

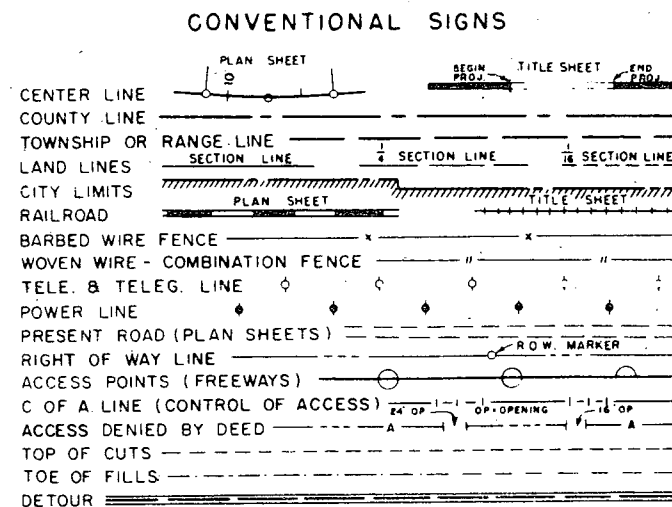
DEPARTMENT OF HIGHWAYS STATE OF COLORADO

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. ER 39(1) FIRST CONTRACT STATE HIGHWAY NO. 51, 196 & 89 PROWERS COUNTY 385

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO	ER 39(1) FIRST CONTRACT	1

INDEX OF SHEETS
See sheet no. 2

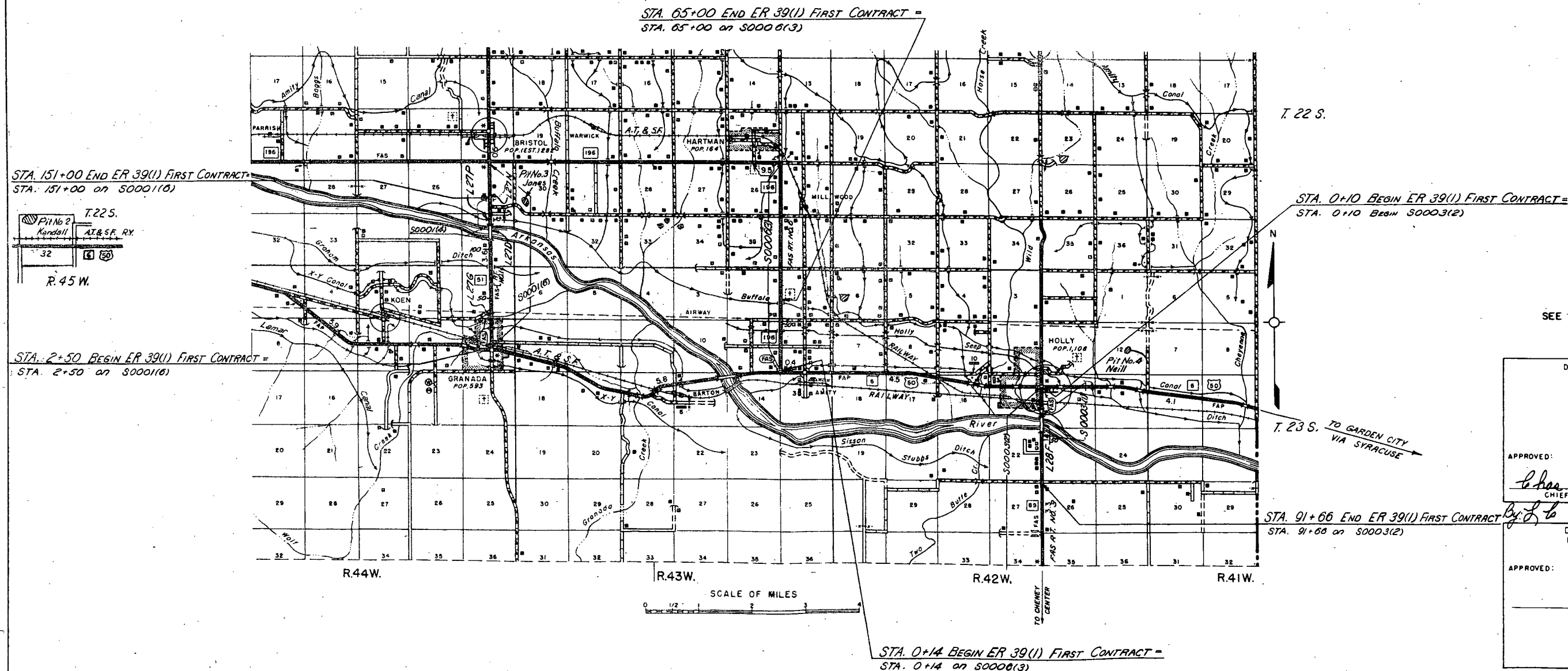
SHEET NO.



SCALES OF ORIGINAL DRAWINGS

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 30,492.0 LIN. FT. = 5.775 MILES
NET LENGTH OF PROJECT



SEE SPECIAL PROVISIONS FOR
NOTICE TO BIDDERS

DEPARTMENT OF HIGHWAYS STATE OF COLORADO	
APPROVED:	DATE
<i>Chas. E. Shumate</i>	10-19-65
CHIEF ENGINEER	
DEPARTMENT OF COMMERCE BUREAU OF PUBLIC ROADS	
APPROVED:	DATE
<i>By L. S. Gower, Deputy Chief Eng.</i>	
DIVISION ENGINEER	

JLC

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER 39(1) (FIRST CONTRACT)	2	

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TABULATION OF LENGTH AND DESIGN

STATION	ROADWAY		
	Lin. Ft.	Miles	
(STATE HIGHWAY No. 51)			
STA. 2+50 BEGIN ER 39(1) FIRST CONTRACT =			
STA. 2+50 on S0001(6)	2698.5		
29+48.5 Bridge End	180.5		
31+29.0 Granada City Limits	74.2		
Wolf Creek L-27-6			
32+03.2 Bridge End	8361.8		
115+65	422.8		
Arkansas River L27-D			
119+87.8	3112.2		
STA. 151+00 END ER 39(1) FIRST CONTRACT =			
STA. 151+00 on S0001(6)	14850.0	2.813	
SUB TOTAL			
(STATE HIGHWAY No. 196)			
STA. 0+14 BEGIN ER 39(1) FIRST CONTRACT =			
STA. 0+14 on S0006(3)	6486.0		
STA. 65+00 END ER 39(1) FIRST CONTRACT =			
STA. 65+00 on S0006(3)	6486.0	1.228	
SUB TOTAL			
(STATE HIGHWAY No. 89)			
STA. 0+10 BEGIN ER 39(1) FIRST CONTRACT =			
STA. 0+10 BEGIN S0003(2)	1278.6		
12+88.6 Holly City Limits	2211.4		
35+00	405.4		
Arkansas River L-28-F			
39+05.4	5260.6		
STA. 91+66 END ER 39(1) FIRST CONTRACT			
STA. 91+66 on S0003(2)	9156.0	1.734	
SUB TOTAL			
TOTALS			
SUMMARY			
	Lin. Ft.	Miles	
Project Total (Net & Gross)	30,492.0	5.775	
DESIGN DATA			
Maximum Degree of Curve	S.H. NO. 51 2°	S.H. NO. 196 1°	S.H. NO. 89 Tangent
Maximum Grade	1.54 %	3.88 %	2.50 %
Minimum S.S.D. (Horizontal)	>1300'	>1300'	>1300'
Minimum S.S.D. (Vertical)	700'	1100'	480'
Maximum Design Speed	70 M.P.H.	70 M.P.H.	60 M.P.H.

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER-39(1) (FIRST CONTRACT)	3	

GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of The Colorado Department OF Highways, adopted January 1, 1958.

All quantities on Preliminary Plans are to be considered approximate only.

During construction of this Project, Traffic will use the present traveled Roadway.

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

Thickness of Subbase, Surfacing and Asphaltic Pavement Materials as shown on Plans is approximate only. These Materials are to be placed on the basis of Tonnes shown on Plans.

For Preliminary Plan Quantities of Asphaltic Road Materials, the following rates of application were used.

Prime Coat	@ 0.40 Gals. Per. Sq. Yd.
Tack Coat (R.C.)	@ 0.1 Gals. Per. Sq. Yd.
Tack (Paving Asphalt)	@ 0.05 " " "
Paving Asphalt { Pit No. 2	@ 6.5% by weight
{ Pit No. 4	@ 6.1% by weight

Road Approaches which require Plant Mixed Asphaltic Surfacing in the "Structure List" shall be primed and a 2" thickness of Asphaltic Surfacing placed as follows:

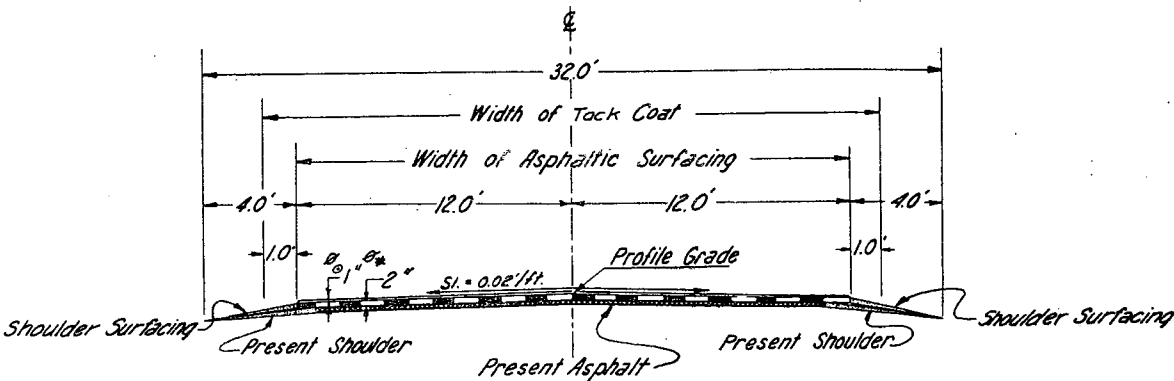
Public Approaches and Entrances to Buildings or Residences shall be surfaced 50 ft. out from edge of Shoulder or to the R.O.W. Line whichever is less. Field Entrances shall be surfaced 4 ft. out from edge of Shoulder.

Application Methods, for Liquid Asphaltic Road Material, which result in the discoloration of Concrete Pavement, Curbs or Gutters will not be permitted.

It is estimated that 300 Blading Hours & 300 Dozing Hours will be needed to shape roadway on this Project.

All Guard Posts encroaching on construction are to be removed by State Forces.

TYPICAL SECTION "A"



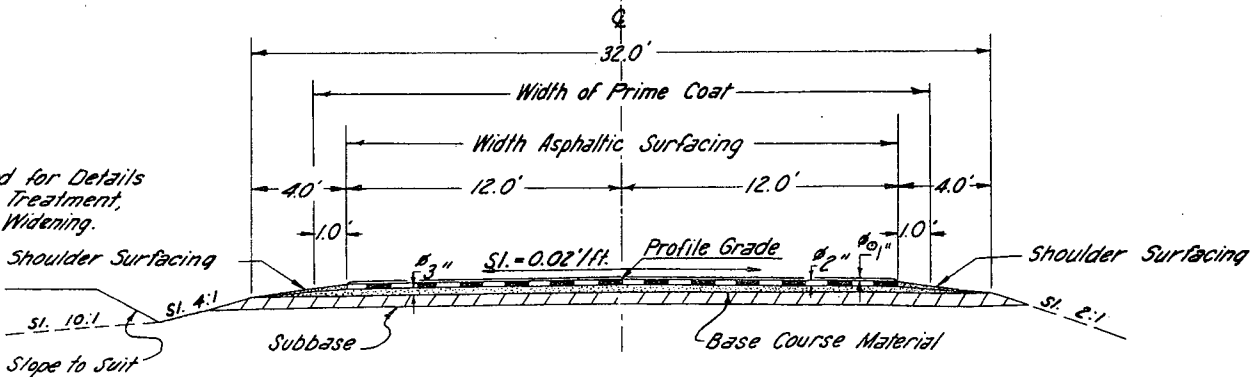
* An additional 1 1/2" is to be used as a Leveling Course

Compacted thickness of Asphalt Pavement will be placed at the rate of 26 tons (Pit No. 2) and 29 tons (Pit No. 4) per 100 Lin. Ft. Shoulder Surfacing 5 Tons Profile Grade as shown is the thickness of Asphaltic Surfacing overlay above present roadway.

Future Construction

For Locations of Sections see Line Sheets Profile.
Approximate Thickness

TYPICAL SECTION "B"



NOTE:

See Standard for Details of Cut Slope Treatment, Flaring and Widening.

Unclassified Excavation below 4:1 Slope and/or 10:1 Slope will not be permitted.

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.

Approximate compacted thickness of Asphaltic Pavement and Base Course Surfacing shall be placed in separate courses at the following rates per 100 Lin. Ft. of Roadway.

Asphaltic Pavement	{ 26 Tons (Pit No. 2)
	{ 29 Tons (Pit No. 4)
Base Course	47 Tons
Shoulder Surfacing	5 Tons

Material above the Subgrade is to be constructed of Subbase Material at Locations designated in Subbase Material Tabulation. Estimated Quantities involved in this operation and thickness of Material required are tabulated in the Subbase Material Plan.

Profile Grade as shown is the thickness of Subbase, Base Course and Plant Mixed Surfacing above present roadway except where Grades are shown on Line Sheets.

SUMMARY OF APPROXIMATE QUANTITIES

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER 397(1) FIRST CONTRACT	4	

SPECIFICATION ITEM NO.	ITEM	UNIT	SH. No. 51	FINAL	SH. No. 196	FINAL	SH. No. 89	FINAL	PROJECT TOTALS	FINAL
11	Removal of Structures	Each	1	1		0	2	0	3	1
11	Reset Mailbox Structures	Each		0	0	4		0	0	4
11	Reset Metal Aprons	Each	1	0		0		0	1	0
12	Removing Fence	Lin. Ft.	4100	10,918	4900	4,855	0,500	870	15,500	16,643
13	Unclassified Excavation	Cu. Yd.	2000	856	4,000	16,022	3,000	6,473	9,000	23,351
13	Stripping	Cu. Yd.	2600	595	3000	1,402	5,400	1,039	11,000	3,036
14	Unclassified Structural Excavation - Miscellaneous	Cu. Yd.	10	9		0	220	86	230	95
16	Structure Backfill (Class X)	Cu. Yd.	12	14		0	108	115	120	129
17	Compaction (Modified)	Cu. Yd.	7,000	2,991	21,000	19,153	8,000	8,200	38,000	30,344
17	Wetting	M Gal.	255	112	745	514	280	247	1,280	873
18	Ton Mile Overhaul	Ton Mi.	89,000	73,564	149,055	132,901	48,645	63,960	286,700	270,425
23	Subbase Material (Class 2)	Ton	3,975	3206.10	13,080	11,376.55	2,765	7,038.15	19,800	21,620.80
26	Gravel or Crushed Rock Surfacing (Grading C)	Ton	1,130	1,092.70	2,120	2,457.20	1,850	2,096.35	5,100	5,646.25
29	Asphalt (85-100 Penetration)	Ton	195	148.15	145	91.84	210	122.22	530	362.24
29	Asphalt (85-100 Penetration) (Tack)	Ton	5	3.68	2	1.00	3	2.91	10	7.59
30	Asphaltic Road Material MC (Prime)	Gal.	1,750	1,062	4,400	3,798	3,350	3,379	9,500	8,239
30	Asphaltic Road Material RC (Tack)	Gal.	1,020	0	390	0	890	0	2,300	0
32	Plant Mixed Asphaltic Surfacing	Ton	2,710	2,371.75	2,098	1,891.80	3,102	2,517.90	7,910	6,781.25
45	18" Culvert Pipe	Lin. Ft.		0		0	138	168	138	168
45	48" Culvert Pipe	Lin. Ft.		0		0	128	128	128	128
53	24" Corrugated Metal Culvert Pipe	Lin. Ft.	61	61		0		0	61	61
67	Riprap	Cu. Yd.		0		0	100	25	100	25
76	Barbed Wire Fence with Metal Posts	Lin. Ft.	5,100	11,683	4,100	4,115	5,800	5,518	15,000	21,316
76	Combination Wire Fence with Metal Posts	Lin. Ft.		0	850	645	1,050	626	1,500	1,271
76	Driveway Gates	Each		1		0	1	1	1	2
76	End Posts	Each	8	29	0	7	19	19	33	55
76	Corner and Line Brace Posts	Each	10	7	8	9	5	3	23	19

SUMMARY OF APPROXIMATE QUANTITIES

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER 39(1) FIRST CONTRACT	5	

SPECIFICATION ITEM NO.	ITEM	UNIT	SH. No. 51	FINAL	SH. No. 196	FINAL	SH. No. 89	FINAL	PROJECT TOTALS	FINAL
107	Blading	Hour	100	89	100	10	100	26	300	125
108	Dozing	Hour	100	3	100	0	100	58	300	61
192	Delineators (Type I)	Each	40	40		0	16	8	56	48
192	Delineators (Type III)	Each	8	2		0	4	2	12	4
<u>FORCE ACCOUNT</u>										
	Debris Cleanup Throughout Project	Lump Sum	(Prorated) •	1,353.80	(Prorated) •	1,013.53	(Prorated) •	829.66	•	3,196.99
	Furnish & Install Identification Signs (State Forces)	Each	2		2		2		0	
	Flagging (By A.T. & S.F. R.R. Co. Forces)	Lump Sum	(Prorated) •				(Prorated) •		•	
<u>NON FEDERAL AID</u>										
	Signing & Striping Entire Project (State Forces)	Lump Sum							•	
45	30" CULVERT PIPE W.O. # 4419	LIN FT.					14	11	14	11
	REMOVE & RELAY 84" C.M.P.	L.S.	600.00	903.62					600.00	903.62
18	STA YD OVERHAUL	STA YD			74,800	156,491			74,800	156,491
18	YD MILE OVERHAUL	YD MILE			3,889	7,366			3,889	7,366

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	EP 39(1) FIRST CONTRACT	6	

SURFACING PLAN

It is estimated that Surfacing Material for the project is available in the vicinity of the pits indicated in the following tabulations. Estimated quantities involved in these operations are shown below

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

PLANT MIXED SURFACING

BASE COURSE & SHOULDER SURFACING

STATION TO STATION	SOURCE	TOP COURSE	TON MILE OVERHAUL		
		TONS			
<u>STATE HIGHWAY No 51</u>	PIT No. 2 Kendall				
2+50 to 20+00		455		5,101	
43+50 to 45+50		52		616	
81+00 to 115+65		901		11,587	
119+87.8 to 133+00		341		4,566	
133+00 to 151+00		468		6,407	
Estimated for: Leveling Course 2+50 to 20+00		123		1,379	
81+00 to 115+65		243		3,125	
133+00 to 148+44.3		108		1,476	
148+63.3 to 151+00		17		235	
<u>STATE HIGHWAY No. 196</u>	PIT No. 4 Neill				
0+14 to 25+00		721		6,229	
25+00 to 40+00		435		3,924	
40+00 to 53+00		377		3,499	
53+00 to 65+00		348		3,313	
Estimated for: Leveling Course					
25+00 to 40+00		120		1,082	
53+00 to 65+00		96		914	
<u>STATE HIGHWAY No. 89</u>	PIT No. 4 Neill				
0+10 to 11+50		331		1,142	
11+50 to 35+00		682		2,578	
39+05.4 to 42+00		85		349	
42+00 to 91+66		1,440		6,638	
Estimated for: Leveling Course					
0+10 to 11+50		91		314	
42+00 to 91+66		397		1,830	
From Structure Quantities		75		326	
TOTALS STATE HIGHWAY No. 51		2,708		34,492	
TOTALS STATE HIGHWAY No. 196		2,097		18,961	
TOTALS STATE HIGHWAY No. 89		3,101		13,177	

STATION TO STATION	SOURCE & "R" VALUE	TONS			TON MILE OVERHAUL			
		BASE COURSE		GRAVEL SHOULDER SURFACING	BASE COURSE		GRAVEL SHOULDER SURFACING	
<u>STATE HIGHWAY No. 51</u>								
2+50 to 20+00 43+50 to 45+50 81+00 to 115+65	PIT No. 3 Jones "R" = 75	94		88 10 173	285		322 30 348	
119+87.8 to 130+62.2 130+81.0 to 133+00 133+00 to 148+44.3		505 103		54 11 77	757 141		81 15 95	
148+63.3 to 151+00				12			17	
<u>STATE HIGHWAY No. 196</u>								
0+14 to 25+00 25+00 to 40+00		1,168		124 75	8,748		929 534	
40+00 to 53+00 53+00 to 65+00		611		65 60	4,185		445 397	
<u>STATE HIGHWAY No. 89</u>								
0+10 to 11+50 11+50 to 35+00		1,105		57 118	14,741		742 1,574	
39+05.4 to 42+00 42+00 to 91+66		138		15 248	1,886		205 3,514	
From Structure Quantities		162			2,252			
TOTALS STATE HIGHWAY No. 51			702		425	11,83		908
TOTALS STATE HIGHWAY No. 196			1,779		324	12,933		2,305
TOTALS STATE HIGHWAY No. 89			1,405		438	18,879		6,035

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER-39(1) FIRST CONTRACT	7	

SUBBASE PLAN

It is estimated that Subbase Material for the project is available in the vicinity of the pits indicated in the following tabulation. Estimated quantities involved in this operation is shown below.

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

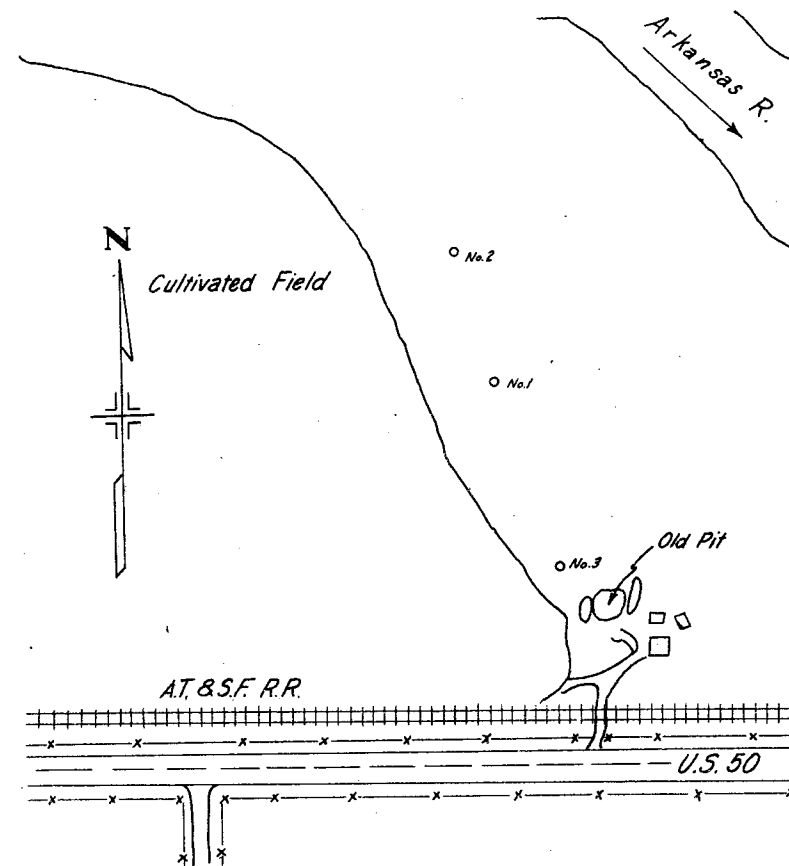
STATION TO STATION	SOURCE & "R" VALUE	THICKNESS # INCHES	SUBBASE CLASS 3		T Ton MILE OVERHAUL	
			Tons			
STATE Highway No. 51	PIT No. 2 Kendall "R" = 65					
43+50 to 45+50		12"	484		5,731	
119+878 to 130+622		12"	2,600		34,762	
130+810 to 133+00		12"	530		7,155	
Estimated for: Correcting Irregularities			361		4,765	
STATE Highway No. 196	PIT No. 4 Neill "R" = 65					
0+14 to 25+00		17"	8,999		77,751	
40+00 to 53+00		11"	2,873		26,661	
Estimated for: Correcting Irregularities			1,187		10,441	
STATE Highway No. 89						
11+50 to 35+00		5"	2,233		8,441	
39+054 to 42+00		5"	280		1,151	
Estimated for: Correcting Irregularities			251		959	
TOTALS STATE Highway No. 51			3,975		52,413	
TOTALS STATE Highway No. 196			13,059		114,853	
TOTALS STATE Highway No. 89			2,764		10,551	

* Based on Design Curve "D"

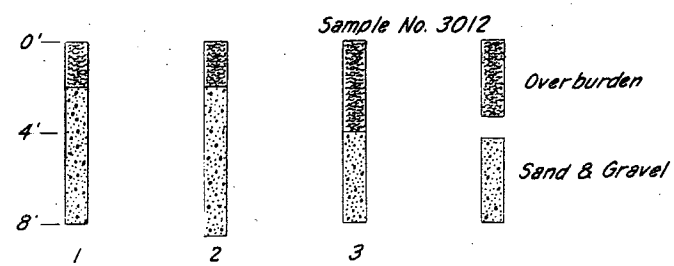
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER-39 (1) First Contract	8	

PIT NO. 2

LOCATION: N.W. 1/4 Sec. 32 T.22S, R.45W
OWNER: Charles Kendall, 301 Willow Valley Rd., Lamar, Colorado.
USE: Subbase & Plant Mixed Asphaltic Surfacing
AVAILABLE: 100,000+ Cu. Yd.
STRIPPING: 1,500 Cu. Yd.
HAUL ROUTE: 1.8 Miles to Bridge No. L-26-F (on Colo. #50)



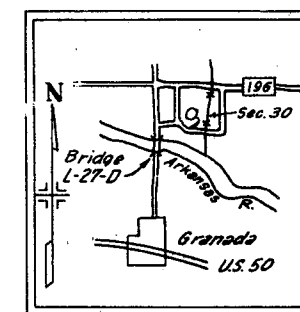
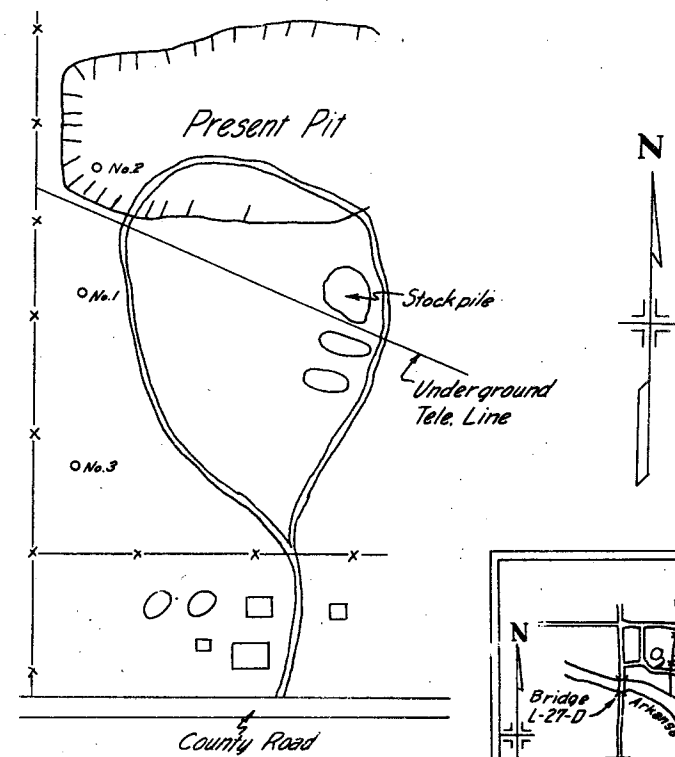
PIT LOG



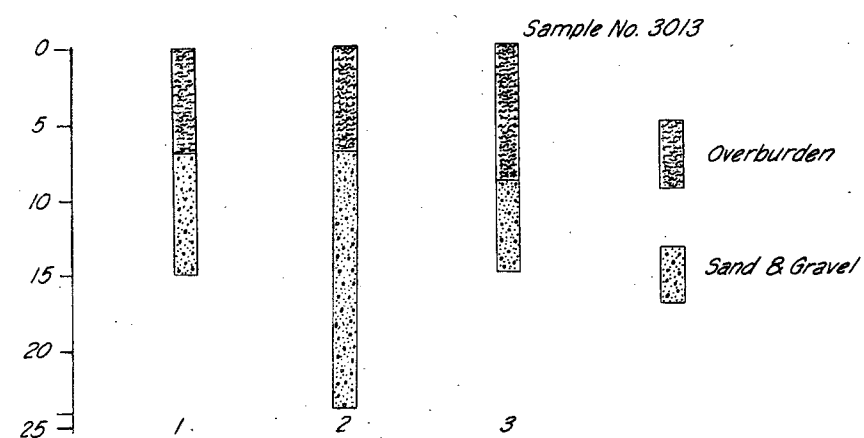
PIT LOCATION

PIT NO. 3

LOCATION: Part S.W. 1/4 Sec. 30 T.22S, R.43W
OWNER: Billy Jones; Holly, Colo.
USE: Base Course Surfacing
AVAILABLE: 150,000 Cu. Yd.
STRIPPING: 4,700 Cu. Yd.
HAUL ROUTE: 1.6 Miles to Bridge L-27-D (on Colo. #51)

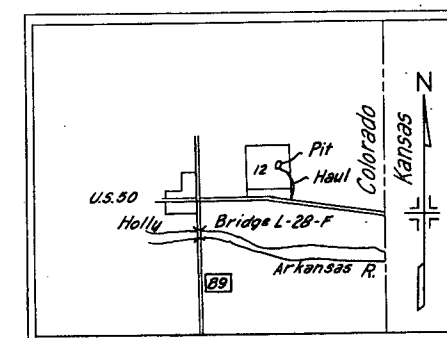
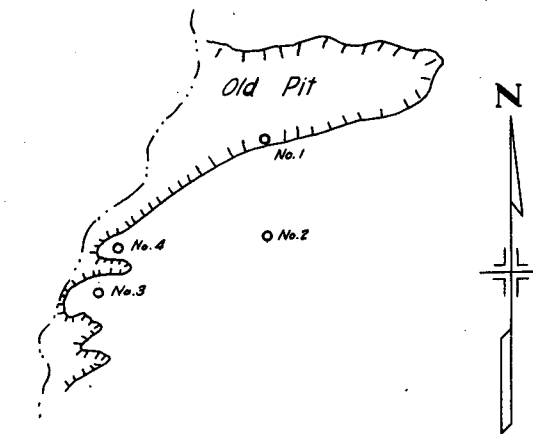


PIT LOG



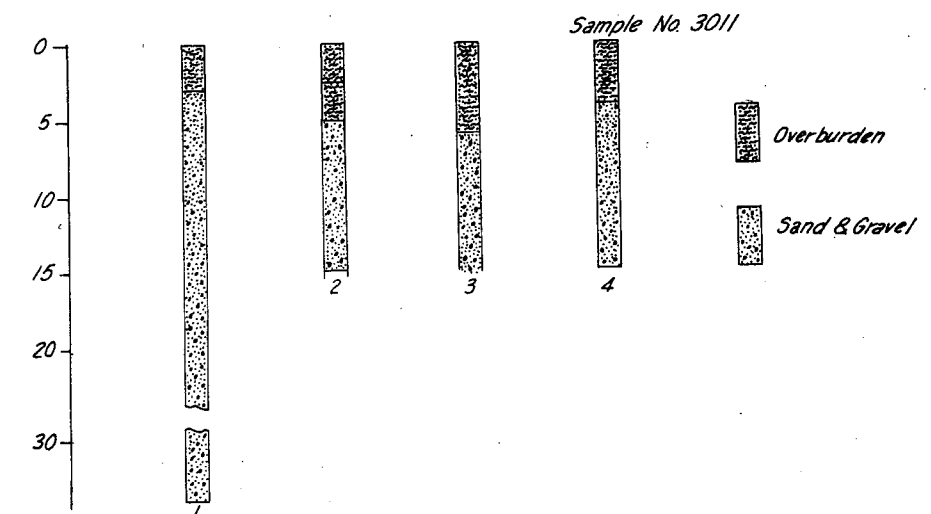
PIT NO. 4

LOCATION: Part of E 1/2 Sec. 12 T.23S, R.42W
OWNER: SW. and Anna L. Neill; Route 2, Holly, Colo.
USE: Subbase & Plant Mixed Asphaltic Surfacing
AVAILABLE: 200,000+ Cu. Yd.
STRIPPING: 4,300 Cu. Yd.
HAUL ROUTE: 4.0 Miles to Bridge L-28-F (on Colo. #89)



*O Windmill

PIT LOG



FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	ER-39 (I) (FIRST CONTRACT)	9	

S.H. NOS. 51, 196 & 89

FENCING TABULATION

Station to Station	Side	Removing Fence Lin. Ft.	Build B.W. Fence Lin. Ft.	Build Comb. Fence Lin. Ft.	B.W. Gates Each	Driveway Gates Each	End Posts Each	Corner & Line Brace Posts Each
STATE HIGHWAY 51								
25+00 to 29+49	Rt.		500				1	
25+00 to 29+49	Lt.		500				1	1
102+00 to 112+60	Lt.	1060	1060		1		2	3
104+00 to 115+20 ✓	Rt.	1120	1120		1		2	2
122+50 to 128+00	Lt.	550	550					1
122+50 to 138+20 ✓	Rt.	1370	1370		1		2	3
STATE HIGHWAY 196								
0+65 to 2+55	Lt.	190		190				2
2+55 to 17+20	Lt.	1465	1465		2		4	1
19+60 to 26+00	Lt.	640		640				2
26+60 to 52+50	Lt.	2590	2590		1		2	3
STATE HIGHWAY 89								
16+90 to 19+50	Rt.	260	260					1
19+50 to 26+00	Rt.	650		635		1	2	1
28+10 to 33+00	Rt.	490	490				1	1
41+00 to 58+00	Rt.	1700	1700		2		6	
17+30 to 35+00	Lt.	1770	1770		2		5	2
40+00 to 52+70	Lt.	1270	1270		1		4	
55+20 to 58+00	Lt.	280	280				1	
TOTALS STATE HIGHWAY 51		4100	5100		3		8	10
TOTALS STATE HIGHWAY 196		4885	4055	830	3		6	8
TOTALS STATE HIGHWAY 89		6420	5770	635	5	1	19	5

DELINEATORS

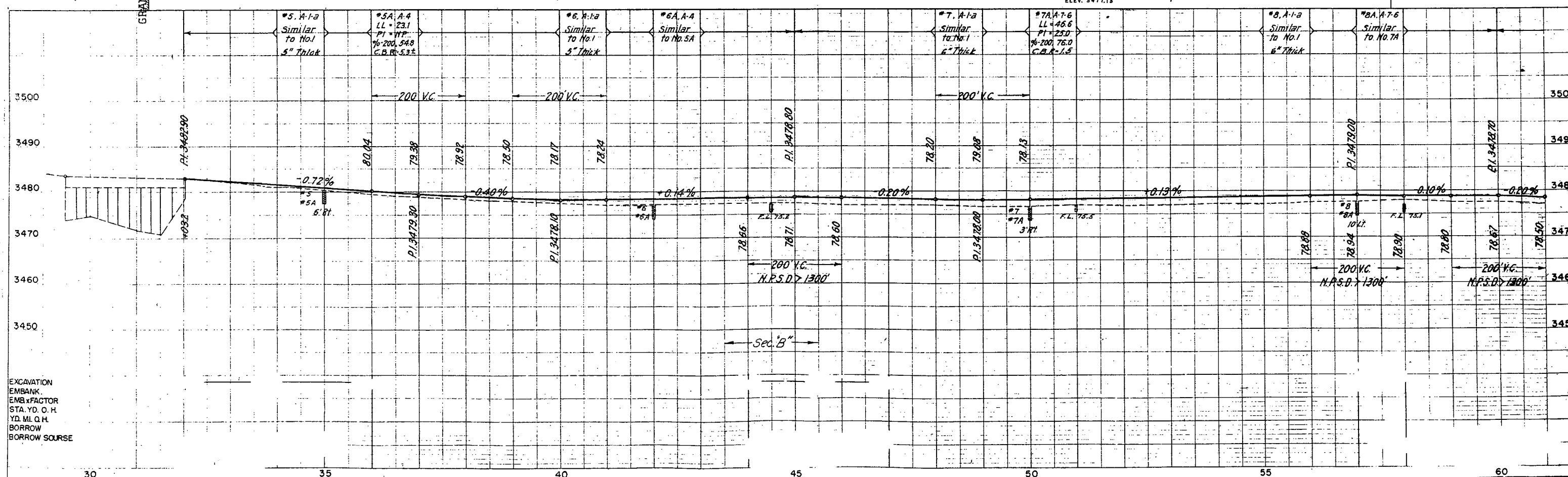
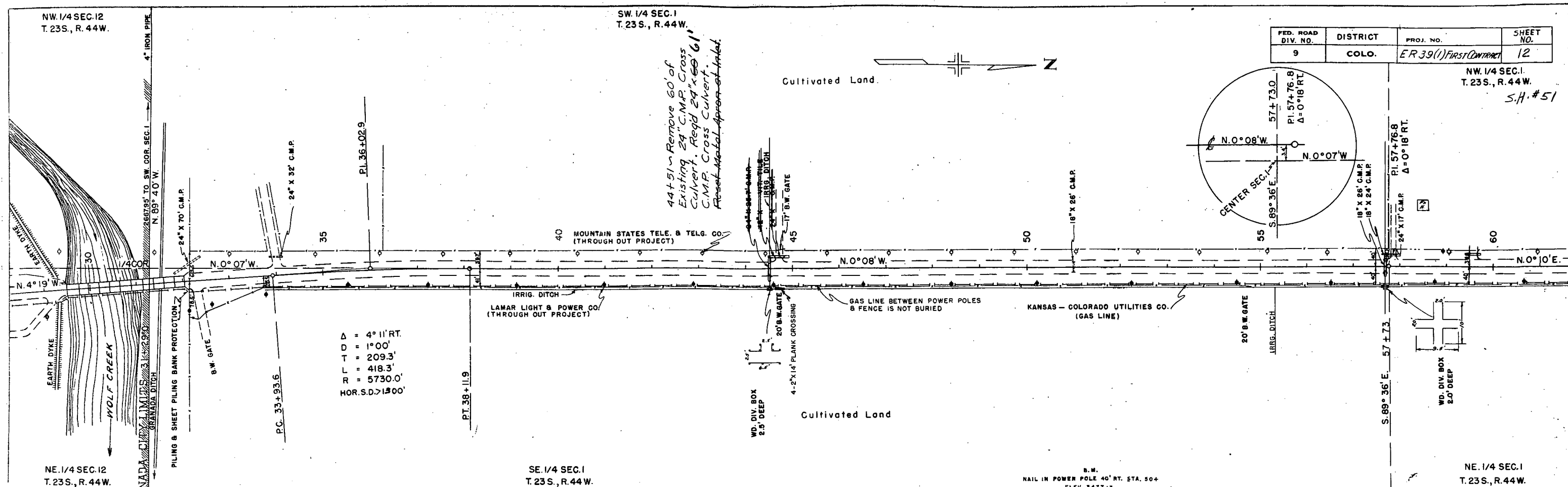
STATION	SIDE	SPACING	TYPE		
			I EACH	II	III EACH
<u>STATE HIGHWAY 51</u>					
14+72 to 19+34	Lt. & Rt.	1° Curve	4		
27+90 to 33+65	Lt. & Rt.	Bridge	8		2
114+05 to 121+47	Lt. & Rt.	Bridge	8		2
129+00 to 132+40	Lt. & Rt.	Bridge	8		2
134+32 to 138+68	Lt. & Rt.	2° Curve	4		
146+80 to 150+20	Lt. & Rt.	Bridge	8		2
<u>STATE HIGHWAY 89</u>					
24+00 to 28+55	Lt. & Rt.	Bridge	8		2
33+40 to 40+65	Lt. & Rt.	Bridge	8		2
<u>TOTALS STATE HIGHWAY 51</u>					
			40		8
<u>TOTALS STATE HIGHWAY 89</u>					
			16		4

STRUCTURE QUANTITIES

FED. ROAD REGION NO.	DIVISION	PROJECT NUMBER	SHEET NO.
9	COLO.	ER-39(1) First Contract	10

LOCATION		REMOVAL OF STRUCTURES NO.	EXCAVATION			UNCLASSIFIED STRUCTURAL EXCAVATION		STRUCTURE BACKFILL		"H" FT.	GRAVEL OR CRUSHED ROCK SURFACING TONS	ASPHALTIC SURFACING TONS	CONCRETE		REINFORCING STEEL LBS.	CULVERT PIPE										SLOPE AND DITCH PAVING CU. YDS.	CORRUGATED METAL CULVERT PIPE																																																																																																																																																																																																																																																																																																																																																																													
			CUBIC YARDS			CUBIC YARDS		CL. X	CL. "A"				CUBIC YARDS	LINEAR FEET										LIN. FT.																																																																																																																																																																																																																																																																																																																																																																																
			UNCL.	EMB.	UNCL. DITCH	CUBIC YARDS	MISC.							CL. "A"		CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"		CUBIC YARDS		CL. "A"	CUBIC YARDS	CL. "A"		CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"	CUBIC YARDS	CL. "A"

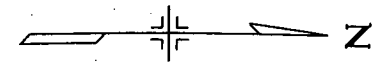
Ø Allowance for Connecting Band



EXCAVATION
EMBANK.
EMBxFACTOR
STA.YD. O. H.
YD. ML Q. H.
BORROW
BORROW SOURCE

PLAN
DATE
BY
CHECKED
APPROVED
NORTH ARROW
SCALE
1" = 40'

N.W. 1/4, SEC. 1
T. 23 S., R. 44 W.



Cultivated Land

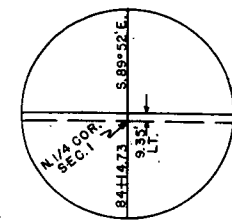
87+00 - Relay 12" x 36" C.M.P. 25
Side Drains, L.R.R.

897 - Removal of Bridge

897+50 - Right Road Approaches L.R.R.

897+70 - Right 8' x 56" Cross Culvert,
Grouted Right Side Flaring at
Inlet & Outlet (Details on Sheet No. 2)

897+70 TO 83+88.2
TREATED TIMBER BRIDGE - CONCRETE DECK
Clear Roadway 22'-8" LENGTH 18'0"
GRANADA DRAINAGE DITCH



FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.
9	COLO.	ER 39(1) First Contract	13

S.W. 1/4, SEC. 36
T. 22 S., R. 44 W.

S.H. #51

894+25 - Right Road
Approach, L.R.R.

90+36 - Right 24" x 44"
Cross Culvert in Irrig. ditch
and ditches. Remove 24" x 16"
C.M.P. and headwalls.

P.O.T. 90+36
24" x 26" C.M.P. - 2 Headwalls

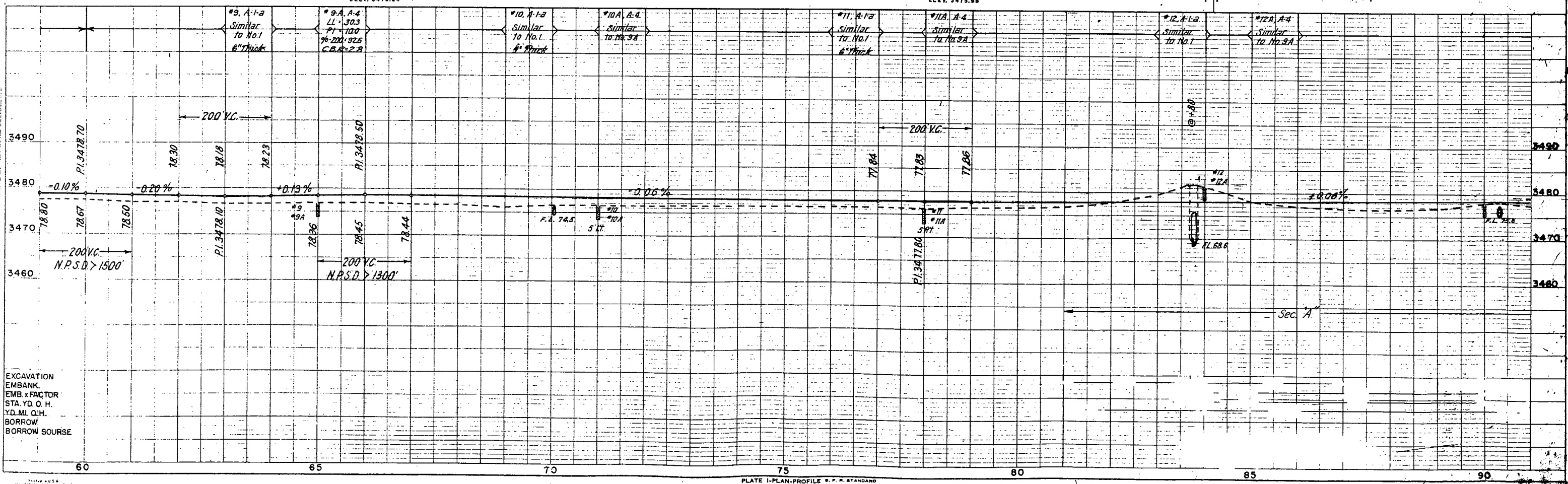
S.M.
NAIL IN POWER POLE 33' RT. STA. 56+25
ELEV. 3478.24

N.E. 1/4, SEC. 1
T. 23 S., R. 44 W.

S.M.
NAIL IN POWER POLE 52' RT. STA. 79+20
ELEV. 3475.88

S.E. 1/4, SEC. 36
T. 22 S., R. 44 W.

PROFILE
DATE
BY
CHECKED
APPROVED
NOTE: 1. ALL GRADES CHECKED
2. B.M. - MOVED
3. STRUCTURE NOTE: SEE PLAN



S.W. 1/4, SEC. 36
T. 22 S., R. 44 W.

N.W. 1/4, SEC. 36
T. 22 S., R. 44 W.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.
9	COLO.	ER 39(1) First Contract	14

S.H. #51

Cultivated Land

P.O.T. 100+00

193+49 - Read 24"x30" Side Drain,
Ditches and Road Approach Lt.
Remove 12"x12"x16" Wood Box Side
Drain Lt.

194+10 to 111+
Read Drain Ditch Lt.

P.O.T. 110+89.5

River Bed

STA. 115+65 TO 119+87.8
BRIDGE - 5 CONTINUOUS CONCRETE & I-BEAM SPANS
STRUCTURE NO. L27D - CLEAR ROADWAY 24'-0"

TELE. LINE, POWER LINE & GAS LINE
HUNG ON BRIDGE

ROCK FILLED BASKET

ROCK FILLED BASKET

ARKANSAS RIVER

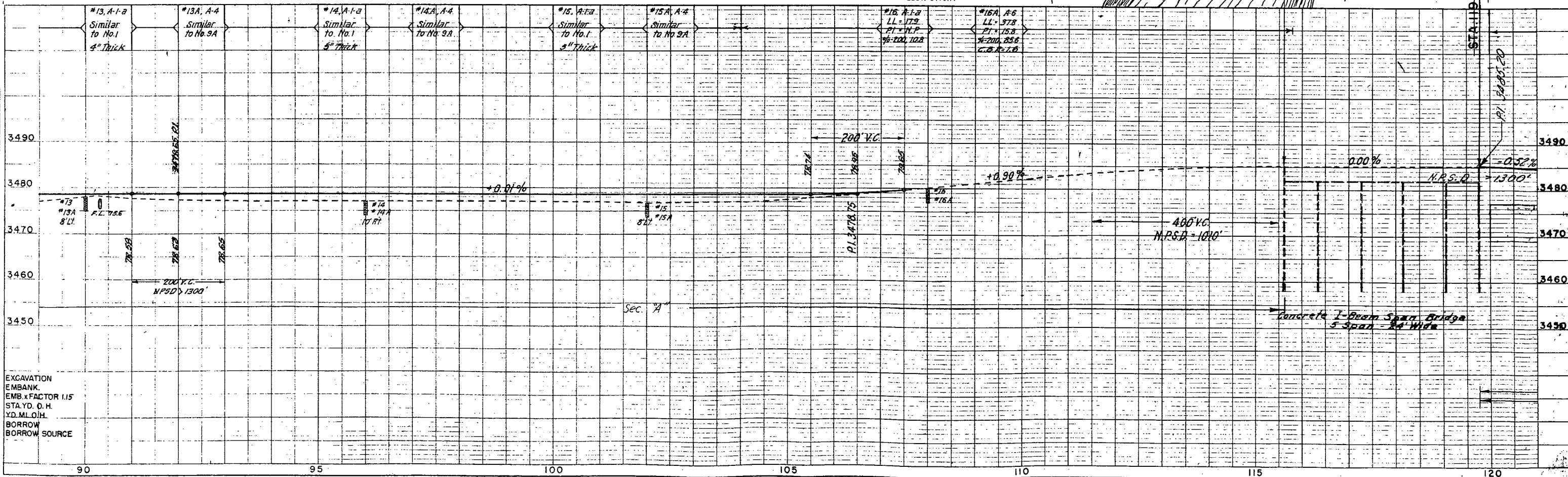
Tomorock Thicker

N.E. 1/4, SEC. 36
T. 22 S., R. 44 W.

STA. 119+87.8 BEGIN WORK 0000(4)
STA. 119+87.8 BEGIN WORK 0000(4)

S.E. 1/4, SEC. 36
T. 22 S., R. 44 W.

B.M.
H.B.G. 180' RT. STA. 110+15 IN FENCE
ELEV. 3478.17



Rev. Length 7/11/50 J.R.W.

—



PLAN
DATE
BY
NOTES:
1. BOOK ALIGNMENT CHECKED
BY 1/22/21
2. SET OF WAY CHECKED
BY 1/22/21

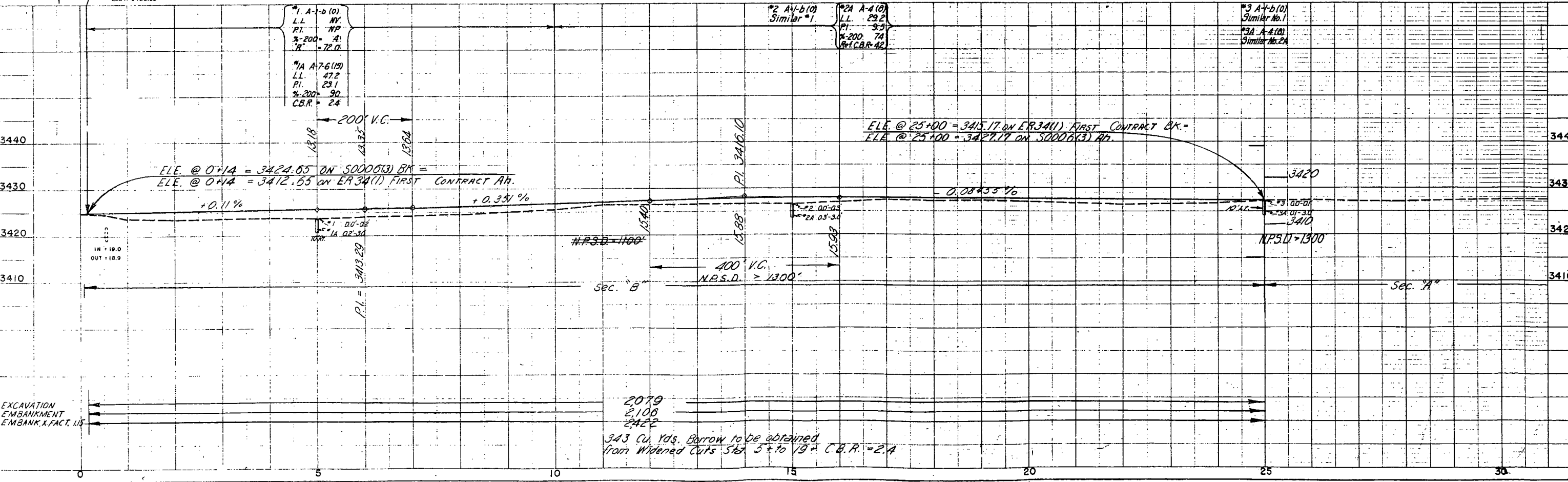
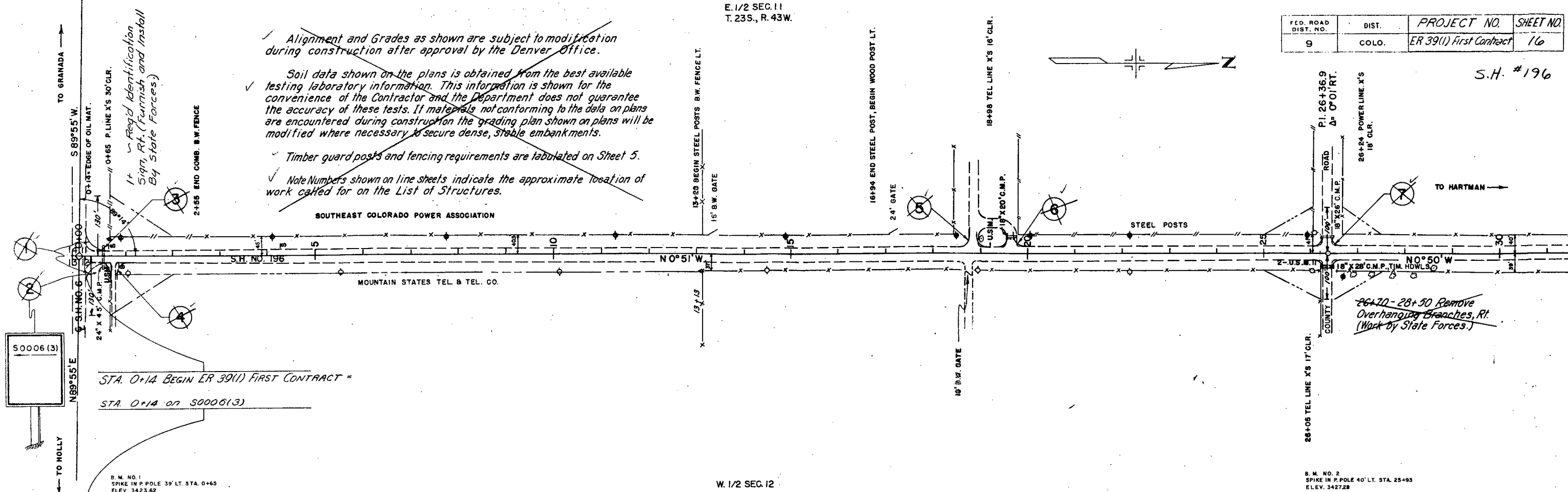
PROFILE
DATE
BY
NOTES:
1. SET OF WAY CHECKED
BY 1/22/21
2. SET OF WAY CHECKED
BY 1/22/21

E. 1/2 SEC. 11
T. 23S., R. 43W.

FED. ROAD DIST. NO.	DIST.	PROJECT NO.	SHEET NO.
9	COLO.	ER 39(1) First Contract	16

S.H. #196

- Alignment and Grades as shown are subject to modification during construction after approval by the Denver Office.
- Soil data shown on the plans is obtained from the best available testing laboratory information. This information is shown for the convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense, stable embankments.
- Timber guard posts and fencing requirements are tabulated on Sheet 5.
- Note Numbers shown on line sheets indicate the approximate location of work called for on the List of Structures.



NE 1/4 SEC. 11
T. 23S., R. 43W.

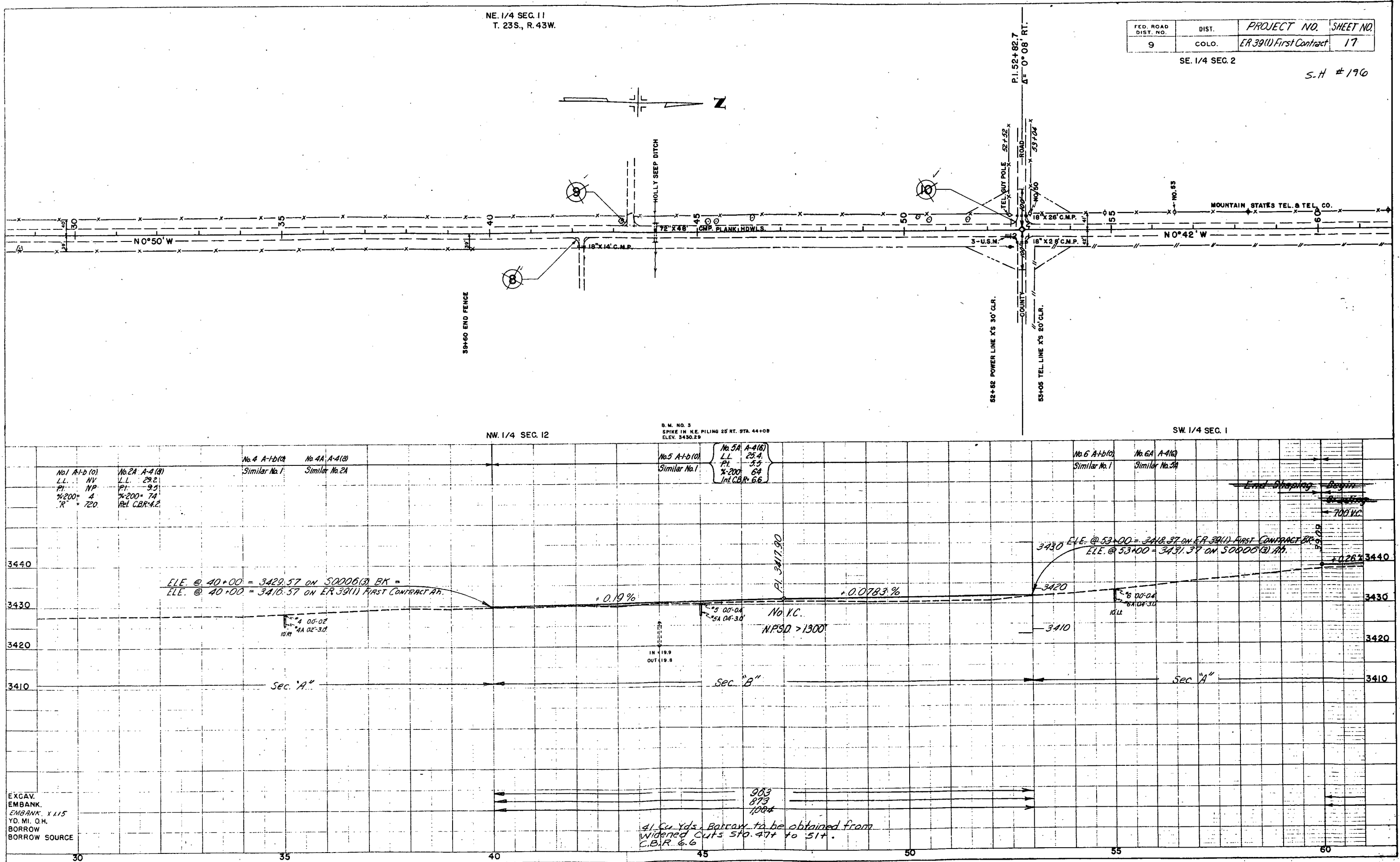
FED. ROAD DIST. NO.	DIST.	PROJECT NO.	SHEET NO.
9	COLO.	ER 39(1) First Contract	17

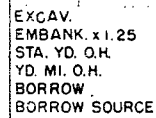
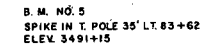
SE. 1/4 SEC. 2

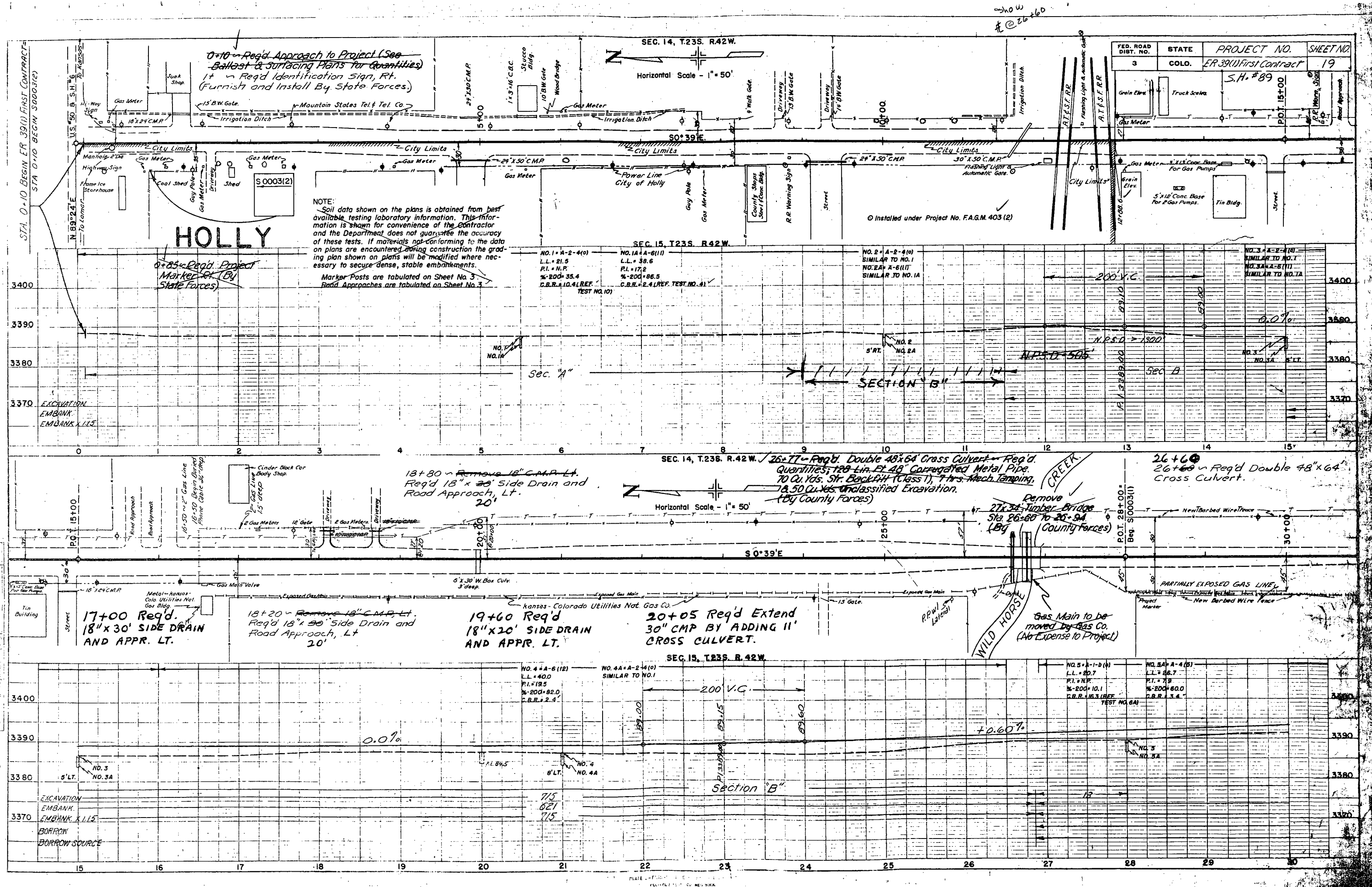
S.H. #190

PLAN
NOTE: SEE PLAN FOR ALL DIMENSIONS
1/2" = 100'

PROFILE
NOTE: SEE PROFILE FOR ALL DIMENSIONS
1" = 10'





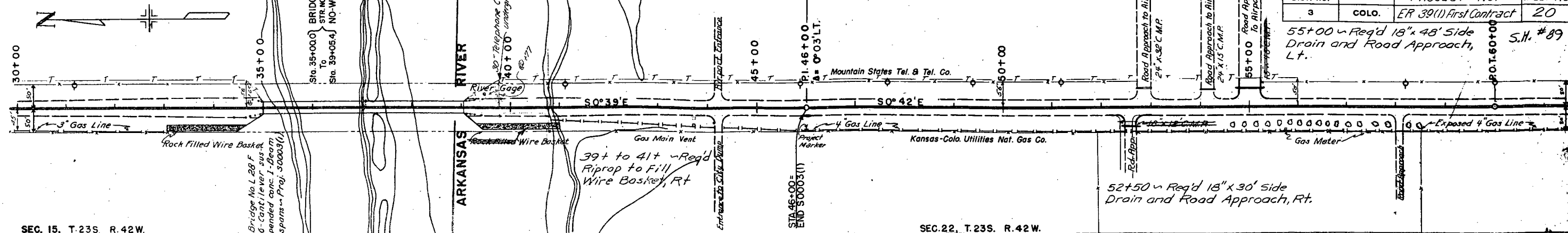


SEC. 14, T.23S. R.42W.

SEC. 23, T.23S. R.42W.

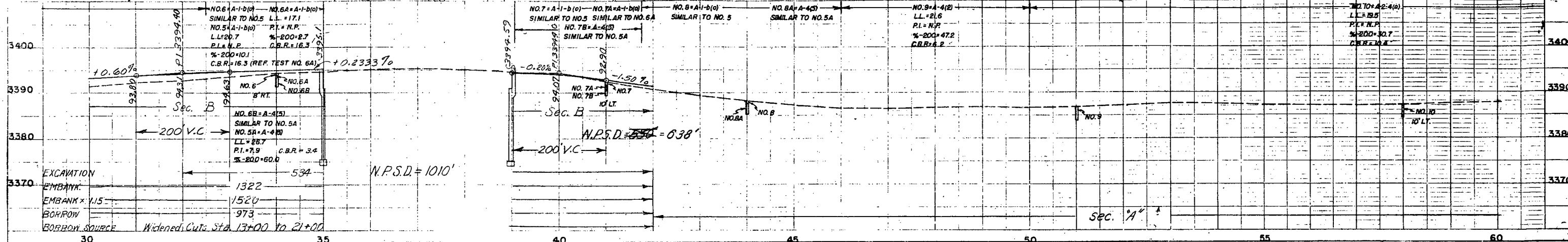
FED. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.
3	COLO.	ER 39(1) First Contract	20

55+00 ~ Reg'd 18" x 48" Side Drain and Road Approach, Lt.
S.H. #89



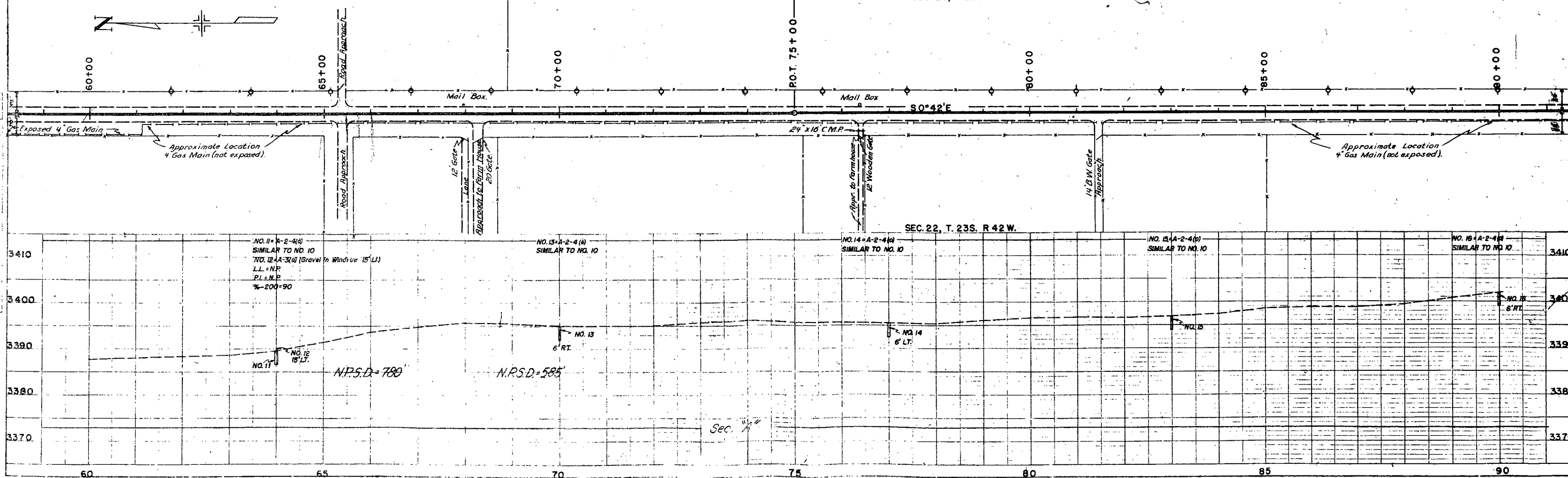
SEC. 15, T.23S. R.42W.

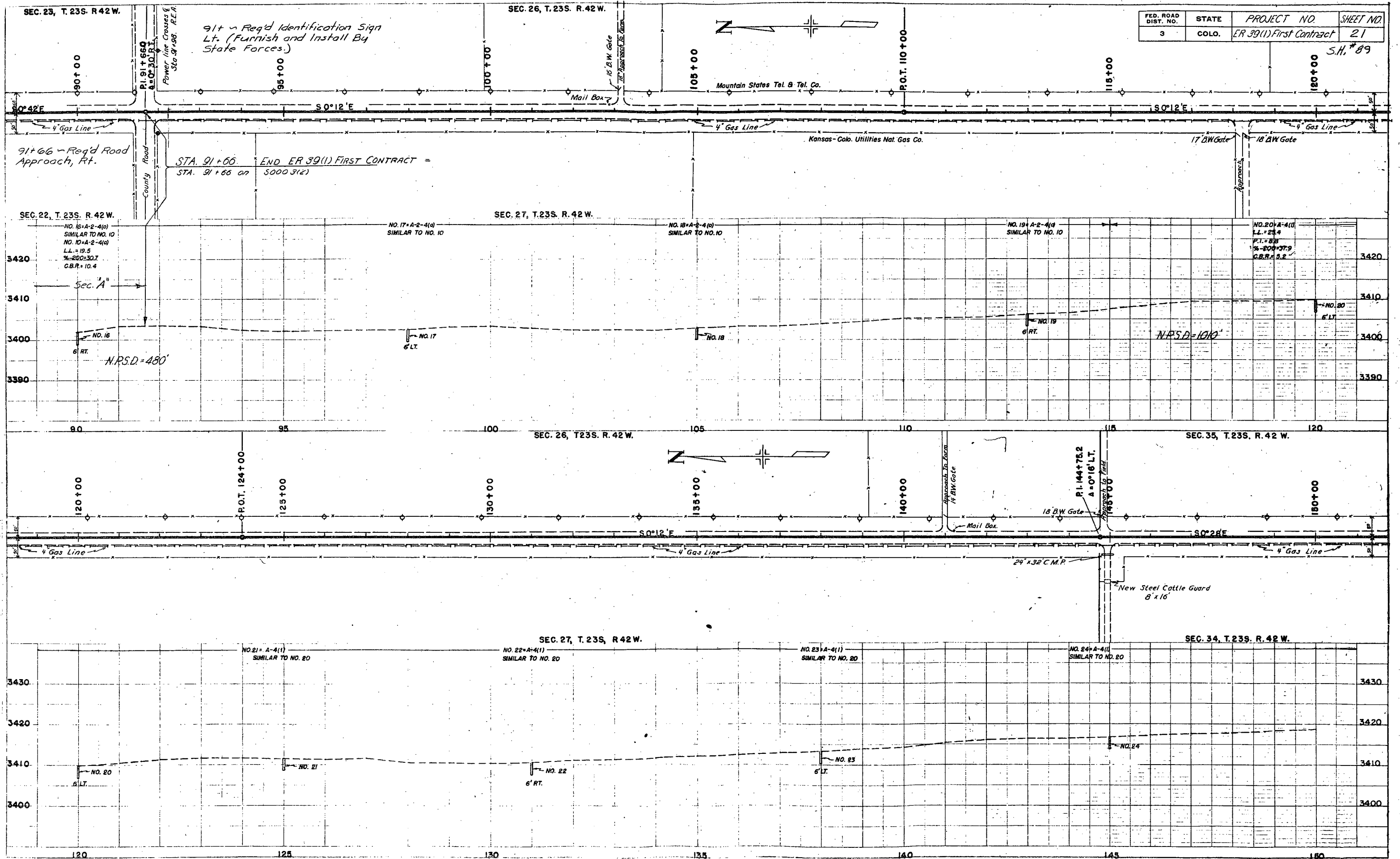
SEC. 22, T.23S. R.42W.



SEC. 23, T.23S. R.42W.

SEC. 22, T.23S. R.42W.





FED. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.
3	COLO.	ER 39(1) First Contract	21

S.H. #89

91+ ~ Req'd Identification Sign
Lt. (Furnish and Install By
State Forces)

STA. 91+66. END ER 39(1) FIRST CONTRACT =
STA. 91+66 on 5000 3(2)

N.P.S.D. = 480'

N.P.S.D. = 1010'

New Steel Cattle Guard
8' x 16'

DATE
BY
NO.
FINAL SURVEY
NOTE BOOK
NO.

DATE
BY
NO.
ORIGINAL SURVEY
NOTE BOOK
NO.

Excavation
Cu. Yds. Area

Excavation
Cu. Yds. Area

Excavation
Cu. Yds. Area

Embankment
Area Cu. Yds.

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	CCLO.	ER 39 (J) FIRST CONTRACT	22	

SUMMARY OF EARTHWORK QUANTITIES

S.H. #51

S.H. #196

S.H. #89

TOTALS

UNCLASSIFIED EXCAVATION

ROADWAY - FROM CROSS SECTIONS
ADDITIONAL ROADWAY EXCAVATION
(WIDENED CUTS)
EST. FOR SUBSIDENCE

992 CU. YDS.
526 " "
152 " "

3042 CU. YDS.
384 " "
343 " "

1262 CU. YDS.
973 " "
224 " "

5296 CU. YDS.
1883 " "
719 " "

STRUCTURE QUANTITIES AS EMBANKMENT
TOTALS

1670 CU. YDS.

3169 CU. YDS.

2619 CU. YDS.

5058 CU. YDS.

UNCLASSIFIED EXCAVATION

ROADWAY - FROM CROSS SECTIONS
ADDITIONAL ROADWAY EXCAVATION
(WIDENED CUTS)

992 CU. YDS.
526 " "
1518 CU. YDS.

3042 CU. YDS.
384 " "
3426 CU. YDS.

1262 CU. YDS.
973 " "
2235 CU. YDS.

5296 CU. YDS.
1883 " "
7179 CU. YDS.

TOTALS

EMBANKMENT X FACTOR

1518 CU. YDS.

3426 CU. YDS.

2235 CU. YDS.

7179 CU. YDS.

COMPACTION

BASE OF CUTS AND FILLS
UNCLASSIFIED EXCAVATION

5300 CU. YDS.
1670 " "
6970 CU. YDS.

16,900 CU. YDS.
3769 " "
20,669 CU. YDS.

4891 CU. YDS.
2619 " "
7510 CU. YDS.

27,091 CU. YDS.
8058 " "
35,149 CU. YDS.

TOTALS

SHEET TOTALS
EXCAVATION
EXCAVATION
EMBANKMENT

CU. YDS.
CU. YDS.
CU. YDS.

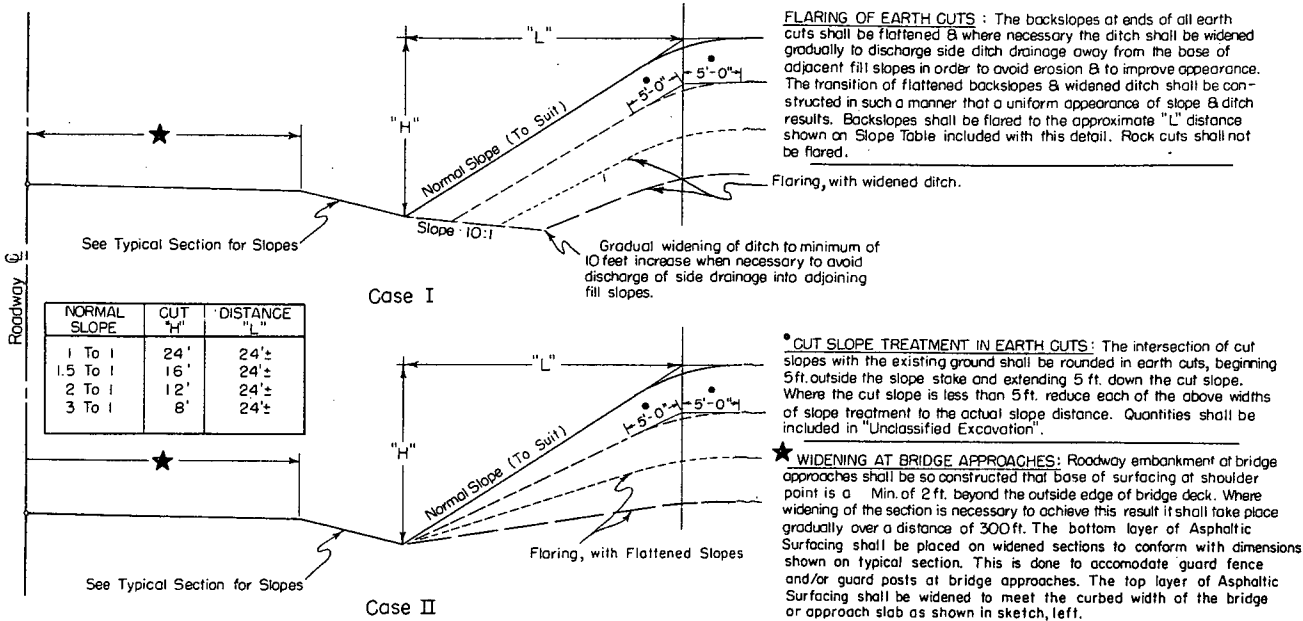
STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT & WIDENING AT BRIDGES AND AT CREST OF GRADES

STANDARD M-2-A
(MAY 1, 1962)

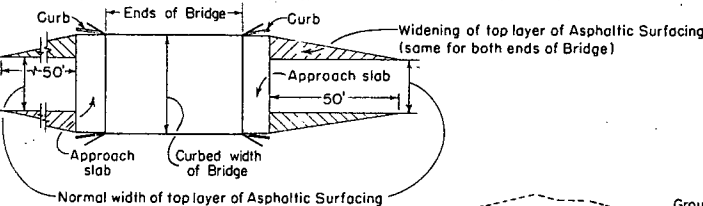
FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.		

REVISIONS		
4-22-63	Rev. Bridge Approaches	LEO
2-3-64	DEPT. NAME	M.R.H.

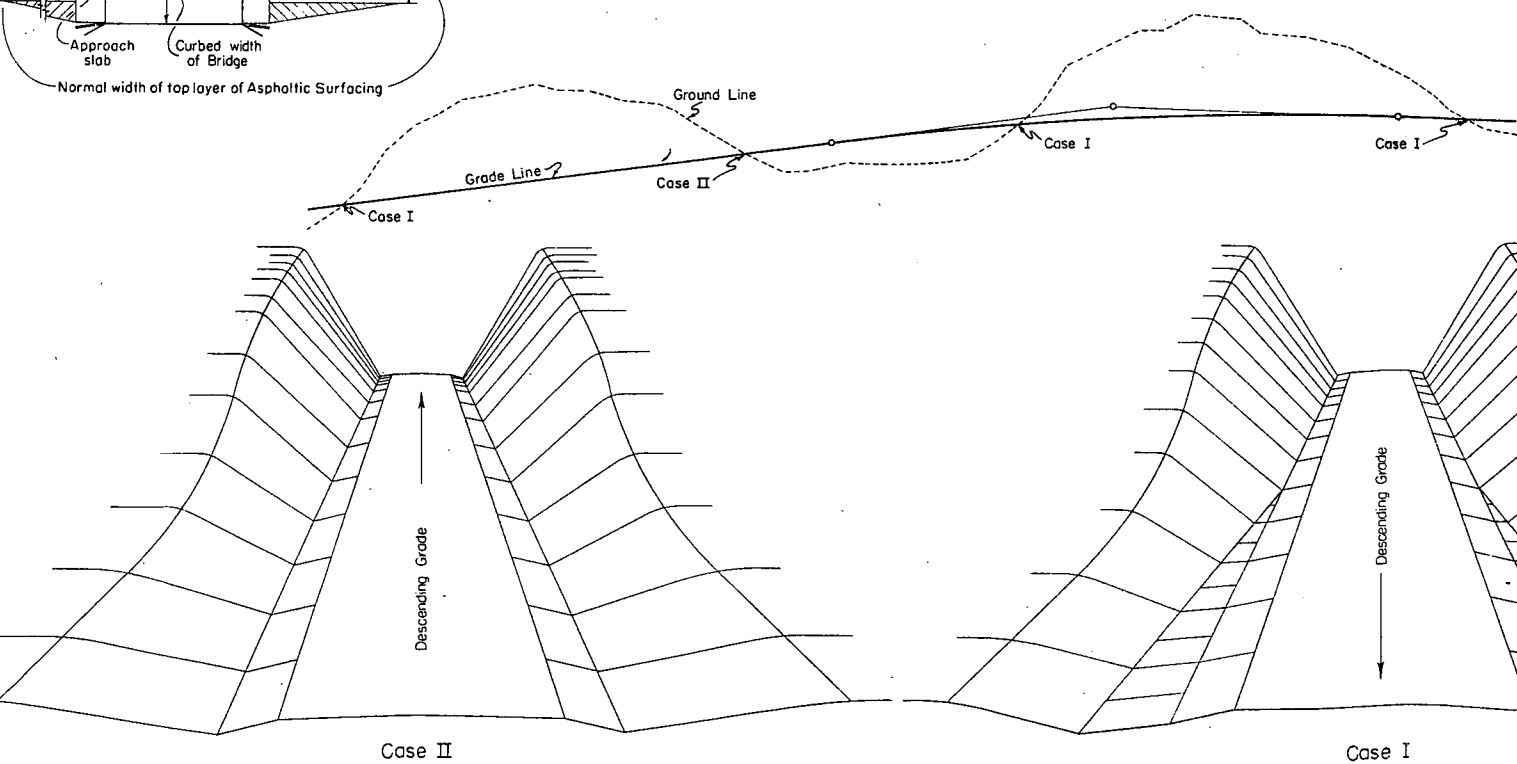
GENERAL DETAILS FOR FLARING OF EARTH CUTS, CUT SLOPE TREATMENT & WIDENING AT BRIDGES



PLAN OF WIDENING TOP LAYER OF ASPHALTIC SURFACING AT BRIDGE APPROACHES



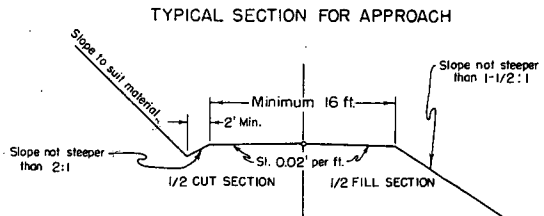
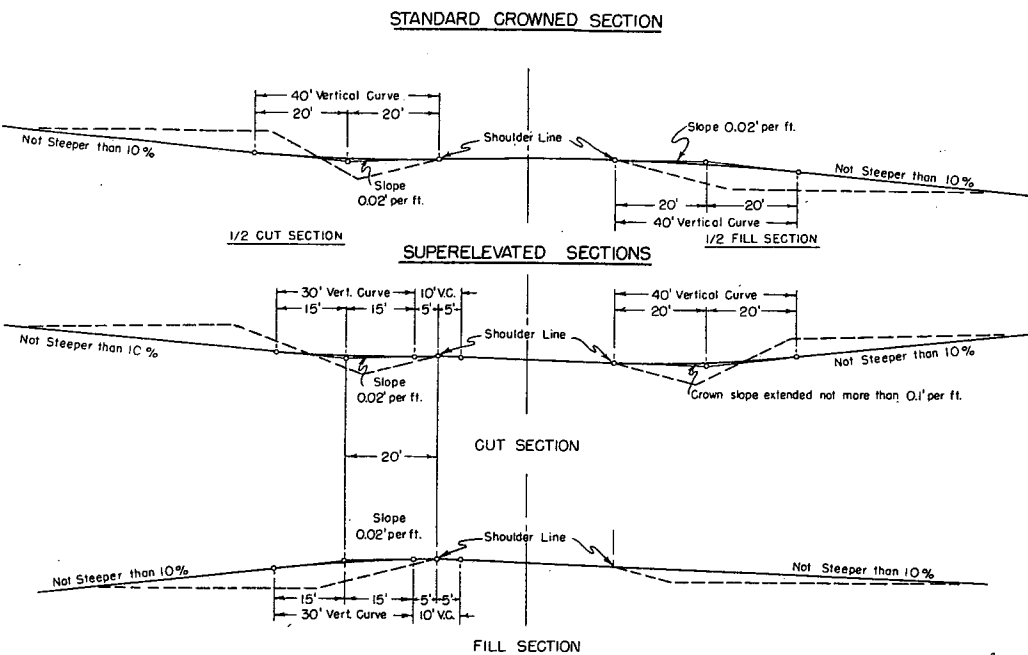
PLAN OF FLARING IN EARTH CUTS



TYPICAL PLANS FOR SIDE APPROACH ROADS

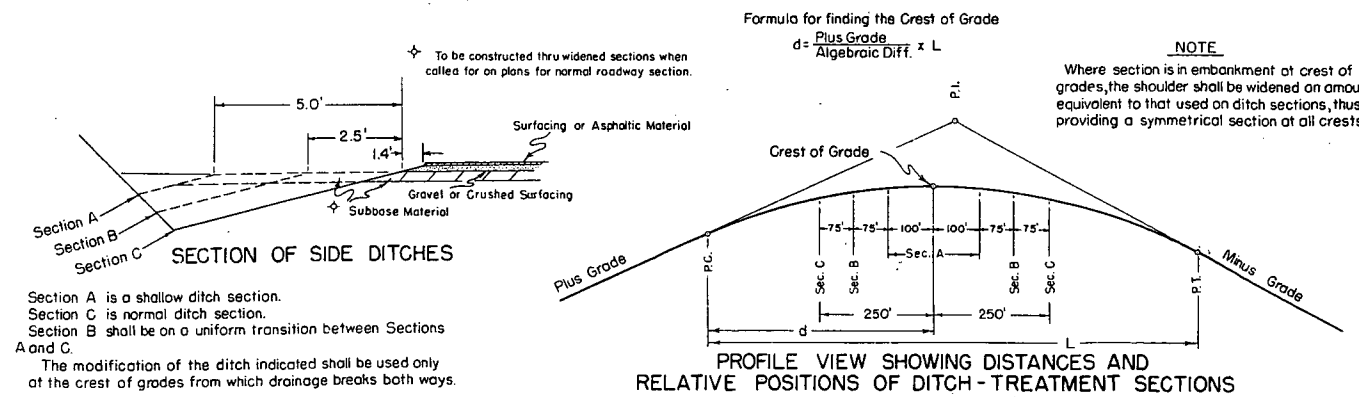
Where practical Side Drains are to be placed in line with the roadway ditches.

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



NOTE:
ROAD APPROACHES: To conform to the above details unless otherwise indicated on plans by 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)



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.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

APPROACH ROADS,
FLARING, CUT SLOPE TREATMENT,
BRIDGE & CREST WIDENING

Designed by A.Z.
Made by S.J.M. & A.R.H.
Checked by C.R.S.

Approved by A. Julian
Date: November 1, 1953

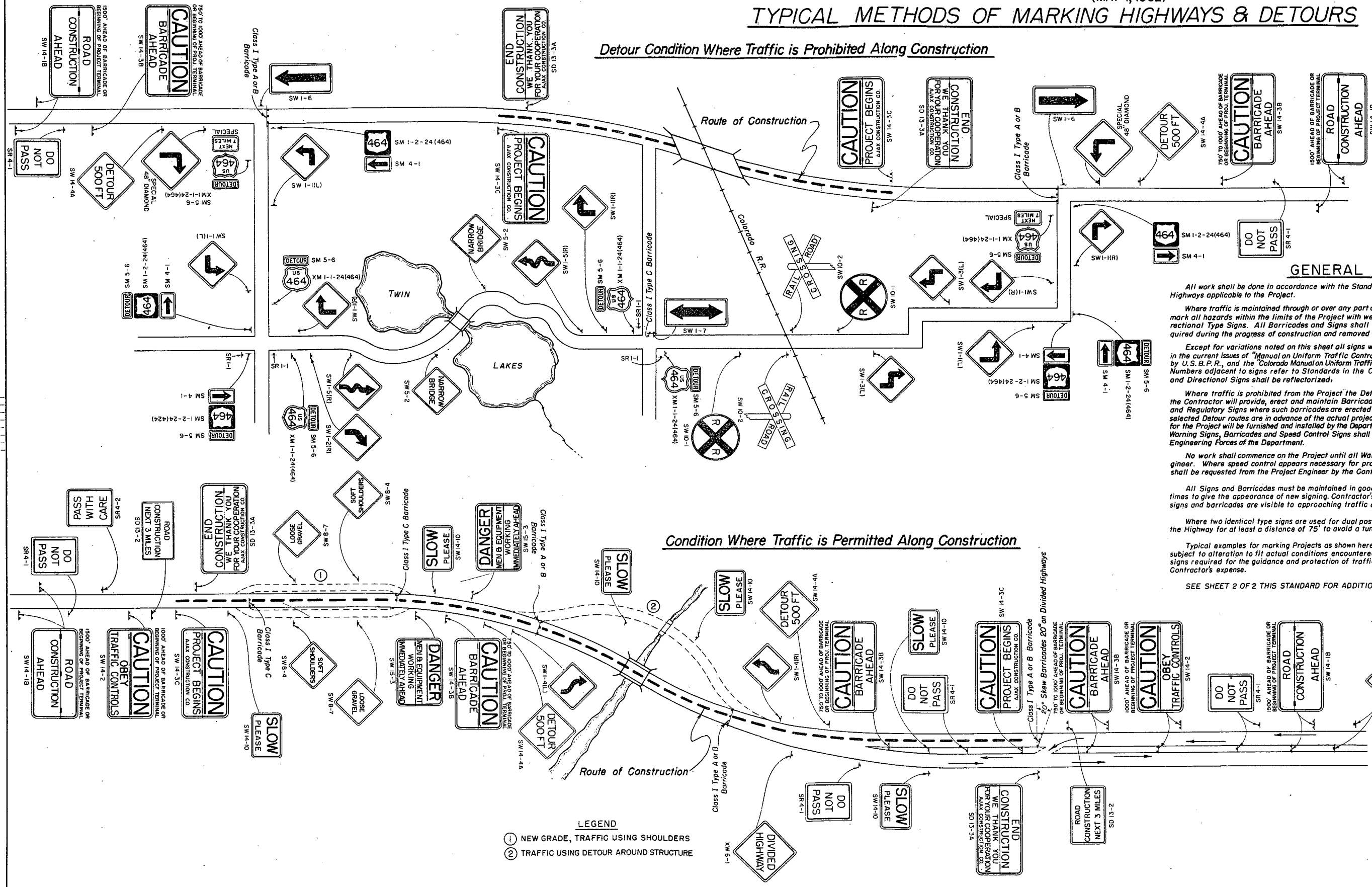
STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-6-B
(SHEET 1 OF 2 SHEETS)
(MAY 1, 1962)

FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.		

REVISIONS		
1-14-63	GENERAL REV.	L.E.O.
1-31-64	DEPT. NAME	MRH

TYPICAL METHODS OF MARKING HIGHWAYS & DETOURS



GENERAL NOTES

All work shall be done in accordance with the Standard Specifications 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 maintained Barricades, Warning Signs and Directional Type Signs. All Barricades and Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when project is completed.

Except for variations noted on this sheet all signs will be in conformity with the specification outlined in the current issues of "Manual on Uniform Traffic Control Devices for Streets & Highways," issued by U.S.B.P.R., and the "Colorado Manual on Uniform Traffic Control Devices for Streets & Highways." Numbers adjacent to signs refer to Standards in the Colorado manual. Standard Warning, Regulatory and Directional Signs shall be reflectorized.

Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor will provide, erect and maintain Barricades complete with approved Directional Arrows and Regulatory Signs where such barricades are erected and maintained at the ends of the Project or where selected Detour routes are in advance of the actual project terminal. U.S. or State Route Markers required for the Project will be furnished and installed by the Department. The location and positioning of Advance Warning Signs, Barricades and Speed Control Signs shall be as recommended by the appropriate District Engineering Forces of the Department.

No work shall commence on the Project until all Warning Signs are in place and approved by the Engineer. Where speed control appears necessary for protection of the travelling public, such speed control shall be requested from the Project Engineer by the Contractor.

All Signs and Barricades must be maintained in good condition and kept clean and free of dirt at all times to give the appearance of new signing. Contractor's and Engineers' equipment must be parked so that signs and barricades are visible to approaching traffic at all times.

Where two identical type signs are used for dual posting they are to be staggered on the two sides of the Highway for at least a distance of 75' to avoid a tunneling effect.

Typical examples for marking Projects as shown hereon constitute a minimum of signs required and are subject to alteration to fit actual conditions encountered in the field. Additional markings and any special signs required for the guidance and protection of traffic will be placed as required on the project at the Contractor's expense.

SEE SHEET 2 OF 2 THIS STANDARD FOR ADDITIONAL NOTES AND DETAILS.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

Construction Traffic Signs

Designed by J.C.R. Approved by J.C.R.
Made by J.C.R. Engineer, Surveys & Plans
Checked by Date: July 22, 1955

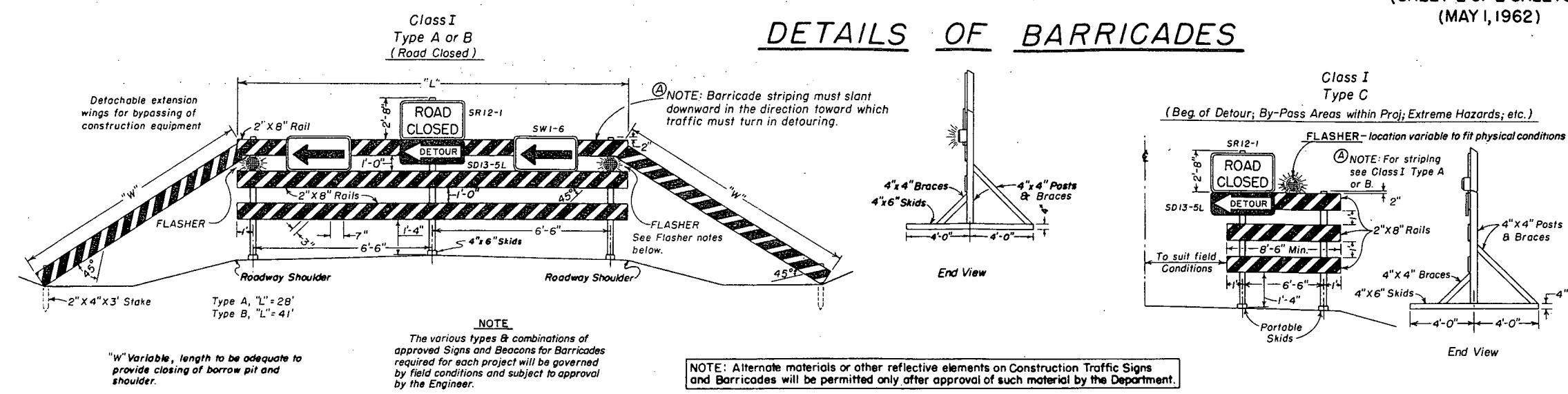
STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-6-B
(SHEET 2 OF 2 SHEETS)
(MAY 1, 1962)

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS		
5-16-62	Rev. Margin & Border Color	L.E.O.
1-14-63	General Rev.	L.E.O.
1-31-64	DEPT. NAME	M.R.H.
8-24-64	Flashers and Striping Notes	M.R.H.

DETAILS OF BARRICADES



SPECIFICATIONS

PAINT - All paint and methods of painting shall be in conformity with Item 38 of the Standard Specifications.

STRIPING - Planking and Wings on all Barricades shall be painted with Maintenance Flat Black on both sides. Reflective Strips shall then be added to the face sides. Reflective Strips shall be Cutout Smooth Surface Yellow, of a type approved by the Department, 3" wide and spaced 7" apart as shown in the detail.

Diversion of traffic will be accomplished as follows:

- 1- Stripes for Barricades diverting traffic to the left shall start on the left hand side of the lower plank and progress up to the right with the stripes making an angle of 45 degrees with the horizontal axis of the board as shown in the detail. Traffic diversion to the right will be just the opposite.
- 2- Stripes on Barricades diverting traffic in both directions shall begin at the center of the lower plank and progress down in both directions.

TIMBER - All Timber used shall conform to the Standard Specifications for Miscellaneous Untreated Timber.

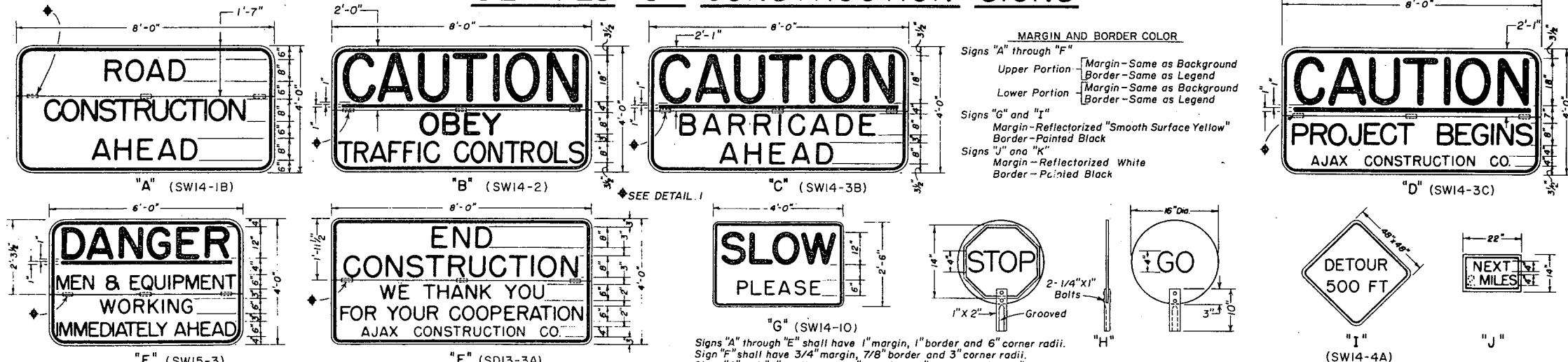
Planking	2" x 8"	S 4 S
Posts (Barricades)	4" x 4"	S 4 S
Posts (Signs)	4" x 4" or 6" x 6"	S 4 S

Barricades may be either portable as shown or fixed with posts set into the ground.

All skids, braces and posts to be painted yellow and nailed together with No. 20d nails.

Bases to be weighted where necessary to provide stability.

DETAILS OF CONSTRUCTION SIGNS



DETAILS OF SIGN AND BEACON FABRICATION AND USAGE

Construction Signs "A" through "G" and "K" shall be made of 5/8" Plywood or other material approved by the Department and as per details above.

Signs having reflectorized Yellow or Red surfaces shall be fabricated from "Flexible Reflective Sheeting" of the "Non-Exposed Lens" type approved by the Department. Signs having reflectorized White surfaces shall be fabricated from "Flexible Reflective Sheeting" of the "Exposed Lens" type approved by the Department.

Construction Sign "A" - Reflectorized Yellow background with painted Black lettering.

Construction Signs "B" through "D" - Top background to be reflectorized "Smooth Surface Red" with the legend and "I" Underline to be a White process point. Balance of lettering to be painted Black over a reflectorized Yellow background.

Construction Sign "E" - The word "DANGER" and the "I" Underline only are to be of a White process point over a reflectorized "Smooth Surface Red." Balance of lettering to be painted Black over a reflectorized Yellow background.

Construction Sign "F" - The words "End Construction" and "Contractors Name" shall be painted Black over a reflectorized White background. Balance of lettering to be applied with a White process point over a reflectorized "Smooth Surface Red" background.

Construction Sign "G" - The legend to be painted Black over a reflectorized "Smooth Surface Yellow" background.

Flagman Warning Sign "H" - This sign shall be made of Plastic or other lightweight material, approved by the Department, having a painted Red background with White lettering on the "Stop" side and a painted Green background with White lettering on the "Go" side. Handle to be grooved on one side to indicate reading of sign to Flagman. This sign will be used whenever Flagmen are necessary. Sign to be reflectorized if used to stop traffic at night.

Detour Warning Sign "I" - This sign shall be made of 3/8" (Min.) Plywood or other material suitable to the Department. Legend to be painted Black on a reflectorized "Smooth Surface Yellow" background.

Construction Sign "J" - This sign shall be made of 3/8" (Min.) Plywood or other suitable material. Legend to be painted Black on a reflectorized White background. 3/4" x 9" metal slides to be placed between "NEXT MILES" spaced so as to accommodate appropriate sized numerals. Numerals calculated to the nearest Mile.

Construction Sign "K" - Reflectorized White background with painted Black lettering.

Signs "A" through "E" and "G" shall be painted on the backside with one coat of white primer and one coat of yellow enamel.

Signs "F", "J" and "K" shall be given 2 coats of white paint on the backside.

Construction Signs shall be placed as follows:

Sign "A" - This is the first advance warning sign and shall be placed 1,500 feet ahead of barricade or beginning of project terminal and on both sides of the traveled way in all cases.

Sign "B" - This is the second advance warning sign and shall be placed 1,000 feet ahead of barricade or beginning of project terminal and on both sides of the traveled way on divided highways and singly on two-lane highways.

Sign "C" - This is the third advance warning sign in cases where barricades are used and shall be placed 750 to 1,000 feet ahead of barricade or beginning of project terminal and on both sides of the traveled way on divided highways and singly on two-lane highways.

Sign "D" - This sign shall be placed to mark the beginning of the Project. It shall be placed singly and may be placed opposite barricade if desirable.

Sign "E" - This sign shall be placed 500 feet ahead of the situation being advised of.

Sign "F" - This sign shall be placed to mark the end of the Project. It shall be placed singly and may be placed opposite barricade if desirable.

Sign "G" - This sign shall be used frequently within the limits of the Project.

Sign "H" - This sign shall be erected at the limits of any project more than 2 miles in extent, where traffic is maintained through the job.

Flares and Torches shall be either of the oil burning or electrical type approved by the Department and shall be placed 3 to 5 feet ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from the use thereof.

Flashers used on the barricades shall be of the battery or electrical type. The lens for this type flasher shall be at least 4 in. in dia. The illuminating element in a flashing yellow beacon or signal shall be flashed continuously at a rate of 50 to 60 flashes per min. with the "on" time being at least 25% of the cycle. Each element, complete, shall be of such design as to render the lens when illuminated clearly visible for 1,000 ft. under all atmospheric conditions except dense fog. The color of the lens shall be in accordance with Technical Report No. 1 of the Institute of Traffic Engineers.

All material shall be sound and durable. Barricades, signs, symbols and lettering shown hereon will be of good workmanship and well maintained. Uneven lettering will not be accepted.

Alternate methods of processing signs or the substitution of symbols or other reflecting elements for painted symbols will be permitted only after approval of such methods or materials by the Department.

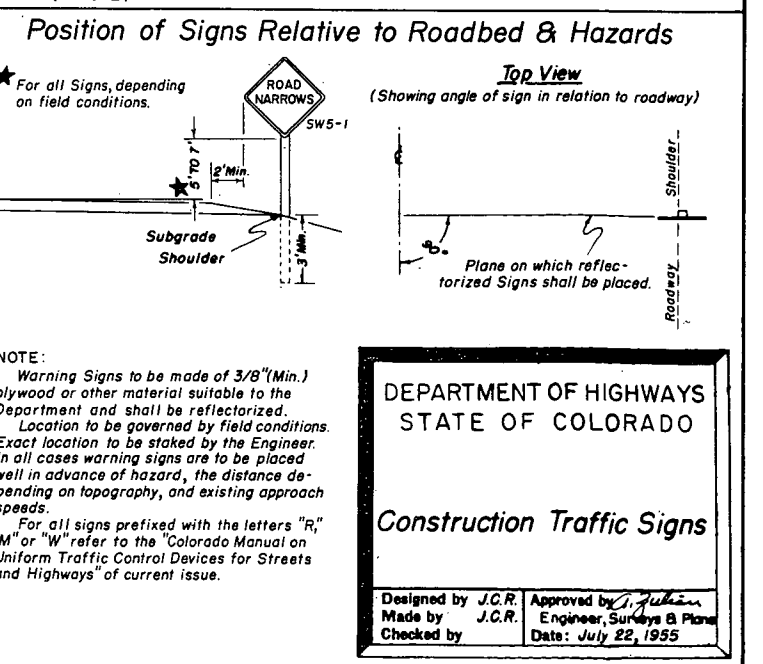
The Department shall furnish and install the following as required OUTSIDE THE LIMITS of the Project:

1. "ROAD CONSTRUCTION AHEAD" Minimum 4
2. "CAUTION OBEY TRAFFIC CONTROLS" Minimum 2
3. "CAUTION BARRICADE AHEAD" As Required
4. "END CONSTRUCTION WE THANK YOU FOR YOUR COOPERATION" As Required
5. "ROAD CONSTRUCTION NEXT 5 MILES" As Required

The Contractor shall furnish and install the following as required WITHIN THE LIMITS of the Project:

1. All Barricades As Required
2. "CAUTION PROJECT BEGINS" Minimum 2
3. "DANGER MEN & EQUIPMENT WORKING IMMEDIATELY AHEAD" As Required
4. "END CONSTRUCTION WE THANK YOU FOR YOUR COOPERATION" Minimum 2
5. "SLOW PLEASE" As Required
6. Standard Warning & Directional Signs As Required
7. Approved Directional Arrows & Regulatory Signs for Barricades As Required
8. Torches and Flares as follows: Class I Type A or B Barricade Minimum 3
Class I Type C Barricade Minimum 1
9. Flashers - Class I Type A or B Barricade 2 Required
Class I Type C Barricade As Required

At the request of the Contractor layouts of signs will be furnished by the Traffic Operations Section indicating the details as to letter size, symbols, spacing, etc. which are required for these signs.



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

Construction Traffic Signs

Designed by J.C.R. Approved by J. Huber
Made by J.C.R. Engineer, Surveys & Plans
Checked by Date: July 22, 1955

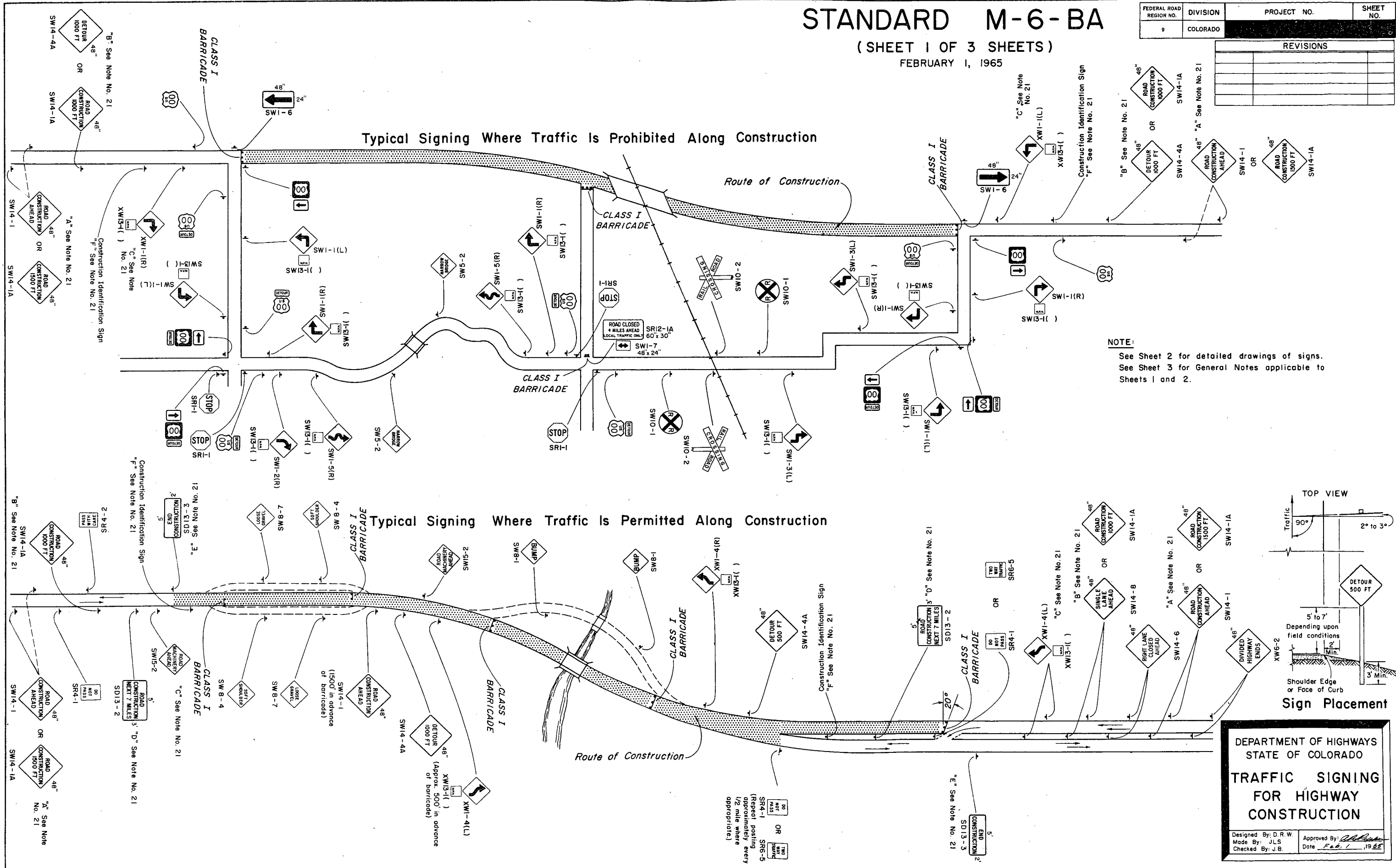
STANDARD M-6-BA

(SHEET 1 OF 3 SHEETS)

FEBRUARY 1, 1965

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		1

REVISIONS



STANDARD M-6-BA

(SHEET 2 OF 3 SHEETS)

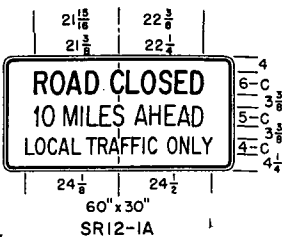
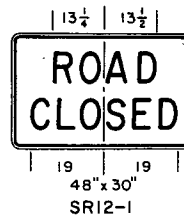
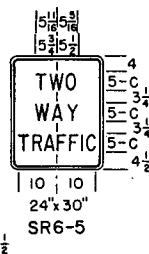
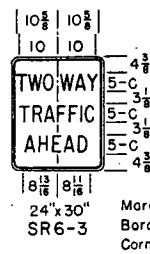
FEBRUARY 1, 1965

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		0

REVISIONS			

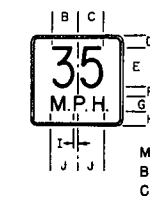
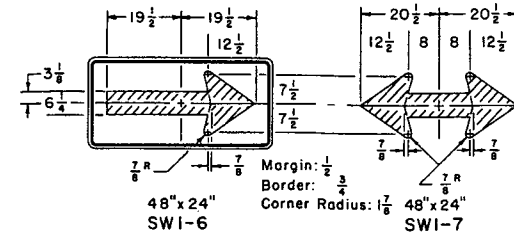
REGULATORY SIGNS

See Note No. 9



WARNING SIGNS

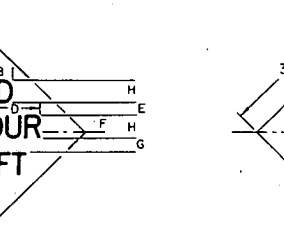
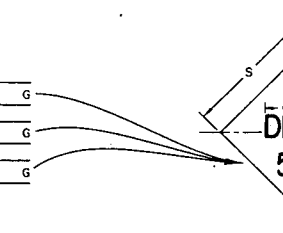
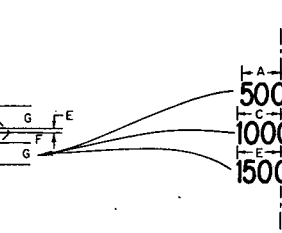
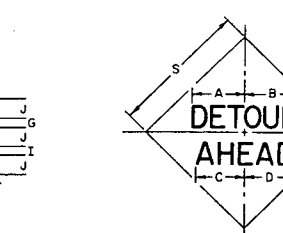
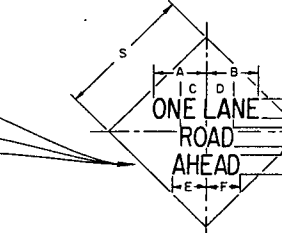
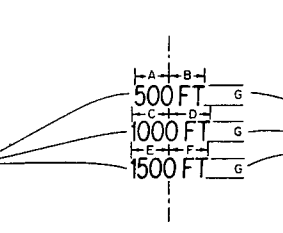
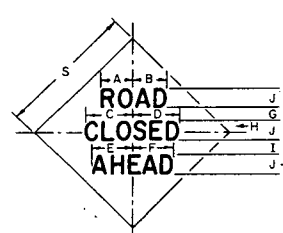
See Note No. 10



Panel	A	B	C	D	E	F	G	H	I	J
SWI3-1	18"x18"	3/8"	5/8"	2 1/4"	8-C	2	3-E	2 3/4"	3/4"	5/8"
XWI3-1	24"x24"	3/8"	5/8"	3 1/4"	10-C	2 1/4"	4-E	4	1 1/8"	6/8"

WARNING SIGNS

See Note No. 10



S	A	B	C	D	E	F	G	H	I	J
SW14-3	48	11 1/2	12 1/2	16 1/2	14 1/2	4 1/2	4 1/2	5 1/2	7-D	
CW14-3	36	8 1/2	8 1/2	11 1/2	10 1/2	3 1/2	3 1/2	4 1/2	5-D	

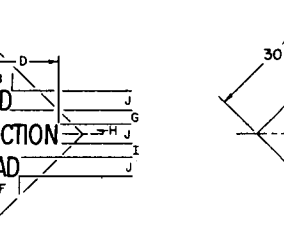
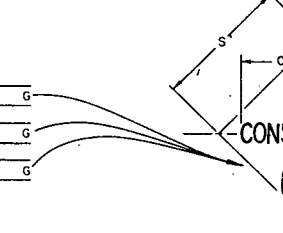
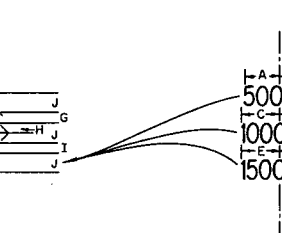
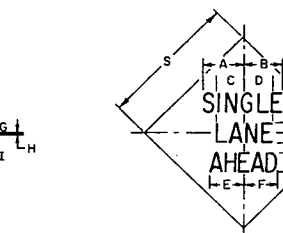
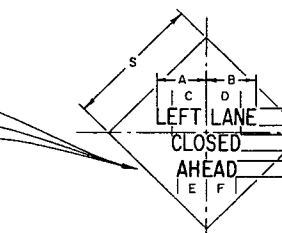
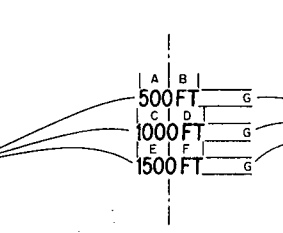
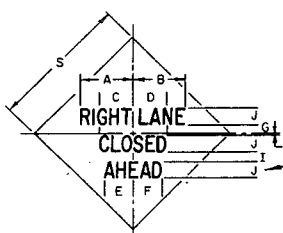
S	A	B	C	D	E	F	G
SW14-3A	48	12	12 1/2	14 1/2	13 1/2	7-C	
CW14-3A	36	8 1/2	8 1/2	10 1/2	9 1/2	5-C	
CW14-3A	36	8 1/2	8 1/2	10 1/2	9 1/2	5-C	

S	A	B	C	D	E	F	G	H	I	J
SW14-5	48	18 1/2	17 1/2	9 3/8	9 3/8	11 1/8	3 1/8	5 1/8	3 1/8	7-C
CW14-5	36	13 1/2	12 1/2	6 3/8	6 3/8	8 1/2	2 1/2	3 1/2	2 1/2	5-C

S	A	B	C	D	E	F	G
SW14-4	48	18 1/2	16 1/2	16 1/2	1 1/2	3 1/2	8-D
CW14-4	36	13 1/2	13 1/2	12 1/2	1 1/2	2 1/2	6-D

S	A	B	C	D	E	F	G
SW14-4A, SW14-4B	48	13 1/2	13 1/2	15	16 1/2	15 1/2	8-C
CW14-4A, CW14-4B	36	10 1/2	10 1/2	11 1/2	12 1/2	11 1/2	6-C

S	A	B	C	D	E	F	G	H
SW14-4B	48	9 1/2	9	18 1/2	18 1/2	4 1/2	6	5
CW14-4B	36	6 1/2	6 1/2	13 1/2	13 1/2	3 1/2	4 1/2	3 1/2



S	A	B	C	D	E	F	G	H	I	J
SW14-6	48	18 1/2	17 1/2	11 1/2	10 1/2	2 1/2	7 1/2	3 1/2	6-C	
CW14-6	36	15 1/2	15 1/2	9 1/2	8 1/2	2 1/2	6 1/2	2 1/2	5-C	

S	A	B	C	D	E	F	G
SW14-6A	48	10 1/2	10 1/2	11 1/2	11 1/2	6-C	
CW14-6A	36	8 1/2	8 1/2	9 1/2	9 1/2	5-C	
CW14-6A	36	8 1/2	8 1/2	9 1/2	9 1/2	5-C	

S	A	B	C	D	E	F	G	H	I	J
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CW14-7	36	14 1/2	14 1/2	9 1/2	8 1/2	2 1/2	6 1/2	2 1/2	5-C	

S	A	B	C	D	E	F	G	H	I	J
SW14-8	48	13 1/2	13 1/2	9 1/2	10 1/2	11 1/2	3 1/2	3 1/2	7-C	
CW14-8	36	11	10 1/2	8 1/2	10 1/2	11 1/2	2 1/2	2 1/2	5-D	

S	A	B	C	D	E	F	G
SW14-1A	48	12	12 1/2	13 1/2	14 1/2	13 1/2	7-C
SW14-1A	48	12	12 1/2	13 1/2	14 1/2	13 1/2	7-C
CW14-1A	36	8 1/2	8 1/2	9 1/2	10 1/2	9 1/2	5-C
CW14-1A	36	8 1/2	8 1/2	9 1/2	10 1/2	9 1/2	5-C

S	A	B	C	D	E	F	G	H	I	J
SW14-1	48	9	9 1/2	26	25 1/2	11 1/2	11 1/2	4 1/2	3 1/2	7-C
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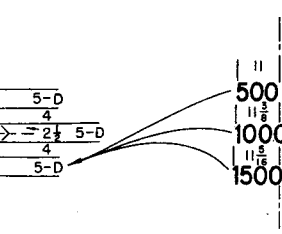
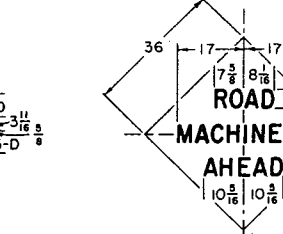
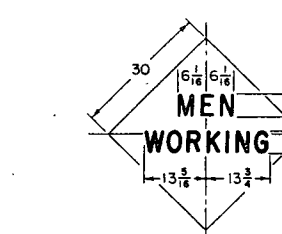
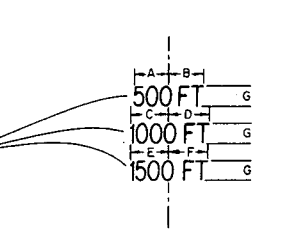
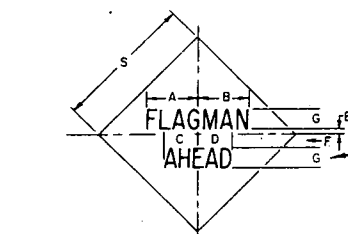
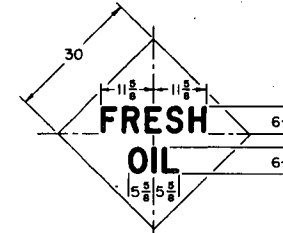
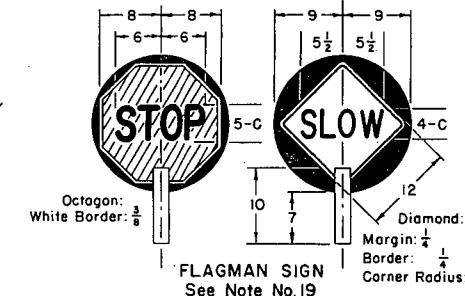
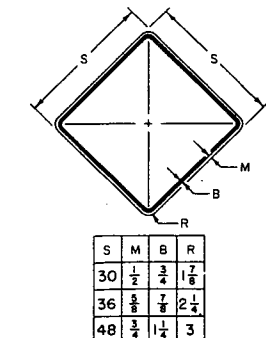


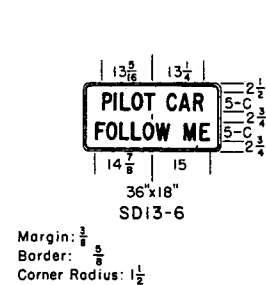
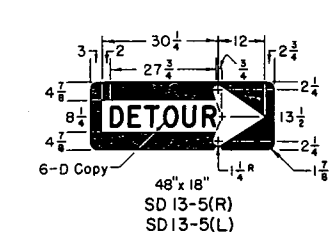
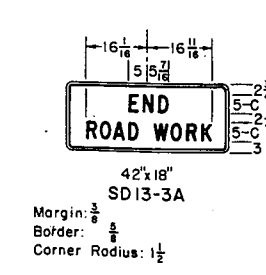
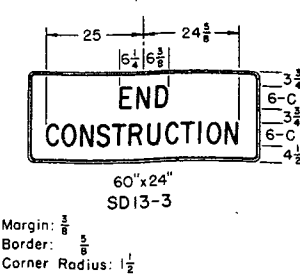
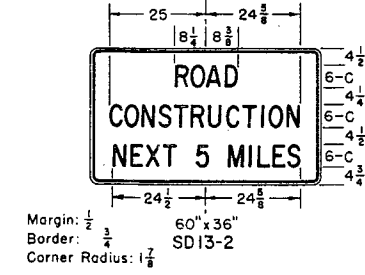
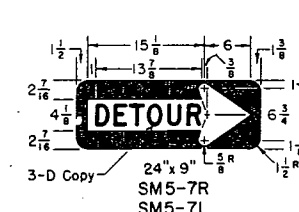
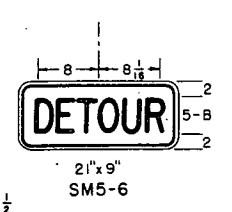
PLATE DETAILS



NOTES:
SEE SHEET 1 FOR TYPICAL SIGNING AND SIGN PLACEMENT.
SEE SHEET 3 FOR GENERAL NOTES APPLICABLE TO SHEETS 1 AND 2.
ALL DIMENSIONS THAT ARE NOT LABELED ARE IN INCHES.

GUIDE SIGNS

See Note No. 11



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

TRAFFIC SIGNING
FOR HIGHWAY
CONSTRUCTION

Designed By: D.R.W.
Made By: H.B.D.
Checked By: J.B.

Approved By: *[Signature]*
Date: Feb. 1, 1965

STANDARD M-6-BA
(SHEET 3 OF 3 SHEETS)
FEBRUARY 1, 1965

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS		

GENERAL NOTES

1. All work shall be done in accordance with: (a) the Standard Specifications of the Department of Highways applicable to the Project, and (b) the "Manual on Uniform Traffic Control Devices for all Classes of Streets and Highways" published by the Department of Highways.

2. 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 (including connecting roads) with well-maintained Barricades, Warning, and Guide Signs. All Barricades and Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when the Project is completed.

3. Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor shall provide, erect and maintain Barricades, complete, (when required) at the ends of the Project, ends of the Detour and connecting roads. All U.S. or State Route Markers required for the Project will be furnished and installed by the Department. The location and positioning of Warning Signs, Barricades, and Regulatory Signs shall be as recommended by the appropriate District Engineering Forces of the Department.

4. Work on the Project shall not be started until all required signs are in place and approved by the Engineer. Where speed control appears necessary such speed control shall be requested from the Engineer by the Contractor. Control of speed through a construction zone may be achieved by Advisory Speed plates in conjunction with Warning Signs (SW13-1 for use with 30" Warning Signs and XW13-1 for use with 36" and 48" Warning Signs). The Advisory Speed plate is to be posted only at those locations where the safe speed is lower than the imposed Regulatory speed limit.

5. All Signs and Barricades shall be placed for best visibility and legibility, maintained in good condition and kept clean and free of dirt at all times. Contractor's and Engineer's vehicles and equipment must be parked so that signs and barricades are visible to approaching traffic at all times.

6. Where two identical signs are used for dual posting they are to be staggered on the two sides of the roadway for a minimum distance of 75' to avoid a tunneling effect.

7. Examples for marking Projects, as shown on Sheet 1, are typical of signs required and are subject to alteration to fit actual conditions encountered in the field. Locations for control devices are to be staked by the Engineer. In all cases Warning signs are to be placed well in advance of the hazard, the distance depending on topography and existing approach speeds. Additional markings and any special signs required for the guidance and protection of traffic will be placed as required on the Project at the Contractor's expense.

8. Desirable sizes for signs are shown on Sheet 1 of this Standard. Where warranted larger or smaller signs shall be used. Detailed dimensions for signs normally used in connection with construction are shown on Sheet 2 of this Standard. For information on standard roadway signs not detailed on this Standard see the "Manual on Uniform Traffic Control Devices for all Classes of Streets and Highways" published by the Department of Highways.

9. Signs with the prefix "R" in the sign code are Regulatory signs and as such impose legal compulsions or restrictions on drivers and should only be used as authorized by the Engineer.

10. Signs with the prefix "W" in the sign code are Warning signs and are used to alert traffic to existing or potentially hazardous conditions.

11. Signs with the prefix "D" or "M" in the sign code are Guide signs. Those with the prefix "D" convey general information and those with the prefix "M" are used for marking the traffic route.

12. All signs shall be reflectorized unless otherwise specified on plans. Regulatory and Guide signs (unless otherwise specified) shall have a screen processed black legend and border on a white flexible reflective sheeting, non-exposed lens background. The back side of Regulatory and Guide signs shall be painted with two coats of "Exterior Sign White Paint." Warning signs shall have a screen processed black legend and border on a highway yellow flexible reflective sheeting, non-exposed lens background. The back side of Warning signs shall be painted with two coats of "Federal Yellow Synthetic Sign Enamel."

13. All paint and methods of painting shall conform with Item 38 of the Standard Specifications.

14. Posts for regulatory, warning, and guide signs will normally be 4" x 4" or 6" x 6" and shall conform to the Standard Specifications for Miscellaneous Untreated Timber S4S. Timber shall conform to Construction grade Paragraph 123B or 125B of Standard No. 15 Grading & Dressing Rules for West Coast Douglas Fir (1956) or Dense Structural 58 and LL Structural 58 Paragraph 284 or 285 of 1956 Grading Rules for Southern Pine. Posts shall be painted with one coat of "White Primer for Wood" and one coat of "Outside White Paint."
15. Sign panels furnished by the Contractor for use only during construction may be fabricated from plywood, aluminum, steel or other suitable material but shall be stable and durable enough to meet other requirements of this Standard.

16. All material shall be sound and durable. Barricades, signs, symbols, and lettering shall be of good workmanship. Uneven lettering will not be accepted.

17. Alternate methods of processing signs or the substitution of symbols or other reflecting elements for painted symbols will be permitted only after approval by the Department.

18. Torches and Lanterns shall be either of the fuel-burning or battery-powered type approved by the Department. Particular care shall be taken to protect all signs and barricades from smoke and smudge.

19. Barricades, Flashing Beacons and Flashers - Refer to appropriate "M" Standard (Timber Barricades) for details.

20. Flagman Sign - This sign shall have a black painted background on both sides to form a contrast for the octagonal Stop sign and the diamond Warning sign. The "STOP" sign shall be fabricated by reverse screen process using transparent red paint on smooth surface silver reflective sheeting. The "SLOW" side of the Flagman Sign shall be black process paint on smooth surface yellow reflective sheeting. Handle to be grooved on one side to indicate reading of sign to Flagman.

21. Sign "A": This is the first advance warning sign and shall be placed 1,500 feet ahead of Barricade or project terminal. Postings are required on both sides of the roadway on divided highways. Dual posting is required where warranted on two-lane, two-way highways.
Sign "B": This is the second advance warning sign and shall be placed 1,000 feet ahead of barricade or project terminal. Postings are required on both sides of the roadway on divided highways and singly on two-lane, two-way highways.
Sign "C": This is the third advance warning sign in cases where barricades are used and shall be placed 500 to 750 feet ahead of barricade or potentially hazardous condition. Postings are required on both sides of the roadway on divided highways and singly on two-lane, two-way highways.
Sign "D": SD13-2 - This sign shall be placed to mark the beginning of a Project of more than 2 miles in extent, where traffic is maintained through the project. It shall be placed singly and near the beginning of construction.
Sign "E": SD13-3 - This sign shall be placed to mark the end of the Project. It shall be placed singly and may be placed opposite barricade if desirable.
Sign "F": Construction identification signs shall be furnished and installed by the Department on all Federal-Aid and Forest Highway Projects where actual construction is in progress and visible to highway users. These signs should be located so as not to obscure or detract from the effectiveness of other official signs. Where two or more projects are contiguous the appropriate data may be included in one set of signs. Refer to appropriate "M" Standard (Identification Signs) for sign details.
Signs A through F shall be furnished, installed and maintained by the Department.

SPECIAL NOTE: Requirements of this Standard are optional to those of Standard M-6-B through 12-31-65. Following that date Standard M-6-B will be obsolete.

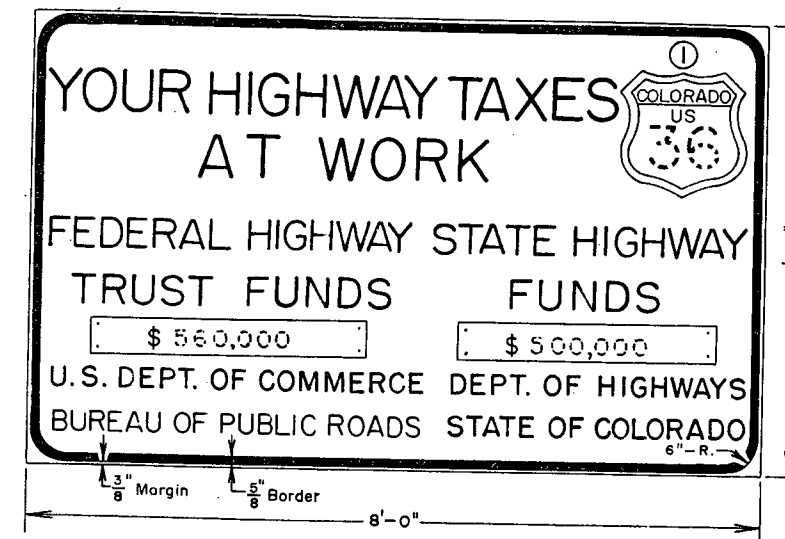
DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

TRAFFIC SIGNING
FOR HIGHWAY
CONSTRUCTION

Designed By: D.R.W.
Made By: J.L.S.
Checked By: J.B.
Approved By: *[Signature]*
Date: Feb 1, 1965

STANDARD M-6-CA
(JAN. 31, 1964)

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO			

[illegible]

Technical drawing of a sign structure, showing side and front elevations with dimensions and material specifications.

Side Elevation (Left):

- Shoulder: Indicated by a horizontal arrow pointing to the left edge.
- Height: 7'-0" (Seven feet, zero inches).

Front Elevation (Right):

- Outline of Sign: Indicated by a dashed line at the top.
- Top Horizontal Members: 3" x 3" x 5/16" Ls (Angles).
- Bottom Horizontal Member: 3" x 3" x 5/16" Clip Ls (Angle).
- Vertical Posts: 6" x 6" Timber Posts.
- Dimensions:
 - Top horizontal member: 1" (thickness).
 - Bottom horizontal member: 1" (thickness).
 - Horizontal distance from left post to right post: 8" (twice, on each side).
 - Horizontal distance from left post to center: a.
 - Horizontal distance from right post to center: a.
 - Vertical distance from top member to bottom member: d.
 - Vertical distance from bottom member to base: c.
 - Base height: 3'-0" Min. (Three feet, zero inches, minimum).

Note:

- Clip angles 18" long

Additional Labels:

- W: Indicated by a horizontal arrow pointing to the right, likely representing width.
- 13: Located in a box on the right side of the drawing.
- 8: Located in a box on the right side of the drawing.
- NO: Located on the right side of the drawing.
- S: Located on the right side of the drawing.
- Th: Located on the right side of the drawing.
- from: Located on the right side of the drawing.

W	H	a	b	c	d
13'-0"	6'-0"	2'-6"	1'-1 $\frac{1}{2}$ "	0'-10 $\frac{1}{2}$ "	11'-8"
8'-0"	4'-0"	1'-6"	1'-1 $\frac{1}{2}$ "	0'-10 $\frac{1}{2}$ "	6'-8"

NOTE:
Signs are to be placed facing traffic approaching the work.
These signs should be so located as not to obscure or detract
from the effectiveness of other official signs.

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

Signs shall be made of $\frac{3}{4}$ " Plywood or other material approved by the Department.

Background to be painted plain white with stencil black letters, numerals and border.

When a third governmental agency is participating its official name should be included centrally in lines 6 and 7

Posts shall be 6"X 6" S 4 S timber or other material approved by the Department and shall be painted white.

Signs are to be non-reflectORIZED, black legend on plain white background. Route Marker plaques to be the appropriate standard colors, non-reflectORIZED.

Layout of signs will be furnished by the Traffic Operations Section indicating the details as to letter size, symbols, spacing, figure for amount of funds, etc. which are required for these signs.

These signs will be furnished and installed by State Forces.

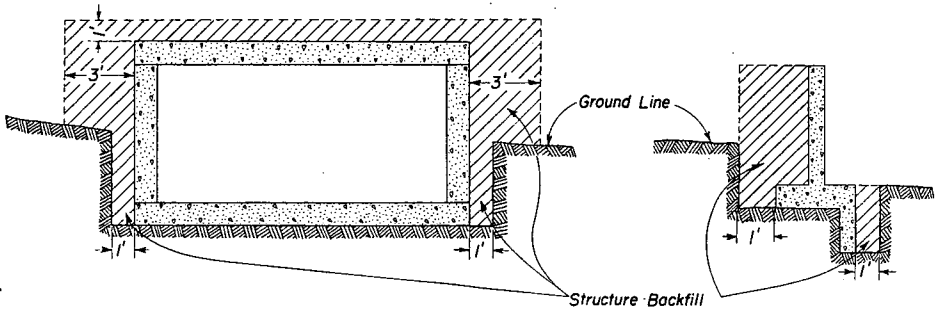
① Applicable Interstate, U. S. Shield or State Route Shield.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

IDENTIFICATION SIGNS

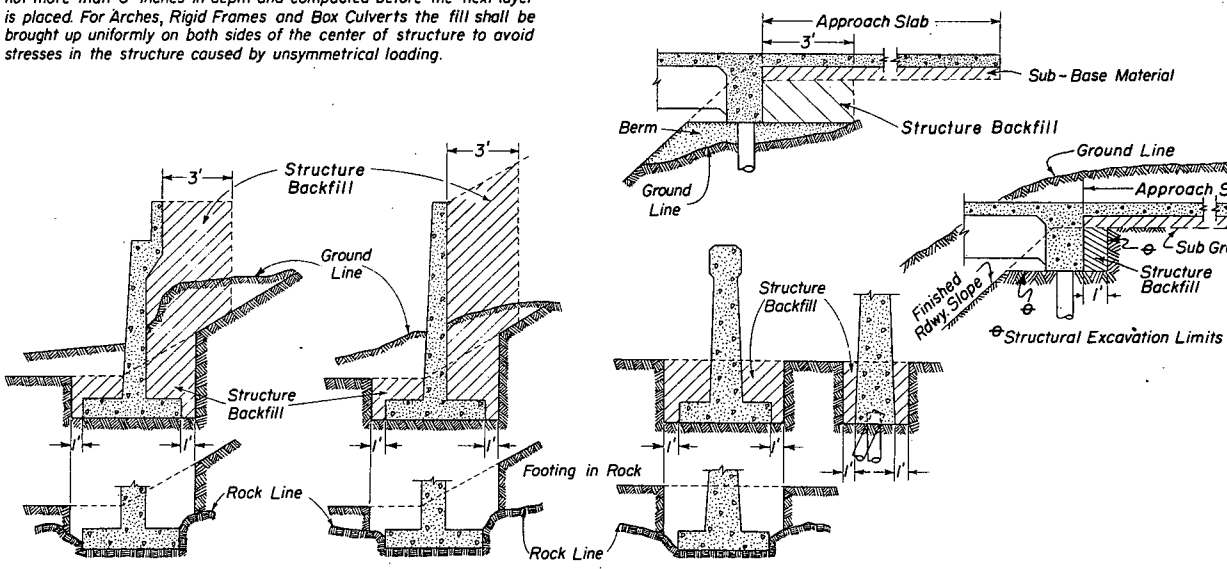
Designed by B.F.R.	Approved by <i>[Signature]</i>
Made by D.J.B.	Staff Design Engr.
Checked by M.R.H.	Date: 2-5-64

CONCRETE BOX CULVERTS & WINGWALLS

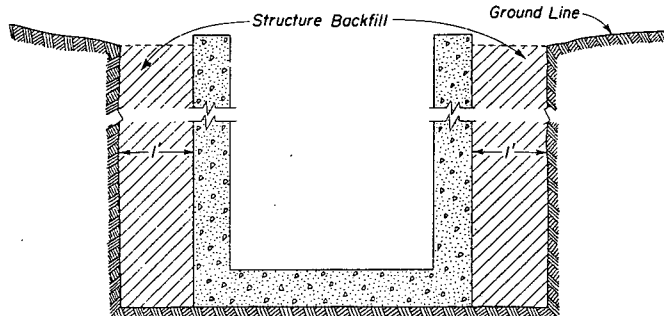


PIERS, ABUTMENTS, RETAINING WALLS ETC.

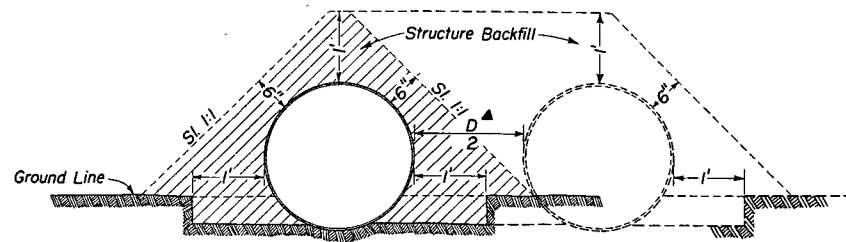
All material that is to be compacted shall be placed in horizontal layers not more than 6" inches in depth and compacted before the next layer is placed. For Arches, Rigid Frames and Box Culverts the fill shall be brought up uniformly on both sides of the center of structure to avoid stresses in the structure caused by unsymmetrical loading.



DROP INLETS, DIVISION BOXES, INTERCEPTING HEADWALLS ETC.



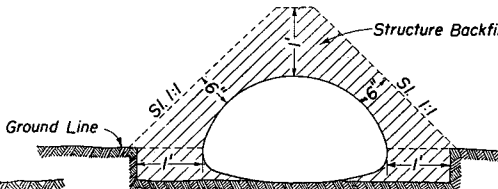
CIRCULAR CONDUIT



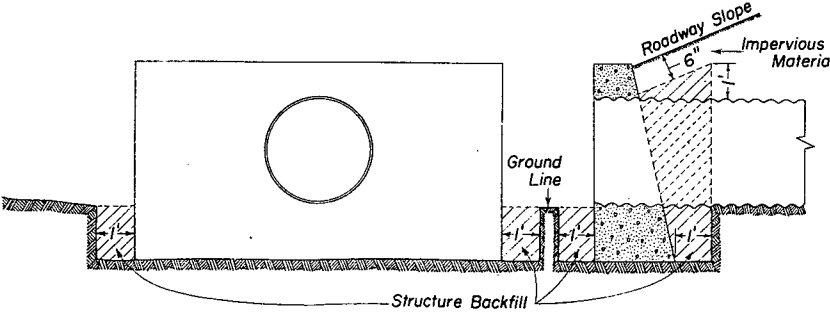
When two or more conduits are layed side by side, the distance between conduits shall be 1/2 the conduit diameter but not less than 1'-0".

See Design Aid No. 16, 16a or 16b for computation of quantities.

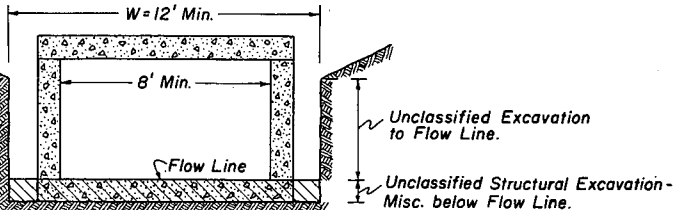
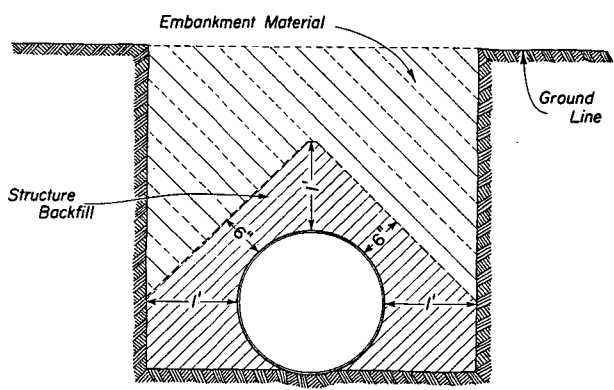
ELLIPTICAL OR ARCH CONDUIT



HEADWALLS AND END OF CULVERTS



SIPHONS OR CONDUIT IN TRENCH



GENERAL NOTES

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

If, in the opinion of the Engineer, the material beneath the Structure is of such character as to cause unequal settlement along the length of the Structure, the material shall be removed to such a depth ordered, and backfilled with gravel or Structure Backfill and compacted in accordance with Item 16 of the Standard Specifications.

For concrete box culverts located where roadway cross section is in Fill, embankment shall be built up and compacted to a point one (1) ft. above flow line of box. The trench shall then be excavated as shown to accommodate construction of the box.

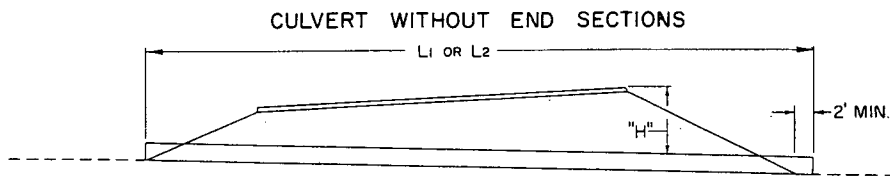
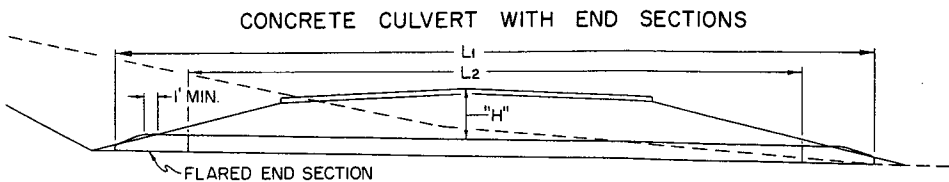
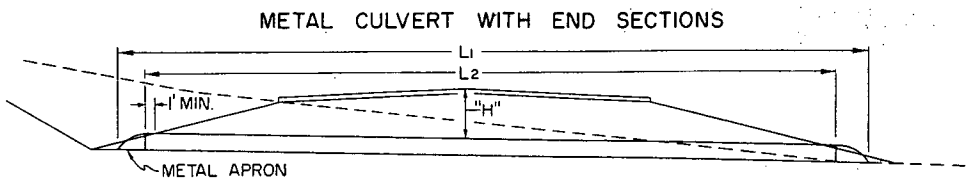
DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

BACKFILL
AROUND STRUCTURES

Designed by H.E.P. Approved by L.E.O.
Made by D.M.E. Bridge Engineer
Checked by L.E.O. Date: May 2, 1958

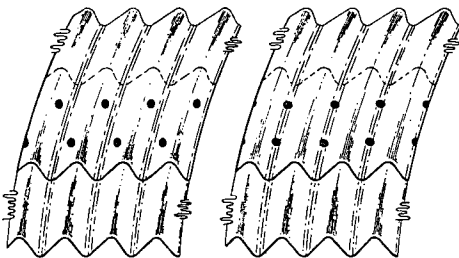
STANDARD M-45-B
(April 12, 1965)

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO			

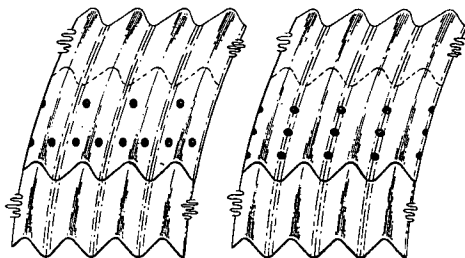


"H"=MAXIMUM HEIGHT OF FILL OVER TOP OF CULVERT, INCLUDING PAVEMENT
L1=LENGTH OF CULVERT TO BE MEASURED UNDER ITEM 45
L2=LENGTH OF PIPE TO BE MEASURED UNDER ITEM 52 AND 53
FOR CLASS OF CONCRETE PIPE SEE STANDARD FOR REINFORCED CONCRETE PIPE
ON DIVIDED HIGHWAY SECTIONS AND SUPERELEVATED SECTIONS, THE "H" DIMENSION SHALL BE THE MAXIMUM DEPTH OF OVERFILL INCLUDING THE PAVEMENT THICKNESS OVER THE TOP OF THE CULVERT.

DETAILS OF SPOT WELDED LONGITUDINAL SEAM
3"x 1" CORRUGATIONS



TYPE II SEAM
TWO WELDS PER CORRUGATION



TYPE III SEAM
THREE WELDS PER CORRUGATION

GENERAL NOTES

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

Gages shown are U.S. Standard and are minimum requirements for use with adequate bedding and backfill, in accordance with the Standard Specifications.

Gages shown are for finished construction. During construction adequate cover shall be provided to protect the structure from damage.

FILL HEIGHTS & GAGE TABLES

TABLE III-CORRUGATED ALUMINUM ALLOY PIPE

DIAMETER IN INCHES	AREA IN SQ. FT.	HEIGHT OF FILL OVER TOP OF PIPE											
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 50				
		GAGE											
8	.3	16	16	16	16	16	16	16	16				
10	.5	16	16	16	16	16	16	16	16	16			
12	.8	16	16	16	16	16	16	16	14	12			
15	1.2	16	16	16	16	16	16	14	12				
18	1.8	16	16	16	16	14	12						
21	2.4	16	16	16	14	12	10						
24	3.1	16	14	14	14	12	10						
30	4.9	14	14	14	12	10*	10*						
36	7.1	14	12	12	-	-	-						
36	7.1	-	-	-	12*	10*	10*						
42	9.6	12	12	10	-	-							
42	9.6	-	-	12*	10*	8*							
48	12.6	12	12	10	-	-							
48	12.6	-	-	12*	10*	8*							
54	15.9	12	12	10	-	-							
54	15.9	-	-	12*	10*	8*							
60	19.6	10	8	-	-								
60	19.6	-	10*	8*	8*								
66	23.8	10	8	-									
66	23.8	-	10*	8*									
72	28.3	10	8	-									
72	28.3	-	10*	8*									
78	33.0	10*	10*										
84	38.0	8*											

* To be 5% elongated

TABLE I-CORRUGATED STEEL PIPE & PIPE ARCHES
2 2/3" x 1/2" CORRUGATIONS (ANNULAR & HELICAL)

DIAMETER IN INCHES	AREA IN SQ. FT.	HEIGHT OF FILL OVER TOP OF PIPE											
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 50	50+ to 60	60+ to 70	70+ to 80	
		GAGE											
12	.8	16	16	16	16	16	16	14	14	14	12		
15	1.2	16	16	16	16	16	14	14	12	12	12		
18	1.8	16	16	16	16	14	14	14	12	12	12		
21	2.4	16	16	16	14	14	14	12	12	10	8		
24	3.1	16	16	14	14	14	12	10	8	8			
30	4.9	16	16	14	14	12	12*	12*	10*	10*			
36	7.1	14	14	14	12	12	12*	12*	10*	8*			
42	9.6	14	14	12	12	12*	12*	10*	8*				
48	12.6	14	14	12	12*	12*	10*	8*					
54	15.9	12	12	12	12*	12*	10*	8*					
60	19.6	12	12	12	12*	12*	10*	8*					
66	23.8	10	10	10	10*	10*	8*	8*					
72	28.3	10	8	8	8*	8*	8*						
78	33.0	8	8	8	8*	8*	8*						
84	38.0	8	8	8	8*	8*							

*Round Pipe to be 5% elongated

**For Pipe Arches, use nominal span dimension

TABLE II-CORRUGATED STEEL PIPE
1" x 3" CORRUGATIONS (WELDED)

DIAMETER IN INCHES	AREA IN SQ. FT.	HEIGHT OF FILL OVER TOP OF PIPE											
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 45	45+ to 50	50+ to 60	60+ to 70	70+ to 80
		GAGE											
30	4.9	16	16	16	16	16	16	16	14	14	14*	12*	12*
36	7.1	16	16	16	16	16	14	14	14*	14*	12*	12*	12*
42	9.6	16	16	16	16	14	14	14*	14*	12*	12*	12*	10*
48	12.6	14	14	14	14	12	12	12*	12*	12*	10*	8*	
54	15.9	14	14	14	14	12	12*	12*	12*	12*	10*	8*	
60	19.6	14	14	14	12	12*	12*	12*	12*	10*	8*		
66	23.8	12	12	12	12	12*	12*	12*	10*	8*			
72	28.3	12	12	12	12*	12*	12*	10*	8*				
78	33.0	12	12	12	10*	8*	8*	8*					
84	38.0	12	12	10	10*	8*							
90	44.0	12	10	8	8*								
96	50.0	10	10	8									
102	57.0	10	8										
108	64.0	8											

* To be 5% elongated

② Type 2 Seam

③ Type 3 Seam

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

CULVERT PIPE
H-20 LOADING

REVISIONS

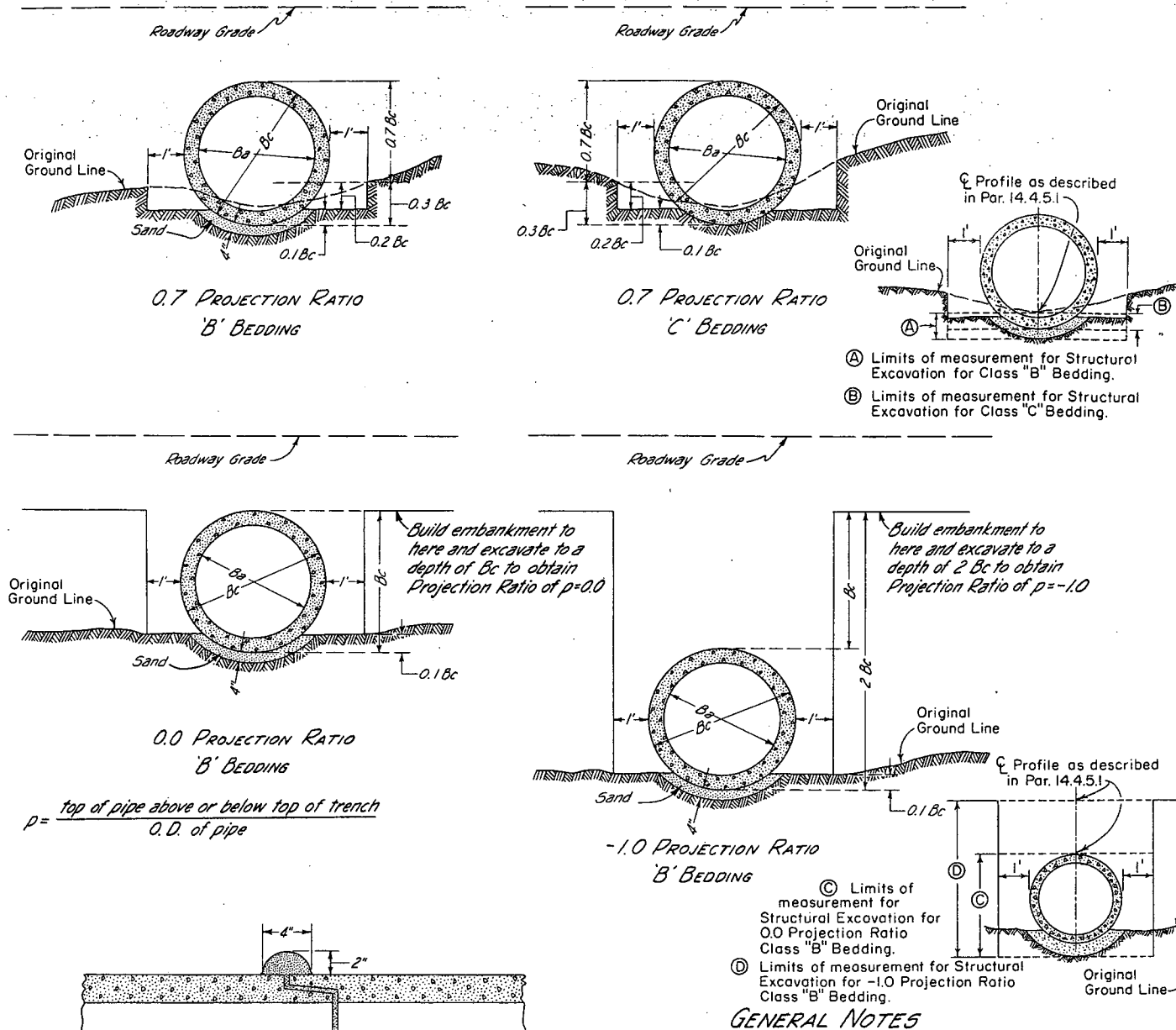
4/16/65	Alum. Ga. & Type 3 Seam Line	M.R.H.

Designed by
Made by ABH
Checked by MRR
Approved by
Staff Design Engineer
Date April 12, 1965

STANDARD M-52-A

(MAY 1, 1962)

FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.		



GENERAL NOTES

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

The Height of Fill for each culvert shall determine the bedding and class of concrete pipe to be used (See table herewith). Location, length and inside diameter of pipe, and class of pipe required shall be shown on plans.

Type 'B' bedding is to be used in solid rock.

Details for placement of structure backfill materials are shown elsewhere in plans.

When projection ratios of 0.0 or -1.0 are used, backfilling above structure backfill material shall be made with materials excavated in order to produce the projection ratio. Cost of this backfilling is to be included in the contract unit price for Item 52.

If material does not stand with a vertical face when attempting to produce 0.0 or -1.0 projection ratios, this standard is not applicable.

APPROVED COMBINATIONS OF HEIGHT OF FILL - PROJECTION RATIO - BEDDING - CLASS

Ba	HEIGHT OF FILL	PROJECTION RATIO	BEDDING	CLASS
12"	#-7'	0.7	C	II
	7'-10'	0.7	C	III
	10'-15'	0.7	C	IV
	15'-19'	0.7	B	IV
	19'-29'	0.0	B	IV
	29'-42'	0.0	B	V
15"	#-8'	0.7	C	II
	8'-11'	0.7	C	III
	11'-16'	0.7	C	IV
	16'-20'	0.7	B	IV
	20'-30'	0.0	B	IV
	30'-44'	0.0	B	V
	44'-47'	-1.0	B	V
18"	#-8'	0.7	C	II
	8'-11'	0.7	C	III
	11'-16'	0.7	C	IV
	16'-20'	0.7	B	IV
	20'-30'	0.0	B	IV
	30'-45'	0.0	B	V
	45'-51'	-1.0	B	V
21"	#-8'	0.7	C	II
	8'-11'	0.7	C	III
	11'-17'	0.7	C	IV
	17'-21'	0.7	B	IV
	21'-31'	0.0	B	IV
	31'-46'	0.0	B	V
	46'-55'	-1.0	B	V
24"	#-9'	0.7	C	II
	9'-12'	0.7	C	III
	12'-17'	0.7	C	IV
	17'-22'	0.7	B	IV
	22'-31'	0.0	B	IV
	31'-45'	0.0	B	V
	46'-58'	-1.0	B	V
27"	#-9'	0.7	C	II
	9'-13'	0.7	C	III
	13'-18'	0.7	C	IV
	18'-22'	0.7	B	IV
	22'-32'	0.0	B	IV
	32'-49'	0.0	B	V
	49'-61'	-1.0	B	V
30"	#-9'	0.7	C	II
	9'-12'	0.7	C	III
	12'-18'	0.7	C	IV
	18'-22'	0.7	B	IV
	22'-32'	0.0	B	IV
	32'-49'	0.0	B	V
	49'-62'	-1.0	B	V
33"	#-9'	0.7	C	II
	9'-13'	0.7	C	III
	13'-18'	0.7	C	IV
	18'-23'	0.7	B	IV
	23'-33'	0.0	B	IV
	33'-50'	0.0	B	V
	50'-65'	-1.0	B	V
36"	#-10'	0.7	C	II
	10'-13'	0.7	C	III
	13'-19'	0.7	C	IV
	19'-23'	0.7	B	IV
	23'-34'	0.0	B	IV
	34'-51'	0.0	B	V
	51'-67'	-1.0	B	V
42"	#-10'	0.7	C	II
	10'-13'	0.7	C	III
	13'-18'	0.7	C	IV
	18'-26'	0.7	B	IV
	26'-34'	0.0	B	IV
	34'-51'	0.0	B	V
	51'-69'	-1.0	B	V
48"	#-11'	0.7	C	II
	11'-14'	0.7	C	III
	14'-19'	0.7	C	IV
	19'-24'	0.7	B	IV
	24'-34'	0.0	B	IV
	34'-53'	0.0	B	V
	53'-71'	-1.0	B	V

① Height above Top of Pipe

* Minimum cover with concrete pavement shall be 1.25' and with asphalt or gravel 1.75'.

Minimum cover on Side Drains shall be 1.0'

REVISIONS		
2-3-64	DEPT. NAME	M.R.H.

Ba	HEIGHT OF FILL	PROJECTION RATIO	BEDDING	CLASS
34"	#-10'	0.7	C	II
	10'-14'	0.7	C	III
	14'-19'	0.7	C	IV
	19'-23'	0.7	B	IV
	23'-34'	0.0	B	IV
	34'-53'	0.0	B	V
	53'-73'	-1.0	B	V
60"	#-11'	0.7	C	II
	11'-14'	0.7	C	III
	14'-20'	0.7	C	IV
	20'-24'	0.7	B	IV
	24'-35'	0.0	B	IV
	35'-53'	0.0	B	V
	53'-74'	-1.0	B	V
66"	#-11'	0.7	C	II
	11'-14'	0.7	C	III
	14'-20'	0.7	C	IV
	20'-24'	0.7	B	IV
	24'-34'	0.0	B	IV
	34'-54'	0.0	B	V
	54'-74'	-1.0	B	V
72"	#-12'	0.7	C	II
	12'-15'	0.7	C	III
	15'-21'	0.7	C	IV
	21'-25'	0.7	B	IV
	25'-35'	0.0	B	IV
	35'-54'	0.0	B	V
	54'-74'	-1.0	B	V
78"	#-11'	0.7	C	II
	11'-15'	0.7	C	III
	15'-20'	0.7	C	IV
	20'-25'	0.7	B	IV
	25'-34'	0.0	B	IV
	34'-43'	-1.0	B	IV
84"	#-11'	0.7	C	II
	11'-15'	0.7	C	III
	15'-21'	0.7	C	IV
	21'-26'	0.7	B	IV
	26'-35'	0.0	B	IV
	35'-44'	-1.0	B	IV
90"	#-12'	0.7	C	II
	12'-15'	0.7	C	III
	15'-18'	0.7	C	IV
	18'-22'	0.0	B	IV
	22'-25'	-1.0	B	IV
96"	#-12'	0.7	C	II
	12'-15'	0.7	C	III
	15'-19'	0.7	C	IV
	19'-23'	0.0	B	IV
	23'-25'	-1.0	B	IV
102"	#-12'	0.7	C	II
	12'-15'	0.7	C	III
	15'-18'	0.7	C	IV
	18'-23'	0.0	B	IV
	23'-25'	-1.0	B	IV
108"	#-13'	0.7	C	II
	13'-16'	0.7	C	III
	16'-19'	0.7	C	IV
	19'-23'	0.0	B	IV
	23'-25'	-1.0	B	IV

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

REINFORCED CONCRETE
PIPE

Designed by J.E.F. Approved by J.A. Newbold
Made by D.M.E. Bridge Engineer
Checked by L.E.O. Date: May 16, 1960

(SHEET 1 OF 2 SHEETS)
(SEPTEMBER 24, 1964)

[illegible]

Diagram illustrating a standard trench shoring system. The system consists of vertical line posts spaced at 16'-0" intervals. The posts are connected by metal stays, which are two equally spaced vertical members between the posts. The end post is reinforced with a diagonal brace. The trench is supported by a trench box, which is shown with a width of 2'-0" and a height of 2'-8". The trench box is anchored to the ground with a 2'-8" anchor. The trench box is supported by the line posts, which are connected by metal stays. The end post is reinforced with a diagonal brace. The trench box is shown with a width of 2'-0" and a height of 2'-8". The trench box is supported by the line posts, which are connected by metal stays. The end post is reinforced with a diagonal brace.

3/8" X 4" STEEL PINS

Bore a 3/8" X 2" Hole in each Post and Brace to receive the Pins. Wrap the ends of the Braces tightly with several turns of 12 1/2 ga. smooth Galv. Wire to prevent splitting or Notch Post and Nail with 40 d Common Nails.

Diagram illustrating the normal spacing between line posts and the end post with bracing.

Key dimensions and components shown:

- Normal Spacing Between Line Posts:** 20'-0"
- End Post Width:** 3'-2"
- End Post Height:** 3'-10"
- Line Post Width:** 2'-8"
- Line Post Height:** 3'-10"
- Normal Spacing Between Line Posts (Close-up):** 7'-0"
- End Post with Bracing:** The end post is shown with internal bracing.
- Line Post:** The line post is shown with internal bracing.
- Anchor:** The anchor is shown at the base of the line post.

Diagram illustrating the normal spacing between line posts and the end post with a brace. The diagram shows a cross-section of a fence line with a diamond mesh. The normal spacing between line posts is 16'-0". The end post is shown with a brace. Dimensions include 2" for the post diameter, 16'-0" for the normal spacing, 2'-0" for the brace length, and 2'-6" for the distance from the end post to the brace. The diagram is labeled "NORMAL SPACING BETWEEN LINE POSTS" and "END POST WITH BRACE".

A diagram of a three-panel truss bridge. The bridge has three vertical supports. The horizontal distance between each support is 7'-0". The height of the bridge is 3'-2". The truss consists of a top chord, a bottom chord, and diagonal members connecting the top and bottom chords. The top chord is a straight line. The bottom chord is a series of connected segments. The diagonal members are straight lines connecting the top and bottom chords. The bridge is shown in a perspective view.

Diagram illustrating the construction of a corner post and braces for intersecting fences. The diagram shows a corner post (labeled "CORNER POST - 2 1/2\" x 2 1/2\" x 1/4\" STRUCTURAL STEEL ANGLE") and two braces (labeled "BRACES - 2\" x 2\" x 1/4\" STRUCTURAL STEEL ANGLES") supporting the corner post. The braces are attached to the corner post and extend outwards. The distance between the braces is marked as 4'-3\" ±.

FENCE INTERSECTION WITH BRACING

EYE BOLTS

FENCE CONSTRUCTION AT STRUCTURES
(For Str's 4' X 4' and greater)

WOOD CORNER POST WITH BRACING

METAL POST BR

BRACE ATTACHMENT
TOP VIEW
LINE BRACE POST

● Fence wire will be stapled to wooden posts or tied to metal posts as shown marked ● on barbed wire or combination wire fence details.

The diagram illustrates a corner post assembly. A vertical post is shown with a cross-section of a square footing at its base. The footing has dimensions of 2'-0" by 2'-0" and a height of 1'-0". A horizontal brace is attached to the post, and a corner post with braces is shown. A note specifies that all footings or bases for brace posts shall be of cast-in-place concrete and shall have circular holes of 1" diameter. The diagram also shows a typical footing brace with dimensions of 1'-0" by 1'-0" by 2'-0".

CORNER POST WITH BRACES

TYPICAL FOOTING BRACE

NOTE:
(R-) All Footings or Bases for Brace Posts shall be of Cast-in-place Concrete and shall have Circular Holes of 1" Diameter. Circular Holes shall be included in the various type Posts.

1'-0"

2'-0"

1'-0"

AL CONCRETE
ING FOR ALL
ES

END POST
WITH BRACE

TYPICAL CONCRETE
FOOTING FOR ALL END,
CORNER AND LINE
BRACE POSTS

End, Corner and Line
Posts "A" or Class "B"
Crowned Tops. The Cost
in the Bid Price for

may be used in lieu

3'-0"

1'-0"

1'-0"

NOTE:
(R-1) All Footings or Bases for End, Corner and Line Brace Posts shall be of Class "A" or Class "B" Concrete and shall have Crowned Tops. The Cost involved shall be included in the Bid Price for the various type Posts.
1" Diameter Circular Holes may be used in lieu of Square Holes.

METAL SLEEVE

COMPRESSED

Splicing Sleeve shall be approved by the Engineer.

(FOR END, CORNER OR LINE BRACE POSTS)

Drill Hole for 1/4" Carriage Bolt
to Prevent Slippage of Brace Band.

NOTE:
At all structures of 4'x4' and over, the fence shall be ended at eye-bolts in the wings of the structure. Where the type of structure prohibits the use of eye-bolts, an end post with brace, shall be used. Eye-bolts shall be made of 1/2" round bars with a minimum of six (6) inches of body length embedded in the concrete and a minimum of 1" inside eye diameter.

(R-1) Eye-bolts shall be furnished and installed by the Contractor. Cost of eye bolts will be included in the contract price for fencing.

* Alternate attachment methods, acceptable to the Engineer, may be used.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
WIRE FENCES
AND
GATES

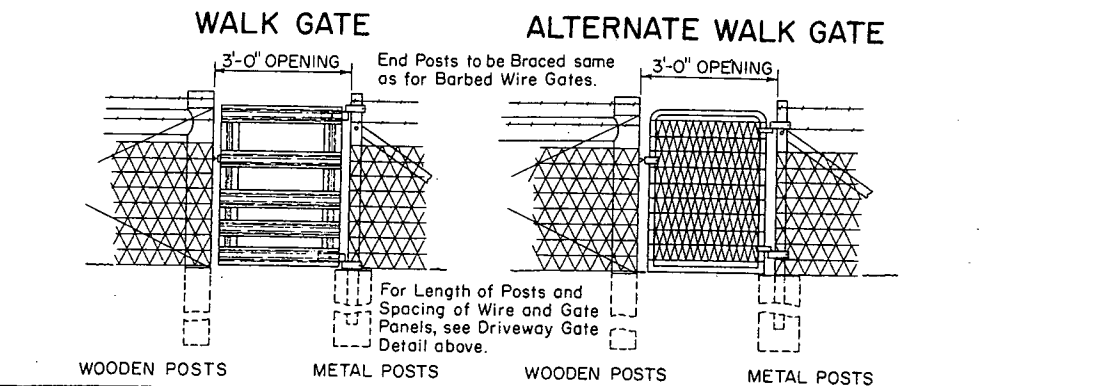
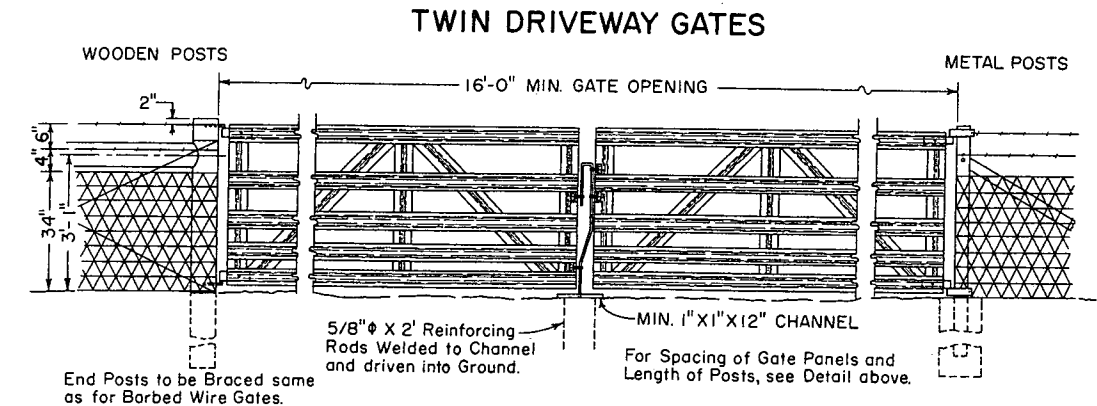
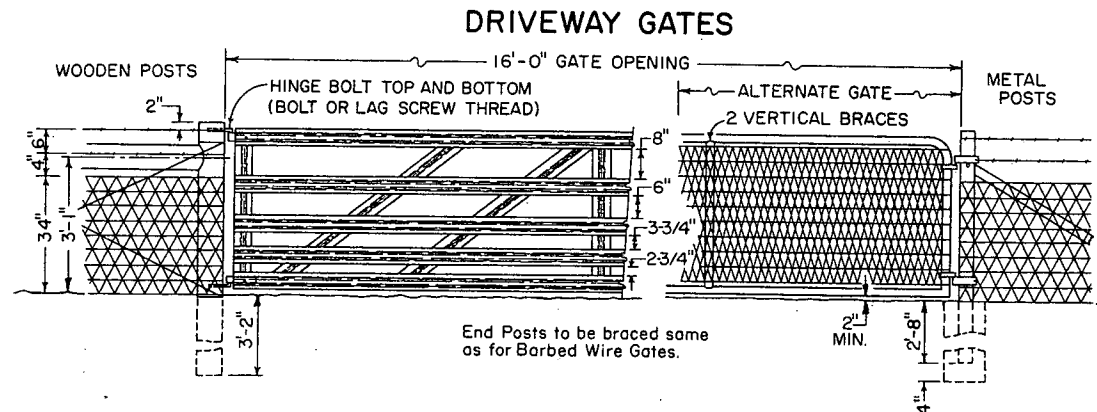
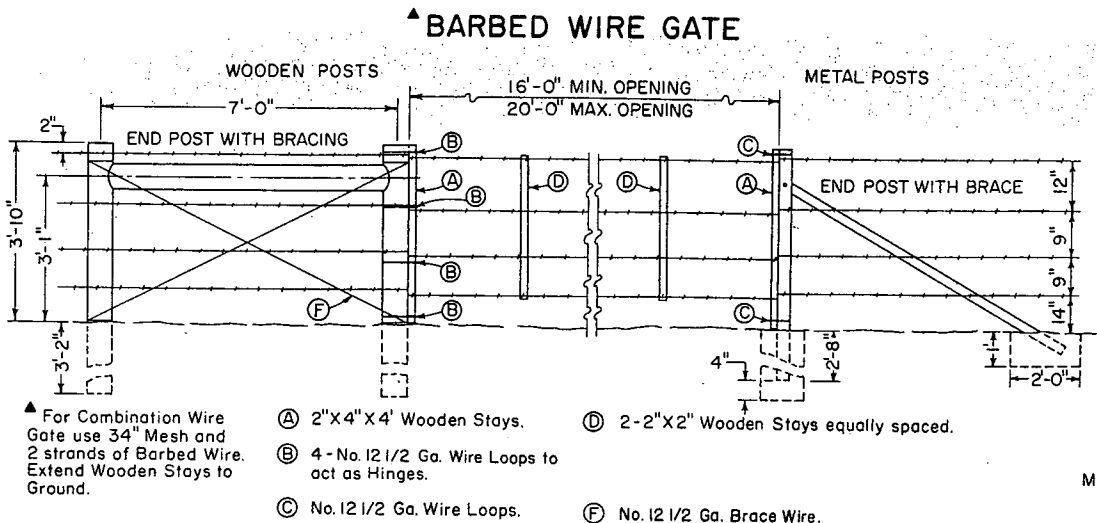
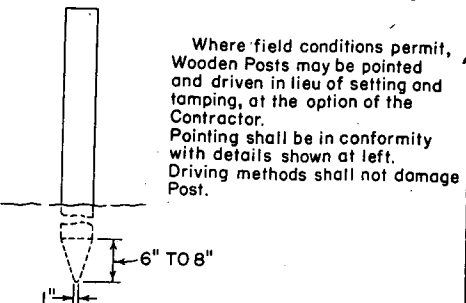
Designed by	L.E.O.	Approved by	R. Julian
Made by	T.E.F.	Engr. Surveys & Plans	
Checked by	E.E.O.	Date:	6-12-1961

STANDARD M-76-A
(SHEET 2 OF 2 SHEETS)
(SEPTEMBER 24, 1964)

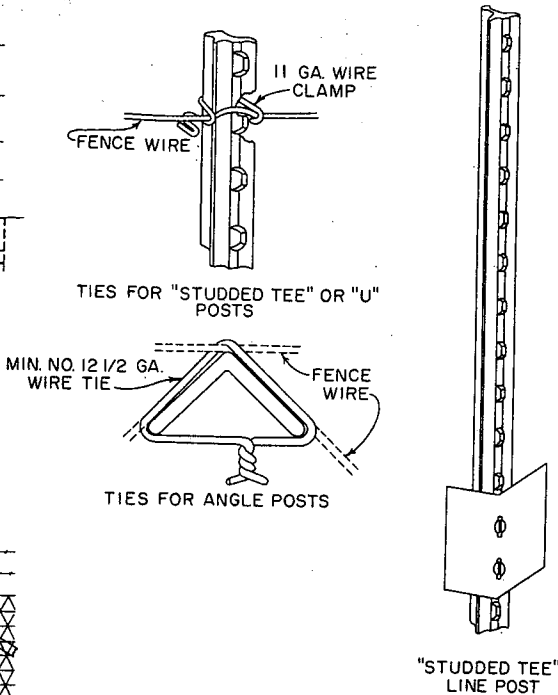
FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.		

REVISIONS		
(R-1)	4-8-65	Fence Wire & General Notes M.R.H.

POST POINTING DETAILS



FENCE WIRE TIES



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

- (R-1) Fence wire shall be ended, double wrapped and tied off at end posts, angle posts and line brace posts. Fence to be continued shall then be restarted in like manner.
- Fence wire to be placed on either road or field side of posts depending on local conditions, i.e. on curves the wire should be placed on the side of the post which would prevent tension on fence ties. This will also apply where wind drift, tumble weeds or other conditions would exert unusual pressure against the wire.

WOOD POSTS:

All line posts shall have a min. dia. of four (4) inches & be 6'-6" long. All end, corner, intersection and brace posts shall have a minimum diameter of five (5) inches and be 7'-0" long. Fence wire will be stapled to wooden posts or tied to metal posts as shown marked on barbed wire or combination wire fence details.

METAL POSTS:

All posts and braces shall be of the types and weights shown or acceptable equivalents. Holes to be provided in end, corner and gate posts as detailed.

CORNER POSTS:

Type - 2 1/2" x 2 1/2" x 1/4" Structural Steel Angles. Weight - 3.81 lbs./lin. ft. Min. Length - 6'-6" Min. No. of Braces - 2

LINE POSTS:

Type - "Studded Tee" or "U" Weight - 1.28 lbs./lin. ft. Min. (without Anchor) Length - 6'-6" Min. Anchor - Securely fastened, with bearing surface sufficient to resist movement of post. Weight - 0.57 lb. Min.

END POSTS:

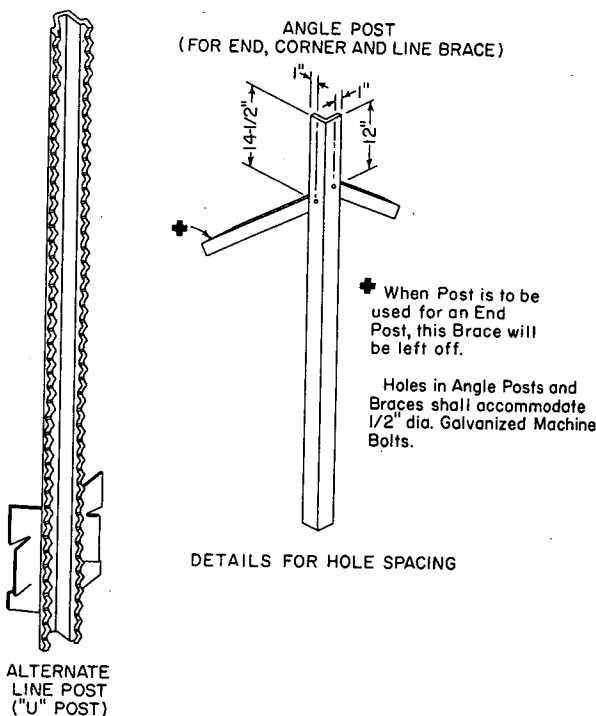
Type - 2 1/2" x 2 1/2" x 1/4" Structural Steel Angles. Weight - 3.81 lbs./lin. ft. Min. Length - 6'-6" Min. No. of Braces - 1

BRACES: (For Corner, End or Line Brace Posts)

Type - 2" x 2" x 1/4" Structural Steel Angles. Weight - 3.08 lbs./lin. ft. Min. Length - Same as corner and end posts used.

Posts shall meet requirements of Par. 4.5 of U.S. Dept. of Commerce Commercial Standard 184-51. Acceptable material includes re-rolled railroad rails.

TYPICAL METAL POSTS



GENERAL NOTES

ALTERNATES:

END, CORNER AND LINE BRACE POSTS:

(R-1) Type - 2 1/2" Std. Galvanized Pipe.

Weight - 3.65 lbs./lin. ft. Min.

BRACES:

Type - 1 3/8" O.D. Tubular Steel with 2 1/2" Brace Band, Hinge Bolt and 1 3/8" I.D. Rail End, all Galvanized. Weight - 1.6 lbs./lin. ft. Min. Length - 6'-6" Min.

BARBED WIRE:

Barbed wire shall conform to Standard Specifications and shall have No. 14 Gauge Galvanized double wrapped barbs. 80 rod reels shall weigh a min. of 78 lbs. net & shall meet ASTM A121-57, Class 1.

4" x 4" WIRE MESH:

Wire mesh used in combination wire fence as shown shall be galvanized and conform to the following:
Width - 34"
Weight - 0.76 lbs./lin. ft. Min.
Horizontal Wires - 2 strands, No. 12 1/2 ga. wire.
Cross Wires - 1 strand, No. 14 ga. wire.
Construction - cross wires to be woven with horizontal wires making a one piece fabric.
Shall meet ASTM A116-57, Class 1.

GATES:

DRIVEWAY GATES:

Height - approximately 42" (5 panels) --- Width of gate opening - 16'-0"
Weight - Galvanized Steel, 90 lbs. Min. --- Tempered Aluminum, 45 lbs. Min.
Gates to be of Riveted construction as follows: Min. 4 No. 10 rivets at each right angle connection and where diagonal braces connect to horizontal panels; Min. 3 No. 10 rivets where diagonal braces connect to top and bottom panels.

ALTERNATE DRIVEWAY GATES:

Height - 42"
Weight - Not less than 79 lbs. complete with latch and hinges.
Width of gate opening - 16'-0"
Gate Frame - 1" I.D. Standard Galvanized Pipe or acceptable equivalent and shall be of all welded construction.
Mesh to be of same construction as shown for 4" x 4" wire mesh except it shall be 2" x 4" mesh 42" high.

WALK GATES:

Height - approx. 42" (5 panels)
Weight - Galvanized Steel, 18 lbs. Min. --- Tempered Aluminum, 10 lbs. Min.
Width of gate opening - 3'-0"

ALTERNATE WALK GATES:

Height - 42"
Weight - Not less than 16 lbs. complete with latch and hinges.
Width of gate opening - 3'-0"
Gate Frame - 3/4" I.D. Standard Galvanized Pipe or acceptable equivalent and shall be of all welded construction.
Mesh to be of same construction as shown for Driveway Gate.

Alternate equivalent standard metal gates other than shown will be acceptable subject to the Engineer's approval.

(R-1) In lieu of galvanized finish on gate frames, Cadmium Plated pipe or Aluminum painting will be considered to be equivalent.

LATCHES AND HINGES:

Galvanized steel or Aluminum of standard make. Hinges shall be placed as shown, to prevent theft. In lieu of standard make latches it will be permissible to use an electro-galvanized chain, eyebolt and snaphook type latch. Eyebolt, chain and snaphook assembly to be secured to latch side of gate. Gate closure effected by wrapping chain around end post and snapping hook into chain.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
WIRE FENCES
AND
GATES

Designed by L.E.O. Approved by J. Julian
Made by T.E.F. Engr. Surveys & Plans
Checked by E.E.O. Date: 6-12-1961

CLASS I BARRICADES (3 RAILS)

STANDARD M-142-AA

FEBRUARY 1, 1965

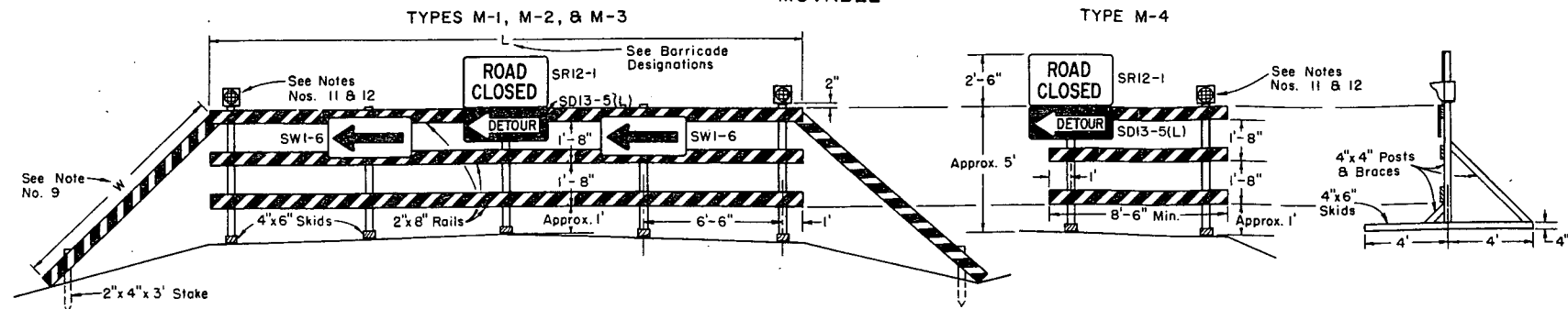
FEDERAL ROAD REGION NO.	DISTRICT	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS	

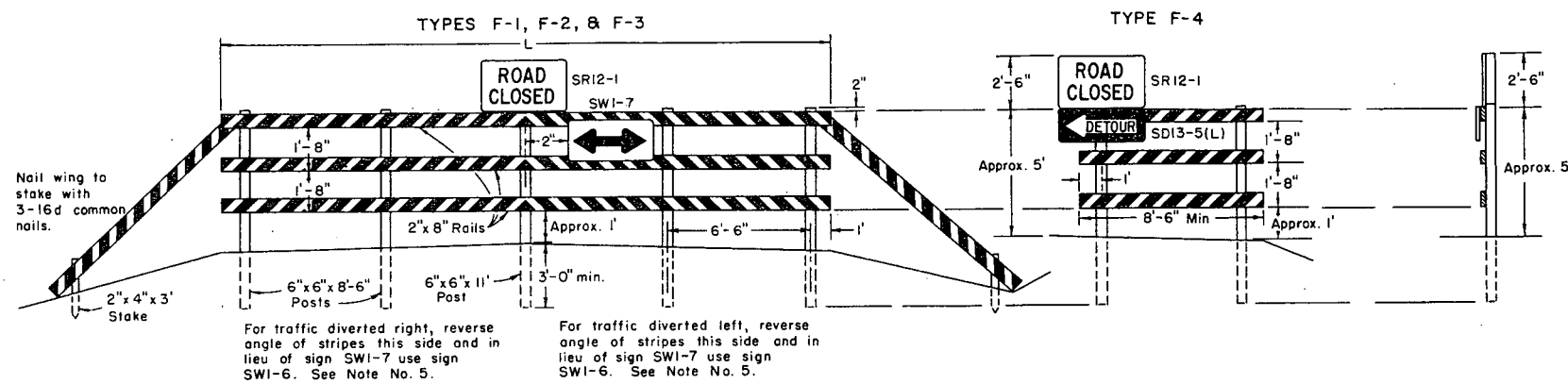
GENERAL NOTES

- All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.
- All signs and sign materials shall conform to the standards set forth in the "Manual on Uniform Traffic Control Devices for all classes of Streets and Highways" published by the Department of Highways and this standard.
- The various types and combinations of approved Signs and Beacons for Barricades required for each project shall be governed by field conditions and subject to approval by the Engineer. All traffic controls shall be placed for best visibility and legibility and maintained in good condition at all times. Oversigning is to be avoided.
- All paint and methods of painting shall be in conformity with Item 38 of the Standard Specifications. All skids, braces, and posts shall be painted with 2 coats of "Exterior Black Paint." Planking and wings on all barricades shall be painted with 2 coats of "Exterior Black Paint" on all sides before adding reflective strips. Reflective strips shall be "cut from smooth surface yellow reflective sheeting" of a type approved by the Department.
- Each barricade rail shall be striped on the face side only with reflective yellow strips slanting downward at a 45° angle toward the side to which traffic is to turn or pass. See "DETAIL OF RAIL AND WING STRIPING."
- When fixed barricades are designated on plans as a bid item the portion of the posts below ground line shall either be dipped in or painted with hot creosote oil. The portion of the post above ground line shall be painted with 2 coats of "Exterior Black Paint."
- All skids, braces, and posts shall be nailed together with No. 20d nails. All screws, bolts, nuts, and washers shall be galvanized or cadmium plated. Skids (bases) of movable barricades shall be weighted where necessary to provide stability.
- All timber used shall conform to the Standard Specifications for Miscellaneous Untreated Timber S4S. Timber shall conform to Construction grade Paragraph 123B or 125B of Standard No. 15 Grading & Dressing Rule for West Coast Douglas Fir (1956) or Dense Structural 58 and LL Structural 58 Paragraph 284 or 285 of 1956 Grading Rules for Southern Pine.
- Detachable extension wings for bypassing of construction equipment are permitted. "W" is variable, length shall be adequate to provide closing of borrow pit and/or shoulder as required.
- Alternate materials or other reflective elements on Traffic signs or Barricades will be permitted only after approval of such material by the Department in writing.
- A Flashing Beacon for use on Barricades is a section of a standard traffic signal head or a similar-type device having a yellow lens in the face, which is illuminated by intermittent flashes. Where commercial power is not available, the beacon may be adapted to operate from storage batteries. Each signal unit lens shall have a visible diameter of not less than 8 inches. Each unit complete shall be of such design as to render the lens when illuminated clearly visible to traffic facing the signal at all distances up to 1000 feet under all atmospheric conditions except dense fog. The color of the yellow lens for caution shall be in accordance with Technical Report No. 1 of the Institute of Traffic Engineers. All beacon flashers shall be equipped with filters for suppression of radio interference. The illuminating element in a flashing yellow beacon shall be flashed at a rate of not less than 50 times nor more than 60 times per minute. The illuminated period of each flash shall be not less than half and not more than two-thirds of the total cycle. The use of Flashing Beacons will be governed by field conditions. Flashing Beacons when warranted generally should be operated continuously throughout the 24 hours of the day. Warrant for Flashing Beacons may be found in Sec. 3G of the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision).
- Flashers are portable, power-operated, lens-directed, enclosed lights, illuminated by rapid intermittent flashes of short duration. Flashers may be used in connection with barricades when approved by the Engineer. An array of random flashers which tends to obscure rather than delineate the traveled way will not be permitted. The use of flashers on a job will be governed by Sec. 5D of the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision). The color of the light emitted by a flasher shall be yellow.
- Flashing Beacons and Flashers, when used, shall be positioned above the top rail of the barricades to produce the most effective results.
- Barricades used as "Traffic Controls for Highway Construction" are not to be paid for separately.
- Class I or Class II fixed barricades will be paid for separately when designated on plans as bid item.
- For additional general information on control of traffic through work areas refer to the "Manual on Uniform Traffic Control Devices for Streets and Highway", Part V, published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision).

MOVABLE

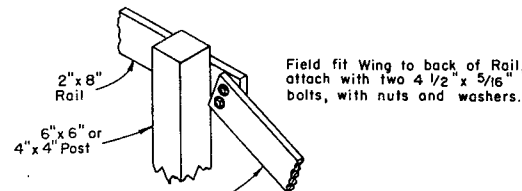
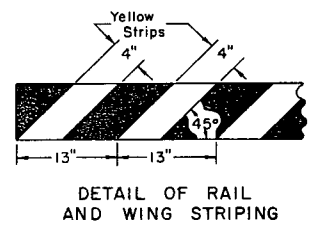
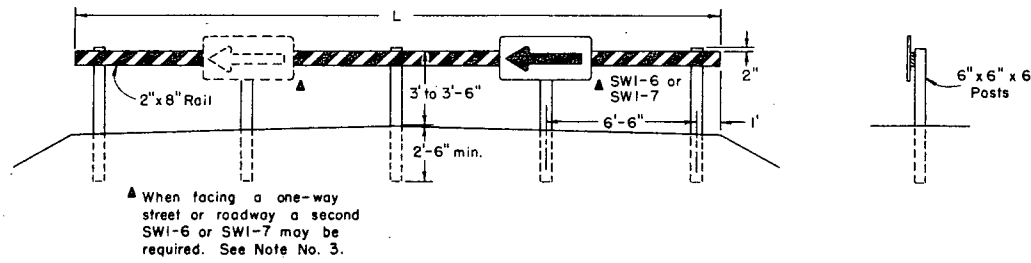


FIXED

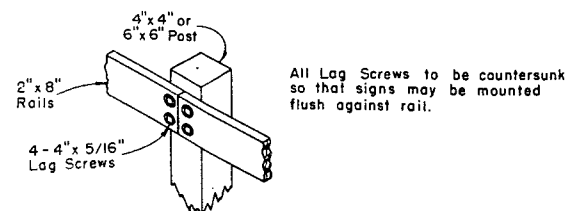


CLASS II BARRICADE (1 RAIL)

FIXED TYPE F-6

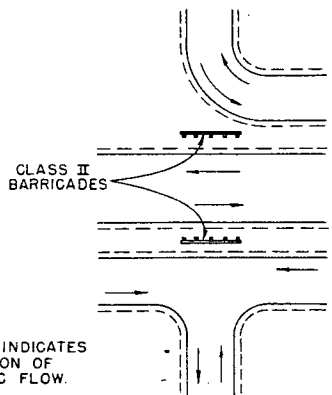


REAR VIEW OF BARRICADE
SHOWING WING ATTACHED
(See Note No. 9)

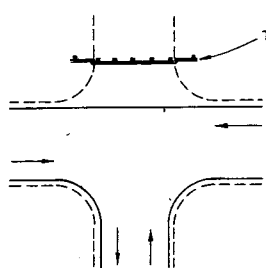


METHOD OF ATTACHING PLANKING
TO POSTS AT JOINTS

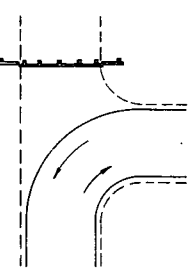
SITUATION C



SITUATION A



SITUATION B



INDICATES
DIRECTION OF
TRAFFIC FLOW.

BARRICADE DESIGNATIONS

Class	Type		Roadway Width	L	Description
	Movable	Fixed			
I	M-1	F-1	26'-34'	28'	Barricade complete with SR12-1 sign and SW1-6 or SW1-7 signs as required.
I	M-2	F-2	35'-44'	41'	Barricade complete with SR12-1 sign and SW1-6 or SW1-7 signs as required.
I	M-3	F-3	Variable	28'	Barricade (without extension wings) complete with SR12-1 sign and SW1-6 or SW1-7 signs as required.
I	M-4	F-4	Variable	Variable 8'-6" min.	Wing Barricade(signs only as appropriate).
II	—	F-6	Variable	28'	Barricade complete with appropriate signs.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

TIMBER BARRICADES

Designed By: D.R.W.
Made By: JLS
Checked By: J.B.
Approved By: *[Signature]*
Date: Feb. 1, 1965

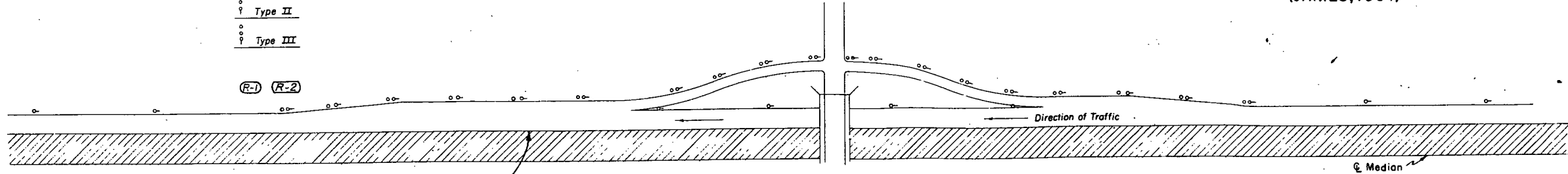
STANDARD M-192-AA

(SHEET 1 OF 2 SHEETS)
(JAN. 28, 1964)

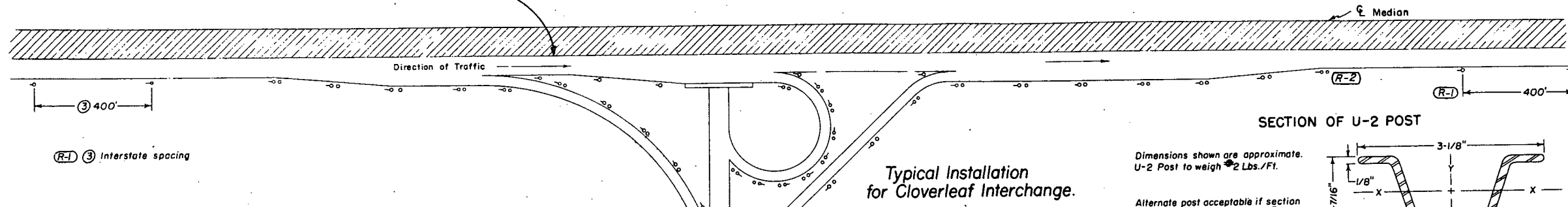
FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS			
10-27-64	Delete (2), (4) & Tangent spacing	M.R.H.	
(R-1) 7-14-65	Post height & delete (5)	M.R.H.	
(R-2) 10-19-65	Type II for speed change lanes	M.R.H.	

- Type I
- Type II
- Type III



Typical Installation for Diamond Interchange.



Typical Installation for Cloverleaf Interchange.

GENERAL NOTES

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

See tabulation in plans for delineator post requirements.

Spacing between Posts on acceleration and deceleration lanes and on relatively straight portions of interchange ramps shall be 100' on Interstate and 200' on Primary and Secondary Projects. Spacing between Posts on the outside of interchange ramp curves shall be as indicated in table for the appropriate degree of curve with a 24 min. spacing. Post spacing in advance and beyond curve shall not apply to ramp curves.

Posts shall meet requirements of Par. 4.5 of U.S. Dept. of Commerce Commercial Standard 184-51. Acceptable material includes re-rolled railroad rails.

When normal delineator spacing falls on a road approach or crossroad, move delineator either direction a distance not to exceed 1/4 normal spacing.

Type, location and spacing of delineators for tunnels and snow sheds shall be as directed by the Engineer.

Delineator Posts are not to be placed along Frontage Roads.

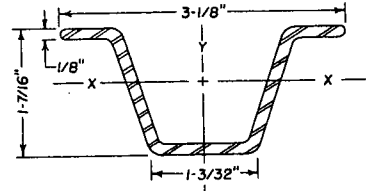
Color of Posts shall be Interstate Green.

SECTION OF U-2 POST

Dimensions shown are approximate.
U-2 Post to weigh 2 Lbs./Ft.

Alternate post acceptable if section modulus is at least 0.200 in.³ about X-X axis or at least 0.250 in.³ about Y-Y axis.

A mill tolerance of minus 3-1/2% of the weight of any one post will be allowed.



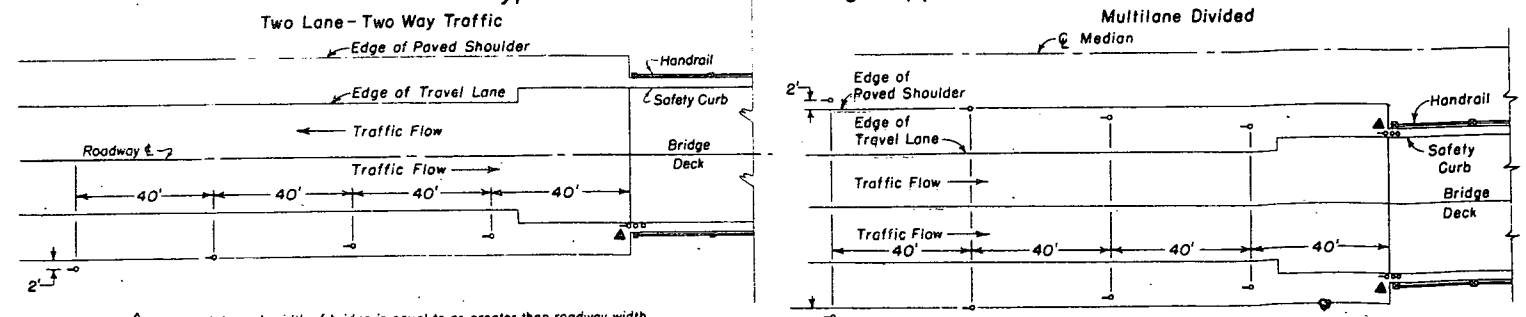
SPACING FOR DELINEATOR POSTS ON HORIZONTAL CURVES

DEGREE OF CURVE	RADIUS	O O SPACING ON CURVE FEET	O SPACING IN ADVANCE OF AND BEYOND CURVE			DEGREE OF CURVE	RADIUS	O O SPACING ON CURVE FEET	O SPACING IN ADVANCE OF AND BEYOND CURVE		
			FIRST SPACE	SECOND SPACE	THIRD SPACE				FIRST SPACE	SECOND SPACE	THIRD SPACE
0°30'	11460.0'	200	200	200	200	8°00'	716.3'	52	94	156	200
1°00'	5730.0'	151	200	200	200	8°30'	674.1'	50	90	150	200
1°30'	3820.0'	123	200	200	200	9°00'	636.7'	48	86	144	200
2°00'	2865.0'	106	191	200	200	9°30'	603.2'	47	85	141	200
2°30'	2292.0'	95	171	200	200	10°00'	573.0'	46	83	138	200
3°00'	1910.0'	86	155	200	200	10°30'	545.7'	45	81	135	200
3°30'	1637.1'	80	144	200	200	11°00'	520.9'	43	77	129	200
4°00'	1432.5'	74	133	200	200	11°30'	498.3'	42	76	126	200
4°30'	1273.3'	70	126	200	200	12°00'	477.5'	41	74	123	200
5°00'	1146.0'	66	119	198	200	15°00'	382.0'	36	65	108	200
5°30'	1041.8'	63	113	189	200	18°00'	318.3'	33	59	99	198
6°00'	955.0'	60	108	180	200	21°00'	272.9'	30	54	90	180
6°30'	881.5'	58	104	174	200	25°00'	229.2'	27	49	81	162
7°00'	818.6'	55	99	165	200	30°00'	191.0'	24	43	72	144
7°30'	764.0'	53	95	159	200						

$S = 2 \sqrt{R-50}$ 1-ST. SPACE = 1.8S 2-ND. SPACE = 3S 3-RD. SPACE = 6S
NO SPACES TO EXCEED 200 FT.

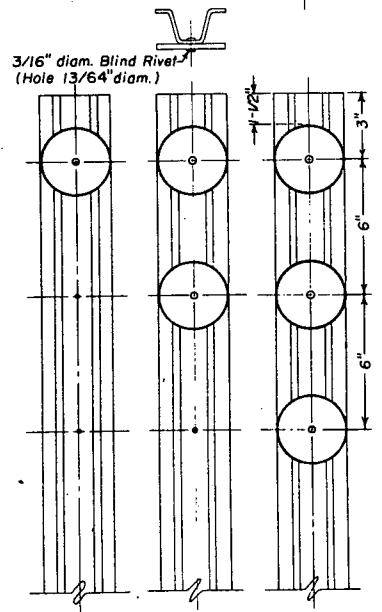
Omit third space on Secondary and Primary Routes and double the distance on the curve and in advance of and beyond curve.
(R-1) For curves less than 2 degrees on Interstate through roadways use Interstate tangent spacing.

Typical Installation at Bridge Approaches



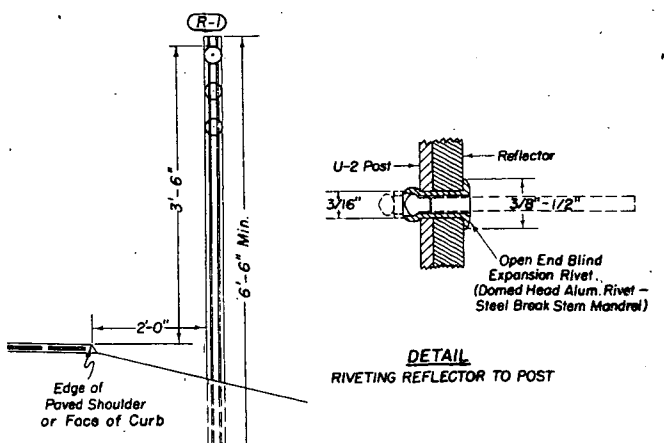
Where curb to curb width of bridge is equal to or greater than roadway width plus usable shoulder width, use this delineator only and omit all others.
Note: Where guard rail is present, place delineators outside of guard rail and at height which will permit clear view of all three Delineator buttons.

When approach slab has curb, place Type III delineator immediately behind curb.



- TYPE I
1-3" diam.
Crystal
Reflector
on U-2 Post
- TYPE II
2-3" diam.
Yellow
Reflectors
on U-2 Post
- TYPE III
3-3" diam.
Yellow
Reflectors
on U-2 Post

Min. 3 holes in all posts required as shown.



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

DELINEATORS

Designed by CKM
Made by WNC
Checked by LEO

Approved by *P. J. Sullivan*
Engineer, Survey & Plans
Date: October 19, 1962

STANDARD M-192-AA

(SHEET 2 OF 2 SHEETS)
(JAN. 28, 1964)

FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS		
10-27-64	Add note & culvert marking	M.R.H.
7-14-65	Spacing & Add. note.	M.R.H.
10-19-63	Added Hazard Note.	M.R.H.

GENERAL NOTES

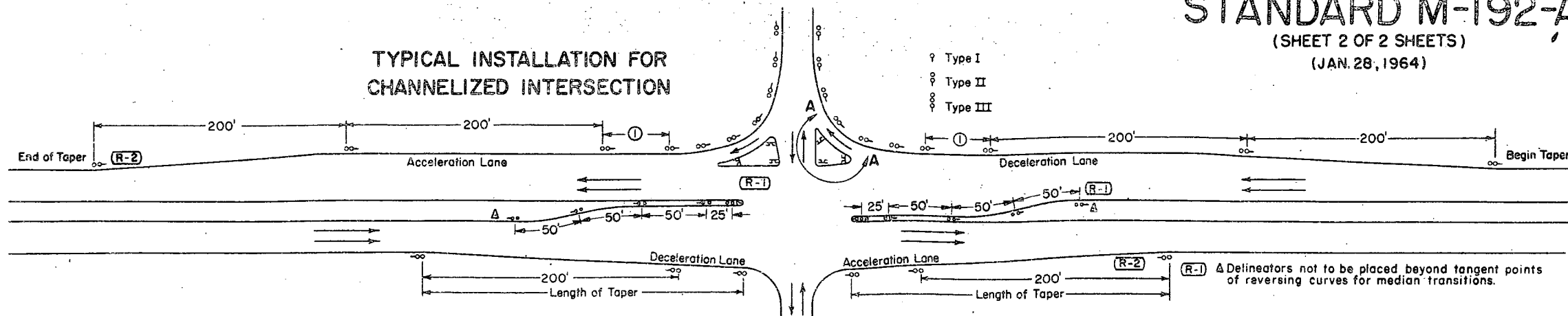
For Radii greater than 200 Feet, use spacing from Table included on Sheet I of this Standard.

For additional General Notes, see Sheet I of this Standard.

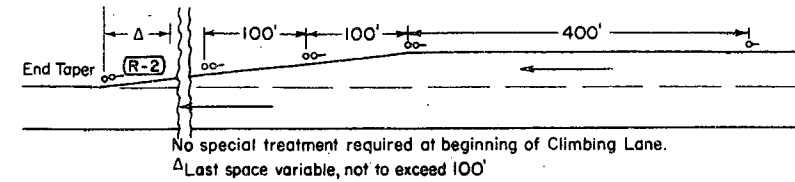
Place face of button at 90° to $\bar{C}$ of roadway.

(R-1) Lengths of speed change lanes including tapers shall be as shown on plans.

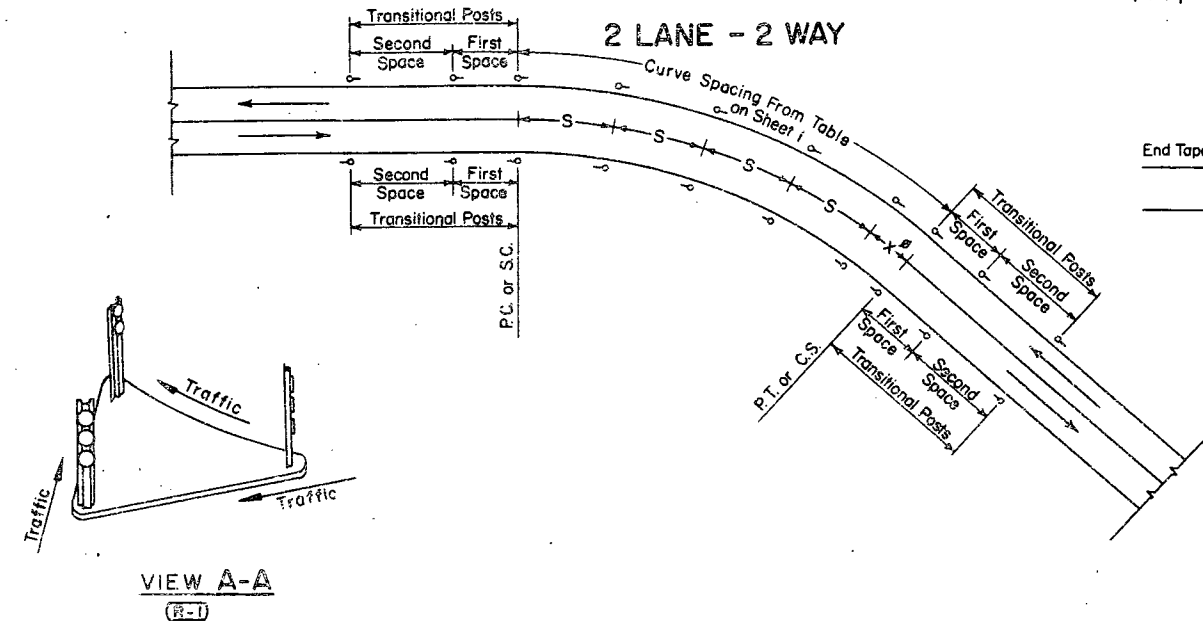
TYPICAL INSTALLATION FOR CHANNELIZED INTERSECTION



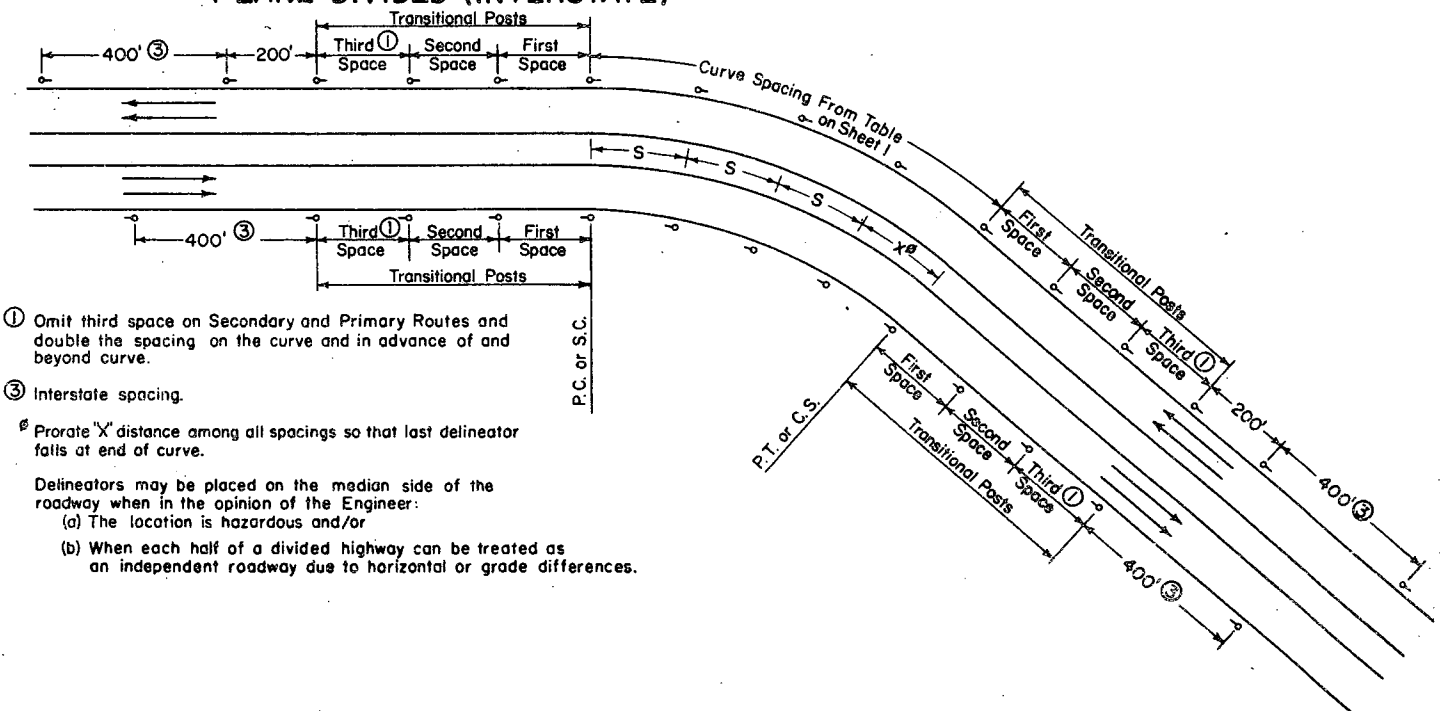
TYPICAL INSTALLATION FOR CLIMBING LANE TRANSITION



2 LANE - 2 WAY

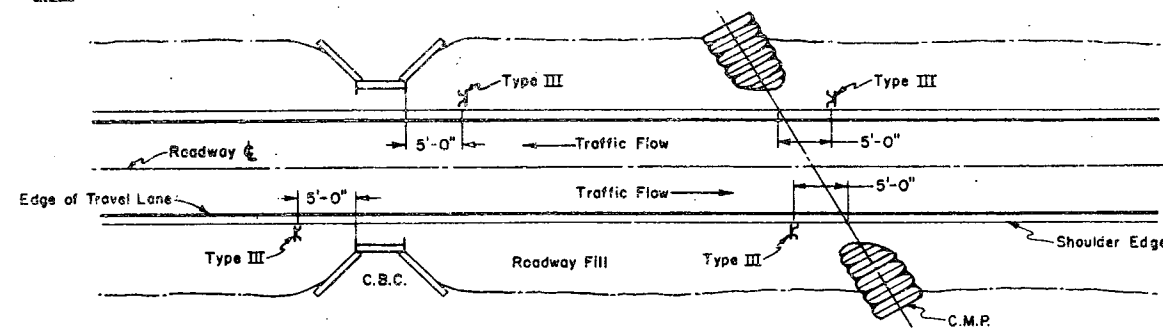


4 LANE DIVIDED (INTERSTATE)



- ① Omit third space on Secondary and Primary Routes and double the spacing on the curve and in advance of and beyond curve.
 - (R-1) ③ Interstate spacing.
 - Prorate 'X' distance among all spacings so that last delineator falls at end of curve.
- Delineators may be placed on the median side of the roadway when in the opinion of the Engineer:
- (a) The location is hazardous and/or
 - (b) When each half of a divided highway can be treated as an independent roadway due to horizontal or grade differences.

(R-2) TYPE III DELINEATOR PLACEMENT AT HAZARDOUS MINOR STRUCTURES



(R-2) Type III Delineators shall be placed as shown to mark hazardous ends of culverts and other minor structures. These structures are considered hazardous when the exposed barrel of the culvert or the roadway side of headwall or box is 6' or less from the edge of travel lane.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO

DELINEATORS

Designed by C.K.M. | Approved by [Signature]
Made by T.E.F. | Engineer, Surveys & Plans
Checked by L.E.O. | Date: Jan. 28, 1964