COLORADO
Department of Transportation

DOCUMENT SEPARATOR SHEET

REGION 5 – JUNE 2017 CONVERSION

To be placed at the beginning of each separator sheet.

r500001651

Description:
ROW Plans 11X17

Route # and Mile Points:
SH 114

Originating Office:

ROW/Survey

File Name:
Saguache to Gunnison_ROW(.PDF)

Box Location:

26 of 38

For assistance, or to request changes to this form,
please email helpdesk@msimaging.com.

MOUNTAIN STATES IMAGING

TEMPORARY CONTROL NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	S 0124 (7)	1	

Rev. 1-14-55, Notice to Bidders, J.C.R.

COLORADO
DEPARTMENT OF HIGHWAYS

FEDERAL AID PROJECT NO. S 0124 (7)

STATE HIGHWAY NO. 114

SAGUACHE COUNTY

SHEETS

1. [illegible] AND TABULATION OF LENGTH AND DESIGN DATA.
2. [illegible] AND SUMMARY OF QUANTITIES
3. [illegible] AND SUB BASE MATERIAL PLANS
4. [illegible] SHEET AND SUMMARY OF SOIL PROFILE TESTS.
5. STANDARD METHODS FOR SUPERELEVATION & WIDENING OF CURVES
6. STANDARD SILE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT & ANCHORING AT BRIDGES & AT CREST OF GRADES
7. STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS.

M-1-C
M-2-EM
M-29-A

CONVENTIONAL SIGNS

- CENTER LINE — w PLAN SHEET — TITLE & SHEET
- RIGHT OF WAY LINE — R OF W MARKER
- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- LAND LINES — SECTION LINE — 1/4 SECTION LINE — 1/16 SECTION LINE
- RAILROAD — TITLE SHEET — PLAN SHEET
- BARBED WIRE FENCE
- COMBINATION WIRE FENCE
- SNOW FENCE
- TELEPHONE & TELEGRAPH LINES
- POWER LINE
- DETOUR
- PRESENT ROAD (Plan Sheets)

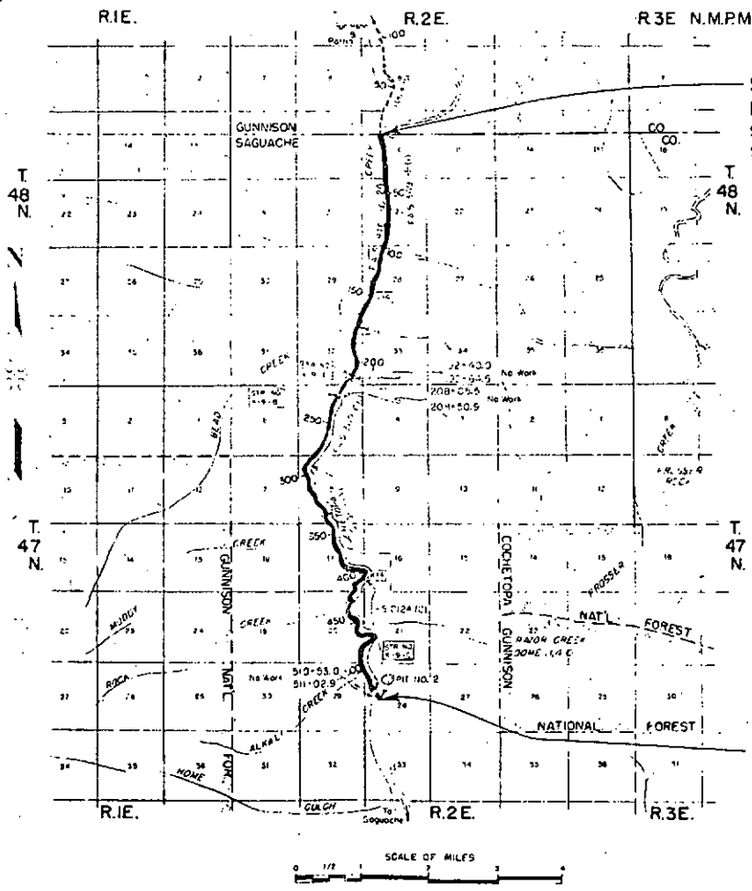
TABULATION OF LENGTH AND DESIGN DATA

STATION	ROADWAY LIN.FT.	NO WORK LIN.FT.
1+39.7 BEGIN S 0124 (7) =		
1+39.7 BEGIN F.A.S. 369-B (1) = Ah.		
0+00 BEGIN S 0124 (5) Bk. — County Line		
	2,322.4	
24+62.1 Bk. = 24+63.4 Ah. Equation		
	1,146.1	
36+09.5 Bk. = 36+35.7 Ah. Equation		
	4,083.7	
77+19.4 Bk. = 77+00.6 Ah. Equation		
	6,726.1	
144+26.7 Bk. = 144+84.9 Ah. Equation		
	2,074.1	
165+58.9 Bk. = 165+96.7 Ah. Equation		
	792.7	
173+89.6 Bk. = 173+74.5 Ah. Equation		
179+50 END F.A.S. 369-B (1) = BEGIN F.A.S. 369-C (1)	1,019.0	
183+93.5 Bk. = 183+94.3 Ah. Equation		
	845.7	
192+40.0 Bridge		24.5
192+64.5	547.2	
198+11.7 Bk. = 198+23.8 Ah. Equation		
	981.7	
208+05.6 Bridge		45.4
208+50.9	1,017.8	
218+68.7 Bk. = 220+20.0 Ah. Equation		
	1,557.9	
233+77.5 Bk. = 235+82.2 Ah. Equation		
280+65 END F.A.S. 369-C (1) = BEGIN S-369 (4)	9,984.1	
335+66.3 Bk. = 335+95.3 Ah. Equation		
	2,760.5	
363+75.6 Bk. = 363+70.0 Ah. Equation		
404+05 END S-369 (4) = BEGIN S 0124 (2)	5,391.6	
417+65.6 Bk. = 418+79.5 Ah. Equation		
	1,186.3	
430+61.8 Bk. = 429+88.3 Ah. Equation		
	4,087.7	
470+76.0 Bk. = 471+11.0 Ah. Equation		
	2,880.1	
499+91.1 Bk. = 498+50.0 Ah. Equation		
	1,103.0	
510+53.0 Bridge		49.9
511+02.9	1,097.1	
522+00.0 END S 0124 (7) =		
522,+00.0 END S 0124 (2)		
TOTAL	51,624.4	119.6

SUMMARY	LIN.FT	MILES
Roadway (Net Length)	51,624.4	9.777
No Work Sections	119.6	0.023
TOTALS S 0124 (7) (Gross Length)	51,744.2	9.800

DESIGN DATA	
MAXIMUM DEGREE OF CURVE	24°
MAXIMUM GRADE	3.60%
MINIMUM N.P.S.D.- horizontal	200'
MINIMUM N.P.S.D.- vertical	385'
MAXIMUM DESIGN SPEED	30 M.P.H.

GROSS LENGTH OF PROJECT 51,744.2 feet = 9.800 miles
NET LENGTH OF PROJECT 51,624.4 feet = 9.777 miles



NOTICE TO BIDDERS

IT IS RECOMMENDED THAT BIDDERS ON THIS PROJECT GO OVER THE PLAN DETAILS WITH ONE OF THE FOLLOWING FIELD REPRESENTATIVES OF THE DEPARTMENT.

HOWER W. GRAY, Construction Engineer, Grand Junction, Colorado
Office Phone 1574 Home Phone 1653 W

NORMAN W. COMPE, Resident Engineer, Montrose, Colorado
Office Phone 581 Home Phone 1169 W

DEPARTMENT OF HIGHWAYS

APPROVED: [signature] 10-28-54
STATE ENGINEER

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

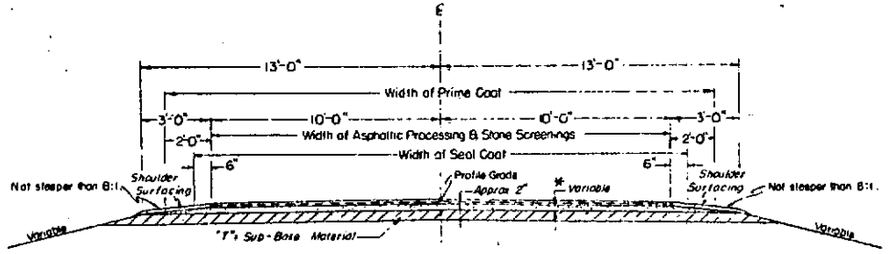
APPROVED:

STATE ENGINEER

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	S 0124 (7)	2	

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

Saguache - Gunnison County Line - South



Material above the subgrade is to be constructed of Sub-Base Material at locations designated in Sub-Base material tabulation. Estimated quantities involved in this operation and thickness of material required are tabulated in the Sub-Base material plan

The Profile Grade from Sta 1+39.7 to 126+00 & Sta. 151+00 to 522+00 is above the present roadway by the combined thicknesses of Bottom Course and Asphaltic Processing.

From Sta 126+00 to 151+00 it is above the present roadway by the combined thicknesses of Sub-Base Material, Bottom Course & Asphaltic Processing.

Approximate 4" and/or 6" compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin ft. of roadway:

Top Course		*23 tons*
Bottom Course	[2"	*26 tons*
	[4"	*51 tons*
Surfacing for Shoulder Areas		*7 tons*

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted June 1, 1952.

All quantities on preliminary plans are to be considered approximate only.

For alignment and grades see projects FAS 369:B(1), 369-C(1), S-369(4) and S 0124(2).

All curves are to be superelevated and widened as provided by the Standard Superelevation sheet included with the plans, except that curves over 6 degrees shall be provided with the superelevation shown on the Standard Superelevation sheet for a 6 degree curve.

At the approaches to bridges, the present roadbed shall be excavated to provide for placing the required thickness of Surfacing and Sub-Base Material to meet the present grades at bridges. The transitions for this operation will take place gradually over a distance of 300 Ft. each way from the bridge ends. Excavated material shall be used to widen roadway shoulders at these approaches. The cost of removing and hauling material shall be included in the contract price for "Shaping Roadbed".

At bridge approaches, the Asphaltic Surfacing shall be widened to meet the curbed width of the bridge and shall take place gradually over a distance of 300 Ft. each way from the Bridge ends. The Prime Coat shall be widened beyond Mat as indicated on Typical Section.

It is estimated that rolling of Asphaltic Surfacing with Flat Wheeled Roller (Tandem) will be necessary after any rolling with Rubber Tired Rollers in order to provide a firm smooth surface.

All side approach roads to the project designated by the Engineer shall be primed and seal coated to approximately 50 feet out from edge of the Asphaltic Surfacing or to the Right of Way line, whichever is less.

The culverts and ditches are to be cleaned by the Saguache County Maintenance Forces at no cost to the project.

It is estimated that Shaping Roadbed will be required over the entire project.

* TABULATION OF BOTTOM COURSE THICKNESS

STATION			THICKNESS
1+39.7	to	15+00	4"
15+00	to	35+00	2"
35+00	to	65+00	4"
65+00	to	151+00	2"
151+00	to	170+00	4"
170+00	to	230+00	2"
230+00	to	250+00	4"
250+00	to	522+00	2"

For preliminary plan quantities of Asphaltic Road Materials and Stone Screenings, the following rates of application were used:

PRIME COAT	MC	at	0.40 Gals per Sq. Yd.
PROCESS	MC	at	0.70 Gals per Sq. Yd. per inch
SEAL COAT	RC	at	0.26 Gals. per Sq. Yd.
STONE SCREENINGS		at	200 Lbs. per Sq. Yd.

Rate of application and grade of Asphaltic Material shall be as determined by the Engineer at time of application.

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	PROJECT TOTALS
13s	Stripping	Cu. Yd.	5,000
17a	Rolling with Tamping Roller (Two (2) Unit)	Hour	80
17b	Rolling with Tamping Roller (Four (4) Unit)	Hour	20
17c	Rolling with Flat Wheeled Roller (Tandem)	Hour	60
17d	Rolling with Flat Wheeled Roller (Three (3) Wheel)	Hour	110
17e	Rolling with Rubber Tired Roller (One (1) Unit)	Hour	70
17ex	Rolling with Rubber Tired Roller (Two (2) Unit)	Hour	70
17f	Furnishing Tamping Roller (Two (2) Unit)	Each	1
17g	Furnishing Tamping Roller (Four (4) Unit)	Each	1
17h	Furnishing Flat Wheeled Roller (Tandem)	Each	1
17i	Furnishing Flat Wheeled Roller (Three (3) Wheel)	Each	1
17j	Furnishing Rubber Tired Roller (One (1) Unit)	Each	1
17jx	Furnishing Rubber Tired Roller (Two (2) Unit)	Each	1
17k	Wetting	M Gal.	1,050
18c	Ton Mile Overhaul	Ton Mile	205,600
23a	Sub-Base Material (Class 1)	Ton	5,400
26c	Gravel or Crushed Rock Surfacing (Grading C)	Ton	33,800
30x	Asphaltic Road Material MC (Prime)	Gal.	57,900
30y	Asphaltic Road Material RC (Seal) (Fortified)	Gal	33,100
30z	Asphaltic Road Material MC (Process) (Fortified)	Gal.	174,600
31a	Road Mix Asphaltic Processing	Sq. Yd.	119,940
31x	Stone Screenings (Type X)	Ton	1,220
110	Shaping Roadbed	Mile	9.8
	FORCE ACCOUNT		
	Removal of Muck	Lump Sum	*
	NON-FEDERAL AID		
	Signing and Striping Entire Project (Work by State Forces)	Lump Sum	*

FEDERAL AID C. DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO	TOTAL SHEETS
9	COLORADO	S 0124 (7)	3	

It is estimated that material for Gravel Surfacing and Sub-Base Material for the project is available in the vicinity of the pit indicated in the following tabulations. Estimated quantities involved in these operations are shown below.

Alteration of these plans as here outlined will be allowed only on written permission from the Department.

SURFACING PLAN

MATERIAL TO BE PLACED	SOURCE	AVAILABLE	QUANTITY TONS USED GRADING C TOP COURSE	QUANTITY TONS USED GRADING C BOTTOM COURSE	QUANTITY TONS USED GRADING C SHOULDER AREAS	OVERHAUL TON MILES TOP COURSE	OVERHAUL TON MILES BOTTOM COURSE	OVERHAUL TON MILES SHLDR. AREAS
1+397 to 15+00	PIT NO 2	45,000 Cu. Yds.	313	694	95	3,003	6,659	912
15+00 to 35+00	0.06 miles from Sta. 515+00		460	520	140	4268	4,824	1,299
35+00 to 65+00	R+82		684	1,517	208	6,024	13,359	1,832
65+00 to 151+00			1,969	2,226	599	15,189	17,172	4,621
151+00 to 170+00			428	950	130	2,879	6,391	875
170+00 to 192+40			518	586	158	3,283	3,714	1,001
Bridge 192+64.5 to 208+05.5			352	398	107	2,103	2,378	639
Bridge 208+50.9 to 230+00			459	519	140	2,585	2,923	788
230+00 to 250+00			459	1,018	140	2,406	5,352	735
250+00 to 510+53.0			5,979	6,759	1,819	15,570	17,616	4,734
Bridge 511+02.9 to 515+00			91	103	28	9	10	3
515+00 to 522+00			161	182	49	20	22	6
Estimated for Corr. Irreg. in Sub-Grade.				1,560			7,951	
Road Approaches				160			862	
Widening at Bridge Appr's.			45	88		180	355	
Curve Widening			437	437		1,388	1,388	
Approaches to Project.			24	40	7	119	255	40
SUB-TOTALS			12,379	17,757	3,620	59,026	91,231	17,465
TOTALS			33,756			167,742		

NOTE : Surfacing for Shoulder Areas not to be placed across road approaches.

SUB-BASE MATERIAL PLAN

MATERIAL TO BE PLACED	SOURCE	QUANTITY AND THICKNESS CLASS 1 AVAILABLE		THICKNESS	TONS			OVERHAUL TON MILES CL. 1	
126+00 to 145+00	PIT NO. 2	45,000 Cu. Yds.		10"	3,002			21,589	
145+00 to 151+00	0.06 miles from Sta. 515+00 R+78*			12"	1,200			8,352	
Approaches					180			1,271	
Estimated for Corr. Irreg. in Sub-Grade					420			2,994	
Estimated for Widening Shoulders.					500			3,563	
TOTALS					5,302			37,769	

* Based on Curve "C".

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	S 0124 (7)	4	

SUMMARY OF SOIL PROFILE TESTS

TEST NO.	STATION OF TEST	SIDE	DEPTH	NO. SAMPLE SIMILAR TO TEST	L.L.	P.I.	%-200	CLASS	DESIGN C.B.R.	STAB. "R" VALUE	REPRESENTS MATERIAL FROM STATION TO STATION
1	8+00	C.L.	0.0 - 0.2		NV	N.P.	19.0	A-1-b(0)			1+37.7 - 15+00
1-A	8+00	C.L.	0.2 - 3.0		33.9	14	44	A-4(2)	14.6		
2	20+00	C.L.	0.0 - 0.3	1				A-1-b(0)			15+00 - 25+00
2-A	20+00	C.L.	0.2 - 3.0		28.1	4.4	19	A-1-b(0)		61.0	
3	30+00	C.L.	0.0 - 0.2	1				A-1-b(0)			25+00 - 35+00
3-A	30+00	C.L.	0.2 - 3.0	2-A				A-1-b(0)			
4	40+00	C.L.	0.0 - 0.2	1				A-1-b(0)			35+00 - 45+00
4-A	40+00	C.L.	0.2 - 3.0		43.5	22.1	19	A-2-7(0)	35.8	Note P.I.	
5	50+00	C.L.	0.0 - 0.2	1				A-1-b(0)			45+00 - 55+10
5-A	50+00	C.L.	0.2 - 3.0	4-A				A-2-7(0)	35.6	-	
6	60+00	C.L.	0.0 - 0.2	1				A-1-b(0)			55+10 - 65+00
6-A	60+00	C.L.	0.2 - 3.0	4-A				A-2-7(0)	36.8	-	
7	70+00	10'Lt.	0.0 - 0.2	1				A-1-b(0)			65+00 - 85+00
7-A	70+00	10'Lt.	0.2 - 3.0		N.V.	N.P.	24	A-1-b(0)		75.0	
8	80+00	C.L.	0.0 - 0.2	1				A-1-b(0)			
8-A	80+00	C.L.	0.2 - 3.0	7-A				A-1-b(0)		75.0	
9	90+00	8'Rt.	0.0 - 0.2	1				A-1-b(0)			85+00 - 95+00
9-A	90+00	8'Rt.	0.2 - 3.0		N.V.	N.P.	32	A-2-4(0)	33.0		
10	100+00	8'Rt.	0.0 - 0.2	1				A-1-b(0)			95+00 - 105+00
10-A	100+00	8'Rt.	0.2 - 3.0		N.V.	N.P.	26	A-2-4(0)	33.0		
11	110+00	C.L.	0.0 - 0.2	1				A-1-b(0)			105+00 - 115+00
11-A	110+00	C.L.	0.2 - 3.0	10-A				A-2-4(0)			
12	120+00	12'Rt.	0.0 - 0.2	1				A-1-b(0)			115+00 - 120+00
12-A	120+00	12'Rt.	0.2 - 3.0		N.V.	N.P.	34	A-2-4(0)	33.0		
13	130+00	8'Rt.	0.0 - 1.0		48.2	13.7	60	A-7-5(6)	4.7		120+00 - 133+50
13-A	130+00	8'Rt.	1.0 - 3.0	12-A				A-2-4(0)	33.0		
14	137+00	C.L.	0.0 - 0.2	1				A-1-b(0)			133+50 - 146+50
14-A	137+00	C.L.	0.2 - 3.0	12-A				A-2-4(0)	33.0		
15	147+00	8'Rt.	0.0 - 1.0		26.8	5.4	59	A-4(5)	6.5		146+50 - 151+00
15-A	147+00	8'Rt.	1.0 - 3.0	12-A				A-2-4(0)	33.0		
16	156+00	8'Lt.	0.0 - 0.2	1				A-4(0)			151+00 - 170+00
16-A	156+00	8'Lt.	0.2 - 3.0		22.8	N.P.	41	A-4(1)	14.7		
17	165+00	C.L.	0.0 - 0.2	1				A-1-b(0)			
17-A	165+00	C.L.	0.2 - 3.0	16-A				A-4(1)	14.7		
18	175+00	10'Rt.	0.0 - 0.2	1				A-1-b(0)			170+00 - 179+50
18-A	175+00	10'Rt.	0.2 - 3.0		22.2	N.P.	32	A-2-4(0)			
19	185+00	C.L.	0.0 - 0.3		N.V.	N.P.	16	A-1-b(0)			179+50 - 200+00
19-A	185+00	C.L.	0.3 - 3.0		20.5	N.P.	20	A-1-b(0)		75.0	
20	195+00	C.L.	0.0 - 0.3	19				A-1-b(0)			
20-A	195+00	C.L.	0.3 - 3.0	19-A				A-1-b(0)		75.0	
21	205+00	8'Rt.	0.0 - 0.3	19				A-1-b(0)			200+00 - 330+00
21-A	205+00	8'Rt.	0.3 - 3.0		21.4	N.P.	11	A-1-b(0)		75.0	
22	215+00	C.L.	0.0 - 0.3	19				A-1-b(0)			
22-A	215+00	C.L.	0.3 - 3.0	21-A				A-1-b(0)		75.0	
23	225+00	C.L.	0.0 - 0.3	19				A-1-b(0)			
23-A	225+00	C.L.	0.3 - 3.0	21-A				A-1-b(0)		75.0	
24	235+00	8'Lt.	0.0 - 0.3	19				A-1-b(0)			230+00 - 250+00
24-A	235+00	8'Lt.	0.3 - 3.0		25.6	6.3	20	A-1-b(0)		63.0	
25	245+00	C.L.	0.0 - 0.3	19				A-1-b(0)			
25-A	245+00	C.L.	0.3 - 3.0	24-A				A-1-b(0)		82.0	
26	255+00	C.L.	0.0 - 0.2	19				A-1-b(0)			250+00 - 260+00
26-A	255+00	C.L.	0.2 - 3.0	21-A				A-1-b(0)		75.0	
27	265+00	5'Lt.	0.0 - 0.4	19				A-1-b(0)			260+00 - 280+65
27-A	265+00	5'Lt.	0.4 - 3.0		22.5	N.P.	21	A-1-b(0)			
28	275+00	10'Rt.	0.0 - 0.3	19				A-1-b(0)			
28-A	275+00	10'Rt.	0.3 - 3.0	27-A				A-1-b(0)			
29	285+00	4'Rt.	0.0 - 0.2		N.V.	N.P.	11	A-1-b(0)			280+65 - 300+00
29-A	285+00	4'Rt.	0.2 - 0.6		N.V.	N.P.	17	A-1-b(0)			
29-B	285+00	4'Rt.	0.6 - 3.0		24.1	3.4	25	A-1-b(0)			
30	295+00	C.L.	0.0 - 0.2	29				A-1-b(0)			
30-A	295+00	C.L.	0.2 - 0.5	29-A				A-1-b(0)			
30-B	295+00	C.L.	0.5 - 3.0	29-B				A-1-b(0)			
31	305+00	8'Rt.	0.0 - 0.2	29				A-1-b(0)			300+00 - 320+00
31-A	305+00	8'Rt.	0.2 - 0.5	29-A				A-1-b(0)			
31-B	305+00	8'Rt.	0.5 - 4.0		N.V.	N.P.	26	A-2-4(0)	23.0		
32	315+00	C.L.	0.0 - 0.2	29				A-1-b(0)			
32-A	315+00	C.L.	0.2 - 0.5	29-A				A-1-b(0)			
32-B	315+00	C.L.	0.5 - 3.0	31-B				A-2-4(0)	23.0		
33	325+00	C.L.	0.0 - 0.2	29				A-1-b(0)			320+00 - 330+00
33-A	325+00	C.L.	0.2 - 3.0		25.0	N.P.	30	A-1-b(0)		66.0	
34	335+00	C.L.	0.0 - 0.2	29				A-1-b(0)			330+00 - 340+00
34-A	335+00	C.L.	0.2 - 3.0	33-A				A-1-b(0)		66.0	
35	345+00	C.L.	0.0 - 0.2	29				A-1-b(0)			340+00 - 350+50
35-A	345+00	C.L.	0.2 - 0.5	29-A				A-1-b(0)			
35-B	345+00	C.L.	0.5 - 3.0		N.V.	N.P.	17	A-1-b(0)		77.0	
36	355+00	10'Lt.	0.0 - 0.2	29				A-1-b(0)			350+50 - 360+50
36-A	355+00	10'Lt.	0.2 - 0.6	29-A				A-1-b(0)			
36-B	355+00	10'Lt.	0.6 - 3.0	35-B				A-1-b(0)			
37	365+00	10'Rt.	0.0 - 0.2	29				A-1-b(0)			360+00 - 370+00
37-A	365+00	10'Rt.	0.2 - 0.6	29-A				A-1-b(0)			
37-B	365+00	10'Rt.	0.6 - 3.0		N.V.	N.P.	9	A-1-b(0)		80.0	
38	375+00	C.L.	0.0 - 0.2	29				A-1-b(0)			370+00 - 380+00
38-A	375+00	C.L.	0.2 - 0.6	29-A				A-1-b(0)			
38-B	375+00	C.L.	0.6 - 3.0	37-B				A-1-b(0)			
39	385+00	10'Lt.	0.0 - 0.2	29				A-1-b(0)			380+00 - 390+00
39-A	385+00	10'Lt.	0.2 - 0.6	29-A				A-1-b(0)			
39-B	385+00	10'Lt.	0.6 - 3.0	37-B				A-1-b(0)			
40	397+00	C.L.	0.0 - 0.3	29				A-1-b(0)			390+00 - 404+05
40-A	397+00	C.L.	0.3 - 0.8	29-A				A-1-b(0)			
40-B	397+00	C.L.	0.8 - 3.0	37-B				A-1-b(0)			
41	410+00	8'Rt.	0.0 - 0.3		N.V.	N.P.	11	A-1-b(0)			404+05 - 415+00
41-A	410+00	8'Rt.	0.3 - 0.7		N.V.	N.P.	7	A-1-b(0)			
41-B	410+00	8'Rt.	0.7 - 1.3		22.1	N.P.	19	A-1-b(0)			
41-C	410+00	8'Rt.	1.3 - 3.0		27.1	8.5	30	A-2-4(0)			

SUMMARY OF SOIL PROFILE TESTS (Cont'd.)

TEST NO	STATION OF TEST	SIDE	DEPTH	NO SAMPLE SIMILAR TO TEST	L.L.	P.I.	%-200	CLASS	DESIGN C.B.R.	STAB. "R" VALUE	REPRESENTS MATERIAL FROM STATION TO STATION
42	415+00	C.L.	0.0 - 0.3	41				A-1-a(0)			415+00 - 425+00
42-A	420+00	C.L.	0.3 - 0.7	41-A				A-1-a(0)			
42-B	420+00	C.L.	0.7 - 3.0	41-C				A-2-4(0)			
43	430+00	C.L.	0.0 - 0.3	41				A-1-a(0)			425+00 - 435+00
43-A	430+00	C.L.	0.3 - 0.9	41-A				A-1-a(0)			
43-B	430+00	C.L.	0.9 - 3.0	41-C				A-2-4(0)			
44	440+00	C.L.	0.0 - 0.3	41				A-1-a(0)			435+00 - 445+00
44-A	440+00	C.L.	0.3 - 0.8	41-A				A-1-a(0)			
44-B	440+00	C.L.	0.8 - 3.0		N.V.	N.P.	18	A-2-4(0)	24.7		
45	450+00	C.L.	0.0 - 0.3	41				A-1-a(0)			445+00 - 455+00
45A	450+00	C.L.	0.3 - 0.6	41-A				A-1-a(0)			
45-B	450+00	C.L.	0.6 - 3.0	44-B				A-1-a(0)		23.7	
46	460+00	10'Rt.	0.0 - 0.3	41				A-1-a(0)			455+00 - 465+00
46-A	460+00	10'Rt.	0.3 - 0.6	41-A				A-1-a(0)			
46-B	460+00	10'Rt.	0.6 - 2.1		N.V.	N.P.	12	A-1-a(0)			
47	470+00	10'Lt.	0.0 - 0.3	41				A-1-a(0)			465+00 - 475+00
47-A	470+00	10'Lt.	0.3 - 0.6	41-A				A-1-a(0)			
47-B	470+00	10'Lt.	0.7 - 2.0	No Sample - Large Rocks							
48	480+00	C.L.	0.0 - 0.3	41				A-1-a(0)			475+00 - 485+00
48-A	480+00	C.L.	0.3 - 0.7	41-A				A-1-a(0)			
48-B	480+00	C.L.	0.7 - 2.0	No Sample - Large Rocks							
49	490+00	C.L.	0.0 - 0.3	41				A-1-a(0)			485+00 - 495+00
49-A	490+00	C.L.	0.3 - 0.8	41-A				A-1-a(0)			
19-B	490+00	C.L.	0.8 - 3.0		N.V.	N.P.	4	A-1-a(0)			
50	500+00	C.L.	0.0 - 0.3	41				A-1-a(0)			495+00 - 507+00
50-A	500+00	C.L.	0.3 - 0.6	41-A				A-1-a(0)			
50-B	500+00	C.L.	0.6 - 3.0	45-B				A-1-a(0)			
51	507+00	C.L.	0.0 - 0.3	41				A-1-a(0)			507+00 - 517+50
51-A	507+00	C.L.	0.3 - 0.7	41-A				A-1-a(0)			
51-B	507+00	C.L.	0.7 - 3.0		39.2	14.1	26	A-2-4(0)	12.0		
52	517+00	C.L.	0.0 - 0.3	41				A-1-a(0)			517+00 - 527+00
52-A	517+00	C.L.	0.3 - 0.8	41-A				A-1-a(0)			
52-B	517+00	C.L.	0.8 - 3.0		29.0	7.1	21	A-2-4(0)	23.7		

LOCATION OF MATERIAL PITS

PIT NO. 1

LOCATION SE1/4, Sec 28, SW1/4, Sec 33 & NW1/4, Sec 32 T 10S, R 2E., N.M.P.M.

OWNER: U.S. LAND

QUANTITY AVAILABLE: 14,000 Cu. Yds

PROPOSED USE: Sub-Base Material

HAUL DISTANCE: 300' to sta 158+00

ESTIMATED FOR STRIPPING OVERBURDEN: NONE

PIT NO. 2

LOCATION NW1/4, Sec 28, T 47 N, R 2 E., N.M.P.M.

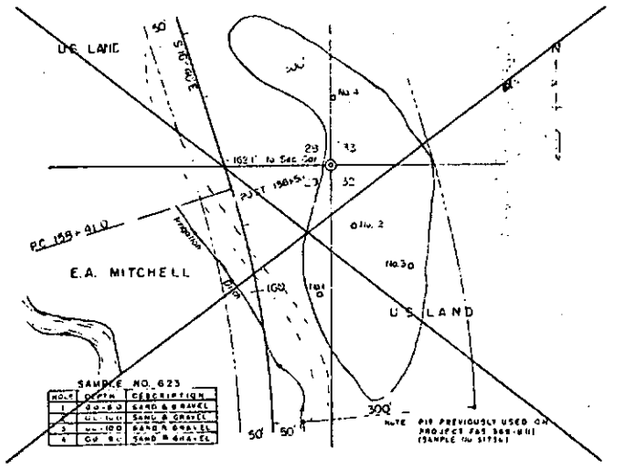
OWNER: U.S. LAND

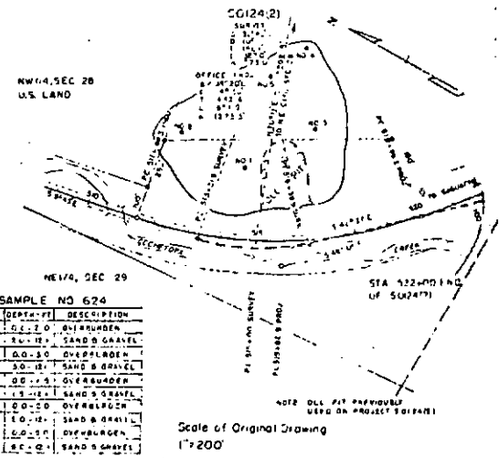
QUANTITY AVAILABLE: 45,000 Cu. Yds

PROPOSED USE: Surfacing, Sub-Base Material, Stone Screenings

HAUL DISTANCE: 300' to sta 515+00

ESTIMATED FOR STRIPPING OVERBURDEN: 5,000 CU. YDS.



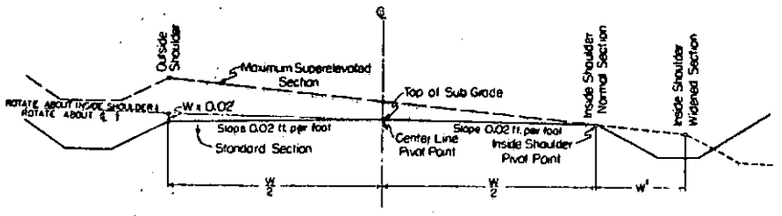


Scale of Original Drawing
1"=200'

REVISIONS

STANDARD M-I-C

FED. ROAD DIV. NO. 8 | DISTRICT | COLO. | SHEET NO. 1 | TOTAL SHEETS 5 | S6124-01

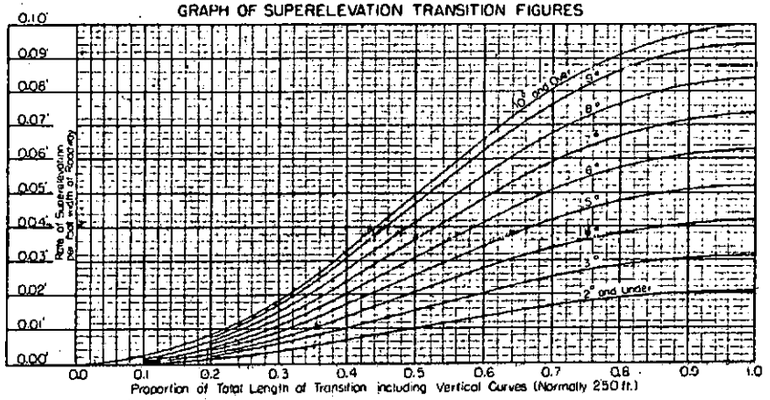


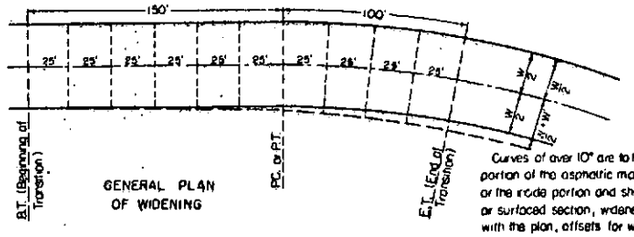
GRADED OR SURFACED SECTION

SUPERELEVATION AND WIDENING TABLES

DISTANCE FROM B.T. (EXPRESSED AS A DECIMAL)	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	0.02056	0.02100
3°	0.00066	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
4°	0.00088	0.00350	0.00788	0.01400	0.02100	0.02800	0.03413	0.03850	0.04113	0.04200
5°	0.00109	0.00438	0.00984	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° and Over	0.06	0.24	0.54	0.96	1.50	2.16	2.94	3.84	4.86	6.00

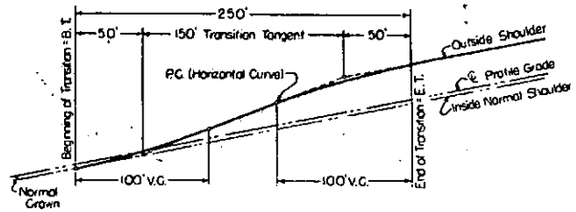
GRAPH OF SUPERELEVATION TRANSITION FIGURES





GENERAL PLAN OF WIDENING

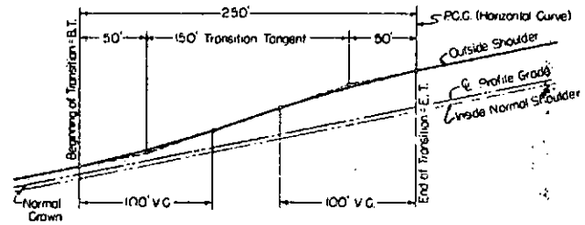
Curves of over 10° are to have the inside portion of the asphaltic mat and shoulder, or the inside portion and shoulder in a graded or surfaced section, widened in accordance with the plan, offsets for widening, and cross sections.



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

The transition in this case, from crowned section to superelevated section, shall proceed 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 superelevation at a point 100 ft. inside the curve.



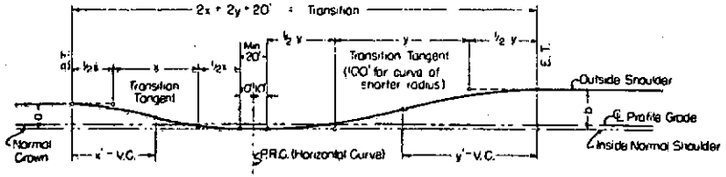
CASE II: COMPOUND CURVE

NOTE: CASE II

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

Superelevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie 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 superelevated 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 superelevation of the respective curves

EXAMPLE: Let a represent the amount of superelevation on 1st. curve;
" b " " " " " " 2nd. " ;
" x " " " " transition tangent " 1st. " ;
" y " " " " " " 2nd. " ;

then, a:b = x: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.R.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.

GENERAL NOTES

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

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. The centerline pivot point is to be used until the superelevation equals 0.02 ft per foot width of roadway. 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 Asphaltic Mat or the inside shoulder of the Graded or Surfaced Section is to be widened from the normal inside edge or 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 shall maintain the Typical Section slope until this slope is exceeded by the required superelevation slope.

The outside ditch on superelevated sections is to be modified, where necessary to provide proper drainage. Otherwise, this ditch shall conform to normal ditch section shown for Project.

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

The full superelevation per foot width of roadway rate for a given degree of curvature is 0.0105 ft x Degree of Curvature.

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

Where spiral curves are used, the transition from normal crowned section to full superelevation and widening shall take place over the full length of spiral curve.

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

COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD METHODS FOR SUPERELEVATION & WIDENING OF CURVES

Designed by H.E.L. | Approved by L. Johnson
Made by S.J.M.
Checked by C.R.S. | Date: November 1, 1953

REVISIONS

STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT & WIDENING AT BRIDGES AND AT CREST OF GRADES

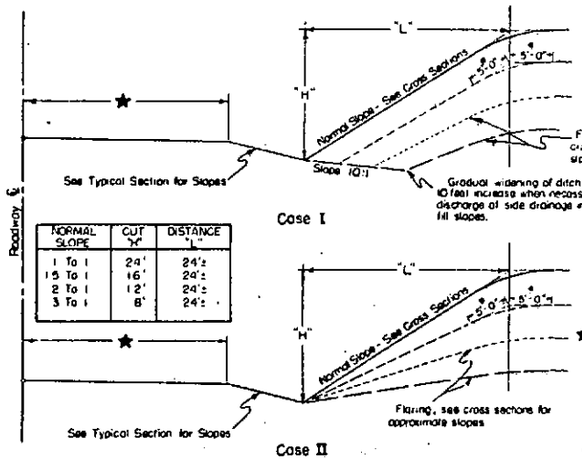
STANDARD M-2-EM

FED. ROAD DIV. NO. 8 | DISTRICT 6 | SHEET NO. 1 | TOTAL SHEETS 6 | SCALE

COLO. | SOLID YELLOW

Rev. 12-9-53, Details of Road Approaches, J.C.R

GENERAL DETAILS FOR FLARING OF EARTH CUTS, CUT SLOPE TREATMENT & WIDENING AT BRIDGES



NORMAL SLOPE	CUT "H"	DISTANCE "L"
1 To 1	24'	24'±
1½ To 1	16'	24'±
2 To 1	12'	24'±
3 To 1	8'	24'±

FLARING OF EARTH CUTS: The backslopes at ends of all earth cuts shall be flattened as where necessary the ditch shall be widened gradually to discharge side ditch drainage away from the base of adjacent fill slopes in order to avoid erosion & to improve appearance. The transition of flattened backslopes & widened ditch shall be constructed in such a manner that a uniform appearance of slope & ditch results. Backslopes shall be flared to the approximate "L" distance shown on Slope Table included with this detail. Rock cuts shall not be flared.

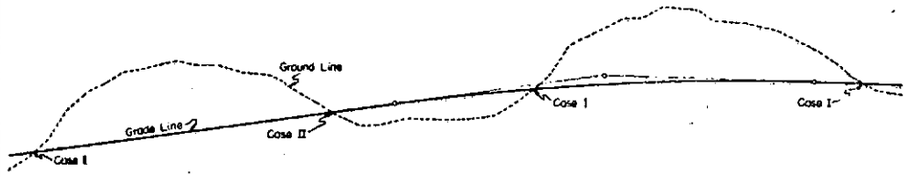
Flaring with widened ditch, see cross sections for approximate slopes.

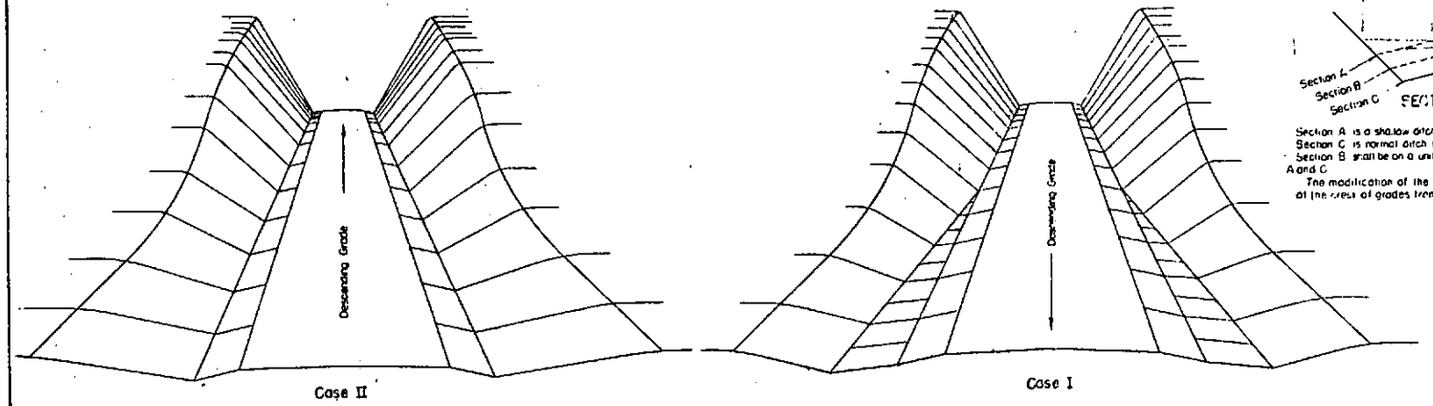
*CUT SLOPE TREATMENT IN EARTH CUTS: The intersection of cut slopes with the existing ground shall be rounded in earth cuts, beginning 5ft outside the slope stake and extending 5 ft down the cut slope. Where the cut slope is less than 5ft reduce each of the above widths of slope treatment to the actual slope distance. Quantities shall be included in "Unclassified Excavation".

★WIDENING AT BRIDGE APPROACHES: Roadway embankment at bridge approaches shall be so constructed that the finish point of the subgrade shoulder is a Min of 2ft beyond the outside edge of bridge rock. Where widening of the section is necessary to achieve this result it shall take place gradually over a distance of 300ft. This is done to accommodate guard fence and/or guard posts at bridge approaches. (See additional requirements for Guard Fences Table I)

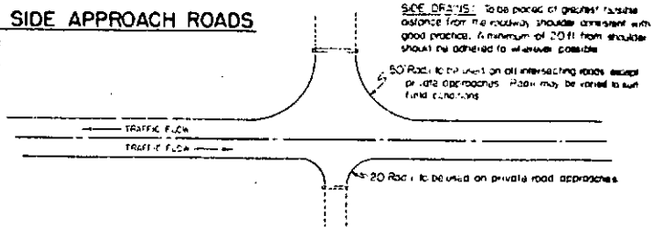
WIDENING TO ACCOMMODATE GUARD FENCES: At all locations on the project (except as provided above for bridge approaches) where guard fence is to be constructed the shoulders shall be widened 2ft. to provide additional lateral support for guard fence posts.

PLAN OF FLARING IN EARTH CUTS





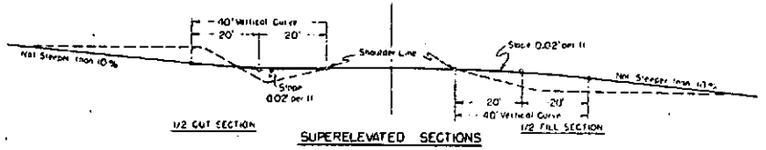
TYPICAL PLANS FOR SIDE APPROACH ROADS



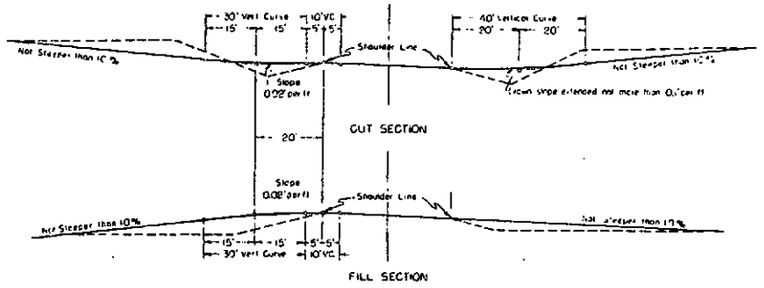
SIDE DRAINS: To be placed at greatest feasible distance from the roadway shoulder consistent with good practice. A minimum of 20 ft from shoulder should be adhered to wherever possible.

50' Radii to be used on all intersecting roads except private approaches. Radii may be varied to suit field conditions.

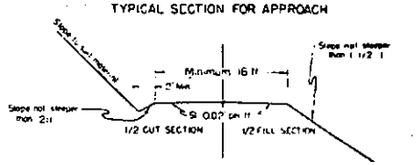
STANDARD CROWNED SECTION



SUPERELEVATED SECTIONS



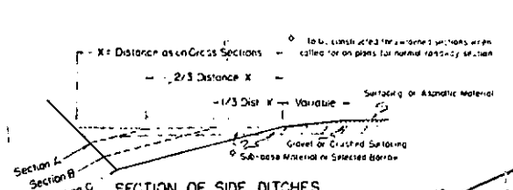
TYPICAL SECTION FOR APPROACH



NOTE:
ROAD APPROACHES: To conform to the above details unless otherwise indicated on plans or Special Details. The width of the crowned section shall be not less than the width of the crowned section of the existing approach road and in no case shall the new construction be less than sixteen (16) feet in width.

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

(TO BE USED ONLY WHERE SIGHT DISTANCE AT CREST OF GRADE IS 600 FT OR LESS)



SECTION OF SIDE DITCHES

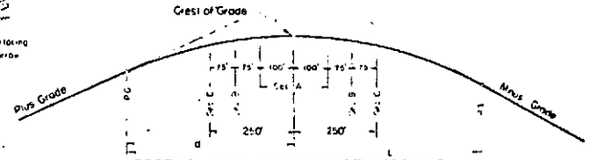
Section A is a shallow ditch section
Section C is normal ditch section.
Section B shall be on a uniform transition between Sections A and C
The modification of the ditch indicated shall be used only at the crest of grades from which drainage breaks both ways

Formula for finding the Crest of Grade

$a = \frac{\text{Plus Grade}}{\text{Algebraic DIFF}} \times L$

NOTE

Where section is of embankment at crest of grades, the shoulder shall be widened an amount equivalent to that used on ditch sections, thus providing a symmetrical section at the crests



PROFILE VIEW SHOWING DISTANCES AND RELATIVE POSITIONS OF DITCH-TREATMENT SECTIONS

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.

All side approach roads to the Project shall be Gravel Surfaced with a four (4) inch thickness of "Gravel or Crushed Rock Surfacing" extending approximately to the Right of Way Line. Estimated tonnage & type of material required for this operation are shown in the Surfacing Plan.

The maximum grades shown are to be the limiting grades for all road approaches. Modifications of grades will be permitted where adherence to the grades as shown would cause damage to property or create other unsatisfactory conditions. Grades less than the maximum shown are to be used wherever feasible.

COLORADO
DEPARTMENT OF HIGHWAYS

STANDARD
SIDE APPROACH ROADS,
FLARING, CUT SLOPE TREATMENT,
AND WIDENING AT BRIDGES AND
AT CREST OF GRADES

Designed by [illegible] | Approved by [illegible]
Made by [illegible]
Checked by C.R.S. | Date November 1, 1953

STANDARD M-2-EM

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

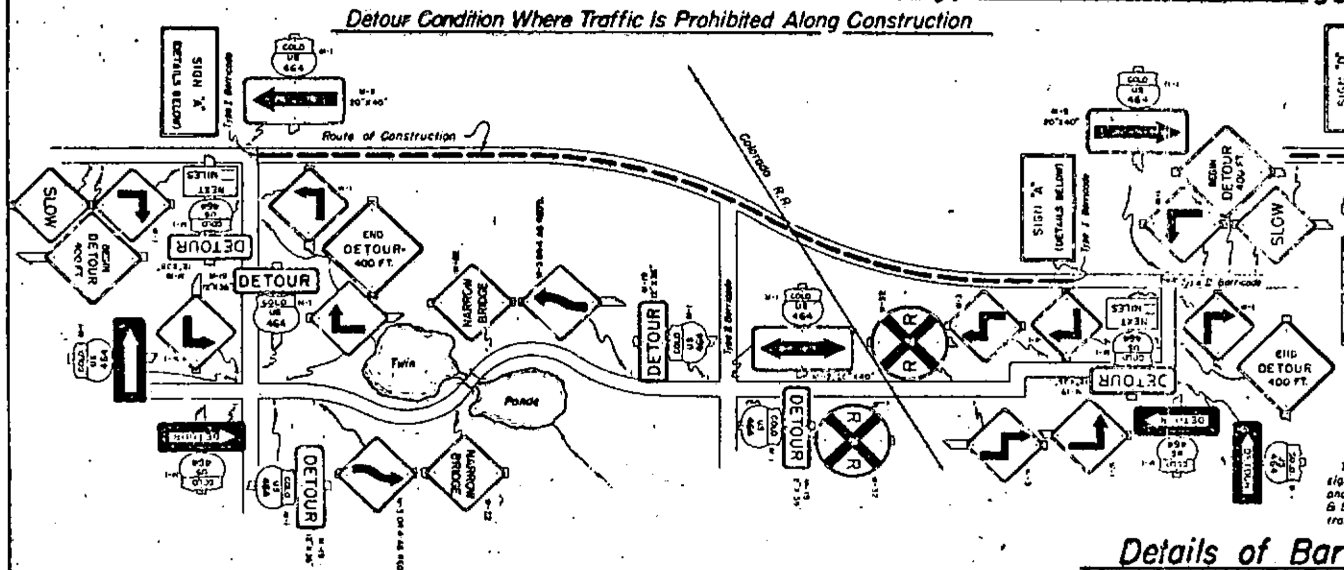
STANDARD M-29-A

FED. ROAD DIV. NO.	DISTRICT	[redacted]	SHEET NO.	TOTAL SHEETS
9	COLO.	[redacted]	[redacted]	

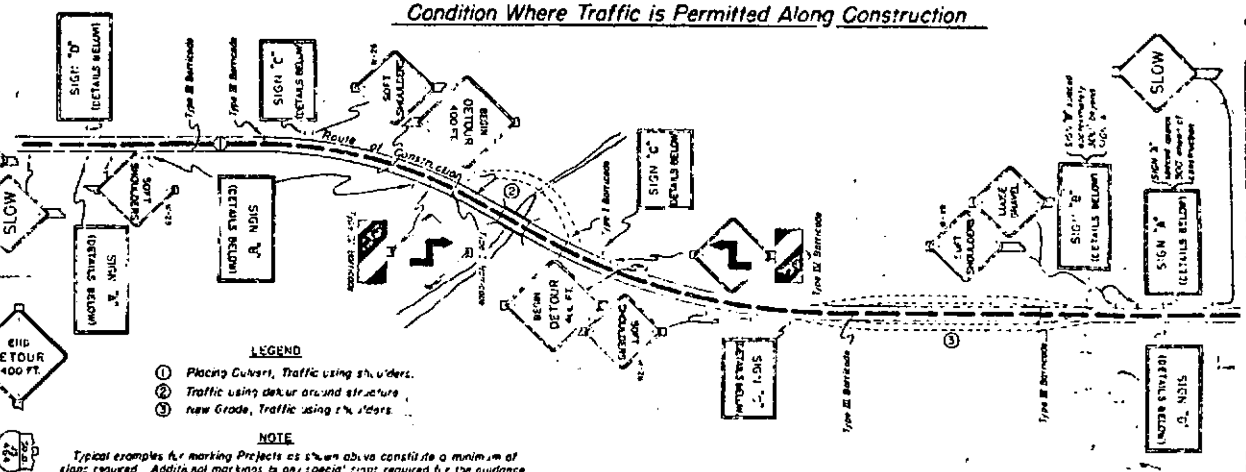
Rev 11-28-52, J C R
Rev 4-22-54, Scotchlite Spec's, J C R

Typical Methods of Marking Highways & Detours

Detour Condition Where Traffic Is Prohibited Along Construction



Condition Where Traffic is Permitted Along Construction



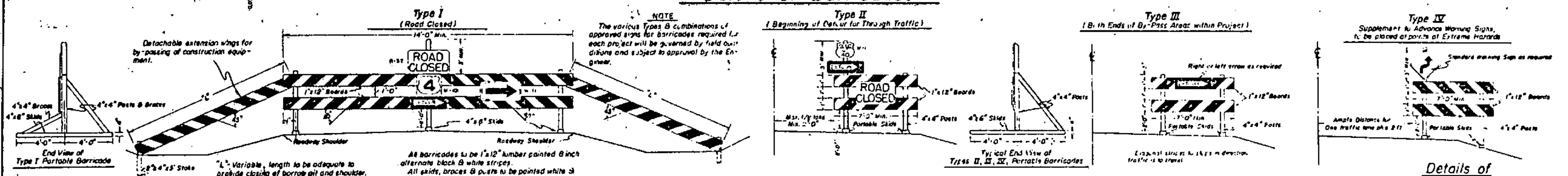
LEGEND

1. Placing Culvert, Traffic using shoulders.
2. Traffic using detour around structure
3. New Grade, Traffic using shoulders.

NOTE

Typical examples for marking Projects as shown above constitute a minimum of signs required. Additional markings & any special signs required for the guidance and protection of traffic will be placed as required along the project. Contractor's & Engineer's equipment must be parked so that signs & barricades are visible to traffic at all times.

Details of Barricades



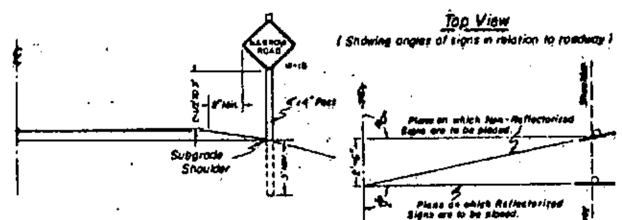
NOTE

The various Types & combinations of approved signs for barricades required for each project will be governed by field conditions and subject to approval by the Engineer.

"L"- Variable, length to be adequate to provide closing of borrow pit and shoulder.

All barricades to be 1"x12" lumber painted 8 inch alternate black & white stripes.
All skids, braces & posts to be painted white & nailed together with No. 20d nails.
Bases to be weighted where necessary to provide stability.

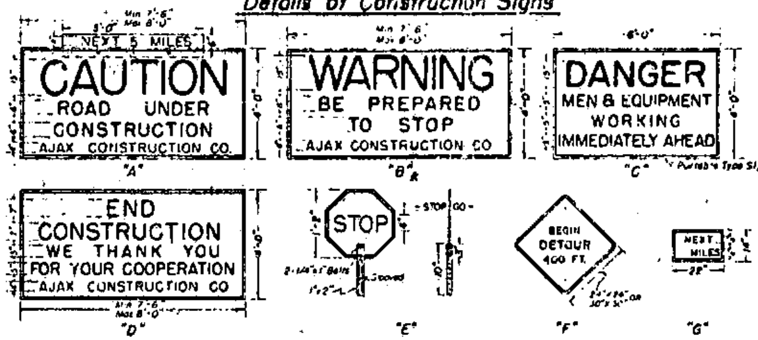
Position of Signs Relative to Roadbed & Hazards



NOTE

Warning Signs to be made of 1/4" (Min) plywood or No. 10 Gauge (Min) metal.
Location to be governed by field conditions. Exact location to be staked by the Engineer. In all cases warning signs are to be placed well in advance of hazard, the distance depending on topography, and existing approach speeds.

Details of Construction Signs



MARKINGS

Construction Signs "A", "B", "C", "D", "G" - to be of 1" material painted White, the words "CAUTION", "WARNING", "DANGER", and "WE THANK YOU FOR YOUR COOPERATION" lettered with Scotchlite (No. 2272 Red, or equal), balance of lettering to be Black.
Construction Sign "A"; to be provided with a detachable board mounted on back of sign with 2-1/4"x2" bolts. 1" material painted white, balance of lettering to be Black. (Miles indicated to the nearest Mile)
Flagman Warning Sign "E" - to be of plastic or other light weight material, painted Red with White lettering on the stop side & painted Green with White lettering on the go side. Handle to be grooved on one side to indicate reading of sign to the Flagman. To be used whenever flagmen are necessary. Sign to be reflectorized if used to stop traffic at night.

Detour Warning Sign "F" - to be of 1/4" (min) plywood or No. 10 (min) gauge metal, painted Yellow, all lettering to be Black.
Construction Sign "G" - 3/4"x9" metal slides to be placed between words "NEXT __ MILES", spaced so as to accommodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor. Numerals calculated to nearest mile.
Signs to be fastened to 2-4"x4" posts set 4 ft. in the ground with a minimum of 3-1"x4" nailing strips on the back. Bottom of sign to be 24" above ground.

GENERAL NOTES

All work shall be done in accordance with the Standard Specification of the Colorado Department of Highways applicable to the project.

Where traffic is maintained through or over any part of the Project, the Contractor will be required to mark all hazards within the limits of the Project with well painted, well maintained Barricades, Warning Signs and Directional Type Signs. All Barricades & Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when project is completed.

All Warning & Directional Type Signs will be "Reflectorized" with "Scotchlite" Reflective Sheeting or a suitable equivalent. Except for variations noted on this sheet all signs will be in conformity with the specifications outlined in "Manual on Uniform Traffic Control Devices for Streets & Highways" issue of August 1948 by the U.S. Public Roads Administration. U.S. or State Route Markers required for the Project will be furnished by the Department and installed by the Contractor. Numbers adjacent to signs refer to Standards in the Manual.

The Contractor shall furnish & install the following as required within the limits of the Project:

1.	All Barricades	As Required
2.	"CAUTION, ROAD UNDER CONSTRUCTION, NEXT __ MILES, CONTRACTORS NAME"	Minimum 2
3.	Standard Warning & Directional Signs	As Required
4.	"WARNING, BE PREPARED TO STOP, CONTRACTORS NAME"	Minimum 2
5.	Approved Directional Arrows for Barricades	As Required
6.	"DANGER, MEN & EQUIPMENT WORKING IMMEDIATELY AHEAD"	Minimum 2
7.	"END CONSTRUCTION, WE THANK YOU FOR YOUR COOPERATION, CONTRACTORS NAME"	Minimum 2
8.	Torches and Flares as follows: Type I Barricades	Minimum 3
	Type II, III & IV Barricades	Minimum 1
	Standard Warning Signs	Minimum 1

Where traffic is prohibited from the Project, the Detour will be marked by the Department except for Barricades complete with approved Warning Signs & Arrows which will be provided, erected & maintained by the Contractor at ends of Project and intersecting roads.

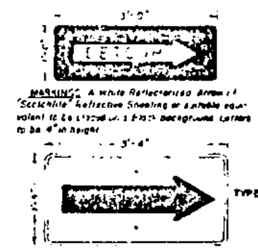
All lumber used shall be of sound durable material. Barricades, Signs, Symbols & Lettering conforming to styles noted hereon will be well painted & maintained. Uneven or smeared lettering will not be accepted.

Flares and Torches shall be of the Oil burning Type approved by the Department and shall be placed 3 ft. to 5 ft. ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from torches and flares.

All signs are to be in clear view of traffic and are not to be obstructed by equipment, weeds or otherwise.

Speed control signs as required, may be requested from the Engineer by the Contractor.

Details of Reflectorized Arrows



MARKINGS: A White Reflectorized Arrow of "Scotchlite" Reflective Sheeting or a suitable equivalent to be placed on a Black background. Letters to be 4" in height.

MARKINGS: A Black Arrow on a "highway yellow" background of "Scotchlite" Reflective Sheeting or suitable equivalent.

COLORADO
DEPARTMENT OF HIGHWAYS

Standard Roadway Construction Traffic Signs

Designed by	Approved by: [illegible] Engineer, Surveys & Plans
Made by J C P	
Checked by	Date October 10, 1950

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.
3	COLO.	369-C(1)	

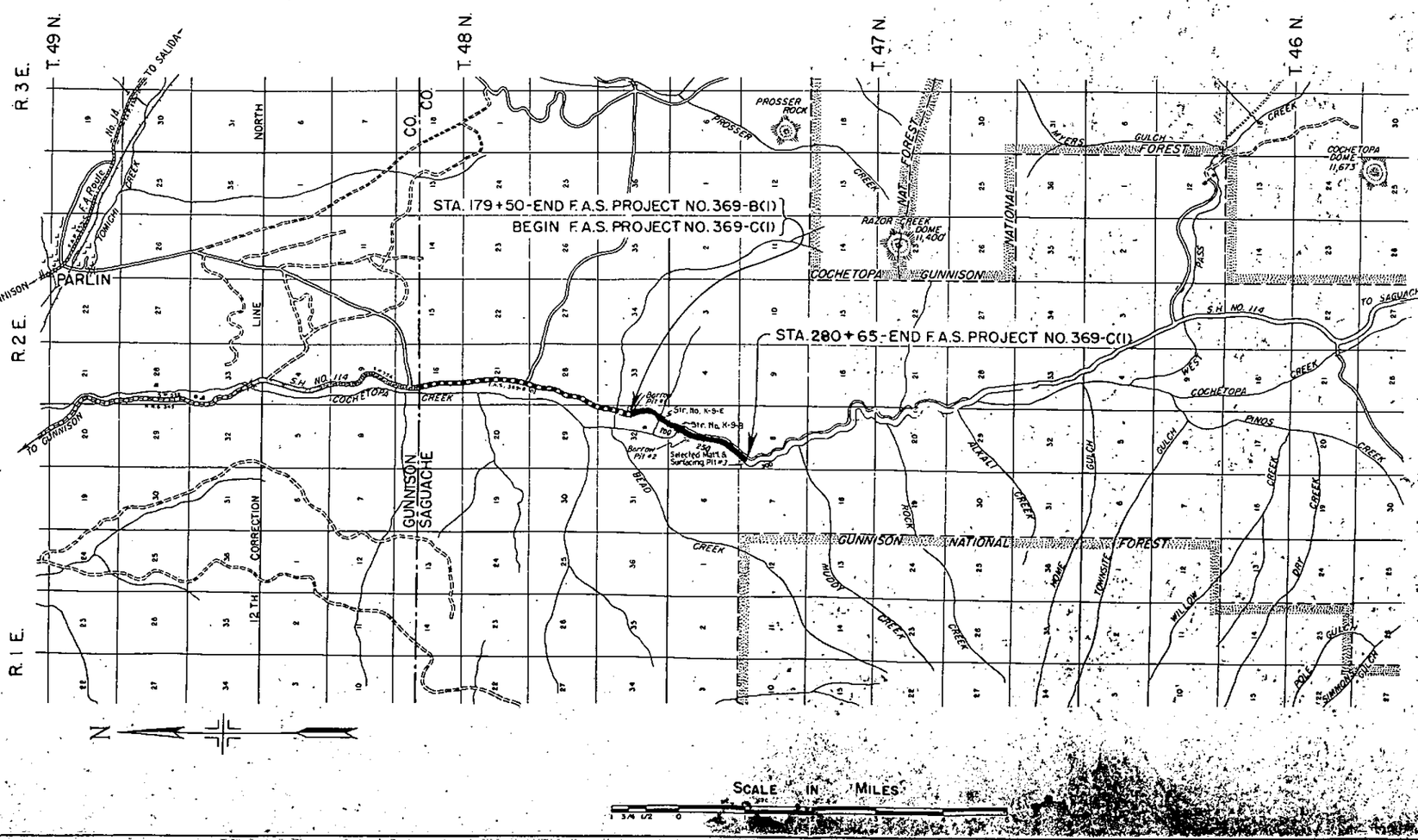
Revised Index of Sheets, Res. Engr. 6-9-41 W.d.m.

COLORADO
STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED
FEDERAL AID SECONDARY PROJECT NO. F.A.S. 369-C (1)
STATE HIGHWAY NO. 114
SAGUACHE COUNTY

INDEX OF SHEETS

SCALES OF ORIGINAL TRACINGS
ON PLAN, 1 IN. = 100 FT.
ON PROFILE { 1 IN. = 100 FT. HORIZONTAL / 1 IN. = 10 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 9,946.1 FT. = 1.883 MILES
NET LENGTH OF PROJECT }



CONVENTIONAL SIGNS

CENTER LINE OF SURVEY 220
RIGHT OF WAY LINES
TOWNSHIP OR RANGE LINES
SECTION LINES
ONE-QUARTER SECTION LINES
BARBED WIRE FENCE
POLE LINES
RAILROAD
PRESENT ROAD

JUN 1941
ENG. DIV. 2
S. H. D.

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

Mr. W. A. Whitney, Division Engineer, Grand Junction, Colo.
(Mr. G. Soper,) Resident Engineer, Gunnison, Colo.

RECOMMENDED FOR APPROVAL
ASSISTANT ENGINEER DATE 5-3-41

APPROVED
STATE HIGHWAY ENGINEER DATE

RECOMMENDED FOR APPROVAL
DISTRICT ENGINEER PUBLIC ROADS ADMINISTRATION FEDERAL WORKS AGENCY

RECOMMENDED FOR APPROVAL
GULF WESTERN REGION PUBLIC ROADS ADMINISTRATION FEDERAL WORKS AGENCY

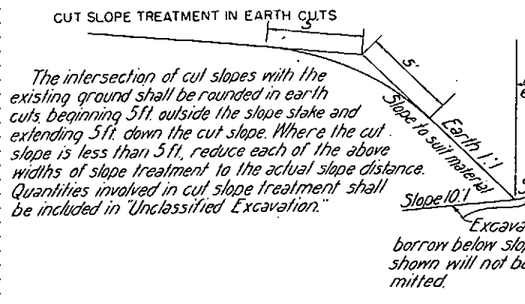
APPROVED
COMMISSIONER PUBLIC ROADS ADMINISTRATION FEDERAL WORKS AGENCY

FED. ROAD DIST. NO.	STATE	F. A. S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C (1)	2	

Revised Summary of Approx. Quant. 6-9-41 - w.d.w.

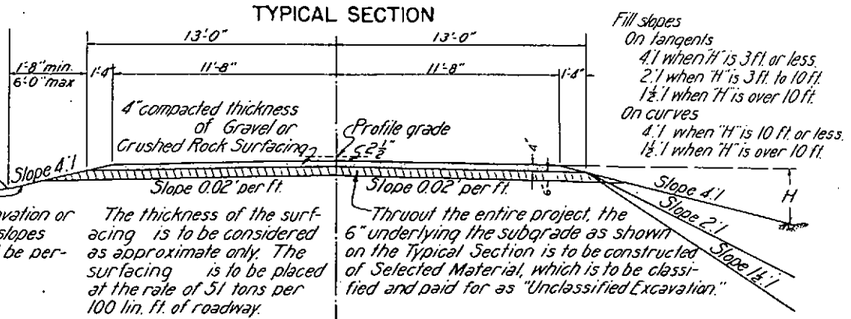
TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

CUT SLOPE TREATMENT IN EARTH CUTS



The intersection of cut slopes with the existing ground shall be rounded in earth cuts beginning 5 ft. outside the slope stake and extending 5 ft. down the cut slope. Where the cut slope is less than 5 ft. reduce each of the above widths of slope treatment to the actual slope distance. Quantities involved in cut slope treatment shall be included in "Unclassified Excavation."

TYPICAL SECTION



Fill slopes
On tangents
4:1 when "H" is 3 ft. or less.
2:1 when "H" is 3 ft. to 10 ft.
1½:1 when "H" is over 10 ft.
On curves
4:1 when "H" is 10 ft. or less.
1½:1 when "H" is over 10 ft.

The thickness of the surfacing is to be considered as approximate only. The surfacing is to be placed at the rate of 51 tons per 100 lin. ft. of roadway.

Thruout the entire project, the 6" underlying the subgrade as shown on the Typical Section is to be constructed of Selected Material, which is to be classified and paid for as "Unclassified Excavation."

½ CUT SECTION ½ FILL SECTION

NOTE: Roadway embankments at bridge approaches shall be so constructed that the finish point of the gravel shoulder is 3 ft. outside the curb line of the bridge. Where widening of the section is necessary to achieve this result, it shall take place uniformly over a distance of 300 ft. This is done to accomodate guard fence or guard posts at bridge approaches.

GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.

All quantities on preliminary plans are to be considered as approximate only.

All roadway excavation required to construct this project is to be obtained as indicated on the plans. All quantities involved beyond the limits of the ditch as shown on Typical Section, either noted on the profile as "Borrow" or on the List of Structures as "Embankment" are to be classified and paid for as "Unclassified Excavation." These quantities are to be staked as part of the original excavation at locations indicated on the plans. Slope stakes beyond the limits of the Typical Section are subject to change by the Engineer to fit embankment requirements actually encountered on construction.

All poles encroaching on construction are to be moved by owners.

All corrugated metal pipe cross culverts are to be provided with one headwall on the inlet end unless otherwise noted on the plans. The ends of corrugated metal culvert pipes, which are not provided with headwalls, shall be covered with approximately 6" of material in such manner that a minimum of metal shall be exposed in the completed work. This shall be accomplished by warping embankment slopes around and adjacent to the culvert.

All side approach roads to the project shall be gravel surfaced with a 4" thickness of "Gravel or Crushed Rock Surfacing" extending approximately 30 ft. from the edge of the highway. Estimated tonnage of surfacing material required in this operation is shown on the List of Structures.

Overhaul will be paid for as measured along the center line of the project, except as otherwise noted on the plans.

All curves are to be superelevated and widened as provided for by the Standard Superelevation sheet included with the plans.

All wire fences, including line posts, shall be placed approximately six (6) inches inside the highway right of way as shown on the plans.

The present traveled roadway will be used for traffic during the construction of this project. Between Sta. 206+ and 209+ the contractor shall construct detour on the right as noted on plans. At all other places on the project where new construction encroaches on the present traveled roadway traffic shall be adequately provided for at the contractor's expense. Also, the contractor shall, at his own expense, construct and maintain in safe condition all temporary approaches to and crossings of intersecting roads.

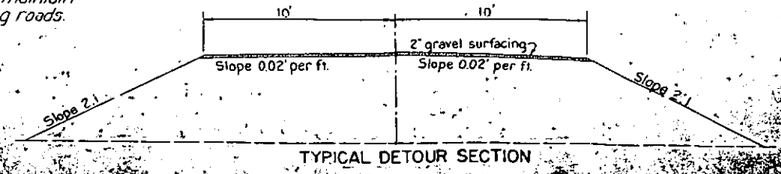
PROTECTION OF FILL SLOPES

At all places on this project where toe of embankments, on stream side, extend into present stream bed, such toes of embankments shall be constructed of large rocks and boulders from adjacent cuts. Rock and boulders shall be placed in toes of embankments on stream side to a minimum height of five (5) feet above stream bed. The embankments at the approaches to each end of bridge, station 208+, are to be constructed of rock from adjacent cuts.

Actual overhaul on this material will be allowed and paid for. All other costs of this work shall be included in the unit price bid per cubic yard for Unclassified Excav.

SELECTED MATERIAL

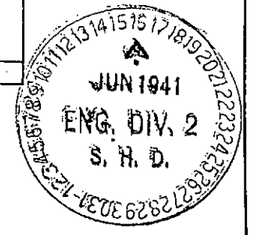
STATIONS	QUANT. PER STATION	APPR. QUANT. REQUIRED	OVERHAUL		SOURCE
	CU. YD.	CU. YD.	STA. YD.	YD. MI.	
179+50 - 263+00	60	4910	54,010	3810	Pit approximately 100 ft. right station 278+00 Located in the N.W. ¼ Section 8, T. 47 N., R. 2 E., N.M.P.M. Pit No. 3.
263+00 - 274+00	60	660	3630		
274+00 - 280+65	60	400			
TOTAL		5970	57640	3810	



TYPICAL DETOUR SECTION

SURFACING PLAN

STATIONS	APPROX. QUANT. REQUIRED TONS	OVERHAUL TON MILE	SOURCE
179+50 - 226+13.3	2300	1000	Pit approximately 100 ft. right station 278+00. Located in the N.W. ¼ Section 8, T. 47 N. R. 2 E., N.M.P.M. Pit No. 3
226+13.3 - 280+65	2840	-	
Approaches and detour	246	100	
TOTAL	5386	1100	



SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ROADWAY	BRIDGE STA. 192+	BRIDGE STA. 208+	PROJECT TOTAL	
10 a	Clearing and Grubbing The Entire Project	Lump Sum	•			•	
11 a	Removal of disused bridge, Sta. 192+	Lump Sum		•		•	
11 b	Removal of disused bridge, Sta. 208+	Lump Sum			•	•	
11 c	Removal of disused detour bridge Sta. 207+	Lump Sum	•			•	
11 d	Removal of 5 Structures	Lump Sum	•			•	
12 a	Removing Fence	Lin. Ft.	6500			6500	
13 c	Unclassified Excavation	Cu. Yd.	68000	150	250	68400	
13 d	Unclassified Ditch Excavation	Cu. Yd.	1000			1000	
14 a	Dry Rock Excavation (Structural)	Cu. Yd.	100	5	10	115	
14 b	Dry Common Excavation (Structural)	Cu. Yd.	260	5	230	495	
14 c	Wet Rock Excavation (Structural)	Cu. Yd.	30	5	150	185	
14 d	Wet Common Excavation (Structural)	Cu. Yd.	90	35	330	455	
14 e	Mechanical Tamping	Hr.	114	50	160	324	
18 a	Station Yard Overhaul	Sta. Yd.	206000			206000	
18 b	Yard Mile Overhaul	Yd. Mi.	4600			4600	
26 a	Gravel or Crushed Rock Surfacing.	Ton	5500			5500	
26 c	Overhaul of Surfacing	Ton Mi.	1200			1200	
42 a	Untreated Bridge Timber	M ft. b.m.		0.8	0.5	1.3	
42 ax	Untreated Bridge Timber (Native)	M ft. b.m.	1.4			1.4	
42 ay	Untreated Bridge Timber (Salvage)	M ft. b.m.	8.3			8.3	
42 b	Treated Bridge Timber	M ft. b.m.		13.9		13.9	
43	Asphalt Plank Wearing Surface	Sq. Ft.		575		575	
44 ax	Native Logs	Lin. Ft.	1256			1256	
44 b	Miscellaneous Treated Timber	M ft. b.m.	0.2			0.2	
46 a	Class "A" Concrete	Cu. Yd.			275	275	
46 b	Class "B" Concrete	Cu. Yd.	38			38	
46 r	Class "A" Concrete (Handrails)	Cu. Yd.			6	6	
47	Reinforcing Steel	Lb.			25400	25400	
48	Structural Steel	Lb.		1700	26400	28100	
53 c	24" Corrugated Metal Culvert Pipe	Lin. Ft.	742			742	
53 e	36" Corrugated Metal Culvert Pipe	Lin. Ft.	158			158	
53 g	48" Corrugated Metal Culvert Pipe	Lin. Ft.	156			156	
60 a	Treated Timber Piling	Lin. Ft.		592		592	
60 e	Metal Pile Shoes	Each		28		28	
67 a	Riprap	Cu. Yd.	10			10	
67 b	Heavy Riprap	Cu. Yd.	148		85	233	
76 a	Barbed Wire Fence with Treated Wooden Posts	Lin. Ft.	5800			5800	
76 g	Barbed Wire Gates	Each	4			4	
81 a	Project Markers	Each	1			1	
81 b	Right of Way Markers	Each	21			21	
89 a	Drain Pipe (Concrete Floor) (3"ϕ x 40" long)	Each			2	2	
89 b	Drain Pipe (Timber Floor) (3"ϕ x 2'-4" long)	Each		2		2	
92	Timber Guard Posts	Each	201			201	
14.3	Rock Filled Dam	Cu. Yd.	90			90	
	FORCE ACCOUNT ITEMS						
1	Obliterate Old Road	Lump Sum				0	

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	3	

LIST OF STRUCTURES

STATIONS	DESCRIPTION	DETAILS ON SHEET NO.	REMOVE STRUCTURE NO	EXCAVATION CU.YD. UNCL.	EXCAVATION CU.YD. EMB.	STRUCTURAL EXCAVATION CU.YD. *	MECHANICAL TAMPING HOUR	CONCRETE CU.YD. CL. "A"	CONCRETE CU.YD. CL. "B"	REINFORCING STEEL LB.	CORRUGATED METAL CULVERT PIPE LIN. FT. 18"	24"	36"	42"	48"	GRAV. OR CR. RK. SURFAC. TON	HEAVY RIPRAP CU.YD.	UNCL. DITCH EXCAVATION CU.YD.	MISCELLANEOUS
179+50	Approach to project				200											60			
181+00 - 183+50	Intercepting ditch Lt.																	60	
182+95	Road approach Rt.				20											17			
185+50	Cross culvert and inlet & outlet ditches					15	10		5.0						48			10	
192+40 - 192+64.5	1 span @ 23' tr. timb. pile trestle, chan. imp. & rem. present bridge	5								(QUANTITIES IN SUMMARY)									
193+00	Road approach Lt.				160											17			
194+00	Cross culvert, inlet & outlet ditches					15	6		1.65			80						10	
194+70 - 196+75	Channel change Rt.			800															
208+05.5 - 208+50.9	1 span @ 40' conc. & I-beam bridge (45°) & ch. imp. & rem. pres. br.	6 to 9								(QUANTITIES IN SUMMARY)									
209+00	Road approach Rt.				600											13			
210+16	Remove structure		1																
210+20	Cross culvert (45°); inlet & outlet ditches					70	15		3.00				106					20	
216+64	Road approach and side drain Lt.				50							24				13			
217+15 - 224+75	Ditch change Lt.																	150	
217+65	Cross culvert & inlet ditch				10	25	6		1.65			78						10	
222+10	Cross culvert & inlet					10	6		1.65			86						10	
225+75 - 227+25	Intercepting ditch Rt.																	35	
227+50	Road approach Lt.				180											13			
228+00	Cross culvert & inlet ditch					30	12		5.00						58			10	
229+75 - 231+25	Intercepting ditch Rt.																	60	
230+08	Remove structure		1																
231+70 - 234+00	Ditch change Lt.																	25	
232+50	Cross culvert & inlet ditch					30	6		1.65			66						10	
233+50	Road approach Rt.				40											13			
234+00	Cross culvert & inlet and outlet ditches					15	5		1.65			60						10	
234+50	Cross culvert & inlet and outlet ditches					25	4		5.00						50			20	
234+65	Remove structure Rt.		1																
236+90 - 239+40	Channel change Lt.			640															
238+75	Cross culvert (30") & inlet ditch					30	8		1.65			100						20	
239+ - 240+	Ditch change Lt.																	10	
240+00	Rock filled Dam & 3:4 headgate Lt.	4																	90 cu.yds. rock filled dam, 0.195 M ft.b.m. misc. tr. timb.
240+ - 241+	Channel change Lt.			150															
241+ - 250+45	Channel change Lt.			1975															
246+50	Cross culvert (No headwalls), outlet ditch, riprap for inlet					15	4					56						10	10 cu.yds riprap.
250+50	Cross culvert					5	8		1.65			56							
252+50 - 257+25	Intercepting ditch Rt.																	90	
253+50 - 255+00	Channel change & heavy riprap for bank protection Lt.			50													148		
258+77	Cross culvert, inlet & remove structure		1			20	4		1.65			44						5	
259+45 - 261+40	Channel change Lt.			625															
260+00 - 265+25	Intercepting ditch Rt.																	200	
264+10 - 266+25	Channel change Lt.			500															
264+47	Cross culvert & ditches					40	12		3.00				52					50	
268+75 - 275+25	Intercepting ditches Rt.																	135	
270+00	Cross culvert & inlet and outlet ditches					25	4		1.65			40						25	
269+82	Remove structure		1																
276+50	Cross culvert & outlet ditch					10	4		1.65			52						10	
278+50 - 280+65	Channel change Lt. (Mat'l. to be used to fill old channel & approach to project)			500															
280+65	Approach to project & project marker				300 ϕ														1 project marker
206+ - 209+	Detour Rt.				1000	(QUANTITIES Shown on Sh. No. 10 & included in Roadway Summary)										100			
207+	Detour bridge Rt. (107) Rem. after abandonment of detour	10																	Remove detour bridge after abandonment
	PROJECT TOTALS		5	5240	2260	380	114		37.50			742	158		156	246	148	995	

* Structural Excavation is estimated to be 30% Rock and 70% Common, each of which is estimated to be 80% dry and 20% wet.

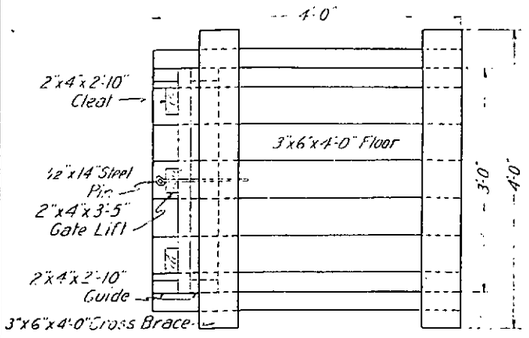
ϕ Material to come from channel change Sta. 278+ - 280+

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	4	

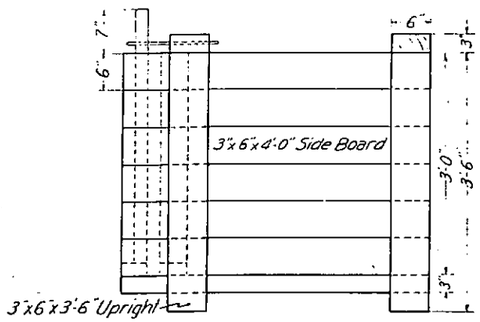
Revised: Fencing Requirements, 6-9-41 - w.d.w.

DETAIL OF HEADGATE

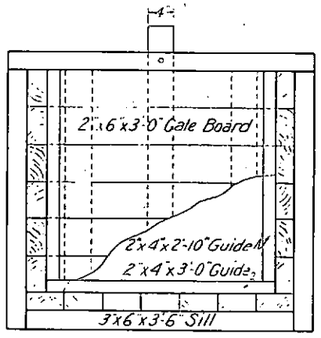
STA. 240+00 LEFT
SCALE 1"=1'



PLAN



SIDE ELEV.



INLET END

BILL OF MATERIALS

NO. PIECES	DESCRIPTION	SIZE	LENGTH
4	Guide	2"x4"	2'-10"
2	Cleat	2"x4"	2'-10"
1	Gate Lift	2"x4"	3'-5"
6	Gate Board	2"x6"	3'-0"
4	Upright	3"x6"	3'-6"
2	Sill	3"x6"	3'-6"
7	Floor Board	3"x6"	4'-0"
12	Side Board	3"x6"	4'-0"
2	Cross Brace	3"x6"	4'-0"
2	Guide	2"x4"	3'-0"
Misc'l Treated Timber			195 M Ft. b.m.
* Steel Pin ½"x14"			1 Pin
* Wire Nails 20d			5 lbs.
* Wire Nails 40d			10 lbs.

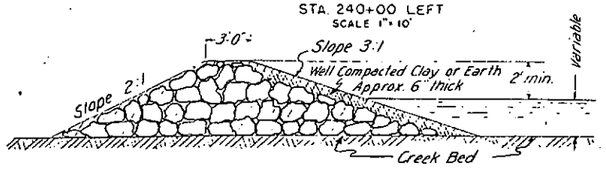
* Hardware to be included in bid price for Misc'l Timber

Nailing Directions

Flooring to sills 2-40d nails per piece per sill.
Upright 3-40d nails per end per post.
Side Board 2-40d nails per piece per post.
Guide 4-20d nails per linear foot.
Endgate to cleat 2-20d nails per piece per 2"x4" (Clinch nails)

DETAIL OF ROCK FILLED DAM

STA. 240+00 LEFT
SCALE 1"=10'



90 cu yds. Rock Fill Dam

GENERAL NOTES

All work shall be done in accordance with the Colorado State Highway Department Specifications adopted June 1, 1940.

All miscellaneous treated timber shall be full sawn.

GUARD POSTS

STATION TO STATION	SIDE	NO.
179+50 - 181+50	R	5
183+26 - 192+37	R	22
191+76 - 192+37	L	5
192+62.5 - 195+78.5	L	10
192+67.5 - 198+28.5	R	15
201+75 - 204+75	R	7
207+41.5 - 208+02.5	R	5
207+41.5 - 208+02.5	L	5
208+53.9 - 210+60.9	R	8
208+53.9 - 225+66.2	L	35
221+00 - 225+00	R	9
227+00 - 235+50	L	18
227+50 - 229+00	R	4
237+50 - 242+50	L	11
252+50 - 256+00	L	8
258+50 - 262+00	L	8
264+25 - 268+75	L	10
274+65 - 280+65	L	13
275+75 - 276+75	R	3
TOTAL		201

Treated timber guard posts are to be spaced on 50 ft. centers, except at bridge ends where standard bridge end spacing shall apply.

R.O.W. MARKERS

STATION	SIDE	NO.
185+24	L & R	2
193+00	R	1
194+00	R	1
198+11.7	L & R	2
199+00	L	1
199+50	R	1
214+75	L	1
215+18	R	1
235+77.5	L	1
237+00	L	1
242+00	R	1
243+00	R	1
246+40	L	1
246+67	R	1
248+00	R	1
258+68	R	1
261+94	L	1
277+30	L	1
278+70	R	1
TOTAL		21

FENCING REQUIREMENTS

STATION TO STATION	SIDE	REMOVE FENCE LIN. FT.	BUILD B.W. FENCE LIN. FT.	LINE POSTS NO.	GATES EACH
183+10 - 192+30	L & R	1210	925		
192+70 - 205+00	L & R	1300	1235		
205+00 - 207+85	R	310	295		
207+50 - 208+15	L	95	85		
208+50 - 210+10	R	225	180		
208+75 - 238+00	L	2875	2750		
238+00 - 241+25	L	405	325		
193+00	R				1
209+00	L				1
216+00	L				1
227+00	L				1
TOTALS		6,420	5,795		4

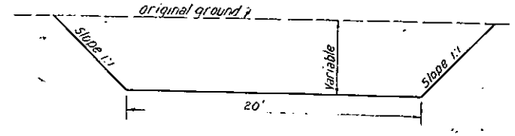
EMBANKMENT MATERIAL NOT AVAILABLE ON R.O.W.

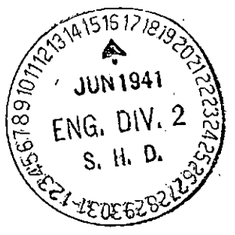
Embankment material not available on highway right of way is estimated to be available from borrow pits as indicated in profile data and noted on tabulation below.

Estimated quantities and overhaul for this Embankment Material are tabulated below.

STA. TO STA.	APPROX QUANT. REQD. CU. YDS.	OVERHAUL STA. YD.	OVERHAUL YD. MI.	SOURCE
184+ - 196+	10,083+	42,700		Pit located approx. 100 ft. left Sta 183+00. In NE¼ Sec. 32 T. 48 N, R. 2 E., N.M.P.M. Pit No. 1
227+ - 251+	11,008	61,469	580	Pit located approx. 100 ft. right Sta. 226+. In NE¼ Sec. 5 T. 47 N, R. 2 E., N.M.P.M. Pit No. 2
TOTAL	21,891	104,169	580	

TYPICAL SECTION OF CHANNEL CHANGES

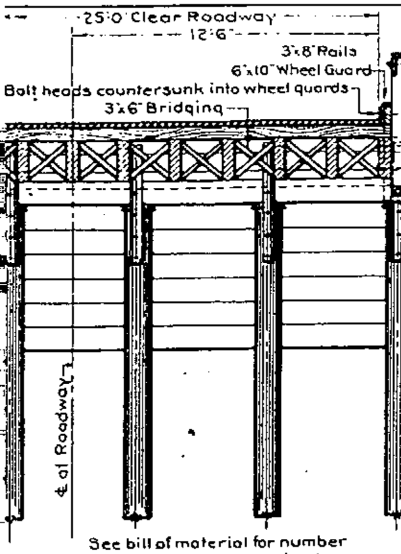




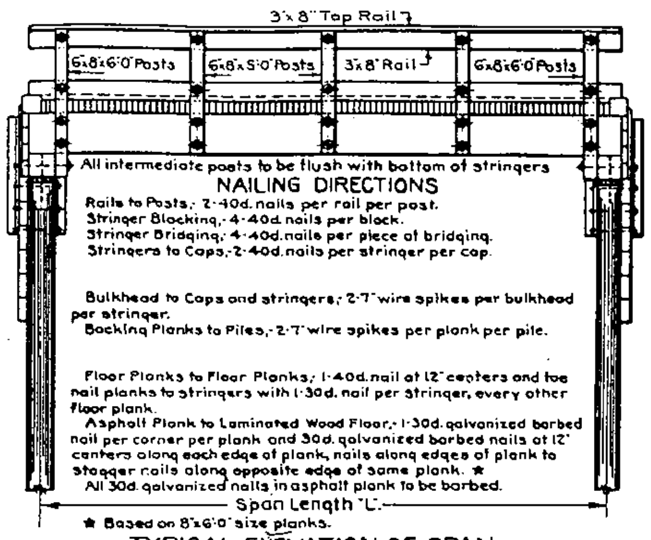
STANDARD P-116 B-H CP.

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	5	

Revised 6-1-40 W.W.D. changed to 1940 Specifications.
Rev. 4-1-41. W.G.S. Mechanical Tamping.



SECTION A-A.



NAILING DIRECTIONS

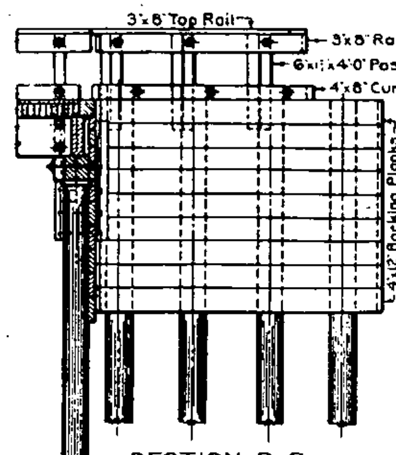
Rails to Posts,- 2-40d. nails per rail per post.
Stringer Blocking,- 4-40d. nails per block.
Stringer Bridging,- 4-40d. nails per piece of bridging.
Stringers to Caps,-2-40d. nails per stringer per cap.

Bulkhead to Caps and stringers,- 2-7" wire spikes per bulkhead per stringer.
Backing Planks to Piles,- 2-7" wire spikes per plank per pile.

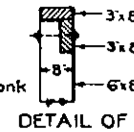
Floor Planks to Floor Planks,- 1-40d. nail at 12" centers and toe nail planks to stringers with 1-30d. nail per stringer, every other floor plank.
Asphalt Plank to Laminated Wood Floor,- 1-30d. galvanized barbed nail per corner per plank and 30d. galvanized barbed nails at 12" centers along each edge of plank, nails along edges of plank to stagger nails along opposite edge of same plank. ★
All 30d. galvanized nails in asphalt plank to be barbed.

★ Based on 8"x6'-0" size planks.

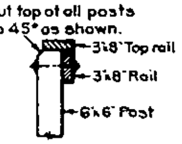
TYPICAL ELEVATION OF SPAN



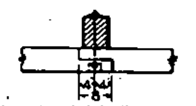
SECTION B-B.
See bill of material for number of backing planks required.



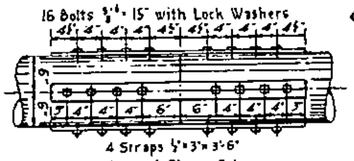
DETAIL OF HANDRAIL POSTS SUPERSTRUCTURE.
Cut top of all posts to 45° as shown.



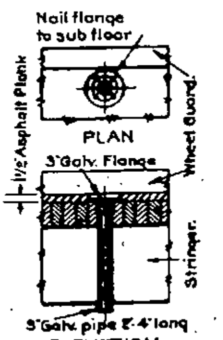
DETAIL OF HANDRAIL POSTS WINGS.


Countersink bolt heads into wheel guards.
PLAN VIEW.
DETAILS OF WHEEL GUARD SPLICE

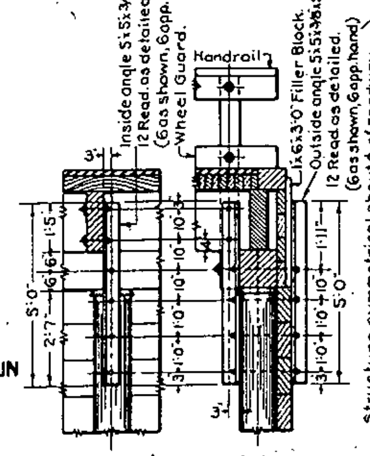
PILE SPLICE



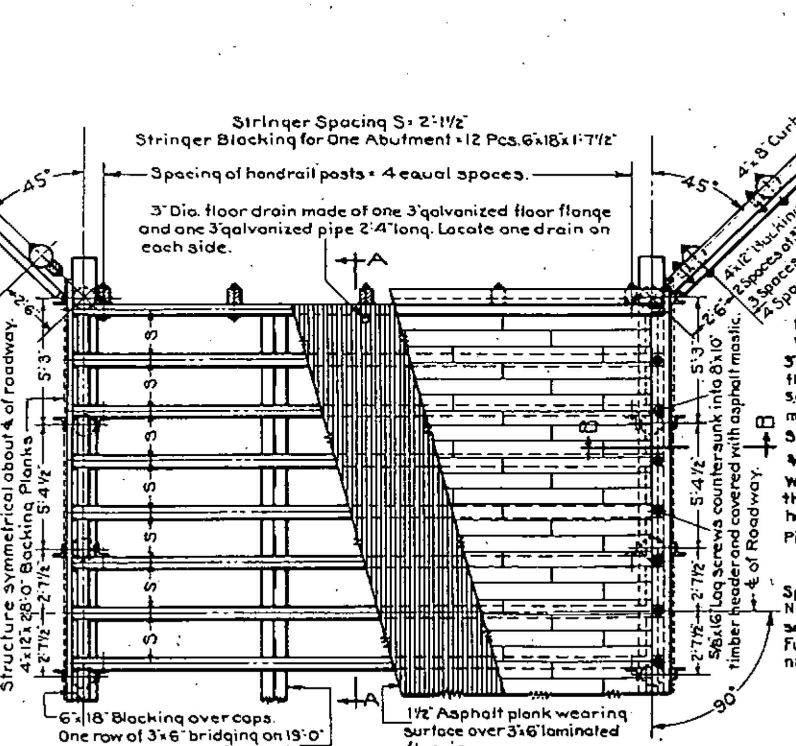
Bolts and Straps Galv.
NOTE: Bolt length given for 12" dia. Pile



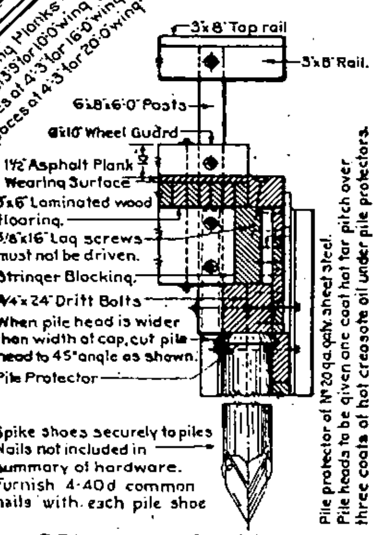
DETAIL OF FLOOR DRAIN



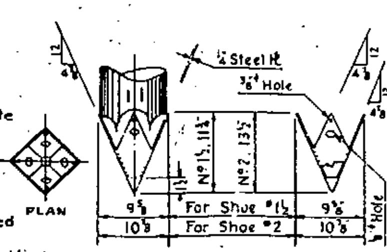
All holes in angles to be 7/8" dia. for 3/4" dia. bolts.
DETAIL OF CONNECTION ANGLES



SECTIONAL PLAN



SECTION THRU ABUTMENT



DETAIL OF PILE SHOE

Furnish American Pulley Co's. Pile Shoe or equivalent. Where pile shoes are specified use No. 1 1/2 shoe for pile tips ≥ 9" and No. 2 shoe for pile tips > 9". Wt. No. 1 1/2 8 lbs., Wt. No. 2. 13 1/2 lbs.

GENERAL NOTES.

All work shall be done according to the Standard Specifications of The Colorado State Highway Department. Adopted June 1 1940.

All timber and piling to be treated or untreated as shown in bills of material.

All timber and piling shall be dense southern yellow pine or west coast douglas fir.

All caps shall be edged to an even depth before treatment. The ends of all stringers shall be dapped on one edge before treatment, to obtain an even depth over caps.

All cut surfaces or bored holes in treated timber or piles shall be thoroly saturated with hot creosote oil.

All piling supporting caps shall be covered with galvanized pile protectors as specified, all other piling tops shall be saturated with hot creosote oil and covered with a thick layer of heavy asphalt or tar.

Joints in top handrail must be staggered with joints in side rail.

All handrailing and posts above the wheel guards shall be painted white and all handrail posts below the top of wheel guards shall be painted black as specified.

All bolts more than 12" long must be threaded not less than 4 inches.

Bolts in the finished structure shall not project more than one half inch beyond the nut.

All bolts must have Std. C.I.O.G. or Malleable Cast Washers under each head and nut.

Bolt lengths are calculated assuming Std. C.I.O.G. washers will be used.

The contractor is cautioned to check bolt lengths before ordering because of variations in thickness of lumber and piling.

The entire exposed surface of all untreated timber shall be painted one coat as specified imediately after the material is delivered to the project.

Before placing handrailing the contact surfacing shall receive the second coat of paint.

When contractor is permitted to drill holes to facilitate pile driving, these holes must be drilled so piling will stand in vertical position after final driving.

Bid price for asphalt plank shall include galvanized barbed nails and necessary asphalt mop.

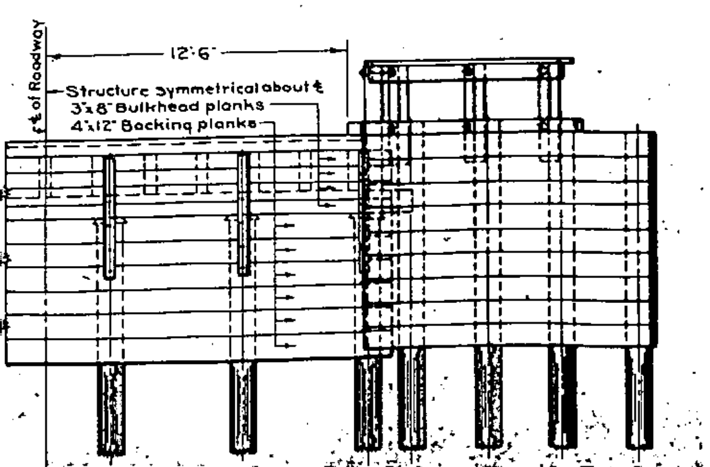
All hardware to be galvanized. Weights of hardware as shown are for ungalvanized material.

All necessary blocking for swaybracing shall be treated timber.

All caps must be surfaced on vertical grain face.

GENERAL NOTES (CONT.)

Contractors' attention is called to Specifications covering Mechanical Tamping. Special care must be used to prevent deflection of abutments and wings by wedging action. Backfill in 6 in. earth layers shall be mechanically tamped beginning at the wall and proceeding outward and downward therefrom at a 4:1 min. slope. Below channel elevation mechanical tamp uniformly on both sides. Above original ground line mechanical tamp out to 6 ft. from the wall. Rolling equipment shall not be used within



HALF END ELEVATION
See bill of material for number of backing planks required.

	INITIAL	DATE
ORIGINAL BY	F.E.R.	10.14.38
CHECKED BY	P.D.W.	10.17.38
VANDYKE BY	A.O.C.	9-28-40
CHECKED BY	G.H.D.	10.2.40.

STANDARD P-116-B-H.CP.

BOLTS AND WASHERS FOR ONE SPAN OF SUPERSTRUCTURE

LOCATION	SIZE	19'-0" SPAN NO.	LENGTH	TOTAL	23'-0" SPAN NO.	LENGTH	TOTAL
POSTS TO RAILS	5/8"	6	10"	7.0 LBS.	6	10"	7.0 LBS.
POSTS TO WHEEL GUARDS	3/4"	6	14"	12.7 LBS.	6	14"	12.7 LBS.
POSTS TO STRINGERS	3/4"	12	16"	28.3 LBS.	12	16"	28.5 LBS.
WHEEL GUARDS TO STRINGERS	3/4"	6	36"	29.0 LBS.	6	38"	30.0 LBS.
WASHERS - STD. C.I.O.G. 5/8 & 3/4		12/48		69.0 LBS.	12/48		69.0 LBS.
TOTAL WEIGHT				146.0 LBS.			147.0 LBS.

BOLTS AND WASHERS FOR ONE ABUTMENT

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8"	2	10"	1.08 LBS.	2.2 LBS.
POST TO BULKHEAD TO CAP	BOLTS	3/4"	2	24"	3.32 LBS.	6.7 LBS.
POSTS TO STRINGERS	BOLTS	3/4"	4	16"	2.36 LBS.	9.5 LBS.
POSTS TO WHEEL GUARDS	BOLTS	3/4"	2	14"	2.12 LBS.	4.3 LBS.
WHEEL GUARDS TO STRINGERS	BOLTS	3/4"	2	38"	5.00 LBS.	10.0 LBS.
TIMBER HEADER TO STRINGERS	LAG SCREWS	5/8"	13	16"	1.38 LBS.	17.8 LBS.
					LBS.	LBS.
WASHERS - STD. C.I.O.G.	WASHERS	5/8"-3/4"	17/18		0.75 / 1.25 LBS.	35.5 LBS.
CAP TO PILES	DRIFT BOLTS	3/4"	6	24"	3.00 LBS.	18.0 LBS.
TOTAL WEIGHT						104.0 LBS.

BOLTS AND WASHERS FOR ONE WING

LOCATION	ITEM	SIZE	NO.	LENGTH	WT. EACH	TOTAL WT.
POSTS TO RAILS	BOLTS	5/8"	3	11"	1.16 LBS.	3.4 LBS.
POSTS TO PILES	BOLTS	3/4"	6	20"	2.84 LBS.	17.0 LBS.
PILES TO CURB PLANK	BOLTS	5/8"	3	18"	1.74 LBS.	5.2 LBS.
					LBS.	LBS.
WASHERS - STD. C.I.O.G.	WASHERS	5/8"-3/4"	12/12		0.75 / 1.25 LBS.	24.4 LBS.
TOTAL WEIGHT						50.0 LBS.

STRUCTURAL STEEL FOR ONE ABUTMENT

OUTSIDE CONNECTION ANGLES	6 PCS.	5"x5"x3/8"x5'-0"		369 LBS.
INSIDE CONNECTION ANGLES	6 PCS.	5"x5"x3/8"x5'-0"		369 LBS.
BOLTS FOR CONNECTION ANGLES	22 PCS.	3/4"x19"	GALV.	60 LBS.
BOLTS FOR CONNECTION ANGLES	8 PCS.	3/4"x9"	GALV.	13 LBS.
WASHERS STD. C.I.O.G.	8 PCS.	3/4" Dia.	GALV.	10 LBS.
	1 1/2% ADDITIONAL FOR OVERRUN			14 LBS.
TOTAL WEIGHT				835 LBS.

NAILS

LOCATION	ITEM	19'-0" SPAN	23'-0" SPAN
ONE SPAN OF SUPERSTRUCTURE	30D. COMMON	25 LBS.	30 LBS.
	30D. GALV. BARBED	105 LBS.	130 LBS.
	40D. COMMON	135 LBS.	165 LBS.
ONE ABUTMENT	40D. COMMON	5 LBS.	5 LBS.
	7" WIRE SPIKES	LBS.	27 LBS.
ONE WING	40D. COMMON	1 LB.	1 LB.
	7" WIRE SPIKES	LBS.	12 LBS.
	40D. COMMON	LBS.	LBS.
	7" WIRE SPIKES	LBS.	LBS.

SUMMARY OF HARDWARE

BOLTS AND WASHERS	1 SPAN	AT	147 LBS. PER SPAN	147 LBS.
	2 ABUTMENTS	AT	104 LBS. PER ABUTMENT	208 LBS.
	4 WINGS	AT	50 LBS. PER WING	200 LBS.
		AT	LBS.	LBS.
		AT	LBS.	LBS.
	TOTAL WEIGHT			555 LBS.

NAILS LOCATION	UNIT	30D. COMMON EACH	TOTAL	30D. GALV. BARBED EACH	TOTAL	40D. COMMON EACH	TOTAL	7" WIRE SPIKES EACH	TOTAL
1 SPAN	LBS.	30	30	130	130	165	165	—	—
2 ABUTMENTS	LBS.	—	—	—	—	5	10	27	54
4 WINGS	LBS.	—	—	—	—	1	4	12	48
	LBS.	—	—	—	—				
TOTAL WEIGHT	LBS.		30		130		179		102

SUMMARY OF QUANTITIES

STRUCTURAL EXCAVATION				
ITEM 14a. DRY ROCK				5 CU. YDS.
ITEM 14b. DRY COMMON				5 CU. YDS.
ITEM 14c. WET ROCK				5 CU. YDS.
ITEM 14d. WET COMMON				35 CU. YDS.
ITEM 42a. UNTREATED BRIDGE TIMBER				
1 SPAN	AT	312 BD. FT. EACH	=	312 BD. FT.
2 ABUTMENTS	AT	48 BD. FT. EACH	=	96 BD. FT.
4 WINGS	AT	84 BD. FT. EACH	=	336 BD. FT.
	AT	BD. FT. EACH	=	BD. FT.
		TOTAL	=	744 BD. FT.
ITEM 42b. TREATED BRIDGE TIMBER				
1 SPAN	AT	7662 BD. FT. EACH	=	7662 BD. FT.
	AT	BD. FT. EACH	=	BD. FT.
2 ABUTMENTS	AT	1731 BD. FT. EACH	=	3462 BD. FT.
4 WINGS	AT	672 BD. FT. EACH	=	2688 BD. FT.
	AT	BD. FT. EACH	=	BD. FT.
		TOTAL	=	13812 BD. FT.
ITEM 43. ASPHALT PLANK WEARING SURFACE				
1 SPAN	AT	575 SQ. FT. EACH	=	575 SQ. FT.
ITEM 48 STRUCTURAL STEEL				
2 ABUTMENTS	AT	835 LBS. EACH	=	1670 LBS.
ITEM 60a. PILING - TREATED				
2 ABUTMENTS	AT	120 LIN. FT. EACH	=	240 LIN. FT.
4 WINGS	AT	88 LIN. FT. EACH	=	352 LIN. FT.
	AT	LIN. FT. EACH	=	LIN. FT.
		TOTAL	=	592 LIN. FT.
ITEM 60e METAL PILE SHOES				
(SEE DETAIL) 28 No. 1 1/2 SHOES.	No. 2 SHOES.	TOTAL	=	28 SHOES
ITEM 65b. DRAIN PIPE				
2 PIECES 3" DIA. GALV. PIPE 2'-4" LONG WITH ONE 3" GALV. FLANGE ON EACH PIPE				
1 SPAN	AT	2 COMPLETE PER SPAN	=	2 PIECES
ITEM 11a REMOVE DISUSED BRIDGE				LUMPSUM.
ITEM 13c UNCLASSIFIED EXCAVATION				150 CU. YDS.
ITEM No. 14e MECHANICAL TAMPING				
ABUT. No. 1 - 25 HRS. / ABUT. No. 2 - 25 HRS. (WINGS INCL.)		TOTAL		50 HOURS

ONE SPAN OF SUPERSTRUCTURE

DESCRIPTION	SIZE	19'-0" SPAN NO.	LENGTH	TOTAL	23'-0" SPAN NO.	LENGTH	TOTAL
UNTREATED TIMBER							
HANDRAILS S4S.	3"x8"	4	20'-0"	160 BD. FT.	4	24'-0"	192 BD. FT.
HANDRAIL POSTS S4S	6"x8"	6	5'-0"	120 BD. FT.	6	5'-0"	120 BD. FT.
TOTAL UNTREATED TIMBER				280 BD. FT.			312 BD. FT.
TREATED TIMBER							
FLOORING S4S.	3"x6"	87	26'-0"	3393 BD. FT.	106	26'-0"	4134 BD. FT.
BRIDGING	3"x6"	4	14'-0"	84 BD. FT.	8	14'-0"	168 BD. FT.
WHEEL GUARDS ▼	6"x10"	2	20'-0"	200 BD. FT.	2	24'-0"	240 BD. FT.
STRINGERS SINGLE SPAN	6"x18"	13	20'-0"	2340 BD. FT.			
	6"x20"				13	24'-0"	3120 BD. FT.
	8"x20"						
TOTAL TREATED TIMBER-SINGLE SPAN				6017 BD. FT.			7662 BD. FT.
ASPHALT PLANK WEARING SURFACE				475 SQ. FT.			575 SQ. FT.

ONE ABUTMENT

UNTREATED TIMBER			
HANDRAIL POSTS S.4.S.	2 PCS.	6"x8"x6'-0"	48 BD. FT.
TOTAL UNTREATED TIMBER			48 BD. FT.
TREATED TIMBER			
FILLER BLOCKS	6 PCS.	1"x6"x3'-0"	9 BD. FT.
TIMBER HEADER	1 PC.	8"x10"x26'-0" FINISH TO 7"x9"	174 BD. FT.
CAP	1 PC.	12"x12"x30'-0"	360 BD. FT.
BULKHEAD PLANKS	4 PCS.	3"x8"x28'-0"	224 BD. FT.
BACKING PLANKS	7 PCS.	4"x12"x28'-0"	784 BD. FT.
STRINGER BLOCKING Cut before treatment (19' & 23' SPANS)	1 PC.	6"x18"x20'-0"	180 BD. FT.
			BD. FT.
TOTAL TREATED TIMBER			1731 BD. FT.
PILING - TREATED	6 PIECES AT 20 LINEAL FT. EACH		120 LIN. FT.

ONE WING

DESCRIPTION	SIZE	10'-0" WING NO.	LENGTH	TOTAL	16'-0" WING NO.	LENGTH	TOTAL	20'-0" WING NO.	LENGTH	TOTAL
UNTREATED TIMBER										
HANDRAILS S4S.	3"x8"	1	10'-0"	20 BD. FT.	1	12'-0"	24 BD. FT.	1	12'-0"	24 BD. FT.
	3"x8"	1	10'-0"	20 BD. FT.	1	12'-0"	24 BD. FT.	1	12'-0"	24 BD. FT.
HANDRAIL POSTS S4S.	6"x6"	3	4'-0"	36 BD. FT.	3	4'-0"	36 BD. FT.	3	4'-0"	36 BD. FT.
TOTAL UNTREATED TIMBER				76 BD. FT.			84 BD. FT.			84 BD. FT.
TREATED TIMBER										
CURB PLANK	4"x8"	1	10'-0"	27 BD. FT.	1	12'-0"	32 BD. FT.	1	12'-0"	32 BD. FT.
BACKING PLANKS	4"x12"		10'-0"	BD. FT.	10	16'-0"	640 BD. FT.		20'-0"	BD. FT.
TOTAL TREATED TIMBER				BD. FT.			672 BD. FT.			BD. FT.
PILING TREATED		3		LIN. FT.	4	22	88 LIN. FT.	5		LIN. FT.

▼

Lengths of Wheel Guards	SPANS		23'-0"	
	SINGLE		23'-0"	
	END			
	END			
	INTERMEDIATE			

JUN 1941
ENG. DIV. 2
S. H. D.

Note:
This standard to be used on 19'-0" and 23'-0" Single Spans Only.

STRUCTURE REQUIRED
1 SPAN AT 23'-0"

LOADING DATA.
LIVE LOAD = A.A.S.H.O. 1935 CLASS "A" (H-15)
DEAD LOAD = Assumes 25 lbs. per sq. ft. additional wearing surface. This includes 1 1/2" asphalt plank wearing surface.

COLORADO
STATE HIGHWAY DEPARTMENT
TREATED TIMBER PILE TRESTLE WITH 6" LAMINATED FLOOR AND 1 1/2" ASPHALT PLANK WEARING SURFACE 25 FT. CLEAR ROADWAY
Across: *Draw*
Sta. *192+40 to 192+64.5*
Near *Parlin* Sec. *32* T. *48N.* R. *2 E.*

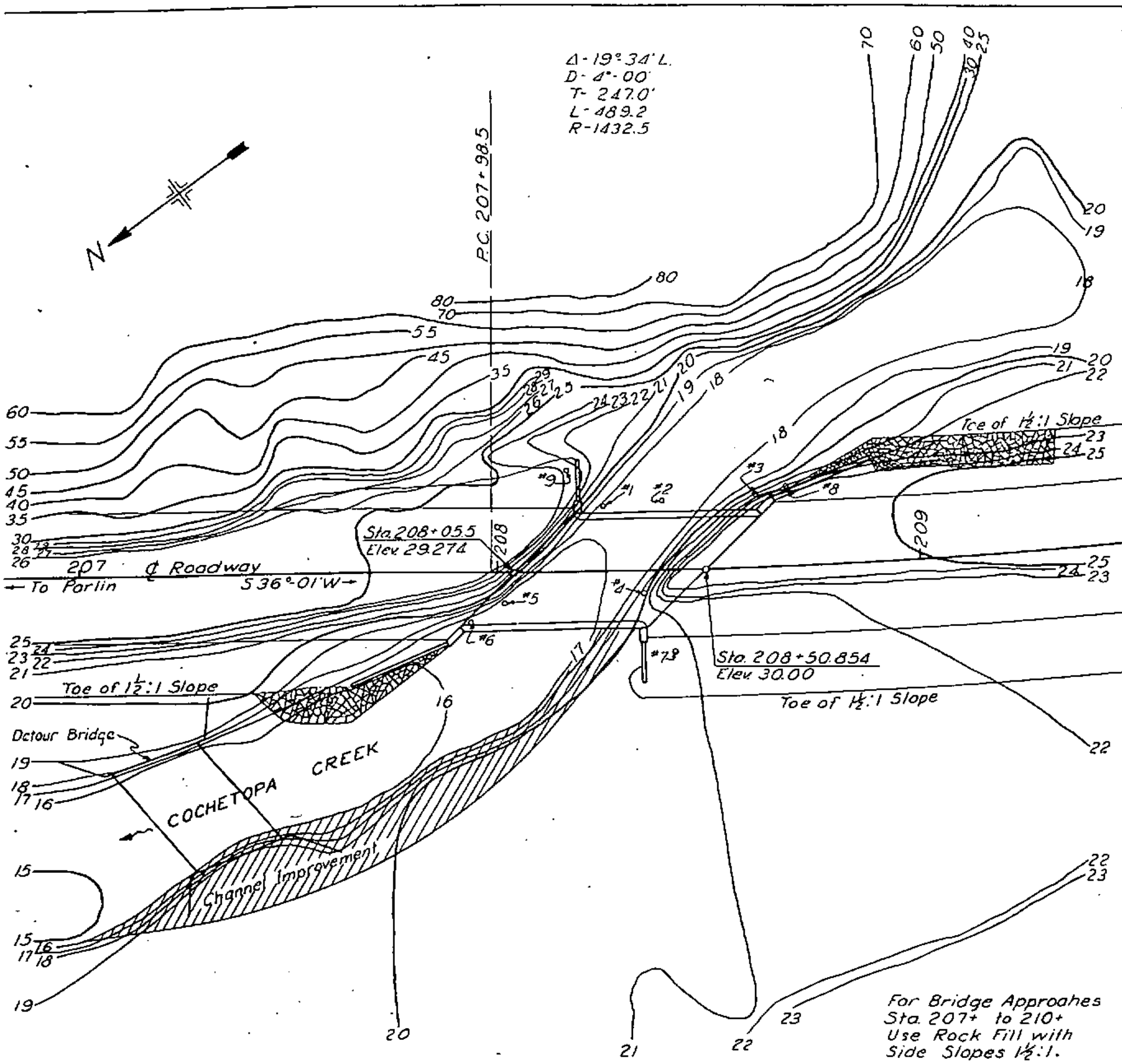
Designed by A.G.K.	Approved by [signature]
Made by A.G.K.	Bridge Engineer
Check Design:	Date: June 25, 1937
Check Detail	

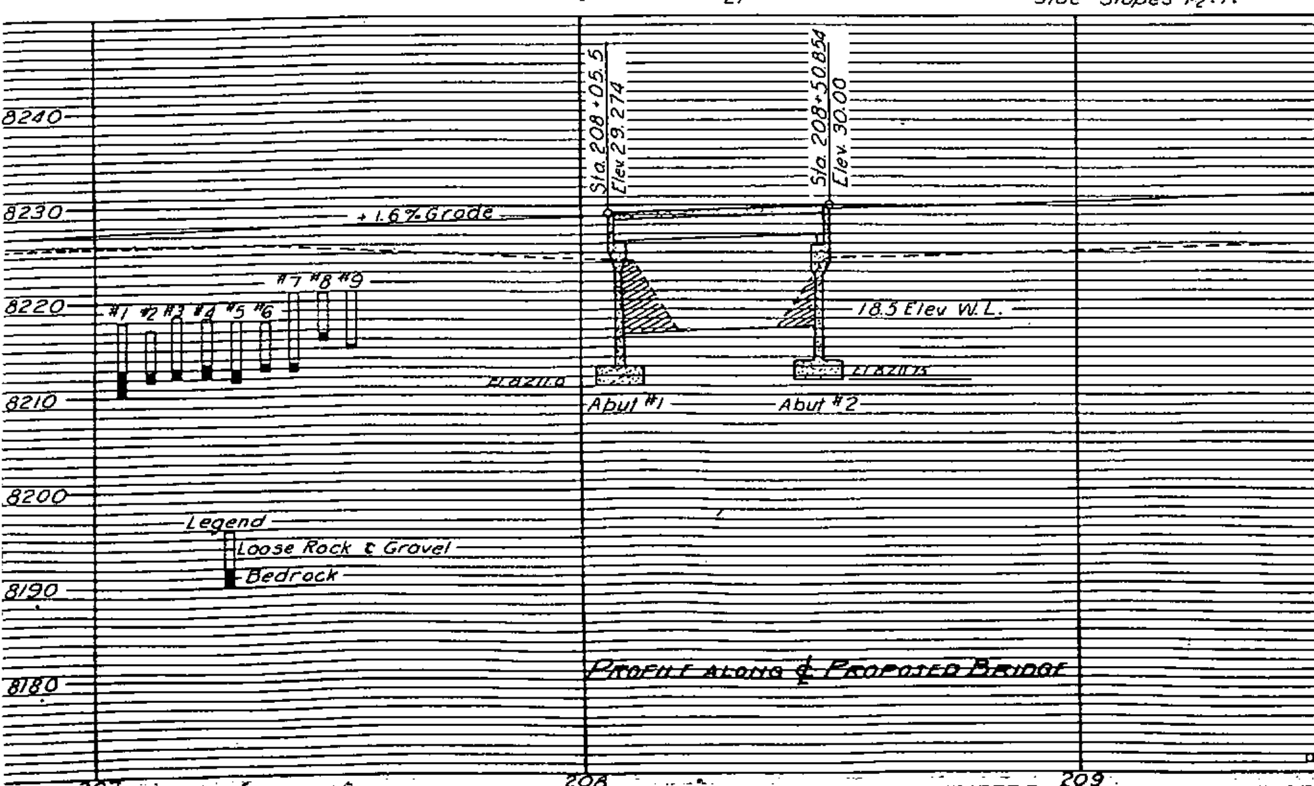
STRUCTURE NO. K-9-F

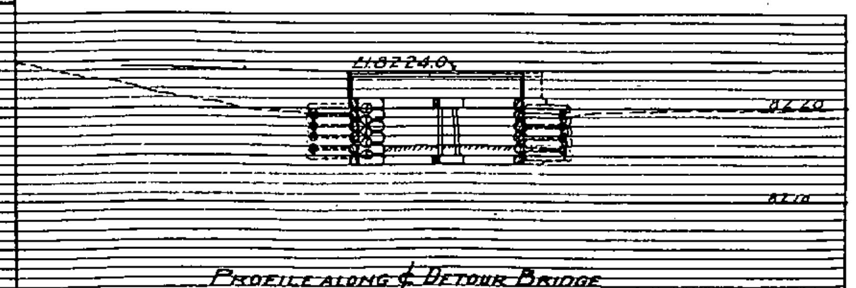
REVISIONS

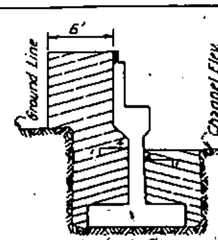
10-15-40 W.M.M. Changed reinf steel quantities
3-28-41 A.F.F. Added detour structure
4-8-41. W.G.S. Mechanical Tamping.

FED. ROAD DIST. NO.	STATE	F.A.S	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C-(1)	6	









Contractors' attention is called to Specifications covering Mechanical Tamping. Special care must be used to prevent deflection of abutments and wings by wedging action. Backfill in 6in. earth layers shall be mechenically tamped beginning at the wall and proceeding outward and downward therefrom at a 4:1 minimum slope. Below channel elevation mechanical tamp uniformly on both sides. Above original ground line mechanical tamp out to 6 ft. from the wall. Rolling equipment shall not be used within 6 ft. of any wall.

SUMMARY OF QUANTITIES

Item	Description	Unit	Superstr.	Abut. #1	Abut. #2	Total
11b	Removal of Present Structure	Lump Sum				•
13c	Unclassified Excavation	Cu. Yd.			250	250
14a	Dry Rock Excavation (Str.)	Cu. Yd.		5	5	10
14b	Dry Common Excavation (Str.)	Cu. Yd.		70	160	230
14c	Wet Rock Excavation (Str.)	Cu. Yd.		70	80	150
14d	Wet Common Excavation (Str.)	Cu. Yd.		170	160	330
42a	Untreated Bridge Timber	M Ft. bm.		0.216	0.216	0.432
46a	Class "A" Concrete	Cu. Yd.	40	117	118	275
46r	Class "A" Concrete - Handrail	Cu. Yd.	4	0.6	0.6	5.2
47	Reinforcing Steel (Includes 1%± Overrun)	Lb.	7500	8870	9000	25,370
48	Structural Steel (Includes 1½%± Overrun)	Lb.	26,190	55	55	26,300
67b	Heavy Riprap	Cu. Yd.		20	65	85
89a	Drain Pipe 3"⌀ x 4'-0" Long (Conc. Floor)	Each	2			2
14e	Mechanical Tamping	Hrs.		80	80	160
*	¾" Expansion Joint Material	Sq. Ft.	50			50
*	¼" Expansion Joint Material	Sq. Ft.		43	42	85
*	#12 Ga. Galv. Sheet Metal	Lb.	550			550

* To be included in unit bid price of Class "A" Concrete.

REFERENCE DRAWINGS:

Sheet No. 7 Details of Superstructure.
Sheet No. 8 Details of Abutment #1.
Sheet No. 9 Details of Abutment #2.
Sheet No. 10 Details of Detour Structure.

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 SHIPLAP, OR TONGUE AND GROOVE LUMBER S3S UNLESS FACED WITH PANEL BOARD.

CONCRETE GIRDERS, FLOOR SLABS AND CURB SHALL BE POURED MONOLITHICALLY. 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 SPLICED.

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 REDESIGN IS NECESSARY."

ALL RIVETS TO BE ¾" DIA. ALL RIVETS TO BE POWER DRIVEN.

LOADING DATA.

LIVE LOAD = A. A. S. H. O. 1935 CLASS A. (H-15)
DEAD LOAD = ASSUMES 15 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE ¾ INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA.

A.A.S.H.O. 1935 EXCEPT CONCRETE UNIT STRESSES
f_c = 750 LBS. PER SQ. IN.
f_s = 18,000 LBS. PER SQ. IN.
n = 12

COLORADO
STATE HIGHWAY DEPARTMENT

1-40'-0" CONC. & I-BEAM SPAN
25'-0" RDWY. - 45° SKEW
SUMMARY OF QUANTITIES
GENERAL LAYOUT

Across Cochetopa Creek
Sta. 208+05.5 to 208+50.85
Near Parlin Sec. 32 T. 48N. R. 2E.

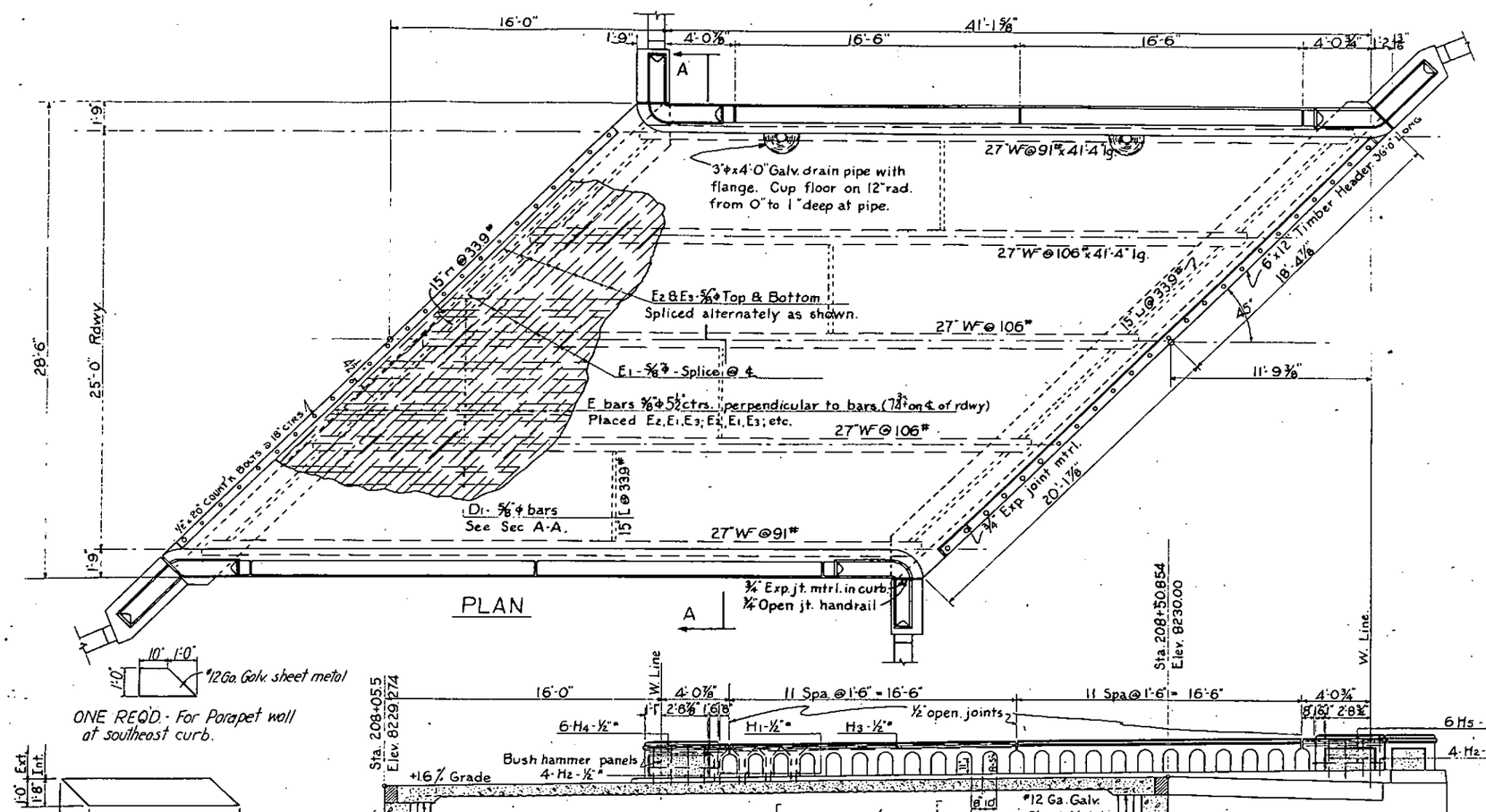
Designed by	Approved by
Made by A.O.C.	Bridge Engineer
Checked by	Date: Sept. 25, 1940.

STRUCTURE NO. K-9-B

REVISIONS

10-15-40 M.M.M. Changed spacing of slab bars to 5½" ℄ R.R.A. Curved Pl. put on bottom at Fixed bearing.

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	7.	

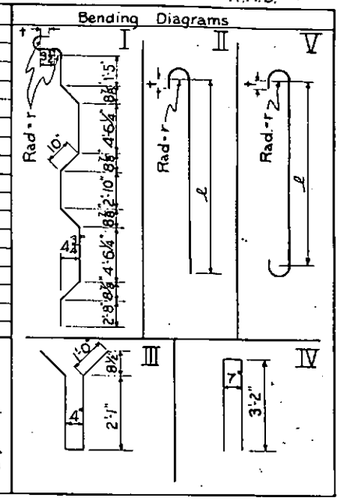


BAR LIST FOR SUPERSTRUCTURE

✓R.A.D.

Mark	Size	No. Req'd	Length	Type	ℓ	r	t
E1	⅝"ϕ	44	20'-9"	I		2½"	2"
E2	⅝"ϕ	90	13'-6"	II	12'-8"	2½"	2"
E3	⅝"ϕ	90	30'-0"	II	29'-2"	2½"	2"
D1	⅝"ϕ	68	23'-3"	Str.			
D2	⅝"ϕ	12	6'-8"	V	5'-0"	2½"	2"
H1	½"*	48	6'-6"	III			
H2	½"*	16	6'-11"	IV			
H3	½"*	16	16'-0"	Str.			
H4	½"*	12	4'-6"	Str.			
H5	½"*	12	4'-0"	Str.			

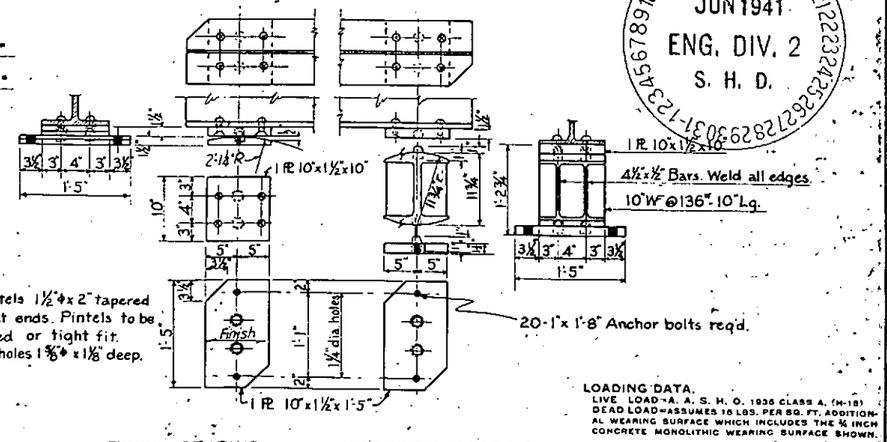
Bending Diagrams



✓G.H.D.

BAR SUMMARY

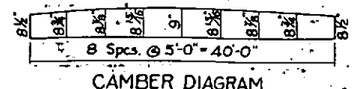
6490 lin. ft. ⅝"ϕ @ 1.043 lb. per lin. ft. =	6769 lb.
781 lin. ft. ½"* @ 0.850 lb. per lin. ft. =	664
Plus 1% ± for overrun =	67
TOTAL =	7500 lb.



All pintels 1½"ϕx2" tapered to 1¼" at ends. Pintels to be threaded or tight fit. Pintel holes 1⅝"ϕ x1⅛" deep.

FIXED BEARING
5 Req'd.

EXPANSION BEARING
5 Req'd.



CAMBER DIAGRAM

REFERENCE DRAWINGS

Sheet No. 6: General Layout & Summary of Quantities
Sheet No. 8 Details of Abutment No. 1.
Sheet No. 9 Details of Abutment No. 2

STRUCTURE NO. 1K-9-B

LOADING DATA.
LIVE LOAD - A. A. S. H. O. 1935 CLASS A. (M-18)
DEAD LOAD - ASSUMES 16 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE ½ INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

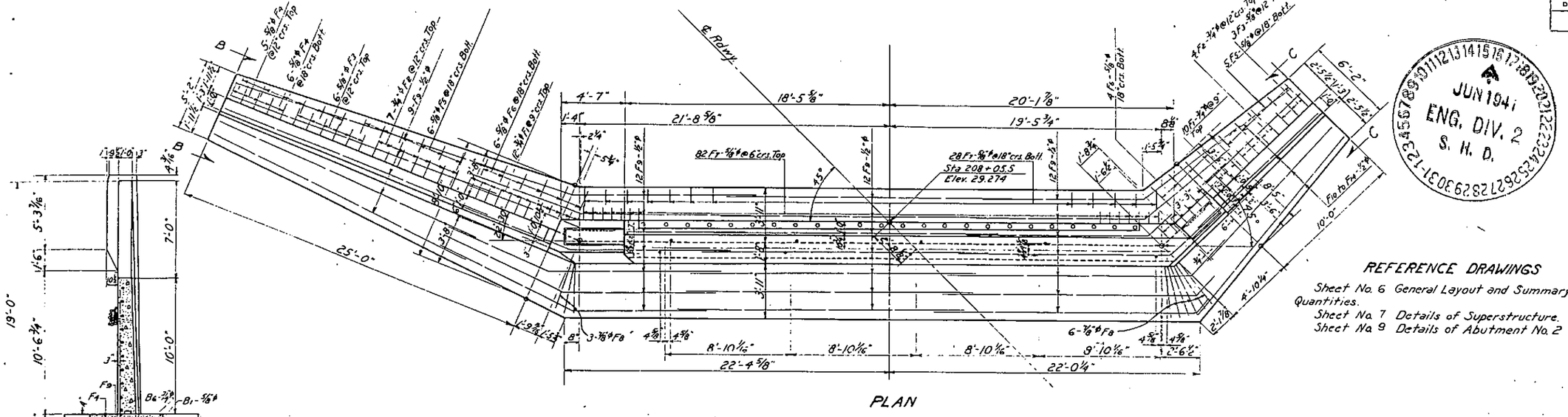
DESIGNING DATA.
A.A.S.H.O. 1935 EXCEPT CONCRETE UNIT STRESSES
f_s = 18000 P.S.I.
f_c = 750 P.S.I.
n = 12

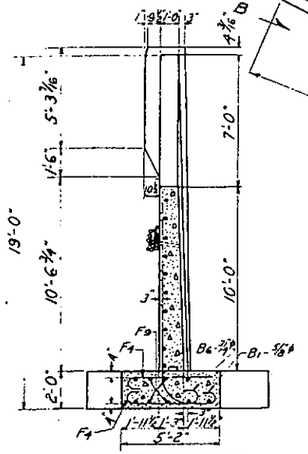
JUN 1941
ENG. DIV. 2
S. H. D.

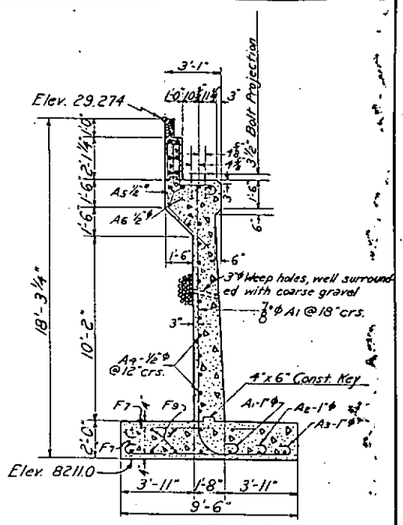
COLORADO
STATE HIGHWAY DEPARTMENT
1-40'-0" CONC. & I-BEAM SPAN
25'-0" RDWY - 45° SKEW.
DETAILS OF SUPERSTRUCTURE

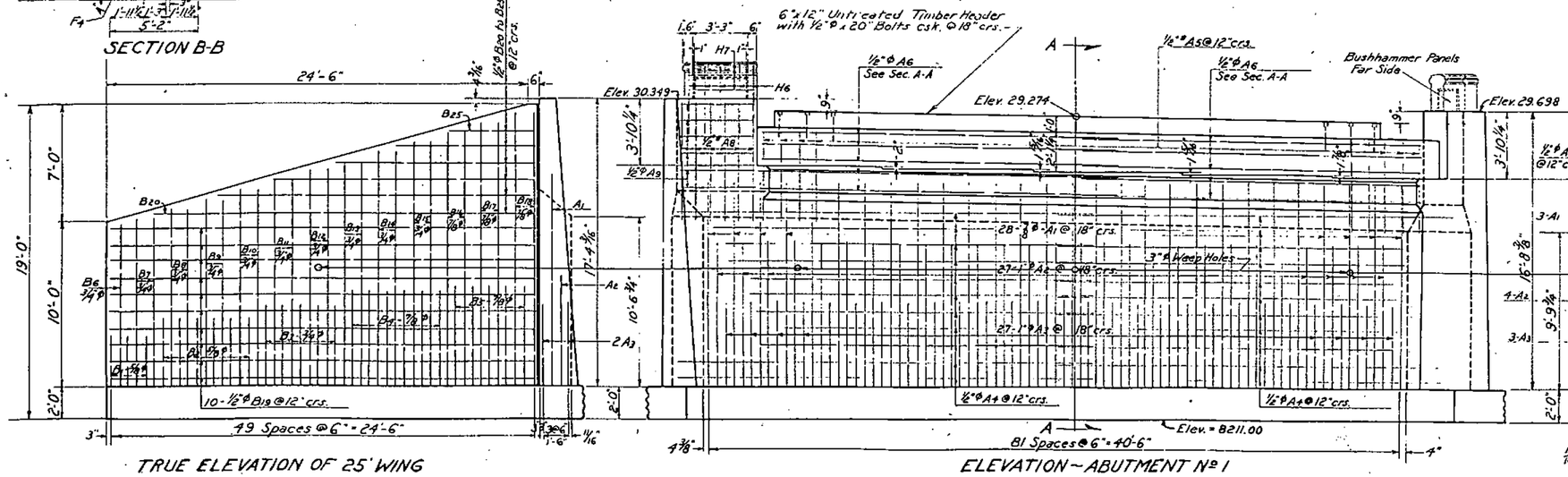
Across Cochetopa Creek
Sta. 208+05.5 to 208+50.854
Near Parlin Sec. 32 T 48 N R. 2 E

Designed by A.F.P.	Approved by
Made by R.A.D.	Bridge Engineer
Checked by G.H.D.	Date: Sept. 15th 1940.









REVISION [illegible]

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	8	

SECTION B-B

PLAN

REFERENCE DRAWINGS

Sheet No. 6 General Layout and Summary of Quantities.
Sheet No. 7 Details of Superstructure.
Sheet No. 9 Details of Abutment No. 2

SECTION A-A

TRUE ELEVATION OF 25' WING

ELEVATION ~ ABUTMENT Nº 1

TRUE ELEVATION OF 10' WING

SECTION C-C

BAR LIST FOR ABUTMENT No.1

✓A.O.C.

Mark	Size	No. Req'd	Length	Type	l	m	r	t
A1	⅞"φ	32	16'-10"	I	12'-10"	9"	3½"	3"
A2	1"φ	32	14'-3"	I	8'-10"	2'-0"	4"	3½"
A3	1"φ	32	12'-4"	I	5'-7"	3'-4"	4"	3½"
A4	½"φ	24	25'-0"	Straight ~ Field Bend.				
A5	½"φ	39	11'-7"	II			2"	2"
A6	½"φ	22	20'-0"	Straight				
A7	½"φ	6	2'-10"	Straight				
A8	½"φ	11	8'-8"	III	5'-0"		2"	2"
A9	½"φ	6	4'-3"	Straight				
B1	⅝"φ	3	7'-6"	I	3'-4"	1'-3"	2½"	2"
B2	⅝"φ	6	8'-9"	I	4'-5"	1'-5"	2½"	2"
B3	¾"φ	5	10'-5"	I	5'-4"	2'-0"	3"	2½"
B4	⅞"φ	6	11'-8"	I	6'-1"	2'-4"	3½"	3"
B5	⅞"φ	5	12'-6"	I	6'-4"	2'-11"	3½"	3"
B6	¾"φ	1	14'-2"	I	10'-4"	9"	3"	2½"
B7	[illegible]	[illegible]	14'-4"	[illegible]	10'-6"	[illegible]	[illegible]	[illegible]

Mark	Size	No. Req'd	Length	Type	l	m	r	t
to	¾"φ	2 each	by 6¾"	I	by 6¾"		3"	2½"
B15			to 18'-10"		to 15'-0"	9"		
B16			19'-7"		15'-7"	9"		
to	⅞"φ	2 each	by 7"	I	by 7"		3½"	3"
B18			20'-9"		to 16'-9"	9"		
B19	½"φ	10	24'-6"	Straight				
B20			22'-6"					
to	½"φ	1 each	by 3'-6"	Straight				
B25			to 5'-0"					
C1	⅝"φ	2	7'-10"	I	3'-3"	1'-8"	2½"	2"
C2	¾"φ	3	9'-3"	I	4'-5"	1'-9"	3"	2½"
C3	⅞"φ	3	10'-6"	I	5'-2"	2'-1"	3½"	3"
C4	1"φ	2	13'-9"	I	7'-10"	2'-6"	4"	3½"
C5	⅝"φ	2	14'-5"	I	10'-9"	9"	2½"	2"
C6	¾"φ	2	16'-1"	I	12'-0"	1'-0"	3"	2½"
C7	¾"φ	2	17'-5"	I	13'-1"	1'-0"	3"	2½"

Mark	Size	No. Req'd	Length	Type	l	m	r	t
C8	⅞"φ	2	18'-10"	I	14'-5"	1'-2"	3½"	3"
C9	⅞"φ	2	20'-1"	I	15'-8"	1'-2"	3½"	3"
C10	½"φ	10	9'-6"	Straight				
C11			9'-0"					
to	½"φ	1 each	by 1'-8"	Straight				
C15			2'-4"					
F1	¾"φ	22	7'-2"	IV	6'-2"		3"	2½"
F2	¾"φ	11	6'-9"	IV	5'-9"		3"	2½"
F3	⅝"φ	9	5'-2"	IV	4'-4"		2½"	2"
F4	⅝"φ	11	4'-10"	IV	4'-0"		2½"	2"
F5	⅝"φ	11	5'-6"	IV	4'-8"		2½"	2"
F6	⅝"φ	10	6'-6"	IV	5'-8"		2½"	2"
F7	⅝"φ	111	6'-10"	IV	6'-0"		2½"	2"
F8	⅞"φ	9	8'-0"	IV	6'-10"		3½"	3"
F9	½"φ	45	20'-0"	Straight ~ Field Bend				
F10	½"φ	2	7'-0"	Straight				

Mark	Size	No. Req'd	Length	Type	l	m	r	t
F11	½"φ	2	10'-0"	Straight				
F12	½"φ	2	12'-0"	Straight				
F13	½"φ	2	14'-0"	Straight				
F14	½"φ	1	17'-6"	Straight ~ Field Bend				
H6	½"φ	8	9'-9"	V				
H7	½"φ	6	3'-10"	Straight				
H8	½"φ	6	2'-6"	Straight				

BAR SUMMARY

✓HCC

878 Lin. Ft. of 1"φ @ 2.670 Lbs per Lin. Ft. = 2344 Lbs.
974 " " " ⅞"φ @ 2.044 " " " " = 1991 "
692 " " " ¾"φ @ 1.502 " " " " = 1039 "
1103 " " " ⅝"φ @ 1.043 " " " " = 1150 "
663 " " " ½"■ @ 0.850 " " " " = 564 "
2537 " " " ½"φ @ 0.668 " " " " = 1695 "
+1% ± Overrun = 87 "
Total = 8870 Lbs.

BENDING DIAGRAMS

STRUCTURE NO. K-9-B

LOADING DATA.
LIVE LOAD A. A. S. H. O. 1935 CLASS A. (H-15)
DEAD LOAD - ASSUMES 15 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE ½ INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA.
A.A.S.H.O. 1935 EXCEPT UNIT STRESSES.
fc = 750 Lbs. per Sq. In. n = 12
fs = 18,000 Lbs. per Sq. In. (Intermed. Grade)

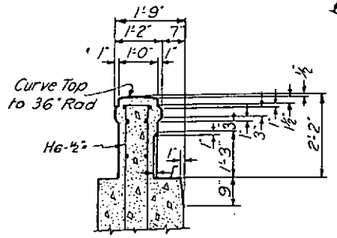
COLORADO
STATE HIGHWAY DEPARTMENT
1-40'-0" CONC. I-BEAM SPAN
25'-0" Rdwy. 45° Skew
DETAILS OF ABUTMENT #1
Across Cochetopa Creek
Sta. 208+05.5 to 208+50.85
Near Parlin Sec. 32 T. 48N. R. 2E.

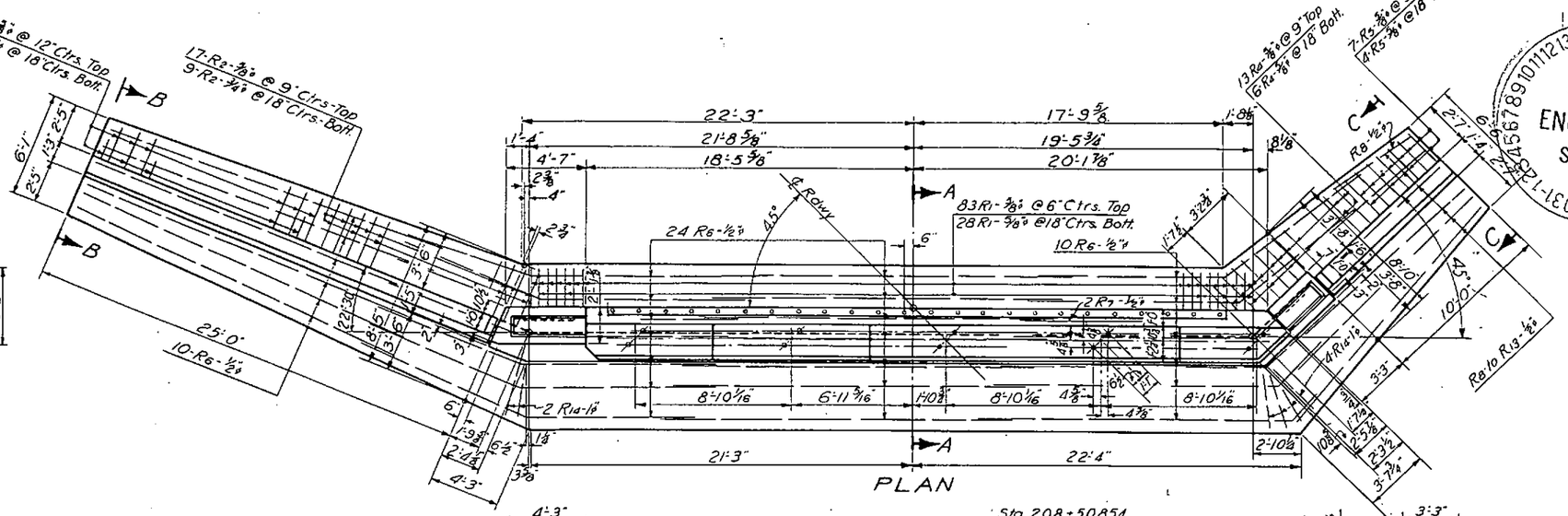
Designed by AFF-HCC	Approved by C. L. Dailey
Made by HCC	Bridge Engineer
Checked by	Date: Sept. 26, 1940

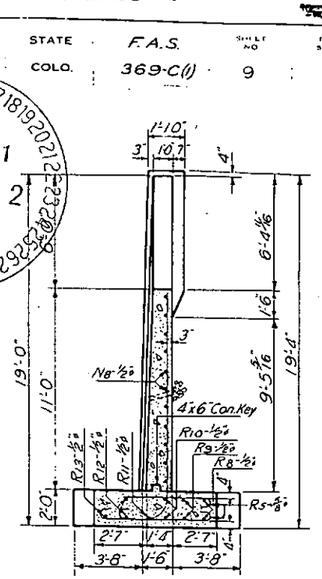
REVISIONS

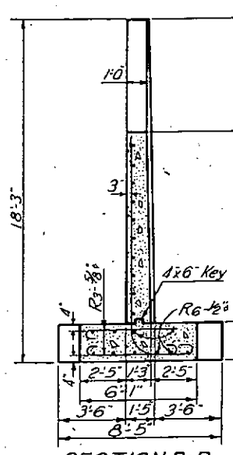
FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	9	

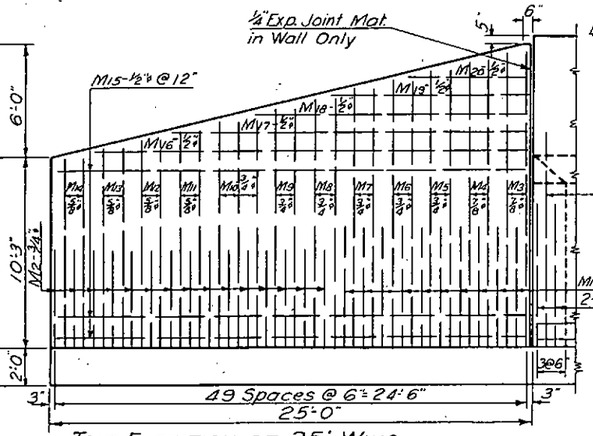
JUN 1941
ENG. DIV. 2
S. H. D.

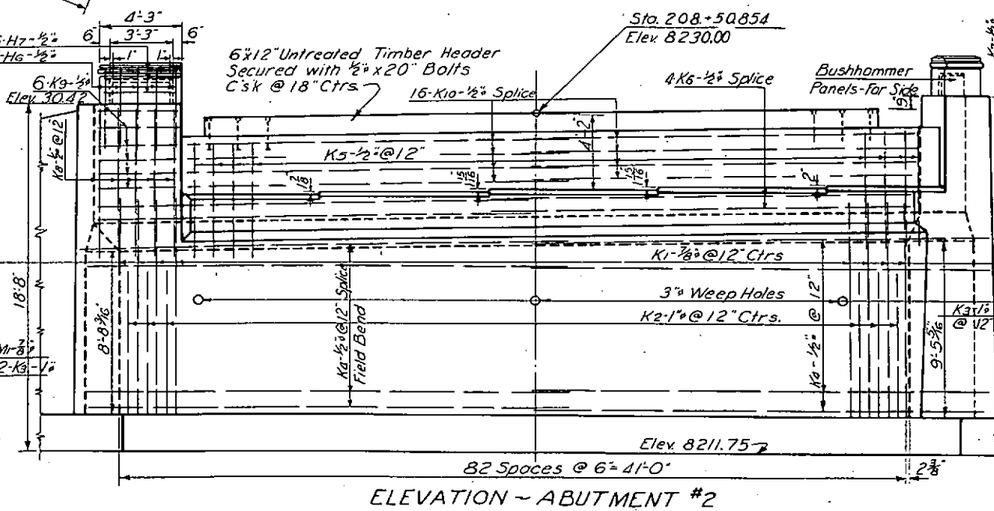


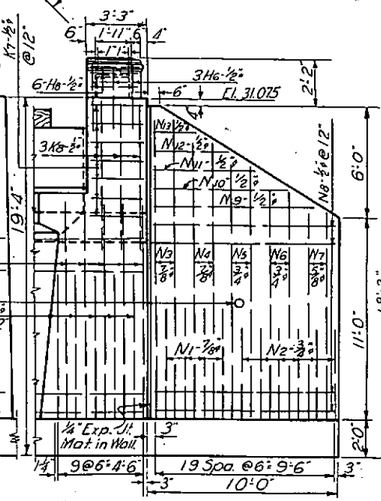


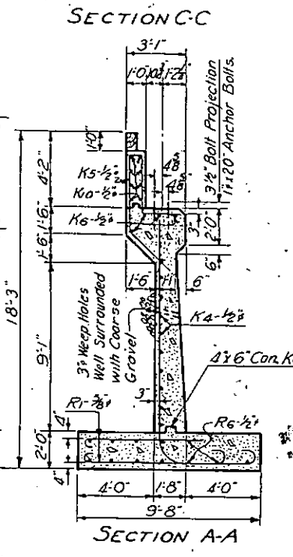












BAR LIST FOR ABUTMENT NO. 2 (E.D.W.)

Mark	Size	No. Reqd.	Length	Type	ℓ	m	r	t
K1	⅞"	48	16'-10"	I	11'-10"	1'-9"	3½"	3"
K2	1"	41	14'-9"	I	7'-11"	3'-5"	4"	3½"
K3	1"	7	14'-1"	I	7'-11"	2'-9"	4"	3½"
K4	½"	20	25'-0"	Str.	Field	Bend		
K5	½"	39	13'-9"	III	-		2"	2"
K6	½"	8	22'-3"	Str.				
K7	½"	7	3'-0"	Str.				
K8	½"	8	9'-6"	IV	5'-10"		2"	2"
K9	½"	6	4'-3"	Str.				
K10	½"	16	20'-0"	Str.				
M1	⅞"	10	12'-4"	I	6'-10"	2'-3"	3½"	3"
M2	¾"	15	10'-0"	I	5'-5"	1'-6"	3"	2½"
M3	⅞"	2	20'-6"	I	16'-1"	1'-2"	3½"	3"
M4	⅞"	2	20'-0"	I	15'-7"	1'-2"	3½"	3"
M5 to M9	¾"	2 Ea.	19'-1" by 6" to 13'-0"	I	15'-0" by 6" to 13'-0"	1'-0"	3"	2½"
M10	¾"	9	16'-6"	II	12'-5"	1'-0"	3"	2½"

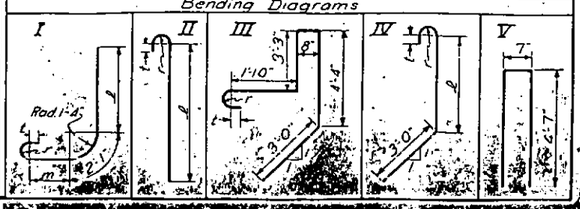
Mark	Size	No. Reqd.	Length	Type	ℓ	m	r	t
M11 to M14	⅝"	2 Ea.	15'-7" by 6" to 14'-1"	I	11'-11" by 6" to 10'-5"	9"	2½"	2"
M15	½"	10	24'-6"	Str.				
M16 to M20	½"	1 Ea.	22'-6" by 4'-0" to 6'-6"	Str.				
N1	⅞"	4	12'-0"	I	6'-4"	2'-5"	3½"	3"
N2	¾"	6	10'-2"	I	5'-4"	1'-9"	3"	2½"
N3	⅞"	2	21'-0"	I	16'-6"	1'-3"	3½"	3"
N4	⅞"	2	19'-9"	I	15'-3"	1'-3"	3½"	3"
N5	¾"	2	18'-0"	I	13'-11"	1'-0"	3"	2½"
N6	¾"	2	16'-10"	I	12'-9"	1'-0"	3"	2½"
N7	⅞"	2	15'-0"	I	11'-1"	9"	2½"	2"
N8	½"	11	9'-6"	Str.				
N9 to N13	½"	1 Ea.	8'-6" by 1'-6" to 2'-6"	Str.				

Mark	Size	No. Reqd.	Length	Type	ℓ	m	r	t
R1	⅜"	111	7'-0"	II	6'-2"		2½"	2"
R2	⅜"	26	6'-6"	II	5'-8"		2½"	2"
R3	⅜"	22	6'-0"	II	5'-2"		2½"	2"
R4	⅜"	19	6'-8"	II	5'-10"		2½"	2"
R5	⅜"	11	6'-1"	II	5'-3"		2½"	2"
R6	½"	44	20'-0"	Str.				
R7	½"	2	14'-0"	Str.				
R8	½"	2	5'-6"	Str.				
R9	½"	2	7'-6"	Str.				
R10	½"	2	10'-6"	Str.				
R11	½"	1	12'-6"	Str.				
R12	½"	2	14'-6"	Str.				
R13	½"	1	16'-6"	Str.				
R14	½"	6"	9'-4"	II	8'-0"		4"	3½"
Hc	½"	8	9'-9"	V				
H7	½"	6	3'-10"	Str.				
H9	½"	C	2'-9"	Str.				

Bar Summary (H.C.C.)

760	Lin. Ft. of 1"	@ 2.670 Lbs. per Ft.	= 2030 Lbs.
1142	" "	⅞" @ 2.044 " "	= 2334 "
512	" "	¾" @ 1.502 " "	= 769 "
1421	" "	⅞" @ 1.043 " "	= 1482 "
729	" "	½" @ 0.850 " "	= 620 "
2508	" "	½" @ 0.668 " "	= 1675 "
		Plus 1% Overrun	= 90 "
		Total	= 9000 Lbs.

Bending Diagrams



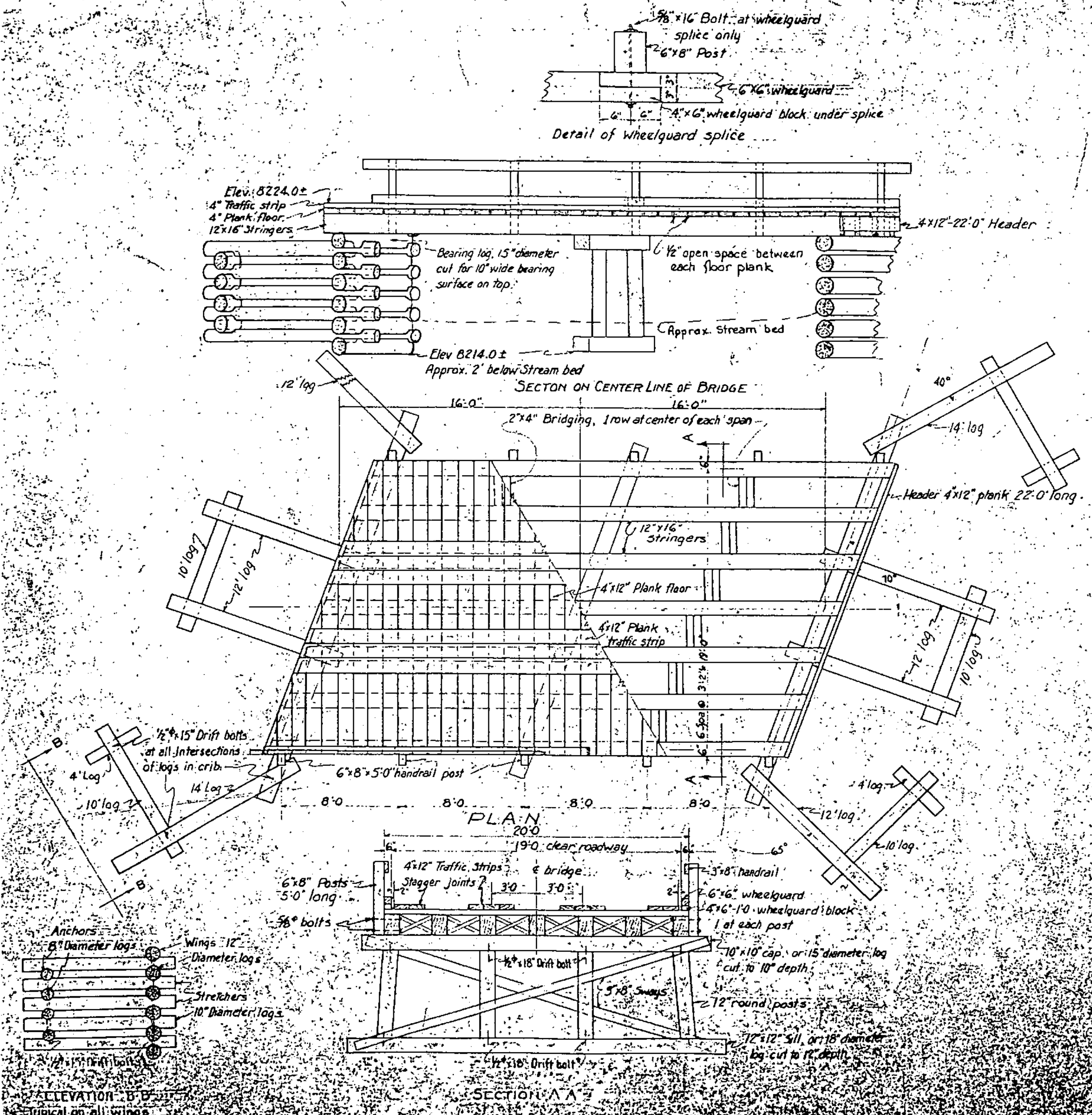
REFERENCE DRAWINGS:
Sheet No. 6 General Layout and Summary of Quantities.
Sheet No. 7 Details of Superstructure.
Sheet No. 8 Details of Abutment #1.

COLORADO
STATE HIGHWAY DEPARTMENT
1-40'-0" CONC. & I-BEAM SPAN
25'-0" RDWY. - 45° SKEW
DETAILS OF ABUTMENT #2
Across Cochetopa Creek
Near Parlin Sta. 208+05.5 to 208+50.85
Sec. 32, T 48N, R 2E

Designed by A.O.C. Approved by C. D. Bailey
Made by A.O.C. Bridge Engineer
Checked by Date: Sept 25 1940

STRUCTURE NO. K-9-B

FED. ROAD DIST NO.	STATE	F.A.S	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	10	[illegible]



NATIVE LUMBER

SUPERSTRUCTURE

DESCRIPTION	No	Size	LENGTH	Bd. Ft.
* Stringers	7	12"×16"	35'0"	3920
* Floor plank	35	4"×12"	20'0"	2800
* Traffic strips (350 lin. ft.)		4"×12	Random.	1400
Handrail posts	10	6"×8"	5'0"	200
Handrail	4	3"×8"	18'0	144
Wheelguard	4	6"×6"	18'0	216
Wheelguard blocks	10	4"×6"	1'0	20
Bridging	6	3"×6"	12'0	108
* Headers	2	4"×12	22'0	176

* This is salvage material from present structure

FRAME BENT

DESCRIPTION	No	SIZE	LENGTH	
▲ Cap	1	10"×10"	24'0	200 Bd. ft.
▲ Sill	1	12"×12"	26'0	312 Bd ft
φ Posts	4	12"φ	6'0	24 Lin ft.
Sways	2	3"×8"	26'0	104 Bd ft.

▲ May be 15" and 18" Logs, see detail

φ TWO LOG CRIBS

DESCRIPTION	No	Size	LENGTH	Lin. ft.
Bearing log	2	15"φ	28'0"	56
Abutment face	10	12"φ	28'0"	280
Wings	12	12"φ	14'0"	168
Wings	12	12"φ	12'0"	144
Abutment stretchers	20	10"φ	12'0"	240
Wing stretchers	28	10"φ	10'0"	280
Wing anchors	16	8"φ	4'0"	64
			Total	1232

HARDWARE

NAILS	
20 d nails	3 lbs
40 d nails	2 lbs
60 d nails	80 lbs
Total	85 lbs

DRIFT BOLTS		
Log to log in crib	220 - 1/2"φ - 15" long	184 lbs
Posts to cap or sill	8 - 1/2"φ 18" long	8 lbs
	Total	192

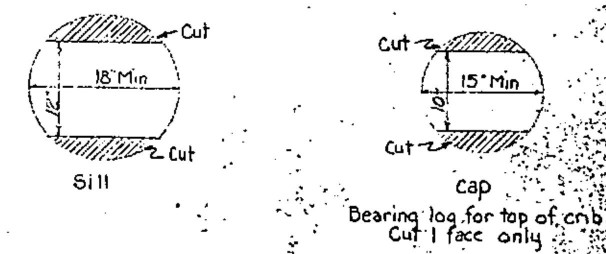
BOLTS and CIOG WASHERS		
Post to stringer	20 - 5/8"φ - 22" long	44 lbs
Post to wheelguard splice	2 - 5/8"φ - 16" long	4 lbs
CIOG washers	44 - 5/8"	32 lbs
	Total	80 lbs

φ Peeling of logs will not be required

SUMMARY OF QUANTITIES

Item	Description	Unit	Total
14a	Dry Rock Excavation (Str.)	Cu. Yd.	—
14 b	Dry Common Excavation (Str.)	Cu. Yd.	35
14 c	Wet Rock Excavation (Str.)	Cu. Yd.	—
14 d	Wet Common Excavation (Str.)	Cu. Yd.	28
42 ax	Untreated Bridge Timber (Native)	Mft. b.m.	1.304
42 ay	Untreated Bridge Timber (Salvage)	Mft. b.m.	8.296
44 ax	Native Logs	Lin. ft.	1256
•	Hardware	Lb	357

• Include in bid price for lumber.



DETAIL OF LOG CAP, SILL AND BEARING LOG.

JUN 1941
ENG. DIV. 2
S. H. D.

NAILING DIRECTIONS.

Rails to Posts - 2-40d nails per rail per post.
W.G. blocking to floor plank - 2-60d nails per block.
Wheelguard to blocking - 2-60d nails per W.G. per block.
Floor plank to stringer - 2-60d nails per plank per stringer.
Traffic strip to floor - 1-60d nail per tread plank per floor plank staggered.
Bridging to stringer - 4-20d nails per piece.
Stringer to caps - 2-60d nails per stringer per cap.
Sways to caps & posts - 2-60d nails per cap or post.

REFERENCE DRAWING
Sheet No 6 for location

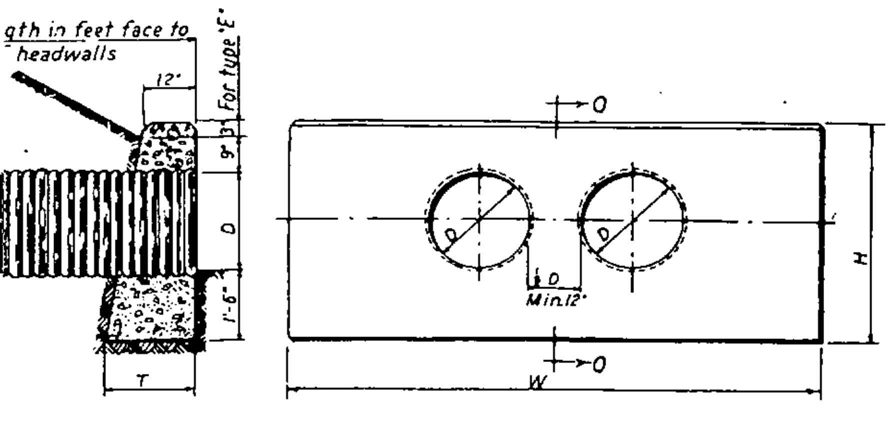
GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1 1940. [illegible]

H-12½ ... f=1000

COLORADO
STATE HIGHWAY DEPARTMENT
2 SPANS @ 16'-0" ...
19'-0 RDWY.
DETOUR BRIDGE
FOR STRUCTURE ...
Across Cochetopa Creek
[illegible]
Near [illegible]

Designed by [illegible] | [illegible]



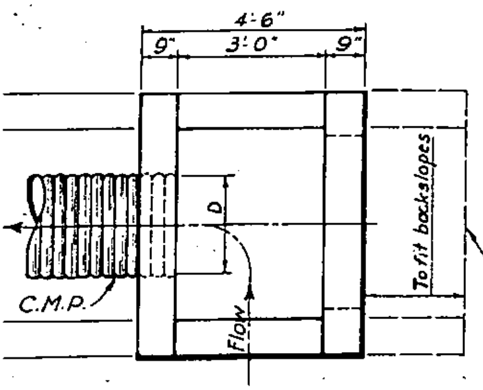
-IONAL ELEV. O-O

FRONT ELEVATION

D	W	H	T	CL."B" CONCRETE FOR 2 HDWALLS	CORRUGATED METAL PIPE		CEMENT RUBBLE MASONRY
[illegible]	7'-6"	3'-9"	1'-6"	2.4 CU. YDS.	16 GAGE	2×L = LIN. FT	
[illegible]	8'-6"	4'-0"	1'-7"	3.0 DO	16 DO	2×L = DO	
[illegible]	10'-6"	4'-6"	1'-10"	4.4 DO	14 DO	2×L = DO	
[illegible]	12'-9"	5'-0"	2'-0"	6.1 DO	14 DO	2×L = DO	
[illegible]	15'-0"	5'-6"	2'-2"	8.1 DO	12 DO	2×L = DO	
[illegible]	17'-3"	6'-0"	2'-5"	10.8 DO	12 DO	2×L = DO	
[illegible]	19'-6"	6'-6"	2'-7"	13.6 DO	12 DO	2×L = DO	

Table title: -OF DIMENSIONS & QUANTITIES FOR DOUBLE CORRUGATED METAL PIPE CULVERTS HEADWALLS

-D. HEADWALLS FOR DOUBLE CORR. METAL PIPE CULV'S.

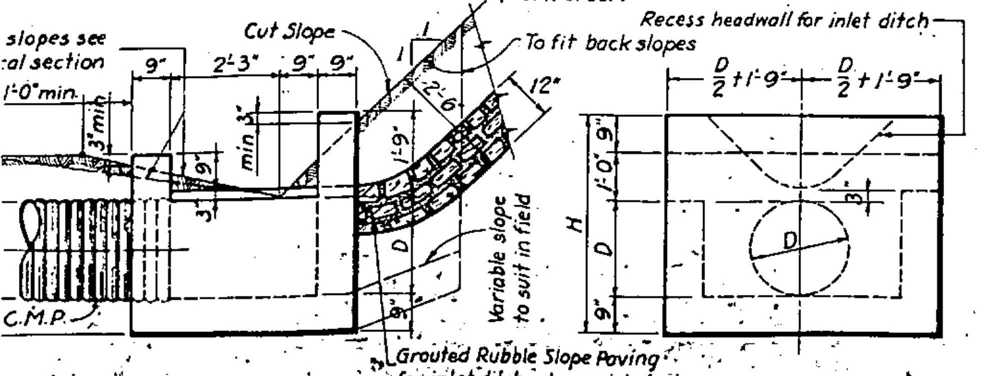


PLAN

QUANTITIES OF CLASS "B" CONCRETE OR CEMENT RUBBLE MASONRY

SIZE OF PIPE	WIDTH OF WALL	HEIGHT OF WALL	QUANTITIES IN ONE HEADWALL
D	W	H	CU. YDS.
12"	4'-6"	3'-6"	1.33
15"	4'-9"	3'-9"	1.48
18"	5'-0"	4'-0"	1.64
24"	5'-6"	4'-6"	1.99
30"	6'-0"	5'-0"	2.34
36"	6'-6"	5'-6"	2.72

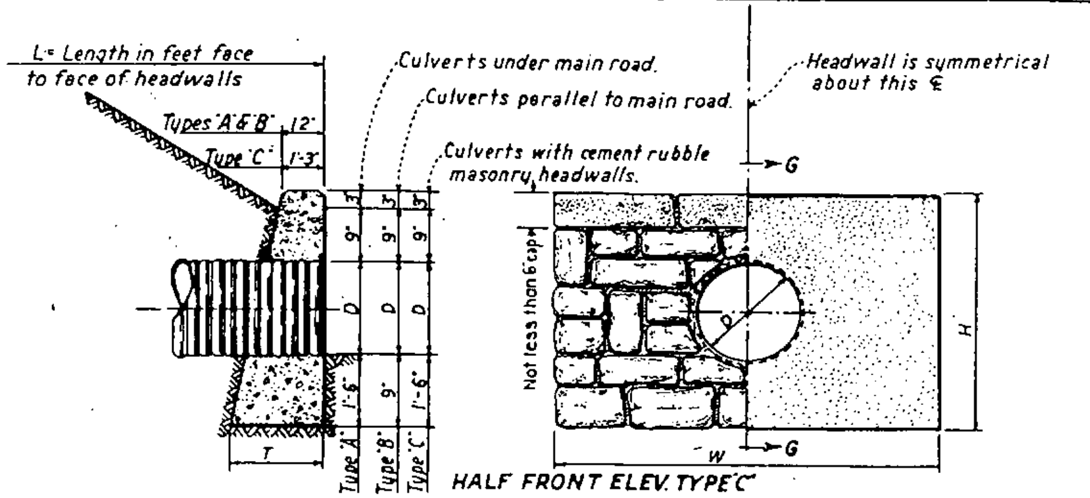
NOTE: Backwall to be eliminated and end walls connected to back slope where ordered by the Engineer. Floor slab is to be extended with side walls if in common material and is to be omitted when inlet is in rock. Actual quantities involved in such operation shall be allowed and paid for. Increases in plan quantities must be covered by work order.



ELEVATION

END VIEW

INTERCEPTING HEADWALLS



HALF FRONT ELEV. TYPE "C"

SECTIONAL ELEV. G-G

HALF FRONT ELEV. TYPE "A" & "B"

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
TYPE "A"	12"	4'-6"	3'-6"	1'-5"	1.4 CU. YDS.	16 GAGE	L = LIN. FT.	
	15"	5'-3"	3'-9"	1'-6"	1.8 DO	16 DO	L = DO	
	18"	6'-0"	4'-0"	1'-7"	2.2 DO	16 DO	L = DO	
	24"	7'-6"	4'-6"	1'-10"	3.5 DO	14 DO	L = DO	
	30"	9'-0"	5'-0"	2'-0"	4.5 DO	14 DO	L = DO	
	36"	10'-6"	5'-6"	2'-2"	6.0 DO	12 DO	L = DO	
	42"	12'-0"	6'-0"	2'-5"	8.0 DO	12 DO	L = DO	
	48"	13'-6"	6'-6"	2'-7"	10.0 DO	12 DO	L = DO	
TYPE "B"	12"	4'-0"	2'-9"	1'-0"	0.8 CU. YDS.	16 GAGE	L = LIN. FT.	
	15"	4'-3"	3'-0"	1'-2"	0.9 DO	18 DO	L = DO	
	18"	4'-6"	3'-3"	1'-3"	1.1 DO	16 DO	L = DO	
	24"	5'-0"	3'-9"	1'-5"	1.2 DO	14 DO	L = DO	
	30"	5'-6"	4'-3"	1'-7"	1.8 DO	14 DO	L = DO	
TYPE "C"	12"	4'-6"	3'-6"	2'-0"		16 GAGE	L = LIN. FT.	1.8 CU. YDS.
	15"	5'-3"	3'-9"	2'-0"		16 DO	L = DO	2.2 DO
	18"	6'-0"	4'-0"	2'-1"		16 DO	L = DO	2.8 DO
	24"	7'-6"	4'-6"	2'-4"		14 DO	L = DO	4.1 DO
	30"	9'-0"	5'-0"	2'-6"		14 DO	L = DO	5.6 DO
	36"	10'-6"	5'-6"	2'-8"		12 DO	L = DO	7.4 DO
	42"	12'-0"	6'-0"	2'-10"		12 DO	L = DO	9.2 DO
	48"	13'-6"	6'-6"	3'-0"		12 DO	L = DO	11.5 DO

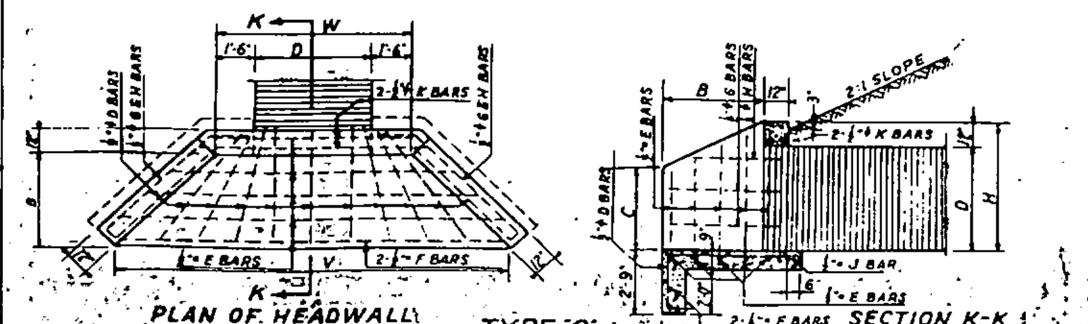
TYPE	D	W	H	V	B	C	UNIT	CONCRETE CLASS "A"	CORRUGATED METAL PIPE		UNIT	REINFORCING STEEL
TYPE "G"	54"	7'-6"	5'-6"	15'-6"	4'-0"	3'-6"	CU. YDS.	12.6 *	12 GAGE	L = LIN. FT.	LBS.	446 ▲
	60"	8'-0"	6'-0"	16'-0"	4'-0"	4'-0"	DO	13.5 *	10 DO	L = DO	DO	482 ▲
	66"	8'-6"	6'-6"	16'-6"	4'-0"	4'-6"	DO	14.4 *	10 DO	L = DO	DO	498 ▲
	72"	9'-0"	7'-0"	19'-0"	5'-0"	4'-6"	DO	17.9 *	10 DO	L = DO	DO	610 ▲
	78"	9'-6"	7'-6"	19'-6"	5'-0"	5'-0"	DO	18.9 *	8 DO	L = DO	DO	630 ▲
	84"	10'-0"	8'-0"	20'-0"	5'-0"	5'-6"	DO	20.0 *	8 DO	L = DO	DO	684 ▲

▲ REINFORCING STEEL QUANTITIES ARE FOR TWO HEADWALLS

* CONCRETE QUANTITIES ARE FOR TWO HEADWALLS

BAR LIST FOR TYPE "G"

DIAMETER OF PIPE		54"	60"	66"	72"	78"	84"	BENDING DIAGRAM
D BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	B + 1'-2"
	NUMBER	11	11	11	12	12	13	
	LENGTH	7'-7"	7'-7"	7'-7"	8'-7"	8'-7"	8'-7"	
E BARS ½" ϕ	SPACING	12"	12"	12"	12"	12"	12"	V + 1'-6" TO W + 1'-6" BY 2'-0" DECREASE
	NUMBER	1 EACH	1 EACH	1 EACH	1 EACH	1 EACH	1 EACH	
	LENGTH	24'-0" TO 20'-0"	25'-6" TO 21'-6"	27'-0" TO 23'-0"	29'-6" TO 24'-6"	31'-0" TO 26'-0"	32'-6" TO 27'-6"	
	DECREASE	BY 12"	BY 12"	BY 12"	BY 12"	BY 12"	BY 12"	
F BARS ½" ϕ	SPACING	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	V
	NUMBER	2	2	2	2	2	2	
	LENGTH	15'-6"	16'-0"	16'-6"	19'-0"	19'-6"	20'-0"	
G BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	X = 5'-7" FOR 54", 60" & 66" DIAMETER; X = 7'-0" FOR 72", 78" & 84" DIA.; X FOR G BARS, Y FOR H BARS; 1'-5"
	NUMBER	4	6	6	6	6	6	
	LENGTH	7'-0"	7'-0"	7'-0"	8'-5"	8'-5"	8'-5"	
H BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	
	NUMBER	2	2	2	2	2	2	
	LENGTH	5'-11"	5'-11"	5'-11"	5'-11"	5'-11"	5'-11"	
J BARS ½" ϕ	SPACING	12"	12"	12"	12"	12"	12"	Y = 4'-6" FOR H BARS
	NUMBER	1	1	1	1	1	1	
	LENGTH	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	
K BARS ½" ϕ	SPACING	8"	8"	8"	8"	8"	8"	W + 1'-0"
	NUMBER	2	2	2	2	2	2	
	LENGTH	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	

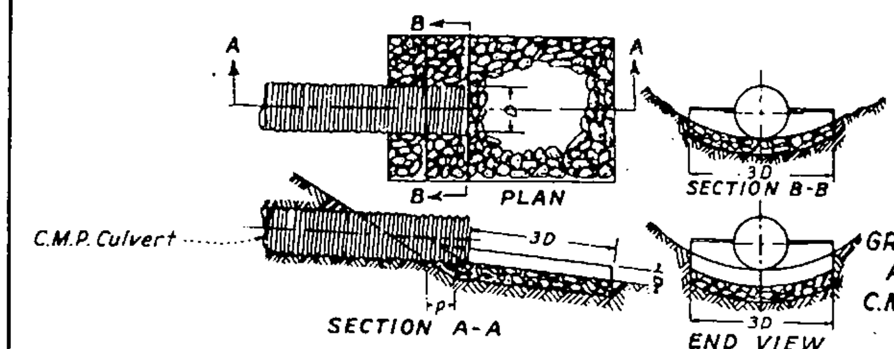


PLAN OF HEADWALL

TYPE "G"

SECTION K-K

STD. HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS



SECTION A-A

END VIEW

STANDARD GROUTED RUBBLE APRON FOR C.M.P. CULVERTS

SQUARE YARDS GROUTED RUBBLE SLOPE & DITCH PAVING "1 FOOT THICK"														
FILL SLOPE	D	15"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
	P / Q	7½"	9"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
1½:1	2'-0"	3	4	6	9	12	17	21	27	33	39	46	54	62
2:1	2'-0"	3	4	7	10	13	18	22	28	34	41	49	57	66
3:1	3'-0"	3	4	7	11	15	20	25	31	38	45	54	63	72
4:1	4'-0"	3	5	8	12	16	22	28	34	42	50	59	69	79

12131415161718192021222324252627282930 31 123456789 10 11
JUN 1941
ENG. DIV. 2
S. H. D.

NOTE: Mechanical Tamping as provided under Item 14 of the specifications shall be applied over such areas as shown on the plans or as ordered by the Engineer.

GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted June 1-1940.
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 tagged with the station number & letter designation
Secondary bars when spliced 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 culvert is 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
GROUTED RUBBLE APRONS
FOR C.M.P. CULVERTS

Designed DGB-GHD	Approved by [signature] Bridge Engineer
Made by LS-AVR.	
Checked GHD-WMR	Date: April 27th 1937.

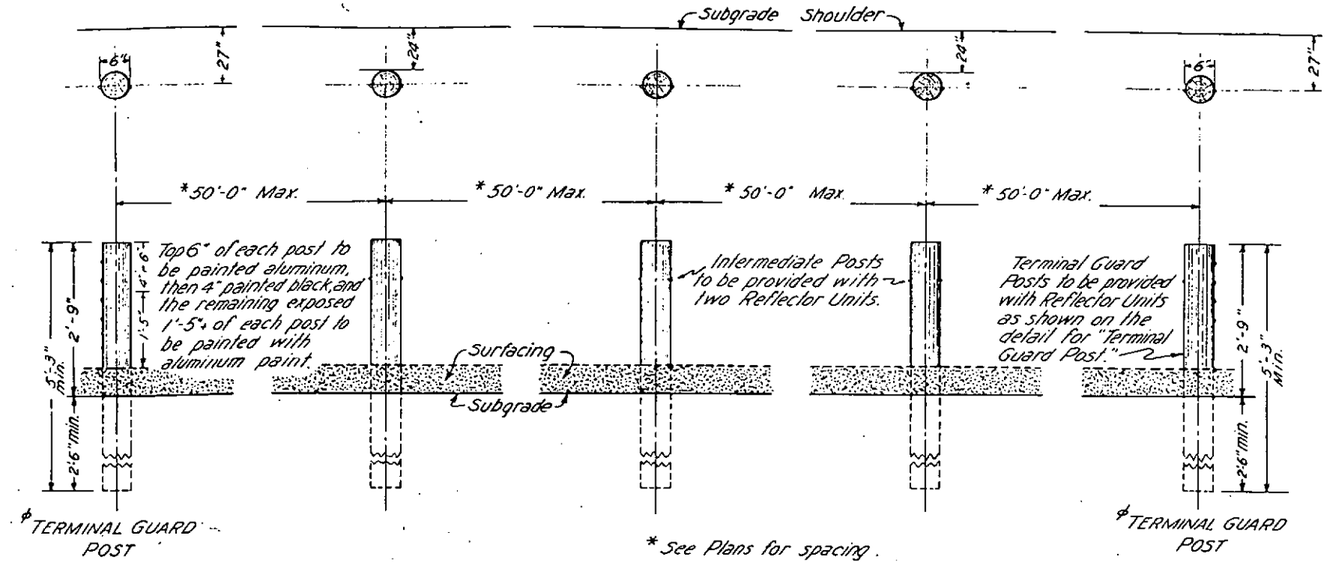
REVISIONS

Rev. 12-19-39-P.B.B. Length and treatment of posts.

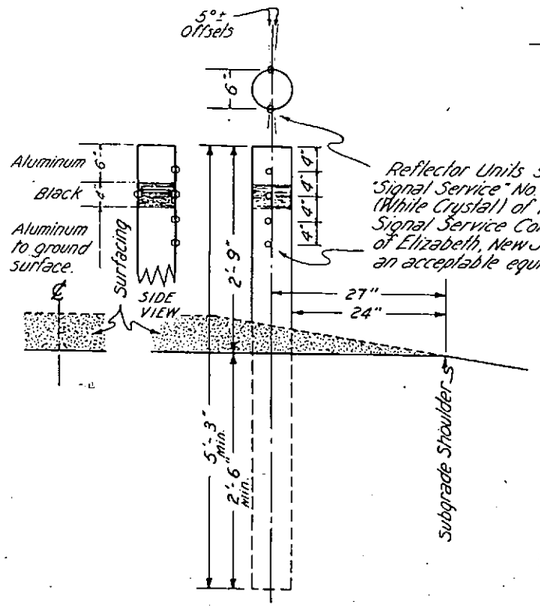
STANDARD M-19-B

Rev. 6-28-40-A.Z.- 1940 Specs. & Location of posts.
Rev. 10-9-40-P.B.B.- Painting & Refl. Units.
Rev. 2-24-41-P.B.B.- Terminal Guard Post Placement.

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	3890	12	

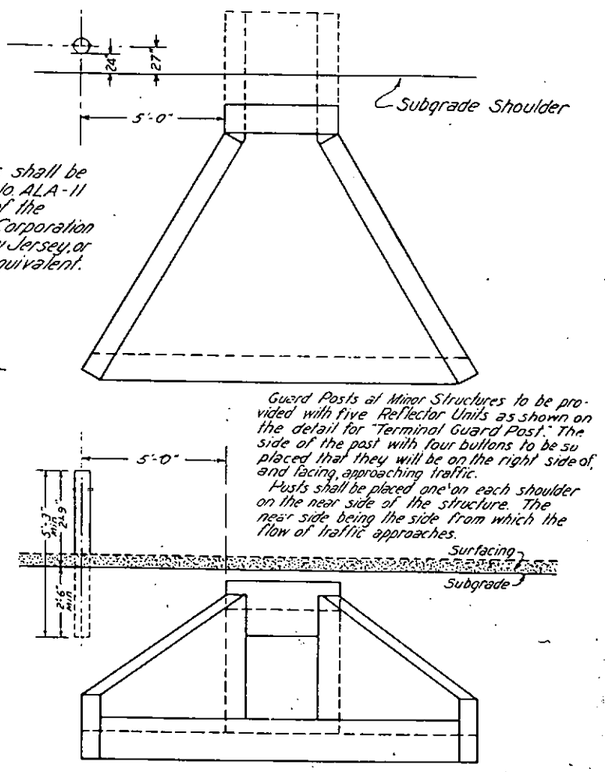


SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



TERMINAL GUARD POST

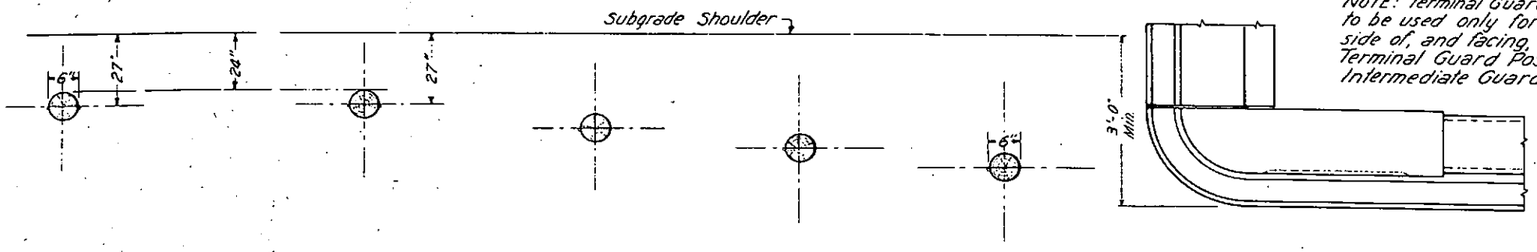
NOTE: Terminal Guard Posts as detailed above to be used only for the near Post on the right side of, and facing, approaching traffic. All other Terminal Guard Posts to be identical with Intermediate Guard Posts.

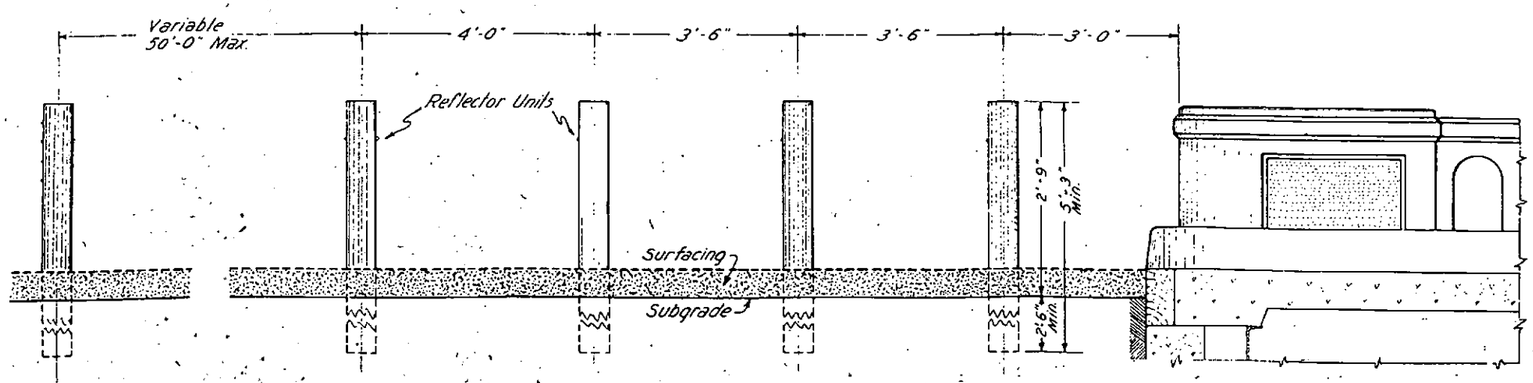


Guard Posts at Minor Structures to be provided with five Reflector Units as shown on the detail for "Terminal Guard Post." The side of the post with four buttons to be so placed that they will be on the right side of, and facing, approaching traffic.

Posts shall be placed one on each shoulder on the near side of the structure. The near side being the side from which the flow of traffic approaches.

SHOWING PLACEMENT AT MINOR STRUCTURES





SHOWING PLACEMENT AT BRIDGE APPROACHES

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 end and two Units on the fourth Post.

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted on June 1, 1940.

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, thoroly seasoned and dry, with square tops.

All wood posts shall be set and tamped 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 300 feet.

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

Posts shall be given a standard pressure Creosote treatment and then be thoroughly steam-cleaned in accordance with requirements of specifications.

JUN 1941
ENG. DIV. 2
S. H. D.

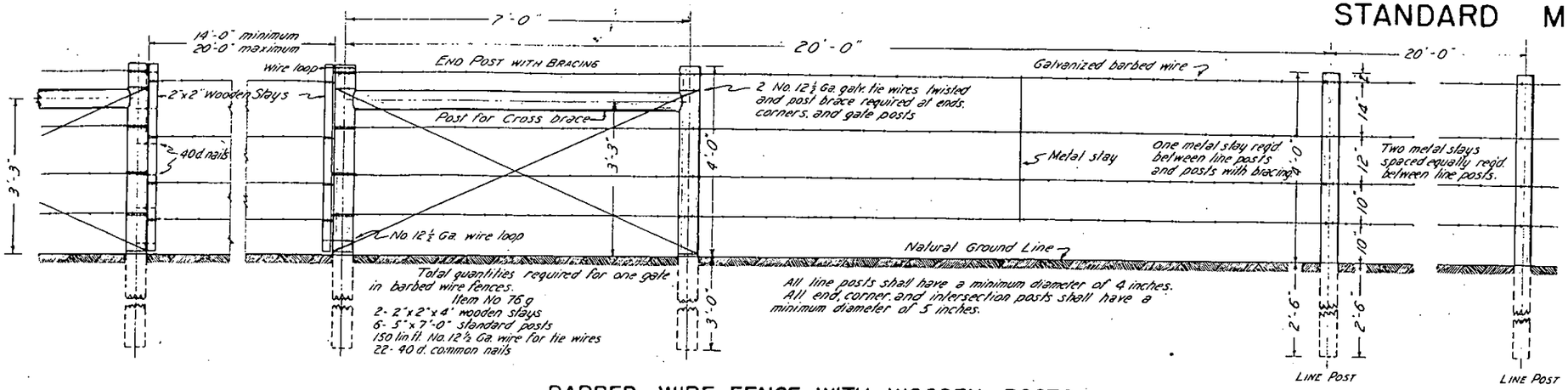
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
TIMBER GUARD POSTS

Designed by R.E.L.
Made by P.B.B.
Checked by
Approved by
Chief Draftsman
Date 7-5-1939

STANDARD M-24-G

FED. ROAD DIST. NO.	STATE	F.A.P.	SHEET NO.	TOTAL SHEETS
3	COLO.	369(1)	13	

Rev. 6-20-40 - A.I. - 1940 Specs.

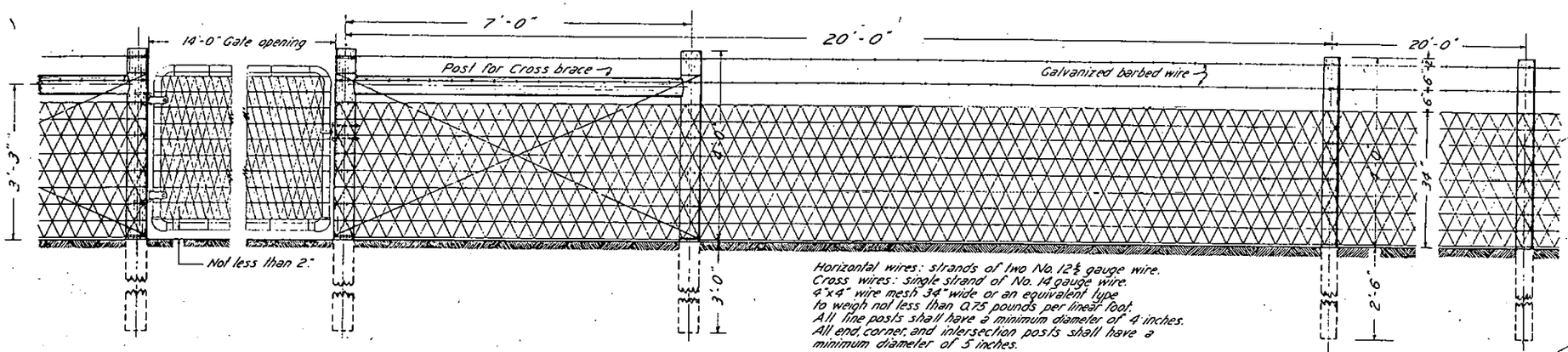


Total quantities required for one gate in barbed wire fences.
Item No. 76 g
2- 2"x2"x4' wooden stays
6- 5"x7'-0" standard posts
150 lin. ft. No. 12½ Ga. wire for tie wires
22- 40 d. common nails

All line posts shall have a minimum diameter of 4 inches.
All end, corner, and intersection posts shall have a minimum diameter of 5 inches.

BARBED WIRE FENCE WITH WOODEN POSTS

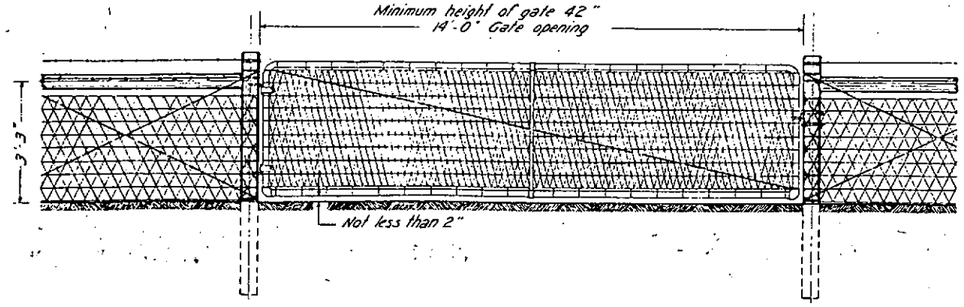
Item No. 76 a



Horizontal wires: strands of two No. 12½ gauge wire.
Cross wires: single strand of No. 14 gauge wire.
4"x4" wire mesh 34" wide or an equivalent type to weigh not less than 0.75 pounds per linear foot.
All line posts shall have a minimum diameter of 4 inches.
All end, corner, and intersection posts shall have a minimum diameter of 5 inches.

COMBINATION WIRE FENCE WITH WOODEN POSTS

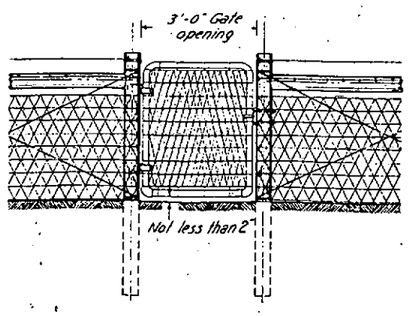
Item No. 76 d



DRIVEWAY GATE

Item No. 76 h

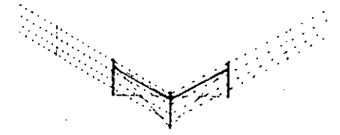
Gate complete with hinges and latch to weigh not less than 70 lbs.
2"x4" single strand wire mesh filler or an equivalent type.
Width of mesh approximately 40 inches.
Horizontal wires No. 10 gauge.
Cross wires No. 12½ gauge.
Galvanized metal latch and hinges.
Minimum 1" dia. galv. pipe frame or an equivalent.



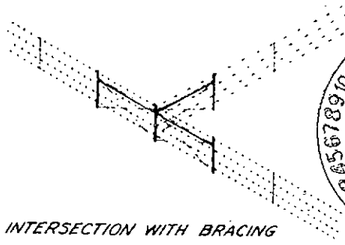
WALK GATE

Item No. 76 i

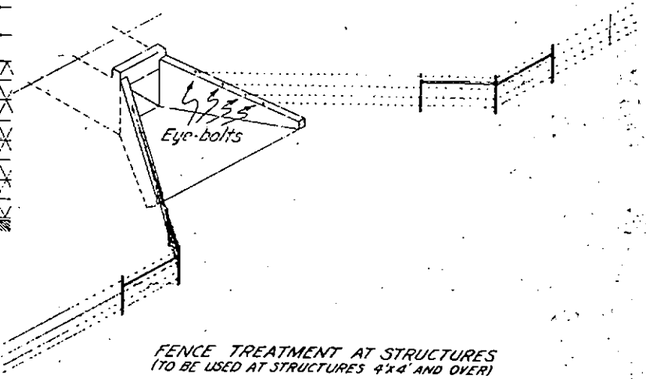
Gate complete with hinges and latch to weigh not less than 19 pounds.
2"x4" single strand wire mesh filler or an equivalent.
Width of mesh approximately 40 inches.
Horizontal wires No. 10 gauge.
Cross wires No. 12½ gauge.
Galvanized metal latch and hinges.
Minimum ¾ dia. galv. pipe frame or an equivalent.



CORNER POST WITH BRACING



FENCE INTERSECTION WITH BRACING



FENCE TREATMENT AT STRUCTURES
(TO BE USED AT STRUCTURES 4'x4' AND OVER)

End post with bracing shall conform to details shown above. (Three posts regd.)
Corner post with bracing shall consist of two end posts with bracing except that the post at the intersection of the two fence lines shall be common to both lines. (Five posts required.)
Fence intersection with bracing shall consist of three end posts with bracing except that the post at the intersection of the three fence lines shall be common to all three lines. (Seven posts regd.)

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.

Barbed wire shall be of standard make, not lighter than No. 12½ gauge, galvanized, with two point barb spaced not more than five inches apart.

Wire mesh must be galvanized and not lighter than shown and noted on this plan.

Wire mesh used in driveway gates shall be painted with an approved waterproof asphalt or mineral paint.

Staples shall be at least 1½" long, made of No. 9 ga. wire base galvanized, 8 staples required per post for barbed wire fence and 14 staples per post for combination wire fence.

Cross braces to be securely nailed with four 40d. nails at each post.

End post with bracing to be used at all gates and fence ends.

Corner post with bracing to be used at all corners and angles in fences.

Fence intersection with bracing to be used at all intersecting fences.

At all structures of 4'x4' or over the fence shall be ended at eye-bolts in the wings of the structure. Where the type of construction prohibits the use of eye-bolts, an end post with bracing shall be used.

Eye-bolts are to be made from ½" round iron bars with a minimum of 6" of body length embedded in the concrete and a minimum of 1" inside eye diameter.

All wooden posts shall be made from seasoned, straight, sound Lodgepole Pine or Southern Yellow Pine, to be peeled and tops to be sawed off square before pressure treatment.

All posts shall be pressure treated with creosote in conformity with requirements given in the Specifications.

JUN 1941
ENG. DIV. 2
S. H. D.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
WIRE FENCES
TREATED
WOODEN POSTS

Designed by R.F.L.	Approved by
Made by P.B.B.	
Checked by R.F.L.	Date: Apr. 27, 1939

SCALE OF LETTERING

STANDARD M-10-A

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369CD	14	

Revised 3-11-1936 A.G.K. Changed to 1935 Specifications.
Revised 6-1-40 G.H.D. Changed to 1940 Specifications.

A B C D E F G H I J

K L M N O P Q R S T

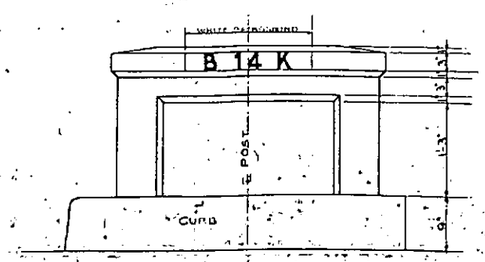
U V W X Y Z

I 14 K

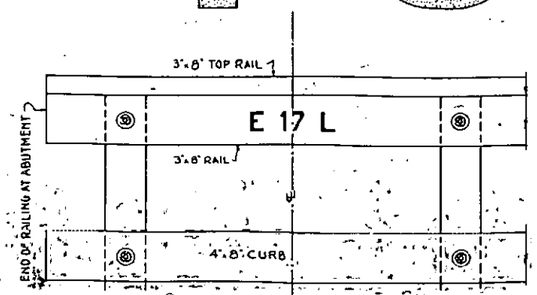
3" 3" 1½" 3"

SAMPLE BRIDGE NUMBER

1 2 3 4 5 6 7 8 9 0 .



TYPICAL CONCRETE ENDPOST.



TYPICAL TIMBER WING

General Notes

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT ADOPTED JUNE 1-1940.

THE STRUCTURE NUMBER SHALL BE STENCILED ON THE RIGHT HAND SIDE OF EACH BRIDGE END AS SHOWN ON THIS STANDARD AND AS SPECIFIED.

THE CORRECT NUMBER FOR EACH BRIDGE IS SHOWN IN THE LOWER RIGHT HAND CORNER OF THE DETAIL SHEETS FOR THAT PARTICULAR BRIDGE.

THE SIZE, SHAPE AND SPACING OF THE LETTERS AND FIGURES SHALL BE IDENTICAL WITH THE FULL SIZE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

BEFORE STENCILING THE NUMBER ON THE BRIDGE, THE SURFACE MUST BE THOROLY CLEANED. A PROPER WHITE BACKGROUND SHALL BE PAINTED ON CONCRETE SURFACES. ON TIMBER HANDRAILS THE WHITE PAINT USED ON THE BRIDGE WILL BE SATISFACTORY. ON CONCRETE ENDPOSTS THE DRY CONCRETE SURFACE SHALL BE PROPERLY SIZED BEFORE PLACING THE WHITE RECTANGLE, UNLESS AN APPROVED WHITE CONCRETE PAINT IS USED.

TWO COATS OF ACCEPTABLE WHITE PAINT SHALL BE APPLIED TO THE CONCRETE IN A NEAT RECTANGULAR SHAPE AND EXTEND THREE INCHES BEYOND THE LIMITS OF THE STRUCTURE NUMBER.

AFTER THIS WHITE BACKGROUND HAS DRIED SUFFICIENTLY, THE CORRECT STRUCTURE NUMBER SHALL BE CAREFULLY STENCILED ON IT WITH TWO COATS OF STANDARD "SECOND FIELD" COAT DARK" AS SPECIFIED UNDER ITEM 41 "STEEL BRIDGES. THE BRACES OF THE STENCILED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND, TO MAKE SOLID FIGURES. SUFFICIENT TIME BETWEEN SUCCESSIVE COATS SHALL BE ALLOWED TO PERMIT THE PRECEDING COAT TO DRY.

THIS WORK WILL NOT BE PAID FOR AS A SEPERATE ITEM. COMPENSATION SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS.

APPROVED JUN 1941 ENG. DIV. 2 S. H. D.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD STRUCTURE NUMBER LETTERING

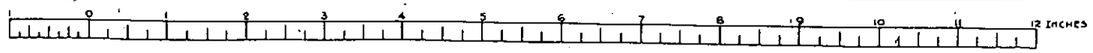
Across ... Sec. ... T. ... R. ...
Near ...

Designed by G.H.D.
Made by G.H.D.
Check: Design
Check Detail

Approved by P. A. Bailey
Bridge Engineer
Date: Feb. 6, 1941

STANDARD M-10-A

STRUCTURE NO.



SCALE OF LETTERING

STANDARD M-14-A

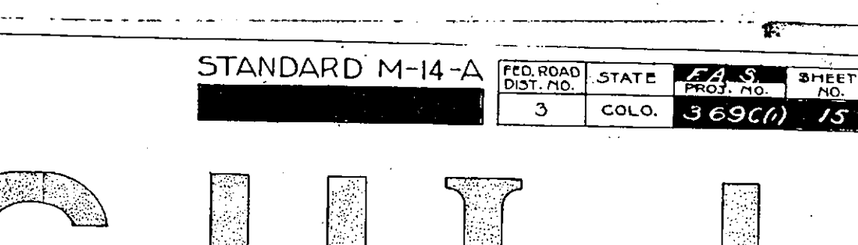
FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369(1)	15	

A B C D E F G H I J

K L M N O P Q R S T

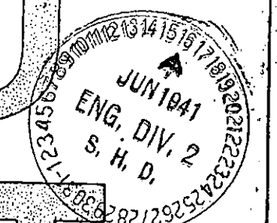
U V W X Y Z

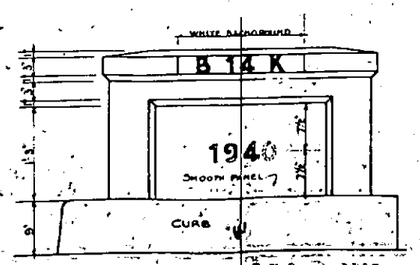
1 2 3 4 5 6 7 8 9 0 .



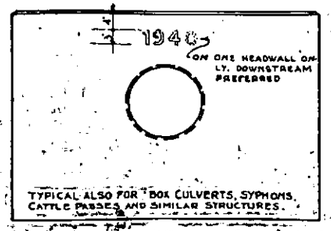
SAMPLE YEAR NUMBER

SECTION

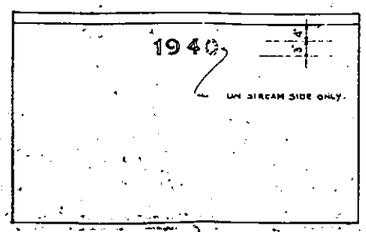




TYPICAL CONCRETE ENDPOST



TYPICAL CULVERT HEADWALL



TYPICAL RETAINING WALL

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JUNE 1, 1940.

THE SIZE, SHAPE AND SPACING OF THE NUMBERS SHALL BE IDENTICAL WITH THE FULL SIZE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

THIS WORK WILL NOT BE PAID FOR AS A SEPARATE ITEM. COMPENSATION SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS.

THE YEAR NUMBER SHALL BE RECESSED INTO THE PANEL OF THE ENDPOST AT THE RIGHT HAND SIDE OF EACH BRIDGE END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS, SYPHONS, RETAINING WALLS ETC. A MINIMUM OF 3/8" AS SHOWN.

THE YEAR NUMBER FOR EACH STRUCTURE SHALL CORRESPOND WITH THE PARTICULAR YEAR IN WHICH THE CONCRETE IS POURED.

NUMBERS TO BE MADE OF WOOD, METAL OR ANY OTHER SUITABLE MATERIAL AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED.

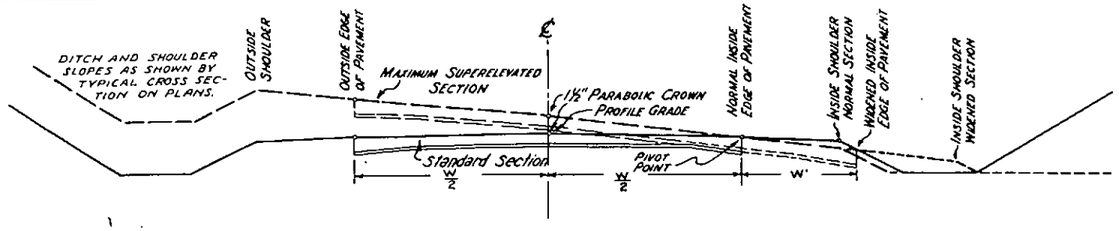
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD STRUCTURE
YEAR NUMBER MARKING.

Designed by O.H.D.	Approved by Rd Bailey
Made by O.H.D.	Bridge Engineer.
Check Design	Date: June 1st 1940.
Check Detail	

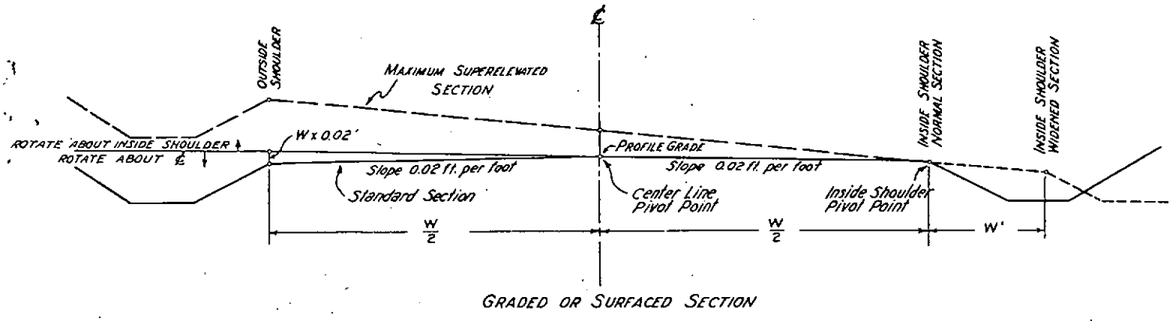
STANDARD M-1-8

FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	F.A.S. 369(C)	16

Rev. 11-2-38 P.B.B. Widening Transition.



PAVEMENT SECTION

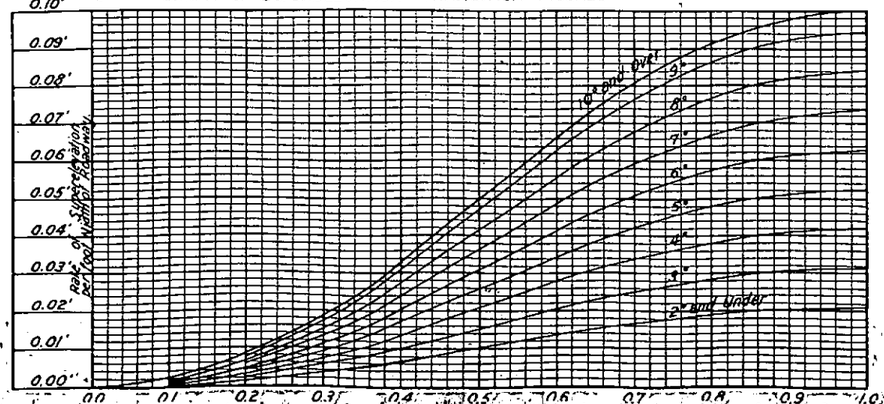


GRADED OR SURFACED SECTION

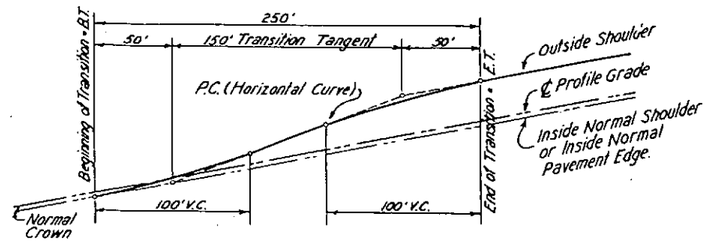
SUPERELEVATION AND WIDENING TABLES

DISTANCE FROM B.T. (PROPORTION)	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	0.02056	0.02100
3°	0.00066	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
4°	0.00088	0.00350	0.00788	0.01400	0.02100	0.02800	0.03413	0.03850	0.04113	0.04200
5°	0.00109	0.00438	0.00984	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° and Over	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



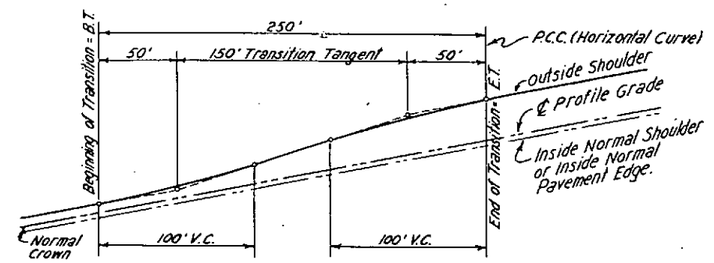
Proportion of Total Length of Transition including Vertical Curves (Normally 250 ft.)



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

The transition in this case, from crowned section to superelevated 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 superelevation at a point 100 ft. inside the curve.



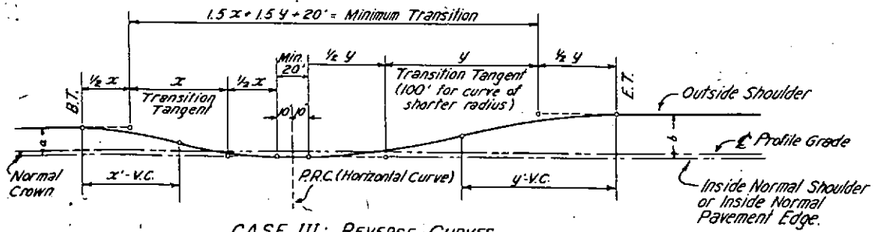
CASE II: COMPOUND CURVE

NOTE: CASE II

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

Superelevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie 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 superelevated 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 superelevation of the respective curves.

EXAMPLE: Let a represent the amount of superelevation on 1st curve;
" b " " " " " 2nd "
" x " " " " transition tangent on 1st "
" y " " " " " 2nd "
then, a : b = x : 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.R.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.

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 1½" 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 superelevation 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 or 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 superelevation slope.

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

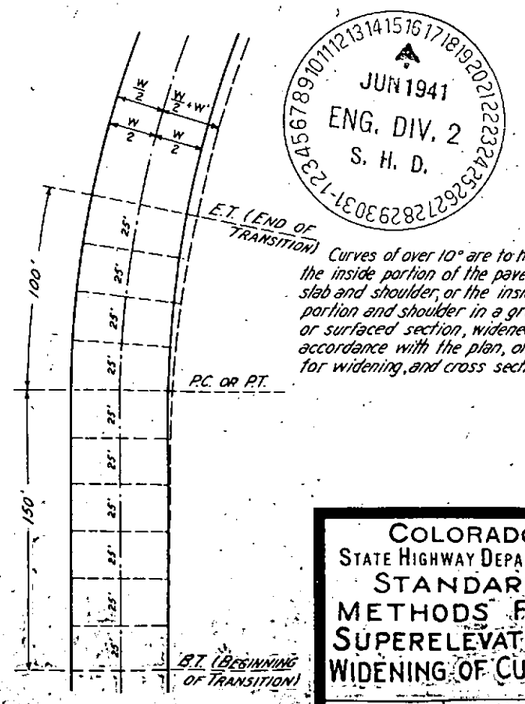
The rate of superelevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

The full superelevation per foot width of roadway rate for a given degree of curvature is

0.0105 ft. x Degree of Curvature.

The maximum superelevation 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 this standard sheet shall be covered by appropriate notes included with curve data on plans.



GENERAL PLAN OF WIDENING

Curves of over 10° are to have the inside portion of the pavement slab and shoulder, or the inside portion and shoulder in a graded or surfaced section, widened in accordance with the plan, offsets for widening, and cross sections.

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD METHODS FOR SUPERELEVATION & WIDENING OF CURVES

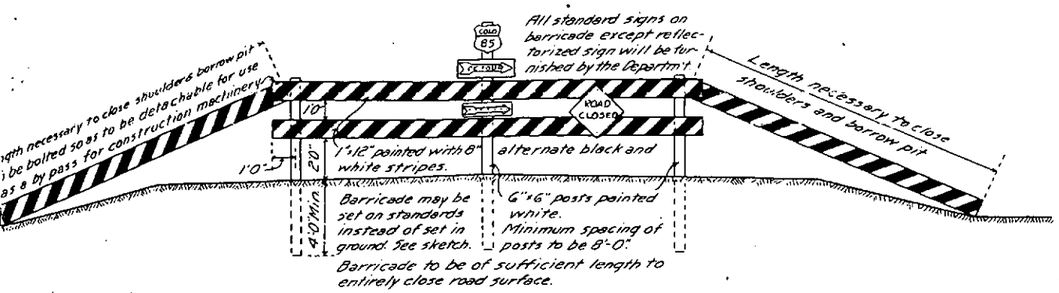
Designed by R.E.L.
Made by P.B.B.
Checked by F.E.S. & P.M.
Approved by J. Marshall
Date FEB. 23RD 1937

STANDARD M-2-B

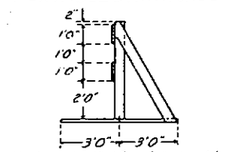
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO	3690(6)	17	

Revised 4-1-37 A.D.R. Changed to 1937 Specifications.
Revised 8-18-39 A.Z. Changed side drain note.
Revised 12-1-39 A.Z. Changed typical plans for side approach roads.
Revised 2-19-40 A.Z. Changed takeoff grades for side approach roads.
Rev. 6-28-40-A.Z.-1940 Specs.

DETAILS OF PERMANENT BARRICADE

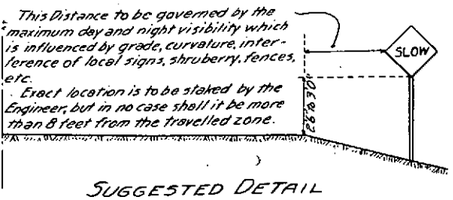


END VIEW OF PORTABLE BARRICADE



Posts to be 6"x6" painted white. Base and brace to be 2"x6", painted white, and nailed with 12d nails. Base to be weighted if necessary for stability.

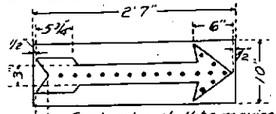
POSITION OF SIGNS RELATIVE TO ROADBED



This Distance to be governed by the maximum day and night visibility which is influenced by grade, curvature, interference of local signs, shrubery, fences, etc.

Exact location is to be staked by the Engineer, but in no case shall it be more than 8 feet from the travelled zone.

SUGGESTED DETAIL OF REFLECTORIZED ARROW

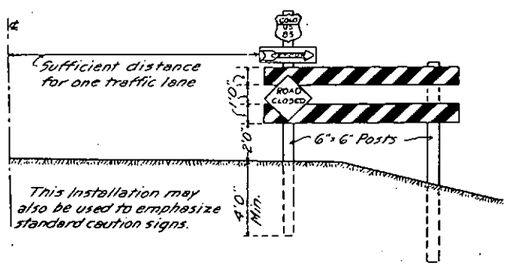


Contractor shall be required to have at least two such arrows for use on barricades at the ends of each project.

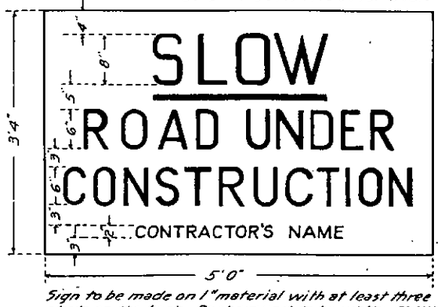
Reflector Buttons and Sign shall be subject to Department approval. Reflector Buttons shall be Signal Service ALA II (white crystal) or suitable equivalent.

Barricades to be placed as construction conditions require.

DETAILS OF PARTIAL BARRICADE



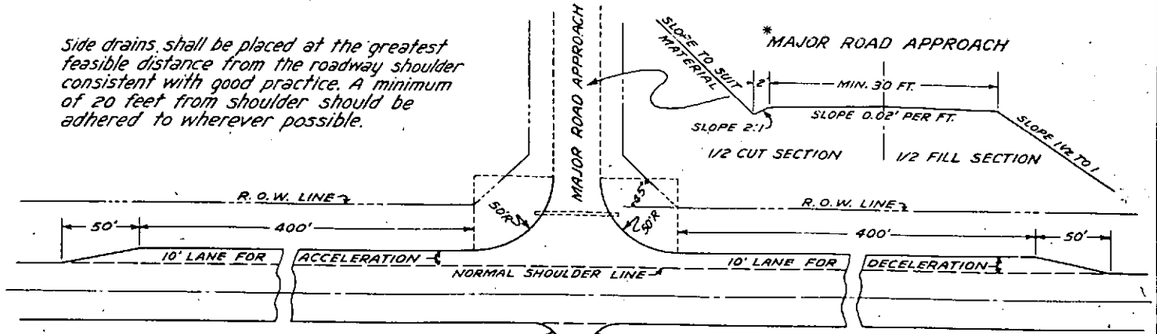
DETAILS OF ROAD UNDER CONSTRUCTION SIGN



Sign to be made on 1" material with at least three cleats on the back. Background to be white, SLOW and underline to be red, and other lettering to be black. Sign to be set on 2-6"x6" posts 4 ft. in the ground.

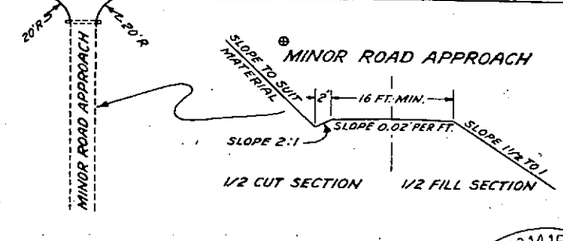
TYPICAL PLANS FOR SIDE APPROACH ROADS

Side drains shall be placed at the greatest feasible distance from the roadway shoulder consistent with good practice. A minimum of 20 feet from shoulder should be adhered to wherever possible.

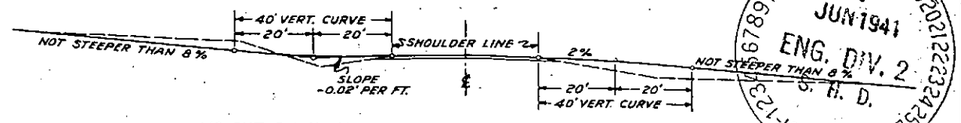


*Major Road Approaches shall be used only where indicated in structure notes on plans.

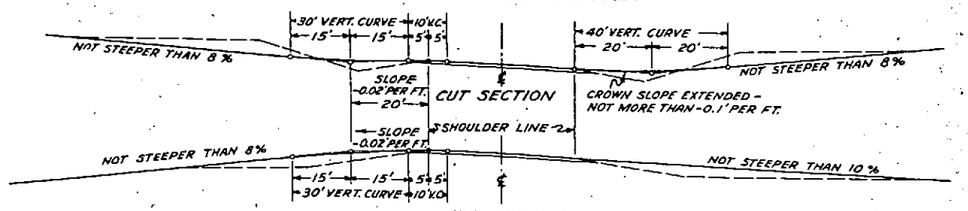
⊕Minor Road Approaches shall be used at all places which are not indicated as "Major Road Approaches." The width of crowned section shall not be less than the existing crowned width of the approaching road, but in no case shall it be less than 16 feet.



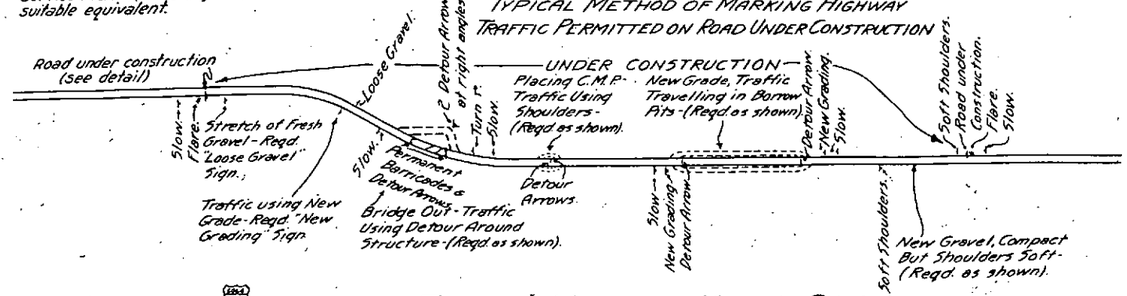
STANDARD CROWNED SECTION



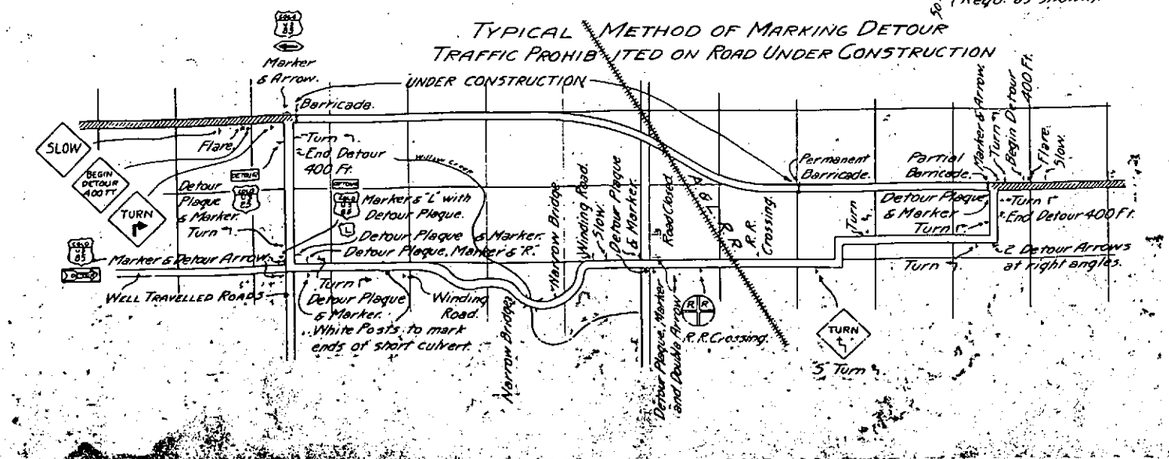
SUPERELEVATED SECTION



TYPICAL METHOD OF MARKING HIGHWAY TRAFFIC PERMITTED ON ROAD UNDER CONSTRUCTION



TYPICAL METHOD OF MARKING DETOUR TRAFFIC PROHIBITED ON ROAD UNDER CONSTRUCTION



GENERAL NOTES ON APPROACHES

The maximum grades shown are to be the limiting grades for all except extreme cases.

When the length of the approach as determined by the intersection of these grades with the natural ground is such as to damage the Property so served, or cause unreasonable conditions, the grades may be modified.

In such cases, methods used, and maximum grades, shall be as indicated on the plans, or provided by work order.

GENERAL NOTES FOR ROADWAY CONSTRUCTION TRAFFIC SIGNS

All Work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted June 1-1940.

Whenever traffic is permitted on a road while under construction, the Contractor shall at all times adequately and appropriately mark any and all hazards on the Project with well painted, well maintained barricades, and standard caution and warning signs. The Contractor shall also mark with standard directional signs any places where the direction of the flow of traffic is not plain.

Whenever traffic is prohibited from a Project under construction, the Detour will be marked by the Department and the barricades at either end of the Project shall be erected and maintained by the Contractor.

All signs and barricades shall be immediately moved, added to, removed, or changed to appropriately mark hazards, or conditions altered, corrected, or changed by construction progress.

The Contractor shall furnish:

(1.) All barricade material. It shall always be well painted, as per sketch, and well maintained.
(2.) A reflectorized arrow of an approved type for each barricade at the ends of the Project, and at other barricades required where traffic is permitted on road under construction.
(3.) "SLOW - ROAD UNDER CONSTRUCTION" signs as required.
(4.) Any special signs the Department may deem necessary for the protection of traffic over the Project.
(5.) At least three (3) flares or torches for each barricade, and other flares to illuminate such signs as are called for on these plans, or as the Department may direct.

Flares or torches shall be placed between 3 and 5 feet ahead of the sign or object to be illuminated, and shall be kept burning from sunset to sunrise.

Costs of all of the foregoing materials and work by the Contractor shall be included in the original contract prices for the Project.

The Highway Department will furnish all standard signs not required to be furnished by the Contractor.

COLORADO
STATE HIGHWAY DEPARTMENT
TYPICAL
SIDE APPROACH ROADS
ROADWAY CONSTRUCTION
TRAFFIC SIGNS

Designed by J.S.M.
Made by S.D.L.
Check J.S.M.
Check K.A.K.

Approved by C.H. Marshall
Date: Aug. 20, 1935

REVISIONS

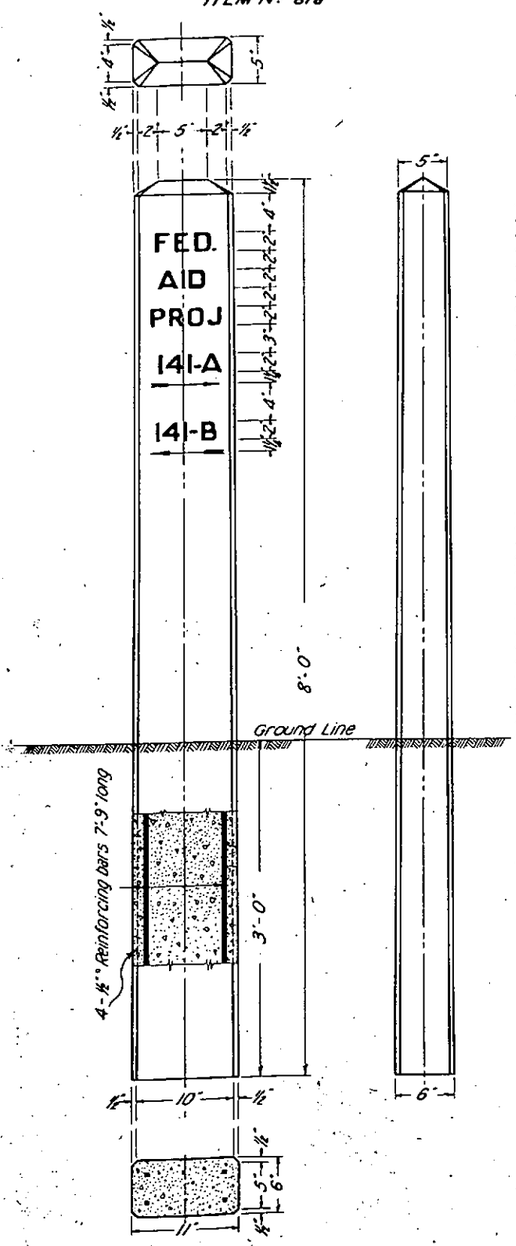
Rev. 6-28-40-A.Z.-1940 Specs.

STANDARD M-7-B

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	369(1)	18	

PROJECT MARKER POST

ITEM Nº 818



NOTES FOR PROJECT MARKER POSTS

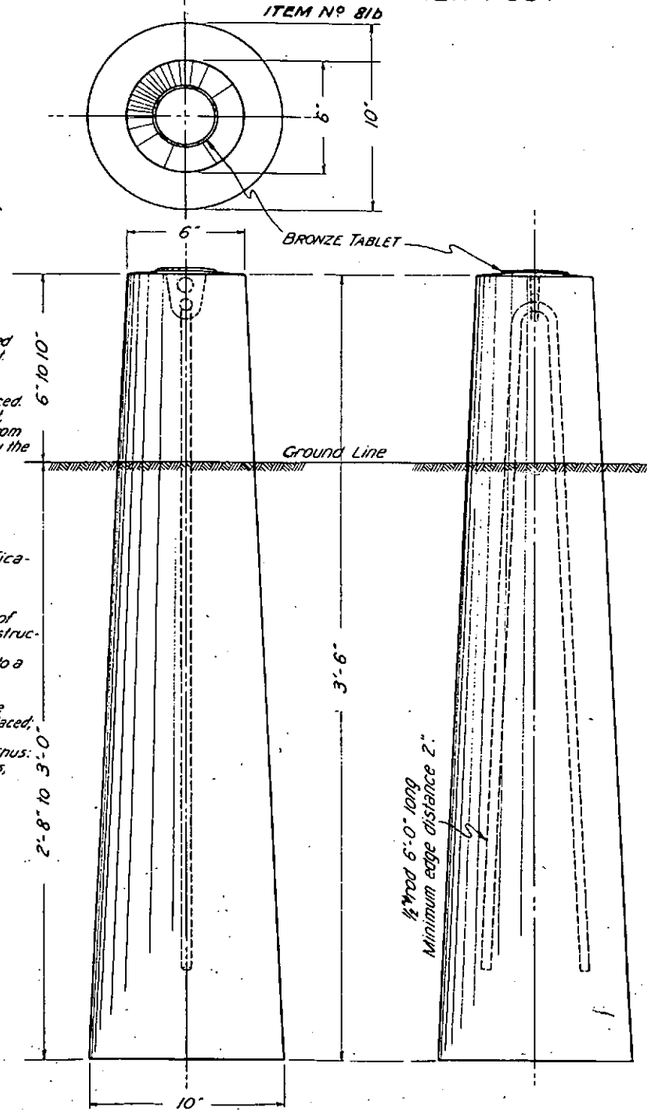
All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" concrete, except use White Portland Cement.
All exposed surfaces shall be rubbed free of form marks.
All letters and numbers shall be 2" plain upright black, painted or stenciled on the concrete with a good quality of black paint. See item Nº 41, "Second Field Coat - Dark."
Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed.
Post to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will indicate properly the projects to which it refers.

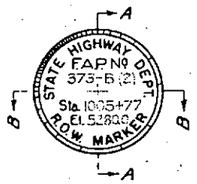
NOTES FOR R.O.W. MARKER POSTS

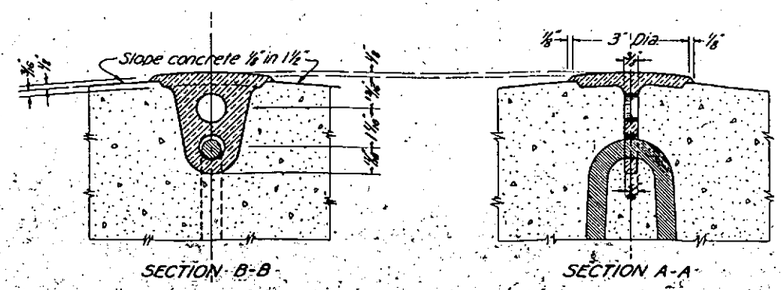
All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.
Posts shall be made of Class "A" concrete.
The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.
All exposed surfaces of the bronze tablet are to be ground to a smooth surface.
All letters are to be depressed a minimum of 1/8 inch.
Information on the bronze tablet indicated by pin lines is to be stamped in the field by the engineering party after post is placed; 3/8 inch letters and figures to be used.
Project designations on tablets shall be properly shown. Thus: F.A.P. Nº for Federal Aid Projects, "S.P.N.º" for State Projects, P.W.A. Nº for P.W.A. Projects, etc.

RIGHT OF WAY MARKER POST

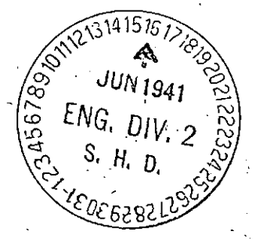
ITEM Nº 818





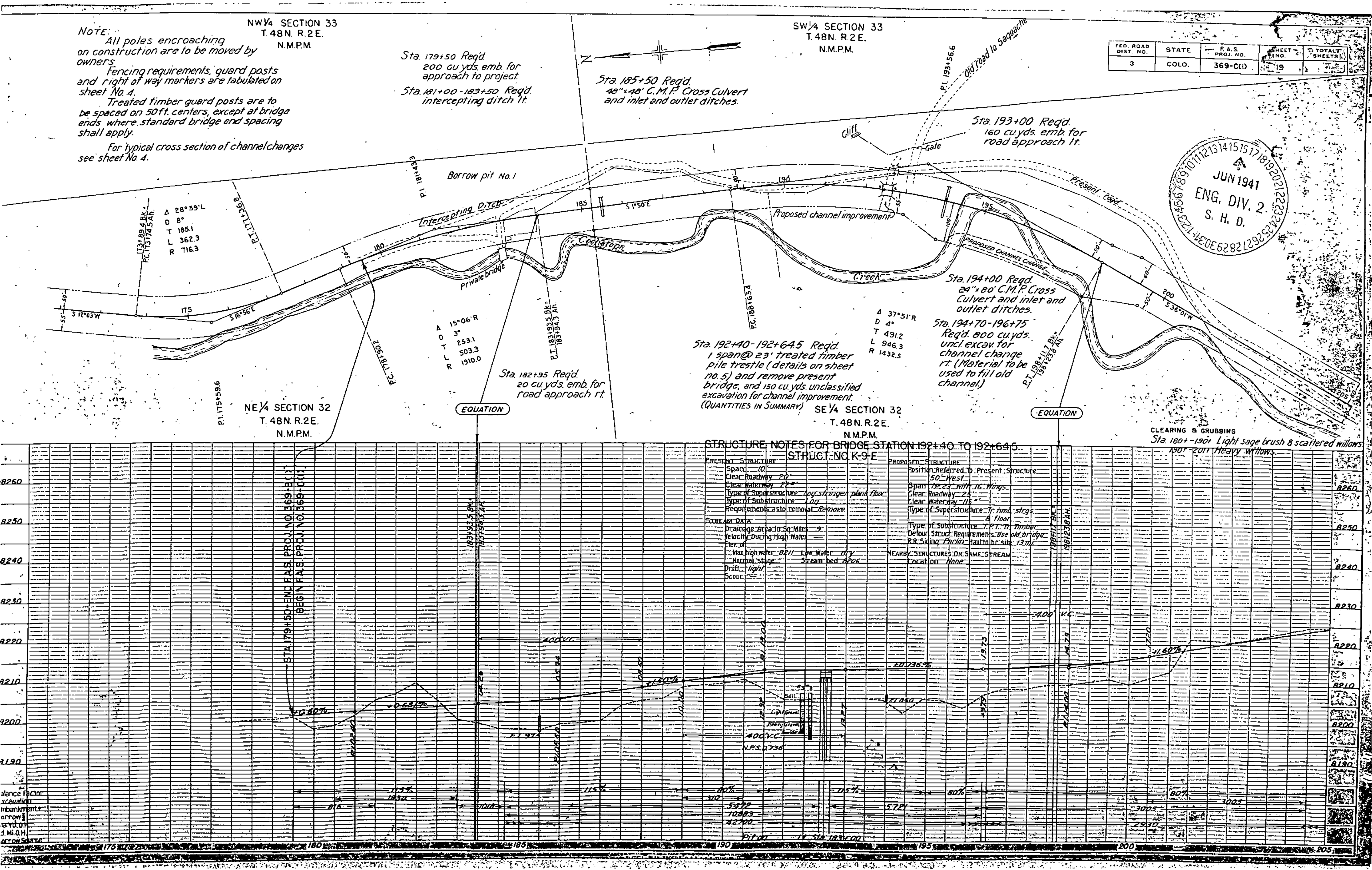


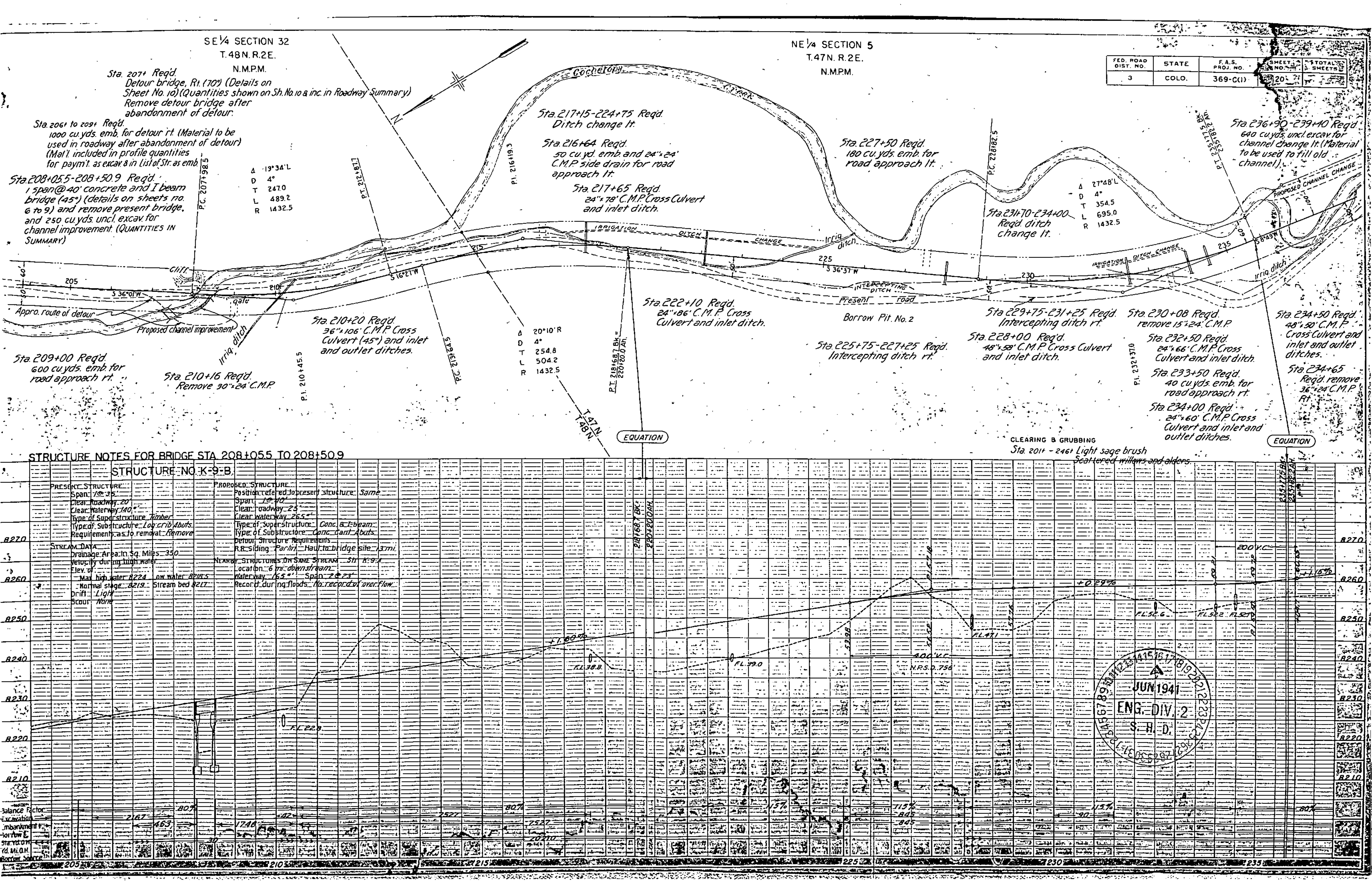
DETAIL OF BRONZE TABLET
FOR RIGHT OF WAY MARKER POST



COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
MARKER POSTS

Designed by R.E.L.
Made by F.F.S.
Checked by R.E.L.
Approved by
Date: Apr. 21 1939


FED. ROAD DIST. NO. 3
STATE COLO.
F.A.S. PROJ. NO. 369-C(1)
SHEET NO. 19
TOTAL SHEETS
NOTE:
All poles encroaching on construction are to be moved by owners.
Fencing requirements, guard posts and right of way markers are tabulated on sheet No. 4.
Treated timber guard posts are to be spaced on 50 ft. centers, except at bridge ends where standard bridge end spacing shall apply.
For typical cross section of channel changes see sheet No. 4.
NW1/4 SECTION 33 T.48N. R.2E. N.M.P.M.
SW1/4 SECTION 33 T.48N. R.2E. N.M.P.M.
NE1/4 SECTION 32 T.48N. R.2E. N.M.P.M.
SE1/4 SECTION 32 T.48N. R.2E. N.M.P.M.
Sta. 179+50 Req'd. 200 cu. yds. emb. for approach to project.
Sta. 181+00 - 183+50 Req'd. intercepting ditch lt.
Sta. 185+50 Req'd. 48"x48' C.M.P. Cross Culvert and inlet and outlet ditches.
Sta. 193+00 Req'd. 160 cu. yds. emb. for road approach lt.
Sta. 194+00 Req'd. 24"x80' C.M.P. Cross Culvert and inlet and outlet ditches.
Sta. 194+70 - 196+75 Req'd. 800 cu. yds. uncl. excav. for channel change rt. (Material to be used to fill old channel.)
Sta. 192+40 - 192+64.5 Req'd. 1 span @ 23' treated timber pile trestle (details on sheet no. 5) and remove present bridge, and 150 cu. yds. unclassified excavation for channel improvement. (QUANTITIES IN SUMMARY)
Sta. 182+95 Req'd. 20 cu. yds. emb. for road approach rt.
Old road to Saguache
Cliff
Gate
Present road
Borrow pit No. 1
Intercepting Ditch
Cochetopa Creek
Private bridge
Proposed channel improvement
PROPOSED CHANNEL CHANGE
Δ 28°59'L D 8° T 185.1 L 362.3 R 716.3
Δ 15°06'R D 3° T 253.1 L 503.3 R 1910.0
Δ 37°51'R D 4° T 491.2 L 946.3 R 1432.5
S 12°03'W
S 16°56'E
S 1°50'E
S 36°01'W
EQUATION
JUN 1941 ENG. DIV. 2 S. H. D.
CLEARING & GRUBBING
Sta. 180+ - 190+ Light sage brush & scattered willows
190+ - 201+ Heavy willows
STA. 179+50 - END F.A.S. PROJ. NO. 369-B(1)
BEGIN F.A.S. PROJ. NO. 369-C(1)
STRUCTURE NOTES FOR BRIDGE STATION 192+40 TO 192+64.5
STRUCT. NO. K-9-E
PRESENT STRUCTURE
Span 10'
Clear Roadway 20'
Clear Waterway 22□'
Type of Superstructure Log stringer plank floor
Type of Substructure Log
Requirements as to removal Remove
STREAM DATA
Drainage Area in Sq. Miles 9
Velocity During High Water —
Elev. of
Max. high water 8211 Low Water dry
Normal stage Stream bed 8206
Drift light
Scour —
PROPOSED STRUCTURE
Position Referred to Present Structure 50' West
Span 1 @ 23' with 16' Wings
Clear Roadway 25'
Clear Waterway 115□'
Type of Superstructure Tr. timb. strgs. & floor
Type of Substructure T.P.T. Tr. timber
Detour Struct. Requirements Use old bridge
R.R. Siding Parlin Haul to br. site 13 mi.
NEARBY STRUCTURES ON SAME STREAM
Location None
400' V.C.
+0.60%
+0.631%
+1.50%
+0.136%
+1.60%
Balance Factor
Excavation
Embankment
Borrow
Borrow Source
Pit No. 1 Lt. Sta. 183+00



FED. ROAD DIST. NO. 3
STATE COLO.
F.A.S. PROJ. NO. 369-C(1)
SHEET NO. 20
TOTAL SHEETS
SE 1/4 SECTION 32
T.48N. R.2E.
N.M.P.M.
NE 1/4 SECTION 5
T.47N. R.2E.
N.M.P.M.
N
Cochetopa Creek
Sta. 207+ Req'd. Detour bridge, Rt. (70°) (Details on Sheet No. 10) (Quantities shown on Sh. No. 10 & inc. in Roadway Summary) Remove detour bridge after abandonment of detour.
Sta. 206+ to 209+ Req'd. 1000 cu. yds. emb. for detour rt. (Material to be used in roadway after abandonment of detour) (Mat'l. included in profile quantities for paym't. as excav. & in List of Str. as emb.)
Sta. 208+05.5-208+50.9 Req'd. 1 span @ 40' concrete and I beam bridge (45°) (details on sheets no. 6 to 9) and remove present bridge, and 250 cu. yds. uncl. excav. for channel improvement. (QUANTITIES IN SUMMARY)
P.C. 207+98.5
Δ 19°34'L
D 4°
T 247.0
L 489.2
R 1432.5
P.T. 212+87.7
P.I. 216+19.3
Sta. 217+15-224+75 Req'd. Ditch change lt.
Sta. 216+64 Req'd. 50 cu. yd. emb. and 24"x24' C.M.P. side drain for road approach lt.
Sta. 217+65 Req'd. 24"x78' C.M.P. Cross Culvert and inlet ditch.
Sta. 227+50 Req'd. 180 cu. yds. emb. for road approach lt.
P.C. 228+82.5
P.T. 235+17.5 Bk. = 235+82.2 Ah.
Sta. 236+90-239+40 Req'd. 640 cu. yds. uncl. excav. for channel change lt. (Material to be used to fill old channel).
PROPOSED CHANNEL CHANGE
Δ 27°48'L
D 4°
T 354.5
L 695.0
R 1432.5
Sta. 231+70-234+00 Req'd. ditch change lt.
IRRIGATION DITCH CHANGE
Irrig. ditch
Cliff
205
S 36°01'W
210
S 16°21'W
215
225
S 36°37'W
230
235
S 8°45'W
gate
Appro. route of detour
Proposed channel improvement
Irrig. ditch
INTERCEPTING DITCH
Present road
Borrow Pit No. 2
Sta. 209+00 Req'd. 600 cu. yds. emb. for road approach rt.
Sta. 210+16 Req'd. Remove 30"x24' C.M.P.
Sta. 210+20 Req'd. 36"x106' C.M.P. Cross Culvert (45°) and inlet and outlet ditches.
P.I. 210+45.5
P.C. 213+64.5
Δ 20°10'R
D 4°
T 254.8
L 504.2
R 1432.5
T.47N. T.48N.
P.T. 218+68.7 Bk. = 220+20.0 Ah.
EQUATION
Sta. 222+10 Req'd. 24"x86' C.M.P. Cross Culvert and inlet ditch.
Sta. 225+75-227+25 Req'd. Intercepting ditch rt.
Sta. 229+75-231+25 Req'd. Intercepting ditch rt.
Sta. 228+00 Req'd. 48"x58' C.M.P. Cross Culvert and inlet ditch.
P.I. 232+37.0
Sta. 230+08 Req'd. remove 15"x24' C.M.P.
Sta. 232+50 Req'd. 24"x66' C.M.P. Cross Culvert and inlet ditch.
Sta. 233+50 Req'd. 40 cu. yds. emb. for road approach rt.
Sta. 234+00 Req'd. 24"x60' C.M.P. Cross Culvert and inlet and outlet ditches.
Sta. 234+50 Req'd. 48"x50' C.M.P. Cross Culvert and inlet and outlet ditches.
Sta. 234+65 Req'd. remove 36"x24' C.M.P. Rt.
CLEARING & GRUBBING
Sta. 201+ - 246+ Light sage brush
Scattered willows and alders.
EQUATION
STRUCTURE NOTES FOR BRIDGE STA. 208+05.5 TO 208+50.9
STRUCTURE NO. K-9-B.
PRESENT STRUCTURE
Span: 1@35'
Clear Roadway: 20'
Clear Waterway: 140'
Type of Superstructure: Timber
Type of Substructure: Log crib abuts.
Requirements as to removal: Remove
PROPOSED STRUCTURE
Position refered to present structure: Same
Span: 1@40'
Clear roadway: 25'
Clear waterway: 265'
Type of Superstructure: Conc. & I-beam
Type of Substructure: Conc. Cant. Abuts.
Detour Structure Requirements
R.R. siding: Parlin. Haul to bridge site: 13 mi.
STREAM DATA
Drainage Area in Sq. Miles: 350
Velocity during high water
Elev. of: Max. high water 8224. Low water 8218.5
Normal stage 8219. Stream bed 8217
Drift: Light
Scour: None
NEARBY STRUCTURES ON SAME STREAM: Str. K-9-A
Location: 6 mi. downstream
Waterway: 165' Span: 2@23'
Record during floods: No record of overflow.
218+68.7 Bk. 220+20.0 Ah.
235+17.5 Bk. 235+82.2 Ah.
8270
8260
8250
8240
8230
8220
8210
+1.60%
+0.29%
+1.16%
400' V.C.
200' V.C.
N.P.S. 0.756
F.L. 22.8
F.L. 38.8
F.L. 39.0
F.L. 47.1
F.L. 52.6
F.L. 52.2
F.L. 52.1
Balance Factor
Excavation
Embankment
Borrow E.
Sta. Yd. O.H.
Yd. Mi. O.H.
Borrow Source
80%
2167
463
1748
42
2527
7527
20710
115%
845
80%
30
205
210
215
225
230
235
A JUN 1941 ENG. DIV. 2 S. H. D.

FED. ROAD DIST. NO.	STATE	F. A. S. (PROJ. NO.)	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	21	51

NE¼ SECTION 5
T.47N. R.2E.
N.M.P.M.

Sta. 238+75 Reqd. 24"x100' C.M.P. Cross Culvert (30°) and inlet ditch.

Sta. 239+ - 240+ Reqd. Ditch change lt.

Sta. 240+ Reqd. 90 cu.yds. of Rock filled dam and 3'x4' treated timber headgate lt. (Details on sheet no.4).

Sta. 240+ - 241+ Reqd. 150 cu.yds. uncl. excav. for channel change lt. (Material to be used to fill old channel.)

Sta. 244+ - 250+45 Reqd. 1975 cu.yds. uncl. excav. for channel change lt. (Material to be used to fill old channel.)

Sta. 246+50 Reqd. 24"x 56' C.M.P. Cross Culvert (no headwall), outlet ditch and 10 cu.yds. riprap for inlet.

Sta. 250+50 Reqd. 24"x 56' C.M.P. Cross Culvert.

Sta. 252+50 - 257+25 Reqd. Intercepting ditch rt.

Sta. 253+50 - 255+00 Reqd. 50 cu.yds. uncl. excav for channel change lt. and 148 cu.yds. heavy riprap for bank protection.

SE¼ SECTION 5
T.47N. R.2E.
N.M.P.M.

Sta. 258+77 Reqd. 24"x44' C.M.P. Cross Culvert, inlet ditch and remove 15'x24' C.M.P.

Sta. 259+45 - 261+40 Reqd. 625 cu.yds. uncl. excav. for channel change lt. (Material to be used to fill old channel.)

Sta. 260+00 - 265+25 Reqd. intercepting ditch rt.

Sta. 264+10 - 266+25 Reqd. 500 cu.yds. uncl. excav. for channel change lt. (Material to be used to fill old channel.)

Sta. 264+47 Reqd. 36"x 52' C.M.P. Cross Culvert, inlet and outlet ditches.

Δ 34°36' R
D 4°
T 446.2
L 865.0
R 1432.5

P.I. 260+89.2
P.C. 256+43.0
P.I. 265+08.0

Cochetopa Creek

PROPOSED CHANNEL CHANGE
PROPOSED DITCH CHANGE
Heavy Riprap
Intercepting Ditch
irrig. ditch
S 8°49' W
S 43°25' W

JUN 1947
ENG. DIV. 2
S. H. D.

CLEARING & GRUBBING
Sta 246+ - 255+ Heavy willows and alders.
255+ - 275+ Heavy sagebrush, scattered willows & alders.

N.W¼ SECTION 5
T.47N. R.2E.
N.M.P.M.

SW¼ SECTION 5
T.47N. R.2E.
N.M.P.M.

1,000 cu.yds. available within R.O.W. limits on fill and N.000 cu.yds. available outside R.O.W. Pot Rk. of Sta. 226+

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	369-C(1)	22	

Sta 269+82 Reqd.
Remove 18"x24' C.M.P.

Sta 268+75-275+25 Reqd.
Intercepting ditches rt.

Sta 270+00 Reqd.
24"x40' C.M.P. Cross Culvert, inlet and outlet ditches.

Intercepting Ditch

S 43°25'W

Sta 276+50 Reqd.
24"x52' C.M.P. Cross Culvert and outlet ditch.

Sta 278+50-280+65 Reqd.
500 cu.yds. uncl. excav for channel change lt. (Material to be used to fill old channel & build approach to project)

PROPOSED CHANNEL CHANGE

P.C. 282+77.8

Sta 280+65 Reqd.
300 cu. yds embankment for approach to project. (Material available from channel change left of Sta. 278+ to 280+) & project marker.

Selected Material & Surfacing Pit.
Pit No. 3

Intercepting Ditch

STA. 280+65 END F.A.S. PROJ. NO. 369-C(1)

SW1/4 SECTION 5
T.47N.R.2E.
N.M.P.M.

Δ 94°18' L
D 7°
T 882.4
L 1347.1
R 818.6

P.T. 296+24.9

PROPOSED CHANNEL CHANGE

Δ 60°48' R
D 12°
T 280.2
L 506.7
R 477.5

P.C. 296+38.3

Cochetopa

Intercepting Ditch

S 50°53'E

P.I. 291+60.2

CLEARING & GRUBBING
Sta. 275+ - 288+ Heavy willows and alders
288+ - 296+ Heavy willows and spruce

NW1/4 SECTION 8
T.47N.R.2E.
N.M.P.M.

JUN 1941
ENG. DIV. 2
S. H. D.

200' V.C.
+1.80%
+1.35%
+1.62%
+1.20%
-1.30%
FL. 298.8
FL. 297.8
FL. 291.1
FL. 287.8
FL. 280.0
FL. 278.0
FL. 273.0
200' V.C.
200' V.C.

Balance Factor
Excavation
Embankment
Bottom
Shrinkage
Station
Grade
Surface

100%
1157
3894
2549
18440
770

8330
8320
8310
8300
8290

COLORADO
STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED
U.S.P.W.H. PROJECT NO. N.R.S. 389-B (1935)
STATE HIGHWAY NO. 114
SAGUACHE COUNTY

INDEX OF SHEETS

SCALES ON ORIGINAL TRACINGS

ON PLAN, 1 IN. = 100 FT.

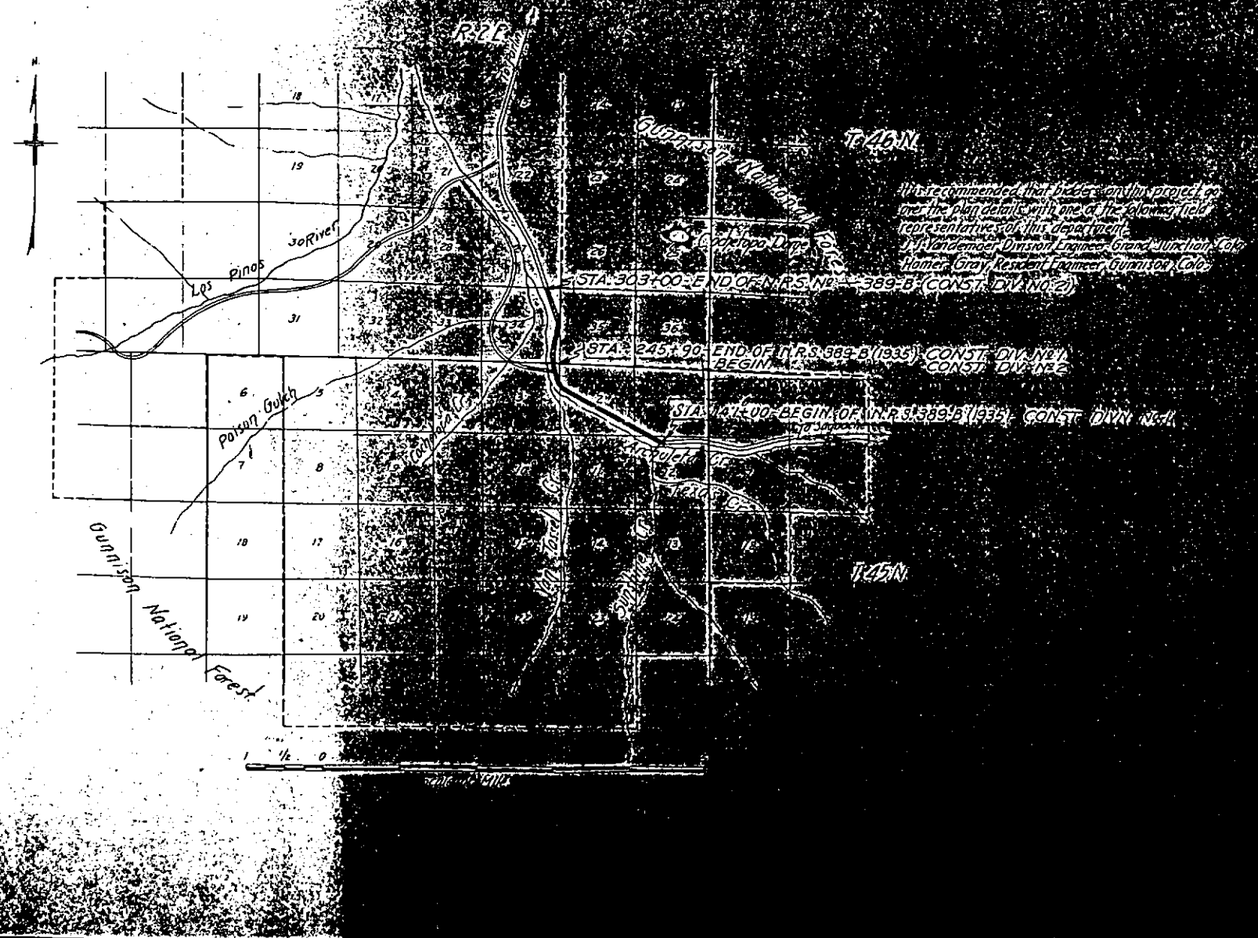
ON PROFILE (1 IN. = 100 FT. HORIZONTAL
1 IN. = 10 FT. VERTICAL

GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD

	TOTAL	CONST. DIV. #1	CONST. DIV. #2
GROSS LENGTH OF PROJECT	15,600 FT. = 2.954 MILES	9,890 FT. = 1.873 MI.	5,710 FT. = 1.081 MI.
NET LENGTH OF PROJECT			

CONVENTIONAL SIGNS

Center Line of Roadway
Right of Way Lines
Section Lines
Quarter Section Lines
Quarter-Quarter Lines
Fences

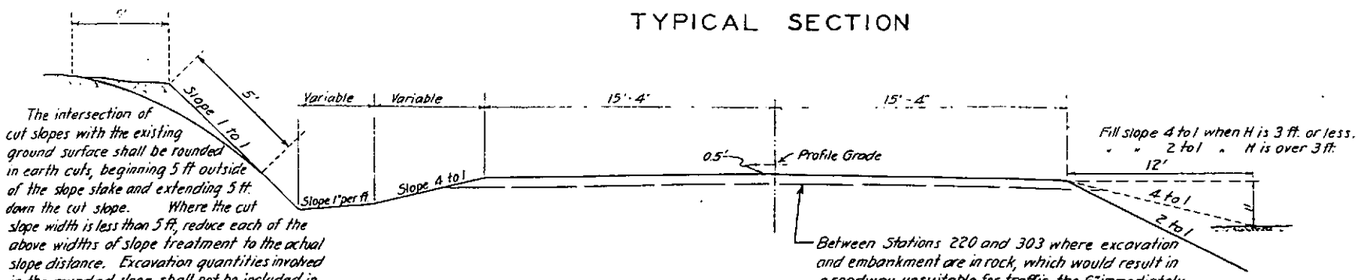


It is recommended that bidders on this project go over the plan details with one of the following field representatives of this department.
J.V. Vandemoer, Division Engineer, Grand Junction, Colo.
Homer Gray, Resident Engineer, Gunnison, Colo.

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

Rev. 3-11-34 A.J.S.
REV. 12-19-34 F.W.D.
" 1-19-35 A.J.S.
Rev. for Const. Div. No. 2 and Elimination of Gravel 1-23-35 H.S.C.

TYPICAL SECTION



The intersection of cut slopes with the existing ground surface shall be rounded in earth cuts, beginning 5 ft outside of the slope stake and extending 5 ft. down the cut slope. Where the cut slope width is less than 5 ft, reduce each of the above widths of slope treatment to the actual slope distance. Excavation quantities involved in the rounded slope shall not be included in "Unclassified Excavation".

Between Stations 220 and 303 where excavation and embankment are in rock, which would result in a roadway unsuitable for traffic, the 6" immediately underlying the subgrade, as shown on the Typical Section, is to be constructed of selected material which is to be classified and paid for as Unclassified Excavation. Selected material is available approximately 0.7 mi. north of Sta. 303.

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department, adopted January 1, 1930.

All quantities on preliminary plans are to be considered approximate only.

All roadway excavation required to construct the project is to be obtained as indicated on the Plans. Quantities involved beyond the limits of ditch as shown on the Typical Section, either noted as "Borrow" on the Plans or as "Embankment" on the Structure List, are to be classified and paid for as "Unclassified Excavation." These quantities are to be staked as part of the original excavation at locations indicated on the plans. Any slope stakes beyond the limits of the typical ditches are subject to change by the Engineer to fit embankment requirements actually encountered during construction.

All curves are to be superelevated in accordance with methods shown on the Standard Superelevation Sheet.

At all places on the project where the new work lies along the present traveled road the contractor shall at his own expense so prosecute construction that traffic may readily pass over the road. Also the contractor shall maintain in safe condition and at his own expense all temporary approaches and crossings of intersecting roads.

Except as limited by the special provisions power equipment may be used on this work.

SUMMARY OF APPROXIMATE QUANTITIES

No.	Item	Unit	Quantity Con. Div. #1	Quantity Con. Div. #2
10	Clearing and Grubbing the Entire Project	Lump Sum	• (a)	• (b)
11	Removing Structures	" "	(5) • (a)	(7) • (b)
12a	Removing Fence	Lin. Ft.	1600	300
13c	Unclassified Excavation	Cu. Yds.	48 200	21 000
14a	Dry Rock Excavation (Structural)	" "	30	30
14b	" Common " "	" "	200	150
14c	Wet Rock " "	" "	10	10
14d	" Common " "	" "	70	50
18a	Station Yard Overhaul	Sta. Yds.	82 000	71 000
18b	Yard Mile Overhaul	Yd. Mi.	3000	4000
46b	Class "B" Concrete	Cu. Yds.	8	14
53b	18" Corrugated Metal Culvert Pipe	Lin. Ft.	590	168
53c	24" " " " "	" "	264	96
53d	30" " " " "	" "		232
75a	Galvanized Barbed Wire Fence (Native Cedar Posts)	" "	1600	300
75b	Gates in " "	Each	2	1
78	Project Markers	"	1	1
79	Right of Way Markers	"	11	7
13y	Cut Slope Treatment	Miles	2.0	1.0

R.O.W. MARKERS

	Sta.	Left	Right
Const. Div. No. 1	147+00	1	1
	202+00	2	1
	206+00	2	
	230+57.9	1	1
	241+50	1	1
Const. Div. No. 2	267+50	2	1
	270+50	2	
	303+00	1	1
	Total Div #1	7	4
	Total Div #2	5	2

FENCING REQUIREMENTS

	Location	Remove	Build Left	
Const. Div. No. 1	195+90 to 206+00	1020	1050	
	215+00 to 220+00	550	500	
	206+00		Gate	
	219+00		Gate	
Const. Div. No. 2	284+60 287+30	270	270	
	285+00		Gate	
	Total Div #1	1570	1550	
	Total Div #2	270	270	

LIST OF STRUCTURES

Location	Description	Remov'ls:	Excavation Cu. Yds. Uncl.	Emb.	Str.	Class "B" Concrete Cu. Yds.	Reinforc. Steel Lbs.	Corrugated Mtl. Pipe Lin. Ft. 18"	24"	30"	Miscellaneous.
Construction Division No. 1	147+00 Project Marker										Proj. Mkr.
	159+00 CMP Culvert and Outlet Ditch		20		50			66			
	163+85 " " " Inlet "		20		15				86		
	169+00 " " " Ditches		5		25			68			
	173+25 " " with Headwall				10	1.7			62		
	179+00 " " and Inlet Ditch		5		10			56			
	186+00 " " " " "		5		10				56		
	188+50 Remove CMP Culvert	1 CMP									
	194+50 CMP Culvert and Inlet Ditch		5		15				54		
	202 to 206 Channel Change		1000								
	203+00 CMP Culvert, Headwall, Ditch		30		10	1.7		56			
	207+70 " " and Inlet Ditch		10		30			70			
	215+50 " " " " "		10		20			58			
	218+00 Remove Culvert	1 CMP									
	218+50 CMP Culvert and Ditches		20		10			58			
	226+00 " " " Inlet, Headwall		5		25	1.7			60		
	226+50 Remove CMP Culvert	1 CMP									
	231+50 " " " Culvert Reqd	1 CMP			10	1.1		48			
	238+00 CMP Culvert, Headwall				20	1.1			56		
	241+00 Remove Culvert	1 CMP									
	Total Constr. Div. No. 1	5 CMP	1135		260	7.3		590	264		1 Pr. Mkr.
Construction Division No. 2	248+70 Remove Culvert	1 CMP									
	249+00 CMP Culvert, Headwall				10	1.1		58			
	253+85 Remove Culvert, Culvert Reqd	1 CMP	10		25	1.7			46		
	265+00 CMP Culvert and Ditch		5		20			50			
	270+00 CMP Culvert, Removal	1 CMP			70	2.3				60	
	275+80 " " "	1 CMP	5		20	2.3			52		
	281+20 " " "	1 CMP	5		20	2.3			48		
	286+50 CMP Culvert		5		20	2.3			52		
	288+50 Remove Culvert	1 CMP									
	296+90 CMP Culvert, Removal	1 CMP	30		25	1.1		60			
	303+00 Project Marker and Approach			100							1 Proj. Mkr.
	Total Constr. Div. No. 2	7 CMP	60	100	210	13.1		168	46	232	1 Pr. Mkr.
	Total of Project	12 CMP	1195	100	470	20.4		758	310	232	2 Pr. Mkr.

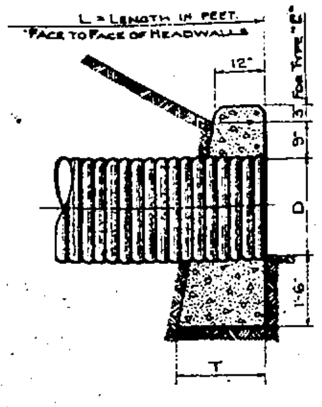
Structural Excavation is estimated to be 90% Common and 10% Rock, each of which is estimated to be 15% Dry, and 2.5% Wet.

STANDARD M-102-E

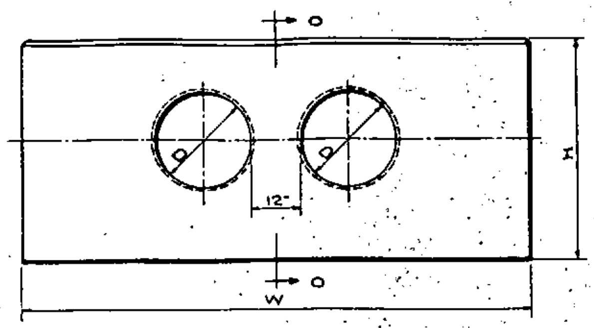
[redacted]

FED. ROAD DIST. No.	STATE	U.S.P.W.H. PROJ. No.	SHEET No.	TOTAL SHEETS
3	COLO.	NRS 389-B 1935	3	

Revised 10-24-33 A.E.K. Corrected Gauge on 24" & 36" Type "E" Culverts.



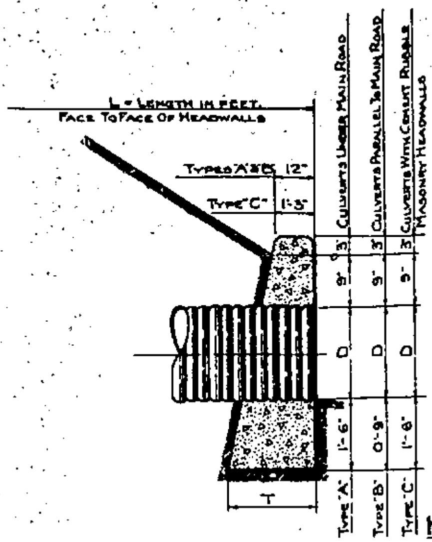
SECTIONAL ELEVATION "O-O"



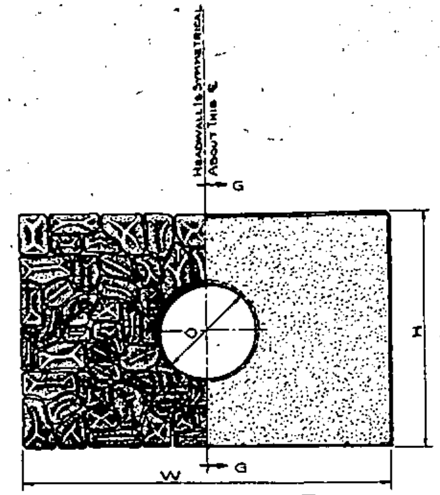
FRONT ELEVATION

TABLE OF DIMENSIONS & QUANTITIES FOR DOUBLE CORRUG. METAL PIPE CULVERT & HEADWALLS								
	D	W	H	T	CL."B" CONCRETE FOR 2 HEADWALLS	CORRUGATED METAL PIPE		CEMENT RUBBLE MASONRY
TYPE "E"	15"	7'-6"	3'-9"	1'-6"	2.2 Cu. Yd's	16 Gage	2×L = Lin. Ft.	
	18"	8'-6"	4'-0"	1'-7"	3.1 do	16 do	2×L = do	
	24"	10'-6"	4'-6"	1'-10"	4.5 do	14 do	2×L = do	
	30"	12'-6"	5'-0"	2'-0"	6.5 do	14 do	2×L = do	
	36"	14'-6"	5'-6"	2'-2"	7.6 do	12 do	2×L = do	
TYPE "F"								

STD. HEADWALLS FOR DOUBLE CORRUGATED METAL PIPE CULVERTS.



SECTIONAL ELEVATION "G-G"



HALF FRONT ELEVATION TYPE "C"

HALF FRONT ELEVATION TYPES "A" & "B"

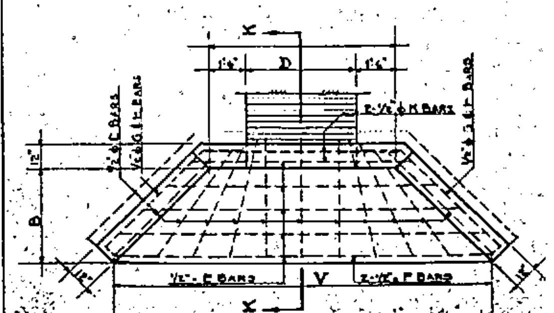
TABLE OF DIMENSIONS & QUANTITIES FOR CORRUGATED METAL PIPE CULVERTS & HEADWALLS								
	D	W	H	T	CL."B" CONCRETE FOR 2 HEADWALLS	CORRUGATED METAL PIPE		CEMENT RUBBLE MASONRY
TYPE "A"	12"	4'-6"	3'-6"	1'-5"	1.4 Cu. Yds.	16 Gage	L = Lin. Ft.	
	15"	5'-3"	3'-9"	1'-6"	1.8 do	16 do	L = do	
	18"	6'-0"	4'-0"	1'-7"	2.2 do	16 do	L = do	
	24"	7'-6"	4'-6"	1'-10"	3.3 do	14 do	L = do	
	30"	9'-0"	5'-0"	2'-0"	4.5 do	14 do	L = do	
	36"	10'-6"	5'-6"	2'-2"	6.0 do	12 do	L = do	
	42"	12'-0"	6'-0"	2'-5"	8.0 do	10 do	L = do	
	48"	13'-6"	6'-6"	2'-7"	10.0 do	10 do	L = do	
TYPE "B"	12"	4'-0"	2'-9"	1'-0"	0.8 Cu. Yds.	16 Gage	L = Lin. Ft.	
	15"	4'-3"	3'-0"	1'-2"	0.9 do	16 do	L = do	
	18"	4'-6"	3'-3"	1'-3"	1.1 do	16 do	L = do	
	24"	5'-0"	3'-9"	1'-5"	1.2 do	14 do	L = do	
	30"	5'-6"	4'-3"	1'-7"	1.A do	14 do	L = do	
TYPE "C"	12"	4'-6"	3'-6"	2'-0"		16 Gage	L = Lin. Ft.	1.6 Cu. Yds.
	15"	5'-3"	3'-9"	2'-0"		16 do	L = do	2.2 do
	18"	6'-0"	4'-0"	2'-1"		16 do	L = do	2.8 do
	24"	7'-6"	4'-6"	2'-4"		14 do	L = do	4.1 do
	30"	9'-0"	5'-0"	2'-6"		14 do	L = do	5.6 do
	36"	10'-6"	5'-6"	2'-8"		12 do	L = do	7.4 do

D	W	H	V	B	C	UNIT	CONCRETE CLASS "A"	CORRUGATED METAL PIPE		UNIT	REINFORCING STEEL
54"	7'-6"	5'-6"	15'-6"	4'-0"	3'-6"	Cu. Yds.	12.6 ✱	8 Gage	L = Lin. Ft.	LBS.	446 ▲
60"	8'-0"	6'-0"	16'-0"	4'-0"	4'-0"	do	13.5 ✱	8 do	L = do	do	482 ▲
66"	8'-6"	6'-6"	16'-6"	4'-0"	4'-6"	do	14.4 ✱	8 do	L = do	do	498 ▲
72"	9'-0"	7'-0"	19'-0"	5'-0"	4'-6"	do	17.9 ✱	8 do	L = do	do	610 ▲
78"	9'-6"	7'-6"	19'-6"	5'-0"	5'-0"	do	18.9 ✱	8 do	L = do	do	630 ▲
84"	10'-0"	8'-0"	20'-0"	5'-0"	5'-6"	do	20.0 ✱	8 do	L = do	do	684 ▲

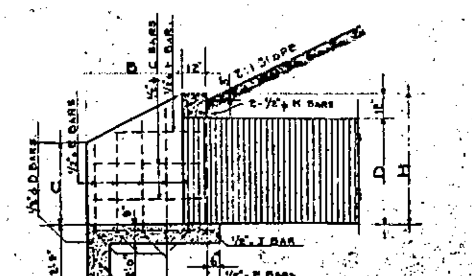
▲ REINFORCING STEEL QUANTITIES ARE FOR TWO HEADWALLS. ✱ CONCRETE QUANTITIES ARE FOR TWO HEADWALLS.

BAR LIST FOR TYPE "G" — W.H.S.M.

DIAMETER OF PIPE		54"	60"	66"	72"	78"	84"	BENDING DIAGRAM
D BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	B + 1'-2"
	NUMBER	11	11	11	12	12	13	
	LENGTH	7'-7"	7'-7"	7'-7"	8'-7"	8'-7"	8'-7"	
E BARS ½" ▪	SPACING	12"	12"	12"	12"	12"	12"	V + 1'-6" to W + 1'-6" by 1'-0" decrease
	NUMBER	1 EACH	1 EACH	1 EACH	1 EACH	1 EACH	1 EACH	
	LENGTH	24'-0" to 20'-0"	25'-6" to 21'-6"	27'-0" to 23'-0"	27'-6" to 24'-6"	31'-0" to 26'-0"	32'-6" to 27'-6"	
	DECREASE	BY 12"	BY 12"	BY 12"	BY 12"	BY 12"	BY 12"	
F BARS ½" ▪	SPACING	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	V
	NUMBER	2	2	2	2	2	2	
	LENGTH	15'-6"	16'-0"	16'-6"	19'-0"	19'-6"	20'-0"	
G BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	X = 5'-7" for 54", 60" & 66" diameter. X = 7'-0" for 72", 78" & 84" diameter.
	NUMBER	4	6	6	6	6	8	
	LENGTH	7'-0"	7'-0"	7'-0"	8'-5"	8'-5"	8'-5"	
H BARS ½" ϕ	SPACING	18"	18"	18"	18"	18"	18"	Y = 4'-6" for H bars.
	NUMBER	2	2	2	2	2	2	
	LENGTH	5'-11"	5'-11"	5'-11"	5'-11"	5'-11"	5'-11"	
J BARS ½" ▪	SPACING	12"	12"	12"	12"	12"	12"	
	NUMBER	1	1	1	1	1	1	
	LENGTH	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	
K BARS ½" ϕ	SPACING	8"	8"	8"	8"	8"	8"	W + 1'-0"
	NUMBER	2	2	2	2	2	2	
	LENGTH	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	

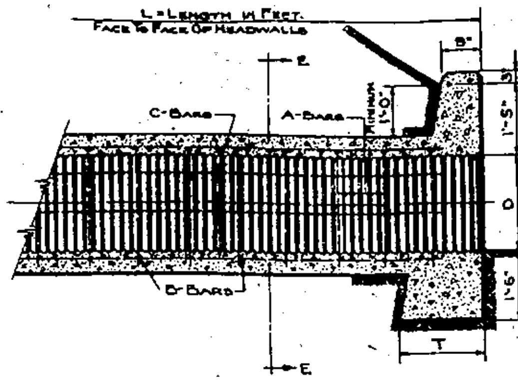


PLAN OF HEADWALL TYPE "G"

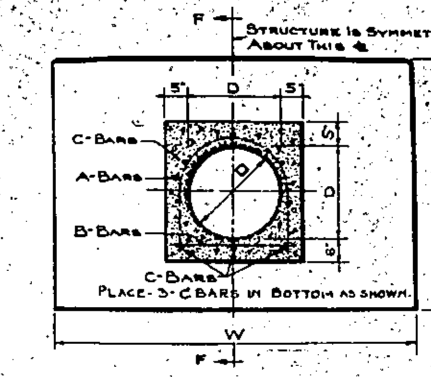


SECTION K-K

STANDARD HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS



LONGITUDINAL SECTION "F-F"



SECTIONAL ELEVATION "E-E"

TABLE OF DIMENSIONS & QUANTITIES FOR INCASED PIPE CULVERT								
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'-2"	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"	(D+2)/2; D+4"
		Number	L-1	L-1	L-1	L-1	L-1	
		Length	3'-9"	4'-5"	5'-0"	6'-4"	7'-7"	
B-BARS		Spacing	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	D+7"
		Number	.5L	.5L	.5L	.5L	.5L	
		Length	1'-7"	1'-10"	2'-1"	2'-7"	3'-1"	
C-BARS		Spacing						L-(2'-0")
		Number	6	8	8	8	8	
		Length	L-(2'-0")	L-(2'-0")	L-(2'-0")	L-(2'-0")	L-(2'-0")	
ITEM No.	DESCRIPTION	UNIT						
46 a	CONCRETE CLASS "A" ★	Cu. Yds.	1.4+0.101L	1.6+0.122L	2.2+0.145L	3.2+0.19L	4.5+0.239L	
47	REINFORCING STEEL	Lbs.	8.36L-16.2 ◉	11.191L-17.2 ▼	11.863L-17.6 ▼	13.139L-18.8 ▼	14.909L-19.4 ▼	
53	GALV. CORR. METAL PIPE	Lin. Ft.	L	L	L	L	L	

★ CONCRETE QUANTITIES SHOWN ABOVE INCLUDE TWO HEADWALLS

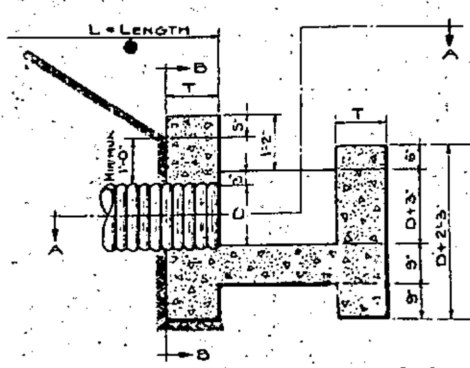
◉ WHEN L = 40 FT. OR MORE ADD 10.6 LBS. FOR LAP IN C-BARS

▼ WHEN L = 40 FT. OR MORE ADD 14.17 LBS FOR LAP IN C-BARS

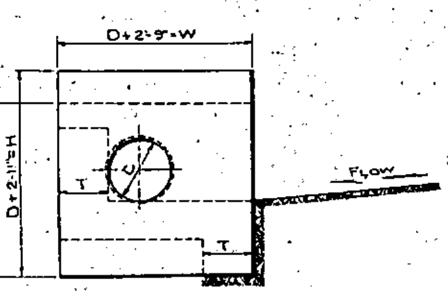
SPECIAL NOTES

ALL REINFORCING BARS SHALL BE ½"ϕ.
MINIMUM DISTANCE ℄ OF BAR TO SURFACE OF CONCRETE SHALL BE 2".
PIPE SHALL BE THOROUGHLY CLEANED BEFORE INCASING WITH CONCRETE.

INCASED PIPE CULVERTS.

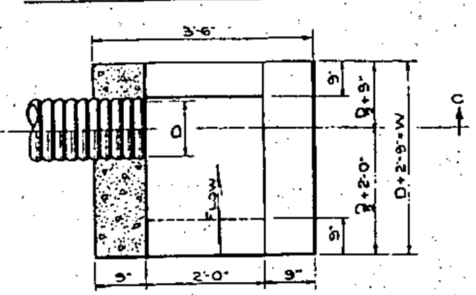


SECTIONAL ELEVATION "C-C"



SECTIONAL ELEVATION "B-B"

SIZE OF PIPE	WIDTH OF WALL	HEIGHT OF WALL	THICKNESS OF WALL	CONCRETE IN ONE HEADWALL
D	W	H	T	CU. YDS.
12"	3'-9"	3'-11"	9"	1.1
15"	4'-0"	4'-2"	9"	1.2
18"	4'-3"	4'-5"	9"	1.3
24"	4'-9"	4'-11"	9"	1.6



SECTIONAL PLAN "A-A"

INTERCEPTING HEADWALLS.

GENERAL NOTES FOR ALL STRUCTURES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JAN 1, 1930.
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 ROUND OR SQUARE, AS SHOWN & NOTED.
ALL REINFORCING BARS SHALL BE TAGGED WITH THE STATION NUMBER AND LETTER DESIGNATION.
SECONDARY BARS WHEN SPLICED 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 CULVERT IS 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.

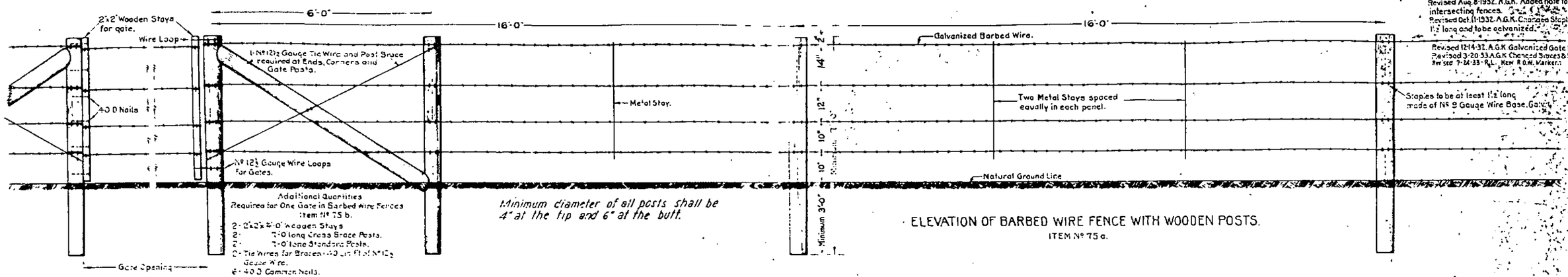
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD HEADWALLS
INTERCEPTING HEADWALLS
INCASED METAL PIPE CULVERT WITH HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS

Designed by P.A.B.-G.H.D. | Approved by R. J. Bailey, Bridge Engineer
Made by G.H.D.-W.W.D. | Date: April 30, 1932
Checked C.H.R. & W.H.McM.

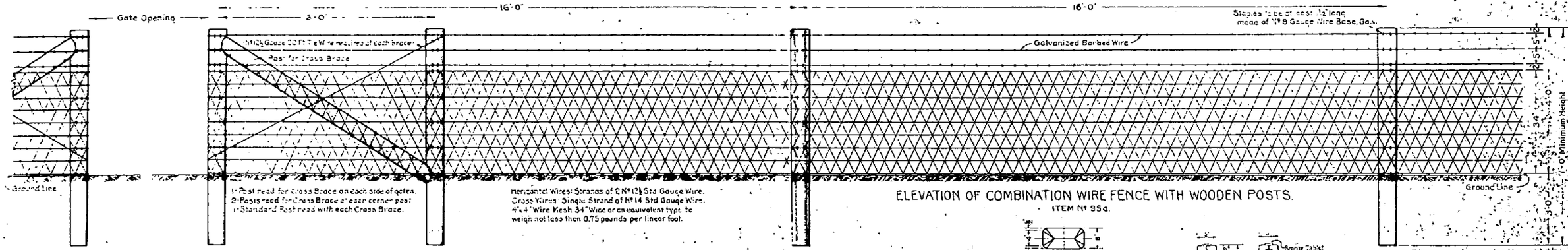
STANDARD M-24-F

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.			

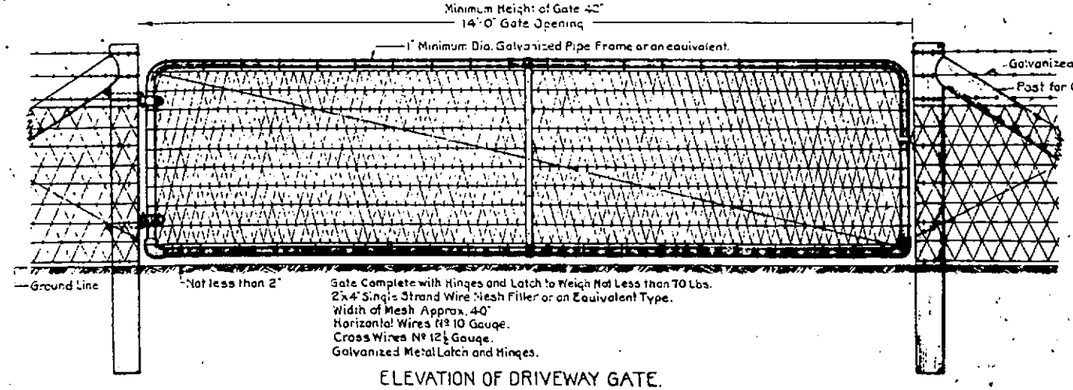
Revised Aug. 8-1932. A.G.K. Added note for intersecting fences.
Revised Oct. 11-1932. A.G.K. Changed Staples to be 1½" long and to be galvanized.
Revised 12-14-32. A.G.K. Galvanized Gate Frames.
Revised 3-20-33. A.G.K. Changed Stays & Post Heights.
Revised 7-24-33-R.L. New R.O.W. Markers.



ELEVATION OF BARBED WIRE FENCE WITH WOODEN POSTS.
ITEM № 75 a.

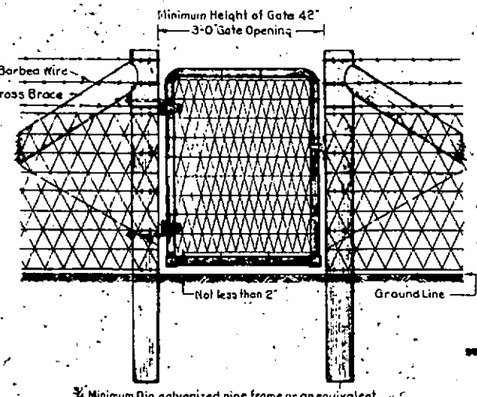


ELEVATION OF COMBINATION WIRE FENCE WITH WOODEN POSTS.
ITEM № 95 a.



Gate Complete with Hinges and Latch to Weigh Not Less than 70 Lbs.
2"x4" Single Strand Wire Mesh Filler or an Equivalent Type.
Width of Mesh Approx. 40"
Horizontal Wires № 10 Gauge.
Cross Wires № 12½ Gauge.
Galvanized Metal Latch and Hinges.

ELEVATION OF DRIVEWAY GATE.
ITEM № 95 b.



¾" Minimum Dia. galvanized pipe frame or an equivalent.
Gate Complete with Hinges and Latch to Weigh Not Less than 19 Lbs.
2"x4" Single Strand Wire Mesh Filler or an Equivalent Type.
Width of Mesh Approx. 40"
Horizontal Wires № 10 Gauge.
Cross Wires № 12½ Gauge.
Galvanized Metal Latch and Hinges.

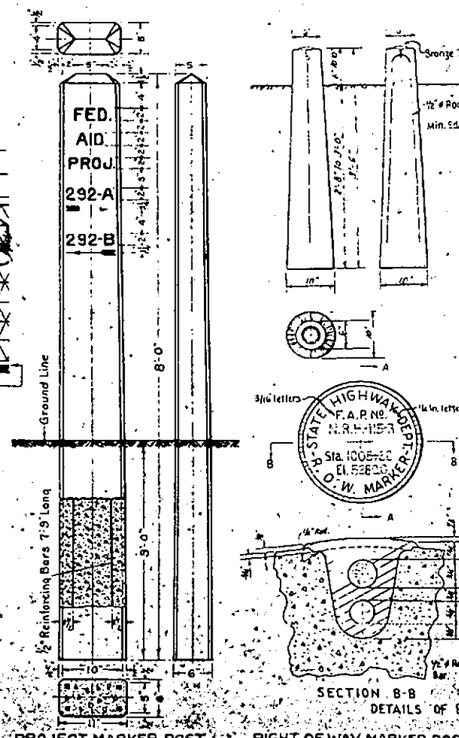
ELEVATION OF WALK GATE.
ITEM № 95 c.

GENERAL NOTES FOR WIRE FENCES.

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, Adopted January 1-1930.
Barbed wire shall be of Standard Make, not lighter than № 12½ Gauge, Galvanized and with Two Point Barbs spaced not more than 5" apart.
Wire Mesh must be galvanized and not lighter than shown and noted on this plan.
Wire Mesh used in Driveway Gates shall be painted with an approved waterproof asphalt or mineral paint.
Staples shall be at least 1½" long, made of № 9 Gauge Wire Base Galv. 8 staples req'd per post for barbed wire fence and 14 Staples per post for Combination Wire Fence.
All Wooden Posts shall be made from seasoned, straight, sound Native Cedar.

	INITIAL	DATE
ORIGINAL BY		
CHECKED BY		
VANDYKE BY		
CHECKED BY		

Cross Braces, Brace Posts and Tie Wires are to be used at all places where intersecting fences are encountered.



PROJECT MARKER POST.
ITEM № 78.

SECTION B-B SECTION A-A
DETAILS OF BRONZE TABLET.

RIGHT OF WAY MARKER POST.
ITEM № 79.

NOTES FOR PROJECT MARKER POSTS.

All Letters and Numbers shall be 2" Plain Upright Block, Painted or Stenciled on the Concrete with a good quality of Black Paint. See Item № 41 "Second Field Coat-Dark."
Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed.
Post is to be set with sign facing the road at the end of the project, five feet beyond edge of shoulder in such a position that the sign will properly indicate the projects to which it refers.
All work shall be done in accordance with Standard Specifications of the Colorado State Highway Department, adopted on Jan. 1, 1930.
Posts shall be made of Class "B" Concrete (Slump 3" to 4") except use White Portland Cement.
All exposed surfaces shall be rubbed free of form marks.

NOTES FOR R.O.W. MARKER POSTS.

All work shall be done in accordance with Standard Specifications of the Colorado State Highway Department, adopted on Jan. 1, 1930.
All exposed surfaces of the Bronze Tablet are to be ground to a smooth surface.
All letters are to be depressed a minimum of 1/16 inch.
Information on the Bronze Tablet indicated by pin lines is to be stamped in the field by the engineering party, after post is placed. 3/16" letters & figures to be used.
Posts shall be made of Class "A" Concrete.
The upper 12 inches of marker shall be rubbed free of form marks, and the top surface of marker must be constructed to drain thoroughly.

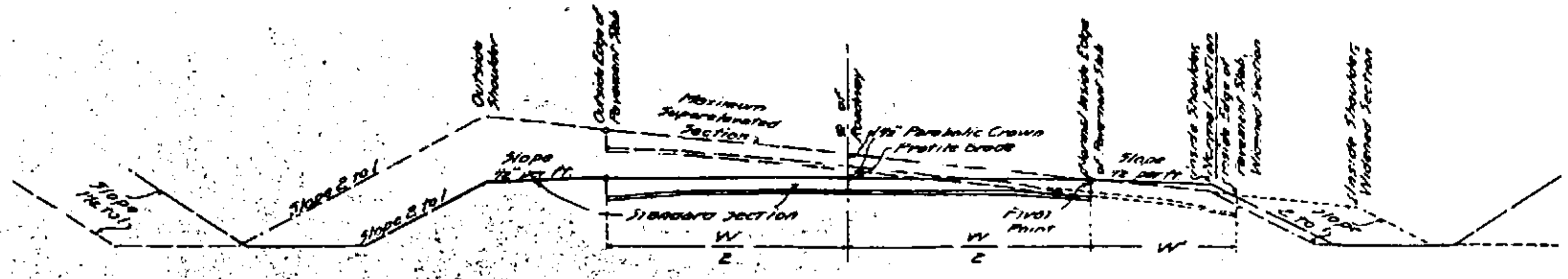
COLORADO STATE HIGHWAY DEPARTMENT STANDARD WIRE FENCES AND MARKER POSTS

Designed by A.G.K.	Approved by C. H. Bell
Made by A.G.K.	Bridge Engineer
Checked by G.H.O.	Date: Feb. 1, 1932

FED. ROAD DIST. No.	STATE	U.S.P.W.H. PROJ. No.	SHEET No.	TOTAL SHEETS
3	COLO.	NRS 389E 1935	5	

Revised 8-17-32 S.B.L. (200' Length)
Revised 8-31-32 S.B.L.
Revised 3-7-34 S.B.L.
Revised 8-24-34 S.B.L. (Special Cases)

STANDARD M-1-A



PAVEMENT SECTION

SUPERELEVATION AND WIDENING NOTES FOR PAVEMENT SECTION

Curves on projects using the pavement section are to be superelevated and widened as indicated in the accompanying drawings and table.

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 or graph. The section is to be rotated about the normal inside edge of the pavement.

When the degree of curvature exceeds 10, the inside portion of the pavement slab is to be widened from the normal inside edge as per the table below. Curves of 10° or less are not to be widened. The 1½" parabolic crown is to be used for curves of 10° and under. The widened section is to have a flat crown.

The slope of the shoulders shall conform to the rate per foot width of roadway required except that the inside shoulder shall maintain the standard slope of 0.0417 ft. per foot width until the superelevation rate exceeds this standard slope.

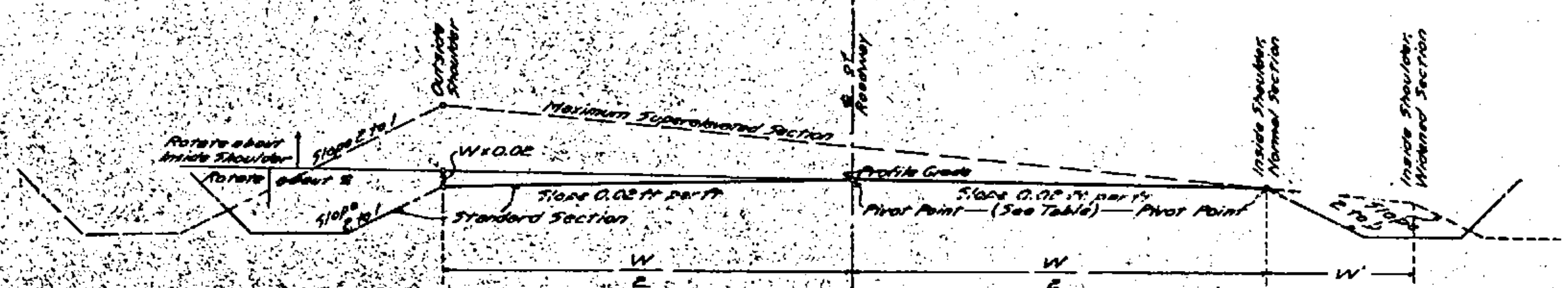
The outside ditch along a superelevated section is to be modified from the standard where a deeper ditch is required to provide drainage.

Details of plans for superelevating and widening are shown on the General Plan for Widening and the Graph of Superelevation Factors.

The subgrade for future pavement is to be constructed to conform to the superelevation and widening requirements for the pavement section.

SUPERELEVATION FACTORS AND OFFSETS FOR WIDENING FOR PAVEMENT SECTION

Distance from B.T.	20 Ft.	40 Ft.	60 Ft.	80 Ft.	100 Ft.=P.C.	120 Ft.	140 Ft.	160 Ft.	180 Ft.	200 Ft.=E.T.	On Curve
Factor	0.02	0.08	0.18	0.32	0.50	0.68	0.82	0.92	0.98	1.00	1.00
Degree of Curve	Rate of Superelevation (in Feet) per Foot Width of Roadway										
2° and Under	0.0004	0.0017	0.0038	0.0067	0.0105	0.0143	0.0172	0.0193	0.0206	0.0210	0.0210
3°	0.0006	0.0025	0.0057	0.0101	0.0158	0.0214	0.0258	0.0290	0.0309	0.0315	0.0315
4°	0.0008	0.0034	0.0076	0.0134	0.0210	0.0286	0.0344	0.0386	0.0412	0.0420	0.0420
5°	0.0010	0.0042	0.0094	0.0168	0.0262	0.0357	0.0430	0.0483	0.0514	0.0525	0.0525
6°	0.0013	0.0050	0.0113	0.0202	0.0315	0.0428	0.0517	0.0580	0.0617	0.0630	0.0630
7°	0.0015	0.0059	0.0132	0.0235	0.0368	0.0500	0.0603	0.0676	0.0720	0.0735	0.0735
8°	0.0017	0.0067	0.0151	0.0269	0.0420	0.0571	0.0689	0.0773	0.0823	0.0840	0.0840
9°	0.0019	0.0076	0.0170	0.0302	0.0473	0.0643	0.0775	0.0869	0.0926	0.0945	0.0945
10° and Over	0.0020	0.0080	0.0180	0.0320	0.0500	0.0680	0.0820	0.0920	0.0980	0.1000	0.1000
	Offsets for Widening-W'-(in Feet)										
Over 10°-Under 12°	0.06	0.24	0.54	0.96	1.50	2.04	2.46	2.76	2.94	3.00	3.00
12° - " 15°	0.08	0.32	0.72	1.28	2.00	2.72	3.28	3.68	3.92	4.00	4.00
15° - " 20°	0.10	0.40	0.90	1.60	2.50	3.40	4.10	4.60	4.90	5.00	5.00
Over 20°	0.12	0.48	1.08	1.92	3.00	4.08	4.92	5.52	5.88	6.00	6.00



GRADED OR SURFACING SECTION

SUPERELEVATION AND WIDENING NOTES FOR GRADED OR SURFACING SECTIONS

Curves on projects using the graded or surfacing section are to be superelevated and widened as indicated in the accompanying sketches and table.

The normal inside shoulder and ditch are to remain as shown in the typical section shown on sheet #2. The outside shoulder is to be the high point of the section.

The outside ditch along a superelevated section is to be modified from the standard where a deeper ditch is required to provide drainage.

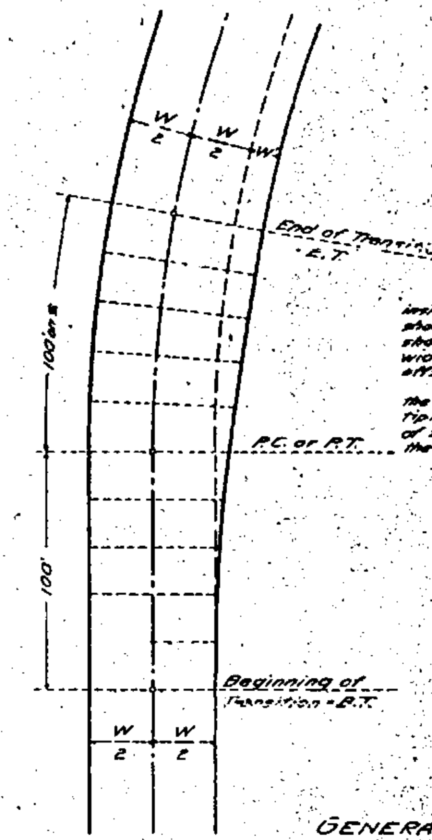
The center line pivot point is to be used as long as the superelevation does not exceed 0.02 feet per foot width of roadway. The normal inside shoulder pivot point is to be used for a superelevation rate in excess of 0.02 ft. per foot width of roadway.

When the degree of curvature exceeds 10° the inside shoulder is to be widened from the normal inside shoulder line as shown by the table and cross section. Curves of 10° and less are not to be widened.

Details of plans for superelevation and widening are shown on the General Plan for Widening and the Graph of Superelevation Factors.

SUPERELEVATION FACTORS AND OFFSETS FOR WIDENING FOR GRADED OR SURFACING SECTIONS

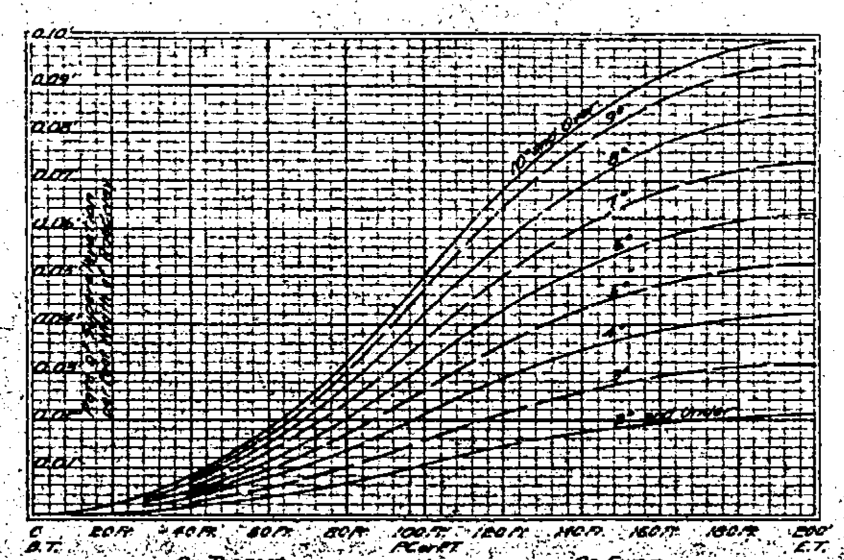
Distance from B.T.	20 Ft.	40 Ft.	60 Ft.	80 Ft.	100 Ft.=P.C.	120 Ft.	140 Ft.	160 Ft.	180 Ft.	200'=E.T.	On Curve	Length of Transition Rotated about	
Factor	0.02	0.08	0.18	0.32	0.50	0.68	0.82	0.92	0.98	1.00	1.00		
Degree of Curve	Rate of Superelevation (in Feet) per Foot Width of Roadway											Center Line	Inside Shoulder
2° and Under	0.0004	0.0017	0.0038	0.0067	0.0105	0.0143	0.0172	0.0193	0.0206	0.0210	0.0210	109 Ft.	91 Ft.
3°	0.0006	0.0025	0.0057	0.0101	0.0158	0.0214	0.0258	0.0290	0.0309	0.0315	0.0315	115 "	85 "
4°	0.0008	0.0034	0.0076	0.0134	0.0210	0.0286	0.0344	0.0386	0.0412	0.0420	0.0420	[illegible]	102 "
5°	0.0010	0.0042	0.0094	0.0168	0.0262	0.0357	0.0430	0.0488	0.0514	0.0525	0.0525	87 "	113 "
6°	0.0013	0.0050	0.0113	0.0202	0.0315	0.0428	0.0517	0.0580	0.0617	0.0630	0.0630	80 Ft.	120 Ft.
7°	0.0015	0.0059	0.0132	0.0235	0.0368	0.0500	0.0603	0.0676	0.0720	0.0735	0.0735	74 "	[illegible]
8°	0.0017	0.0067	0.0151	0.0269	0.0420	0.0571	0.0689	0.0773	0.0823	0.0840	0.0840	[illegible]	[illegible]
9°	0.0019	0.0076	0.0170	0.0302	0.0473	0.0643	0.0775	0.0869	0.0926	0.0945	0.0945	65 "	[illegible]
10° and Over	0.0020	0.0080	0.0180	0.0320	0.0500	0.0680	0.0820	0.0920	0.0980	0.1000	0.1000	[illegible]	[illegible]
	Offsets for Widening-W'-(in Feet)												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



Curves of over 10° are to have the inside portion of the pavement slab and shoulder, or the inside portion and shoulder in a graded or surfacing section, widened in accordance with the plan, offsets for widening, and cross sections.

In the graph below the values for the graph labeled "10° and Over," multiplied by 1,000 gives the percentage of the total widening at any point on the transition.

GENERAL PLAN FOR WIDENING



GRAPH OF SUPERELEVATION TRANSITION FACTORS

The rate of superelevation per foot width of roadway to be applied at the outside edge of the pavement slab and at the outside shoulder of the roadway is computed as follows:

The full superelevation per foot width of roadway rate for a given degree of curvature is

0.0105 ft. x degree of curvature.

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

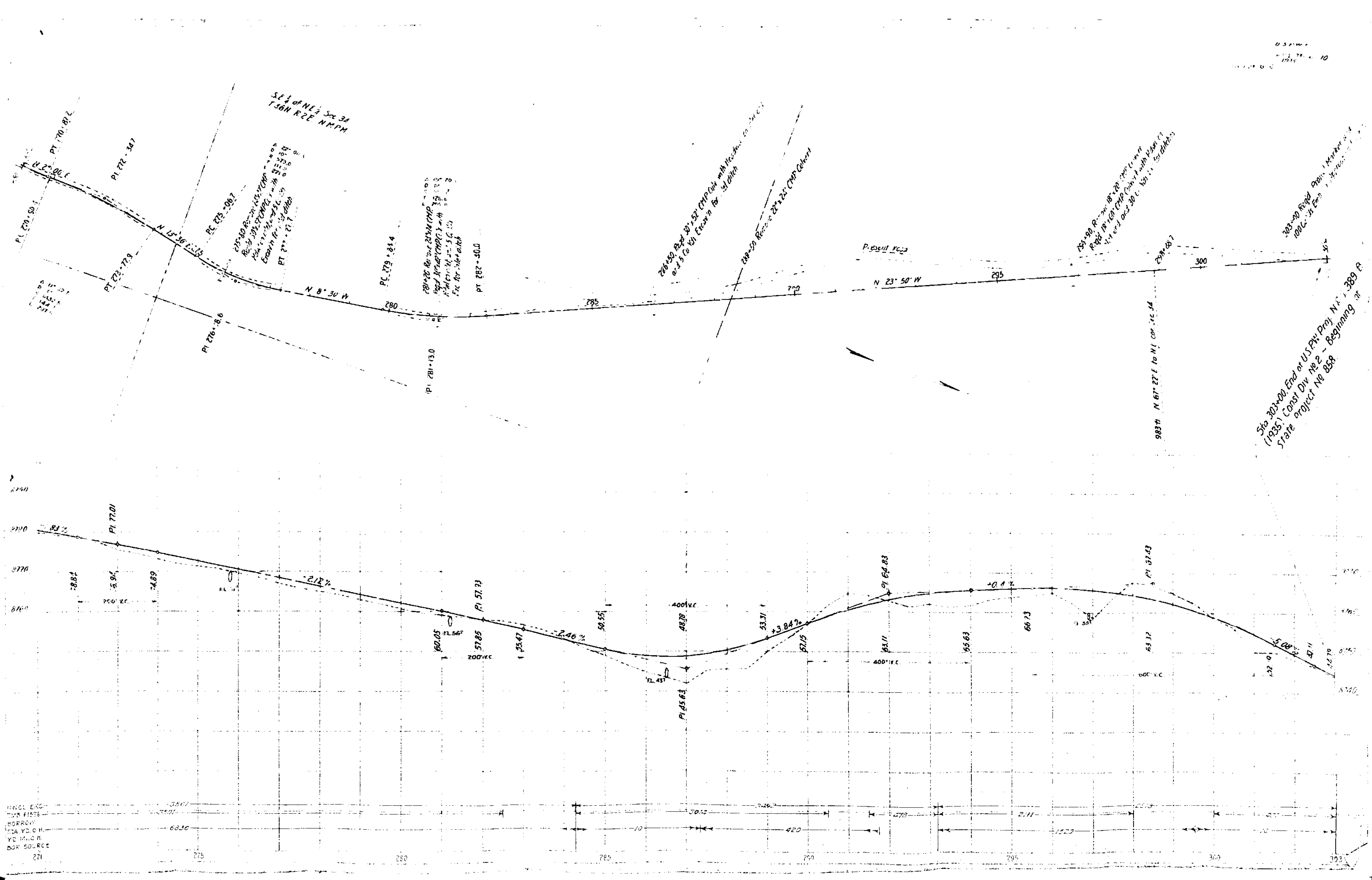
The above graph has been prepared from the rates of superelevation shown in the tabulations.

SPECIAL CASES: When the roadway alignment does not permit the use of the 200 ft. transition lengths, the required lengths may be proportionately shortened. A minimum distance of 200 ft. between the points of full superelevation shall be used.

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD METHODS FOR SUPERELEVATION AND WIDENING OF C[illegible]

U.S.P.W.H.
NPS 389-B
9
Rev. 12-19-34
" 1-23-35 REL
Δ 5° 36' L
D 2°
R 2865
T 140.1
L 280.0
P.C. 238+39.9
239+26
240
241+00, Remove 18"x26" CMP Culvert
P.T. 241+45.9
N. 13° 06' W.
N. 13° 03' E. 754.1 ft.
P.I. 240+10
245
246+73
STA. 245+90 - END OF U.S.P.W. HIGHWAY PROJ. Nº N.R.S. 389-B (1935) CONST. DIV. Nº 1, BEGIN OF CONST. DIV. NO. 2
330 ft.
248+20, Remove 18"x38" CMP Culvert
249+00, Reqd. 18"x38" CMP Culvert with Headwall at Inlet End.
250
P.C. 249+83.8
P.C. 251+07.0
P.T. 252+28.8
S.E.¼ S.E.¼ Sec. 34
T.46N. R.2E. N.M.P.M.
Δ 14° 41' R
D 6°
R 955.0
T 123.2
L 245.0
253+85, Remove 26"x26" CMP Culvert, Reqd. 24"x46" CMP Culvert with Headwall on Inlet End and 10 Cu. Yds. Excavation for Inlet Ditch
255
N. 1° 36' E.
260
P.I. 262+62.1
P.C. 261+68.8
P.T. 263+53.8
Δ 18° 30' R
D 10°
R 573.0
T 93.3
L 185.0
265+00, Reqd. 18"x20" CMP Culvert and 5 Cu. Yds. Excavation for Inlet Ditch
265
N. 20° 06' E.
Δ 18° 00' L
D 10°
R 573.0
T 90.8
L 180.0
P.C. 269+07.2
270+00 Remove 24"x30" CMP Culvert. Reqd. 30"x80" CMP Culvert with Headwall on Inlet End.
P.T. 270+87.2
P.I. 269+98.0
P.I. 270+90.4
270
N. 2° 06' E.
8800
8790
8780
8770
+2.54%
P.I. 92.01
90.09
91.95
600' V.C.
-0.02%
P.I. 91.89
-0.27%
FL. 85±
89.72
FL. 85±
400' V.C.
90.75
P.I. 89.19
92.91
+1.86%
93.84
P.I. 99.42
96.50
600' V.C.
93.30
FL. 88±
-2.04%
100' V.C.
87.18
86.15
85.25
P.I. 86.16
-1.83%
FL. 75±
UNCL. EXC.
EMB. +15%
BORROW
STA. YD. O.H.
YD. MI. O.H.
BOR. SOURCE
3290
3290
7010
3673
3673
3920
214
27
110
3276
3276
2860
To be used to widen curve 261-265
240
245
250
255
260
265
270



S.E.¼ of N.E.¼ Sec. 34
T.36N R.2E N.M.P.M.
N 23° 00' E
PT 270+87.2
PI 272+34.7
PI 270+59.1
N 13° 36' E
PC 275+06.7
PT 273+77.9
PI 276+18.6
N 8° 30' W
PC 279+84.4
280
PT 282+40.0
PI 281+13.0
285
N 23° 50' W
295
300
Present Road
N 67° 22' E to N.E. cor. Sec. 34
Sta 303+00 End of U.S. Pub. Proj. N.R.H. 389 B (1935) Const Div No 2 - Beginning of State project No 858
PI 77.01
-2.18%
-2.46%
+3.84%
+0.4%
PI 57.73
PI 45.63
PI 64.83
PI 67.83
200' V.C.
400' V.C.
600' V.C.
275
280
285
290
295
300
303