

### GENERAL NOTES

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

EACH REINFORCING BAR SHALL BE TAGGED WITH BAR DESIGNATION, STRUCTURE NUMBER AND STATION OF THE PROJECT. THE FIRST DIGIT OF DIGITS, 0-11 OF THE REINFORCING BAR DESIGNATION INDICATES THE BAR SIZE. EXAMPLE: 406 = #4 BAR, 1103 = #11 BAR. ALL DIMENSIONS ON BAR BENDING DIAGRAM ARE OUT TO OUT. DIMENSIONS FOR REINFORCING BARS NOT SHOWN AS CLEAR SHALL BE TO THE CENTERLINE OF THE BAR. IF BY PERMISSION OF THE ENGINEER PRIMARY BARS ARE SPLICED, THEY SHALL LAP A MINIMUM OF 40 DIAMETERS.

ALL CONCRETE SURFACES MARKED WITH THE SYMBOL  $\int$  AS SHOWN ON DRAWING NO. B-5 SHALL RECEIVE A CLASS 2 SURFACE FINISH.

ALL CONCRETE CHAMBERS SHALL BE 3/4" UNLESS OTHERWISE NOTED.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M 213-65 UNLESS OTHERWISE NOTED.

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

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

WHEN EXCAVATING FOR FOOTINGS THE FINAL SIX INCHES IN DEPTH SHALL BE DONE BY HAND-LABOR METHODS.

FOR DETAILS OF STRUCTURE EXCAVATION AND STRUCTURE BACKFILL, SEE STANDARD M-206-A.

ALL STRUCTURAL STEEL NOT OTHERWISE NOTED SHALL BE AASHTO SPECIFICATION M-113.

ALL STRUCTURAL STEEL NOT OTHERWISE NOTED SHALL BE PAINTED IN ACCORDANCE WITH SECTION 509 FOR ALUMINUM PAINT.

ALL BOLTS SHALL BE 3/4" DIAMETER, HIGH STRENGTH, UNLESS OTHERWISE NOTED.

NO WELDING OF ANY KIND SHALL BE PERMITTED ON THE FLANGES OF STEEL GIRDEPS UNLESS SPECIFICALLY CALLED FOR ON THE PLANS.

ALL REINFORCING BAR SPLICES SHOWN IN THE SUPERSTRUCTURE SHALL HAVE A MINIMUM LAP OF 40 DIAMETERS UNLESS OTHERWISE NOTED. WHERE SPLICES CONTAIN BARS OF DIFFERENT DIAMETERS THE SPLICE LENGTH SHALL BE GOVERNED BY THE SMALLEST BAR.

THE FOLLOWING TABLE SHOWS THE MINIMUM 40 DIAMETER LAP FOR COMMON BAR SIZES.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
LAP	1'-0"	2'-10"	2'-6"	2'-11"	3'-4"	3'-10"	4'-3"	4'-9"

### LOADING DATA

LIVELOAD: AASHTO HS-20-44 OR INTERSTATE ALTERNATE.  
DEADLOAD: ASSUMES 20 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE (FUTURE)  
NO PROVISION HAS BEEN MADE FOR ADDITIONAL OVERLAYS.

### DESIGN DATA

AASHTO UNIT STRESSES EXCEPT AS NOTED.

REINFORCING STEEL:	GRADE 40	$F_s = 20,000$ LBS. PER SQ. IN.
	GRADE 60	$F_s = 24,000$ LBS. PER SQ. IN.
STRUCTURAL STEEL:	A 36	$F_s = 20,000$ LBS. PER SQ. IN.
	A 572 GRADE 50	$F_s = 27,000$ LBS. PER SQ. IN.
CONCRETE:	$F_c = 1,200$ LBS. PER SQ. IN.	$n = 10$

### SUMMARY OF QUANTITIES

Item	Description	Unit	Super-struct	Abut. 1	Pier 2	Pier 3	Abut. 4	Total
202	Removal of Portions of Present Structure	Each						1
205	Structure Excavation	Cu. Yd.		14	22	25	14	75
206	Structure Backfill (Class 2)	Cu. Yd.		6	7	7	6	26
② 502	Steel Piling (10BP42)	Lin. Ft.		260	352	352	258	1220
509	Structural Steel	Lbs.	76040	341	178	171	341	78271
509	Structural Steel (Galvanized)	Lbs.	4517					4517
516	Dampproofing (Linseed oil)	Sq. Yd.	611					611
601	Concrete, Class A	Cu. Yd.		9	20	20	9	58
601	Concrete, Class D	Cu. Yd.		109				109
507	Concrete Slope & Ditch Paving (Rein)	Cu. Yd.		6			6	12
602	Reinforcing Steel	Lbs.	31262	1205	3443	3443	1205	41558
506	Guard Rail Type 3A (Double)	Lin. Ft.	129					129
①	16 Gage Galvanized Sheet Metal	Sq. Ft.	260					260
①	1/2" Expansion Joint Material	Sq. Ft.	120					120

- ① To be included in the bid price for Item 601, Concrete Class A.
- ② 10W 45 May be used in lieu of 10BP42.
- ③ Includes 143 sq. yds. for two approach slabs.

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	V006-6(2)	29	

REVISIONS	

### INDEX OF DRAWINGS

- B1 General Information - Summary of Quantities
- B2 General Layout
- B3 Engineering Geology
- B4 Elevations
- B5 Bar List - Bar Summary - Bending Diagram - Surface Finish Details
- B6 Construction & Piling Layout
- B7 Details of Abutments
- B8 Pier Details
- B9 Superstructure Detail
- B10 Superstructure Sections
- B11 Details of Girder
- B12 Miscellaneous Details

# VOID

### LEGEND

- TOP = TOP FACE
- N.F. = NEAR FACE
- F.F. = FAR FACE
- B.E.I. = BY EQUAL INCREMENTS
- CROSS REFERENCE DRAWING NUMBER
- SECTION OR DETAIL IDENTIFICATION

### BRIDGE DESCRIPTION

3-Simple Spans (30'-0", 66'-0", 30'-0")  
Concrete Slab and I-Beam - Span 1+3  
Concrete Slab and Welded Steel Girder - Span 2

Over Existing St.  
Approach to 92.0' Roadway, 90°00' Skew  
Guard Rail Type 3A (Double)

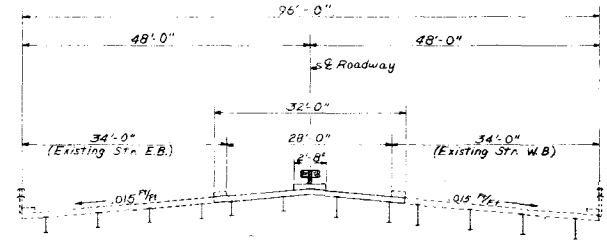
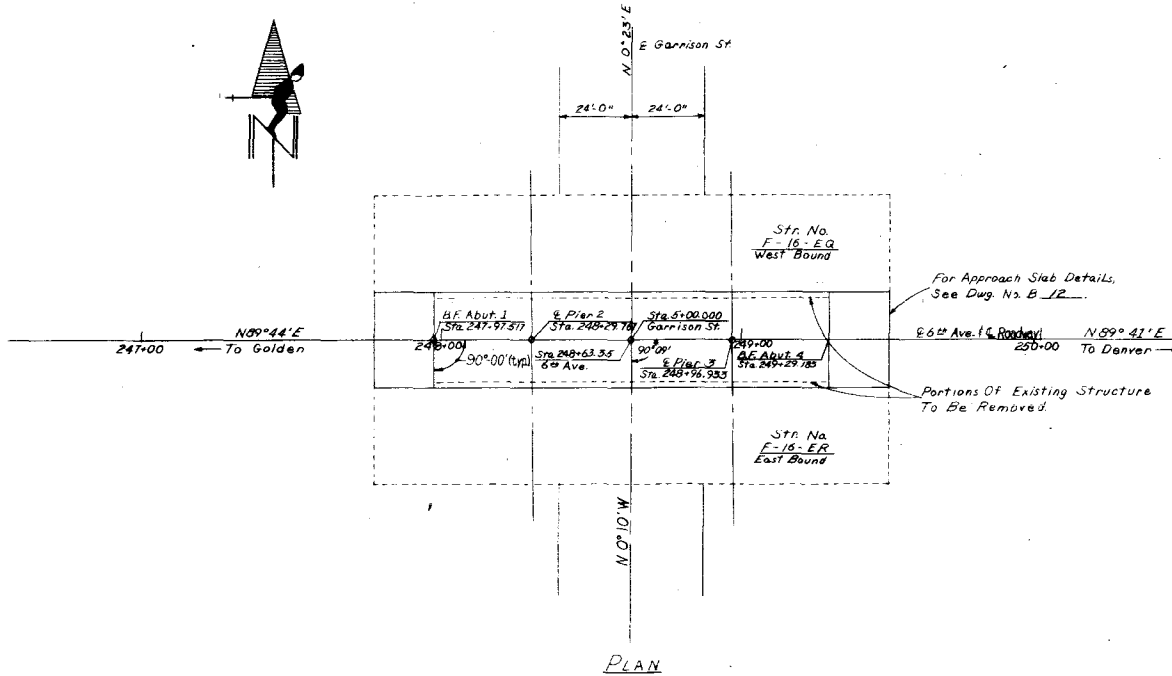


DIVISION OF HIGHWAYS	
GENERAL INFORMATION	
SUMMARY OF QUANTITIES	
Station: 2+77.57 to 2+92.22	
Sheet: 29 of 29	
Drawn: G. Singh	Section: 2/10/45 R. 69W
Checked: R. Schiff	Structure: F-16-EQ
Bridge Engineer: R. Schiff	Numbers: F-16-ER
Date: 05/23/71	DWG. No. B-1 OF 12

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	U006-6(2)	30	

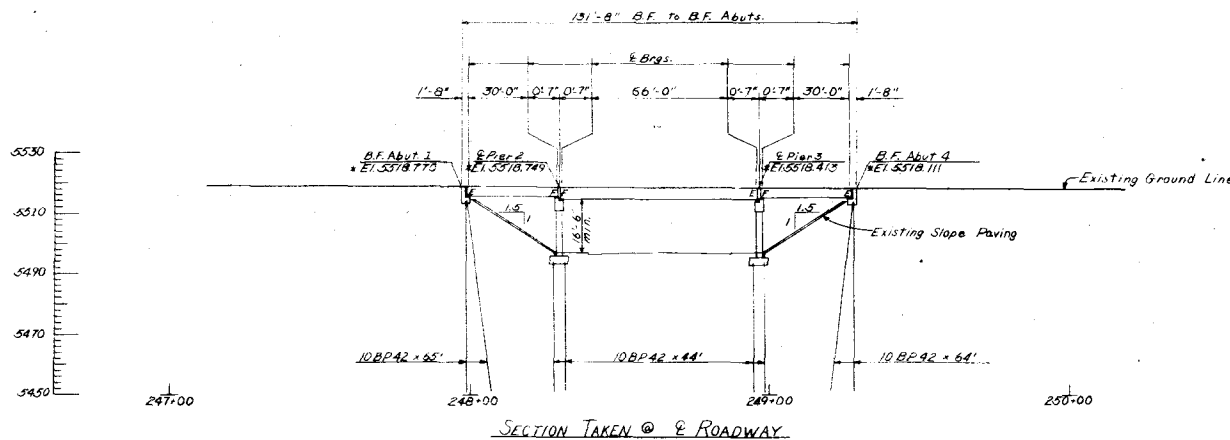
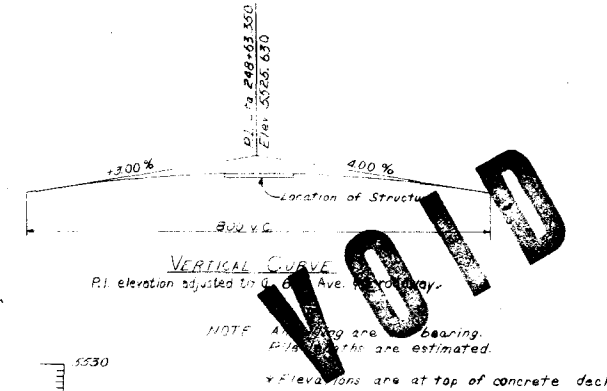
  

REVISIONS	



TYPICAL SECTION

DESIGNED BY	CHECKED BY	DATE	APPROVED BY
G.S.	R.F.S.	12-78	G.S.
G.S.	R.F.S.	1-79	G.S.
G.S.	R.F.S.	2-79	G.S.



**VOID**

**DIVISION OF HIGHWAYS**

GENERAL LAYOUT

Approved:	Designer: <i>G. Singh</i>	Detailer: <i>R. Schiff</i>
Bridge Engineer:	Structure Numbers: <i>F-16-EQ</i>	
Date:	<i>F-16-ER</i>	
	DWG. No. <i>B-2</i>	OF <i>12</i>

### GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE STATE OF COLORADO HIGHWAYS.

DO NOT REMOVE ANY MATERIALS FROM THE PROJECT UNLESS SPECIFICALLY NOTED OTHERWISE. THE BIDDING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

ALL CONCRETE SHALL BE CLASS 2 CONCRETE UNLESS OTHERWISE NOTED.

ALL CONCRETE CHAMBERS SHALL BE UNLESS OTHERWISE NOTED.

EXPANSION JOINT MATERIALS SHALL BE UNLESS OTHERWISE NOTED.

FOUNDATIONS AND TIE-INS SHALL BE UNLESS OTHERWISE NOTED. WHEN THE CONTRACTOR HAS TO EXCAVATE FOR FOUNDATIONS AND TIE-INS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

WHEN TREATING UNDERGRAUNTS WITH PRESERVATIVE, THE PRESERVATIVE FOR TREATMENT SHALL BE UNLESS OTHERWISE NOTED.

WHEN EXCAVATING FOR FOUNDATIONS AND TIE-INS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

ALL UTILITIES SHALL BE PROTECTED AND SHALL BE UNLESS OTHERWISE NOTED.

ALL STRUCTURES SHALL BE UNLESS OTHERWISE NOTED.

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### SUMMARY OF QUANTITIES

Item	Description	Unit	Super-structure	Abut. 1	Pier 1	Pier 2	Abut. 2	Total
202	Removal of Portions of Existing Structure	Each						
206	Structure Excavation	Cu Yd		10	20	20	10	60
203	Structure Backfill (Comp)	Cu Yd		5	10	10	5	30
502	Steel Piling (10" dia)	Lineal Ft		260				260
504	Steel Piling (12" dia)	Lineal Ft		0	4	0	0	4
509	Structural Steel	Lbs		10,000	30,000	30,000	10,000	80,000
509	Structural Steel (Galvanized)	Lbs		10,000	30,000	30,000	10,000	80,000
516	Damp-proofing (Linsud oil)	Sq Yd		10	20	20	10	60
601	Concrete Class A	Cu Yd		10	20	20	10	60
601	Concrete Class B	Cu Yd		10	20	20	10	60
607	Concrete Slope & Ditch Pavina (Reinf)	Cu Yd		10	20	20	10	60
608	Reinforcing Steel	Lbs		10,000	30,000	30,000	10,000	80,000
706	Asphalt Concrete	Sq Yd		10	20	20	10	60
711	1/2" Bag Bituminous Seal Coat	Sq Yd		260				260
811	2" High Iron Pipe Culvert	Lineal Ft		260				260

- ① To be included in the bid price for Item 202, Concrete Class A
- ② 10" dia. May be used for 12" dia.
- ③ 10" dia. May be used for 12" dia.

DATE	BY	REVISION
05/15/22	JK	1
05/15/22	JK	2
05/15/22	JK	3
05/15/22	JK	4
05/15/22	JK	5
05/15/22	JK	6
05/15/22	JK	7
05/15/22	JK	8
05/15/22	JK	9
05/15/22	JK	10

ALL QUANTITIES SHALL BE UNLESS OTHERWISE NOTED.

ALL QUANTITIES SHALL BE UNLESS OTHERWISE NOTED.

NO.	DESCRIPTION	QUANTITY	UNIT
1	ASPHALT CONCRETE	60	SQ YD
2	1/2" BAG BITUMINOUS SEAL COAT	260	SQ YD
3	2" HIGH IRON PIPE CULVERT	260	LINEAL FT

### LOADING DATA

LOADING DATA SHALL BE UNLESS OTHERWISE NOTED.

### DESIGN DATA

DESIGN DATA SHALL BE UNLESS OTHERWISE NOTED.

REGION NO.	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	COLORADO	V006-6(2)	23

### INDEX OF DRAWINGS

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88	Pier Details
89	Superstructure Details
90	Superstructure Sections
91	Miscellaneous Details

### LEGEND

1" = 20'	Vertical Scale
1" = 20'	Horizontal Scale
1" = 20'	Profile Scale
1" = 20'	Plan Scale

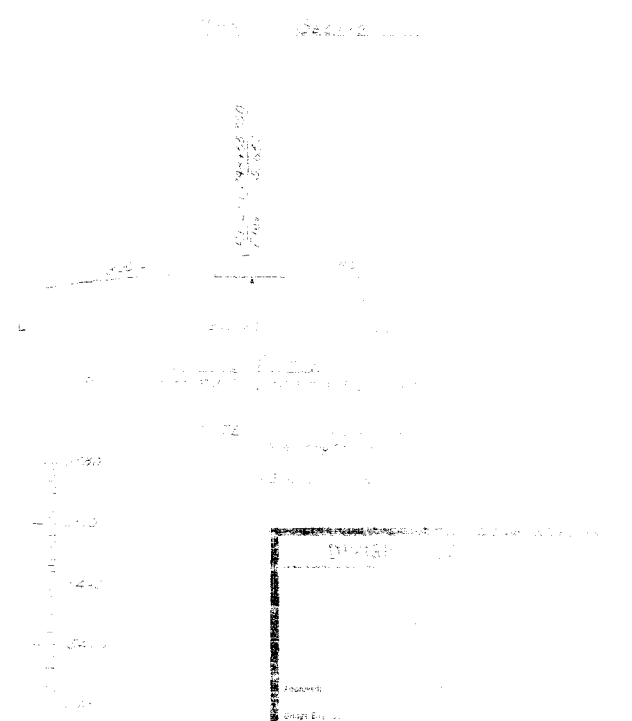
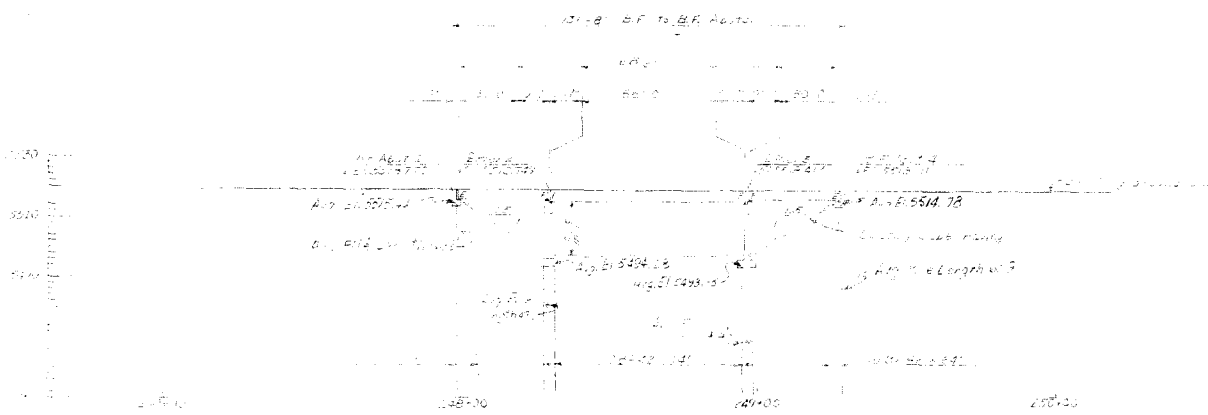
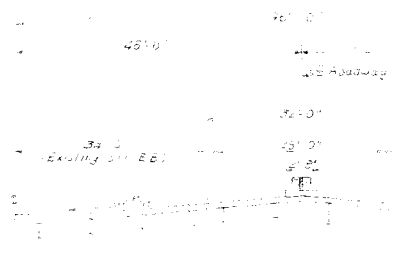
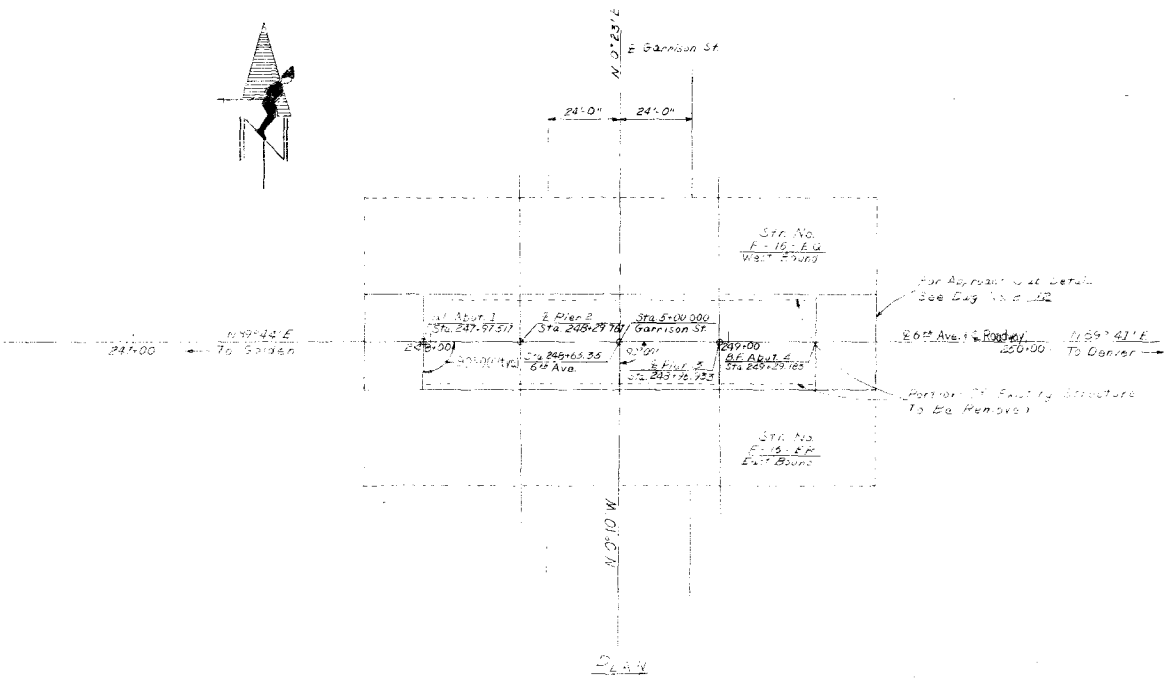
SHORE DESCRIPTION  
SHORE DESCRIPTION SHALL BE UNLESS OTHERWISE NOTED.

DIVISION OF HIGHWAYS	
GENERAL INFORMATION	
SUMMARY OF QUANTITIES	
Region No.	1
Project No.	V006-6(2)
Sheet No.	23
Author	JK
Checked	JK
Approved	JK
Date	05/15/22
DWG No.	B-10-002

FOR INFORMATION PURPOSES  
THIS DRAWING IS NOT TO BE USED  
FOR CONSTRUCTION OF RECORDS

AS CONSTRUCTED  
RANDED

FEDERAL ROAD DISTRICT	COUNTY	TOWNSHIP	RANGE	SECTION
1	1	1	1	1



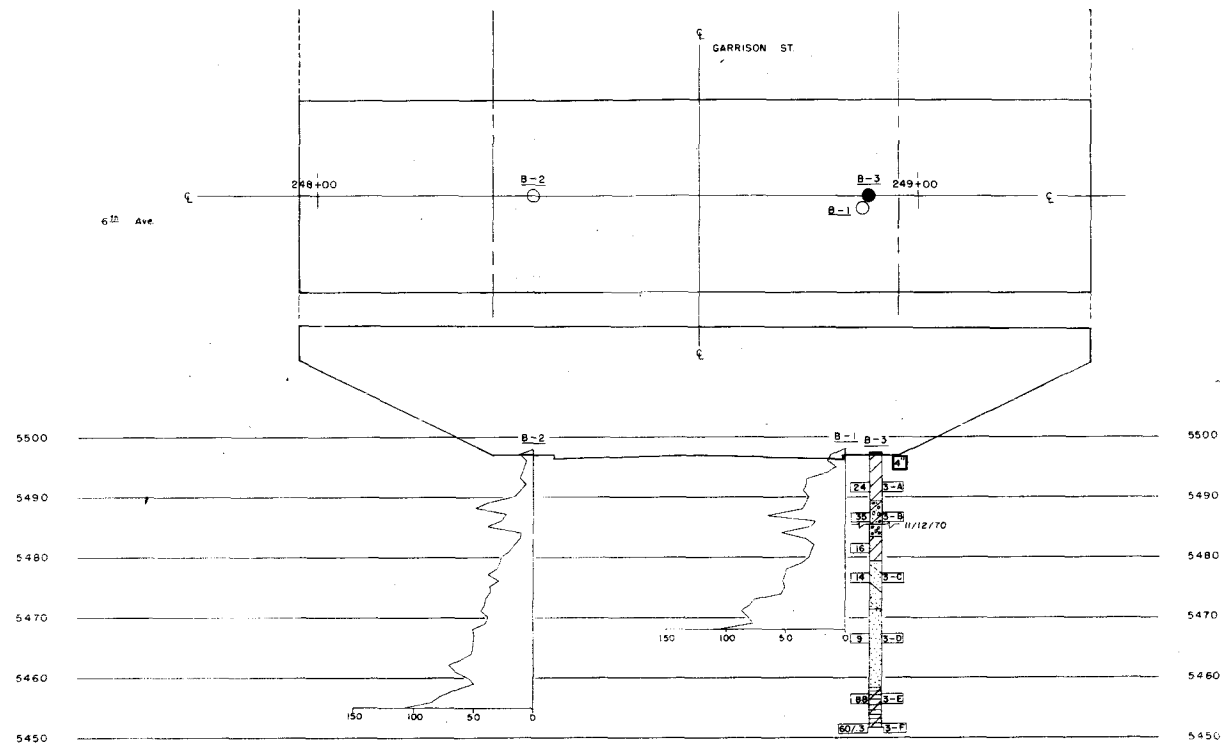
NO.	DATE	DESCRIPTION
1	7/27/72	ISSUED FOR PERMITS
2	8/1/72	ISSUED FOR CONSTRUCTION

SECTION TAKEN @ ROADWAY

NO.	DATE	DESCRIPTION
1	7/27/72	ISSUED FOR PERMITS
2	8/1/72	ISSUED FOR CONSTRUCTION

F. H. SHAW  
 12 CO. ROAD  
 DENVER, CO.

FED. ROAD DIST. NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
8	COLO.	U 006-6(2)	37	



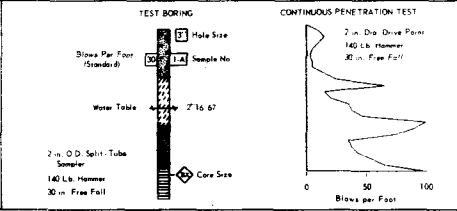
**SUMMARY OF TEST RESULTS**

Dist.	Depth	Class.	Grading Analysis		Atterberg Limits		Torsion Shear Strength		Cone	SPT
			Gravel	Coarse Sand	Liquid Limit	Plasticity Index	Unconf. Comp.	Confined Comp.		
0-1.50	0-1.50	E-S SANDY CLAY A-7-6(2)	7	22	70	54	23	32	220	
0-8.00	1.5-8.00	SANDY GRAVEL A-2-6(1)	48	10	17	25	34	18	16	10.5
0-20.00	8.0-20.00	SANDY CLAY A-6(5)	9	9	33	49	38	22	16	30.0
0-30.00	20.0-30.00	SILTY SAND A-2-4(1)	15	24	41	20	NV	NP	25.5	
0-40.00	30.0-40.00	CLAYSTONE A-7-5(3)	0	0	10	90	68	39	29	32.8
0-45.00	40.0-45.00	CLAYSTONE A-7-6(2)	0	0	10	90	47	27	20	30.0, 125.7, 7.00

**TYPE OF MATERIAL**

- CLAY
- SAND
- GRAVEL
- ASPHALT
- CLAYSTONE
- SAND, SILTY & CLAYEY
- GRAVELLY CLAY, SANDY

**LEGEND**



- Location of Test Boring
- Location of Continuous Penetration Test
- Water Table
- Alloy Ring
- Core Boring

**DEPARTMENT OF HIGHWAYS  
 STATE OF COLORADO**

**ENGINEERING GEOLOGY**

Across GARRISON ST. ST. NO. (F-16-EQ)  
 No. 248 To 249 (F-16-ER)  
 Near LAKEWOOD Sec. T R  
 Geologist K. W. B. Approved by  
 Made by D. K. D. Bridge Engineer  
 Checked by G. C. P. Date 10

STRUCTURE NO. E-16-EQ, 1 E-16-ER  
 DWG NO. B-3 OF 12

Table with columns: REVISIONS, containing revision details.

PROJ. NO. U006-6(2)
STA. NO.
F-16-EQ
E-LEADER
INPUT KE AND WRA
JAN 13 1971

INPUT DATA FOR BRIDGE F-16-EQ

PDF = 248 - 43.3500 ALPHA = 0 0 0.00 RMY = 32.0000 GB = 3.0000
PT = 248 - 63.3500 EPI = 5525.6300 VC = 800.0000 W = -4.0000
TYPE = 2 SLOPE = .0150

TENTH POINTS

CL E BRG PIER 1
CL W BRG PIER 2

Table with columns: STATION, ELEVATION, listing data for CL E BRG PIER 1 and CL W BRG PIER 2.

CL E BRG PIER 2
CL W BRG PIER 3

Table with columns: STATION, ELEVATION, listing data for CL E BRG PIER 2 and CL W BRG PIER 3.

CL E BRG PIER 3
CL BRG ABUT 4

Table with columns: STATION, ELEVATION, listing data for CL E BRG PIER 3 and CL BRG ABUT 4.

CL GIRDER 1

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CL GIRDER 1

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CL GIRDER 1

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CL GIRDER 5

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CL GIRDER 5

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S CUT LINE

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S CUT LINE

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S CUT LINE

Table with columns: STA BACK, STATION, ELEVATION, listing data for S CUT LINE.

Vertical text on the left margin: DESIGNED BY, CHECKED BY, DATE, etc.

DIVISION OF HIGHWAYS
ELEVATIONS
Approver:
Designer: G. Singh, Designer: R. Schiff
Structure Number: F-16-EQ
Date: DWG. No. B 4 OF 12

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	U006-6(2)	33	

REVISIONS	

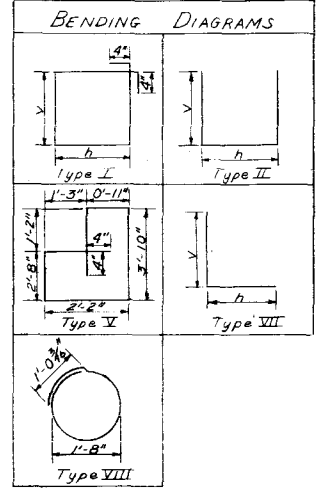
**BAR LIST ~ ABUT. 1 & 4**

Mark	No. Req'd	Length	Type	Dimensions h v
404	41	7'-0"	II	0'-8" 3'-2"
405	41	8'-6"	I	2'-4" 1'-7"
406	6	32'-0"	Str.	
501	2	32'-0"	Str.	
601	32	1'-6"	Str.	
801	6	32'-0"	Str.	

**BAR LIST ~ PIER 2 & 3 (CONT.)**

**SUMMARY ~ PIER 3**

263 Lin Ft. #4 Bar @ 0.568 Lbs./Lin Ft. = 176 Lbs.  
 614 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 640 Lbs.  
 260 Lin Ft. #7 Bar @ 2.044 Lbs./Lin Ft. = 531 Lbs.  
 771 Lin Ft. #11 Bar @ 5.313 Lbs./Lin Ft. = 4096 Lbs.  
 Total = 5443 Lbs.



**BAR LIST ~ SUPERSTRUCTURE**

Mark	No. Req'd	Length	Type	Dimensions h v
407	66	4'-3"	II	2'-3" 1'-0"
408	24	4'-8"	I	1'-0" 1'-0"
502	702	31'-11"	Str.	
503	70	31'-8"	Str.	
504	74	30'-0"	Str.	
505	74	39'-0"	Str.	

**SUMMARY ~ ABUT. 1**

828 Lin Ft. #4 Bar @ 0.668 Lbs./Lin Ft. = 553 Lbs.  
 64 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 67 Lbs.  
 48 Lin Ft. #6 Bar @ 1.502 Lbs./Lin Ft. = 72 Lbs.  
 92 Lin Ft. #8 Bar @ 2.670 Lbs./Lin Ft. = 513 Lbs.  
 Total = 1205 Lbs.

**SUMMARY ~ ABUT. 4**

828 Lin Ft. #4 Bar @ 0.668 Lbs./Lin Ft. = 553 Lbs.  
 64 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 67 Lbs.  
 48 Lin Ft. #6 Bar @ 1.502 Lbs./Lin Ft. = 72 Lbs.  
 192 Lin Ft. #8 Bar @ 2.670 Lbs./Lin Ft. = 513 Lbs.  
 Total = 1205 Lbs.

**SUMMARY**

385 Lin Ft. #4 Bar @ 0.668 Lbs./Lin Ft. = 256 Lbs.  
 29,728 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 31,006 Lbs.  
 Total = 31,262 Lbs.

**\* BAR LIST ~ 2 APPROACH SLABS**

Mark	No. Req'd	Length	Type	Dimensions h v
506	40	31'-8"	Str.	
507	80	2'-5"	Str.	
703	126	19'-8"	Str.	

**SUMMARY**

1460 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 1523 Lbs.  
 2478 Lin Ft. #7 Bar @ 2.044 Lbs./Lin Ft. = 5065 Lbs.  
 Total = 6588 Lbs.

\* To be included in roadway quantities.

**\* SUMMARY OF QUANTITIES**  
 2 APPROACH SLABS

Item No.	Description	Unit	Total
412	Concrete Pavement (10 inch)	Sq Yd	143
602	Reinforcing Steel	Lb	6,588

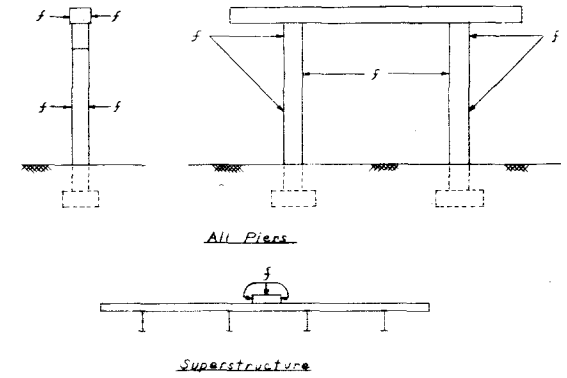
Concrete for approach slabs may be class A, D, or P.

**BAR LIST ~ PIER 2 & 3**

Mark	No. Req'd	Length	Type	Dimensions h v
401	42	6'-3"	VIII	
508	2	28'-2"	Str.	
509	44	12'-8"	V	
701	36	5'-8"	Str.	
702	2	28'-2"	Str.	
1101	20	16'-10"	Str.	
1102	20	6'-2"	VII	1'-5" 4'-9"
1103	5	20'-0"	Str.	
1104	6	28'-2"	Str.	
1105	4	10'-6"	Str.	

**SUMMARY ~ PIER 2**

263 Lin Ft. #4 Bar @ 0.668 Lbs./Lin Ft. = 176 Lbs.  
 614 Lin Ft. #5 Bar @ 1.043 Lbs./Lin Ft. = 640 Lbs.  
 260 Lin Ft. #7 Bar @ 2.044 Lbs./Lin Ft. = 531 Lbs.  
 771 Lin Ft. #11 Bar @ 5.313 Lbs./Lin Ft. = 4096 Lbs.  
 Total = 5443 Lbs.



**SURFACE FINISH DETAILS**  
 (Details showing portions of structure to receive Class 2 surface finish)

**DIVISION OF HIGHWAYS**

BAR LIST ~ BAR SUMMARY  
 BENDING DIAGRAMS  
 SURFACE FINISH DETAILS

Approved:	Designer: G. Singh   Designer: R. Smith
Structure Number:	F-16-EQ
Bridge Engineer:	F-16-ER
Date:	DWG. No. 8 5 OF 12

CHECKED BY: [Signature]  
 DATE: [Date]  
 QUANTITY BY: [Signature]  
 DATE: [Date]  
 CHECKED BY: [Signature]  
 DATE: [Date]

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 006-6 (2)	34	

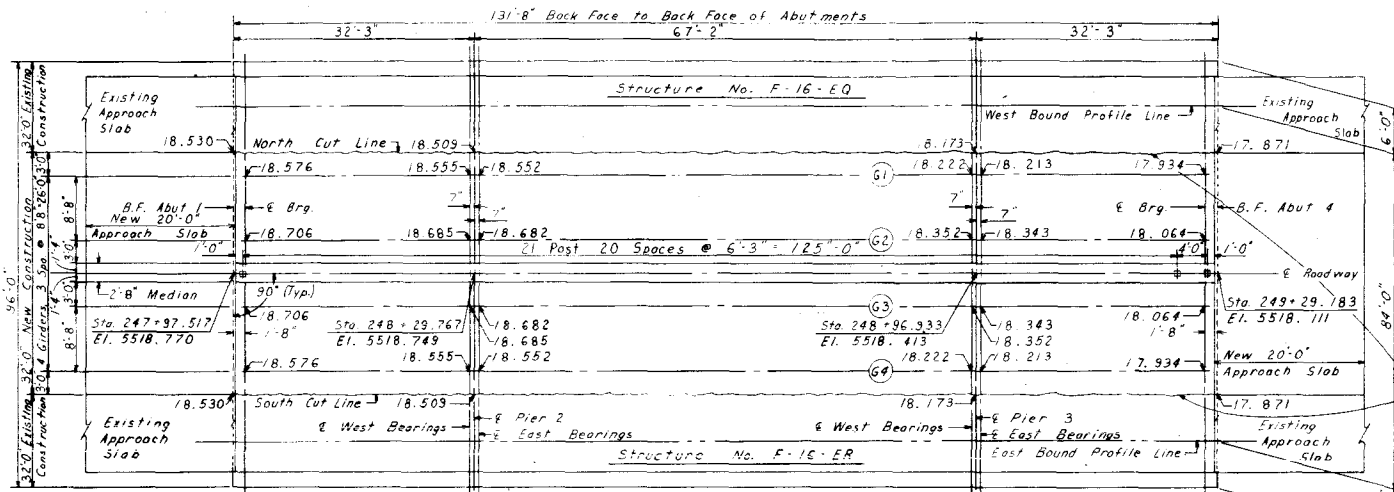
REVISIONS	



Cut lines - Coat surfaces with epoxy bonding material. Epoxy shall be included in the bid price for Item 601 Concrete Class D.

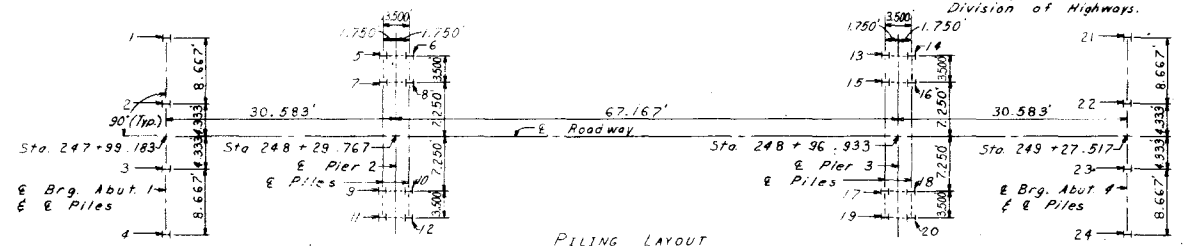
**CUTOFF ELEVATIONS OF PILING**

No.	Elevation	No.	Elevation
1	5514.34	13	5493.95
2	5514.37	14	
3	5514.37	15	
4	5514.24	16	
5	5494.28	17	
6		18	
7		19	
8		20	5493.95
9		21	5513.58
10		22	5513.71
11		23	5513.71
12	5494.28	24	5513.58



**CONSTRUCTION LAYOUT**

**Notes:**  
 All elevations shown are at top of concrete deck.  
 Structure Number F-16-EQ is similar to Structure Number F-16-ER except as noted.  
 Stations and Elevations shown are calculated from "As Constructed Plans" for Structure No. F-16-EQ & F-16-ER. These elevations may be adjusted to meet elevations of the Existing Structures.  
 Salvaged material shall become the property of the Colorado Division of Highways.



**PILING LAYOUT**

**Notes:**  
 Piling numbered 1, 4, 21 and 24 are to be battered 2:12.  
 The piling dimensions shown are at the bottom of the concrete.  
 All pilings are 10 BP 42. Maximum piling load = 32 tons at Abutments and 54 tons at Piers.

DESIGNED BY	DATE	CHECKED BY
QUANTITIES BY	12-73	
CONTRACT NO.		
CONTRACT BY		

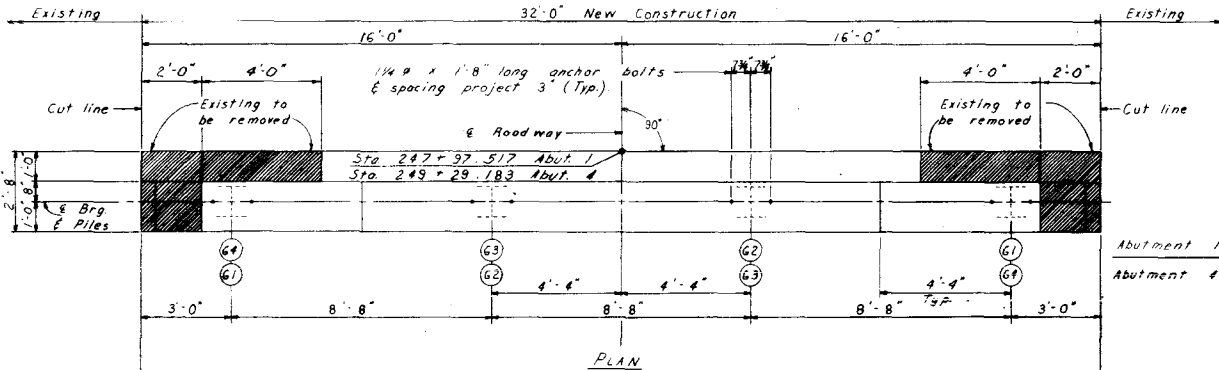
**DIVISION OF HIGHWAYS**

CONSTRUCTION & PILING LAYOUT

Approved:	Designer: G. Singh	Designer: K. Sharpley
Bridge Engineer:	Structure Number: F-16-EQ	
Date:	DWG. No. B. 6.	OF 12



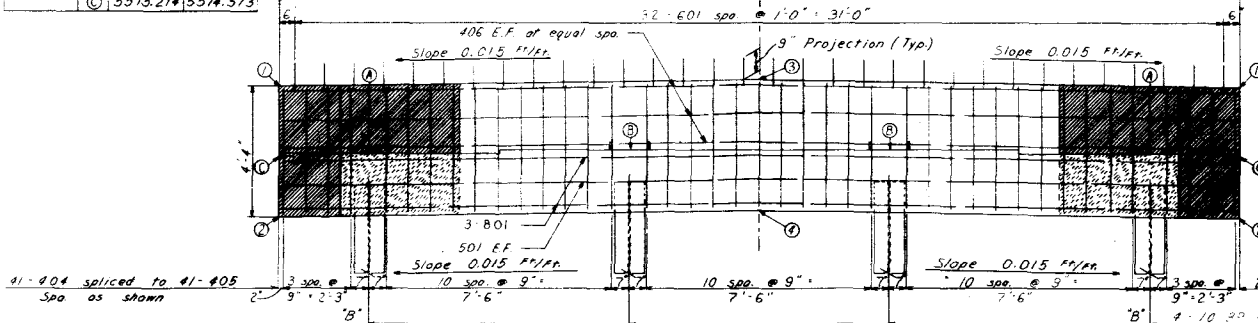
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	U 006-6 (2)	35	
REVISIONS				



PLAN

Table of Elevations

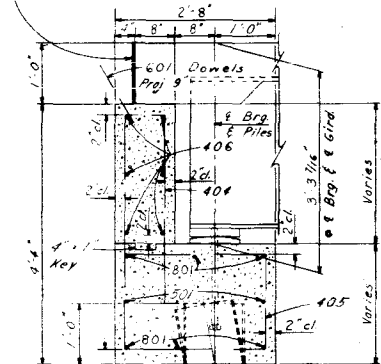
Location	Point	Abut. 1	Abut. 4
Back Face of Abut	①	5517.530	5516.871
	②	5513.196	5512.538
	③	5517.770	5517.111
	④	5513.436	5512.778
Brig. Seats	A	5515.289	5514.648
	B	5515.419	5514.778
	C	5515.214	5514.573



ELEVATION

ABUTMENT 1  
 (Abutment 4 Same except as noted)

1/2" Exp'n. Jt. Material nailed in place. Tool corners, set 1" below concrete surface and fill with poured mastic joint filler.



SECTION THRU ABUTMENT

#1-804 spliced to #1-405  
 Spa as shown

1-10 #2 @ 42" required of each abutment, spaced as shown. Better piles marked "B" at 2'-12". Maximum pile loading = 32 Tons.

**DIVISION OF HIGHWAYS**

DETAILS OF ABUTMENTS

Approved:	Designer: S. Singh	Checker: N. Sharpley
Bridge Engineer:	Structure Numbers: F-16, E.O.	F-16, E.R.
Date:	DWG. No. 8 7 OF 12	

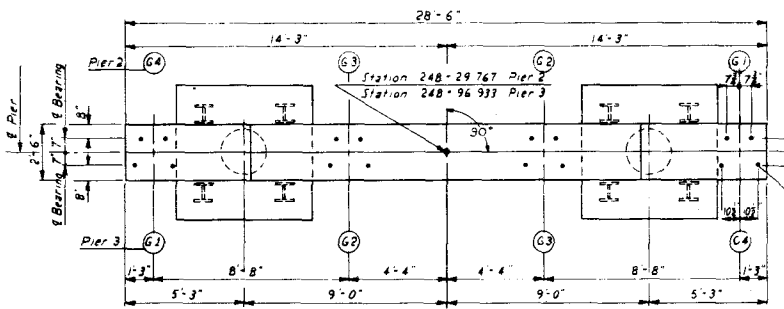
ELEVATIONS TABLE						
ELEVATION	A	B	C	D	E	F
Pier 2	15,198	15,206	14,245	14,115	14,115	5492.26
Pier 3	5,057	4,927	3,915	3,785	10,785	5492.95

Base elevation 5500

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 066-6(2)	36	

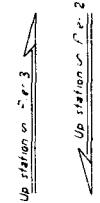
  

REVISIONS	

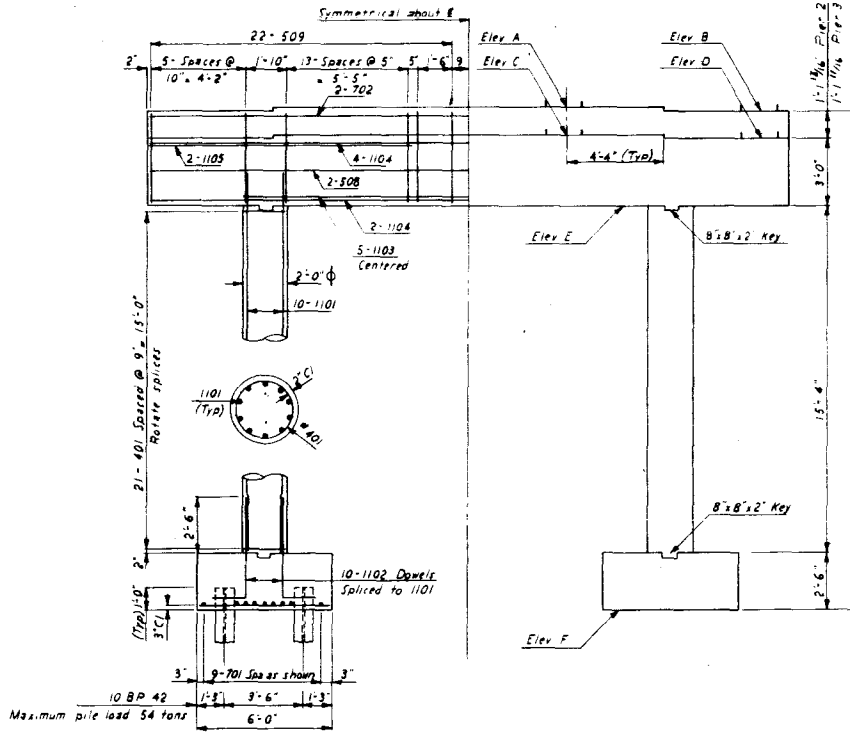


PLAN OF PIER

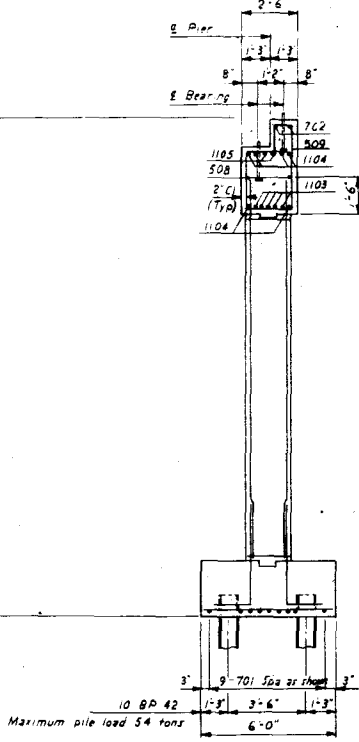
1 1/2"  $\phi$  x 18" Anchor bolt (Typ)  
(Project 3)



INITIAL	DATE	CHECKED BY	DATE	QUANTITY BY	DATE	QUANTITY BY	DATE



ELEVATION OF PIER



TYPICAL SECTION THRU PIER

Note: Pier 3 is the same as Pier 2 unless otherwise noted

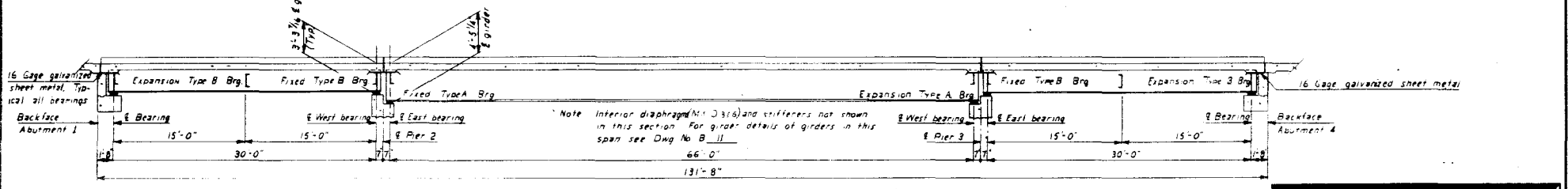
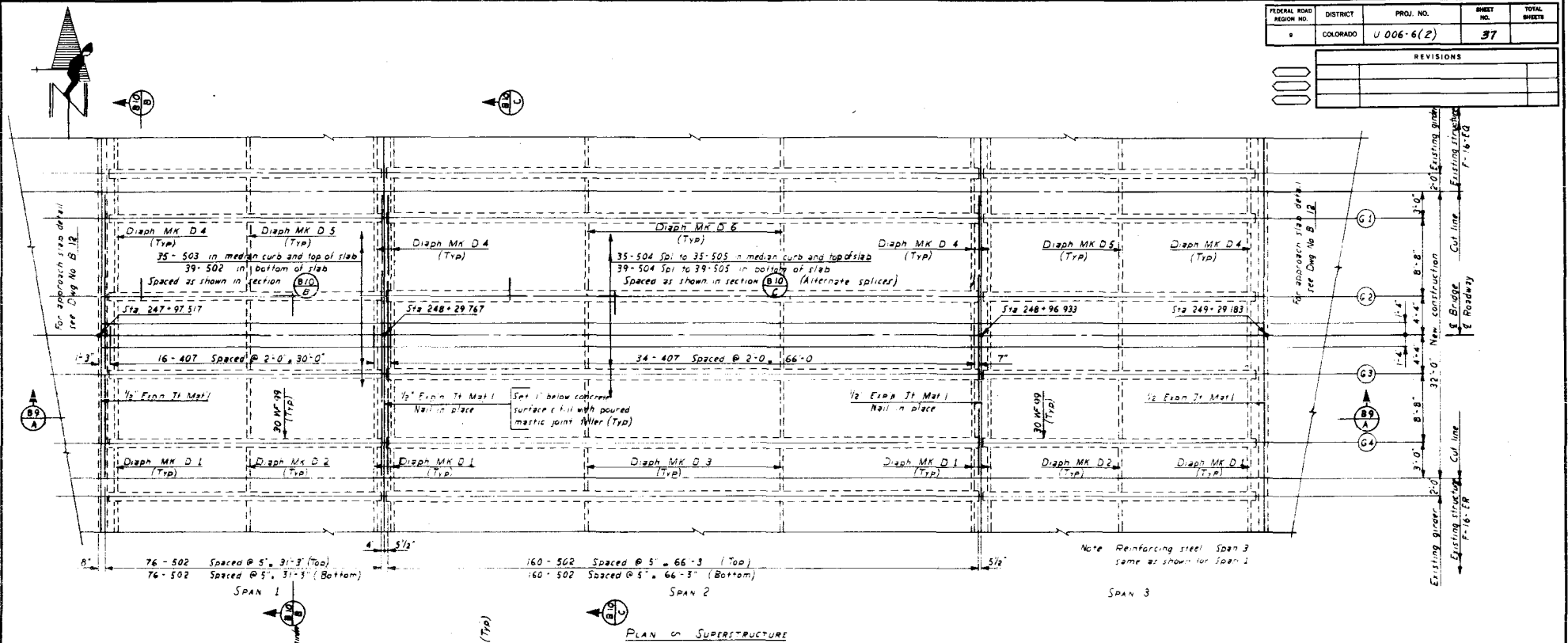
DIVISION OF HIGHWAYS		
PIER DETAILS		
Approved:	Designer: G. Singh	Checker: J. J. Sawyer
Bridge Engineer:	Structure Numbers: F-16-EG	
Date:	F-16-ER	
DWG. No. B. 8 OF 12		

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 006-6(2)	37	

REVISIONS	

DESIGNED BY	CHECKED BY	DATE	QUANTITY BY	DATE
WJS	WJS	12-7-47	WJS	12-7-47
WJS	WJS	1-11-48	WJS	1-11-48
WJS	WJS	1-11-48	WJS	1-11-48



**Section A-A**

**Notes:**  
 407 may be placed after slabs poured out before initial set takes place.  
 Special care shall be exercised in removing portions of the existing structure to preserve the existing reinforcing steel which shall be cleaned and straightened and project a minimum of 24 bar diameters into new construction.  
 Equipment used in removing portions of the existing structure shall be approved by the engineer.  
 For details of bearings see Dwg No. B-12.

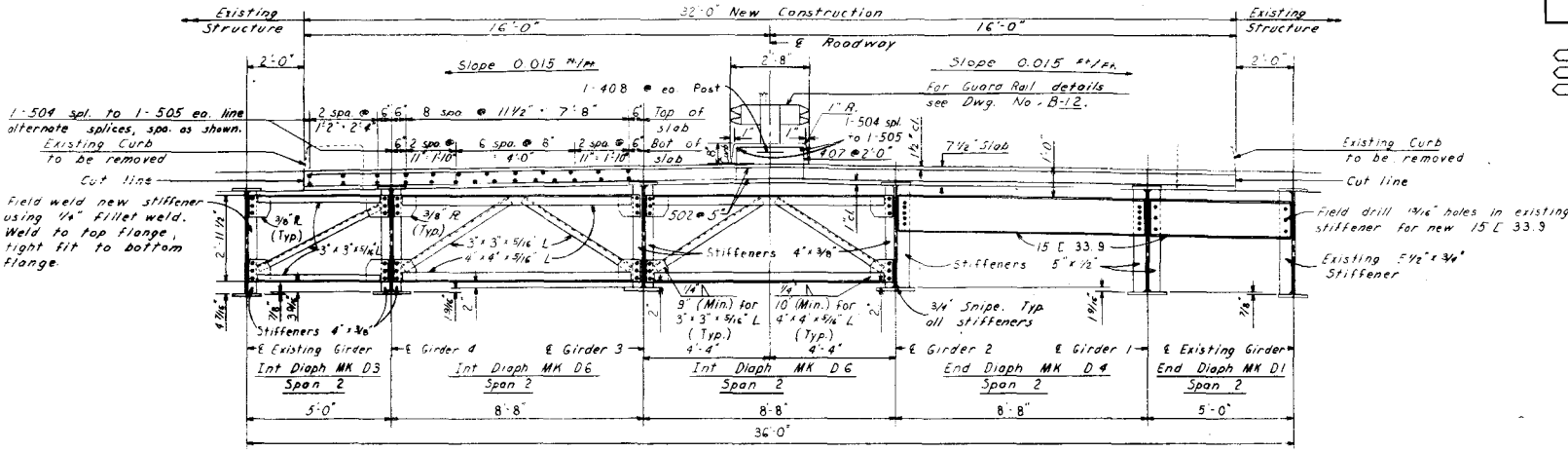
**Notes:**  
 Reinforcing steel Span 3 same as shown for Span 1.

**Section A-A**

<b>DIVISION OF HIGHWAYS</b>		
SUPERSTRUCTURE DETAIL		
Approved:	Designer: G. Smith	Detailer: P. J. Houser
Bridge Engineer:	Structure Number: F-16-EQ	
Date:	DWG No. B-9	OF 12

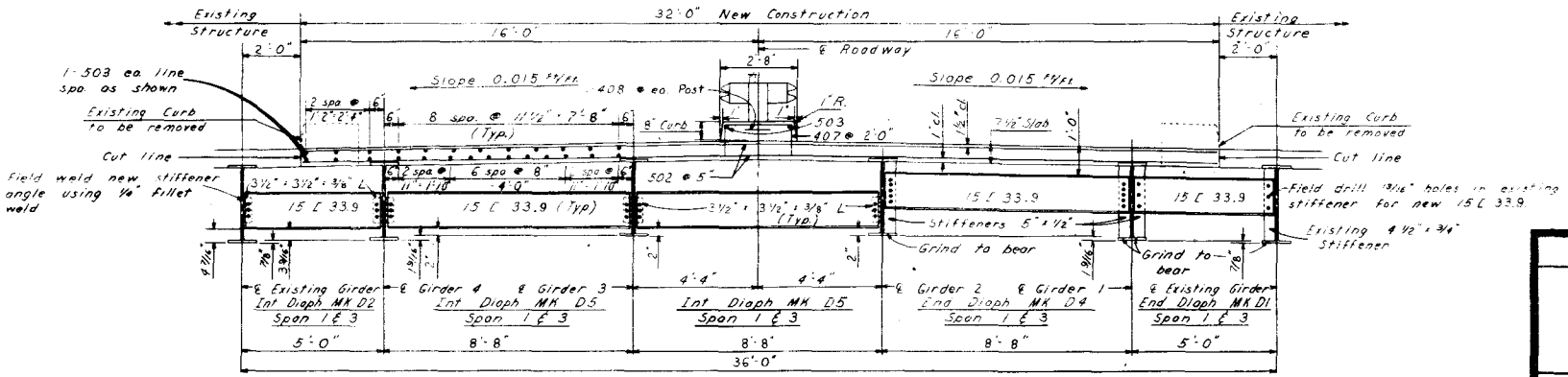
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	U 006-6(2)	38	

REVISIONS	



SECTION B-2

DATE	BY	CHECKED BY
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.
12-17-61	K. R. S.	K. R. S.



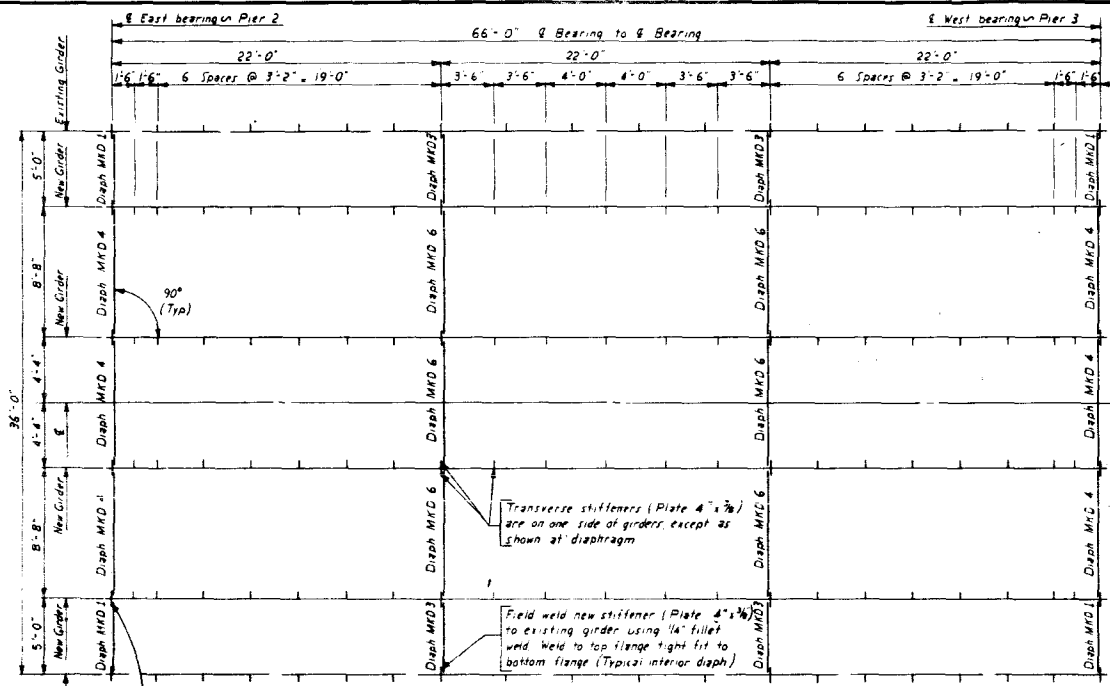
SECTION B-2

**DIVISION OF HIGHWAYS**

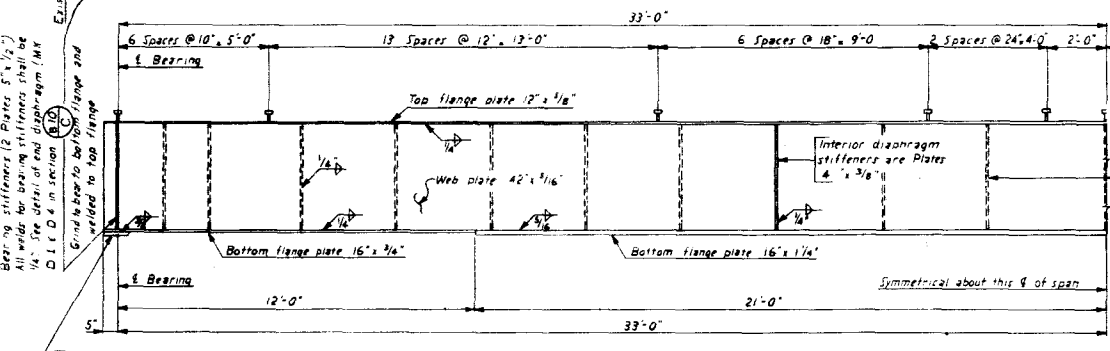
SUPERSTRUCTURE SECTIONS

Approved:	Designer: G. Singh	Checker: H. Shetty
Bridge Engineer:	Structure Numbers: F-16-EQ	
Date:	Structure Numbers: F-16-ER	
	DWG. No. B-10	OF 12

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 006-6(2)	39	
REVISIONS				



FRAMING PLAN SPAN 2

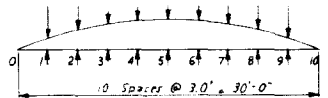
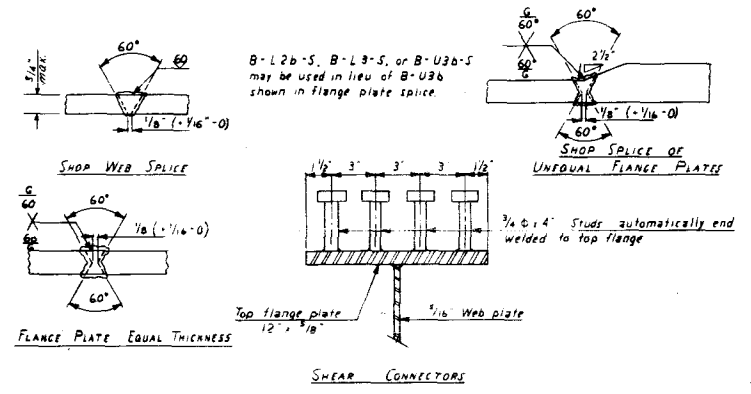


GIRDER DETAIL SPAN 2

Bearing stiffeners (2 plates, 5" x 1/2")  
 All welds for bearing stiffeners shall be  
 1/4". See detail of end diaphragm (M.T.  
 D.I.E.D.4 in section B-D)

DESIGNED BY	CHKD BY
DRAWN BY	APPROVED BY
DATE	

Typical stiffener spacing  
 for all new girder span 2



SLAB THICKENING DIAGRAM SPAN 2  
 (See table below)

Point	0	1	2	3	4	5	6	7	8	9	10
Dead load deflection	0	1/16	1/16	1/8	3/16	3/16	1/2	3/8	1/8	1/16	0
Vertical curve correction	0	1/16	1/16	1/8	3/16	3/16	1/2	3/8	1/8	1/16	0
Slab thickening	0	1/8	3/16	1/4	3/16	3/16	1/2	3/8	1/8	1/16	0

All intermediate stiffeners are  
 plates 4" x 3/8". All stiffeners  
 to have tight fit to bottom flange  
 and welded to top flange



GIRDER CAMBER DIAGRAM SPAN 2  
 Note: Girder camber diagram above is typical  
 for all girders in span 2. Cut girder web  
 to camber, as shown on bottom line of  
 table below. Slab remains constant 7 1/2" thick

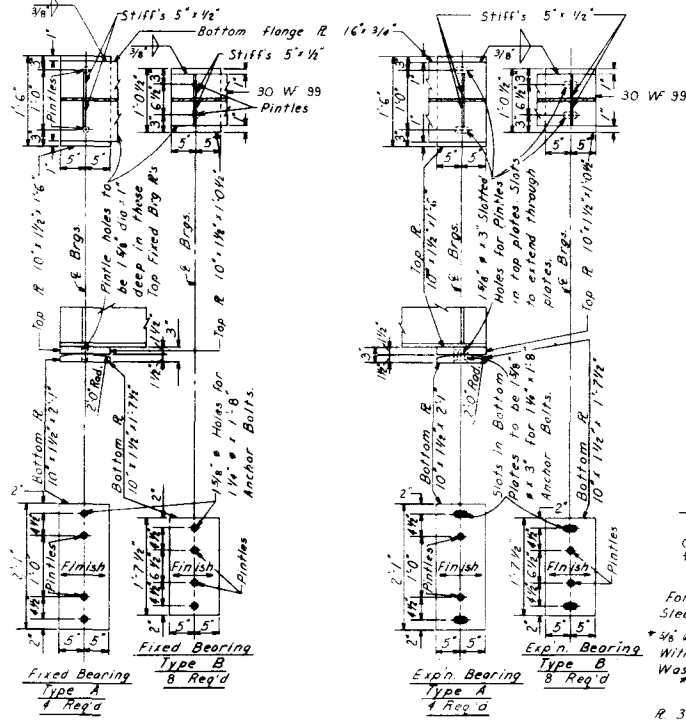
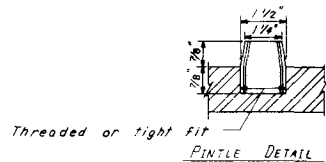
Point	1	2	3	4	5	6	7	8	9	10
Dead load deflection	3/8	1/2	3/4	1	1 1/8	1 1/4	1 1/2	1 3/4	1 1/2	1
Vertical curve correction	3/16	1/2	3/4	1	1 1/8	1 1/4	1 1/2	1 3/4	1 1/2	1
Girder web camber	3/16	1	1 1/8	1 1/4	1 1/2	1 3/4	1 1/2	1	3/4	0

**DIVISION OF HIGHWAYS**

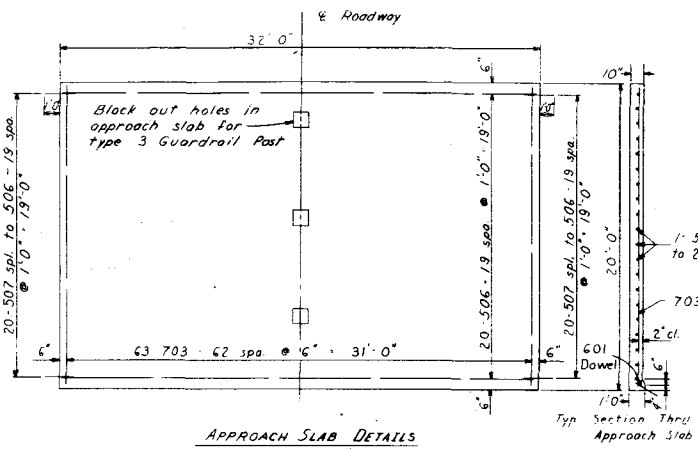
DETAILS OF GIRDERS

Approved:	Designer: G. Singh	Draftsman: P. Seetharam
Bridge Engineer	Structure Numbers: F-16-20	Date: F-16-68
Date:	DWG. No. B-11 OF 12	

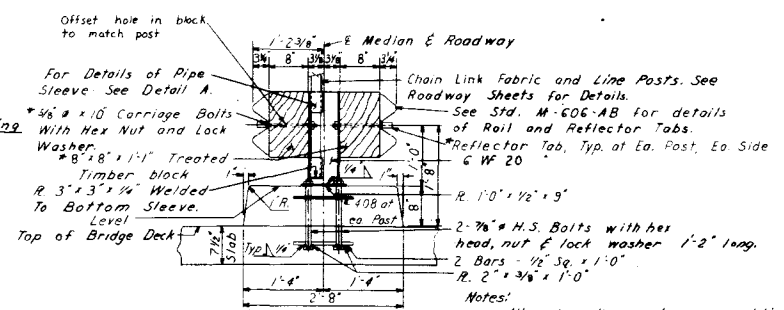
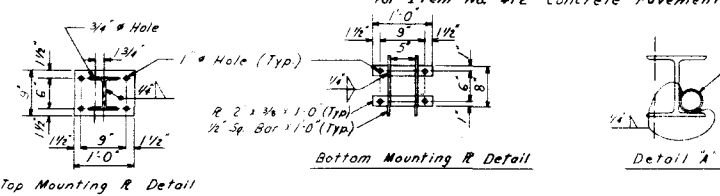
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 006-6 (2)	40	
REVISIONS				



Note:  
 Type A Fixed and Exp'n. Bearings are used under girders of span 2. Type B Fixed and Exp'n. Bearings are used under girders of spans 1 and 3.

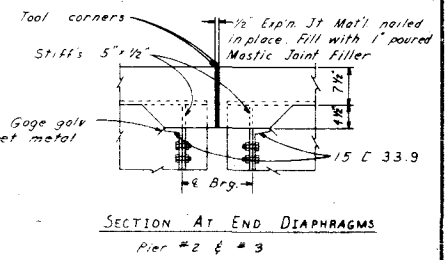


Note: Drill and Grout 507 Bars into existing approach slabs. All modifications of the existing approach slab to be included in the bid price for Item No. #12 Concrete Pavement 10".



No. Guardrail Post req'd.	22
No. Guardrail Pcs. req'd.	20 12'-6"
No. Guardrail Pcs. req'd.	2 4'-0"

Notes:  
 All posts, clips, anchor assemblies, anchor bolts, nuts, and washers shall be galv. after fabrication in accordance with the specifications. Lap splices in direction of traffic. Aluminum guard rail 0.125" thick will be an acceptable equivalent for steel guard rail. To be included in the bid price for Item 606, Guard Rail, Type 3A (Double).



**DIVISION OF HIGHWAYS**

MISCELLANEOUS DETAILS

Approved:	Designer: G. Singh	Checker: K. Sharkey
Division Engineer:	Structure: F-16-EQ	Number: F-16-ER
Date:	DWG. No. 12	OF 12

DESIGNED BY	DATE	CHECKED BY	DATE
DESIGNED BY	7-2-70	CHECKED BY	7-2-70
QUANTITIES BY		QUANTITIES BY	
QUANTITIES BY		QUANTITIES BY	
REVISED BY		REVISED BY	
REVISED BY		REVISED BY	