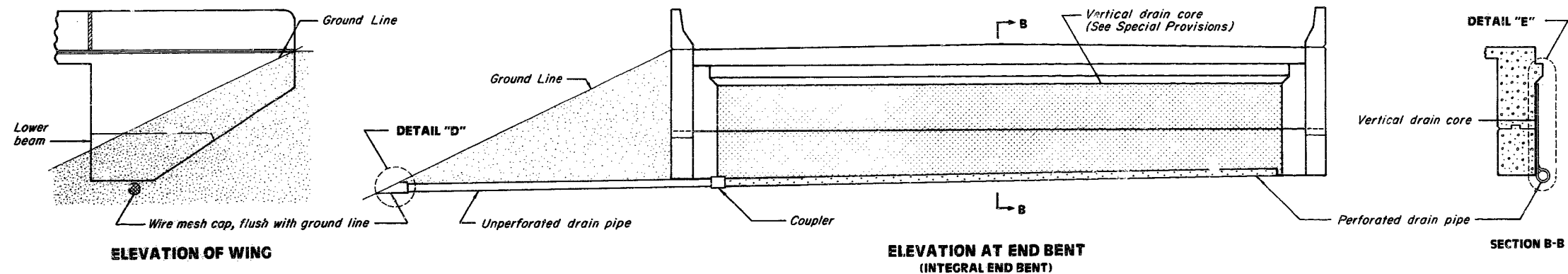


**GENERAL NOTES:**

DRAIN PIPE MAY BE EITHER 6" DIAMETER CORRUGATED METALLIC-COATED STEEL PIPE UNDERDRAIN, 4" DIAMETER CORRUGATED POLY VINYL CHLORIDE (PVC) DRAIN PIPE, OR 4" DIAMETER CORRUGATED POLYETHYLENE (PE) DRAIN PIPE.

PLACE DRAIN PIPE AT FILL FACE OF END BENT AND SLOPE TO LOWEST GRADE OF GROUND LINE, ALSO MISSING THE LOWER BEAM OF END BENT BY 1 1/2". (SEE ELEVATION AT END BENT)

PERFORATED PIPE SHALL BE PLACED AT FILL FACE SIDE AT THE BOTTOM OF END BENT AND PLAIN PIPE SHALL BE USED WHERE THE VERTICAL DRAIN ENDS TO THE EXIT AT GROUND LINE.



**ABUTMENT VERTICAL DRAIN**

326 151

Abut. Vert. Drain

Revised

MARCH 1986

SEPTEMBER 1980

DETAILED FEB. 1987  
CHECKED FEB. 1987

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 14 of 16

JEFFERSON COUNTY

A-3098



COMPLETE BILL OF REINFORCING STEEL

[illegible]

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.

SIZE OF 180° HOOKS (GRADE 40 KSI)	SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 80 KSI)
D = 5d FOR #3 THRU #11	D = 6d FOR #3 THRU #8
D = 10d FOR #12 AND #18	D = 8d FOR #9, #10 AND #11
	D = 10d FOR #14 AND #18

NOTES: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO  
BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. HOOKS.  
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE  
PROCEDURES AS SHOWN ON THIS SHEET.

E - EPOXY COATED REINFORCEMENT.  
S - STIRRUP.

V - BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.

NO. EA. - NUMBER OF BARS OF EACH LENGTH.  
NOMINAL LENGTHS - ARE BASED ON OUT TO OUT  
DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE  
LISTED FOR FABRICATORS USE. (NEAREST INCH)  
ACTUAL LENGTHS - ARE MEASURED ALONG CENTERLINE  
BAR TO THE NEAREST INCH.

\* ALL HOOKS AND BENDS FOR SHAPE NO. 12 - GRADE 40 (ONLY) ARE BASED ON  $D = 5d$ .

Two additional #6-U4 & #7-H12 are included in bar bill for testing.



Sheet No. 15 of 16

JEFFERSON COUNTY

A-3098

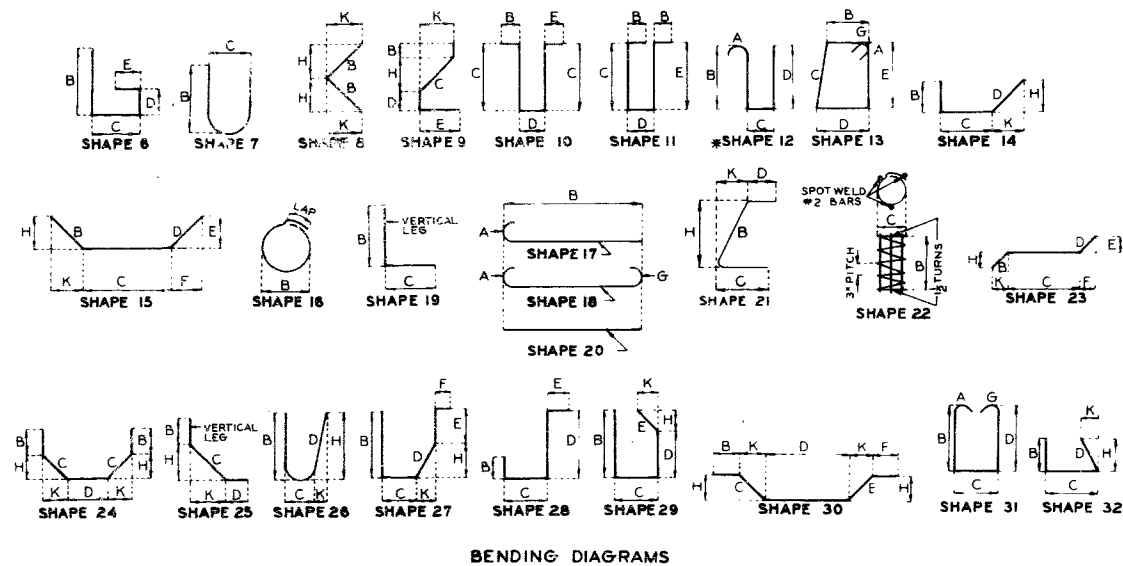
STD. 90.8	REVISED
MAY 1974	NOV. 1979

328/153

STD. 90. B. 5 REVISED  
MAY 1974 NOV. 1977

DETAILED MAY 1980  
CHECKED MAY 1980

Note: This drawing is not to scale. Follow dimensions

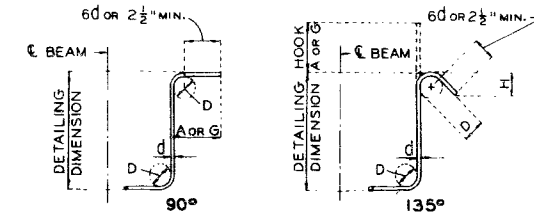


BENDING DIAGRAMS

# COMPLETE BILL OF REINFORCING STEEL

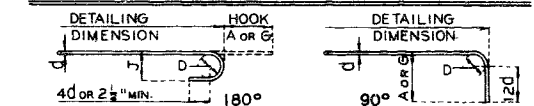
NO. REQD.	MARK NO.	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS												NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT			
									B		C		D		E		F		H					K		
									FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.				FT.	IN.	FT.
12	6H50	WING		20					9	3.500									9	4	9	4				
		INCK = 12.000 IN							4	3.500									4	4	4	4	12			
2	6T41	WING		25					2	0.500	7	7.875	3	2.500				4	6.500	6	2.000	12	11	12	10	3
2	6T42	WING		25					2	0.500	7	8.500	3	4.500				4	7.500	6	2.000	13	2	13	1	3
34	5U41	BEAM		10	S						4	5.875	2	3.250								11	3	11	1	39
10	4U42	BEAM		13	S				2	3.250	2	10.000	2	3.250	2	10.000						11	0	10	9	7
5	4U43	BEAM		10	S						2	10.875	2	3.250								8	1	7	11	2
57	6U44	DIAPH	E	19	S				3	9.000	4	0.500										7	10	7	8	65
34	5U45	DIAPH	E	10	S						3	9.000	2	3.250								9	9	9	7	34
4	4U46	BEAM		13	S				2	3.250	2	9.000	2	3.250	7	9.000						10	10	10	7	2
12	6V41	WING		20			V	2	6	2.500												6	3	6	3	
		INCR = 9.000 IN								2	6.000											2	6	2	6	
4	6V42	WING		20						6	10.000											6	10	6	10	4
12	6V43	WING		20			V	2	6	3.000												6	3	6	3	
		INCR = 9.000 IN								2	5.500											2	6	2	6	7
4	6V44	WING		20						6	10.500											6	11	6	11	4
32	6H100	DIAPH AT INT BT		20					7	4.000												7	4	7	4	35
32	4H101	DIAPH AT INT BT		20					7	7.000												7	7	7	7	16
32	5H102	DIAPH AT INT BT		19					8.500	2	9.500											3	6	3	5	11
24	5H105	DIAPH AT INT BT		20					2	8.000												2	9	2	8	6
36	5H106	DIAPH AT INT BT		20					3	11.000												3	11	3	11	14
32	6U100	DIAPH AT INT BT	E	28	S					2	0.625	3	4.000	14.000								6	7	6	3	30
98	4U101	DIAPH AT INT BT	E	28	S					2	2.625	3	4.000	12.000								6	7	6	5	42
16	5V100	DIAPH AT INT BT		20					3	6.000												3	6	3	6	5
358	5R1	BARRIER CURB	E	19	S				2	6.000	3.500											2	10	2	8	95
358	5R2	BARRIER CURB	E	15	S				2	6.125	3.500					2	6.000	3.000				2	10	2	9	102
342	5R3	BARRIER CURB	E	19	S				17.000	6.000												23	22			65
302	5R4	BARRIER CURB	E	27	S					6.000	11.125	7.000	12.000	9.125	6.375	3	0	2	10			8				89
40	5R5	BARRIER CURB	E	27	S					6.000	11.125	7.000		9.125	6.375	2	0	23								80
16	5R6	BARRIER CURB	E	10	S					23.500	6.000											4	5	4	3	
42	5R7	BARRIER CURB	E	20					10	6.000												10	6	10	6	46
4	5R8	BARRIER CURB	E	20					10	1.500												10	2	10	2	4
4	5R9	BARRIER CURB	E	20					8	9.000												8	9	8	9	3
48	5R10	BARRIER CURB	E	20					9	9.000												9	9	9	9	46
12	5R11	BARRIER CURB	E	20					32	7.000												32	7	32	7	46
12	5R12	BARRIER CURB	E	20					32	9.000												32	9	32	9	46
12	5R13	BARRIER CURB	E	20					37	6.000												37	6	37	6	46
		CAST-IN-PLACE																								
		CONVENTIONAL																								
		FORMS																								
344	551	SLAB	E	20					41	10.000												41	10	41	10	1500
246	552	SLAB	E	20					41	10.000												41	10	41	10	1073
26	553	SLAB	E	20			V	2	39	0.875												39	1	39	1	
		INCR = 35.625 IN								3	6.000											3	6	3	6	51
18	554	SLAB	E	20			V	2	37	10.625												37	11	37	11	
		INCR = 49.875 IN								4	8.250											4	8	4	8	46
136	555	SLAB	E	20					38	10.000												38	10	38	10	550
184	556	SLAB	E	20					38	7.000												38	7	38	7	740
132	557	SLAB	E	20					16	0.000												16	0	16	0	228
		PRECAST PANEL																								
		FORMS																								
287	551	SLAB	E	20					41	10.000												41	10	41	10	1252
136	555	SLAB	E	20					38	10.000												38	10	38	10	550
24	556	SLAB	E	20					38	7.000												38	7	38	7	96
26	558	SLAB	E	20			V	2	38	2.000												38	2	38	2	
		INCR = 38.750 IN								2	8.000											2	8	2	8	51
298	459	SLAB	E	20					3	2.000												3	2	3	2	63
66	5510	SLAB	E	20					20	6.000												20	6	20	6	141
66	5511	SLAB	E	20					30	0.000												30	0	30	0	208

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO		18	38	



STIRRUP HOOK DIMENSIONS				
GRADES 40-50-60 KSI				
BAR SIZE	D (IN.)	90° HOOK A OR G	135° HOOK A OR G	APPROX. H
#3	1-1/2"	4"	4"	2-1/2"
#4	2"	4-1/2"	4-1/2"	3"
#5	2-1/2"	6"	5-1/2"	3-3/4"
#6	4-1/2"	8"	7"	4-1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



SIZE OF 180° HOOKS (GRADE 40 KSI) SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 60 KSI)  
D = 5d FOR #3 THRU #11  
D = 10d FOR #14 AND #18  
D = 6d FOR #3 THRU #8  
D = 8d FOR #9, #10 AND #11  
D = 10d FOR #14 AND #18

END HOOK DIMENSIONS				
180° HOOKS				
BAR SIZE	GRADE 40 A OR G	GRADE 40 J	GRADE 60 A OR G	GRADE 60 J
#3	5"	2-3/4"	5"	3"
#4	6"	3-1/2"	6"	4"
#5	7"	4-1/2"	7"	5"
#6	8"	5-1/4"	8"	6"
#7	9"	6-1/4"	10"	7"
#8	10"	7"	11"	8"
#9	12"	8"	15"	11-1/4"
#10	13"	9"	17"	12-3/4"
#11	14"	10"	19"	14-1/4"
#14	21-2"	20-1/2"	21-2"	20-1/2"
#18	21-11"	21-3"	21-11"	21-3"

NOTES: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. HOOKS.  
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.  
E - EPOXY COATED REINFORCEMENT.  
S - STIRRUP.  
X - BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.  
V - BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.

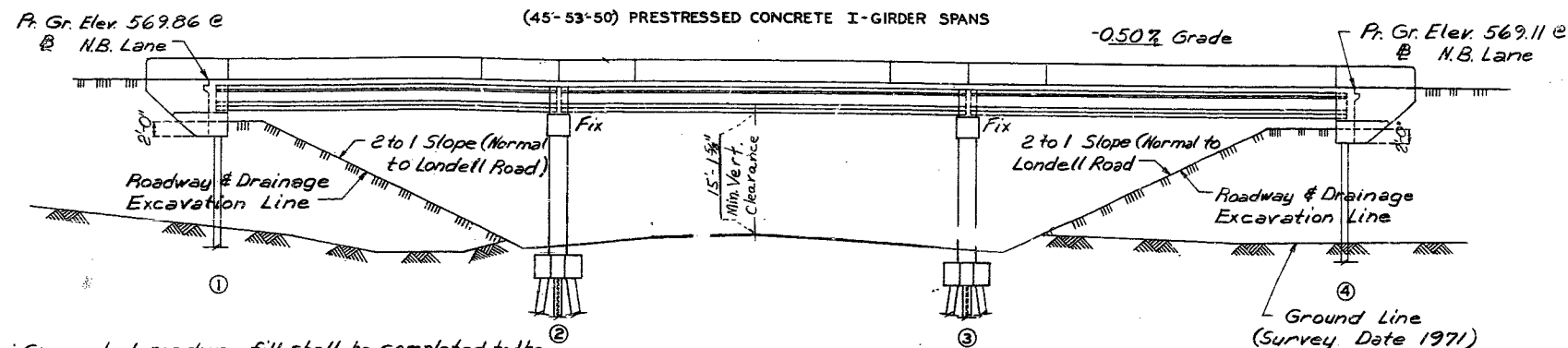
NO. EA. - NUMBER OF BARS OF EACH LENGTH.  
NOMINAL LENGTHS - ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)  
ACTUAL LENGTHS - ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

\* ALL HOOKS AND BENDS FOR SHAPE NO. 12 - GRADE 40 (ONLY) ARE BASED ON D = 5d.

Two additional 5R7 & 4U101 bars are included in bar bill for testing.

## MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

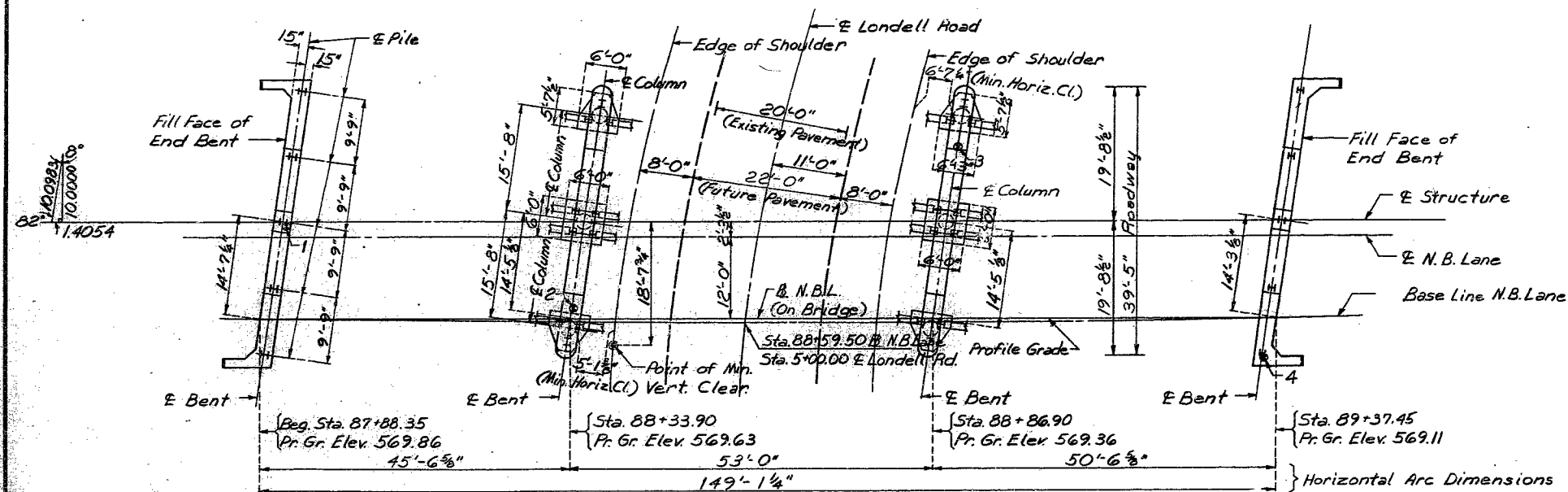
STATE	PROJ. NO.	SHEET NO.
MO.	F-21-2(23)	21
SEC./SUR.	22 TWP.43N RGE. 5E	



Note: Compacted roadway fill shall be completed to the final roadway section and up to the elevation of the concrete beam within the limits of the structure and for not less than 25'-0" in back of the fill face of the end bents before piles are driven for any bents falling within the embankment section.

GENERAL ELEVATION

Note: For Bottom of footing elevations at Bents No. 2 & 3 see sheets No. 4 & 5



## CURVE DATA (N.B. LANE)

P.I. Sta. 86+23.16  
 $\Delta = 6^{\circ}00'11''$   
 $D = 0^{\circ}30'$   
 $R = 11,459.16'$   
 $T = 600.55'$   
 $L = 1200.00'$   
 $S.E. = \text{None}$   
 $W = \text{None}$

Accepted:  
 Prepared By: Gene Winch, Ed Werner  
 Resident Engineer: Charles G. Beyer 1/10/89  
 Dist. Office:  
 Main Office:

## QUANTITIES FOR ALTERNATE SLABS

TYPE OF SLAB	REINF. (LBS.)		CONC. (CU. YD.)
	EPOXY	PLAIN	
Precast Panel Forms	27,210	6,170	185.4*

Note: The table of Estimated Quantities for Alternate Slabs represents the quantities used by the state in preparing the cost estimate for concrete slabs. Variations may be encountered in the estimated quantities but these variations cannot be used for an adjustment in the Contract Unit Price per square yard of Alternate Slab used.

Precast Panel quantities based on skewed end panels.  
 \*Based on minimum top flange thickness and minimum joint filler thickness.

DESIGNED SEPT. 1980  
 DETAILED MAR. 1980  
 CHECKED MAY 1983

Note: This drawing is not to scale. Follow dimensions.

## PILE DATA

BENT NO.	1		2			3			4	
	Lt.	Gr.	Lt.	Gr.	Rt.	Lt.	Gr.	Rt.	Lt.	Gr.
Pile Type and Size	HP 10 x 42									
Number	5		3	4	3	4	3		5	
Approximate Length Ft.										
Design Bearing Tons	45		55			55			47	
Hammer Energy reqd. Ft. Lbs.	10,000		13,000			13,000			10,600	

Minimum energy requirement of hammer based on plan length and design bearing value of piles.  
 All pile shall be driven to practical refusal.  
 Manufactured pile point reinforcement shall be used on all piles in this structure. See Special Provisions.

## GENERAL NOTES:

Design Specifications: A.A.S.H.T.O. - 1983 and Interims thru 1985  
 Load Factor Design

## Design Loading:

H520-44, 15"/sq. ft. Future Wearing Surface  
 Earth 120\*/cu. ft. Equivalent Fluid Pressure 30\*/cu. ft.  
 Superstructure: Simply supported non-composite for Dead Load.  
 Continuous composite for Live Load.

## Design Unit Stresses:

Class B Concrete (Substructure)  $f'_c = 3,000$  psi.  
 Class B1 Concrete (Safety Barrier Curb)  $f'_c = 4,000$  psi.  
 Class B2 Concrete (Superstructure except Prestressed Girders and Safety Barrier Curb)  $f'_c = 4,000$  psi.  
 Reinforcing Steel (Grade 60)  $f_y = 60,000$  psi.  
 Steel Pile  $F_b = 96,000$  psi.  
 For Prestressed Girder Stresses, see Girder Sheets.

## Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1 1/2" unless otherwise shown.

## Joint Filler:

All joint filler shall meet the requirements of Std. Spec. 1057.2.4, except as noted.

## Bearings:

Bearing shall be 60 durometer Neoprene Pads.

## Construction Clearance:

A minimum vertical clearance of 14'-0" from existing lanes and a minimum lateral clearance 28'-0" centered on existing lanes shall be maintained during construction.

## QUANTITIES

ITEM	SUBSTR.	SUPERSTR.	TOTAL
Class 1 Excavation	Cu. Yd.	101.5	101.5
Structural Steel Pile (10")	Lin. Ft.	991	991
Class B Concrete	Cu. Yd.	88.5	88.5
( ) Slab on Concrete I-Girders, see Spec. Prov. Sq. Yd.		697	697
Safety Barrier Curb	Lin. Ft.	0	0
Plain Neoprene Bearing Pads	Each	30	30
Prestressed Concrete Members, I-6dr. (45') Each		5	5
Prestressed Concrete Members, I-6dr. (50') Each		5	5
Prestressed Concrete Members, I-6dr. (53') Each		5	5
Reinforcing Steel	Lb.	9,120	9,120
Pile Point Reinforcement	Each	30	30
Abutment Vertical Drain	Lump Sum	1	1
Slip Form Safety Barrier Curb (Cont.) L.N. Ft.		330	330

Note: Cost of furnishing, fabricating and installing Neoprene Bearing Pads complete in place, will be paid for at the contract unit price for Plain Neoprene Bearing Pads per each.

All concrete between the upper and lower construction joints in end bents is included in the estimated superstructure quantities for Slab on Concrete I-Girders, see Special Provisions.

All reinforcement in the end bents is included with superstructure quantities.

B.M. "D Chisel Square" Northwest corner of Bridge on top of Barrier Wall. Elev. 585.20

## BRIDGE OVER LONDELL ROAD

STATE ROAD RTE. 21 N.B.L. FROM OTTO TO RTE. 141

ABOUT 1 MILE SOUTH OF RTE. 141

PROJECT NO. F-21-2(23)

STA. 87+88.35 N.B.L.

JOB NO. 6-U-21-256B

RTE. 21

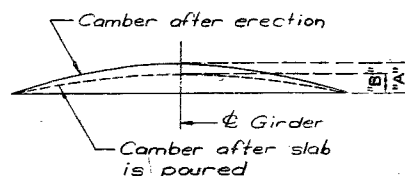
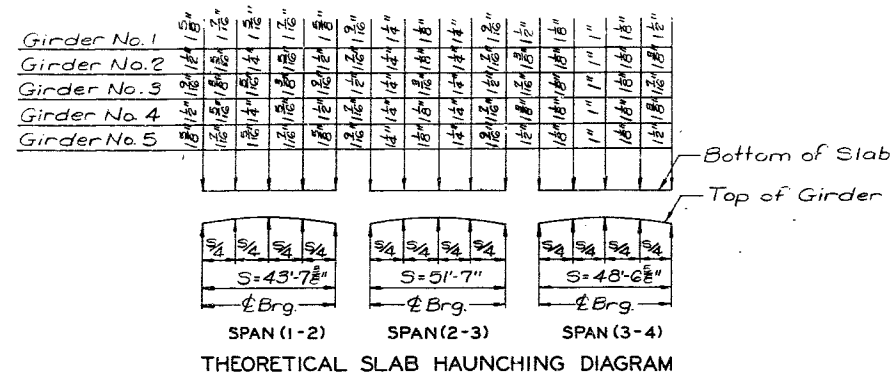
JEFFERSON

COUNTY

DATE 3/12/87

STD.
STD. 706.35
A-3098

Sheet No. 1A of 16



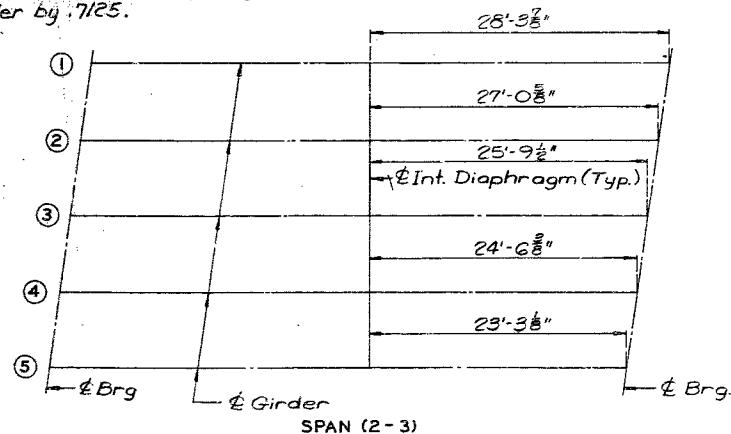
GIRDER CAMBER DIAGRAM

Note: If girder camber is different from that shown in the Camber Diagram, it shall be necessary to adjust the slab haunches, increase the slab thickness or to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

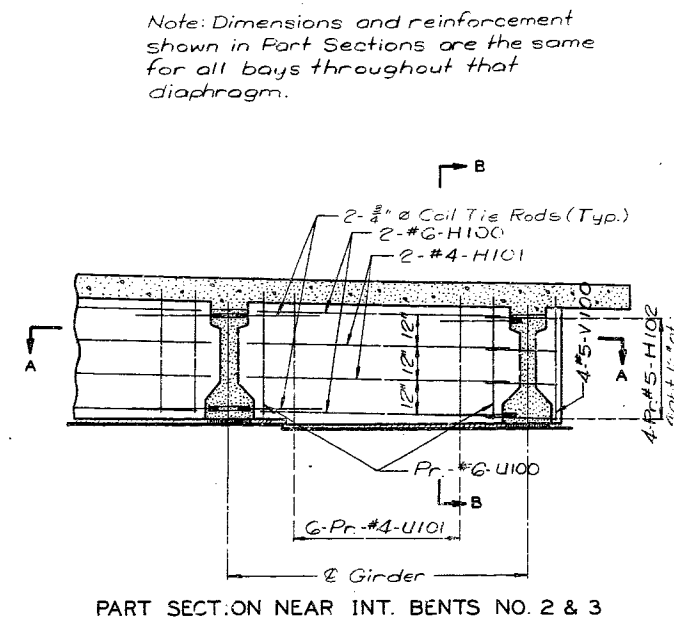
Concrete in the slab haunches is included in the Estimated Quantities for Alternate Slabs as Class B2 Concrete.

The slab is to be built parallel to grade and to the minimum thickness indicated.

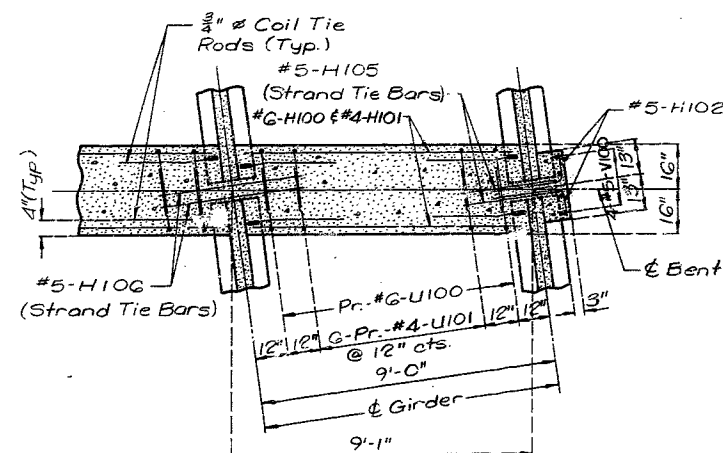
To determine camber at quarter point multiply camber at  $\frac{1}{2}$  girder by .7125.



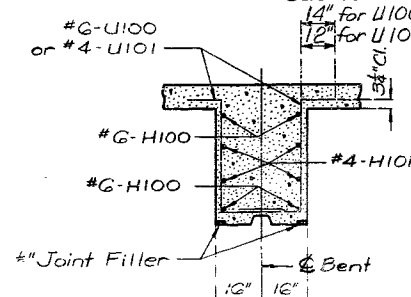
PLAN OF GIRDERS SHOWING LOCATION OF INTERMEDIATE DIAPHRAGMS



PART SECTION ON NEAR INT. BENTS NO. 2 & 3

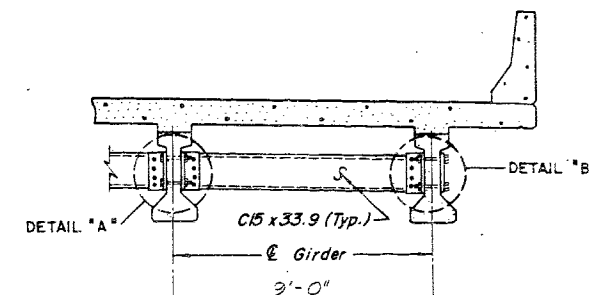


SECTION A-A

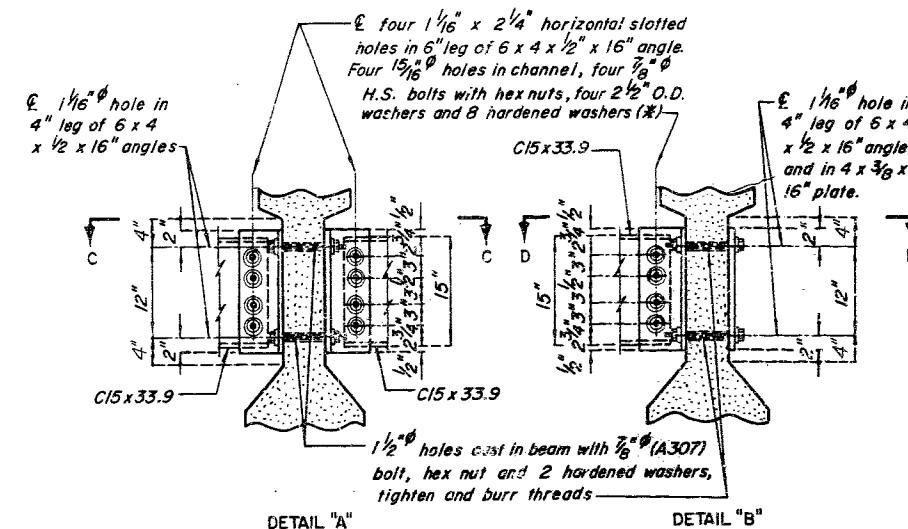


SECTION B-B

Note: For number and location of #5-H105 and #5-H106 (Strand Tie Bars) at intermediate bents, see girder sheets.  
Diaphragms at Intermediate Bents are vertical.

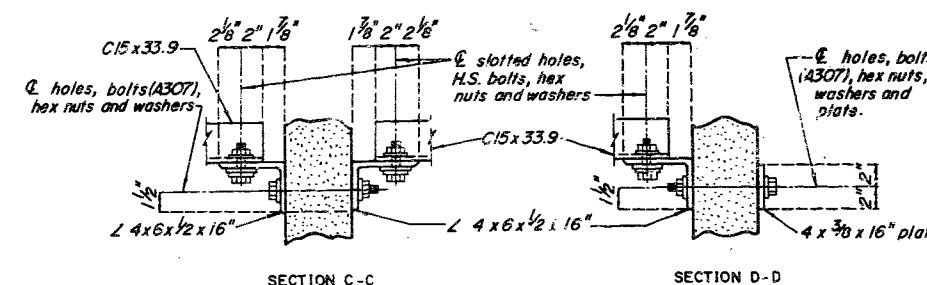


PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS



DETAIL "A"

DETAIL "B"



SECTION C-C

SECTION D-D

STEEL DIAPHRAGM NOTES:

- IN LIEU OF 2 1/2" O.D. WASHERS, CONTRACTOR MAY SUBSTITUTE A 3/16" MIN. THICKNESS PLATE WITH FOUR 15/16" HOLES AND 1 HARDENED WASHER PER BOLT.
- ALL H.S. BOLTS MAY BE TENSIONED BY TURN-OF-NUT METHOD.
- ALL DIAPHRAGM MATERIALS INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
- FABRICATED STRUCTURAL STEEL SHALL BE A36 EXCEPT AS NOTED.
- PAYMENT FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN CONTRACT UNIT PRICE FOR PRESTRESSED CONCRETE GIRDERS.
- Shop drawings will not be required for Steel Intermediate Diaphragms and Angle Connections.

P/S - INT. DIA. (STR.)  
AUGUST 1983  
Revised  
APRIL 1985

DETAILED MAY 1985  
CHECKED MAY 1985

Note: This drawing is not to scale. Follow dimensions.

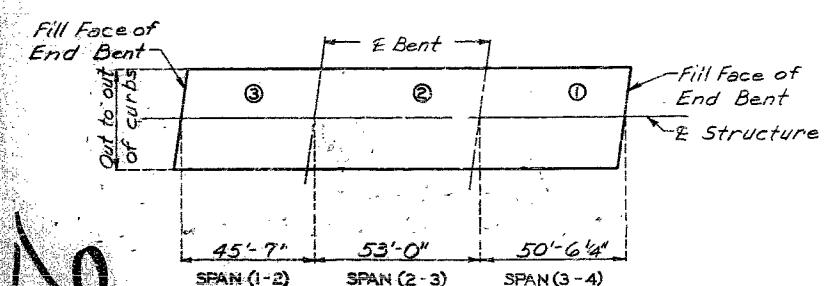
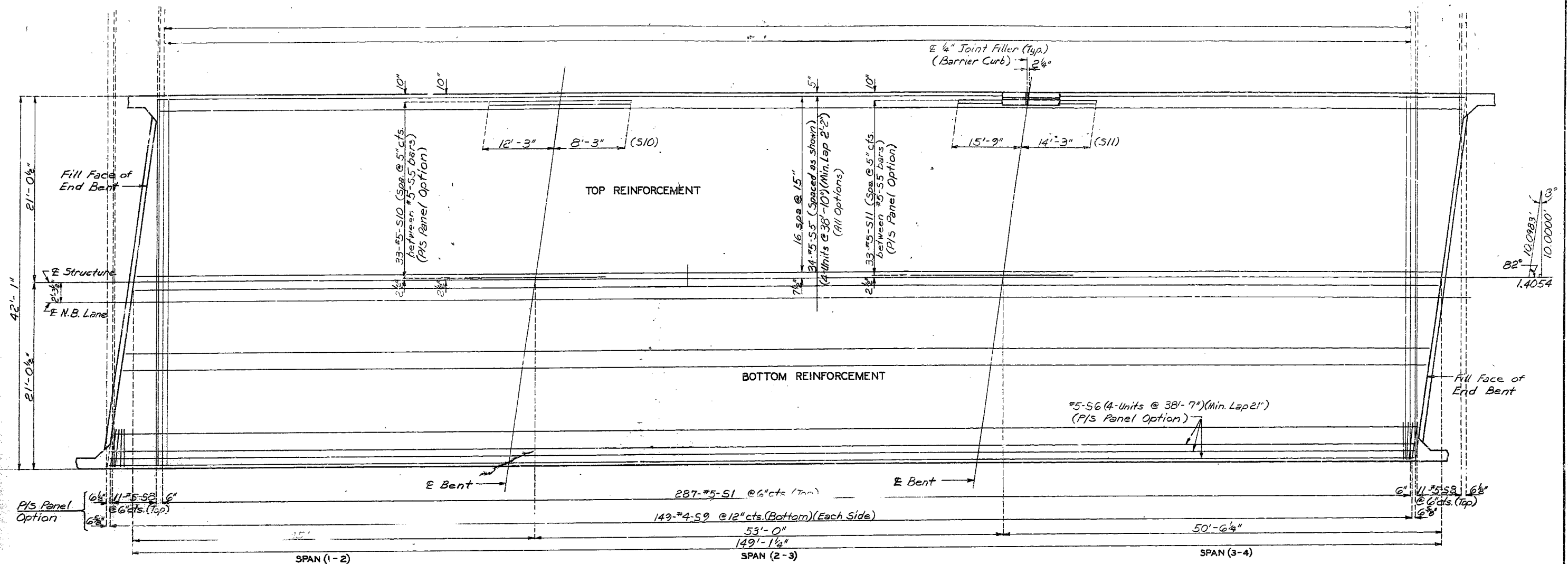
Sheet No. 10 of 16

JEFFERSON

COUNTY

A-3098

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	F-21-2(2b)	19	23	



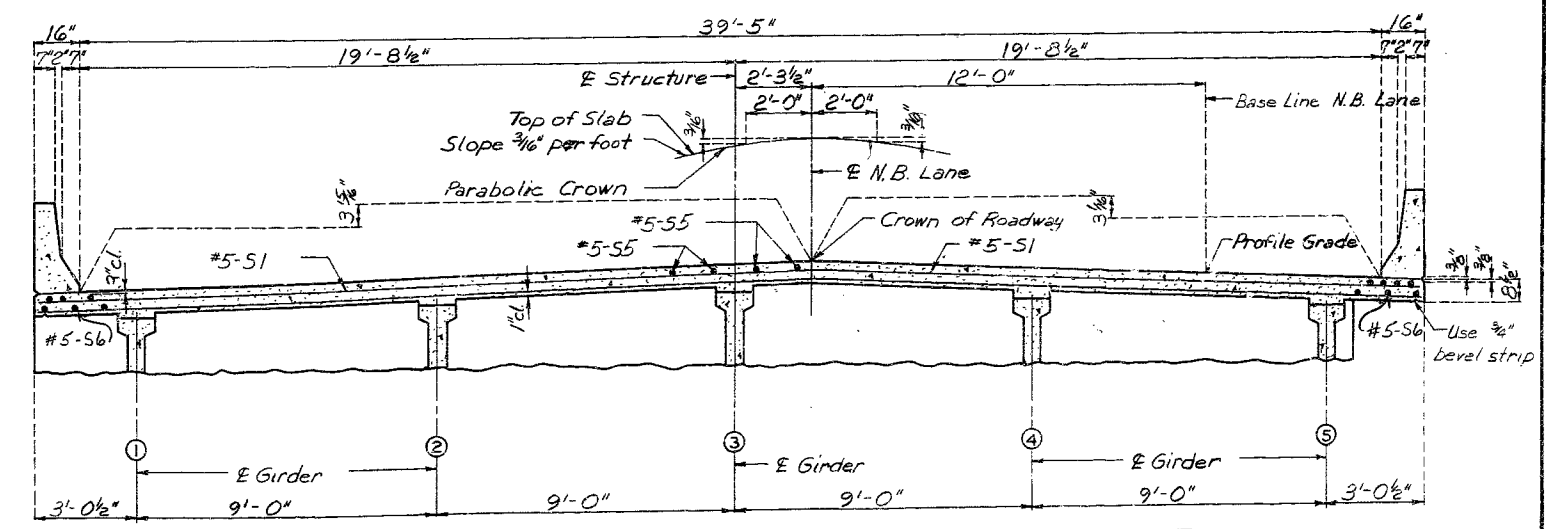
Sequence of Pour	Direction	Min. Rate of Pour Cu. Yds./Hour
End to End		25

Note: The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours and shall pour and satisfactorily finish the slab pours at the rate given. Alternate pours to the basic sequence are subject to the approval of the engineer in accordance with section 702.3.12.4 of Missouri Standard Specifications. The diaphragm at the intermediate bents and integral end bents shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

SLAB POURING SEQUENCE

DETAILED JAN 1980  
CHECKED MAY 1980

Note: This drawing is not to scale. Follow dimensions.



Note: For details and reinforcement of safety barrier curb not shown see Sheet No. 13.

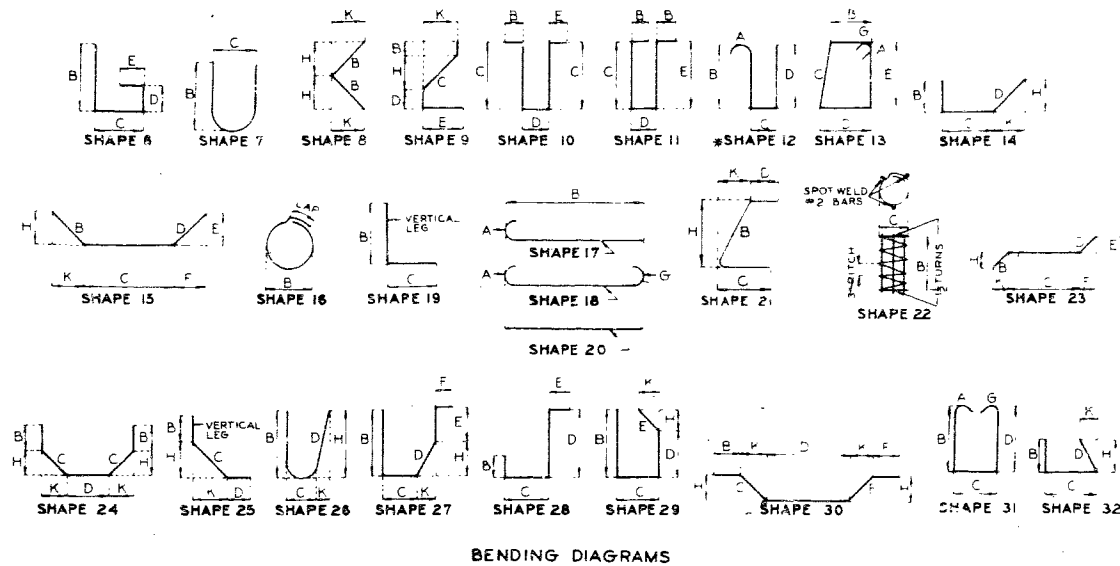
Sheet No. 11 of 16.

HALF SECTION NEAR INT BENT

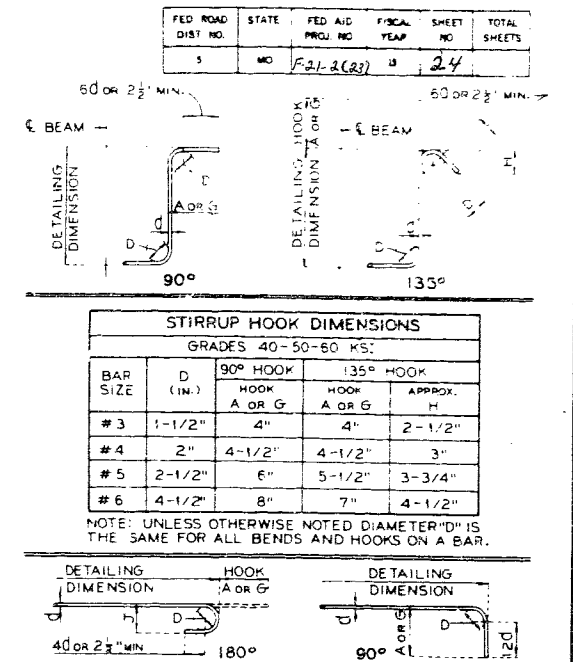
JEFFERSON COUNTY

A3098





COMPLETE BILL OF REINFORCING STEEL

[illegible]

SIZE OF 180° HOOKS (GRADE 60 KSI)	SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 60 KSI)
D = 5d FOR #3 THRU #11	D = 6d FOR #3 THRU #8
D = 10d FOR #14 AND #18	D = 8d FOR #9, #10 AND #11
	D = 10d FOR #14 AND #18

END HOOK DIMENSIONS						
BAR SIZE	180° HOOKS				90° HOOKS	
	GRADE 40		GRADE 60		ALL GRADES	
	A OR G	J	A OR G	J	A	OR S
# 3	5"	2-3/4"	5"	3"	6"	
# 4	6"	3-1/2"	6"	4"	8"	
# 5	7"	4-1/2"	7"	5"	10"	
# 6	8"	5-1/4"	8"	6"	12"	
# 7	9"	6-1/4"	10"	7"	14"	
# 8	10"	7"	11"	8"	16"	
# 9	12"	8"	15"	11-1/4"	19"	
# 10	13"	9"	17"	12-3/4"	22"	
# 11	14"	10"	19"	14-1/4"	21-0"	
# 14	21-"	20-1/2"	21-2"	20-1/2"	21-7"	
# 18	21-11"	21-3"	21-11"	21-3"	31-5"	

NOTES: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE  
PROCEDURES AS SHOWN ON THIS SHEET.

E - EPOXY COATED REINFORCEMENT.

S - STIRUP.

X-BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.

Y - BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN

V - BAR DIMENSIONS VARY IN EQUAL INCREMENTS  
DIMENSIONS SHOWN ON THIS LINE AND THE  
LINE

LINE.

NO. EA. - NUMBER OF BARS OF EACH LENGTH.

NOMINAL LENGTHS - ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS-ARE MEASURED ALONG CENTERLINE  
BAR TO THE NEAREST INCH.

BAR TO THE NEAREST INCH.

\* ALL HOOKS AND BENDS FOR SHAPE NO. 12 - GRADE 40 (ONLY) ARE BASED ON  $D = 5d$ .

Two additional #5-R74-4-U10 bars are included in bar bill for testing.