AWARD SET

TITLE SHEET

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	I70-2(42)197	1

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

P.E., R.O.W. and Utilities under Project No. I 70-2 (30)

(R-1) 8-4-78, *Remove East Bound Structure, WCB*

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS — STATE OF COLORADO

PLAN AND PROFILE OF PROPOSED
FEDERAL AID PROJECT NO. I 70-2(42)197
STATE HIGHWAY NO. 70
SUMMIT COUNTY

SEE STANDARD M-100-A FOR STANDARD SYMBOLS

TABULATION OF LENGTH & DESIGN DATA

STATION	ROADWAY LIN.FT.	MAJOR STRUCTURES LIN. FT.
838+00.0 BEGIN I 70-2(42)197 = 838+00.0 ON I 70-2(45)194		
	4,197.00	
879+97.00		
STR. NO. F-12-AL		381.00
883+78.00		
	517.90	
888+95.90 (PROJ.) Bk. = EQUATION 889+03.64 (SURV.) Ah.		
	11,192.35	
1000+95.99 BK = EQUATION 1004+90.08 Ah.		
	1,068.06	
1015+58.14		
1015+58.14 END I 70-2(42)197 = 1015+58.14 ON I 70-2(52)197		
TOTALS	16,975.31	381.00

SUMMARY

	LIN.FT.	MILES
ROADWAY	16,975.31	3.215
MAJOR STRUCTURES	381.00	.072
TOTAL (NET AND GROSS)	17,356.31	3.287

DESIGN DATA

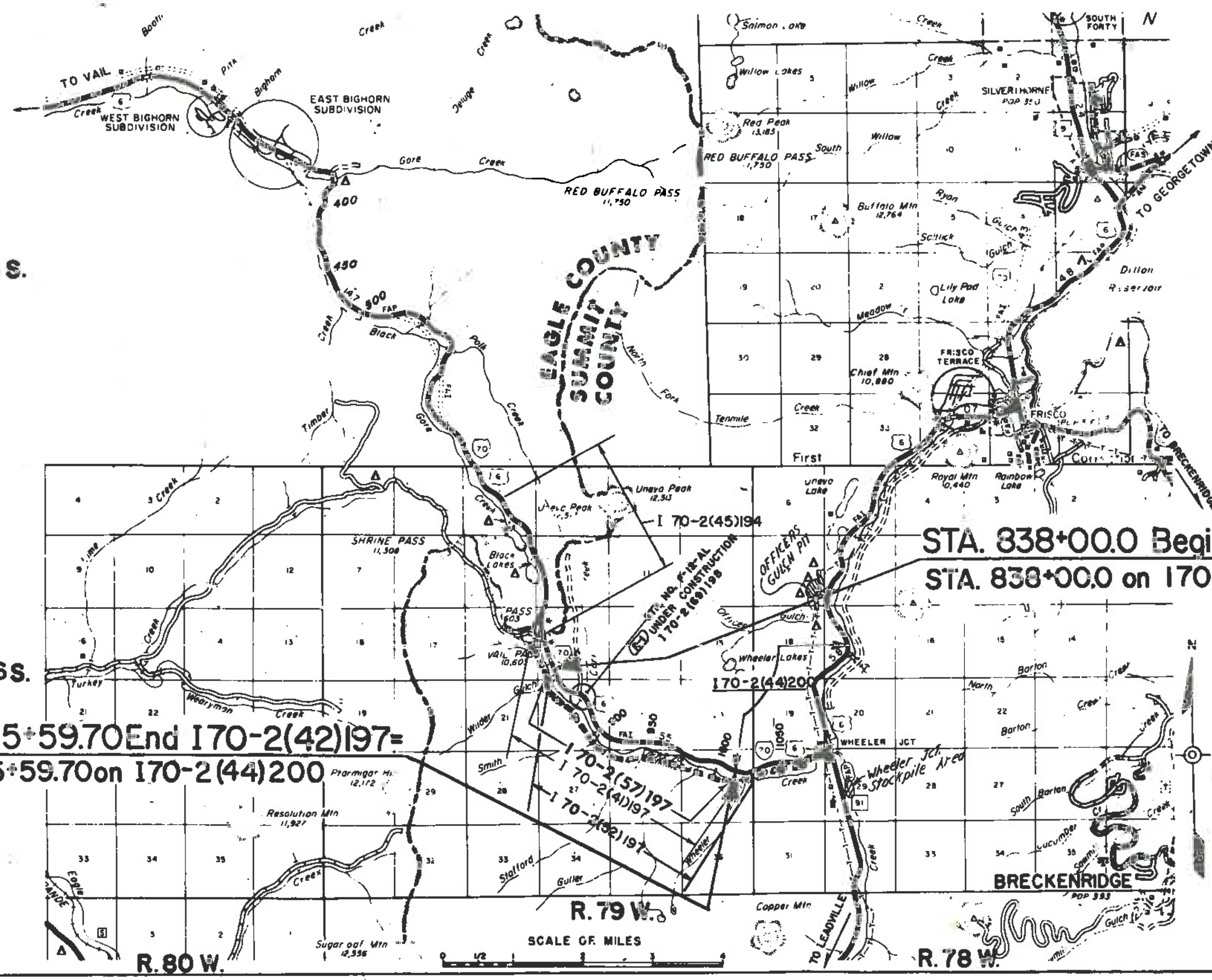
MAXIMUM DEGREE OF CURVE		5°00'
MAXIMUM GRADE		5.8914
MINIMUM SSD HORIZONTAL		548'
MINIMUM SSD VERTICAL		466'
MAXIMUM DESIGN SPEED		60 MPH
1997 DESIGN TRAFFIC	ADT	15,900
	DHV	3,180

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



INDEX OF SHEETS

CONTINUED ON SHEET NO. 8

DIVISION OF HIGHWAYS

APPROVED W.J. Capron 7-21-78
FOR CHIEF ENGINEER DATE

AS CONSTRUCTED INFORMATION

CONTRACTOR ____
ENGINEER ____
(Project or Resident)
PROJECT STARTED ____
PROJECT COMPLETED ____
AS CONSTRUCTED PLANS APPROVED ____
TITLE DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

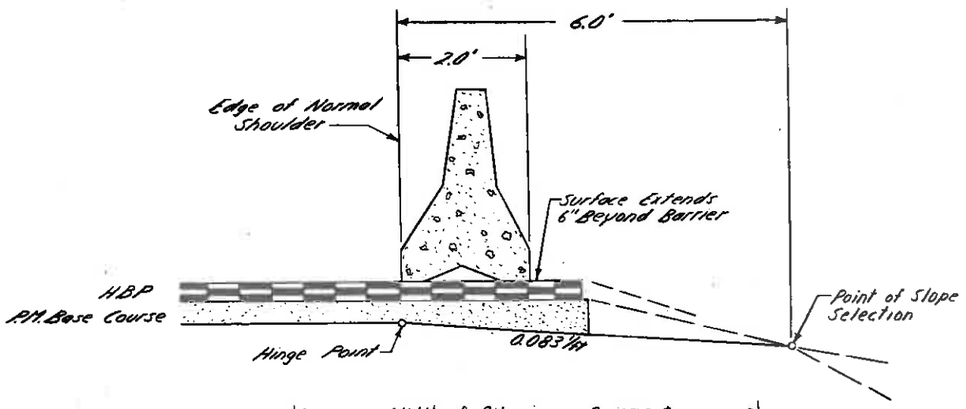
APPROVED ____ DATE

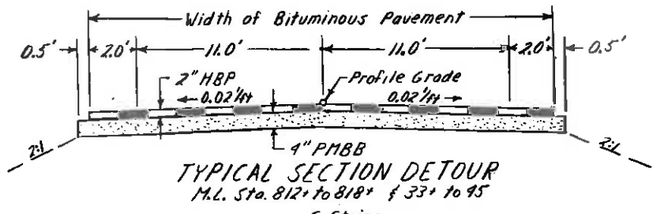
DIVISION ADMINISTRATOR

W.C.B.

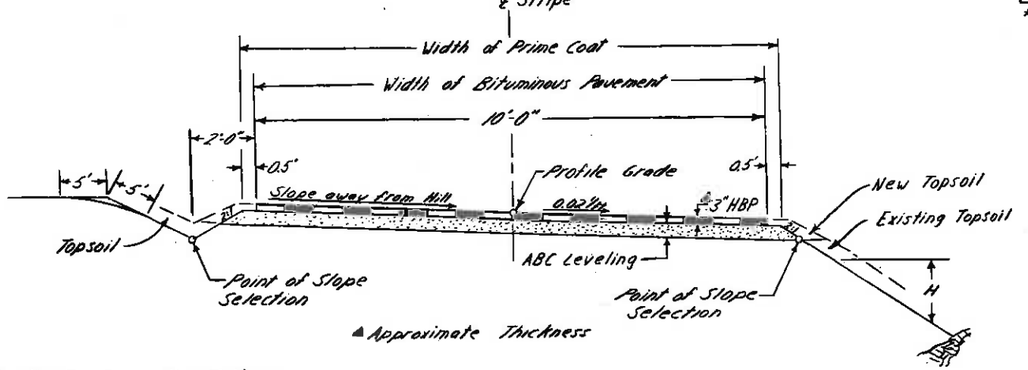
AS CONSTRUCTED	FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS ☐ REVISED ☐ VOID ☐	VIII	COLORADO	I 70-2(42)197	2	

WIDENING FOR GUARD RAIL





TYPICAL SECTION DETOUR
M.L. Sta. 812+ to 818+ & 33+ to 95



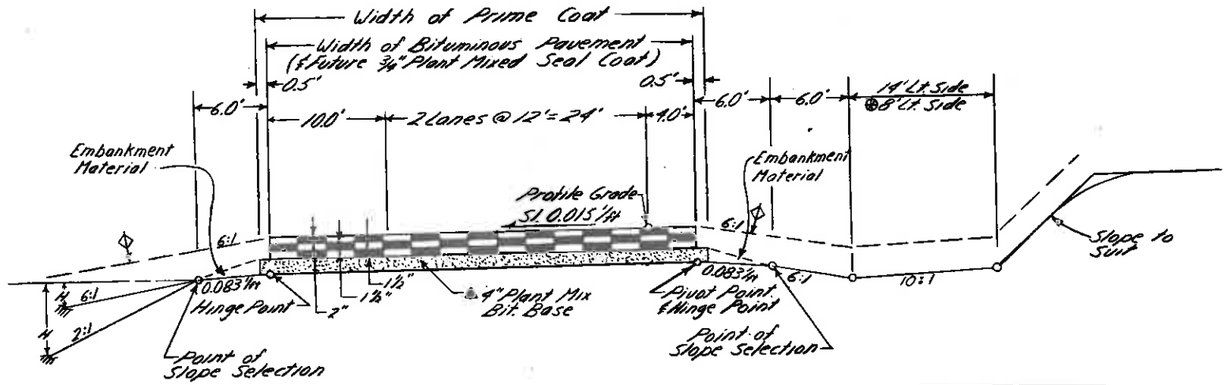
NOTE: Grading For Recreation Trail Was Completed on Previous Project, I 70-2(68)197. Any additional grading shall be accomplished by Equipment Hours

TYPICAL SECTION RECREATION TRAIL

Material shall be placed in separate courses at the following approximate rate per 100 lin. ft. of the Recreation Trail

Bituminous Pavement - Top Layer	19 Tons
ABC Leveling Course - Bottom Layer	7 Tons

TYPICAL SECTION (WEST BOUND ONLY)



*FILL SLOPE	
H	Slope
0' to 10'	6:1
10' to 20'	4:1
20' to 30'	3:1
Over 30'	2:1

*For information only, See Cross-Section

◊ Topsoil this Project

⊛ Sta. 996+00 to 996+50

▲ Approximate Thickness

* For Rock Cuts See Cross Sections For Slopes

*CUT SLOPE	
H	Slope
0' to 6'	6:1
6' to 10'	4:1
10' to 15'	3:1
⊛Over 15'	2:1

*For information only, See Cross-Sections

Material shall be placed in separate courses at the following approximate rate per 100 lin. ft. of roadway:

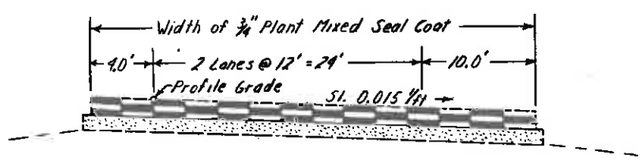
Bituminous Pavement - Top Layer	47 Tons
Middle Layer	35 Tons
Bottom Layer	35 Tons
Plant Mix Bituminous Base	96 Tons

The rates shown have been determined from information available at the time of design. Rates should be adjusted during construction to obtain the required approximate thickness

Hot Bituminous Pavement may be placed in two lifts when approved by the Engineer.

Break points on slopes and in bottoms of ditches shall be rounded on Construction for a pleasing appearance.

Slopes shall be varied as directed by the Engineer for aesthetics



TYPICAL SECTION (EAST BOUND ONLY)

Seal Coat shall be placed at the following approximate rate - 18 Tons per 100 Lin. Ft. of Roadway

DEPARTMENT OF HIGHWAYS
HIGHWAYS — STATE OF COLORADO
.118 (Taylor)
1 1977

SUMMARY OF APPROXIMATE QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED ☐ VOID ☐

FEDERAL ROAD SECTION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
XIII	COLORADO	170-2(42)197	3	

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	STR. NO. F-12-AL	ROADWAY	PROJECT TOTALS
			201	Clearing and Grubbing	L.S.		1	1
			202	Removal of Structure	Each		35	35
			202	Removal of Pavement Marking	Sq. Ft.		21,193	21,193
			202	Removal of Bridge	Each		2	2
			202	Removal of Ground Sign	Each		7	7
			203	Unclassified Excavation	Cu. Yd.		360,898	360,898
			203	Compaction (AASHTO T 180)	Cu. Yd.		420,881	420,881
			203	Vibratory Rolling	Hour		100	100
			203	Blading	Hour		100	100
			203	Dozing	Hour		350	350
			203	Dozing (Landscaping)	Hour		200	200
			203	Truck (Dump)	Hour		150	150
			203	Front End Loader	Hour		300	300
			203	Combination Loader	Hour		400	400
			204	Haul	Yd. Mi.		334,706	334,706
			204	Haul	Ton Mi.		177,810	177,810
			206	Structure Excavation	Cu. Yd.		12,291	12,291
			206	Structure Backfill (Class 2)	Cu. Yd.		2,983	2,983
			206	Filter Material (Class A)	Cu. Yd.		6,972	6,972
			206	Bed Course Material	Cu. Yd.		61	61
			207	Topsoil (Haul)	Cu. Yd.		34,530	34,530
			209	Wetting	M. Gal.		10,559	10,559
			209	Water (Landscaping)	M. Gal.		1,100	1,100

(R-1) 8-9-78, Asphalt Cement, WCB

SUMMARY OF APPROXIMATE QUANTITIES

AS CONSTRUCTED		
NO REVISIONS ☐	REVISED ☐	VOID ☐

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	170-2(92)197	4	

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	STR. NO. F-12-AL	ROADWAY	PROJECT TOTALS
			210	Reset End Section	Each		2	2
			210	Reset Ground Sign	Each		1	1
			212	Seeding (Native)	Lb		2,090	2,090
			212	Seeding (Forbs)	Ounce		18	18
			212	Fertilizer	Lb.		21,630	21,630
			212	Soil Preparation (Native)	Acre		44	44
			213	Mulching	Ton		50	50
			213	Mulching (Hydraulic)	Ton		19	19
			213	Mulch Netting (Paper)	Sq. Yd.		105,859	105,859
			213	Soil Retention Blanket (Jute)	Sq. Yd.		25,886	25,886
			301	Plant Mix Bituminous Base (Class 6)	Ton		18,467	18,467
			304	Aggregate Base Course (Class 6) (Haul)	Ton		2,119	2,119
			403	Hot Bituminous Pavement (Grading E)	Ton	180	20,551	20,731
			403	Hot Bituminous Pavement (Grading E) (Haul)	Ton		4,405	4,405
			410	Plant Mix Seal (Type B)	Ton		4,688	4,688
(R-1)			411	Asphalt Cement (AC-5)	Ton	11	1,766	1,777
(R-1)			411	Asphalt Cement (AC-5) (Fortified)	Ton		759	759
			411	Asphalt Cement (AC 20) (Rubberized)	Ton		305	305
			411	Emulisified Asphalt (CSS-1H)	Gal.		15,670	15,670
			411	Liquid Asphaltic Material (MC-70)	Gal.		40,714	40,714
			504	Place Timber Cribbing	Sq. Ft.		3,869	3,869
			506	Heavy Riprap	Cu. Yd.		100	100
			507	Dry Rubble Slope and Ditch Paving	Cu. Yd.		121	121
			515	Waterproofing (Membrane)	Sq. Yd.	1,624		1,624

DEPARTMENT OF HIGHWAYS
HIGHWAYS — STATE OF COLORADO
113 (Rev.)
1977

SUMMARY OF APPROXIMATE QUANTITIES

AS CONSTRUCTED		
NO REVISIONS ☐	REVISED ☐	VOID ☐

FEDERAL ROAD CITATION NO.	CITATION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
XIII	COLORADO	170-2(42)197	5	

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT				STR. NO. F-12-AL					ROADWAY			PROJECT TOTALS			
			603	18 Inch Corrugated Steel Pipe	Lin. Ft.									112			112			
			603	24 Inch Corrugated Steel Pipe	Lin. Ft.									2,538			2,538			
			603	30 Inch Corrugated Steel Pipe	Lin. Ft.									106			106			
			603	36 Inch Corrugated Steel Pipe	Lin. Ft.									80			80			
			603	42 Inch Corrugated Steel Pipe	Lin. Ft.									390			390			
			603	18 Inch Steel End Section	Each									10			10			
			603	24 Inch Steel End Section	Each									27			27			
			603	30 Inch Steel End Section	Each									2			2			
			603	36 Inch Steel End Section	Each									1			1			
			603	42 Inch Steel End Section	Each									2			2			
			604	Inlet Type D (5 Foot)	Each									17			17			
			605	8 Inch Perforated Corrugated Steel Pipe	Lin. Ft.									14,164			14,164			
			605	8 Inch Non Perforated Corrugated Steel Pipe	Lin. Ft.									120			120			
			606	Guard Rail (Type 4) (Precast-Portable) (Colored)	Lin. Ft.									2,572			2,572			
			607	Silt Fence	Lin. Ft.									1,200			1,200			
			612	Delineator (Type 1)	Each									186			186			
			612	Delineator (Type 1) (Barrier)	Each									14			14			
			612	Reflector	Each									143			143			
			614	Flagging	Hour									10,000			10,000			

DEPARTMENT OF HIGHWAYS
/ HIGHWAYS — STATE OF COLORADO
n. 113 (Taylor)
M 1977

SUMMARY OF APPROXIMATE QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED ☐ VOID ☐

FEDERAL ROAD DIVISION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	1702(42)197	6	

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT				STR. NO. F-12-AL					ROADWAY			PROJECT TOTALS			
			614	Sign Panel (Class 1)	Sq. Ft									52			52			
			614	Timber Sign Post (4 x 4) Inch	Lin. Ft									96			96			
			614	Steel Sign Post (U-2)	Lin. Ft									33			33			
			619	Concrete Footing (Type 4)	Each									2			2			
			619	Modification of Sign Legend	L. S.									1			1			
			619	Flashing Yellow Beacon (Portable)	Each									2			2			
			619	Barricade (Type 3 M-A) (Temporary)	Each									21			21			
			619	Barricade (Type 3 M-C) (Temporary)	Each									3			3			
			619	Barricade (Type 3 M-D) (Temporary)	Each									1			1			
			619	Construction Traffic Sign (Panel Size A)	Each									9			9			
			619	Construction Traffic Sign (Panel Size B)	Each									37			37			
			619	Construction Traffic Sign (Panel Size C)	Each									17			17			
			619	Vertical Panel	Each									50			50			
			619	Traffic Cone	Each									50			50			

SUMMARY OF APPROXIMATE QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED ☐ VOID ☐

FEDERAL ROAD TRUCK NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	170-2(92)197	7	

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	STR. NO. F-12-AL	ROADWAY	PROJECT TOTALS
			620	Field Laboratory	Each		1	1
			626	Mobilization	L.S.		1	1
			627	Pavement Marking Paint	Gal.		782	782
				FORCE ACCOUNT				
			F/A01	Minor Contract Revisions	F.A.		1	1
			F/A02	Erosion Control	F.A.		1	1
			F/A03	Landscaping Special Effects	F.A.		1	1
			F/A04	Obliterating Old Road	F.A.		1	1
			F/A05	On-The-Job-Trainee	Each		4	4
			F/A06	Transplant Trees	F.A.		1	1
				STATE FURNISHED MATERIAL				
				Timber Cribbing	Sq. Ft.		3,864	3,864

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	170-7(42)197	8	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

GENERAL NOTES

FOR PRELIMINARY PLAN QUANTITIES OF BITUMINOUS MATERIALS AND COVER COAT MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:

PRIME COAT (MC-70) @ 0.40 GALS. PER SQ. YD.
TACK COAT (CSS-1H) @ 0.10 GALS. PER SQ. YD.

DILUTED EMULSIFIED ASPHALT FOR TACK COAT SHALL CONSIST OF 1 PART EMULSIFIED ASPHALT AND ONE PART WATER.

RATES OF APPLICATION SHALL BE AS DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION.

ANY LAYER OF BITUMINOUS PAVEMENT THAT IS TO HAVE A SUCCEEDING LAYER PLACED THEREON SHALL BE COMPLETED FULL WIDTH BEFORE SUCCEEDING LAYER IS PLACED.

DILUTED EMULSIFIED ASPHALT SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED AND SHALL CONSIST OF A DILUTION OF CSS-1H AND WATER, THE PORTIONS OF WHICH SHALL BE 9 PARTS WATER AND 1 PART CSS-1H, BASED ON VOLUME MEASUREMENT. PLAIN WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED IN OTHER AREAS. LOCATIONS SHALL BE AS ORDERED.

THE FOLLOWING SHALL BE FURNISHED WITH EACH BITUMINOUS PAVER:

1. A SKI TYPE DEVICE AT LEAST 30 FEET IN LENGTH.
2. AT LEAST 5,000 FEET OF CONTROL LINE AND STAKES.

IT IS ESTIMATED THAT OLD ROAD IS TO BE OBLITERATED AT THE FOLLOWING LOCATIONS:

STATIONS 874+ TO 887+.

DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:

FULL DEPTH OF ALL EMBANKMENTS

BASES OF CUTS 1 FOOT

BASES OF FILLS 1 FOOT.

COMPACTION FOR THIS PROJECT SHALL BE AASHTO T 180.

EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.

IT IS ESTIMATED THAT 10,000 HOURS OF FLAGGING FOR CONTROLLING TRAFFIC WILL BE REQUIRED FOR THIS PROJECT.

THE MINIMUM THICKNESS OF TOPSOIL SHALL BE 4 INCHES. IT IS ESTIMATED THAT 33,780 CU. YDS. WILL BE REQUIRED FOR ROADWAY AND 750 CU. YDS. FOR SHOULDER EDGE ON RECREATION TRAIL. APPROXIMATELY 34,530 WILL BE OBTAINED FROM STOCKPILES RIGHT OF STATION 948+, FROM ROADWAY STATION 880± (W.B.) AND SURFACING STOCKPILE AREA

SEEDING, SOIL PREPARATION, FERTILIZING WITH COMMERCIAL FERTILIZER, AND MULCHING WILL BE REQUIRED FOR APPROXIMATELY 44 ACRES ON ALL DISTURBED AREAS NOT SURFACED.

ALL ROADWAY CUT SLOPE DITCHES SHALL HAVE SOIL RETENTION BLANKET (JUTE) APPLIED TO CONTROL EROSION.

SEEDING SHOWN BELOW WILL BE REQUIRED ON ALL ROADWAY DITCHES IN ADDITION TO NORMAL SEEDING.

COMMON NAME	BOTANICAL NAME	PERCENT PURITY	PERCENT GERMINATION	RATE PLS/ACRE
RED FESCUE V. DAWSON	FESTUCA RUBRA	80	77	35
FULTS	PUCCINELLIA DISTANS	85	80	35
LEMMONI	PUCCINELLIA DISTANS	85	80	20
KENTUCKY BLUEGRASS V. NUGGET	POA PRATENSIS	80	68	20
TOTAL PLS/ACRE SEEDING				110

CLASS "AX" CONCRETE WILL BE PERMITTED ON THIS PROJECT IN LIEU OF CLASS "A".

IT IS ESTIMATED THAT THE FOLLOWING WILL BE REQUIRED ON THIS PROJECT:

ITEM	HOURS
BLADING	100
DOZING	350
DOZING (LANDSCAPING)	200
TRUCK (DUMP)	150
FRONT END LOADER (RUBBER TIRE)	300
COMBINATION LOADER	400

IT IS ESTIMATED THAT 1,624 SQ. YDS. OF WATERPROOFING (MEMBRANE) WILL BE REQUIRED FOR CORRAL CREEK BRIDGE, STA. 880+.

ADDITIONAL LANDSCAPING MAY BE DONE ON FUTURE CONTRACT.

IT IS ESTIMATED THAT EXISTING HAUL ROAD IS TO BE OBLITERATED. WORK PAID FOR BY EQUIPMENT HOURS, TOPSOIL SEED AND MULCH.

COMMON NAME	BOTANICAL NAME	PERCENT PURITY	PERCENT GERMINATION	RATE PLS/ACRE
STREAMBANK WHEATGRASS	AGROPYRON RIPARIUM	97	92	7
WESTERN WHEATGRASS	AGROPYRON SMITHII	85	70	4
KENTUCKY BLUEGRASS	POA PRATENSIS	85	75	3
SMOOTH BROME (MANCHAR)	BROMUS INERMIS	85	80	5
TIMOTHY	PHLEUM PRATENSE	99	90	4
RED FESCUE	FESTUCA RUBRA	98	85	3
MEADOW FOXTAIL	ALOPECURUS PRATENSIS	95	80	4
SLENDER WHEATGRASS	AGROPYRON PAUCIFLORUM	90	85	5
WHITE DUTCH CLOVER	TRIFOLIUM REPENS	98-1/2	90	2
ALSIKE CLOVER	TRIFOLIUM HYBRIDUM	98-1/2	90	3
TOTAL PLS/ACRE SEEDING (NATIVE)				40

COMMERCIAL FERTILIZER (FOR SEEDING)	PERCENT AVAILABLE	LBS/ACRE AVAILABLE	LBS/ACRE AVAILABLE	RATE LBS/ACRE
NITROGEN (18-0-0)	18	50		278
POTASH (0-45-0)	45		100	222
TOTAL LBS/ACRE FERTILIZER				500

RATE OF APPLICATION WILL BE ADJUSTED BY THE ENGINEER TO MEET SOIL CONDITIONS.

SEEDING (FORBS) WILL BE REQUIRED WHERE DESIGNATED. APPROXIMATELY 5 ACRES WILL BE SEEDED WITH FORBS. THE FOLLOWING TYPES AND RATES SHALL BE USED:

COMMON NAME	BOTANICAL NAME	OUNCES PLS/ACRE
PRIMROSE, YELLOW EVENING	OENOTHERA HOOKERI	1/2
PENSTEMON	PENSTEMON SPP. MIXED	1/2
GENTIAN, FRINGED	GENTIAMOPSIS THERMALIS	1/4
IRIS, WILD BLUE	IRIS MISSOURIENSIS	1/2
FLAX, WILD BLUE	LINUM LEWISII	1/2
COLUMBINE	AQUILEGIA	1/4
DAISY, ASPEN, FLEABANE	ERIGERON SPECIOSUS	1/4
COMPOSITES		3/4
TOTAL OZ./ACRE FORBS		3-1/2

SEED TYPES THAT ARE NOT AVAILABLE AT TIME OF CONSTRUCTION MAY BE SUBSTITUTED FOR AFTER APPROVAL OF THE ENGINEER.

THE ACTUAL TYPE OF MULCH AND SEEDING METHOD SHALL BE DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION. NORMALLY THE FOLLOWING WILL BE USED:

FOR ALL SLOPES 3:1 OR FLATTER, SEEDING SHALL BE DONE BY DRILLING. HYDRAULIC MULCHING SHALL BE APPLIED AT A RATE OF 1 TON PER ACRE.

FOR ALL SLOPES STEEPER THAN 3:1, SEEDING SHALL BE DONE BY THE HYDRAULIC METHOD OR HANDBROADCAST WHERE PERMITTED. MULCHING SHALL BE NATIVE HAY APPLIED AT A RATE OF 2 TONS PER ACRE. THESE STEEPER SLOPES SHALL HAVE PAPER FIBER MULCH NETTING UNLESS OTHERWISE DIRECTED. CRITICALLY ERODIBLE SLOPES SHALL HAVE SOIL RETENTION BLANKETS APPLIED, AS DIRECTED BY THE ENGINEER.

INTERCEPTING DITCHES

STATION	TO	STATION	SIDE	CU. YDS.
838+00	to	839+50	Lt.	28
913+42	to	932+50	Lt.	380
940+00	to	968+00	Lt.	191
974+15	to	980+16	Lt.	113
984+67	to	988+23	Lt.	65
992+67	to	994+15	Lt.	29
996+18	to	1013+33	Lt.	306
TOTAL				1,112

SEEDING SUMMARY

Seeding (Native)	2090 lbs
Fertilizer	21,630 lbs
Soil Preparation (Native)	44 acres
Mulching	30 tons
Mulching (Hydraulic)	19 tons
Seeding (Forbs)	18 ounces

SUMMARY OF EARTHWORK QUANTITIES

INDEX: Book | Page | Sheet

UNCLASSIFIED EXCAVATION	Cu. Yd.
Roadway (From Computer)	349,591
Structure Quantities as Embankment	5,178
Estimate for Cut Slope Treatment	1,748
Intercepting Ditches	1,112
Topsoil – Remove	1,000
Topsoil – Replace	1,000
Shoulder Material	1,269
TOTAL	360,898
COMPACTION (AASHTO T 180)	
Embankment (Net)	349,591
Base of Cuts and Fills	66,112
Structure Quantities as Emb. (Net)	5,178
TOTAL	420,881
HAUL	Yd. Mi.
From Mass Diagram	334,706
ROADWAY QUANTITIES BALANCE (For Information Only)	
EXCAVATION	
Unclassified	349,591
Total	
EMBANKMENT, NET	
Roadway (From Computer)	349,591
*EMBANKMENT x FACTOR (1.0)	
Roadway (From Computer)	349,591
WETTING	M. Gal.
Compaction	10,522
Surfacing	37
Total	10,559
WATER (LANDSCAPING)	
Seeding and Mulching	1,100
Total	1,100

* Includes 10,540 Cu. Yds. for Flattening Fill Slopes.

"S" STANDARDS

S-614-19B	TYPICAL GROUND SIGN PLACEMENT		11-17-71
S-614-20B	CLASS I GROUND SIGN INSTALLATIONS		11-02-73
S-614-21B	CLASS II GROUND SIGN INSTALLATIONS		12-02-69
S-614-26C	BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS	(2 SHEETS)	5-2-74
S-614-27C	CONCRETE, FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS	(2 SHEETS)	9-24-75
S-614-33D	MILEPOST SIGN AND INSTALLATION		10-28-77
S-614-39A	TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION	(4 SHEETS)	5-8-78
S-614-52A	BARRICADES, DRUMS AND VERTICAL PANEL CHANNELIZING DEVICES		12-04-74
S-627-1A	TYPICAL PAVEMENT MARKINGS	(2 SHEETS)	10-28-77

THE STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS—STATE OF COLORADO
DOH FORM NO. 125 (MYLAR)
REV. MARCH, 1977

STRUCTURE QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED ☐ VOID ☐

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	170-2(42)197	9

INDEX BOOK	INDEX PAGE	INDEX SHEET	LOCATION	UNCLASSIFIED EXCAVATION CUBIC YARD EXCAV.	UNCLASSIFIED EXCAVATION CUBIC YARD EMB.	UNCLASSIFIED EXCAVATION CUBIC YARD DITCH	STRUCTURE EXCAVATION CUBIC YARD	STRUCTURE BACKFILL CUBIC YARD CL. 2	REMOVAL OF STRUCTURE EACH	AGGREGATE BASE COURSE (CLASS 6) OR SURFACING (CLASS 6) TON	HOT BITUMINOUS PAVEMENT (GRADING E) TON	INLET TYPE D (5 FOOT) EACH	INLET TYPE D (5 FOOT) "H"	FILTER MATERIAL (CLASS A) CU.YD.	6" NON-PERFORATED CSP LIN.FT.	6" PERFORATED CSP LIN.FT.	CORRUGATED STEEL PIPE LINEAR FEET 18"	24"	30"	36"	42"	"H" OVER CULV. FT.	DRY RUBBLE SLOPE AND DITCH PAVING CUBIC YARD	STEEL END SECTION EACH 18"	24"	30"	42"	36"	MISCELLANEOUS
			RECREATION TRAIL																										
			840+ to 845+		92		333							296		500													
			859+ to 860+					5																					10 Cu. Yd. - Heavy Riprap
			866+ to 873+		129		470	5						345	20	700													
			882+ to 883+					5																					10 Cu. Yd. - Heavy Riprap
			884+ to 890+		111		400							295		600													
			894+87				11	8									26							2					
			902+ to 908+		101		365	5						270	20	548													
			902+18				11	8									18							2					
			908+68				10	6									18							2					
			912+70				15	10									22							2					
			914+ to 916+		37		137	5						99	20	200													
			920+05				11	8									28							2					
			924+ to 926+		37		137							99		200													
			925+ to 926+					5																					10 Cu. Yd. - Heavy Riprap
			928+ to 931+		56		203	5						148	20	300													
			941+ to 944+		56		200							148		300													
			941+ to 942+																										50 Cu. Yd. - Heavy Riprap
			945+ to 946+					5																					10 Cu. Yd - Heavy Riprap
			959+ to 953+					5																					
			963+ to 966+		56		203	5						143	20	300													10 Cu. Yd · Heavy Riprap
			977+ to 980+		46		170	5						123	20	250													
			991+ to 998+		120		433							320		650													

THE STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS--STATE OF COLORADO
DOH FORM NO. 126 (MYLAR)
REV. MARCH, 1977

STRUCTURE QUANTITIES

AS CONSTRUCTED			FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS ☐	REVISED ☐	VOID ☐	VIII	COLORADO	I70-7(82)197	10

INDEX BOOK	INDEX PAGE	INDEX SHEET	LOCATION	UNCLASSIFIED EXCAVATION CUBIC YARD EXCAV.	UNCLASSIFIED EXCAVATION CUBIC YARD EMB.	UNCLASSIFIED EXCAVATION CUBIC YARD DITCH	STRUCTURE EXCAVATION CUBIC YARD	STRUCTURE BACKFILL CUBIC YARD CL. 2	REMOVAL OF STRUCTURE EACH	AGGREGATE BASE COURSE SURFACING (CLASS 6) TON	HOT BITUMINOUS PAVEMENT (GRADING E) TON	INLET TYPE D (5 FOOT) EACH	INLET TYPE D (5 FOOT) "H"	FILTER MATERIAL (CLASS A) CU. YD.	8" NON-PERFORATED CSP LIN. FT.	8" PERFORATED CSP LIN. FT.	CORRUGATED STEEL PIPE LINEAR FEET 18"	CORRUGATED STEEL PIPE LINEAR FEET 24"	CORRUGATED STEEL PIPE LINEAR FEET 30"	CORRUGATED STEEL PIPE LINEAR FEET 36"	CORRUGATED STEEL PIPE LINEAR FEET 42"	"H" OVER CULV. FT.	DRY RUBBLE SLOPE AND DITCH PAVING CUBIC YARD	STEEL END SECTION EACH 18"	STEEL END SECTION EACH 24"	STEEL END SECTION EACH 30"	STEEL END SECTION EACH 42"	STEEL END SECTION EACH 36"	MISCELLANEOUS
			812+ to 818+(UB)		300		2	7										30												1 - Reset 24" End Section
			812+ to 818+(WB)	500					1																				1 - Reset 24" End Section
			833+(EB) to 838+(WB)	50	50																								
			839+ to 842+				300	400																						1200 Sq. Ft - Timber Cribbing (Type A)
			840+ to 847+		114		413							305		620													
			842+ to 893+				102	384																						1589 Sq. Ft - Timber Cribbing (Type B)
			847+00		44		83	39				1	3'-6"					86					6	3		1				1.5 Cu. Yd - Bedding Course Material
			847+																										
			855+00		39		76	96	1			1	3'-6"				①	64 30 6					7	3		1				1.5 Cu. Yd - Bedding Course Material
			855+ to 861+		111		399							295		600													
			856+90						1																					
			859+						1																					
			861+ to 865+		68		297							182		370													
			861+33		23		53	23				1	3'-6"					66					7	10		1				5 Cu. Yd. - Bedding Course Material
			863+ to 872+		175		632							468		950													
			869+						1																					
			865+00		20		37	23				1	3'-6"					70					7	3		1				1.5 Cu. Yd. - Bedding Course Material
			870+25		37		99	45				1	3'-6"					98					8	15		1				7.5 Cu. Yd. - Bedding Course Material
			870+						1																					
			881+						1																					
			889+ to 895+		107		387							286		580													
			894+						1																					
			895+00		56		114	58				/	3'-6"				②	170 72 16					8	3						1.5 Cu. Yd. - Bedding Course Material
			895+						1																					
			898+ to 902+		77		279							206		418													
			902+ to 907+		95		344							259		516													
			902+28		47		109	66										174					19	3		1				1.5 Cu. Yd. - Bedding Course Material
			903+						1																					
			905+						1																					
			908+37		38		56	59	1								③	166 20					20	3		1				1.5 Cu. Yd. - Bedding Course Material
			909+ to 912+		72		259							191		388													
			912+88		22		82	69	1									144					11	3		2				1.5 Cu. Yd. - Bedding Course Material
			918 + 87		37		83	50	1			1	3'-6"				①	166 42 8					7	3		1				1.5 Cu. Yd. - Bedding Course Material
			921+ to 924+		57		206							132		308													
			923+						1																					
			924+ to 931+		131		473							350		710													
			924 + 08		21		66	31				1	3'-6"					72					5	12		1				6 Cu. Yd. - Bedding Course Material
			931+70		34		62	41	1									120					9			2				
			932+ to 938+		112		407							300		610													

THE STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS–STATE OF COLORADO
DOH FORM NO. 125 (MYLAR)
REV. MARCH, 1977

STRUCTURE QUANTITIES

AS CONSTRUCTED			FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS ☐	REVISED ☐	VOID ☐	VIII	COLORADO	170-2(192)197	11

INDEX BOOK	INDEX PAGE	INDEX SHEET	LOCATION	UNCLASSIFIED EXCAVATION CUBIC YARD EXCAV.	EMB.	DITCH	STRUCTURE EXCAVATION CUBIC YARD	STRUCTURE BACKFILL CUBIC YARD CL. 2	REMOVAL OF STRUCTURE EACH	AGGREGATE BASE COURSE (CLASS 6) TON	HOT BITUMINOUS PAVEMENT (GRADING E) TON	INLET TYPE D (5 FOOT) EACH	"H"	FILTER MATERIAL (CLASS A) CU.YD.	8" NON-PERFORATED CSP LIN.FT.	8" PERFORATED CSP LIN.FT.	CORRUGATED STEEL PIPE LINEAR FEET 18"	24"	30"	36"	42"	"H" OVER CULV. FT.	DRY RUBBLE SLOPE AND DITCH PAVING CUBIC YARD	STEEL END SECTION EACH 18"	24"	30"	42"	36"	MISCELLANEOUS
			936+						1																				
			938 +						1																				
			938 + 50		25		52	42										① 68 40 8				8	3		2				1.5 Cu. Yd - Bedding Course Material
			939+ to 940+				100	300																					600 Sq. Ft - Timber Cribbing (Type A)
			940+ to 944+		70		257							187		380													
			944 + 50		19		43	29	1			1	3'-6"					68				4	3		1				1.5 Cu. Yd. - Bedding Course Material
			945+ to 948+		65		239							173		350													
			~~948+~~																										
			948 + 80		42		94	54	1			1	3'-6"					② 66 36 4				7	7		1				3.5 Cu. Yd - Bedding Course Material
			951 +						1																				
			953 + 50		40		87	44				1	3'-6"					② 64 28 8				5	4		1				2 Cu. Yd. - Bedding Course Material
			958 +						1																				
			958 + 69	10	38		90	48											106			6				2			
			963+ to 968+		92		333							246		500													
			963 + 10		13		43	29	1									64				4			2				
			970 + 40		186		350	168													③ 186 110		25	8			1		4 Cu. Yd. - Bedding Course Material
			970 +						1																				
			972+						1																				
			973+ to 978+		78		283							207		420													
			978 +						1																				
			978 + 10		16		29	23				1	3'-6"					70				8	3		1				1.5 Cu. Yd. - Bedding Course Material
			979+ to 982+		56		200							198		300													
			982 + 60		16		63	44	1			1	4'-6"							80		7	8					1	4 Cu. Yd. - Bedding Course Material
			985+						1																				
			985+55		15		39	29				1	3'-6"					68				5	3		1				1.5 Cu. Yd. - Bedding Course Material
			986+ to 990+		83		300							222		450													
			990+ to 991+																										480 Sq. Ft. - Timber Cribbing (Type A)

THE STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS-STATE OF COLORADO
DOH FORM NO. 125 (MYLAR)
REV. MARCH, 1977

STRUCTURE QUANTITIES

AS CONSTRUCTED			
NO REVISIONS		REVISED	VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	I70-2(42)197	12

INDEX BOOK	INDEX PAGE	INDEX SHEET	LOCATION	UNCLASSIFIED EXCAVATION CUBIC YARD EXCAV.	UNCLASSIFIED EXCAVATION CUBIC YARD EMB.	UNCLASSIFIED EXCAVATION CUBIC YARD DITCH	STRUCTURE EXCAVATION CUBIC YARD	STRUCTURE BACKFILL CUBIC YARD CL. 2	REMOVAL OF STRUCTURE EACH	AGGREGATE BASE COURSE (CLASS 6) TON	HOT BITUMINOUS PAVEMENT (GRADING S) TON	INLET TYPE D (5 FOOT) EACH	INLET TYPE D (5 FOOT) "H"	FILTER MATERIAL (CLASS A) CU.YD.	6" NON-PERFORATED CSP LIN.FT.	8" PERFORATED CSP LIN.FT.	CORRUGATED STEEL PIPE LINEAR FEET 18"	24"	30"	36"	42"	"H" OVER CULV. FT.	DRY RUBBLE SLOPE AND DITCH PAVING CUBIC YARD	STEEL END SECTION EACH 18"	24"	30"	42"	36"	MISCELLANEOUS
			991+00		15		78	80									①	(72 (52 (39				6	3		2				1.5 Cu. Yd - Bedding Course Material
			991+						1																				
			992+					1	1																				
			995+00		52		112	59	1												94	5	9			1			4.5 Cu. Yd. - Bedding Course Material
			996+ to 999+		71		258							190		386													
			999+85		42		73	32				1	3'6"					68				5	3		1				1.5 Cu. Yd.- Bedding Course Material
			1000+						1																				
			1005+ to 1011+		89		320							236		480													
			1007 +						1																				
			1010+						1																				
			1011+00		65		106	95				1	3'6"					98				5			1				
			1011+ to 1014+		52		187							138		280													
			1014+						1																				
			1014+20		15		31	25				1	3'6"					82				8	6		1				3 Cu. Yd. - Bedding Course Material
			33+ to 45+ (E.B.)	1000	1000					●	●																		
			TOTALS	1,560	△5,178		12,241	2,983	35	●	●	17		6,972	120	14,164		112	2,538		106	80	390			121	10	27	2	2	1	

△ Carried to Earthwork Summary
● Carried to Surfacing Plan

① Requires 25° Elbows
② Requires 15° Elbows
③ Requires 5° Elbows
④ Requires 25° and 30° Elbows

AS CONSTRICTED			FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS [ ]	REVISED [ ]	VOID [ ]	VIII	COLORADO	170-7[illegible]2)197	13	

SURFACING PLAN

STATION	SOURCE	QUANTITY-TONS								HAUL-TON MILE							
		BASE COURSE		PMBB		SURFACE COURSE HOT BITUMINOUS PAVEMENT				BASE COURSE		PMBB		SURFACE COURSE HOT BITUMINOUS PAVEMENT			
		ABC CL.6 (HAUL)		CL.6		BOTTOM LAYER G.R.E		MIDDLE LAYER G.R.E		ABC CL.6		CL.6		BOTTOM LAYER G.R.E		MIDDLE LAYER G.R.E	
MAINLINE 838+00.00 to 879+97.00				9,030		1,969		1,969				21,569		7,863		7,863	
STR. NO. F-12-AL																	
									1,973 180								10,560 886
883+78.00 to 888+85.90(Proj) Bk=				498		182		182				2,407		880		880	
889+03.64(Surv) Ah. to 1000+95.99 Bk=				10,745		3,917		3,917				40,015		14,587		14,587	
1004+90.08 Ah. to 1015+58.14				1,026		374		374				2,630		959		959	
TEMPORARY DETOURS																	
812+ to 818+ (WB)		▲96							▲50	*587							*306
822+		▲50							▲30	*306							*189
33+ to 95+ (EB)		▲240							▲125	*279							*195
Guard Rail Widening				480		206		206	275			1,971		846		846	1,130
RECREATION TRAIL																	
200+00 to 206+25.01 Bk=	Stockpiles	▲44							▲119	*270							*733
0+00 Ah. to 29+08.5		▲204							▲553	*1,188							*3,219
29+08.5 to 29+35.5									▲6								*34
Str. F-12-AJ																	
29+35.5 to 30+18.95 Bk=	Wheeler Flats	▲6							▲16	*34							*89
27+66.85 Ah. to 49+08.5		▲150							▲407	*799							*2,166
49+08.5 to 49+35.5									▲6								*31
Str. F-12-BA																	
49+35.5 to 94+75.5		▲318							▲863	*1,490							*4,042
94+75.5 to 95+14.5									▲8								*34
Str. F-12-BB																	
95+14.5 to 98+26.29 Bk=		▲22							▲60	*93							*253
99+88.39 Ah. to 116+93.5		▲120							▲324	*483							*1,305
116+93.5 to 117+50.5									▲11								*43
Str. F-12-BC																	
117+50.5 to 126+57.5		▲64							▲173	*242							*657
126+57.5 to 127+02.5									▲9								*34
Str. F-12-BD																	
127+02.5 to 132+74.87 Bk=		▲41							▲109	*149							*395
133+74.87 Ah. to 194+57.80		▲476							▲1156	*1273							*3455
194+57.80 to 214+57.80		▲140							▲380	*313							*848
Estimated for Irregularities		▲193		1,688						*751		6860					
TOTALS		▲2,114		18,967		6,148		6,148	8,435 ▲1905	*8257		75,452		25,135		25,135	39,635 *17,968

Note: Stabilization Based on
1. CBRA 18 Kip = 185
2. Regional Factor = 3.0
3. Serviceability Index = 2.5
4. Subgrade R Value = 47-82

Strength Coefficients
5. Hot Bituminous Pavement = 0.44
6. Plant Mix Bituminous Base = 0.39

* Detour & Recreation Trail Quantities for Information Only
▲ Detour & Recreation Trail Quantities

AS CONSTRUCTED		
NO REVISIONS	REVISED	VOID

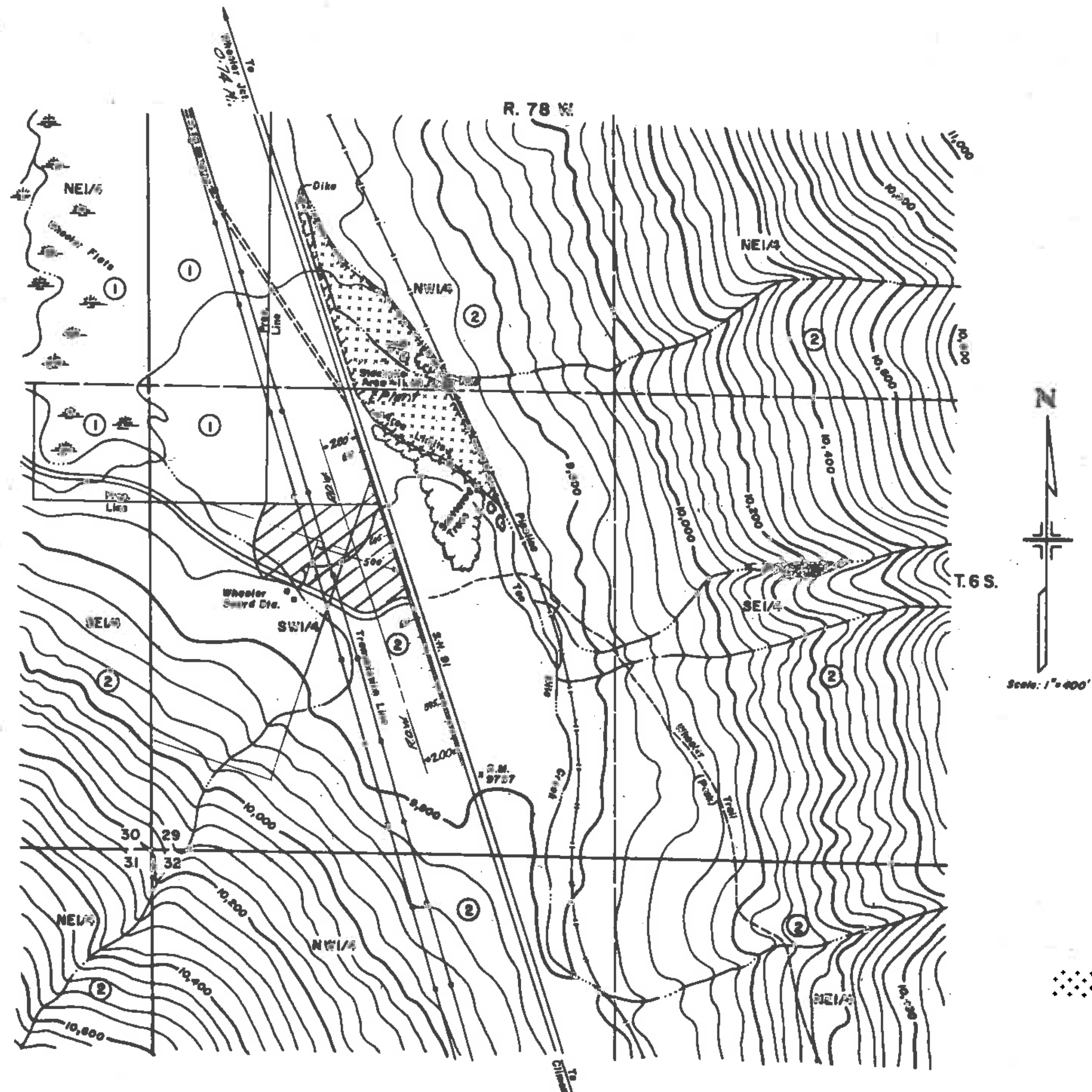
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	170-2(42)197	19	

WHEELER JUNCTION
STOCKPILE AREA

WHEELER JUNCTION STOCKPILE AREA

SUMMIT COUNTY, COLO.
T. 6 S., R. 78 W., 6th P. M.

USE: ABC, AGGREGATE FOR PMBB, HBP, PLANT MIX SEAL & TOPSOIL



OWNERSHIP LEGEND	
PARCEL NO.	OWNER
1	Copper Mountain Inc.
2	Arapahoe National Fore

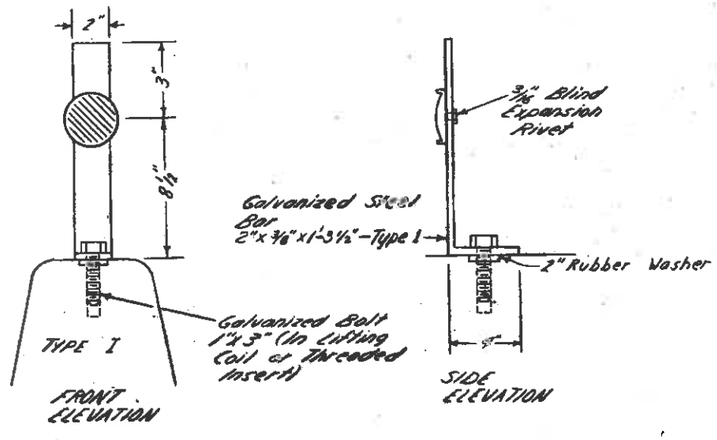
I 70-2(42)197 STOCKPILE AREA & PLANT AREA

AS CONSTRUCTED			FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS	REVISED	VOID	VIII	COLORADO	I70-2(82)197	16	

SEAL COAT

STATION (E.B. LANES)	SOURCE	QUANTITY-TONS SEAL COAT TYPE B TONS		HAUL - TON MILE SEAL COAT TYPE B TON-MILE	
823 + 00 to 878 + 22.62 Bk.	WHEELER JUNCTION STOCKPILE AREA	995		5,579	
878 + 34.33 Ah. to 942 + 63.44 Bk.		1,158		5,182	
942 + 72.35 Ah. to 965 + 91.76 Bk.		419		1,528	
966 + 07.10 Ah. to 1052 + 26.00		1,552		4,051	
7 + 27.00 to 39 + 00.00		564		1,113	
TOTALS		4,688		17,453	

DETAIL OF CONCRETE BARRIER DELINEATOR



For Rubber information see Standard S-612-SIA and Guard Rail Details

DELINEATORS

STATION	SIDE	SPACING	TYPE I EACH		TYPE I BARRIER EACH	
TEMPORARY DETOUR(EB to WB)						
312+72.91 to 318+99.05	Both	5°00'	14			
MAINLINE						
858+16.01 to 859+06.54	Both	0°30'	18			
859+06.54 to 876+19.87	Both	5°00'	16		2	
876+19.87 to 894+62.69	Both	3°00'	6		8	
894+62.69 to 905+61.91	Both	Tangent	8			
905+62.91 to 921+98.15	Both	5°00'	20			
921+98.15 to 937+28.55	Both	5°00'	18			
937+28.55 to 959+87.03	Both	2°00'	20			
959+87.03 to 975+78.87	Both	5°00'	12		4	
975+78.87 to 990+20.65	Both	4°00'	16			
990+20.65 to 1006+63.08	Both	4°00'	14			
1006+63.08 to 1015+58.14	Both	3°00'	10			
TEMPORARY DETOUR(WB to EB)						
138+00 to 143+19.72	Both	3°45'	14			
TOTALS			*186		^14	

Delineators to be placed 6' from shoulder

*Includes 75 Yellow Type I for Median Side
^Includes 11 Yellow Type I Barrier for Median Side

Note: Reflectors are to be placed on the back side of existing Median Side Delineators for facing westbound traffic while detouring over the East Bound lanes. It is estimated that: 130 Crystal Type I, 7 Crystal Type I Barrier, and 6 Crystal Type III reflectors will be required for this project

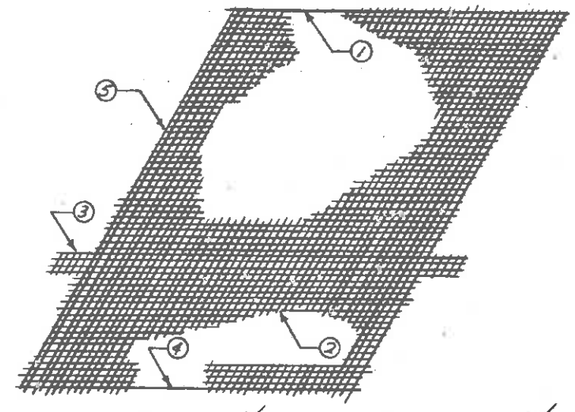
FEDERAL ROAD DESIGN NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	170-2(42)197	16	

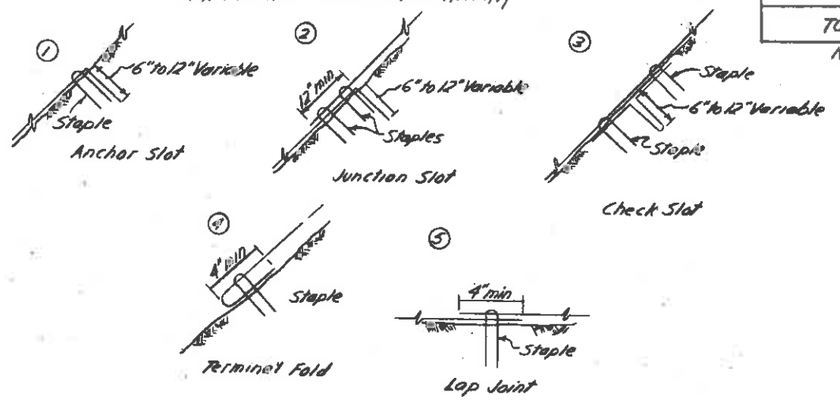
AS CONSTRUCTED			
NO REVISIONS		REVISED	VOID

MULCH NETTING

STATION TO STATION	SIDE	MULCH NETTING SQ. YDS.	
838+00 to 839+50	Lt.	1,517	
839+50 to 840+00	Lt.	128	
839+50 to 845+50	Rt.	3,400	
840+00 to 841+50	Lt.	150	
853+50 to 854+50	Rt.	312	
854+50 to 855+50	Rt.	212	
855+50 to 859+50	Rt.	3,778	
859+50 to 861+50	Rt.	712	
890+50 to 893+50	Rt.	2,900	
898+82.85 to 899+82.85 898+82.85 to 912+00	Rt. Rt.	389 8,384	
918+50 to 919+50	Lt.	534	
918+50 to 919+50 919+50 to 923+50	Rt. Rt.	923 7,556	
925+50 to 929+00	Rt.	389	
925+90 to 926+45 926+45 to 929+00	Lt. Lt.	868 3,635	
929+00 to 929+50 929+50 to 930+20	Lt. Lt.	245 109	
932+65 to 935+65	Lt.	1,500	
937+42 to 939+42 939+42 to 940+00	Rt. Rt.	1,823 129	
940+00 to 942+65	Lt.	1,178	
944+60 to 947+67	Lt.	2,087	
950+50 to 951+50 952+50 to 953+50 955+50 to 957+50	Rt. Rt. Rt.	834 823 312	
963+50 to 964+50 964+50 to 965+50 966+50 to 967+50	Lt. Lt. Lt.	1,078 3,400 829	
969+70 to 970+70 970+70 to 971+70 971+70 to 974+70	Rt. Rt. Rt.	1,411 1,834 6,800	
873+65 to 978+00 978+00 to 980+65 980+65 to 979+65	Lt. Lt. Lt.	8,604 3,887 234	
983+65 to 984+65 984+65 to 987+65 987+65 to 988+65 984+15 to 985+65	Lt. Lt. Lt. Rt.	634 2,400 356 100	
987+75 to 990+75 990+75 to 991+75 991+75 to 992+75 992+70 to 993+70	Rt. Rt. Rt. Lt.	2,834 1,489 900 1,389	
993+70 to 994+00 996+00 to 996+50 996+50 to 999+75 999+75 to 1005+50	Lt. Lt. Lt. Lt.	321 435 5,817 4,023	
1005+50 to 1007+75 1008+20 to 1011+85 1013+00 to 1014+80 1015+25 to 1015+75	Lt. Lt. Lt. Lt.	5950 3881 1,100 100	
TOTAL		106,859	

MULCH NETTING





DESCRIPTION OF JOINTS AND SLOTS

Anchor Slot - Buried upper edge of Blanket

Junction Slot - Joint between upper and lower pieces. Upper piece overlapping buried end of lower piece

Check Slot - Extra piece of Blanket folded lengthwise and buried perpendicular to the slope. Continuous upper piece overlaying the unfolded portion remaining above ground. (To be used where directed)

Terminal Fold - Bottom edge of Blanket, folded under and stapled

Lap Joint - Overlap joint between two rolls, running down the slope

SOIL RETENTION BLANKET (JUTE)

STATION	SIDE	JUTE SQ. YDS.	
MAINLINE			
838+00 to 839+50	Lt.	2,167	
860+00 to 873+00	Lt.	1,445	
889+03 to 898+00	Lt.	997	
913+00 to 929+50	Lt.	1,834	
933+60 to 936+00	Lt.	334	
939+50 to 947+50	Lt.	889	
954+00 to 967+50	Lt.	1,500	
973+50 to 989+50	Lt.	1,778	
992+50 to 994+50	Lt.	223	
995+50 to 1000+96	Lt.	607	
1004+90 to 1011+30	Lt.	734	
1012+50 to 1015+58	Lt.	343	
TOTAL		12,851	

NOTE: All cut slope ditches shall have soil retention blanket (Jute) applied to control erosion.

SOIL RETENTION BLANKET (JUTE)

STATION	SIDE	JUTE SQ. YDS.	
MAINLINE			
872+50 to 874+50	Rt.	1,057	
874+50 to 878+50	Rt.	5,245	
885+50 to 890+30	Rt.	6,723	
From Ditch Tab. Above		12,851	
TOTAL		25,886	

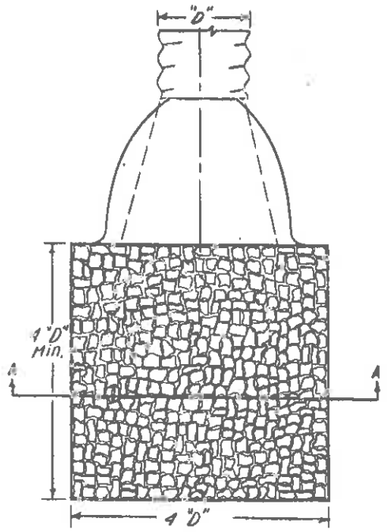
HIGHWAYS, STATE OF COLORADO
NO. 136
1977

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-7(123)187	17	

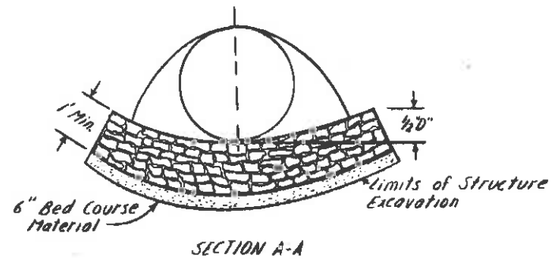
AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

DETAIL OF DRY RUBBLE SLOPE & DITCH PAVING



PLAN



SECTION A-A

Stone Size = 12"

GUARD RAIL

STATION			SIDE	GUARD RAIL TYPE "B" LIN. FT.		VB FEET
*838+98.0	to	845+52.0*	RT	704		4
*853+98.0	to	861+52.0*	RT	804		4
*872+45.0	to	879+97.00△	RT	752		4
*878+49.0	to	879+97.00△	LT	152		4
△883+78.0	to	893+47.74**	RT	962		4
△883+78.0	to	885+30.0*	LT	152		4
*898+53.0	to	912+97.0*	RT	◎1,394		4
*918+43.0	to	923+97.0*	RT	◎504		4
*937+93.0	to	941+27.0*	RT	◆384		4
*969+50.0	to	975+09.0*	RT	559		4
*987+68.0	to	992+62.0**	RT	◎494		4
TOTAL				2,572		

* Includes 12' Transition Section
△ Connect to Bridge Rail
▣ 72 Foot Flare on Approach End
◎ (Precast-Portable) (Colored)
◆ Future Guard Rail

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	PROJECT NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	18	

AS CONSTRUCTED

NO REVISIONS ____ REVISED ____ VOID ____

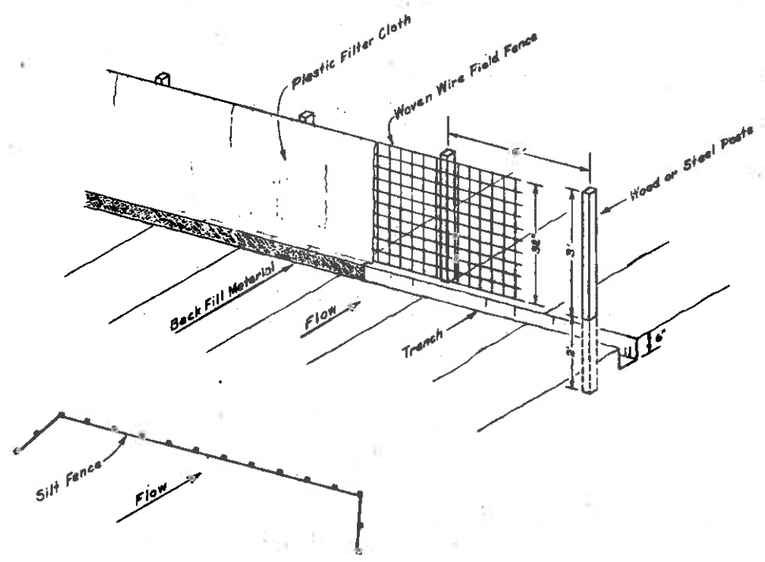
SILT FENCE

STATION			SIDE	SILT FENCE Lin. Ft.	
* 846+	to	848+	Rt.	200	
* 856+	to	857+	Rt.	180	
* 864+	to	865+	Rt.	180	
* 869+	to	870+	Rt.	100	
* 875+	to	876+	Lt.	90	
* 880+	to	881+	Lt.	130	
* 882+	to	883+	Lt.	110	
* 894+	to	895+	Rt.	120	
901+	to	903+	Rt.	140	
908+	to	909+	Rt.	120	
911+	to	912+	Rt.	100	
932+	to	933+	Rt.	140	
937+	to	939+	Rt.	120	
948+	to	949+	Rt.	100	
953+	to	954+	Rt.	100	
990+	to	992+	Rt.	140	
999+	to	1000+	Rt.	100	
1010+	to	1011+	Rt.	140	
TOTAL				1,200	

Note: See Alignment Sheets for Approximate Locations.

* Placed by others, to be removed on this project as subsidiary item.

DETAIL OF SILT FENCE



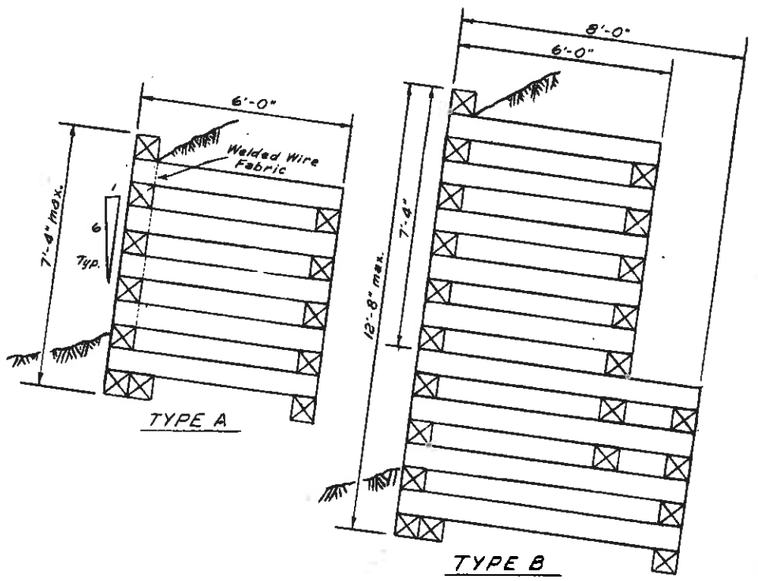
AS CONSTRUCTED								
NO REVISIONS		REVISED		VOID				

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	19	

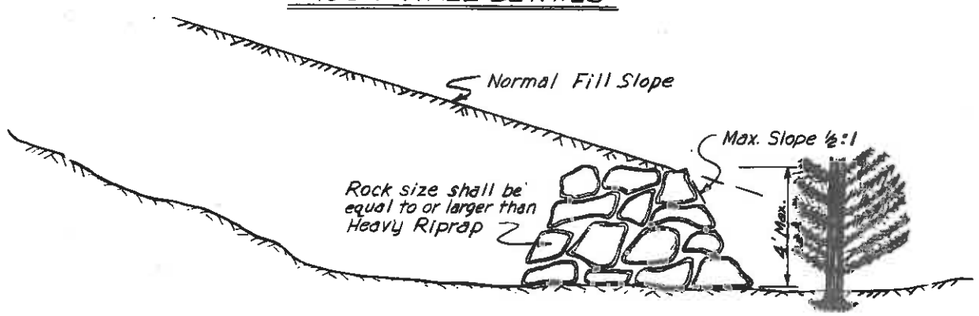
TIMBER CRIB WALL DETAILS

NOTES

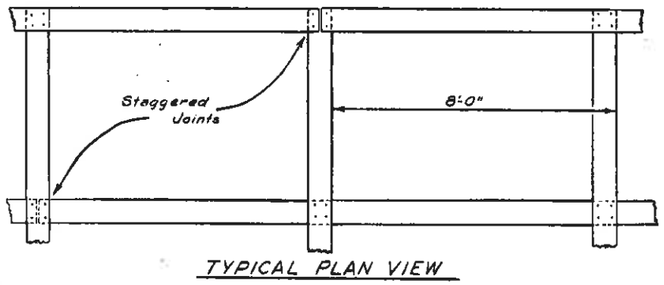
1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
2. ALL CRIBS TILT BACK TO FILL @ 2":12"
3. STABILITY COMPUTATIONS BASED ON 1-1/2:1 BACKSLOPE.
4. ALL TIMBER AND DRIFT PINS WILL BE STATE FURNISHED. TIMBER SHALL BE CUT AND REDRILLED TO FIT.
5. DRIFT PINS & HOLES TO BE 3/4" ø.
6. ALL STRETCHERS TO BE LAID HORIZONTAL.
7. FILL WITHIN CRIBS & BEHIND CRIBS CONSISTS OF SAND, SAND & GRAVEL, OR OTHER FREE DRAINING GRANULAR MATERIAL PLACED IN 6" LAYERS AND COMPACTED WITH VIBRATORY COMPACTORS.
8. SOIL WEIGHT ASSUMED TO BE 125#/FT^3.
9. EQUIVALENT SOIL FLUID PRESSURE 30#/FT^3.
10. WELDED WIRE FABRIC SHALL HAVE A MAXIMUM GRID OPENING OF 2" X 1" AND SHALL BE FABRICATED WITH 14 GAUGE GALVANIZED WIRE. WIRE FABRIC SHALL BE FURNISHED BY CONTRACTOR. PAYMENT WILL BE INCLUDED IN "PLACE TIMBER CRIBBING."
11. THE WELDED WIRE FABRIC SHALL BE FASTENED TO THE TIMBER STRETCHES BY STAPLING IN HORIZONTAL ROWS WITH A MINIMUM OF FIVE STAPLES PER ROW. STAPLES WILL BE 2" CEMENT COATED, BARBED. THE WELDED WIRE FABRIC SHALL BE STAPLED AT THE TOP AND BOTTOM STRETCHES AND AT ALTERNATE INTERMEDIATE STRETCHERS. IF THE WIRE IS TO BE OVERLAPPED, THE MINIMUM OVERLAP SHALL BE FOUR INCHES.



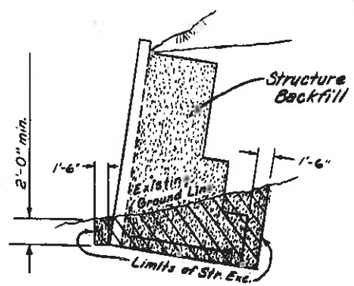
ROCK WALL DETAILS



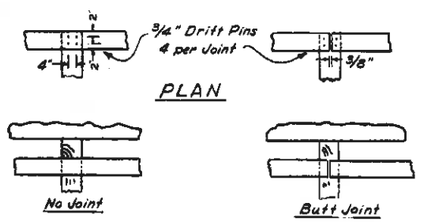
NOTE : Rock wall construction will be paid for under appropriate equipment hours where directed.



TYPICAL PLAN VIEW



STR. EXC. & BACKFILL DETAIL



PLAN

ELEVATION

HIGHWAYS STATE OF COLORADO
NO 126
977

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	20	

AS CONSTRUCTED

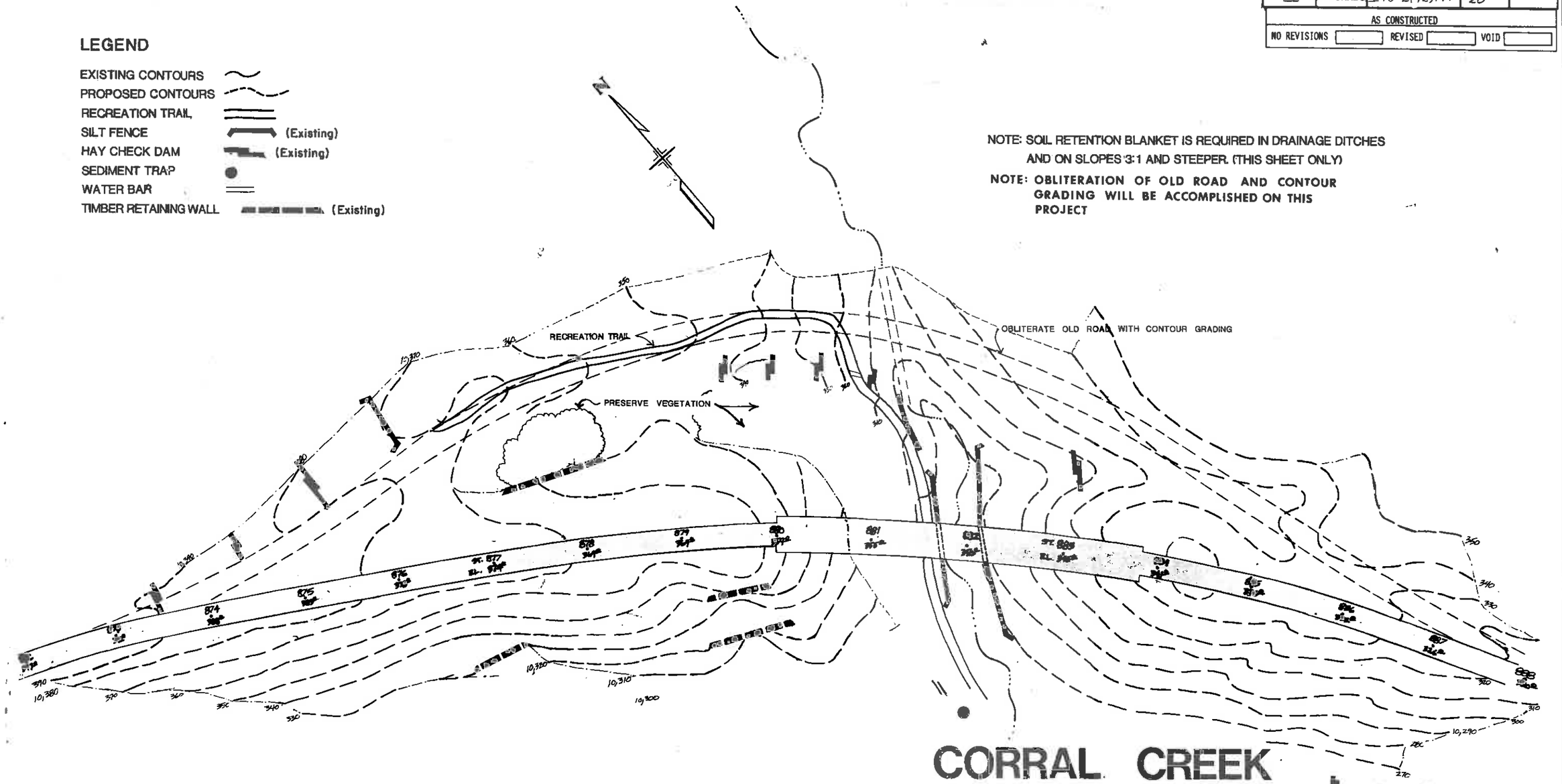
NO REVISIONS ☐ REVISED ☐ VOID ☐

LEGEND

EXISTING CONTOURS
PROPOSED CONTOURS
RECREATION TRAIL
SILT FENCE (Existing)
HAY CHECK DAM (Existing)
SEDIMENT TRAP
WATER BAR
TIMBER RETAINING WALL (Existing)

NOTE: SOIL RETENTION BLANKET IS REQUIRED IN DRAINAGE DITCHES AND ON SLOPES 3:1 AND STEEPER. (THIS SHEET ONLY)

NOTE: OBLITERATION OF OLD ROAD AND CONTOUR GRADING WILL BE ACCOMPLISHED ON THIS PROJECT



CORRAL CREEK

landscape · erosion control plan

SCALE: 0 50' 100' 150'

GHWAYS, STATE OF COLORADO
O 126
574

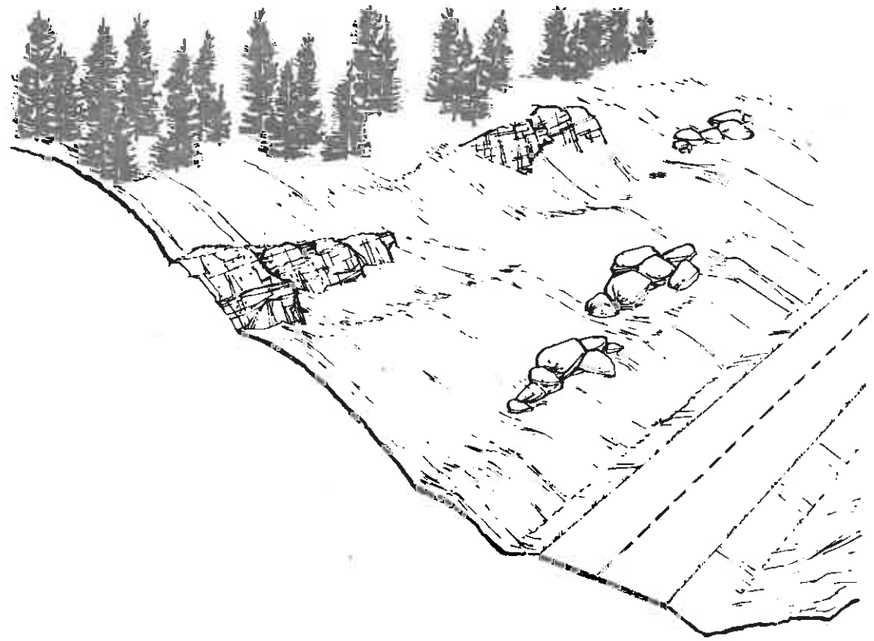
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	21	

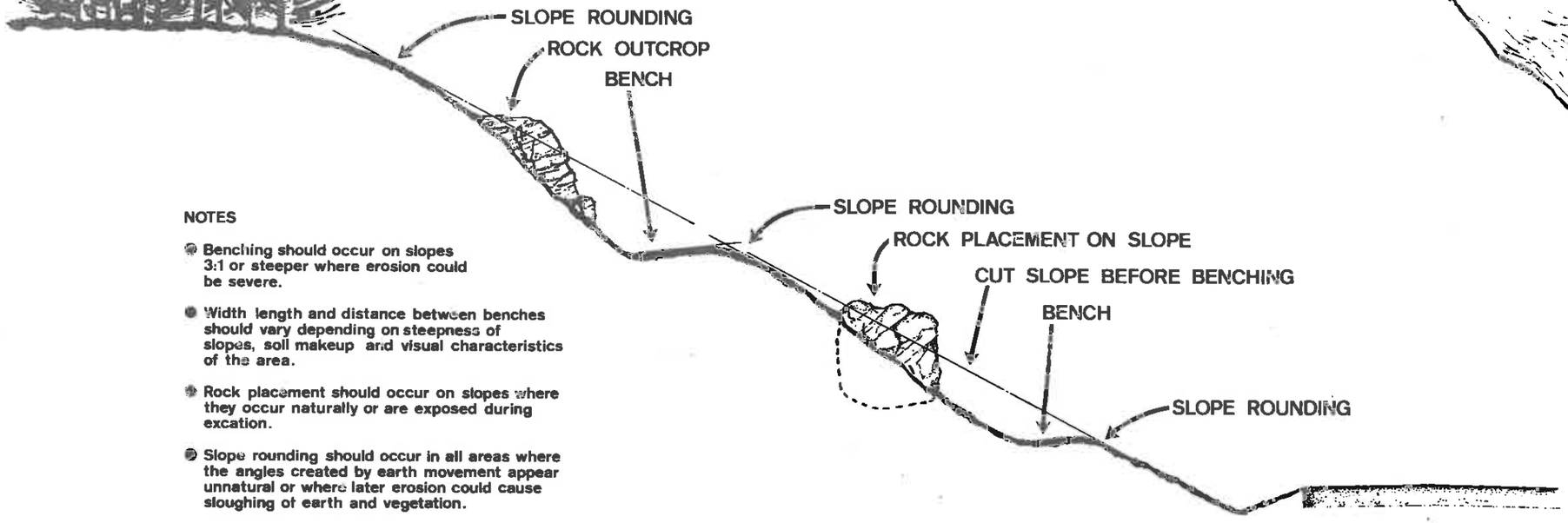
AS CONSTRUCTED

NO REVISION ☐ REVISED ☐ VOID ☐

BENCHING, ROCK PLACEMENT AND ROUNDING

AREA OF SELECTIVE THINNING





NOTES

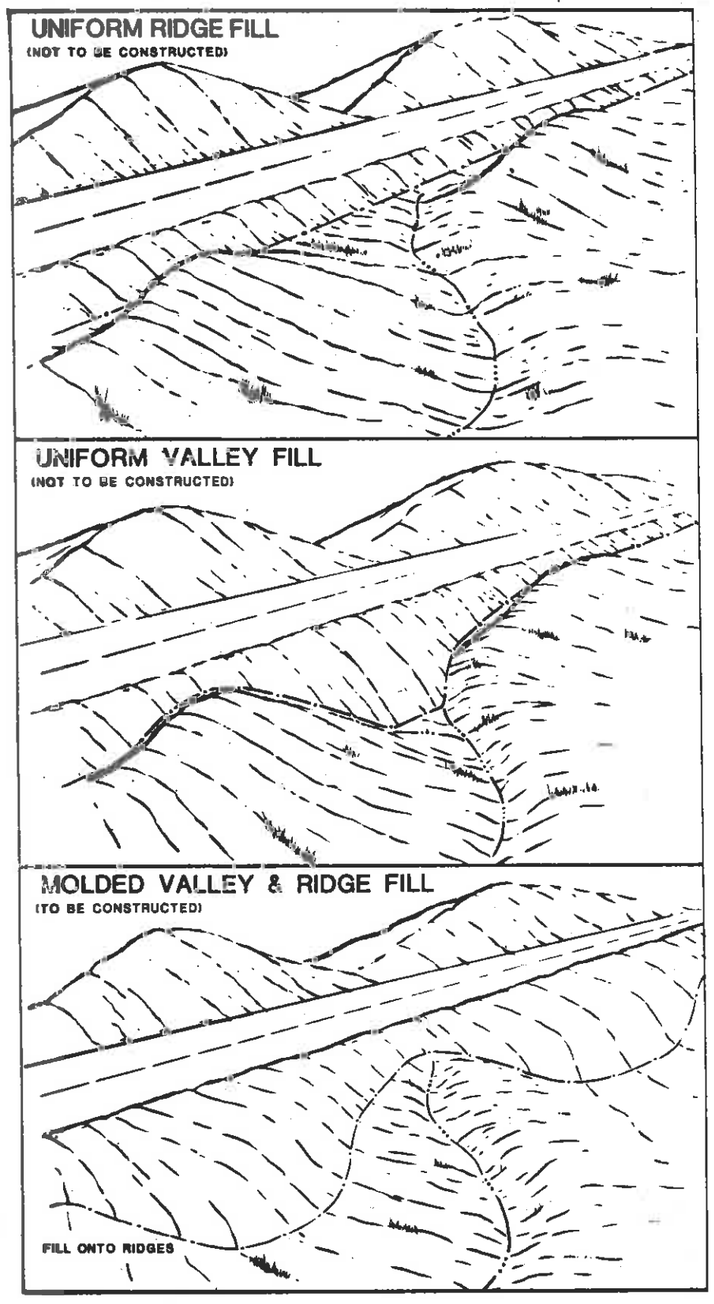
- Benching should occur on slopes 3:1 or steeper where erosion could be severe.
- Width length and distance between benches should vary depending on steepness of slopes, soil makeup and visual characteristics of the area.
- Rock placement should occur on slopes where they occur naturally or are exposed during excation.
- Slope rounding should occur in all areas where the angles created by earth movement appear unnatural or where later erosion could cause sloughing of earth and vegetation.
- Concepts shown on this sheet will be accomplished and paid for as part of earthwork operations except rock placement and selective thinning which will be paid for under Landscaping Special Effects (Force Account)

LANDSCAPE SLOPE MOLDING

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)197	22	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

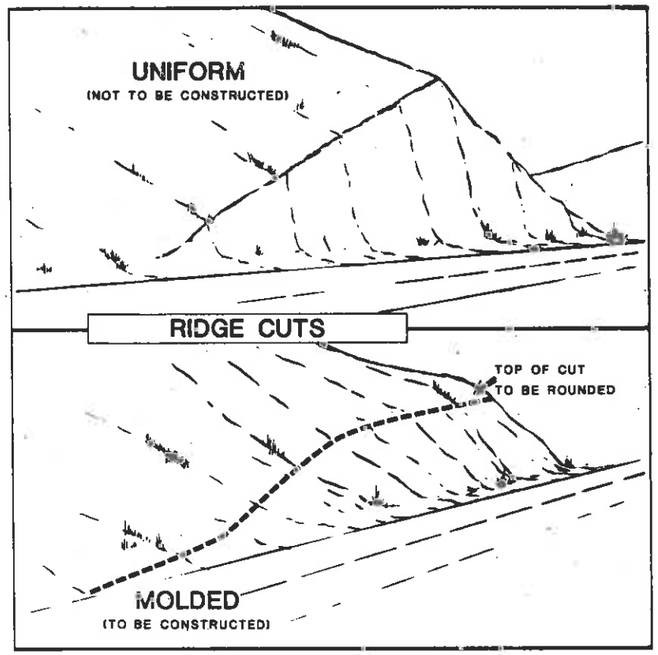


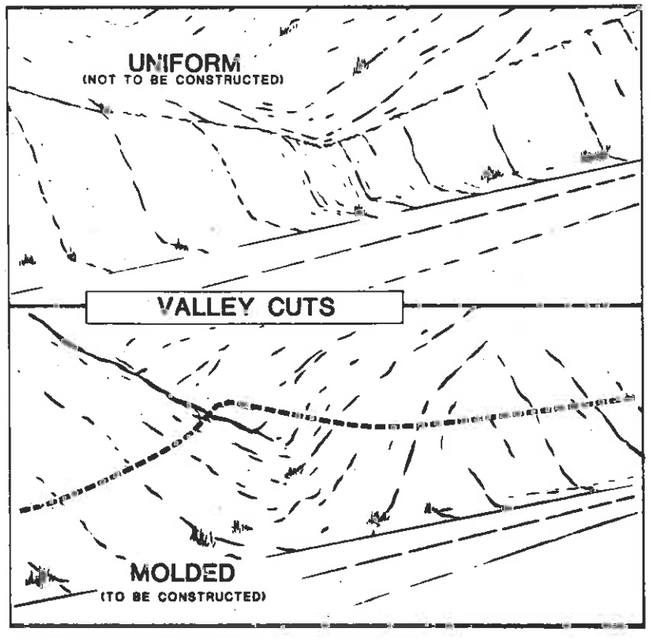
STATION	LANDFORM	RECOMMENDED SLOPE TREATMENT
876-877+, RT.	RIDGE	TIMBER CRIB WALL
880, 884, RT.	RIDGE	SEE DETAIL SHEET (CORRAL CREEK, LANDSCAPE-EROSION CONTROL PLAN)
886, RT.	RIDGE	SEE DETAIL SHEET (CORRAL CREEK, LANDSCAPE-EROSION CONTROL PLAN)
910+84-911+50, RT.	RIDGE	TIMBER CRIB WALL
913+90, LT.	RIDGE	ROCK BENCH (1)
914+42, LT.	VALLEY	ROCK BENCHES (2)
914+93, LT.	RIDGE	NO BENCH, ROUGHEN FACE
915+45, LT.	VALLEY	ROCK BENCHES (2)
915+96, LT.	RIDGE	ROCK BENCH (1)
916+99, LT.	VALLEY	ROCK BENCHES (2)
918+02, LT.	RIDGE	NO BENCH, ROUGHEN FACE
919+04, LT.	VALLEY	ROCK BENCHES (3)
920+06, LT.	RIDGE	NO BENCH, ROUGHEN FACE
921+07, LT.	RIDGE	ROCK BENCH (1)
922+07, LT.	RIDGE	NO BENCH, ROUGHEN FACE
923+07, LT.	VALLEY	ROCK BENCHES (2)
924+07, LT.	VALLEY	ROCK BENCHES (3)
924+32, LT.	RIDGE	NO BENCH, ROUGHEN FACE
924+57, LT.	VALLEY	ROCK BENCHES (3)
925+08, LT.	RIDGE	ROCK BENCH (1)
925+71, LT.	VALLEY	ROCK BENCHES (3)
926+09-926+80, LT.	RIDGE	SLOPE CONTOUR GRADING
927+10, LT.	VALLEY	VALLEY CUT
928+12-929+13, LT.		SLOPE CONTOUR GRADING
945+16-946+17, LT.	VALLEY	VALLEY CUT
947+17, LT.	RIDGE	RIDGE CUT
964-967, LT.	RIDGE	CONTOUR GRADE SLIDE AREA
968+15-972+19, LT.		CONTOUR GRADE STOCKPILE AREA
971+ - 974+, RT.	RIDGE	TIMBER CRIB WALL
974+ - 980, LT.	RIDGES	RIDGE CUT, CONTOUR GRADING
980+15, LT.	VALLEY	VALLEY CUT
984+17, LT.	VALLEY	VALLEY CUT
984+67-985+17, LT.	RIDGE	RIDGE CUT
985+67, LT.	VALLEY	VALLEY CUT
986+23-988+23, LT.	RIDGE	RIDGE CUT
989+23, LT.	VALLEY	VALLEY CUT
993+17-994+17, LT.	RIDGE	RIDGE CUT
997+, LT.	VALLEY	VALLEY CUT
998+, LT.	RIDGE	RIDGE CUT
999-1001, LT.	RIDGE	REMOVE RIDGE, USE VALLEY CUT CONCEPT
1005-1006, LT.	RIDGE	RIDGE CUT
1006-1006+75, LT.	VALLEY	VALLEY CUT
1006+75-1008+75, LT.	RIDGE	RIDGE CUT, ROCK BENCH (1)
1009-1015		CONTOUR GRADING
1013-1014	RIDGE	RIDGE CUT

GENERAL NOTES:

DRAINAGE ——— ··· ——— TOE OF FILL ——— · ——— TOP OF CUT ▬▬▬▬▬

1. INFORMATION SHOWN ON THIS SHEET IS CONCEPTUAL, AND DOES NOT REPRESENT EXACT LINES, DIMENSIONS, OR LOCATIONS OF RESPONSIBILITY.
2. THESE DESIGN IDEAS WILL BE INCLUDED IN THE INITIAL PROJECT STAKING SO THAT THEY MAY BE IMPLEMENTED AS A PART OF NORMAL EXCAVATION PROCEDURES.
3. ADDITIONAL WORK PERFORMED FOR LANDSAPING PURPOSES WILL BE PAID FOR UNDER APPLICABLE CONTRACT UNIT PRICE.





HIWAYS, STATE OF COLORADO
NO. 138
77

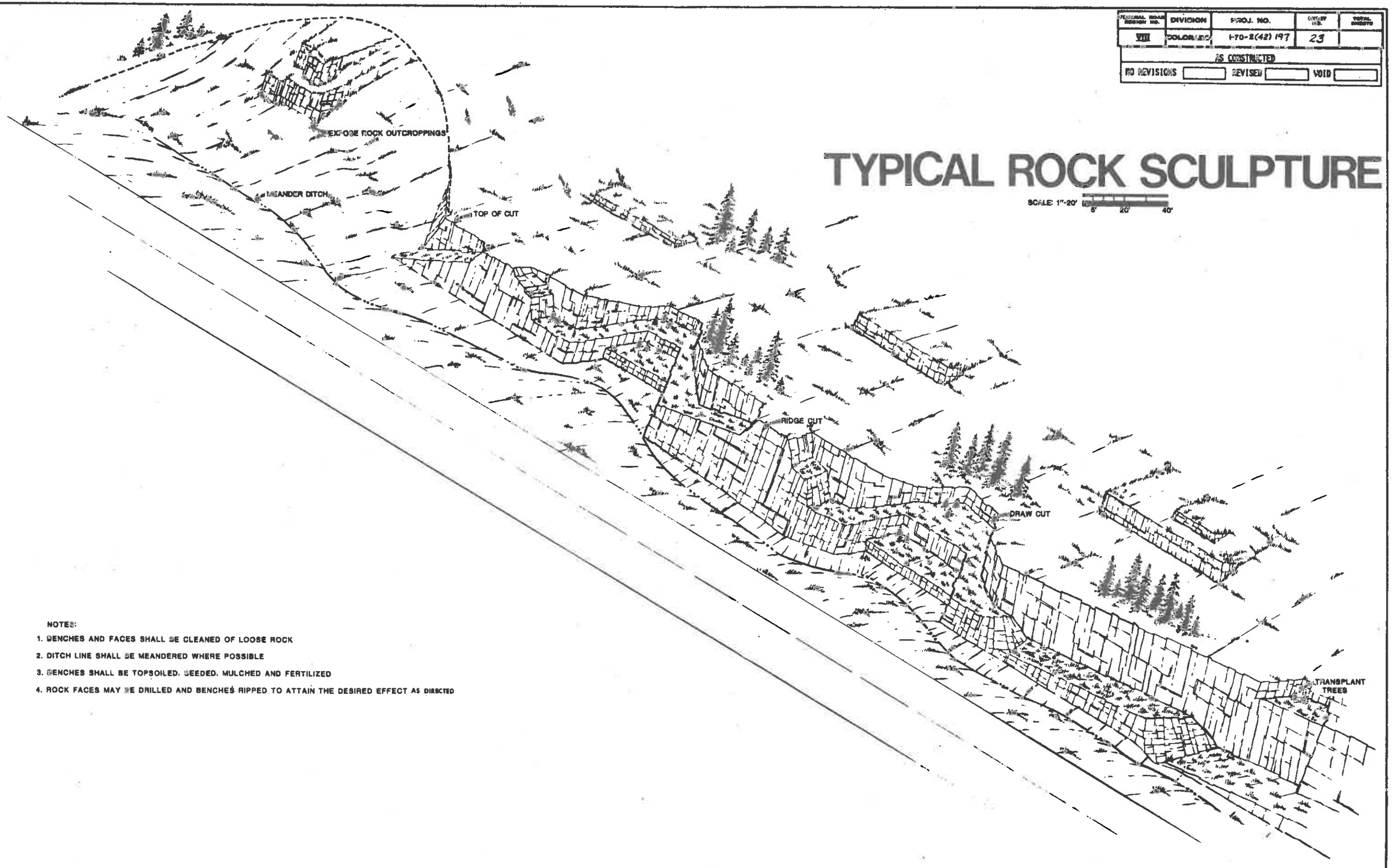
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	COUNTY NO.	TOTAL SHEETS
VII	COLORADO	I-70-2(42) 197	23	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

TYPICAL ROCK SCULPTURE

SCALE: 1"-20'
0' 20' 40'



NOTES:

1. BENCHES AND FACES SHALL BE CLEANED OF LOOSE ROCK
2. DITCH LINE SHALL BE MEANDERED WHERE POSSIBLE
3. BENCHES SHALL BE TOPSOILED, SEEDED, MULCHED AND FERTILIZED
4. ROCK FACES MAY BE DRILLED AND BENCHES RIPPED TO ATTAIN THE DESIRED EFFECT AS DIRECTED

FEDERAL ROAD PROJECT NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	24	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

STA. 838+00.0 Begin I70-2(42)197 =
STA. 838+00.0 on I 70-2(45)194

Curve Data
Detour - Both Curves
Δ = 13°52'8.9"
T = 139.373'
D_c = 5°00'
L_c = 277.383'
R_c = 1145.916'

W.B.
Δs 34°09'00" Lt.
Ts, 833.22'
Ts2 767.36'
Δc 21°24'
Dc 3°00'
Tc 360.87'
Lc 713.33'
Rc 1909.859
S = 0.078'/Ft.
MOS = 70 m.p.h.
SSD > 900'
Θs, 7°30'
Ls1 500'
LT.1 333.63'
S.T, 166.94'
Θs2 5°15'
Ls2 350'
LT.2 233.44'
S.T2 116.76'

E.B.
Δs 28°59'00" Lt.
Ts 1334.91'
Es 151.47'
Δc 25°14'
Dc 1°15'
Tc 1025.97'
Lc 2018.67'
Rc 4583.662'
S = 0.056'/Ft.
MOS = 60 m.p.h
SSD > 900'
Θs 1°52'30"
Ls 300'
LT 200.01'
S.T. 100.01'

812+ to 818+ (WB) = Req'd Temporary Detour, Extend Existing 24"x 150' CSP at Sta 814+42 (EB) 30' Lt and Reset End Section Lt

812+ to 818+ (WB) = Remove Temporary Detour, Remove Previously Placed 24"x 30' CSP Extension at Sta 814+42 (EB), Reset End Section to Original Position

833+ (EB) to 838+ (WB) = Req'd Temporary Approach WB to EB and Remove

839 + to 842 + ea Req'd Timber Cribbing Rt. (Type A)

PT 318 + 99.05 Detour 12' Rt at POT 817+87.78 (EB)

PC 316 + 21.66

PT 314 + 12.28

82'± 30.00' Lt. Rd 20+00 (Lt. Rd)

PC 312 + 72.91 (Detour 12' Lt of POT 812+72.91 (WB))

P.I. 317+61.04

P.I. 315 + 50.29

P.T. 809+50.41

S 24°40' E

S 19°30' E

N 09°29' W.

Vail Pass Rest Area

Recreation Trail

TEN MILE

PINE WILLOW

BRUSH & WILLOW

STA. 823+00 Begin E.B. (P.M. Seal)

STA 200+00 Begin Recreation Trail
Approx. 250' Rt of Sta. 830+80 (EB)

TBM # 25 WBL EL = 10,595.383, Book No. 31787

TBM # 27 WBL - EL = 10,571.366, Book No. 31787

BM # 1 WBL - EL. = 10,563.25, Book No. 31644
BM # 2 EBL - EL. = 10,549.64, Book No. 31641
BM # 2 WBL - EL. = 10,548.52, Book No. 31644

AS CONSTRUCTED	FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS ☐ REVISED ☐ VOID ☐	VIII	COLORADO	I 70-2(42)197	25

Factor
Uncl. Exc.
Embankment
Emb. x Factor
Yd. Mi. Haul

AS CONSTRUCTED

NO REVISIONS | REVISED | VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	26	

840+ to 845+ ∽ Req'd 8" x 500' Perforated C.S.P. Rt. of Recreation Trail.

840+ to 847+ ∽ Req'd 8" x 620' Perforated C.S.P. Lt. & Connect to Type "D" Inlet (Sta. 847+00 Lt.)

842+ to 843+ ∽ Req'd Timber Cribbing Rt. (Type B)

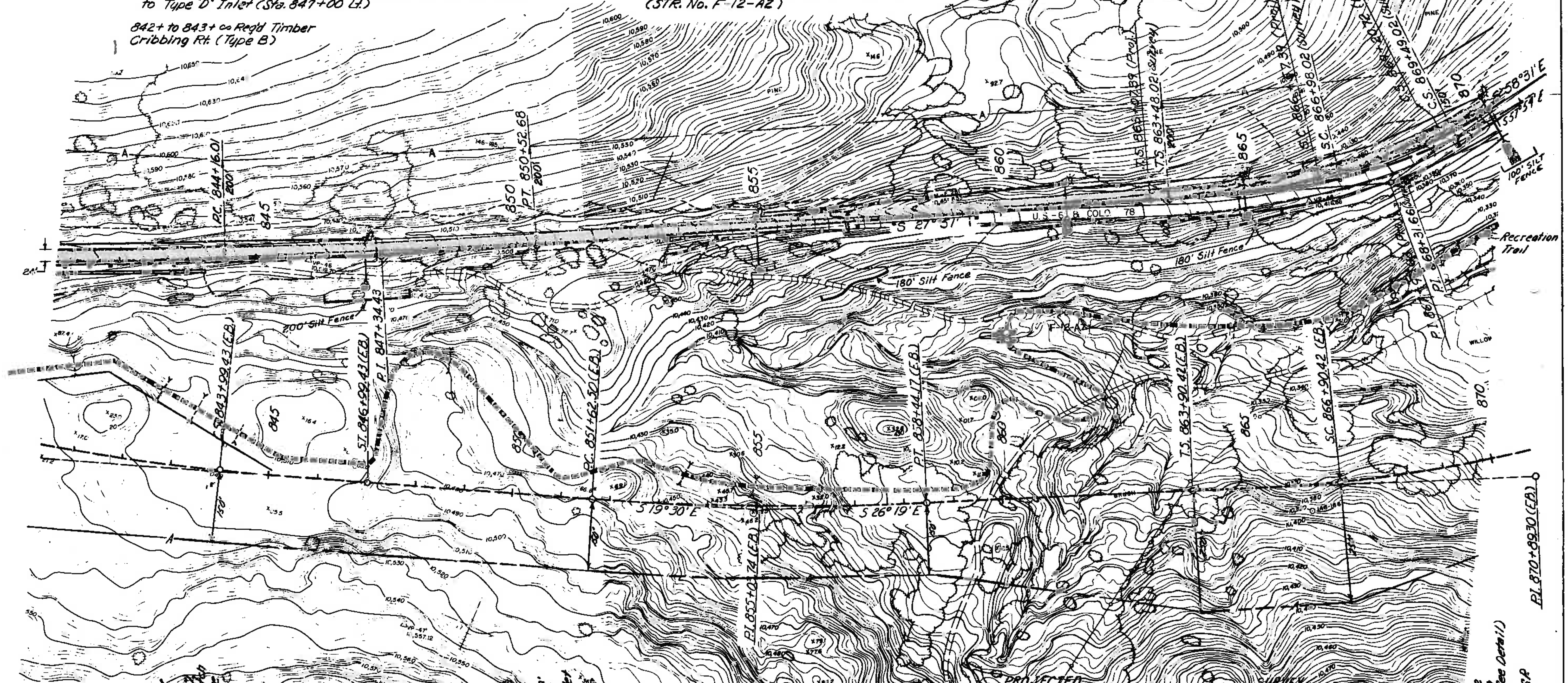
855+ to 861+00 ∽ Req'd 8" x 600' Perforated C.S.P. Lt. & Connect to Type "D" Inlet (861+33 Lt.)

861+ to 865+ ∽ Req'd 8" X 370' Perforated C.S.P. Lt. & Connect to Type "D" Inlet (865+00 Lt.)

863+ to 872+ ∽ Req'd 8" X 950' Perforated C.S.P. Rt.

859+ to 860+ ∽ Req'd Heavy Riprap around Bridge Abutments on Recreation Trail. (STR. No. F-12-AZ)

866+ to 873+ ∽ Req'd 8" x 700' Perforated C.S.P. Lt. of Recreation Trail and Connect to 8" x 20' Non-Perforated C.S.P. Cross Culvert under Recreation Trail.



847+00 ∽ Req'd 24" x 88' CSP Cross Culvert, End Section Rt., Type D Inlet (H=3'-6"), Dry Rubble Slope and Ditch Paving Rundown Rt., Dike Lt. (See Details)

Δc	3°11'00" Lt.
Dc	0°30'
Tc	318.42'
Lc	636.67'
Rc	11,459.156
Ec	4.42'
TL	200.00'
e	0.015 '/Ft.
M.D.S.	= 60 mph
S.S.D.	> 600'

847+ ∽ Remove 24" CSP W/Hd'wall

855+00 ∽ Req'd 24" x 100' C.S.P. Cross Culvert, End Section Rt., Type "D" Inlet (H=3'-6"), Dry Rubble Slope and Ditch Paving Rundown Rt., Dike Lt. (See Details)

856+90 ∽ Remove 24" C.S.P. w/ Hd'wall.
859+ ∽ Remove 24" C.S.P. W/Hd'wall.
861+33 ∽ Req'd 24" x 66' C.S.P. Cross Culvert, End Section Rt., Type D Inlet (H=3'-6"), Dry Rubble Slope and Ditch Paving Rundown Rt., Dike Lt. (See Details)
864+ ∽ Remove 24" C.S.P. w/ Hd'wall.
865+00 ∽ Req'd 24" x 70 C.S.P. Cross Culvert, End Section Rt., Type D Inlet (H=3'-6"), Dry Rubble Slope and Ditch Paving Rundown Rt., Dike Lt. (See Details)

PROJECTED

Δ	30°40'00" Lt.	θs	8°45'
Ts	490.29'	Ls	350'
Es	46.89	LT.	233.62'
		ST.	116.93'
Δc	13°10'		
Dc	5°00'	e	= 0.060'/Ft.
Tc	132.18'	M.D.S.	= 60 M.P.H.
Lc	263.33'	SSD	= > 600
Rc	1145.916'		

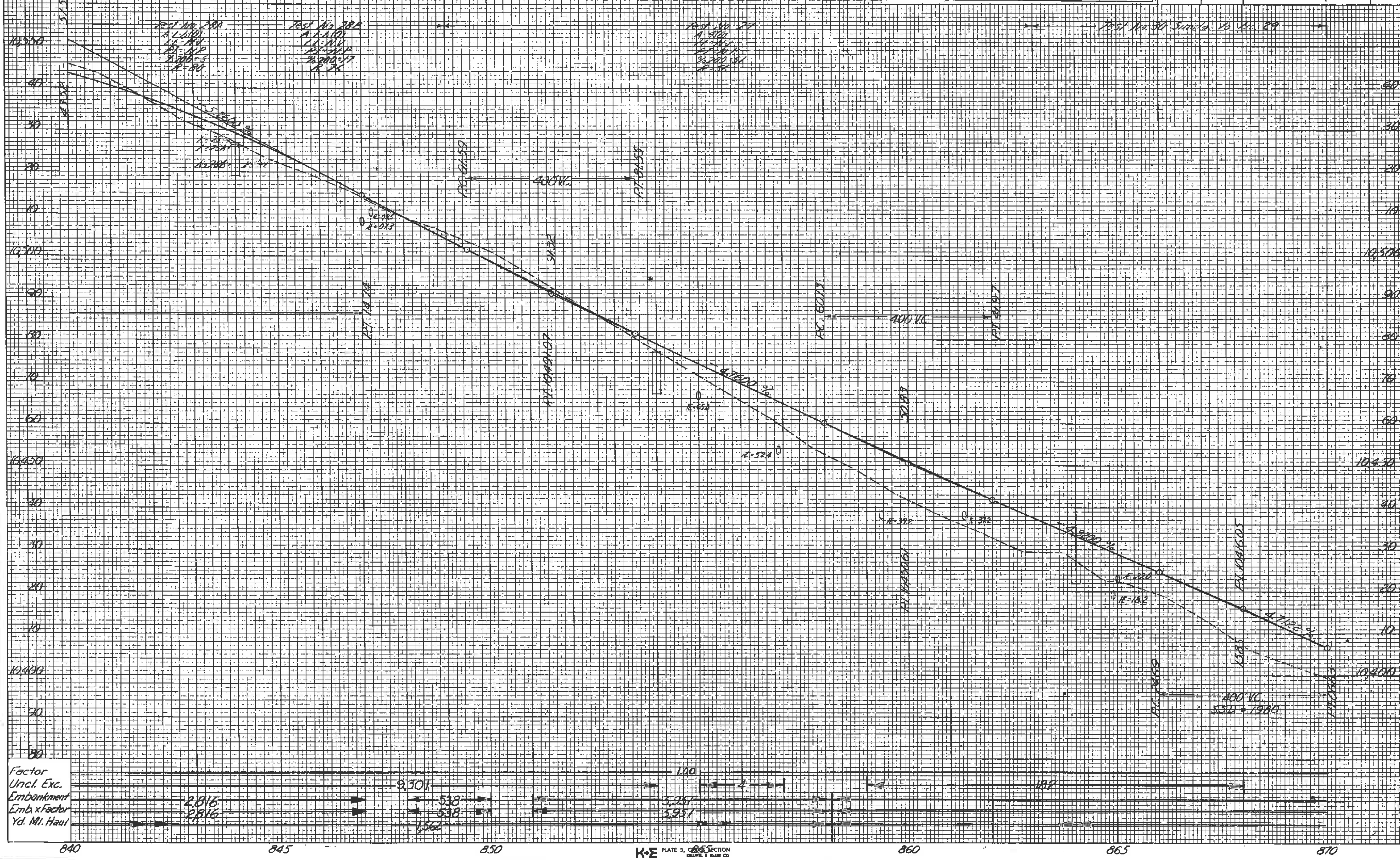
SURVEY

Δ	30°03'00" Lt.	θs	8°45'
Ts	483.64'	Ls	350'
Es	45.17'	L.T.	233.62'
		S.T.	116.93
Δc	12°33'		
Dc	5°00'		
Tc	126.00'	e	0.060 '/Ft.
Lc	251.00'	M.D.S.	
Rc	1145.916'	S.S.D.	

870+75 ∽ Req'd 24" x 98' CSP Cross Culvert, End Section Rt., Type D Inlet (H=3'-6"), Dry Rubble Slope and Ditch Paving Rundown Rt., Dike Lt. (See Detail)

870+ Remove 24" CSP W/Hd'wall.

AS CONSTRUCTED	FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS / REVISED / VOID	VIII	COLORADO	I 70-2(42)197	27



K+E PLATE 3, CROSS SECTION KEUFFEL & ESSER CO.

DIVISION OF HIGHWAYS, STATE OF COLORADO
B. O. N. FORM NO. 126
JUNE 1969

AS CONSTRUCTED			
NO REVISIONS	REVISED	VOID	

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	28	

(R-1) 8-4-78, Note # Bridge Stations, WCB

884+ to 890+ ± Reg'd 8"x 600' Perforated CSP Lt. of Recreation Trail.

(R-1) Str. No. F-12-AL Constructed Under Proj. No. I 70-2(69)198

889+ to 895+ ± Reg'd 8"x 580' Perforated C.S.P. Lt. & Connect to Type "D" Inlet (Sta. 895+00 Lt)

898+ to 902+ ± Reg'd 8"x 418' Perforated CSP Lt.

Recreation Trail

120' Silt Fence

COBRAL CREEK

WILLOW

PINE

Topsoil

SCATTERED BRUSH

Survey Curve Data (W.B.)

Δ 31°36'00" Rt.
Ts 500.38'
Es 49.62'

Δc 14°06'
Dc 5°00'
Tc 141.72'
Lc 282.00'
Rc 1145.916'
θs 8°45'
Ls 350'
L.T. 233.62'
S.T. 116.93'

Projected Curve Data (W.B.)

Δ 32°13'00" Rt.
Ts 702.09'
Es 80.08'

Δc 23°13'
Dc 3° 00'
Tc 392.33
Lc 773.89
Rc 1909.859'
θs 4°30'
Ls 300'
L.T. 200.06'
S.T. 100.06'

e 0.060 ft/ft.
M.D.S. = 70 mph.
S.S.D > 600'

882+ to 883+ ± Reg'd Heavy Riprap around Bridge Abutments on Recreation Trail. (STR. NO. F-12-BA).

888+ ± Remove 24" C.S.P. Lt.

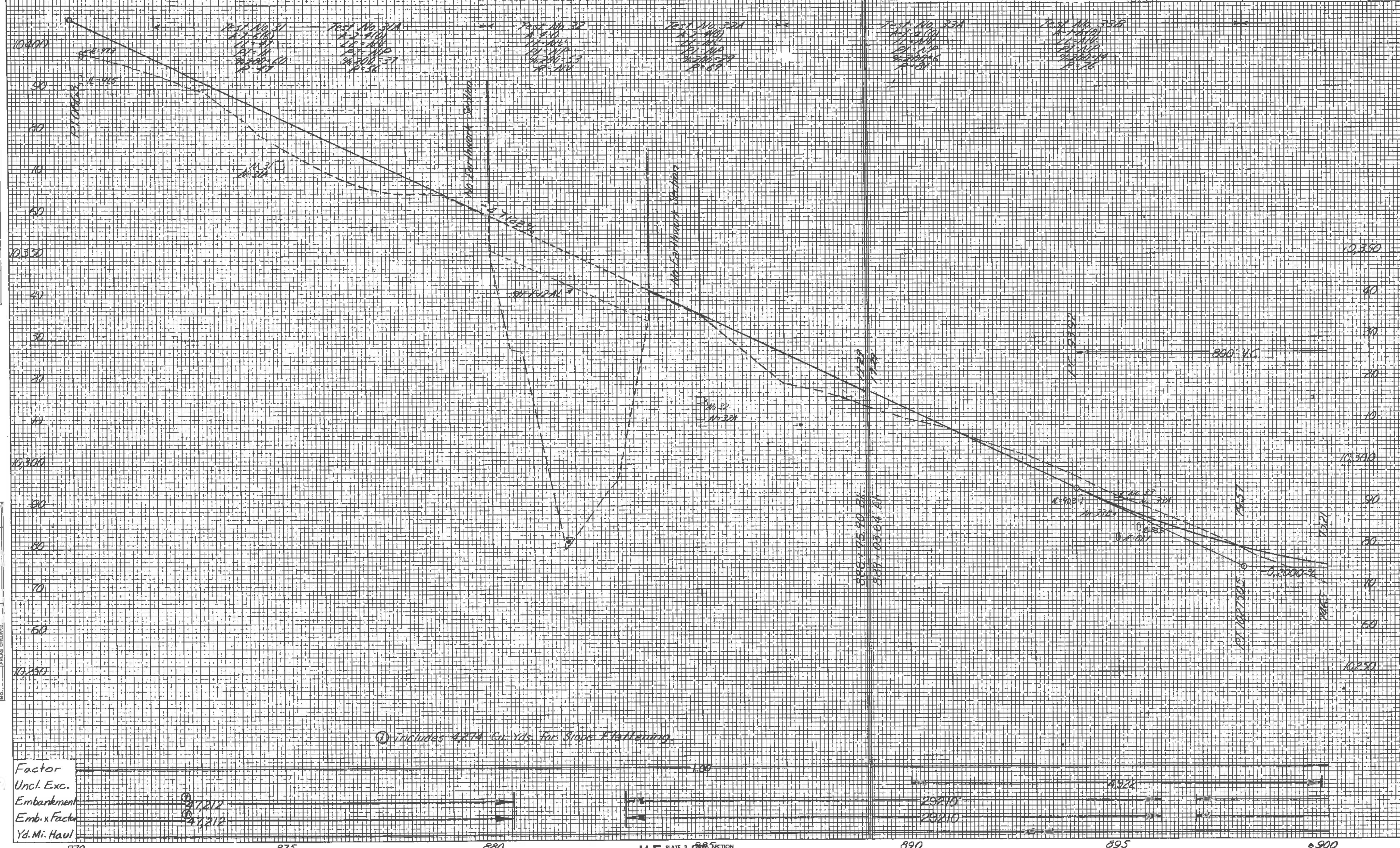
898+ ± Remove 24" C.S.P. w/Hd'wall

895+00 ± Reg'd 24"x 38" C.S.P. Cross Culvert with connection to 24" C.S.P. under Recreation Trail an Rt. Type D Inlet (H=3'-6") Dry Rubble Slope and Ditch Paving Rundown Rt.; Dike Lt. (See Details)

894+87 ± Reg'd 18"x 26" C.S.P. Cross Culvert under Recreation Trail, End Sections Lt. & Rt.

895+ ± Remove 24" C.S.P. w/Hd'wall

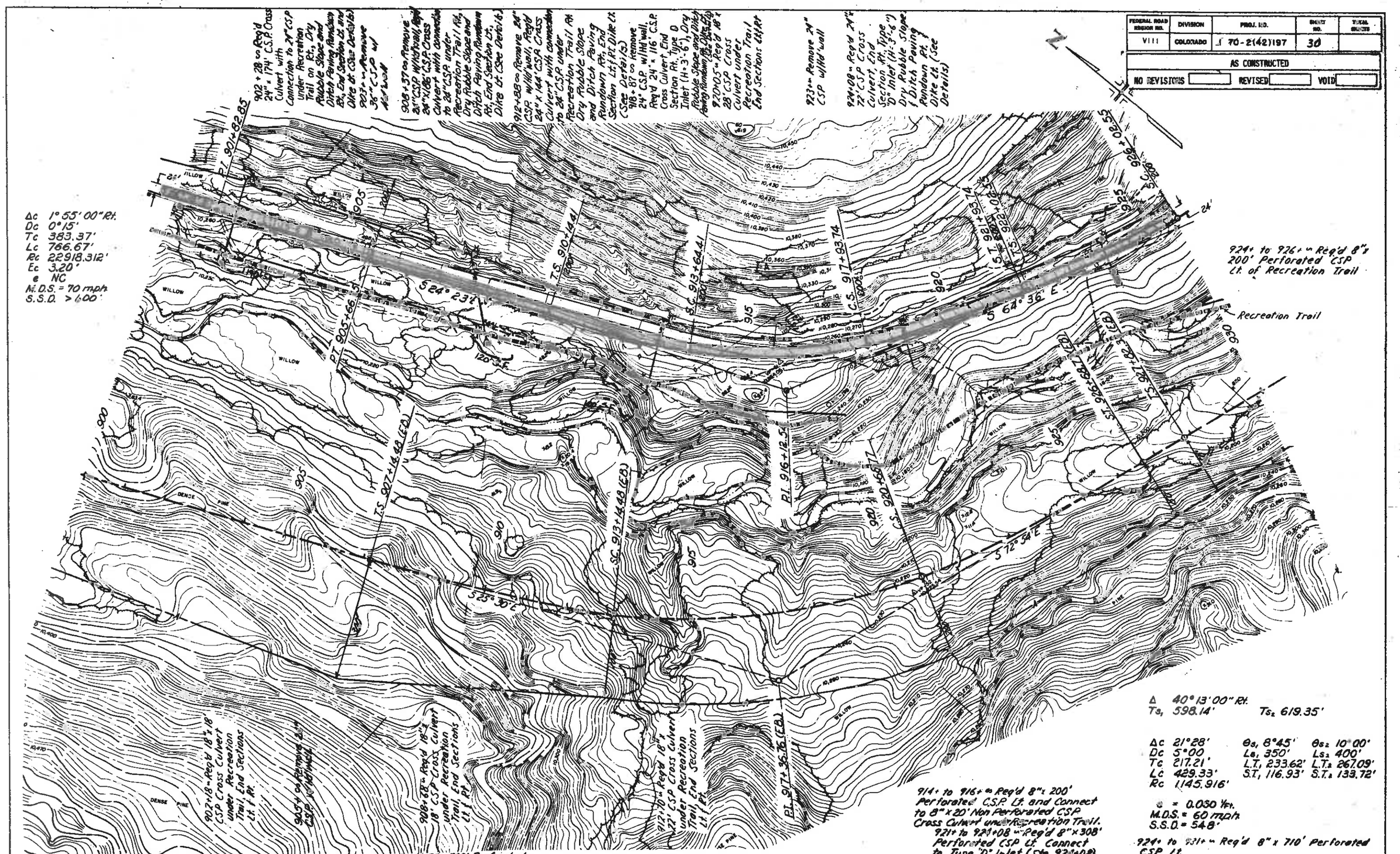
AS CONSTRUCTED	FEDERAL ROAD REGION NO	DIVISION	PROJECT NO	SHEET NO
NO REVISION ☐ REVISED ☐ VOID ☐	VIII	COLORADO	I 70—2(42)197	29



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	F 70-2(42)197	30	

AS CONSTRUCTED

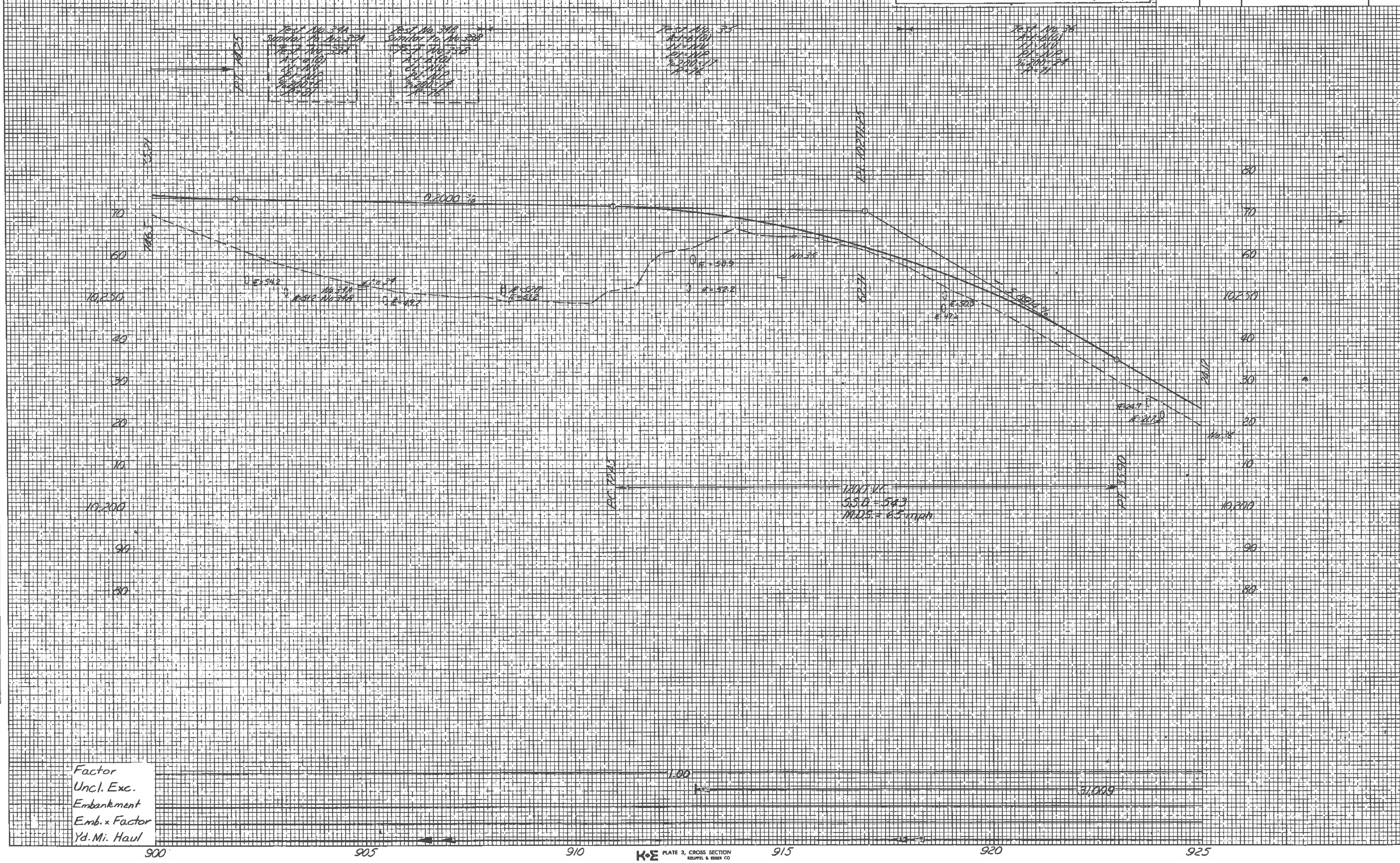
NO REVISIONS ☐ REVISED ☐ VOID ☐



FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	I 70-2(42)197	31

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐



HIGHWAYS, STATE OF COLORADO
M NO. 126

AS CONSTRUCTED			FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISION	REVISED	VOID	VIII	COLORADO	I 70-2(42)197	32	

Δ 34°21'00" Lt.
Ts₁ 553.35' Ts₂ 532.82'

Δc 15°36'
Dc 5°00'
Tc 156.97'
Lc 312.00'
Rc 1145.916

θs₁ 10°00' θs₂ 8°45'
Ls₁ 400' Ls₂ 350'
L.T.₁ 267.09' L.T.₂ 233.62'
S.T.₁ 133.72 S.T.₂ 116.93'

e 0.060 '/Ft.
M.D.S. = 60 mph.
S.S.D. >600'

931+70 ∞ Remove 24" C.S.P. W/Hdwl. Req'd 24" x 120' C.S.P. Cross Culvert, End Section Lt. & Rt., Inlet Basin with Dike Lt.

936+ ∞ Remove 24" CSP

938+ ∞ Remove 24" C.S.P.

938+50 ∞ Req'd 24" x 136' CSP Cross Culvert Dry Rubble Slope & Ditch Paving Rundown Rt., End Sections Lt. & Rt. Dike Lt.

944+50 ∞ Remove 24" C.S.P. w/Hd wall. Req'd 24" x 68' C.S.P. Cross Culvert, End Section Rt., Type D Inlet (H-3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

939+ to 940+ ∞ Req'd Timber Cribbing (Type A) Rt.

945+ to 946+ ∞ Req'd Heavy Riprap around Bridge Abutments on Recreation Trail. (STR. NO. F-12-BC)

941+ to 942+ ∞ Req'd Heavy Riprap Lt. of Recreation Trail.

Δ 21°24'00" Rt.
Ts 691.54'
Es 52.03'

Δc 15°24' θs 3°00'
Dc 2°00' Ls 300'
Tc 387.34' LT. 200.03'
Lc 770.00' ST. 100.03'
Rc 2864.789'

e = 0.080 '/Ft.
M.D.S. = 65 mph.
S.S.D. > 600'

941+ to 944+ ∞ Req'd 8" x 300' Perforated CSP Rt. of Recreation Trail.

945+ to 948+ ∞ Req'd 8" x 350' Perforated CSP Lt. & Connect to Type "D" Inlet (Sta. 948+50 Lt.)

954+ to 955+ Req'd Heavy Riprap around Bridge Abutments on Recreation Trail. (STR. NO. F-12-BD)

925+ to 926+ ∞ Req'd Heavy Riprap around Bridge Abutments on Recreation Trail. (STR. NO. F-12-BB)

928+ to 931+ ∞ Req'd 8" x 300' Perforated CSP Rt. & Connect to 8" x 20' Non Perforated Cross Culvert under Recreation Trail.

932+ to 938+ ∞ Req'd 8" x 610' Perforated CSP Lt.

940+ to 944+ ∞ Req'd 8" x 380' Perforated CSP Lt. and Connect to Type "D" Inlet. (Sta. 944+50 Lt).
939+ to 940+ ∞ Req'd Timber Cribbing Rt. (Type A)

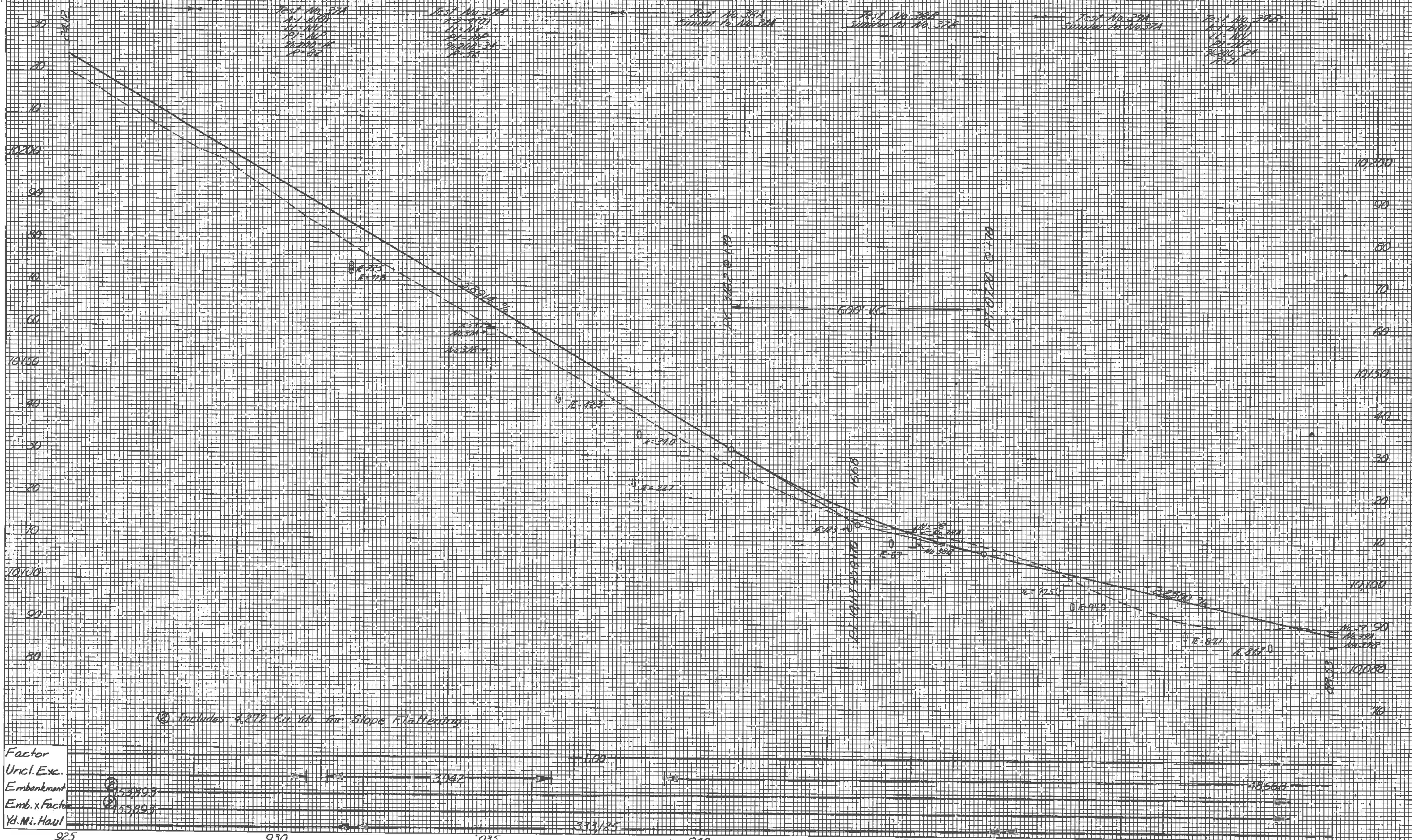
948+ ∞ Remove 36" CSP

948+80 ∞ Req'd 24" x 106' CSP Cross Culvert, End Section Rt., Type D Inlet (H-3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

951+ ∞ Remove 24" CSP

953+50 ∞ Req'd 24" x 100' C.S.P. Cross Culvert, End Section Rt., Type "D" Inlet (H-3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

AS CONSTRUCTED			FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS	REVISED	VOID	VIII	COLORADO	I 70-2(42)197	33



AS CONSTRUCTED
NO REVISIONS | REVISED | VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	34	

958 + ∞ Remove 36" C.S.P. w/Hd'wall.

958 + 69 ∞ Reg'd 30" x 106' C.S.P. Cross Culvert, End Sections Rt. & Lt.

D.A. - 0.20 Sq. Mi.
Q_{100} = 16 c.f.s.

963 + 10 ∞ Remove 24" C.S.P., Reg'd 24" x 64' C.S.P. Cross Culvert End Sections Lt. & Rt.

970 + 40 ∞ Reg'd 42" x 296' C.S.P. Cross Culvert with connection to 42" C.S.P. under Recreation Trail on Rt. Dry Rubble Slope & Ditch Paving Rundown Rt. & End Section & Dike Lt. (See Details)
D.A. = 0.87 Sq. Mi.
Q_{100} = 98 c.f.s.

970 + ∞ Remove 48" C.S.P. w/Hd'wall.

972 + ∞ Remove 24" C.S.P. w/Hd'wall.

978 + ∞ Remove 24" C.S.P. w/Hd'wall.

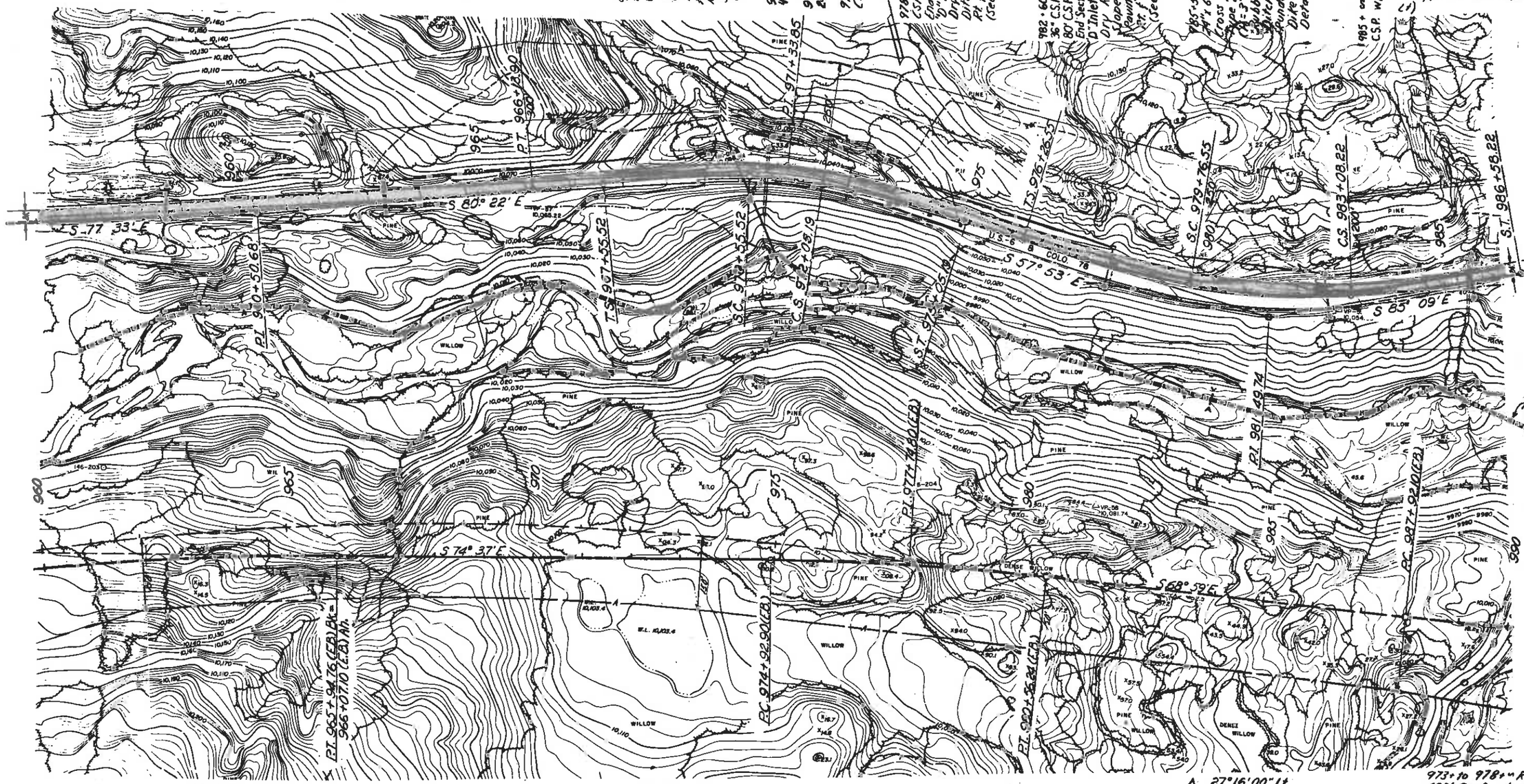
978 + 40 ∞ Reg'd 24" x 70' C.S.P. Cross Culvert End Section Rt. Type "D" Inlet (H = 3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

982 + 60 ∞ Remove 36" C.S.P., Reg'd 36" x 80' C.S.P. Cross Culvert End Section Rt. Type "D" Inlet (H = 4'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

985 + 55 ∞ Reg'd 24" x 68' C.S.P. Cross Culvert, Type "D" Inlet (H = 3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

985 + ∞ Remove 42" C.S.P. w/Hd'wall.

979+ to 982+ ∞ Reg'd 8" x 300' Perforated C.S.P. Lt. Connect to Type "D" Inlet (Sta. 982+60 Lt)



Δc 2°49'00" Lt.
Dc 0°15'
Tc 563.45'
Lc 1126.67'
Rc 22,918.312'
E_c 6.92'

e NC
M.D.S. = 70 mph
S.S.D. > 600'

Δ 22°29'00" Rt.
Ts 378.33'
Es 25.77'

Θs 7°30'
Ls 300'
L.T. 200.18'
S.T. 100.16'

Δc 7°29'
Dc 5°00'
Tc 74.94'
Lc 149.67'
Rc 1145.916'

e = 0.060 ft/ft.
M.D.S. = 60 mph
S.S.D. > 600

963+ to 968+ ∞ Reg'd 8" x 500' Perforated C.S.P. Lt.

963+ to 966+ ∞ Reg'd 8" x 300' Perforated C.S.P. Lt. & Connect to 8" x 20' Non-Perforated C.S.P. Cross Culvert under Recreation Trail.

Δ 27°16'00" Lt.
Ts 523.19'
Es 45.25'

Θs 7°00'
Ls 350'
L.T. 233.52'
S.T. 116.83'

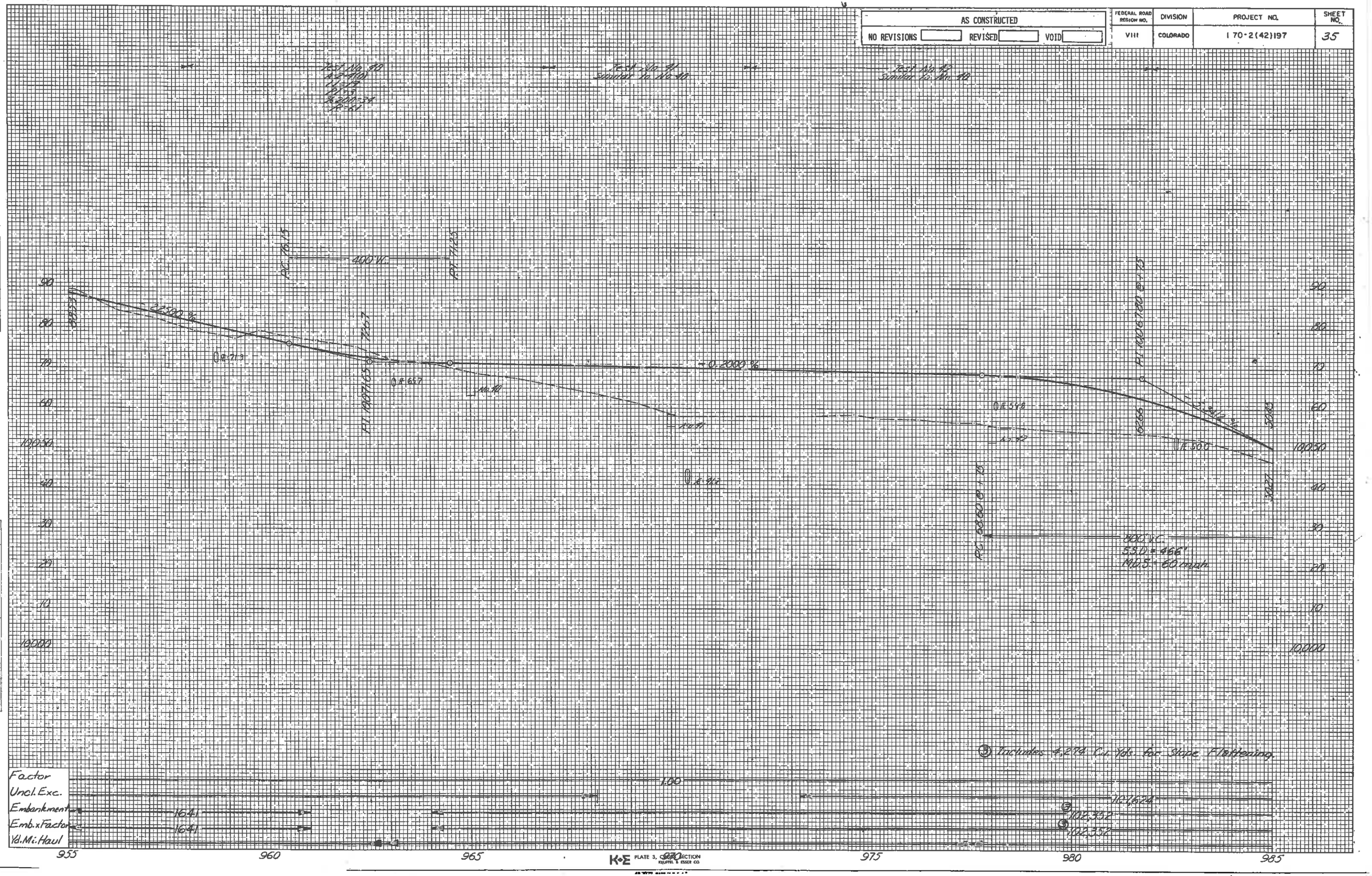
Δc 13°16'
Dc 4°00'
Tc 166.58'
Lc 331.67'
Rc 1432.394'

e 0.060 ft/ft.
M.D.S. = 65 mph
S.S.D. > 600'

973+ to 978+ ∞ Reg'd 8" x 420' Perforated C.S.P. Lt. Connect to Type "D" Inlet (Sta. 978+10 Lt)

977+ to 980+ ∞ Reg'd 8" x 250' Perforated C.S.P. Lt. & Connect to 8" x 20' Non-Perforated C.S.P. Cross Culvert Under Recreation Trail.

AS CONSTRUCTED	FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS ☐ REVISED ☐ VOID ☐	VIII	COLORADO	I 70-2(42)197	35



③ Includes 4,274 Cu. Yds. for Slope Flattening.

K+E PLATE 3, CROSS SECTION KEUFFEL & ESSER CO.

HIGHWAYS, STATE OF COLORADO
NO. 126

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	36	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

986+ to 990+ ~ Req'd 8" x 450' Perforated CSP Lt.

991+ to 998+ ~ Req'd 8" x 650' Perforated CSP Lt. of Recreation Trail

996+ to 999+ ~ Req'd 8" x 386' Perforated CSP Lt. & Connect to Type "D" Inlet (Sta. 999+85 Lt.)

1005+ to 1011+ ~ Req'd 8" x 480' Perforated CSP Lt. & Connect to Type "D" Inlet (Sta. 1011+00 Lt.)

STA. 1015+59.70 End I 70-2(42)197 =
STA. 1015+59.70 on I 70-2(44)200

1011+ to 1014+ ~ Req'd 8" x 280' Perforated CSP Lt. & Connect to Type "D" Inlet.. (Sta. 1014+20 Lt.)

Δ 26°31'00" Rt.
Ts 513.26'
Es 42.88'

Δc 12°31'	θs 7°00'
Dc 4°00'	Ls 350'
Tc 157.08'	LT. 233.52'
Lc 312.92	S.T. 116.83'
Rc 1432.394	

e 0.080 '/Ft.
M.D.S.= 65 mph.
S.S.D. > 600'

990+ to 991+ ~ Req'd Timber Cribbing (Type A) Rt.

991+00 ~ Req'd 24" x 258' CSP Cross Culvert under Recreation Trail Rt. Dry Rubble Slope & Ditch Paving Rundown Rt. End Sections Lt. & Rt. Dike Lt. (See Details)

991+ ~ Remove 24" CSP W/Hd'wall.

992+ ~ Remove 60" CSP

995+00 ~ Remove 36" CSP W/Hd'wall, Req'd 42" x 94' CSP Cross Culvert, Dry Rubble Slope & Ditch Paving Rundown Rt. End Section & Dike Lt. (See Details)
DA = 0.79 Sq. Mi
Q100 = 43 cfs

999+85 ~ Req'd 24" x 68' CSP Cross Culvert, End Section Rt. Type "D" Inlet (H= 3'-6") Dry Rubble Slope & Ditch Paving Rundown Rt. with Dike Lt. (See Details)

1000+ ~ Remove 24" CSP W/Hd'wall

1007+ ~ Remove 24" CSP W/Hd'wall

1010+ ~ Remove 24" CSP W/Hd'wall

1011+00 ~ Req'd 24" x 96' CSP Cross Culvert, End Section Rt., Type D Inlet (H= 3'-6"), Dike Lt.

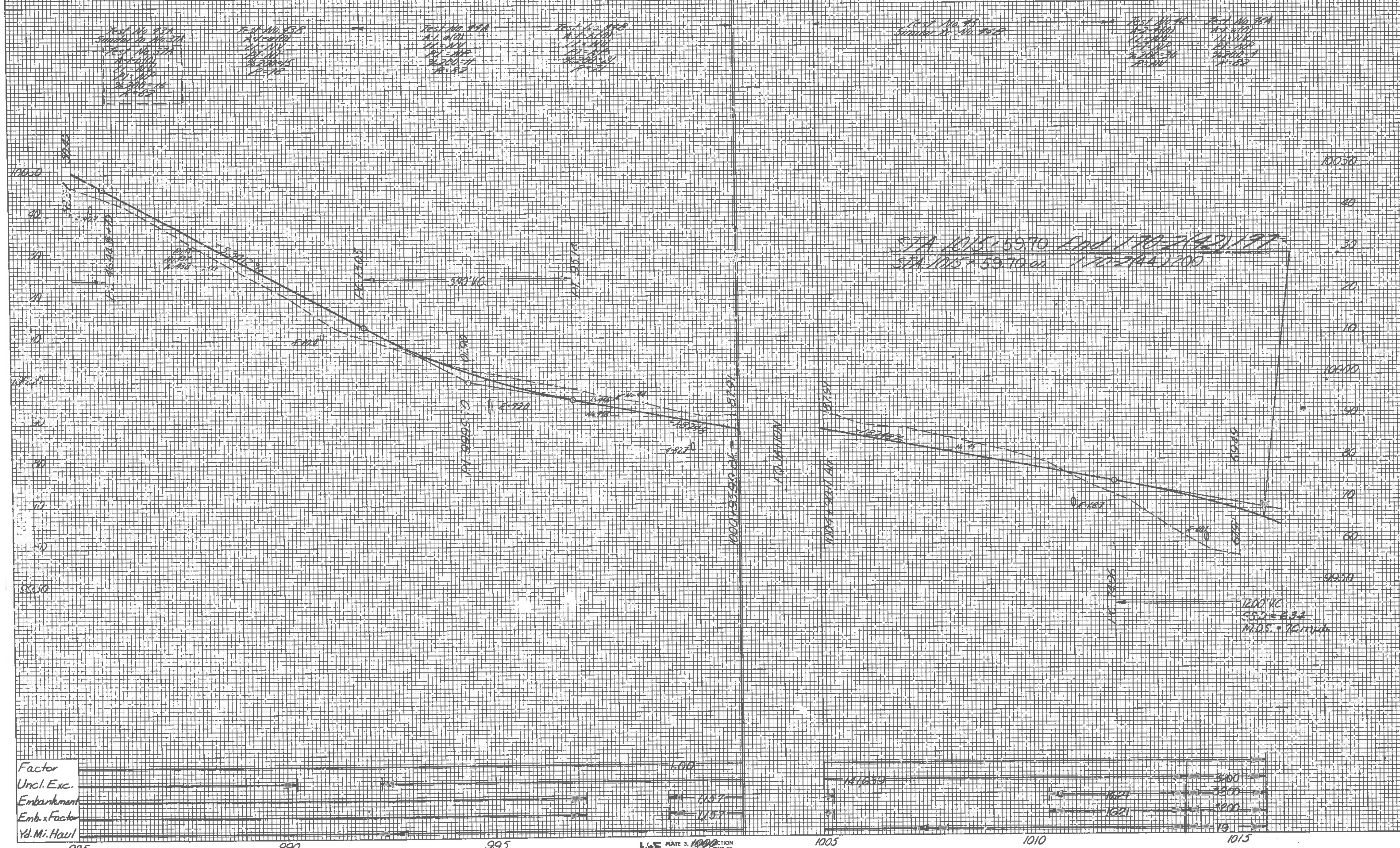
1014+ ~ Remove 24" CSP w/ Hd'wall

1014+20 ~ Req'd 24" x 82' CSP Cross Culvert, End Section Rt., Type D Inlet (H= 3'-6"), Dry Rubble Slope & Ditch Paving Rundown Rt. & Dike Lt. (See Details)

Δ 25°44'00" Lt.
Ts1 600.22'
Ts2 724.24'

Δc 12°14'	θs1 4°30'
Dc 3°00'	θs2 9°00'
Tc 204.67'	Ls1 300'
Lc 407.78'	Ls2 600'
Rc 1909.859'	LT.1 200.06'
	LT.2 400.52'
e 0.050 '/Ft.	S.T.1 100.06'
M.D.S. 70 mph.	S.T.2 200.47'
S.S.D. > 600'	

AS CONSTRUCTED	FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
NO REVISIONS ☐ REVISED ☐ VOID ☐	VIII	COLORADO	I 70-2(42)197	37



AS-CONSTRUCTED	FEDERAL ROAD ENGINEERING NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS [ ] REVISED [ ] VOID [ ]	VIII	COLORADO	I 76-2 (42) 177	98	

W.B. PROJ.

$\Delta s = 25°44'$ Lt.
$Ts = 600.2'$
$Ts_2 = 724.2'$

$\Delta c = 12°14'$
$Dc = 3°00'$
$Tc = 204.7'$
$Lc = 407.8'$
$Rc = 1909.9'$

$\theta s_1 = 4°30'$
$\theta s_2 = 9°00'$
$Ls_1 = 300'$
$Ls_2 = 600'$
$LT_1 = 200.1'$
$LT_2 = 400.5'$
$ST_1 = 100.1'$
$ST_2 = 200.5'$

$e = 0.060$ ft/ft
SSD = 935'
M.D.S. = 75 mph

W.B. PROJ.

$\Delta s = 3°30'$ Lt.
$Ts_1 = 671.1$
$Ts_2 = 509.9$

$\Delta c = 13°30'$ Lt.
$Dc = 4°00'$
$Tc = 169.5'$
$Lc = 337.5'$
$Rc = 1,432.4'$
$e = 0.060$ ft/ft
M.D.S. = 65 mph.
S.S.D. = 844'

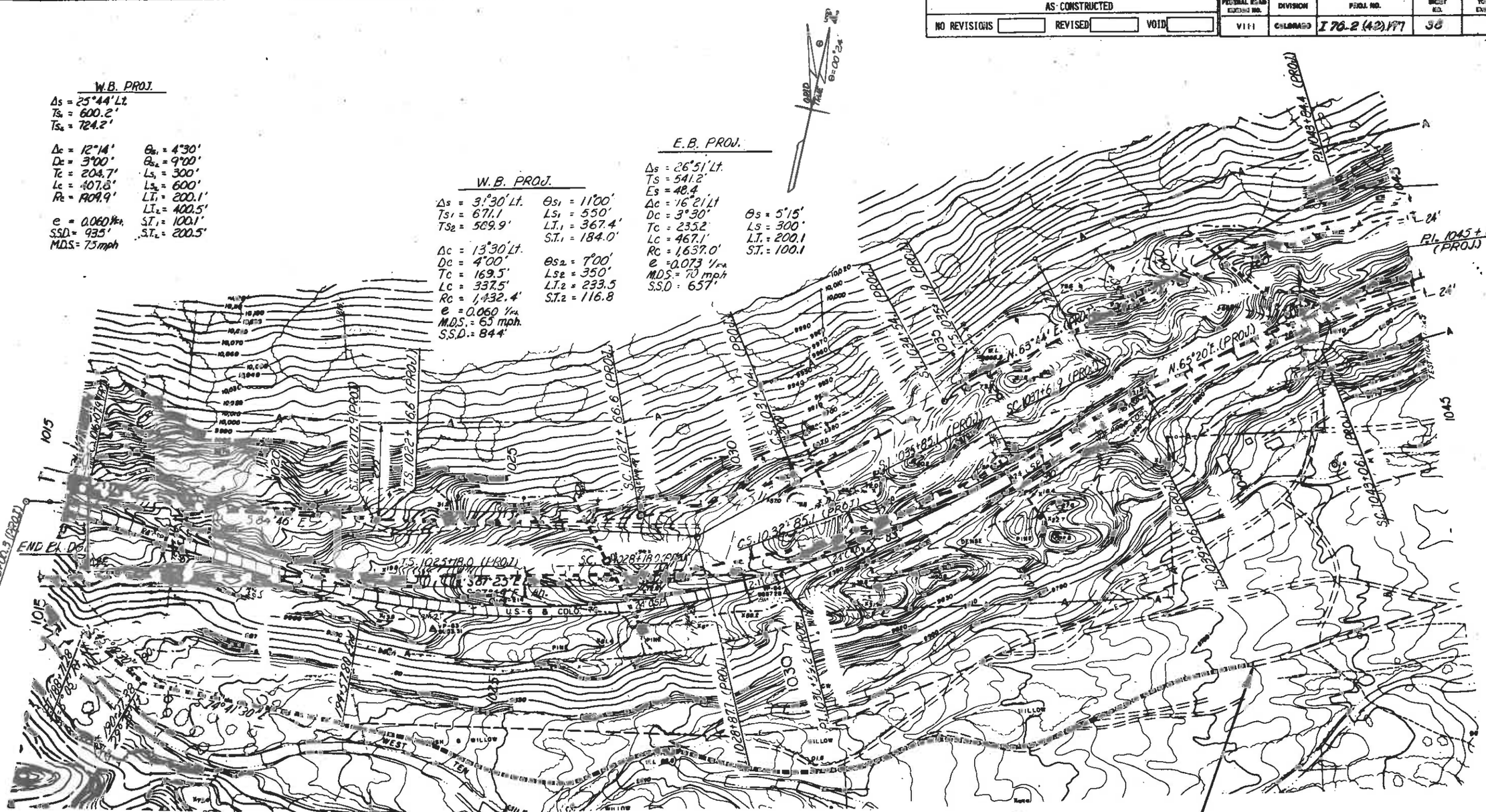
$\theta s_1 = 11°00'$
$Ls_1 = 550'$
$LT_1 = 367.4'$
$ST_1 = 184.0'$

$\theta s_2 = 7°00'$
$Ls_2 = 350'$
$LT_2 = 233.5$
$ST_2 = 116.8$

E.B. PROJ.

$\Delta s = 26°51'$ Lt.
$Ts = 541.2'$
$Es = 48.4$
$\Delta c = 16°21'$ Lt
$Dc = 3°30'$
$Tc = 235.2$
$Lc = 467.1'$
$Rc = 1,637.0'$
$e = 0.073$ ft/ft
M.D.S. = 70 mph
S.S.D. = 657'

$\theta s = 5°15'$
$Ls = 300'$
$LT = 200.1$
$ST = 100.1$

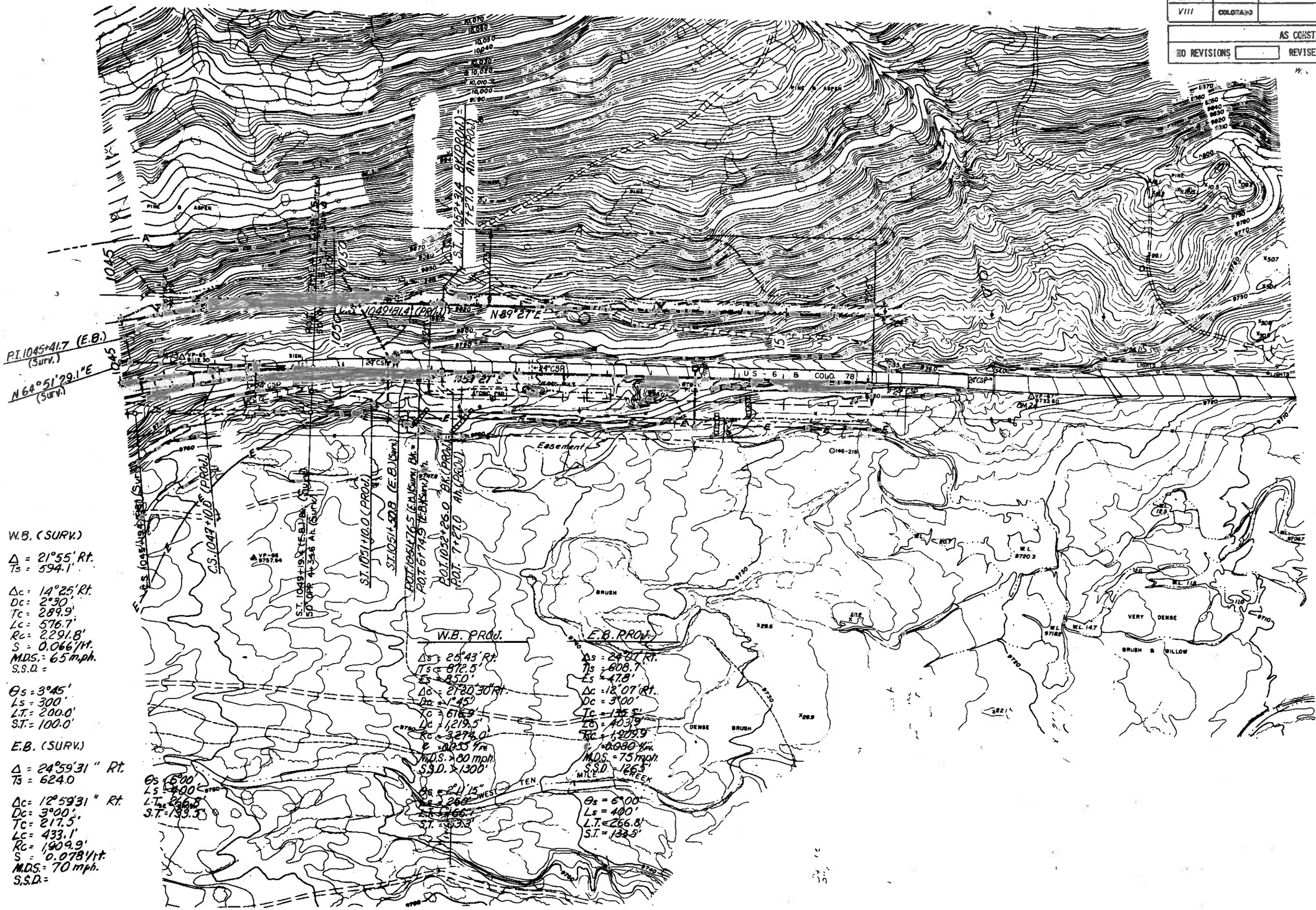


STA. 199+57.80 End Recreation Trail
Approx. 310' Rt. of Sta. 1021+30 (EB)

FEDERAL ROAD SYSTEM NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO		39	

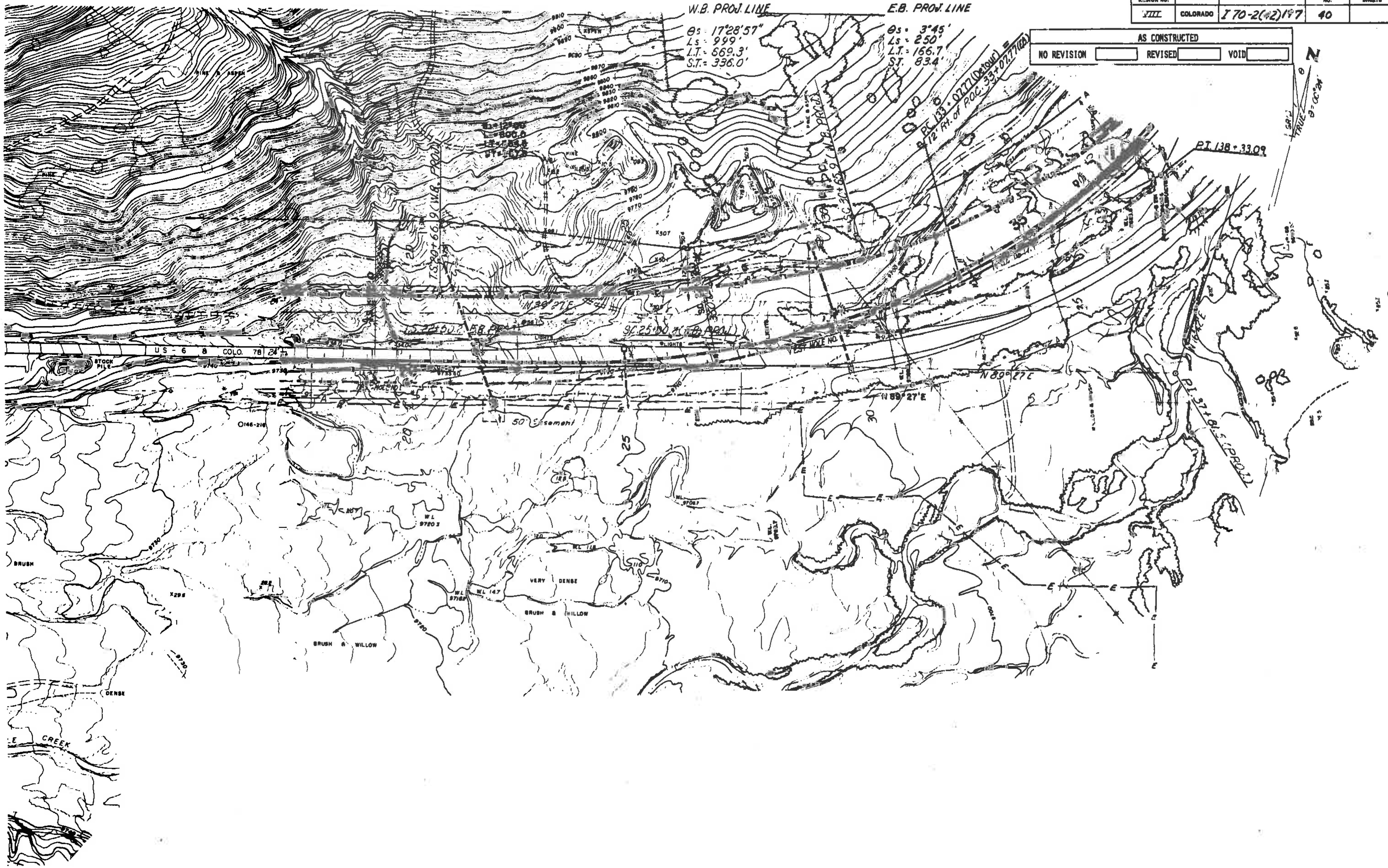
AS CONSTRUCTED

NO REVISIONS [ ] REVISED [ ] VOID [ ]



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	40	

AS CONSTRUCTED		
NO REVISION	REVISED	VOID



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)197	#1	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

Survey

$\Delta s = 108° 22' Lt.$
$Ts = 3065.2'$
$Es = 1377.7'$
$\Delta c = 84° 22'$ $\quad \theta s = 12° 00'$
$Dc = 3° 00'$ $\quad Ls = 800.0'$
$Tc = 1730.9'$ $\quad L.T. = 534.6'$
$Lc = 2812.2'$ $\quad S.T. = 267.8'$
$Rc = 1909.9'$

(W.B. Proj.)

$\Delta s = 102° 45' 11" Lt.$
$Ts = 2578.6'$
$Es = 1026.1'$
$\Delta c = 67° 47' 17"$ $\quad \theta s = 17° 28' 57"$
$Dc = 3° 30'$ $\quad Ls = 999.0'$
$Tc = 1099.8'$ $\quad L.T. = 669.3'$
$Lc = 1936.8'$ $\quad S.T. = 336.0'$
$Rc = 1637.0'$
$e = 0.080'/ft.$
M.O.S. = 70 M.P.H.
S.S.D. > 1300'

(E.B. Proj.)

$\Delta s = 72° 45' Lt.$
$Ts_1 = 1531.3'$
$Ts_2 = 1408.2'$
$\Delta c = 69° 00'$
$Dc = 3° 00'$
$Tc = 1312.6'$
$Lc = 2300.0'$
$Rc = 1909.9'$
$e = 0.080$ V/ft
M.O.S. = 75 mph
S.S.D > 1300'

$\theta s = 3° 45'$
$Ls = 250.0'$
$L.T. = 166.7'$
$S.T. = 83.4'$

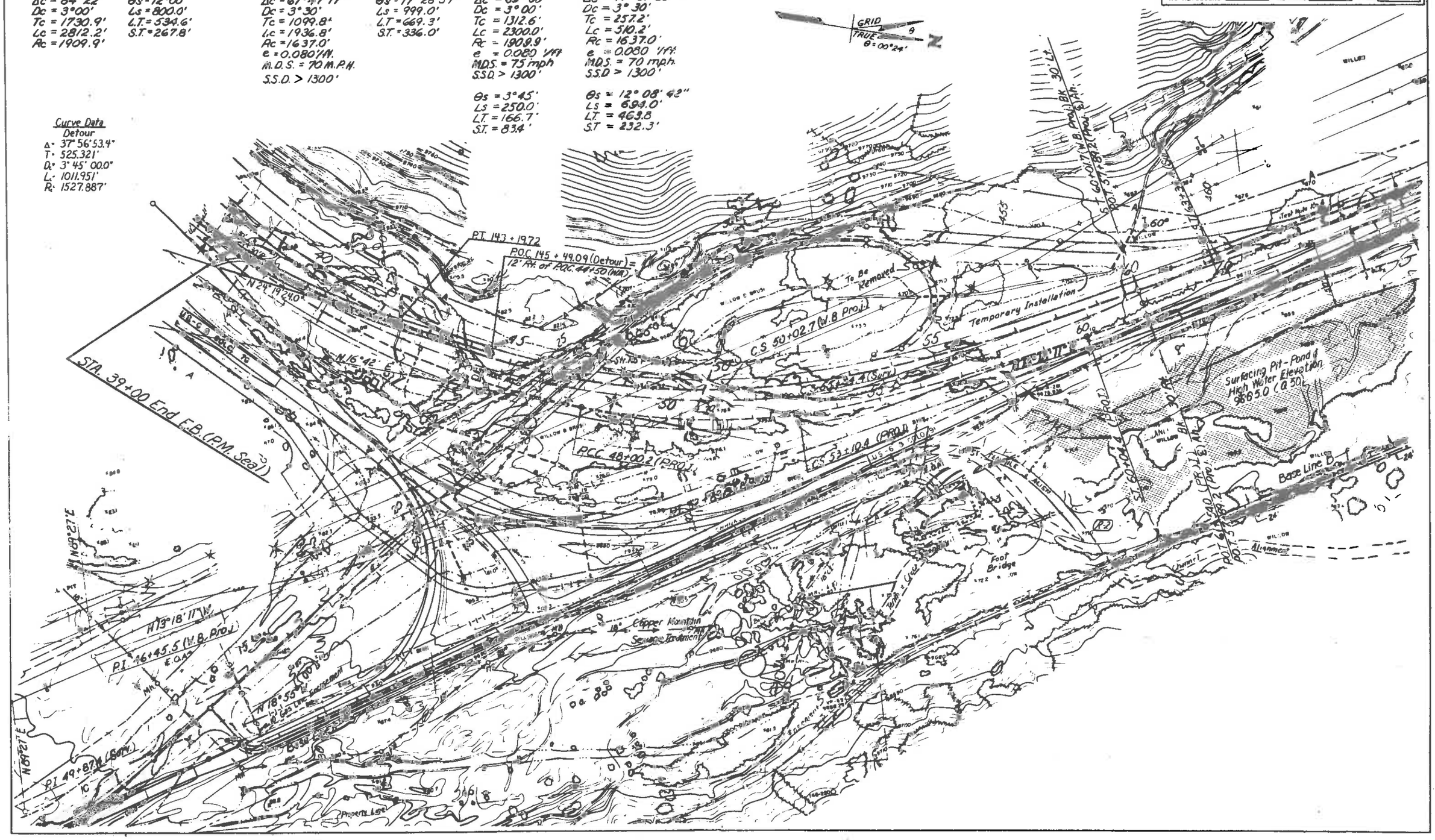
$\Delta s = 30° 00' 11" Lt.$
$Ts_1 = 463.1'$
$Ts_2 = 764.0'$
$\Delta c = 17° 51' 29$
$Dc = 3° 30'$
$Tc = 257.2'$
$Lc = 510.2'$
$Rc = 1637.0'$
$e = 0.080$ V/ft
M.O.S. = 70 mph
S.S.D > 1300'

$\theta s = 12° 08' 42"$
$Ls = 694.0'$
$L.T. = 463.8$
$S.T. = 232.3'$

33+ to 45+ (E.B.) ⇨ Reg'd Temporary Detour and Remove.

Curve Data
Detour
$\Delta = 37° 56' 53.4"$
$T = 525.321'$
$D = 3° 45' 00.0"$
$L = 1011.951'$
$R = 1527.887'$

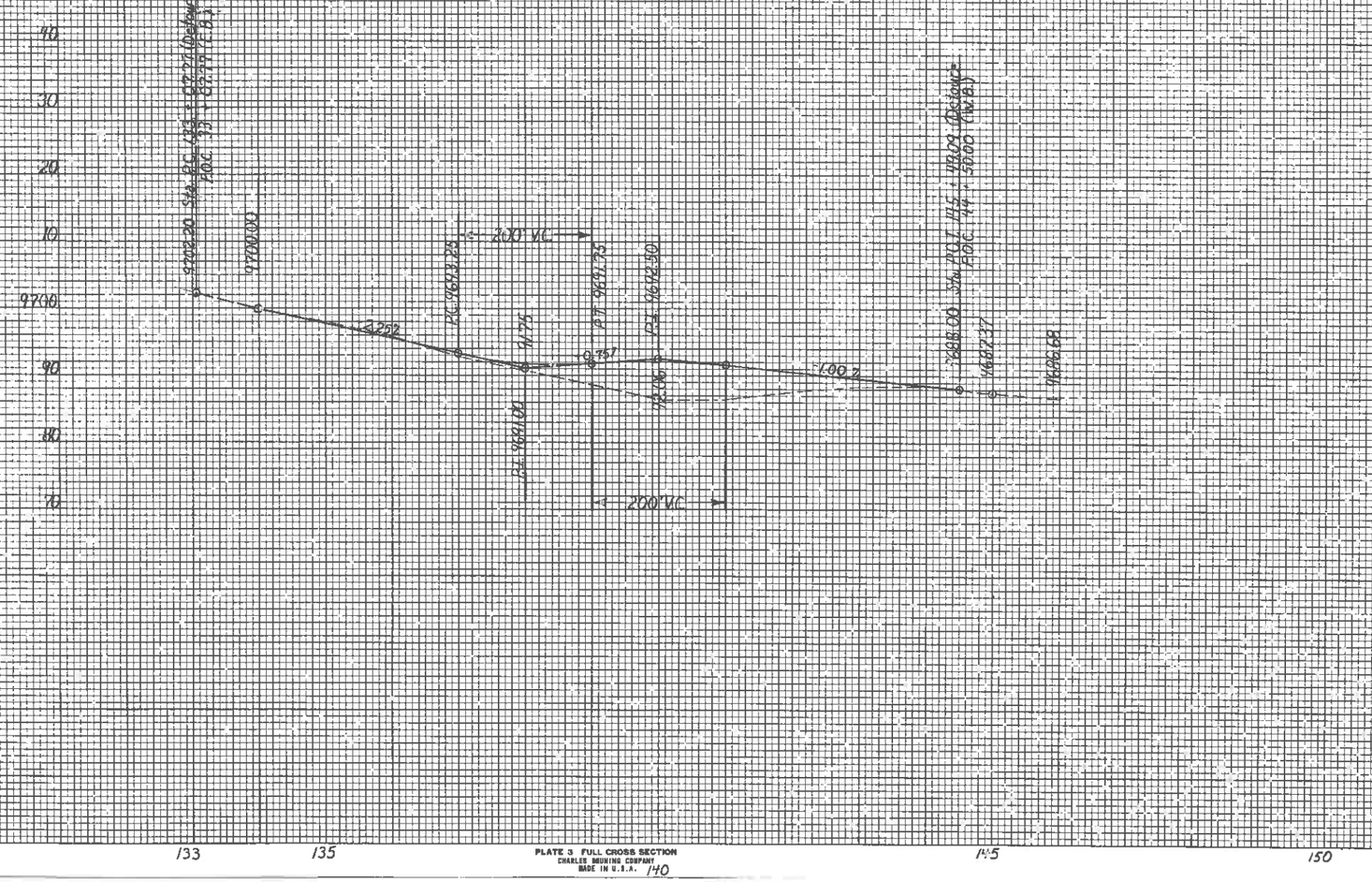
GRID
TRUE
$\theta = 00° 24'$



TMENT OF HIGHWAYS
HIGHWAYS—STATE OF COLORADO
0.210

AS CONSTRUCTED								
NO REVISIONS		REVISED		VOID				
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)197	42	

DETOUR
FROM (WB) TO (EB)



133 135 PLATE 3 FULL CROSS SECTION 145 150
CHARLES MUNNING COMPANY
MADE IN U.S.A. 140

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	43	

AS CONSTRUCTED

NO REVISIONS | REVISED | DATE

(R-1) 8-4-76, MARKING LAYOUT J.D.S.

TABULATION OF SIGNING QUANTITIES

ITEM NO.	ITEM	UNIT	PROJECT TOTALS
202	REM. PVMT. MKG.	SQ. FT.	21,193
202	REM. GROUND SIGN	EACH	7
210	RES. GROUND SIGN	EACH	1
614	SIGN PANEL (Cl. I)	SQ. FT.	52
614	TIMBER SIGN POST (4x4)	LIN. FT.	96
614	STEEL SIGN POST (U-2)	LIN. FT.	33
614	CONC. FOOTING (TY. 4)	EACH	2
614	MODIFICATION SIGN LEGEND	L.S.	1
614	FLASH. BEACON (PORT.)	EACH	2
614	BARRICADE (3-MA)(TEMP.)	EACH	21
614	BARRICADE (3-MC)(TEMP.)	EACH	3
614	BARRICADE (3-MD)(TEMP.)	EACH	1
614	CONST. TRAF. SIGN (A)	EACH	9
614	CONST. TRAF. SIGN (B)	EACH	37
614	CONST. TRAF. SIGN (C)	EACH	17
614	VERTICAL PANEL	EACH	50
614	TRAFFIC CONE (28 INCH)	EACH	50
627	PVMT. MKG. PAINT	GAL.	782

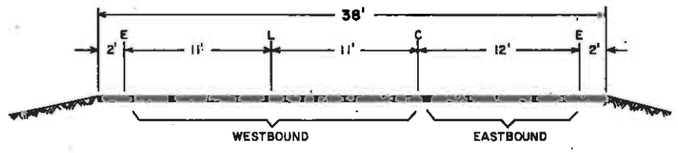
(R-1)

TYPICAL DETOUR STRIPING LAYOUT

E = EDGE LINE – 4" Solid White

C = CENTER LINE – 5" Broken Yellow
CENTER LINE – 5" Solid Yellow

L = LANE LINE – 5" Broken White



AS CONSTRUCTED							
NO REVISIONS		REVISED		VOID			

FEDERAL ROAD DESIGN NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
[redacted]	COLORADO	I70-2(92)	44	

TABULATION OF SIGNS

SIGN NO.	SIGN CODE	STATION	SIGN PANEL SIZE	BACK-GROUND COLOR	REMOVE: GROUND SIGN (EACH)	REMOVE: SIGN STRUCTURE (EACH)	RESET GROUND SIGN (EACH)	MODIFY: TIMBER SIGN POST (EACH)	MODIFY: STEEL SIGN POST (EACH)	NO. OF POSTS	LENGTH OF POST	POST TYPE (LIN. FT.): 4x4 TIMBER	6x6 TIMBER	W6x12 BEAM	W8x18 BEAM	W8x21 BEAM	W8x24 BEAM	W10x21 BEAM	W10x25 BEAM	W12x31 BEAM	W12x40 BEAM	U-2 POST	CONC. FOOTING TYPE (EACH): A	B	C	D	E	F	G	H	SIGN PANEL (SQ. FT.): CLASS I	CLASS II	CLASS III
1		860+00					1		MODIFY	LEGEND																2							
2	MILEPOST	867+00	12"x48"	GREEN						1	11'											11										4.00		
3		892+60			1																												
4		934+00			1																												
5	MILEPOST	917+00	12"x 48"	GREEN						1	11'											11										4.00		
6		937+00			1																												
7		962+00			1																												
8	MILEPOST	969+00	12"x48"	GREEN						1	11'											11										4.00		
9		986+50			1																												
10		1008+50			1																												
11		1010+00			1																												
X	DELETED																																
* 12	SDII-1	OPP. 830+50	24"x 18"	GREEN						1	10'	10.0																				3.00		
* 13	SR5-3	OPP 831+00	24"x 24"	WHITE						1	10'-6"	10.5																				4.00		
14A	SPECIAL	OPP 843+50	DIAMOND 24" SIDES	YELLOW						1	11'	11.0																				4.00		
14B	ESW7-1		24"x 18"	YELLOW																												3.00		
15	CWI-1(L)	OPP 846+00	DIAMOND 24" SIDES	YELLOW						1	11'	11.0																				4.00		
16	CWI-5(L)	OPP 858+00	DIAMOND 24" SIDES	YELLOW						1	11'	11.0																				4.00		
17A	SPECIAL	OPP 909+00	DIAMOND 24" SIDES	YELLOW						1	11'	11.0																				4.00		
17B	ESW7-1		24"x 18"	YELLOW																												3.00		
18	CWI-3(R)	OPP 915+50	DIAMOND 24" SIDES	YELLOW						1	11'	11.0																				4.00		
* 19	SR5-3	OPP 1037+00	24"x 24"	WHITE						1	10'-6"	10.5																				4.00		
X	DELETED																																
* 20	SDII-1	OPP 1038+00	24"x 18"	GREEN						1	10'	10.0																				3.00		
	PROJECT	*TOTALS*			*7*		*1*					*96.0*										*33*				*2*					*52.00*		

*= SIGN LAYOUT WILL BE FURNISHED WITH THE SPECIAL SIGNS.

NOTES:

1. SEE PLANS FOR FABRICATION DETAILS OF REGULATORY SIGNS, WARNING SIGNS, ROUTE MARKERS, AND AUXILIARY MARKERS.
2. PANELS FOR CLASS I SIGNS SHALL BE EITHER SINGLE SHEET ALUMINUM OR SINGLE SHEET STEEL AND SHALL BE REFLECTORIZED AS INDICATED. SEE STANDARD S-614-20B.
3. PANELS FOR CLASS II SIGNS SHALL BE EITHER SINGLE SHEET ALUMINUM OR SINGLE SHEET STEEL, SHALL HAVE BACKING ZEES, AND SHALL BE REFLECTORIZED AS INDICATED. SEE STANDARDS S-614-21B AND S-614-22C.
4. PANELS FOR CLASS III SIGNS SHALL BE EITHER LAMINATED ALUMINUM, EXTRUDED ALUMINUM, OR SHEET ALUMINUM. SEE STANDARDS S-614-23C, S-614-24B AND S-614-25C.
5. CLASS III SIGNS WITH A GREEN OR BLUE BACKGROUND SHALL BE FABRICATED FROM EITHER LAMINATED ALUMINUM OR SHEET ALUMINUM AND SHALL HAVE A REFLECTORIZED BACKGROUND. CLASS III SIGNS WITH A BLACK BACKGROUND SHALL BE FABRICATED FROM EITHER LAMINATED ALUMINUM OR EXTRUDED ALUMINUM AND SHALL HAVE A PORCELAIN ENAMELED BACKGROUND.
6. LEGEND AND BORDER ON ALL CLASS III SIGNS SHALL BE WHITE CUTOUT ALUMINUM WITH REFLEX REFLECTORS OR APPROVED ALTERNATE.
7. FOR TYPICAL GROUND SIGN PLACEMENT, SEE STANDARD S-614-19B.
8. FOR DETAILS OF SIGN SUPPORTS FOR GROUND SIGNS SEE STANDARD S-614-26C.
9. FOR DETAILS OF FOOTINGS, PEDESTALS, AND SIGN ISLANDS SEE STANDARD S-614-27C.
10. POST LENGTHS ARE APPROXIMATE ONLY. EXACT LENGTHS TO BE DETERMINED BY THE ENGINEER.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS—STATE OF COLORADO
D OH FORM 129
SEPTEMBER 1972

AS CONSTRUCTED			
NO REVISIONS		REVISED	VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	45	

(R-1) 8-4-78, SIGN CODE J.D.S.

TABULATION OF CONSTRUCTION SIGNS

SIGN NO.	SIGN CODE	STATION	RESET GROUND SIGN (EACH)	CONCRETE BARRIER TEMPORARY (LIN. FT.)	BARRICADE TYPE (EACH) 3M-A	3M-B	3M-C	3M-D	CONSTRUCTION TRAFFIC SIGN PANEL SIZE (EACH) A	B	C	VERTICAL PANEL (EACH)	TRAFFIC CONE 28 INCH (EACH)	FLASHING BEACON (PORTABLE) (EACH)	PORTABLE ELECTRONIC ADVANCE WARNING SIGN (EACH)
101	SG20-2	806+00								1					
102	XW20-1	I 70 E.B.								1					
103	XW20-1	I 70 E.B.								1					
104	XW20-1	I 70 E.B.								1					
105	XW20-1	I 70 E.B.								1					
106A	IW9-1(L)	793+50									1				
106B	SPECIAL														
107A	IW9-1(L)	793+75									1				
107B	SPECIAL														
108A	IW9-1(L)	796+25									1				
108B	SPECIAL														
109A	IW9-1(L)	796+75									1				
109B	SPECIAL														
110	IW6-2	800+50								1					
111	IW6-2	801+00								1					
112	IW4-2(L)	803+00								1					
113	IW4-2(L)	804+00								1					
114	IR4-1	807+75									1				
115	IR4-1	808+75									1				
116		812+00 TO 814+75			6										
117	SR11-2	815+30					1			1					
118A	SR11-2	838+70					1			1					
118B	SW1-6														
119	SW1-6	838+30							1						
120	DELETED														
121	DELETED														
X															
122A	SR11-2	834+30					1			1					
122B	SW1-6														
123	IR5-9	813+00								1					
124	IR5-9	813+00								1					
125A	IW6-3	815+35									1				
125B	IR5-1														
126A	IR4-7	815+20									1				
126B	EIR4-7														
127	IW6-1	821+00								1				1	
128A	SR3-2	835+25							1						
128B	ESR3-2														

TABULATION OF CONSTRUCTION SIGNS

SIGN NO.	SIGN CODE	STATION	RESET GROUND SIGN (EACH)	CONCRETE BARRIER TEMPORARY (LIN. FT.)	BARRICADE TYPE (EACH) 3M-A	3M-B	3M-C	3M-D	CONSTRUCTION TRAFFIC SIGN PANEL SIZE (EACH) A	B	C	VERTICAL PANEL (EACH)	TRAFFIC CONE 28 INCH (EACH)	FLASHING BEACON (PORTABLE) (EACH)	PORTABLE ELECTRONIC ADVANCE WARNING SIGN (EACH)
129	SPECIAL	835+10									1				
130	IW13-2(15)	835+75									1				
131	SR5-9	231+00 RAMP							1						
132	SR5-9	231+00 RAMP							1						
133	SPECIAL	845+00									1				
134A	IW6-3	233+50 RAMP									1				
134B	IR5-1														
135		835+00	MASK	SIGN *											
136	IR4-2	845+50									1				
137		887+00	MASK	SIGN *											
138	IW6-3	900+00								1					
139	IW6-3	900+00								1					
140		956+00	MASK	SIGN *											
141	IW6-3	960+00								1					
142	IW6-3	960+00								1					
143	IW6-3	1020+00								1					
144	IW6-3	1020+00								1					
145	IR2-1(55)	26+50									1				
(R-1) 146	IR4-4	29+00									1				
147	IW6-3	31+50								1					
148	IW6-1	27+50								1				1	
149A	IR5-1	39+00									1				
149B	IW6-3														
150	IR5-9	40+50								1					
151	IR5-9	40+50								1					
152	SR11-2	40+60						1		1					
153		41+25 TO 49+75			15										
154	DELETED														
155	DELETED														
156	DELETED														
157	DELETED														
158	SR1-2	55+10							1						
159	DELETED														
X															
X															

NOTES

1. SEE APPROPRIATE PLAN SHEETS, STANDARDS AND SPECIFICATIONS FOR FABRICATION AND INSTALLATION DETAILS OF CONSTRUCTION SIGNS, BARRICADES, BARRIERS AND CHANNELIZING DEVICES.
2. LOCATIONS ARE APPROXIMATE ONLY. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.

* TO BE PAID FOR AS "MODIFICATION SIGN LEGEND".

Δ LAYOUT WILL BE FURNISHED WITH THE SPECIAL SIGNS.

EPARTMENT OF HIGHWAYS
N OF HIGHWAYS—STATE OF COLORADO
ORM 136
AR 1972

AS CONSTRUCTED		
NO REVISIONS ☐	REVISED ☐	VOID ☐

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	46	

TABULATION OF CONSTRUCTION SIGNS

SIGN NO.	SIGN CODE	STATION	~~RESET GROUND SIGN (EACH)~~	~~CONCRETE BARRIER TEMPORARY (LIN. FT.)~~	BARRICADE TYPE (EACH)				CONSTRUCTION TRAFFIC SIGN PANEL SIZE (EACH)			VERTICAL PANEL (EACH)	TRAFFIC CONE 28 INCH (EACH)	FLASHING BEACON (PORTABLE) (EACH)	~~PORTABLE ELECTRONIC ADVANCE WARNING SIGN (EACH)~~
					3M-A	~~3M-B~~	3M-C	3M-D	A	B	C				
160	DELETED														
161	IW6-2	60+00								1					
162	IW6-2	58+50								1					
163	DELETED														
164	DELETED														
165A	IR4-7	39+90									1				
165B	EIR4-7														
166	SG20-2	45+50								1					
167	XW20-1	I70 W.B.								1					
168	XW20-1	I70 W.B.								1					
169	XW20-1	I70 W.B.								1					
170	XW20-1	I70 W.B.								1					
CONES		AS NEEDED											50		
VERTICAL PANELS		" "										50			
	XW20-7	" "								4					
BE / PREPARED / TO / STOP		" "							4						
PROJECT TOTALS					21		3	1	9	37	17	50	50	2	

TABULATION OF CONSTRUCTION SIGNS

SIGN NO.	SIGN CODE	STATION	RESET GROUND SIGN (EACH)	CONCRETE BARRIER TEMPORARY (LIN. FT.)	BARRICADE TYPE (EACH)				CONSTRUCTION TRAFFIC SIGN PANEL SIZE (EACH)			VERTICAL PANEL (EACH)	VERTICAL PANEL WITH LIGHT (EACH)	DRUM CHANNELIZING DEVICE (EACH)	PORTABLE ELECTRONIC ADVANCE WARNING SIGN (EACH)
					3M-A	3M-B	3M-C	3M-D	A	B	C				

NOTES

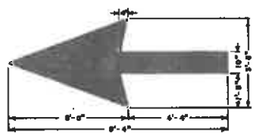
1. SEE APPROPRIATE PLAN SHEETS, STANDARDS AND SPECIFICATIONS FOR FABRICATION AND INSTALLATION DETAILS OF CONSTRUCTION SIGNS, BARRICADES, BARRIERS AND CHANNELIZING DEVICES.
2. LOCATIONS ARE APPROXIMATE ONLY. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.

TABULATION OF PAVEMENT MARKINGS

AS CONSTRUCTED			FEDERAL ROAD PROJECT NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS	REVISED	VOID	VIII	COLORADO	I 70-2(42)	47	

STATION	LOCATION	PAVEMENT MARKING LINES (Linear Feet)										
		EDGE		LANE	CENTER		CHANNELIZING		CROSSHATCH		CROSS WALK	STOP
		WHITE SOLID 4 INCH	YELLOW SOLID 4 INCH	WHITE BROKEN 5 INCH	YELLOW SOLID 5 INCH	YELLOW BROKEN 5 INCH	WHITE SOLID 10 INCH	YELLOW SOLID 10 INCH	WHITE SOLID 10 INCH	YELLOW SOLID 10 INCH	WHITE SOLID 12 INCH	WHITE SOLID 24 INCH
TEMPORARY PAVEMENT MARKING												
806+80 TO 815+00	TRANSITION (E.B. STA)	400		400	400			1,420		315		
813+00 TO OPP. 816+40	TRANSITION (W.B. STA.)	340	340	340								
815+00 TO 845+50	2-WAY RD.	5,300		2,650	5,300							
836+80 TO 836+00	RT. TURN						150					
OPP. 833+10	MEDIAN CROSSOVER	800										
845+50 TO 850+50	2-WAY RD.	1,000		500	500	500						
850+50 TO 878+22.62BK.	2-WAY RD.	5,546		2,773	2,773	2,773						
878+34.33 AH. TO 942+63.44BK.	2-WAY RD.	12,859		6,430	6,430	6,430						
942+72.35 AH. TO 965+94.76 BK.	2-WAY RD.	4,646		2,323	2,323	2,323						
966+07.10 AH. TO 1052+26.01 BK.	2-WAY RD.	17,238		8,619	8,619	8,619						
7+27.0 AH. TO 26+50	2-WAY RD.	3,846		1,923	1,923	1,923						
26+50 TO 29+00	2-WAY RD.	500		250	500							
29+00 TO 35+00	2-WAY RD.	1,200		600	1,200							
35+00 TO 39+30	TRANSITION (E.B. STA.)			450	450			900		215		
OPP. 38+36 TO 41+00	TRANSITION (W.B. STA.)	264	264	264								
41+00 TO 45+00	TRANSITION (W.B. STA.)		400	400								
41+00 TO 52+70	TRANSITION (W.B. STA)						1,170					
SUB-TOTAL (TEMP. PVMT. MKG.)		*53,938*	*1,004*	*27,922*	*30,418*	*22,568*	*1,320*	*2,320*	—	*530*	—	—
FINAL PAVEMENT MARKING W.B. LANES												
813+00 TO 1000+95.99BK.	MAINLINE	18,796	18,796	18,796								
1004+90.03 AH. TO 1018+00	MAINLINE	1,310	1,310	1,310								
833+80 TO 837+40	DECEL LANE						720					
40+00 TO 53+00	MAINLINE	1,300	1,300	1,300								
48+00 TO 53+00	ACCEL. LANE			500								
SUB-TOTAL (FINAL PVMT. MKG. W.B LANES)		*21,406*	*21,406*	*21,906*	—	—	*720*	—	—	—	—	—
FINAL PAVEMENT MARKING E.B. LANES												
805+00 TO 878+22.62BK.	MAINLINE	7,323	7,323	7,323								
878+34.33 AH. TO 942+63.44 BK.	MAINLINE	6,430	6,430	6,430								
942+72.35 AH. TO 965+94.76 BK.	MAINLINE	2,323	2,323	2,323								
966+07.10 AH. TO 1052+26.0 BK.	MAINLINE	8,619	8,619	8,619								
7+27.0 AH. TO 41+00	MAINLINE	3,373	3,373	3,373								
809+50 TO 813+00	DECEL. LANE						700					
833+50 TO 837+50	ACCEL. LANE	400					400					
35+00 TO 37+00	DECEL. LANE			200								
37+00 TO 40+00	DECEL LANE						600					
SUB-TOTAL (FINAL PVMT. MKG. E.B. LANES)		*28,468*	*28,068*	*28,268*	—	—	*1,700*	—	—	—	—	—
PROJECT TOTALS		*103,812*	*50,478*	*78,096*	*30,418*	*22,568*	*3,740*	*2,320*	—	*530*	—	—

STATION	LOCATION	PAVEMENT MARKING LINES (Linear Feet)										
		EDGE		LANE	CENTER		CHANNELIZING		CROSSHATCH		CROSS WALK	STOP
		WHITE SOLID 4 INCH	YELLOW SOLID 4 INCH	WHITE BROKEN 5 INCH	YELLOW SOLID 5 INCH	YELLOW BROKEN 5 INCH	WHITE SOLID 10 INCH	YELLOW SOLID 10 INCH	WHITE SOLID 10 INCH	YELLOW SOLID 10 INCH	WHITE SOLID 12 INCH	WHITE SOLID 24 INCH
PAVEMENT MARKING REMOVAL												
806+25 TO 815+00	E.B.			975								
815+00 TO 878+22.62 EK.	E.B.	6,323	6,323	6,323								
878+34.33 AH. TO 942+63.44BK.	E.B.	6,430	6,430	6,430								
942+72.35 AH. TO 965+94.76 BK.	E.B.	2,323	2,323	2,323								
963+07.10 AH. TO 1052+26.0 BK.	E.B.	8,619	8,619	8,619								
7+27.0 AH. TO 39+50	E.B.	3,223	3,223	3,223								
812+75 TO 815+75	W.B.		300	300								
40+00 TO 45+00	W.B.		500	500								
48+00 TO 53+00	W.B.			500								
PROJECT TOTAL	*(LINEAR FEET)*	*26,918*	*27,718*	*29,193*	—	—	—	—	—	—	—	—
PROJECT TOTAL	*(SQUARE FEET)*	*8,913*	*9,239*	*3,041*	—	—	—	—	—	—	—	—
			21,193	*SQ. FT. REM. PVMT. MKG.*								



PAVEMENT MARKING ARROW DETAIL

NOTE:
FOR DETAILS OF PAVEMENT MARKING LINES AND LINE PLACEMENT, SEE STANDARD S-627-1A

IT IS ESTIMATED THAT THE RECREATION TRAIL (LENGTH 22,073 FT) WILL REQUIRE 18 GAL. OF YELLOW PAINT FOR A CENTER LINE (BROKEN YELLOW, 4 INCHES WIDE- 3 FT. SEGMENTS WITH 9 FT. GAPS).

SUMMARY OF PAVEMENT MARKING QUANTITIES

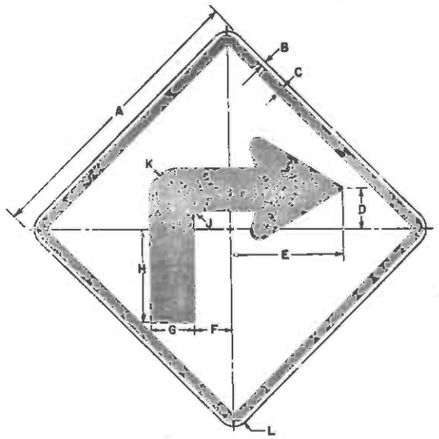
COLOR	PAINT (GAL.)	THERMOPLASTIC (SQ. FT.)
YELLOW	345	
WHITE	437	
TOTAL	782	

UNIFORM STANDARD WARNING SIGNS

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	98	

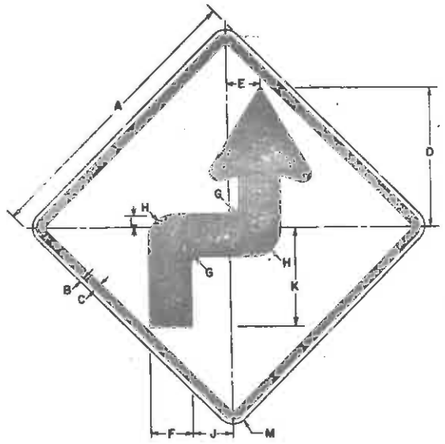
AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐



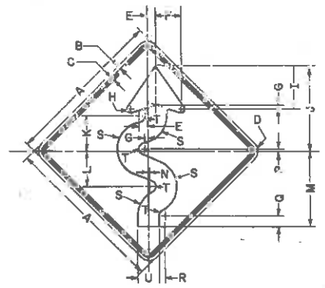
CODE	A	B	C	D	E	F	G	H	J	K	L
CWI-1(R)	24	3/8	3/8	3 1/4	9 3/8	3	3 1/2	7 1/8	15/16	2 1/2	1 1/4
CWI-1(G)	30	1/2	1/2	4 1/8	12	3 3/4	4 3/8	9 1/16	1	3	1 5/8
XWI-1(R)	36	3/4	3/4	4 7/8	14 5/8	4 1/2	5 1/4	11 5/16	1 1/4	3 3/4	2 1/4
IWI-1(R)	48	1	1 1/4	6 1/2	19 1/2	6	7	15 1/2	1 5/8	4 7/8	3

Legend – Black (Non-Refl)
Background – Yellow (Refl)
Reverse arrow design for left (L)



CODE	A	B	C	D	E	F	G	H	J	K	L	M
CWI-3(R)	24	3/8	3/8	11 3/8	24 3/8	3 1/2	15/16	2 1/2	3	8 5/16	1 1/3	1 1/2
CWI-3(R)	30	1/2	1/2	14 1/16	30	4 3/8	4 3/8	1	3 1/2	10 3/4	1 5/8	1 1/2
XWI-3(R)	36	5/8	3/4	17 7/16	36 1/2	5 1/4	5 1/4	1 1/4	3 5/8	4 1/2	12 1/2	1 5/8	2 1/4
IWI-3(R)	48	3/4	1 1/4	22 3/8	48	7	7	1 5/8	4 7/8	6	16 5/8	2 3/8	3

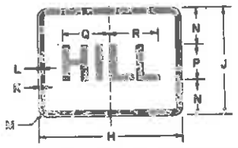
Legend — Back (Non-Refl)
Background — Yellow (Refl)
Reverse arrow design for left (L)



CODE NUMBER	PANEL DIMENSIONS A	B	C	D	LEGEND DIMENSIONS E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U
CWI-5(R or L)	24	3/8	3/8	1 1/2	1 1/4	3 3/4	1/2	5/8	6 1/2	12 3/4	5 3/16	5 1/4	11 3/8	5/32	1/16	1 13/32	2 1/2	4 1/8	7/8	3 1/4
SWI-5(R or L)	30	1/2	3/4	1 7/8	1 9/16	4 11/16	5/8	3/4	8 1/8	15 15/16	6 31/64	6 9/16	14 7/8	3/16	5/16	2	3 1/8	5 5/32	1 3/32	4 1/16
XWI-5(R or L)	36	5/8	3/4	2 1/4	1 7/8	5 5/8	3/4	29/32	9 3/4	19 1/8	7 55/64	7 7/8	17 15/16	7/32	3/8	2 23/32	3 3/4	6 3/16	1 5/16	4 7/8
IWI-5(R or L)	48	3/4	1 1/4	3	2 1/2	7 1/2	1	1 5/16	13	25 1/2	10 5/8	10 1/2	22 3/4	5/16	1/2	3 47/64	5	6 1/4	1 1/4	6 1/2

NOTES:

1. All Warning Signs shall have a Screen Processed Black Legend and Border on a Reflectorized Yellow Background.
2. Galvanized Sheet Steel shall be hot dip Galvanized sheets of structural quality, 0.0598" min. thick., Grade A per ASTM Spec. A446-60T, 2 oz. coating class with a light Phosphate coating on surfaces that are to receive reflective sheeting per Federal Spec. TT-C-490 for Galvanized sheets.
3. See applicable Standard for installation details: Class I or Class II as denoted in the Tabulation of Signs.



CODE	H	J	K	L	M	N	P	Q	R
ESW7-1	24	18	3/8	3/8	1 1/2	6	6D	7 7/8	8 7/8
EIW7-1	36	24	3/8	3/8	1 1/2	8	8D	10 5/8	10 7/8

Legend - Black (Non-Refl.)
Background - Yellow (Refl.)

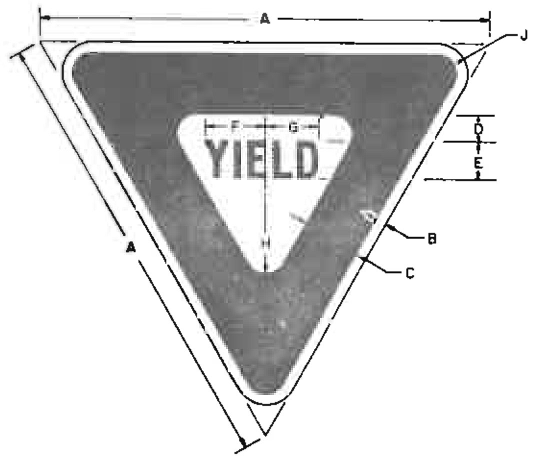
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70 - 2(42)	49	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

UNIFORM STANDARD REGULATORY SIGNS

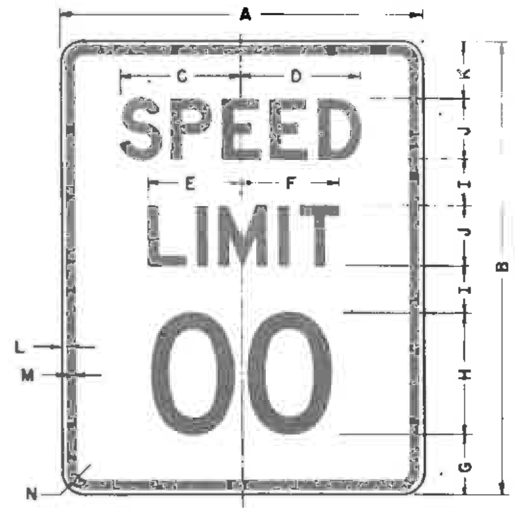
ADDITIONAL CONSTRUCTION SIGNS



CODE	A	B	C	D	E	F	G	H	J
SR1-2	36	3/4	5	2	3C	4 23/32	4 1/4	1 1/4	2
XR1-2	48	1	6	2 3/4	4C	6 1/8	5 7/8	2	3
IR1-2	60	1 1/2	8	3 1/2	5C	7 23/32	7 1/4	2 1/2	4

Background – Reflectorized White.

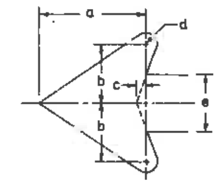
Legend and Border – Reflectorized Red (Reverse screened on reflective sheeting).



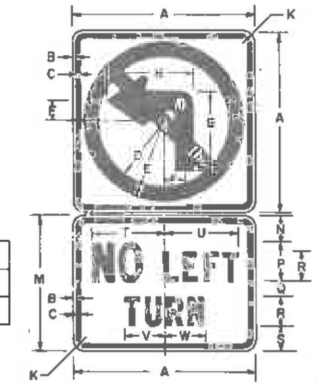
CODE	A	B	C	D	E	F	G	H	I	J	K	L	M	N
CR2-1(-)	18"	24"	7 3/8"	7 3/8"	5 7/8"	6"	2 3/8"	8" "D"	1 1/2"	4" "D"	2 5/8"	3/8"	9/16"	1 1/2"
SR2-1(-)	24"	30"	9 5/8"	9 5/8"	7 1/4"	7 1/4"	4"	10" "E"	2"	4" "E"	4"	3/8"	5/8"	1 1/2"
XR2-1(-)	36"	48"	14"	14 1/32"	10 3/4"	11 5/16"	7 1/2"	14" "E"	4 1/2"	6" "E"	5 1/2"	5/8"	7/8"	2"
IR2-1(--)	48"	60"	15 27/32"	15 7/8"	12 9/32"	12 7/8"	8"	16" "E"	6 1/4"	8" "D"	7 1/2"	3/4"	7/8"	3"

Legend and border – Screen processed black.

Background – Reflectorized white.



ARROW DETAILS	a	b	c	d	e
SR3-2	4 11/16	2 5/8	3/8	1/2	2 1/2
XR3-2	7 1/32	3 15/16	9/16	3/4	3 3/4



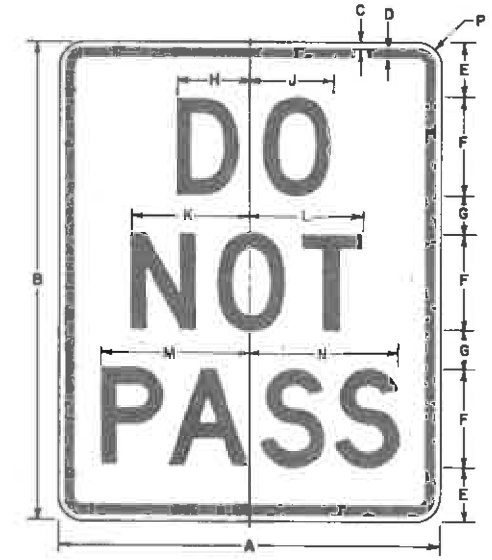
Background – Reflectorized White

Circle and Diagonal – Reflectorized Red

Legend and Border – Screen Processed Black

SYMBOL PANEL	A	B	C	D	E	F	G	H	J	K	L
SR3-2	24	3/8	5/8	8 1/2	10 1/2	2 3/4	10 1/2	11 1/2	2	1 1/2	2
XR3-2	36	5/8	7/8	12 3/4	15 3/4	4 1/8	15 3/4	17 1/4	3	2 1/4	3

WORD PANEL	M	N	P	Q	R	S	T	U	V	W
ESR3-2	18	3 1/2	5C	2	4C	3 1/2	9 1/2	9 9/16	5 11/32	5 5/16
EXR3-2	24	4	7C	3	6C	4	13 5/8	13 13/16	8 1/32	8



CODE	A	B	C	D	E	F	G	H	J	K	L	M	N	P
CR4-1	18	24	3/8	5/8	3 1/2	4D	2 1/2	3 1/2	3 5/16	4 3/4	4 7/8	6 1/4	6 1/4	1 1/2
SR4-1	24	30	3/8	5/8	3 1/2	6D	2 1/2	4 11/16	5	7 1/8	7 3/8	9 3/8	9 3/4	1 1/2
XR4-1	36	48	5/8	7/8	7	8D	5	6 1/4	6 5/8	9 1/2	9 3/4	12 1/2	13	2 1/4
IR4-1	48	60	3/4	1 1/4	8	10D	7	7 3/4	8 5/16	11 7/8	12 1/4	15 5/8	16 1/4	3

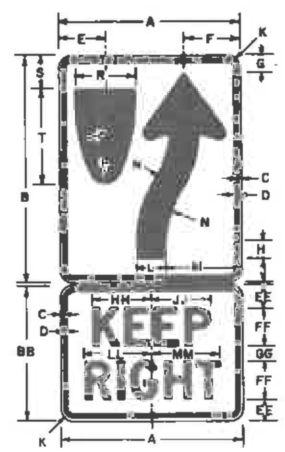
Legend – Black (Non-Refl.)

Background – White (Refl.)

CODE	A	B	C	D	E	F	G	H	J	K	L	M	N	P
CR4-2	18	24	3/8	5/8	3 1/2	4C	2 1/2	5 7/16	5 5/8	5	4 3/4	5 3/8	5 1/2	1 1/2
SR4-2	24	30	3/8	5/8	3 1/2	6C	2 1/2	8 3/16	8 7/16	7 1/2	7 5/8	8	8 1/4	1 1/2
XR4-2	36	48	5/8	7/8	7	8C	5	10 7/8	11 1/4	10	9 1/2	10 5/16	11	2 1/4
IR4-2	48	60	3/4	1 1/4	8	10C	7	13 5/8	14 1/8	12 1/2	11 13/16	13 5/8	13 3/4	3

Legend – Black (Non-Refl.)

Background – White (Refl.)

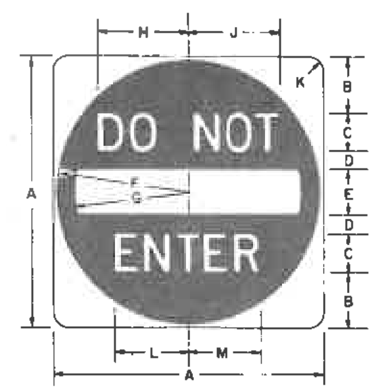


CODE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
CR4-7	18	24	3/8	5/8	4 11/16	5 1/2	1 3/8	1 7/8	2 1/4	1 1/2	3	7 1/2	5 1/4	1 1/2	22 1/2	6	3 3/8	9 3/8
SR4-7	24	30	3/8	5/8	6 1/4	7 3/8	1 7/8	2 1/2	3	1 1/2	4	10	7	2	30	8	4 1/2	12 1/2
XR4-7	36	48	5/8	7/8	9 3/8	11 1/8	2 13/16	3 3/4	4 1/2	2 1/4	6	15	10 1/2	3	45	12	6 3/4	18 3/4
IR4-7	48	60	3/4	1 1/4	12 1/2	14 13/16	3 3/4	5	6	3	8	20	14	4	60	16	9	25

CODE	A	BB	C	D	EE	FF	GG	HH	JJ	K	LL	MM
ECR4-7	18	12	3/8	5/8	1 1/2	4D	1	4 7/8	5 7/16	1 1/2	5 7/16	5 11/16
ESR4-7	24	18	3/8	5/8	3	5D	2	7 7/16	8 9/16	1 1/2	9	9 3/8
EXR4-7	36	24	5/8	7/8	3 1/2	7D	3	10 9/16	11 1/4	2 1/4	12	12 1/2
EIR4-7	48	36	3/4	1 1/4	6 1/2	9D	5	13 5/8	14 7/16	3	15 1/2	16

Legend – Black (Non-Refl.)

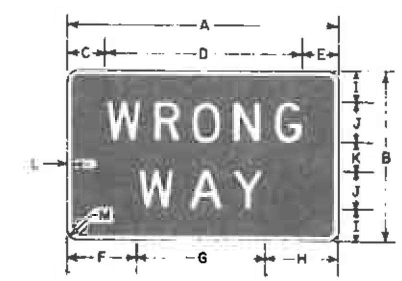
Background – White (Refl.)



CODE	A	B	C	D	E	F	G	H	J	K	L	M
SR5-1	30	6 1/2	4D	2	5	14 1/2	12 1/2	9 1/2	9 21/32	1 7/8	7 3/4	7 3/4
XR5-1	36	7 1/2	5D	2 1/2	6	17 1/2	15	11 7/8	12 9/64	2 1/4	9 11/16	9 47/64
IR5-1	48	11	6D	3	8	23 1/2	20	14 1/4	14 15/32	3	11 5/8	11 21/32

Background and Legend – Reflectorized White.

Circle – Reflectorized Red (Reverse screened on reflective sheeting)



CODE	A	B	C	D	E	F	G	H	I	J	K	L	M
SR5-1A	24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]
SR5-9	36"	24"	5 1/64"	25 15/32"	5 15/64"	9 21/32"	16 45/64"	9 41/64"	4 1/2"	6"–D	3"	5/8"	1 1/2"R
IR5-9	48"	30"	6 29/64"	35 3/64"	6 1/2"	12 7/16"	23 9/64"	12 27/64"	5 1/2"	7"–E	5"	3/4"	1 7/8"R

Legend and border – Reflectorized white.

Background – Reflectorized red (Reverse screened on reflective sheeting.)

FEDERAL ROAD REGION NO	DISTRICT	PROJ NO	SHEET NO	TOTAL SHEETS
VIII	COLORADO	I 70 - 2 (42)	50	

AS CONSTRUCTED

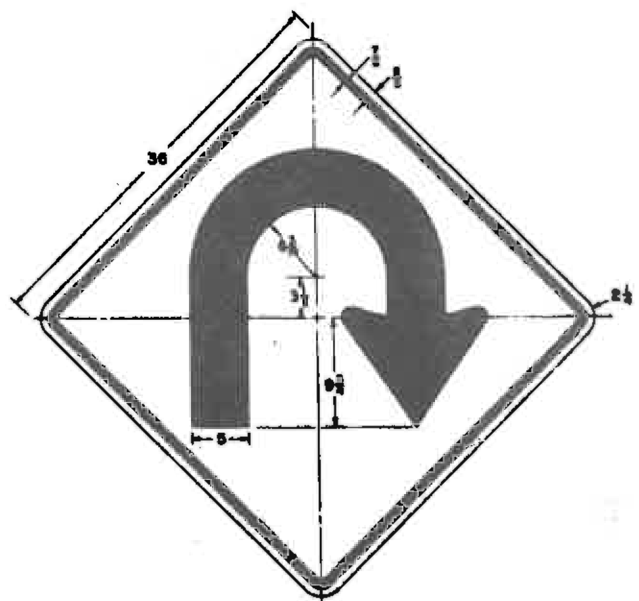
NO REVISIONS ☐ REVISED ☐ VOID ☐

(E-I) 8-4-78, NOTE J.D.S.

UNIFORM STANDARD WARNING SIGNS

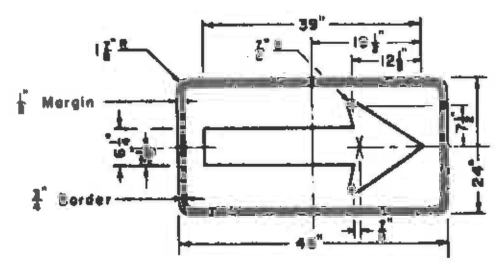
ADDITIONAL CONSTRUCTION SIGNS

(E-I) NOTE: Background color for Construction Warning Signs shall be reflectorized orange.

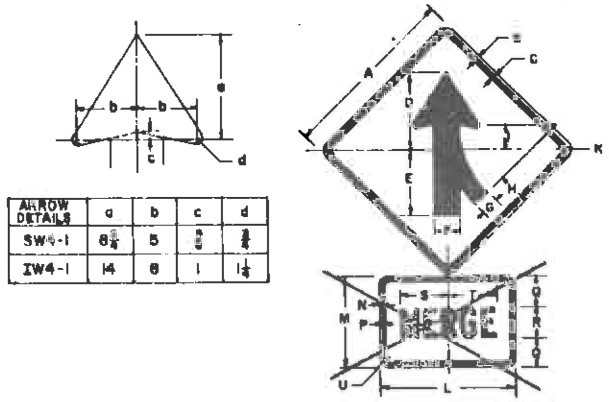


SW1-2a(R)

Legend – Black (Non-Refl)
Background – Yellow (Refl)
Reverse arrow design for left (L)



SW1-6



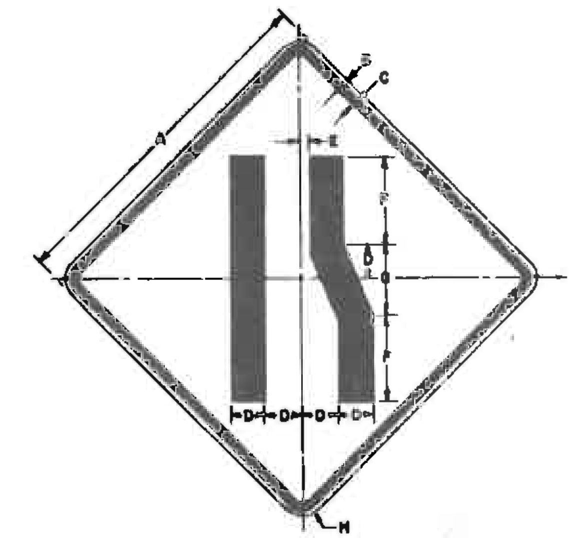
ARROW DETAILS	a	b	c	d
SW4-1	8[illegible]	5	[illegible]	[illegible]
IW4-1	14	8	1	1¼

Reverse symbol design for left.

Background - Reflectorized Yellow.
Legend and Border - Screen Processed Black.

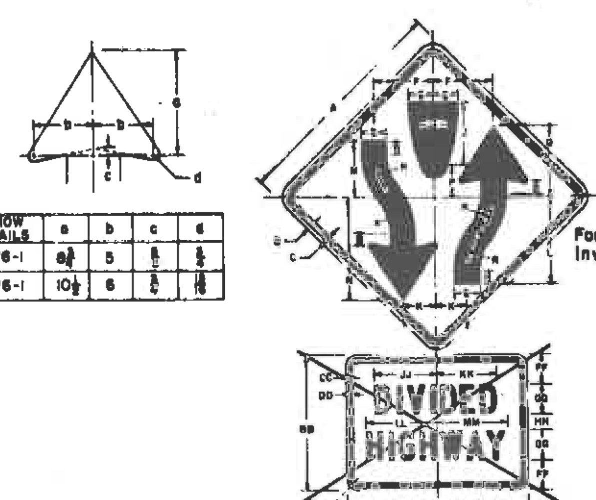
SYMBOL PANEL	A	B	C	D	E	F	G	H	J	K
SW4-1	30	[illegible]	[illegible]	13	11	4[illegible]	3	5[illegible]	4[illegible]	2
IW4-1	48	[illegible]	1[illegible]	20[illegible]	17½	7	4[illegible]	8[illegible]	[illegible]	3

WORD PANEL	L	M	N	P	Q	R	S	T	U
ESW4-1	24	18	[illegible]	[illegible]	[illegible]	5C	10[illegible]	10[illegible]	1[illegible]
EIW4-1	36	24	[illegible]	[illegible]	8	8C	12[illegible]	[illegible]	1[illegible]



CODE	A	B	C	D	E	F	G	H
CW4-2(R)	30	[illegible]	[illegible]	3[illegible]	[illegible]	[illegible]	[illegible]	1[illegible]
SW4-2(R)	36	[illegible]	[illegible]	4	1	10	[illegible]	[illegible]
IW4-2(R)	48	[illegible]	1[illegible]	5[illegible]	1[illegible]	13[illegible]	10[illegible]	3

Legend – Black (Non-Refl)
Background – Yellow (Refl)
Reverse symbol design for left (L)

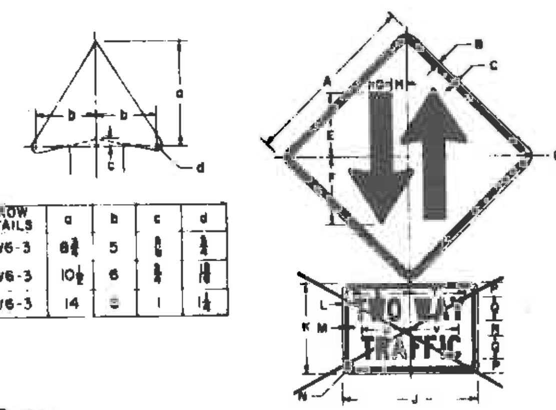


ARROW DETAILS	a	b	c	d
SW6-1	8[illegible]	5	[illegible]	[illegible]
XW6-1	10½	6	[illegible]	[illegible]

For symbol on W6-2 use inverted W6-1 panel.
Background - Reflectorized Yellow
Legend and Border - Screen Processed Black.

SYMBOL PANEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
SW6-1	36	[illegible]	[illegible]	2¼	4	9½	30	2	10	5	14	9	16½	5	11½	10
IW6-1	48	[illegible]	1¼	3	5¼	12[illegible]	39[illegible]	2[illegible]	13[illegible]	6[illegible]	18[illegible]	11[illegible]	21[illegible]	6[illegible]	15[illegible]	13[illegible]

WORD PANEL	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM
ESW6-1	24	18	[illegible]	[illegible]	[illegible]	[illegible]	4C	2	8[illegible]	8[illegible]	9[illegible]	9[illegible]
EIW6-1	36	24	[illegible]	[illegible]	1½	4½	6C	3	12[illegible]	12[illegible]	14[illegible]	14[illegible]



ARROW DETAILS	a	b	c	d
SW6-3	8[illegible]	5	[illegible]	[illegible]
XW6-3	10½	6	[illegible]	[illegible]
IW6-3	14	8	1	1¼

Background - Reflectorized Yellow.
Legend and Border - Screen Processed Black.

SYMBOL PANEL	A	B	C	D	E	F	G	H
SW6-3	30	[illegible]	[illegible]	2	11½	12½	4	2½
XW6-3	36	[illegible]	[illegible]	2¼	13	14	5	3
IW6-3	48	[illegible]	1¼	3	17	18	6	4

WORD PANEL	J	K	L	M	N	P	Q	R	S	T	U	V
ESW6-3	24	18	[illegible]	[illegible]	[illegible]	[illegible]	4C	3	9½	9½	8½	8[illegible]
EIW6-3	36	24	[illegible]	[illegible]	1½	4	6C	4	14[illegible]	14[illegible]	12[illegible]	12[illegible]

Series 'D' Letters

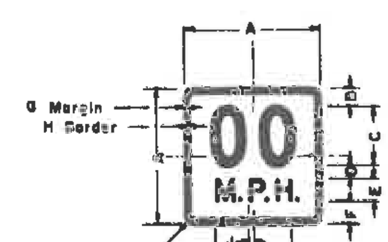
(See IW4-1 for Plate Details)

IW9-1(L)

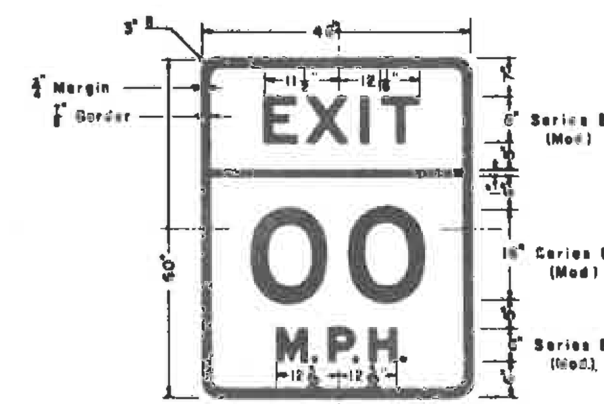
Series 'E' Letters

(See IW4-1 for Plate Details)

IW9-1(R)



CODE	A	B	C	D	E	F	G	H	I	J	K
SW13-1(--)	18"	2¼"	8"C	2"	5"E	2[illegible]"	[illegible]"	[illegible]"	1[illegible]"	[illegible]"	5[illegible]"
XW13-1(--)	2[illegible]"	3¼"	10"C	2[illegible]"	4"E	4"	[illegible]"	[illegible]"	1[illegible]"	[illegible]"	6[illegible]"



Stroke Width of Letters and Numerals is modified to 0.2" per inch of Letter Height.

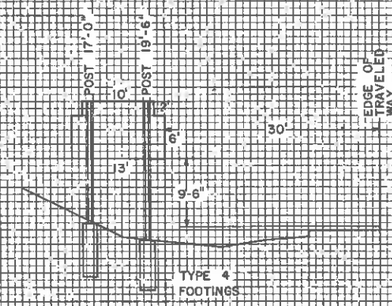
IW13-2 (--)

FEDERAL ROAD PROJECT NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	51	

AS CONSTRUCTED

NO REVISIONS ☐ REVISED ☐ VOID ☐

CROSS SECTION AT CLASS III SIGN LOCATION

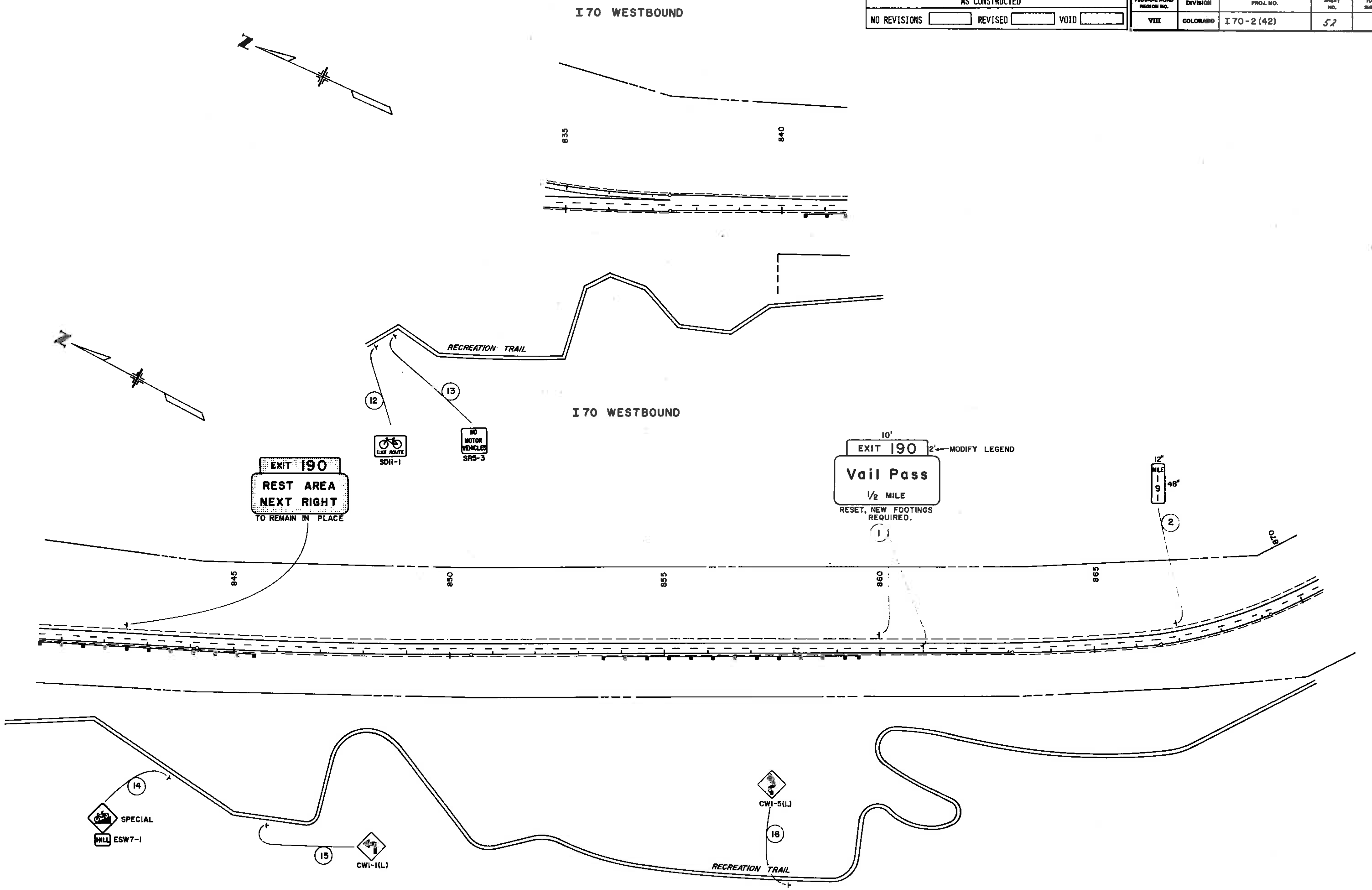


SIGN NO. 1
STA. 860+00 W.B.

EPARTMENT OF HIGHWAYS
. OF HIGHWAYS—STATE OF COLORADO
RM 126
ER 1972

AS CONSTRUCTED		
NO REVISIONS	REVISED	VOID

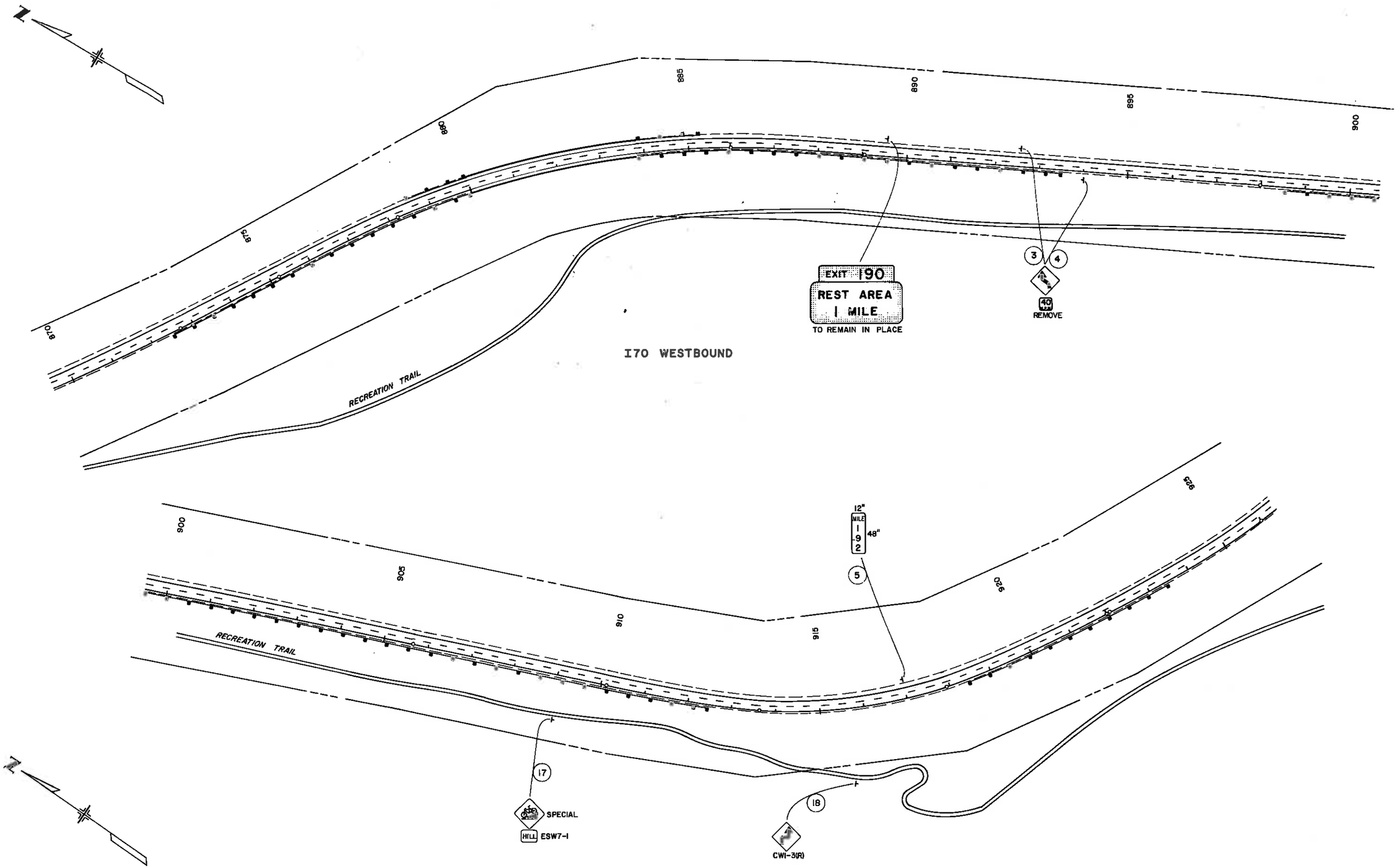
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	52	



AS CONSTRUCTED								
NO REVISIONS		REVISED		VOID				

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	53	

I70 WESTBOUND



HIGHWAYS—STATE OF COLORADO
I 128
X 1972

AS CONSTRUCTED						
NO REVISIONS		REVISED		VOID		

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	54	

I70 WESTBOUND

N

REMOVE
6

930 935 940 945 950 955

I70 WESTBOUND

N

RECREATION TRAIL

REMOVE
7

960 965 970 975 980 985

8

12"
MILE
I-93
48"

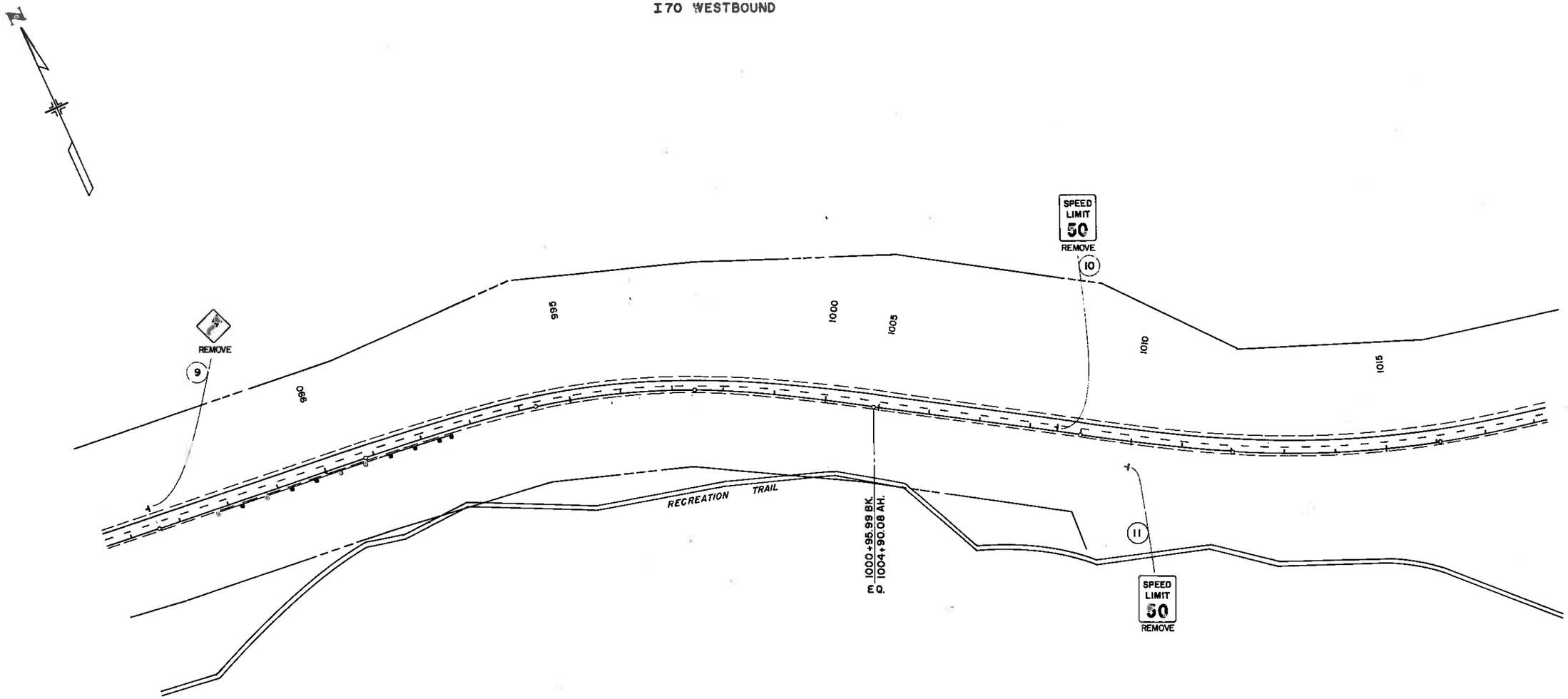
RECREATION TRAIL

ARTMENT OF HIGHWAYS
F HIGHWAYS—STATE OF COLORADO
M 126
R 1973

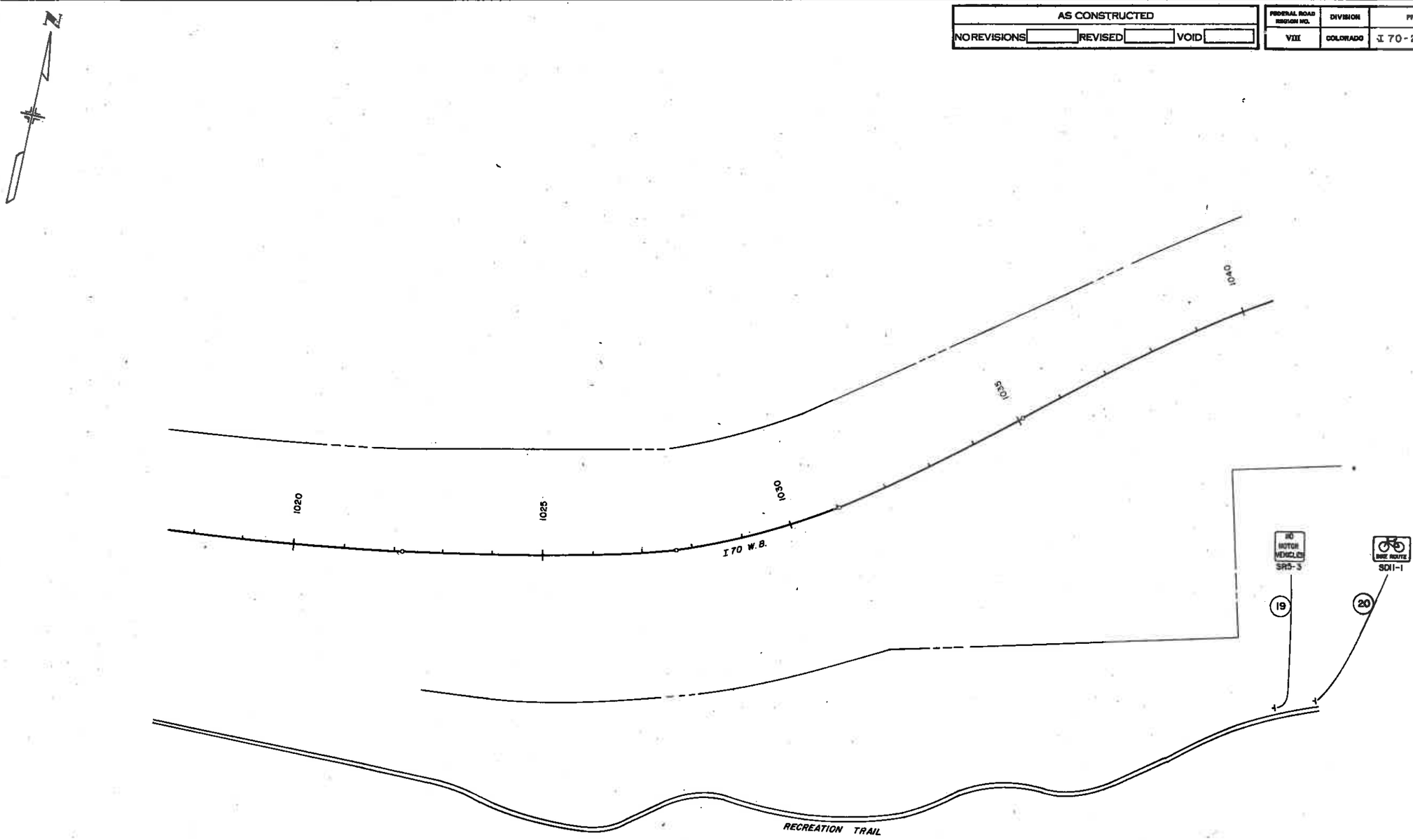
AS CONSTRUCTED					
NO REVISIONS		REVISED		VOID	

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70 - 2 (42)	55	

I70 WESTBOUND

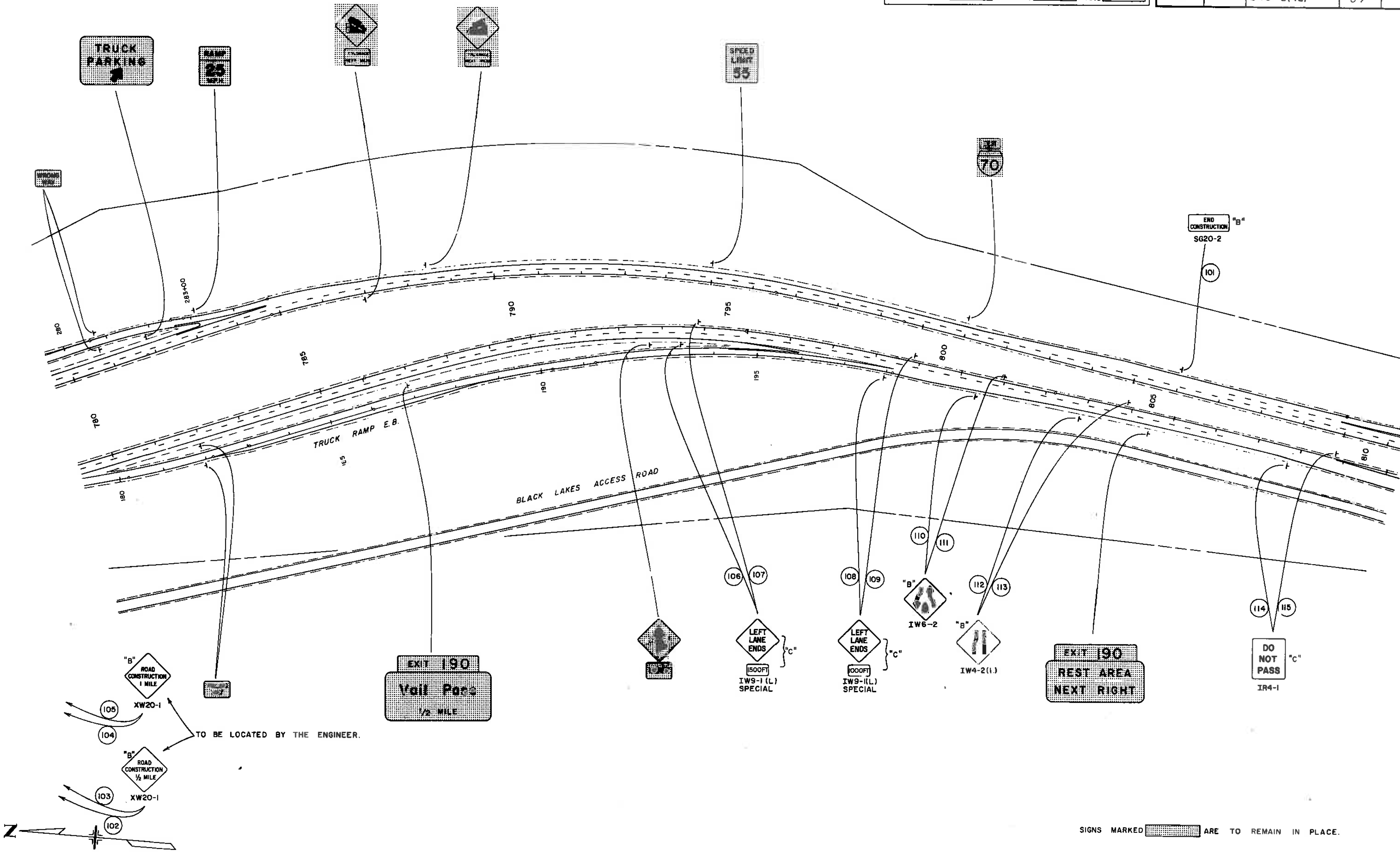


AS CONSTRUCTED									
NO REVISIONS		REVISED		VOID		FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
						VIII	COLORADO	I 70-2(42)	58	



AS CONSTRUCTED		
NO REVISIONS	REVISED	VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	57	

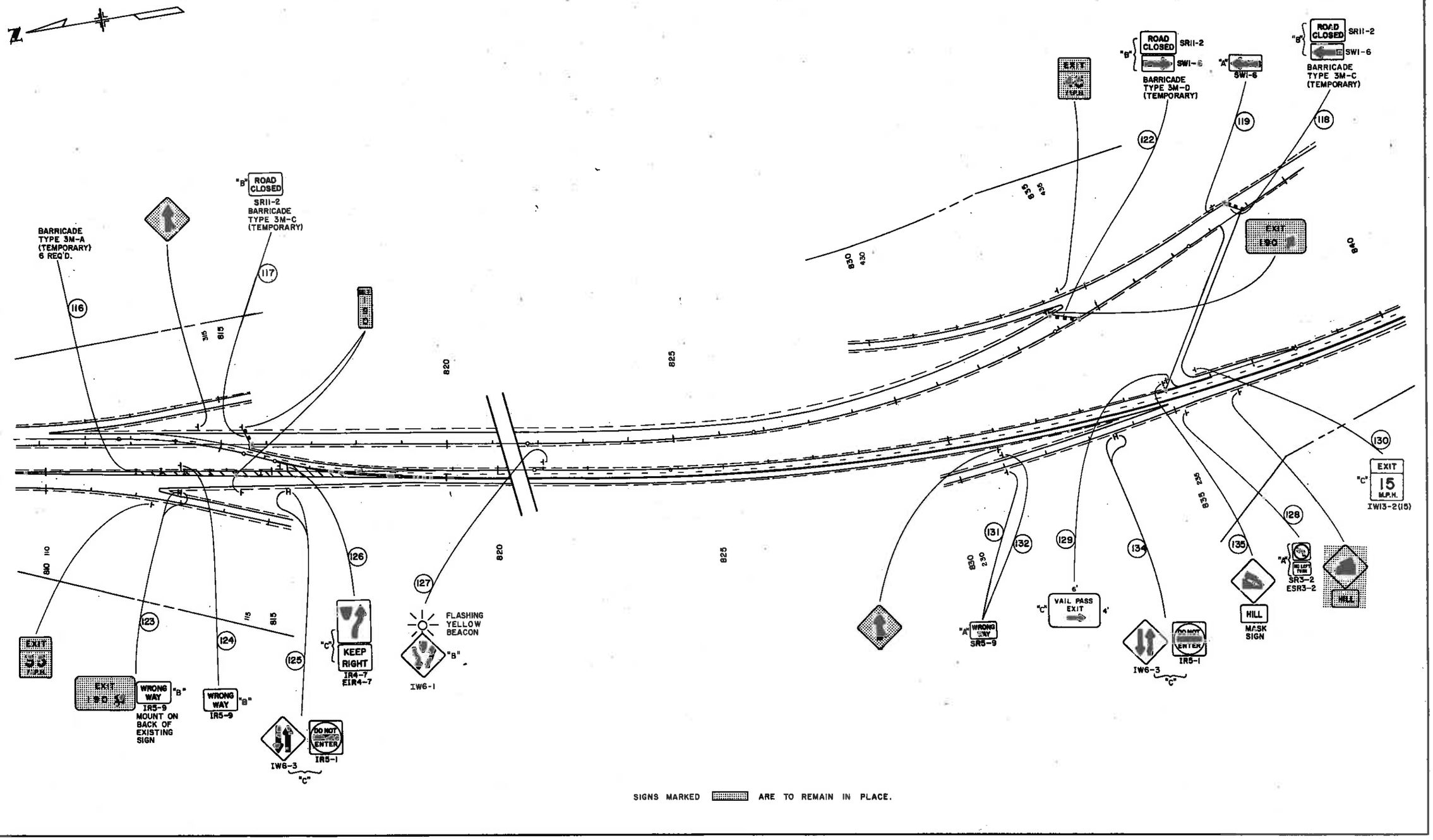


TRUCK PARKING
RAMP 25 M.P.H.
SPEED LIMIT 55
70
END CONSTRUCTION "B"
SG20-2
101
280
283+00
785
790
795
800
805
810
780
180
190
195
TRUCK RAMP E.B.
BLACK LAKES ACCESS ROAD
106
107
108
109
110
111
112
113
114
115
LEFT LANE ENDS
1500FT
IW9-1 (L) SPECIAL
"C"
LEFT LANE ENDS
1000FT
IW9-1(L) SPECIAL
"C"
"B"
IW6-2
"B"
IW4-2(L)
EXIT 190
REST AREA NEXT RIGHT
DO NOT PASS
"C"
IR4-1
EXIT 190
Vail Pass
1/2 MILE
"B"
ROAD CONSTRUCTION 1 MILE
XW20-1
105
104
TO BE LOCATED BY THE ENGINEER.
"B"
ROAD CONSTRUCTION 1/2 MILE
XW20-1
103
102
N

SIGNS MARKED [shaded] ARE TO REMAIN IN PLACE.

AS CONSTRUCTED					
NO REVISIONS		REVISED		VOID	

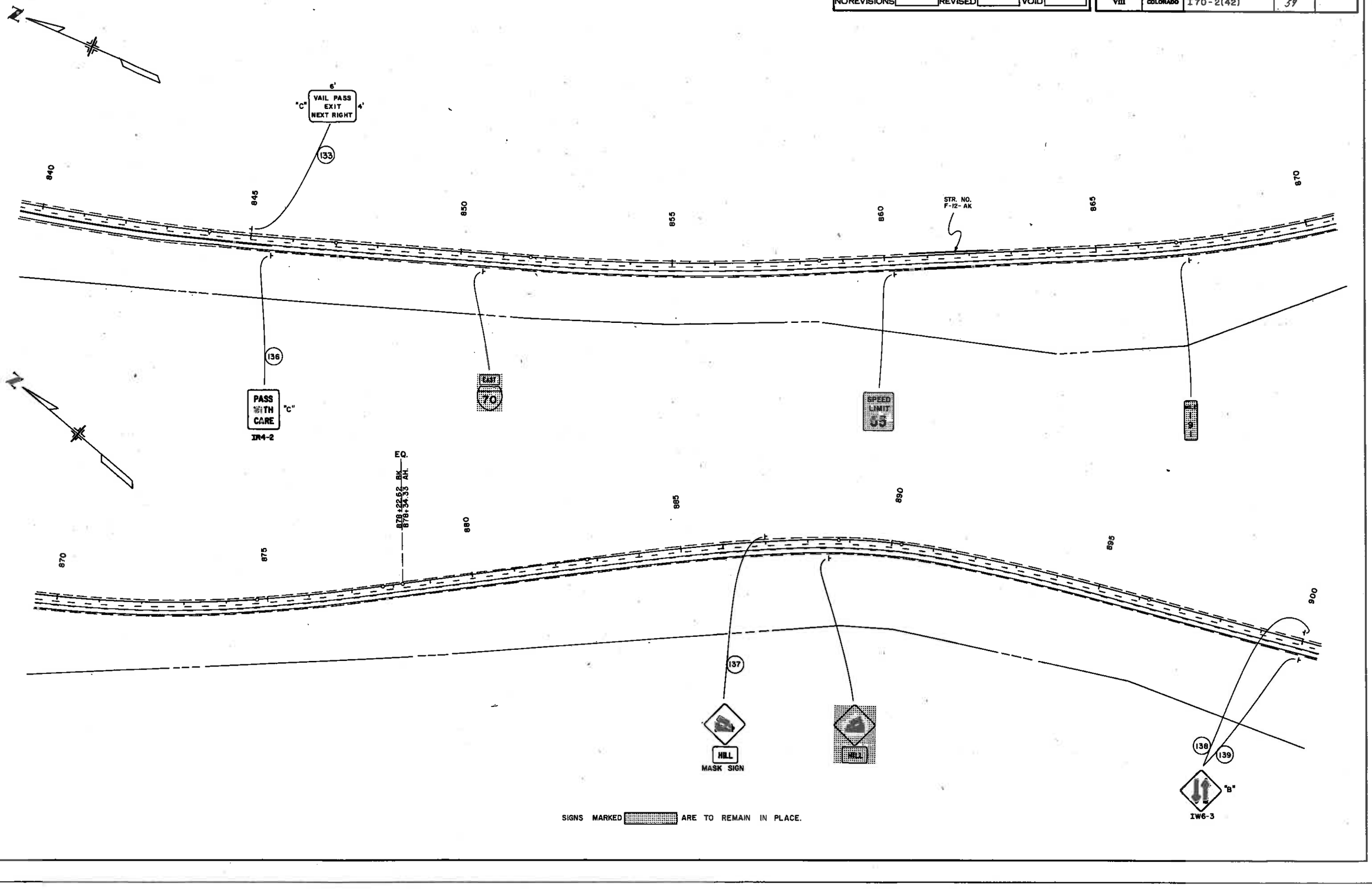
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-1(42)	58	



SIGNS MARKED ▨ ARE TO REMAIN IN PLACE.

AS CONSTRUCTED						
NO REVISIONS		REVISED		VOID		

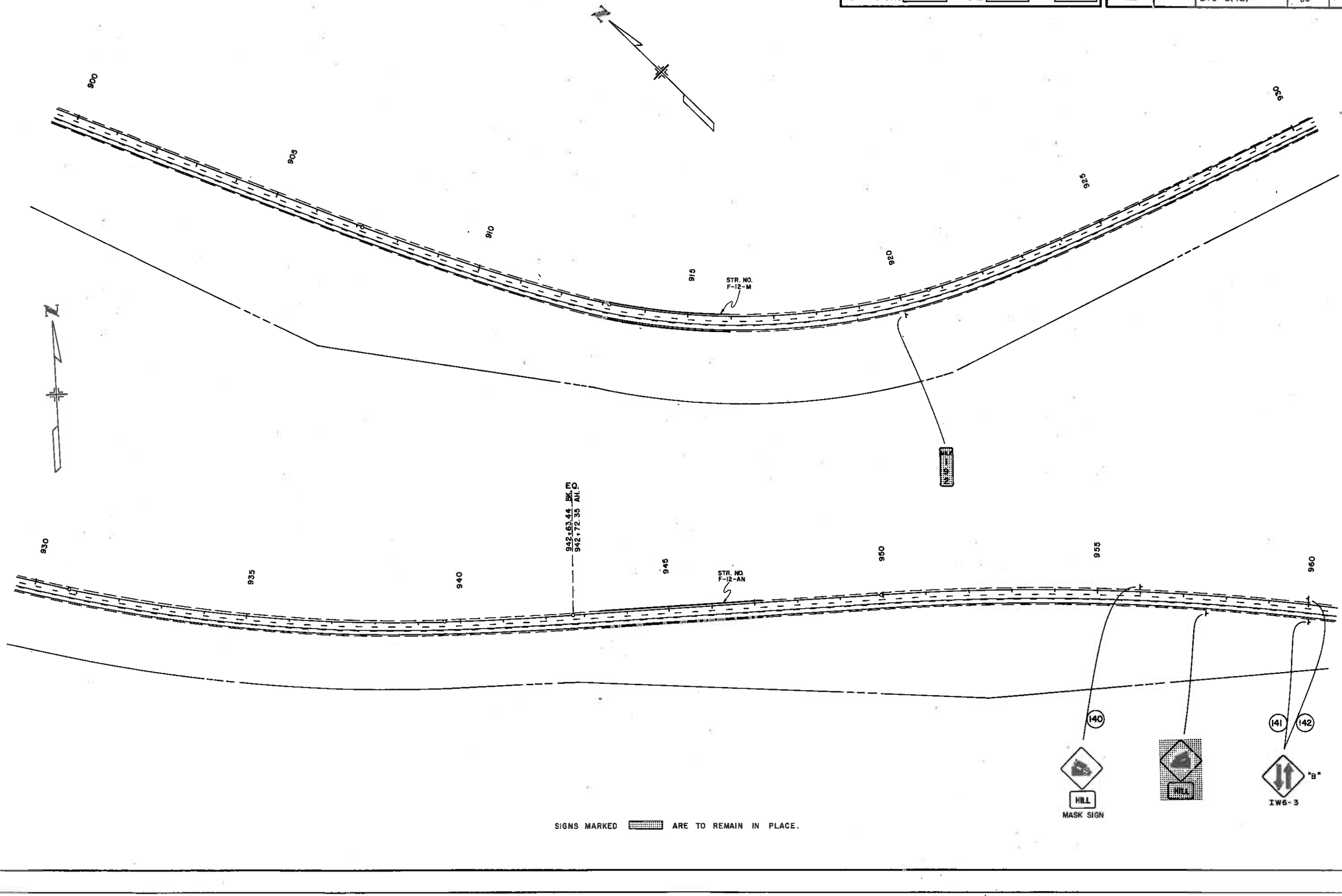
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	59	



SIGNS MARKED ▒▒▒▒ ARE TO REMAIN IN PLACE.

AS CONSTRUCTED							
NO REVISIONS		REVISED		VOID			

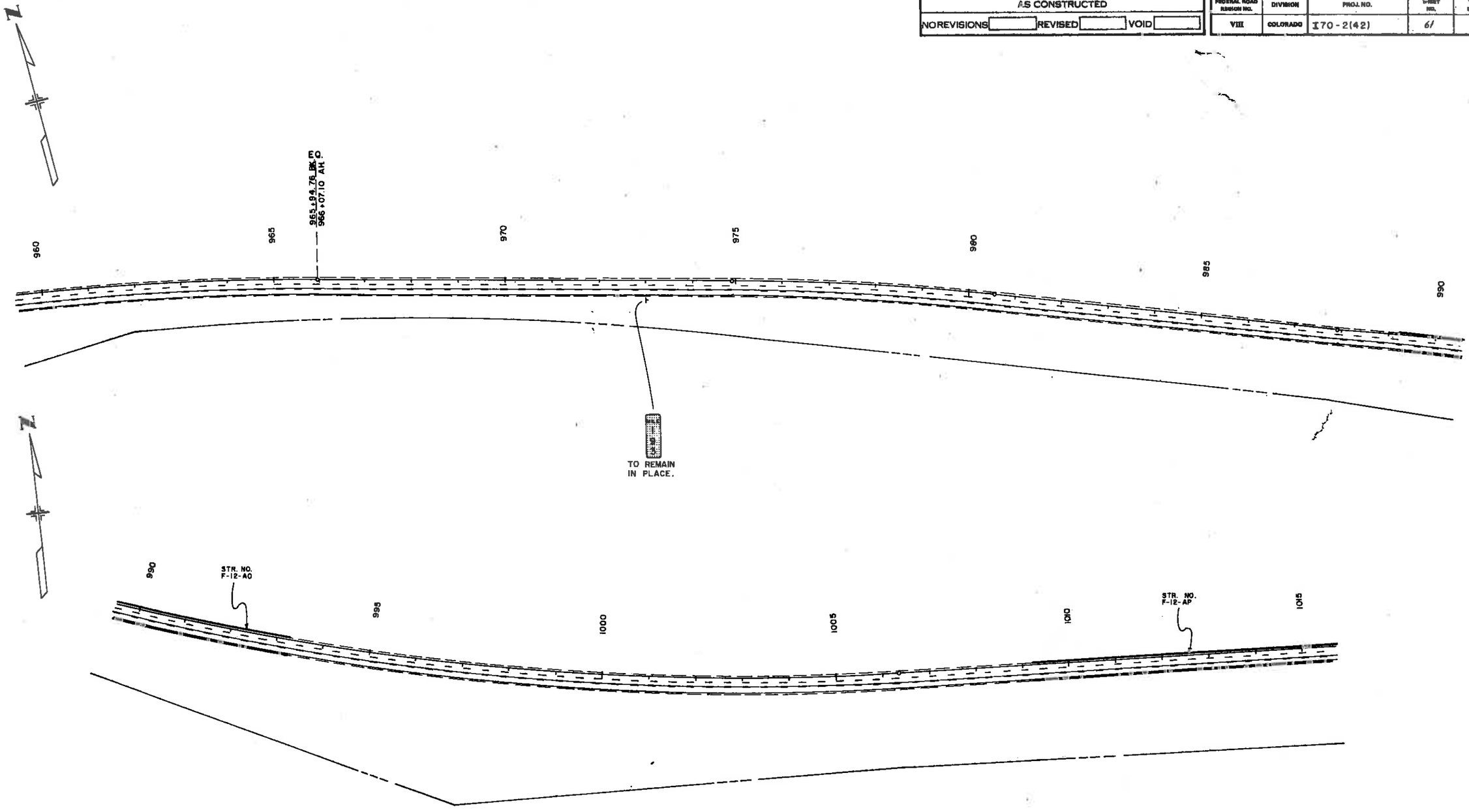
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	60	



SIGNS MARKED ▨ ARE TO REMAIN IN PLACE.

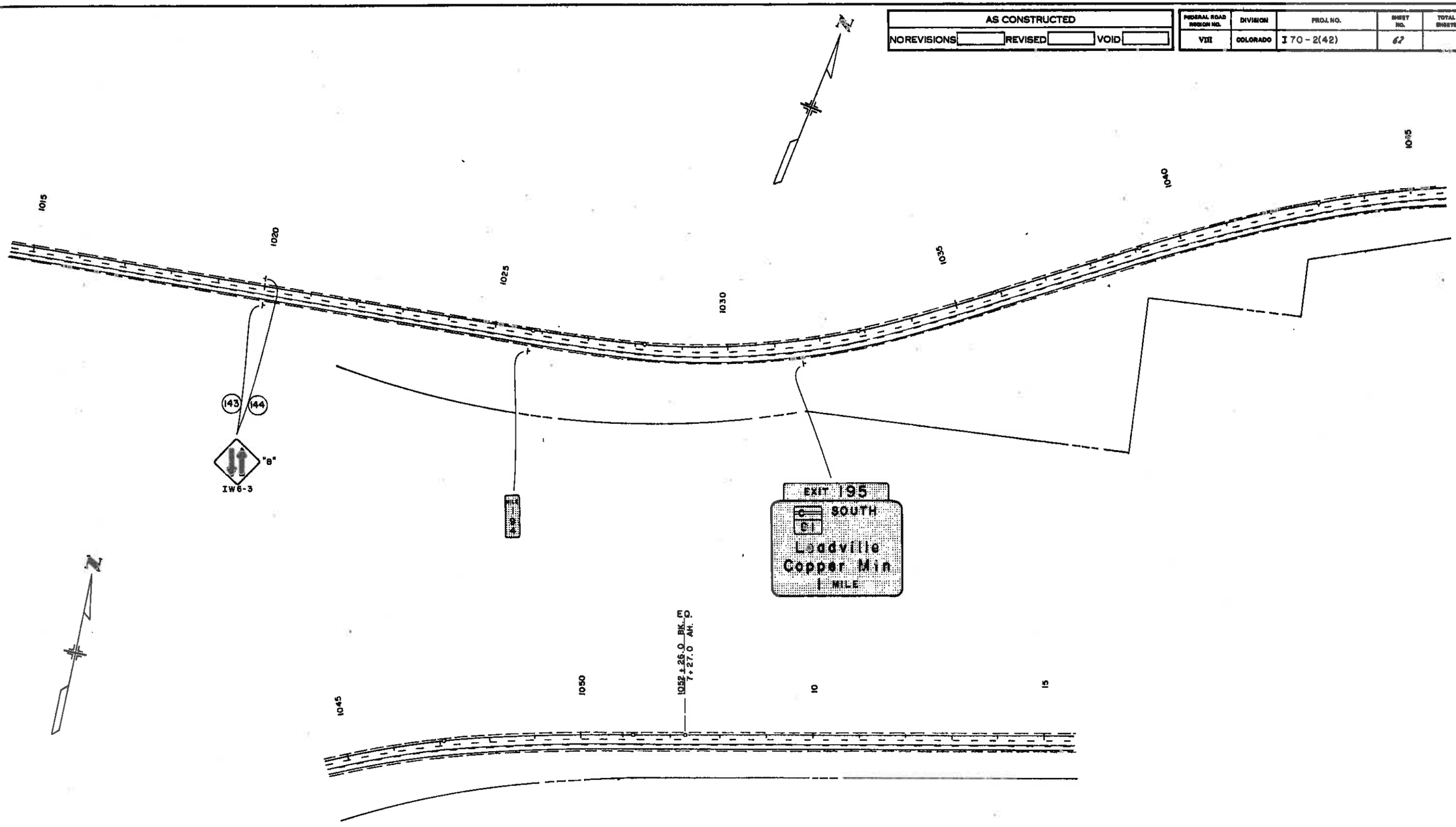
AS CONSTRUCTED									
NO REVISIONS		REVISED		VOID					

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-2(42)	61	



AS CONSTRUCTED								
NO REVISIONS		REVISED		VOID				

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70 - 2(42)	62	



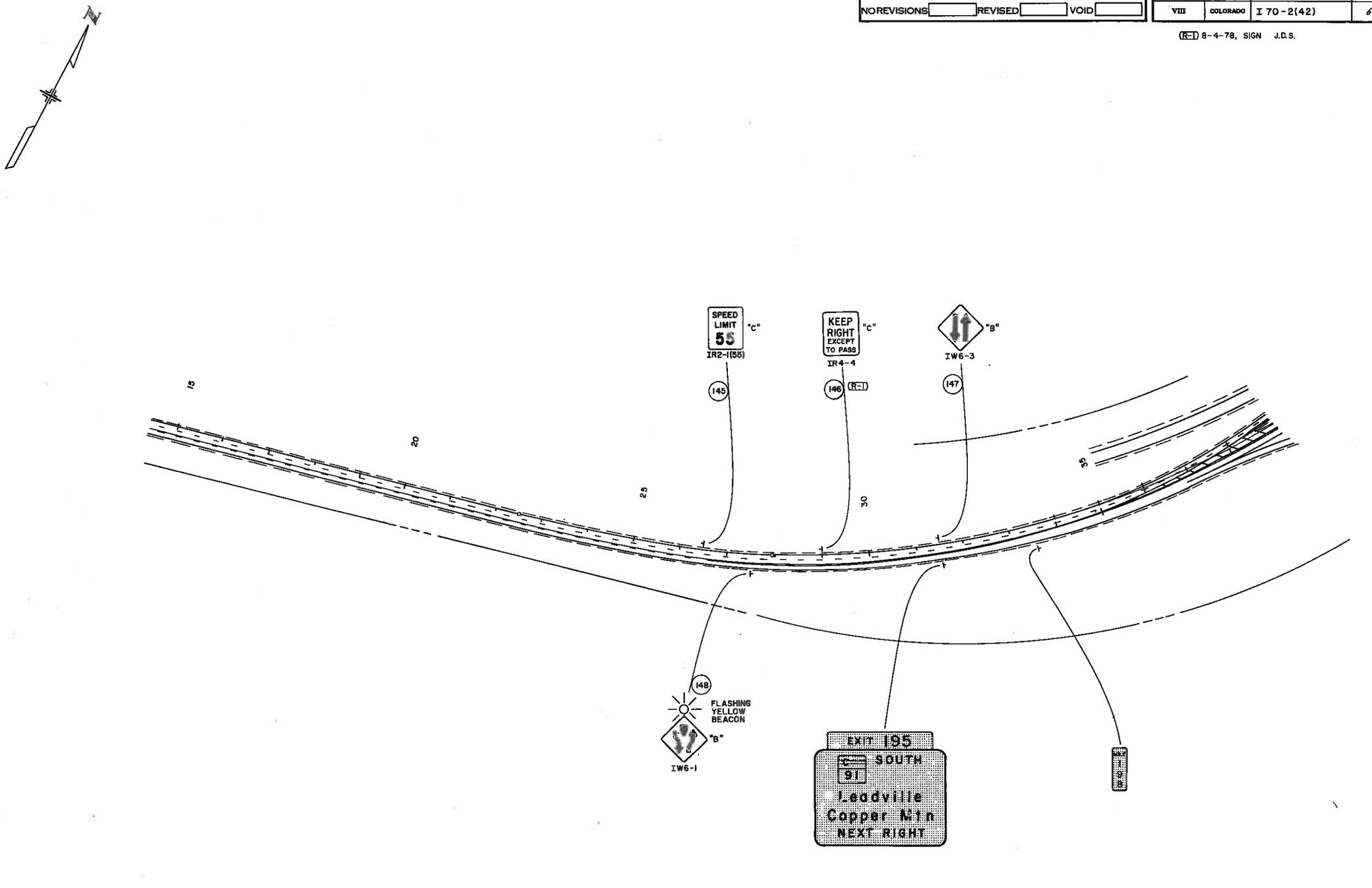
SIGNS MARKED [ ] ARE TO REMAIN IN PLACE.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS — STATE OF COLORADO
D O H FORM 1.6
JULY 1976

AS CONSTRUCTED			
NO REVISIONS		REVISED		VOID	

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	63	

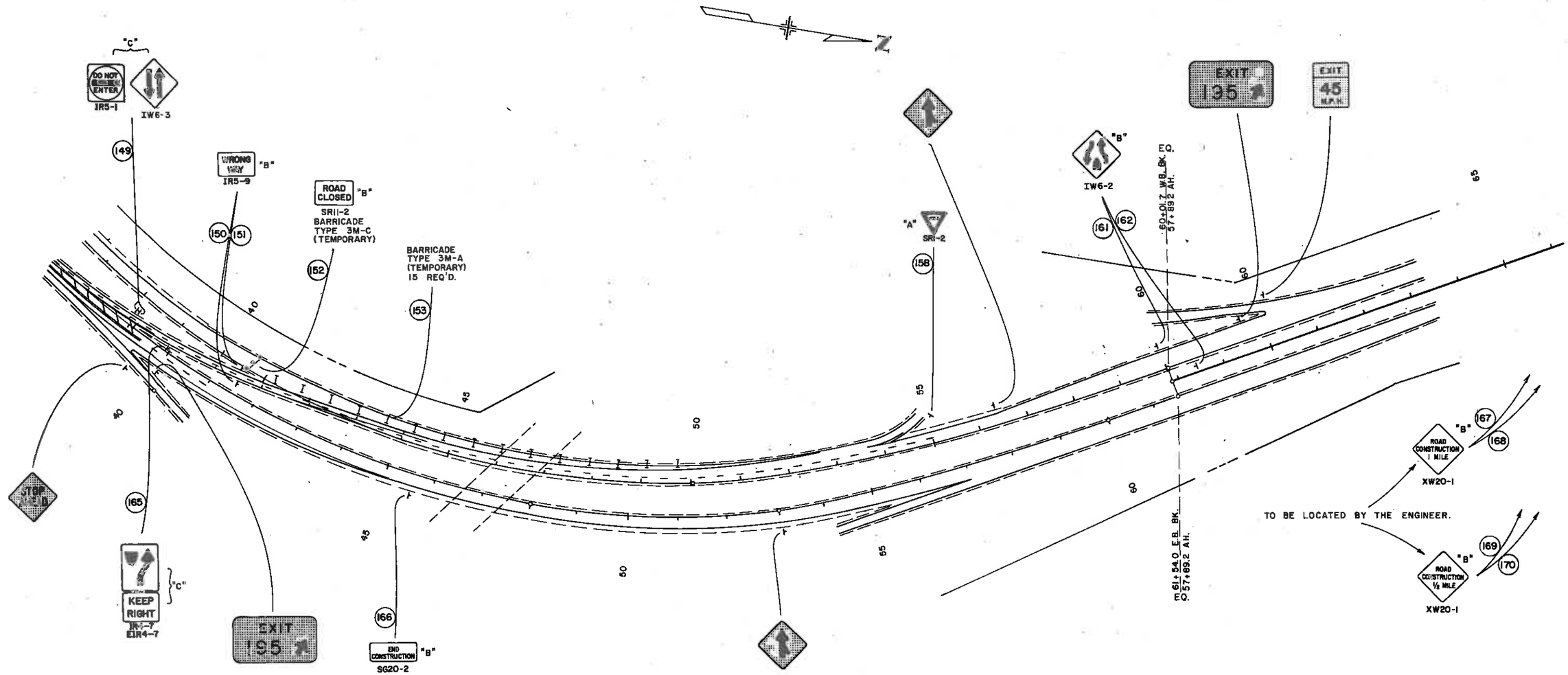
(R-1) 8-4-78, SIGN J.D.S.



SIGNS MARKED [ ] ARE TO REMAIN IN PLACE.

AS CONSTRUCTED								
NO REVISIONS		REVISED		VOID				

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-2(42)	69	



SIGNS MARKED ▨ ARE TO REMAIN IN PLACE.

DIVISION OF HIGHWAYS, STATE OF COLORADO
D. O. H. FORM NO. 126
Rev. October, 1972

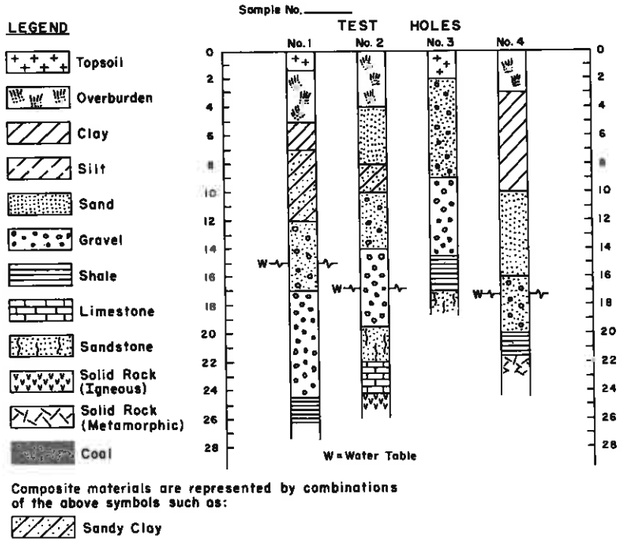
STANDARD M-100-A

(MAY 11, 1973)

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

REVISIONS		

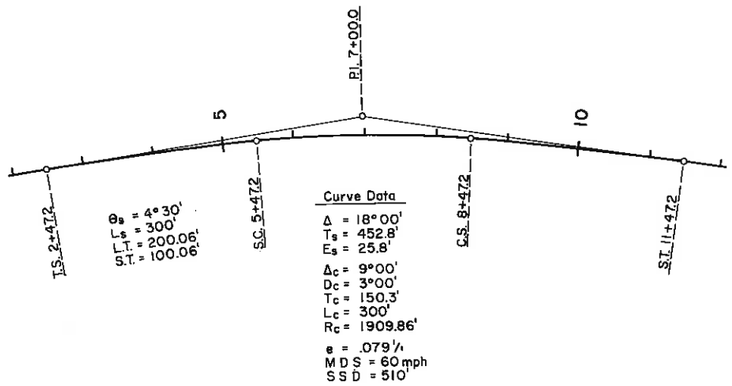
TYPICAL LOG OF PIT



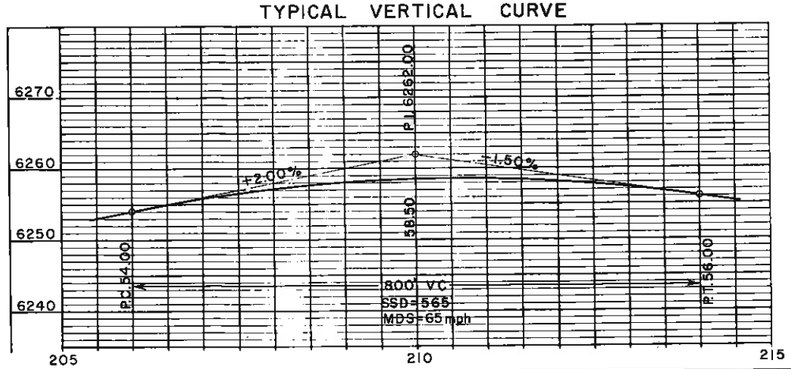
Composite materials are represented by combinations of the above symbols such as:

Sandy Clay

TYPICAL HORIZONTAL CURVE



TYPICAL VERTICAL CURVE

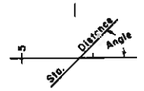


Road Approaches

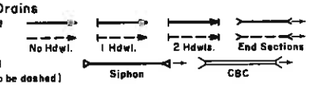
Section Corner

Center of Section

Ties to Section Corner

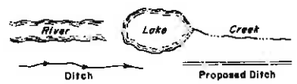


Culverts & Drains



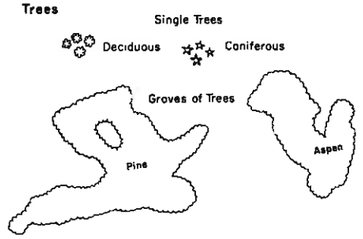
Bridges

Water

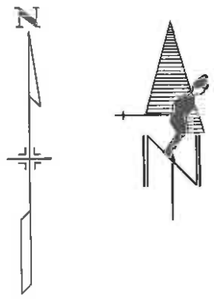


Mountains

Trees



NORTH ARROWS



County Line
Township or Range Line
Land Lines — Section Line — 1/4 Section Line — 1/16 Section Line
Property or Tract Line
City Limits
Railroad
Existing Road
New Road

Control of Access
Access denied by Deed — OP=OPENING — 24'OP — 16'OP — E.O.A.
Right of Way Line — R.O.W. MARKER
Protected By Freeway Law (Virgin Location)
Top of Cuts
Toe of Fills
Barbed Wire Fence
Chain Link Fence
Barrier Fence
Woven Wire-Combination Fence
Snow Fence
Wood Fence
Deer Fence
Guard Rail — TYPE — EXIST. — TYPE — NEW
Guard Post — EXIST. — NEW
Delineators — Type I, II, III, IV, V

Sidewalk — TYPE — EXIST. — TYPE — NEW
Curb and Gutter — TYPE — EXIST. — TYPE — NEW
Gutter — TYPE — EXIST. — TYPE — NEW
Tel. & Teleg. Lines — Exist. — To be Removed — Relocated
Electric Lines
Elec. Trans. Tower
Buried Tel. Cable — EXIST. — NEW
Buried Electric Cable — EXIST. — NEW
Gas Main — 6" EXIST. — 6" NEW
Oil Main — 10" EXIST. — 10" NEW
Water Main — 4" EXIST. — 4" NEW
Sanitary Sewers — 15" EXIST. — 15" NEW — M.H. — INLET
Storm Sewers — M.H. — 18" EXIST. — 18" NEW

Light Standard - Existing
Light Standard - To be Removed
Light Standard - Relocated
Light Standard - Clear Luminaire
Light Standard - Amber Luminaire
Bridge Wall Luminaire
Bridge Ceiling Luminaire
High Mast Light Standard — N = Number of Luminaires

GENERAL NOTES

THESE SYMBOLS ARE INTENDED TO EXPLAIN THE VARIOUS TOPOGRAPHIC FEATURES INVOLVED ON THE ROADWAY PLAN SHEETS WHICH ARE PREPARED AT SCALES OF 1 INCH = 50 FEET OR 1 INCH = 100 FEET. NOTES ARE ADDED WHERE NECESSARY TO CLARIFY THE SYMBOL. IF THESE SYMBOLS ARE NOT APPROPRIATE FOR USE WITH OTHER SCALES, A LEGEND IS PROVIDED IN THE PLANS TO EXPLAIN THE SYMBOLS THAT ARE USED.

GUARD RAIL, CURB & GUTTER, ETC. ARE REPRESENTED BY A SYMBOL WITH TYPE GIVEN BY NOTE. SEE THE APPROPRIATE DIVISION M-STANDARD FOR EXPLANATION OF THE VARIOUS TYPES.

EXISTING BUILDINGS AND OTHER MAN MADE TOPOGRAPHICAL FEATURES NOT SYMBOLED HERE ARE SHOWN BY DASHED LINES WITH EXPLANATORY NOTES AS NECESSARY. NEW FEATURES TO BE CONSTRUCTED ARE SHOWN BY SOLID LINES.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

STANDARD SYMBOLS

Designed by R.L.M	Approved by Lou M. Cox
Made by H.P.S	Staff Design Engr.
Checked by D.W.D	Date: May 11, 1973

ISION OF HIGHWAYS, STATE OF COLORADO
D.H. FORM NO. 126
. MARCH, 1972

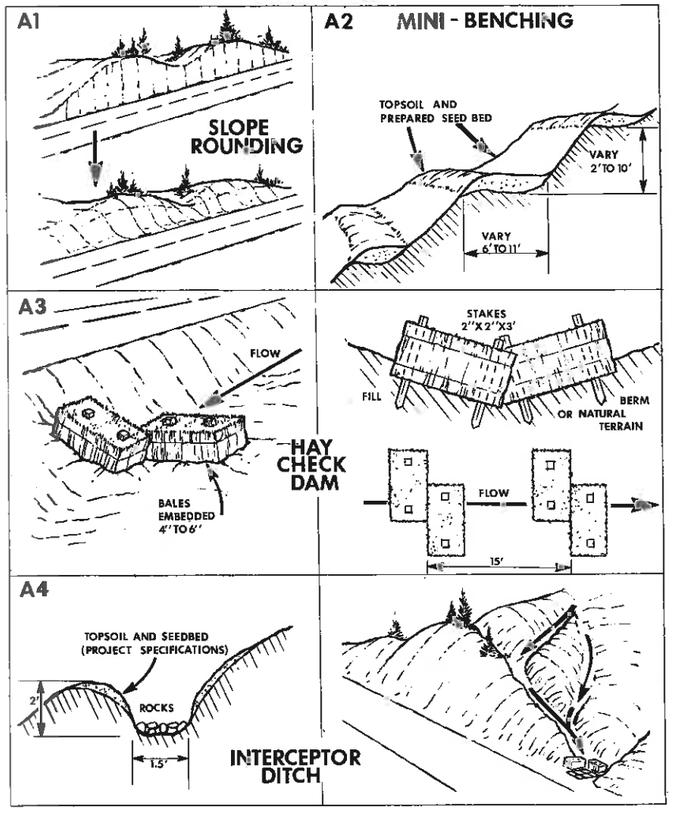
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS

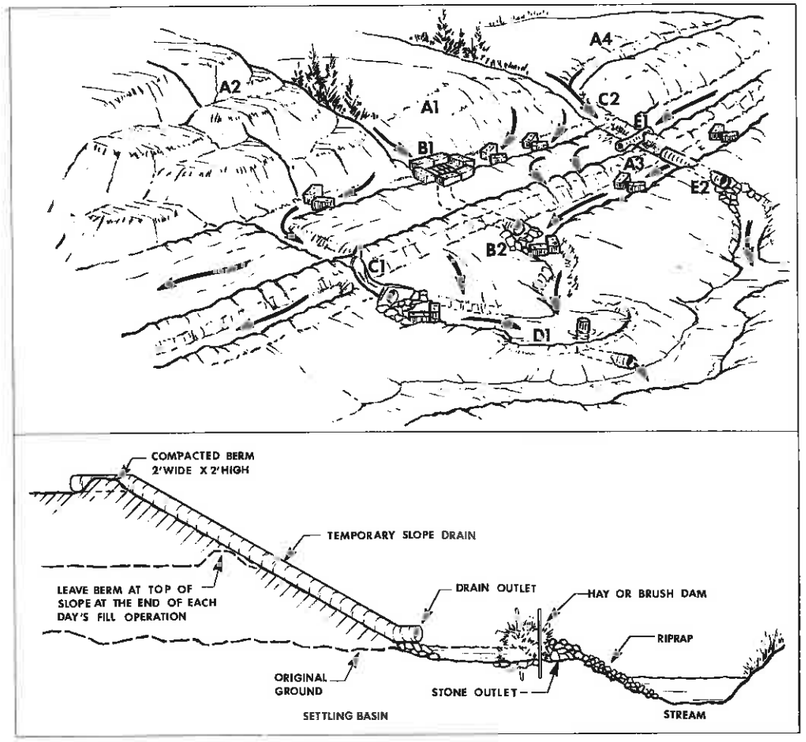
STANDARD M-107-A

(APRIL 21, 1975)

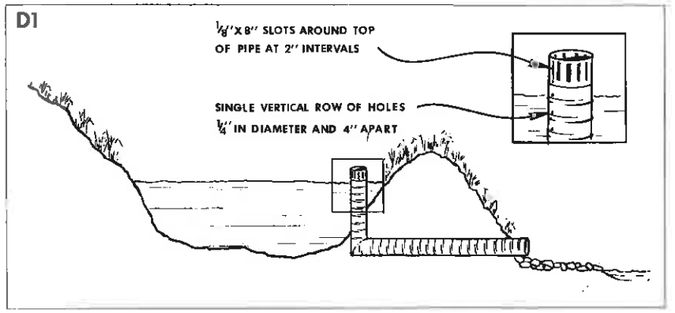
SLOPES



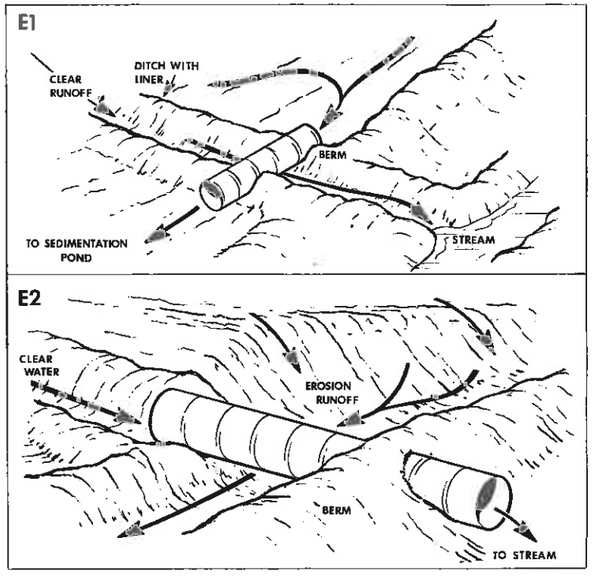
TYPICAL PLAN CONCEPT



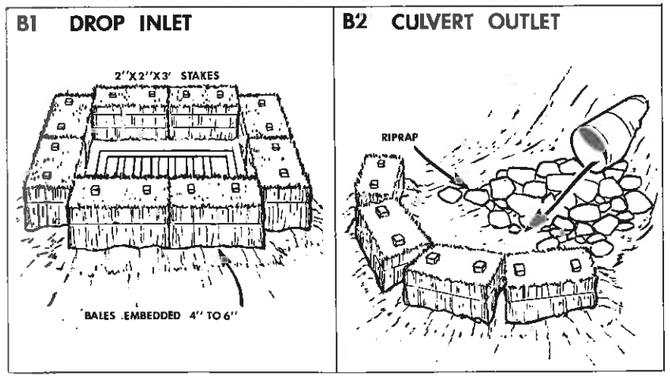
SEDIMENTATION POND



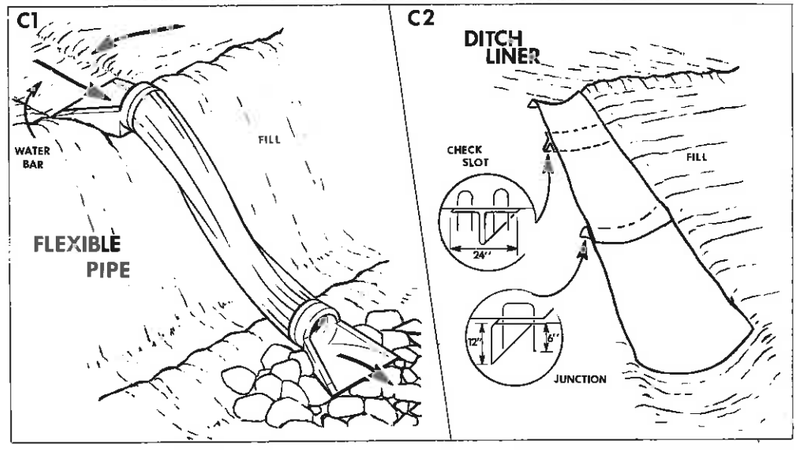
CLEAR WATER DIVERSION



DRAINAGE STRUCTURES



RUNOFF CONTROL STRUCTURES



GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS APPLICABLE TO THE PROJECT.

EROSION CONTROL DETAILS ARE CONSIDERED TO BE TEMPORARY AND ARE TO SERVE ONLY DURING CONSTRUCTION, OR UNTIL THEY ARE INTEGRATED INTO A FINAL EROSION CONTROL SYSTEM.

AT THE END OF EACH DAYS WORK THE APPROPRIATE COMBINATION OF TEMPORARY EROSION CONTROL MEASURES WILL BE PLACED FOR EACH DRAINAGE SECTION UNDER CONSTRUCTION, AS PER TYPICAL PLAN CONCEPT.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TEMPORARY EROSION CONTROL

DESIGNED BY: RGM MADE BY: RDL CHECKED BY: MJT	APPROVED BY: B. L. Peterson STAFF DESIGN ENGINEER DATE: Apr. 21, 1975

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

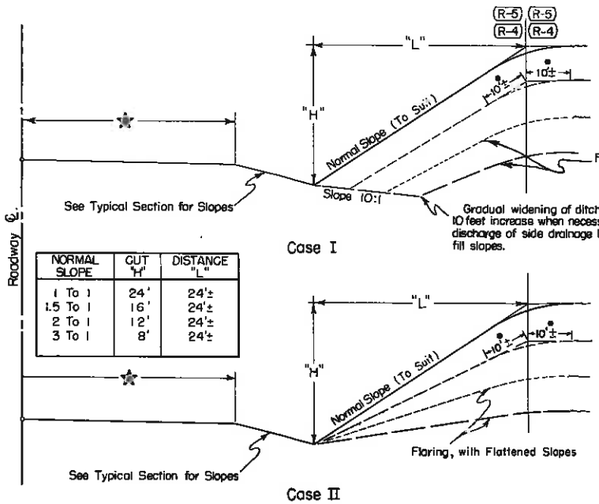
STANDARD M-203-B

(JULY 1, 1965)

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

REVISIONS			
(R-1)	2-6-68	Median, Cross Over	MRH
(R-2)	7-30-68	Dept. Name	MRH
(R-3)	4-1-69	Widening for Guard Rail	M.R.H.
(R-4)	4-27-70	Cut Slope and Note	M.R.H.
(R-5)	12-11-72	Cut Slope Tr. Dimension	M.R.H.

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



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

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

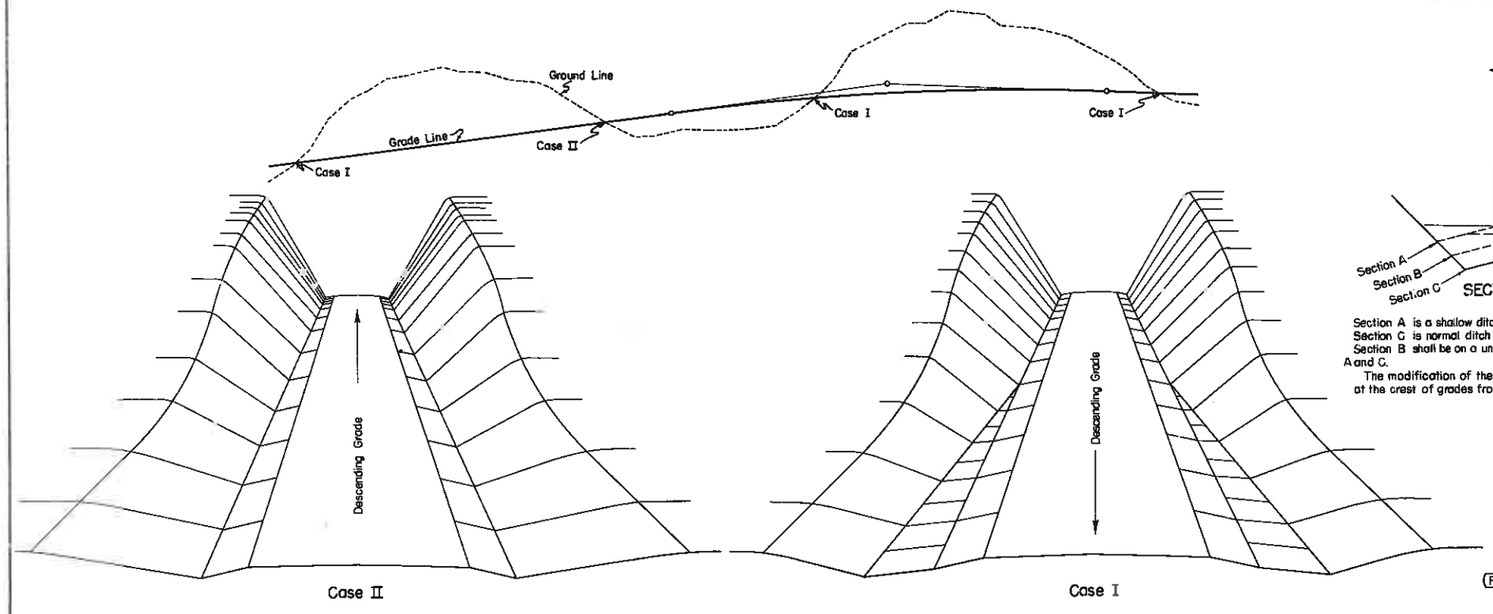
*CUT SLOPE TREATMENT IN EARTH CUTS: The intersection of cut slopes with the existing ground shall be rounded in earth cuts, beginning outside the slope stake and extending down the cut slope. The exact dimension will be determined by the Engineer based on the type of material encountered.

Quantities shall be included in "Unclassified Excavation".

*WIDENING AT BRIDGE APPROACHES: Roadway embankment at bridge approaches shall be so constructed that base of surfacing at shoulder point is a minimum of 2 ft. beyond the edge of bridge deck. Where widening is necessary to achieve this result it shall take place gradually over a distance of 300 ft. (R-4)

WIDENING FOR BITUMINOUS CURB (Only where Guard Rail is required); See appropriate M-Standard for Guard Rail. (R-3)

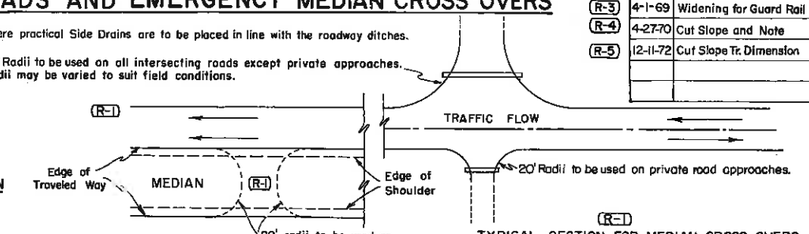
PLAN OF FLARING IN EARTH CUTS (R-4)



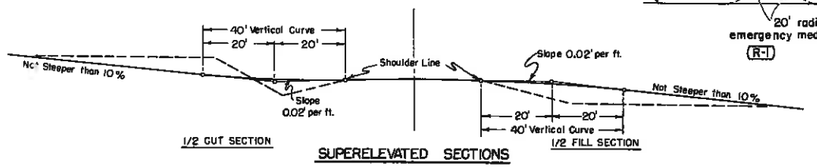
TYPICAL PLANS FOR SIDE APPROACH ROADS AND EMERGENCY MEDIAN CROSS OVERS (R-1)

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

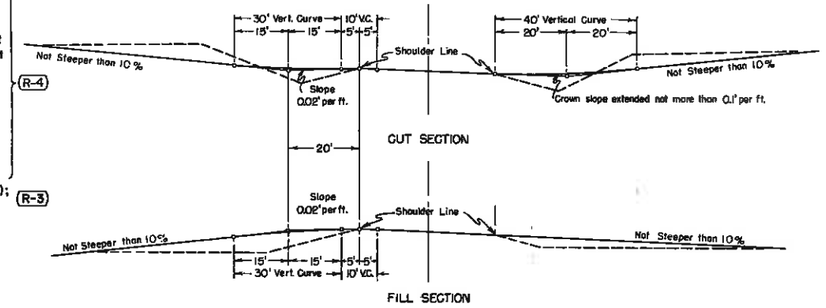
50' Radii to be used on all intersecting roads except private approaches. Radii may be varied to suit field conditions.



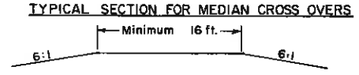
STANDARD CROWNED SECTION



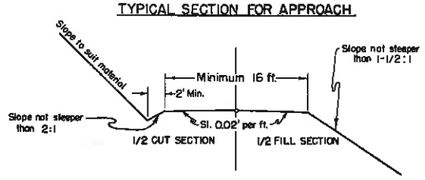
SUPERELEVATED SECTIONS



TYPICAL SECTION FOR MEDIAN CROSS OVERS



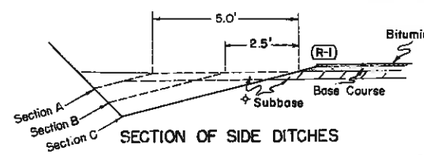
TYPICAL SECTION FOR APPROACH



NOTE:
Road Approaches shall conform to the above details unless otherwise indicated on plans. The width of the crowned section shall not be less than the width of the crowned section of the existing approach road and the new construction shall not be less than 16 feet in width.

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

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



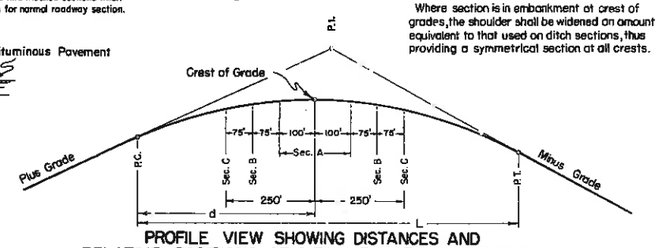
SECTION OF SIDE DITCHES

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

Formula for finding the Crest of Grade

$$d = \frac{\text{Plus Grade}}{\text{Algebraic Diff.}} \times L$$

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



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

GENERAL NOTES (R-2)

All work shall be done in accordance with the Standard Specifications applicable to the Project.

All side approach roads to the Project shall be Gravel Surfaced with a 4 inch thickness of Aggregate Base Course extending approximately to the Right of Way Line. Estimated tonnage and class of material required for this operation are shown in the Aggregate Base Course 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 flatter than the maximum shown are to be used wherever feasible. (R-4)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

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

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

Approved by [signature]
Staff Design Engr.
Date: July 1, 1965.

STANDARD TYPES of DITCHES and CONSTRUCTION METHODS

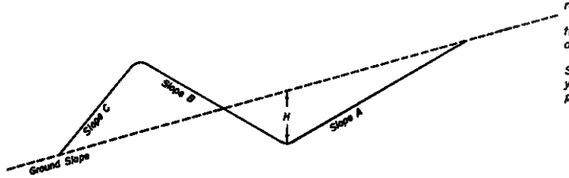
STANDARD M-203-C

(JULY 1, 1965).

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

DETAILS for CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



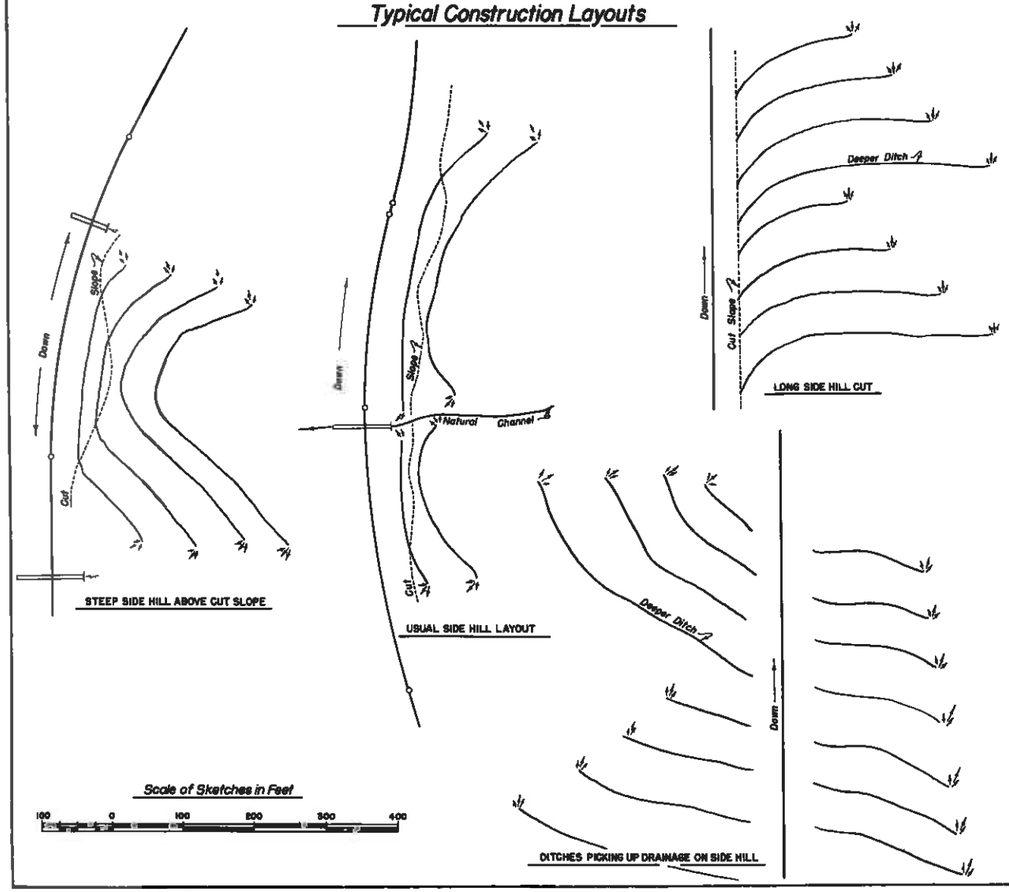
PURPOSE & USE OF THE TABLE

The primary purpose of the information for Contour and Intercepting Ditches shown on this sheet is to serve as a guide in construction and to readily arrive at yardages of excavation involved.

Foremost consideration in constructing these ditches is given first to the natural ground line slope contranted in construction, thence to the other values shown on the Typical Section.

By properly arriving at the combination of values shown on the Typical Section and in the Table for a specified condition, the number of cubic yards of excavation per 100 lin. ft. of ditch may be read under the appropriate column for this item.

Typical Construction Layouts



Scale of Sketches in Feet

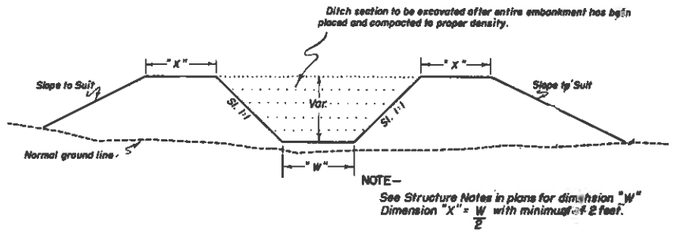
100 0 100 200 300 400

Table of Slopes and Yardages

SLOPES				H	Cubic Yards per 100 lin. ft. of Ditch
Ground	A	B	C		
5:1 Or Flatter	2:1	4:1	2:1	15"	16
				18"	23
				21"	32
		3:1		15"	15
				18"	22
				21"	30
		2:1		15"	14
				18"	20
				21"	27
		1-1/2:1		15"	13
				18"	19
				21"	25
	1-1/2:1	4:1	1-1/2:1	15"	12
				18"	18
				21"	25
		3:1		15"	12
				18"	17
				21"	23
		2:1		15"	10
				18"	15
				21"	20
		1-1/2:1		15"	10
				18"	14
				21"	19
4:1	2:1	4:1	2:1	15"	17
				18"	25
				21"	34
		3:1		15"	17
				18"	24
				21"	32
		2:1		15"	15
				18"	22
				21"	30
		1-1/2:1		15"	15
				18"	21
				21"	29
	1-1/2:1	4:1	1-1/2:1	15"	13
				18"	18
				21"	25
		3:1		15"	12
				18"	17
				21"	23
		2:1		15"	11
				18"	16
				21"	21
		1-1/2:1		15"	10
				18"	14
				21"	20
3:1	2:1	3:1	2:1	15"	22
				18"	31
				21"	43
		2:1		15"	21
				18"	30
				21"	41
		1-1/2:1		15"	20
				18"	29
				21"	40
	1-1/2:1	3:1	1-1/2:1	15"	13
				18"	19
				21"	26
		2:1		15"	12
				18"	17
				21"	24
		1-1/2:1		15"	12
				18"	17
				21"	23
2:1	1-1/2:1	2:1	1-1/2:1	15"	20
				18"	29
				21"	40
		1-1/2:1		15"	20
				18"	28
				21"	39
	1:1	2:1	1:1	15"	9
				18"	13
				21"	17
		1-1/2:1		15"	8
				18"	12
				21"	16
1-1/2:1	1:1	1-1/2:1	1:1	15"	11
				18"	16
				21"	21

▲ *Slopes are approximate and may be varied to suit conditions encountered during construction.*

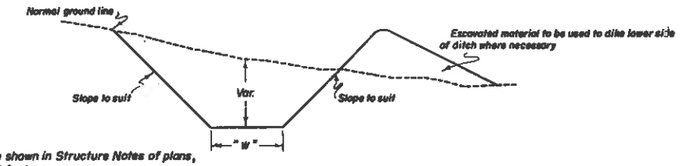
TYPICAL SECTIONS for DRAINAGE, IRRIGATION DITCHES and CHANNEL CHANGES



NOTE—
See Structure Notes in plans for dimension "W"
Dimension "X" = W/2 with minimum of 2 feet.

For Embankment Sections

(Generally for use in Irrigation Ditches & Channel Changes)



NOTE –
Unless otherwise shown in Structure Notes of plans, dimension "W" = 1 foot.

For Cut Sections

REVISIONS		
(R-1) 7-23-68	Dept. Name	M.R.H.

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications applicable to the Project.

All ditches are to be constructed to lines and grades as staked by the Engineer using the ditch section shown on plans or as ordered by the Engineer.

CONTOUR INTERCEPTING DITCHES: *Ditches are to be laid out along the ground contour on a grade of not over 1% (Type of soil shall govern the grade).*

Ends of ditches are to be lined up so that concentration of flow from a higher contour ditch into one of lower contour is, as far as possible avoided. The use of a deeper ditch is recommended where this condition is encountered.

The following horizontal spacing of ditches is recommended:

4% to 6%	Approximately 70' Centers
8% to 10%	Approximately 60' Centers
20% to 4:1 Slope	Approximately 55' Centers
30% to 1-1/2:1 Slope	Approximately 50' Centers

(R-1)

Where ditch checks are required the intervening ditch between one set of ditch checks shall not exceed a grade of 1.0%. Details of checks will be shown on plans when required.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

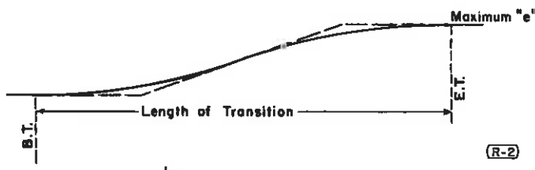
DITCH TYPES

Designed by C.G.M.	Approved by
Made by C.G.M.	Staff Design Engr.
Checked by	Date: July 1, 1965

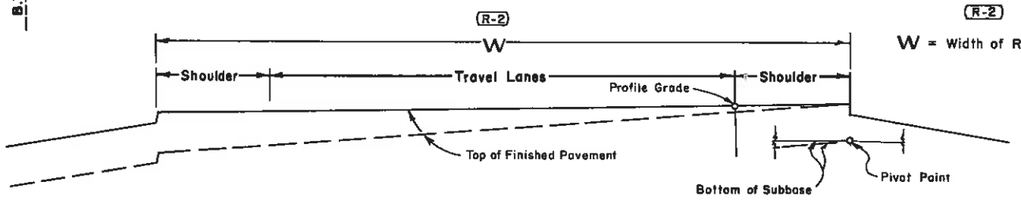
STANDARD M-203-SD

(OCTOBER 22, 1971)

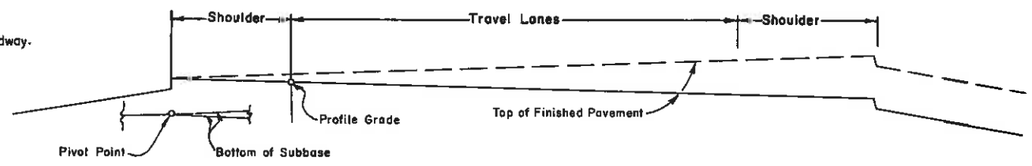
FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO		

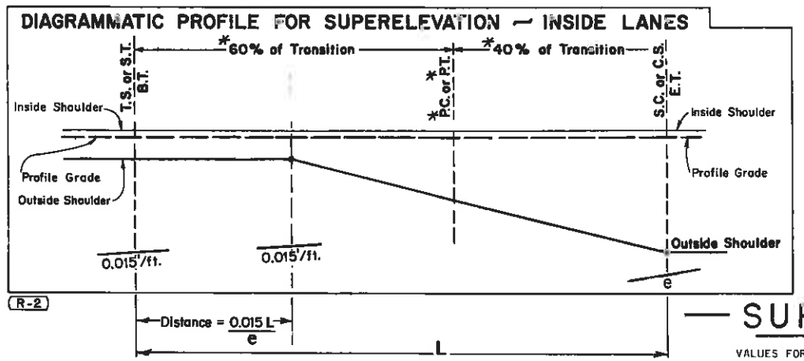


NOTE–
For obtaining smooth profiles on pavement edges, vertical curves can be inserted between the angular breaks at the beginning and the end of the superelevation transition.



R-2
W = Width of Roadway.

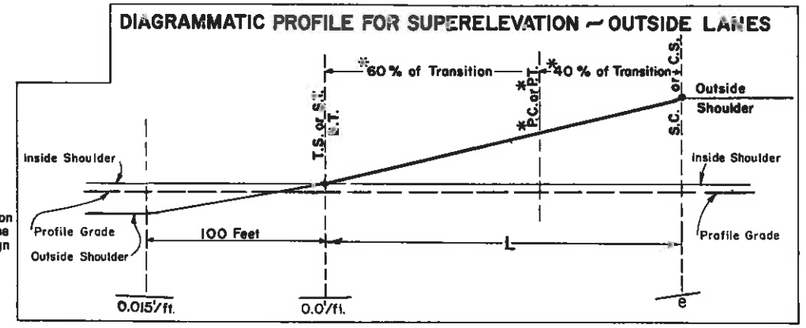




*When Curve is Not Spiralled

R-2

e = Maximum rate of superelevation in feet (per foot of width) for the given degree of curve and design speed.



REVISIONS			
R-1	3-24-75	Revise "L".	M.R.H.
R-2	1-6-77	Clarify definitions.	T.A.L.

— SUPERELEVATION RATES —

VALUES FOR DESIGN ELEMENTS RELATED TO DESIGN SPEED AND HORIZONTAL CURVATURE

Use in Mountainous Areas and Areas where Icing Conditions Frequently Exist

D	R	V=30 MPH e	V=30 MPH L-FEET	V=40 MPH e	V=40 MPH L-FEET	V=50 MPH e	V=50 MPH L-FEET	V=60 MPH e	V=60 MPH L-FEET	V=65 MPH e	V=65 MPH L-FEET	V=70 MPH e	V=70 MPH L-FEET	V=75 MPH e	V=75 MPH L-FEET	V=80 MPH e	V=80 MPH L-FEET
0° 15′	22918′	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	240
0° 30′	11459′	NC	0	NC	0	NC	0	RC	175	RC	190	RC	200	.022	220	.024	240
0° 45′	7639′	NC	0	NC	0	RC	150	.022	175	.025	190	.029	200	.032	220	.036	240
1° 00′	5730′	NC	0	RC	125	.021	150	.029	175	.033	190	.038	200	.043	220	.047	240
1° 30′	3820′	RC	100	.021	125	.030	150	.040	175	.046	200	.053	240	.060	220	.065	320
2° 00′	2865′	RC	100	.027	125	.036	150	.051	210	.057	250	.065	290	.072	340	.076	380
2° 30′	2292′	.021	100	.033	125	.046	170	.060	240	.068	290	.073	330	.078	370	.080	400
3° 00′	1910′	.025	100	.038	125	.053	190	.067	270	.072	320	.073	310	.078	380	.080	400
3° 30′	1637′	.028	100	.043	140	.058	210	.073	300	.077	320	.080	360	.080	380	D max=2.5°	
4° 00′	1432′	.032	100	.047	150	.063	230	.077	310	.079	340	.080	360	D max=3.0°			
5° 00′	1146′	.038	100	.055	170	.071	260	.080	320	.080	360	D max=4.5°					
6° 00′	955′	.043	120	.061	190	.077	280	.080	320	D max=5.0°							
7° 00′	819′	.048	130	.067	210	.079	280	D max=6.0°									
8° 00′	716′	.052	140	.071	220	.080	280										
9° 00′	637′	.056	150	.075	240	D max=7.0°											
10° 00′	573′	.059	160	.077	240												
11° 00′	521′	.063	170	.079	250												
12° 00′	477′	.066	180	.080	250												
13° 00′	441′	.068	180	.080	250												
14° 00′	409′	.070	190	D max=12.5°													
16° 00′	358′	.074	200														
18° 00′	318′	.077	210														
20° 00′	286′	.079	210														
22° 00′	260′	.080	220														
		.080	220														
		D max=23.0°															

$e_{max} = 0.08$

Use in Rolling Areas and Areas where Icing Conditions Occasionally Exist

D	R	V=30 MPH e	V=30 MPH L-FEET	V=40 MPH e	V=40 MPH L-FEET	V=50 MPH e	V=50 MPH L-FEET	V=60 MPH e	V=60 MPH L-FEET	V=65 MPH e	V=65 MPH L-FEET	V=70 MPH e	V=70 MPH L-FEET	V=75 MPH e	V=75 MPH L-FEET	V=80 MPH e	V=80 MPH L-FEET
0° 15′	22913′	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	240
0° 30′	11459′	NC	0	NC	0	NC	0	RC	175	RC	190	RC	200	.022	220	.024	240
0° 45′	7639′	NC	0	NC	0	RC	150	.024	175	.027	190	.029	200	.033	220	.036	240
1° 00′	5730′	NC	0	RC	125	.023	150	.032	175	.035	190	.039	200	.044	220	.048	240
1° 30′	3820′	RC	100	.021	125	.033	150	.046	190	.052	220	.059	260	.065	310	.071	370
2° 00′	2865′	RC	100	.028	125	.042	150	.059	210	.066	250	.074	330	.082	390	.089	450
2° 30′	2292′	.021	100	.034	125	.051	180	.069	250	.077	320	.086	360	.094	430	.099	490
3° 00′	1910′	.025	100	.040	150	.059	210	.079	300	.087	380	.094	420	.100	490	.100	500
3° 30′	1637′	.029	100	.046	160	.067	240	.087	350	.093	400	.098	420	.100	480	.100	500
4° 00′	1432′	.032	100	.051	180	.073	260	.093	380	.098	420	.100	470	D max=3.0°		D max=3.0°	
5° 00′	1146′	.038	110	.061	190	.084	300	.099	400	.100	410	.100	450				
6° 00′	955′	.046	120	.070	220	.092	330	.100	410	D max=4.5°		D max=4.0°					
7° 00′	819′	.053	140	.077	240	.098	350	D max=5.5°									
8° 00′	716′	.059	160	.084	260	.100	360										
9° 00′	637′	.064	170	.089	280	.100	360										
10° 00′	573′	.068	180	.093	290	D max=8.3°											
11° 00′	521′	.073	200	.097	310												
12° 00′	477′	.077	210	.099	310												
13° 00′	441′	.080	220	.100	320												
14° 00′	409′	.082	220	.100	320												
16° 00′	358′	.089	240	D max=12.8°													
18° 00′	318′	.092	250														
20° 00′	286′	.097	260														
22° 00′	260′	.099	270														
24° 00′	239′	.100	270														
		.100	270														
		D max=24.0°															

$e_{max} = 0.10$

Use in Plains Areas and Areas where Icing Conditions Seldom Exist or Where Roadways are Well Sanded during Icing Conditions

D	R	V=30 MPH e	V=30 MPH L-FEET	V=40 MPH e	V=40 MPH L-FEET	V=50 MPH e	V=50 MPH L-FEET	V=60 MPH e	V=60 MPH L-FEET	V=65 MPH e	V=65 MPH L-FEET	V=70 MPH e	V=70 MPH L-FEET	V=75 MPH e	V=75 MPH L-FEET	V=80 MPH e	V=80 MPH L-FEET
0° 15′	22913′	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	240
0° 30′	11459′	NC	0	NC	0	NC	0	RC	175	RC	190	RC	200	.022	220	.024	240
0° 45′	7639′	NC	0	NC	0	RC	150	.024	175	.026	190	.029	200	.033	220	.036	240
1° 00′	5730′	NC	0	RC	125	.023	150	.031	175	.035	190	.039	200	.043	220	.048	240
1° 30′	3820′	RC	100	.022	125	.034	150	.047	190	.053	230	.059	270	.065	310	.072	360
2° 00′	2865′	RC	100	.030	125	.045	160	.062	250	.070	300	.078	350	.087	410	.095	470
2° 30′	2292′	.022	100	.037	125	.055	200	.076	310	.085	370	.095	430	.105	500	.113	560
3° 00′	1910′	.025	100	.044	140	.065	230	.088	360	.097	420	.106	480	.117	560	.120	600
3° 30′	1637′	.030	100	.050	160	.074	270	.098	400	.107	460	.116	520	.120	570	.120	600
4° 00′	1432′	.034	100	.057	180	.082	300	.106	430	.114	490	.120	540	.120	570	D max=3.0°	
5° 00′	1146′	.042	110	.068	210	.096	350	.117	470	.120	520	.120	540	D max=4.0°			
6° 00′	955′	.049	130	.079	250	.107	390	.120	490	.120	520	D max=4.0°					
7° 00′	819′	.055	150	.088	280	.114	410	.120	490	D max=5.0°							
8° 00′	716′	.062	170	.096	300	.119	430	D max=6.8°									
9° 00′	637′	.068	180	.103	320	.120	430										
10° 00′	573′	.074	200	.108	340	.120	430										
11° 00′	521′	.079	210	.113	360	D max=9.0°											
12° 00′	477′	.084	230	.116	370												
13° 00′	441′	.089	240	.119	370												
14° 00′	409′	.093	250	.120	380												
16° 00′	358′	.101	270	.120	380												
18° 00′	318′	.108	290	D max=14.5°													
20° 00′	286′	.113	310														
22° 00′	260′	.117	320														
24° 00′	239′	.120	320														
		.120	320														
		D max=26.5°															

$e_{max} = 0.12$

D = DEGREE OF CURVE
R = RADIUS OF CURVATURE
V = ASSUMED DESIGN SPEED

R-2
R-1 L = LENGTH OF SUPERELEVATION TRANSITION.

NC = NORMAL CROWN SECTION
RC = REMOVE ADVERSE CROWN, SUPERELEVATE AT NORMAL CROWN SLOPE

R-2

SPIRALS DESIRABLE BUT NOT AS ESSENTIAL ABOVE THE UPPERMOST HEAVY LINE. LENGTHS ROUNDED IN MULTIPLES OF 25 OR 50 FEET PERMIT SIMPLER CALCULATIONS.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

SUPERELEVATION OF CURVES DIVIDED HIGHWAYS

Designed by JWK
Made by RLM
Checked by DLV

Approved by John M. Coy
Staff Design Engr.
Date: October 22, 1971

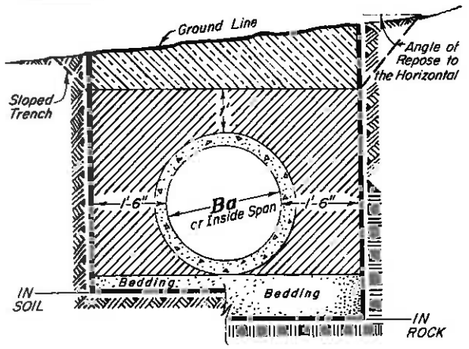
STANDARD M-206-AB

(MARCH 4, 1976)
(SHEET 1 OF 3)

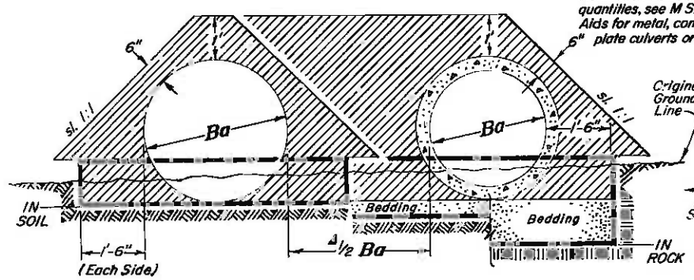
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS			
R-1	3-26-76	Gen. Note, footing in rock.	T.A.L.
R-2	4-16-76	Limit of Str. Excav. in Box Culv. detail.	T.A.L.
R-3	5-8-78	Backfill for Wingwall.	T.A.L.

SIPHON OR CONDUIT IN TRENCH

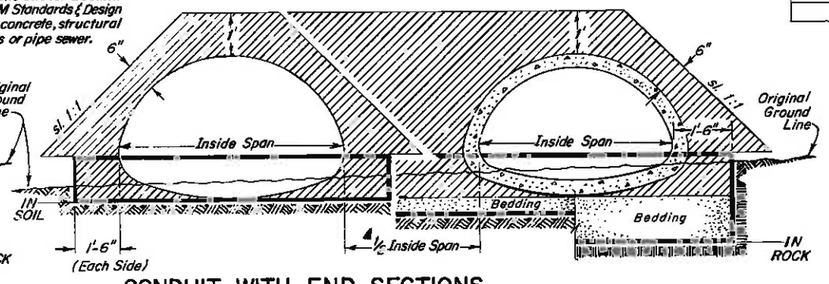


CIRCULAR CONDUIT

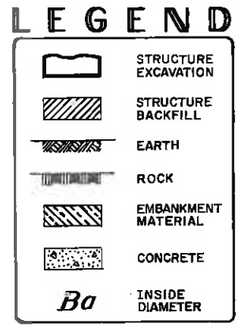


NOTE: For additional Culvert installation details and for Backfill quantities, see M Standards & Design Aids for metal, concrete, structural plate culverts or pipe sewer.

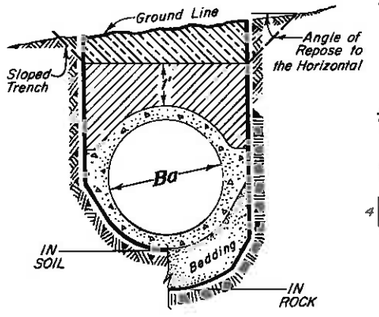
ELLIPTICAL OR ARCH CONDUIT



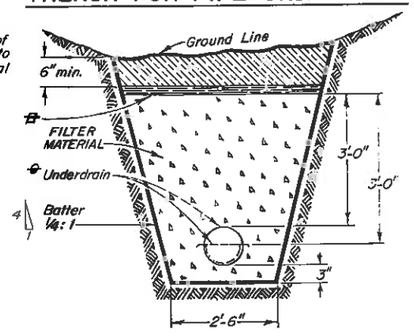
LEGEND



CAST IN PLACE CONDUIT



TRENCH FOR PIPE UNDERDRAIN



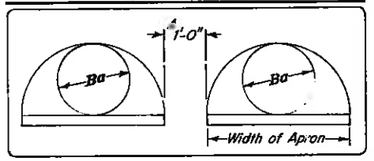
[B] One thickness of Building Paper (30 weight) or Plastic Sheeting (10 mil.) or 4" layer of loose straw or acceptable equivalent.

[C] The highest nominal thickness for Underdrain shall be:

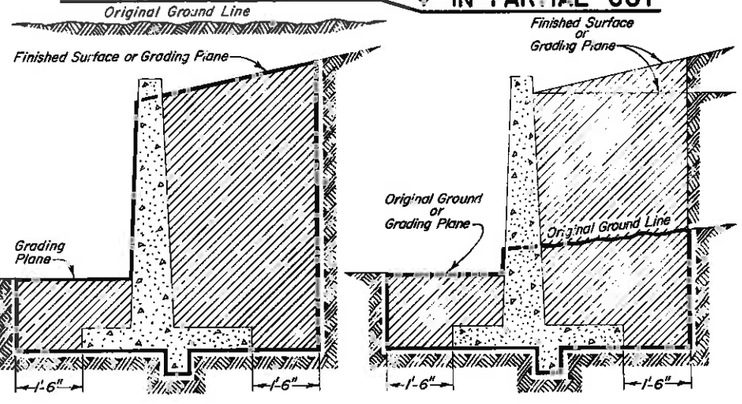
TYPE III PIPE	CLASS I & II	CLASS III
STEEL	.052"	.064"
ALUMINUM	.048"	.060"

[A] When 2 or more conduits are laid side by side they shall be placed so that the adjacent pipes will be ½ Inside Diameter or ½ Inside Span or 3 feet apart (including wall thickness) whichever is less. Minimum spacing shall be not less than one foot between outside walls of pipe or End Section.

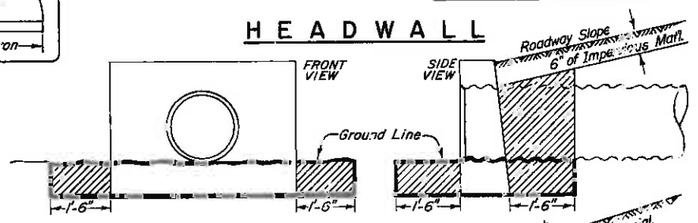
CONDUIT WITH END SECTIONS



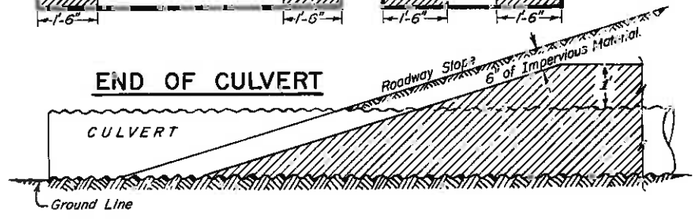
RETAINING WALL IN CUT & IN PARTIAL CUT



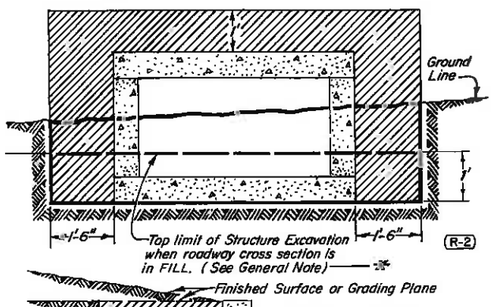
HEADWALL



END OF CULVERT



CONCRETE BOX CULVERT

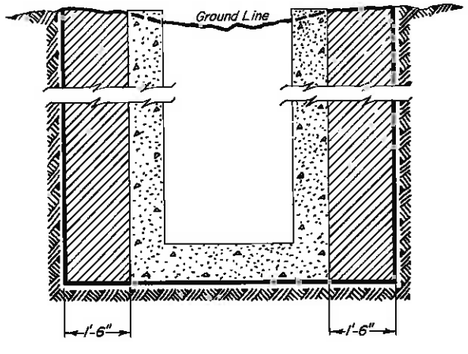


(R-2)

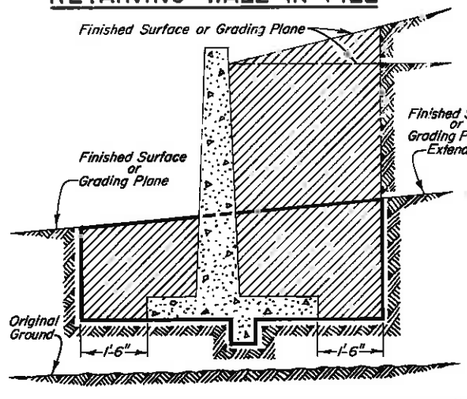
WINGWALL

(R-3)

DROP INLETS, DIVISION BOXES, INTERCEPTING HEADWALLS, ETC.



RETAINING WALL IN FILL



GENERAL NOTES (R-1)

All work shall be done in accordance with the Standard Specifications applicable to the project.

* — Where the roadway cross section is in FILL, excavation for box culverts shall be done as follows:

1. Embankment shall be built up to one foot above the bottom of the box culvert.
2. The trench shall then be excavated to accommodate construction of the box culvert.

Excavation and Backfill patterns different from those indicated on these sheets will be shown elsewhere on the Plans.

Excavation for structure installation shall be classified as "Structure Excavation" unless otherwise shown on the Plans.

Structure footings which are located in rock shall be poured out to undisturbed rock without forming.

**DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS**

EXCAVATION & BACKFILL FOR STRUCTURES

Designed by M R H	Approved by D. L. Harmon
Made by J R B	Staff Design Engineer
Checked by O L S	Date: March 4, 1976

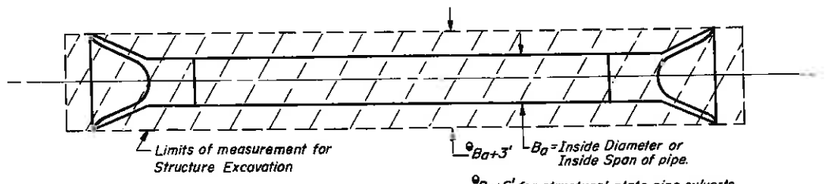
STANDARD M-206-AB

(MARCH 4, 1976)
(SHEET 2)

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

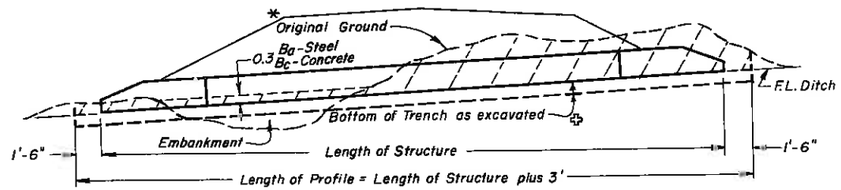
	REVISIONS:		
R-1	3-26-76	Revision date only.	T. A. L.
R-2	4-16-76	" " "	T. A. L.
R-3	5-8-76	" " "	T. A. L.

STRUCTURE EXCAVATION MEASUREMENT FOR PIPE CULVERTS



PLAN

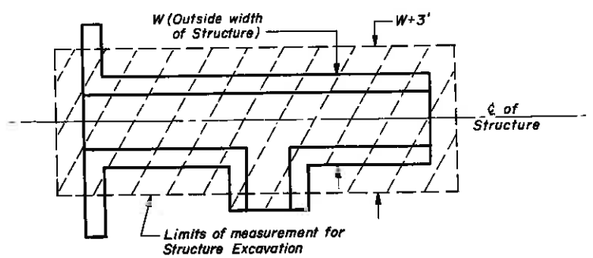
*Ba+6' for structural plate pipe culverts.



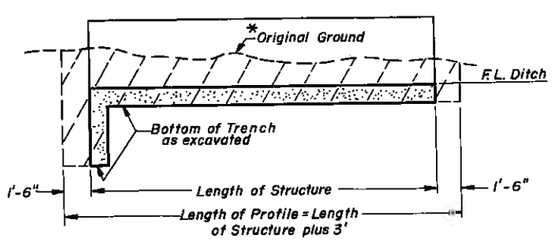
PROFILE

✠ For applicable limits of Structure Excavation, see bedding details on standards for metal, reinforced concrete and structural plate pipe culverts.

STRUCTURE EXCAVATION MEASUREMENT FOR DIVERSION OR DIVISION BOXES

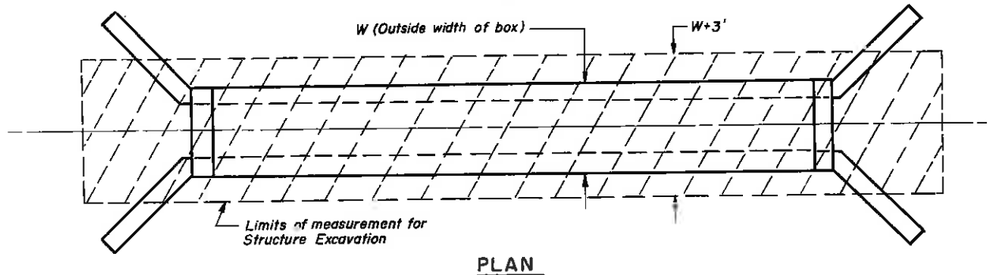


PLAN



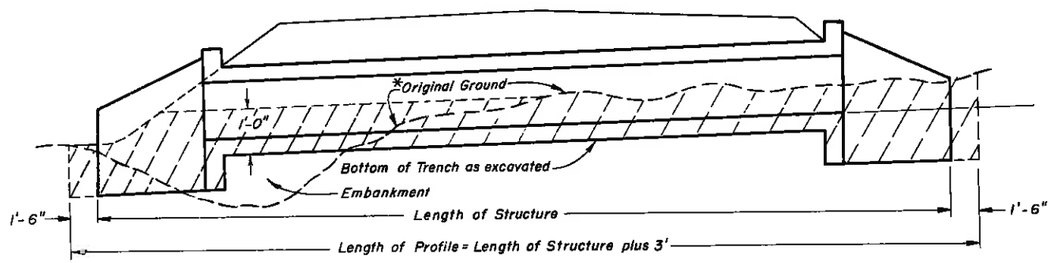
PROFILE

STRUCTURE EXCAVATION MEASUREMENT FOR CONCRETE BOX CULVERTS



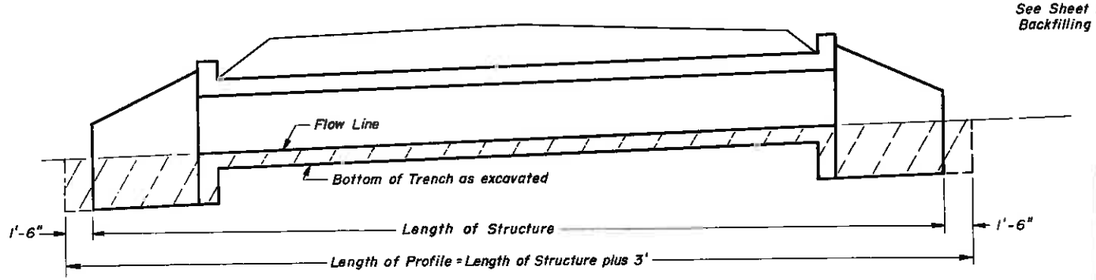
PLAN

Without Channel Change or Channel Improvement



PROFILE

With Channel Change or Channel Improvement



PROFILE

* Along ℄ of Structure

Areas to be used for Structure Excavation computations.

GENERAL NOTES (Continued)

TRENCH INSTALLATION:

Trenches over 5 feet in depth shall be either shored or the trench walls shall be sloped to the angle of repose. If sloped, the bottom of the slope shall be a minimum of 1 foot above the top of the pipe.

Shoring will be required when the bottom of the slope is more than 3 feet above the bottom of the trench. Shoring shall extend a minimum of one foot above the bottom of the slope.

Timber sheeting or shoring may be cut off 1 foot above the top of the pipe after backfilling is complete.

NOTE:
See Sheet 1 for General Notes and Backfilling Details.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

EXCAVATION AND BACKFILL FOR STRUCTURES

Designed by: M.R.H.	Approved by: R. L. Vernon
Made by: H.P.B.	Staff Design Engr.
Checked by:	Date: March 4, 1976

FORM NO. 126
MARCH, 1974

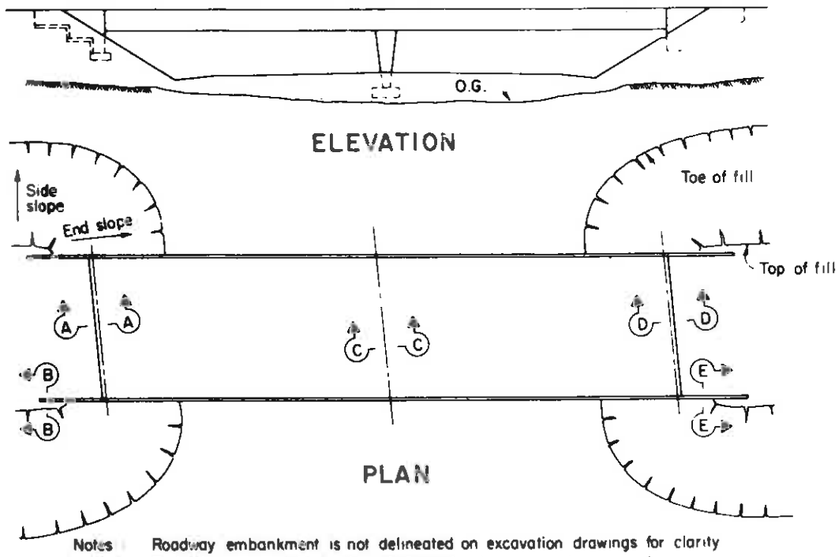
STANDARD M-206-AB

(MARCH 4, 1976)
(SHEET 3)

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

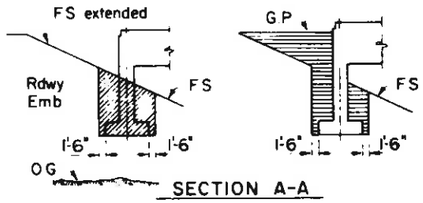
REVISIONS			
R-1	3-26-76	Revision date only.	T.A.L.
R-2	4-16-76	" " "	T.A.L.
R-3	5-8-78	" " "	T.A.L.

IN FILL

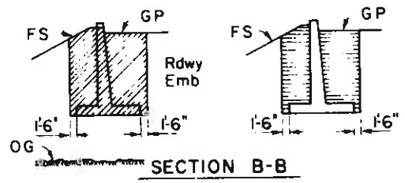


Notes: Roadway embankment is not delineated on excavation drawings for clarity
Embankment must be in place before structure excavation is made

EXCAVATION — BACKFILL

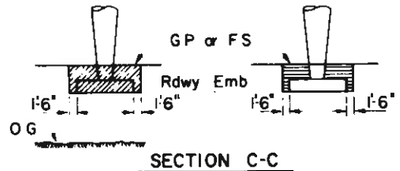


SECTION A-A

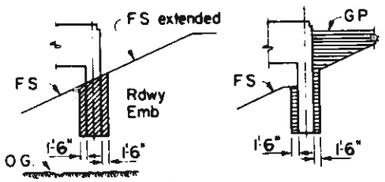


SECTION B-B

EXCAVATION — BACKFILL

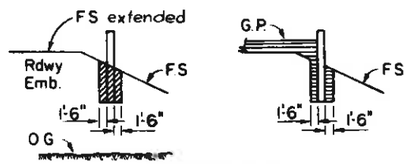


SECTION C-C



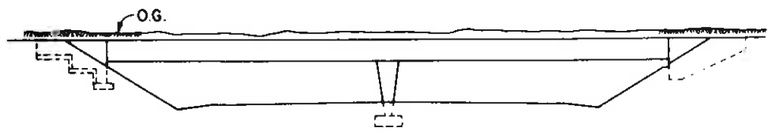
SECTION D-D

EXCAVATION — BACKFILL

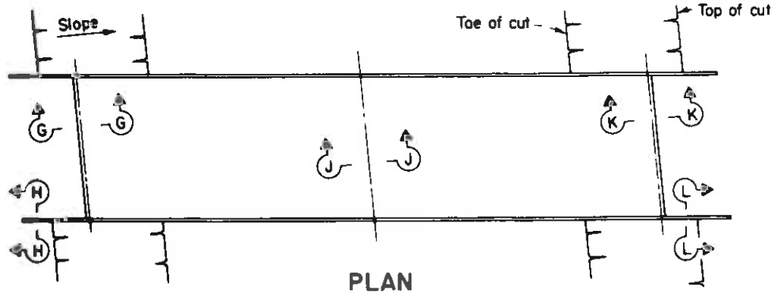


SECTION E-E

IN CUT

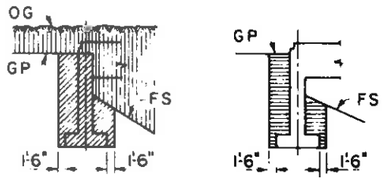


ELEVATION

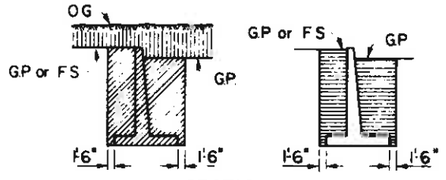


Note: If no roadway excavation is involved at bridge, structure excavation is measured from original ground.

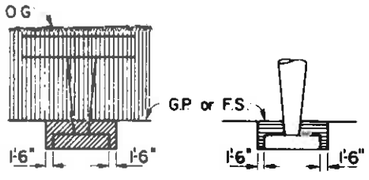
EXCAVATION — BACKFILL



SECTION G-G

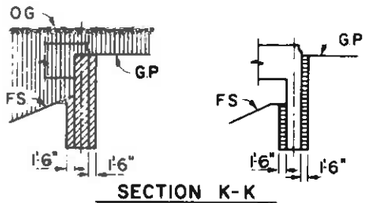


SECTION H-H

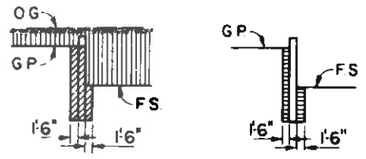


SECTION J-J

EXCAVATION — BACKFILL



SECTION K-K



SECTION L-L

ABBREVIATIONS

O.G. Original Ground
F.S. Planned Finished Surface
G.P. Planned Grading Plane

LEGEND

Structure Excavation
Structure Backfill
Roadway Excavation

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

EXCAVATION & BACKFILL FOR STRUCTURES (BRIDGE)

Designed by M R H
Made by J R B
Checked by O L S

Accepted by [signature]
Staff Design Engineer
Date: March 4, 1976

DIVISION OF HIGHWAYS, STATE OF COLORADO
D.O.H. FORM NO. 126
REV. MARCH, 1974

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

REVISIONS			
R-1	10-28-77	MULCH DETAILS	MJT

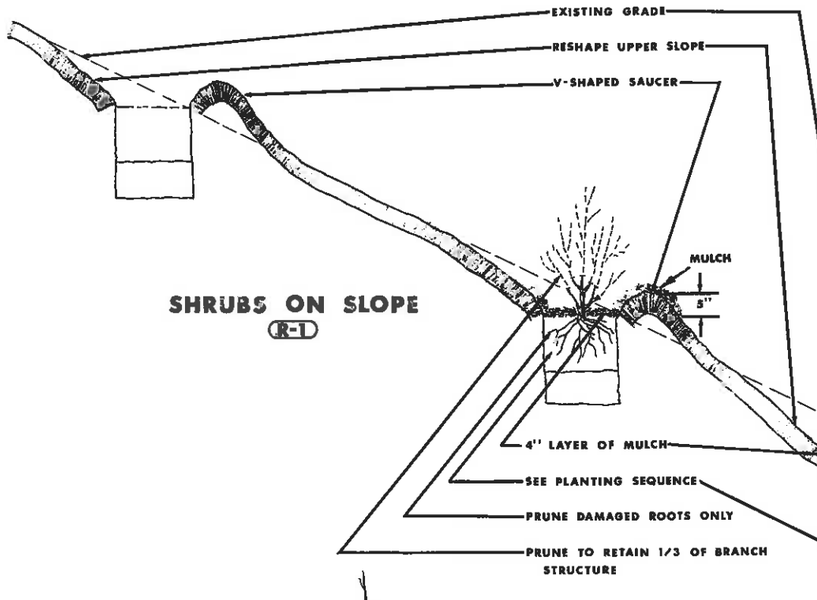
STANDARD M-214-A

(JANUARY 21, 1975)

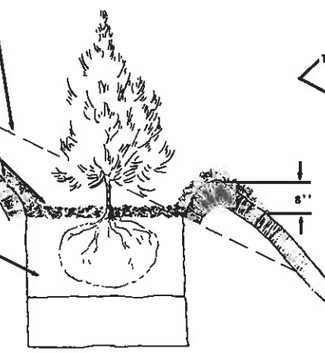
GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT

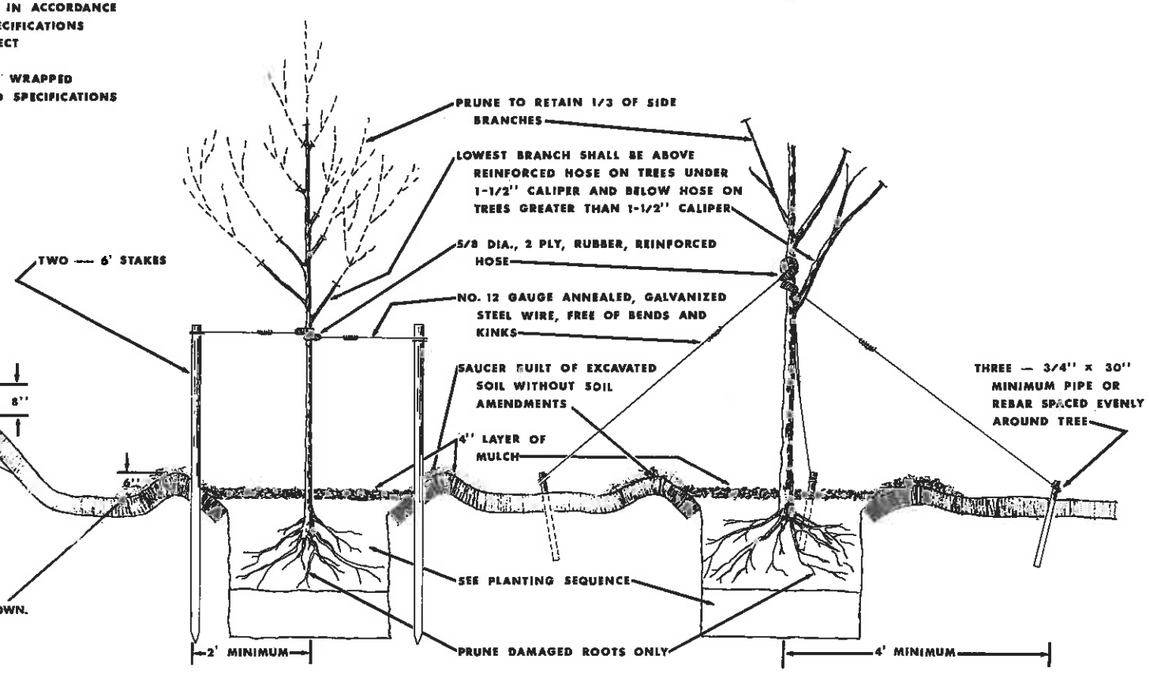
DECIDUOUS TREES SHALL BE WRAPPED ACCORDING TO STANDARD SPECIFICATIONS



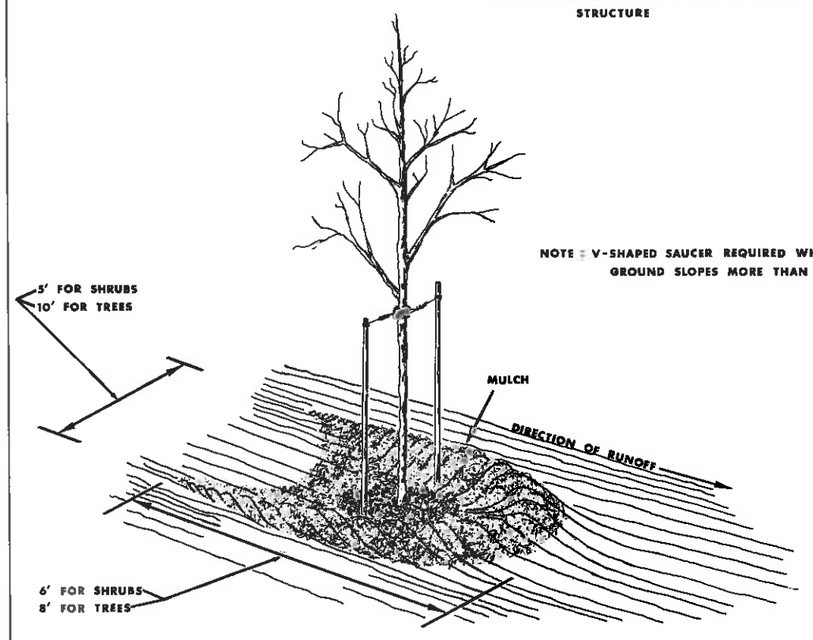
SHRUBS ON SLOPE
R-1



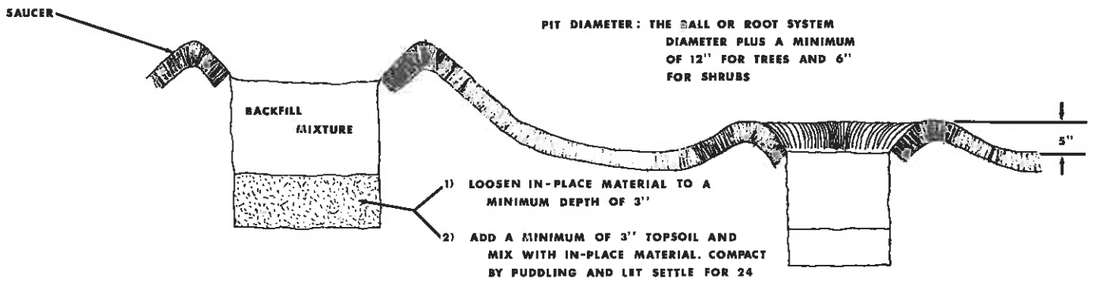
TREES ON SLOPE
MULCH SHALL COVER SAUCER BERM AS SHOWN.
R-1



DECIDUOUS TREES UNDER 1-1/2" CALIPER AND TREES OVER 1-1/2" CALIPER
LEVEL PLANTING AREA



V-SHAPED SAUCER FOR PLANTING ON SLOPES
R-1



PLANTING SEQUENCE

1) LOOSEN IN-PLACE MATERIAL TO A MINIMUM DEPTH OF 3"
2) ADD A MINIMUM OF 3" TOPSOIL AND MIX WITH IN-PLACE MATERIAL. COMPACT BY PUDDLING AND LET SETTLE FOR 24 HOURS
3) PLANT, ADD BACKFILL MIXTURE, COMPACT BY PUDDLING AND LET SETTLE FOR 24 HOURS
4) WATER BY STANDARD TECHNIQUE

SHRUBS IN LEVEL AREA

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

PLANTING DETAILS

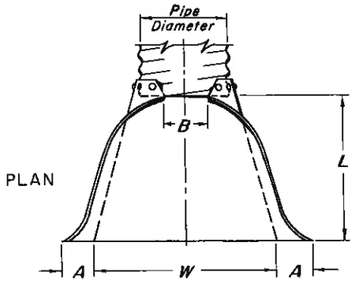
DESIGNED BY:	SPH	Approved by E. L. Ehrman
MADE BY:	SPH	Staff Design Engineer
CHECKED BY:	MJT	Date: January 21, 1975

STANDARD M-603-CA

(NOVEMBER 10, 1967)

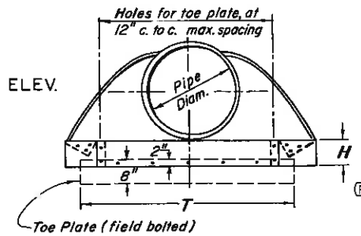
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

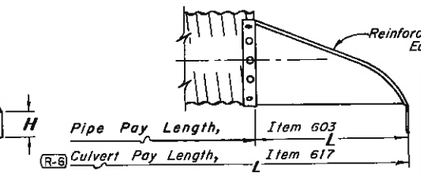
	REVISIONS		
R-1	4-19-68	Welding--Conc. Arch, Ellipt.--Gen. Notes	M.R.H.
R-2	7-23-68	Dept. Name.	M.R.H.
R-3	3-10-71	Change all gage to thickness.	M.R.H.
R-4	6-25-71	General Note for Joint Fasters.	M.R.H.
R-5	8-21-75	Gen'l. Note & CSPA Table.	M.R.H.
R-6	8-29-77	Notes for Conc. Sti. End S. for RCP.	T. A. L.

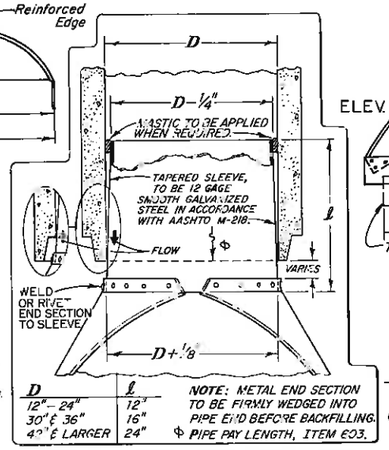


(R-3)

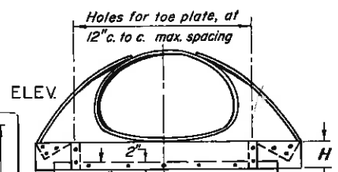
PIPE DIAM. in.	THICK-NESS in.	DIMENSIONS A (1"±) in.	B (Max.) in.	H (1"±) in.	L (1½"±) in.	W (2"±) in.	T in.
12	.064	6	6	6	21	24	34
15	.064	7	8	6	26	30	40
18	.064	8	10	6	31	36	46
21	.064	9	12	6	36	42	52
24	.064	10	13	6	41	48	58
30	.079	12	16	8	51	60	70
36	.079	14	19	9	60	72	94
42	.109	16	22	11	69	84	106
48	.109	18	27	12	78	90	112
54	.109	18	30	12	84	102	124
60	.109	18	33	12	87	114	136
66	.109	18	36	12	87	120	142
72	.109	18	39	12	87	126	148
78	.109	18	42	12	87	132	154
84	.109	18	45	12	87	138	160

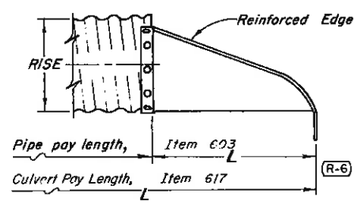


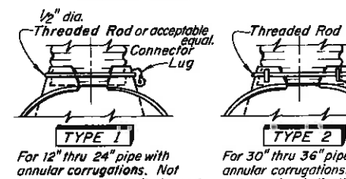




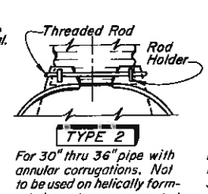
D	L
12"–24"	12"
30" & 36"	16"
42" & LARGER	24"



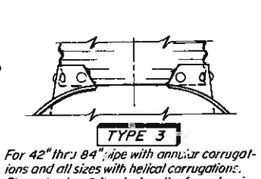




For 12" thru 24" pipe with annular corrugations. Not to be used on helically formed pipe unless recorrugated.



For 30" thru 36" pipe with annular corrugations. Not to be used on helically formed pipe unless recorrugated.



For 42" thru 84" pipe with annular corrugations and all sizes with helical corrugations. Shop attach a 2 ft. min. length of annular pipe with galv. rivets or bolts, spot welds, or 2" long skip welds on 8" ctrs. Repair burnt galv. per Spec.

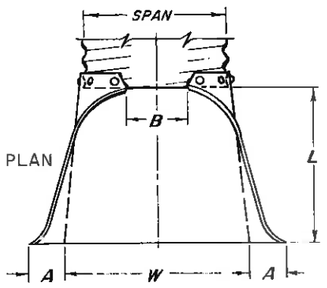
TYPICAL CONNECTIONS

END SECTION AND CONNECTION DETAILS FOR ROUND CORRUGATED STEEL PIPE CULVERTS

(R-6)

STEEL END SECTION FOR CONCRETE PIPE

(R-6) (Alternate for Concrete End Section)



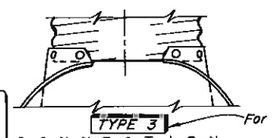
(R-3)

PIPE ARCH SPAN • RISE in.	in.	THICK-NESS in.	DIMENSIONS A (1"±) in.	B (Max.) in.	H (1"±) in.	L (1½"±) in.	W (2"±) in.	T in.
17 x 13	21 x 15	.064 .064	7 7	9 10	6 6	19 23	30 36	40 46
24 x 18	28 x 20	.064 .064	8 9	12 14	6 6	28 32	42 48	52 58
35 x 24	42 x 29	.079 .079	10 12	16 18	6 8	39 46	60 75	70 85
49 x 33	57 x 38	.109 .109	13 18	21 26	9 12	53 63	85 90	103 108
64 x 43	71 x 47	.109 .109	18 18	30 33	12 12	70 77	102 114	120 132

(R-5)

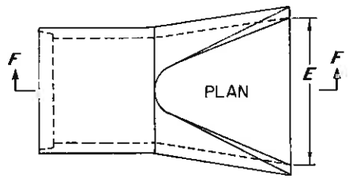
END SECTION AND CONNECTION DETAIL FOR CORRUGATED STEEL PIPE ARCH CULVERT

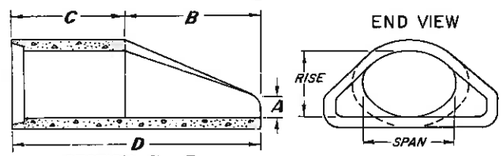
NOTE:
End sections for pipe arches shall be shop attached to a minimum 2 ft. of pipe with galvanized rivets or bolts, or by welding. (R-1)



For all sizes of pipe with Annular or Helical corrugations.

CONNECTION





EQUIVALENT CIRCULAR DIAM.(Inches)	NOMINAL (in.) SPAN	RISE	DIMENSIONS (Inches) A	B	C	D	E
24	30	19	8½	39	33	72	48
30	38	24	9½	54	18	72	60
36	45	29	11⅛	60	24	84	72
42	53	34	15¾	60	36	96	78
48	60	38	21	60	36	96	84
54	68	43	25½	60	36	96	90
60	76	48	30	60	36	96	96

END SECTION FOR REINFORCED CONCRETE ELLIPTICAL PIPE (R-1)

GENERAL NOTES (R-5)

All work shall be done in accordance with the Standard Specifications applicable to the project.

Concrete End Sections are to be furnished with tongue or groove as req'd.

Alternate equivalent designs for Concrete End Sections may be submitted to the Division for approval. Design length of culvert is based on length of End Section shown in table. Additional pipe required to provide the design length of the culvert shall be furnished by and at the expense of the Contractor.

Other sizes of concrete pipe and end sections may be available upon request; however, the designer should contact supplier prior to calling for sizes other than those shown on this standard.

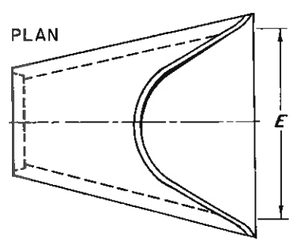
Inside configuration and joint of concrete end section and pipe shall match.

End sections for CSP Arch Culvert shall match the dimensions of the culvert shown on plans.

Galvanized Toe Plate as shown will be required on End Sections for corrugated steel pipe and shall be same thickness as End Sections. Toe Plate shall be field bolted to End Section with ⅜" galvanized bolts, nuts and washers.

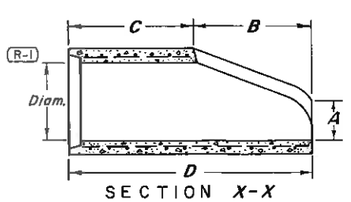
Designs for Aluminum End Sections for use on aluminum culverts shall be submitted to the Division for approval prior to use.

Concrete Pipe Joint Fasteners, where shown on plans, shall be installed so that a minimum of 15 linear feet of the outlet end of the pipe are mechanically locked together. End Section lengths, when used, will be included in the 15 l.f. requirement.

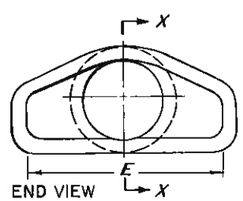


PIPE I. D. in.	DIMENSIONS A in.	B in.	C in.	D in.	E in.	
12	5½	23	49	72	24	
15	7	26	47	73	29	
18	11½	26	48	74	36	
24	12	43	54	97	48	
30	17	53	43	96	60	
36	18	60	37	97	71	
42	24	61	36	97	78	
48	28	70	28	98	84	
54	27	65	35	100	90	
60	36	58	40	98	96	
72	34½	75	21	96	108	

(R-1)

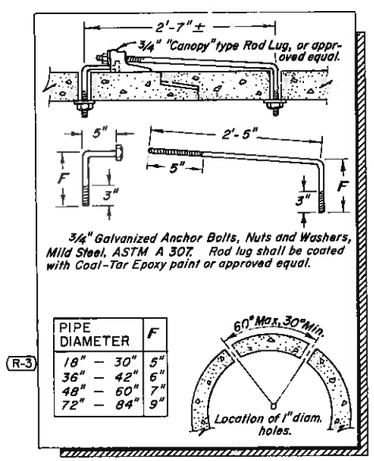


(R-1)



(R-1)

END SECTION FOR REINFORCED CONCRETE CIRCULAR PIPE

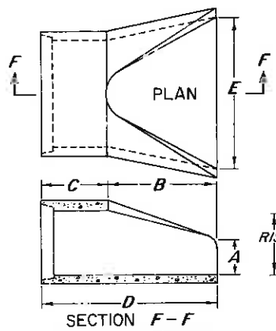


(R-3)

PIPE DIAMETER	F
18" – 30"	5"
36" – 42"	6"
48" – 60"	7"
72" – 84"	9"

(R-4)

CONCRETE JOINT FASTENER



See Figure 1 of AASHTO M 206 for actual sizes. (R-5)

EQUIVALENT CIRCULAR DIAM.(Inches)	NOMINAL (in.) SPAN	RISE	DIMENSIONS (Inches) A	B	C	D	E
24	29	18	8½	39	33	72	48
30	36	22	9½	50	46	96	60
36	43	27	11⅛	60	36	96	72
42	50	31	15 13/16	60	36	96	78
48	58	36	21	60	36	96	84
54	65	40	25½	60	36	96	90
60	72	44	31	60	36	96	96
72	88	54	31	60	39	99	120

END SECTION FOR REINFORCED CONCRETE ARCH PIPE

(R-1)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CONCRETE AND METAL END SECTIONS

(R-2)

Designed by	M.R.H.	Approved by	J. M. C.
Made by	J.R.B.	Staff Design Engineer	(ASST.)
Checked by	R.S.M.	Date:	November 10, 1967

STANDARD M-603-MA

(JANUARY 11, 1974)

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

REVISIONS			
(R-1)	8-20-75	Gen'l. Notes & Table IV.	M.R.H.

FILL HEIGHT & THICKNESS TABLES FOR METAL CULVERT PIPE

TABLE I CORRUGATED STEEL PIPE

$2^2/_3$-inch by $^1/_2$-inch Corrugations
Riveted, Welded or Helical Fabrication

Pipe Diameter (inches)	Minimum Cover, Top of Pipe to Top of Subgrade (inches)	Maximum Fill Heights above Top of Pipe in Feet — Minimum Thickness Required (Decimal inches) 0.064	0.079	0.109	0.138	0.168
12	12	84	91	—	—	—
15	12	67	73	—	—	—
18	12	56	61	—	—	—
24	12	42	46	59	—	—
30	12	34	36	47	—	—
36	12	28	30	39	41	—
42	12	31	43	46 (67)	48 (70)	50 (73)
48	12	27	37	45 (58)	46 (61)	47 (64)
54	12	—	33	43 (52)	44 (54)	45 (57)
60	12	—	—	43 (47)	43 (49)	44 (51)
66	12	—	—	42	43	43 (47)
72	12	—	—	—	41	43
78	12	—	—	—	—	39
84	12	—	—	—	—	35

Values for elongated pipe are shown in parentheses.

TABLE II CORRUGATED STEEL PIPE ARCH

$2^2/_3$-inch by $^1/_2$-inch Corrugations
Riveted, Welded or Helical Fabrication

Pipe Dimensions Span x Rise (inches)	Equiv. Diameter (inches)	Corner Radius (inches)	Minimum Cover, Top of Pipe to Top of Subgrade for 2 Tons per sq. ft (inches)	Minimum Thickness Required (Decimal inches)	Maximum Fill Heights above Top of Pipe in Feet — Corner Bearing Pressure in Tons per Square Foot: *2 Tons	3 Tons*
17 x 13	15	3	18	0.064	13	15+
21 x 15	18	3	18	0.064	12	15+
24 x 18	21	3	18	0.064	10	15+
28 x 20	24	3	18	0.064	10	15
35 x 24	30	3	18	0.064	9	14
42 x 29	36	3½	18	0.064	9	13
49 x 33	42	4	18	0.079	8	12
57 x 38	48	5	18	0.109	8	12
64 x 43	54	6	18	0.109	8	12
71 x 47	60	7	18	0.138	8	12
77 x 52	66	8	18	0.168	8	12
83 x 57	72	9	18	0.168	9	13

TABLE III CORRUGATED STEEL PIPE

3-inch by 1-inch Corrugations
Riveted, Welded, Helical or Bolted Fabrication

Pipe Diameter (inches)	Minimum Cover, Top of Pipe to Top of Subgrade (inches)	Maximum Fill Heights above Top of Pipe in Feet ☆ — Minimum Thickness Required (Decimal inches) 0.064	0.079	0.109	0.138	0.168
36	12	48	60	78 (88)	89 (106)	101 (118)
42	12	41	51	64 (76)	71 (91)	79 (101)
48	12	36	45	57 (66)	61 (80)	66 (88)
54	12	32	40	52 (59)	55 (71)	59 (79)
60	12	29	36	49 (53)	51 (64)	54 (71)
66	12	26	33	47	49 (58)	51 (64)
72	12	24	30	44	47 (53)	49 (59)
78	12	22	28	41	46 (49)	47 (54)
84	12	21	26	38	45	46 (51)
90	12	19	24	35	43	45
96	12	18	22	33	40	44
102	24	17	21	31	38	42
108	24	—	20	30	35	39
114	24	—	19	28	34	37
120	24	—	—	27	32	35

☆ *Fill heights greater than 90' shall be used only after thorough investigation of foundation material.*

TABLE IV CORRUGATED STEEL PIPE ARCH

3-inch by 1-inch Corrugations
Riveted, Welded or Helical Fabrication

Pipe Dimensions Span x Rise (inches)	Equiv. Diameter (inches)	Corner Radius (inches)	Minimum Cover, Top of Pipe to Top of Subgrade for 2 Tons per sq. ft. (inches)	Minimum Thickness Required (Decimal inches)	Maximum Fill Heights above Top of Pipe in Feet — Corner Bearing Pressure in Tons per Square Foot: *2 Tons	3 Tons*
43 x 27	36	5	18	0.064	12	15+
50 x 31	42	6	18	0.064	12	15+
58 x 36	48	7	18	0.064	12	15+
65 x 40	54	8	18	0.064	12	15+
72 x 44	60	9	18	0.064	12	15+
73 x 55	66	12	18	0.064	15+	-------
81 x 59	72	14	18	0.079	15	-------
87 x 63	78	14	18	0.079	14	15+
95 x 67	84	16	18	0.109	13	15+
103 x 71	90	16	24	0.109	12	15+
112 x 75	96	18	24	0.109	11	15+
117 x 79	102	18	24	0.109	10	15
128 x 83	108	18	24	0.138	9	14

(R-1)

TABLE V CORRUGATED ALUMINUM PIPE

$2^2/_3$-inch by $^1/_2$-inch Corrugations
Riveted, Helical or Spot Welded Fabrication

Pipe Diameter (inches)	Minimum Cover, Top of Pipe to Top of Subgrade (inches)	Maximum Fill Heights above Top of Pipe in Feet — Riveted or Helical Fabrication — Minimum Thickness Required (Decimal inches) 0.060	0.075	0.105	0.135	0.164	Spot Welded Fabrication 0.060	0.075
12	12	45	45	78	81	84	26	33
18	12	30	30	52	54	56	18	22
24	12	22	22	39	41	42	14	16
30	12	18	18	31	32	34	11	13
36	12	15	15	26	27	28	9	11
42	12	—	26	43	43	44	—	—
48	12	—	—	40	41	43	—	—
54	12	—	—	35	37	38	—	—
60	12	—	—	—	33	34	—	—
66	12	—	—	—	30	31	—	—
72	12	—	—	—	—	29	—	—

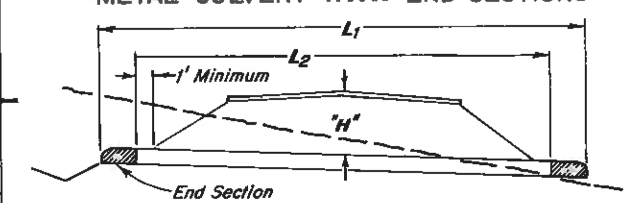
TABLE VI CORRUGATED ALUMINUM PIPE ARCH

$2^2/_3$-inch by $^1/_2$-inch Corrugations
Riveted, Welded or Helical Fabrication

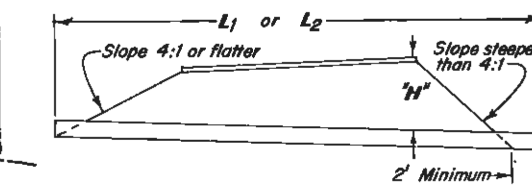
Pipe Dimensions Span x Rise (inches)	Equiv. Diameter (inches)	Corner Radius (inches)	Minimum Cover, Top of Pipe to Top of Subgrade for 2 Tons per sq.ft. (inches)	Minimum Thickness Required (Decimal inches)	Maximum Heights of Fill above Top of Pipe in Feet — Corner Bearing Pressure in Tons per Square Foot: *2 Tons	3 Tons*
18 x 11	15	4	18	0.060	15	-------
22 x 13	18	4	18	0.060	14	-------
25 x 16	21	4	18	0.060	12	15+
29 x 18	24	4½	18	0.060	10	15+
36 x 22	30	5	18	0.060	9	14
43 x 27	36	5½	18	0.075	9	13
50 x 31	42	6	18	0.105	8	12
58 x 36	48	7	18	0.135	8	12
65 x 40	54	8	18	0.135	8	12
72 x 44	60	9	18	0.164	8	12

* *In the absence of a Bearing Pressure Report use fill heights listed under "2 Tons". Where bearing pressures exceeding 2 tons per square foot are required for given fill heights, the foundation material shall be investigated to determine its bearing capacity.*

METAL CULVERT WITH END SECTIONS

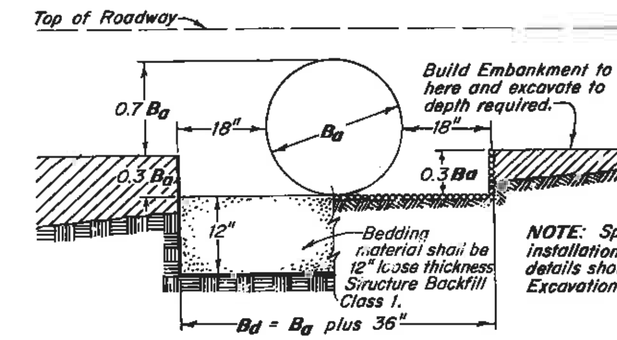


METAL CULVERT WITHOUT END SECTIONS



"H" = Maximum height of fill over top of Culvert, including pavement.
L_1 = Length of Culvert to be measured when placed in accordance with Section 617.
L_2 = Length of pipe to be measured when placed in accordance with Section 603. Length of extension, when placed in accordance with Section 617, shall be the actual number of feet of new culvert required.

INSTALLATION OF METAL CULVERT PIPE



—— = *Limits of Structure Excavation in ROCK.*
ooooo = *Limits of Structure Excavation in SOIL.*

NOTE: Spacing for multiple pipe installations shall conform to the details shown on M Standard for Excavation and Backfill for Structures.

(R-1)

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications applicable to the project.

The tables on this sheet show minimum thickness for structural requirements only. They are intended for use only where corrosive and/or abrasive conditions are negligible. Heavier metal and/or protective coatings shall be used where site investigations indicate corrosive and/or abrasive conditions.

Pipe arch with equal periphery and with span and rise dimensions approximately equal to those required by plans will be permitted.

During construction, adequate cover shall be provided to protect the structure from damage.

Pipe shall be placed with longitudinal seams at the sides or quarter points but not along top of vertical axis.

When a culvert is to be extended with pipe of different material, the connection shall conform to the details on plans or be approved.

Structural plate pipes of equal or larger diameter, conforming to Section 510 of the Standard Specifications, may be substituted for the pipes shown on this sheet at no additional cost to the State.

Variations from corner radii shown will be acceptable provided the pipe is of sufficient strength to support it's designated fill height.

The minimum depth of fill excluding pavement over corrugated metal pipe culvert shall be as staked by the Engineer, but shall not be less than shown in the Fill Height Tables.

Extensions for CSP Arch Culvert shall match the dimensions of the culvert shown on plans.

Backfill and compaction shall be in accordance with Section 206.

TRENCH INSTALLATION

Installation and Maximum Fill Heights shall conform to the M Standard for "Pipe Sewer in Trench."

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

METAL CULVERT PIPE
H-20 LOADING

Designed by	M.R.H.	Approved by	Jon M. Coy
Made by	J.R.B.	Staff Design Engineer	
Checked by	O.L.S.	Date:	January 11, 1974

DIVISION OF HIGHWAYS, STATE OF COLORADO
D. O. H. FORM NO. 126
Rev. October, 1972

STANDARD M-604-DA

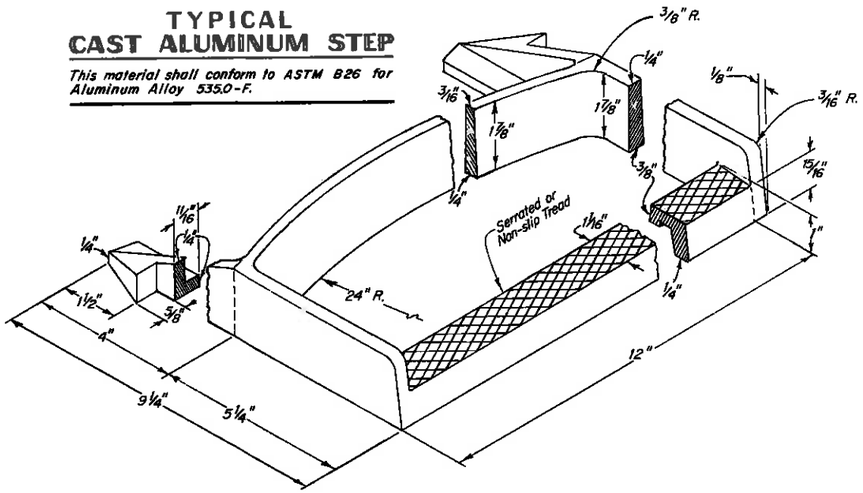
(SEPTEMBER 20, 1976)

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

REVISIONS		

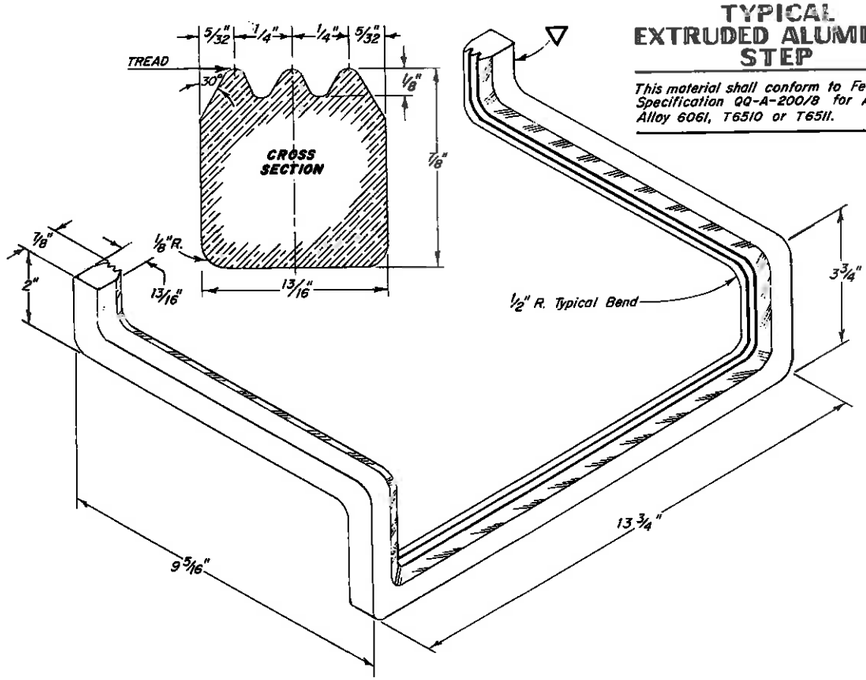
TYPICAL CAST ALUMINUM STEP

This material shall conform to ASTM B26 for Aluminum Alloy 535.0-F.



TYPICAL EXTRUDED ALUMINUM STEP

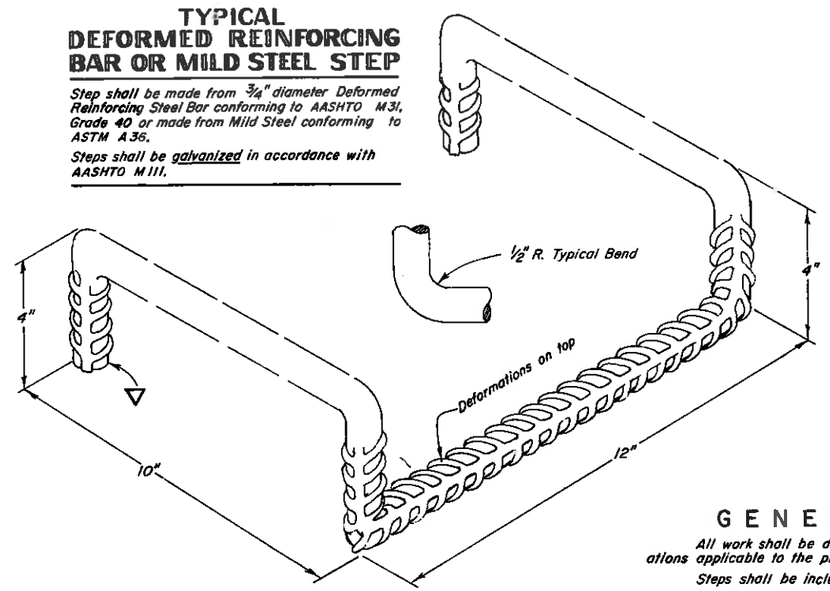
This material shall conform to Federal Specification QQ-A-200/8 for Aluminum Alloy 6061, T6510 or T6511.



TYPICAL DEFORMED REINFORCING BAR OR MILD STEEL STEP

Step shall be made from 3/4" diameter Deformed Reinforcing Steel Bar conforming to AASHTO M31, Grade 40 or made from Mild Steel conforming to ASTM A36.

Steps shall be galvanized in accordance with AASHTO M111.



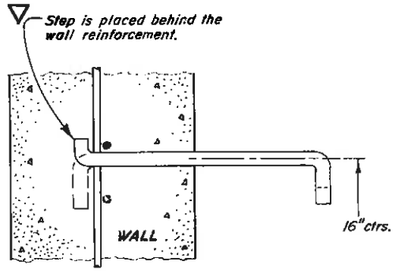
GENERAL NOTES

All work shall be done in accordance with the Standard Specifications applicable to the project.

Steps shall be included in the cost of "Manholes" or "Inlets".

Cast Iron Steps will not be permitted.

All Steps shall conform to the requirements of AASHTO M199.



TYPICAL STEP INSTALLATION FOR BAR STEPS

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

STEPS FOR MANHOLES & INLETS

Designed by T A L	Approved by D. L. Vernon
Made by J R B	Staff Design Engineer
Checked by O L S	Date: September 20, 1976

IVISION OF HIGHWAYS, STATE OF COLORADO
I. O. H. FORM NO. 126
ev. October, 1972

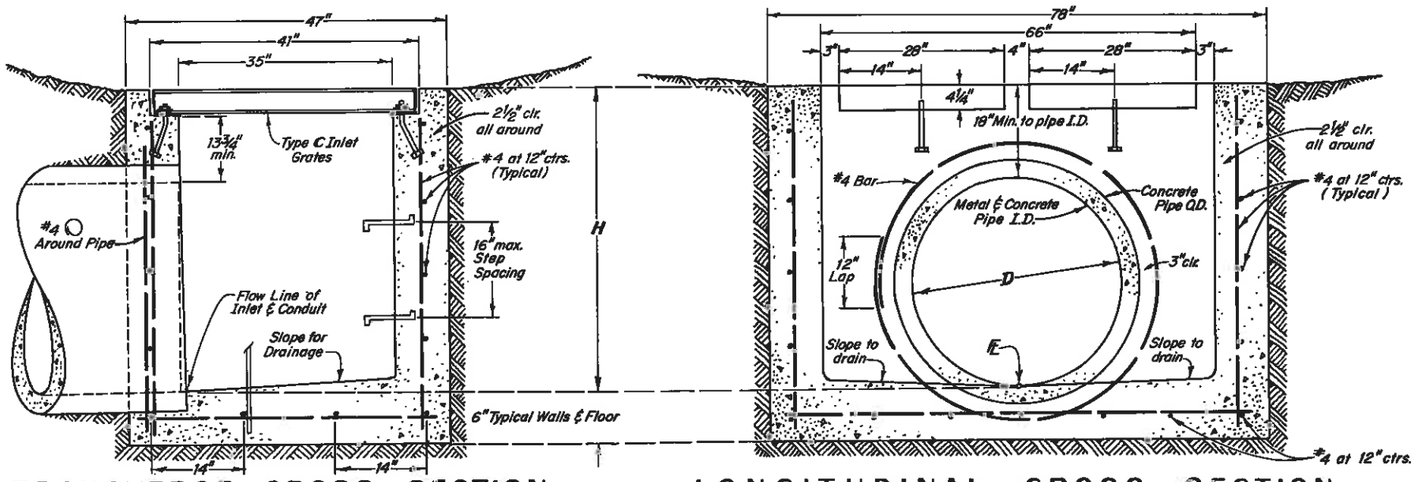
STANDARD M-604-H

(OCTOBER 31, 1974)

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

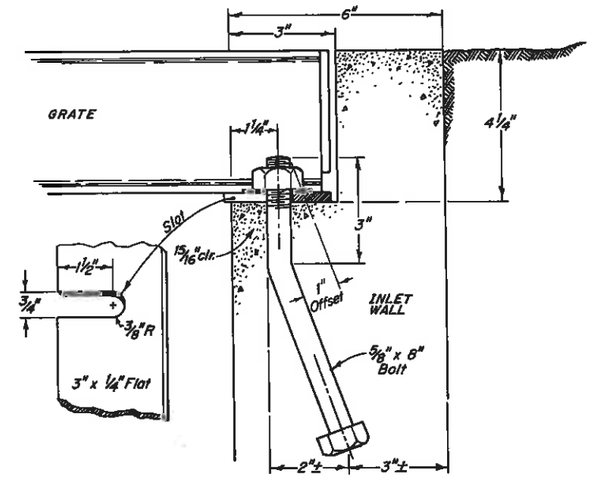
REVISIONS		

INLET, TYPE D

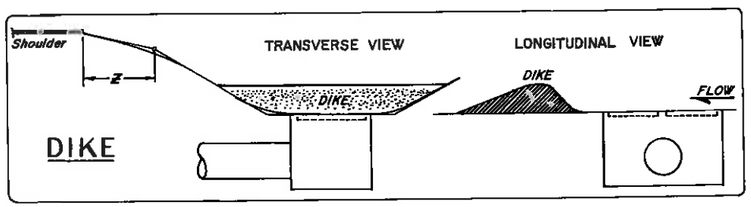


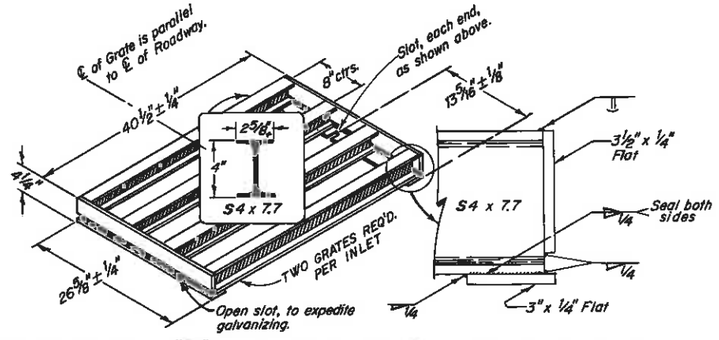
TRANSVERSE CROSS SECTION

LONGITUDINAL CROSS SECTION



GRATE INSTALLATION DETAIL





TYPE "C" INLET GRATE

QUANTITIES: 2 STEEL GRATES - ONE INLET

NO. PIECES	DESCRIPTION	LENGTH	Lb. per Ft.	WEIGHT (lbs.)
8	S4 x 7.7 Beam	40"	7.70	206
4	3½" x ⅛" Flat	26 5/16"	2.98	26
4	3" x ¼" Flat	26 5/16"	2.55	24
			TOTAL	256 lbs.

QUANTITIES FOR ONE INLET

H ft.	CONCRETE ▽ cu. yd.	STEEL ▽ lb.	PIPE RANGE, D in. CSP	PIPE RANGE, D in. RCP	STEEL RING * CSP lb.	STEEL RING * RCP lb.	NO. STEPS REQ'D.
3.0	1.5	109	18	18	5	6	0
3.5	1.7	115	18-24	18-24	6	7	0
4.0	1.9	134	18-30	18-30	7	9	1
4.5	2.0	140	18-36	18-36	9	10	1
5.0	2.2	159	18-42	18-42	10	11	2
5.5	2.4	165	18-48	18-48	11	12	2
6.0	2.6	184	18-54	18-48	12	12	2
6.5	2.7	190	18-60	18-48	13	12	3
7.0	2.9	209	18-66	18-48	14	12	3
7.5	3.1	215	18-66	18-48	14	12	4
8.0	3.3	234	18-66	18-48	14	12	4
8.5	3.4	240	18-66	18-48	14	12	4
9.0	3.6	259	18-66	18-48	14	12	5
9.5	3.8	265	18-66	18-48	14	12	5
10.0	4.0	284	18-66	18-48	14	12	5

▽ *Concrete and Steel quantities are for ONE entire Inlet before deduction for volume occupied by pipe.*

* *Steel Ring weights are for the maximum pipe D shown.*

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications applicable to the project.

Concrete shall be Class A, B, or D.

See plans for size and location of Conduit.

Inlet Grating shall be galvanized as described for Frames, Grates, Covers & Steps in Section 712.

All exposed concrete surfaces shall receive Class I finish.

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

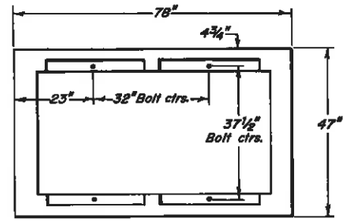
Inlet may be Cast-in-Place or Precast.

Steps will be required when Inlet "H" exceeds 3'-6".

For detail of Inlet Step, see Standard M-604-D.

Steps shall be included in the cost for "Inlet, Type D".

Grating shall conform to Section 604.



PLAN VIEW
SHOWING ANCHOR BOLT LAYOUT

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

INLET, TYPE D

Designed by M R H	Approved by D. L. Vernon
Made by J R B	Staff Design Engineer
Checked by O L S	Date: October 31, 1974

DIVISION OF HIGHWAYS, STATE OF COLORADO
D. O. H. FORM NO. 126
Rev. October, 1972

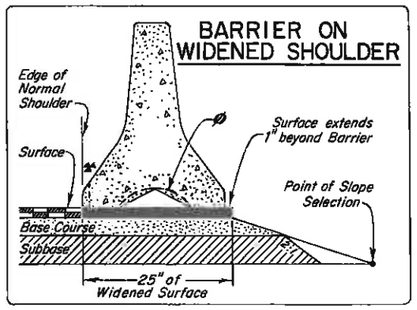
STANDARD M-606-EA

(JULY 20, 1976)

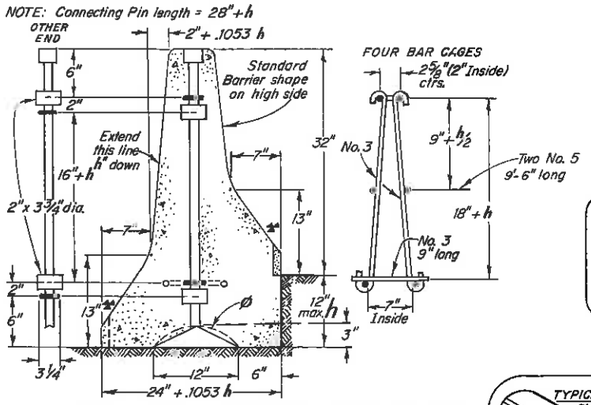
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

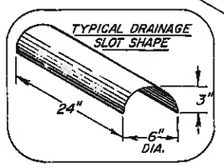
REVISIONS		
R-1	10-28-77 Gen'l. Note A_1 – Make lifting coil mandatory.	T.A.L

BARRIER ON WIDENED SHOULDER

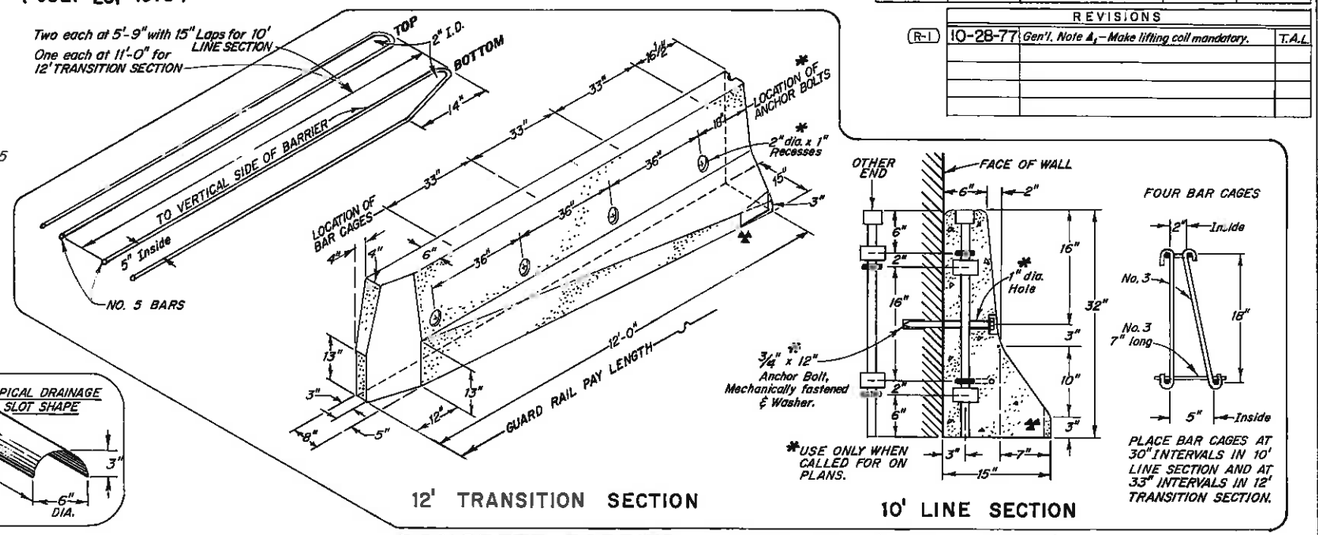


BARRIER FOR OFFSET ROADWAYS

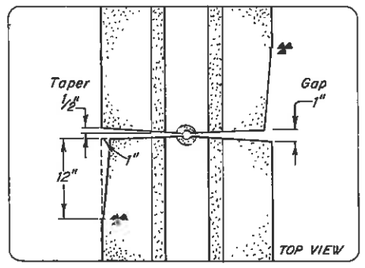




12' TRANSITION SECTION

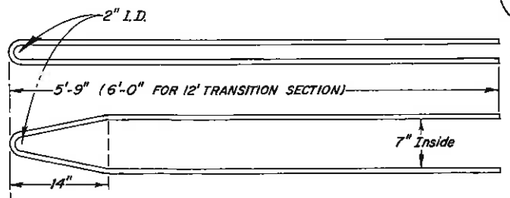


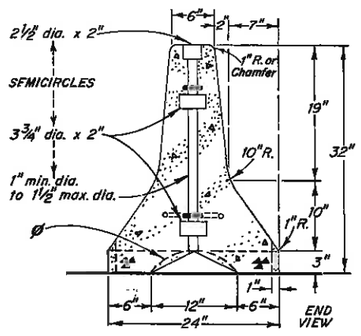
CONCRETE BARRIER — TYPE 4A (WALL TYPE)

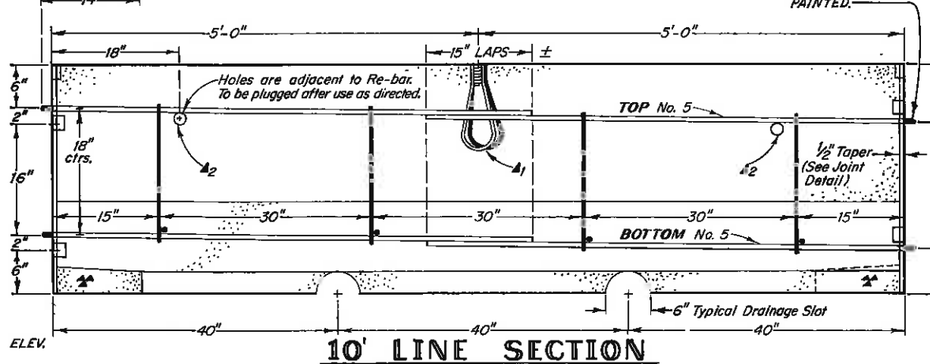


JOINT IN MEDIAN BARRIER

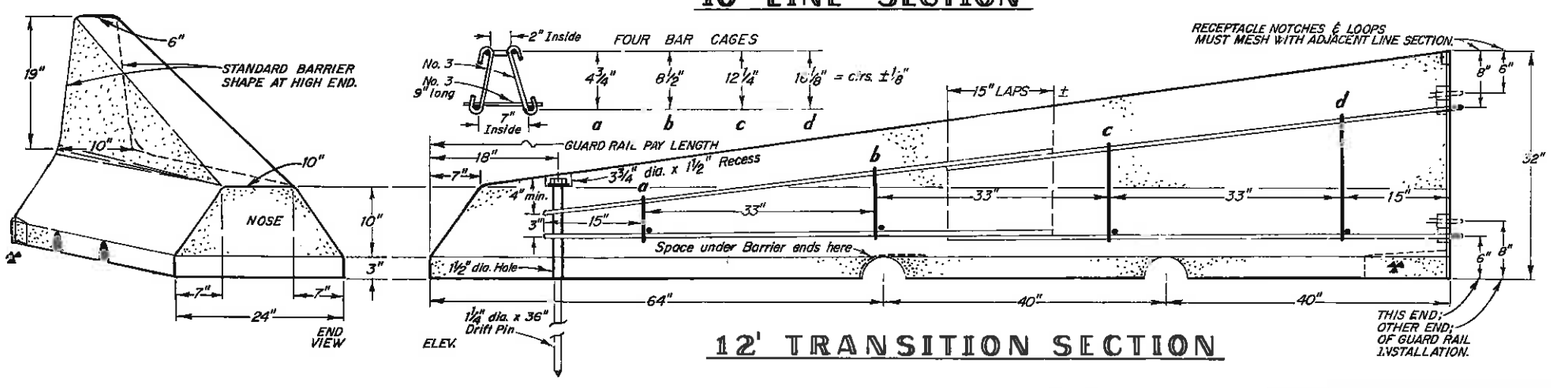
(Reverse Location of Taper for a Joint in Shoulder Barrier.) (SEE GENERAL NOTE)



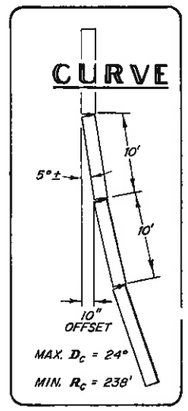




10' LINE SECTION



12' TRANSITION SECTION



GENERAL NOTES

R-1

All work shall be done in accordance with the Standard Specifications applicable to the project.

Concrete shall be Class **A, B** or **D**.

All exposed loops shall be thoroughly cleaned and painted in accordance with Section 509.

Drainage Slots may be omitted on: median installations with inlet drainage; shoulder barrier on high outside superelevated shoulders; and median barrier on vertical crest curve.

Existing asphaltic surface shall be patched along the barrier foundation.

Nuts, washers, lifting hardware, connecting pins, drift pins and anchor bolts shall be galvanized.

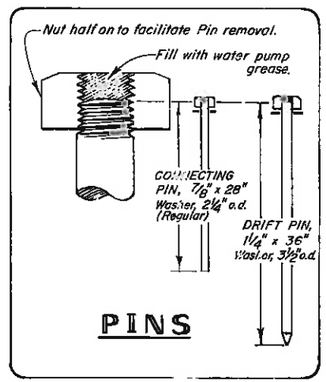
Where transition is required (see "h" in Offset Roadways), cast-in-place barrier shall be constructed, complete with matching reinforcement and hardware, to abutt precast barrier.

Ø ——— Triangular space in base of barrier is typical, circular arch shape will be permitted.

▲ ——— Taper shall be 1" in 12" at traffic approach corners of Section to eliminate snagging of plowblade.

A_1 ——— MANDATORY: 1" x 12" Lifting Coil with double flared loops. (Safe working load, 8000 lbs.)

A_2 ——— OPTIONAL: Holes through Barrier for lifting by Rods and Yoke; maximum dia. 2".



PINS

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

GUARD RAIL — TYPE 4 CONCRETE BARRIER — PRECAST — PORTABLE

Designed by T A L	Approved by D. L. Vernon
Made by J R B	Staff Design Engineer
Checked by O L S	Date: July 20, 1976

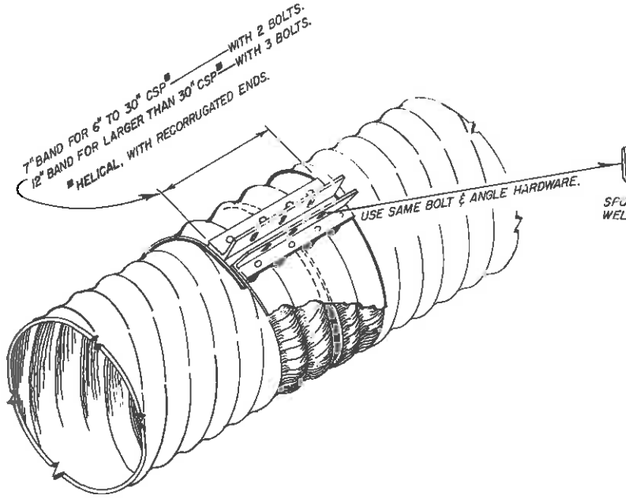
DIVISION OF HIGHWAYS, STATE OF COLORADO
D. O. H. FORM NO. 126
Rev. October, 1972

STANDARD M-707-CB

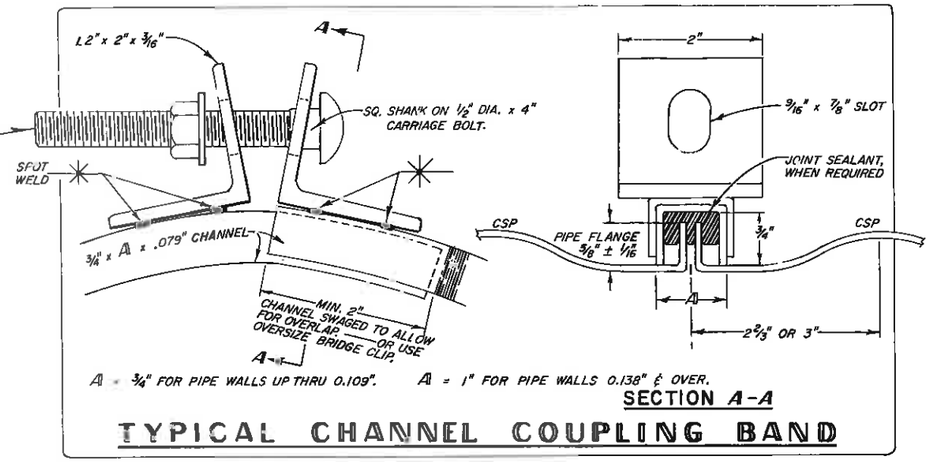
(JANUARY 25, 1978)

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

REVISIONS		

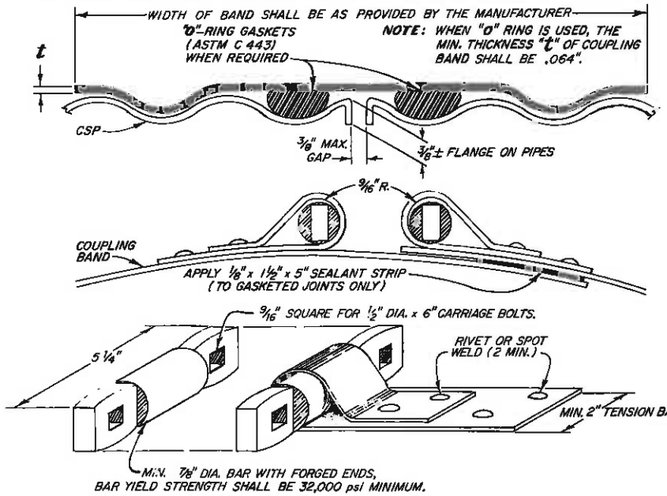


TYPICAL ANNULAR BAND FOR HELICAL PIPE WITH RECORRUGATED ENDS

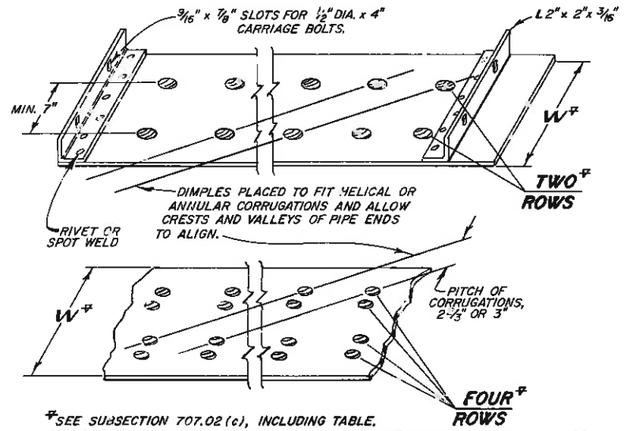


TYPICAL CHANNEL COUPLING BAND

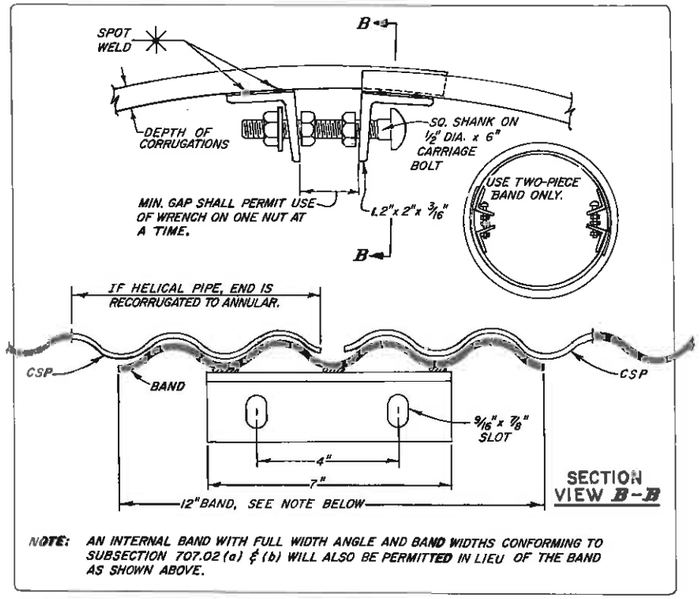
PIPE DIAM.	CULVERT WALL	CORRUGATION	t
THRU 72"	.064" TO .168"	2 2/3" x 1/2"	.052"
78" THRU 84"	.168"	2 2/3" x 1/2"	.064"
48" THRU 84"	.064" TO .109"	3" x 1"	.052"
90" THRU 120"	.079" TO .109"	3" x 1"	.064"



TYPICAL ALTERNATIVE ANNULAR COUPLING BAND

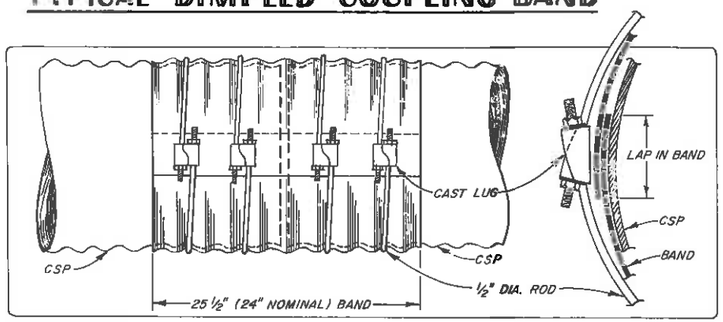


TYPICAL DIMPLED COUPLING BAND



NOTE: AN INTERNAL BAND WITH FULL WIDTH ANGLE AND BAND WIDTHS CONFORMING TO SUBSECTION 707.02 (a) & (b) WILL ALSO BE PERMITTED IN LIEU OF THE BAND AS SHOWN ABOVE.

TYPICAL INTERNAL ANNULAR COUPLING BAND



TYPICAL SIPHON COUPLING BAND

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications & AASHTO M 36 except as shown hereon.

All Coupling Band connection hardware shall be galvanized or electroplated in accordance with the Standard Specifications.

For Pipe Arches use the same width band as for round pipe of equal periphery.

Dimensions and thicknesses are minimum.

TOLERANCE: Inside pipe diameters shall not vary more than 1/2" for all sizes of pipe.

Spot welds shall develop minimum required strength of strap or angle.

DISCLAIMER: Infringement on patented couplings shall be the Contractor's responsibility in accordance with Subsection 107.03.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TYPICAL ALTERNATE COUPLING BANDS FOR CORRUGATED CULVERT PIPE

Designed by ABCR & OLS	Approved by D. L. Ulman
Made by JRB	Staff Design Engineer
Checked by TAL	Date: January 25, 1978

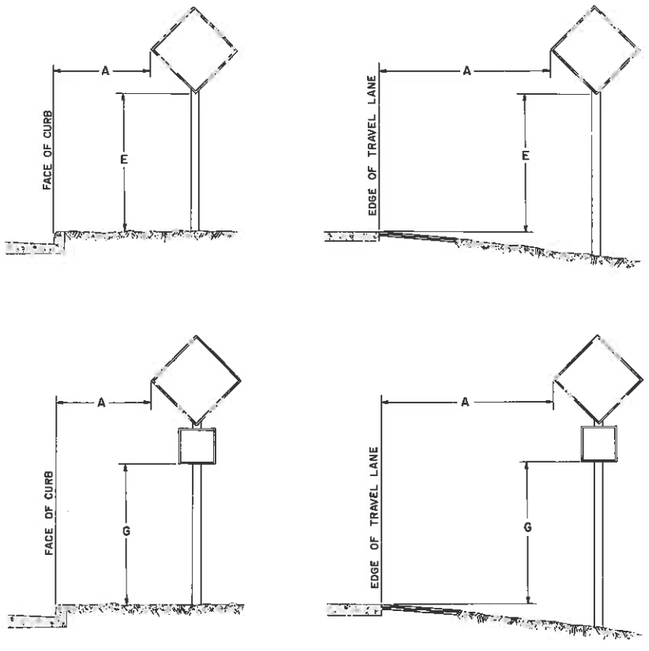
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS — STATE OF COLORADO
FORM D.O.H. 126
JULY, 1968

STANDARD S - 614 - 19B

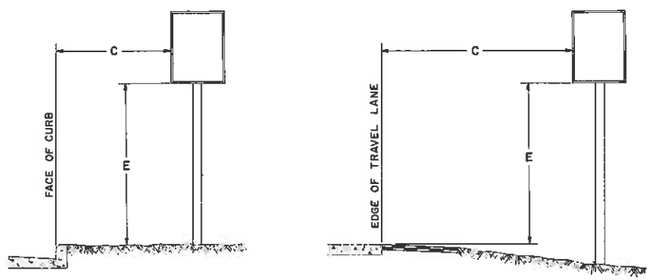
NOVEMBER 18, 1970

REVISIONS		
(R-1) 11-17-71	Table	J.D.S.

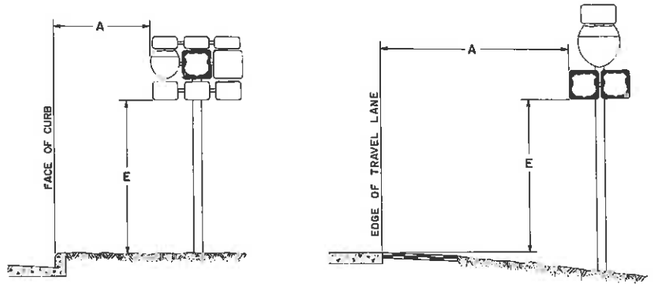
WARNING SIGN PLACEMENT



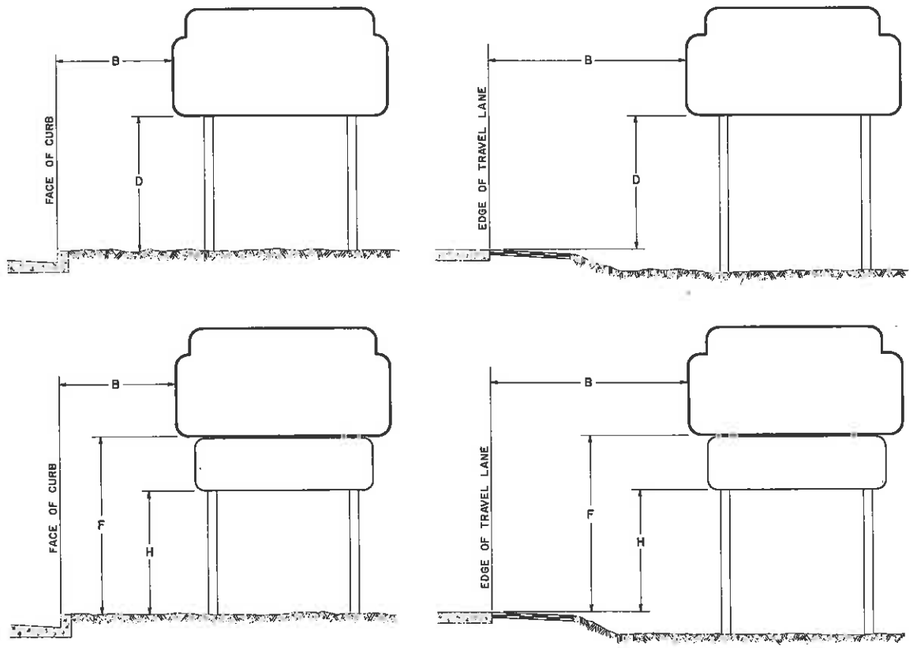
REGULATORY SIGN PLACEMENT



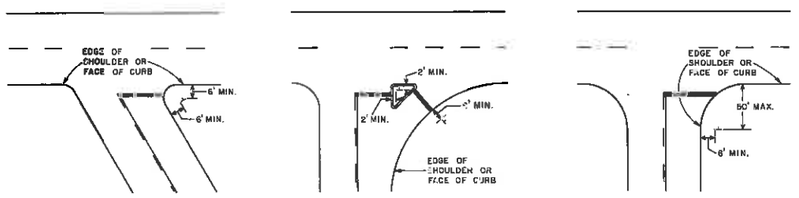
ROUTE MARKER ASSEMBLY PLACEMENT

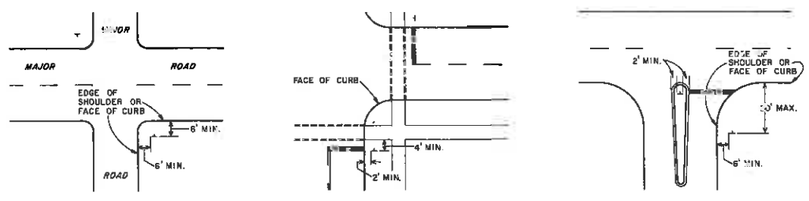


CLASS III SIGN PLACEMENT



TYPICAL LOCATIONS STOP SIGNS AND YIELD SIGNS

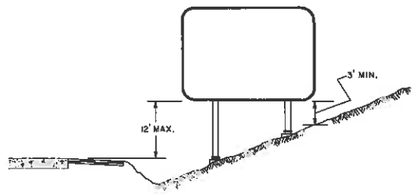




GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the project.
2. The Engineer shall establish grades and locations for all sign posts in accordance with details shown on the plans.
3. Special care shall be taken in sign location to ensure an unobstructed view of each sign.
4. Signs shall be set to provide as much lateral clearance as existing conditions permit but shall not exceed maximum clearances as shown in the LATERAL PLACEMENT TABLE.
5. The lateral placement for all signs may be reduced to a minimum of 2 ft. outside of the shoulder edge or face of curb where necessary to fit field conditions or improve sight distance.
6. Minimum post embedment shall be 3 ft. for U-2 posts and 4"x4" timber posts, and 5 ft. for 6"x6" timber posts. For footing depth see applicable Standard.

CLASS III SIGNS PANEL GROUND CLEARANCE



PLACEMENT TABLES

LATERAL

KEY	ALL SYSTEMS	
	MIN.	MAX.
A	*	22'-0"
B	*	30'-0"
C	*	16'-0"

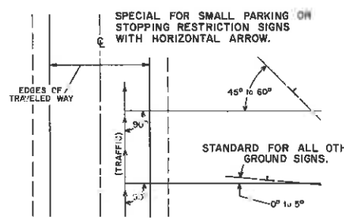
* In no case shall any part of a sign be less than 2 ft. beyond any surface prepared for normal or emergency travel of vehicles.

(R-1) VERTICAL

KEY	INTERSTATE	EXPRESSWAY		NON-EXPRESSWAY	
		URBAN	RURAL	URBAN	RURAL
D	5'-0"**	7'-0"	6'-0"	7'-0"	5'-0"
E	6'-0"	7'-0"	5'-0"	7'-0"	5'-0"
F	8'-0"	—	—	—	—
G	6'-0"	6'-0"	4'-0"	6'-0"	4'-0"
H	5'-0"	4'-0"	4'-0"	4'-0"	4'-0"

** When lateral placement is minimum, "D" shall be 7'-0".

ANGULAR PLACEMENT (ALL GROUND SIGNS)



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TYPICAL GROUND SIGN PLACEMENT

Designed By: J.J.S. | Approved By: [signature] Traffic Engineer
Mode By: J.E.M.
Checked By: J.J.B. | Date: Nov. 18, 1970

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS STATE OF COLORADO
DOH FORM 1C4

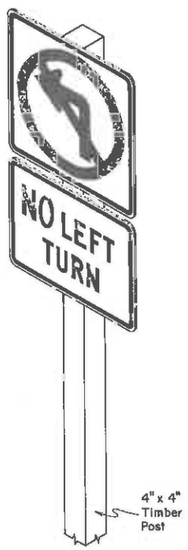
STANDARD S-614-20B

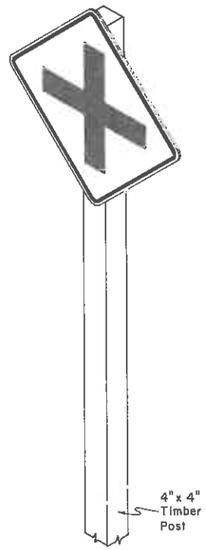
JULY 1, 1968

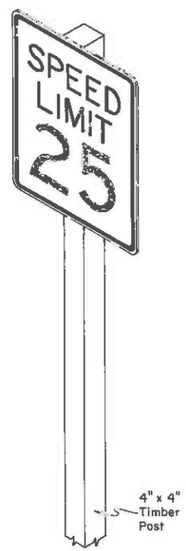
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

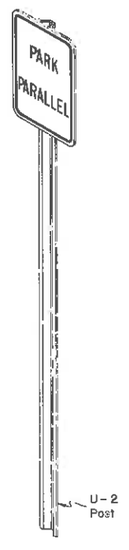
REVISIONS			
(R-1)	11-17-71	Illustrations & Note	J.D.S.
(R-2)	10-6-72	Rev post, Add note	J.D.S.
(R-3)	11-2-73	Rev. Illustrations	J.D.S.

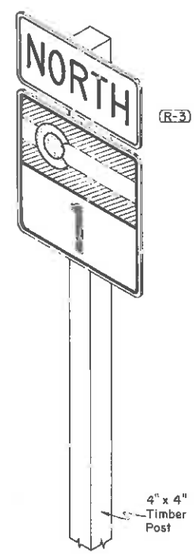
TYPICAL CLASS I GROUND SIGN INSTALLATIONS











GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the Project.
2. All Class I sign panels shall be either sheet steel, 0.0598" minimum thickness, or sheet aluminum, 0.100" minimum thickness.
3. Class I sign panels shall be fastened directly to the post. Fasten to U-2 post with 2 - 1/4" stove bolts and to timber posts with 2 - 3/8" machine bolts. See appropriate Standard for exceptions.
4. A plastic fiber washer shall be placed between the bolt head and the face of the sign panel. Use a C.I.O.G. washer under the nut on the back of the timber post.
5. Bolts, nuts and metal washers shall be galvanized or cadmium plated.
6. Exposed bolt heads and fiber washers on the face of the sign panel shall be painted or reflectorized to match the surrounding color.

(R-2) 7. All reflective sheeting shall be of the Smooth Surface Type.

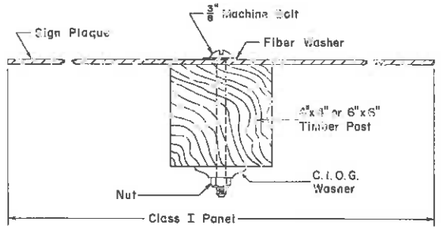
8. For sign placement see appropriate Standard.

(R-1) 9. Steel posts shall meet requirements of Paragraph 4.5 U.S. Department of Commerce Commercial Standard 184-51. Re-rolled rails will not be permitted. U-2 post to weigh 2 lbs./ft. A mill tolerance of minus 3 1/2 % of the weight of any one post will be allowed. Alternate post acceptable if section modulus is at least 0.200 in^3 about the X-X axis and at least 0.250 in^3 about the Y-Y axis.

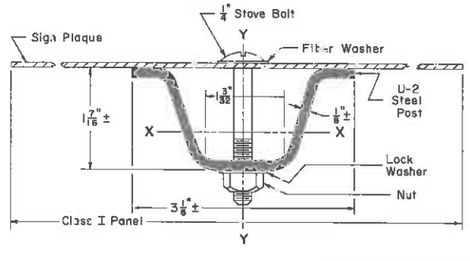
10. For additional information, refer to "TABULATION OF SIGNS". Timber posts shall be 4"x4" or 6"x6" as noted therein and shall conform to Standard Dressed (S4S) Sizes.

(R-2) 11. Vertical spacing between panels on the same post shall be 1" minimum to 1 1/2" maximum.

TYPICAL TIMBER POST SECTION



TYPICAL U-2 POST SECTION



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CLASS I GROUND SIGN INSTALLATIONS

Designed By:	F.J.B.	Approved By:	Traffic Engineer
Made By:	J.E.M.		
Checked By:	J.D.S.	Date: July 1, 19 68	

COLORADO DEPARTMENT OF HIGHWAYS
FORM C. D. H. 128
JANUARY 1960

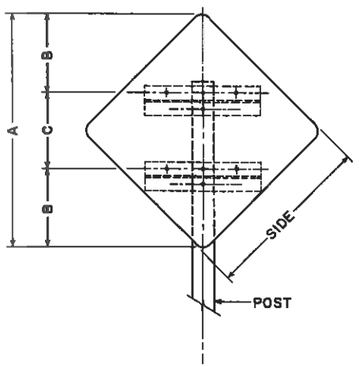
STANDARD S-614-21B

JULY 1, 1968

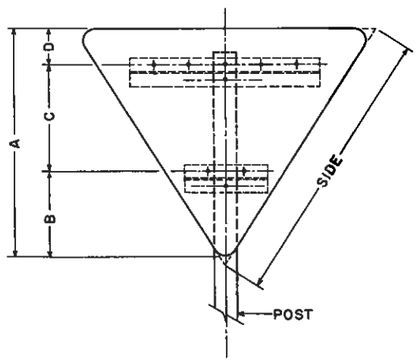
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO			

REVISIONS			
(R-1)	4-22-69	REVISED TABLE	J.L.S.
(R-2)	12-2-69	REV. TABLE & ADD NOTE	J.J.B.

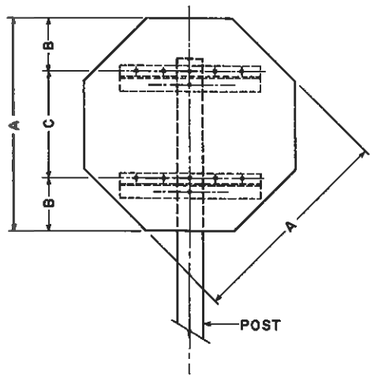
DIAMOND



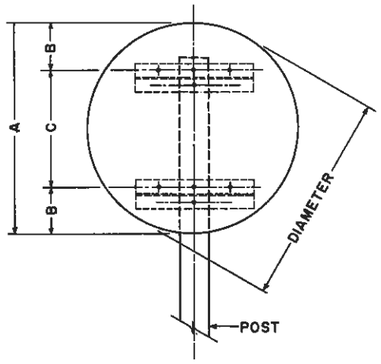
TRIANGLE



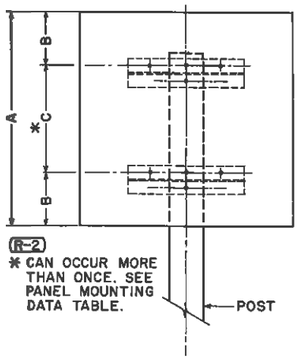
OCTAGON



CIRCLE

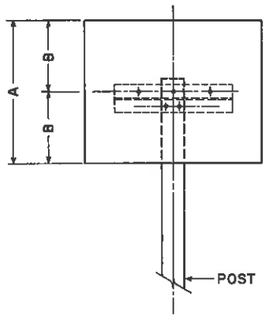


RECTANGLE



(R-2)
* CAN OCCUR MORE THAN ONCE. SEE PANEL MOUNTING DATA TABLE.

RECTANGLE
(ONE ZEE)



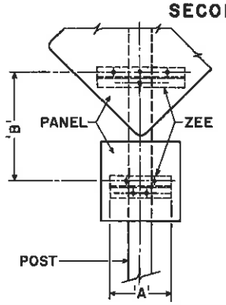
CLASS II PANEL MOUNTING DATA (R-1) (R-2)

SIGN TYPE	A	B	C	D	POST SIZE	BACKING ZEE LENGTH
DIAMOND 30" SIDES	40 7/8"	14 7/16"	12"	—	4" x 4"	1'-8"
36" SIDES	49 1/16"	14 1/32"	21"	—	6" x 6"	1'-8"
48" SIDES	65 3/8"	20 3/16"	25"	—	6" x 6"	2'-8"
TRIANGLE 36" SIDES	29 3/16"	14 3/16"	9"	6"	4" x 4"	1'-8", 1'-2"
48" SIDES	38 9/16"	14 9/16"	18"	6"	4" x 4"	2'-8", 1'-2"
60" SIDES	48"	20"	22"	6"	6" x 6"	2'-8", 1'-8"
OCTAGON 30" x 30"	30"	9"	12"	—	4" x 4"	1'-8"
48" x 48"	48"	12"	24"	—	6" x 6"	2'-8"
CIRCLE 36" DIAMETER	36"	8"	20"	—	6" x 6"	1'-8"
RECTANGLE 40" x 20"	20"	10"	—	—	4" x 4"	2'-8"
30" x 24"	24"	12"	—	—	4" x 4"	1'-8"
36" x 24"	24"	12"	—	—	4" x 4"	2'-2"
40" x 24"	24"	12"	—	—	4" x 4"	2'-8"
48" x 24"	24"	12"	—	—	6" x 6"	3'-2"
30" x 30"	30"	9"	12"	—	4" x 4"	1'-8"
48" x 30"	30"	9"	12"	—	6" x 6"	3'-2"
60" x 30"	30"	9"	12"	—	6" x 6"	4'-2"
30" x 36"	36"	9"	18"	—	6" x 6"	1'-8"
36" x 36"	36"	9"	18"	—	6" x 6"	2'-2"
48" x 36"	36"	9"	18"	—	6" x 6"	3'-2"
40" x 40"	40"	9"	22"	—	6" x 6"	2'-8"
36" x 42"	42"	9"	24"	—	6" x 6"	2'-2"
36" x 48"	48"	12"	24"	—	6" x 6"	2'-2"
40" x 48"	48"	12"	24"	—	6" x 6"	2'-8"
42" x 48"	48"	12"	24"	—	6" x 6"	2'-8"
48" x 48"	48"	12"	24"	—	6" x 6"	3'-2"
60" x 48"	48"	12"	24"	—	6" x 6"	4'-2"
48" x 54"	54"	12"	30"	—	6" x 6"	3'-2"
48" x 60"	60"	12"	36"	—	6" x 6"	3'-2"
36" x 72"	72"	10"	26" (2)	—	6" x 6"	2'-2"
48" x 96"	96"	12"	24" (3)	—	6" x 6"	3'-2"

GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the project.
2. All Class II sign panels shall be either single sheet steel, 0.0598" minimum thickness, or single sheet aluminum, 0.100" minimum thickness, and shall be furnished with backing zees.
3. Timber posts shall be 4"x4" or 6"x6" as noted in the "Tabulation of Signs" and shall conform to Standard Dressed (S4S) Sizes.
4. Backing zees are 3"x 2¾" x ¼" at 6.7 lbs. per ft. for steel or 2.33 lbs. per ft. for 6061-T6 aluminum.
5. Exposed bolt heads on the face of the sign shall be painted or reflectorized to match the surrounding color.
6. For sign placement see "Typical Ground Sign Placement" Standard.
7. All reflective sheeting shall be of the Non-Exposed Lens Type.
8. Bolts, nuts and metal washers shall be galvanized or cadmium plated.

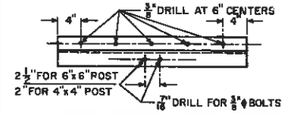
SECONDARY PANEL MOUNTING



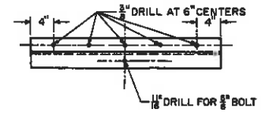
PANEL SIZE		'A' ZEE LENGTH	'B' ZEE SPACING	POST SIZE
PRIMARY	SECONDARY			
30" SIDES	18" SQUARE	1'-2"	24 7/16"	6" x 6"
36" SIDES	24" SQUARE	1'-8"	27 1/32"	6" x 6"
48" SIDES	24" SQUARE	1'-8"	33 3/16"	6" x 6"

NOTE: SEE CLASS II PANEL MOUNTING DATA AND TYPICAL BACKING ZEES FOR OTHER DIMENSIONS AND FASTENERS.

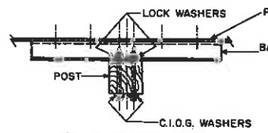
TYPICAL BACKING ZEES



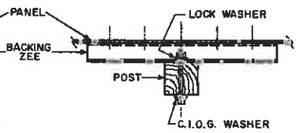
ONE POST-ONE ZEE



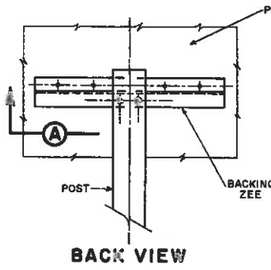
ONE POST-TWO ZEES



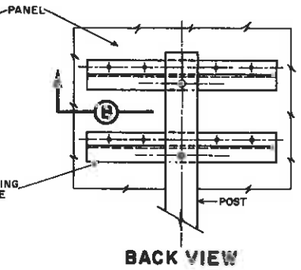
SECTION-A



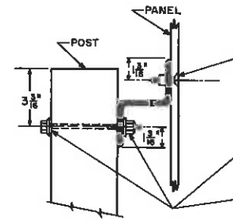
SECTION-B



BACK VIEW



BACK VIEW



SIGNS ARE FASTENED TO BACKING ZEES WITH ⅜" ϕ (NO. 4 THRU NO. 10, AS REQUIRED) 90° COUNTERSUNK ALUMINUM LOCKBOLT FASTENERS.

FOR SINGLE POST SIGNS WITH ONE BACKING ZEE, USE TWO ⅜" ϕ MACHINE BOLTS WITH C.I.O.G. WASHERS AND HEX NUTS WITH LOCK WASHERS AT THE ZEE.

FOR SINGLE POST SIGNS WITH TWO BACKING ZEES, USE ONE ⅜" ϕ MACHINE BOLT WITH C.I.O.G. WASHER AND HEX NUT WITH LOCK WASHER AT EACH ZEE.

END VIEW

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CLASS II GROUND SIGN INSTALLATIONS

Designed By: J.L.S.	Approved By: [signature]
Made By: F.J.B.	Traffic Engineer
Checked By: G.W.F.	Date July 1, 1968

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS STATE OF COLORADO
D.O.H. FORM 126
JULY, 1968

STANDARD S-614-26C

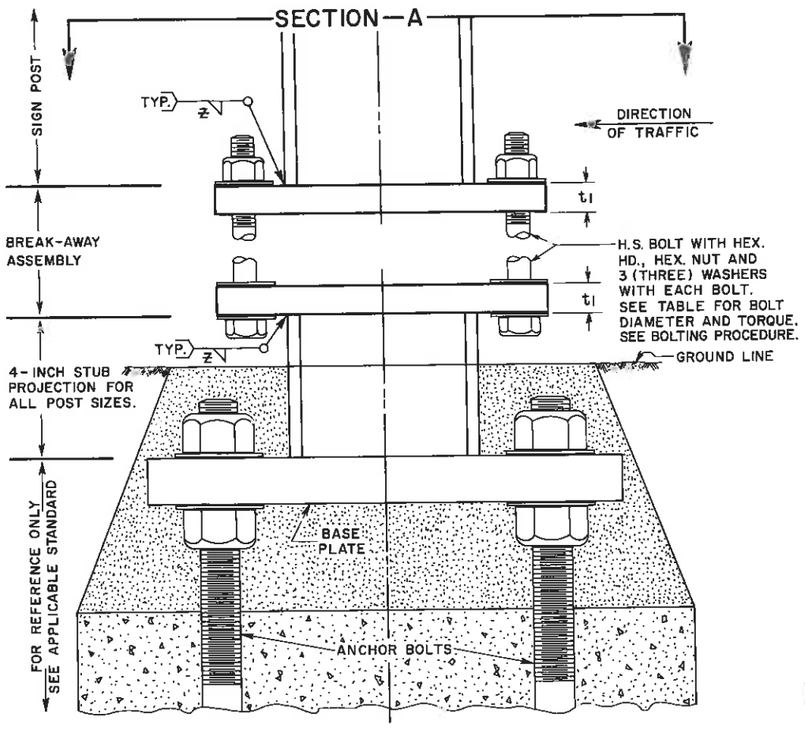
(SHEET 1 OF 2 SHEETS)

APRIL 11, 1973

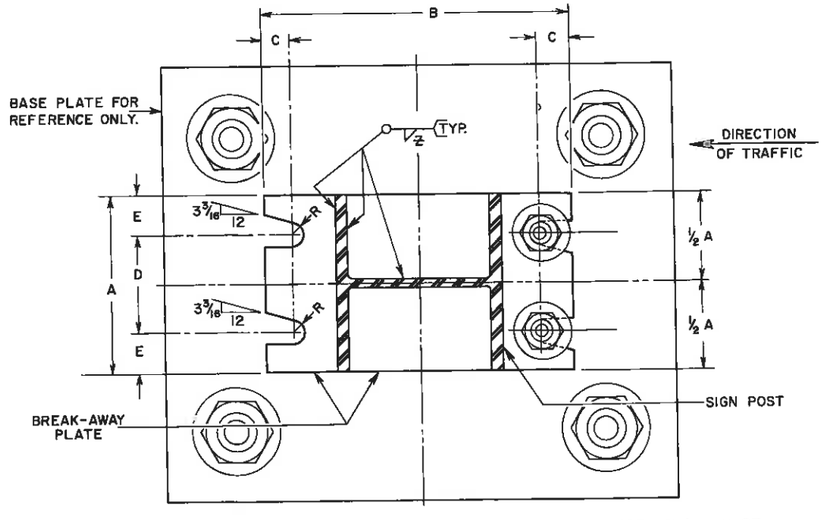
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS			
(R-1)	5-2-74	Rev. Note	J.D.S.

TYPICAL ELEVATION STEEL POST ASSEMBLY



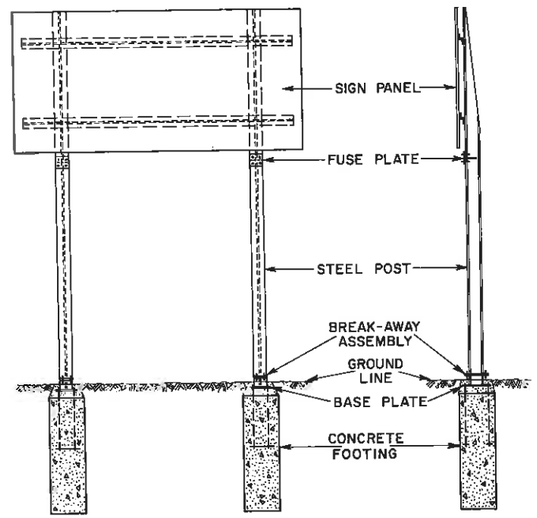
TYPICAL SECTION -A-



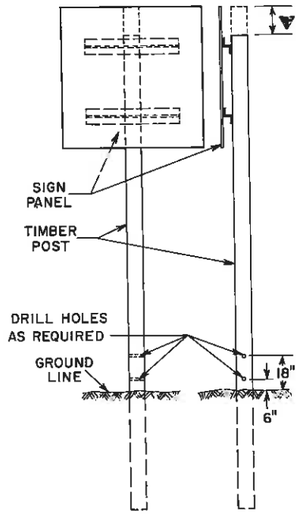
SECTION SHOWN IS FOR INSTALLATION ON RIGHT SHOULDER AND IN GORE. PLATE SLOT BEVELS ARE OPPOSITE HAND FROM THAT REQUIRED FOR INSTALLATION ON LEFT SHOULDER.

TYPICAL BREAK-AWAY SIGN SUPPORT INSTALLATIONS

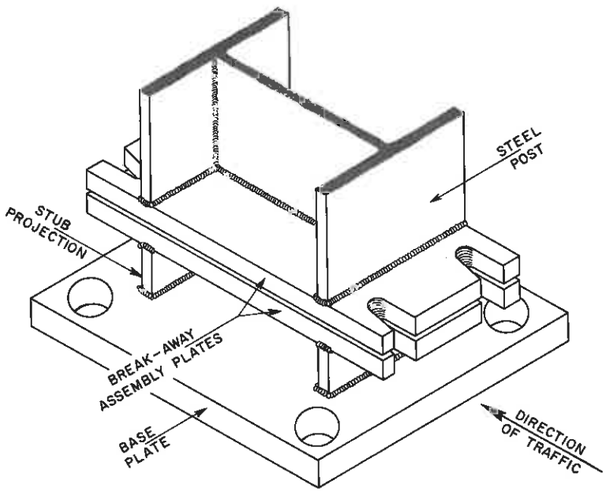
STEEL POSTS



TIMBER POSTS



TYPICAL PROJECTED VIEW STEEL POST ASSEMBLY



GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the Project.
2. Design conforms with AASHO "Specifications for the Design and Construction of Structural Supports for Highway Signs".
3. All structural steel shall conform to ASTM—A36 and Section 509 of the Standard Specifications.
4. Notched steel fuse plates shall conform to the requirements of ASTM—A36.
5. All high strength bolts, nuts and washers shall conform to ASTM—A325.
6. All bolts other than high strength bolts shall conform to ASTM—A307.
7. All bolts, nuts, and washers shall be galvanized as per ASTM—A153 or ASTM—A164.
8. All holes shall be drilled.
9. All steel cuts shall preferably be saw cuts; however, flame cutting will be permitted, provided all edges are ground. Remove all burrs. Metal shall not project beyond the plane of the plate face.
10. High strength bolts in the break-away assembly shall be tightened only to the torque shown in the table. DO NOT OVERTIGHTEN.
11. (R-1) The "STUB POST" and one "BREAK-AWAY PLATE" are considered part of the footing. The other "BREAK-AWAY PLATE" and all nuts, bolts and washers for fastening the break-away plates are considered a part of the post.
12. Timber posts shall be in accordance with Section 614 of the Standard Specifications as to Size, Alternate Size, Grade, Species, Treatment, and Break—Away Holes.
13. For all base plate and footing work see the applicable Standard included in the plans.
14. For additional information, refer to "Tabulation of Signs" and "Cross Sections for Class III Signs" included in the plans.
15. ▼ Timber post flush with top of sign panel for direct mount and 3 3/16" minimum above bolt for backing zee mount.

BREAK-AWAY PLATE DATA TABLE

DIMENSION / POST SIZE	BOLT SIZE AND TORQUE	A	B	C	D	E	t1	WELD ℄	R	STUB POST LENGTH
W 12 x 40	7/8" ø x 3 3/4" 1,135 in. Lb.	8"	19 1/4"	1 5/8"	4"	2"	1 1/4"	3/8"	15/32"	0'-4"
W 12 x 31	3/4" ø x 3 1/2" 750 in. Lb.	6 1/2"	16 5/8"	7/8"	3 1/2"	1 1/2"	1"	5/16"	13/32"	0'-4"
W 10 x 25		5 3/4"	14 5/8"	7/8"	3 1/4"	1 1/4"	1"	5/16"	13/32"	0'-4"
W 10 x 21		5 3/4"	14 3/8"	7/8"	3 1/4"	1 1/4"	1"	5/16"	13/32"	0'-4"
W 8 x 20		5 1/4"	12 5/8"	7/8"	2 3/4"	1 1/4"	1"	5/16"	13/32"	0'-4"
W 8 x 17	5/8" ø x 2 3/4" 450 in. Lb.	5 1/4"	12"	3/4"	3"	1 1/8"	3/4"	1/4"	11/32"	0'-4"
W 6 x 15.5		6"	10"	3/4"	3 3/4"	1 1/8"	3/4"	1/4"	11/32"	0'-4"
W 6 x 12		5"	10"	3/4"	2 3/4"	1 1/8"	3/4"	1/4"	11/32"	0'-4"

BOLTING PROCEDURE FOR BREAK-AWAY PLATE ASSEMBLY

1. Assemble post to stub with bolts and with one flat washer on each bolt top, bottom, and between the break-away plates.
2. Tighten all bolts to a "snug tight" condition with a 12" to 15" wrench to bed washers and to clean bolt threads, then loosen each bolt in turn and retighten in a systematic order to the prescribed torque. (See Break-Away Plate Data Table)
3. Burr threads at junction with nut using a center punch to prevent nut loosening.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS

Designed By: G.W.F.
Made By: F.J.B.
Checked By: J.D.S.

Approved By: [signature]
Traffic Engineer
Date April 11, 1973

JULY, 1963

STANDARD S-614-26C

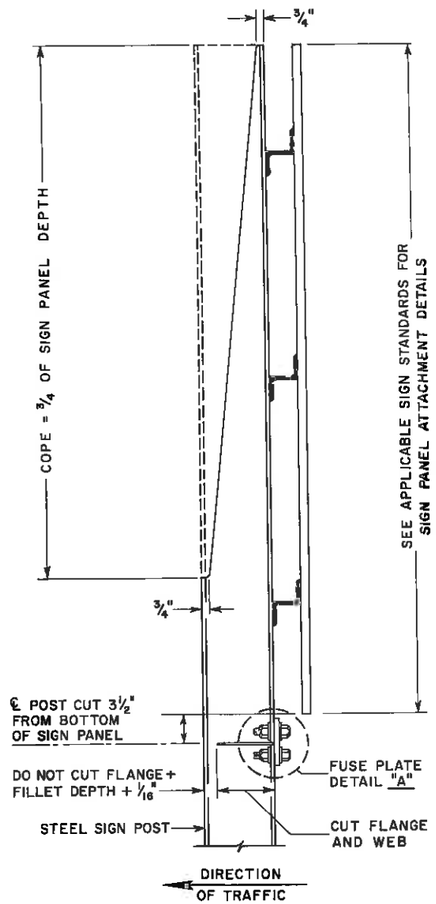
(SHEET 2 OF 2 SHEETS)

APRIL 11, 1973

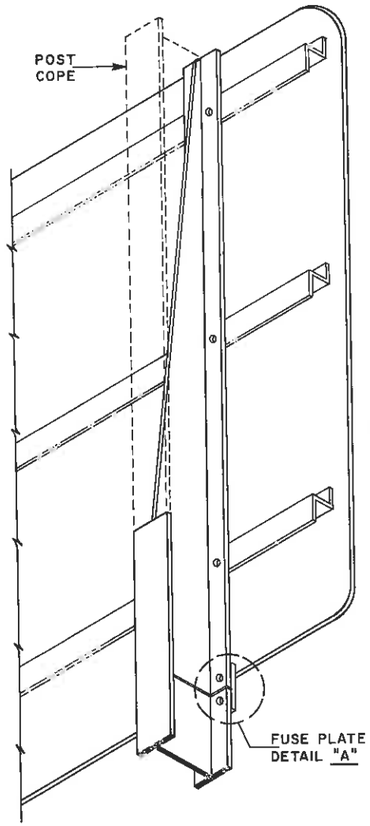
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS			
(R-1)	5-2-74	Rev. Note on Sheet No. 1	J.D.S.

TYPICAL SIDE VIEW FUSE PLATE AND POST COPE

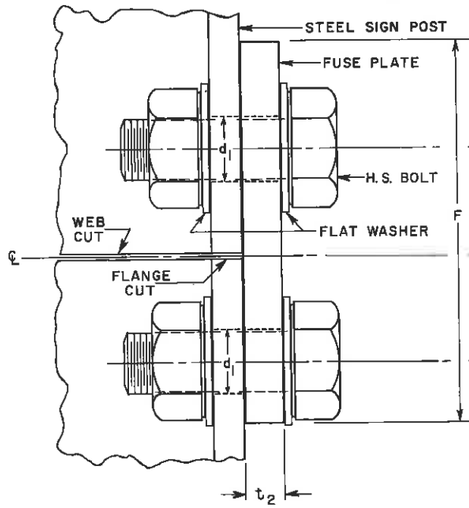


TYPICAL PROJECTED VIEW FUSE PLATE AND POST COPE

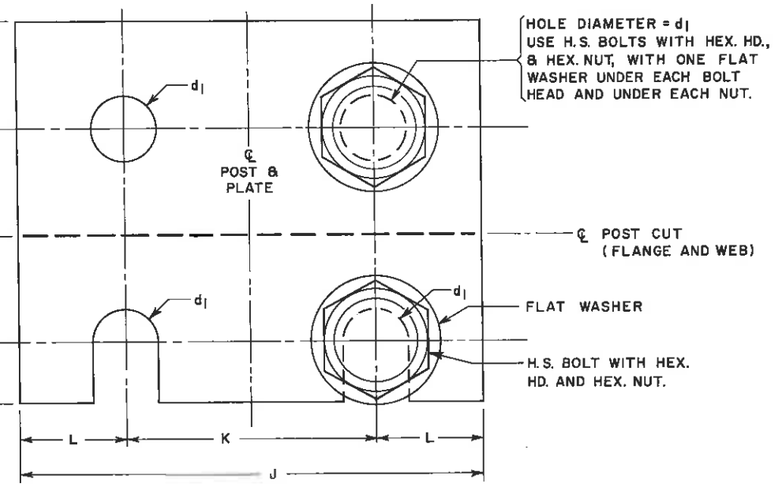


TYPICAL FUSE PLATE HINGE DETAILS

DETAIL "A" – SIDE VIEW



DETAIL "A" – FRONT VIEW
(POST & 2 BOLTS NOT SHOWN)



FUSE PLATE HINGE DATA TABLE

DIMENSION / POST SIZE	F	G	H	J	K	L	N	d_1	t_2	BOLT SIZE	MINIMUM RESIDUAL BOLT TENSION	FABRICATION NOTES
W 12 x 40	6"	3 1/4"	1 3/4"	8"	4"	2"	1"	15/16"	5/8"	7/8"ø x 2 1/2"	36,050 LBS.	Fuse plate and post flange holes shall be drilled. Install fuse plate with the notches toward the base of the post. IMPORTANT— All fuse plate hinge bolts shall be tightened in the shop following a method approved by the Engineer. Tightening shall be to such a degree as to obtain the minimum residual tension in each of the bolts.
W 12 x 31	5 3/8"	3"	1 1/2"	6 1/2"	3 1/2"	1 1/2"	7/8"	15/16"	9/16"	7/8"ø x 2 1/2"	36,050 LBS.	
W 10 x 25	5 3/8"	3"	1 1/2"	5 3/4"	2 3/4"	1 1/2"	7/8"	15/16"	9/16"	7/8"ø x 2 1/2"	36,050 LBS.	
W 10 x 21	5 3/8"	3"	1 1/2"	5 3/4"	2 3/4"	1 1/2"	7/8"	15/16"	9/16"	7/8"ø x 2 1/2"	36,050 LBS.	
W 8 x 20	4 7/8"	2 1/2"	1 1/2"	5 1/4"	2 3/4"	1 1/4"	7/8"	15/16"	9/16"	7/8"ø x 2 1/2"	36,050 LBS.	
W 8 x 17	4 1/2"	2 1/2"	1 1/4"	5 1/4"	2 3/4"	1 1/4"	3/4"	13/16"	1/2"	3/4"ø x 2"	28,400 LBS.	
W 6 x 15.5	4 1/2"	2 1/2"	1 1/4"	6"	3 1/2"	1 1/4"	3/4"	13/16"	1/2"	3/4"ø x 2"	28,400 LBS.	
W 6 x 12	3 3/4"	2"	1 1/8"	4"	2 1/4"	7/8"	5/8"	11/16"	3/8"	5/8"ø x 2"	19,200 LBS.	

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS

Designed By: G.W.F.
Made By: F.J.B.
Checked By: J.D.S.

Approved By: [signature]
Traffic Engineer
Date April 11, 1973

STANDARD S-614-27C

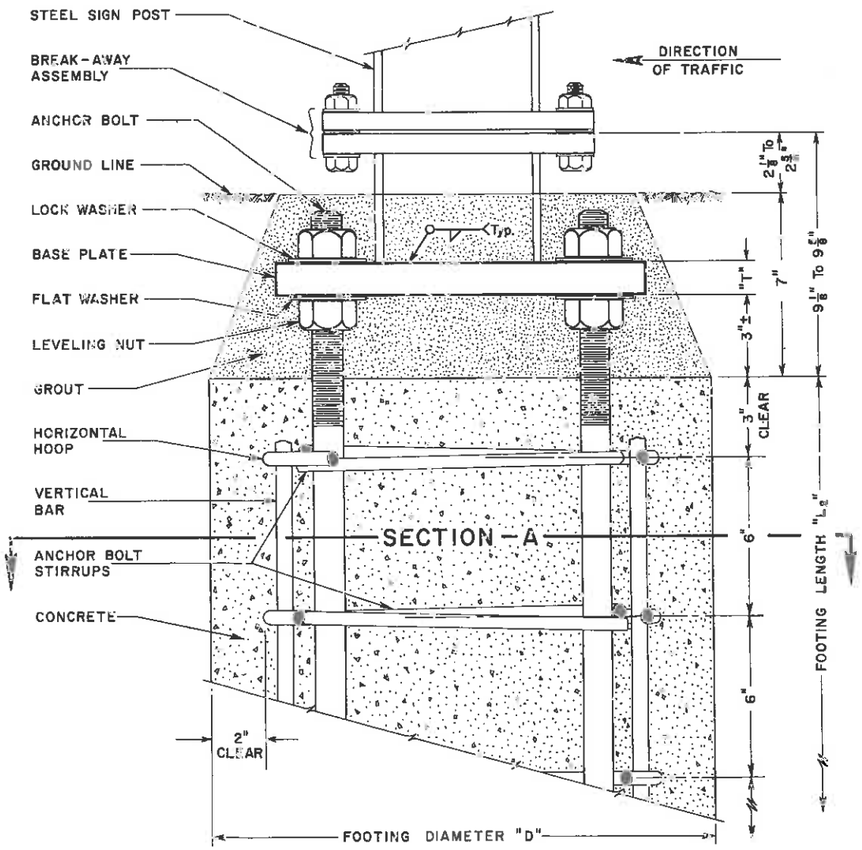
(SHEET 1 OF 2 SHEETS)

APRIL 11, 1973

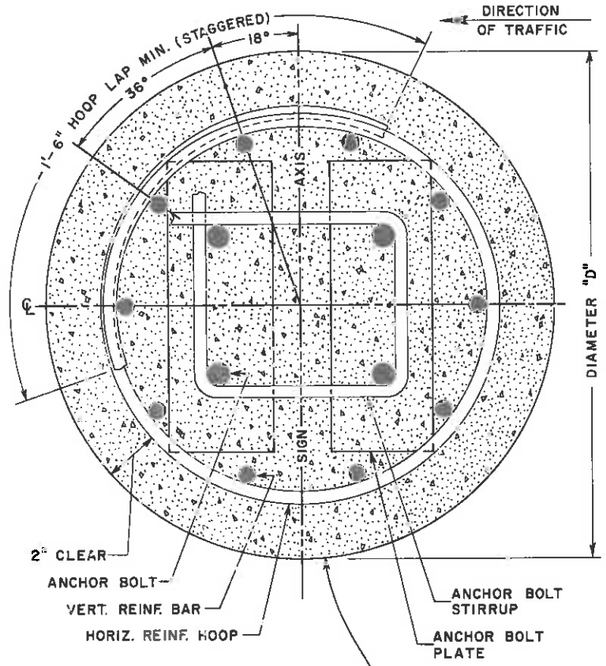
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS			
(R-1)	5-2-74	Add Note on Sheet No. 2	J.D.S.
(R-2)	9-24-75	Rev. "D" for Ty. I Footing	J.D.S.

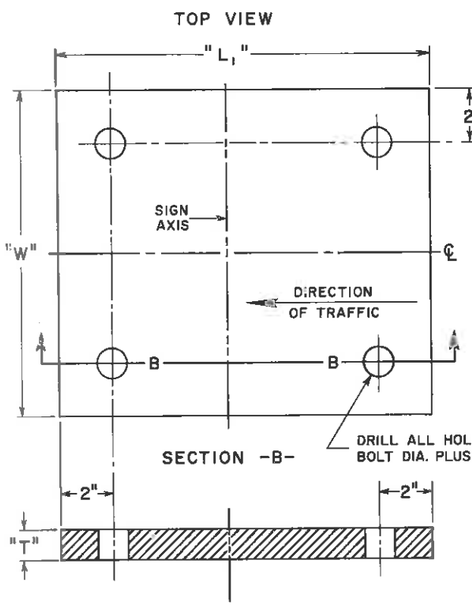
TYPICAL CONCRETE FOOTING ASSEMBLY



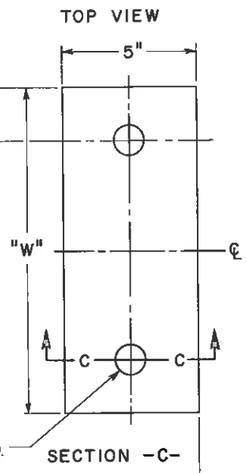
TYPICAL SECTION -A-



BASE PLATE TYPICAL DETAILS



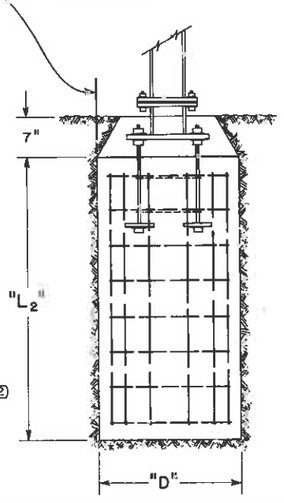
BOLT PLATE TYPICAL DETAILS



EXCAVATION PROCEDURE

DRILL TO O.D. OF FOOTING NEAT LINE AND TO DEPTH SHOWN, AND IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR DRILLED CAISSONS. (FOOTINGS SHALL BE CAST IN PLACE AGAINST UNDISTURBED MATERIAL.)

TYPICAL FOOTING INSTALLATION



CONCRETE FOOTING TABLE

SIZE	MAXIMUM ALLOWABLE MOMENT	POST TO BASE ℄ WELD	POST BASE STRUCTURAL DATA: BASE PLATE "L1"	"W"	"T"	ANCHOR COMPONENTS: ANCHOR BOLTS	BOLT PLATES	STIRRUPS	FOOTING STRUCTURAL DATA: SIZE TYPE	"D"	"L2"	REINFORCING: VERT. BAR	HORIZ. HOOP
W12x40	79.1 kip ft.	1/2" FILLET	21 1/4"	16"	1 3/4"	4-1 1/4"ϕ x 2'-6"	2-5"x 3/4"x 16"	2-1/2"ϕ	8	36"	11'	10-#10 x 10'-6"	22-#4@3"
W12x31	37.6 kip ft.	3/8" FILLET	19 3/4"	14"	1 5/8"	4-1 1/8"ϕ x 2'-3"	2-5"x 3/4"x 14"	2-1/2"ϕ	7	36"	10'	10-#9 x 9'-6"	20-#4@6"
W10x25	36.9 kip ft.	3/8" FILLET	16 1/2"	14"	1 1/4"	4-1"ϕ x 2'-6"	2-5"x 3/4"x 14"	2-1/2"ϕ	6	30"	9'	10-#9 x 8'-6"	18-#4@6"
W10x21	29.3 kip ft.	3/8" FILLET	16 1/4"	14"	1 1/4"	4-1"ϕ x 2'-6"	2-5"x 3/4"x 14"	2-1/2"ϕ	5	30"	8'	10-#8 x 7'-6"	16-#4@6"
W8x20	22.7 kip ft.	3/8" FILLET	14"	13 1/4"	1 1/8"	4-7/8"ϕ x 2'-0"	2-5"x 3/4"x 13 1/4"	2-1/2"ϕ	4	24"	7'	10-#8 x 6'-6"	14-#4@6"
W8x17	18.3 kip ft.	3/8" FILLET	14"	13 1/4"	1"	4-7/8"ϕ x 2'-0"	2-5"x 3/4"x 13 1/4"	2-1/2"ϕ	3	24"	6'	10-#7 x 5'-6"	12-#4@6"
W6x15.5	14.2 kip ft.	3/8" FILLET	14"	12 1/4"	1"	4-3/4"ϕ x 1'-6"	2-5"x 3/4"x 12 1/4"	2-1/2"ϕ	2	24"	5'	10-#6 x 4'-6"	10-#4@6"
W6x12	8.3 kip ft.	1/4" FILLET	13"	12"	7/8"	4-3/4"ϕ x 1'-6"	2-5"x 3/4"x 12"	2-1/2"ϕ	1	24"	4'	10-#5 x 3'-6"	8-#4@6" (R-2)
6x6 TIMBER	5.0 kip ft.	TIMBER POST SHALL BE SET IN DRILLED OR EXCAVATED HOLES -- DEPTH SHALL BE 5' FOR 6x6 POST (Unless otherwise noted on the tabulation in the plans) AND 3' FOR 4x4 POST. POSTS SHALL BE PLACED PLUMB, BACKFILLED WITH EXCAVATED MATERIALS, AND THOROUGHLY TAMPED INTO PLACE.											
4x4 TIMBER	1.4 kip ft.												

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.
2. ALL CONCRETE IS TO BE CLASS "A" OR CLASS "B". GROUT SHALL CONFORM TO "JOINT MORTAR".
3. ANCHOR BOLTS PROJECT ABOVE FOOTING 4", PLUS BASE PLATE THICKNESS, PLUS BOLT DIAMETER. THREAD UPPER PORTION -- PROJECTION PLUS 2"±. GALVANIZE UPPER PORTION -- PROJECTION PLUS 4"±.
4. USE ASTM-A36 STEEL FOR BASE PLATES AND BOLT PLATES. USE ASTM-A307 STEEL FOR ANCHOR BOLTS.
5. USE GRADE 40 FOR REINFORCING STEEL VERTICAL BARS, HORIZONTAL HOOPS, AND ANCHOR BOLT STIRRUPS.
6. FOR ALL STEEL WORK ABOVE THE BASE PLATE, AND FOR ANGULAR PLACEMENT OF SIGNS, SEE APPLICABLE STANDARDS INCLUDED IN THE PLANS.
7. FOR ADDITIONAL INFORMATION, REFER TO "TABULATION OF SIGNS" AND "CROSS SECTIONS FOR CLASS III SIGNS" INCLUDED IN THE PLANS.
8. ALTERNATE FOOTING DESIGNS ARE AVAILABLE FROM THE TRAFFIC ENGINEER FOR FOOTINGS IN ROCK.

CONT'D. SHEET 2.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS

Designed By:	J. E. S.	Approved By:	Traffic Engineer
Made By:	F. J. B.		
Checked By:	J. D. S.	Date:	April 11, 1973

STANDARD S-614-27C

(SHEET 2 OF 2 SHEETS)

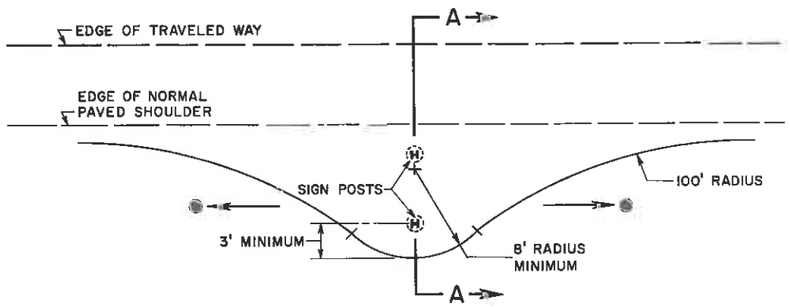
APRIL 11, 1973

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

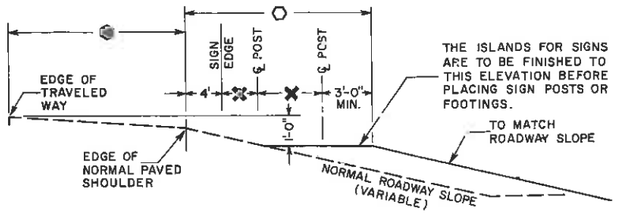
REVISIONS			
(R-1)	5-2-74	Add Note	J. D. S.
(R-2)	9-24-75	Rev. Table on Sheet No. 1	J. D. S.

DETAILS OF SIGN PLACEMENT

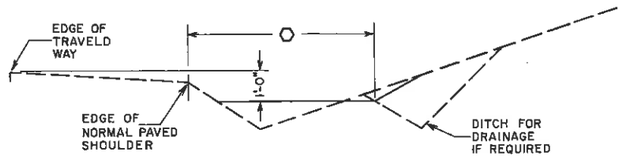
TYPICAL SIGN ISLAND PLAN



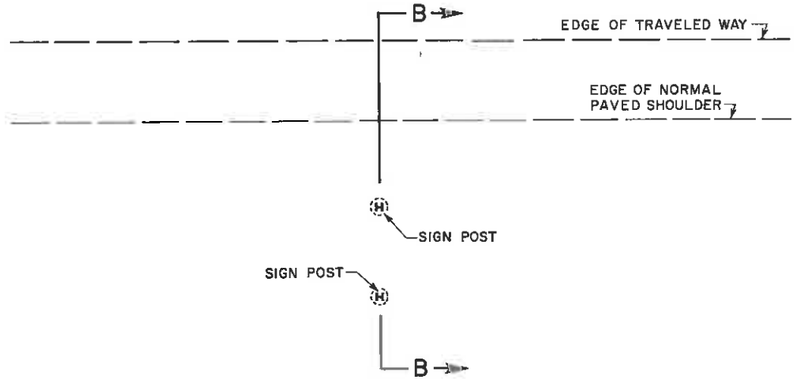
TYPICAL FILL SECTION : A-A



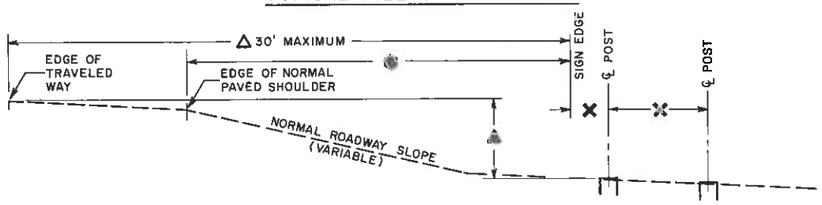
TYPICAL CUT SECTION : A-A



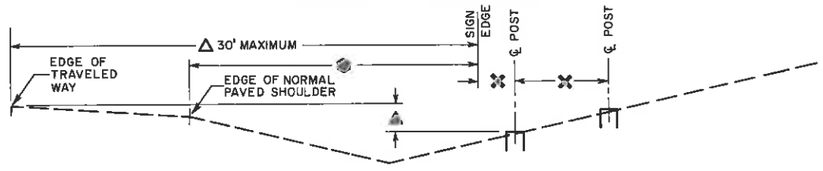
MAXIMUM CLEARANCE PLAN



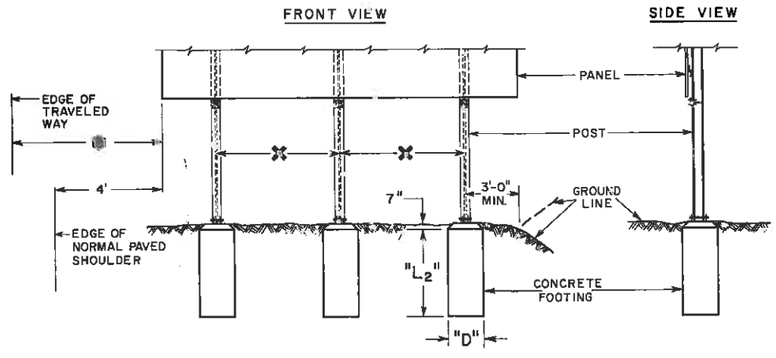
TYPICAL FILL SECTION : B-B



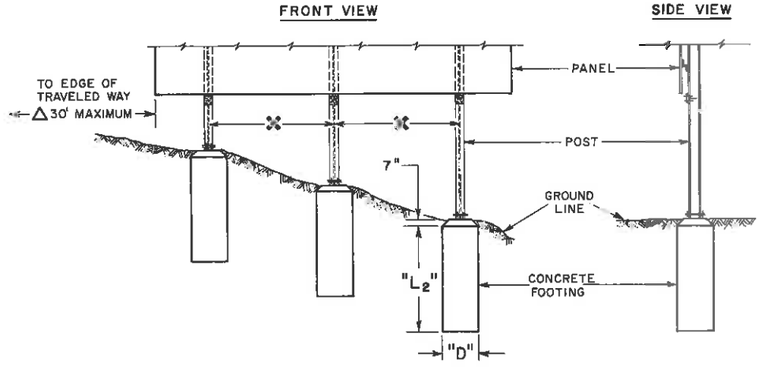
TYPICAL CUT SECTION : B-B



TYPICAL SIGN ISLAND ELEVATIONS



TYPICAL ELEVATIONS



GENERAL NOTES CONT'D.

9. ✖... FOR DIMENSIONS SEE APPLICABLE STANDARD INCLUDED IN THE PLANS.
10. ●... THE SIGN ISLAND SIDE SLOPE PARALLEL TO THE ROADWAY SHALL BE 4:1 OR FLATTER.
11. O... VARIABLE, SEE SIGN ISLAND WIDTH COLUMN IN "TABULATION OF SIGNS" INCLUDED WITH THE PLANS, OR SEE APPLICABLE STANDARD.
12. ●... VARIABLE DIMENSION, SEE CROSS SECTIONS.
13. ▲... VARIABLE FOOTING ELEVATIONS, SEE CROSS SECTIONS FOR PLACEMENT.
14. △... THE LATERAL PLACEMENT MAY BE REDUCED TO A MINIMUM OF 4 FEET FROM THE EDGE OF NORMAL PAVED SHOULDED TO FIT FIELD CONDITIONS WHEN THE DESIRABLE 30 FOOT MAXIMUM PLACEMENT IS NOT FEASIBLE. SEE THE CROSS SECTIONS.
15. ..... EMBANKMENT FOR SIGN ISLANDS IS TO BE COMPACTED AS REQUIRED UNDER ITEM 203 OF THE STANDARD SPECIFICATIONS.
16. ..... FOR ANGULAR PLACEMENT OF SIGNS, SEE APPLICABLE STANDARD.
(R-1) 17. THE "STUB POST" AND ONE "BREAK-AWAY PLATE" ARE CONSIDERED PART OF THE FOOTING. THE OTHER "BREAK-AWAY PLATE" AND ALL NUTS, BOLTS AND WASHERS FOR FASTENING THE BREAK-AWAY PLATES ARE CONSIDERED A PART OF THE POST.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS

Designed By:	J. E. S.	Approved By:	Traffic Engineer
Made By:	F. J. B.		
Checked By:	J. D. S.	Date	April 11, 1973

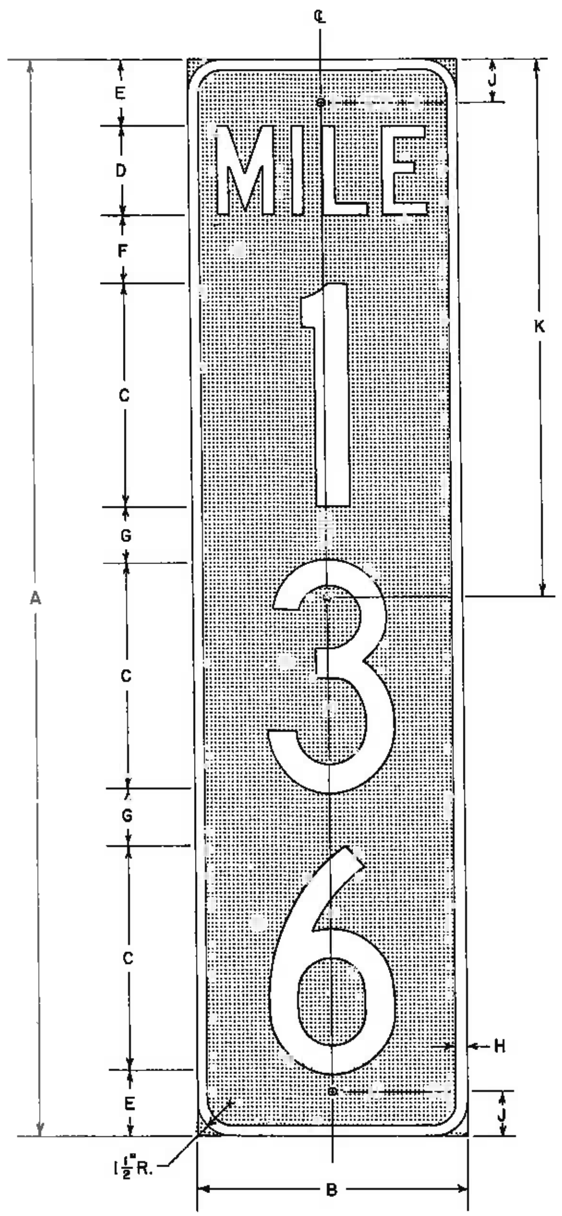
STANDARD S-614-33D

DECEMBER 16, 1976

REVISIONS			
(R-1)	10-28-77	Rev. Fastener	J.D.S.

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

MILEPOST PANEL DETAILS



FREEWAYS & EXPRESSWAYS (dimensions in inches)

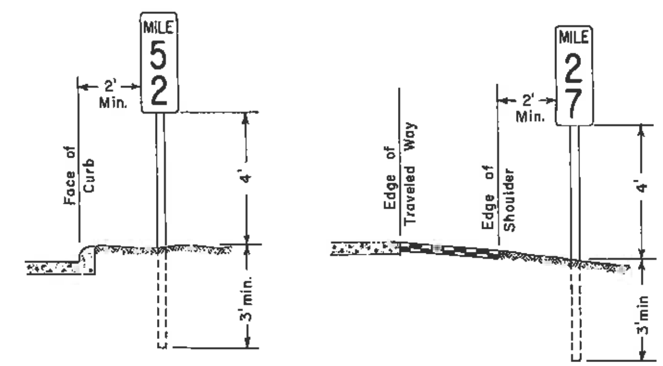
	A	B	C▲	D▲	E	F	G	H	J	K
1-Digit	24	12	10	4	3	4	—	½	2	—
2-Digit	36	12	10	4	3	3	3	½	2	18
3-Digit	48	12	10	4	3	3	2½	½	2	24

OTHER (dimensions in inches)

	A	B	C▲	D●	E	F	G	H	J	K
1-Digit	18	10	6	4	2½	3	—	½	2	—
2-Digit	27	10	6	4	2½	3	3	½	3	—
3-Digit	36	10	6	4	2½	3	3	½	2	18

▲ Series "C" ● Series "B"

LATERAL PLACEMENT DETAILS



GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the project.

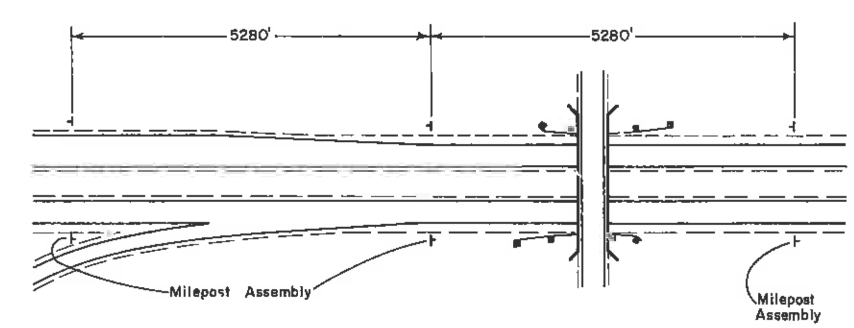
2. Posts shall meet requirements of Par. 4.5 U.S. Department of Commerce Commercial Standard 184-51. U-2 posts shall weigh 2 lbs/ft. except that a mill tolerance of minus 3½ % of the weight of any one post will be allowed.
   Alternate posts will be acceptable if section modulus is at least 0.200 $in.^3$ about the X-X axis or at least 0.250 $in.^3$ about the Y-Y axis.
   Color of posts shall be interstate green.
   Posts shall be set in drilled or excavated holes, placed plumb and firmly tamped in place; or may be driven plumb.
   There shall be a minimum of 23—$\frac{5}{16}$" diameter mounting holes, drilled or punched on 2" centers with the first hole 1½" from the top of the post.

(R-1) 3. Fasten the panel to the U-2 post with ¼" Stove Bolts (Standard Fastener) as follows: Use a plastic fiber washer or nylon washer between the bolt head and the face of the panel and a lock washer under the nut on the back of the post. Bolts, nuts and metal washers shall be galvanized or cadmium plated. Jam bolt threads after tightening or use vandel-proof bolts.

4. All panels shall be either sheet steel 0.0598" minimum thickness or sheet aluminum 0.100" minimum thickness.
   Mounting holes shall be $\frac{5}{16}$" diameter.
   Background on sign panels shall be interstate green reflective sheeting. (smooth surfaced type)
   Legend and border shall be cutout silver reflective sheeting.

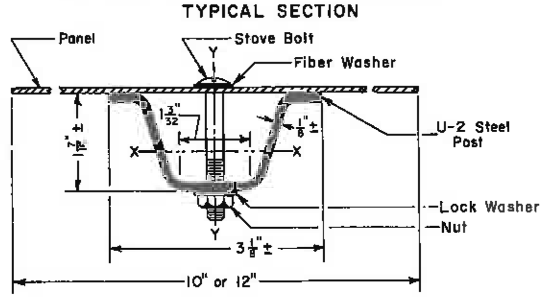
5. Mileposts shall be located in line with delineator posts.

TYPICAL PLACEMENT DETAILS



(R-1) STANDARD FASTENER DETAILS

TYPICAL SECTION



(R-1)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

MILEPOST SIGN AND INSTALLATION

Designed By: J.E.M.
Made By: B.H.B.
Checked By: J.D.S.

Approved By: [signature]
Staff Traffic Engineer
Date Dec. 16, 1976

STANDARD S-614-33D

NOTE: See sheet No. 4 for typical Construction Traffic Sign and Channelizing Device requirements for each Case.

STANDARD S-614-39A

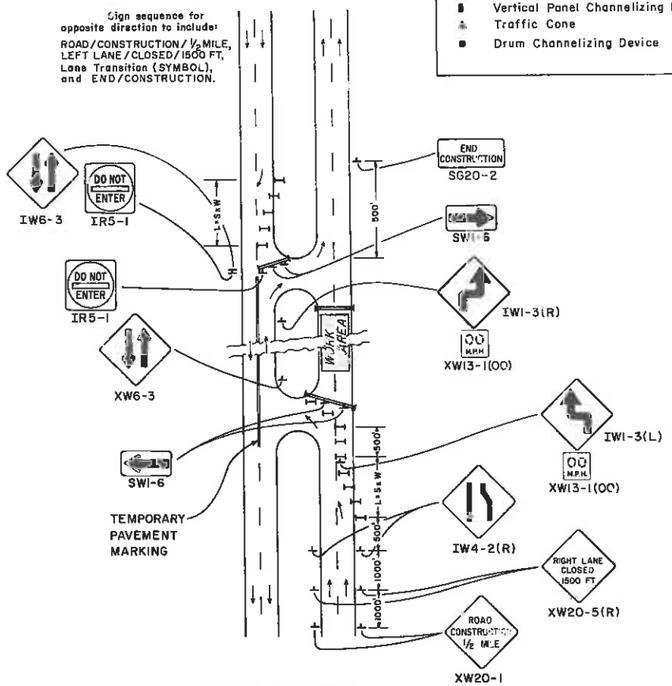
SHEET 1 OF 4 SHEETS
MAY 17, 1977

REGIONAL ROAD BUILDING	DIVISION	PROJ NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS		
(R-1) 5-8-78	Rev. Date Only	J.D.S.

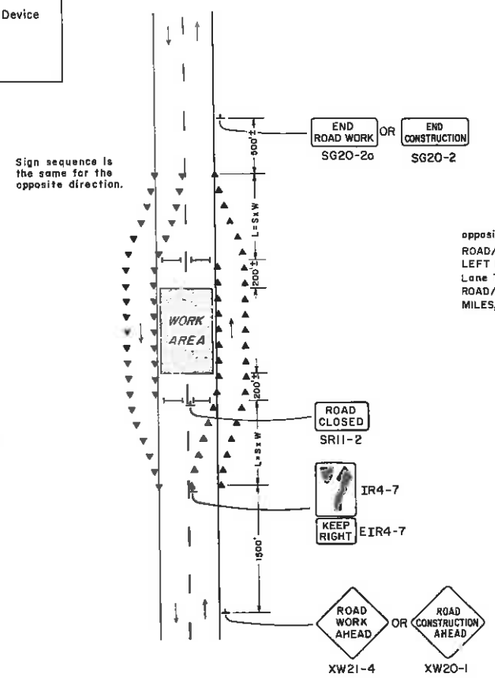
LEGEND
- Type 3 Barricade
- Type 1 or 2 Barricade
- Concrete Barrier (Temporary)
- Flagman
- Vertical Panel Channelizing Device
- Traffic Cone
- Drum Channelizing Device

CASE I



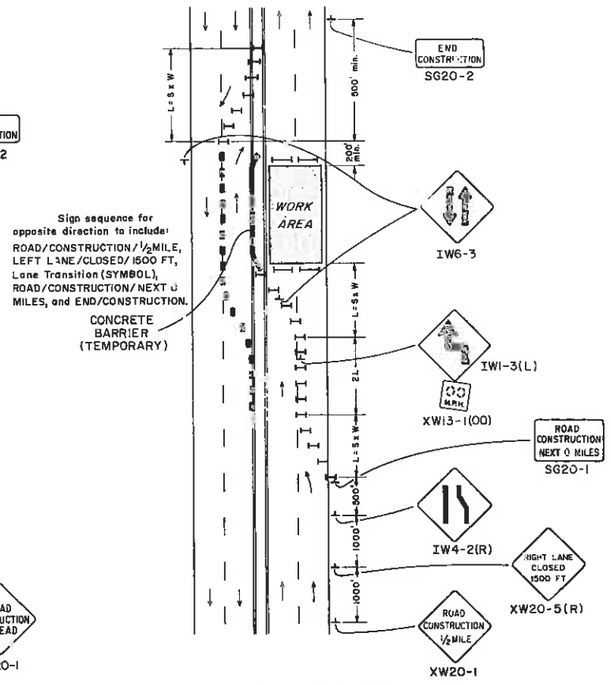
TYPICAL APPLICATION
CLOSURE OF ONE ROADWAY,
4-LANE DIVIDED HIGHWAY

CASE II



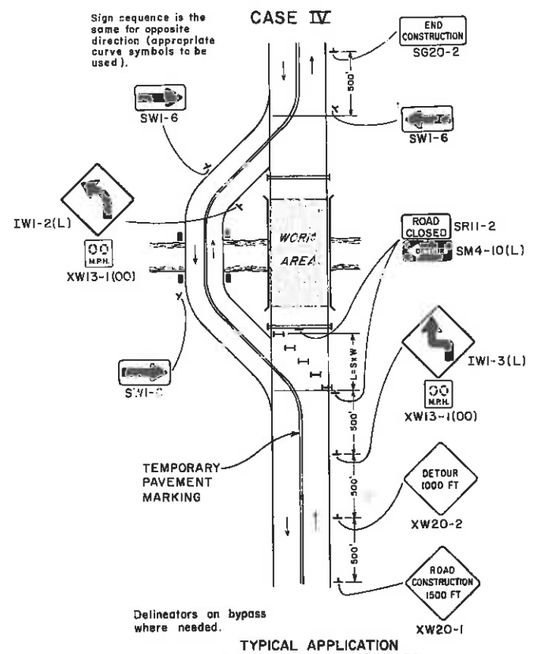
TYPICAL APPLICATION
ROAD CLOSURE, USE OF
ADJACENT SHOULDERS

CASE III



TYPICAL APPLICATION
CLOSURE OF HALF OF 4-LANE
HIGHWAY, NOT PHYSICALLY DIVIDED

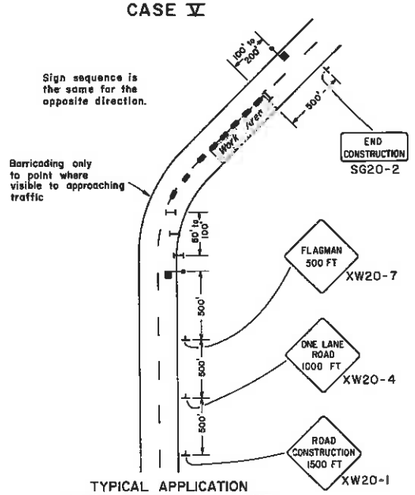
CASE IV



Delineators on bypass where needed.

TYPICAL APPLICATION
ROAD CLOSURE, BYPASS
DETOUR PROVIDED

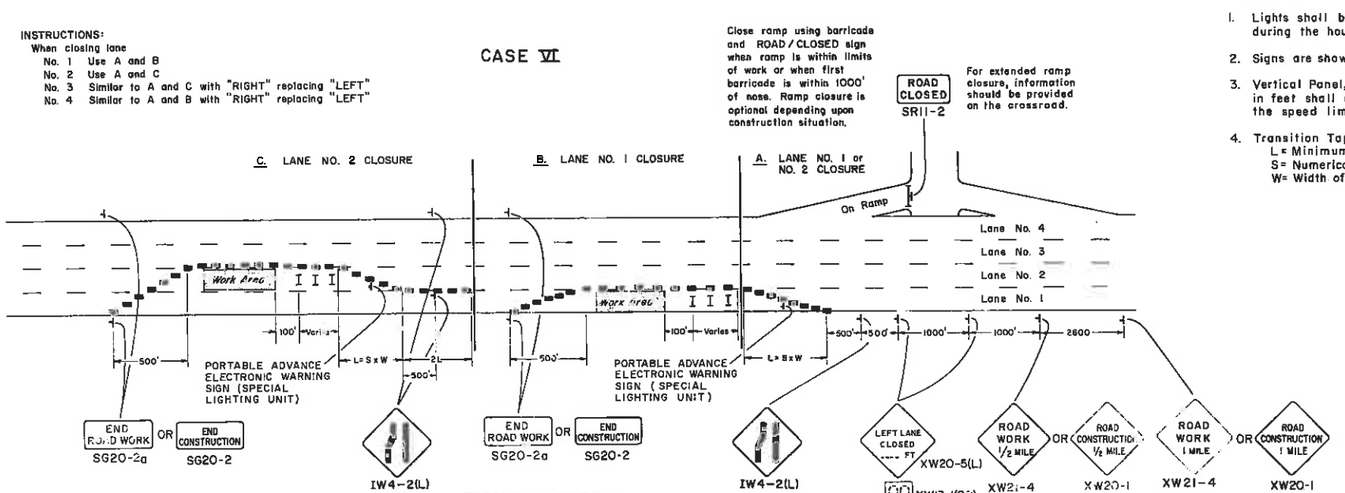
CASE V



TYPICAL APPLICATION
LANE CLOSURE, 2-LANE
HIGHWAY, AT CURVE

CASE VI

INSTRUCTIONS:
When closing lane
- No. 1 Use A and B
- No. 2 Use A and C
- No. 3 Similar to A and C with "RIGHT" replacing "LEFT"
- No. 4 Similar to A and B with "RIGHT" replacing "LEFT"



TYPICAL APPLICATION
LANE CLOSURE, MULTILANE FREEWAY

NOTES

1. Lights shall be used to mark flagman stations during the hours of darkness.
2. Signs are shown for one direction of travel only.
3. Vertical Panel, Traffic Cone, and Drum spacing in feet shall equal the numerical value of the speed limit (eg. 45mph = 45ft. spacing).
4. Transition Taper: L = SxW.
   L = Minimum length of taper.
   S = Numerical value of speed limit or 85 percentile speed.
   W = Width of offset

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION

Designed By:	J.V.N.	Approved By:	Staff Traffic Engineer
Made By:	J.E.M.	Date:	May 17, 1977
Checked By:	J.D.S.		

FEDERAL PROJECT REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

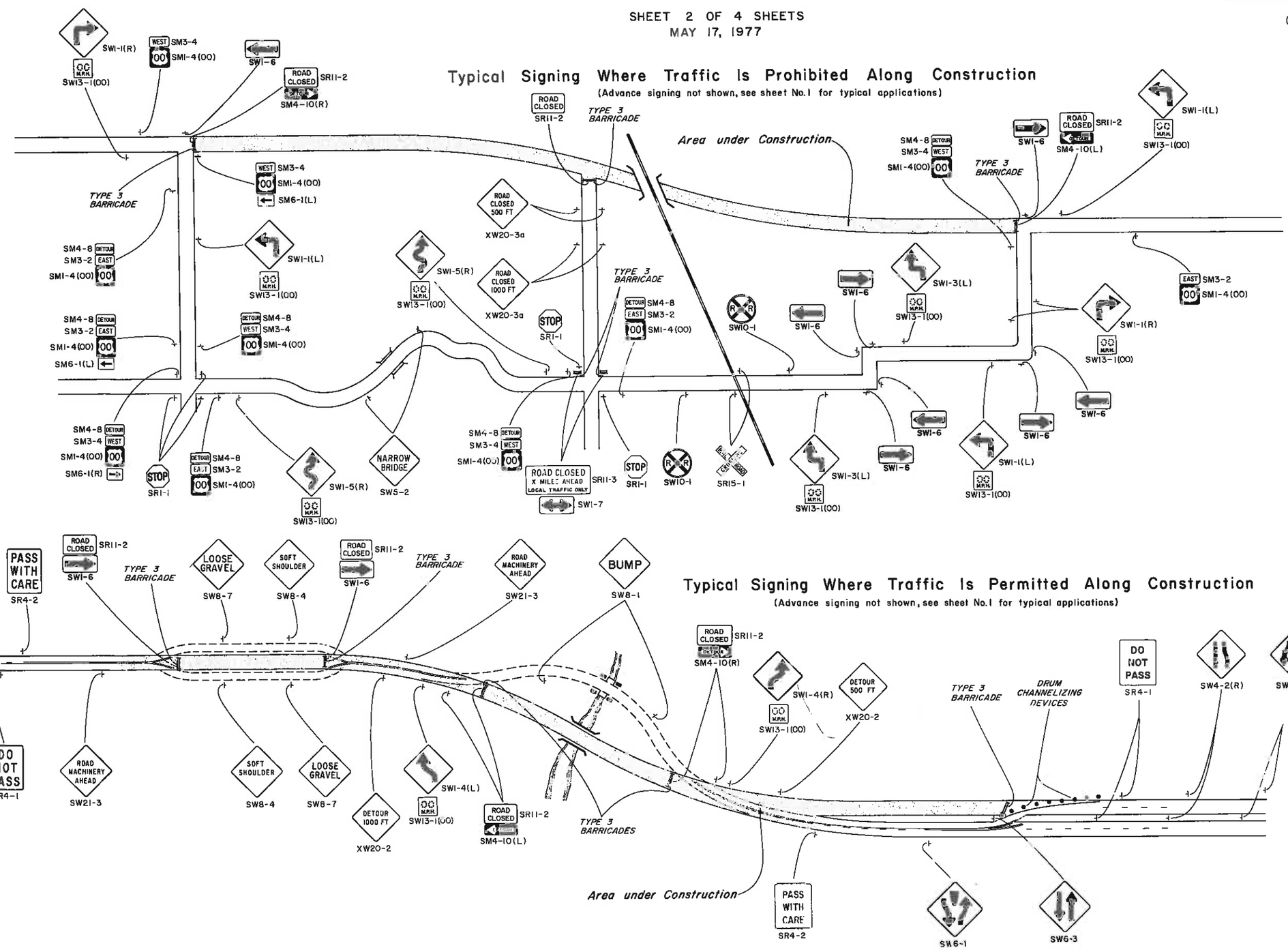
REVISIONS		
(R-1) 5-8-78	Rev. Date Only	J. D. S.

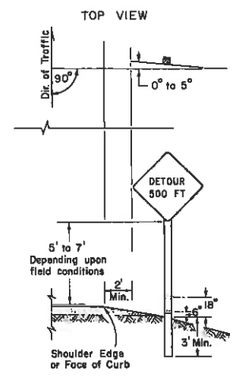
STANDARD S-614-39A

SHEET 2 OF 4 SHEETS
MAY 17, 1977

Typical Signing Where Traffic Is Prohibited Along Construction

(Advance signing not shown, see sheet No.1 for typical applications)





Sign Placement

Typical Signing Where Traffic Is Permitted Along Construction

(Advance signing not shown, see sheet No.1 for typical applications)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION

Designed By	F.J.B.	Approved By: Wm. E. Fisher
Made By	J.E.M.	Staff Traffic Engineer
Checked By	J.D.S.	Date: May 17, 1977

STANDARD S-614-39A

STANDARD S-614-39A

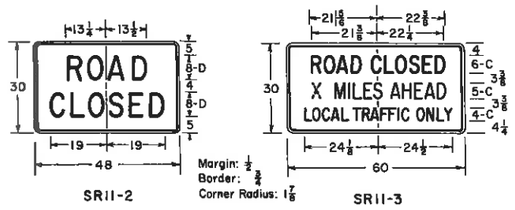
SHEET 3 OF 4 SHEETS
MAY 17, 1977

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

REVISIONS			
R-1	5-8-78	Rev. Date Only	J.D.S.

REGULATORY SIGNS

See Note No. 9

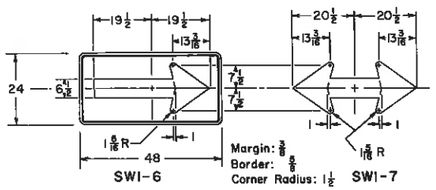


SR11-2 — Margin: 1/2, Border: 3/4, Corner Radius: 1 7/8

SR11-3 — Margin: 3/8, Border: 3/8, Corner Radius: 1/2

WARNING SIGNS

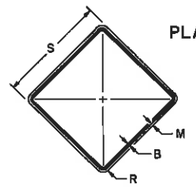
See Note No. 10



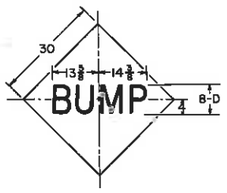
SW1-6 — Margin: 3/8, Border: 3/8, Corner Radius: 1/2

SW1-7

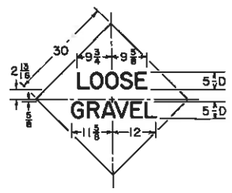
PLATE DETAILS



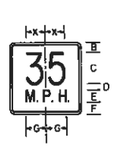
S	M	B	R
30	1/2	3/4	1 7/8
36	5/8	7/8	2 1/4
48	3/4	1 1/4	3



SW8-1



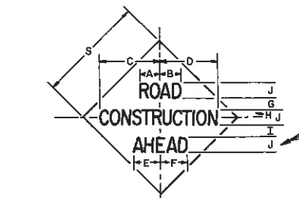
SW8-7



Margin: 3/8, Border: A, Corner Radius: 1/2

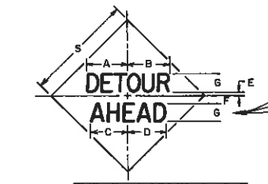
Panel	A	B	C	D	E	F	G
SW13-1(00)	18"x18"	5/8	2 1/2	8E	2	3E	2 1/2	5 5/16
XW13-1(00)	24"x24"	5/8	3 5/8	10E	2 3/4	4E	3 5/8	7 1/16

x - Req'd. digits to be visually centered



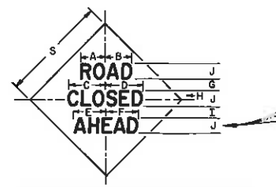
	S	A	B	C	D	E	F	G	H	I	J
XW20-1	48	9 1/2	9 13/16	26	25 1/2	12 1/4	12 1/4	4 3/8	3 1/2	4 3/4	7-C
SW20-1	36	6 7/8	7 1/8	20 5/8	20 1/4	8 3/4	8 3/4	3 5/8	2 1/2	3 5/8	5-C

	S	A	B	C	D	E	F	G
	48	12	12 3/16	13 1/8	14	13 1/8	14	7-C
	36	8 3/4	8 13/16	9 3/8	10	9 3/8	10	5-C



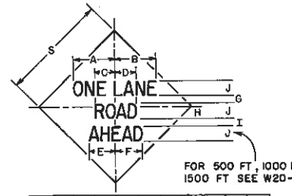
	S	A	B	C	D	E	F	G
XW20-2	48	18	18 7/16	17 7/16	17 7/16	1 1/4	3 1/2	8-D
SW20-2	36	13 1/2	13 3/4	13 1/8	13 1/8	1/8	2 5/8	6-D

	S	A	B	C	D	E	F	G
	48	16 1/4	17 1/4	17	18	17	18	8D
	36	12 3/8	12 13/16	12 3/4	13 1/4	12 3/4	13 1/4	6D

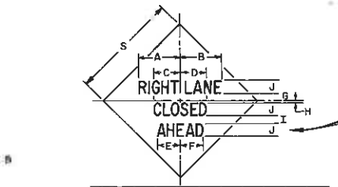


	S	A	B	C	D	E	F	G	H	I	J
XW20-3a	48	11 11/16	12 7/16	17 1/4	17 1/4	15 1/2	15 1/2	4 3/4	4 1/2	5 1/4	7-D
SW20-3a	36	8 3/8	8 7/8	12 3/8	12 3/8	10 7/8	10 7/8	3 1/2	3 1/4	3 3/4	5-D

	S	A	B	C	D	E	F	G
	48	14 1/4	15 1/16	14 7/8	15 3/4	14 7/8	15 3/4	7D
	36	10 7/16	10 13/16	11 1/8	11 1/4	11 1/8	11 1/4	5D

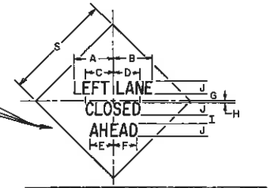


	S	A	B	C	D	E	F	G	H	I	J
XW20-4	48	18 1/2	17 3/4	9 11/16	9 11/16	12 1/4	12 1/4	3 1/8	5 1/4	3 1/8	7-C
SW20-4	36	13 1/8	12 5/8	7	7	8 3/4	8 3/4	2 1/4	3 3/8	2 1/4	5-C

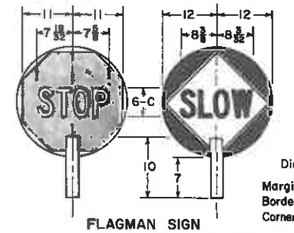


	S	A	B	C	D	E	F	G	H	I	J
XW20-5(R)	48	19	19	14 3/4	14 3/4	10 1/2	10 1/2	2 7/8	1/4	3 3/8	6-C
SW20-5(R)	36	15 3/4	15 3/4	12 5/16	12 5/8	8 3/4	8 3/4	2 3/8	3/8	2 3/4	5-C

	S	A	B	C	D	E	F	G
	48	10 3/8	10 1/2	11 1/4	12	11 1/4	12	6-C
	36	8 1/4	8 13/16	9 3/8	10	9 3/8	10	5-C

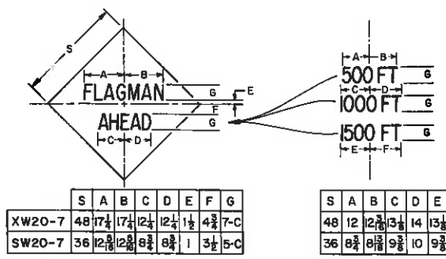


	S	A	B	C	D	E	F	G	H	I	J
XW20-5(L)	48	17 7/16	17 7/16	14 3/4	14 3/4	10 1/2	10 1/2	2 7/8	1/4	3 3/8	6-C
SW20-5(L)	36	14 1/2	14 1/2	12 5/16	12 5/16	8 3/4	8 3/4	2 3/8	3/8	2 3/4	5-C



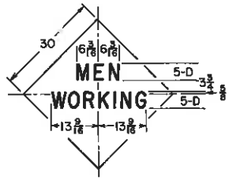
Diamond: Margin: 1/4, Border: 1/4, Corner Radius: 1 3/4

FLAGMAN SIGN
See Notes No. 21 and No. 23

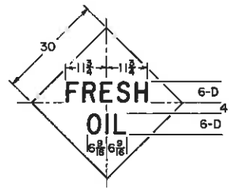


	S	A	B	C	D	E	F	G
XW20-7	48	17 1/4	17 1/4	12 1/4	12 1/4	1 1/2	4 3/4	7-C
SW20-7	36	12 5/8	12 5/8	8 3/4	8 3/4	1	3 1/2	5-C

	S	A	B	C	D	E	F	G
	48	12	12 3/16	13 1/8	14	13 1/8	14	7-C
	36	8 3/4	8 13/16	9 3/8	10	9 3/8	10	5-C



SW21-1



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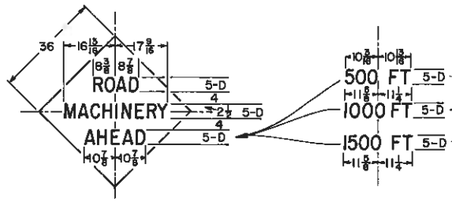

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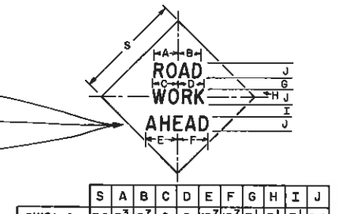
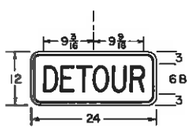


	S	A	B	C	D	E	F	G	H	I	J
SW21-4	36	8 3/8	8 5/8	9	9	10 3/8	10 3/8	3 1/2	3 1/4	3 1/2	5-D



SM4-8

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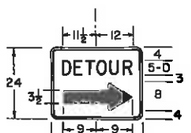
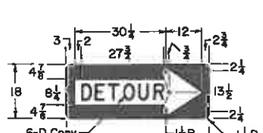


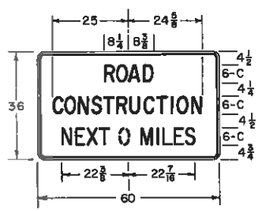
SM4-9(R or L)

Margin: 3/8, Border: 3/8, Corner Radius: 1 1/2



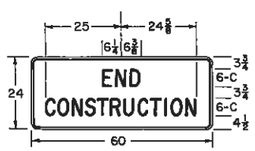
SM4-10(R or L)

Reverse dimensions for Left designation



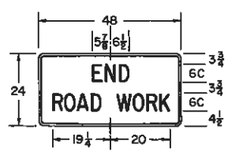
SG20-1

Margin: 3/8, Border: 1/4, Corner Radius: 2 1/4



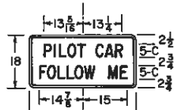
SG20-2

Margin: 3/8, Border: 3/8, Corner Radius: 1 1/2



SG20-2a

Margin: 3/8, Border: 3/8, Corner Radius: 1 1/2



SG20-4

Margin: 3/8, Border: 3/8, Corner Radius: 1 1/2

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION

Designed By: J.E.M.	Approved By: Wm. A. Tucker
Made By: J.E.M.	Staff Traffic Engineer
Checked By: J.D.S.	Date: May 17, 1977

STANDARD S-614-39A

JULY, 1968

STANDARD S-614-39A

SHEET 4 OF 4 SHEETS
MAY 17, 1977

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

REVISIONS			
(R-1)	5-8-78	Rev. Note No. 7	J.D.S.

GENERAL NOTES

1. All work shall be done in accordance with the "Standard Specifications" applicable to the Project and the "Manual on Uniform Traffic Control Devices for Streets and Highways" (adopted by the Federal Highway Administration) and the related "Colorado Supplement".

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, Regulatory, 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 must be diverted from the Project by road closure, the Detour will be marked by the Division except that the Contractor shall provide, erect and maintain Barricades (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 Division. The location and positioning of Barricades, Warning and Regulatory signs shall be as recommended by the Engineer.

4. Work on the Project shall not be started until all required signs are in place and approved by the Engineer. Where speed limit reduction appears necessary such speed limit reduction shall be requested from the Engineer by the Contractor. Advisory Speed plates may be used in conjunction with Warning Signs (SW13-1 for use with 30" Diamond signs and XW13-1 for use with 36" and 48" Diamond signs), where the safe speed is lower than the imposed Regulatory speed limit.

5. All Barricades and Signs 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 barricades and signs 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.

(R-1) 7. Examples for signing Projects, as illustrated on Sheets 1 and 2, are typical of signs required and are subject to alteration to fit actual conditions encountered in the field. In all cases Warning signs are to be placed well in advance of the hazard, the distance depending on topography and existing approach speeds.

8. Desirable sizes for signs are shown on Sheets 1 and 2 of this Standard. Larger or smaller signs shall be used where warranted. Detailed dimensions for signs normally used in connection with construction are shown on Sheet 3 of this Standard. For information on standard roadway signs not detailed on this Standard see the "Manual on Uniform Traffic Control Devices for Streets and Highways" (adopted by the Federal Highway Administration) and the related "Colorado Supplement". Detailed layouts for these signs will be furnished in the plans or on request.

9. Signs with the prefix "R" in the sign code are Regulatory signs, and as such they impose legal restrictions on drivers and shall 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", "G" or "M" in the sign code are Guide signs. Those with the prefix "D" or "G" convey general information and those with the prefix "M" are used to mark the traffic route.

12. All Warning and Regulatory signs shall be posted on both sides of the roadway on divided highways. Dual posting is required where warranted on two-lane, two-way highways.

13. Guide sign SG20-1 shall be placed to mark the beginning of all Projects more than 2 miles in extent, where traffic is maintained through the project. It shall be placed singly and near the beginning of construction.
Guide sign SG20-2 shall be placed to mark the end of the Project. It shall be placed singly and may be placed opposite barricade if desirable.

14. Inapplicable pavement markings that could be confusing to motorists shall be removed by a method approved by the Engineer. Temporary markings shall be used as necessary to define vehicle paths. Refer to the appropriate Division Standard (Typical Pavement Markings) for marking details.
Adhesive pavement marking tape and raised pavement markers may be used with the approval of the Engineer.

15. Lanterns and Torches: Lanterns shall be used only in low speed urban areas and Open-Flame Torches shall not be used under any circumstances.

16. Barricades, Flashing Beacons and Flashers: refer to appropriate Division Standard for details.

17. Traffic Cones shall be orange, at least 18" in height, and not weighted to an extent that would be hazardous to traffic. They shall not be used during the hours of darkness.

18. If closure is for extended period, including nighttime operations, barricade warning lights and temporary pavement markings are to be installed through-out the construction zone and inapplicable pavement markings are to be removed.

19. 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.

20. All signs shall be reflectorized unless otherwise specified on plans. All reflective sheeting shall be non-exposed lens type.

21. When Flags are used in lieu of the Flagman Sign, they shall be a minimum of 24"x24", made of a good grade of bright red material, and fastened securely to a staff of approximately 3 feet in length. The free edge should be weighted to insure that the flag will hang vertically, even in heavy winds.

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

23. Flagman Sign: The background of the STOP face shall be reflectorized red with white reflectorized letters and border. The background of the SLOW face shall be reflectorized orange with black letters and border.

24. Painting for all wood surfaces shall conform with the "Standard Specifications".

25. 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 Division.

26. Posts for regulatory, warning and guide signs shall conform with the "Standard Specifications" for Timber Sign Posts.

27. Diamond warning signs shall have a standard size of 48"x48". Where speeds and volumes are relatively low, a minimum size of 36"x36" may be used for Construction Approach Warning Signs, provided that a minimum letter size of 5" can be accommodated on this size with the appropriate legend.

TYPICAL CONSTRUCTION TRAFFIC SIGN AND CHANNELIZING DEVICE REQUIREMENTS

CASE	Construction Traffic Signs Each Panel Size ▲			Channelizing Devices per 100'			
	A	B	C	Barricades	Cones	Vertical Panels	Drums
I	11	11	*	2	3	2	2
II	6	4	*	2	3	2	2
III	4	9	*	2	3	2	2
IV	16	8	*	2	3	2	2
V	0	8	*	2	3	2	2
VI	6	11-13	*	2	3	2	2

* As directed by the Engineer

▲ PANEL SIZE		
	A	0.01 to 9.00 sq. ft. including Type 1 and Type 2 Barricades.
	B	9.01 to 16.00 sq. ft.
	C	16.01 sq. ft. and over

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION

Designed By: F. J. B	Approved By: W. E. Fuller
Made By: F. J. B.	Staff Traffic Engineer
Checked By: J. D. S.	Date: May 17, 1977

STANDARD S-614-39A

STANDARD S-614-52A

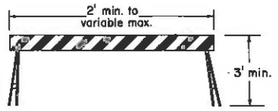
(MARCH 1, 1972)

(R-3)

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

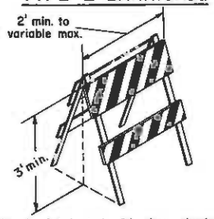
REVISIONS			
(R-1)	6-26-73	Notes	J.D.S.
(R-2)	11-1-73	Notes, Illustrations, & Title	J.D.S.
(R-3)	12-4-74	Notes, Illustrations, & Table	J.D.S.

TYPE 1 BARRICADE ▲ (R-3)



May be fabricated of lumber, aluminum or other suitable light weight materials of structural soundness.
Stands may be detachable for mobility.
Type 1 Barricade has 2 reflectorized rail faces (one each direction).

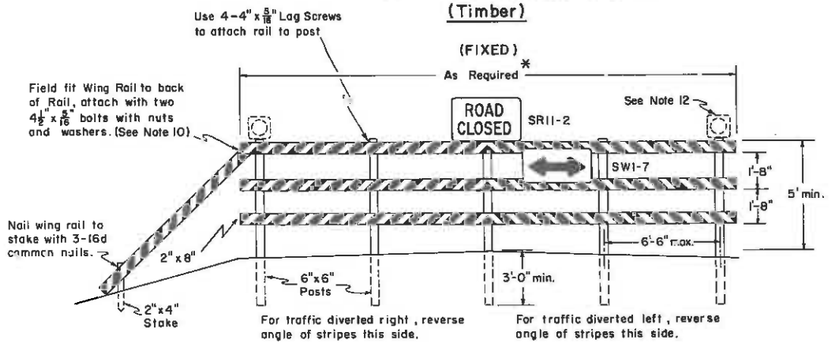
TYPE 2 BARRICADE ▲ (R-3)



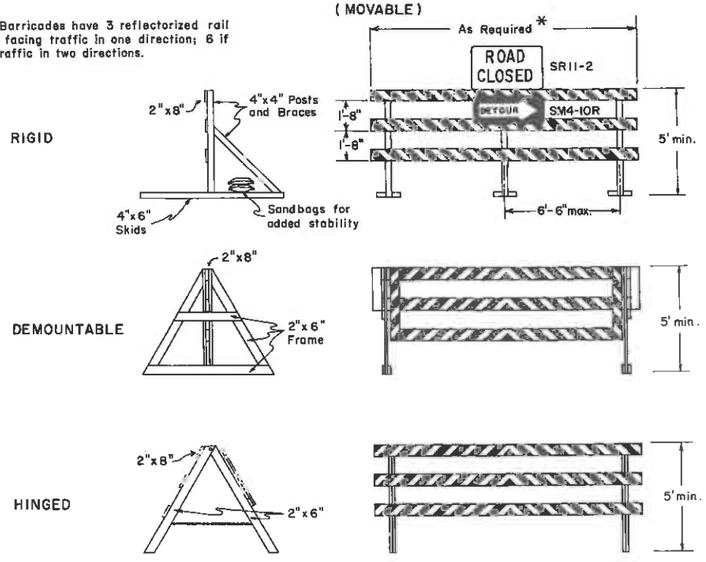
May be fabricated of lumber, aluminum or other suitable light weight materials of structural soundness.
Type 2 Barricade has 4 reflectorized rail faces (two each direction).

TYPICAL TYPE 3 BARRICADES ▲ (R-3)

(Timber)



Type 3 Barricades have 3 reflectorized rail faces if facing traffic in one direction; 6 if facing traffic in two directions.



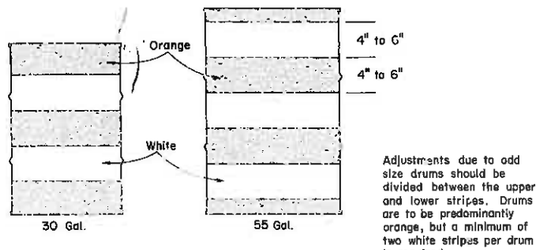
(R-3)

	BARRICADE DESIGNATIONS		
	TYPE 1	TYPE 2	TYPE 3
Rail Width	8" min. – 12" max.	Top – 8" min. – 12" max. Mid – 4" min. – 8" max.	8" min. – 12" max.
Rail Length	2' min. to variable max.	2' min. to variable max.	As required, see Table *
Height	3' min.	3' min.	5' min.
Stripes	See Detail of Barricade Striping		See Notes 4 & 7
Frame	Demountable or Heavy Duty "A" Frame	Light "A" Frame	Posts, Skids or "A" Frame
Flexibility	Movable	Portable	Fixed or movable
Use	Temporary	Temporary	Temporary or Permanent

(R-2)

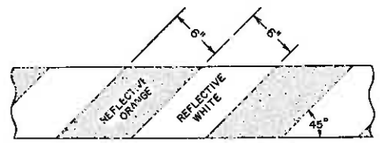
RAIL LENGTH TABLE *		
TYPE 3 BARRICADE		LENGTH
FIXED	MOVABLE	
F – A	M – A	8' – 14'
F – B	M – B	15' – 24'
F – C	M – C	25' – 35'
F – D	M – D	> 35'

(R-3) (R-2) TYPICAL DRUM CHANNELIZING DEVICE



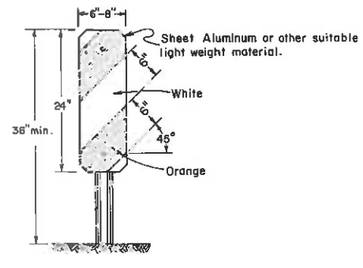
Adjustments due to odd size drums should be divided between the upper and lower stripes. Drums are to be predominantly orange, but a minimum of two white stripes per drum is required.

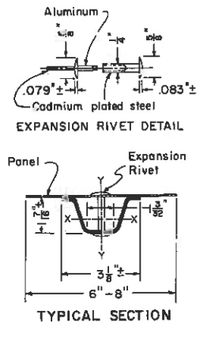
(R-3) DETAIL OF BARRICADE RAIL STRIPING ■



(R-3)

TYPICAL VERTICAL PANEL CHANNELIZING DEVICE





GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications applicable to the project.
2. All signs, sign materials, beacons, and barricade warning lights shall conform to the standards set forth in the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the Federal Highway Administration, of current issue, and the Colorado Supplement thereto, and this standard.
3. 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. Typical barricade applications are shown in Part 6 of the Manual on Uniform Traffic Control Devices for Streets and Highways.

(R-3) 4. Painting shall conform with Subsections 508.08 and 614.07 of the Standard Specifications. All skids, braces and posts shall be painted with 2 coats of "Exterior White Paint". Horizontal and wing rails on all barricades shall have orange and white stripes. The entire area of orange and white stripes shall be reflectorized.

(R-2) 5. Each barricade rail and vertical panel channelizing device shall be striped on the face side only with stripes slanting downward at a 45° angle toward the side to which traffic is to turn or pass. The backsides of rails and vertical panel channelizing devices shall be painted with "Exterior White Paint".

6. When fixed barricades are designated on plans, the portion of the posts below ground line shall be dipped in hot creosote oil. The portion of the post above ground line shall be painted with 2 coats of "Exterior White Paint".

(R-3) 7. Black and white barricade may be used to mark the end of a road, street or highway where there is no crossroad or outlet.

8. All skids, braces, rails 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.

(R-1) 9. All timber shall be Grade No. 2 or better, S 4 S, Douglas fir or Larch, as described in the current Standard Grading Rules published by the Western Wood Products Association, and shall conform to applicable paragraphs for the rails and posts.

10. Detachable extension wing rails for bypassing of construction equipment are permitted when necessary. The length is variable and shall be adequate to provide closing of borrow pit and/or shoulder as required. May be used on Fixed or Movable Type 3 Barricades.

11. Alternate materials or other reflective elements on traffic signs or barricades will be permitted only after approval of such material by the Division in writing.

(R-1) 12. Flashing Beacons or Barricade Warning Lights shall be used in connection with barricades when called for by the Engineer. When used, they shall be positioned above the top rail of the barricades to produce the most effective results. When used, Barricade Warning Lights shall be of the type specified by the Engineer.

(R-1) 13. All reflective surfaces shall be reflective sheeting of the smooth surface type.

14. Barricades used as "Traffic Controls for Highway Construction" are not to be paid for separately.

15. Barricades will be paid for separately when designated on plans as bid items.

(R-2) 16. Drums shall be reflectorized for use at night and should never be placed in the roadway without advance warning signs.

(R-3) ▲ 17. For wooden barricades, nominal lumber dimensions are satisfactory.

(R-3) ■ 18. For rails less than 3' long, 4" wide stripes are to be used.

(R-2)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

BARRICADES, DRUMS, & VERTICAL PANEL CHANNELIZING DEVICES

Designed By: GWF	Approved By: Traffic Engineer
Made By: JVN	Date March 1, 1972
Checked By: GWF	

STANDARD S-627-IA

(SHEET 1 OF 2 SHEETS)

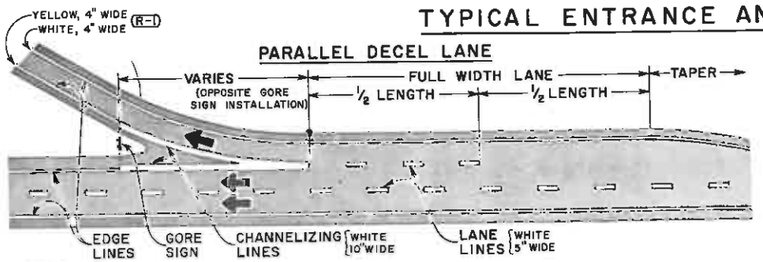
AUGUST 3, 1976

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

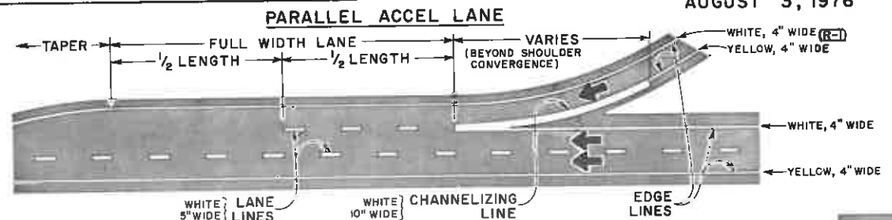
REVISIONS			
(R-1)	12-10-76	Rev. Edge Lines	J. D. S.
(R-2)	5-25-77	Rev. Date Only	J. D. S.
(R-3)	10-28-77	Rev. Segment-Gap Ratio	J. D. S.

TYPICAL ENTRANCE AND EXIT RAMP MARKINGS

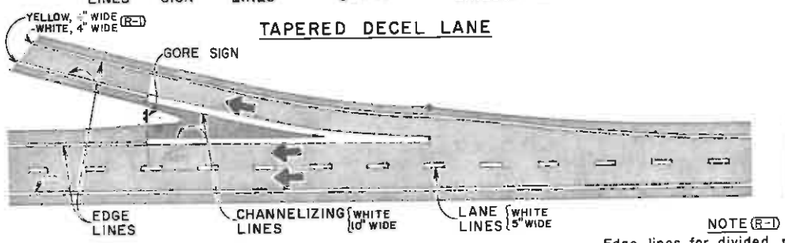
PARALLEL DECEL LANE



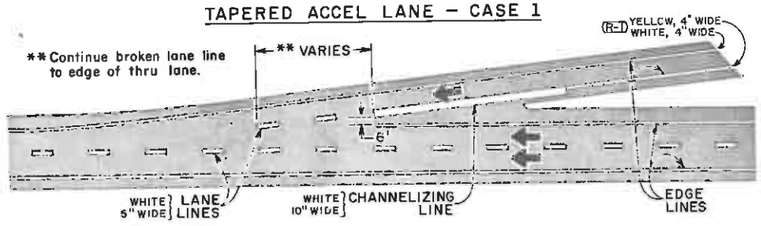
PARALLEL ACCEL LANE



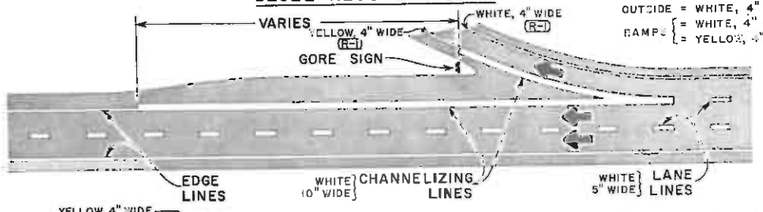
TAPERED DECEL LANE



TAPERED ACCEL LANE - CASE 1

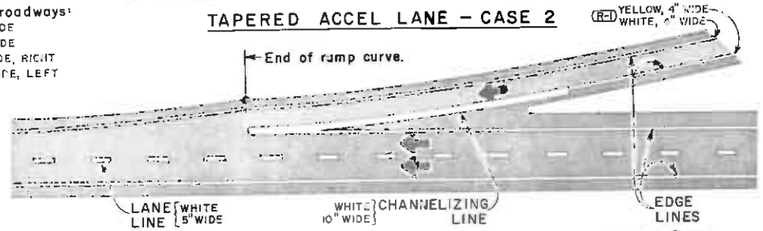


DECEL RECOVERY ZONE

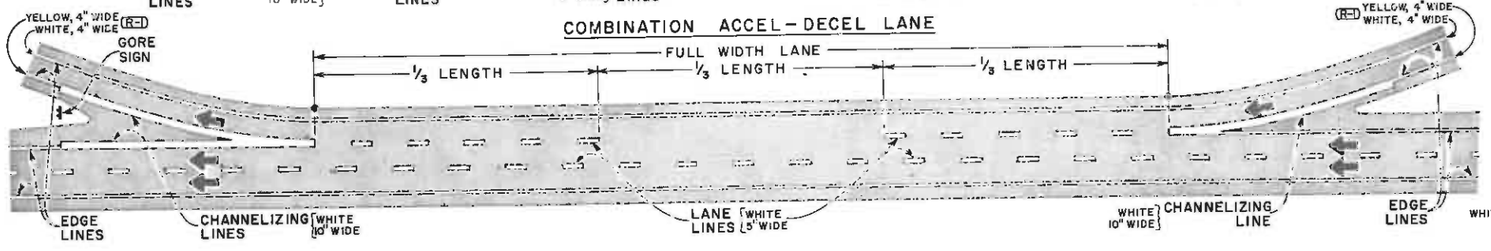


NOTE (R-1)
Edge lines for divided roadways:
MEDIAN = YELLOW, 4" WIDE
OUTSIDE = WHITE, 4" WIDE
RAMPS = WHITE, 4" WIDE, RIGHT; YELLOW, 4" WIDE, LEFT

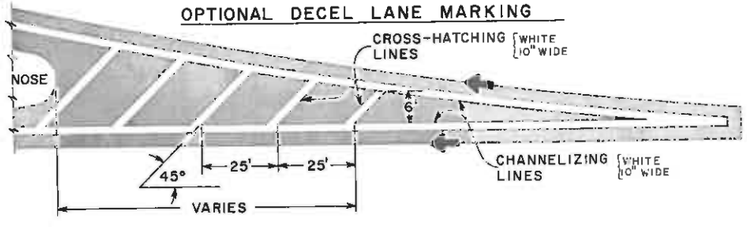
TAPERED ACCEL LANE - CASE 2



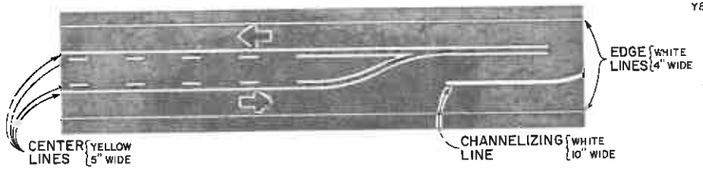
COMBINATION ACCEL-DECEL LANE



OPTIONAL DECEL LANE MARKING

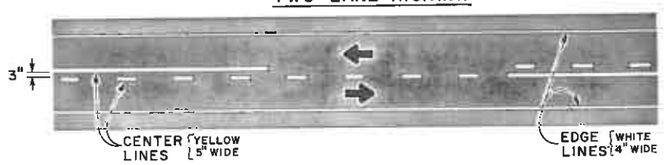


TWO WAY LEFT TURN LANE

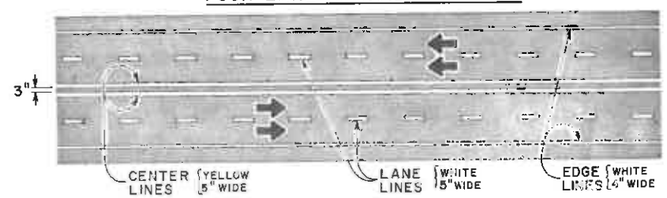


TYPICAL HIGHWAY MARKINGS

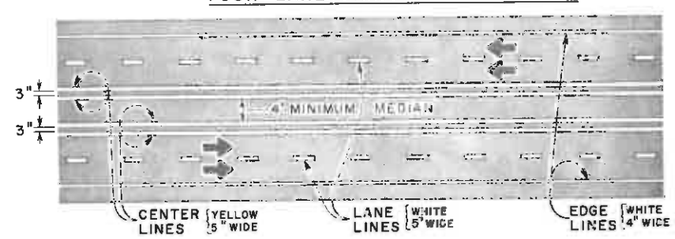
TWO LANE HIGHWAY



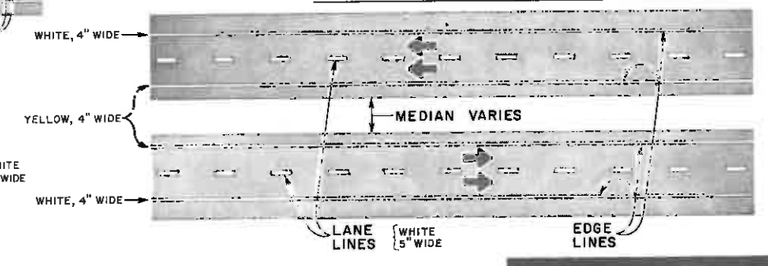
FOUR LANE UNDIVIDED HIGHWAY



FOUR LANE PAINT DIVIDED HIGHWAY



FOUR LANE DIVIDED HIGHWAY



GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.

(R-3) CENTER LINES
1. Broken yellow, 5 inches wide - 10 foot segments with 30 foot gaps.
2. Solid yellow, 5 inches wide.

These lines separate adjacent-opposite direction traffic lanes. Double lines shall be spaced 3 inches apart.

(R-3) LANE LINES
1. Broken white, 5 inches wide - 10 foot segments with 30 foot gaps.
2. Solid white, 5 inches wide.

These lines separate adjacent-same direction traffic lanes. A solid line may be used to discourage lane changing.

EDGE LINES
1. Parallel - Solid white or yellow, 4 inches wide.
2. Diagonal - Solid white, 10 inches wide, spaced at intervals of 20 feet minimum to 100 feet maximum.

(R-1) Yellow edge lines shall be used only for the left edge, in the direction of travel, of divided streets and highways (separated by other than a painted median) and one-way roadways (including ramps).

Edge lines are not continued through intersections and are not broken for driveways. Care must be taken to avoid edge line appearing as lane line along roadways with wide shoulders and / or closely spaced driveways.

CHANNELIZING LINES
Solid white, 10 inches wide. These lines are used with acceleration-deceleration lanes, pavement width transitions, and left-right turn slots or islands.

CROSS-HATCHING LINES
Solid white or yellow, 10 inches wide - 45 degree Diagonal, spaced at 25 foot intervals. These lines are optional and may be placed at locations indicated on the plans or determined by the Engineer. Yellow shall be used for painted median - undivided road only.

PARKING LINES
Solid white, 3 inches wide - diagonal or parallel as shown on the plans.

STOP LINES
Solid white, 24 inches wide - extend parallel to intersected roadway across all approach lanes or as indicated at locations on the plans. Locate at the desired stopping point, not more than 30 feet nor less than 4 feet from the nearest edge of the intersected traffic lane.

CROSSWALK LINES (see note on sheet 2)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TYPICAL PAVEMENT MARKINGS

Designed By:	F.J.B.	Approved By:	W. E. Tucker
Mode By:	F.J.B.		Staff Traffic Engineer
Checked By:	J.E.M.	Date:	August 3, 1976

STANDARD S-627-IA

STANDARD S-627-1A

(SHEET 2 OF 2 SHEETS)

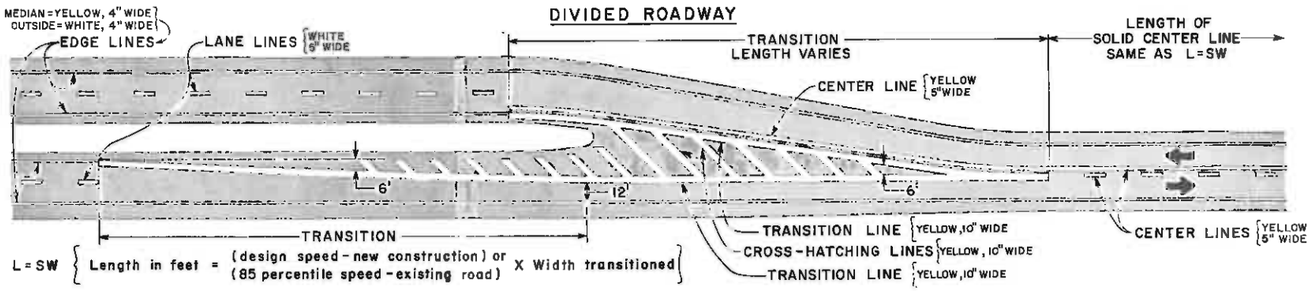
AUGUST 3, 1976

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

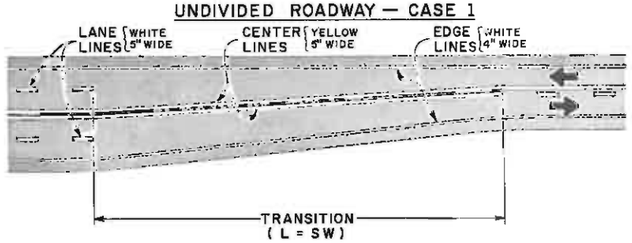
REVISIONS			
(R-1)	12-10-76	Rev. Date Only	J.D.S.
(R-2)	5-25-77	Rev. Edge Lines	J.D.S.
(R-3)	10-28-77	Rev. Date Only	J.D.S.

(R-2) Edge lines not to be used when traveled way is less than 20 ft.

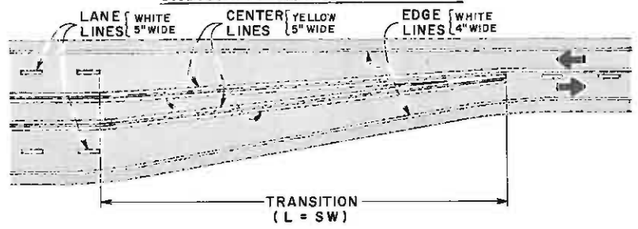
TYPICAL PAVEMENT WIDTH TRANSITION MARKINGS



UNDIVIDED ROADWAY — CASE 1



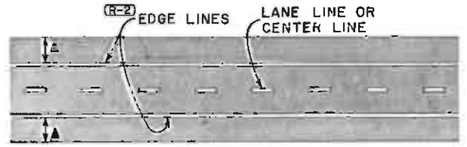
UNDIVIDED ROADWAY — CASE 2



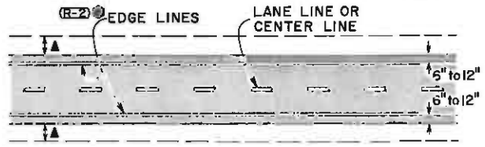
TYPICAL PAVEMENT EDGE MARKINGS

NOTE: ▲ = SHOULDER WIDTH

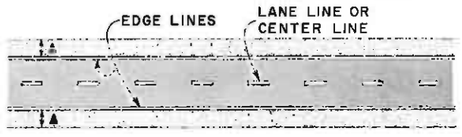
SHOULDERS SAME SURFACE



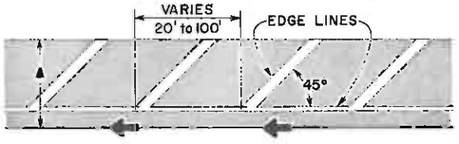
NO SHOULDER OR UNSURFACED SHOULDER



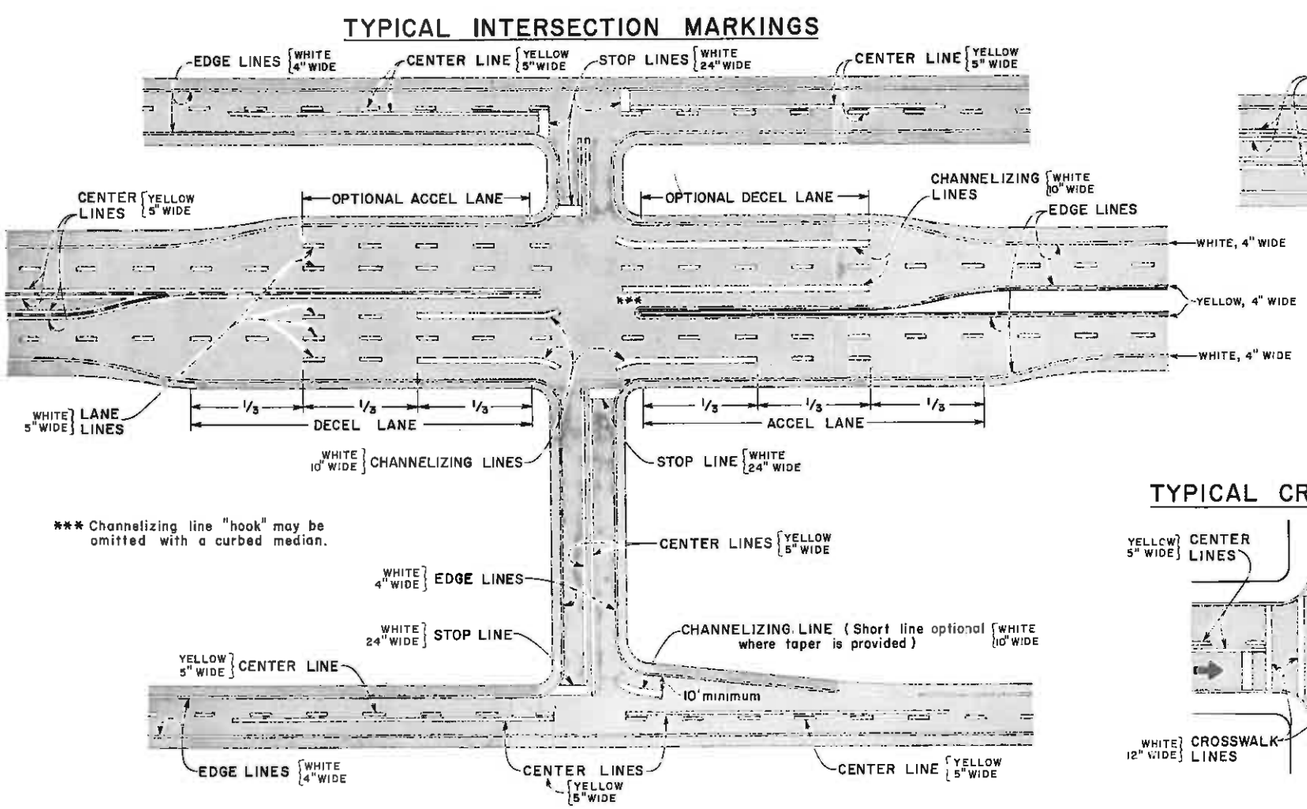
SHOULDER CONTRASTING SURFACE



OPTIONAL DIAGONAL EDGE LINE

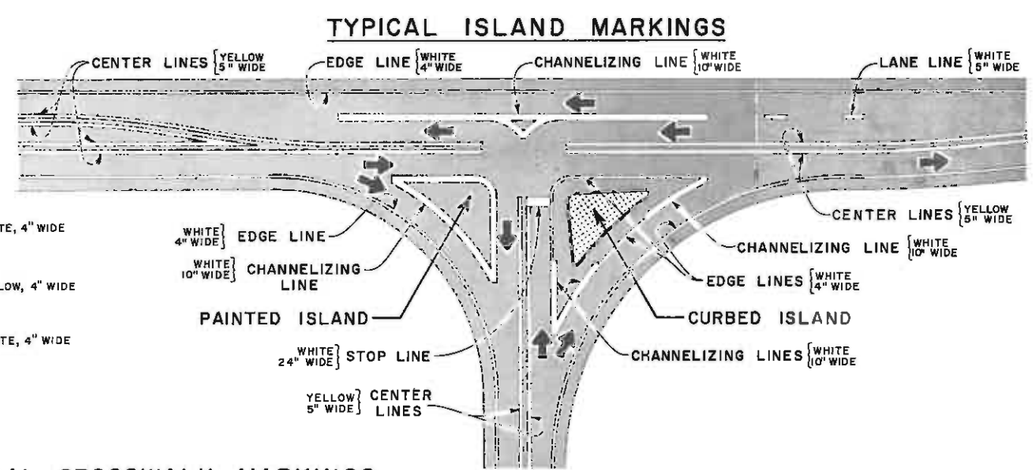


TYPICAL INTERSECTION MARKINGS

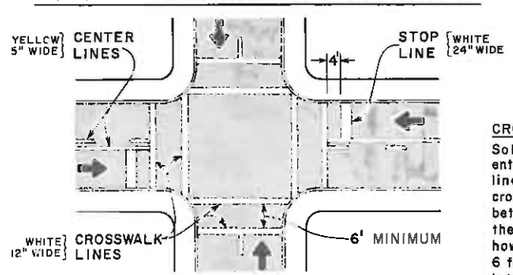


*** Channelizing line "hook" may be omitted with a curbed median.

TYPICAL ISLAND MARKINGS



TYPICAL CROSSWALK MARKINGS



CROSSWALK LINE APPLICATION

Solid white, 12 inches wide — extend across entire width of pavement. If no advance stop line is provided, increase the width of the crosswalk lines to 24 inches. The distance between the lines is usually determined by the width of the sidewalks so connected, however, in no case shall this be less than 6 feet. Complicated and/or channelized intersections and mid-block crosswalks shall be as detailed in the plans or as directed by the Engineer.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TYPICAL PAVEMENT MARKINGS

Designed By:	F.J.B.	Approved By:	W. C. Decker
Made By:	F.J.B.		Staff Traffic Engineer
Checked By:	J.J.S.	Date:	August 3, 1976