

**PLAN AND PROFILE OF PROPOSED
U.S. WORKS PROGRAM HIGHWAY PROJECT № W.P.H. 81-F(3)
STATE HIGHWAY NO. 20
CLEAR CREEK COUNTY**

Rev. Const. Div. *1 & *2 Combined 10-11-39 W.W.H.
Rev. 11-1-39 - Standard M-22-B - E.A.R.

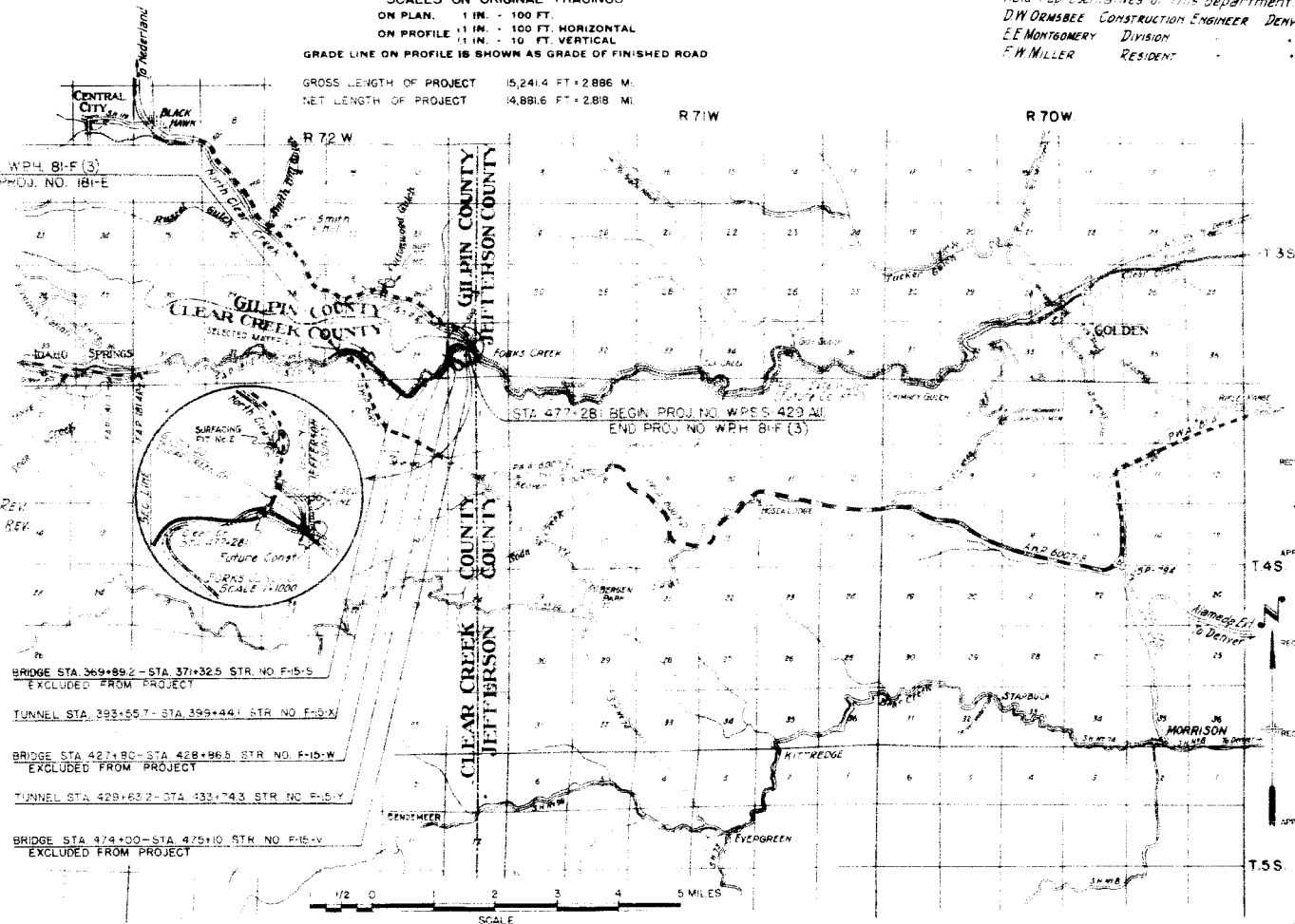
CENTER LINE OF SURVEY
RIGHT OF WAY LINE
SECTION LINE
ONE-QUARTER SECTION LINE
POLE LINE
RAILROAD

It is recommended that bidders on this project go over the plan details with one of the following field representatives of this department:

D.W. ORMSBEE	CONSTRUCTION ENGINEER	DENVER, COLO.
E.F. MONTGOMERY	DIVISION	
F.W. MILLER	RESIDENT	

GROSS LENGTH OF PROJECT	15,241.4 FT = 2.886 MI.
NET LENGTH OF PROJECT	14,881.6 FT = 2.818 MI.

1. TITLE - MAIN AND TITLE SHEET
2. TYPICAL SECTIONS AND SUMMARY OF QUANTITIES
- 3-4. TUNNEL SECTIONS
5. LIST OF STRUCTURES
6. MISCELLANEOUS QUANTITIES
7. DETAILS OF TUNNEL PORTALS STA'S 393+ , 399+ , 420+ & 439+
8. " " DRAINAGE STA 393+
9. " " CONC PAVEMENT & REINFC CONCRETE BRIDGE
APPROACH SLAB STA 428+
- 10-15. MISCELLANEOUS DETAILS STA 392+ TO 400+
16. STANDARD CONCRETE PAVEMENT JOINT DETAILS
17. " " HEADWALLS FOR CMP CULVERTS
18. " " MANHOLES & INLETS
19. " " TIMBER GUARD POSTS
20. " " SEMI-RIGID METAL PLATE GUARD FENCE
21. " " FLEXIBLE " " "
22. " " METHODS FOR SUPERELEVATION AND
WIDENING OF CURVES
23. TYPICAL SIDE APPROACH ROADS- ROADWAY
CONSTRUCTION TRAFFIC SIGNS
- 24-29. PLAN AND PROFILE SHEETS



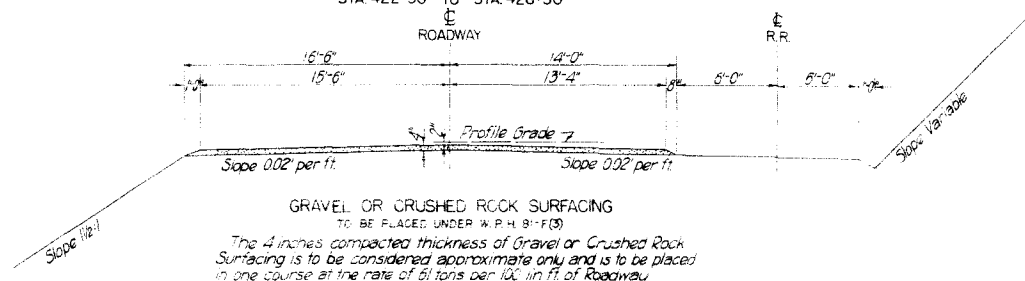
FED. ROAD DIST. NO.	STATE	U.S. W.P.H. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	W.P.H. 81-F(3)	2	

Rev. 10-11-32 - W.H.M. - Sheet Remade
Rev. 11-1-32 - W.H.M.

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

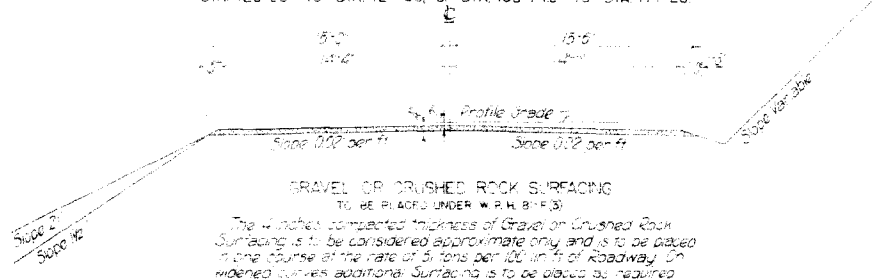
TYPICAL CROSS SECTION

STA 422+50 TO STA 426+50



TYPICAL CROSS SECTION

STA 292+50 TO STA 393+55.7, STA 399+44.1 TO STA 422+50,
STA 426+50 TO STA 427+80, STA 433+74.3 TO STA 477+28.1



GENERAL NOTES

This Project is to be constructed in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1937.

Quantities on Preliminary Plans are to be considered approximate only.

All Curves are to be super-elevated and widened as provided for by the Standard Super-elevation Sheet included with the Plans.

Except as otherwise noted on the Plans, Overhaul will be paid for as measured along the center line of the Project.

During construction of this Project, traffic will use the present traveled Roadway. At all places on the Project where new construction encroaches on the present Road traffic must be adequately provided for at the Contractor's expense. Also, the Contractor shall construct and maintain all temporary approaches to and crossings of intersecting Roads.

When the operation of paving, tunnel drainage, and other construction require the closing of the Road to traffic, the portions involved will be closed on order of the Engineer. Upon the completion of such construction the Road will then be reopened to traffic on order of the Engineer, and the Contractor shall again adequately provide for traffic at his expense.

SUMMARY OF APPROXIMATE QUANTITIES

NO.	ITEM	UNIT	ROADWAY		TUNNELS		PROJECT TOTALS
			GRAVEL SURF	CONC PAVING	STA 393+ STA 429+	TOTALS	
11 c	Removal of Timber Header	Each					
13 c	Unclassified Excavation	Cu Yd	5500	50	5550	550	6100
14 a	Dry Rock Excavation (Structural)	Cu Yd	205		205	35	240
14 b	Dry Common Excavation (Structural)	Cu Yd	50		50	10	60
14 c	Wet Rock Excavation (Structural)	Cu Yd	30		30	10	40
14 d	Wet Common Excavation (Structural)	Cu Yd	10		10	10	20
15 a	Station Yard Overhaul	Sta Yd	17000	500	17500	6000	23500
15 b	Yard Mile Overhaul	Yd Mi	400	100	500	800	1300
26 a	Gravel or Crushed Rock Surfacing	Ton	10000		10000		10000
26 c	Overhaul of Surfacing	Ton Mi	10000		10000		10000
37 a	Concrete Pavement	Sq Yd		150	150	1010	2460
37 c	Sand Cushion	Cu Yd		20	20	90	230
44 c	Miscellaneous Treated Timber	M.F.T.B.M.	0.1		0.1	0.2	0.3
46 a	Class 'A' Concrete	Cu Yd	5	25	30	235	425
46 b	Class 'B' Concrete	Cu Yd	2		2		4
47	Reinforcing Steel	Lb	300	4100	4400	26400	48400
53 x	12" Corrugated Metal Culvert Pipe	Lin Ft	44		44		88
53 b	18" Corrugated Metal Culvert Pipe	Lin Ft	142		142		284
53 c	24" Corrugated Metal Culvert Pipe	Lin Ft	110		110		220
72 x	6" Perforated Corrugated Metal Pipe Underdrain	Lin Ft	90		90	630	720
72 y	12" Perforated Corrugated Metal Pipe Underdrain	Lin Ft				572	572
72 z	Comb Recessed Reflector Lamp & Gutter	Lin Ft				1155	2015
74 x	Timber Guard Posts	Each	234	11	245		245
74 y	Metal Plate Guard Fence	Lin Ft	5455	50	5505		5505
74 z	Special Metal Plate Guard Fence	Lin Ft	325		325		325
75	Concrete Sidewalks	Sq Ft				1000	1000
111 a	24" C.I. Manhole Ring & Cover	Each					1
111 x	24" Storm Sewer Ring & Cover	Each					2
20	Blading & Grading Roadway	Mile	25		25		25
50 a	Stone Masonry (Silver Plume)	Cu Yd				24	53
50 b	Stone Masonry (Native)	Cu Yd				25	110

TYPICAL TUNNEL SECTION
Sta. 393+55.7 to 399+41.1
SHOWING CONSTRUCTION DETAILS FOR
CURB & GUTTER, SIDEWALK, PAVEMENT, AND DRAINAGE

SHOWING CONSTRUCTION DETAILS FOR
CURB & GUTTER, SIDEWALK, PAVEMENT, AND DRAINAGE

2. $\Delta H_{\text{vap}} = H - V = 0.10 \text{ kcal/mol}$



2-54



PLAN

FACE ELEVATION

LIST OF STRUCTURES

STATION	DESCRIPTION	REF SHEET NO	EXCAVATION		STRUCTURAL EXCAV. CU YDS	OVERHAUL STA YD YD MI	SAND CHURNING CU YD	CONCRETE				MISC TR TIMB M ² FT BM	REINF STEEL LBS	CM CULVT PIPE LIN FT			STONE MASONRY SILVER PLUME CU YD	PERF UNDERDRAIN LIN FT	CMP MASONRY NATIVE CU YD	STONE REFLECTOR CURB & GUT LIN FT	COMB REC CULVT PIPE LIN FT	C/STORM SEWER RING AND COVER EACH	MISCELLANEOUS	
			CU YDS UNCL	SEL MATL				PAVEMT SQ YD	CL "A" CU YD	CL "B" CU YD	SIDEWKS SQ FT			12" 12"	18" 18"	24" 24"								
392 + 56	ROADWAY																							
392 + 997-393 + 557	Cross Culvert (5k 80"), Inlet	15	10		110					1.65					110									
392 + 997-393 + 557	Perforated C.M.P. Underdrain Rt	15															56							
393 + 217-393 + 557	Perforated C.M.P. Underdrain Lt	15															34							
302 + -477 + 281	Blading And Grading Roadway																							
399 + 441-399 + 881	C.M.P. connection to 12" C.M.P. Underdrain Rt				30																			
399 + 50	Manhole Rt	15			15				4.30			0.041	261		44									
400 + 05	Cross Culvert (5k 45")	15			110									142										
428 + 865	Remove Timber Header																							
428 + 865-429 + 165	Reinf Concrete Bridge Appr Slab	13					7		26.00				4020											
429 + 165-429 + 632	Concrete Pavement	13					10		50															
428 + 865-429 + 632	Shoulder Fill Rt & Lt			40		500	50																	
292 + 50 -302 +	Raising Roadway & Bridge Apprs		3000			2000																		
292 + 50 -345 +	Topping Subgrade & Leveling Roadway		1900			5000	300																	
ROADWAY TOTALS			3010	1940	265	7500	350	17	150	30.30	1.65	0.041	4281	44	142	110		90						
TUNNEL NO. 1 STA. 393+557 TO 399+441																								
393 + 557-399 + 887	Tunnel Portal and Portal Barrel & Open Concrete Drain	78.8		220	40	2400	200		155.00				9090				3			22				
393 + 557-399 + 441	Tunnel Drainage	12		100		100	100											130	572					
393 + 557-399 + 441	Conc. Pavement & Timber Headers	3					60	1440				0.280												
393 + 557-399 + 441	Comb. Rec. Reflector Comb. and Gutter Lt & Rt	3					20													65				
393 + 557-399 + 441	Conc. Sidewalks Lt & Rt	3		100		100	100	30			2.00													
393 + 20	Timber Manhole Rt	1							3.50			1.35												
397 + 00	Tunnel Manhole Rt	14			10				3.50															
399 + 341-399 + 441	Tunnel Portal	78.9		100	25	100	130		76.00				7000						24					
TUNNEL NO. 1 TOTALS				520	85	4720	530	30	1440	155.00		0.30	9350	26316			24	630	572	46	125			
TUNNEL NO. 2 STA. 429+632 TO 433+743																								
429 + 632-429 + 732	Tunnel Portal	78.0		160	20	1000	270		89.00				7930				13			30				
429 + 432-433 + 743	Comb. Rec. Reflector Comb. and Gutter Lt & Rt	38.4					5													330				
429 + 632-433 + 743	Conc. Pavement & Timber Headers	4					60	1320				0.140												
429 + 632-433 + 743	Concrete Sidewalks Lt & Rt	4		90		1000	150	15			2.00													
433 + 643-433 + 743	Tunnel Portal	78.1		200	25	2200	350		98.00				9650				16			43				
TUNNEL NO. 2 TOTALS				450	45	4960	770	30	0.0	167.00		2.100	0.40	7580			29			73	330			
PROJECT TOTALS				3010	2910	395	28180	1850	527	2600	455.30	1.65	5200	0.533	48177	44	142	110	53	720	572	119	2015	2

*Structural Excavation is estimated to be 80% Rock and 20% Common, each of which is estimated to be 90% Dry and 10% Wet.

*Estimated classification of Structural Excav. on Sheets 7 to 10 inc.

*Embankment

*Items chargeable to Concrete Pavement. Other Items under Roadway, chargeable to Gravel Surfacing.

METAL PLATE GUARD FENCE

STATION	SIDE	IN	FT
325.00 -	330.00	R	500
331.88 -	345.00	R	1325
345.00 -	340.00	R	100
349.00 -	355.00	R	600
368.69 -	369.69	R	100
371.18 ³ -	371.43 ³	R	25
371.50 ³ -	372.50 ³	L	100
371.88 ³ -	372.21 ³	R	375
426.38 ³ -	427.58 ³	L	100
426.58 ³ -	427.96 ³	R	375
• 429.01 ³ -	429.51 ³	R	50
434.42 -	433.81 ³	R	625
475.28 ³ -	477.20 ³	L	200
474.98 ³ -	477.28 ³	R	230
551.50 -	552.57 ³	-	1375
420.50 -	421.50	-	100
421.50 -	421.15	L	50
444.00 -	444.44 ³	-	375

TIMBER GUARD POSTS

STATION	DIFF	SPACE	NO.
296.00 - 305.37 ⁵	R	50	21
311.75 - 324.76 ²	R	50	21
325.00 - 360.00	R	50	11
375.48 ³ - 391.50	L	36'	52
393.27 ⁴ - 399.52 ²	R&L	Tunnel	10
398.47 ³ - 399.78 ¹	R&L	Tunnel	10
401.79 - 425.00	L	35'	31
426.70 - 426.40	L	30'	20
427.90 - 426.40	R	50	10
* 429.50 ¹ - 429.60 ²	R	Tunnel	2
433.97 ¹ - 434.56 ²	R&L	Tunnel	9
436.00 - 437.56 ²	R	20	18
438.30 ¹ - 442.00	R	30	7
440.50	R	20	1
* 445.73 ¹ - 449.30 ²	L	Tunnel	9
473.6 - 474.00	L	20	5

[illegible]

SPECIAL METAL PLATE GUARD FENCE

$$\text{Sto } 2\text{H}_2\text{O} \cdot \text{H}_2 = 12 \cdot 16 + 2 = 40 \text{ g/mol} \quad \text{Sto } \text{H}_2\text{O} = 18 \text{ g/mol}$$

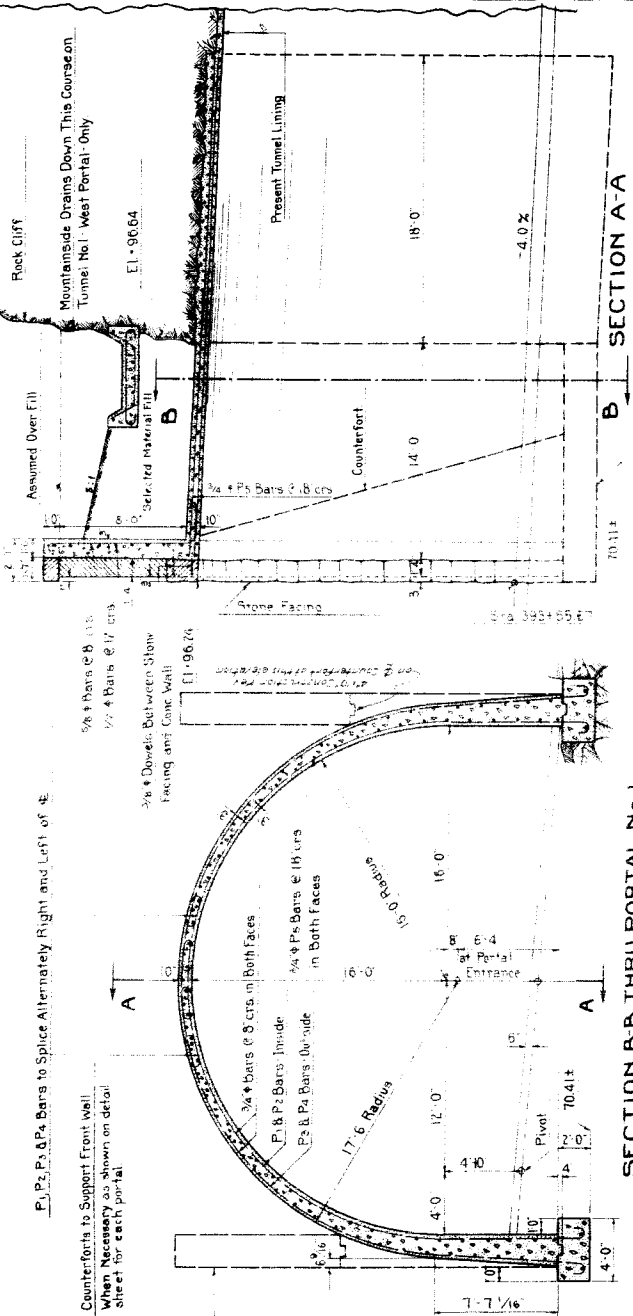
SURFACING PLAN

MATERIAL TO BE PLACED	APPROX QUANT	EST OVERHAUL	2. H.E. OF MATERIAL
STA. TO STA	TONS	TON MILES	
ROADWAY			
282+50 - 302+00	1,000	2400	
371+32+ - 392+50	1200	700	
399+24+ - 427+30	1200	50	
433+12+ - 442+00	1100	F.H.	
473+10 - 477+23	150	F.H.	
360+50 - 369+28	4100	5800	
W. BENTON A. ROAD			
303+50 - 362+50	200	260	11.00 x 1.5 = 16.50 x 4000
371+32+ - 376+21	70	90	21.00 x 4000
40+00 - 417+00	10	10	21.00 x 1000 = 21.00 x 1000
431+50 - 442+50	50	F.H.	
473+10 - 477+23	40	F.H.	
TOTAL	8600	9210	

Figure 1. The effect of the number of iterations on the accuracy of the proposed algorithm. The accuracy of the proposed algorithm increases with the number of iterations. The accuracy of the proposed algorithm is 100% when the number of iterations is 1000.

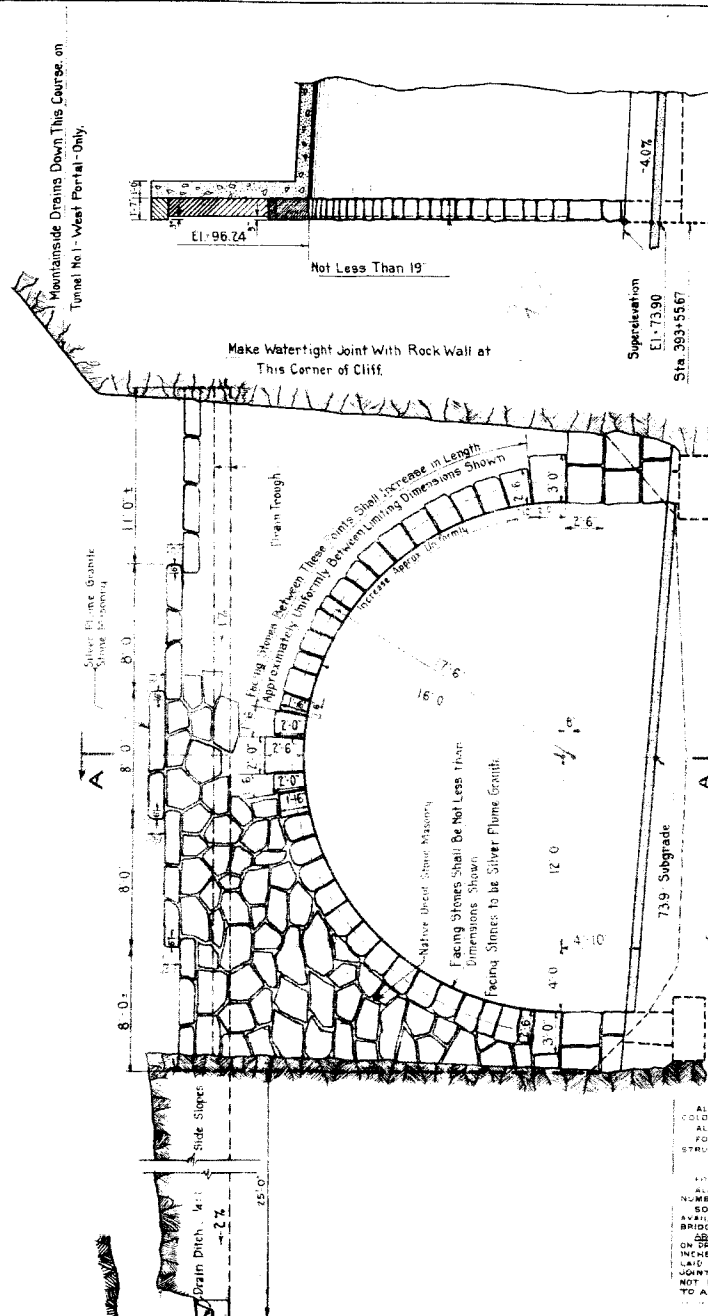
SELECTED MATERIAL

[illegible]



SECTION B-B THRU PORTAL NO. 1
THIS SECTION TYPICAL FOR TUNNELS NO. 1 & NO. 2 U.S.P.W.H. 81-F(4) AND TUNNEL NO. 3 W.P.S.S. 429 A(2)
Additional construction joints may be used but must be approved by the Bridge Engineer

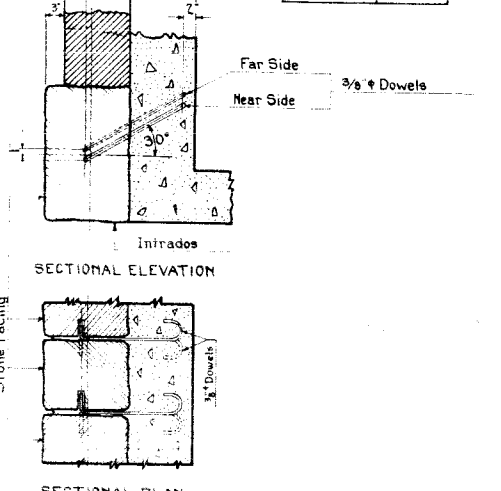
NOTE: Detail Design of Portal and Counterforts Shown on Sheet No. 7
Barrel of West Portal - Tunnel No. 1 Shown
Barrel of East Portal - Tunnel No. 1 Similar Except as Noted on Sheet No. 8



FRONT ELEVATION - TUNNEL PORTAL
WEST PORTAL ELEVATION - STA 393+55.67
TUNNEL NO. 1
EAST PORTAL ELEVATION SIMILAR (SEE SHEET NO. 8)
STONE FACING ON ALL OTHER PORTALS TO BE SIMILAR

REV 10-11-39: Stone Facing
REV 11-1-39: Stone Facing, W.G.S.

FED. ROAD DIST. NO.	STATE	U.S.P.W.H.	SHEET NO.	TOTAL SHEETS
3	COLO.	81-F(4)	7	
		W.P.S.S.	6	
		429 A(2)		



SECTIONAL ELEVATION
SECTIONAL PLAN
DETAILS OF FACING
STONE ANCHORAGE
ITEM NO. 150

- REFERENCE DRAWINGS
- Sheet No. 7 - Tunnel No. 1 Architectural Details.
 - Sheet No. 8 - Tunnel No. 1 West Portal
 - Sheet No. 9 - Tunnel No. 1 East Portal
 - Sheet No. 10 - Tunnel No. 2 West Portal
 - Sheet No. 11 - Tunnel No. 2 East Portal
 - Sheet No. 12 - Tunnel No. 3 South Portal
 - Sheet No. 13 - Tunnel No. 3 North Portal
 - Sheet No. 14 - Tunnel No. 3 North Portal
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 - Sheet No. 99 - Tunnel No. 3 North Portal
 - Sheet No. 100 - Tunnel No. 3 North Portal

GENERAL NOTES

- ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT.
- ALL CONCRETE SHALL BE CLASS "A".
- FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF LUMBER SIZES AND MAY BE NATIVE LUMBER.
- FOOTINGS IN ROCK SHALL BE POURED OUT TO THE ROCK AND NOT FORMED.
- ALL REINFORCING BARS SHALL BE DEFORMED AND TAGGED WITH THE STATION NUMBER AND LETTER DESIGNATION. MAIN BARS SHALL NOT BE SPICED EXCEPT AS SHOWN.
- SOUNDINGS AND DEPTH OF FOOTINGS SHOWN ARE ACCORDING TO THE BEST AVAILABLE DATA. IF ESSENTIALLY DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDSIGN IS NECESSARY.
- CONCRETE STONES (FOR ITEM NO. 150) SHALL BE AS INDICATED ON DRAWINGS. DEPTH OF ARCH RING STONES SHALL BE A MINIMUM OF SEVENTEEN (17) INCHES AND A MAXIMUM OF TWENTY (20) INCHES. STONES SHALL BE SIZED AND LAID TO GIVE A NEAT ARCHITECTURAL EFFECT. ADJOINING FACES BETWEEN MORTAR JOINTS SHALL BE ROUGHLY TRIMMED TO STONES WILL FIT WITH A MORTAR JOINT NOT EXCEEDING TWO (2) INCHES IN THICKNESS. ALL JOINTS SHALL BE RAKED OUT TO A DEPTH OF ONE (1) INCH BEFORE MORTAR SETS. POINTING WILL BE REQUIRED.

DESIGNING DATA
ARCH. NO. 1005
BRIDGE NO. 1005
REV. 10-11-39, JUL. 1939

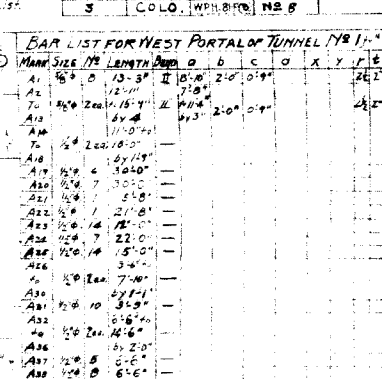
COLORADO
STATE HIGHWAY DEPARTMENT
TUNNEL PORTALS
ARCHITECTURAL DETAILS
BARREL DESIGN

APPROVED BY: *[Signature]*
DATE: 10-11-39

DESIGNED BY: *[Signature]*
DATE: 10-11-39

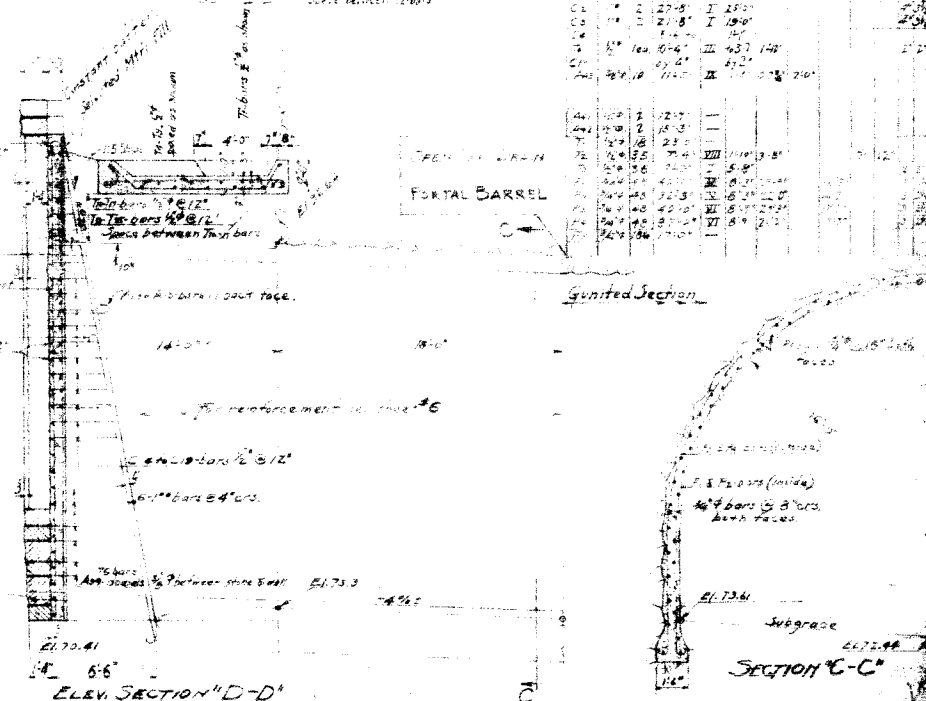
CHECKED BY: *[Signature]*
DATE: 10-11-39

STRUCTURE NO. F-15-X



A-7	200	2-5	III	100	2-5
A-8	200	2-10	—	—	—
C-1	200	3-5	I	300	2-5
C-2	200	2-5	I	250	2-5
C-3	200	2-5	I	150	2-5
C-4	200	2-5	—	—	—
C-5	200	2-5	III	650	1-5
C-6	200	2-5	—	—	—
C-7	200	2-5	II	250	2-5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

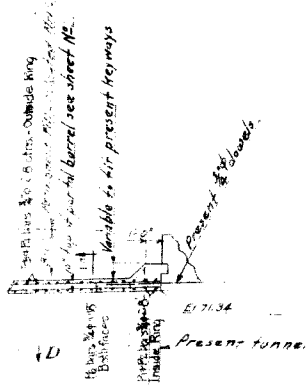


SUMMARY OF QUANTITIES FOR THIS SHEET					
ITEM NO.	DESCRIPTION	UNIT	PORTAL	DRAIN	TOTAL
158 A	EXPOSED STRUCTURAL EXCAVATION	CU YD	2.8	72	33
158 B	DRY CONDITION	CU YD	8		5
158 A	CONCRETE CLASS 75"	CU YD		78	175
158 B	REINFORCING STEEL	LB	18,000	215	18,215
158 A	CONCRETE CLASS 75"	CU YD		78	175
158 B	REINFORCING STEEL	LB	18,000	215	18,215

COLORADO
STATE HIGHWAY DEPARTMENT
TUNNEL PORTALS
WEST PORTAL TUNNEL

NOTE: Contractor to field bend reinforcing steel to fit requirement
 where field construction varies from dimensions shown on these
 drawings.

Approx. Surface profile



BAR LIST FOR PORTAL 5-A 399+491

Item	Size	No.	Length	a	b	c	x	y	ft
1	4"	8	10'-0"	0	0	0	0	0	0
2	4"	8	10'-0"	0	0	0	0	0	0
3	4"	8	10'-0"	0	0	0	0	0	0
4	4"	8	10'-0"	0	0	0	0	0	0
5	4"	8	10'-0"	0	0	0	0	0	0
6	4"	8	10'-0"	0	0	0	0	0	0
7	4"	8	10'-0"	0	0	0	0	0	0
8	4"	8	10'-0"	0	0	0	0	0	0
9	4"	8	10'-0"	0	0	0	0	0	0
10	4"	8	10'-0"	0	0	0	0	0	0
11	4"	8	10'-0"	0	0	0	0	0	0
12	4"	8	10'-0"	0	0	0	0	0	0
13	4"	8	10'-0"	0	0	0	0	0	0
14	4"	8	10'-0"	0	0	0	0	0	0
15	4"	8	10'-0"	0	0	0	0	0	0
16	4"	8	10'-0"	0	0	0	0	0	0
17	4"	8	10'-0"	0	0	0	0	0	0
18	4"	8	10'-0"	0	0	0	0	0	0
19	4"	8	10'-0"	0	0	0	0	0	0
20	4"	8	10'-0"	0	0	0	0	0	0
21	4"	8	10'-0"	0	0	0	0	0	0
22	4"	8	10'-0"	0	0	0	0	0	0
23	4"	8	10'-0"	0	0	0	0	0	0
24	4"	8	10'-0"	0	0	0	0	0	0
25	4"	8	10'-0"	0	0	0	0	0	0
26	4"	8	10'-0"	0	0	0	0	0	0
27	4"	8	10'-0"	0	0	0	0	0	0
28	4"	8	10'-0"	0	0	0	0	0	0
29	4"	8	10'-0"	0	0	0	0	0	0
30	4"	8	10'-0"	0	0	0	0	0	0
31	4"	8	10'-0"	0	0	0	0	0	0
32	4"	8	10'-0"	0	0	0	0	0	0
33	4"	8	10'-0"	0	0	0	0	0	0
34	4"	8	10'-0"	0	0	0	0	0	0
35	4"	8	10'-0"	0	0	0	0	0	0
36	4"	8	10'-0"	0	0	0	0	0	0
37	4"	8	10'-0"	0	0	0	0	0	0
38	4"	8	10'-0"	0	0	0	0	0	0
39	4"	8	10'-0"	0	0	0	0	0	0
40	4"	8	10'-0"	0	0	0	0	0	0
41	4"	8	10'-0"	0	0	0	0	0	0
42	4"	8	10'-0"	0	0	0	0	0	0
43	4"	8	10'-0"	0	0	0	0	0	0
44	4"	8	10'-0"	0	0	0	0	0	0
45	4"	8	10'-0"	0	0	0	0	0	0
46	4"	8	10'-0"	0	0	0	0	0	0
47	4"	8	10'-0"	0	0	0	0	0	0
48	4"	8	10'-0"	0	0	0	0	0	0
49	4"	8	10'-0"	0	0	0	0	0	0
50	4"	8	10'-0"	0	0	0	0	0	0
51	4"	8	10'-0"	0	0	0	0	0	0
52	4"	8	10'-0"	0	0	0	0	0	0
53	4"	8	10'-0"	0	0	0	0	0	0
54	4"	8	10'-0"	0	0	0	0	0	0
55	4"	8	10'-0"	0	0	0	0	0	0
56	4"	8	10'-0"	0	0	0	0	0	0
57	4"	8	10'-0"	0	0	0	0	0	0
58	4"	8	10'-0"	0	0	0	0	0	0
59	4"	8	10'-0"	0	0	0	0	0	0
60	4"	8	10'-0"	0	0	0	0	0	0
61	4"	8	10'-0"	0	0	0	0	0	0
62	4"	8	10'-0"	0	0	0	0	0	0
63	4"	8	10'-0"	0	0	0	0	0	0
64	4"	8	10'-0"	0	0	0	0	0	0
65	4"	8	10'-0"	0	0	0	0	0	0
66	4"	8	10'-0"	0	0	0	0	0	0
67	4"	8	10'-0"	0	0	0	0	0	0
68	4"	8	10'-0"	0	0	0	0	0	0
69	4"	8	10'-0"	0	0	0	0	0	0
70	4"	8	10'-0"	0	0	0	0	0	0
71	4"	8	10'-0"	0	0	0	0	0	0
72	4"	8	10'-0"	0	0	0	0	0	0
73	4"	8	10'-0"	0	0	0	0	0	0
74	4"	8	10'-0"	0	0	0	0	0	0
75	4"	8	10'-0"	0	0	0	0	0	0
76	4"	8	10'-0"	0	0	0	0	0	0
77	4"	8	10'-0"	0	0	0	0	0	0
78	4"	8	10'-0"	0	0	0	0	0	0
79	4"	8	10'-0"	0	0	0	0	0	0
80	4"	8	10'-0"	0	0	0	0	0	0
81	4"	8	10'-0"	0	0	0	0	0	0
82	4"	8	10'-0"	0	0	0	0	0	0
83	4"	8	10'-0"	0	0	0	0	0	0
84	4"	8	10'-0"	0	0	0	0	0	0
85	4"	8	10'-0"	0	0	0	0	0	0
86	4"	8	10'-0"	0	0	0	0	0	0
87	4"	8	10'-0"	0	0	0	0	0	0
88	4"	8	10'-0"	0	0	0	0	0	0
89	4"	8	10'-0"	0	0	0	0	0	0
90	4"	8	10'-0"	0	0	0	0	0	0
91	4"	8	10'-0"	0	0	0	0	0	0
92	4"	8	10'-0"	0	0	0	0	0	0
93	4"	8	10'-0"	0	0	0	0	0	0
94	4"	8	10'-0"	0	0	0	0	0	0
95	4"	8	10'-0"	0	0	0	0	0	0
96	4"	8	10'-0"	0	0	0	0	0	0
97	4"	8	10'-0"	0	0	0	0	0	0
98	4"	8	10'-0"	0	0	0	0	0	0
99	4"	8	10'-0"	0	0	0	0	0	0
100	4"	8	10'-0"	0	0	0	0	0	0

FRONT ELEVATION OF PORTAL AT STA. 399+441
EAST PORTAL 1921

SECTION "B-B"
Note: Section "B-B" is similar to Section "B-B" on Sheet No. 6

SUMMARY OF QUANTITIES FOR THIS SHEET

Item	Description	Unit	Total
14a	Dry Rock Excavation (Structure)	cuyd	20
14b	Common	cuyd	5
14c	Wet Rock	cuyd	5
14d	Common	cuyd	5
46a	Chippin Concrete	sq. ft.	76
47	Reinforcing Steel (Structure)	lb.	3,800
100a	Stone Masonry	sq. ft.	76
100b	Stone Masonry	sq. ft.	76
100c	Stone Masonry	sq. ft.	76

NOTE: For quantities of stone, see drawing of stone facing.
 For quantities of stone, see drawing of stone facing.

Summary of quantities for this sheet

Item	Description	Unit	Total
14a	Dry Rock Excavation (Structure)	cuyd	20
14b	Common	cuyd	5
14c	Wet Rock	cuyd	5
14d	Common	cuyd	5
46a	Chippin Concrete	sq. ft.	76
47	Reinforcing Steel (Structure)	lb.	3,800
100a	Stone Masonry	sq. ft.	76
100b	Stone Masonry	sq. ft.	76
100c	Stone Masonry	sq. ft.	76

COLON

SECRET

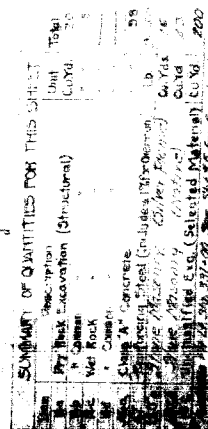


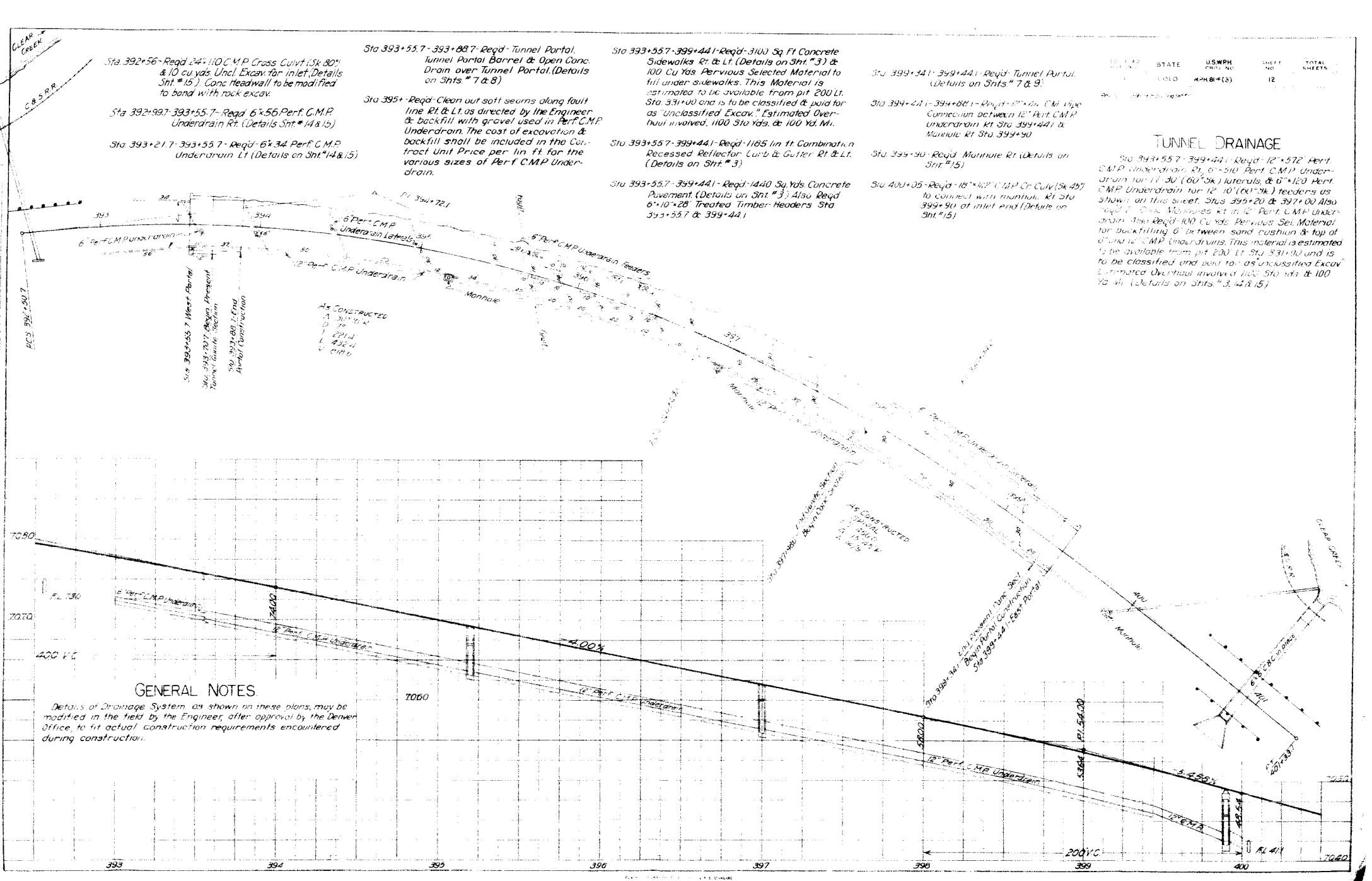
A 4x4 grid of 16 small diagrams, each showing a different mechanical or electrical component, possibly a valve or switch, with various labels and symbols.

2.20	4	3.4	I	3.50	
2.25	4	2.8	I	2.80	
2.35	4	2.2	I	2.30	
C 23		1.4		3.10	
	200	6.4	III	6.40	
C 27		7.2		7.20	
C 28	200	9.8	III	9.80	
C 30		8.3		8.30	
C 36		8.0		8.00	
	50	2.00	II	2.00	
C 39		2.2		2.20	
C 40	10	30.0	I	30.00	
C 41	10	22.5	I	22.50	
C 42	10	22.5	I	22.50	
C 43	10	22.5	I	22.50	
C 44	10	22.5	I	22.50	

	SUMMARY	TOTAL	
860	100%	860	100%
290	34%	290	34%
570	66%	570	66%
37	4%	37	4%
202	23%	202	23%
	TOTAL	860	100%

COLORADO
STATE HIGHWAY DEPARTMENT
TUNNEL PORT
EAST FORK, CO.





PROJECT NO.	STATE	USWPH	SHEET NO.	TOTAL SHEETS
100-1-100	COLO	PHBBI-1(3)	12	

TUNNEL DRAINAGE

Sta 393+55.7 - 399+44.1 - Reqd: 12" x 572' Perft. CMP Underdrain Rt. 6" x 510' Perft. CMP Underdrain for 17' 30" (60" Sk) laterals & 6" x 120' Perft. CMP Underdrain for 12' 10" (60" Sk) laterals as shown on this sheet. Stas 399+20 & 399+00 Also Reqd: 6" Sk. Manholes Rt in 12" Perft. CMP Underdrain. Also Reqd: 100 Cu Yds. Perft. Set Material for backfilling 6" between sand cushion & top of 6" and 12" CMP Underdrains. This material is estimated to be available from pit 200 Lt Sta 331+00 and is to be classified and paid for as unclassified Excav. Estimated Overhaul involved 1100 Sta Yds & 100 Yd Mi. (Details on Shts "3, 4 & 15)

Sta 392+56 - Reqd 24" 110 C.M.P. Cross Culvert (Sk 80") & 10 cu yds. Uncl. Excav. for inlet. (Details Sht #15). Conc. Headwall to be modified to bond with rock excav.
Sta 392+99.7 - 393+55.7 - Reqd 6" x 56' Perft. C.M.P. Underdrain Rt. (Details Sht #14 & 15)
Sta 393+21.7 - 393+55.7 - Reqd 6" x 34' Perft. C.M.P. Underdrain Lt. (Details on Sht #14 & 15)

Sta 393+55.7 - 393+88.7 - Reqd: Tunnel Portal, Tunnel Portal Barrel & Open Conc. Drain over Tunnel Portal. (Details on Shts "7 & 8)
Sta 395+ - Reqd: Clean out soft seams along fault line Rt. & Lt. as directed by the Engineer & backfill with gravel used in Perft. C.M.P. Underdrain. The cost of excavation & backfill shall be included in the Contract Unit Price per lin ft. for the various sizes of Perft. C.M.P. Underdrain.

Sta 393+55.7 - 399+44.1 - Reqd: 3100 Sq Ft Concrete Sidewalks Rt. & Lt. (Details on Sht "3) & 100 Cu Yds. Pervious Selected Material to fill under sidewalks. This Material is estimated to be available from pit 200 Lt. Sta 331+00 and is to be classified & paid for as "Unclassified Excav." Estimated Overhaul involved, 1100 Sta Yds. & 100 Yd. Mi.
Sta 393+55.7 - 399+44.1 - Reqd: 1165 lin ft. Combination Recessed Reflector Curb & Gutter Rt. & Lt. (Details on Sht #3)
Sta 393+55.7 - 399+44.1 - Reqd: 1440 Sq Yds. Concrete Pavement. (Details on Sht #3) Also Reqd 6" x 10" x 28' Treated Timber Headers Sta 393+55.7 & 399+44.1

Sta 399+44.1 - 399+44.1 - Reqd: Tunnel Portal. (Details on Shts "7 & 9)
Sta 394+24.1 - 399+88.1 - Reqd: 12" x 60' C.M.P. Pipe Connection between 12" Perft. C.M.P. Underdrain Rt. Sta 399+44.1 & Manhole Rt. Sta 399+90
Sta 399+90 - Reqd: Manhole Rt. (Details on Sht #15)
Sta 400+05 - Reqd: 18" x 42" C.M.P. Cr. Culv (Sk 42") to connect with manhole Rt Sta 399+90 at inlet end (Details on Sht #15)

GENERAL NOTES

Details of Drainage System, as shown on these plans, may be modified in the field by the Engineer, after approval by the Denver Office, to fit actual construction requirements encountered during construction.

BRIDGE APPROACH SLABS STA 428+8, STA 479+8 STA 482+8

REV. 10-11-82 17

FED. ROAD DIST. NO.	STATE	U.S.W.P.H. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	WPH 8-F(3)	15	
		WPSS 429-A(2)	7	

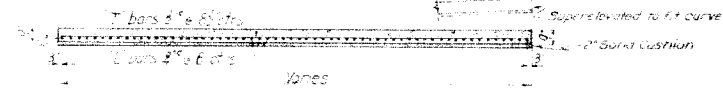
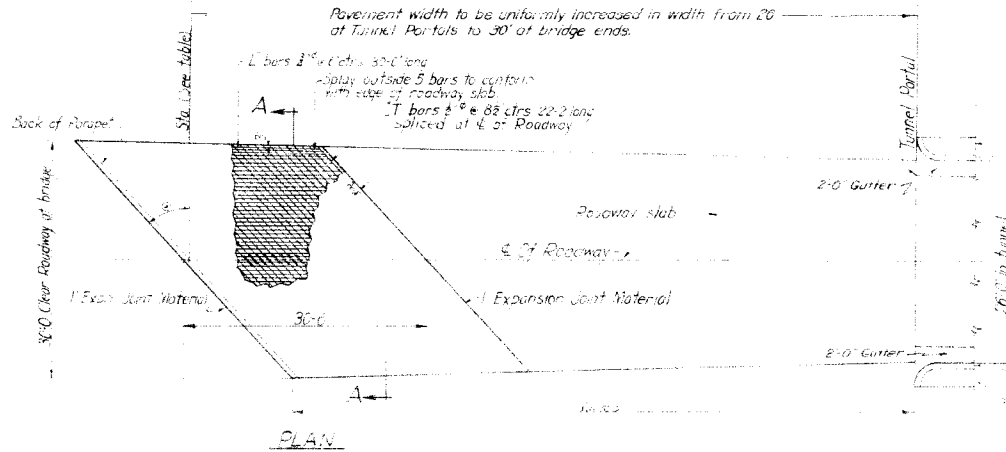
MARK	SIZE	REQD.	LENGTH	TYPE
L	1/4"	60	30'-0"	Straight
T	1/2"	66	22'-2"	dc

SUMMARY FOR ONE SLAB
 1800 Lbs. 1/4" Bars = 1300 Lbs. = 2700 Lbs.
 1900 Lbs. 1/2" Bars = 660 Lbs. = 1270 Lbs.
 Plus 12" concrete = 43 Lbs.
Total = 4020 Lbs.

ITEM	DESCRIPTION	UNIT	TOTAL
46a	Class A Concrete	Cu yd	20
47	Reinforcing Steel (includes 12" for column)	Lb	4020
37c	Sand Cushion	Cu yd	7
11c	Removal of Timber Header	Each	ONE
1	Exp. Joint Mat. (12" Wide)	Lip Ft	66

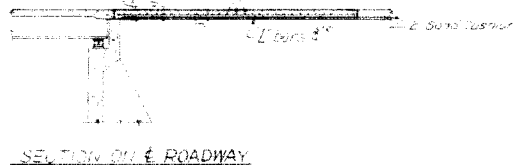
Includes cutting off bolts flush with concrete.
 To be included in price bid for Class A Concrete.

NOTE: Quantities are for one approach slab. 3 Slabs Required

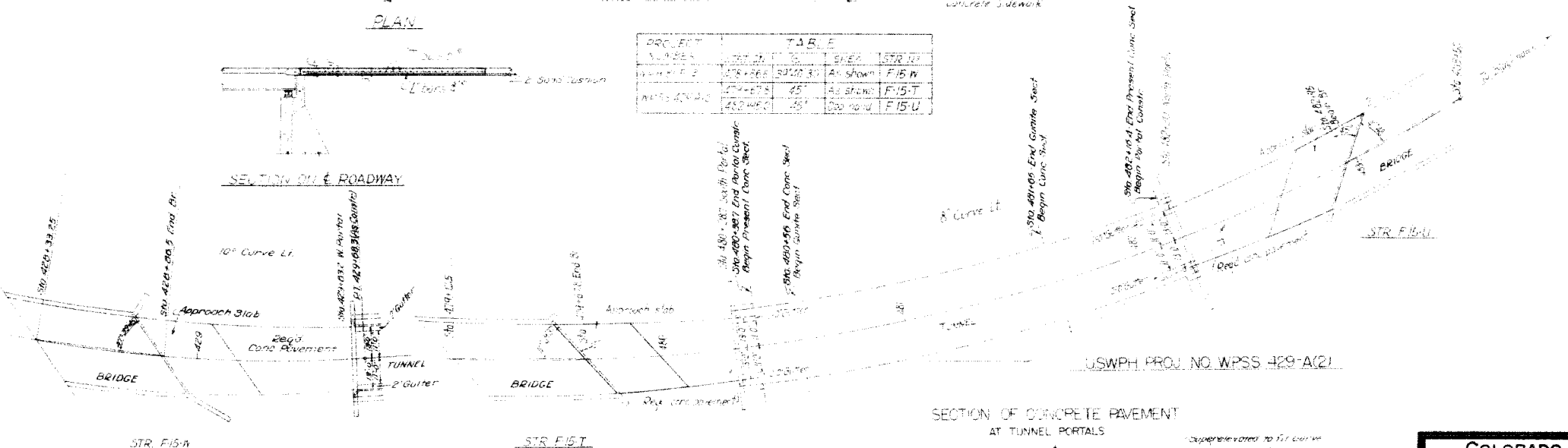


SECTION 4.4 (TYPICAL)

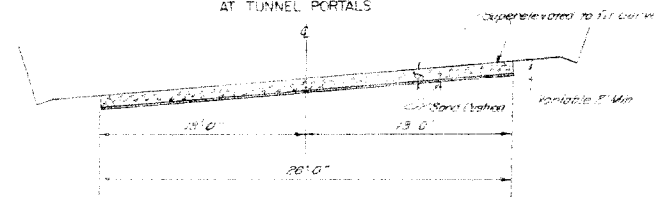
PROJECT	DATE	BY	CHKD.	STR. NO.
WPH 8-F(3)	10-11-82	RJL	AS	F15-H
WPSS 429-A(2)	10-11-82	AS	AS	F15-T
				F15-U



SECTION 4.4 (TYPICAL)



SECTION OF CONCRETE PAVEMENT
AT TUNNEL PORTALS

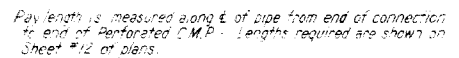


COLORADO
 STATE HIGHWAY DEPARTMENT
 DETAILS OF
BRIDGE APPROACH SLABS
 AND
CONCRETE PAVEMENT
 ACROSS CLEAR CREEK
 Near FLOYD HILL, Sec. 1, T. 1N, R. 1E
 Designed by RSR
 Made by RSR
 Checked by RSR
 Approved by Bridge Engineer
 Date: 1982

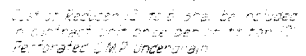
STRUCTURE NO. F15-T, F15-U, F15-H

FED. ROAD DIST. NO.	STATE	USWPH PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	WPA 8-F (3)	14	

Rev. 10-1-59 MHR

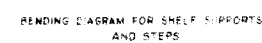


Length of the several sizes of Perf. C.M.P. Underdrains shall be measured and paid for as indicated in the above sketch. Rock shall be excavated one foot (1') beyond ends of laterals and feeders and backfilled with material as indicated in sketches. Ducts to be placed along ends of lateral and feeder pipes shall be fitted with galvanized iron screens. Screens shall be either "galvanized Trench Iron Screens" or a suitable equivalent approved by the Engineer.

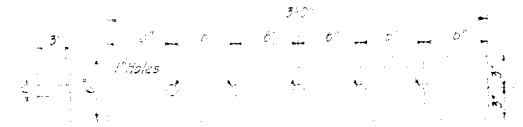
[illegible]

Cross connections and Y connections for Perforated CMP drain lines as shown in these detail sketches shall be furnished and installed by contractor in drain lines at locations indicated on sheet 12 or Plans the Tunnel Drainage Plan. The cost of furnishing and installing cross and Y connections shall be included in the original contract price per linear foot for Perforated CMP Underdrain of the several sizes complete in place.

0366 Millim Miscellaneous Treated Timber
35 Cords, Class A Concrete
12 Lbs Reinforcing Steel
24 C.I. Storm Sewer Ring & Cover

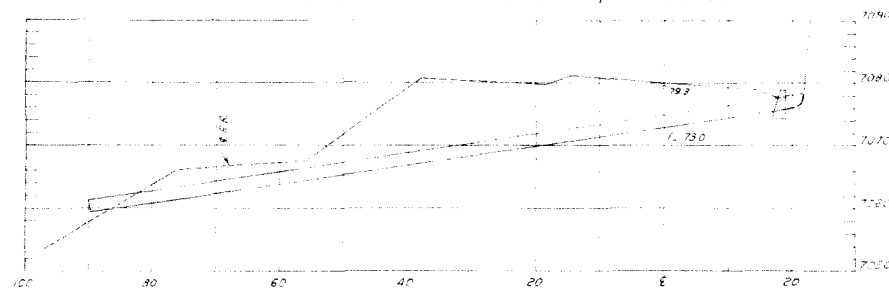
[illegible]

Construct Drain inlets thru curb at manholes as indicated above and adjust gutter section for ten feet each side of drains to properly slope for flow of drainage



PLAN
3" x 6" x 3'-0" PLANK
8 REQUIRED FOR EACH MANHOLE

CROSS SECTION 24"X110' C.M.P. (SKEW 80°), STA. 392+56

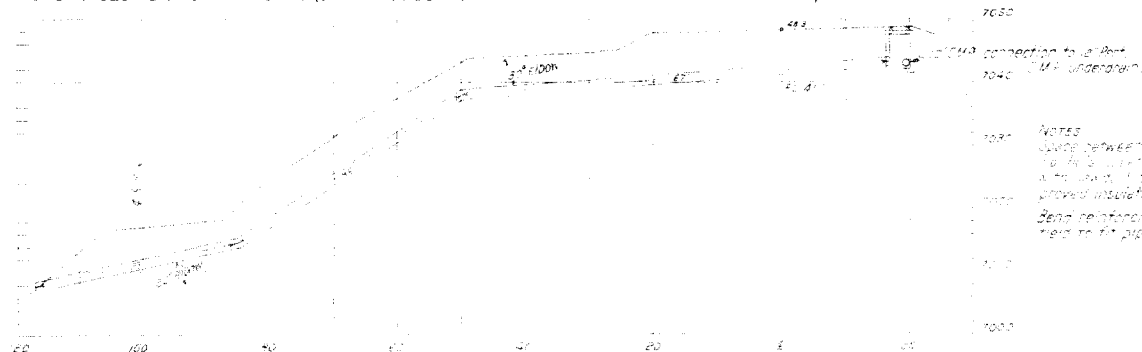


DETAIL OF CONCRETE MANHOLE, STA. 399+90, RT.

SUMMARY OF QUANTITIES FOR ONE MANHOLE

ITEM NO.	ITEM	UNIT	QUANTITY
440	Miscellaneous Treated Timber	Mft/bm	0.41
440	Class "A" Concrete	Cu. Yd.	4.3
47	Reinforcing Steel	Lb.	261
1118	24" C.M. Manhole Ring and Cover	Each	1

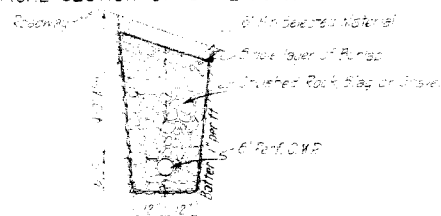
CROSS SECTION 18"X142' C.M.P. (SKEW 45°) CONNECTING WITH MANHOLE AT INLET END, STA. 400+05



NOTES
 Joints between slabs and
 to be filled with concrete
 and covered with material
 provided insulating material
 Bend reinforcing bars in
 field to fit pipes

2. Follow for 6" C.M.P. concrete with 10' x 10' x 10' bands to be furnished and
 installed by contractor. 3. Located in line above and cast in place.
 4. The drainage connection and drive shall be provided for the corrugated
 pipe in concrete.

TYPICAL SECTION OF 6" PERFORATED C.M.P. UNDERDRAIN



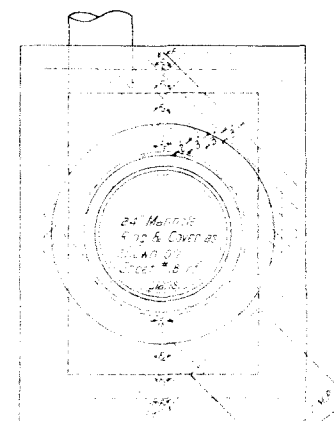
STA. 393+, RT. & LT.

The contract unit price per linear foot for 6" Perforated C.M.P. underdrain
 complete in place shall include all excavation and backfill as
 shown in sketch.

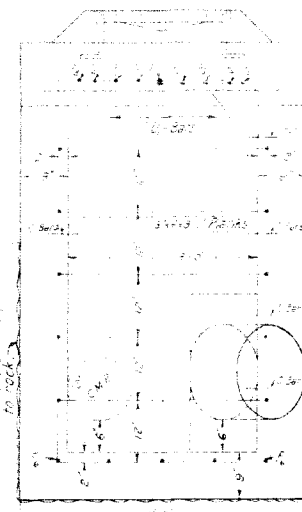
BAR LIST

MARK	NO.	LENGTH	BENDING DIAGRAM
1	4	3'-6"	STRAIGHT
2	4	3'-6"	
3	4	3'-6"	
4	4	3'-6"	
5	4	3'-6"	BENT
6	4	3'-6"	
7	4	3'-6"	
8	4	3'-6"	
9	4	3'-6"	BENT
10	4	3'-6"	
11	4	3'-6"	
12	4	3'-6"	

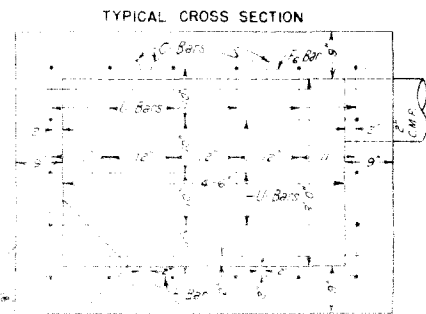
All bars to be 1/2" round except C-bars
 which are to be 3/4" square.



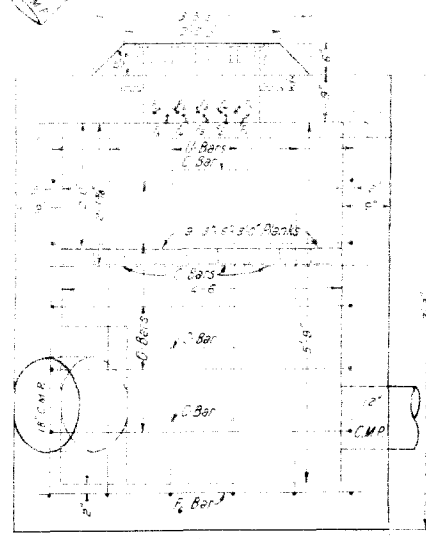
PLAN OF TOP



END ELEV.



TYPICAL CROSS SECTION

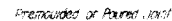


SIDE ELEV.

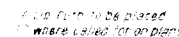
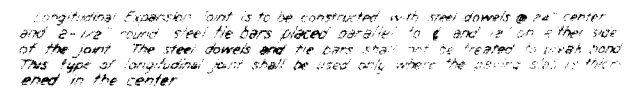
STANDARD M-8-A



A



1/2" x 48' Round Reinforcing Steel
Joints on 24" centers
1/2" Round Steel Tie Bars



COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD CONCRETE
PAVEMENT
JOINT DETAILS

Designed by	Approved by
Made by	Bridge Engineer
Checked by	Date 193

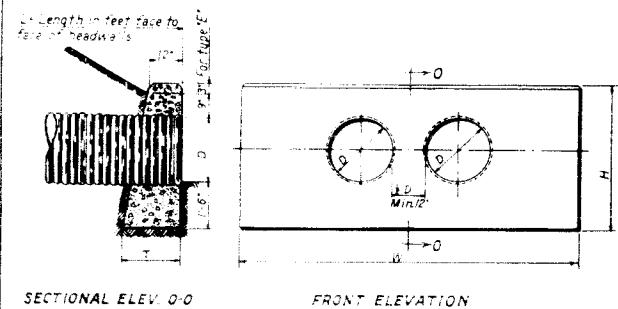


TABLE OF DIMENSIONS & QUANTITIES FOR DOUBLE CORRUGATED METAL PIPE CULVERT & HEADWALLS										
TYPE	D	W	H	T	CL. B' CONCRETE FOR 2 HEADWALLS		CORRUGATED METAL PIPE		CEMENT RUBBLE MASONRY	
					CU. YDS	LINEAL FT.	CU. YDS	LINEAL FT.		
TYPE A	12"	7'-4"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	18"	10'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	24"	12'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	30"	14'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
TYPE B	12"	7'-4"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	18"	10'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	24"	12'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7
	30"	14'-0"	4'-0"	1'-0"	4.4	24	14	24	2.1	1.7

STD. HEADWALLS FOR DOUBLE CORR. METAL PIPE CULV'S

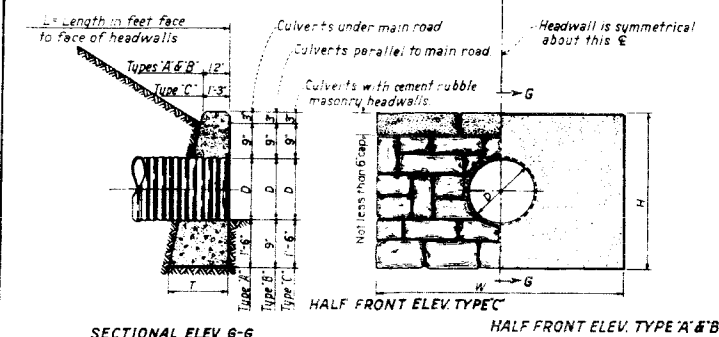
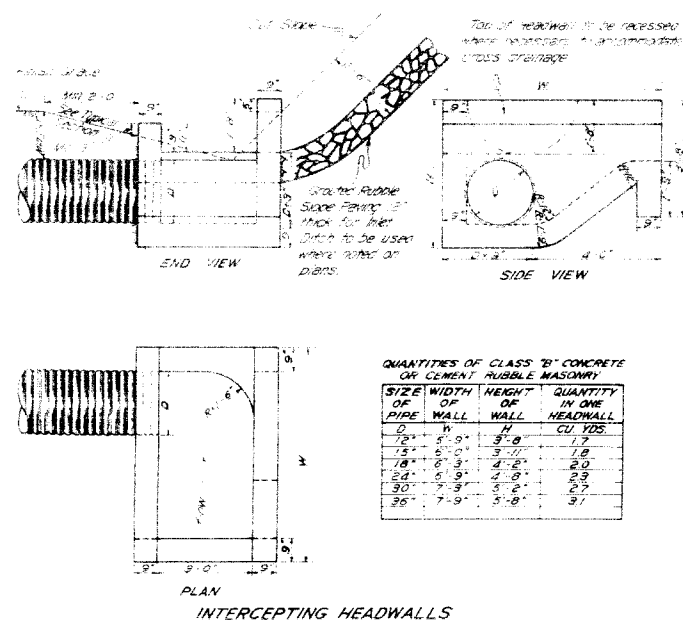
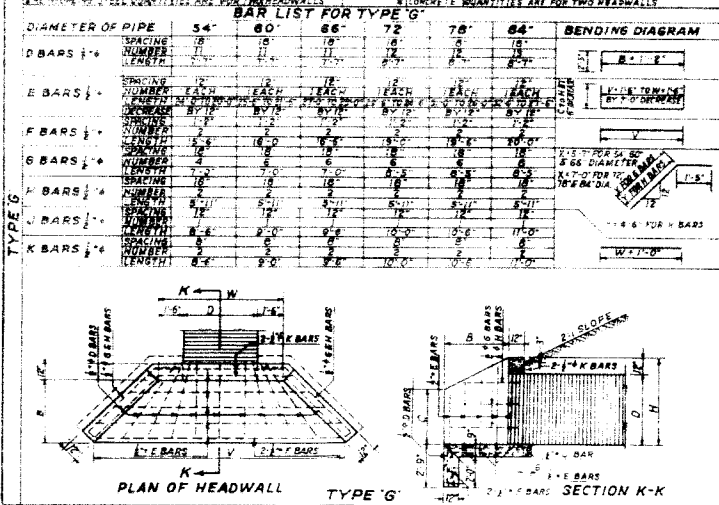


TABLE OF DIMENSIONS & QUANTITIES FOR CORRUGATED METAL PIPE CULVERTS & HEADWALLS											
TYPE	D	W	H	T	CL. B' CONCRETE FOR 2 HEADWALLS		CORRUGATED METAL PIPE		CEMENT RUBBLE MASONRY		
					CU. YDS	L=LIN. FT.	CU. YDS	L=LIN. FT.			
TYPE A	12	4'-5"	3'-6"	1'-0"	1.4	24	1.6	24	1.1	24	
	18	6'-0"	4'-2"	1'-0"	1.8	24	1.8	24	1.1	24	
	24	7'-0"	4'-8"	1'-0"	2.2	24	2.2	24	1.1	24	
	30	8'-0"	5'-4"	1'-0"	2.6	24	2.6	24	1.1	24	
	36	9'-0"	6'-0"	1'-0"	3.0	24	3.0	24	1.1	24	
TYPE B	12	4'-5"	3'-6"	1'-0"	1.4	24	1.6	24	1.1	24	
	18	6'-0"	4'-2"	1'-0"	1.8	24	1.8	24	1.1	24	
	24	7'-0"	4'-8"	1'-0"	2.2	24	2.2	24	1.1	24	
	30	8'-0"	5'-4"	1'-0"	2.6	24	2.6	24	1.1	24	
	36	9'-0"	6'-0"	1'-0"	3.0	24	3.0	24	1.1	24	
TYPE C	12	4'-5"	3'-6"	1'-0"	1.4	24	1.6	24	1.1	24	
	18	6'-0"	4'-2"	1'-0"	1.8	24	1.8	24	1.1	24	
	24	7'-0"	4'-8"	1'-0"	2.2	24	2.2	24	1.1	24	
	30	8'-0"	5'-4"	1'-0"	2.6	24	2.6	24	1.1	24	
	36	9'-0"	6'-0"	1'-0"	3.0	24	3.0	24	1.1	24	



STD. HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS

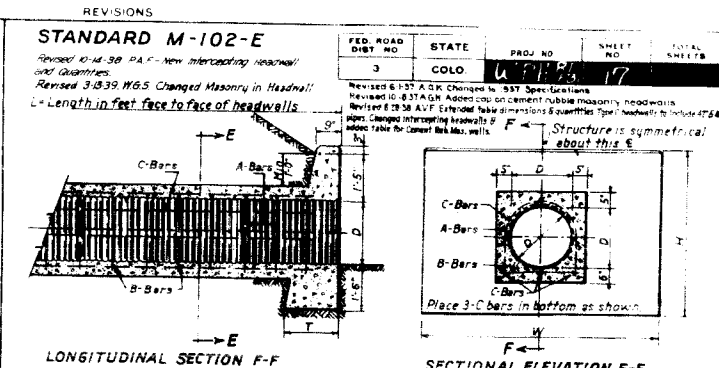


TABLE OF DIMENSIONS AND QUANTITIES FOR INCASED PIPE CULVERTS								
Diameter of pipe		D	12"	15"	18"	24"	30"	BENDING DIAGRAM
Width of headwall		W	4'-6"	5'-3"	6'-0"	7'-6"	9'-0"	
Height of headwall		H	4'-2"	4'-5"	4'-8"	5'-5"	5'-8"	
Width of headwall base		T	1'-7"	1'-8"	1'-9"	2'-0"	2'-3"	
A BARS		SPACING	12"	12"	12"	12"	12"	
		QUANTITY	1.7	1.8	2.0	2.2	2.4	
B BARS		SPACING	12"	12"	12"	12"	12"	
		QUANTITY	1.7	1.8	2.0	2.2	2.4	
C BARS		SPACING	12"	12"	12"	12"	12"	
		QUANTITY	1.7	1.8	2.0	2.2	2.4	
		SPACING	12"	12"	12"	12"	12"	
		QUANTITY	1.7	1.8	2.0	2.2	2.4	

ITEM	DESCRIPTION	UNIT
45a	Concrete Slabs A	sq. yds.
45b	Reinforcing Steel	lbs.
45c	Gravel	cuyd.
45d	Concrete	cuyd.

ITEM	DESCRIPTION	UNIT	12"	15"	18"	24"	30"
45a	Concrete Slabs A	sq. yds.	4.00	4.23	4.46	5.00	5.54
45b	Reinforcing Steel	lbs.	800	850	900	1000	1100
45c	Gravel	cuyd.	1.00	1.05	1.10	1.25	1.40
45d	Concrete	cuyd.	1.00	1.05	1.10	1.25	1.40

Consider quantities shown above include two headwalls

When L = 40 feet or more add 10.6 Lbs for lap in C-bars

When L = 40 feet or more add 14.7 Lbs for lap in C-bars

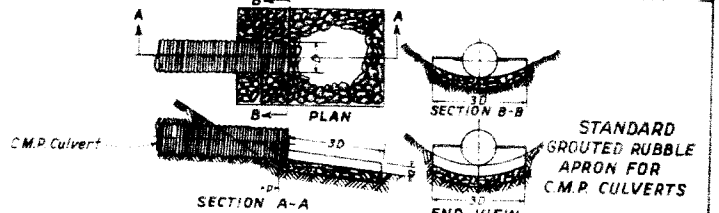
SPECIAL NOTES

All reinforcing bars shall be V-8

Minimum distance E of bar to surface of concrete shall be 2"

Pipe shall be thoroughly cleaned before incasing with concrete

INCASED PIPE CULVERTS



SQUARE YARDS GROUTED RUBBLE APRON FOR C.M.P. CULVERTS

PIPE	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
12"	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
18"	1.8	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1
24"	2.0	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3
30"	2.2	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5
36"	2.4	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7
42"	2.6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9
48"	2.8	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1
54"	3.0	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3
60"	3.2	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5
66"	3.4	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7
72"	3.6	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9
78"	3.8	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1
84"	4.0	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3

GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted June 1, 1937

All concrete shall be class "A" except types A & B which shall be class "B"

All exposed surfaces shall be rubbed free of form marks

All exposed corners shall be beveled to a 2" face

All construction joints shall be thoroughly cleaned before fresh concrete is poured

All walls shall have forms on both sides

All reinforcing bars shall be deformed

All reinforcing bars shall be tagged with the station number letter and size

Secondary bars when applied shall be given a lap of 50 diameters

Main bars shall not be spliced

Minimum fill over top of culverts shall be 1'-0"

When culverts are skewed, headwalls shall be placed parallel to % of roadway

Minimum grade of pipe shall be 1%

For size and location of culverts see sheet No. 2

Footings in rock shall be poured out to the rock and not formed.

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD HEADWALLS INTERCEPTING HEADWALLS INCASED METAL PIPE CULVERT WITH HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS

Designed by W.D. Bailey Approved by W.D. Bailey

Checked by W.D. Bailey

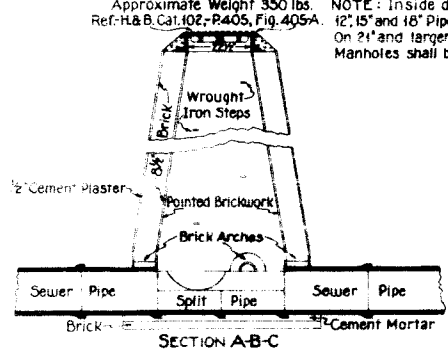
Checked by W.D. Bailey

STANDARD M-12-B

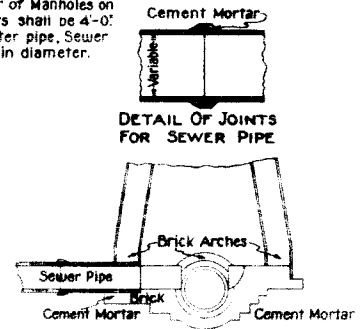
FED. ROAD DIST. NO.	STATE	W.P.H. DIST. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	243	18	

DENVER A GENERAL PLAN FOR MANHOLES PATTERN MAN-HOLE RING & COVER OR EQUIVALENT ON PIPE SEWERS

Approximate Weight 350 lbs.
Ref. H&B Cat. 102, P. 405, Fig. 405-A.
NOTE: Inside diameter of Manholes on 12", 15" and 18" Pipe Sewers shall be 4'-0". On 21" and larger diameter pipe, Sewer Manholes shall be 5'-0" in diameter.



SECTION A-B-C



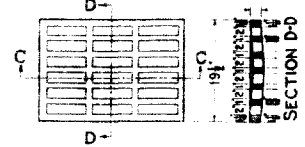
DETAIL OF JOINTS FOR SEWER PIPE

SECTION E-F-G

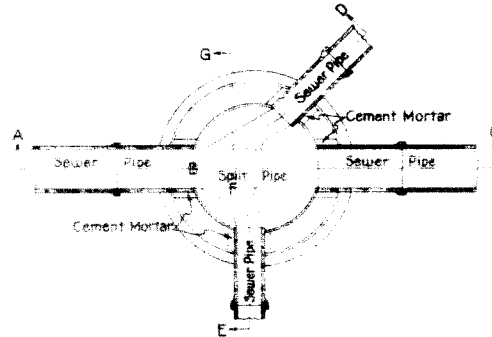
SPECIAL NO. 12 INLET GRATING & FRAME



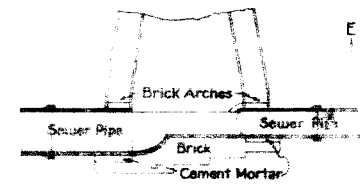
SECTION C-C



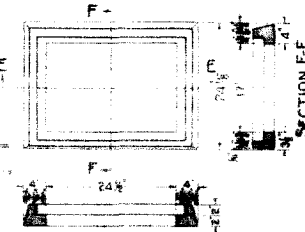
SECTION D-D



PLAN

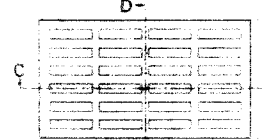


SECTION A-B-D

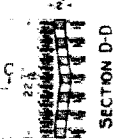


SECTION E-E

SPECIAL NO. 13 INLET GRATING & FRAME



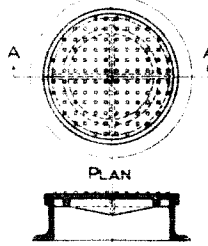
SECTION C-C



SECTION D-D

DENVER PATTERN MAN-HOLE RING & COVER OR EQUIVALENT

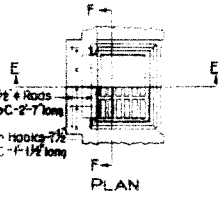
Ref. H&B Cat. 102, P. 405, Fig. 405-A.



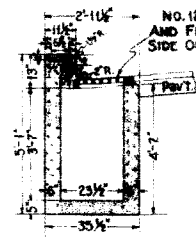
PLAN

SECTION A-A

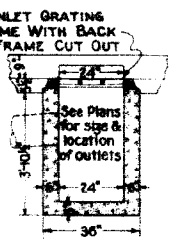
SPECIAL NO. 12 CONCRETE INLET



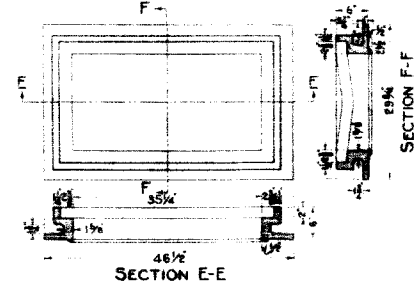
PLAN



SECTION E-E

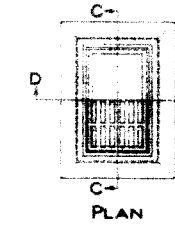


SECTION F-F

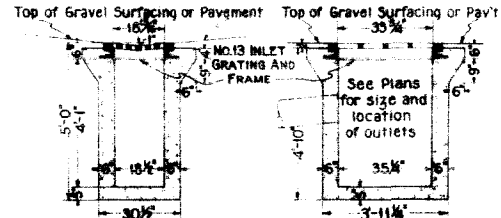


SECTION E-E

SPECIAL NO. 13 CONCRETE INLET



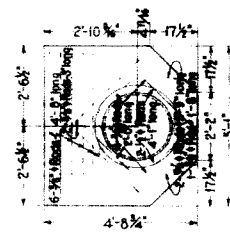
PLAN



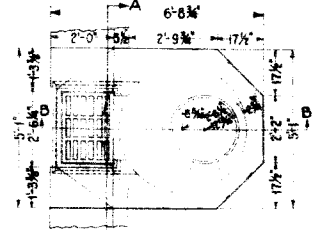
SECTION D-D

SECTION C-C

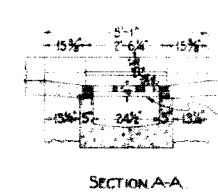
SPECIAL No. 8 CONCRETE INLET



PLAN OF TOP SHOWING REINFORCING BARS



TOP VIEW (MANHOLE COVER REMOVED)

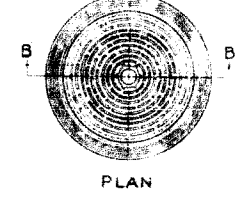


SECTION A-A

The minimum depth of gutter is here shown said depth being variable. Forms must be constructed so as to admit increasing said depth as much as 2 1/2\"/>

NO. 12 INLET GRATING AND FRAME WITH BACK SIDE OF FRAME CUT OUT

SECTION B-B STORM SEWER RING AND COVER REF. H&B CAT. 102, P. 405, Fig. 405-D, OR EQUIVALENT



PLAN

SECTION B-B

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD MANHOLES,
INLETS & PIPE JOINTS
ON SEWERS

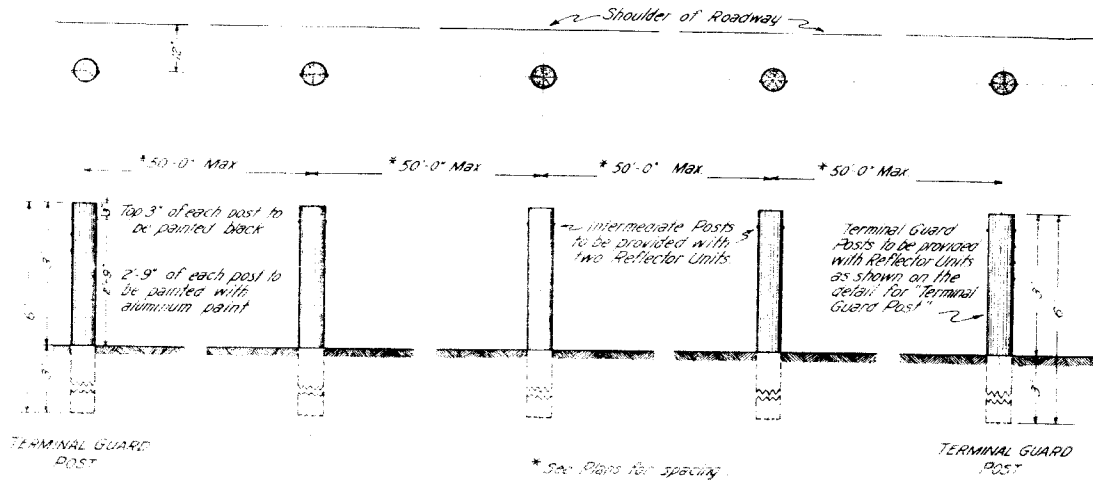
Designed by
State by H.R.H.
Check Design
Check Detail

Approved by
Bridge Engineer
Date

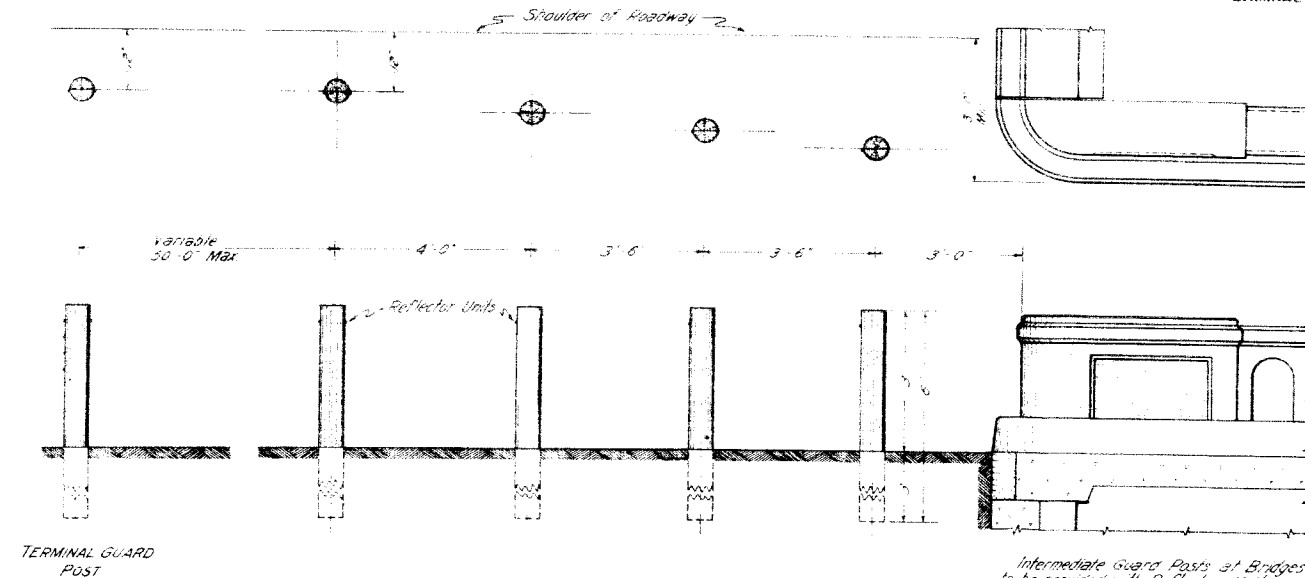
158

STANDARD M-19-B

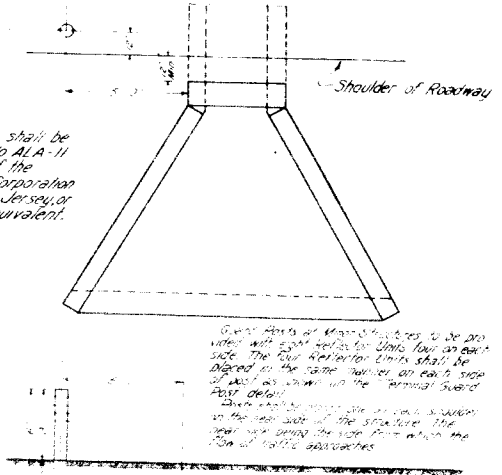
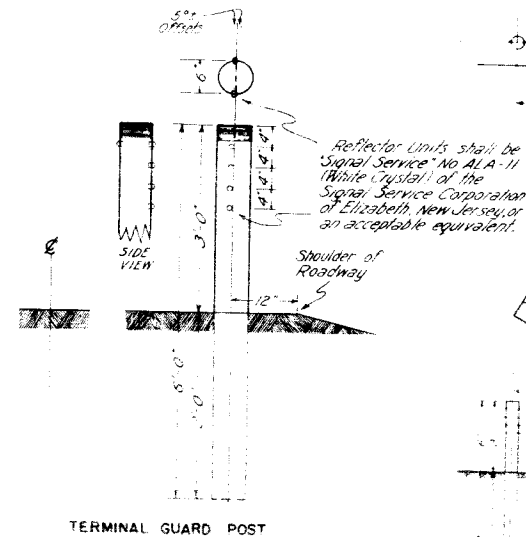
FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	WPH	19	
	COLO	8123	



SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



SHOWING PLACEMENT AT BRIDGE APPROACHES



SHOWING PLACEMENT AT MINOR STRUCTURES

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted on June 1, 1937.

All wood posts shall be made from seasoned straight sound Lodgepole Pine, Southern Yellow Pine, or West Coast Douglas Fir.

No section of wood posts shall be less than 6" in diameter. All wood posts shall be entirely peeled and shaved, thoroughly seasoned and dry, with square tops. Posts shall not be treated.

All wood posts shall be set and lamped in plumb and firm, to the lines and grades as directed by the Engineer.

Reflector Units in all posts shall be placed in such position that the units will function at a distance of 500 feet.

On tangents the Reflector Units shall be placed at an angle of approximately five degrees to a line parallel to the centerline of the highway.

In all instances a test shall be made to assure the position of the Reflector Units to be the most effective possible.

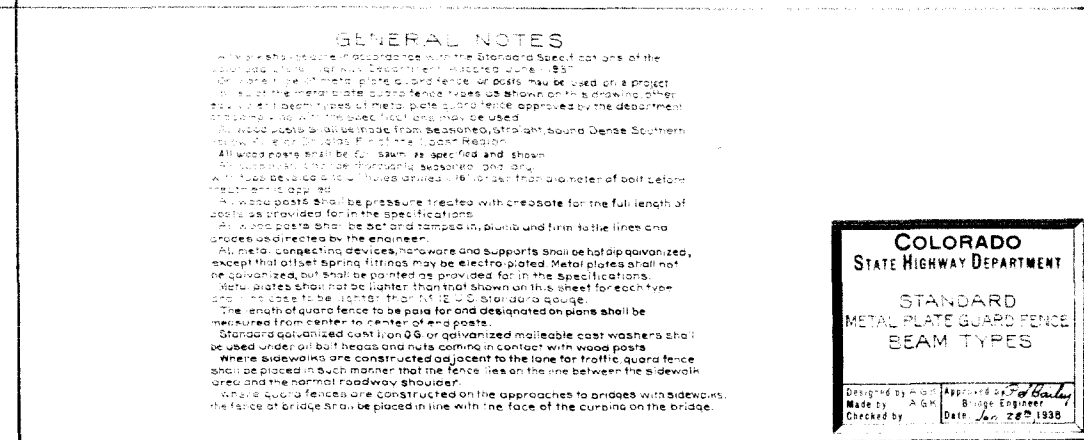
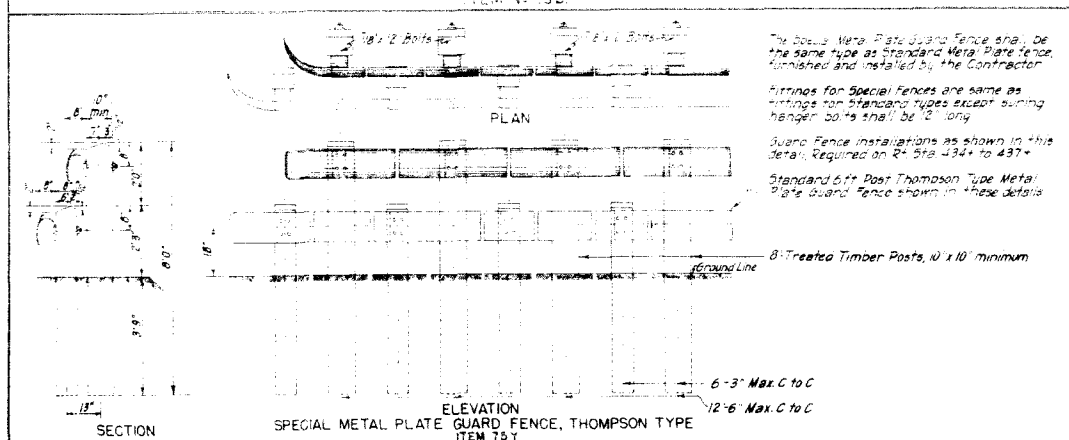
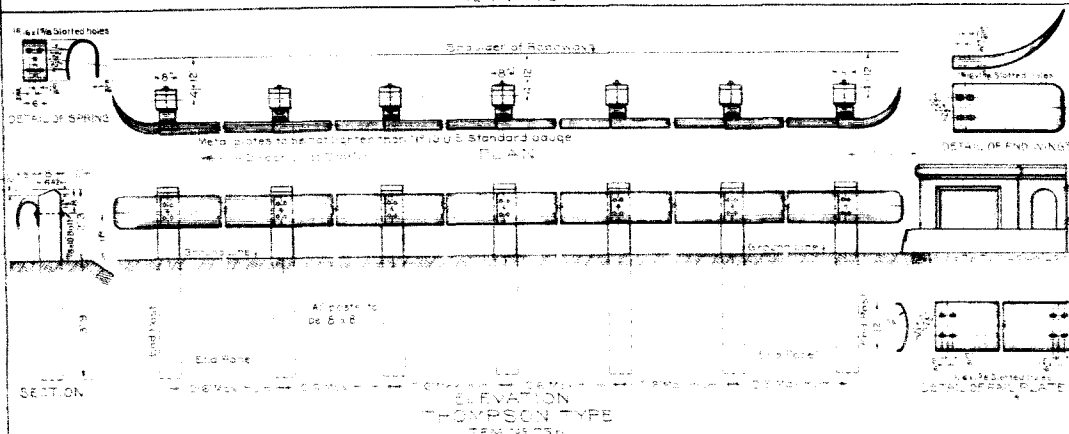
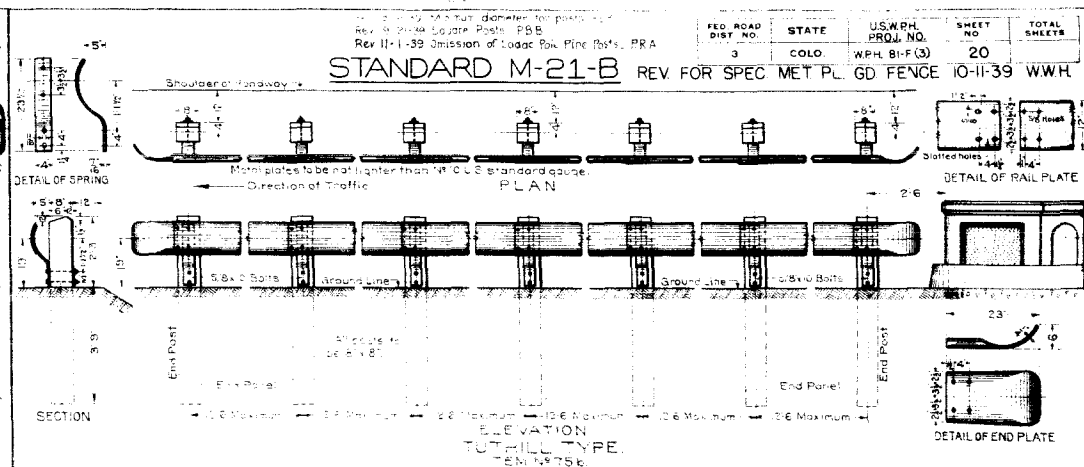
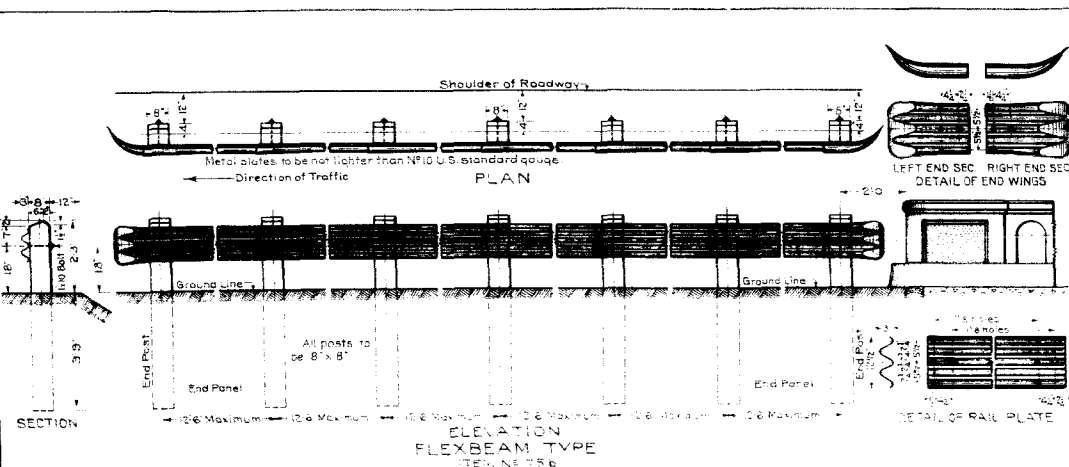
The diameter of holes drilled in the posts shall be drilled approximately one-sixteenth (1/16) inch less than the diameter of the signal button base. In all instances the hole shall be enough undersize that the button when driven into the post shall have complete bond with the post and be securely locked in correct position.

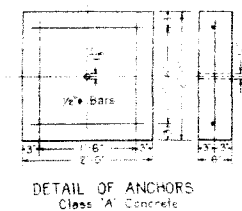
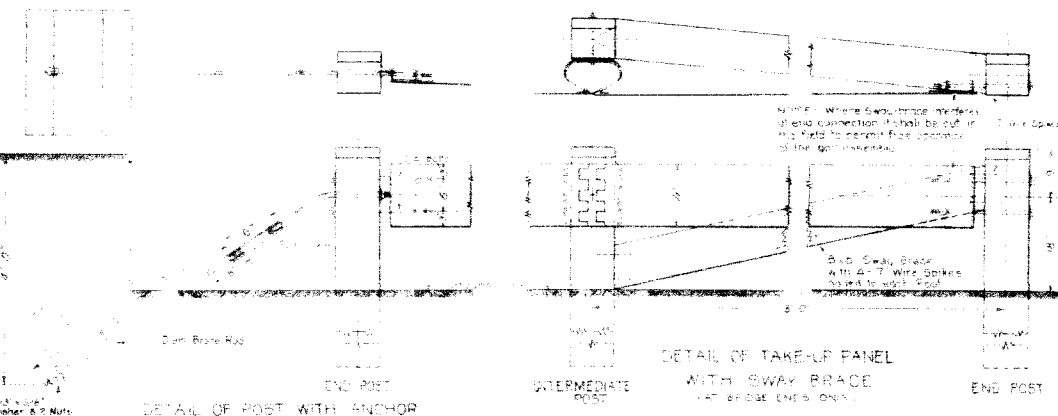
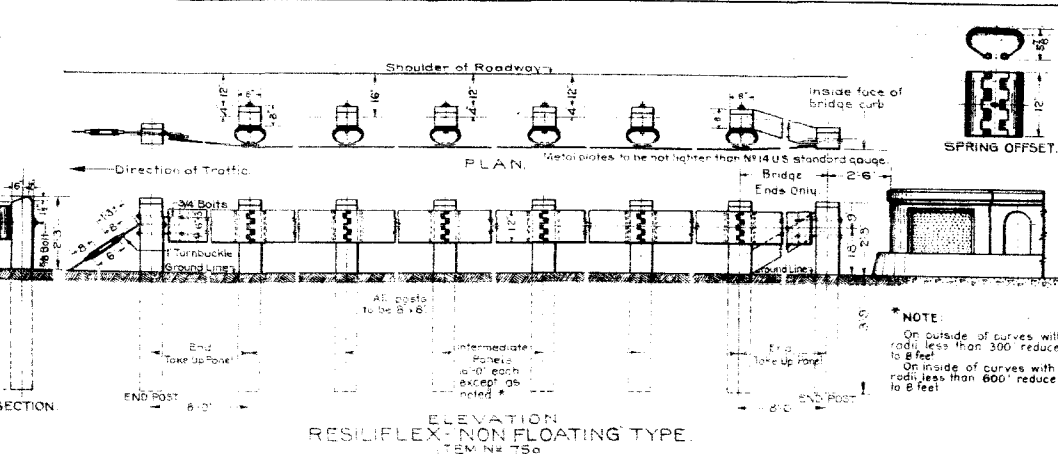
Intermediate Guard Posts at Bridges to be provided with Reflector Units as shown that is one Unit each on the three Posts nearest the bridge and two Units on the fourth Post

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD
TIMBER GUARD
POSTS

Designed by R.E.L. Approved by R.E.L.
Made by P.B.B. Chief Draftsman
Checked by Date 2-28-1939





REVISIONS

Rev. 8-24-34 P.B.S. End Panels, Spacing, etc.

Rev. 9-21-30 P.B.S. Square Posts

Rev. 1-1-30 M.K.M. Large Hole Pins added

STANDARD M-22-B

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLD.	100	1	1

GENERAL NOTES

- All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1937.
- Only one type of metal plate guard fence or posts may be used on a project. In lieu of the metal plate guard fence types as shown on this drawing, other equivalent floating and non-floating types of metal plate guard fence approved by the department and complying with the specifications may be used.
- Where posts are spaced eight (8) feet on centers, every alternate bracket may be steel floating bracket except those on End Take-Up Panels.
- All road posts shall be made from seasoned, straight, sound Dense Southern Yellow Pine or Douglas Fir of the Coast Region.
- All wood posts shall be full size as specified and shown.
- All wood posts shall be thoroughly seasoned and dried, with knots removed and all holes drilled larger than diameter of bolt or rod before treatment is applied.
- All wood posts shall be pressure treated with creosote for the full length of posts as provided for in the specifications.
- Wood posts shall be set and braced in place and firm, to the lines and grades as required by the engineer.
- All metal connecting devices, hardware and supports shall be hot dip galvanized, except that offset spring fittings may be electro plated. Metal plates shall not be galvanized, but shall be painted as provided for in the specifications.
- Metal plates shall be of the type shown on this sheet for each type and shall be lighter than N14 U.S. standard gauge.
- The length of guard fence to be paid for and designated on plans shall be measured from center to center of end posts.
- Standard galvanized steel or galvanized malleable cast washers shall be used on all bolts coming in contact with wood posts.
- Where sidewalks are constructed adjacent to the line for traffic, guard fence shall be placed in such manner that the fence lies on the line between the sidewalk area and the normal roadway shoulder.
- Where guard fences are constructed on the approaches to bridges with sidewalks, the fence on bridge shall be placed in line with the face of the curbing on the bridge.

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD
METAL PLATE GUARD FENCE
FLOATING & NON-FLOATING
TYPES

Designed by A&K
Made by A&K
Checked by A&K

Approved by
Bridge Engineer
Date:

GENERAL NOTES

Curves on projects using the Sections shown are to be superelevated and widened as indicated in the accompanying drawings and tables.

The normal inside edge of the Pavement slab is to remain at the standard elevation of 0.125 ft below the profile grade, and the outside edge of the slab is to be superelevated at the rate per foot width of roadway given in the table. The Section is to be rotated about the normal inside edge of the Pavement, with a $1\frac{1}{2}$ ° parabolic crown for curves of 10° and under, and a flat crown for widened Sections.

The normal inside edge of the Graded or Surfaced Section is to remain at the standard elevation of 0.02 ft per foot width of roadway below the profile grade, or as shown on the Typical Section for the Project. Also, the center line pivot point is to be used until the super-elevation equals 0.02 ft per foot width of roadway, but when this elevation is exceeded the normal inside shoulder pivot point is to be used.

When the degree of curvature exceeds 10° the inside edge of the Pavement slab or the inside shoulder of the Graded or Surfaced Section is to be widened from the normal inside edge of shoulder, respectively, as shown by the table and plan or by cross-sections. Curves of 10° or less are not to be widened.

The slope of the shoulders and widened sections shall conform to the rate per foot width of roadway required, except that the inside shoulder of paved sections shall maintain the Typical Section slope until this slope is exceeded by the required super-elevation slope.

The outside ditch on super-elevated Sections is to be modified, where necessary to provide drainage. Otherwise, this ditch shall conform to normal ditch section shown for Project.

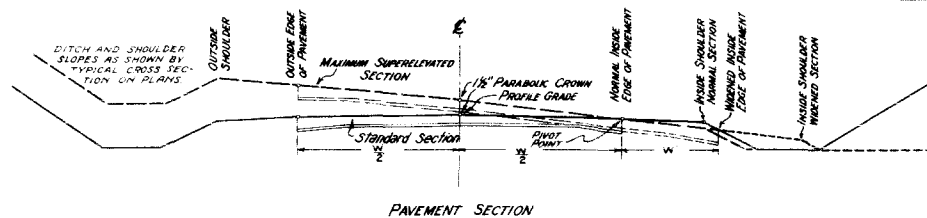
The rate of super-elevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

The full super-elevation per foot width of roadway rate for a given degree of curvature is

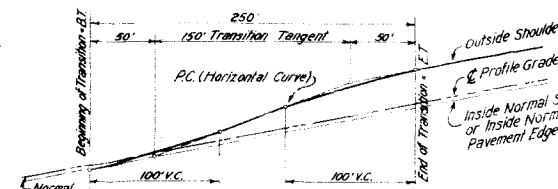
$$0.0165 \text{ ft} \times \text{Degree of Curvature}$$

The maximum super-elevation of 0.10 ft per foot width, applying to curves of 10° and over, is not to be exceeded.

Special transition problems not covered by the standard sheets shall be covered by appropriate notes included with curve data on plans.



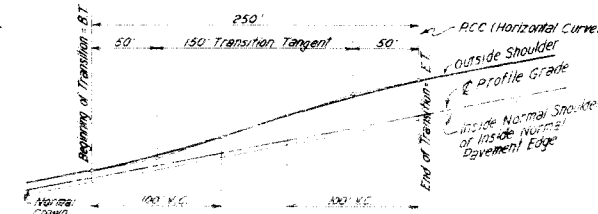
PAVEMENT SECTION



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

The transition in this case, from crowned section to super-elevated section, shall proceed uniformly by raising the outside shoulder, over a distance of 250 ft, as shown, beginning at a point on the tangent 150 ft from the end of the curve, and acquiring full super-elevation at a point 100 ft inside the curve.



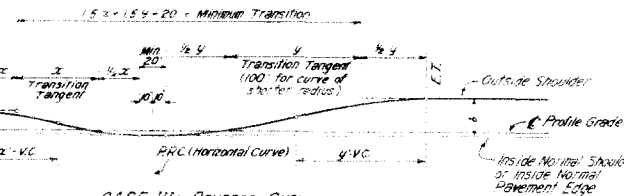
CASE II: COMPOUND CURVE

NOTE: CASE II

Super-elevation transitions at the outside ends of compound curves shall be constructed in accordance with rules given under CASE I.

Super-elevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall be within the limits of the curve of the longer radius.

In cases where curves in the same direction have a tangent distance of less than 300 ft between points of curve, the intervening tangent shall be super-elevated an amount equal to that of the curve of greater radius and the transition shall be made as in the case of a true compound curve.



CASE III: REVERSE CURVES

NOTE: CASE III

Transitions between true reverse curves shall be accomplished as shown on the above diagram.

Transition tangents shall be directly proportional to the amount of super-elevation of the respective curves.

EXAMPLE: Let a represent the amount of super-elevation on 1st curve;

$$\frac{a}{x} = \frac{b}{y} \quad \text{transition tangent on 1st}$$

then, $a \cdot b = x \cdot y$

The transition tangent of the curve having the shorter radius shall be set at 100 ft. A normal crowned section 20 ft long, 10 ft on each side of the P.C. shall be used.

In cases where curves in opposite directions are in such proximity that a standard transition can not be had, the practice outlined for true reversing curves shall be used.

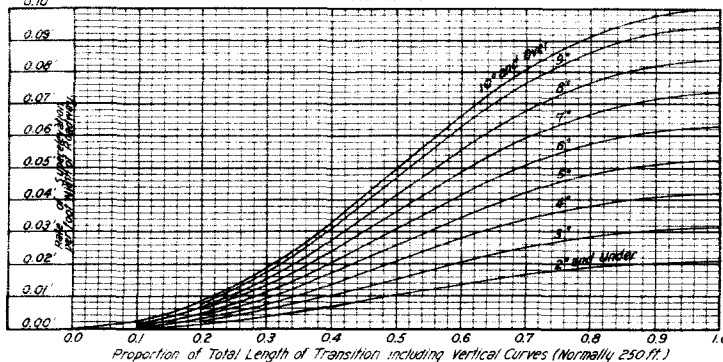
The total distance between the P.T. of the first curve and the P.C. of the succeeding curve shall be prorated into the transition distance of the respective curves until a maximum of 150 ft of transition tangent for each curve is achieved.

GRADED OR SURFACED SECTION

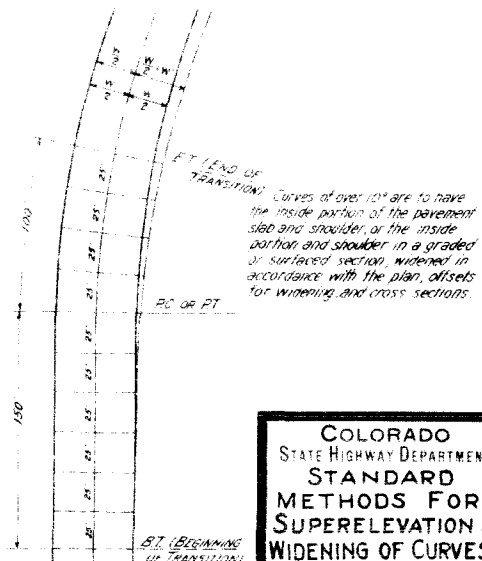
SUPERELEVATION AND WIDENING TABLES

DISTANCE FROM B.T. (FOR CURVES)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	MAX. 1.0
Degree of Curvature	RATE OF SUPERELEVATION (IN FEET) PER FOOT WIDTH OF ROADWAY									
2° and Under	0.00044	0.00175	0.00394	0.00700	0.01050	0.01400	0.01706	0.01925	0.02085	0.02100
3°	0.00066	0.00263	0.00559	0.01050	0.01575	0.02100	0.02539	0.02888	0.03094	0.03150
4°	0.00088	0.00350	0.00768	0.01400	0.02100	0.02800	0.03413	0.03850	0.04113	0.04200
5°	0.00109	0.00439	0.00964	0.01750	0.02625	0.03500	0.04266	0.04813	0.05141	0.05250
6°	0.00131	0.00525	0.01181	0.02100	0.03150	0.04200	0.05119	0.05775	0.06169	0.06300
7°	0.00153	0.00613	0.01378	0.02450	0.03675	0.04900	0.05972	0.06738	0.07197	0.07350
8°	0.00175	0.00700	0.01575	0.02800	0.04200	0.05600	0.06825	0.07700	0.08225	0.08400
9°	0.00197	0.00788	0.01772	0.03150	0.04725	0.06300	0.07678	0.08663	0.09253	0.09450
10° and Over	0.00208	0.00833	0.01875	0.03333	0.05000	0.06667	0.08125	0.09166	0.09792	0.10000
OFFSETS FOR WIDENING - W' (IN FEET)										
Over 10° - Under 12°	0.03	0.12	0.27	0.48	0.75	1.08	1.47	1.92	2.43	3.00
12° - 15°	0.04	0.16	0.36	0.64	1.00	1.44	1.96	2.56	3.24	4.00
15° - 20°	0.05	0.20	0.45	0.80	1.25	1.80	2.45	3.20	4.05	5.00
20°	0.06	0.24	0.54	0.96	1.50	2.16	2.94	3.84	4.86	6.00

GRAPH OF SUPERELEVATION TRANSITION FIGURES



GENERAL PLAN OF WIDENING



COLORADO
 STATE HIGHWAY DEPARTMENT
 STANDARD
 METHODS FOR
 SUPERELEVATION &
 WIDENING OF CURVES

DESIGNED BY R.E.L. APPROVED BY
 W.D. P.B. J. Marshall
 CHIEF ENGINEER FEB 25th 1937

[illegible]

1. This is a nation governed by the
Muslims and the people who are
not Muslims are not allowed to
be in the country. This is a
very bad thing.

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A hand-drawn diagram of a road layout. At the top, a car is shown driving on a road. Below the car, a sign reads "No Left Turn". To the right of this sign, a road branches off to the right, marked with a "No Right Turn" sign. The road continues straight ahead, marked with a "No Left Turn" sign. The road is labeled "Main Road" on the left and "Branch Road" on the right. The diagram is drawn on a grid background.

SLOW
ROAD UNDER
CONSTRUCTION
CONTRACTORS NAME

FED ROAD DIST NO	STATE	W-71 PROJ NO	SHEET NO	TOTAL SHEETS
3	COLORADO	81FB	23	

Revised 1937 A.R.K. changed to 1937 Specifications
 Revised 8-18-99 - A.Z. - Changed side drain note.

[illegible]

Hand-drawn geological cross-section of the Teton Mountains. The diagram shows a series of peaks and valleys. Key features include:

- A large peak on the left labeled "Teton Peak".
- A valley labeled "Teton Valley".
- A series of smaller peaks and valleys labeled "Teton Range".
- A large area labeled "Teton Basin".
- A series of peaks and valleys labeled "Teton Range".
- A large area labeled "Teton Basin".
- A series of peaks and valleys labeled "Teton Range".
- A large area labeled "Teton Basin".

The diagram is drawn with simple lines and includes some handwritten notes and labels.

[illegible]

NOTE:

All pole links encroaching on construction are to be moved by owners.
Fencing requirements, gates, and right of way markers are tabulated on sheet No 2

Between Sta 294+ and 296+ the portion of embankment included in cross-hatching as indicated on the cross section sheets shall not be placed until the abutment on Clear Creek bridge is completed. This portion of the embankment shall be placed when and as directed by the Engineer.

Sta 293+25 to 294+57: Reqd 445 cu yds Heavy riprap (3 thick) See Sheet No 3

SW 1/4 SEC 34
T 3 S R 72 W

PI 306+07.9

SE 1/4 SEC 34
T 3 S R 72 W

Sta 308+00 to 308+28: 1.5' x 28' CMP cross culvert
to 308+28: 1.5' x 28' CMP cross culvert

Sta 308+28 to 308+50: 1.5' x 28' CMP cross culvert
to 308+50: 1.5' x 28' CMP cross culvert

Sta 308+50 to 308+78: 1.5' x 28' CMP cross culvert
to 308+78: 1.5' x 28' CMP cross culvert

Sta 308+78 to 308+100: 1.5' x 28' CMP cross culvert
to 308+100: 1.5' x 28' CMP cross culvert

WPH 8(F13)

This Project consists of surfacing operations and incidental grading work, placing of guard fences & posts, tunnel portals, paving and drainage work.

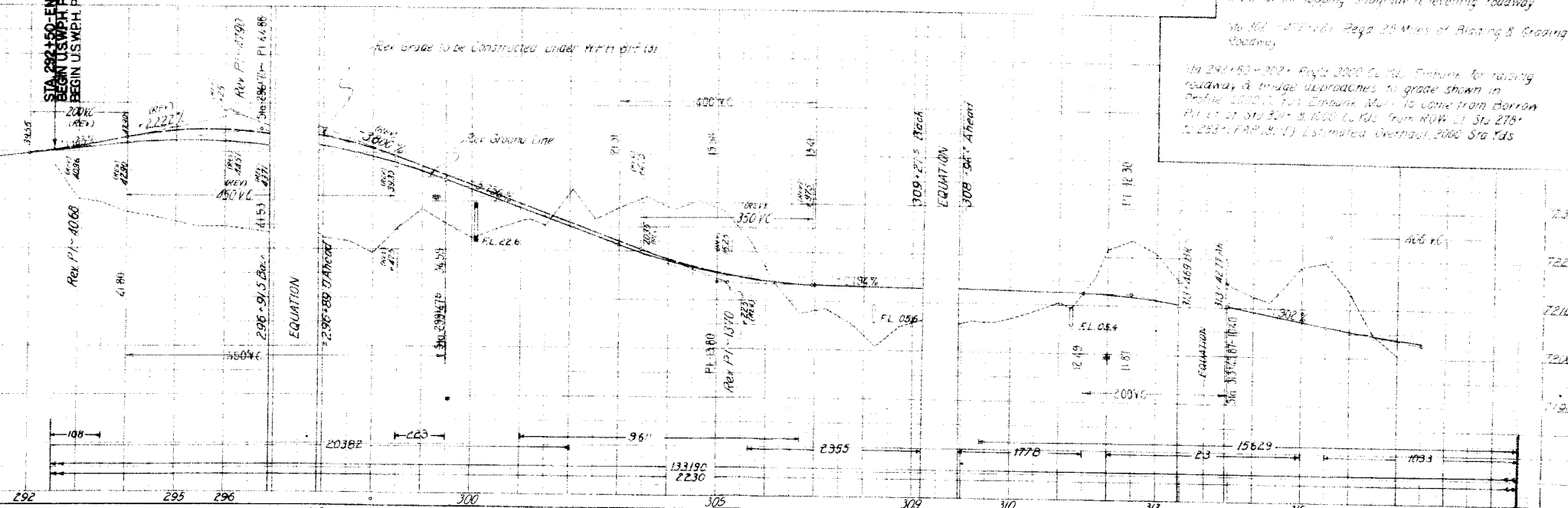
Surfacing Plans on Sheet No. 5 of Plans
Selecting Material Plans on Sheet No. 6 of Plans
Guard Fencing Road on Sheet No. 6 of Plans
Guard Posts Road on Sheet No. 6 of Plans

Sta 308+100 to 308+125: 1.5' x 28' CMP cross culvert
to 308+125: 1.5' x 28' CMP cross culvert

Sta 308+125 to 308+150: 1.5' x 28' CMP cross culvert
to 308+150: 1.5' x 28' CMP cross culvert

Sta 292+50 to 302+ Reqd 2000 cu yds. Embank for raising roadway & bridge approaches to grade shown in Profile 2000. For Embankment, 10' come from Barron Pit 10' at Sta 294+ 3,000 cu yds from ROW at Sta 275+ to 293+ (FAP 8(F1)) Estimated Overhaul 2000 Sta Yds

STA 292+50-END OF FAP 8(F1)
BEGIN USWEH PRO NO WPH 8(F13)
UNIT =



SE 1/4 SEC 34
T 3 S R 72 W

Sta 317+48 - Road - Remove and reset
to road mile post

Sta 32+60 to 327+ - Road - move railroad track
to 100' from center line of road
to 100' from the road center line

Sta 327+ - Road - 100' from center line
to 100' from the road center line

Sta 327+ - Road - 100' from center line
to 100' from the road center line

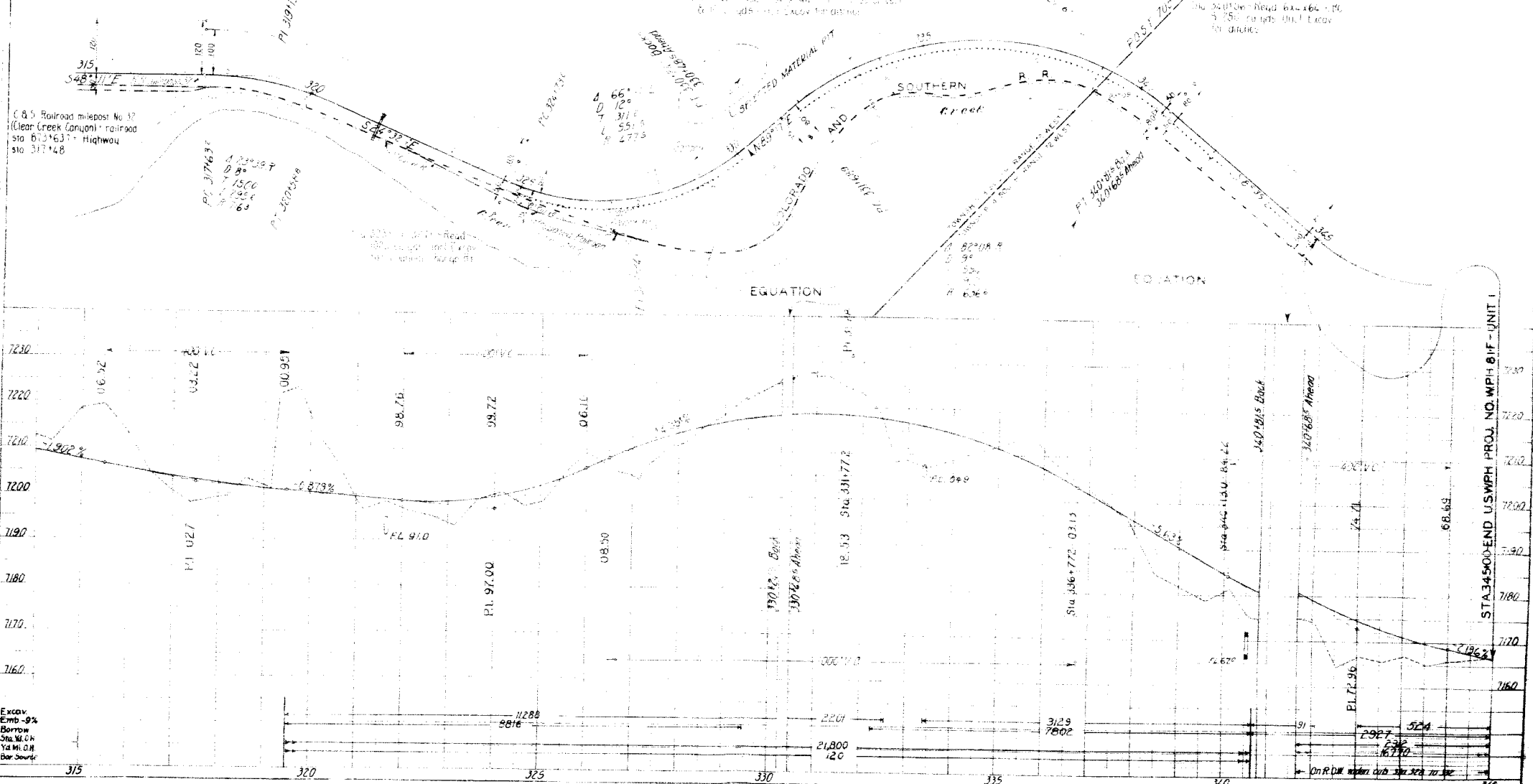
Sta 327+ - Road - 100' from center line
to 100' from the road center line

Sta 327+ - Road - 100' from center line
to 100' from the road center line

Sta 327+ - Road - 100' from center line
to 100' from the road center line

STATE	USWPH	UNIT	TOTAL
COLORADO	100	12	12
WPH (FEET)			25

NE 1/4 SEC. 3
T 4 S R 72 W



STA 345+00 - END USWPH PROJ. NO. WPH 81F - UNIT 1

STA. 345+00 END-US.W.P.H. PROJ. NO. W.P.H. 81-F-UNIT #1
BEGIN - US.W.P.H.-PROJ. NO. W.P.H. 81-F-UNIT #2

Sta 360+00
Reqd. 36+00 CMP cross curv
a 100' cu yds uncl excav for
inlet ditch

Sta 371-00
Reqd - 48' - 32' CMP cross cut
under Railroad, RI

N.W. 1/4 SEC. 2
T.4 S., R. 72 W.

U.S. WPH PROJ. NO	SHEET NO
WPH 81-F	29
UNIT NO 2 CD#1	
WPH 81-F (2)	29
WPH 81-F (3)	26

Sta 372+50 to 392+46
Req'd: Rebuild and raise RR track and grade.
(Quantities included in Cross Section quantities)

She 31c-08
Kaya Louise
Crossing 110
to be done

WPH 81 - F (2)

194-1501-1031-1032-5 - Page 3, above #45, under the
 1 and 2 below the word "work" as:
 1. "DETAILED ON SHEET NOS. 4 & 10-1"
 2. "10-1 was on number 4, 10-2, 10-3, 10-4, 10-5 of the sketch
 for the design development of the jet of the engine, for determining
 the weight and moments and 10-6, 10-7, 10-8, 10-9, 10-10, 10-11, 10-12, 10-13, 10-14, 10-15, 10-16, 10-17, 10-18, 10-19, 10-20, 10-21, 10-22, 10-23, 10-24, 10-25, 10-26, 10-27, 10-28, 10-29, 10-30, 10-31, 10-32, 10-33, 10-34, 10-35, 10-36, 10-37, 10-38, 10-39, 10-40, 10-41, 10-42, 10-43, 10-44, 10-45, 10-46, 10-47, 10-48, 10-49, 10-50, 10-51, 10-52, 10-53, 10-54, 10-55, 10-56, 10-57, 10-58, 10-59, 10-60, 10-61, 10-62, 10-63, 10-64, 10-65, 10-66, 10-67, 10-68, 10-69, 10-70, 10-71, 10-72, 10-73, 10-74, 10-75, 10-76, 10-77, 10-78, 10-79, 10-80, 10-81, 10-82, 10-83, 10-84, 10-85, 10-86, 10-87, 10-88, 10-89, 10-90, 10-91, 10-92, 10-93, 10-94, 10-95, 10-96, 10-97, 10-98, 10-99, 10-100, 10-101, 10-102, 10-103, 10-104, 10-105, 10-106, 10-107, 10-108, 10-109, 10-110, 10-111, 10-112, 10-113, 10-114, 10-115, 10-116, 10-117, 10-118, 10-119, 10-120, 10-121, 10-122, 10-123, 10-124, 10-125, 10-126, 10-127, 10-128, 10-129, 10-130, 10-131, 10-132, 10-133, 10-134, 10-135, 10-136, 10-137, 10-138, 10-139, 10-140, 10-141, 10-142, 10-143, 10-144, 10-145, 10-146, 10-147, 10-148, 10-149, 10-150, 10-151, 10-152, 10-153, 10-154, 10-155, 10-156, 10-157, 10-158, 10-159, 10-160, 10-161, 10-162, 10-163, 10-164, 10-165, 10-166, 10-167, 10-168, 10-169, 10-170, 10-171, 10-172, 10-173, 10-174, 10-175, 10-176, 10-177, 10-178, 10-179, 10-180, 10-181, 10-182, 10-183, 10-184, 10-185, 10-186, 10-187, 10-188, 10-189, 10-190, 10-191, 10-192, 10-193, 10-194, 10-195, 10-196, 10-197, 10-198, 10-199, 10-200, 10-201, 10-202, 10-203, 10-204, 10-205, 10-206, 10-207, 10-208, 10-209, 10-210, 10-211, 10-212, 10-213, 10-214, 10-215, 10-216, 10-217, 10-218, 10-219, 10-220, 10-221, 10-222, 10-223, 10-224, 10-225, 10-226, 10-227, 10-228, 10-229, 10-230, 10-231, 10-232, 10-233, 10-234, 10-235, 10-236, 10-237, 10-238, 10-239, 10-240, 10-241, 10-242, 10-243, 10-244, 10-245, 10-246, 10-247, 10-248, 10-249, 10-250, 10-251, 10-252, 10-253, 10-254, 10-255, 10-256, 10-257, 10-258, 10-259, 10-260, 10-261, 10-262, 10-263, 10-264, 10-265, 10-266, 10-267, 10-268, 10-269, 10-270, 10-271, 10-272, 10-273, 10-274, 10-275, 10-276, 10-277, 10-278, 10-279, 10-280, 10-281, 10-282, 10-283, 10-284, 10-285, 10-286, 10-287, 10-288, 10-289, 10-290, 10-291, 10-292, 10-293, 10-294, 10-295, 10-296, 10-297, 10-298, 10-299, 10-300, 10-301, 10-302, 10-303, 10-304, 10-305, 10-306, 10-307, 10-308, 10-309, 10-310, 10-311, 10-312, 10-313, 10-314, 10-315, 10-316, 10-317, 10-318, 10-319, 10-320, 10-321, 10-322, 10-323, 10-324, 10-325, 10-326, 10-327, 10-328, 10-329, 10-330, 10-331, 10-332, 10-333, 10-334, 10-335, 10-336, 10-337, 10-338, 10-339, 10-340, 10-341, 10-342, 10-343, 10-344, 10-345, 10-346, 10-347, 10-348, 10-349, 10-350, 10-351, 10-352, 10-353, 10-354, 10-355, 10-356, 10-357, 10-358, 10-359, 10-360, 10-361, 10-362, 10-363, 10-364, 10-365, 10-366, 10-367, 10-368, 10-369, 10-370, 10-371, 10-372, 10-373, 10-374, 10-375, 10-376, 10-377, 10-378, 10-379, 10-380, 10-381, 10-382, 10-383, 10-384, 10-385, 10-386, 10-387, 10-388, 10-389, 10-390, 10-391, 10-392, 10-393, 10-394, 10-395, 10-396, 10-397, 10-398, 10-399, 10-400, 10-401, 10-402, 10-403, 10-404, 10-405, 10-406, 10-407, 10-408, 10-409, 10-410, 10-411, 10-412, 10-413, 10-414, 10-415, 10-416, 10-417, 10-418, 10-419, 10-420, 10-421, 10-422, 10-423, 10-424, 10-425, 10-426, 10-427, 10-428, 10-429, 10-430, 10-431, 10-432, 10-433, 10-434, 10-435, 10-436, 10-437, 10-438, 10-439, 10-440, 10-441, 10-442, 10-443, 10-444, 10-445, 10-446, 10-447, 10-448, 10-449, 10-450, 10-451, 10-452, 10-453, 10-454, 10-455, 10-456, 10-457, 10-458, 10-459, 10-460, 10-461, 10-462, 10-463, 10-464, 10-465, 10-466, 10-467, 10-468, 10-469, 10-470, 10-471, 10-472, 10-473, 10-474, 10-475, 10-476, 10-477, 10-478, 10-479, 10-480, 10-481, 10-482, 10-483, 10-484, 10-485, 10-486, 10-487, 10-488, 10-489, 10-490, 10-491, 10-492, 10-493, 10-494, 10-495, 10-496, 10-497, 10-498, 10-499, 10-500, 10-501, 10-502, 10-503, 10-504, 10-505, 10-506, 10-507, 10-508, 10-509, 10-510, 10

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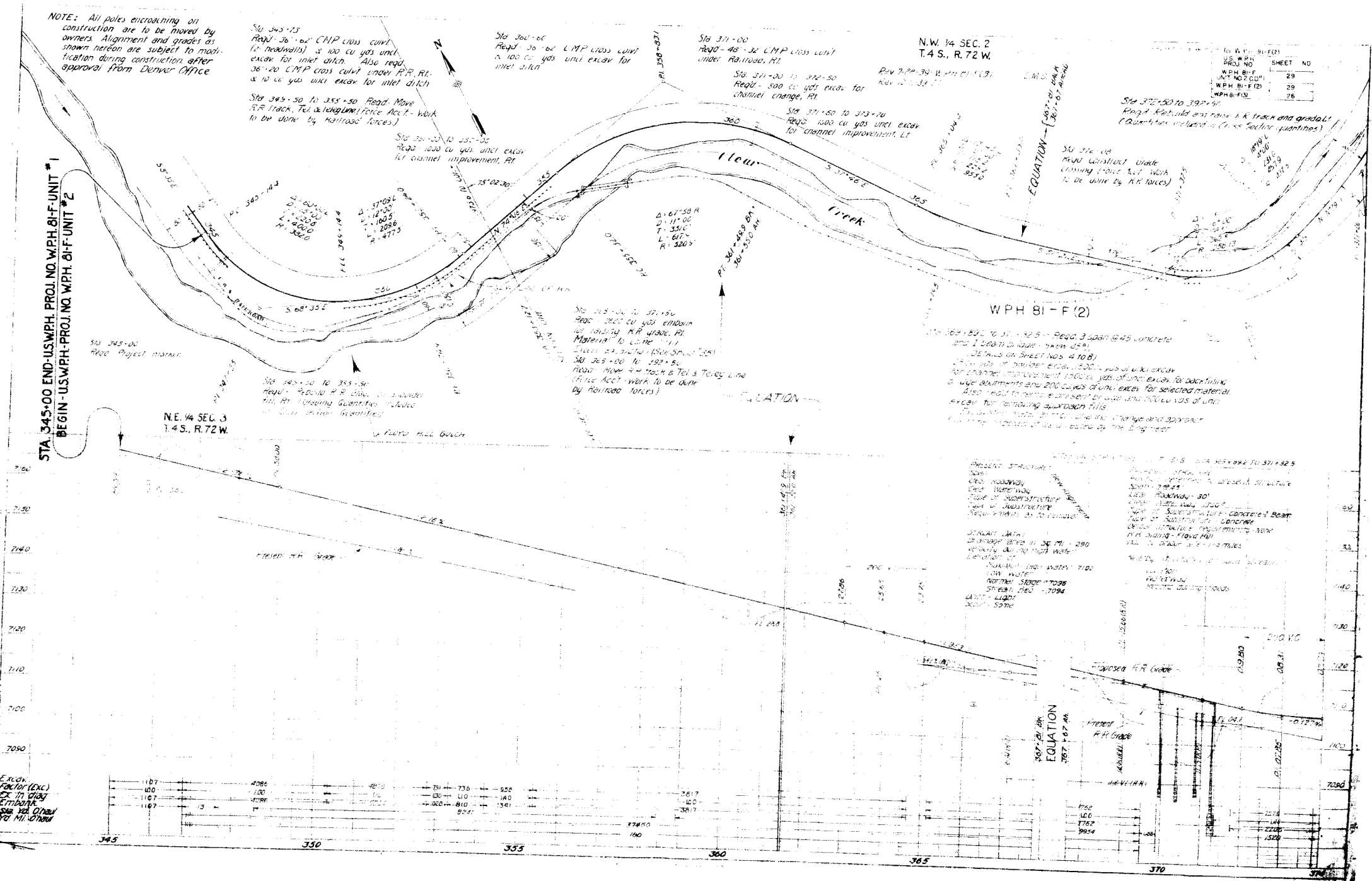
EQUATION 367.01/58

Moses H. Grove

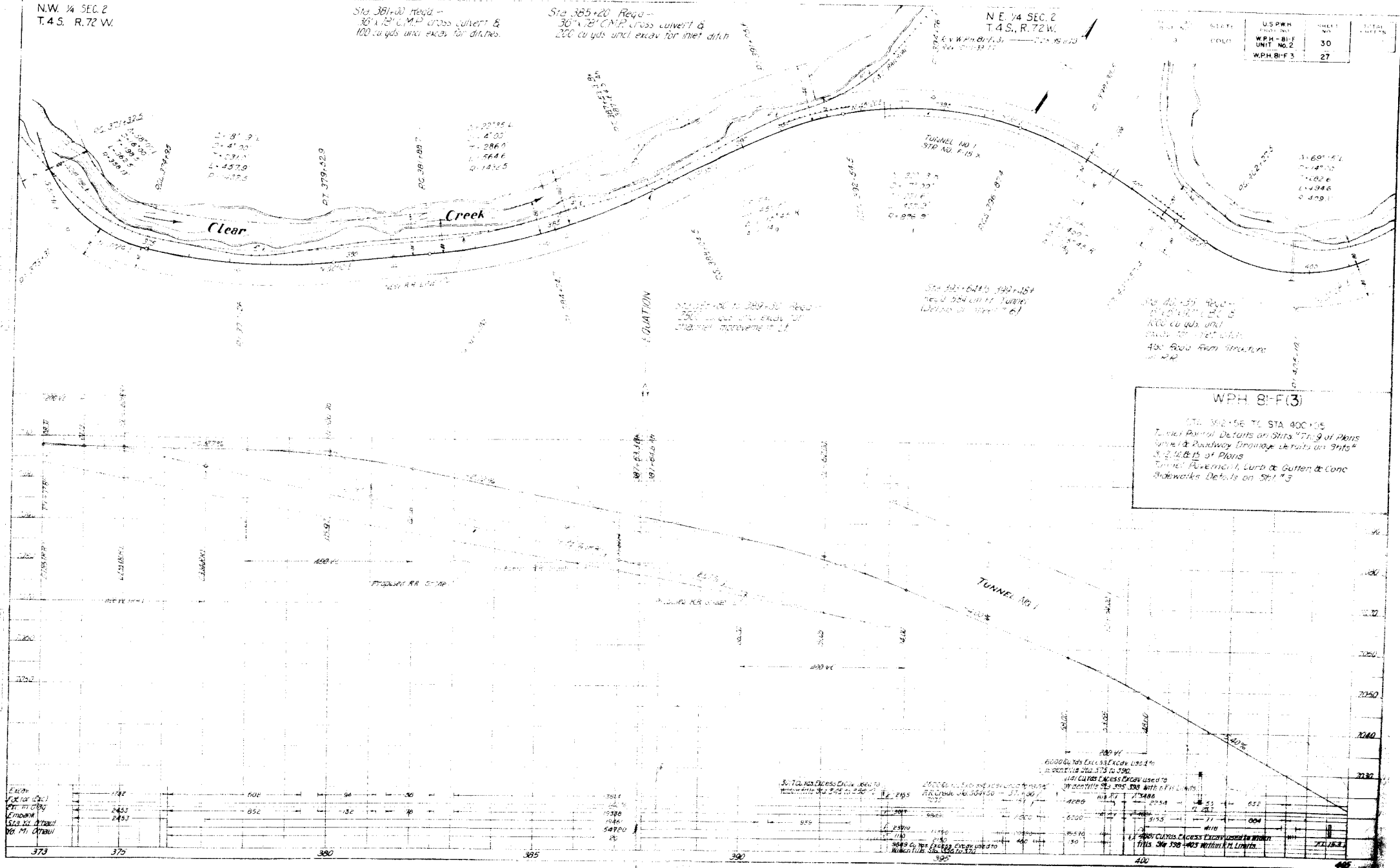
Present

Figure 1. Schematic representation of the experimental design. The subjects were divided into two groups: the control group (C) and the experimental group (E). The control group was subjected to a standard training protocol (C-TP) and the experimental group was subjected to a modified training protocol (E-TP). The control group was subjected to a standard training protocol (C-TP) and the experimental group was subjected to a modified training protocol (E-TP).

EXCOW
Factor (EXC)
EX in diag
Embark
SIA Yd O'hau
Yd MI O'hau



U.S.P.W.H. CROSS NO.	SHEET NO.	TOTAL SHEETS
W.P.H.-81-F UNIT NO.2	30	
W.P.H.81-F 3	27	



Sta 403+00 to 427+15--
Reqd: Rebuild a House R.R. Grade
(Quantities included in Cross Section Quantities)

Sta 403+00 to 428+
Reqd: Move Railroad Track & Tel & Telegraph Line
(Pole Account - Work To Be Done By RR Co Forces)

Sta 404+60 - Reqd: 30' x 100' C.M.P. cross culvert
& 200 cu yds. uncl. excav. for inlet ditch.

Sta 416+75 - Reqd: 6' x 4' x 60' Conc. Box culvert
3,500 cu yds. uncl. excav. for inlet ditch.
Also Reqd Rem. Structure on Railroad

Sta 419+30 to 421+70 - Reqd: 2,500 cu yds
uncl. excav. for channel improvement, etc.

Sta 420+90 - Reqd: Construct bridge crossing
(Pole Account - Work To Be Done By RR Co Forces)

Sta 421+25 - Reqd: 24' x 60' C.M.P. cross culvert
& 20 cu yds. uncl. excav. for inlet ditch.

Sta 421+15 to 428+00 - Reqd -
680 cu yds. uncl. excav. & 2,388 cu yds.
embank. to rebuild a House R.R. Grade. R.R.
embank. material to come from R.R. Excav.
& Excess Roadway Excav. (See sheets #36 to 38)

Sta 423+25 - Reqd: -
24' x 60' C.M.P. cross culvert
& 20 cu yds. uncl. excav. for
inlet ditch.

Revised by W.P.H. 81-F(2)
Rev. 7-29-39 - F.M.3 for
W.P.H. 81-F(3)
Rev. 10-11-39 T.T.

STATE	U.S. W.P.H. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	5010	28	31
	UNIT NO. 2501		
	W.P.H. 81-F(2)		
	W.P.H. 81-F(3)		

W.P.H. 81-F(3)

Sta 428+865 to Sta 433+743

Sta 428+865 to 431+100 - Reqd: Rein. Conc. Bridge Approach
300' (Details on Sht #13)
Sta 429+100 to 429+130 - Reqd: 150 Sq Yds Conc Pavement
(Details on Sht #13)
Sta 428+865 to 431+100 - Reqd: 40 Cu Yds. Selected Material
for shoulder - R.R. & L.
Sta 429+130 to 431+100 - Reqd: Tunnel Portal (Details on Shts
#1 & 10)
Sta 429+130 to 433+743 - Reqd: 1010 Sq Yds. Conc Pavement
(Details on Sht #4) & 10' x 10' x 28" Tr. Timber Header
at Sta 433+743
Sta 429+130 to 433+743 - Reqd: 8.00 in. R.R. Combination
Reinforced & Plaster Curb & Gutter R.R. & L. (Details
on Shts #3 & 4)
Sta 429+130 to 433+743 - Reqd: 2.00 Sq Ft Conc Sidewalks R.R.
& L. (Details on Sht #4) Also Reqd: 90 Cu Yds.
Selected Material to fill under sidewalks.
Sta 433+743 to 433+743 - Reqd: Tunnel Portal (Details on
Shts #7 & 11)
Sta 428+865 - Reqd: Rein. 6' x 6' x 40' Timber Header
to support M. tunnel for channel. This is estimated to
be available from Sta 403+00 to Sta 428+865 to be classified &
paid for as "Uncl. Fill Excavation". Estimated overhaul
involved Sta 428+865 to 433+743 is 300 Sta Yds. to 500 Sta Yds. to
433+743 is 1000 Sta Yds. to 1500 Sta Yds.

W.P.H. 81-F(2)

Sta 427+800 to 428+865 - Reqd: 2 spans
12.50 Conc. & 1 Beam Bridge (See 428+865)
(Details on Sheet Nos. 9 to 15)
25 cu yds. of boulder excav. and
200 cu yds. of uncl. excav. for
channel improvement, 2000 cu yds.
of uncl. excav. for backfilling bridge
abutments and 200 cu yds. of uncl.
excav. for selected material.

Sta 428+ - Reqd: C.M.P. cross culvert
& 20 cu yds. uncl. excav. for inlet ditch.
(Details on Shts #3 & 4)

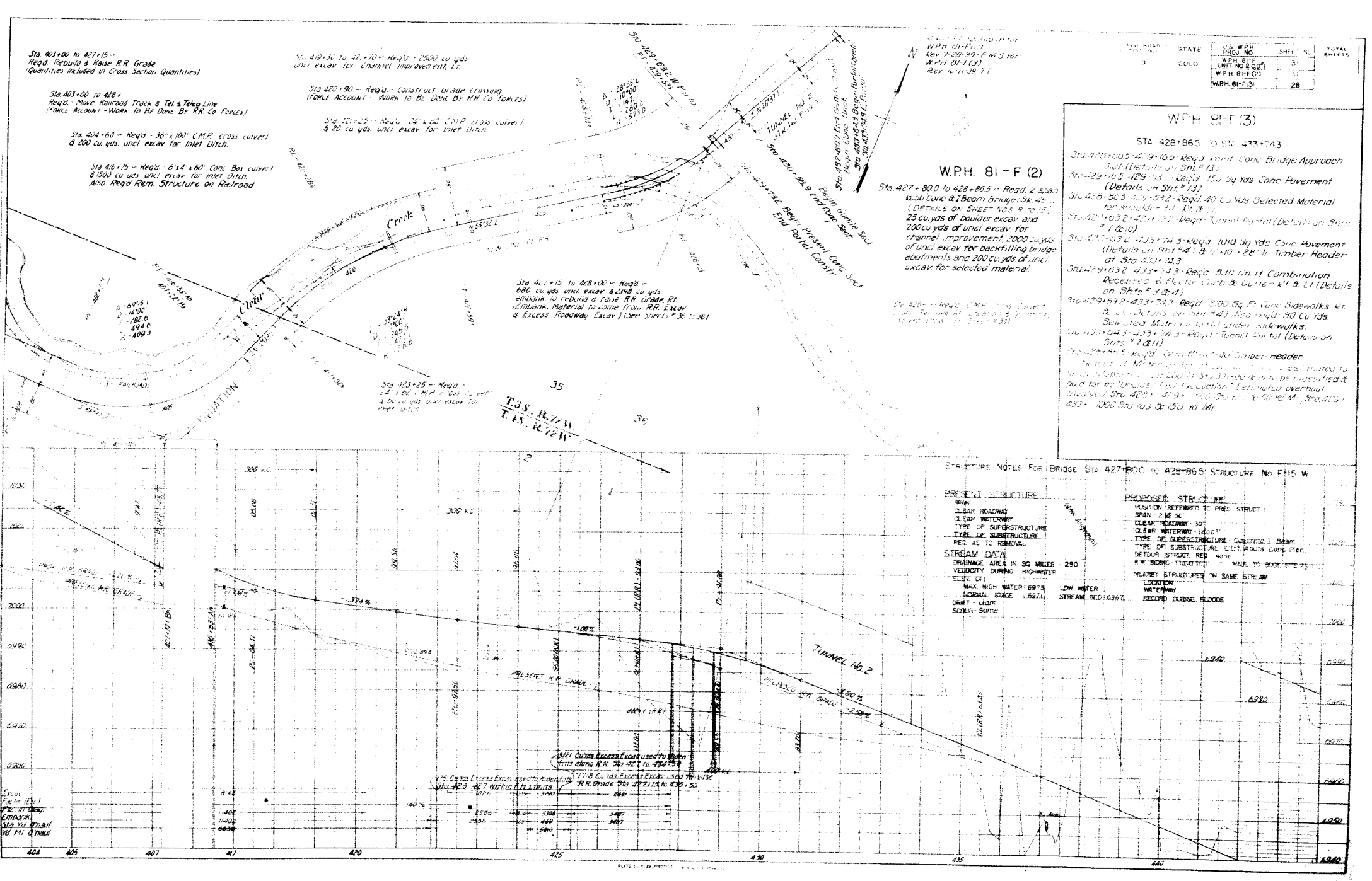
STRUCTURE NOTES FOR BRIDGE Sta 427+800 to 428+865 STRUCTURE NO. FH-15-W

PRESENT STRUCTURE

SPAN
CLEAR ROADWAY
CLEAR WATERWAY
TYPE OF SUPERSTRUCTURE
TYPE OF SUBSTRUCTURE
REQ. AS TO REMOVAL
STREAM DATA
DRAINAGE AREA IN SQ. MILES
VELOCITY DURING HIGHWATER
ELEV. OF:
MAX. HIGH WATER: 697.5
NORMAL STAGE: 697.1
DRAFT - LIGHT
SCOUR - SOME

PROPOSED STRUCTURE

POSITION REFERRED TO PRESENT STRUCTURE
SPAN: 2 x 50'
CLEAR ROADWAY: 30'
CLEAR WATERWAY: 400'
TYPE OF SUPERSTRUCTURE: CONCRETE BEAM
TYPE OF SUBSTRUCTURE: CUTOFF ADJUST LONG PIER
DETOUR STRUCT. REQ. - NONE
R.R. SIDING: 1500' MILE TO BOSS SITE 2300'
NEARBY STRUCTURES ON SAME STREAM
LOCATION
WATERWAY
RECORD DURING FLOODS



Sta 403+00 to 427+15
Sta 403+00 to 428+
Sta 404+60
Sta 416+75
Sta 419+30 to 421+70
Sta 420+90
Sta 421+25
Sta 421+15 to 428+00
Sta 423+25
Sta 427+800 to 428+865
Sta 428+865 to 431+100
Sta 429+100 to 429+130
Sta 428+865 to 431+100
Sta 429+130 to 431+100
Sta 429+130 to 433+743
Sta 433+743 to 433+743
Sta 428+865

Sta 428+00 to 433+57.84 -
Head 306' LULU Tunnel
(Detail on Sheet #6)

Sta 431 - Reqd. Remove Railroad
Drill at (Force Account) Work to
Be Done by Railroad Co. (Force)
(Location Shown on Sheet #33)

Sta 432 - To 437+861 - Reqd.
Move Lulu & remove Railroad Track at -
Head Reqd. Move & remove Tel. & Telegraph
Line Account Work to Be Done by Railroad

Sta 436 - To 451+17 - Reqd.
Dark New Railroad Grade at
Location & Utilities Shown on Sheets #33, 34 & #35 to 437

Sta 438 - Reqd. LULU Cross Convert
Under Railroad Mt. Location & Utilities
(Detail on Sheet #33)

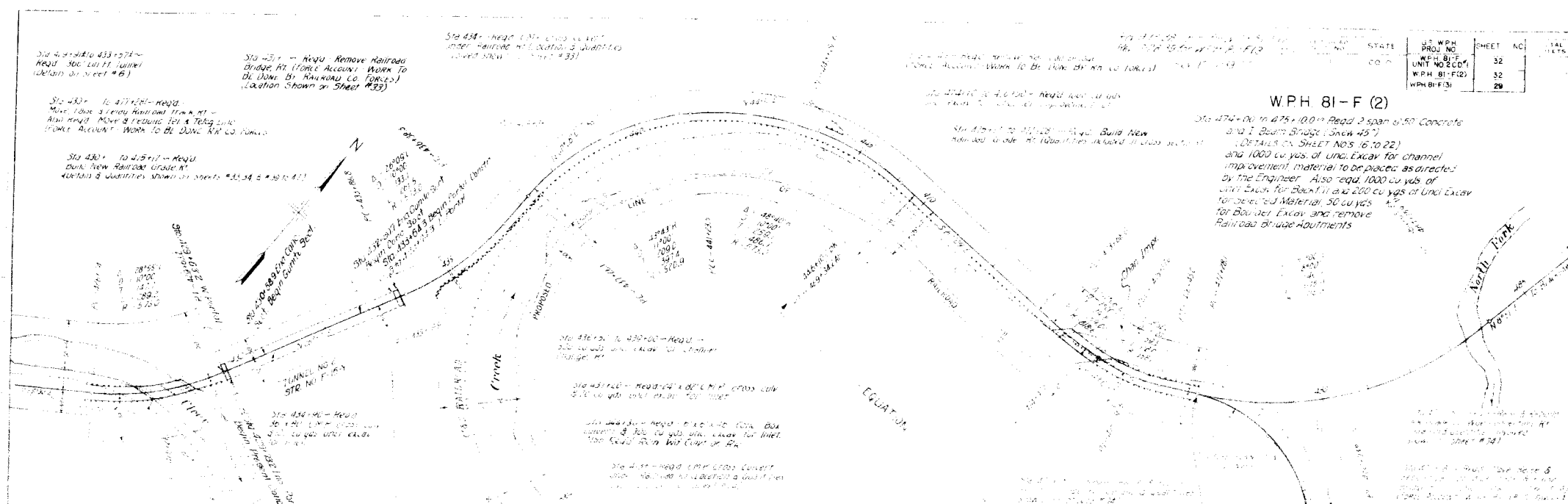
Sta 438 - Reqd. LULU Cross Convert
Under Railroad Mt. Location & Utilities
(Detail on Sheet #33)

Sta 474+00 to 475+00 - Reqd. New 2 span
16'0" concrete and 1 beam bridge (See 457)
Head 306' LULU Tunnel

WPH 81-F (2)

Sta 474+00 to 475+00 - Reqd. 2 span 16'0" concrete
and 1 beam bridge (See 457)
(Details on Sheet Nos. 16 to 22)
and 1000 cu yds. of uncl. Excav. for channel
improvement. Material to be placed as directed
by the Engineer. Also reqd. 1000 cu yds. of
uncl. Excav. for ditch 11 and 200 cu yds. of uncl. Excav.
for ditched Material. 50 cu yds.
for Boulder Excav. and remove
Railroad bridge abutments

STATE	UNIT NO. 2	SHEET NO.	TOTAL SHEETS
CO.	WPH 81-F (2)	32	32
	WPH 81-F (3)	29	



STRUCTURE NOTES FOR BRIDGE STA 474+00 TO 475+00 STRUCTURE NO. F-15 V

EXISTING STRUCTURE
SPAN
CLEAR ROADWAY
CLEAR WATERWAY
TYPE OF SUPERSTRUCTURE
TYPE OF SUBSTRUCTURE
REQ. AS TO REMOVAL
STREAM DATA
DRAINAGE AREA IN SQ. MI. - 290
VELOCITY DURING HIGH WATER
ELEVATION
MAX. HIGH WATER - 6800.3
LOW WATER
NORMAL STAGE - 6899
SCOUR - 50 FT.

PROPOSED STRUCTURE
POSITION - REFERRED TO PREST. STRUCT
SPAN - 2 @ 50'
CLEAR ROADWAY - 16'
CLEAR WATERWAY - 100'
TYPE OF SUPERSTRUCTURE - CONC. T-BEAM
TYPE OF SUBSTRUCTURE - CONTAINING CONC. PIERS
DETOUR STRUCT. REQ. - NONE
R.R. BEING REMOVED - YES TO BODIESITE - 31' 0"
NEARBY STR. ON SAME STREAM
LOCATION
WATERWAY
RECORD DURING FLOODS

STA. 477+281
END U.S.W.P.H. PROJECT NO. WPH-81-F (3)
END U.S.W.P.H. PROJECT NO. WPH-81-F UNIT NO. 2
BEGIN U.S.W.P.H. PROJECT NO. WPH-81-F (1)

