

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
A	9	COLO. 1.002-2(48)	4	

### SUMMARY OF QUANTITIES - NORTH BRIDGE - F-16-EG

Item No.	Description	Unit	Superstructure	Abutment No. 1	Pier No. 2	Pier No. 3	Abutment No. 4	App. Slabs <sup>A</sup>	Total
14g	Common Excavation (Str.)	Cubic			65	65			130
16a	Structure Backfill (Class I)	Cubic Yard			36	36			72
16c	Mechanical Tamping	Hour		7	4	4	10		25
18a	Station Yard Overhaul	Stg. Yard							
18b	Yard Mile Overhaul	Yard Mile							
32a	Plant Mixed Asphaltic Surfacing	Ton	See Project Summary						
46a	Class "A" Concrete	Cubic Yard	210.0	24.9	49.0	50.6	27.7	47.0	363
47	Reinforcing Steel (Added 1% Overrun)	Pound	37675	2045	10885	10890	2300	5625	63,795
48	Structural Steel (Added 1/2% for paint)	Pound	181765		135	135			182035
61a	Steel Piling (8" BP @ 36")	Lin. Ft.		450			450		900
80c	Sheet Copper (32 oz.)	Pound	4						4
*	16 Ga. Galvanized Sheet Metal	Sq. Ft.	113						113
*	1/2" Expansion Joint Material - Type III	Sq. Ft.	131						131
91b	Steel Railing	Lin. Ft.	294					30	294
30a	Electrical Conduit with Junction Boxes	Lin. Ft.	151					30	151
60x	Drilling Holes to Facilitate Pile Driving			225			225		450

### SUMMARY OF QUANTITIES - SOUTH BRIDGE - F-16-EH

Item No.	Description	Unit	Superstructure	Abutment No. 1 Includes Med.	Pier No. 2	Pier No. 3	Abutment No. 4 Includes Med.	App. Slabs <sup>A</sup>	Total
14g	Common Excavation (Str.)	Cubic Yard			99	68			167
16a	Structure Backfill (Class I)	Cubic Yard			70	20			110
16c	Mechanical Tamping	Hour		8	6	6	11		33
18a	Station Yard Overhaul	Stg. Yard							
18b	Yard Mile Overhaul	Yard Mile							
32a	Plant Mixed Asphaltic Surfacing	Ton	See Project Summary						
46a	Class "A" Concrete	Cubic Yard	179.1	26.9	43.4	43.9	30.7	36.0	324
47	Reinforcing Steel (Added 1% Overrun)	Pound	31440	2000	9475	9475	2315	4525	54705
48	Structural Steel (Add 1/2% for paint)	Pound	157860	120	120	120	120		58340
61a	Steel Piling (8" BP @ 36")	Lin. Ft.		550			550		1100
80c	Sheet Copper (32 oz.)	Pound	4						4
60x	Drilling Holes to Facilitate Pile Driving	Lin. Ft.		264			275		539
*	1/2" Expansion Joint Material - Type III	Sq. Ft.		26			26		52
*	16 Ga. Galvanized Sheet Metal	Sq. Ft.	88						88
*	1/2" Expansion Joint Material - Type III	Sq. Ft.	107						107
91b	Steel Railing	Lin. Ft.	294	15			5	50	324
30a	Electrical Conduit with Junction Boxes	Lin. Ft.	151					5	151

\* To be included in bid price of Class "A" Concrete. Expansion Joint Material shall be according to AASHTO Specification M-153-54 and of the type shown.  
 Δ Total Quantities do not include Quantities for Approach Slabs.  
 + Steel Pipe Piles 10 3/4" OD x 0.188 wall thickness may be used in place of the 8" BP @ 36"

#### GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.

ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINMENT AS SPECIFIED.

ALL CONCRETE SURFACES EXPOSED TO WEATHER SHALL RECEIVE AN OXYGEN-BARRIER FINISH.

CLASS "A" SURFACE FINISHING SURFACES SHALL RECEIVE ORDINARY SURFACE FINISH.

CONCRETE GIRDERS, FLOOR SLABS, AND CURBS SHALL BE POURED MONOLITHICALLY.

FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHEET OR TONGUE AND GROOVE LUMBER 1 1/2" UNLESS FACED WITH PANEL BOARD.

FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.

SOUNDINGS AND DEPTHS OF FOOTINGS SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REVISION IS NECESSARY.

ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305-50T OR THE LATEST REVISION THEREOF AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT.

SECONDARY BARS WHEN SPICED SHALL LAP 20 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.

ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM UNLESS OTHERWISE NOTED EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.

HANDRAIL EDGES SHALL HAVE HEX HEADS, NUTS, AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL RIVETS EXCEPT AS NOTED ARE 1/2" DIA. AND SHALL BE POWER DRIVEN.

WHEN TREATED TIMBER OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CREOSOTE OIL.

WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.

HIGH STRENGTH BOLTS MAY BE USED IN PLACE OF FIELD RIVETS BUT AT NO ADDITIONAL EXPENSE TO THE STATE. THE BOLTS TO BE HIGH TENSILE STEEL AND SHALL BE ASSEMBLED IN ACCORDANCE WITH SPECIFICATIONS APPROVED BY THE RESEARCH COUNCIL ON RIVETS AND BOLTED STRUCTURAL JOINTS OF THE ENGINEERING FOUNDATION JAN. 31, 1951.

PRIMARY BARS SHALL NOT BE SPICED EXCEPT BY PERMISSION OF THE ENGINEER. WHEN SPICED THEY SHALL LAP 20 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.

AND 20 DIAMETERS FOR BARS NEAR BOTTOM OF MEMBERS.

#### LOADING DATA

LIVE LOAD: HS 20-44  
 DEAD LOAD: 150 lbs per sq ft  
 WIND LOAD: 30 lbs per sq ft  
 ICE LOAD: 10 lbs per sq ft

#### DESIGNING DATA

REINFORCING STEEL: 20000 lbs per sq ft  
 STRUCTURAL STEEL: 18000 lbs per sq ft  
 IN: 10

**COLORADO**  
 DEPARTMENT OF HIGHWAYS

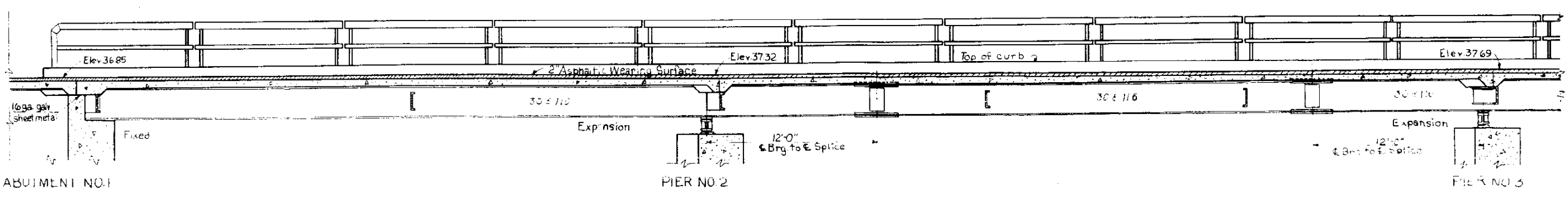
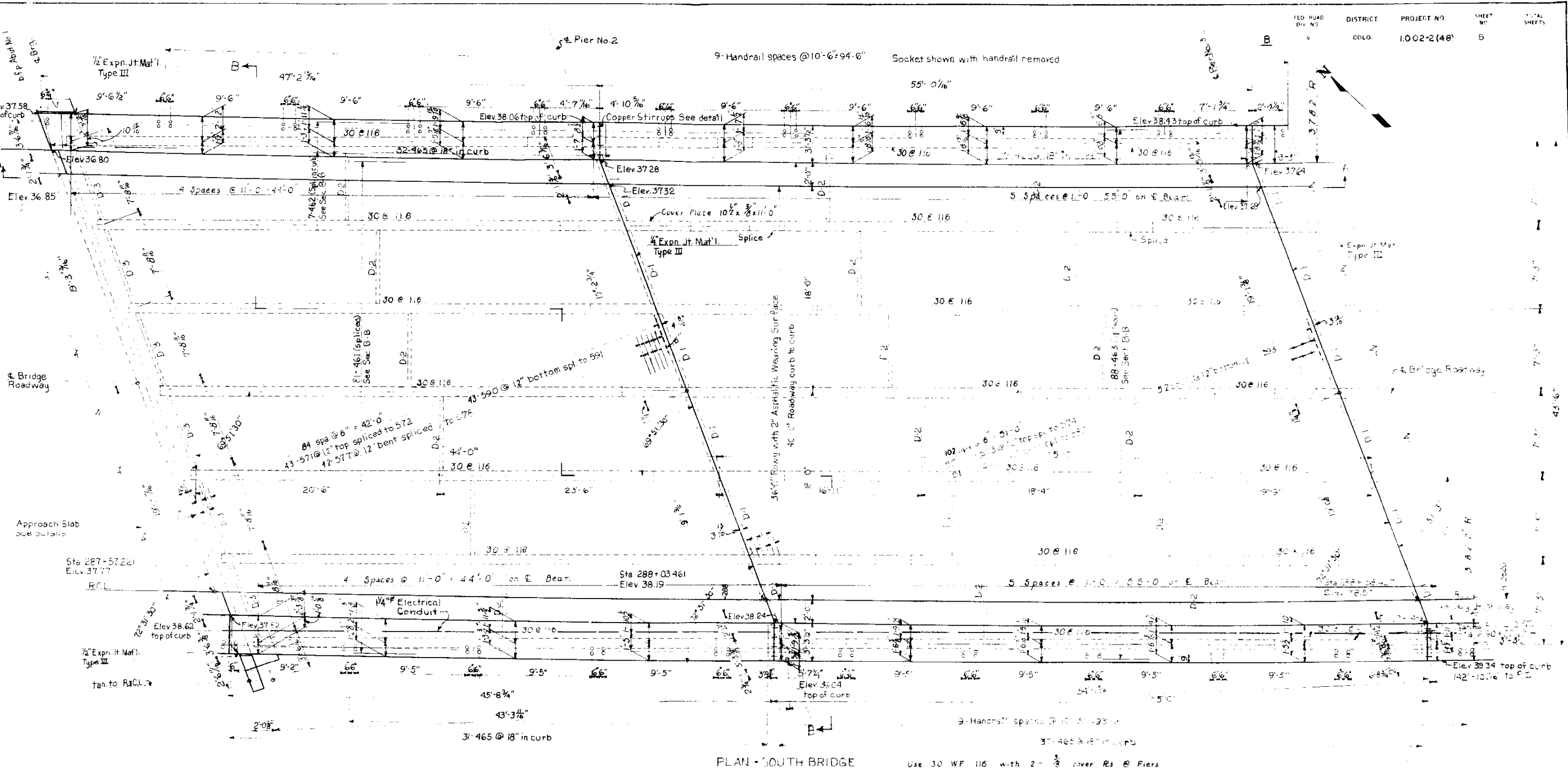
**2-3 SPAN (44'-55'-44') CONTINUOUS  
 CONCRETE SLAB & W/F BEAM BRIDGES  
 50'-0" RDWY (NORTH); 40'-0" RDWY (SO.)**

**GENERAL LAYOUT, SUMMARY OF QUANTITIES**

Across Saw: Relocation At Valley Highway  
 No. Bridge Sta. 286+63.30 To 289+04.22  
 So. Bridge Sta. 287+57.22 To 289+04.22

in Denver      45 R 68W  
 Made by      Bridge Engineer  
 Checked by      Date      1956

NORTH BRIDGE F-16-EG  
 STRUCTURE NO. SOUTH BRIDGE F-16-EH

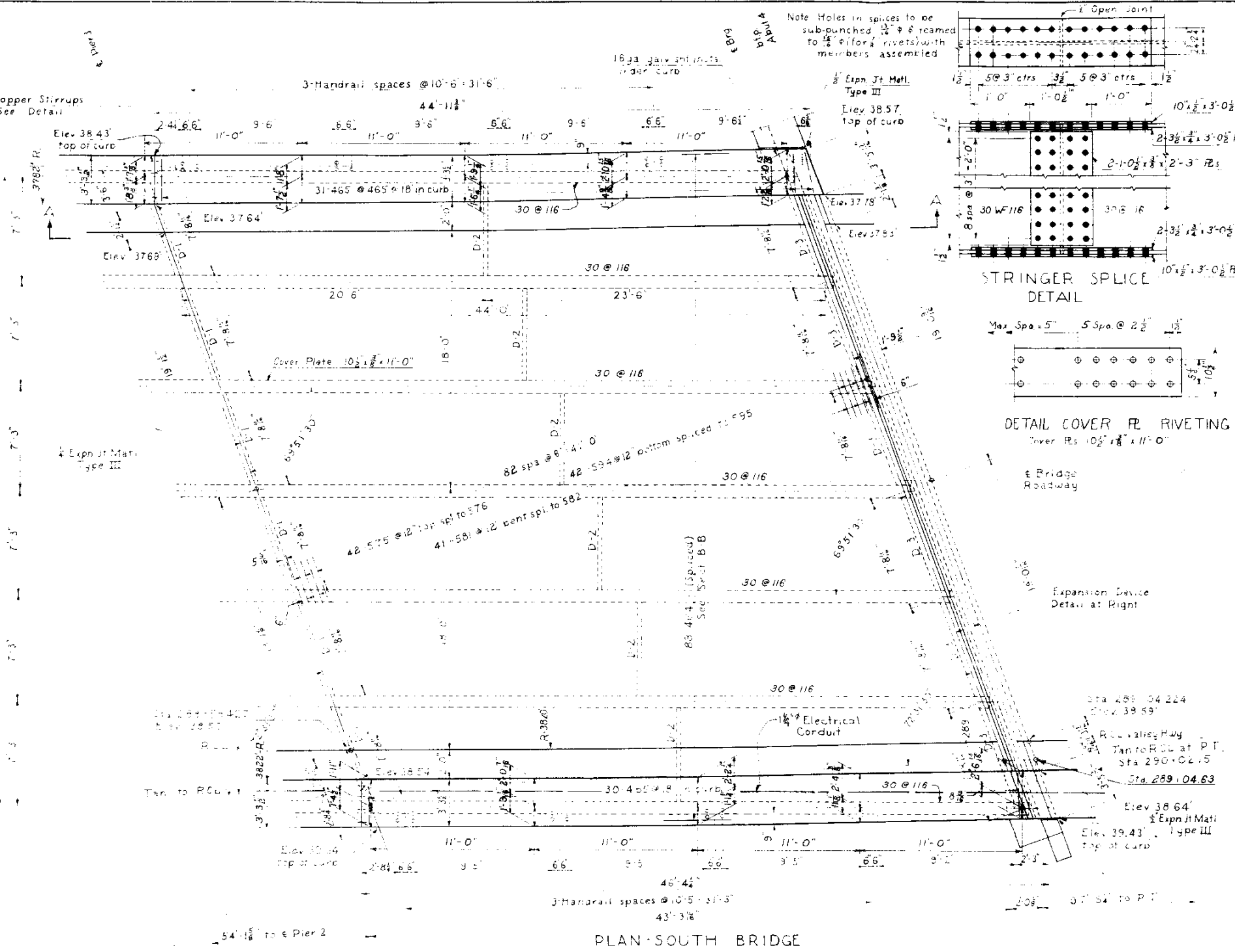


**COLORADO**  
**DEPARTMENT OF HIGHWAYS**  
**3 SPAN (44'-55'-44') CONTINUOUS**  
**CONCRETE T-BEAM BRIDGE**  
**40'-0" ROADWAY 2'-0" CURBS**  
**SUPERSTRUCTURE SPAN 1&2**

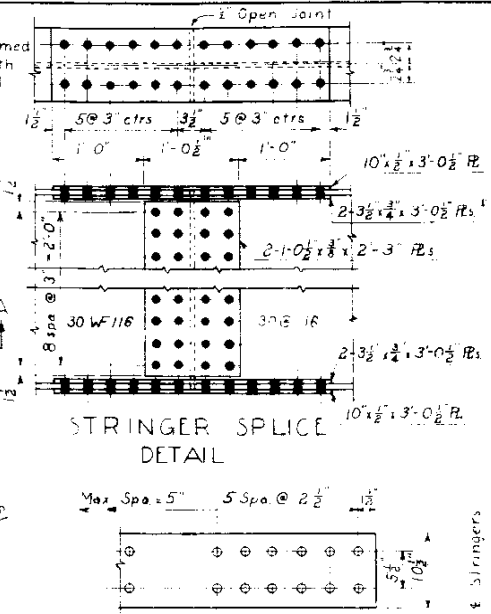
Armed Sp. Concrete - 8" x 12" x 14" H.W. I-Beams  
 South Bridge - Sta. 287+57.22 to 289+04.22  
 Denver - 7th & B. Ave.

Designed by J.D.W. Approved by R.T.T. Bridge Engineer  
 Made by R.T.T. Checked by  
 Date: 10/25/1956

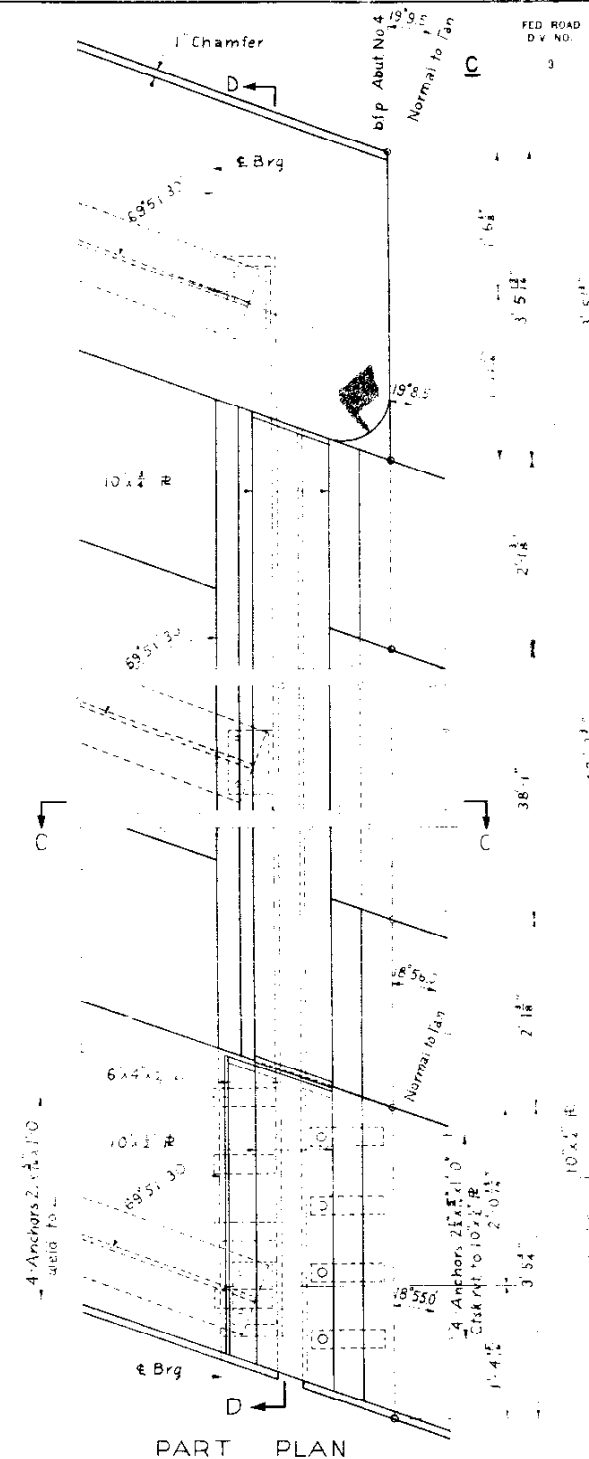
STRUCTURE NO. F-16-EH



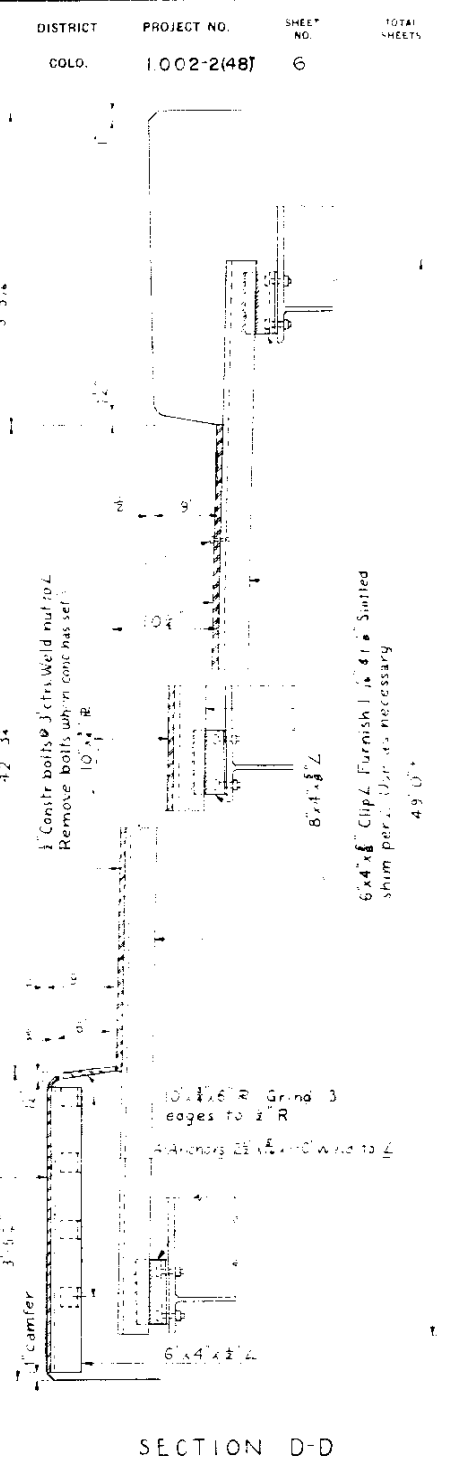
PLAN SOUTH BRIDGE



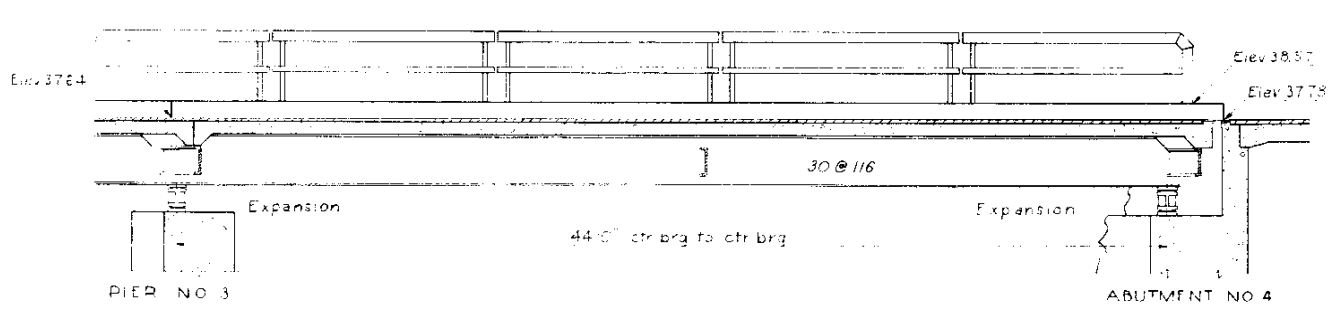
STRINGER SPlice DETAIL  
 DETAIL COVER PLATE RIVETING



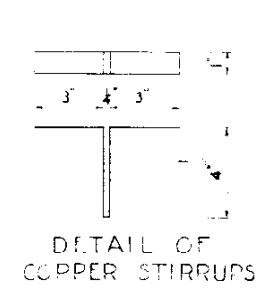
PART PLAN



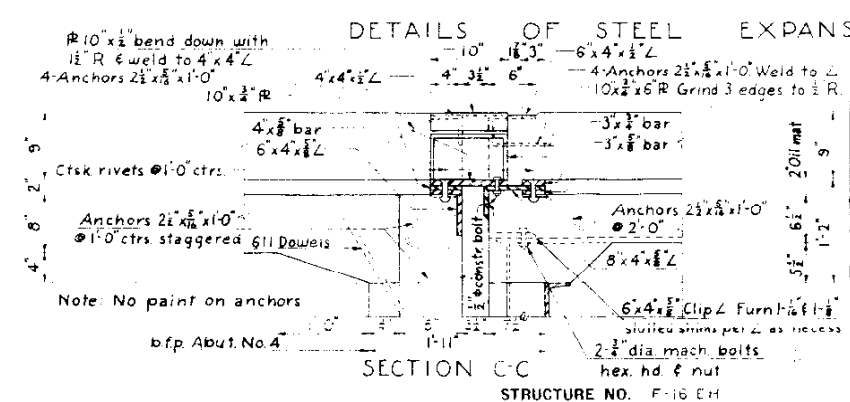
SECTION D-D



SECTION A-A



DETAIL OF COPPER STIRRUPS

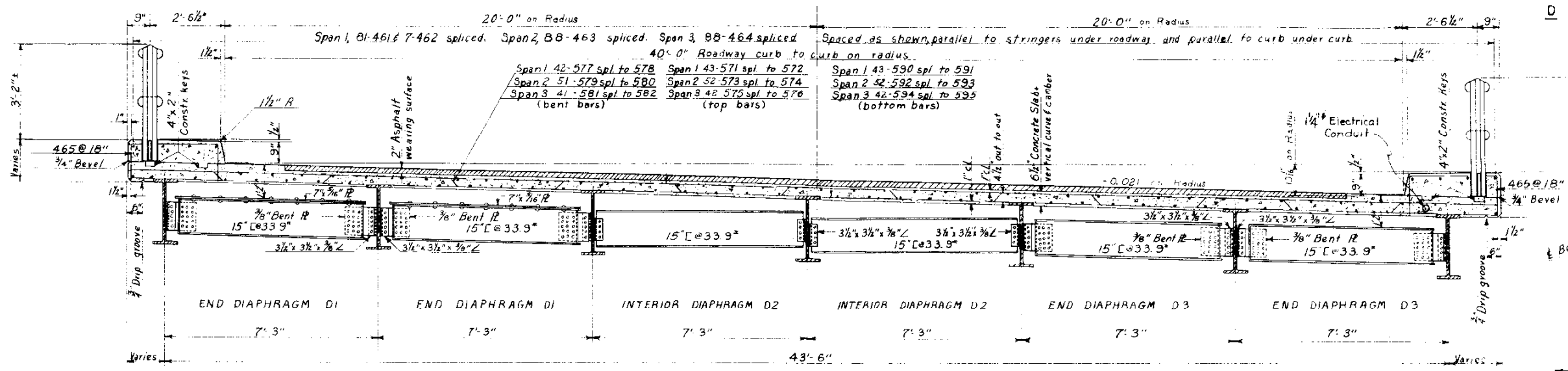


SECTION C-C

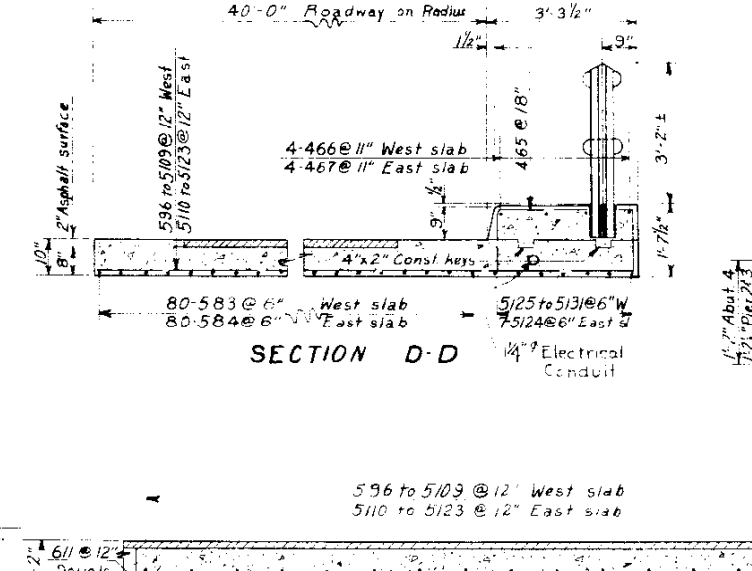
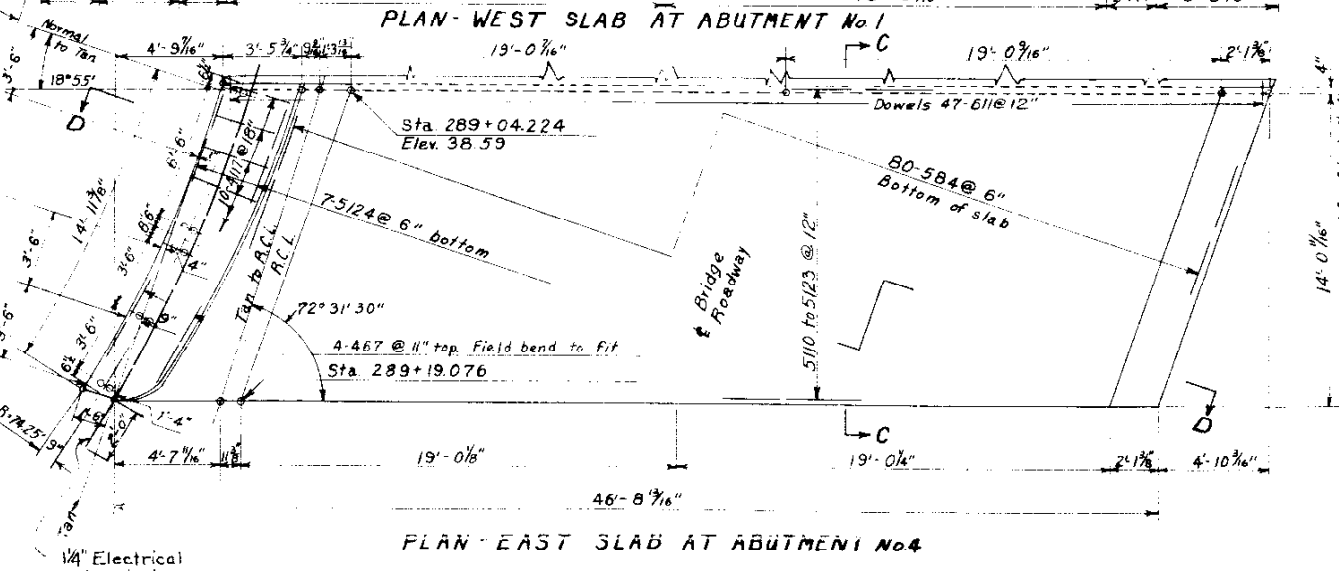
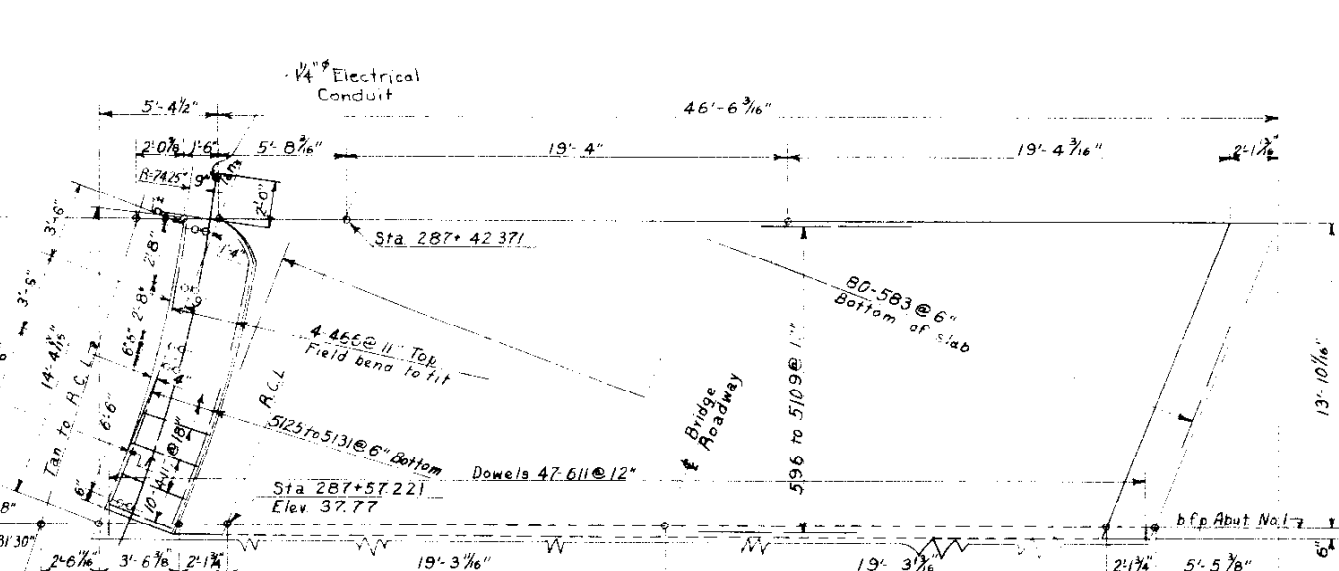
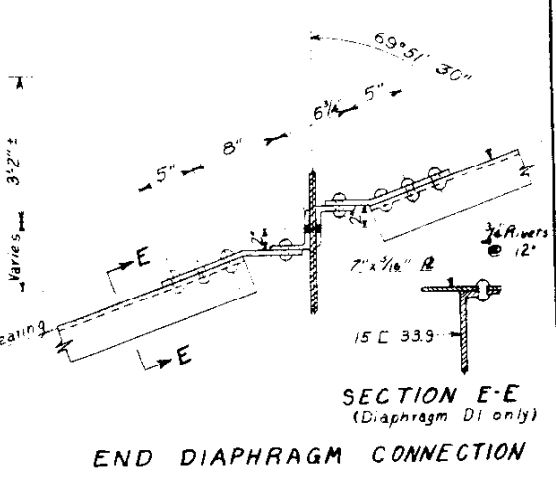
**COLORADO DEPARTMENT OF HIGHWAYS**  
 3 SPAN (44'-55'-44') CONTINUOUS CONCRETE I-BEAM BRIDGE  
 40'-0" ROADWAY 2'-0" CURBS SUPERSTRUCTURE SPAN 3

Across Spur Relocation at Valley Hwy Sta. 287+57.22 to 289+04.22 In Center Section T. 45. R. 65W  
 Designed by D.V. Approved by T. L. A. Bridge Engineer  
 Made by RTT Checked by Date: 1956

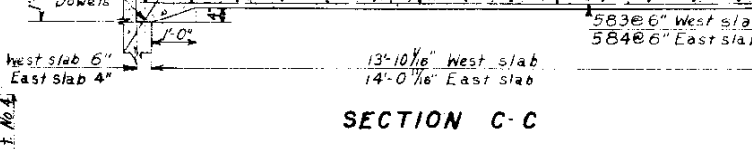
STRUCTURE NO. F-16 EH



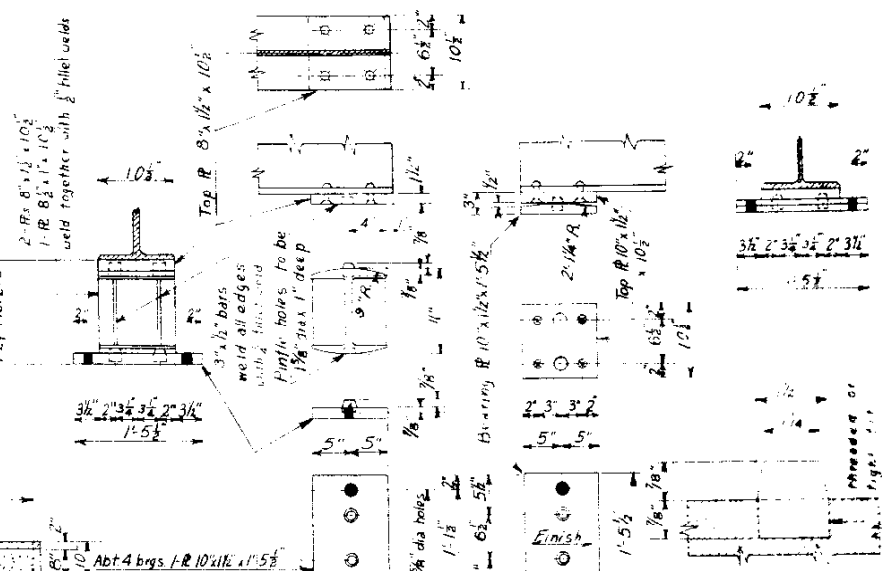
SECTION B-B ON SUPERSTRUCTURE PLAN



SECTION D-D



SECTION C-C



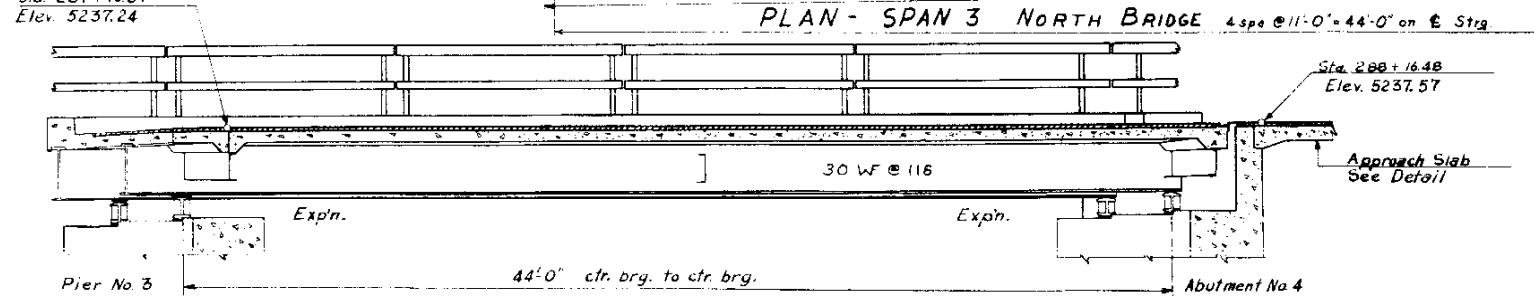
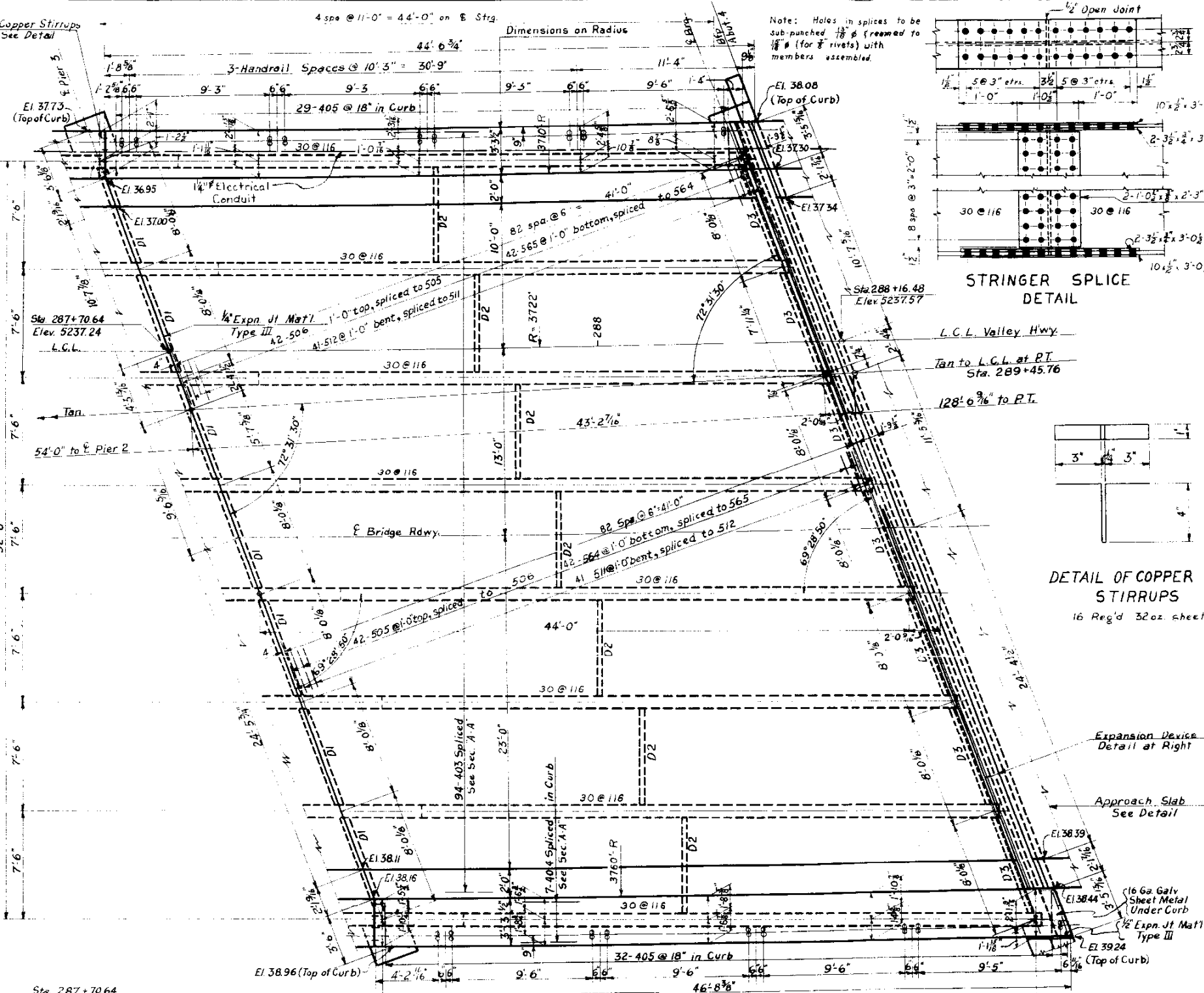
EXPANSION BEARING  
 7 Req with 1 1/2" Brg R for Abut 4  
 14 Req with 1 1/2" Brg R for Pier 2 & 3

FIXED BEARING  
 7 Req for Abut 1

DETAIL OF ROCKER BEARINGS

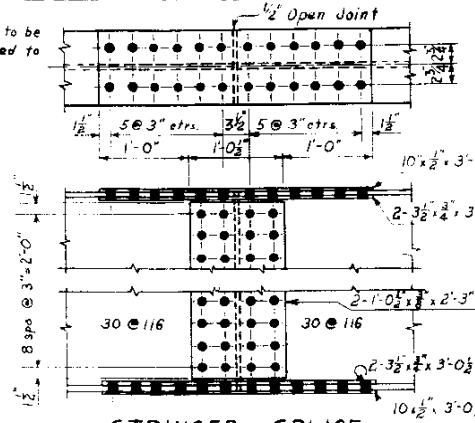
**COLORADO**  
 DEPARTMENT OF HIGHWAYS  
 3 SPAN (44'-55'-44') CONTINUOUS  
 CONCRETE & I BEAM BRIDGE  
 40'-0" ROADWAY  
 2'-0" CURBS 69°51'30" SKEW  
 APPROACH SLABS, BEARING  
 AND DIAPHRAGM DETAILS  
 Arroyo Spur Relocation at Valley Hwy.  
 Sta 287+57.22 to 289+04.22  
 Project No. 1.002-2(48)  
 Sheet No. 7 of 40 R&RW

Designed by J.D.W. Approved by [Signature] Bridge Engineer  
 Made by RTT  
 Checked by [Signature] Date: [Signature] 5. 1956

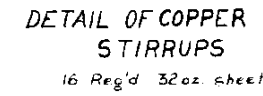


SECTION ALONG LEFT CONTROL LINE (L.C.L.)

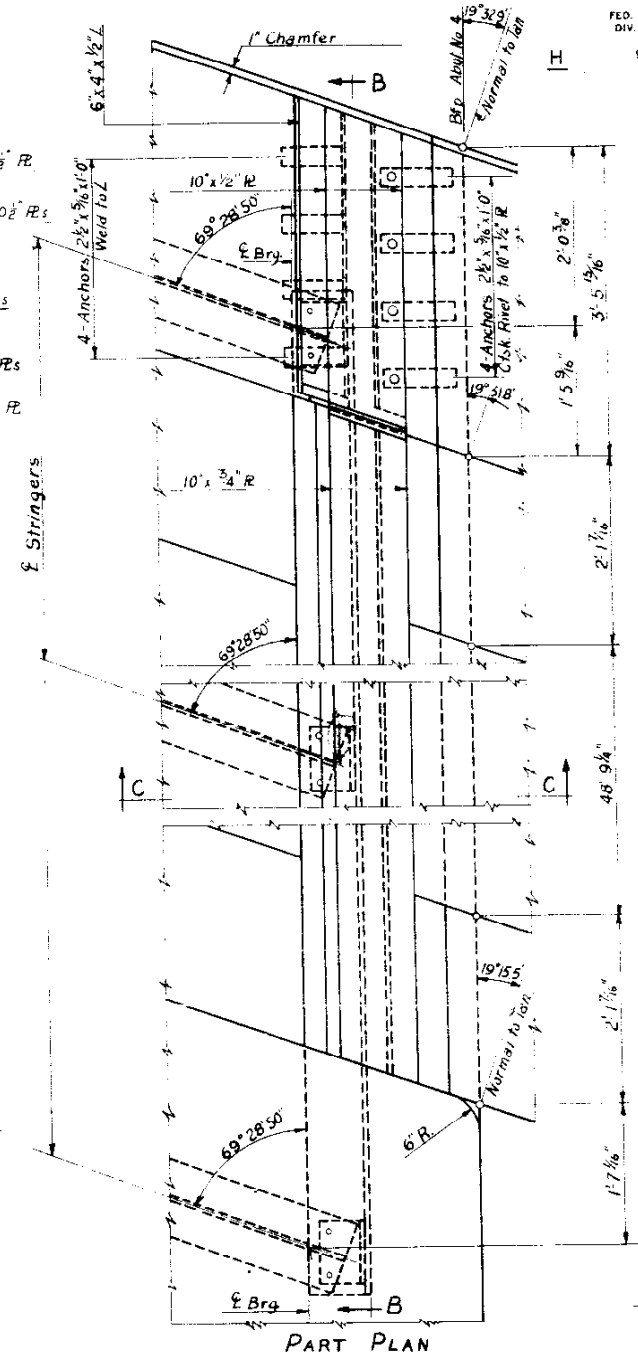
Reinforcing Bar Dimensions are to  $\frac{1}{2}$  of Bar Unless Marked "Clear" (Cl.)



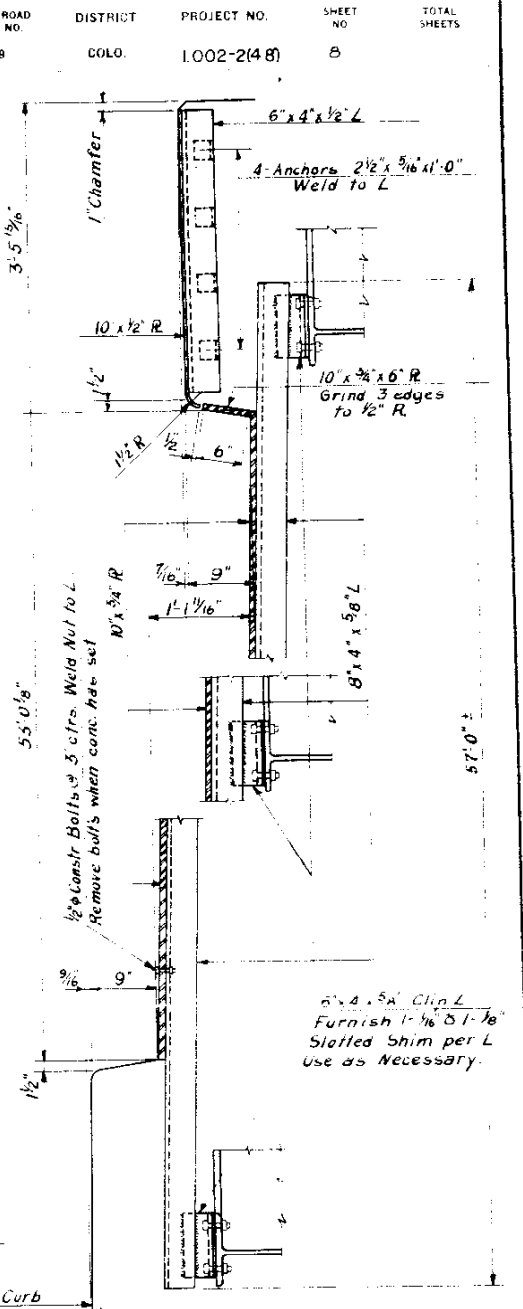
STRINGER SPLICE DETAIL



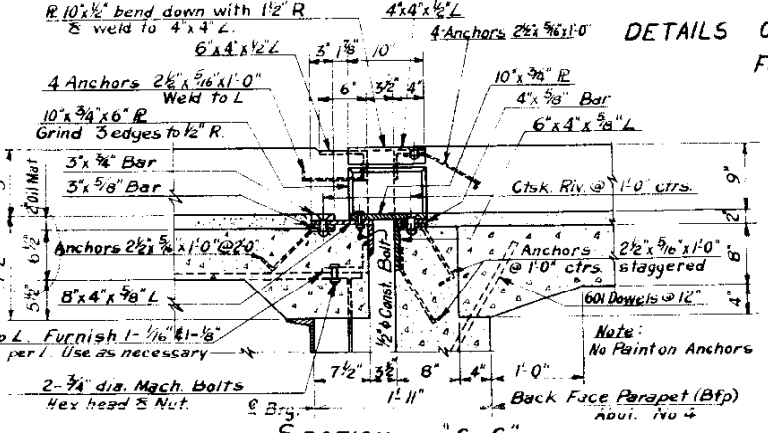
DETAIL OF COPPER STIRRUPS



PART PLAN



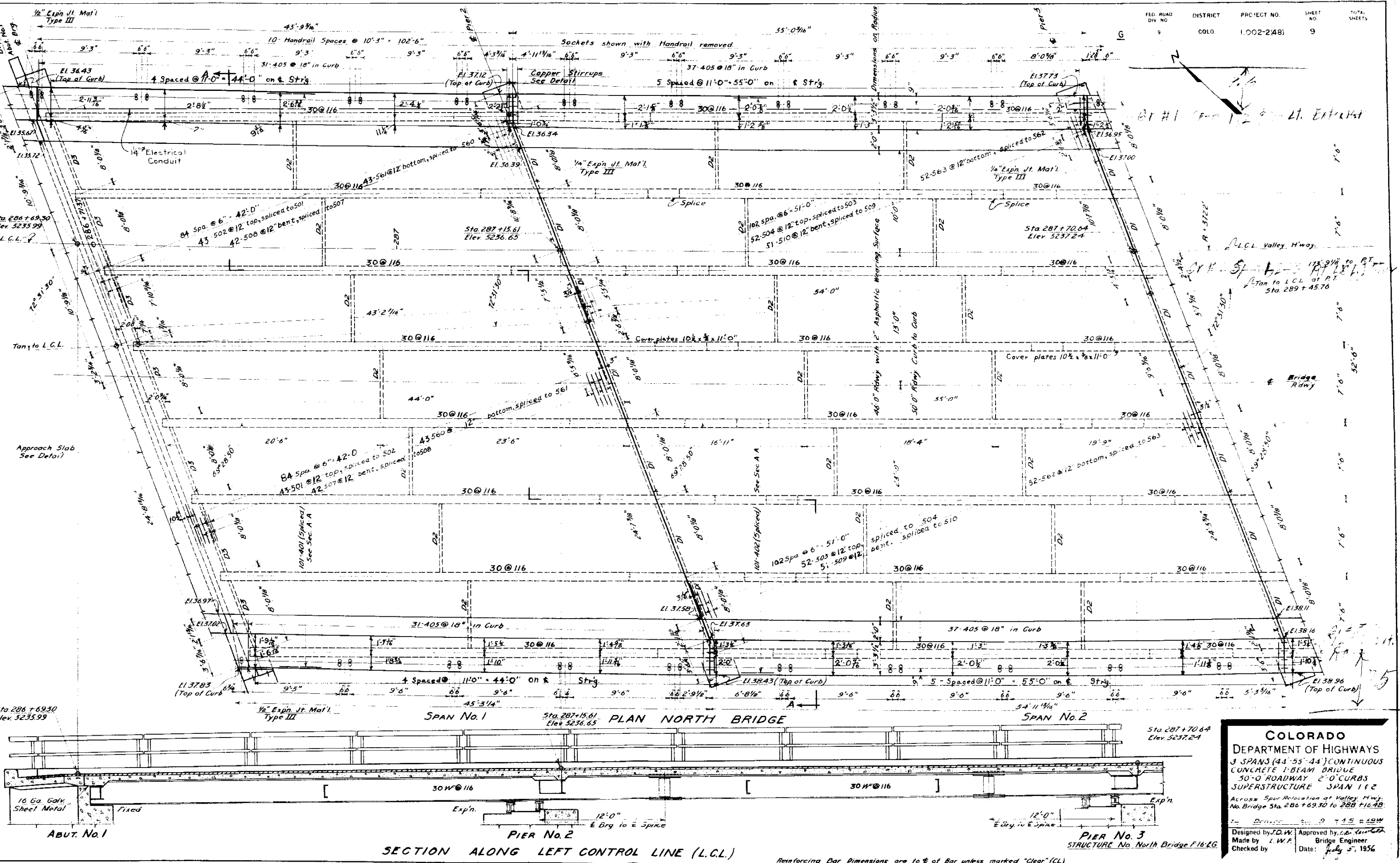
SECTION "B-B"



SECTION "C-C" NORTH BRIDGE STR. No. F-16-EG

DETAILS OF STEEL EXPANSION DEVICE FOR NORTH BRIDGE (F-16-EG)

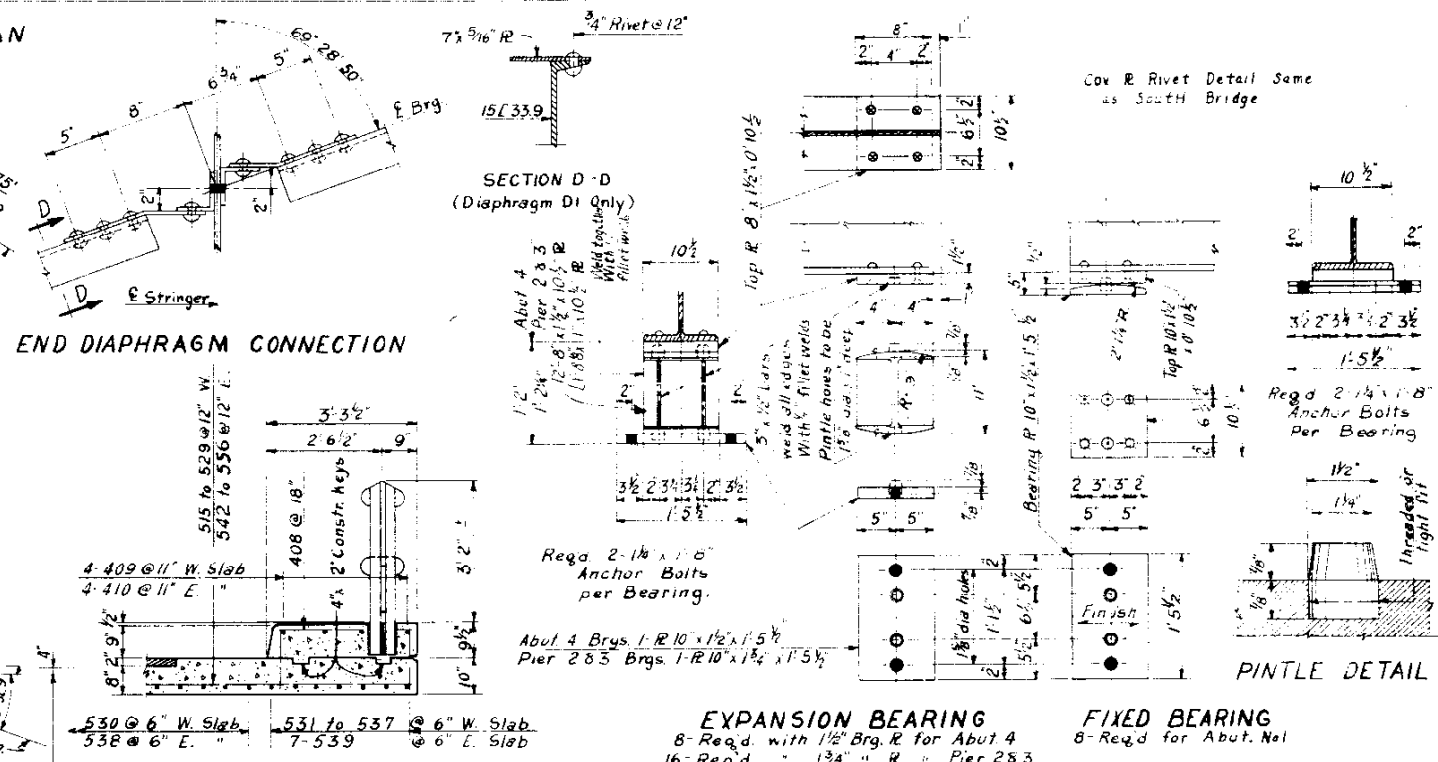
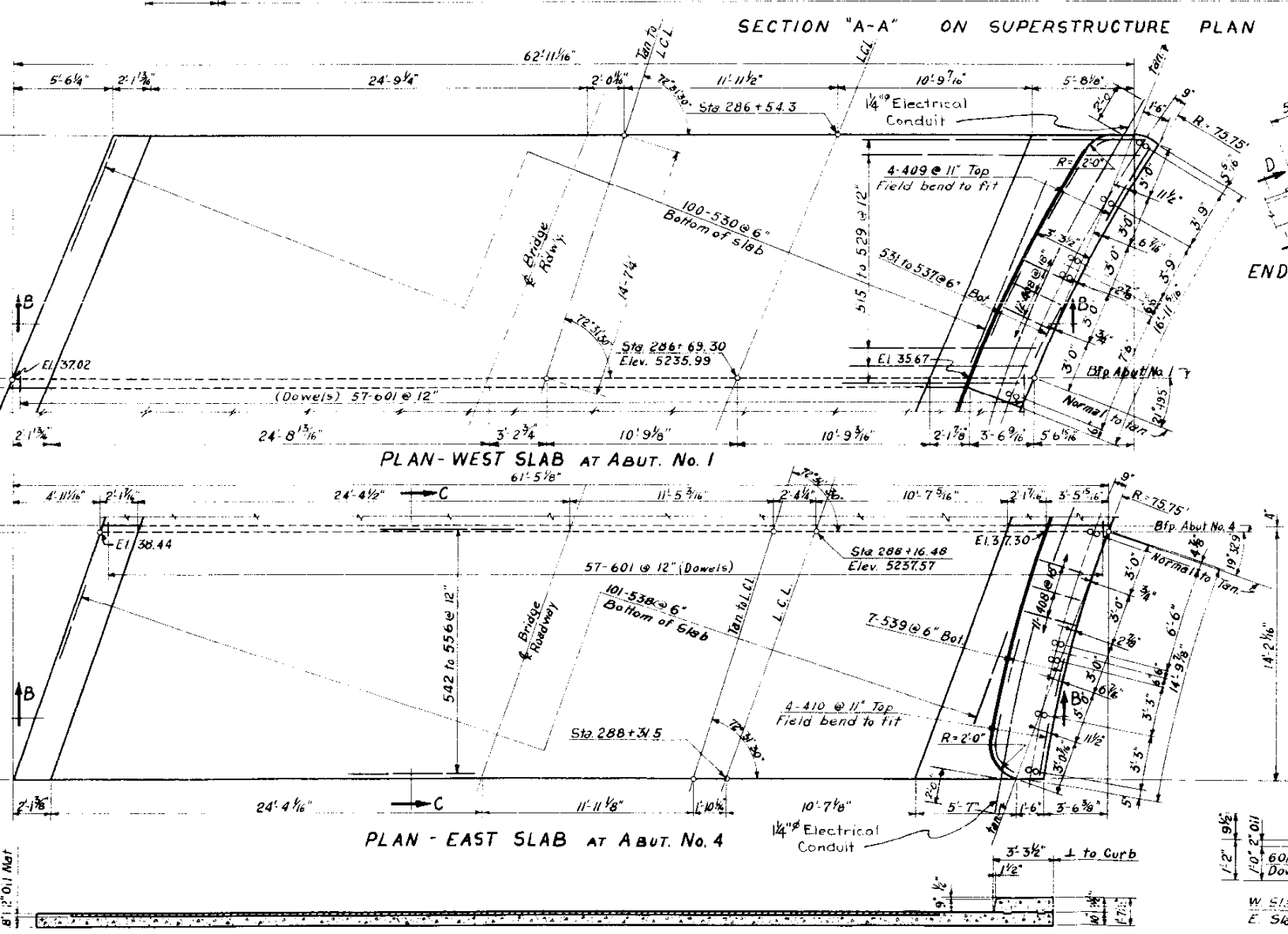
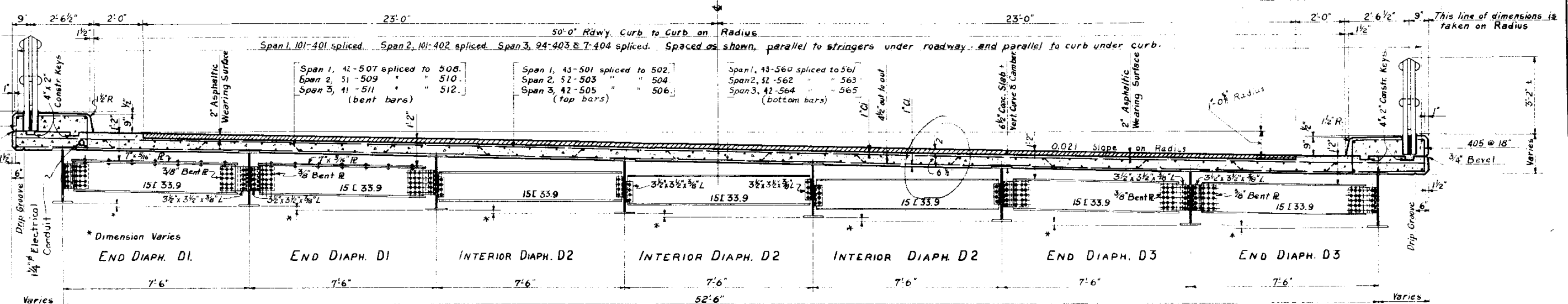
**COLORADO DEPARTMENT OF HIGHWAYS**  
 3 SPAN (44'-5 1/2' x 41') CONTINUOUS CONCRETE T-BEAM BRIDGE  
 50'-0" ROADWAY 2'-0" CURBS SUPERSTRUCTURE SPAN 3  
 ACROSS SPUR RELOCATION AT VALLEY HWY. NORTH BRIDGE STA 286+69.30 TO 288+16.48  
 IN DENVER Sep 9 T & S P. 68 RW  
 Designed by J.D.W. Approved by L.W.F. Bridge Engineer  
 Made by L.W.F. Checked by Date July 5, 1956



**COLORADO**  
 DEPARTMENT OF HIGHWAYS  
 3 SPANS (44'-55'-44') CONTINUOUS  
 CONCRETE I-BEAM BRIDGE  
 30'-0" ROADWAY 2'-0" CURBS  
 SUPERSTRUCTURE SPAN 1 & 2  
 Across Spur Relocation at Valley Hwy.  
 No. Bridge Sta. 286 + 69.30 to 288 + 16.48

Designed by D.W. Approved by L.W.A.  
 Made by I.W.A. Bridge Engineer  
 Checked by Date: July 5, 1956

Reinforcing Bar Dimensions are to  $\pm$  of Bar unless marked "Clear" (CL)



**SECTION 'B-B'**  
**DETAILS OF APPROACH SLABS-NORTH BRIDGE**  
**SECTION 'C-C' FOR EAST SLAB SHOWN**  
**(FOR WEST SLAB SIMILAR AS NOTED) STRUCTURE NO. F-16-EG N. Bridge**

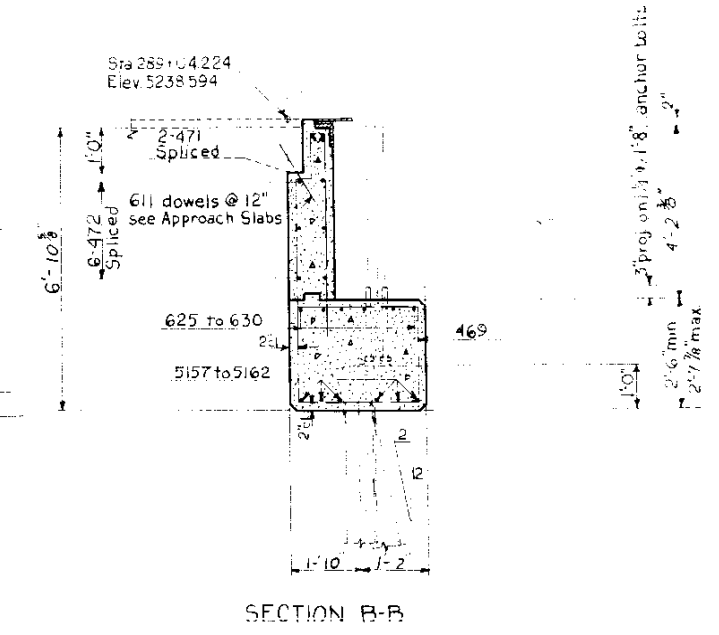
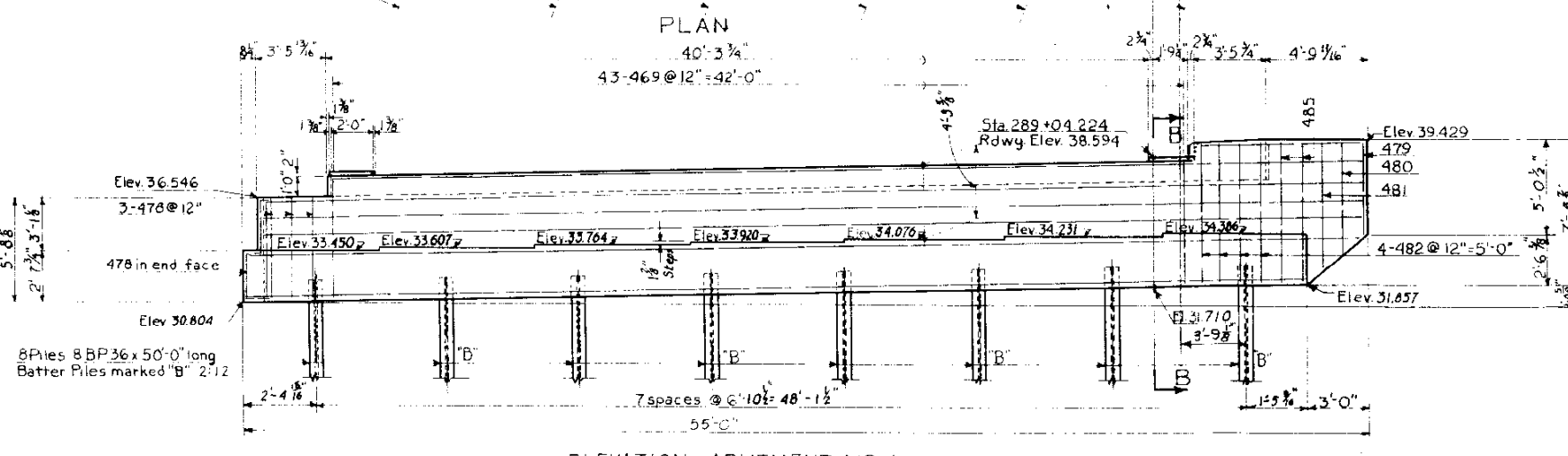
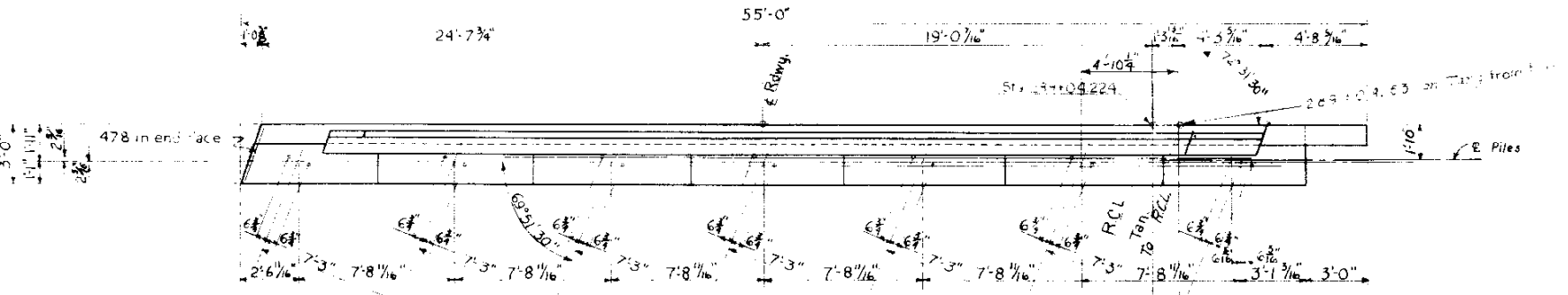
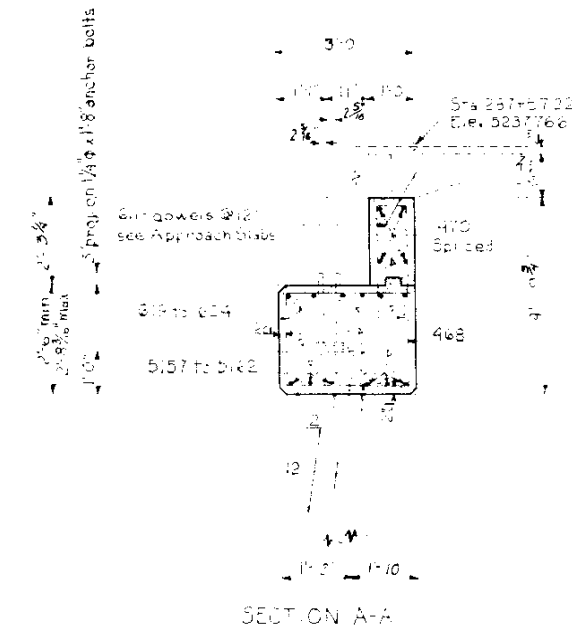
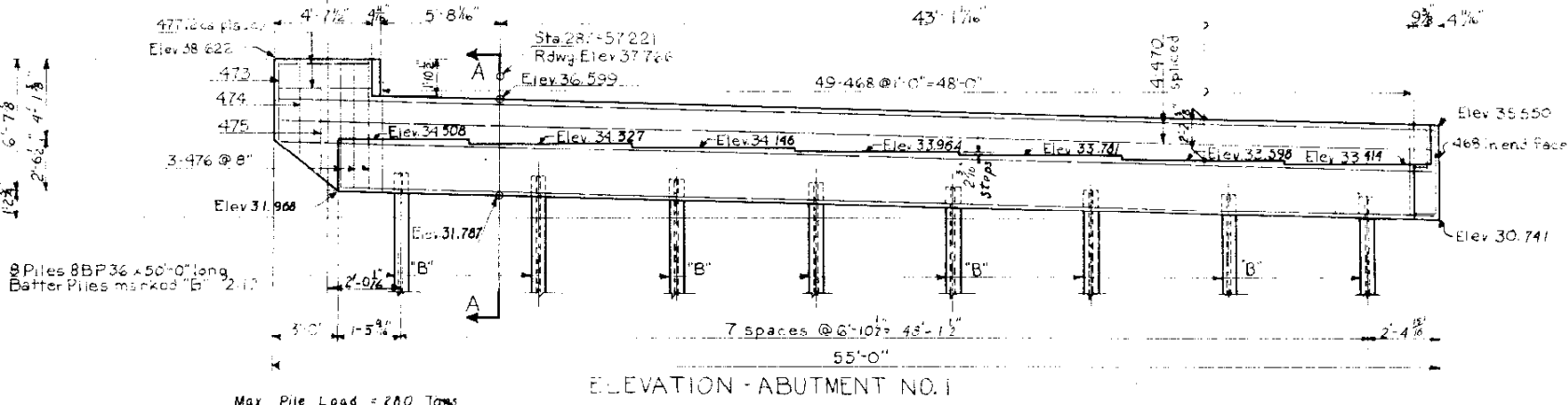
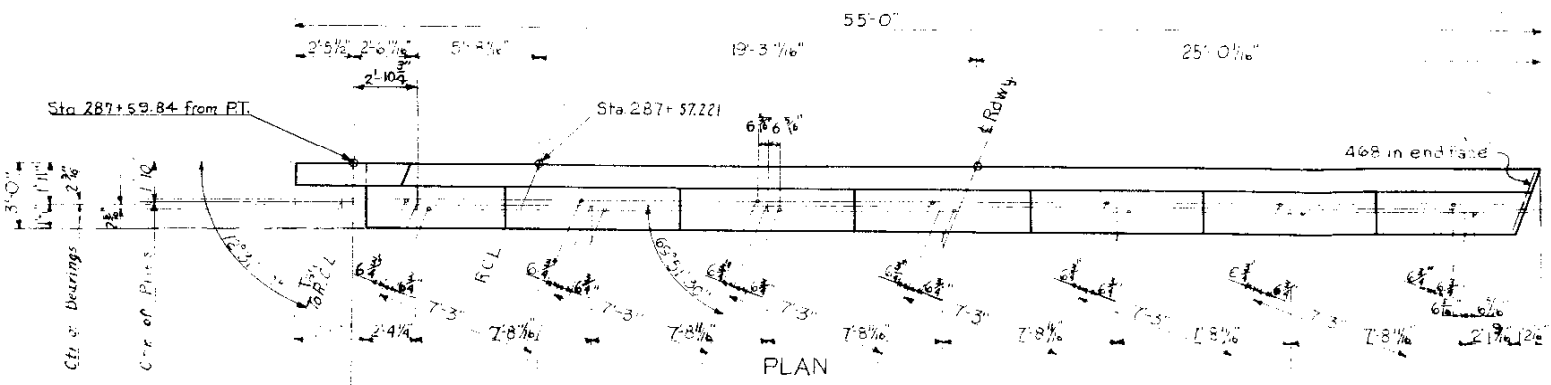
**COLORADO**  
**DEPARTMENT OF HIGHWAYS**  
3 SPAN (44'-35'-44') CONTINUOUS  
CONCRETE T-BEAM BRIDGE  
30'-0" ROADWAY 2'-0" CURBS  
APPROACH SLAB, BEARING &  
DIAPHRAGM DETAILS  
Across Spur Relocation at Valley Highway.  
Sta. 286+69.30 to 288+16.48  
En. Drawn Sec. 9 T. 45 R. 62W  
Designed by L. W. F. Approved by L. W. F.  
Made by L. W. F. Bridge Engineer  
Checked by Date: July 5, 1956

REVISIONS

Rev 1-4-57 JVG Changed Dimensions

FED. ROAD DIST. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	1.002-248	11	

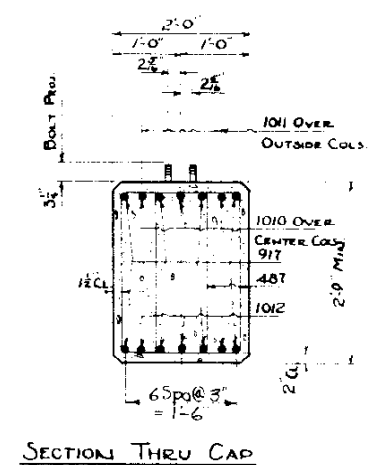
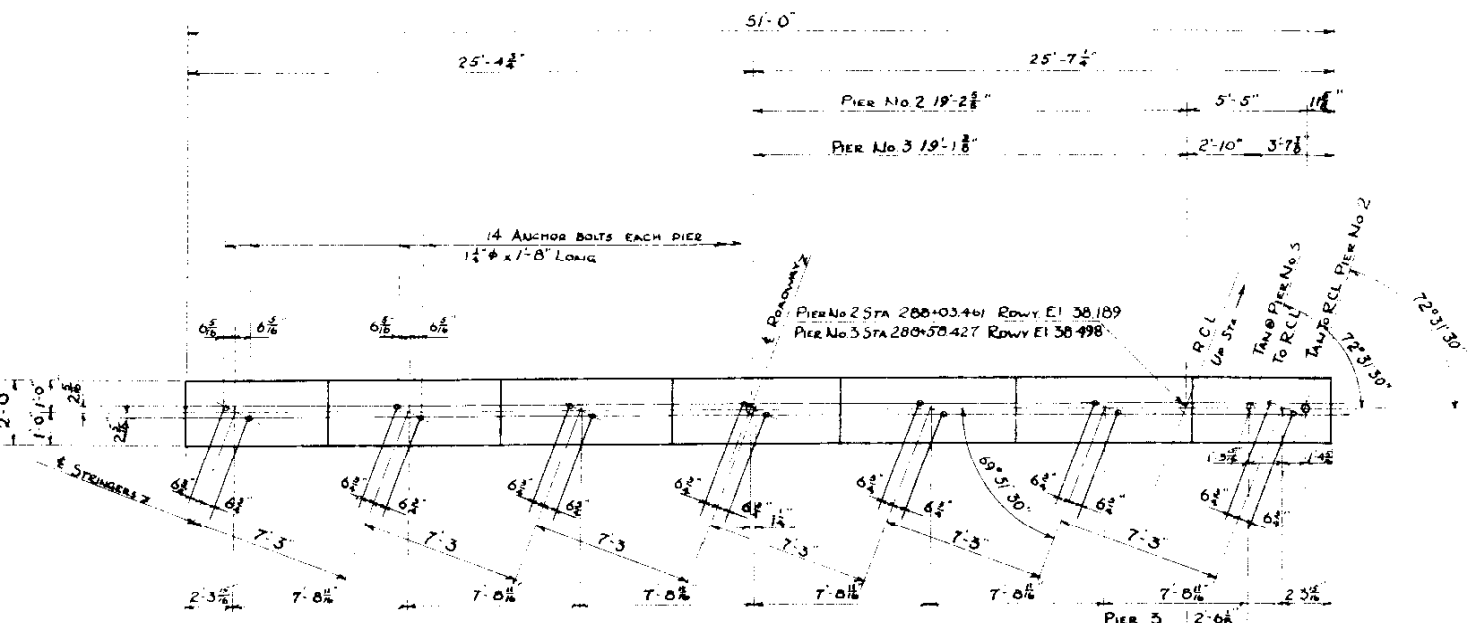
E



SOUTH  
STRUCTURE NO. F-16-EH

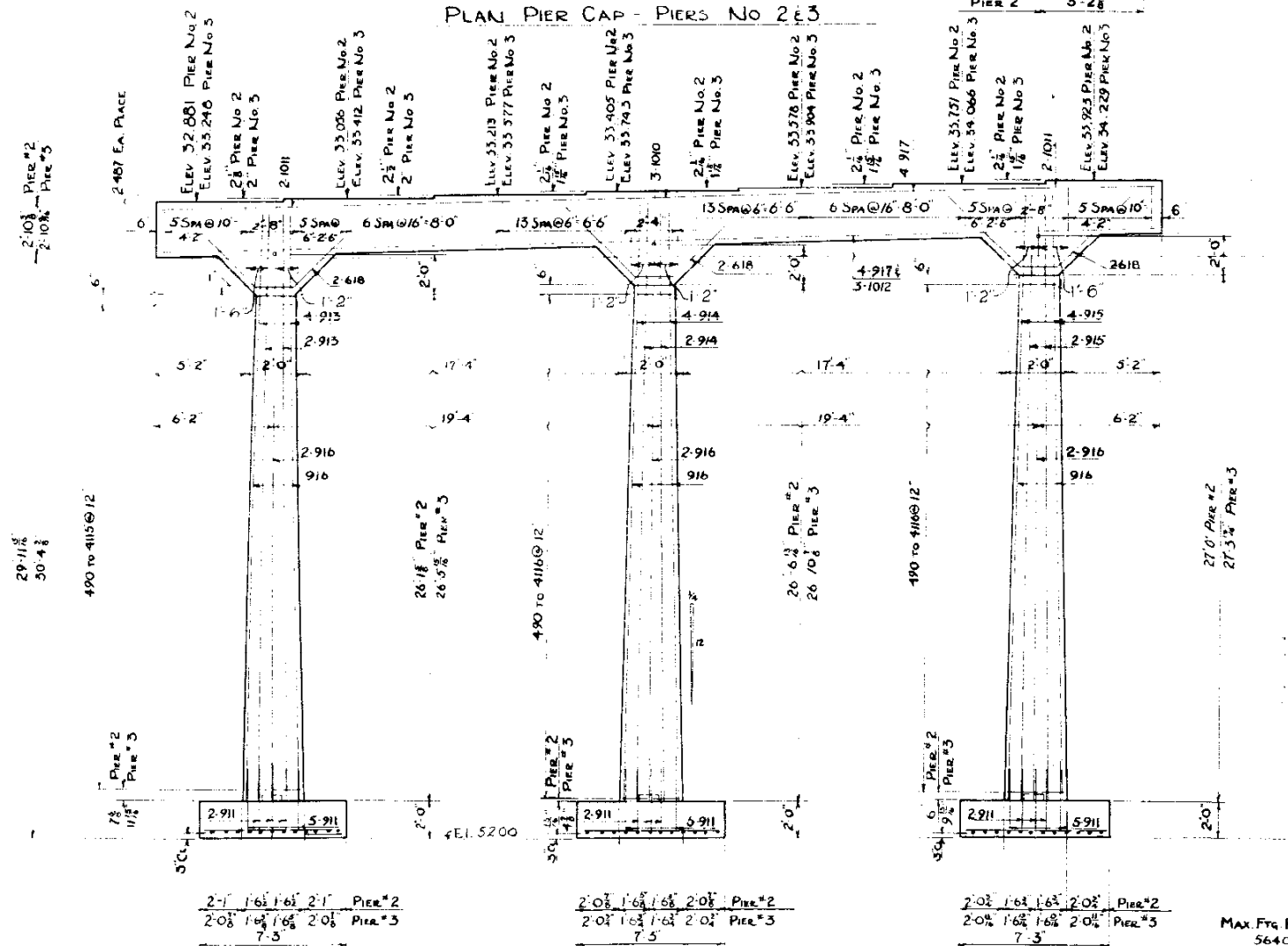
**COLORADO**  
DEPARTMENT OF HIGHWAYS  
3 SPANS (44'55.4') CONTINUOUS  
CONCRETE I-BEAM BRIDGE  
40'-0" ROADWAY 2'-0" CURBS  
ABUTMENTS NO 1 & 4  
Across Spur Relocation at Valley Hwy.  
Sta. 287+57.22 to 289+04.22  
In Denver Sec 9 T.4S R.68W  
Designed by J.D.W. Approved by R.T.T.  
Made by R.T.T. Bridge Engineer  
Checked by Date: 1956



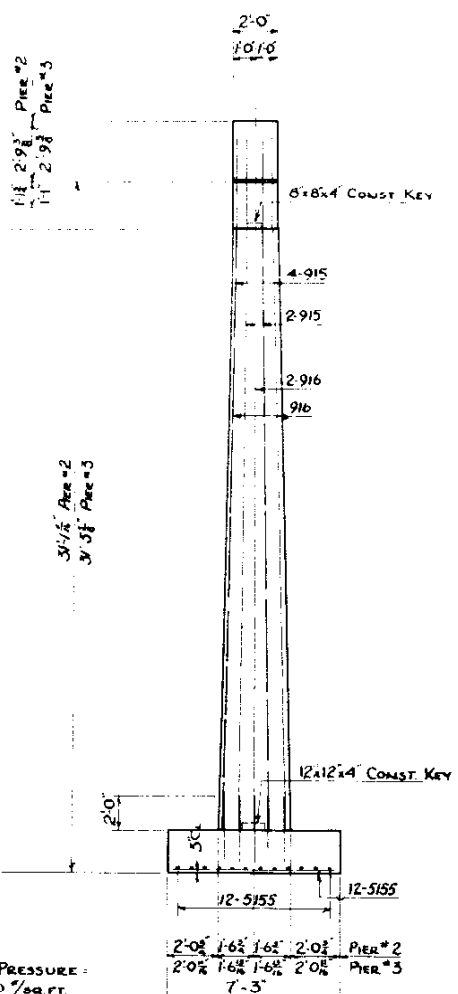


PLAN PIER CAP - PIERS NO 2 & 3

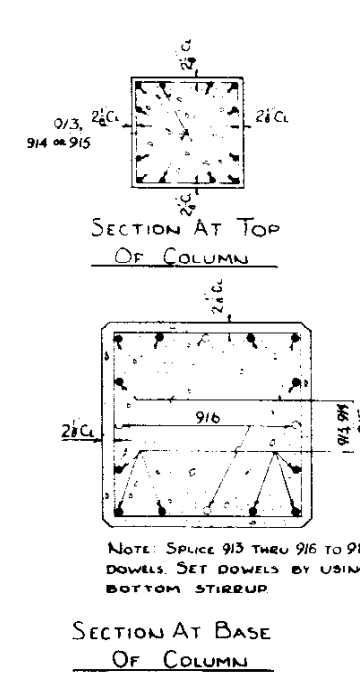
SECTION THRU CAP



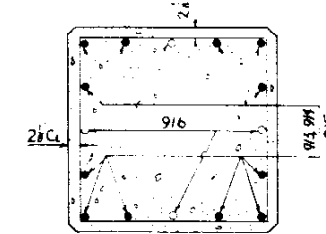
ELEVATION - PIERS NO. 2 & 3



END ELEVATION

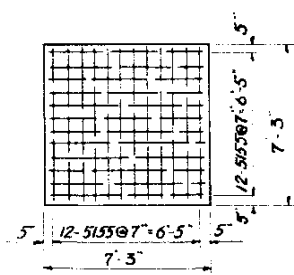


SECTION AT TOP OF COLUMN



SECTION AT BASE OF COLUMN

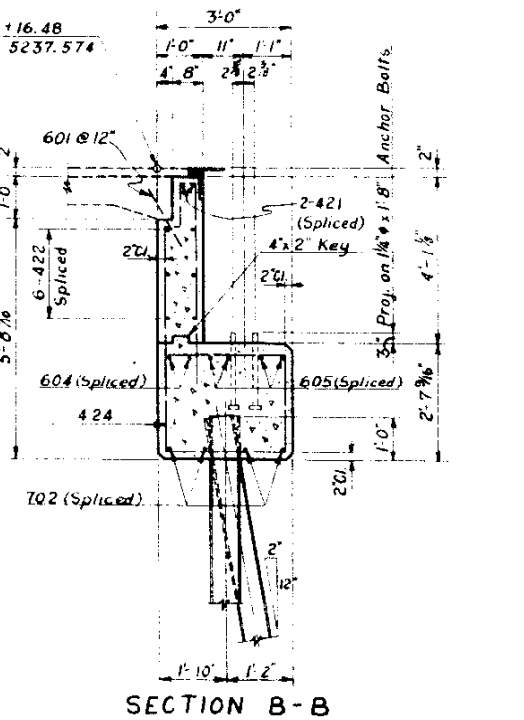
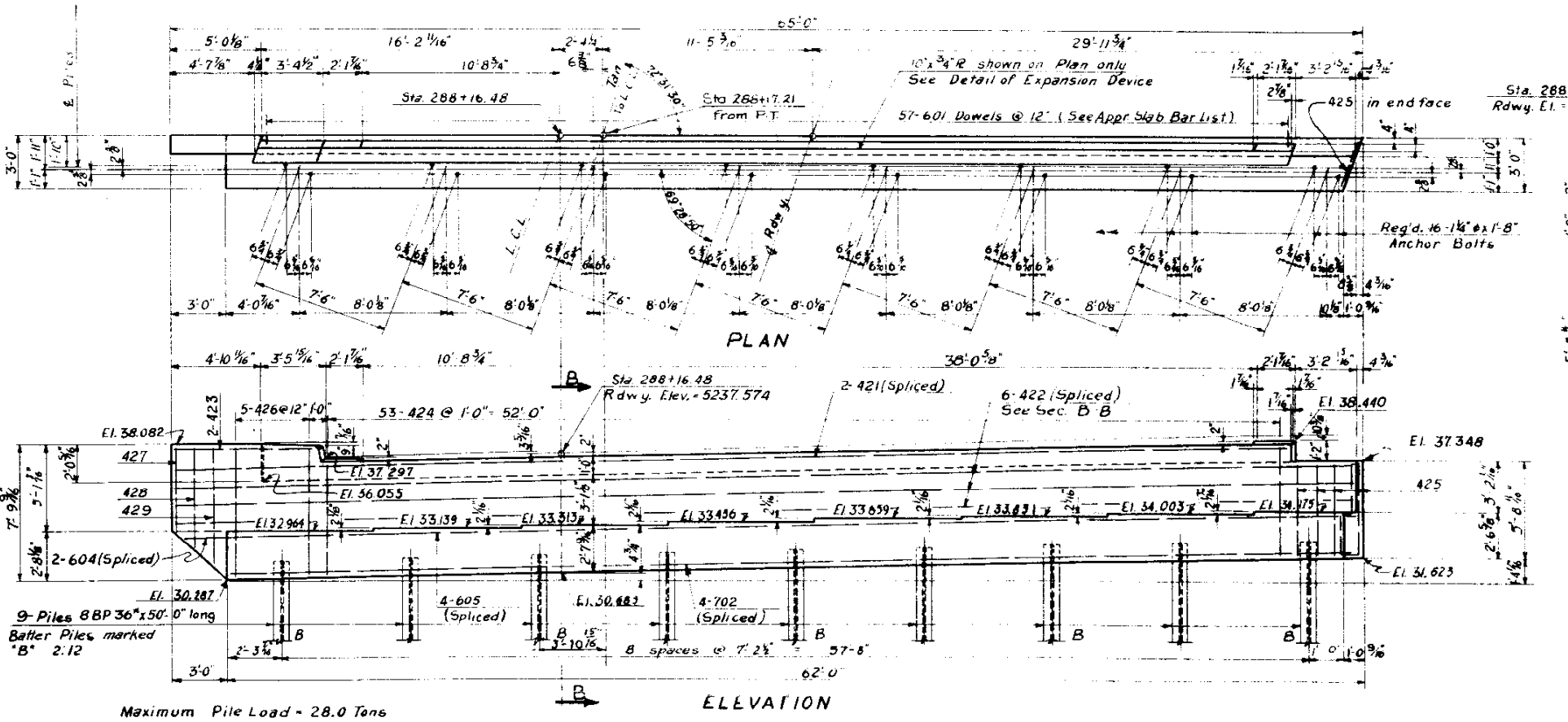
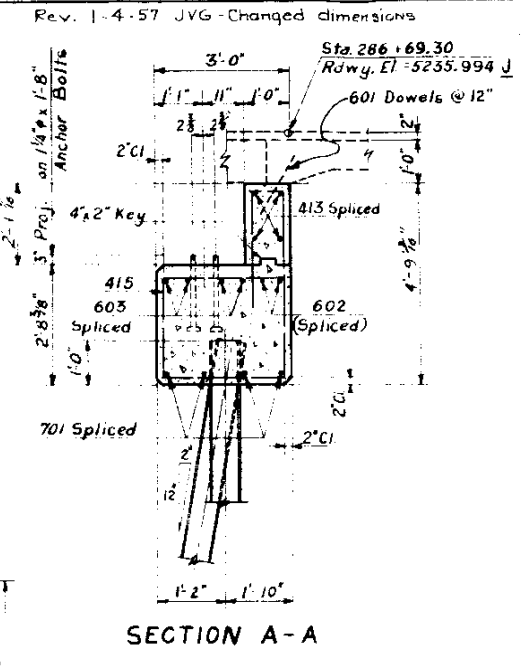
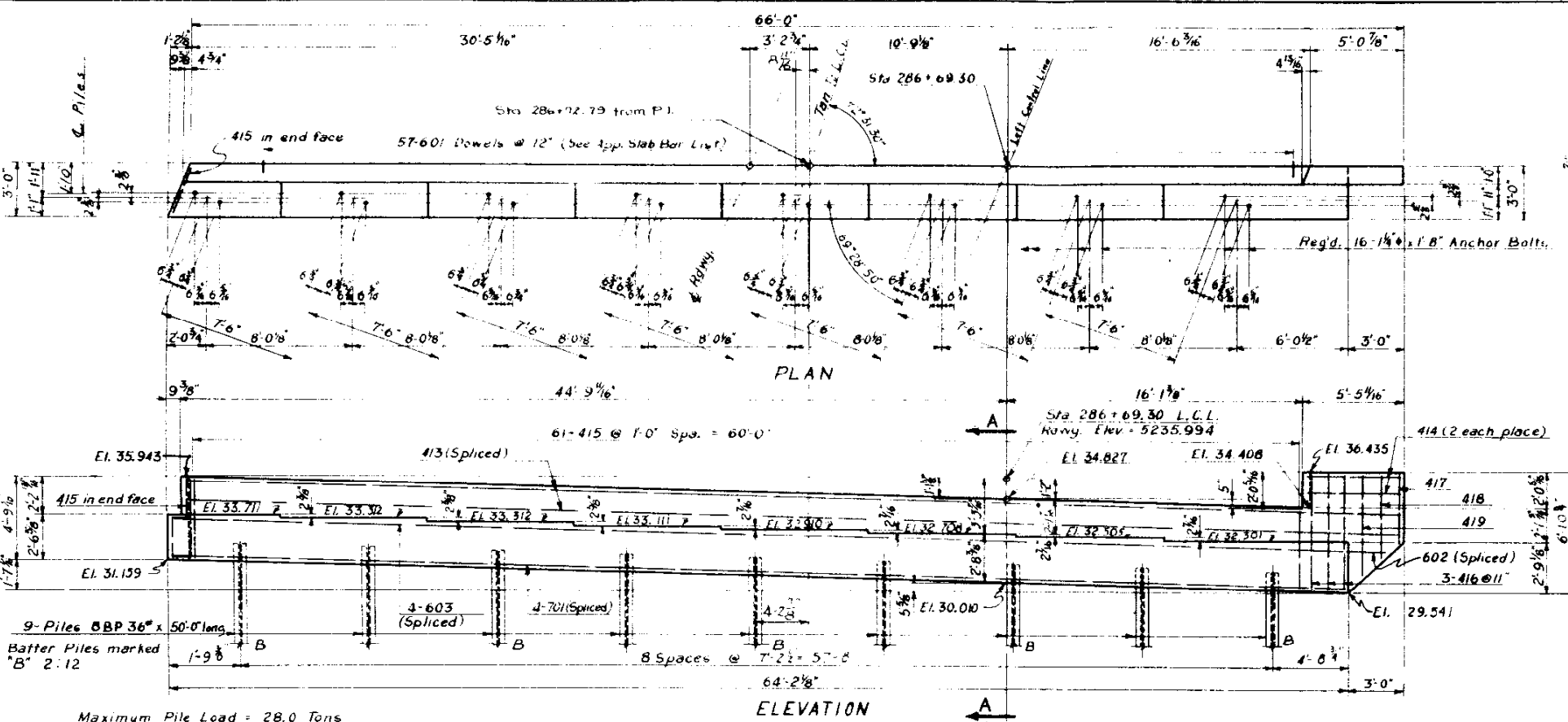
NOTE: SPlice 915 THru 916 TO 911 DOWELS. SET DOWELS BY USING BOTTOM STIRRUP



FOOTING PLAN

MAX. Ftg. PRESSURE: 5640 /sq. ft.

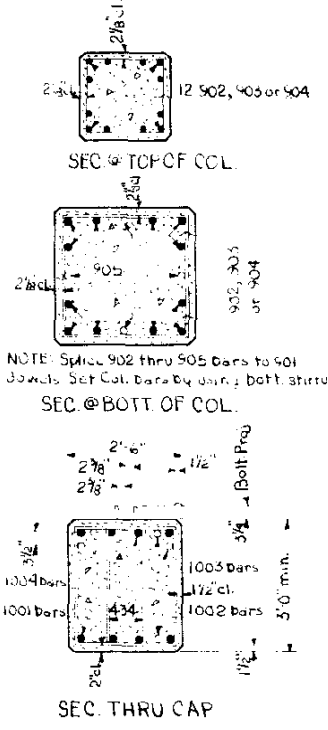
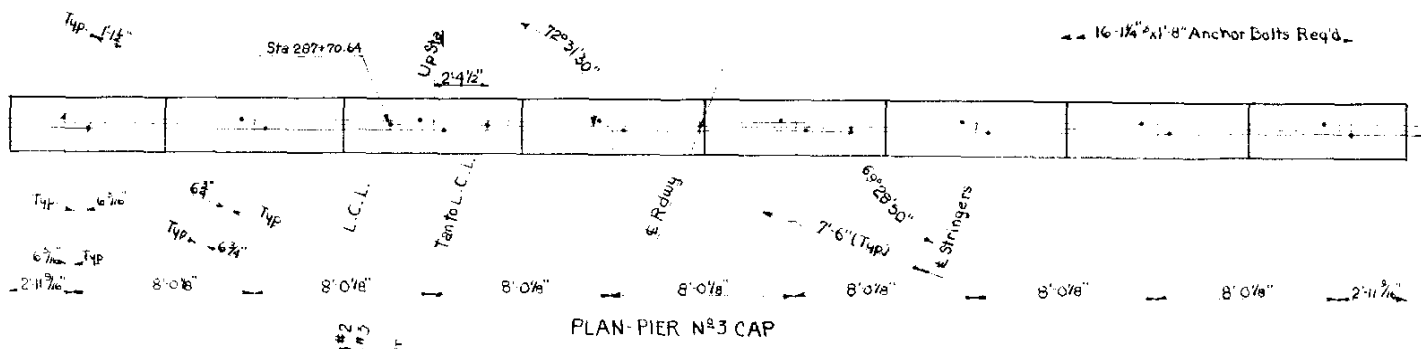
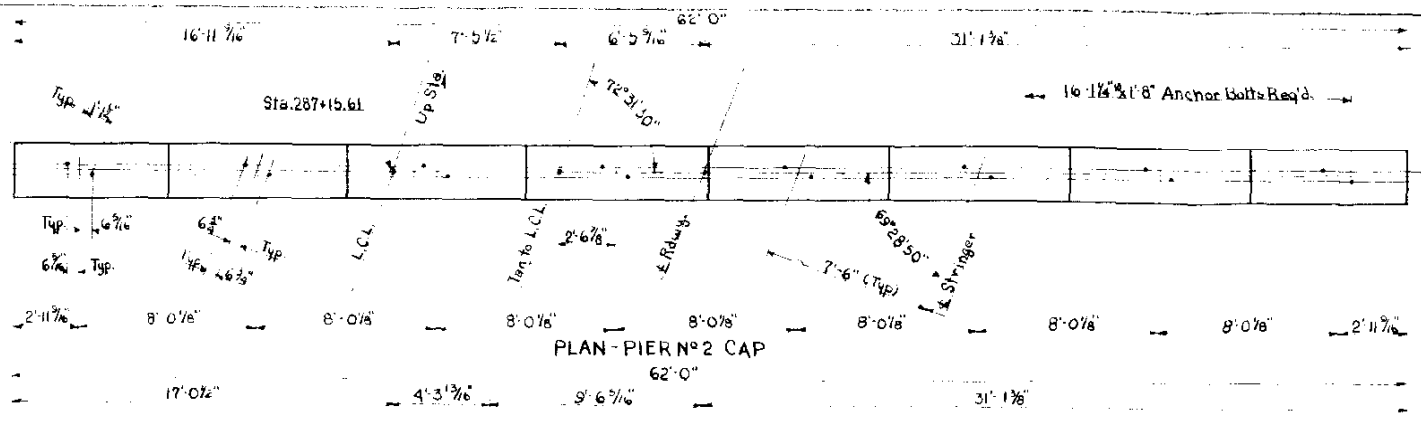
**COLORADO**  
 DEPARTMENT OF HIGHWAYS  
 3 SPANS (44'-5 1/2" x 44') CONTINUOUS  
 CONCRETE I-BEAM BRIDGE  
 40'-0" ROADWAY 2'-0" CURBS  
 PIERS NOS. 2 & 3  
 Across Spur Relocation At Valley Highway  
 Sta. 26+12.22 to 29+04.22  
 HAJ DENVER Sec. 9 T. 45 R. 68W  
 Designed by J.D.W. Approved by *[Signature]*  
 Made by R.T.T. Bridge Engineer  
 Checked by *[Signature]* Date July 5, 1936



Reinforcing bar dimensions are to 1/4 of bar unless marked "Clear" (Cl)

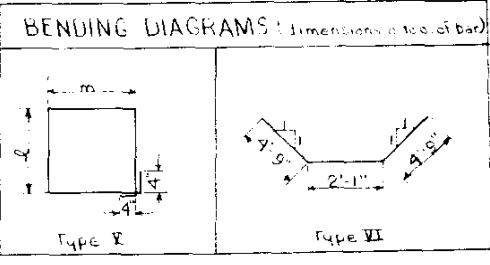
**COLORADO DEPARTMENT OF HIGHWAYS**  
 3 SPAN (44'-55'-44') CONTINUOUS CONCRETE T-BEAM BRIDGE  
 50'-0" ROADWAY 2'-0" CURBS  
 ABUTMENTS NO. 1 & 4  
 Across Spur Relocation at Valley Highway  
 In Denver See 2 & 4 of DRAWING  
 Designed by J.W. Made by L.W.F. Checked by  
 Approved by [Signature] Bridge Engineer  
 Date: July 3, 1956

Structure No. F-16-EG



BAR LIST - PIER NO. 2 & NO. 3

Mark	Size	No. 2	No. 3	Length	Type	2	m
435	to 1/2" P	3ea	3ea	7'-4"	Str.	1'-8"	1'-8"
459	11'-4"	2	2	11'-4"	Str.	2'-8"	2'-8"
460	11'-6"	1	2	11'-6"	Str.	2'-8"	2'-8"
434	1/2" P	136	136	9'-1"	Str.	2'-8"	2'-8"
570	3/8" P	72	72	6'-5"	Str.		
610	3/4" P	6	6	11'-7"	Str.		
901	1/8" P	48	48	3'-8"	Str.		
902	1/8" P	12	12	29'-4"	Str.		
903	1/8" P	12	12	29'-9"	Str.		
904	1/8" P	12	12	30'-5"	Str.		
905	1/8" P	12	12	19'-6"	Str.		
1001	1/4" P	8	8	30'-6"	Str.		
1002	1/4" P	3	3	43'-4"	Str.		
1003	1/4" P	15	15	18'-4"	Str.		
1004	1/4" P	4	4	60'-0"	Str.		

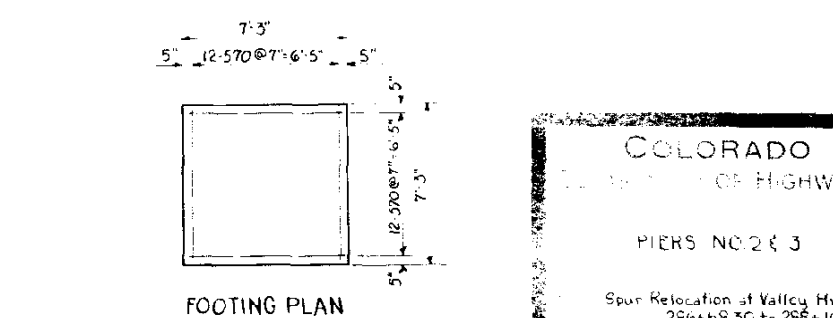
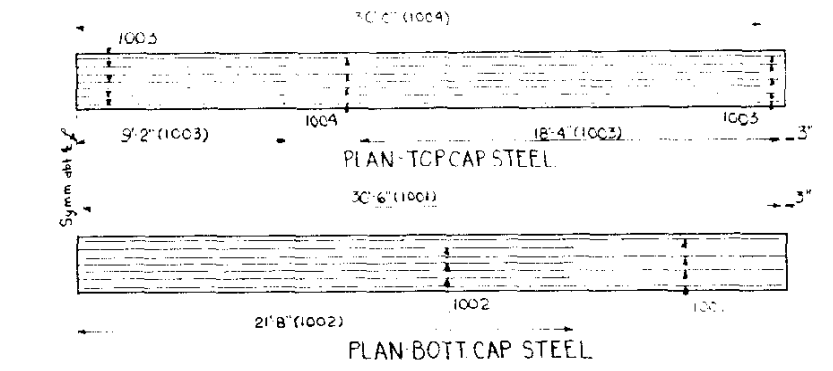
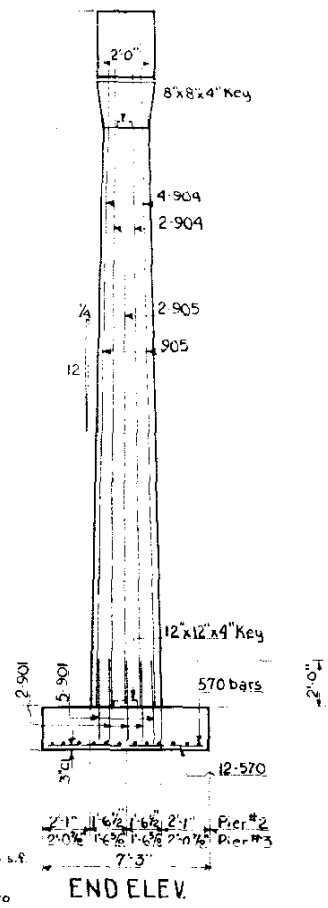
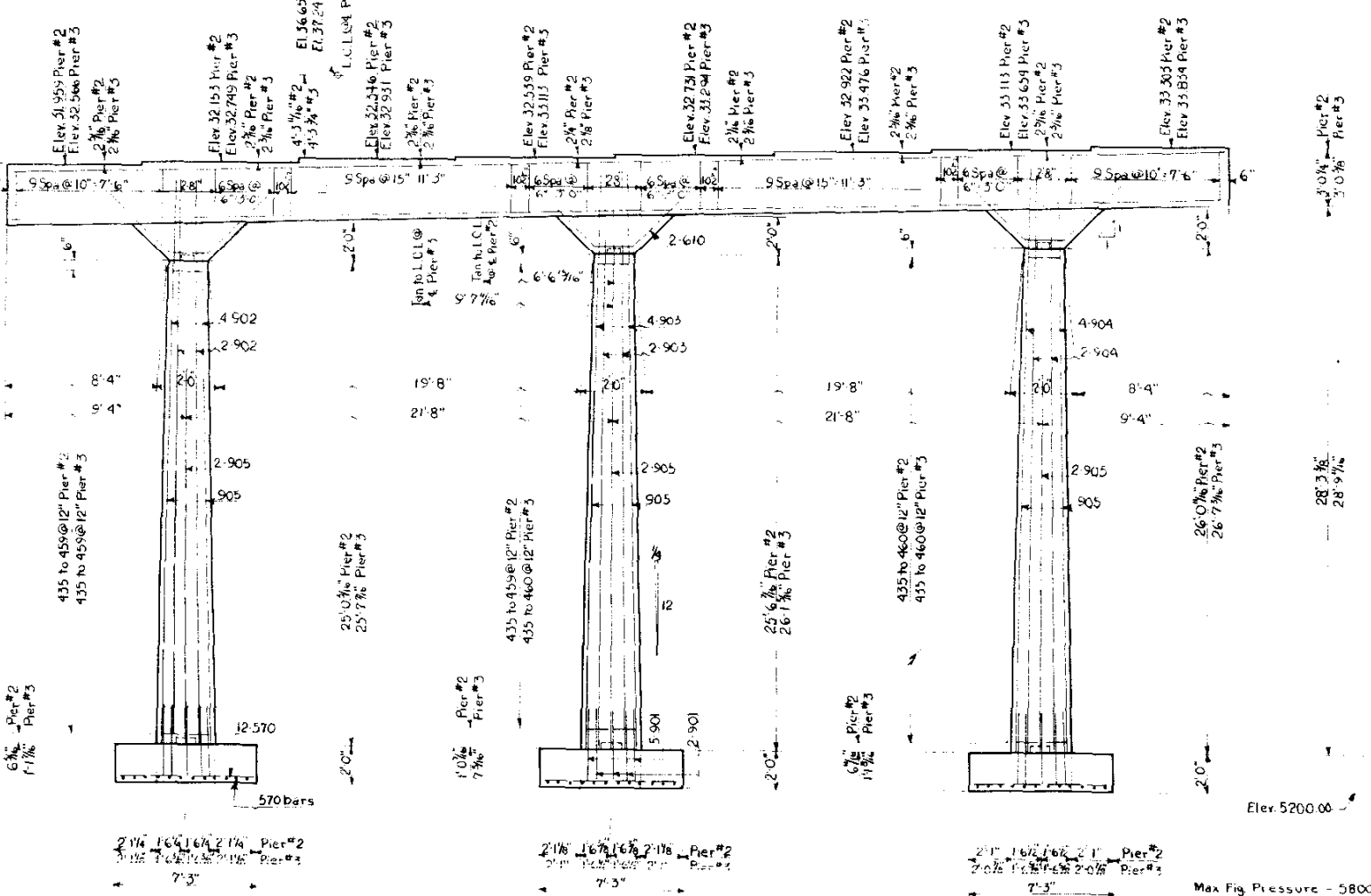


BAR SUMMARY - PIER NO. 2

1947	lin. ft.	1/2" P	@ 0.668	lin. ft.	1301	lbs.
486	lin. ft.	3/8" P	@ 1.043	lin. ft.	507	lbs.
70	lin. ft.	3/4" P	@ 1.502	lin. ft.	105	lbs.
1482	lin. ft.	1/8" P	@ 3.4	lin. ft.	5039	lbs.
889	lin. ft.	1/4" P	@ 4.303	lin. ft.	3825	lbs.
Plus 1% Overrun					108	lbs.
Total					10885	lbs.

BAR SUMMARY - PIER NO. 3

1508	lin. ft.	1/2" P	@ 0.668	lin. ft.	1000	lbs.
486	lin. ft.	3/8" P	@ 1.043	lin. ft.	507	lbs.
70	lin. ft.	3/4" P	@ 1.502	lin. ft.	105	lbs.
1482	lin. ft.	1/8" P	@ 3.4	lin. ft.	5039	lbs.
889	lin. ft.	1/4" P	@ 4.303	lin. ft.	3825	lbs.
Plus 1% Overrun					106	lbs.
Total					10890	lbs.



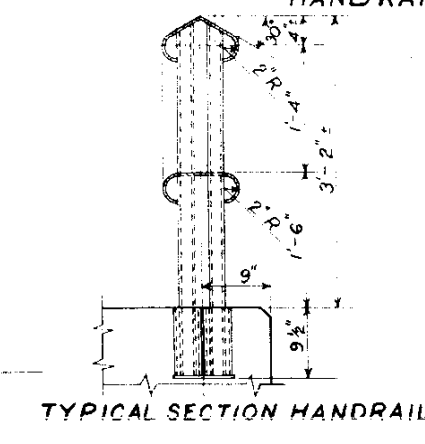
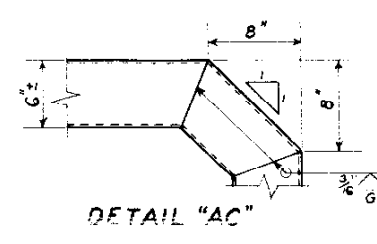
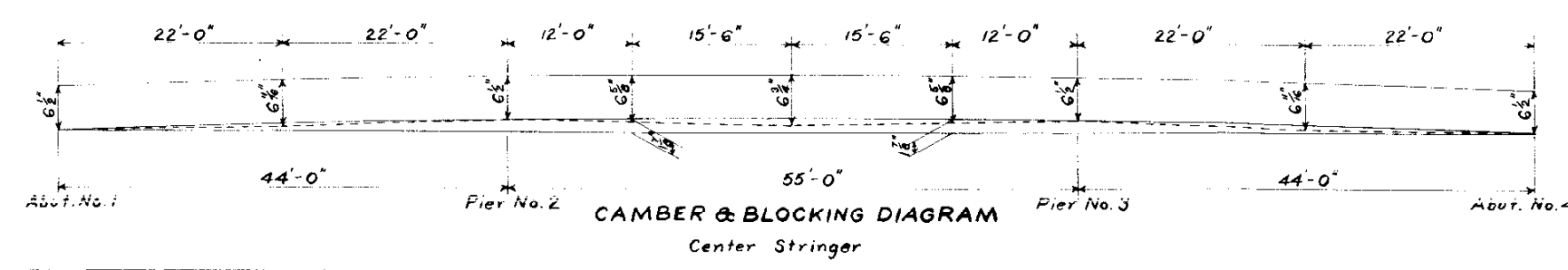
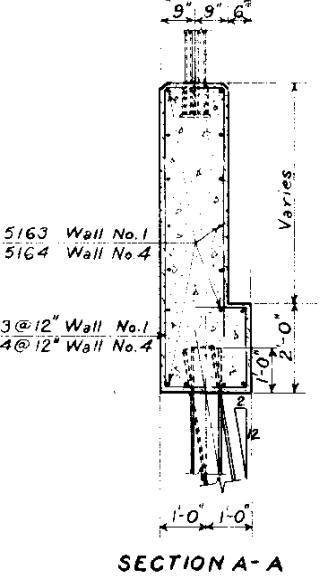
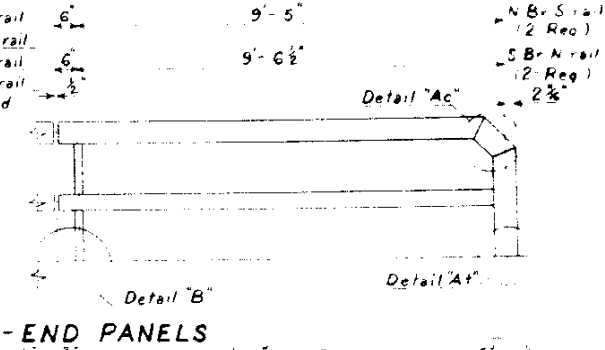
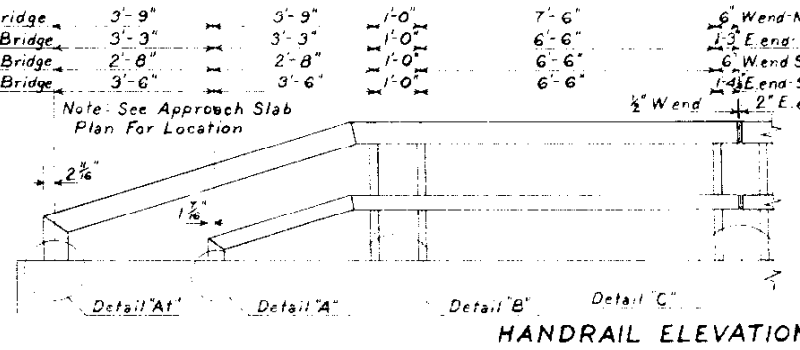
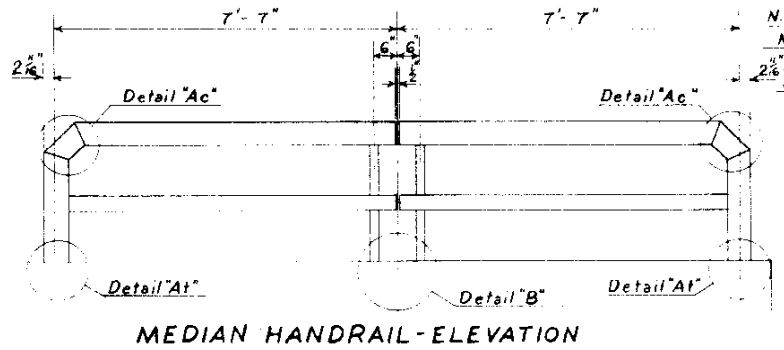
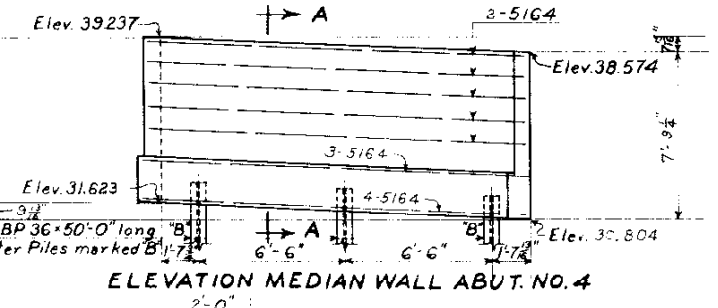
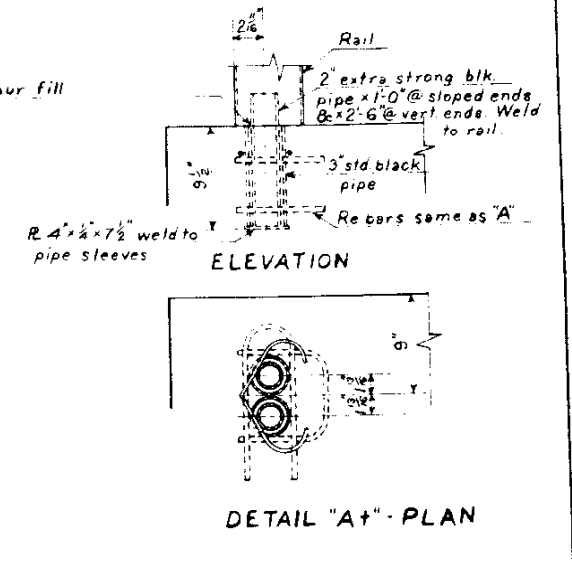
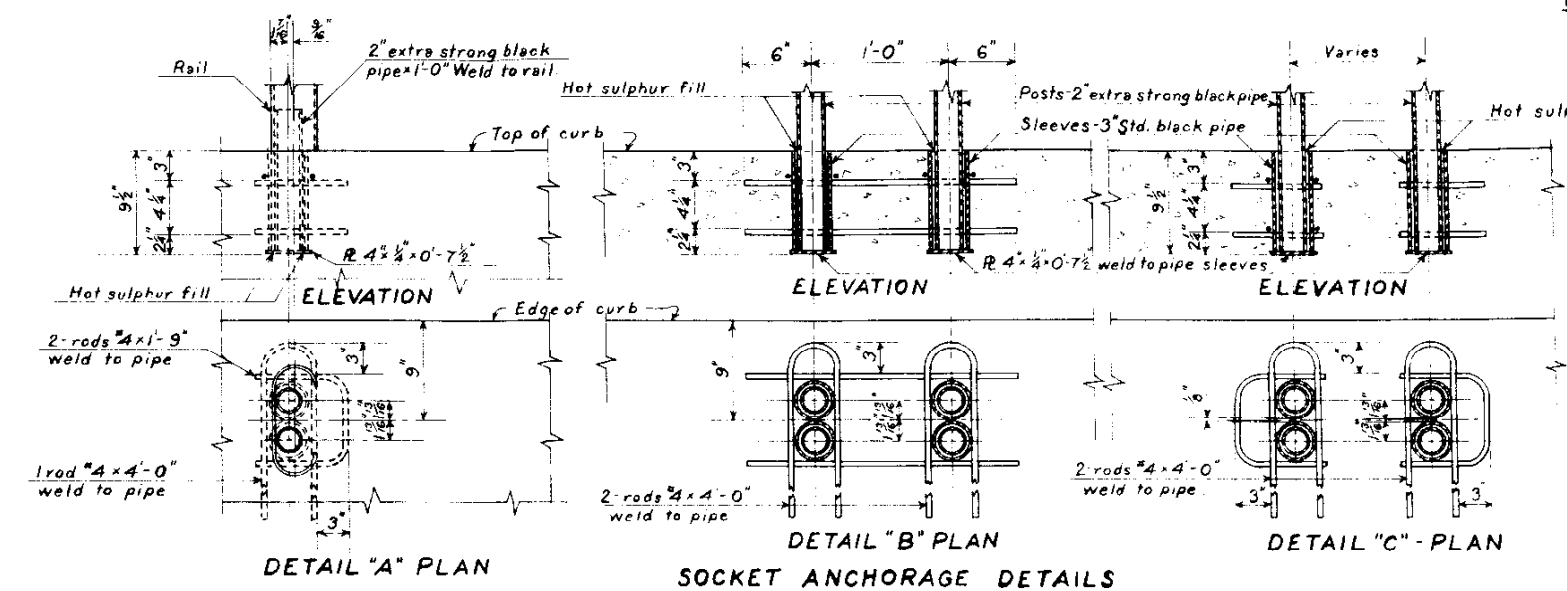
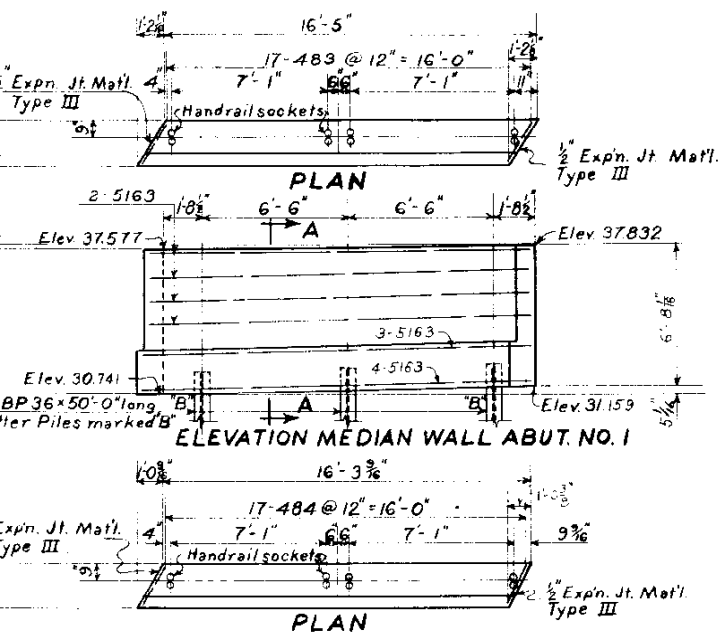
COLORADO  
DIVISION OF HIGHWAYS

PIERS NO. 2 & 3

Span Relocation of Valley Hwy.  
286+69.30 to 286+16.48

Denver, CO 80202

DATE: July 3, 1956



**COLORADO**  
 DEPARTMENT OF HIGHWAYS  
 2-3 SPAN (44'-55'-44') CONTINUOUS  
 CONCRETE & I BEAM BRIDGES  
 50'-0" RDWY. (NORTH) 40'-0" RDWY. (S)  
 MEDIAN WALL & SUPERSTR. DET.  
 Across Spur Relocation At Valley Highway  
 No. Bridge Sta 286+69.30 To 288+16.48  
 So. Bridge Sta 287+57.22 To 289+04.22  
 In Denver Sec. 9 T. 4 S. R. 68W  
 Designed by J.D.W. Approved by R.T.T.  
 Made by R.T.T. Bridge Engineer  
 Checked by Date: 2.5.1956

F-16-EG (North Bridge)  
 STRUCTURE NO. F-16-EH (South Bridge)

