

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		79	72	
SEC. 1 SUR. 543E TWP. 42N R43E R15E					

GENERAL NOTES:

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

Design Loadings:

H520-44 15' sq. ft. Future Wearing Surface.
Earth 120' cu. ft. Equivalent Fluid Pressure 30' cu. ft.
Fatigue Stress - Case II

Design Unit Stresses:

Class B Concrete (Substructure) $f'_c = 2,000$ psi.
Class B1 Concrete (Safety Barrier Curb) $f'_c = 4,000$ psi.
Class B2 Concrete (Superstructure except Safety Barrier Curb) $f'_c = 4,000$ psi.

Reinforcing Steel: (Grade 60) $f_y = 60,000$ psi.

Structural Carbon Steel $f_y = 36,000$ psi.

Steel Pile $f_b = 9,000$ psi.

Fabricated Steel:

Field connections, High Strength Bolts $\frac{3}{4}$ " holes $\frac{1}{4}$ " except as noted.
Turn of Nut Method of tensioning high strength bolts will be permitted.

Reinforcing Steel:

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

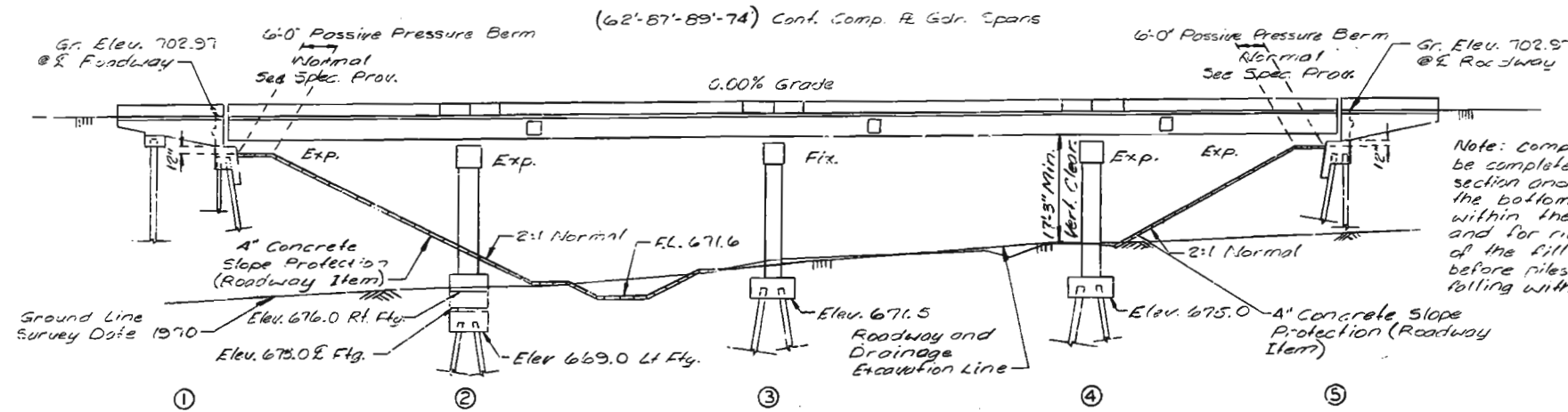
All reinforcing bars in tops of substructure beams or caps shall be spaced to clear anchor bolts for bearings by at least $\frac{1}{2}$ ".

Paint:

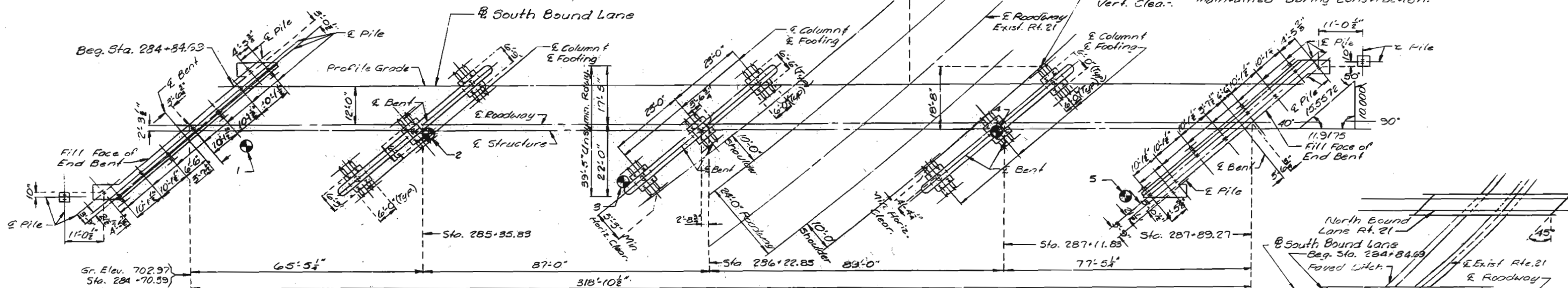
System B by contractor in accordance with Std. Spec. 712.12 (Color of the final field coat for System B shall be green).

Clearance:

A minimum vertical clearance of 14'-6" from crown of existing lanes and a minimum lateral clearance of 28'-0" centered on existing lanes shall be maintained during construction.



Note: Compacted roadway fill shall be completed to the final roadway section and up to the elevation of the bottom 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.



Note: * Indicates location of borings. For boring data see sheet No. 2.

ESTIMATED QUANTITIES

ITEM	SUBSTR.	SUPERSTR.	TOTAL
Class I Excavation	Cu. Yd. 180		180
Slab Drains	Each 42		42
Structural Steel Pile (10 In.)	Lin. Ft. 1366		1366
Class B Concrete	Cu. Yd. 230.3		230.3
() Slab on Steel, see Special Provisions	Sq. Yd. 1,475		1,475
Safety Barrier Curb	Lin. Ft. 691		691
Laminated Neoprene Brg. Pads (Steel Structures)	Each 25		25
Elastomeric Expansion Joint Seal (3.0 In.)	Lin. Ft. 123		123
Reinforcing Steel	Lb. 35,650		35,650
Reinforcing Steel (Epoxy Coated)	Lb. 3,630		3,630
Fabricated Structural Carbon Steel	Lb. 278,250		278,250
Painting System B Green	Tons 138.1		138.1
Vertical Drain at End Bents	Each 2		2
Pile Point Reinforcement	Each 56		56

Note: All concrete and reinforcement in safety barrier curbs are included with superstructure quantities. Concrete above upper construction joint in backwall at end bents No. 1 & 5 is included with Class B (Substructure) quantities.

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

PILE DATA

BENT NO.	WING	BEAM	1	2	3	4	5
Pile Type and Size	HP10x42	HP10x42	HP10x42	HP10x42	HP10x42	HP10x42	HP10x42
Number	1	9	12	12	12	1	9
Approximate Length Ft.	45	41	16	16	38	34	
Design Bearing Tons	5	49	49	52	52	5	49
Hammer Energy req'd. Ft.-Lb.	7000	12100	11600	12200	12200	7000	12100

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

Note: See sheet No. 2 for Estimated Quantities for Alternate Slabs.

① Lt. 15' & 19' Rt. 22'

LOCATION SKETCH

B.M. *50 A Elev. 701.28. Spike in trunk of 20' White Oak 3' Rt. of Sta. 280+82 & of N.B.L.

BRIDGE S.B. LANE OVER EXISTING ROUTE 21

STATE ROAD FROM ROUTE 141 TO OTTO

ABOUT 3 MILES NORTH OF OTTO

PROJECT NO. F-11-1(25)

STA. 284+84.69

JOB NO. 6-P-21-17

RTE. 21 S.B.L.

JEFFERSON

COUNTY

DATE 7/15/87

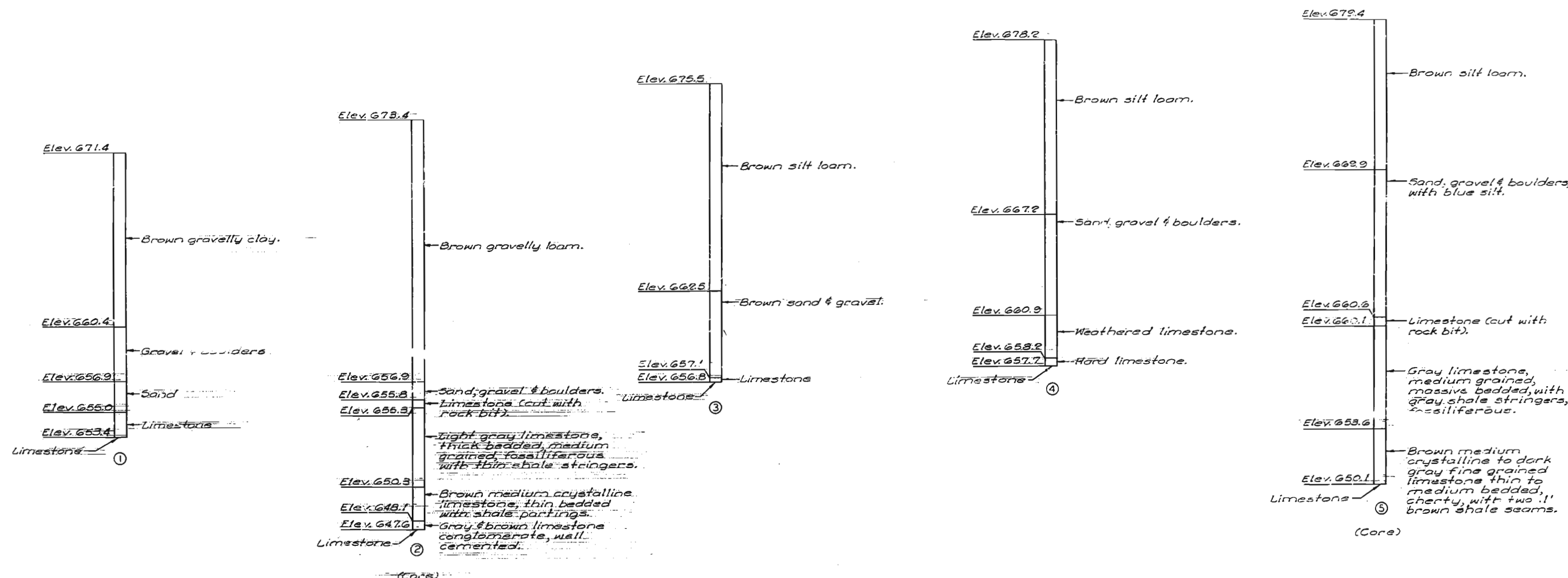
STD. 611.60

STD. 706.35

A-2941

DESIGNED 1/10/79
DETAILED Dec. 1979
CHECKED J. J. 12/80

Sheet No. 1 of 18



BORING DATA

Note: For location of borings see sheet No. 1.

ESTIMATED QUANTITIES FOR ALTERNATE SLABS			
TYPE OF SLABS	SLAB ON STEEL		
	REINF. (LBS.)		CONC. CU. YD.
	EPOXY	PLAIN	
Cast-In-Place Conventional Forms	94,650	---	360.6
Precast Panel Forms	61,480	---	256.4
Stay-in-Place Forms	94,650 **	---	336.9 *

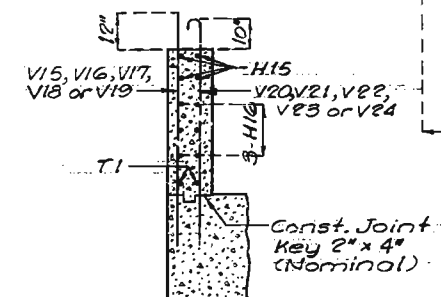
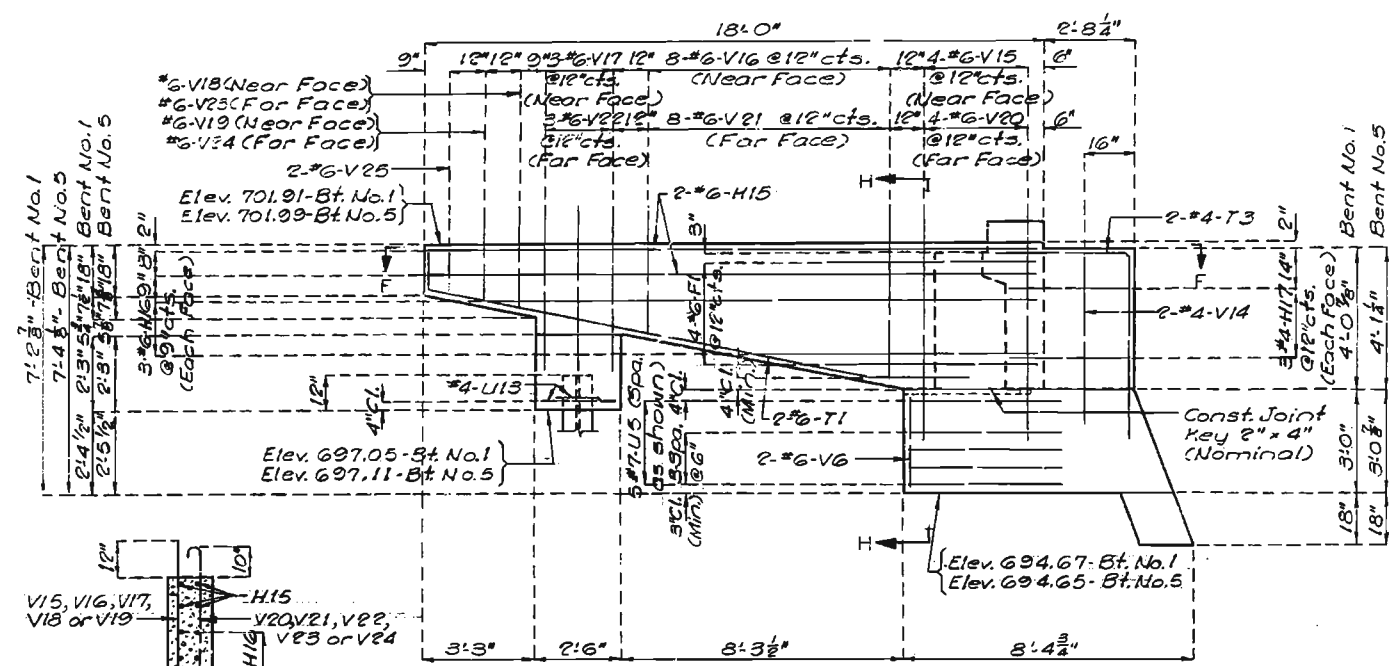
Note: The table of Estimated Quantities for Alternate Slabs represents the quantities used by the state in preparing the cost estimate for concrete slabs. Variations may be encountered in these estimated quantities but these variations cannot be used for an adjustment in the Contract Unit Price per square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

See Special Provisions for alternate methods of forming slabs.

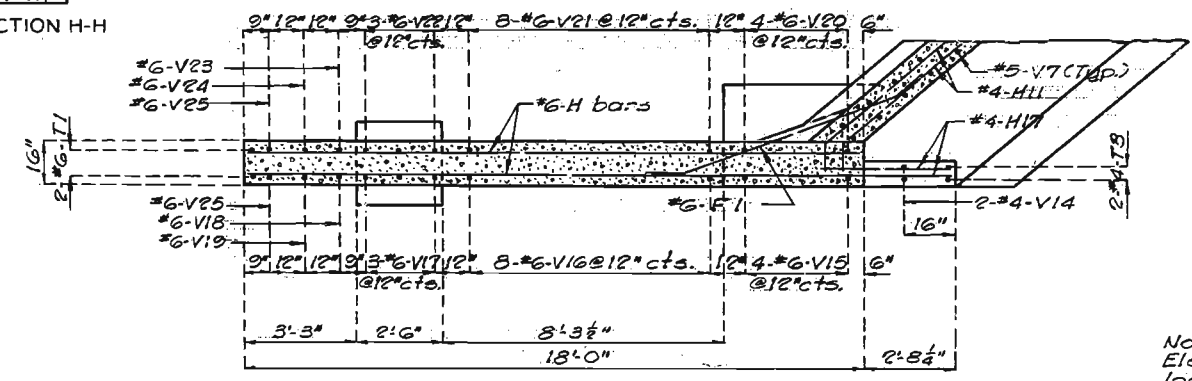
* Does not include concrete required to fill corrugation of S.I.P. forms.

** Does not include reinforcing bars used as bar supports. Precast panel quantities based on skewed end panels.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		18	83	

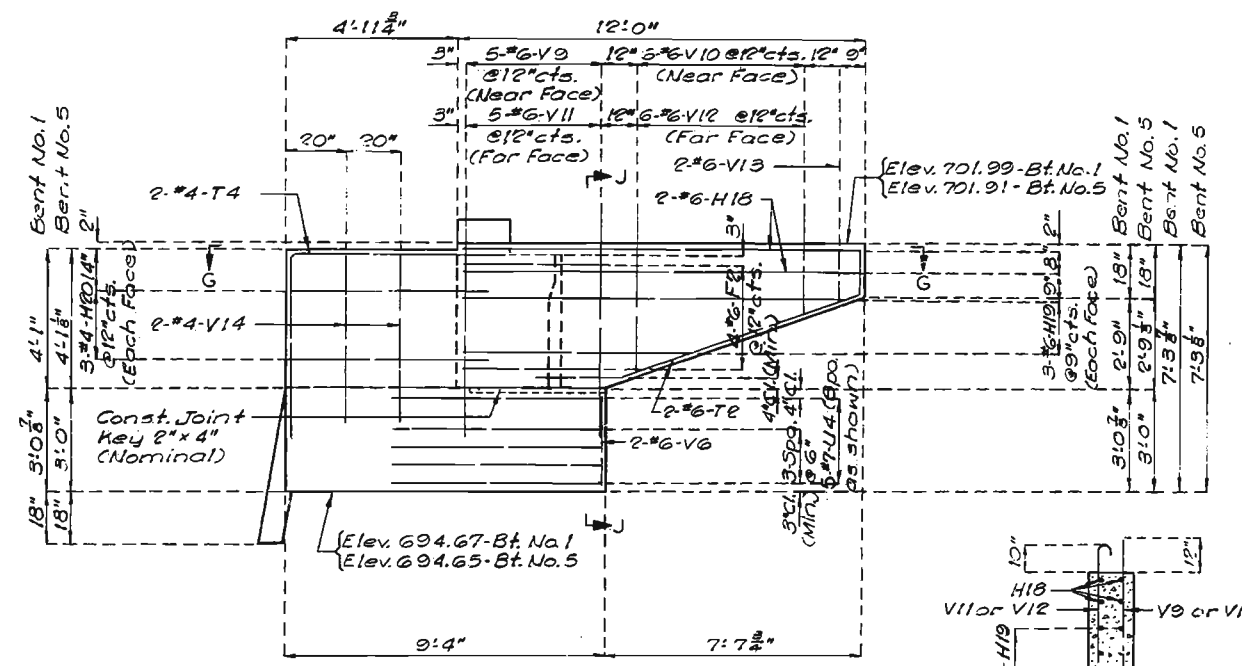


SECTION H-H

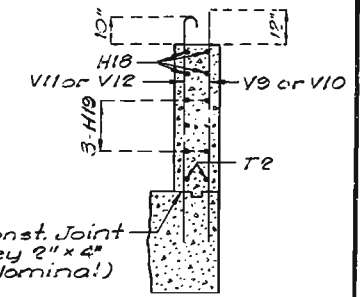


SECTION F-F

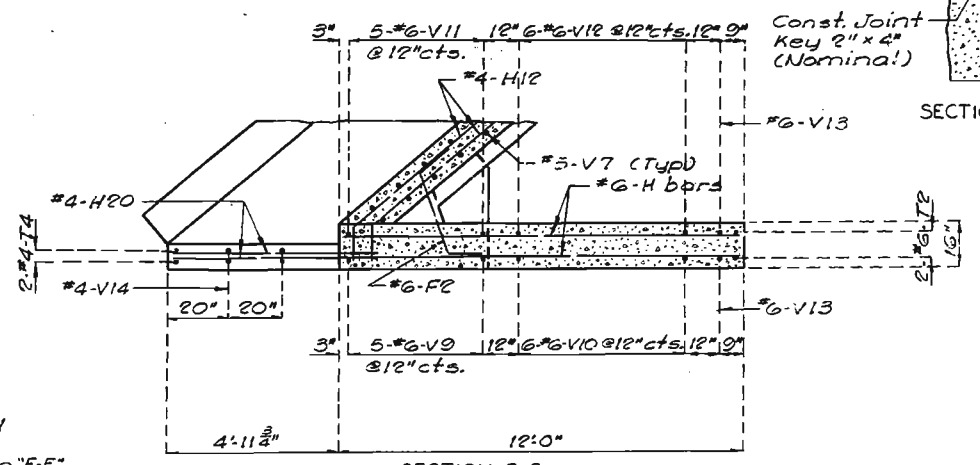
Note: For location of Elevation "B-B" and Elevation "C-C" see sheet No. 3. For location of Elevation "D-D" and Elevation "E-E" see sheet No. 4.



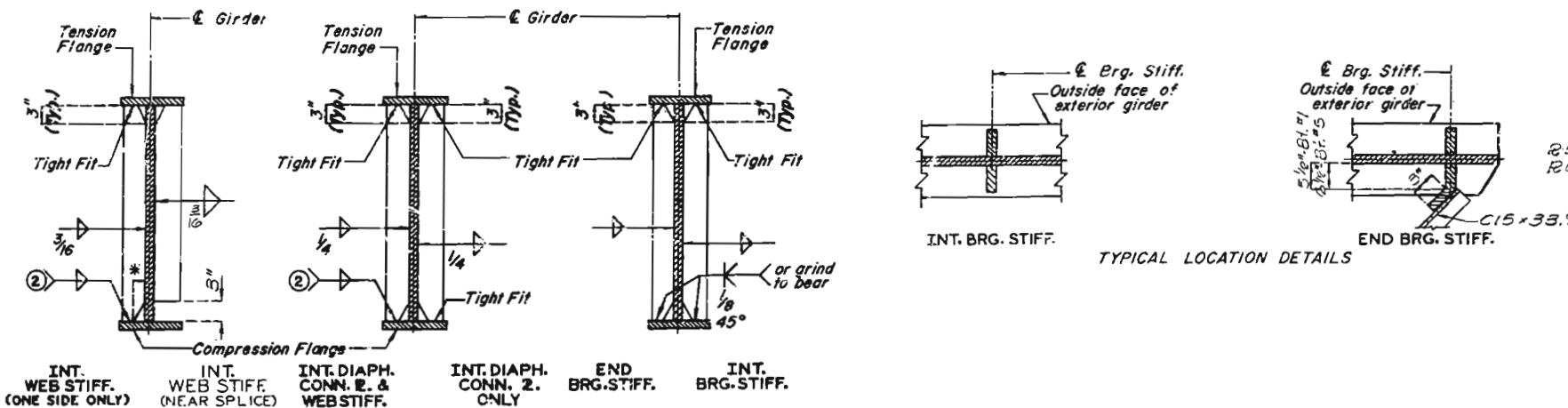
ELEVATION C-C (BENT NO. 1)
ELEVATION E-E (BENT NO. 5)



SECTION J-J

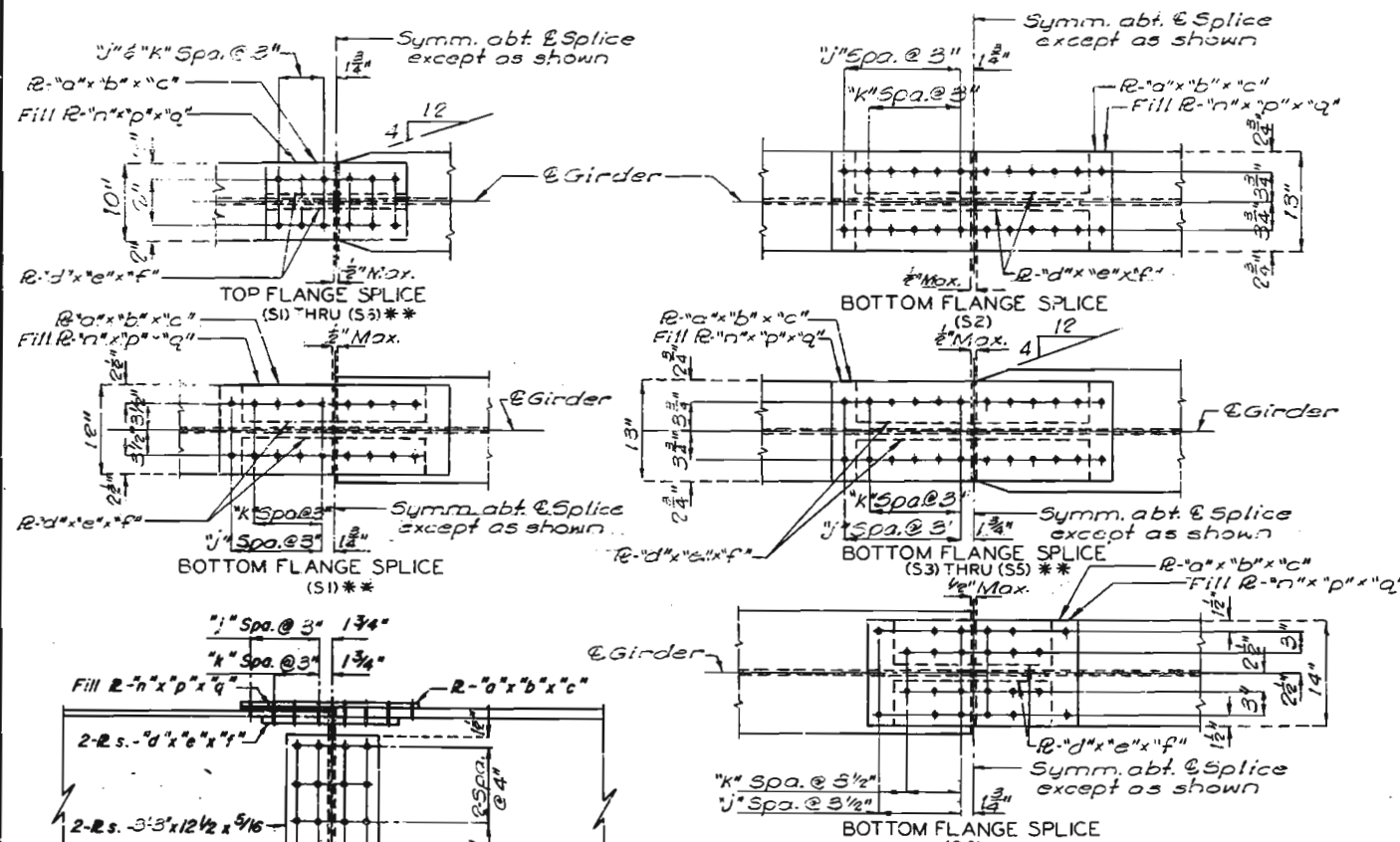


SECTION G-G



② Weld to compression flange as located on ELEVATION OF GIRDER.
* 1/2" typical for all Int. Web Stiff., Int. Diaph. Conn. R. and Brg. Stiff..

WELDING DETAILS

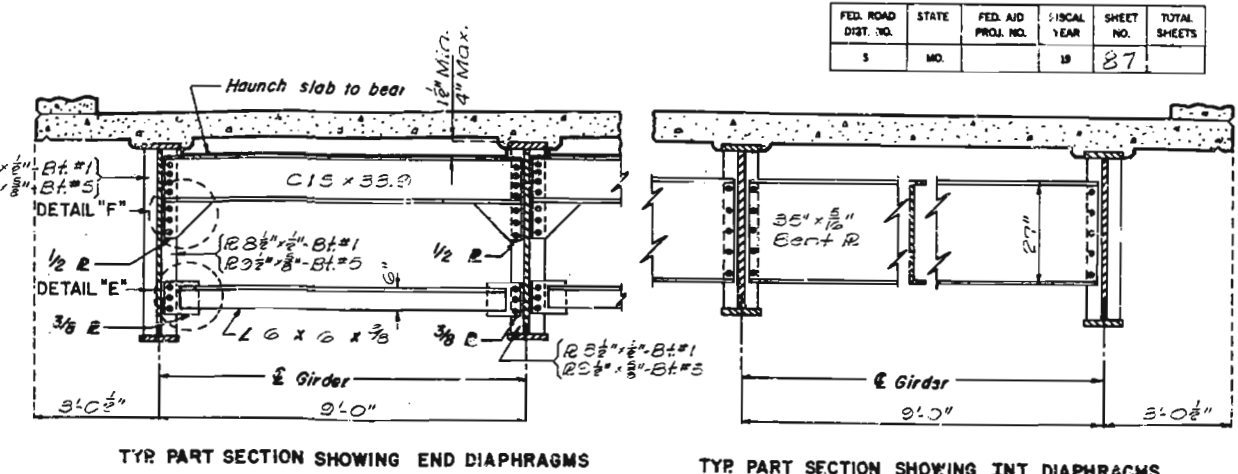


* Payweight for "Fabricated Structural Carbon Steel" will be based on shop welded splices regardless of types used at splices (S1), (S3) and (S5).

SPICE LOCATION	TABLE OF DIMENSIONS - FIELD SPLICE									
	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	"i"	"j"
Top Flanges (S1) thru (S6)	10"	3/16"	18 1/2"	4"	1/2"	18 1/2"	2"	2"	10"	1 1/2"
Bottom Flanges (S1)	12"	1/2"	24 1/2"	5"	1/2"	24 1/2"	4"	3"	12"	3/4"
(S2) thru (S5)	13"	5/16"	24 1/2"	5 1/2"	1/2"	24 1/2"	5"	4"	13"	1/8"
(S6)	14"	3/4"	25 1/2"	6"	1/2"	25 1/2"	5"	2"	14"	1 1/2"

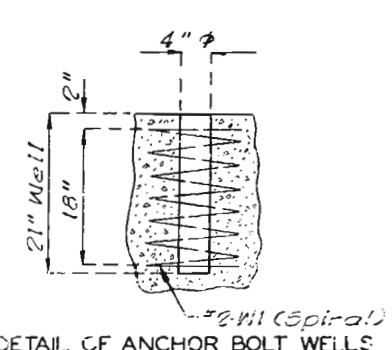
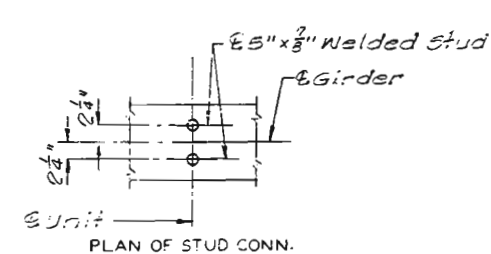
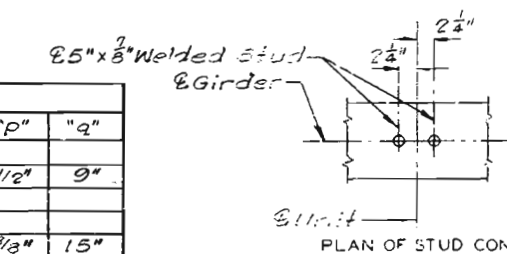
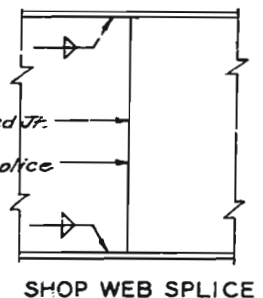
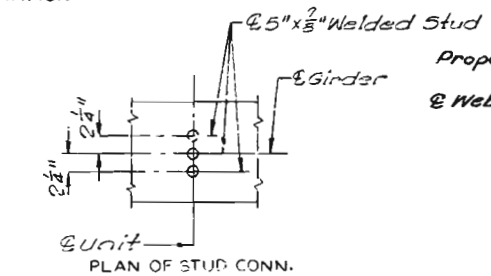
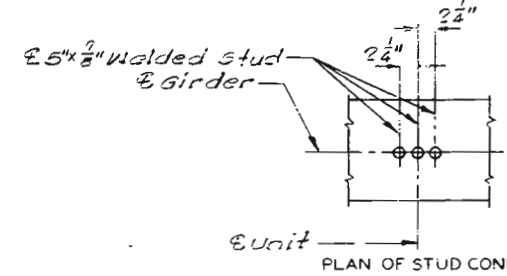
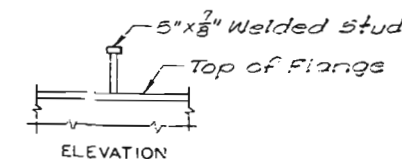
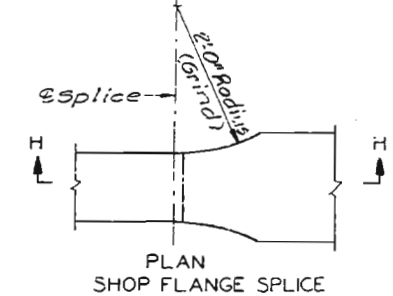
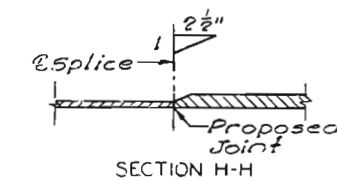
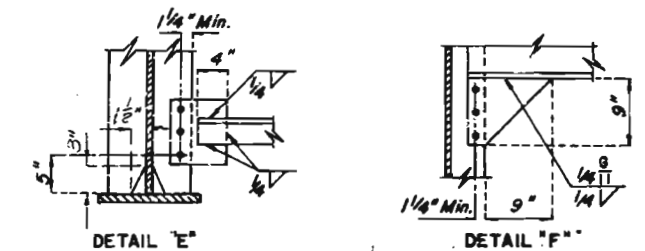
DETAILS OF FIELD SPLICE

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



TYR PART SECTION SHOWING END DIAPHRAGMS

TYR PART SECTION SHOWING INT. DIAPHRAGMS



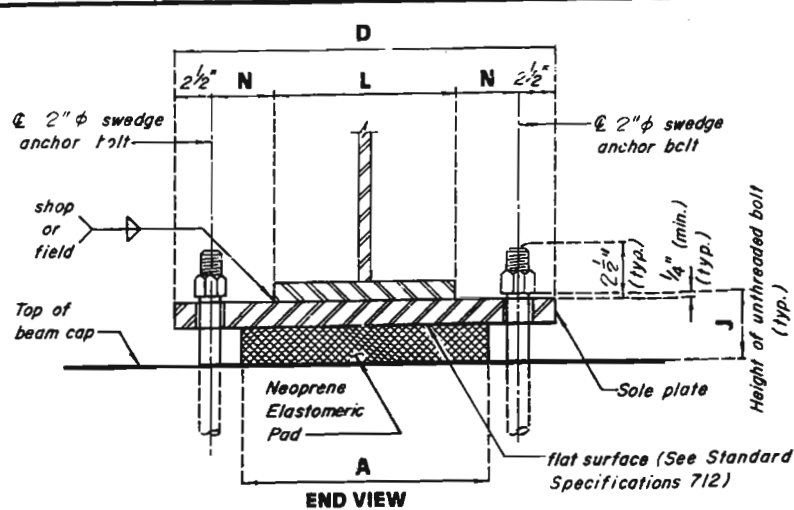
PRECAST PRESTRESSED CONC. PANEL OPTION

CAST-IN-PLACE STAY-IN-PLACE OPTION

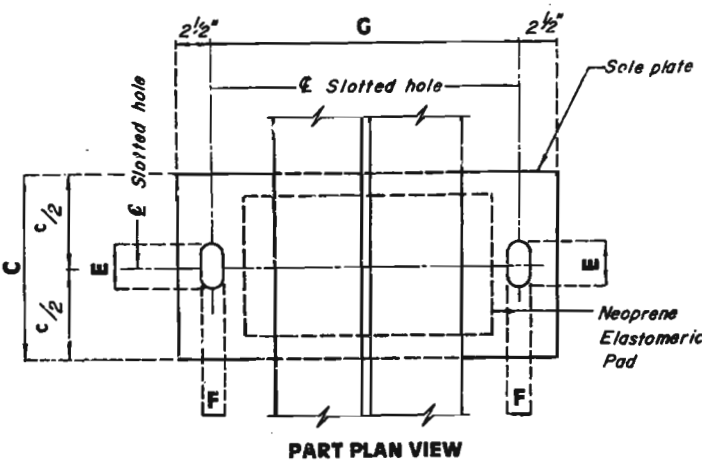
DETAILS OF SHEAR CONNECTORS

Note: Weight of 2035 lbs. of shear connectors is included in weight of "Fabricated Structural Carbon Steel".

3021
459
REVISED
JAN. 1987
L.A.M. NEOR BRGS.
MARCH 1979



Note: The location of anchor bolts in relation to the slotted holes in the sole plate shall correspond with the temperature at the time of erection. At 60° F. the slotted holes should center on the anchor bolts.

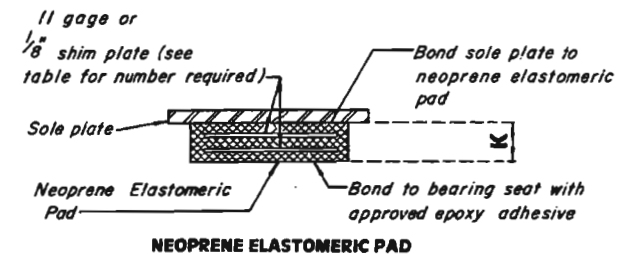
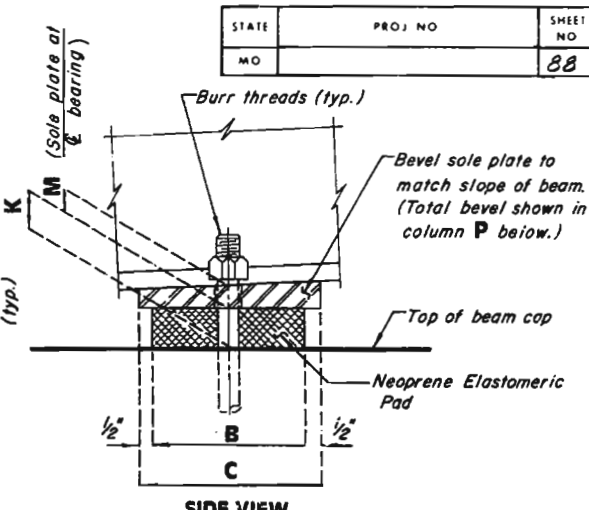
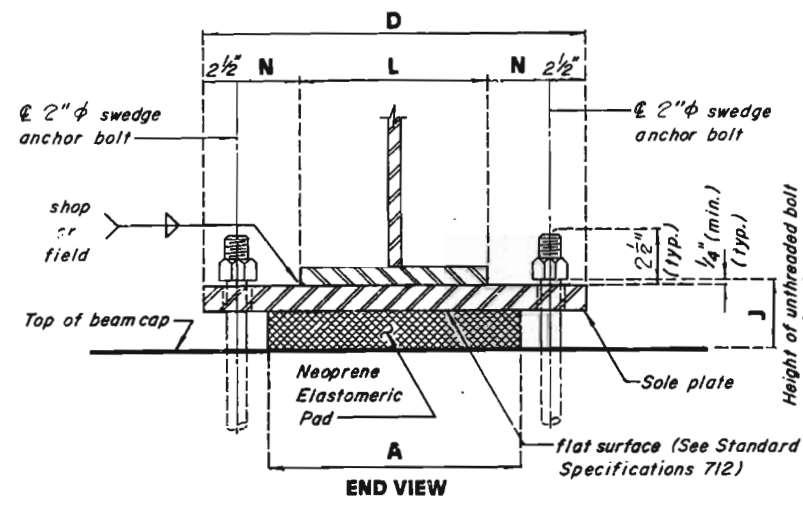
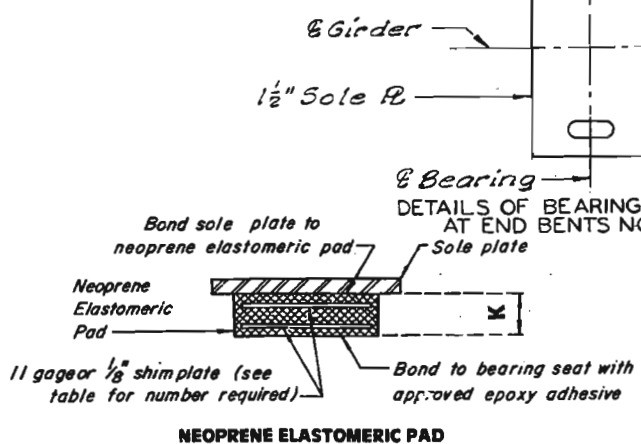
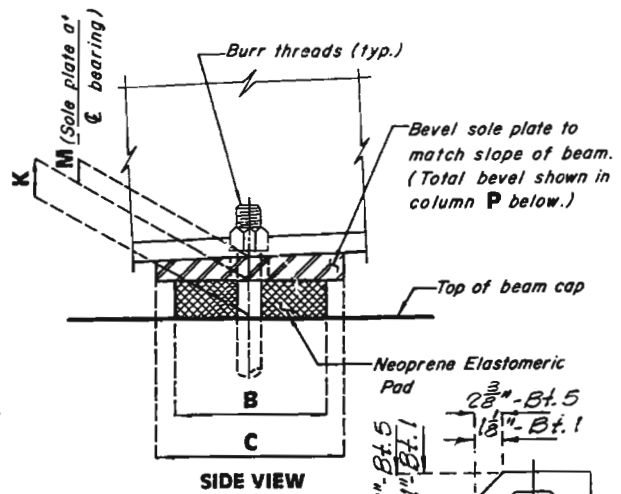


EXPANSION BEARINGS

NUMBER REQUIRED = 5 at End Bent No. 1
5 at Int. Bent No. 2
5 at Int. Bent No. 4
5 at Int. Bent No. 5

BENT NO.	A	B	C	D	E	F	G	J	K	L	M	N	P	NUMBER OF SHIM PLATES (*)
1	9"	12"	13"	21"	5 1/2"	2 1/8"	16"	6 3/8"	4 3/8"	12"	1 1/2"	2"	—	7
2	20"	13"	14"	21 1/2"	4 1/2"	2 1/8"	23"	4 3/8"	2 3/8"	13"	1 1/2"	5"	—	3
4	22"	14"	15"	21 3/4"	4 1/2"	2 1/8"	21 1/2"	4 3/8"	2 3/8"	16"	1 1/2"	4 1/2"	—	3
5	10"	14"	15"	23"	5 1/2"	2 1/8"	18"	6 3/8"	4 3/8"	14"	1 1/2"	2"	—	7

(*) THE REQUIRED SHIM PLATE SHALL BE PLACED BETWEEN EQUAL LAYERS OF ELASTOMER AND MOLDED TOGETHER TO FORM AN INTEGRAL UNIT.



FIXED BEARINGS

NUMBER REQUIRED = 5 at Int. Bent No. 3

BENT NO.	A	B	C	D	F	G	J	K	L	M	N	P	NUMBER OF SHIM PLATES (*)
3	20"	13"	14"	21 1/2"	2 1/8"	23"	4 3/8"	2 3/8"	16"	1 1/2"	3 1/2"	—	2

(*) THE REQUIRED SHIM PLATE SHALL BE PLACED BETWEEN EQUAL LAYERS OF ELASTOMER AND MOLDED TOGETHER TO FORM AN INTEGRAL UNIT.

GENERAL NOTES:

ANCHOR BOLTS SHALL BE A-588 SWEDGED BOLTS AND SHALL EXTEND 18 INCHES INTO CONCRETE WITH HEXAGON NUTS. (SWEDGING SHALL BE 1" LESS THAN EXTENSION INTO CONCRETE.)
WEIGHT OF ANCHOR BOLTS AND HEXAGON NUTS FOR BEARINGS SHALL BE INCLUDED IN WEIGHT OF FABRICATED STRUCTURAL STEEL.
NEOPRENE ELASTOMERIC PADS SHALL BE ③ DUROMETER.
THE SOLE PLATE SHALL BE FURNISHED WITH THE BEARING AND FIELD OR SHOP WELDED TO THE STRINGERS OR GIRDELS.
STRUCTURAL STEEL FOR SOLE PLATE SHALL BE A-36.
PAYMENT FOR THE SOLE PLATE WILL BE INCLUDED IN THE COST OF THE BEARING ASSEMBLY. SEE SPECIAL PROVISIONS.
ALL ANCHOR BOLTS SHALL BE A-588 STEEL WITH A-563 DH3 OR A563 C3 (HEAT TREATED) HEXAGON NUTS.
THE ACCEPTED QUANTITY OF ELASTOMERIC BEARING ASSEMBLIES, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR LAMINATED NEOPRENE BEARING PADS (STEEL STRUCTURES), EACH.
ALL STRUCTURAL STEEL FOR SOLE PLATES, ANCHOR BOLTS AND HEXAGON NUTS SHALL BE PAINTED WITH 2 COATS (5 MILS MINIMUM) OF INORGANIC ZINC. WELD AREAS TO BE TOUCHED UP AFTER ASSEMBLY.

DETAILS OF LAMINATED NEOPRENE BEARINGS (STEEL STRUCTURES)

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

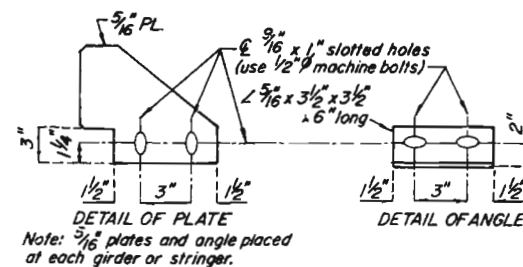
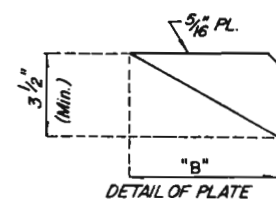
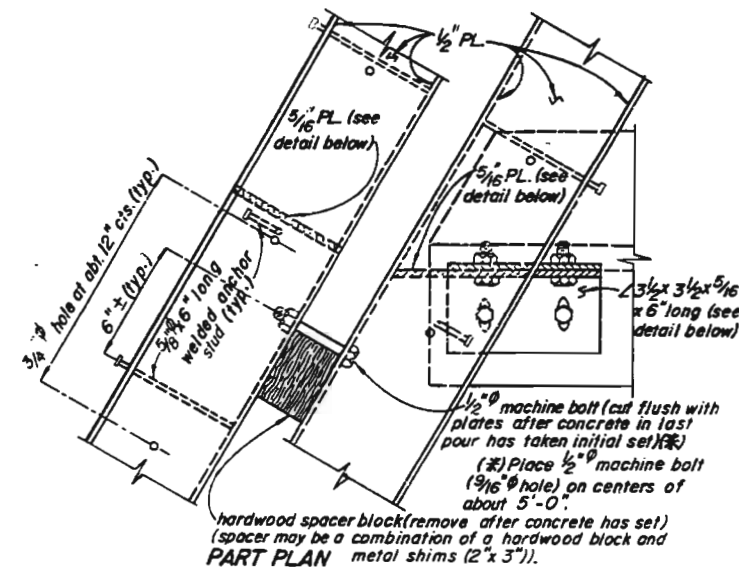
Sheet No. 10 of 18

JEFFERSON COUNTY

A-2941

DETAILED MAY 1987
CHECKED May 1987

PART SECTION THRU ARMORED JOINT

[illegible]

NOTE: All dimensions are at right angles.
Expansion gap and dimension "A" shall be increased $\frac{1}{16}$ " for each 10° fall in temperature and decreased $\frac{1}{16}$ " for each 10° rise in temperature.

GENERAL NOTES:

THE CERTIFIED NUTS AND BOLTS FOR THE ANCHOR STUDS OR WING TYPE THREADED INSERTS SHALL BE TIGHTENED TO THE FOOT POUNDS "G" SPECIFIED IN THE TABLE OF DIMENSIONS. RETIGHTEN TO "G" FOOT POUNDS A MINIMUM OF 30 MINUTES AFTER INITIAL TIGHTENING. THE WELDED ANCHOR STUDS SHALL BE THE REDUCED BASE TYPE

MATERIAL FOR THE ARMORED JOINT SHALL BE A36 STRUCTURAL GRADE STEEL. ANCHORS FOR THE ARMORED JOINT SHALL BE APPROVED STUD WELDED ANCHORS (C1010 THRU C1020).

SEE SPECIAL PROVISIONS FOR PAINING.

ANCHOR BOLTS IN THE BARRIER CURB SHALL BE CAST-IN-PLACE, GROUTED OR CONE- EXPANSION TYPE. HOLES IN THE BARRIER CURB FOR ANCHORS SHALL NOT BE DRILLED UNTIL THE CONCRETE IS AT LEAST 7 DAYS OLD

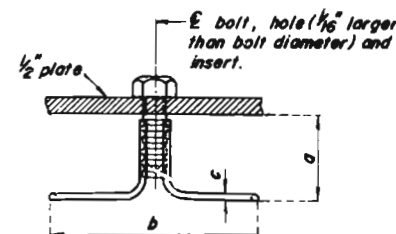
PLAN DIMENSIONS ARE BASED ON INSTALLATION AT 60°F. THE EXPANSION GAP AND OTHER DIMENSIONS SHALL BE ADJUSTED DURING INSTALLATION FOR COMPLIANCE WITH ANY TEMPERATURE CHANGE.

CONTACT SURFACE OF STEEL TO ALUMINUM SHALL BE INSULATED WITH THE MATERIAL SPECIFIED ON THE SHOP DRAWINGS.

FURNISHING, PAINTING AND INSTALLING THE STRUCTURAL STEEL ARMORED JOINT AND CURB PLATES SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR EXPANSION JOINT SEAL

BOLT CAVITIES TO BE FILLED WITH APPROVED SEALANT IN COMPLIANCE WITH MANUFACTURER'S CERTIFICATION.

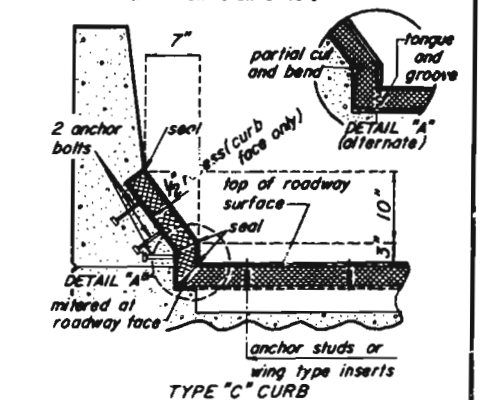
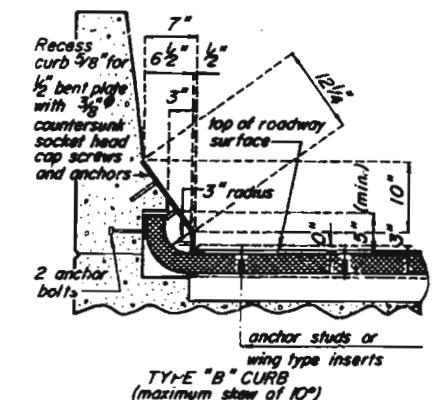
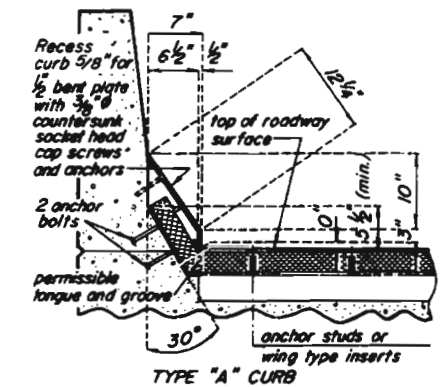
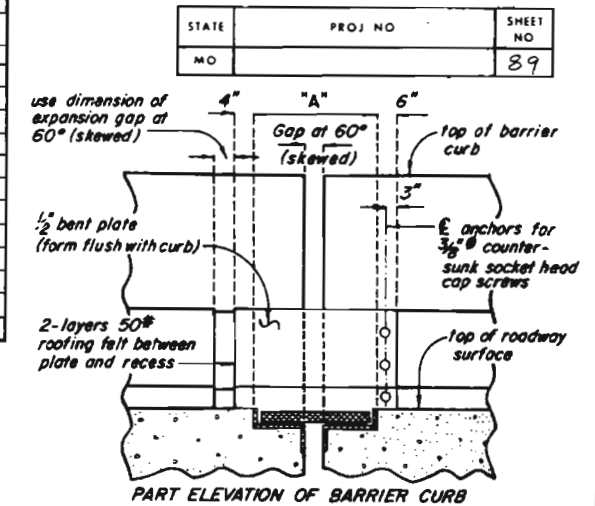
PLATES SHALL BE FIELD ADJUSTED BY ADDING OR REMOVING METAL SHIMS (2" x 3"), AS REQUIRED FOR TEMPERATURE CORRECTION. THE EXPANSION GAP SHALL BE ADJUSTED FOR ANY TEMPERATURE CORRECTION PRIOR TO POURING TOP OF END BENT BACKWALL.



Bolt Diameter	Safe Load Tension (lbs.) (min.)	Approx. Ult. Cap. Tension (lbs.) (min.)	Dimensions		
			a (min.)	b	c
1/2"	800	8,000	1-5/8"	5"	2-18"
5/8"	1,300	9,200	1-5/8"	5"	2-18"
3/4"	1,800	13,200	2-1/4"	6"	2-18"
7/8"	2,400	16,200	2-1/2"	6-1/2"	3-06"
1"	2,000	16,200	2-1/2"	6-1/2"	3-06"

DETAILS OF ALTERNATE WING TYPE THREADED INSERT

(Machine bolts need only be used to secure the Wing Type Threaded Inserts to the steel plate until the concrete has attained 3,000 p.s.i.)

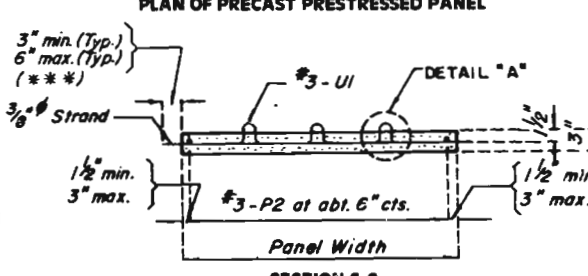
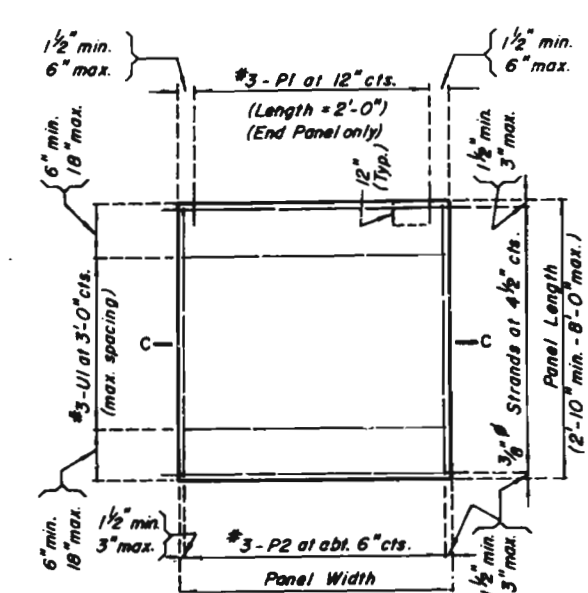
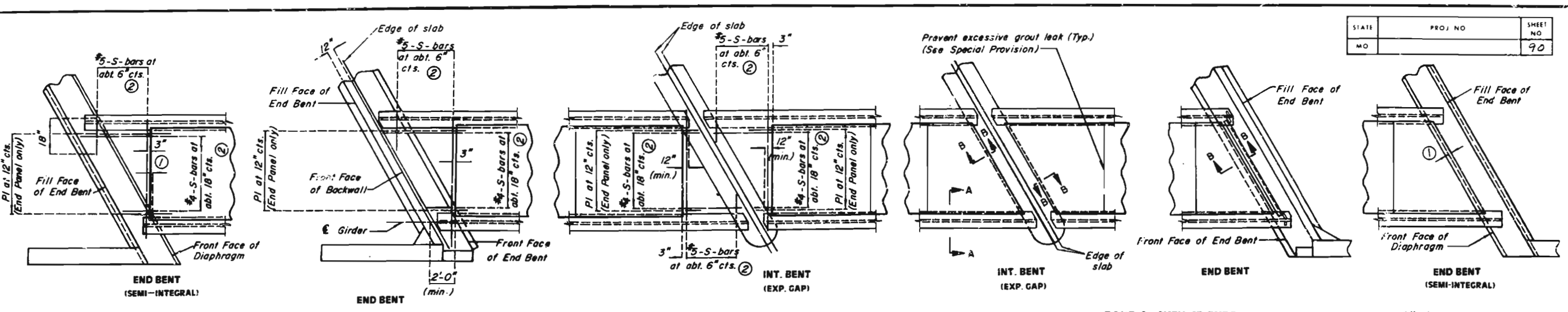


ALTERNATE CURB TREATMENTS

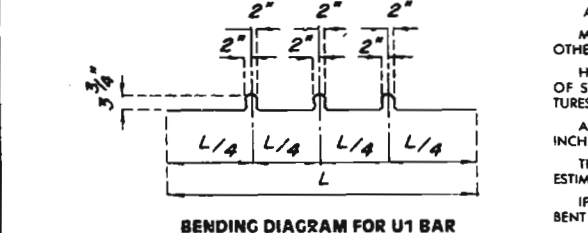
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STEEL
P/C-P/S PANEL (3")
REVISED
JULY 1985
MAY 1985

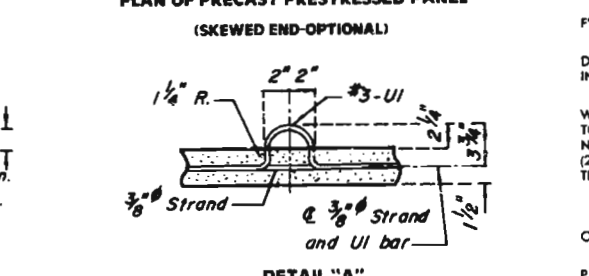
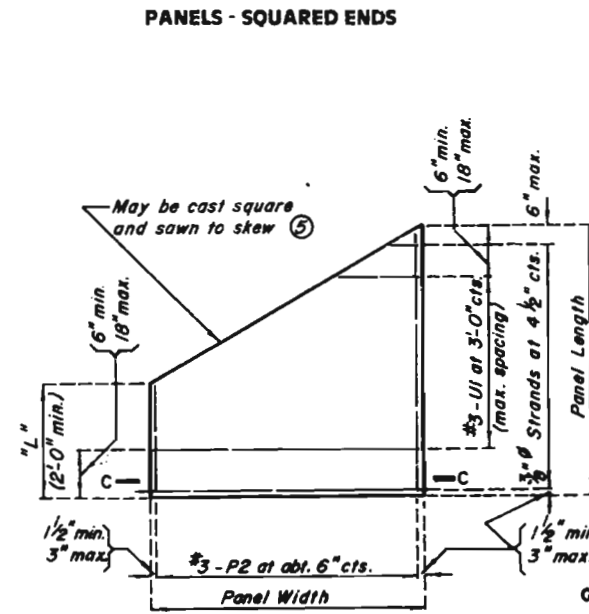
DETAILED AUG. 1985
CHECKED Aug 1985



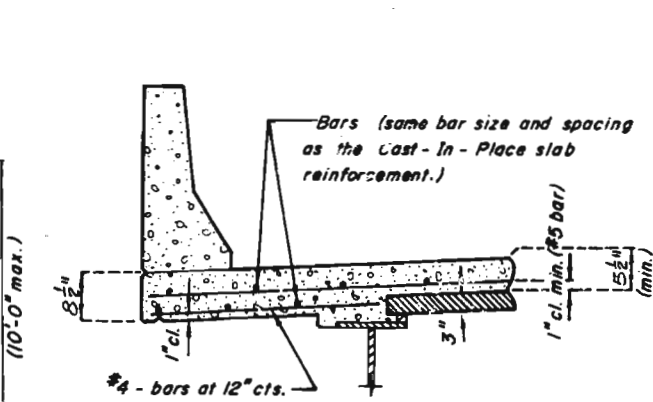
(***) Prestressing strands to extend 6" or to within 1" of adjacent panel.



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



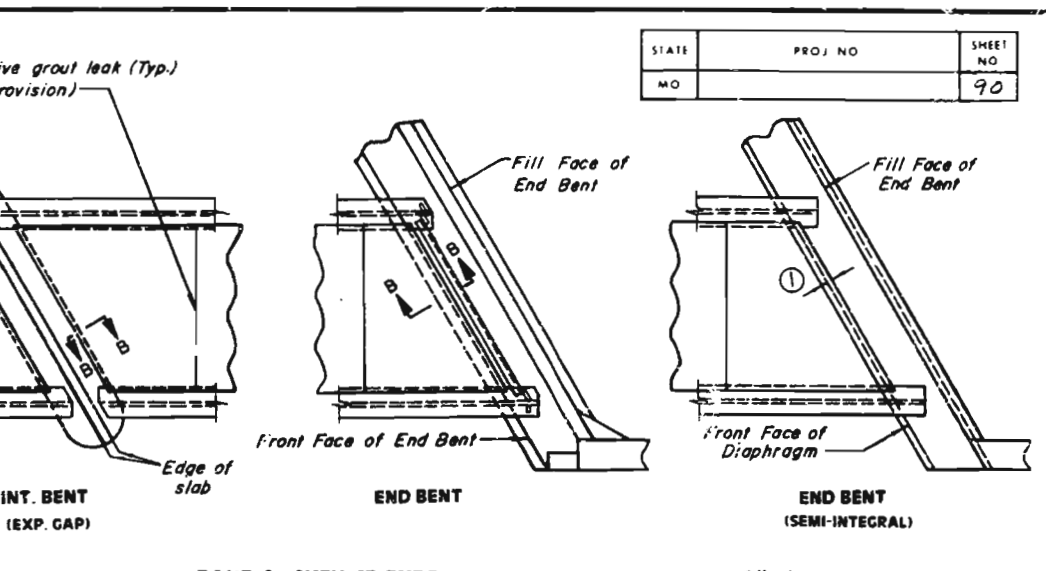
PLAN OF PRECAST PRESTRESSED PANELS PLACEMENT



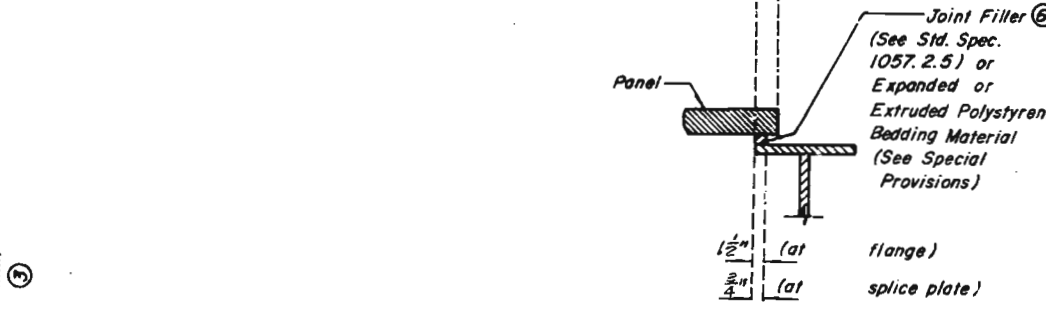
GENERAL NOTES:

PRESTRESSED PANEL:
CONCRETE FOR PRESTRESSED PANELS SHALL BE CLASS A1 WITH $F_c = 5,000$ PSI, $F_t = 3,500$ PSI.
THE TOP SURFACE OF ALL PANELS SHALL RECEIVE A SCORED FINISH WITH A DEPTH OF SCORING OF 1/4 INCH PERPENDICULAR TO THE PRESTRESSING STRANDS IN THE PANEL (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 = 0.085 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 1/4 INCH EXCEPT OVER SPICE PLATES WHERE MINIMUM THICKNESS SHALL BE 1/2 INCH. WHEN JOINT FILLER IS LESS THAN 1/2" THICK OVER SPICE PLATE, MAKE THE WIDTH OF JOINT FILLER AT SPICE THE SAME WIDTH AS PANEL ON SPICE. 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 EXCEPT AT SPICES, AND THE MAXIMUM CHANGE IN THICKNESS BETWEEN ADJACENT PANELS SHALL BE 1/4 INCH TO CORRECT FOR VARIATIONS FROM GIRDER CAMBER DIAGRAM. THE POLYSTYRENE BEDDING MATERIAL MAY BE CUT TO MATCH HAUNCH HEIGHT ABOVE TOP OF FLANGE.
SUPPORT FROM DIAPHRAGM FORMS REQUIRED UNDER OPTIONAL SKEWED END UNTIL CAST-IN-PLACE CONCRETE HAS REACHED 3,000 PSI COMPRESSIVE STRENGTH.

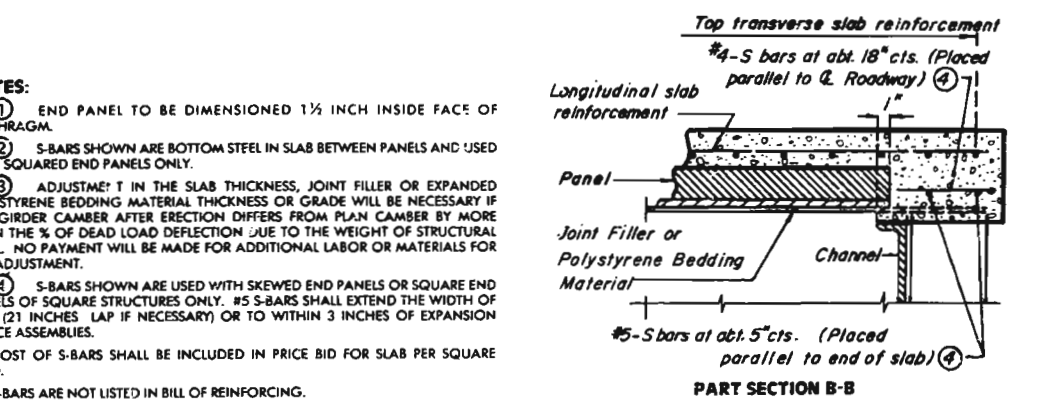
DETAILS OF PRECAST PRESTRESSED PANELS



SECTION A-A

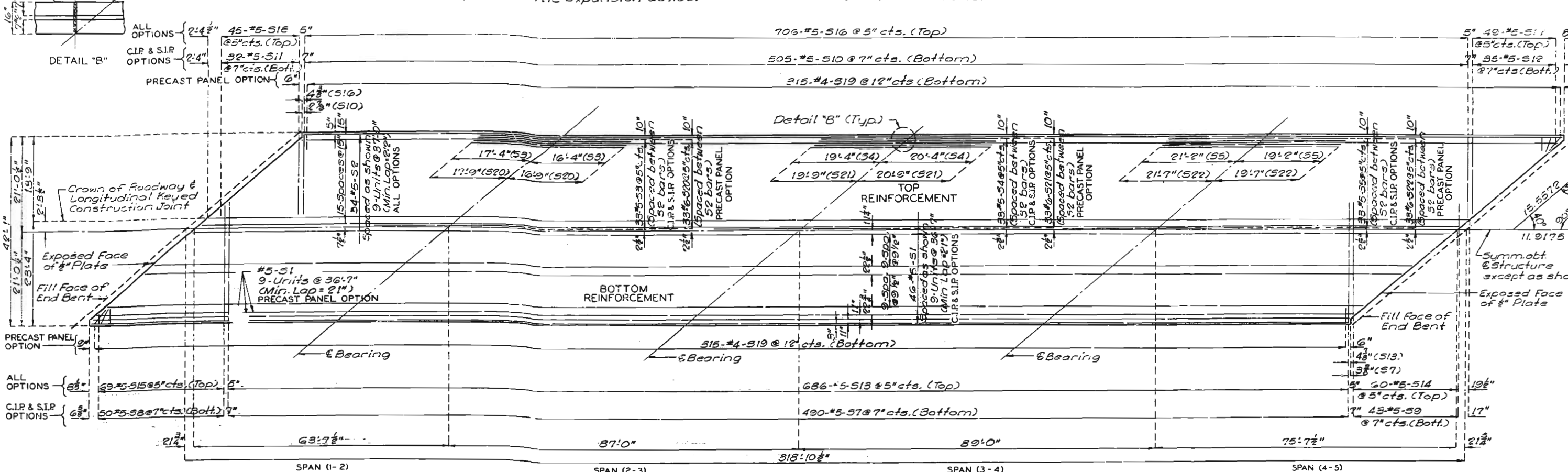


NOTE:
USE THEORETICAL SLAB HAUNCH ON SHEET NO. 14 FOR DETERMINING THICKNESS OF JOINT FILLER OR POLYSTYRENE BEDDING MATERIAL WITHIN THE LIMITS NOTED BELOW.



PERMISSIBLE CONST. JOINT

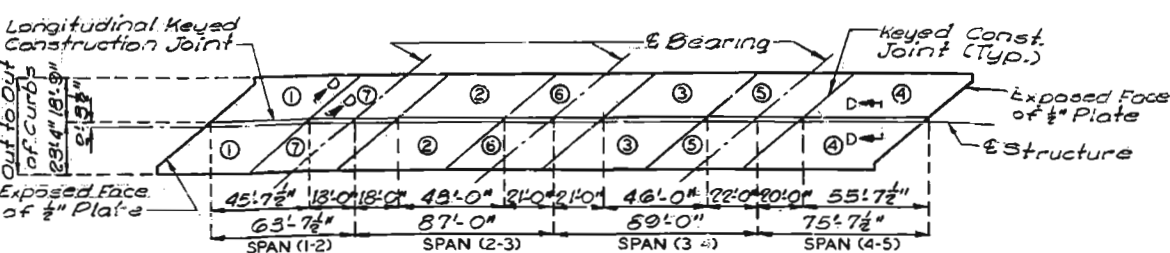
ADJUST THE PERMISSIBLE CONST. JOINT TO A CLEARANCE OF 6 INCHES MIN. FROM THE JOINTS OF THE PRESTRESSED PANELS.



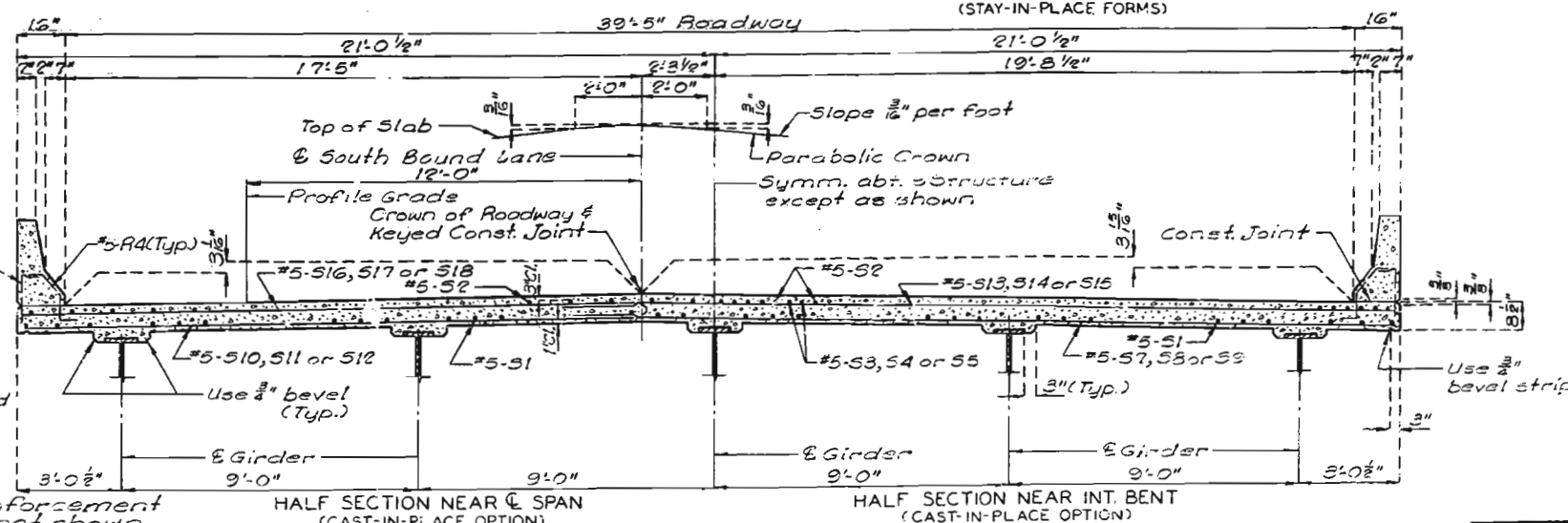
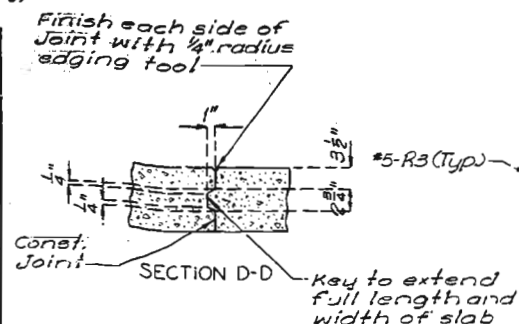
SLAB POURING NOTE:
The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of the concrete to 2.5 hours. (Pour right side first)

Note: For details and location of slab drains see sheet No. 14. For "Plate Girder Camber Diagram" and "Theoretical Slab Haunching Detail" see sheet No. 14.

Note: Bottom transverse reinforcing steel shall be placed to match form corrugation valleys.



SEAL POURING SEQUENCE										MIN RATE OF POUR CU. YDS./HR.	
Basic Sequence	Sequence of Pours						Direction		WITH RETARDER	NO RETARDER	
	1	2	3	4	5	6	7				
Basic Sequence	1	2	3	4	5	6	7		25	25	
Either Direction:											
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with section 703.3.12.4 of Missouri Standard Specifications.											
Alternate "A" Pours	1	7+2	6+3	5+4					25	28	
	End to 7		1 to 6		2 to 5		3 to End				
Alternate "B" Pours	1+7+2	6+3	5+4					25	28		
	End to 6		2 to 5		3 to End						
Alternate "C" Pours	1+7+2	6+3+5+4						25	28		
	End to 6		2 to End								
Alternate "D" Pours	1+7+2+6+3+5+4								25	28	
	End to End										



DETAILED NOV. 1979
CHECKED Dec. 1979

Note: This drawing is not to scale. *see sheet* Follow dimensions

Note: For details and reinforcement of safety barrier curb not shown see sheet No. 15

Sheet No. 13 of 18

JEFFERSON COUNTY

A-2941

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		12	92	

GENERAL NOTES:

SLAB DRAINS MAY BE FABRICATED OF EITHER 1/4" WELDED SHEETS OF A.S.T.M. A36 STEEL OR FROM 1/4" STRUCTURAL STEEL TUBING A.S.T.M. A500 OR A501.

OUTSIDE DIMENSIONS OF DRAINS ARE 8"x4".

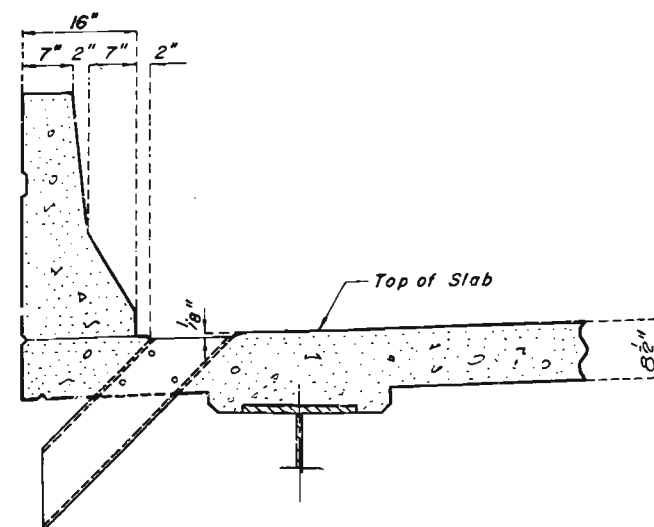
THE DRAINS SHALL BE CAST IN THE CONCRETE WITH THE TOP OF THE DRAINS BEING 1/8" BELOW THE FINISHED CONCRETE LINE.

LOCATE DRAINS IN THE SLAB BY DIMENSIONS SHOWN IN THE PART ELEVATION.

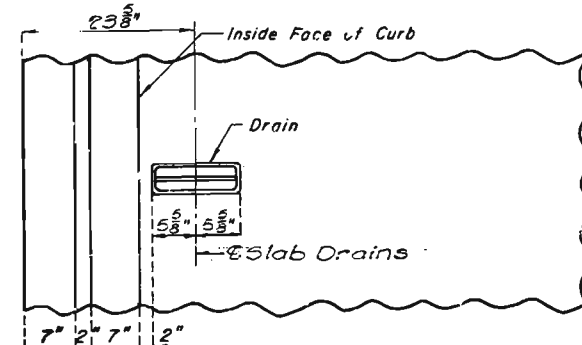
SHIFT REINFORCING STEEL IN FIELD WHERE NECESSARY TO CLEAR DRAINS.

THE DRAINS SHALL BE GALVANIZED IN ACCORDANCE WITH A.S.T.M. A123.

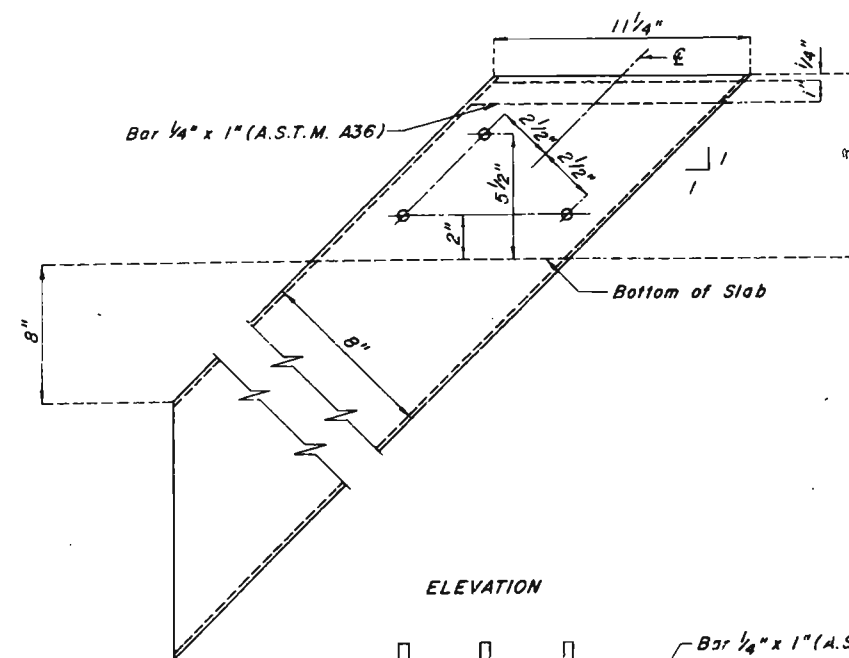
SHOP DRAWINGS WILL NOT BE REQUIRED FOR THE SLAB DRAINS.



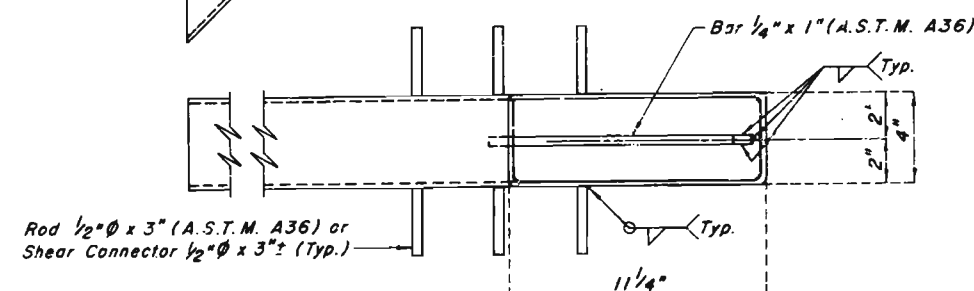
PART ELEVATION OF SLAB



PART PLAN OF SLAB

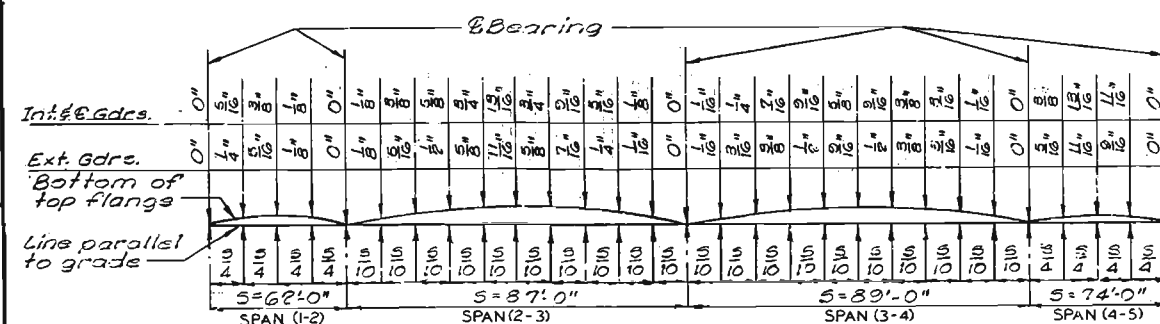
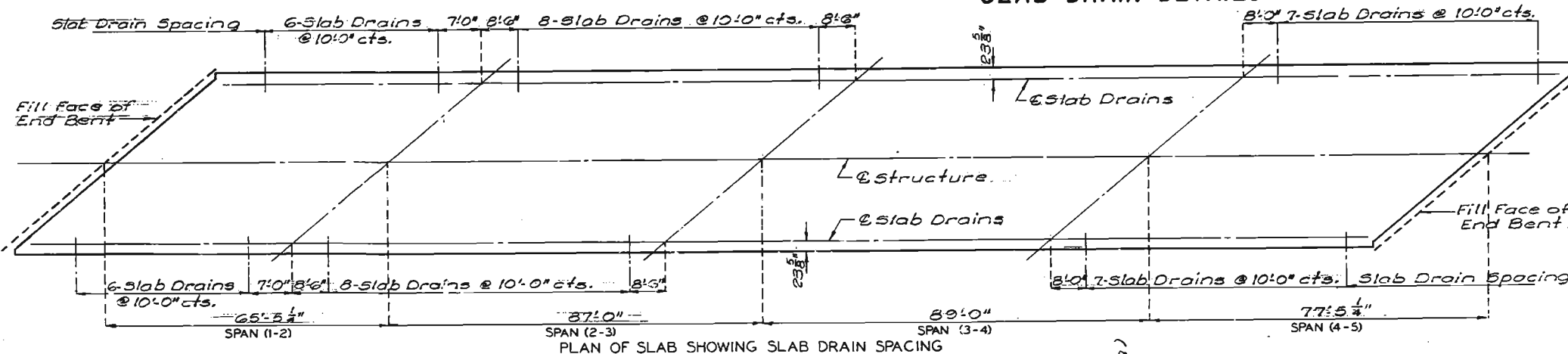


ELEVATION



PLAN

SLAB DRAIN DETAILS

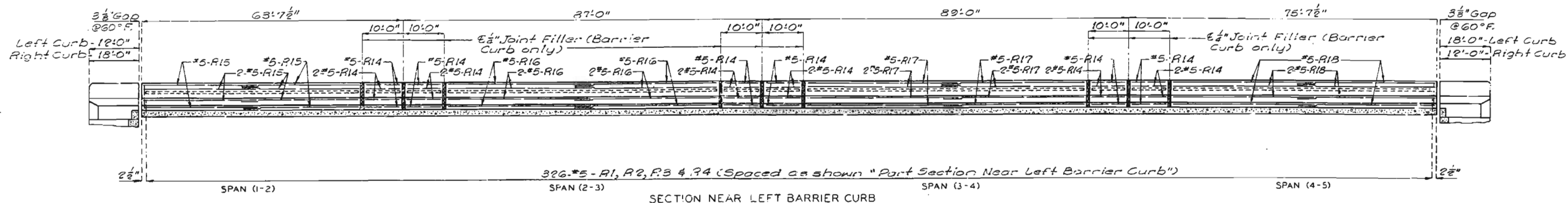


THEORETICAL SLAB HAUNCH

* Dimension may vary if girder camber after erection differs from plan camber by more than the % of Dead Load Deflection due to weight of structural steel. No payment will be made for additional forming or concrete required for variation in haunching.

Note: Camber includes allowance for dead load deflection due to slab, curb and structural steel. 11% of dead load deflection due to weight of structural steel. To determine haunch for the stay-in-place alternates add 3/8" to the haunch for the cast-in-place alternate.

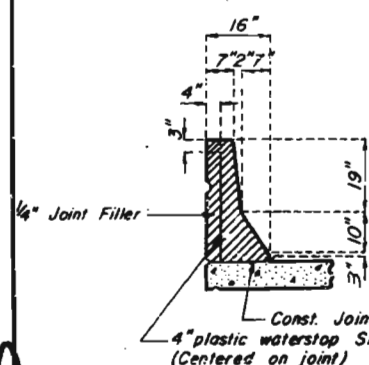
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		8	93	



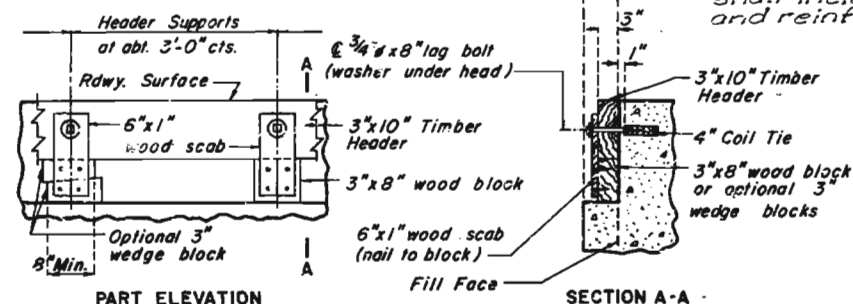
Note: Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing. Concrete in safety barrier curb shall be Class B1.

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.

Note: The cross-sectional area above the slab = 2.27 sq. ft.



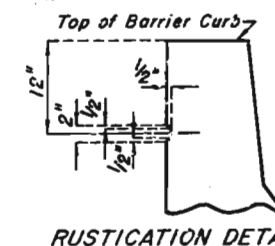
Note: Plastic waterstop shall be placed in all safety barrier curb filled joints. Cost of plastic waterstop complete in place to be included in unit price bid for concrete.



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

DETAILS OF TIMBER HEADER AT END BENTS

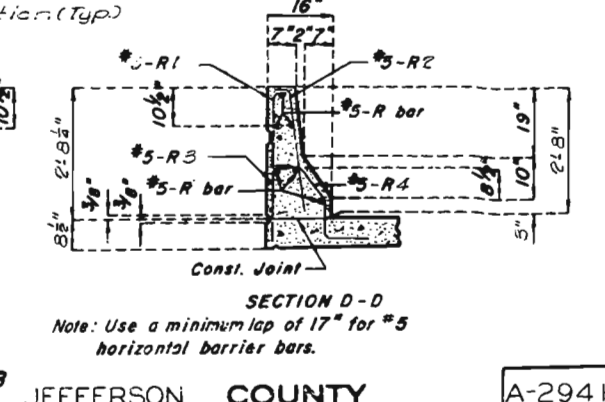
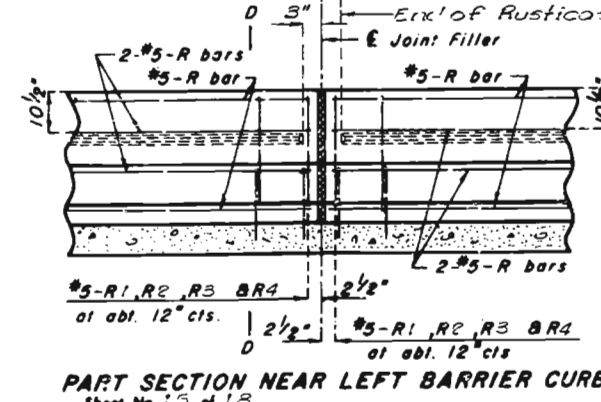
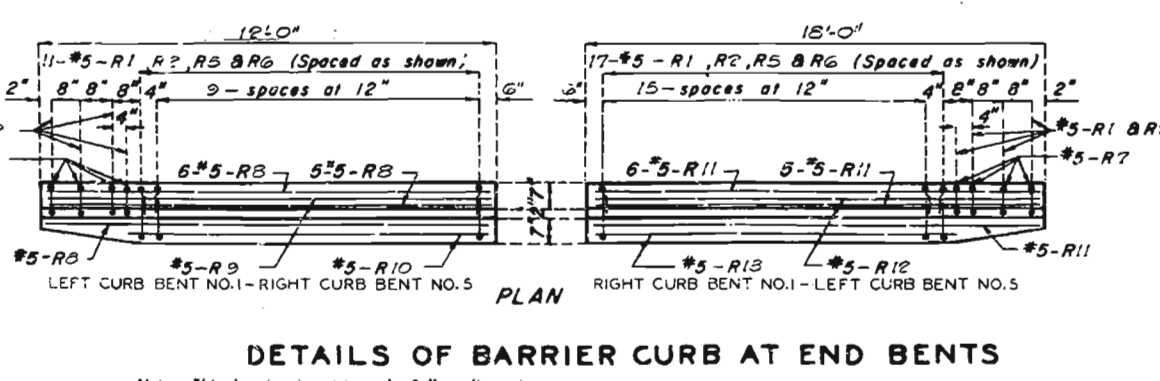
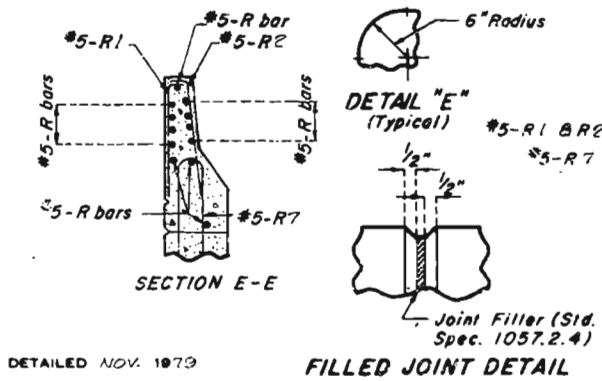
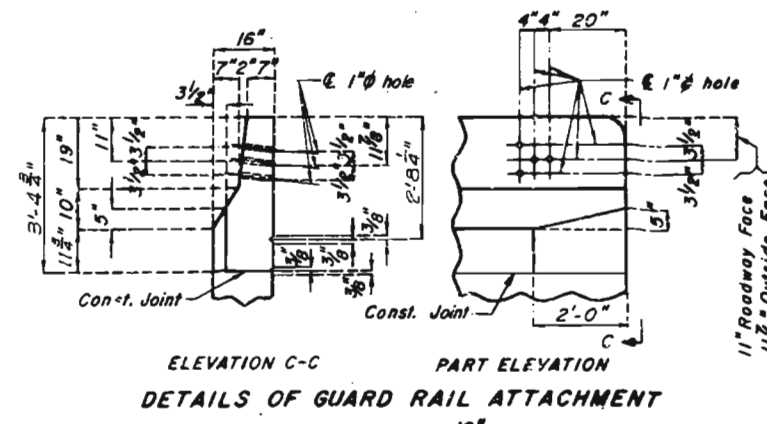
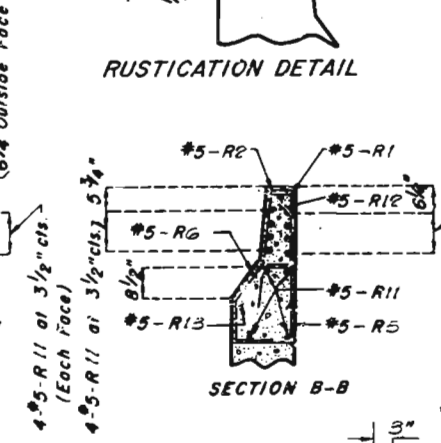
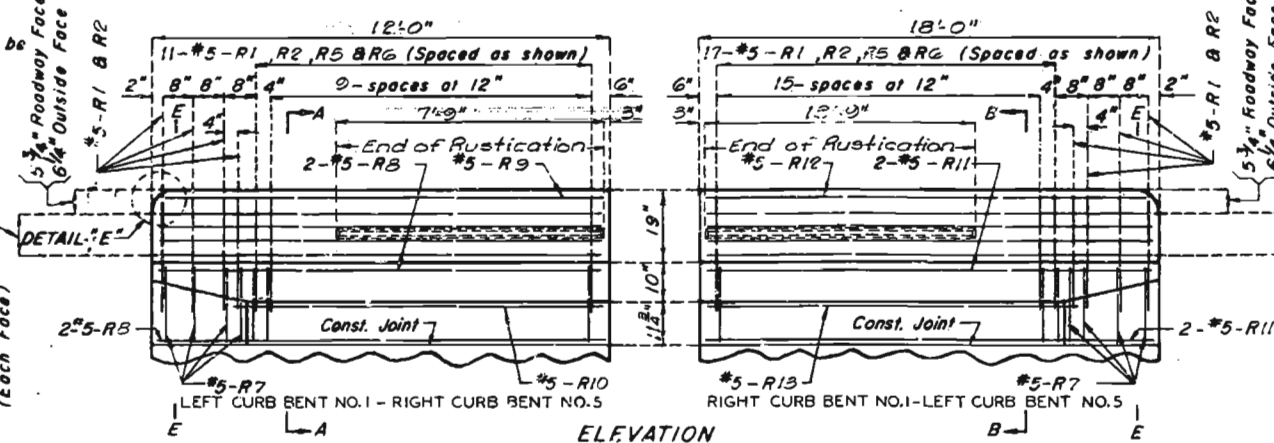
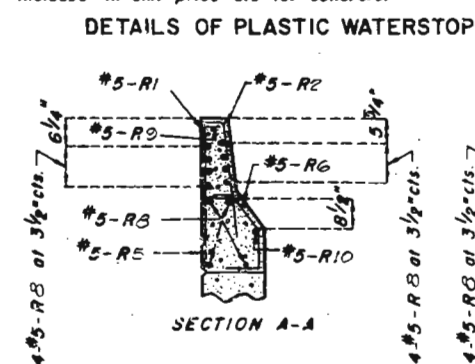
Note: Stop Rustication either side of open joints in barrier curb as shown in "Details of Barrier Curb at End Bents."



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.



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

JEFFERSON COUNTY

A-2941

464 326

REVISED NOV. 1979

AUG. 1978

STANDARD DRAWING

DETAILED NOV. 1979

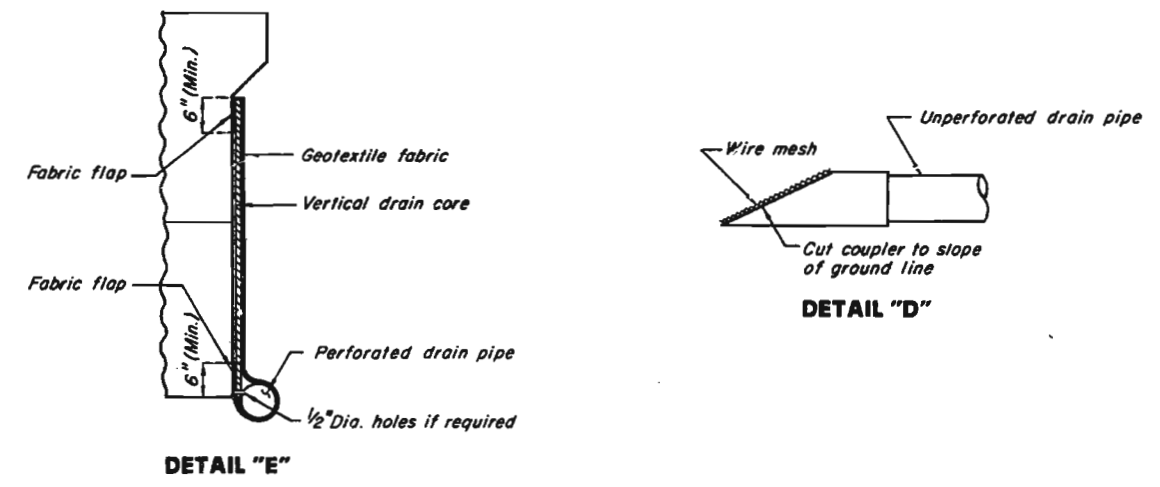
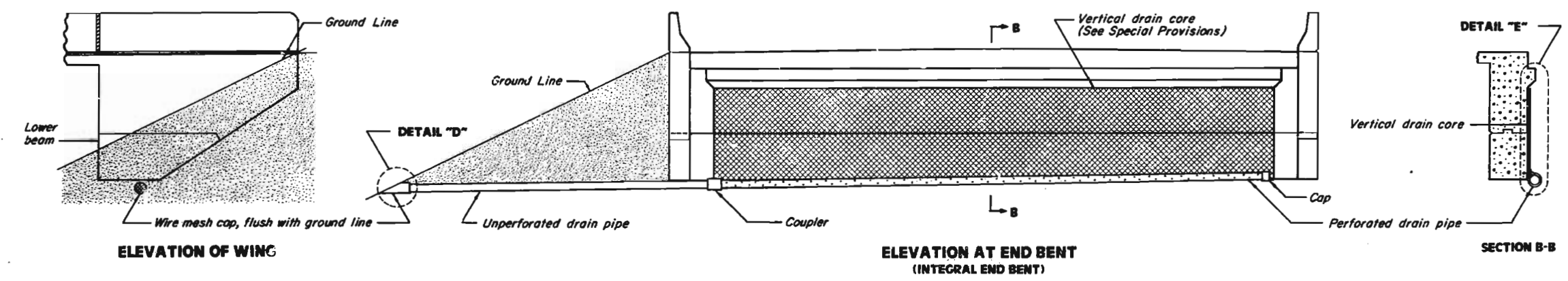
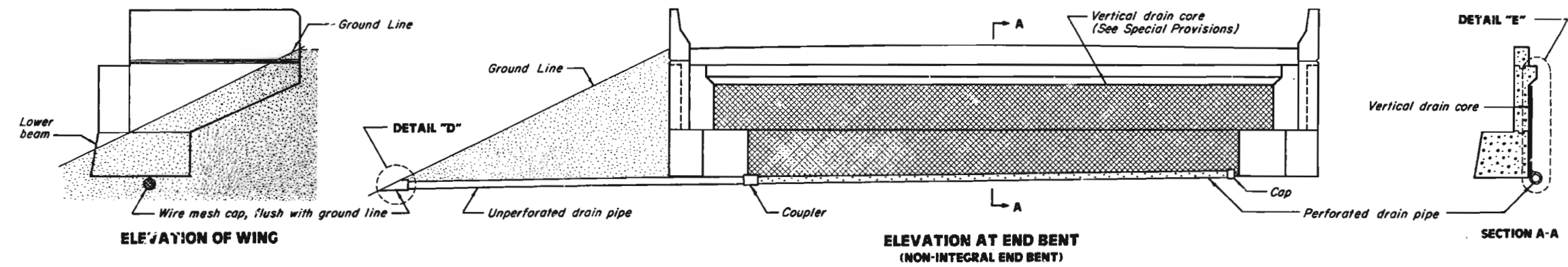
CHECKED JAN. 1980

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.



VERTICAL DRAIN AT END BENTS

DETAILED MAY 1987
CHECKED May 1987

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

Sheet No. 16 of 18

JEFFERSON COUNTY

A-2941

465 327

Verit Drain	Revised	MAR 1987
MARCH 1986		

466 328

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO.	LOCATION	EPOXY	SHAPE NO.	STIRRUP	SUBSTR.	VARIES	NO. EACH	DIMENSIONS										NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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6d FOR #3 THRU #5

12d FOR #6 OR 2 1/2" MIN.

9 BEAM

DETAILING DIMENSION

90°

DETAILING MAY 1987

CHECKED May 1987

7

135°

1

BEAM

DETAILING DIMENSION

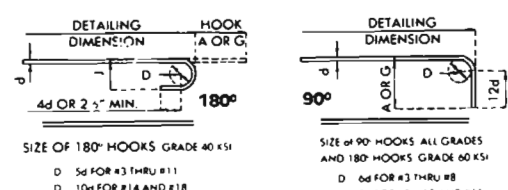
135°

1

STIRRUP HOOK DIMENSIONS				
GRADES 40-50-60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	APPROX. H
#3	1 1/8"	4"	4"	2 1/2"
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 1/2"
#6	4 1/2"	12"	7 1/2"	4 1/2"

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

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



SIZE OF 180° HOOKS GRADE 40 KSI

SIZE OF 90° HOOKS ALL GRADES

6d FOR #3 THRU #5

10d FOR #6 AND #7

10d FOR #8 AND #9

10d FOR #10 AND #11

10d FOR #12 AND #13

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO.	LOCATION	E	SHAPE NO	S	STIRRUP	SUBSTR.	VARIES	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.
16	6V16	WING	E 20	X	V				2	4	11.000								4	11	4	11				
		INCR = 2.250 IN								3	7.000								3	7	3	7	172			
6	6V17	WING	E 20	X						4	11.000								4	11	4	11	44			
2	6V18	WING	E 20	X						2	10.000								2	10	2	10	9			
2	6V19	WING	E 20	X						2	8.000								2	8	2	8	8			
10	6V20	WING	E 17	X						6	1.000								6	9	6	9	101			
16	6V21	WING	E 17	X	V			2		4	9.000								5	5	5	5				
		INCR = 2.250 IN								3	5.000								4	1	4	1	114			
6	6V22	WING	E 17	X						4	9.000								5	5	5	5	49			
2	6V23	WING	E 17	X						2	8.000								3	4	3	4	10			
2	6V24	WING	E 17	X						2	6.000								3	2	3	2	17			
4	6V25	WING		20	X					16.000									16		16					
20	2W1	A. & B. WELLS		22	X					18.000		9.125							26	1	26	1	8			
		INT. BENT 2																								
27	8D1	FOOTING & COLUMN		20	X					6	4.000								6	4	6	4	45			
12	6D3	FOOTING		10	X					3	3.000		18.000						9	0	7	8	13			
12	6D4	FOOTING		10	X					3	7.000		18.000						8	8	8	4	15			
4	11H1	BEAM		18	X					56	10.000								60	0	60	0	127			
6	11H2	BEAM		17	X					15	6.000								17	1	17	1	54			
8	7H3	BEAM		7	X					3	8.000	2	3.500						8	6	8	6	13			
8	10H4	BEAM		20	X					57	10.000								57	10	57	10	199			
2	6H5	BEAM		20	X					57	10.000								57	10	57	10	17			
58	4P1	COLUMN		16	X					2	3.000								7	11	7	11	34			
88	6U1	BEAM		13	S	X				2	5.000	2	9.000	2	5.000	2	9.000		11	8	11	2	147			
3	4U2	BEAM		10	S	X					6.000	2	5.000						3	5	3	3				
2	6U3	BEAM		13	S	X				2	3.000	2	9.000	2	3.000	2	9.000		11	4	10	10	3			
9	8V3	COLUMN		20	X					24	10.000								24	10	24	10	59			
9	8V4	COLUMN		20	X					21	1.000								21	1	21	1	50			
9	8V5	COLUMN		20	X					18	1.000								18	1	18	1	43			
10	2W1	A. & B. WELLS		22	X					18.000		9.125							26	1	26	1	4			
		INT BENTS 3 & 4																								
54	8D1	COLUMN & FOOTING		20	X					6	4.000								6	4	6	4	91			
24	6D2	FOOTING		10	X						3	6.000		18.000					8	6	8	2	29			
24	6D3	FOOTING		10	X						3	3.000		18.000					8	0	7	8	27			
8	11H1	BEAM		18	X					56	10.000								60	0	60	0	255			
12	11H2	BEAM		17	X					15	6.000								17	1	17	1	108			
16	7H3	BEAM		7	X					3	8.000	2	3.500						8	6	8	6	27			
16	10H4	BEAM		20	X					57	10.000								57	10	57	10	398			
4	6H5	BEAM		20	X					57	10.000								57	10	57	10	34			
111	4P1	COLUMN		16	X					2	3.000								7	11	7	11	58			
176	6U1	BEAM		13	S	X				2	5.000	2	9.000	2	5.000	2	9.000		11	8	11	2	295			
6	4U2	BEAM		10	S	X					6.000	2	5.000						3	5	3	3	1			
4	6U3	BEAM		13	S	X				2	3.000	2	9.000	2	3.000	2	9.000		11	4	10	10				

329
467

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO.	LOCATION	EPOXY	SHAPE NO.	STIRRUP	SUBSTR.	VARIES	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.
27	8V1	COLUMN BENT 3		20	X				22	4.000									22	4	22	4	1610		
27	8V2	COLUMN BENT 4		20	X				19	1.000									19	1	19	1	1376		
20	2#1	A. B. WELLS		22	X				18.000	9.125									26	1	26	1	87		
		SUPERSTRUCTURE																							
724	SR1	BARRIER CURB	E	19	S				2	6.000	3.500								2	10	2	8	2014		
724	SR2	BARRIER CURB	E	15	S				2	6.125	3.500				2	6.000	3.000		2	10	2	4	2077		
652	SR3	BARRIER CURB	E	19	S				17.000	6.000									23	22			1747		
652	SR4	BARRIER CURB	E	27	S				6.000		11.125	7.000	12.000	9.125	6.375	3	0	2	10				1927		
56	SR5	BARRIER CURB	E	19	S				18.500	6.000						2	1	23					1127		
56	SR6	BARRIER CURB	E	27	S				12.000	4.375	11.125	6.000		6.375	9.125	3	3	3	1				1807		
16	SR7	BARRIER CURB	E	7					3	4.000	6.000					6	10	6	10				1147		
24	SR8	BARRIER CURB	F	20					11	9.000						11	9	11	9				2947		
2	SR9	BARRIER CURB	E	20					11	7.000						11	7	11	7				247		
2	SR10	BARRIER CURB	E	20					10	0.000						10	0	10	0				217		
24	SR11	BARRIER CURB	E	20					17	9.000						17	9	17	9				4447		
2	SR12	BARRIER CURB	F	20					17	7.000						17	7	17	7				377		
2	SR13	BARRIER CURB	E	20					16	0.000						16	0	16	0				337		
72	SR14	BARRIER CURB	F	20					9	9.000						9	9	9	9				7327		
24	SR15	BARRIER CURB	E	20					27	5.000						27	5	27	5				6867		
24	SR16	BARRIER CURB	E	20					34	2.000						34	2	34	2				8597		
24	SR17	BARRIER CURB	E	20					35	2.000						35	2	35	2				8807		
24	SR18	BARRIER CURB	E	20					33	5.000						33	5	33	5				8367		
		SLAB																							
		C.O.P. & S.O.P. OPTION																							
414	SS1	SLAB	E	20					36	7.000									36	7	36	7	15797		
306	SS2	SLAB	E	20					37	0.000									37	0	37	0	11807		
66	SS3	SLAB	E	20					33	8.000									33	8	33	8	23187		
66	SS4	SLAB	E	20					39	8.000									39	8	39	8	27317		
66	SS5	SLAB	E	20					40	4.000									40	4	40	4	27767		
490	SS7	SLAB	E	20					25	1.000									25	1	25	1	128197		
50	SS8	SLAB	E	20					18.000										18		18		7027		
		INCR = 5.875 IN							25	5.000									25	5	25	5	7027		
43	SS9	SLAB	E	20					2	11.000									2	11	2	11	5967		
		INCR = 5.875 IN							23	8.000									23	8	23	8	9747		
505	SS10	SLAB	E	20					18	6.000									18	6	18	6	2077		
32	SS11	SLAB	E	20					16	20.000									20		20		3097		
		INCR = 5.875 IN							16	10.000									16	10	16	10	3097		
35	SS12	SLAB	E	20					18.000										18		18		7027		
		INCR = 5.875 IN							18	2.000									18	2	18	2	3597		
686	SS13	SLAB	E	20					25	6.000									25	6	25	6	182657		
60	SS14	SLAB	E	20					3	5.000									3	5	3	5	8607		
		INCR = 4.250 IN							24	1.000									24	1	24	1	9697		
69	SS15	SLAB	E	20					19.000										19		19		7327		
		INCR = 4.250 IN							25	4.000									25	4	25	4	9697		
708	SS16	SLAB	E	20					18	6.000									18	6	18	6	136617		
49	SS17	SLAB	E	20					19.000										19		19		7327		
		INCR = 4.250 IN							18	5.000									18	5	18	5	5117		
45	SS18	SLAB	E	20					20.000										20		20		4407		
		INCR = 4.250 IN							17	1.000									17	1	17	1	4407		

COMPLETE BILL OF REINFORCING STEEL

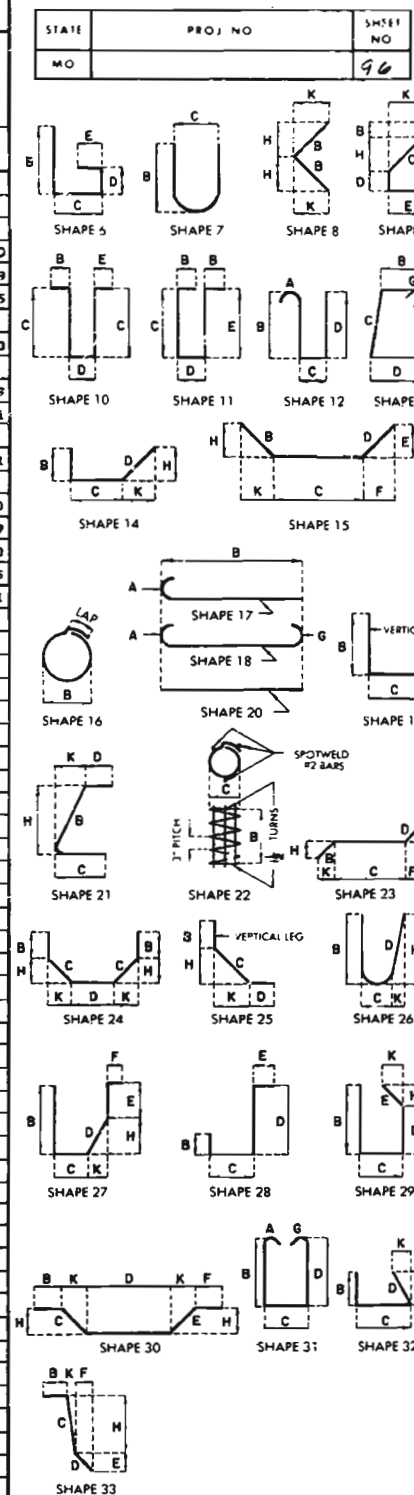
NO. REQ	MARK NO	LOCATION	EPOXY	SHAPE NO	STIRRUP	SUBSTR	VARIES	NO. EACH	DIMENSIONS												NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Note: 2 additional S16, S19 and V20 bars are included in bar bill for testing purposes.

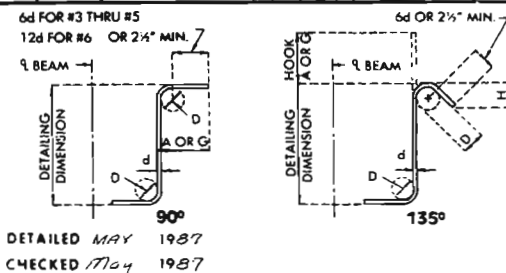
BAR SIZE	D (IN.)	END HOOK DIMENSIONS			
		180° HOOKS		90° HOOKS	
		A OR G	J	A OR G	J
#3	2 1/4"	5"	3"	6"	4"
#4	3"	6"	4"	8"	6"
#5	3 3/4"	7"	5"	10"	8"
#6	4 1/4"	8"	6"	12"	10"
#7	5 1/4"	10"	7"	14"	12"
#8	6"	11"	8"	16"	14"
#9	9 1/4"	15"	11 1/2"	19"	17"
#10	10 1/4"	17"	13 1/2"	22"	19"
#11	12"	19"	14 1/2"	24"	21"
#14	18 1/4"	23 1/2"	21 1/2"	27"	24"

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 DIAGRAM AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
- ACTUAL LENGTHS - ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST 1/8".
- PAYMENTS ARE BASED ON ACTUAL LENGTHS.



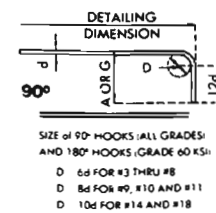
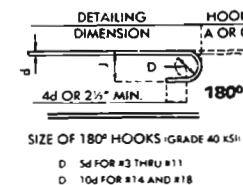
BENDING DIAGRAMS



BAR SIZE	D (IN.)	STIRRUP HOOK DIMENSIONS			
		GRADES 40-50-60 KSI		APPROX. H	
		90° HOOK	135° HOOK	90° HOOK	135° HOOK
#3	1 1/4"	4"	4"	2 1/4"	2 1/4"
#4	2"	4 1/4"	4 1/4"	3"	3"
#5	2 1/4"	6"	5 1/4"	3 1/4"	3 1/4"
#6	4 1/4"	12"	7 1/4"	4 1/4"	4 1/4"

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

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



MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

PLAN

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		85	72	
SEC. 1 SUR. 5632 TWP. 42N R43E R15E					

GENERAL NOTES:

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

Design Loading:
HS20-44 15' sq. ft. Future Wearing Surface.
Earth 120' cu. ft., Equivalent Fluid Pressure 30' cu. ft.
Fatigue Stress-Case II

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 Safety Barrier Curb) $f'_c = 4,000$ psi.

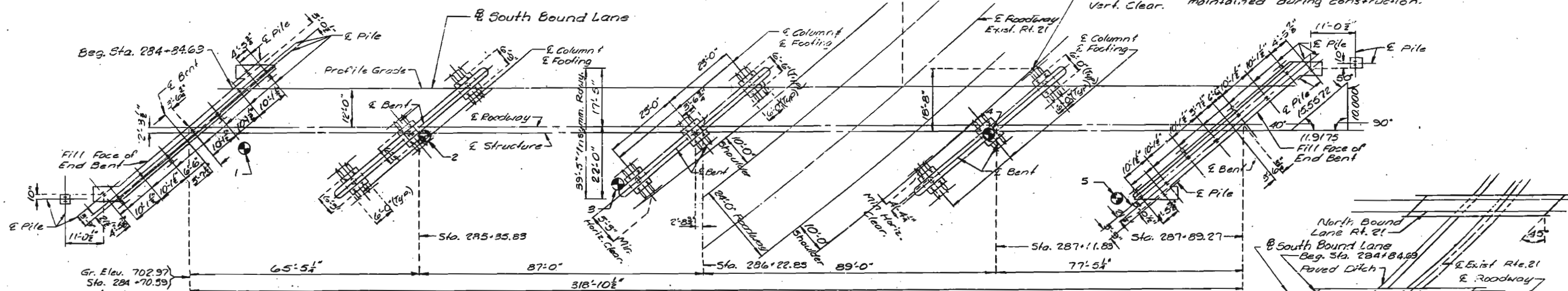
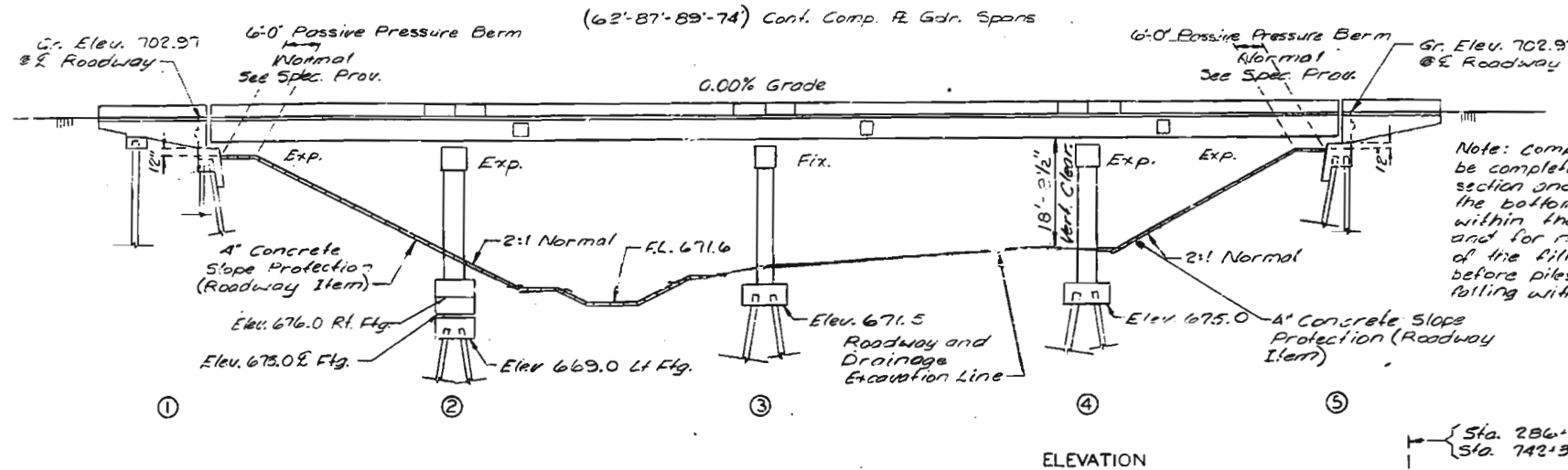
Reinforcing Steel: (Grade 60) $f_y = 60,000$ psi.
Structural Carbon Steel $f_y = 36,000$ psi.
Steel Pile $f_b = 9,000$ psi.

Fabricated Steel:
Field connections, High Strength Bolts $\frac{3}{4}$ " holes $\frac{1}{4}$ " except as noted.
Turn of Nut Method of tensioning high strength bolts will be permitted.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1" unless otherwise shown.
All reinforcing bars in tops of substructure beams or caps shall be spaced to clear anchor bolts for bearings by at least $\frac{1}{2}$ ".

Paint:
System B by contractor in accordance with Std. Spec. 712.12 (Color of the final field coat for System B shall be green).

Clearance:
A minimum vertical clearance of 14'-6" from crown of existing lanes and a minimum lateral clearance of 28'-0" centered on existing lanes shall be maintained during construction.



Note: \odot Indicates location of borings.
For boring data see

QUANTITIES			
ITEM	SUBSTR.	SUPERSTR.	TOTAL
Class I Excavation	Cu. Yd. 178		178
Slab Drains	Each 42		42
Structural Steel Pile (10 In.)	Lin. Ft. 1404		1404
Class B Concrete	Cu. Yd. 230.3		230.3
Slab on Steel, P/C PANEL OPTION	Sq. Yd. 1,475		1,475
Safety Barrier Curb	Lin. Ft. 0		0
Laminated Neoprene Brg. Pads (Steel Structures)	Each 25		25
Elastomeric Expansion Joint Seal (3.0 in.)	Lin. Ft. 123		123
Reinforcing Steel	Lb. 35,650		35,650
Reinforcing Steel (Epoxy Coated)	Lb. 3,630		3,630
Fabricated Structural Carbon Steel	Lb. 277,180		277,180
Painting System B Green	Tons 137.6		137.6
Vertical Drain at End Bents	Each 2		2
Pile Point Reinforcement	Each 56		56
Slip Form Safety Barrier Curb	Lin. Ft. 691		691

Note: All concrete and reinforcement in safety barrier curbs are included with superstructure quantities. Concrete above upper construction joint in backwall at end bents No. 1 & 5 is included with Class B (Substructure) quantities.

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

PLAN

PILE DATA						
BENT NO.	1	2	3	4	5	
Pile Type and Size	WING BEAM HP10x42	HP10x42	HP10x42	HP10x42	WING BEAM HP10x42	
Number	1 9	12	12	12	1 9	
Average Length Ft.	44' 42'	40'	16'	16'	38' 34'	
Design Bearing Tons	5 49	49	52	52	5 49	
Hammer Energy req'd. Ft. Lb.	7000 12100	11600	12200	12200	7000 12100	

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.

Note: See sheet No. 2 for Estimated Quantities for Alternate Slabs.

Accepted -
Prepared by - *Steve Wipac*
Resident Engineer
Dist. Office
Main Office

Date - 11-8-85
Date -
Date -

Sheet No. 1A of 18

④ LT. - 14'
E - 18'
RT. - 23'

B.M. Elev. 705.37 \odot on top of Northwest corner of Safety Barrier Curb.

BRIDGE S.B. LANE OVER EXISTING ROUTE 21

STATE ROAD FROM ROUTE 141 TO OTTO

ABOUT 3 MILES NORTH OF OTTO

PROJECT NO. MAF-21-2 (25) STA. 284+84.69

JOB NO. 6-P-21-17

JEFFERSON

RTE. 21 S.B.L.

COUNTY

DATE 6/15/87

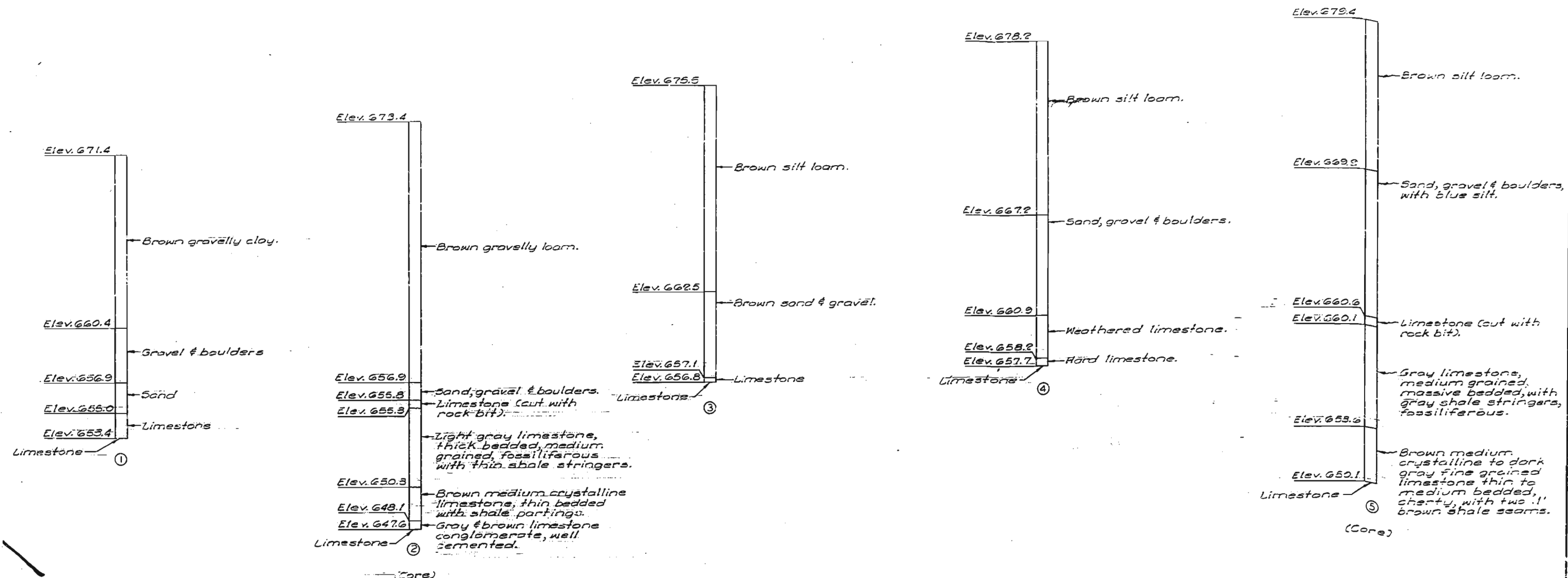
STD. 611.60

STD. 706.35

A-2941

DESIGNED May 16/85
DETAILED Dec. 19/85
CHECKED Jan. 19/86

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	60	



BORING DATA

Note: For location of borings see sheet No. 1.

QUANTITIES FOR SLAB			
TYPE OF SLABS	SLAB ON STEEL		
	REINF. (LBS.)		CONC.
	EPOXY	PLAIN	CU.YD.
Precast Panel Forms *	61,480	—	256.4

* Built P/C Panel Option.

Note: The table of Estimated Quantities for Alternate Slabs represents the quantities used by this state in preparing the cost estimate for concrete slabs. Variations may be encountered in these 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.
Used ON-Flex 35 Expansion Joint. (See Sheet 11)

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