

Construction Plans

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104(I)	1	

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COLORADO
STATE HIGHWAY DEPARTMENT
PLAN AND PROFILE OF PROPOSED
FEDERAL AID SECONDARY PROJECT NO. S 0104(I)
STATE HIGHWAY NO. 14
LARIMER COUNTY

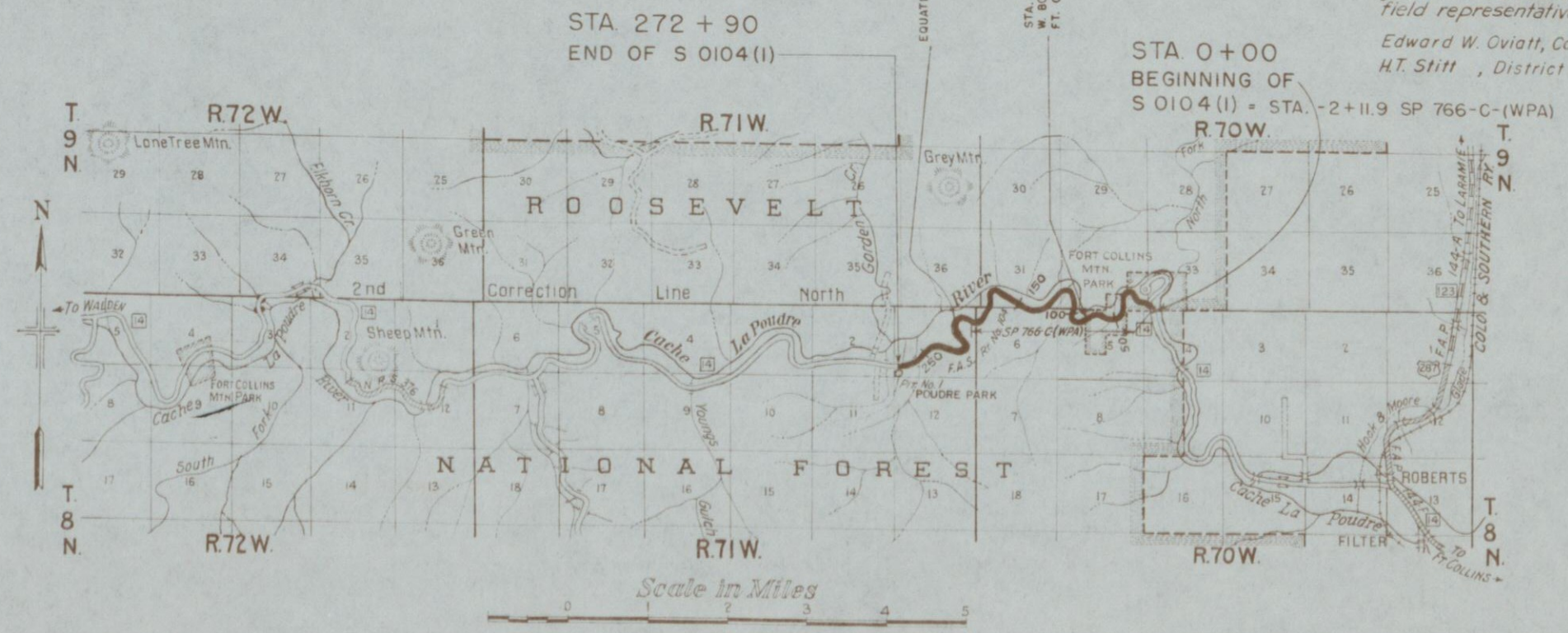
CONVENTIONAL SIGNS

- CENTER LINE OF SURVEY
RIGHT OF WAY LINES
TOWNSHIP LINES
SECTION LINES
ONE QUARTER SECTION LINES
BARBED WIRE FENCE
TELEPH. & TELEG. LINE
POWER LINE

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 } 26,083.4 FEET = 4.940 MILES
NET LENGTH OF PROJECT }



NOTICE TO BIDDERS
It is recommended that Bidders on this Project go over the plan details with one of the following field representatives of this department.
Edward W. Oviatt, Construction Engineer, Greeley
H.T. Stitt, District Engineer, Denver

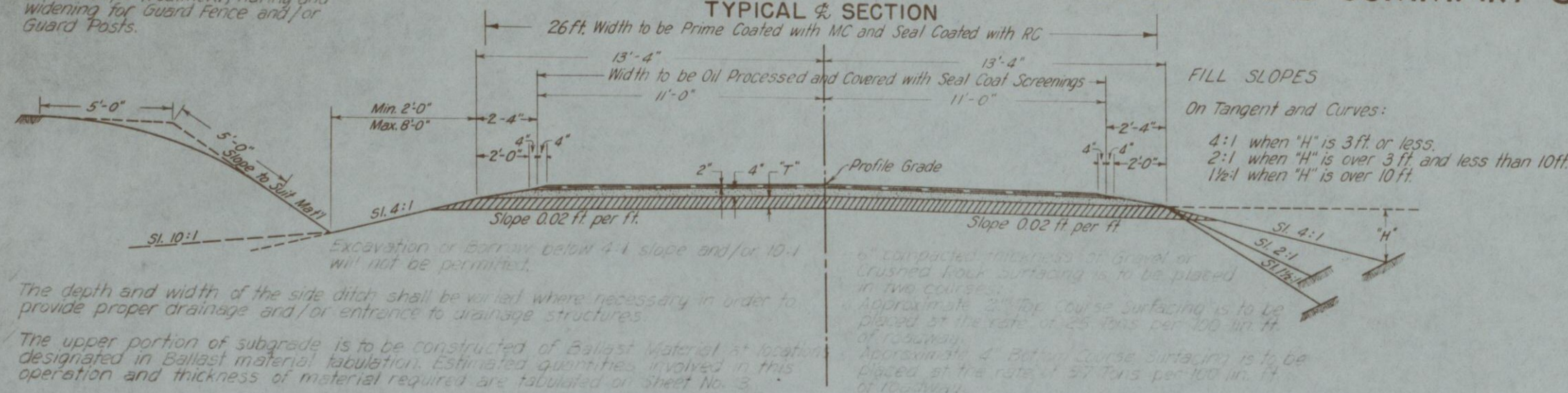


FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104 (II)	2	

Rev. 10-14-48 J.P.K.
Rev. 10-20-48 J.P.K.

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

Note:
See Standard M-2-C for details of cut slope treatment, flaring and widening for Guard Fence and/or Guard Posts.



The depth and width of the side ditch shall be varied where necessary in order to provide proper drainage and/or entrance to drainage structures.

The upper portion of subgrade is to be constructed of Ballast Material at locations designated in Ballast material tabulation. Estimated quantities involved in this operation and thickness of material required are tabulated on Sheet No. 3.

GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department adopted January 1, 1948.

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

All roadway excavation required to construct this Project is to be obtained and used as indicated on the plans. Quantities involved beyond the limits of the ditches shown on the Typical Cross Section, either noted as "Borrow" on the Plans or as "Embankment" in the List of Structures, 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 Sections as shown, are subject to change by the Engineer to fit conditions actually met in construction.

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

All Corrugated Metal Pipe Cross Culverts shall be laid with Metal Apron at Inlet and unless otherwise noted on the plans.

Culverts projecting from embankments shall be covered with approximately 8 inches of embankment material in such a manner that a minimum of pipe shall be exposed in the completed work. This shall be accomplished by warping embankment slopes around and adjacent to the culvert.

Except as otherwise noted on the plans, payment for overhaul will be based on measurement along centerline of the project.

Right of Way fences, including line posts, shall be constructed approximately six (6) inches inside the Boundary of the Highway Right of Way as shown on the plans.

Approximate location and quantities involved in construction of intercepting ditches are tabulated on summary of earthwork quantities sheet.

All curves are to be superelevated and widened as provided by the Standard Superelevation sheet included with the plans, except as otherwise noted on the plans. In cases where spiral curves are used the transition from normal crown section to full superelevation and widening (where required) shall take place over the full length of spiral curve.

Curves on this project over 6 degrees shall be provided with the superelevation shown on the Standard Superelevation sheet for a 6 degree curve.

Flat wheeled roller may be substituted for rubber tired roller.

If excavation operations develop material which will stand on slopes steeper than slope stake lines, the Department reserves the right to change cut slopes during the progress of such excavations.

GENERAL NOTES - CONTINUED

The Detour for this project lies along the present traveled road. At all places on the project where the new work lies along the present traveled road, the Contractor shall, at his own expense, prosecute construction in such manner that traffic may readily pass over the road. Also, the Contractor shall maintain in safe condition and at his own expense, all temporary approaches to and crossings of intersecting roads.

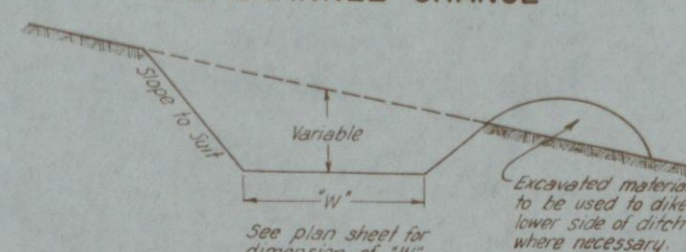
Asphaltic Road Material MC is to be used for prime coat over a 26 ft. width of roadway previous to placing of Oil Processed Material. Grade of MC oil to be determined by the Engineer.

Asphaltic Road Material MC-3 is to be used for processing oil mat on this project.

Asphaltic Road Material RC is to be used for seal coat over the entire processed area. Grade of RC oil to be determined by the Engineer.

All side approach roads to the project shall be prime and seal coated to approximately 50 ft. cut from edge of oil or to the Right of Way line, whichever is less, unless otherwise noted on the plans.

TYPICAL SECTION OF DITCHES & CHANNEL CHANGE



TABULATION OF LENGTH & DESIGN DATA

STATION	ROADWAY	
	LIN. FT.	
0+00 Begin S0104 (I) =		
37+241.9 SP 766-C-(WPA)	5997.9	
59+97.9 Bk. = Eq		
60+15.0 Ah. = Eq		
139+05.4 Bk. = Eq	7890.4	
139+00.9 Ah. = Eq		
180+86.8 Bk. = Eq	4185.9	
180+87.7 Ah. = Eq		
192+41.3 Bk. = Eq	1153.6	
201+84.2 Ah. = Eq		
213+99.2 Bk. = Eq	1715.0	
219+03.5 Ah. = Eq		
223+05.4 Bk. = Eq	401.0	
223+00.6 Ah. = Eq		
226+19.3 Bk. = Eq	313.2	
226+41.7 Ah. = Eq		
242+30.0 Bk. = Eq	1583.3	
244+04.3 Ah. = Eq		
250+06.5 Bk. = Eq	602.2	
250+57.3 Ah. = Eq		
263+05.6 Bk. = Eq	1247.7	
263+03.7 Ah. = Eq		
272+90.0 End S0104 (I)	981.3	
TOTAL	26,083.4	
SUMMARY	LIN. FT.	MILES
Total S0104 (II) Roadway	26,083.4	4.940
TOTAL	26,083.4	4.940
DESIGN DATA		
Maximum Degree of Curve	45°	
Maximum Grade	7.5%	
Minimum N.P.S.D. - horizontal	150'	
Minimum N.P.S.D. - vertical	220'	
Maximum Design Speed	30 M.P.H.	

SURFACING PLAN

It is estimated that material for Gravel Surfacing for the project is available in the vicinity of the pit indicated in the following tabulation. Estimated quantities involved in this operation are shown below.

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

MATERIAL TO BE PLACED	SOURCE	QUANTITY			OVERHAUL TON MILES
		AVAILABLE	TONS USED		
			TOP COURSE GRADING 'C'	BOTTOM COURSE GRADING 'B'	
0+00 to 222+64.1 222+64.1 to 272+90 Road App. & App. to Project	500' from Station 272+90 in S.W. 1/4 Sec. 1, T8N R71W	Ample	5326 1195 375	12143 2725 	55242 FM 611
Estimated for filling low spots in Roadway				1000	1650
TOTALS			6896	15868	37503

BALLAST PLAN

It is estimated that Ballast material for the project is available in the vicinity of the pit indicated in the following tabulation. Estimated quantities involved in this operation are shown below.

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

MATERIAL TO BE PLACED	SOURCE	AVAILABLE	QUANTITY & THICKNESS		OVERHAUL TON MILES
			THICKNESS INCHES	TONS USED	
				CLASS "I"	
11+00 to 19+00	500' from station	Ample	6"	728	2731
42+00 to 50+00	272+90 in S.W. 1/4			728	2303
67+46 to 73+54	Sec. 1, T5N			74	1492
90+46 to 110+27	R71W			1803	3551
120+46 to 159+67				2512	1550
172+00 to 222+64.1				3746	1472
222+64.1 to 272+90				4350	FM
TOTALS				15421	16732

FENCING REQUIREMENTS

STATION	SIDE	REMOVE FENCE	BUILD B. W. FENCE	
		LIN. FT.	LIN. FT.	
79+05 to 85+00	Lt	135	335	
120+30 to 121+00	Lt	70		
175+00 to 185+00	Lt	230	200	
187+40 to 188+75	Lt	130	135	
263+60 to 272+90	Lt	150	330	
269+50 to 272+90	Rt	350	340	
TOTALS		3165	3240	

TIMBER GUARD POSTS

STATION	SPACING	NUMBER	
		LEFT	RIGHT
4+00 to 8+00	50'		9
12+00 to 15+00	50'		7
25+50	Culvert	1	1
30+65	Culvert	1	1
35+00	Culvert	1	1
43+22	Culvert	1	1
51+70	Culvert	1	1
75+36	Culvert	1	1
99+00	Culvert	1	1
101+50 to 110+00	50'		18
106+00	Culvert	1	1
113+20	Culvert	1	1
119+07	Culvert	1	1
131+38	Culvert	1	1
135+60	Culvert	1	1
138+44	Culvert	1	1
151+00 to 157+00	50'		13
152+97	Culvert	1	1
160+00	Culvert	1	1
168+80	Culvert	1	1
180+00	Culvert	1	1
183+00 to 192+00	50'		19
188+40	Culvert	1	1
202+37	Culvert	1	1
203+25	Culvert	1	1
211+65	Culvert	1	1
218+00	Culvert	1	1
221+00 to 234+00	50'		27
224+30	Culvert	1	1
225+40	Culvert	1	1
230+32	Culvert	1	1
235+00	Culvert	1	1
240+00	Culvert	1	1
244+00 to 252+00	50'		17
245+00	Culvert	1	1
251+25	Culvert	1	1
262+15	Culvert	1	1
TOTALS			162

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO	ITEM	UNIT			PROJECT TOTALS
10a	Clearing & Grubbing entire Project	Lump Sum			•
11b	Removal of 17 Structures	Lump Sum			•
11c	Removal of Shed, Sta. 210+	" "			•
11a	Removing and Resetting Mail Boxes	" "			•
12a	Removing Fence	Lin. Ft.			3200
12ax	Removing Fence (Guard)	" "			610
13c	Unclassified Excavation	Cu. Yds.			44,000
13d	Unclassified Ditch Excavation	Cu. Yds.			400
14a	Dry Rock Excavation (Structural)	Cu. Yds.			280
14b	Dry Common Excavation	" "			280
14c	Wet Rock Excavation	" "			100
14d	Wet Common Excavation	" "			100
16a	Structure Backfill (Class I)	" "			550
16d	Mechanical Tamping	Hour			130
17a	Rolling with Tamping Roller	Unit Hour			100
17b	Rolling with Flat Wheeled Roller	Hour			30
17c	Rolling with Rubber Tired Roller	"			210
17d	Furnishing Tamping Roller	Roller Unit			2
17e	Furnishing Flat Wheeled Roller	Lump Sum			•
17f	Furnishing Rubber Tired Roller	" "			•
17g	Wetting	M. Gal.			760
18a	Station Yard Overhaul	Sta. Yd.			58,000
18b	Yard Mile Overhaul	Yard-Mile			400
18c	Ton Mile Overhaul	Ton Mile			54,300
23a	Ballast (Class I)	Ton			15,500
26b	Gravel or Crushed Rock Surfacing (Grading B)	Ton			15,300
26c	Gravel or Crushed Rock Surfacing (Grading C)	"			6,300
30x	Asphaltic Road Material (RC-)	Gal.			20,400
30y	Asphaltic Road Material (MC-)	"			32,500
30j	Asphaltic Road Material (MC-3)	"			67,100
31a	Road Mix Oil Processing	Sq. Yd.			70,000
31c	Stone Screenings (Type I)	Ton			710
53b	18" Corrugated Metal Culvert Pipe	Lin. Ft.			190
53c	24" Corrugated Metal Culvert Pipe	" "			1352
53d	30" Corrugated Metal Culvert Pipe	" "			48
53e	36" Corrugated Metal Culvert Pipe	" "			46
64	Dry Rubble Slope & Ditch Paving (12" thick)	Sq. Yd.			90
67b	Heavy Rip-rap	Cu. Yd.			1010
76a	Barbed Wire Fence with Treated Wooden Posts	Lin. Ft.			3300
81b	Right of Way Markers	Each			18
92	Timber Guard Posts	Each			162
95c	Metal Aprons for 24" Corrugated Metal Pipe Culverts	Each			20
95d	Metal Aprons for 30" Corrugated Metal Pipe Culverts	"			1
95e	Metal Aprons for 36" Corrugated Metal Pipe Culverts	"			1
119	Shaping Roadbed	Mile			1.8
WORK BY STATE FORCES					
81a	Project Markers	Each			2
FORCE ACCOUNT					
	Cleaning 8 Culverts	Lump Sum			•
RIGHT OF WAY- FORCE ACCOUNT					
	Move Ice House & Appurtenances Sta. 191+	Lump Sum			•
	Move Cabin & Appurtenances Sta. 245+	" "			•
	Move Cabin & Appurtenances Sta. 247+	" "			•
	Move Store & Appurtenances Sta. 249+	" "			•

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104(1)	3	

Remove Item for M.S.T. & T. Co. Work-10-6-45-MW

LIST OF STRUCTURES

R.O.W. MARKERS

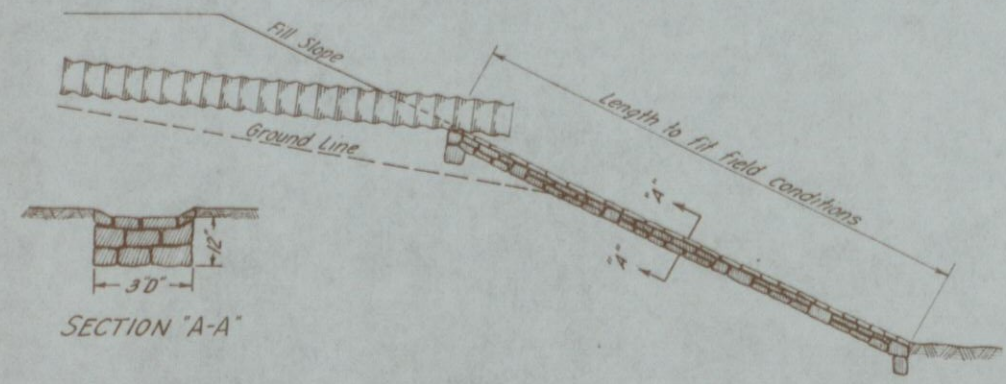
LIST OF STRUCTURES

CONTINUED FROM SHEET NO. 4

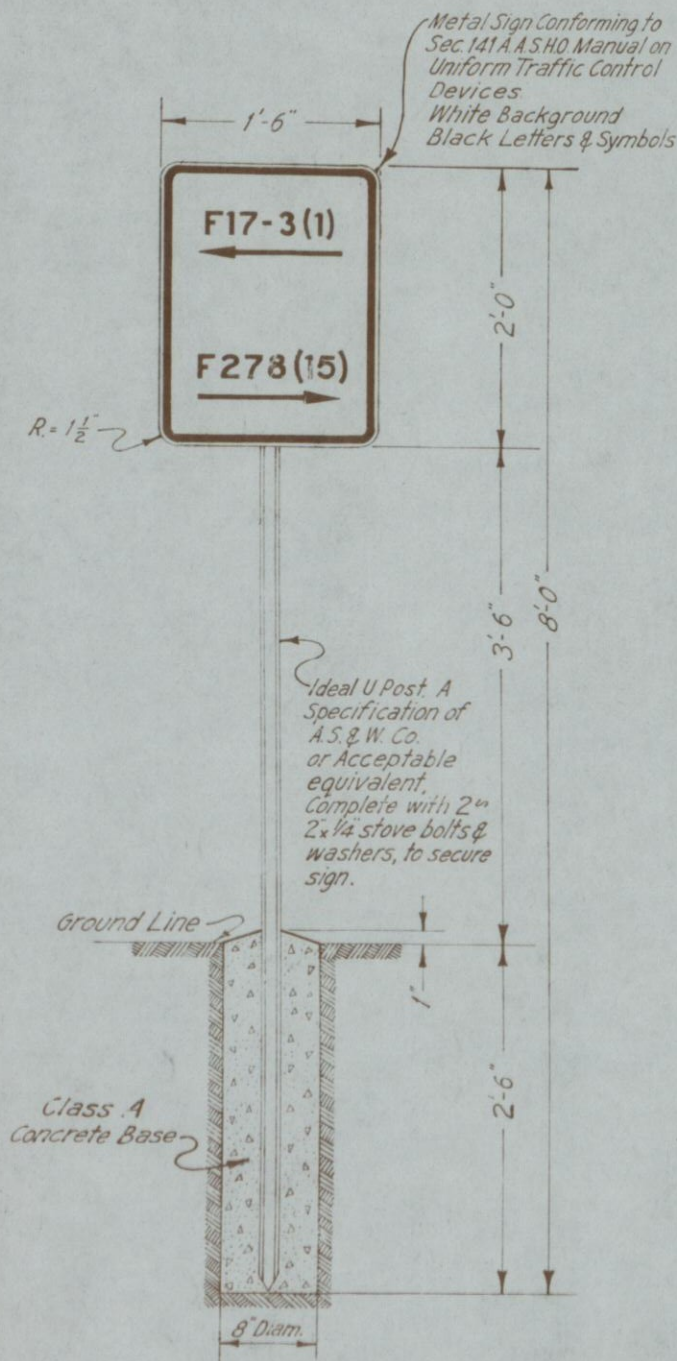
STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION		STRUCTURAL EXCAVATION *			STRUCTURE BACKFILL CLASS 1 CU.YDS.	MECH. TAMP. HRS.	GRAVEL OR CRUSHED ROCK SURF. TONS	CONCRETE		REINFORCING STEEL LBS.	CORRUGATED METAL CULVERT PIPE					DRY RUBBLE SL. & DIT PAVING 12" THICK SQ. YDS.	REMOVE GUARD FENCE LIN.FT.	MET. APRONS FOR CORR. METAL PIPE CULVERTS EACH	MISCELLANEOUS				
			UNCLASS. CU.YDS.	UNCL. DITCH CU.YDS.							CU. YDS.	CL. "A"		CL. "B"	LIN. FT.											
			EXC.	EMB.										18"	24"	30"	36"									
212+10	Road Approach & Side Drain, Lt. Remove 2'x2'x24' Wood Box, Lt. Road Approach, Lt.	1		10				5	7		20				26								24	30	36	
217+10			25								30															
218+00	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet. No Metal Apron.				10			10	13							42			23							
221+50	10'x20' Parking Area, Lt.		100																							
224+30	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet.				5			15	15							46			7			1				
225+30	Road Approach, Lt.		10																							
225+40	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet. Remove 12" C.M.P.	1			5			10	11							52			7			1				
230+94	Cross Culvert & Inlet Ditch (W-1). Remove 12"x30" C.M.P.	1			5			20	18							54						1				
235+00	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet. No Metal Apron.				5			10	15							48			7							
240+00	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet. No Metal Apron.				5			35	19							56			7							
245+	Move Cabin & Appurtenances, Lt.							(Right of Way - Force Account)																		
245+00	Cross Culvert & Inlet Ditch (W-1). Paving at Outlet.				5			10	20							62			7			1				
251+25	Cross Culvert Inlet Ditch (W-1). Remove 12"x30" C.M.P.	1			5			10	14							40						1				
247+	Move Cabin & Appurtenances, Lt.							(Right of Way - Force Account)																		
262+15	Cross Culvert & Inlet Ditch (W-1).				5			15	12							40						1				
269+67	Remove 12"x32" C.M.P.	1																								
271+00	Road Approach, Rt.			10							20															
249+	Move Store & Appurtenances, Rt.							(Right of Way - Force Account)																		
272+90	Project Marker & Approach to Project			10							40															
Entire Project	Monumental Tampers for C.M.P. 100' x 30'																									Project Marker (By State Forces)
	PROJECT TOTALS	11	145	130	170			145	544	123	315				190	1352	43	46	90	603	20	1	1			

* Structural Excavation is estimated to be 50% Common & 50% Rock, each of which is estimated to be 15% Dry & 25% Wet.

DETAILS FOR PAVING AT OUTLET



PROJECT MARKER POST ITEM N° 81a



NOTES FOR PROJECT MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted January 1st 1948.

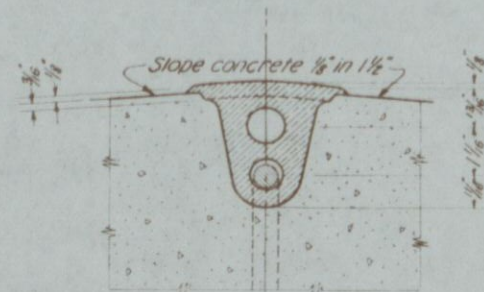
Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed. Post to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will 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 January 1st 1948.

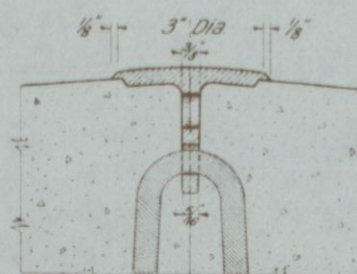
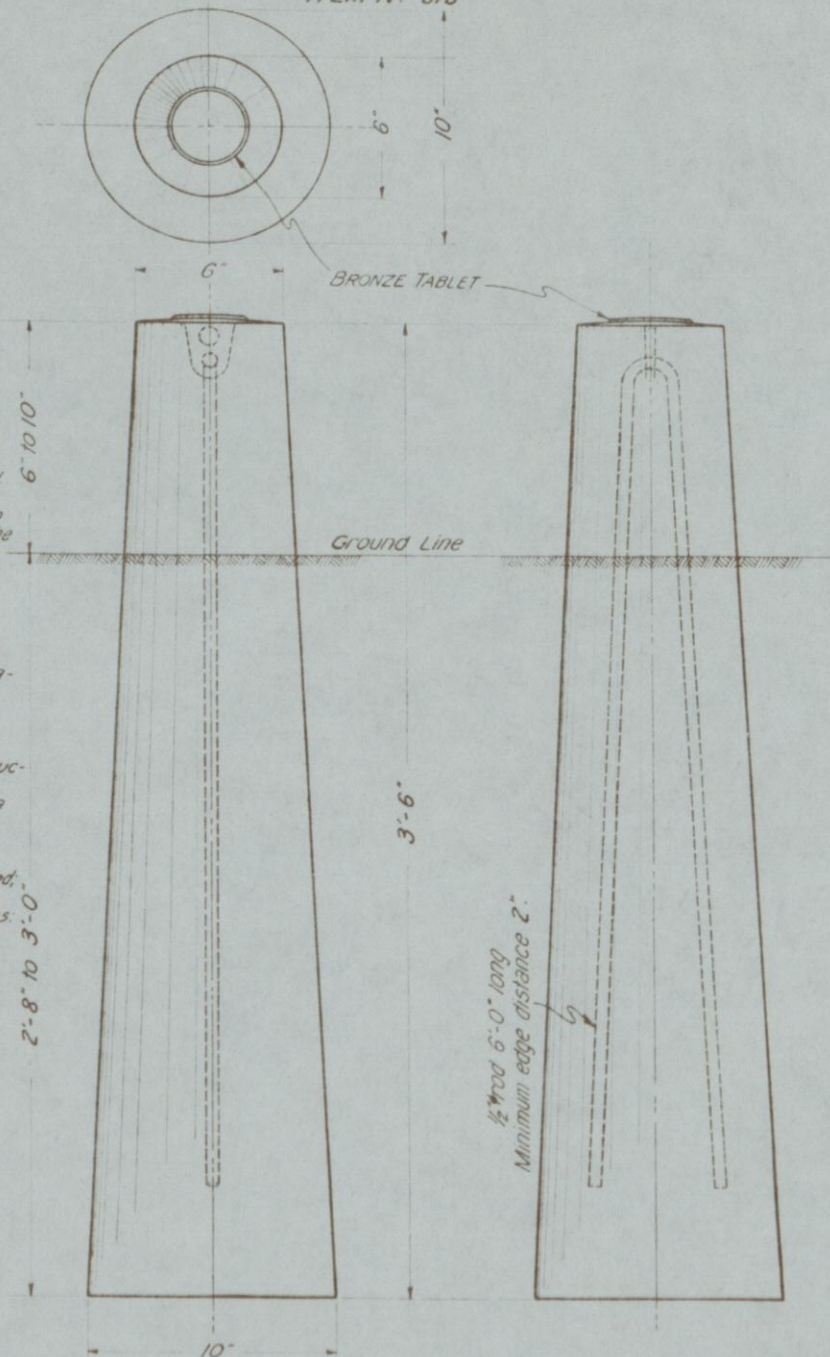
Posts shall be made of Class "A" Concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly. All exposed surfaces of the bronze tablet are to be ground to a smooth surface.

All letters are to be depressed a minimum of 1/16 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 inch letters and figures to be used. Project designations on tablets shall be properly shown. Thus: "F.A.P. N°" for Federal Aid Projects, "S.P. N°" for State Projects, "P.W.A. N°" for P.W.A. Projects, etc.



SECTION B-B

RIGHT OF WAY MARKER POST ITEM N° 81b



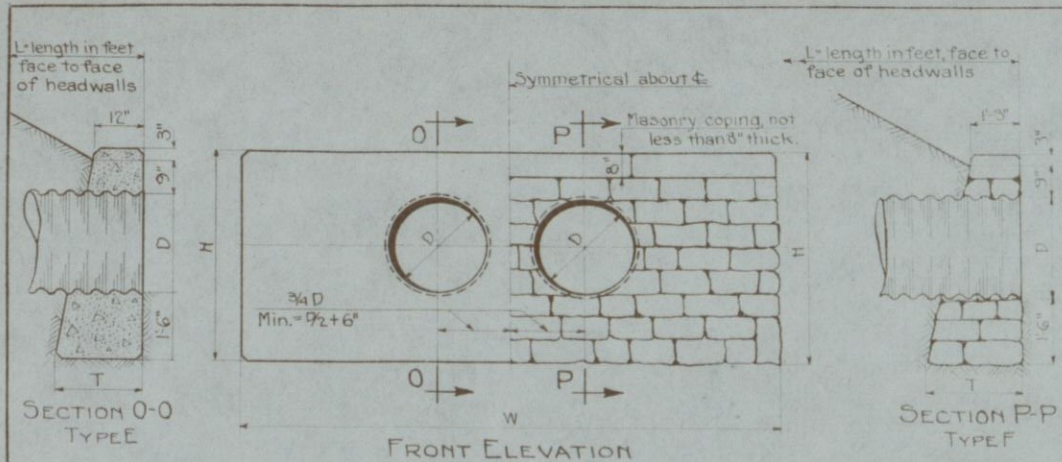
SECTION A-A

DETAIL OF BRONZE TABLET FOR RIGHT OF WAY MARKER POST

REVISIONS

Rev. 6-28-40, A.Z. 1940 Specs.
Rev. 1-2-46, C.S.D. Item 81a
STANDARD M-7-B
Rev. 8 Jan. 46 P.S.B. 1/2" to 1/2" Φ
Rev. June 10 '46, W.E.M. Bronze Tablet
Rev. Mar. 21-1947, W.H.M. - Project Marker Post
Rev. Nov. 20-1947, J.P.K. - Metal Project Marker
Rev. Dec. 13-1947, J.P.K. - Concrete Base for Metal Project Marker

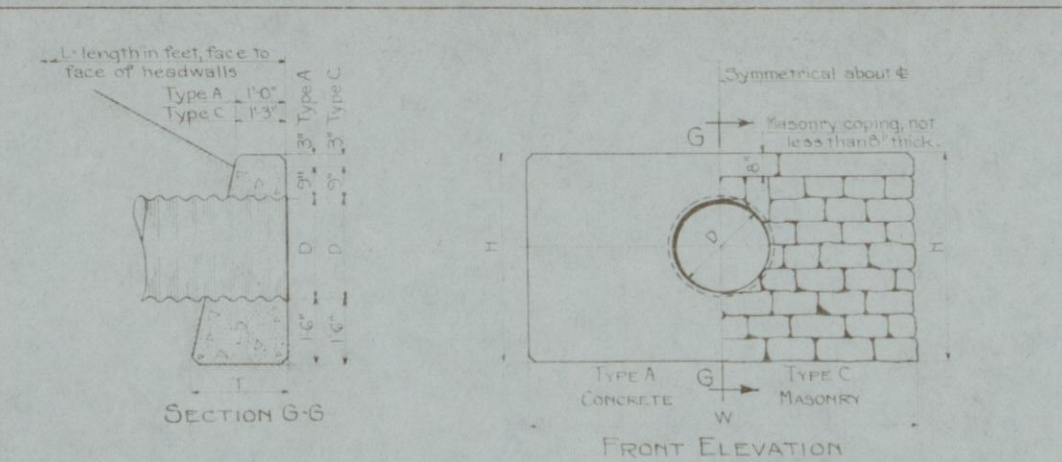
FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	50104(1)	6



STANDARD HEADWALLS FOR DOUBLE CORRUG. METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

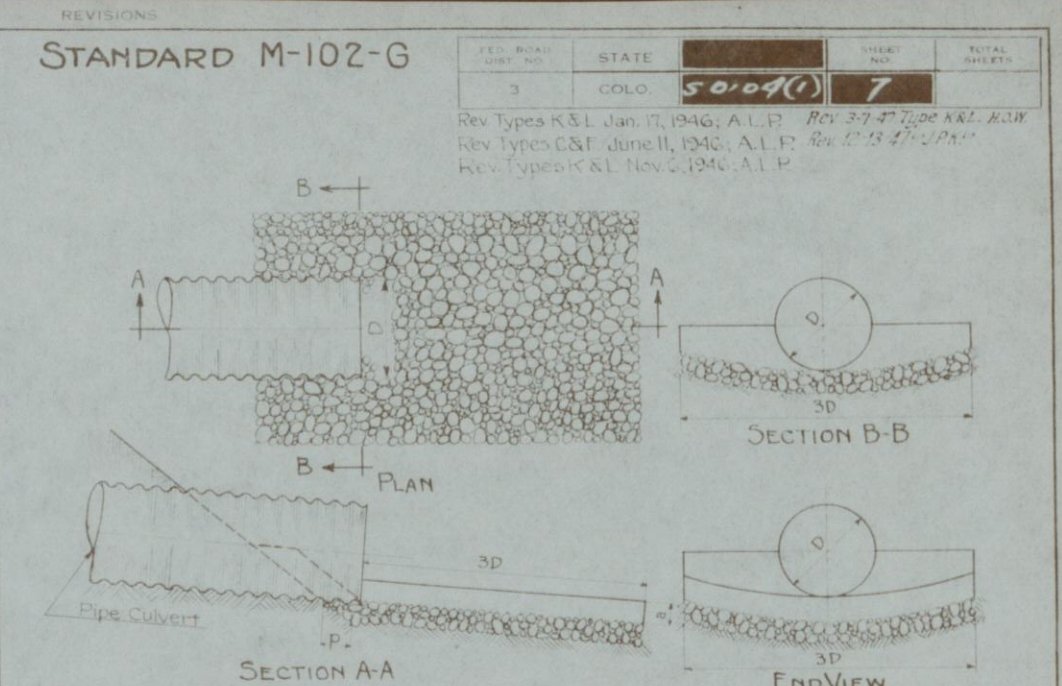
TYPE E			BOTH TYPES			TYPE F		
D DIAM.	T	CLASS B CONCRETE IN TWO HEADWALLS	W	H	CORRUGATED METAL PIPE 2xL= LIN. FT.	CEMENT RUBBLE MASONRY IN TWO HEADWALLS	T	D DIAM.
15"	1'-6"	2.4 Cu. Yds.	7'-6"	3'-9"	16 GAGE	3.1 Cu. Yds.	2'-0"	15"
18"	1'-7"	3.0 Do	8'-6"	4'-0"	16 Do	3.8 Do	2'-1"	18"
24"	1'-10"	4.4 Do	10'-6"	4'-6"	14 Do	5.5 Do	2'-4"	24"
30"	2'-0"	6.1 Do	12'-9"	5'-0"	14 Do	7.5 Do	2'-6"	30"
36"	2'-2"	8.1 Do	15'-0"	5'-6"	12 Do	10.0 Do	2'-8"	36"
42"	2'-5"	10.8 Do	17'-3"	6'-0"	12 Do	12.8 Do	2'-10"	42"
48"	2'-7"	13.6 Do	19'-6"	6'-6"	12 Do	16.3 Do	3'-0"	48"



STANDARD HEADWALLS FOR SINGLE CORRUG. METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

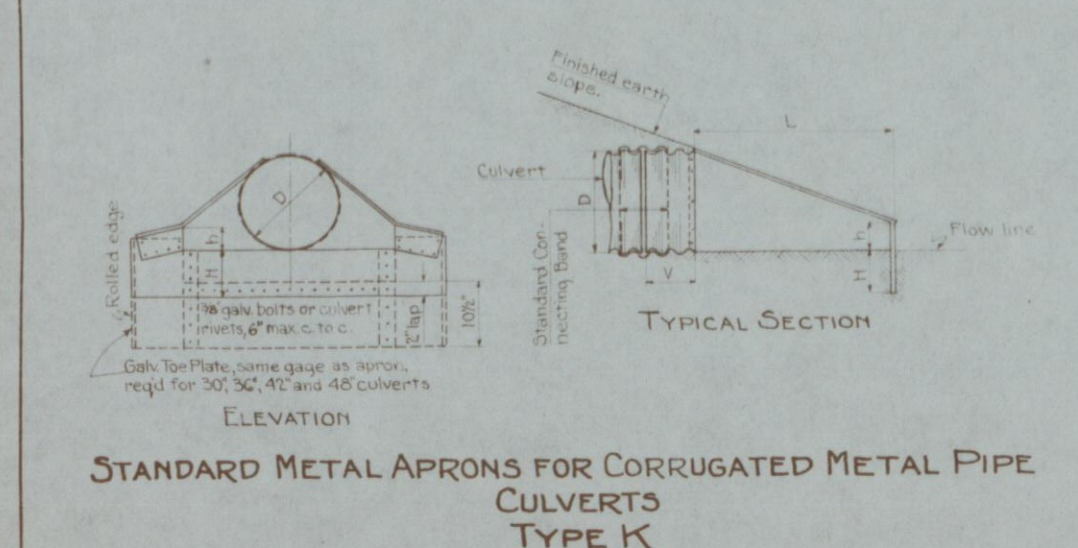
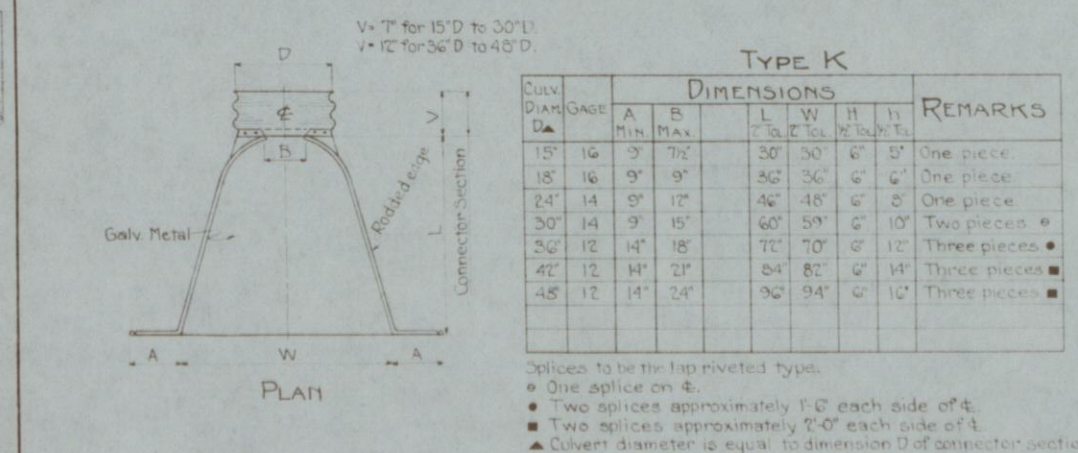
TYPE A			BOTH TYPES			TYPE C		
D DIAM.	T	CLASS B CONCRETE IN TWO HEADWALLS	W	H	CORRUGATED METAL PIPE L= LIN. FT.	CEMENT RUBBLE MASONRY IN TWO HEADWALLS	T	D DIAM.
15"	1'-6"	1.8 Cu. Yds.	5'-3"	3'-9"	16 GAGE	2.2 Cu. Yds.	2'-0"	15"
18"	1'-7"	2.2 Do	6'-0"	4'-0"	16 Do	2.8 Do	2'-1"	18"
24"	1'-10"	3.3 Do	7'-6"	4'-6"	14 Do	4.1 Do	2'-4"	24"
30"	2'-0"	4.5 Do	9'-0"	5'-0"	14 Do	5.6 Do	2'-6"	30"
36"	2'-2"	6.0 Do	10'-6"	5'-6"	12 Do	7.4 Do	2'-8"	36"
42"	2'-5"	8.0 Do	12'-0"	6'-0"	12 Do	9.2 Do	2'-10"	42"
48"	2'-7"	10.0 Do	13'-6"	6'-6"	12 Do	11.5 Do	3'-0"	48"



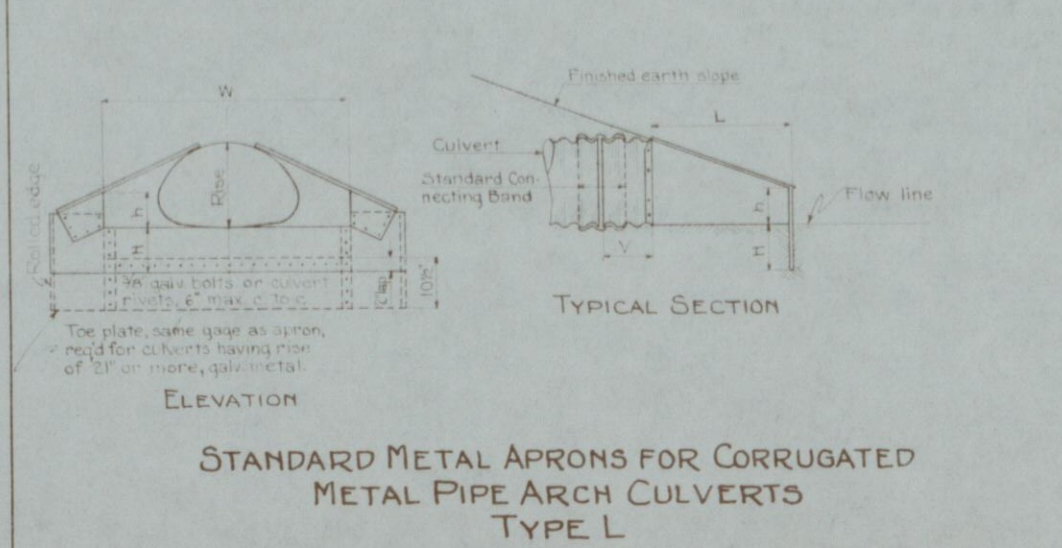
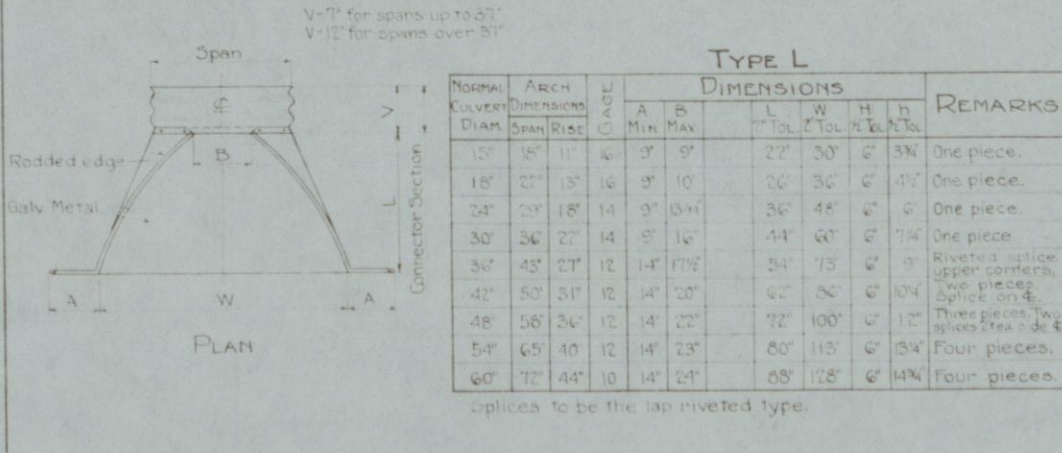
STANDARD GROUTED RUBBLE APRON FOR PIPE CULVERTS

SQUARE YARDS GROUTED RUBBLE SLOPE AND DITCH PAVING 1 FOOT THICK

FILL SLOPE	D	15"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
1:1	2'-0"	3	4	6	9	12	17	21	27	33	39	46	51	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



STANDARD METAL APRONS FOR CORRUGATED METAL PIPE CULVERTS TYPE K

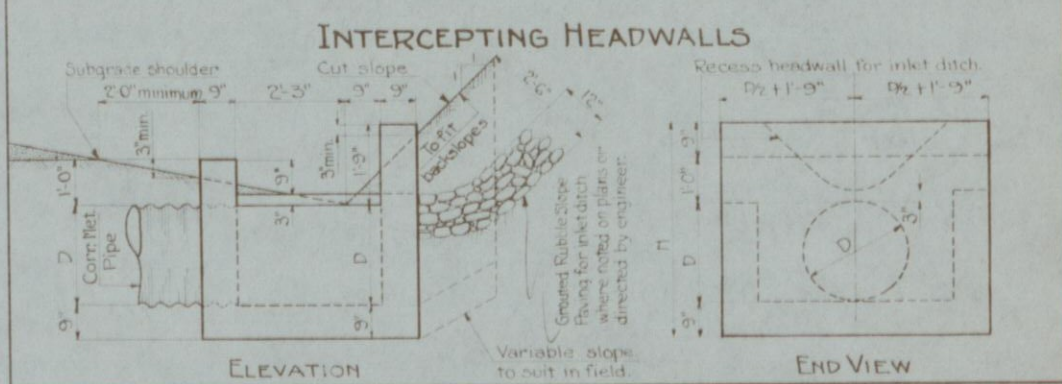


STANDARD METAL APRONS FOR CORRUGATED METAL PIPE ARCH CULVERTS TYPE L

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.
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.



GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted January 1st 1948.

All exposed concrete surfaces shall receive class 1 surface finish.

All exposed concrete corners shall be beveled to a 2 inch face.

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

All walls shall have forms on both sides.

The minimum fill over top of culverts shall be 1'-0".

When culvert is skewed, headwalls shall be placed parallel to centerline.

Minimum grade of pipe shall be 1%.

For size and location of culverts see plan sheets for project.

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

Mechanical Tamping, as provided under Item No. 14 of the specifications, shall be applied over such areas as shown on the plans or as ordered by the Engineer.

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD HEADWALLS

INTERCEPTING HEADWALLS

GALVANIZED METAL APRONS

GROUTED RUBBLE APRONS

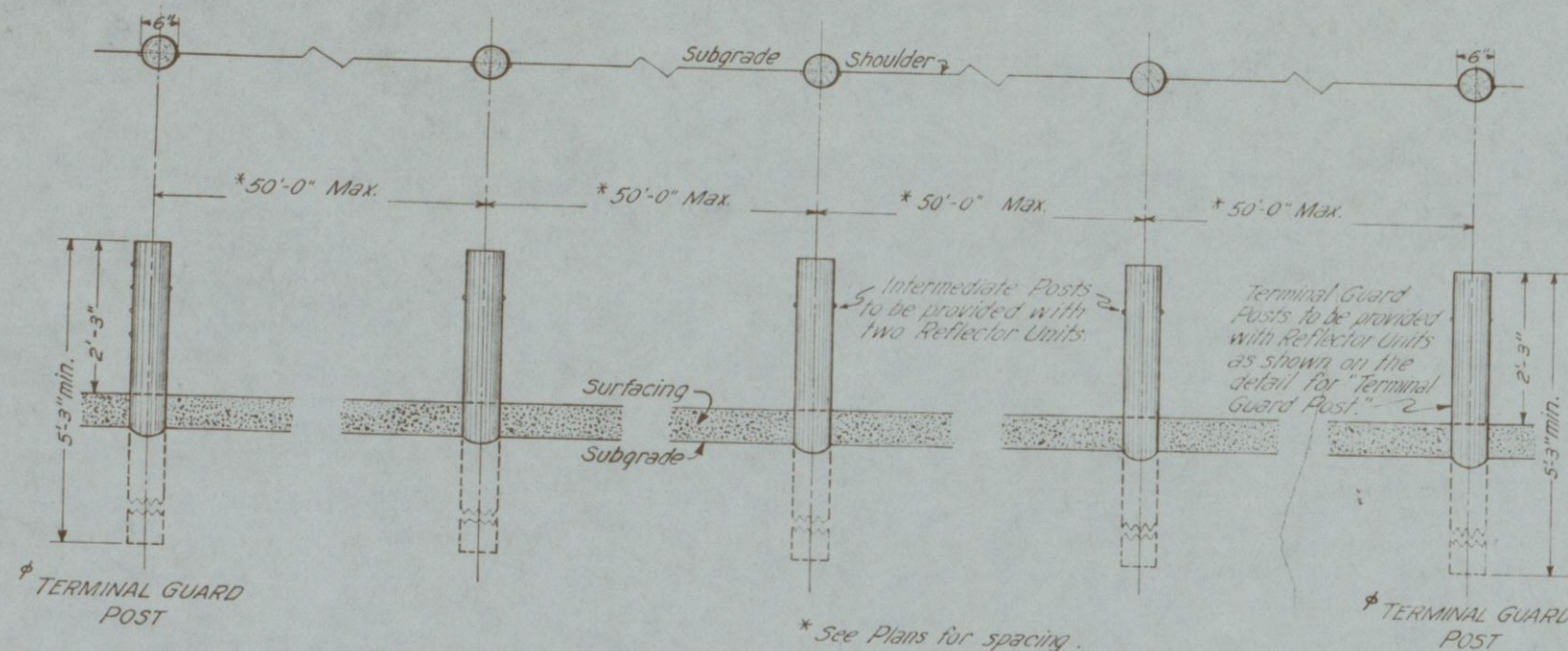
FOR CORR. MET. PIPE CULVERTS

Designed by W.F. W. Approved by *W.F. W.*
Made by A.L.F. Bridge Engineer
Checked by H.W.P. Date December 15, 1945

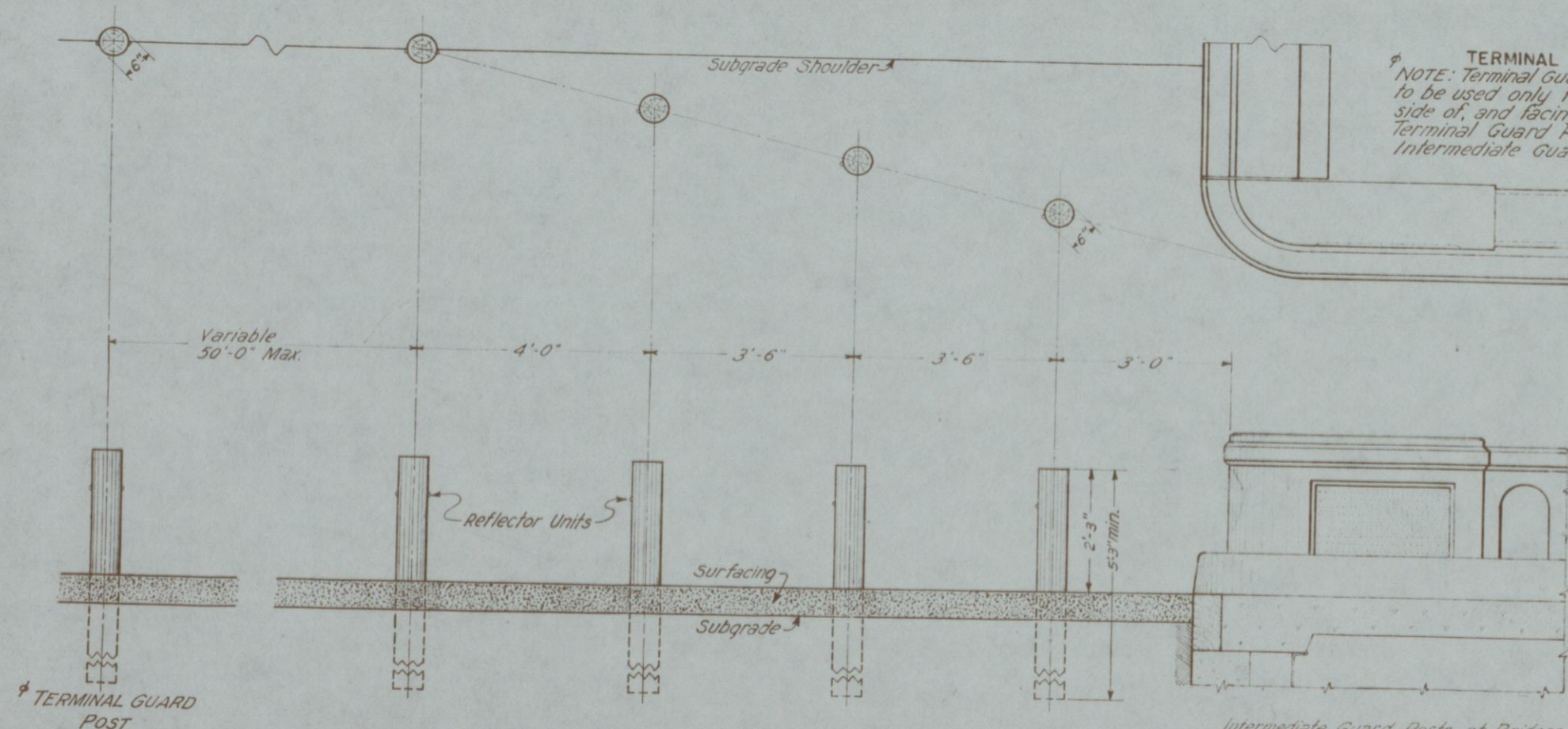
REVISIONS

Rev. 11-24-39-PBB. Reflector Units (Min. 5' Str.)
 Rev. 12-19-39-PBB. Length and treatment of posts.
STANDARD M-19-B
 Rev. 6-28-40-A.Z. - 1940 Specs. & Location of posts.
 Rev. 10-9-40-PBB. - Painting & Refl. Units.
 Rev. 2-24-41-PBB. - Terminal Guard Post Placement.
 Rev. 7-7-41-PBB. - White Paint.
 Rev. 7-9-42 H.O.W. Delete Painting of Posts.
 Rev. 8-6-45 A.Z. - Location of posts.
 Rev. 12-13-47 J.P.K.

FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	50104(1) 8	

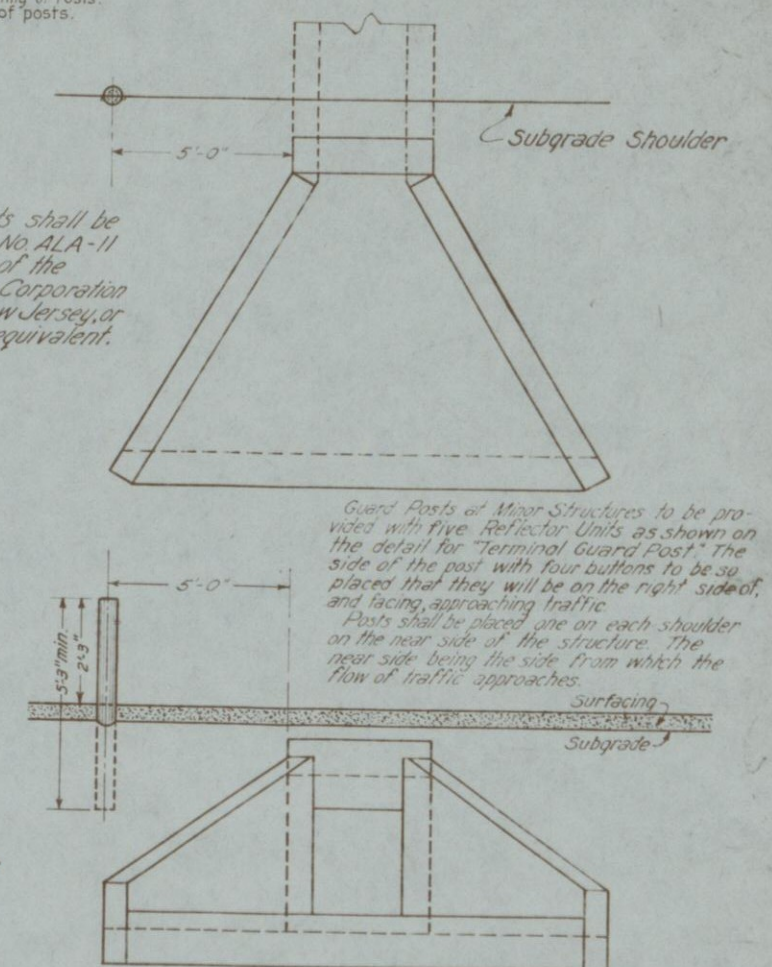
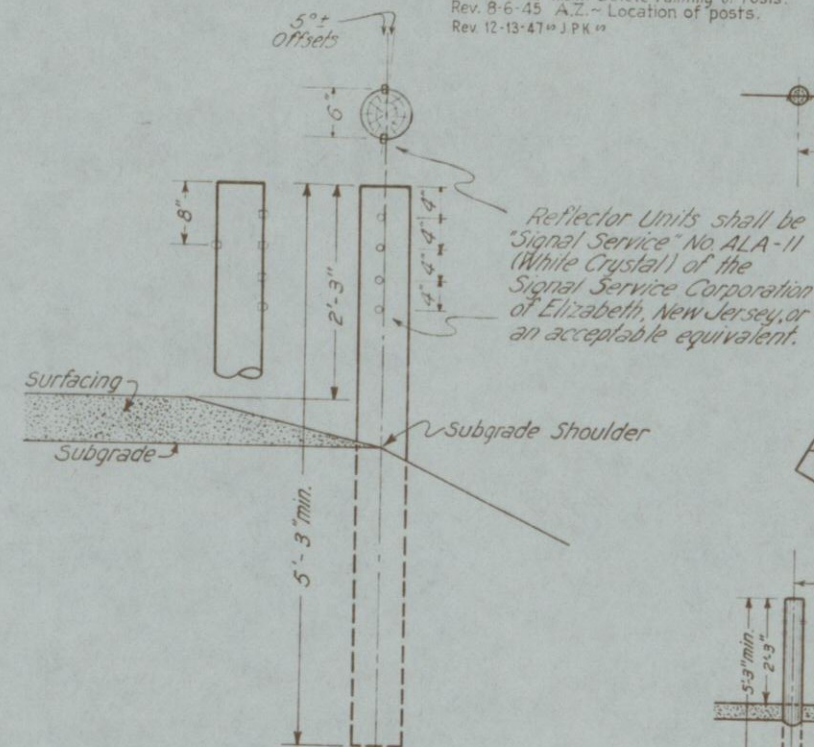


SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



SHOWING PLACEMENT AT BRIDGE APPROACHES

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.



SHOWING PLACEMENT AT MINOR STRUCTURES

GENERAL NOTES

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

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

No section of wood posts shall be less than 6" in diameter. All wood posts shall be entirely peeled and shaved, thoroughly seasoned and dry, with square tops.

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 500 feet.

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

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

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

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

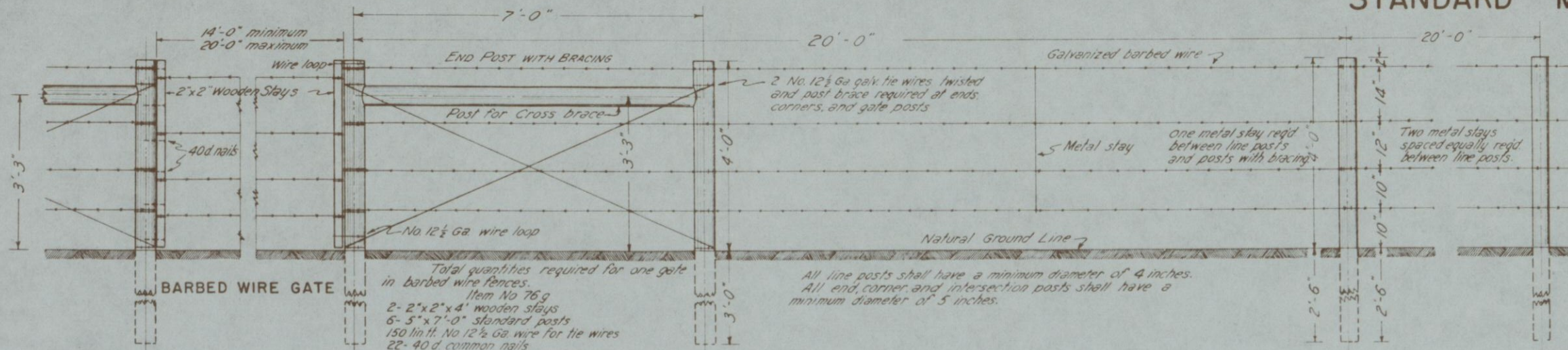
COLORADO
 STATE HIGHWAY DEPARTMENT
STANDARD
TIMBER GUARD
POSTS

Designed by R.E.L. Approved by Chief Draftsman
 Made by PBB. Chief Draftsman
 Checked by Date: January 1st 1949

STANDARD M-24-G

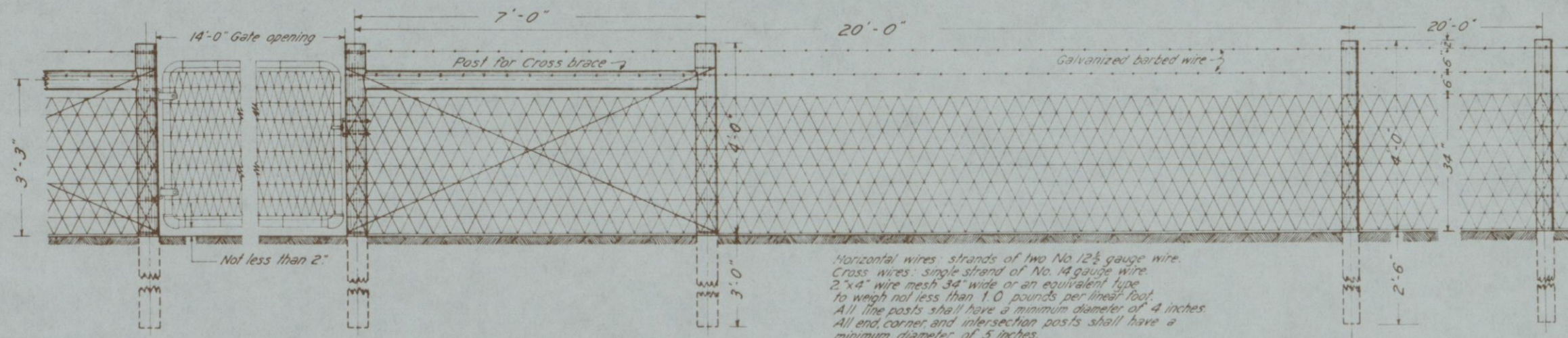
FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	50104(1) 9	

Rev. 6-20-40-A.Z.-1940 Specs.
Rev. 9-30-47-A.Z.-Wire mesh finish in Drive & Walk gates
Rev. 12-13-47-J.P.K.



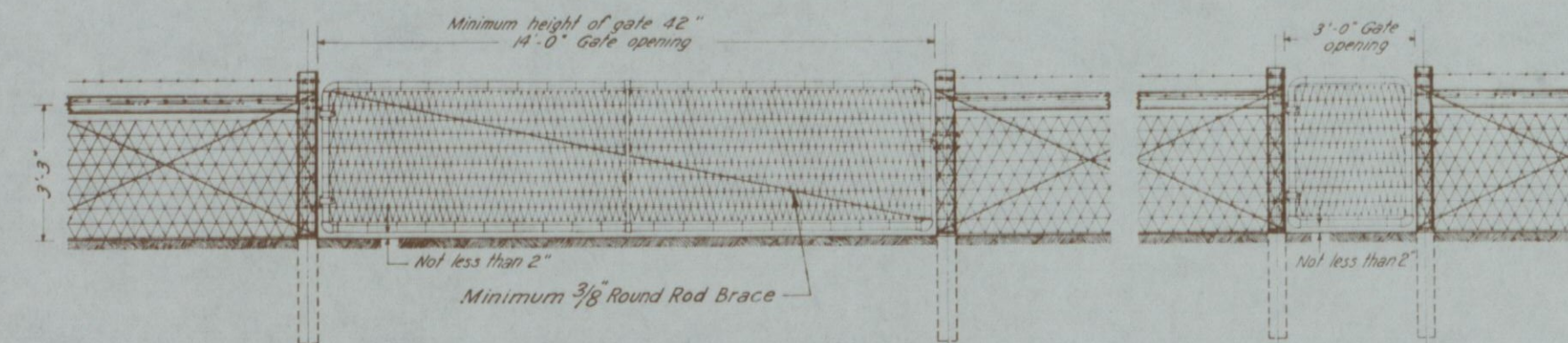
BARBED WIRE FENCE WITH WOODEN POSTS

Item No. 76 a



COMBINATION WIRE FENCE WITH WOODEN POSTS

Item No. 76 d



DRIVEWAY GATE

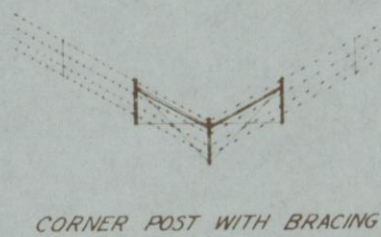
Item No. 76 h

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. 12 1/2 gauge.
Galvanized metal latch and hinges.
Minimum 1" dia. galv. pipe frame or an equivalent.

WALK GATE

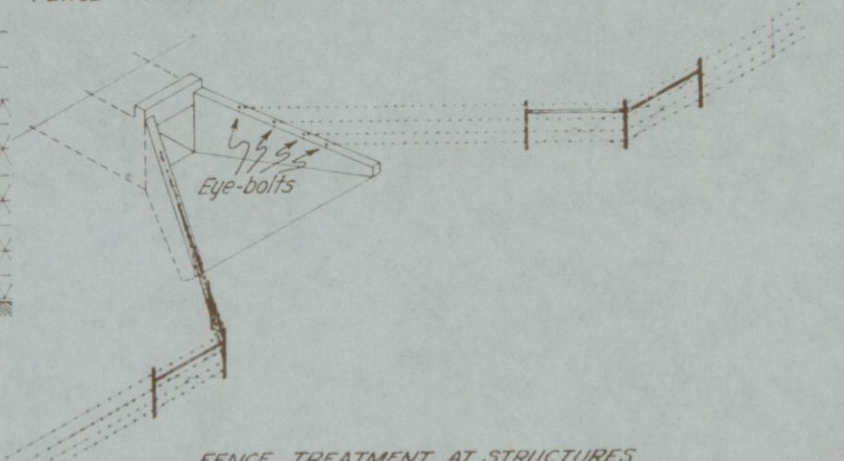
Item No. 76 i

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. 12 1/2 gauge.
Galvanized metal latch and hinges.
Minimum 1/4" 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)

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted January 1st 1948.

Barbed wire shall be of standard make, not lighter than No. 12 1/2 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 and walk gates, unless galvanized, shall be painted with an approved waterproof asphalt or mineral paint.

Staples shall be at least 1 1/2" 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 1/2" 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.

End post with bracing shall conform to details shown above. (Three posts req'd.)
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 req'd.)

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
WIRE FENCES
TREATED
WOODEN POSTS

Designed by R.E.L. Approved by J.H. Marshall
Made by P.B.B. Date: January 1st 1948
Checked by R.E.L.

GENERAL NOTES

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

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

The normal inside edge of the Graded or Surfaced Section is to remain at the standard elevation of 0.02 ft. per foot width of roadway below the profile grade, or as shown on the Typical Section for the Project. Also, the centerline pivot point is to be used until the superlevation 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 superlevation 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.

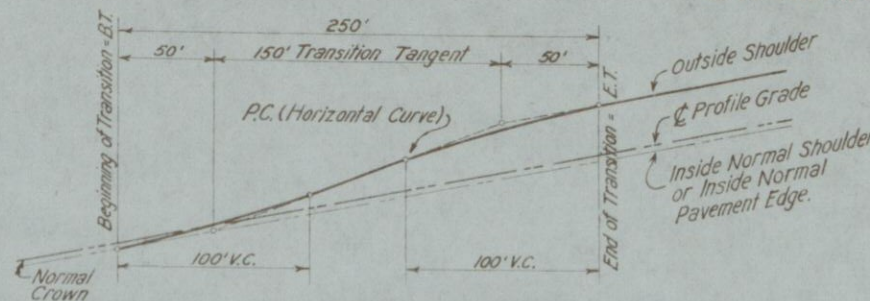
The rate of superlevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

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

$$0.0105 \text{ ft.} \times \text{Degree of Curvature}$$

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

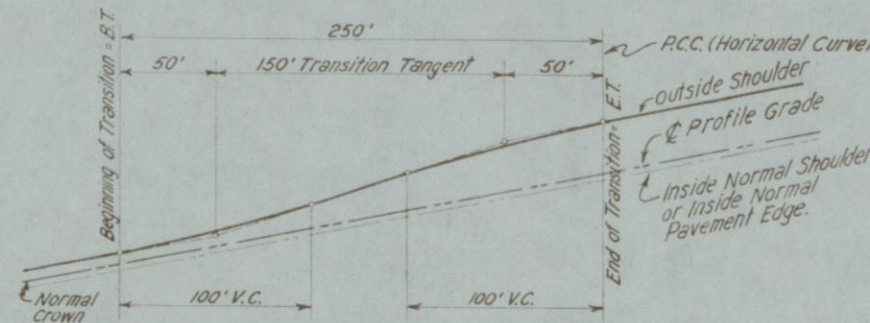
Special transition problems not covered by this standard sheet shall be covered by appropriate notes included with curve data on plans.



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 superlevation at a point 100 ft. inside the curve.



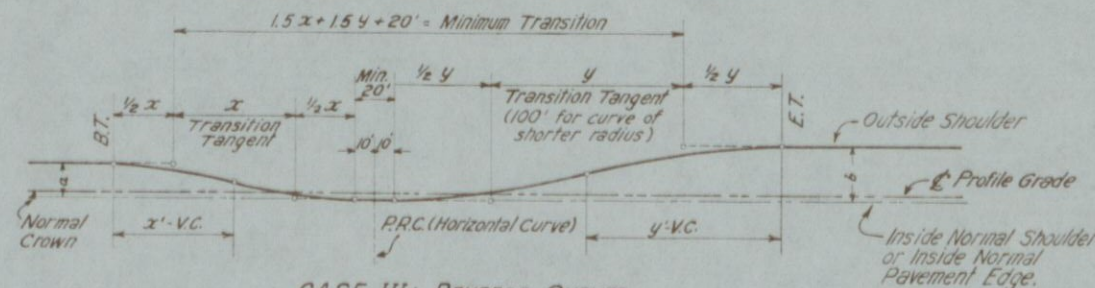
CASE II: COMPOUND CURVE

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 superlevation of the respective curves.

EXAMPLE: Let a represent the amount of superlevation on 1st curve;

" b " " " " " 2nd " ;

" x " " " " " transition tangent on 1st " ;

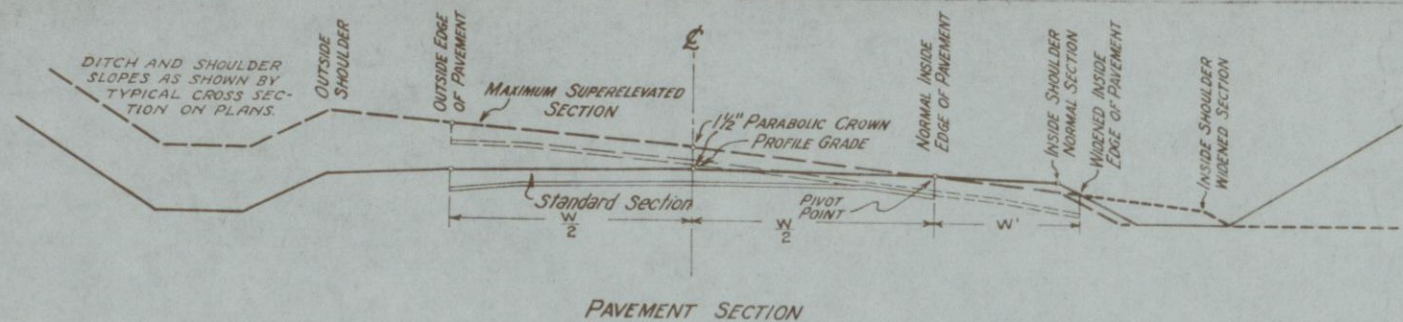
" y " " " " " " 2nd " ;

then, $a:b = x:y$.

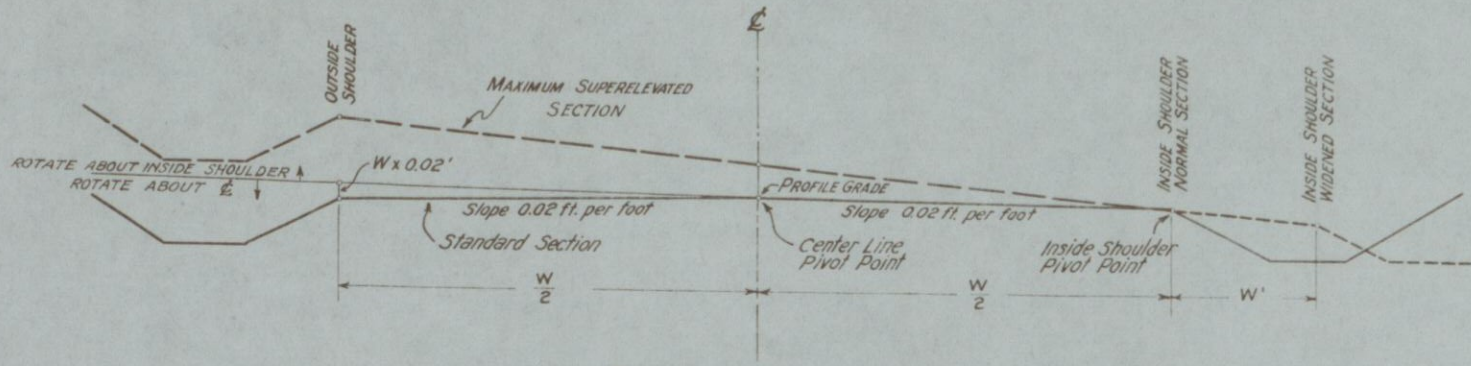
The transition tangent of the curve having the shorter radius shall be set at 100 ft. A normal crowned section 20 ft. long, 10 ft. on each side of the P.C. shall be used.

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.



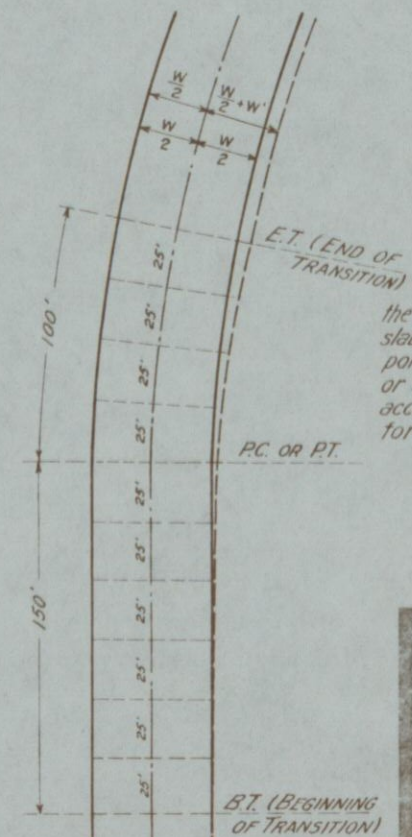
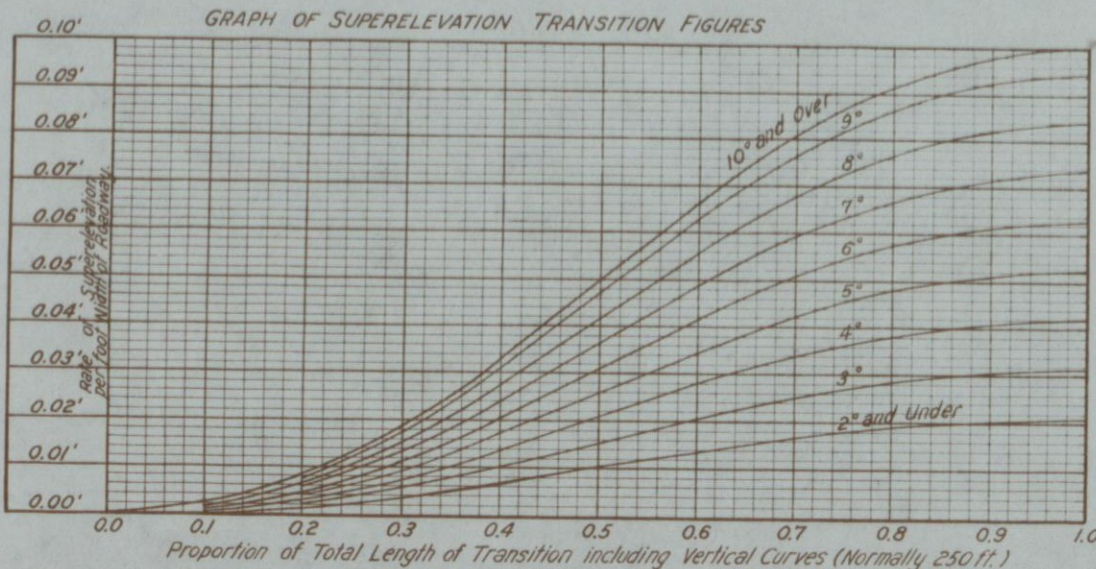
PAVEMENT SECTION



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

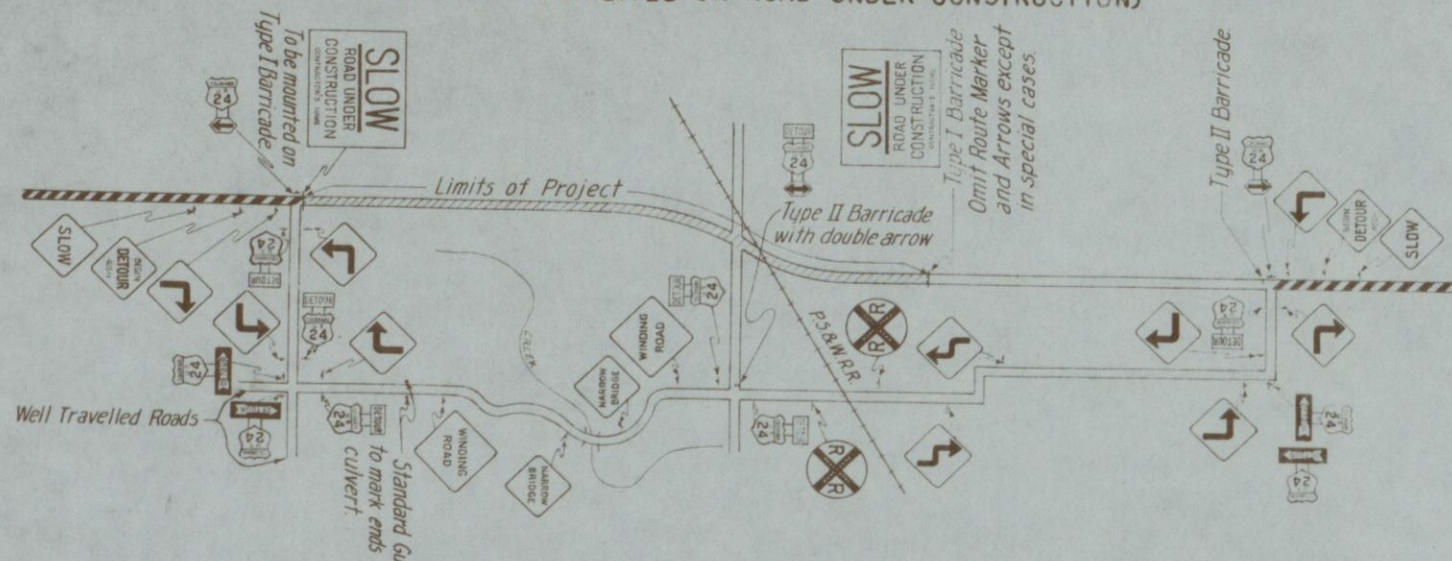


GENERAL PLAN OF WIDENING

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

Designed by R.E.L. Approved by P.B.B. Checked by P.B.B. Date January 1st 1948

TYPICAL METHOD OF MARKING DETOUR (TRAFFIC PROHIBITED ON ROAD UNDER CONSTRUCTION)

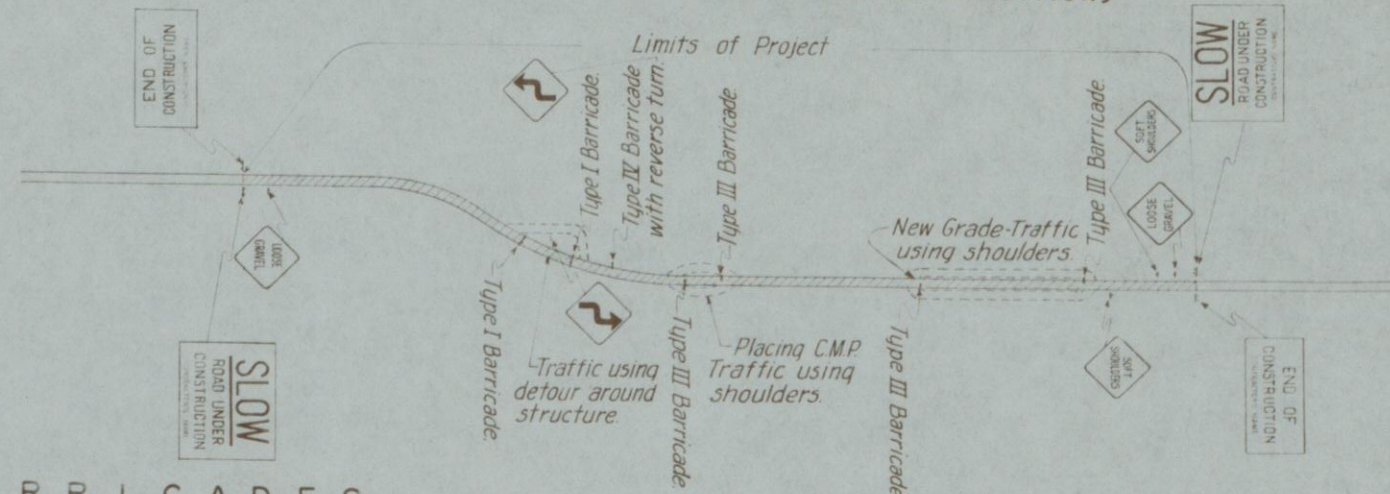


STANDARD M-2-D

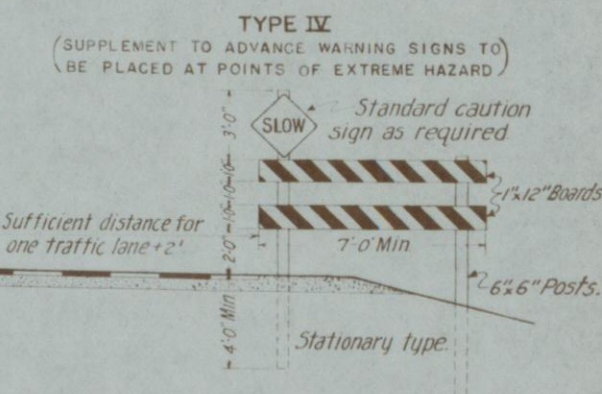
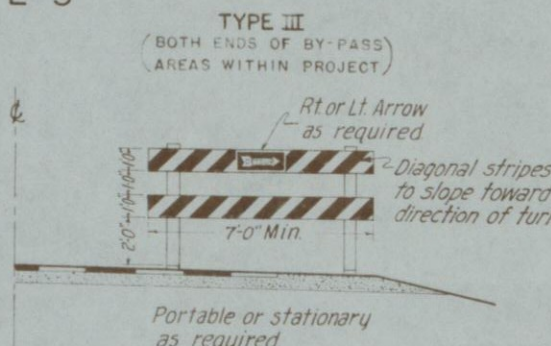
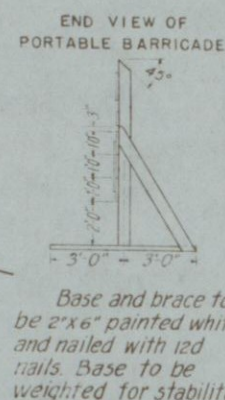
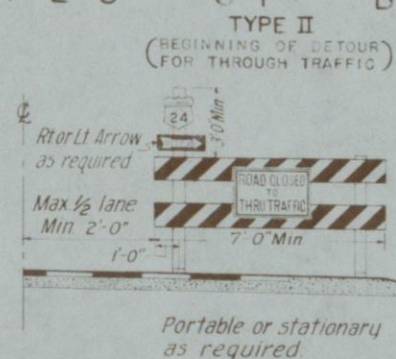
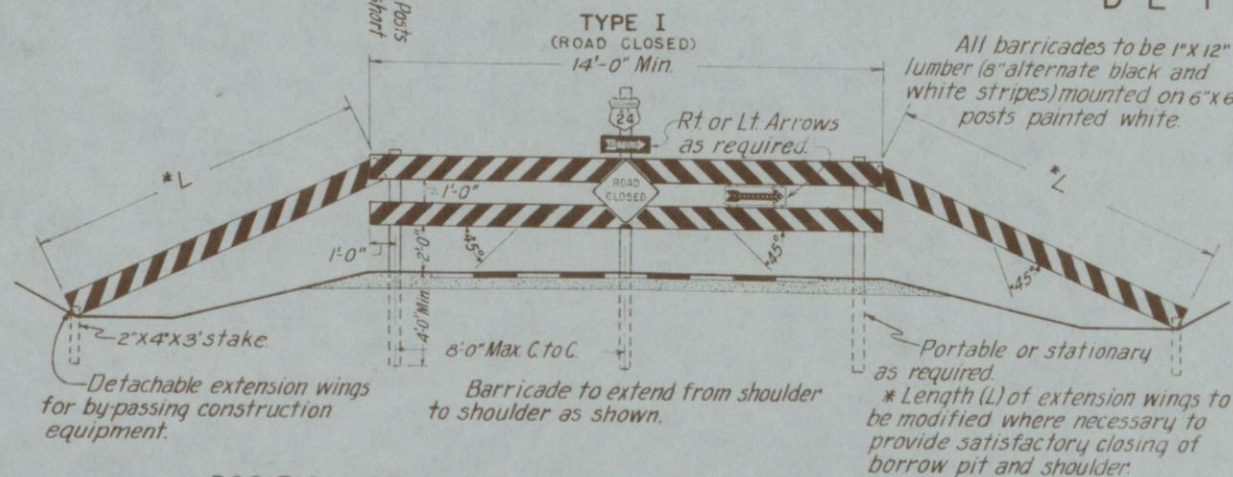
FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	50104 (1)	12

Rev. 9-10-46 Slow Signs RBR Rev. 12-13-47 J.P.K.

TYPICAL METHOD OF MARKING HIGHWAY (TRAFFIC PERMITTED ON ROAD UNDER CONSTRUCTION)



DETAILS OF BARRICADES



GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT 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 AND STANDARD CAUTION SIGNS, WARNING SIGNS, AND DIRECTIONAL TYPE SIGNS. BARRICADES AND SIGNS SHALL BE MOVED, ADDED TO, CHANGED OR REMOVED AS REQUIRED DURING THE PROGRESS OF CONSTRUCTION TO MEET CHANGING CONDITIONS.

THE CONTRACTOR SHALL FURNISH AND INSTALL THE FOLLOWING AS REQUIRED WITHIN THE LIMITS OF THE PROJECT:

1. ALL BARRICADES
2. APPROVED REFLECTORIZED DIRECTIONAL ARROW FOR EACH TYPE I BARRICADE
3. SLOW - ROAD UNDER CONSTRUCTION (CONTRACTOR'S NAME) SIGNS - MINIMUM 2
4. END OF CONSTRUCTION (CONTRACTOR'S NAME) SIGNS - MINIMUM 2
5. STANDARD CAUTION, WARNING AND DIRECTIONAL TYPE SIGNS AS REQUIRED.
6. FLARES OR TORCHES AS FOLLOWS:
 - A. TYPE I BARRICADES - MINIMUM 3 EACH
 - B. TYPE III OR IV BARRICADES - MINIMUM 1 EACH
 - C. STANDARD CAUTION OR WARNING SIGNS - MINIMUM 1 EACH

NOTE: FLARES OR TORCHES SHALL BE OF AN OIL BURNING TYPE APPROVED BY THE STATE OF COLORADO AND SHALL BE PLACED FROM 3 TO 5 FEET AHEAD OF THE SIGN OR OBJECT TO BE ILLUMINATED. IN ALL CASES FLARES OR TORCHES SHALL BE PLACED A SUFFICIENT DISTANCE AWAY, WITHIN THE ABOVE RANGE, TO AVOID DAMAGE TO FACE OF SIGN FROM SMOKE OR FLAME AND SHALL BE KEPT BURNING FROM SUNSET TO SUNRISE.

ALL LUMBER USED IN BARRICADES AND SIGNS SHALL BE SOUND, DURABLE MATERIAL AND SHALL BE KEPT WELL PAINTED WITH NEAT, UNIFORM LETTERS AND SYMBOLS CONFORMING TO STYLE SHOWN FOR THE VARIOUS SIGNS. UNEVEN OR SMEARED LETTERING WILL NOT BE PERMITTED.

WHERE TRAFFIC IS PROHIBITED FROM THE PROJECT, THE DETOUR WILL BE MARKED BY THE DEPARTMENT, EXCEPT THAT TYPE I BARRICADES, COMPLETE WITH NECESSARY ARROWS AND SIGNS, SHALL BE PROVIDED, ERECTED, PAINTED AND MAINTAINED BY THE CONTRACTOR AT BOTH ENDS OF THE PROJECT AND AT ALL INTERSECTING ROADS REQUIRED TO BE LEFT OPEN FOR CROSS TRAFFIC.

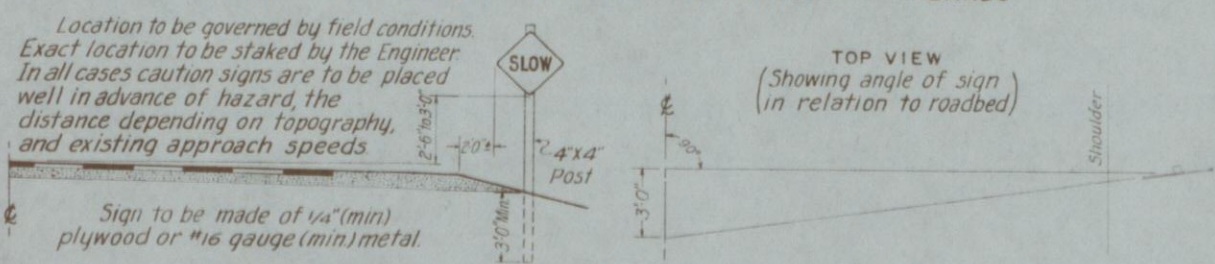
US AND/OR STATE ROUTE MARKERS DEEMED NECESSARY FOR GUIDANCE OF TRAFFIC OVER THE PROJECT OR FOR USE ON TYPE I BARRICADES WILL BE FURNISHED BY THE DEPARTMENT TO BE INSTALLED BY THE CONTRACTOR.

THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL SIGNS FURNISHED HIM BY THE DEPARTMENT AND SHALL RETURN SAME UPON COMPLETION OF THE PROJECT. THE CONTRACTOR WILL BE REQUIRED TO REIMBURSE THE DEPARTMENT FOR ANY SIGNS FURNISHED HIM WHICH HAVE BECOME DAMAGED OR LOST DURING HIS OPERATIONS.

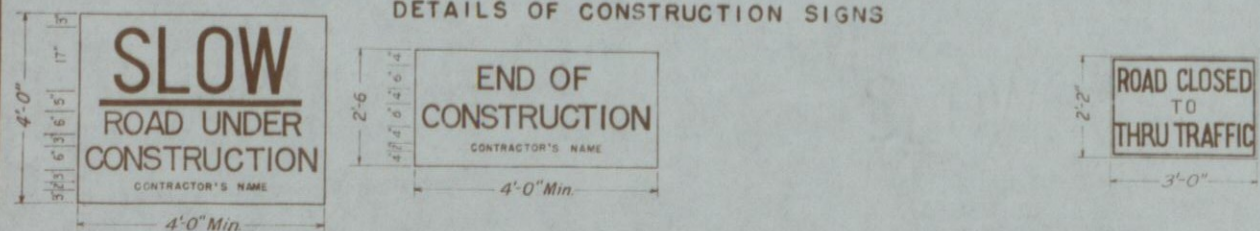
THE TYPICAL METHOD OF MARKING AS SHOWN ILLUSTRATES THE MINIMUM ACCEPTABLE SIGNING PROCEDURE. MODIFICATIONS AND ADDITIONAL REQUIREMENTS WILL BE DETERMINED BY LOCATION, TRAFFIC VOLUME AND OTHER PERTINENT CONDITIONS AFFECTING THE PUBLIC CONVENIENCE AND SAFETY.

ANY SPECIAL SIGNS DEEMED NECESSARY FOR THE GUIDANCE AND PROTECTION OF TRAFFIC OVER THE PROJECT OR DETOUR WILL BE FURNISHED AND INSTALLED BY THE DEPARTMENT.

ALL COSTS INCIDENTAL TO THE FOREGOING REQUIREMENTS WILL NOT BE PAID FOR AS A SEPARATE ITEM BUT SHALL BE INCLUDED IN THE ORIGINAL CONTRACT PRICES FOR THE PROJECT.

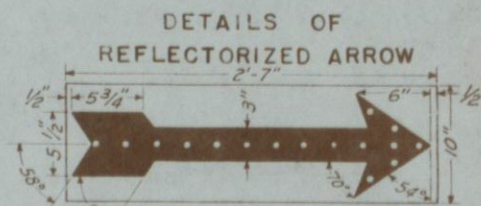


DETAILS OF CONSTRUCTION SIGNS



Signs to be of 1" material with at least three cleats in back. Background to be white, SLOW and underline to be red, and all other lettering to be black. Sign to be set on 2-4"x4" posts 4 feet in the ground, except when mounted on face of Type I barricades (opposite side from reflectorized arrow) at limits of project. Not required on Type I barricades inside limits of project.

Above sign to be furnished and installed by the Department where required.

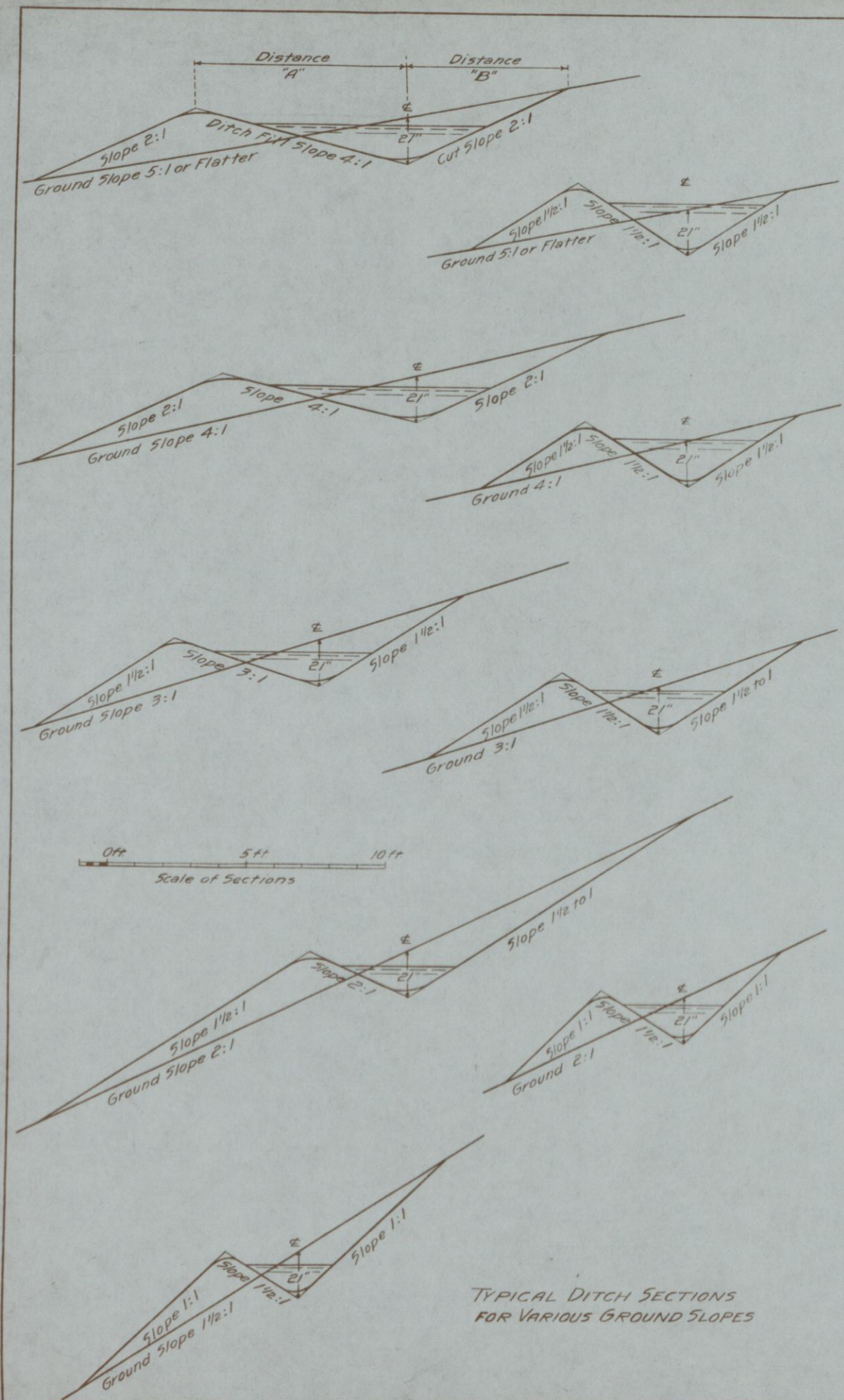


For use on Type I Barricades at ends of project and/or inside of project where needed. Reflector buttons shall be Signal Service ALA 31 (white crystal) or suitable equivalent. Minimum thickness of lumber to be 1".

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

Designed by *ARP* Approved by *R.E.L.*
 Made by *B.C.*
 Checked by *B.C.* Date: January 1st 1948



DETAILS OF DITCH SECTIONS

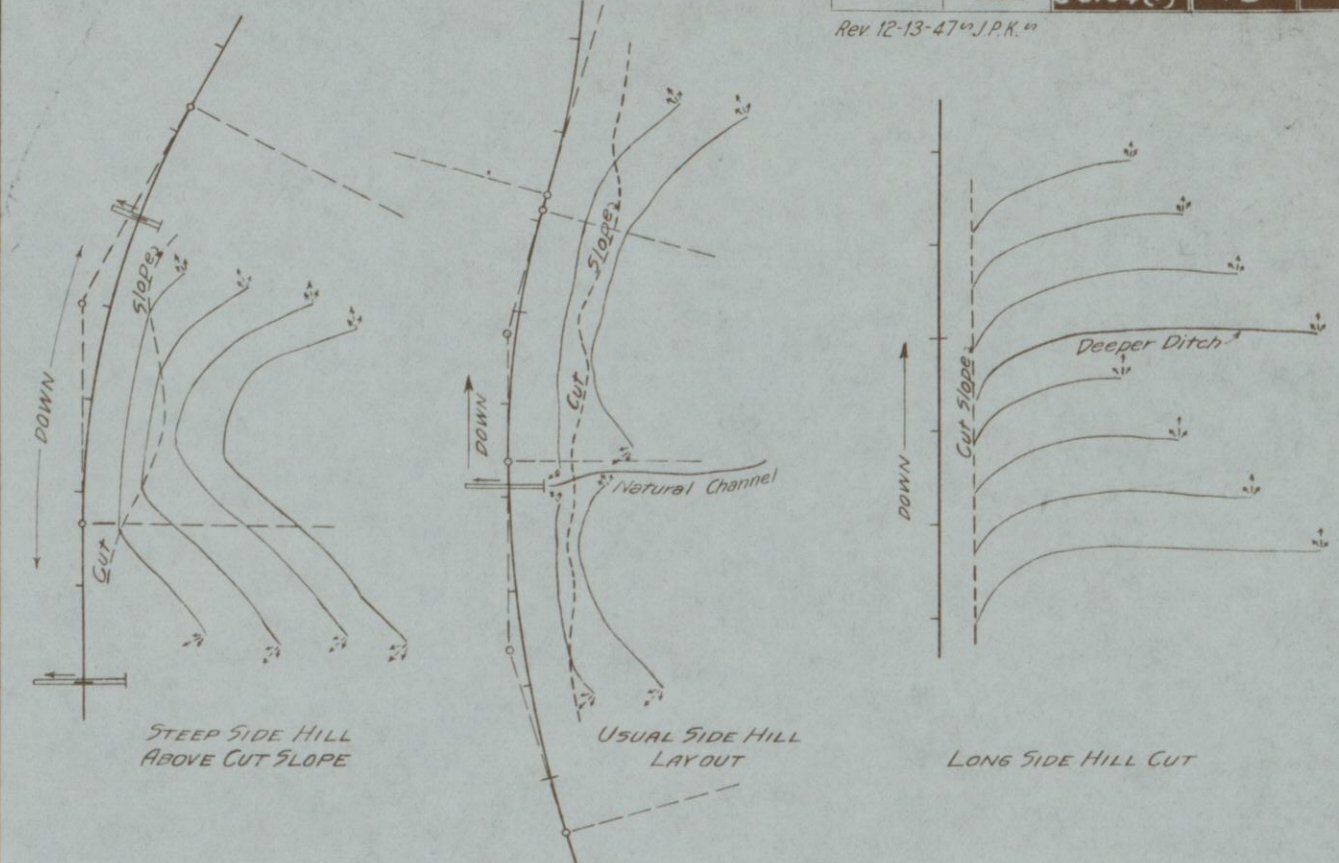
Ground Slope	Cut Slope	Ditch Fill Slope	± Cut	Cut Area Sq. Ft.	Cut Vol. per 100 ft. of Cut	Ditch Area Sq. Ft.	Dist. "A" Ft.	Dist. "B" Ft.
5:1	2:1	4:1	15"	4.3	15.8	3.7	4.2	5.6
			18"	6.2	22.9	5.9	5.0	6.7
			21"	8.5	31.5	8.5	5.8	7.8
		3:1	15"	4.1	15.1	4.1	4.2	4.7
			18"	5.8	21.6	6.5	5.0	5.6
			21"	8.0	29.5	9.3	5.8	6.6
		2:1	15"	3.7	13.8	4.6	4.2	3.6
			18"	5.3	19.8	7.0	5.0	4.3
			21"	7.3	27.0	10.0	5.8	5.0
	1 1/2:1	4:1	15"	3.5	13.0	4.8	4.2	2.9
			18"	5.0	18.6	7.3	5.0	3.5
			21"	6.9	25.4	10.3	5.8	4.0
		3:1	15"	3.3	12.4	3.4	2.7	2.6
			18"	4.8	17.9	5.4	3.2	3.7
			21"	6.7	24.7	7.8	3.7	4.7
5:1	1 1/2:1	4:1	15"	3.1	11.6	3.8	2.7	2.7
			18"	4.5	16.7	5.8	3.2	3.6
			21"	6.2	22.8	8.3	3.7	4.3
		3:1	15"	2.8	10.3	4.0	2.7	2.7
			18"	4.0	14.9	6.1	3.2	3.3
			21"	5.5	20.2	8.8	3.7	4.0
	1 1/2:1	4:1	15"	2.6	9.5	4.1	2.7	2.9
			18"	3.7	13.7	6.3	3.2	3.5
			21"	5.1	18.7	8.8	3.7	4.0
		3:1	15"	4.7	17.4	2.8	5.0	5.0
			18"	6.7	24.8	4.5	6.0	6.0
			21"	9.2	34.0	6.6	7.0	7.0
4:1	2:1	4:1	15"	4.5	16.5	3.3	5.0	4.3
			18"	6.4	23.6	5.2	6.0	5.1
			21"	8.8	32.4	7.5	7.0	6.0
		3:1	15"	4.2	15.4	3.9	5.0	3.3
			18"	6.0	22.1	6.0	6.0	4.0
			21"	8.2	30.2	8.5	7.0	4.7
	1 1/2:1	4:1	15"	4.0	14.7	4.2	5.0	2.7
			18"	5.7	21.0	6.4	6.0	3.3
			21"	7.7	28.5	9.1	7.0	3.8
		3:1	15"	3.4	12.7	2.6	3.0	2.7
			18"	4.9	18.3	4.1	3.6	3.3
			21"	6.7	24.9	6.0	4.2	4.0
3:1	2:1	4:1	15"	3.2	11.9	3.0	3.0	2.7
			18"	4.6	17.0	5.9	3.6	3.3
			21"	6.3	23.3	8.8	4.2	4.0
		3:1	15"	2.9	10.8	3.4	3.0	2.7
			18"	4.2	15.5	5.3	3.6	3.3
			21"	5.7	21.1	7.5	4.2	4.0
	1 1/2:1	4:1	15"	2.7	10.1	3.6	3.0	2.7
			18"	3.9	14.3	5.5	3.6	3.3
			21"	5.3	19.5	7.8	4.2	3.8
		3:1	15"	5.9	21.7	2.3	7.5	3.8
			18"	8.4	31.1	3.8	9.0	4.5
			21"	11.5	42.6	5.5	10.5	5.3
3:1	1 1/2:1	4:1	15"	5.6	20.8	3.0	7.5	3.0
			18"	8.1	29.9	4.7	9.0	3.6
			21"	11.0	40.8	6.7	10.5	4.2
		3:1	15"	5.5	20.3	3.4	7.5	2.5
			18"	7.8	29.0	5.3	9.0	3.0
			21"	10.7	39.8	7.5	10.5	3.5
	1 1/2:1	4:1	15"	3.5	13.1	2.1	3.8	3.8
			18"	5.0	18.7	3.4	4.5	4.5
			21"	6.9	25.6	4.9	5.3	5.3
		3:1	15"	3.3	12.1	2.6	3.8	3.0
			18"	4.7	17.4	4.1	4.5	3.6
			21"	6.4	23.8	5.9	5.3	4.2
2:1	1 1/2:1	4:1	15"	3.1	11.6	2.9	3.8	2.5
			18"	4.5	16.6	4.5	4.5	3.0
			21"	6.1	22.7	6.4	5.3	3.5
		3:1	15"	5.5	20.3	1.6	7.5	2.5
			18"	7.8	29.0	2.6	9.0	3.0
			21"	10.7	39.7	3.8	10.5	3.5
	1 1/2:1	4:1	15"	5.4	19.8	2.0	7.5	2.1
			18"	7.7	28.4	3.1	9.0	2.6
			21"	10.5	36.9	4.5	10.5	3.0
		3:1	15"	2.4	8.7	1.4	2.5	2.5
			18"	3.4	12.5	2.3	3.0	3.0
			21"	4.6	17.0	3.3	3.5	3.5
1 1/2:1	1:1	2:1	15"	2.2	8.3	1.7	2.5	2.1
			18"	3.2	11.9	2.6	3.0	2.6
			21"	4.4	16.2	3.8	3.5	3.0
		1 1/2:1	15"	2.9	10.8	1.2	3.8	1.9
			18"	4.2	15.6	1.9	4.5	2.3
			21"	5.8	21.3	2.7	5.3	2.6

• Section shown at left.
• 1:1 Slopes are difficult to seed.
• Cut Slope exceeds a 10 ft. length.

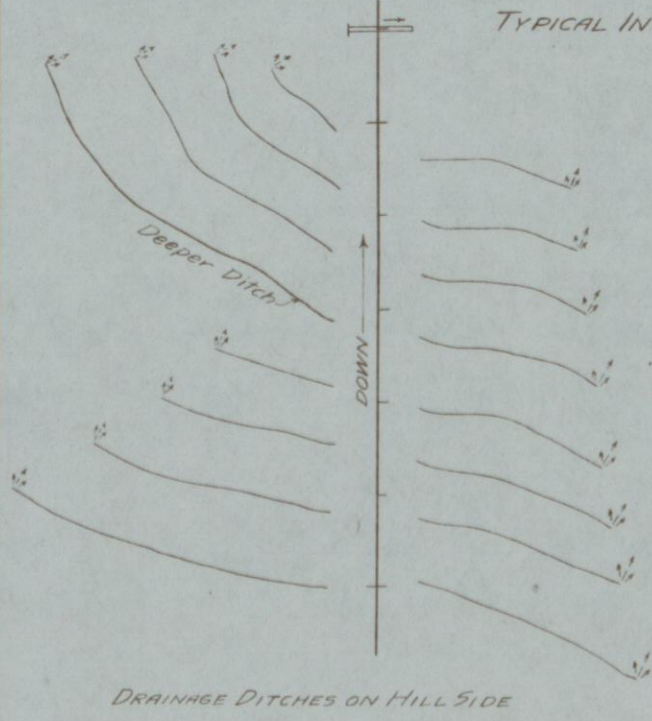
STANDARD M-107-B

FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	50104(1)	13

Rev 12-13-47 J.P.K.



TYPICAL INTERCEPTING DITCH ARRANGEMENTS



GENERAL NOTES

Contour Intercepting and Drainage Ditches on this Project are to be constructed to the line and grade staked by the Engineer using the Ditch Section called for on the Plans or ordered by the Engineer.

Ends of Intercepting and Drainage Ditches are to be lined up so that concentration of flow from a higher contour ditch into one of lower contour is, as far as possible, avoided. Use a deeper ditch when any such flow might be picked up.

The following horizontal spacing of ditches is recommended:

Slope % or Slope Ratio	Horizontal Spacing of Ditches
4% to 6%	70 ft. centers
8% to 10%	60 ft. centers
20% to 4:1	55 ft. centers
30% to 1 1/2:1	50 ft. centers

Ditches are to be laid out along the ground contour on a grade of not over -1%. (Type of soil and volume of flow shall govern the grade.)

Ditch checks may be required for drainage which cannot be diverted as shown. Ditch checks and ditches shall be set in such a manner that the grade of the ditch from the downstream side of the check to the lip of the adjacent downstream ditch shall not exceed -0.5%. The checks shall conform to standard plans of the Department.

Grasses are to be planted to stabilize the slope and ditch banks whenever conditions permit.

COLORADO STATE HIGHWAY DEPARTMENT
CONTOUR INTERCEPTING
AND DRAINAGE DITCHES

Designed by S.B.L.	Approved by
Made by S.B.L.	John S. Marshall Chief Draftsman
Checked by	Date January 1st 1948

Fencing and Timber Guard Posts are tabulated on sheet No. 3.
R.O.W. Markers are tabulated on sheet No. 4.

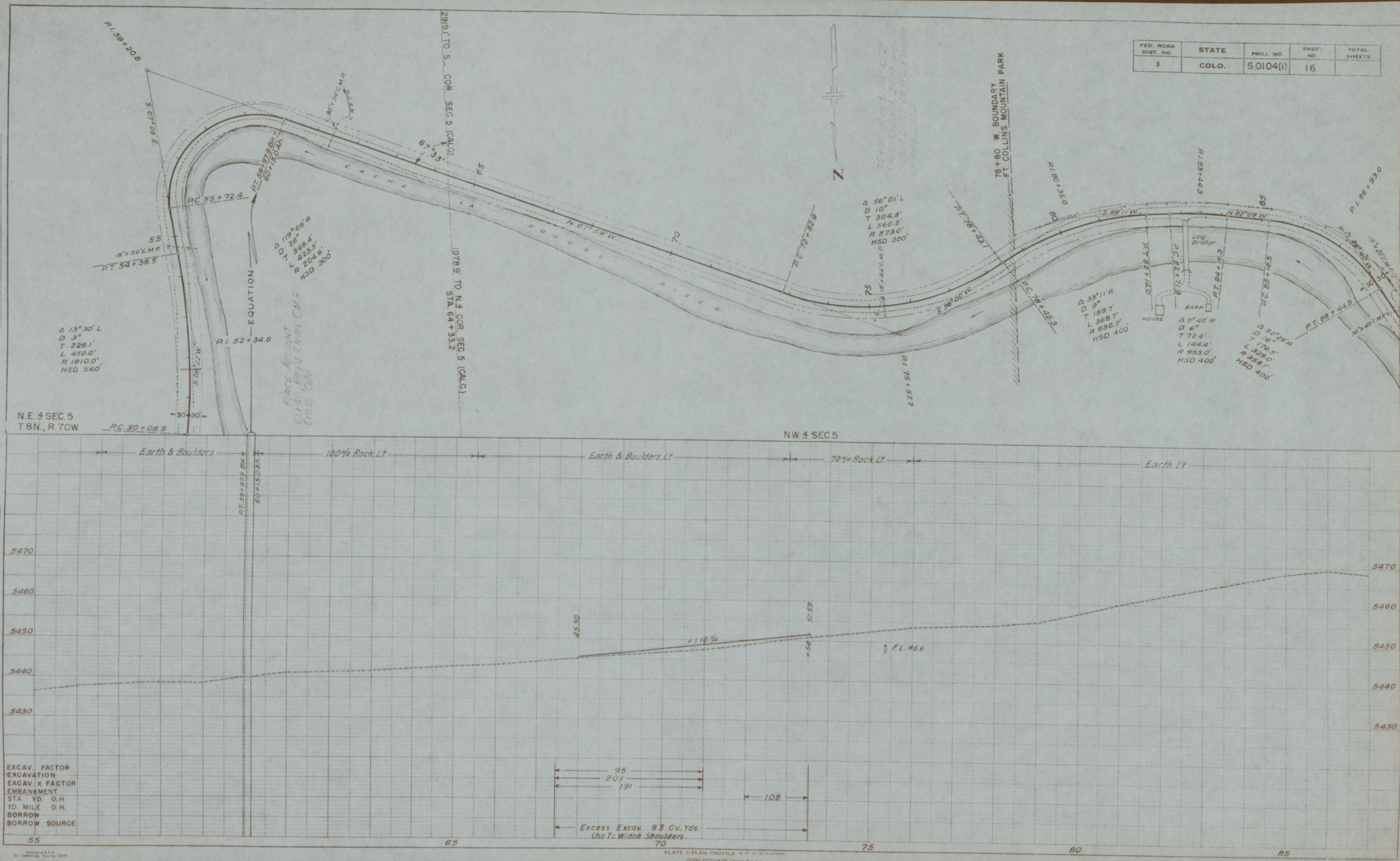
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3	COLO.	S 0104(1)	14	

PLATE I-PLAN-PROFILE M. P. R. STANDARD
EUGENE DIETZGEN CO., Chicago, New York

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	SO104(I)	16	

DATE	
BY	
PLAN	
NOTE BOOK	
NO.	

DATE	
BY	
PROFILE	
NOTE BOOK	
NO.	



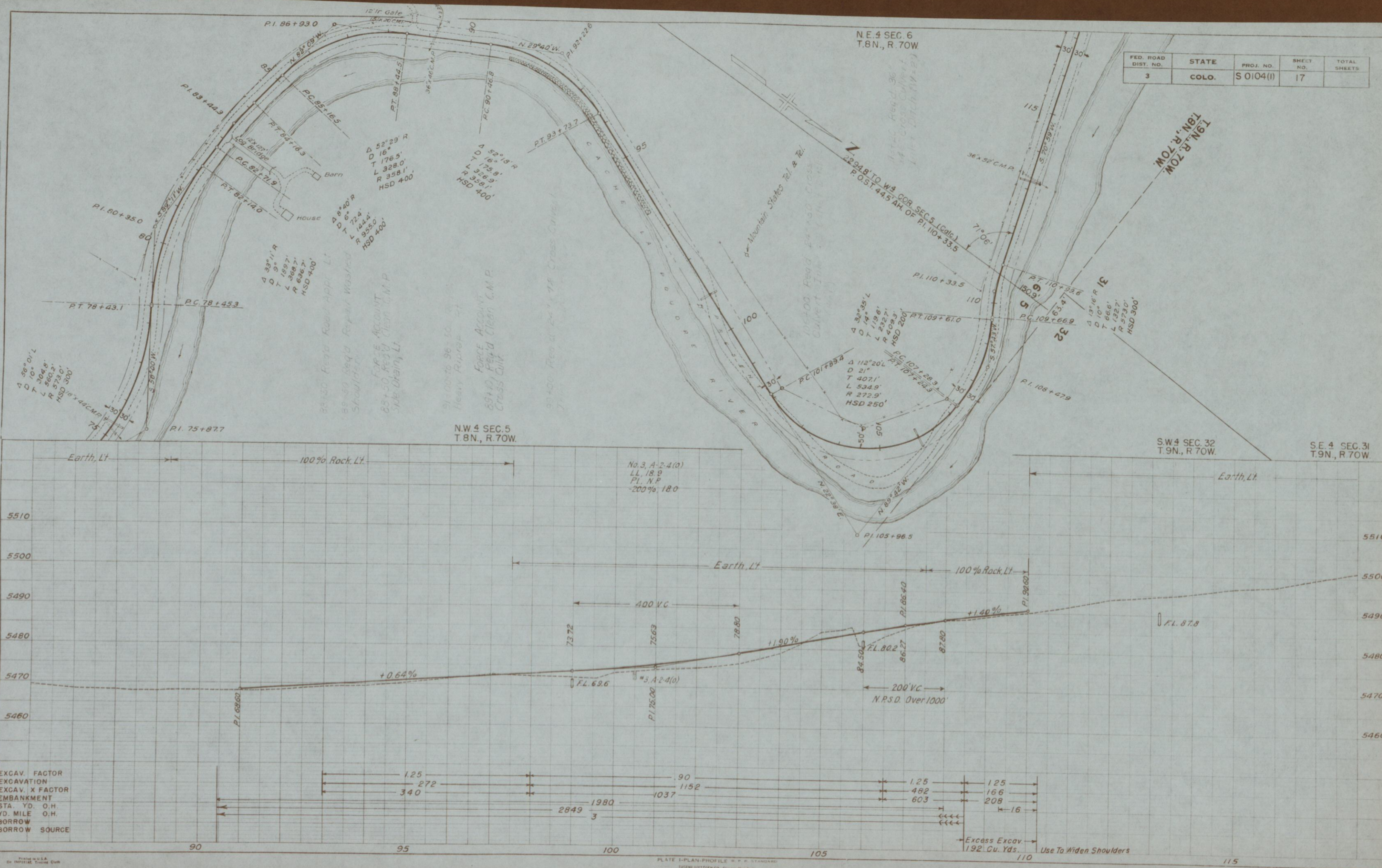
EXCAV. FACTOR
EXCAV. X FACTOR
EMBANKMENT
STA. YD. O.H.
YD. MILE O.H.
BORROW
BORROW SOURCE

Printed in U.S.A.
By Imperial Printing Co.

DATE	
PLAN	SURVEYED PLOTTED ALIGNED CHECKED BY NOTE BOOK NO.

DATE	
PROFILE	SURVEYED PLOTTED CHECKED BY NOTE BOOK NO.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104(II)	17	



PLAN	SURVEYED PLOTTED	ALIGNMENT CHECKED	RT. OF WAY CHECKED	DATE
NOTE BOOK				

PROFILE	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
	GRADES CHECKED		
	B.M.'S. NOTED		

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S0104(1)	19	

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On IMPERIAL Tracing Cloth

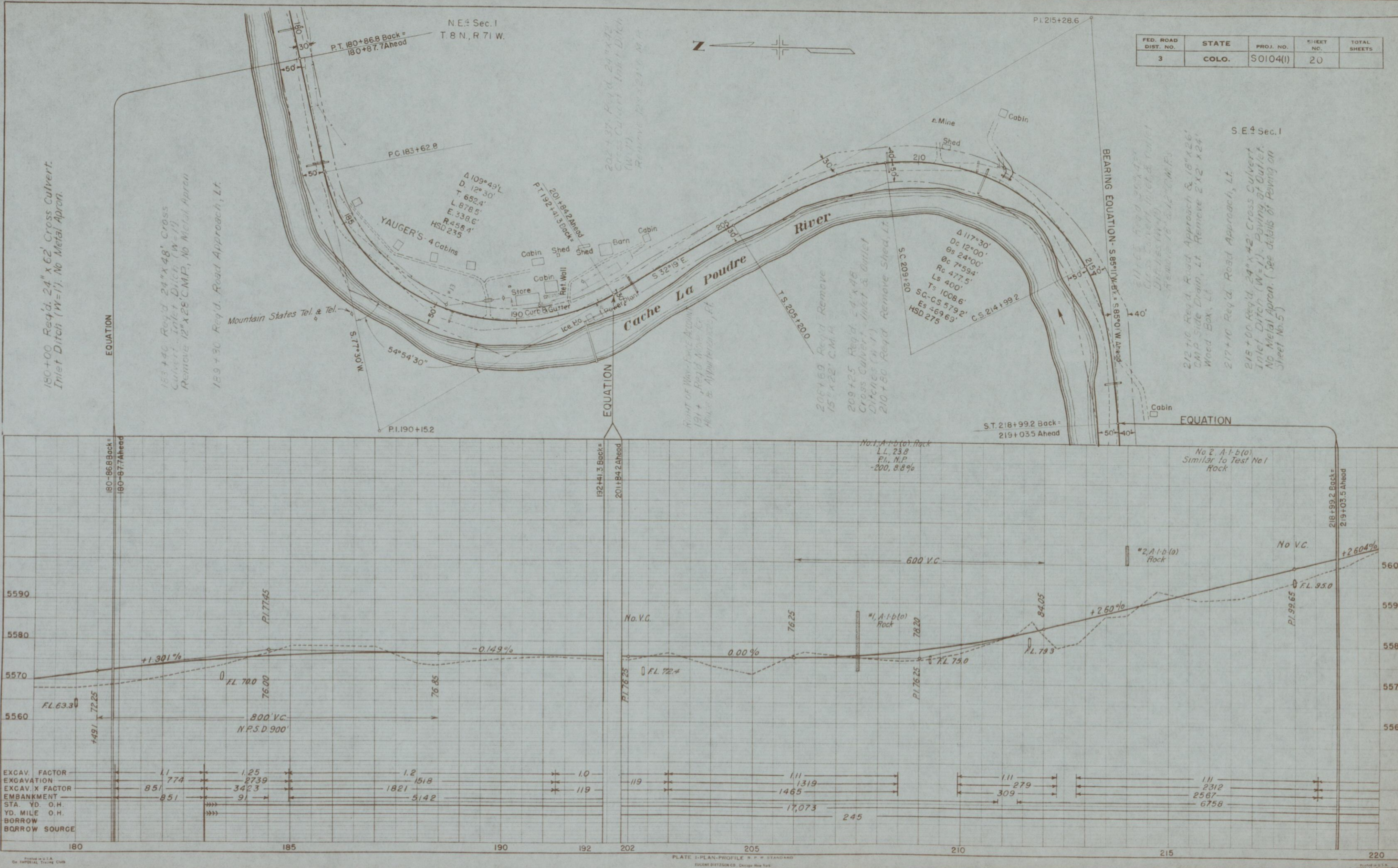
PLATE 1-PLAN-PROFILE W. F. W. STANDARD
EUGENE DITZGEN CO. Chicago, New York

Printed in U.S.A.
 The International Typographic Union

PLAN	DATE
SURVEYED	
PLOTTED	
CHECKED	
BY	
NO.	

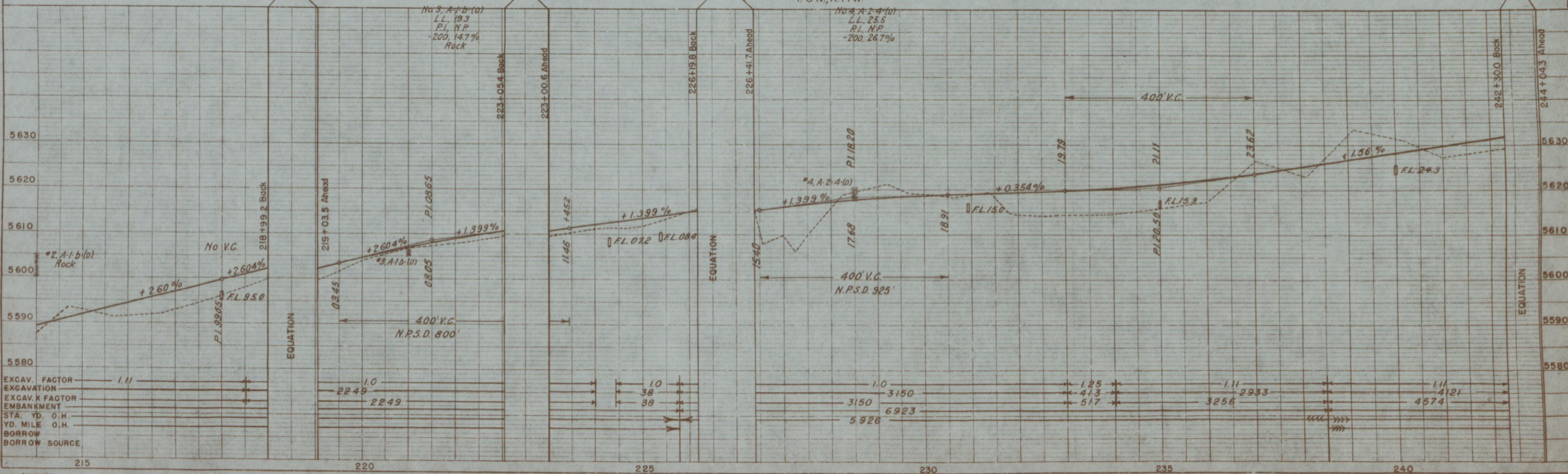
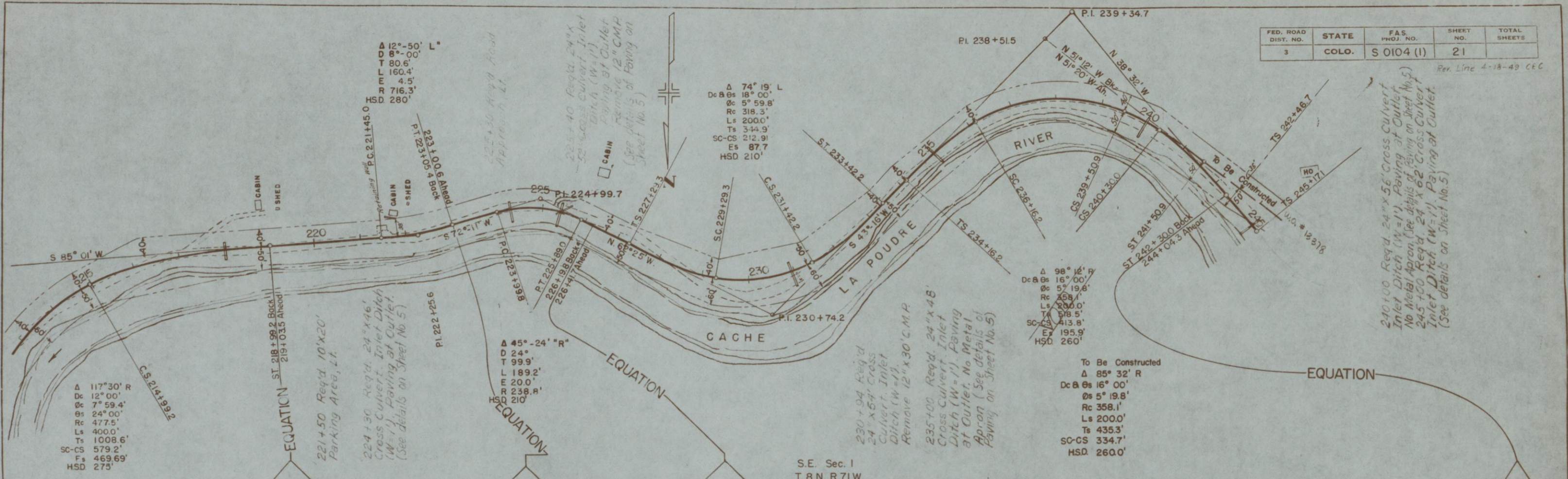
PROFILE	DATE
SURVEYED	
PLOTTED	
CHECKED	
BY	
NO.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S0104(I)	20	



FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104 (I)	21	

Rev. Line 4-18-49 CEC

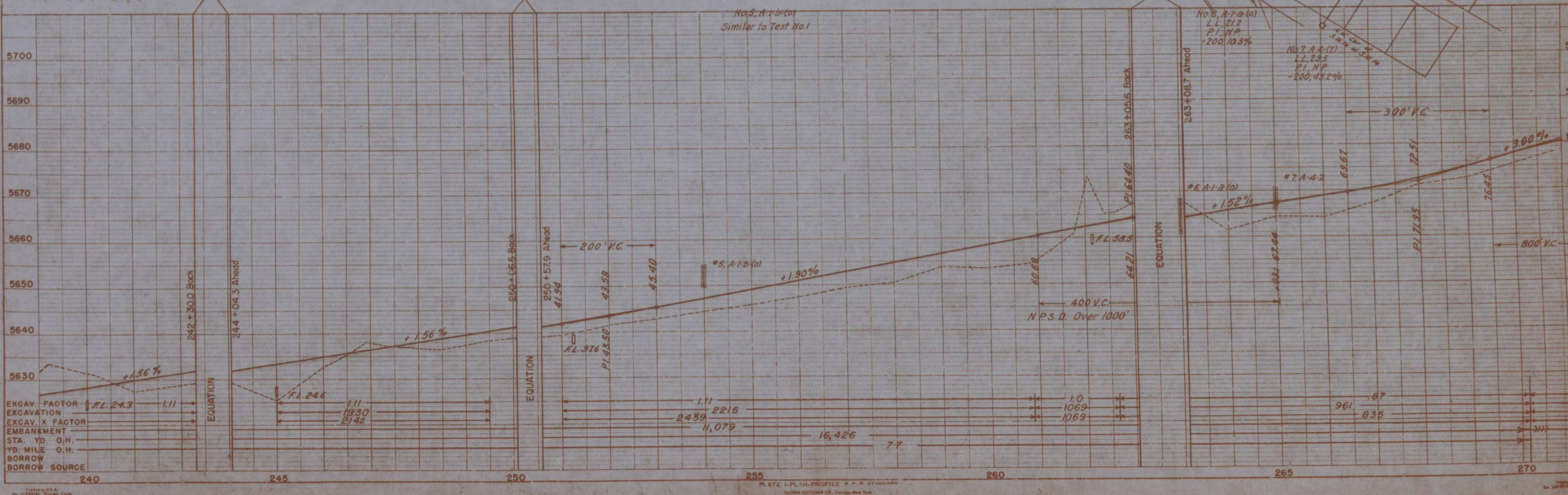
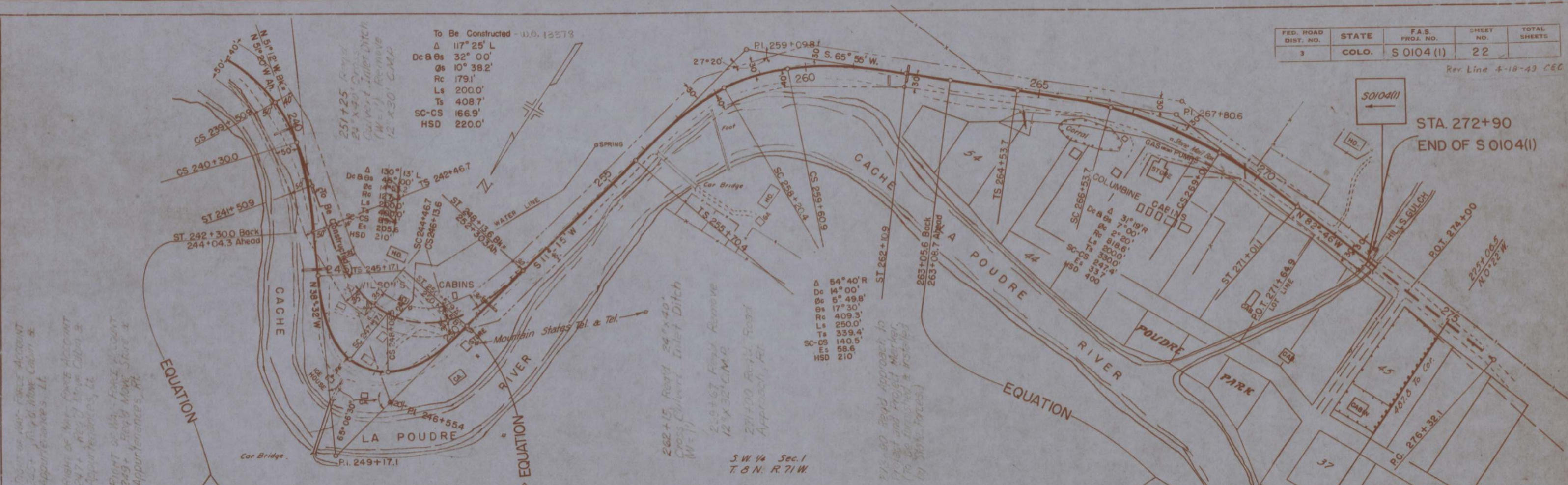


DATE	4-45
PLANNED	J.M. MEYER
DESIGNED	J.M. MEYER
CHECKED	J.M. MEYER
NOTED	J.M. MEYER
BY	J.M. MEYER

DATE	4-45
PLANNED	J.M. MEYER
DESIGNED	J.M. MEYER
CHECKED	J.M. MEYER
NOTED	J.M. MEYER
BY	J.M. MEYER

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104 (I)	22	

Rev. Line 4-18-43 CEC



FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	S 0104(I)	23	

DATE	7-25
BY	McTear
REVIEWED	
PLANNED	
CONSTRUCTION	
NO.	

DATE	7-25
BY	McTear
REVIEWED	
PLANNED	
CONSTRUCTION	
NO.	

