STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D. O. H. FORM NO. 1175
REV. OCT. 1980

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS – STATE OF COLORADO

P.E., R.O.H. and Utilities under Project I 70-3(125)

FED. ROAD REGION	DIVISION	PROJECT NUMBER	SHEET NUMBER
VIII	COLO.	I 70 – 3(140)	1

AS CONSTRUCTED

NO REVISIONS [ ] REVISED [12-12-88] VOID [ ]

REVISIONS		

PLAN AND PROFILE OF ~~PROPOSED~~ AS CONSTRUCTED
FEDERAL AID PROJECT NO. I 70-3(140)
STATE HIGHWAY NO. 470
JEFFERSON COUNTY

SCALES OF ORIGINAL DRAWINGS

ON PLAN, 1 IN. = 100 FT.

ON PROFILE { 1 IN. = 100 FT. HORIZONTAL; 1 IN. = 10 FT. VERTICAL

TABULATION OF LENGTH

STATION TO STATION	LINEAR FEET ROADWAY	LINEAR FEET MAJOR STRUCTURE
STA 335+96 60 Begin I 70-3(140)= STA 231+97.08 Ramp A, 102' RL on I-IR 70-3(137) M.P = 259.45		
	3352 07*	
STA. 369+48 67 End I 70-3(140)= STA. 1207+17.30 Ramp D, 90' Lt on I-IR 70-3(143) M.P = 260.08		
SH 470 – NORTH BOUND 28+00		
	438.71	
32+38.71 STRUCTURE NO. F-16-KW		311.36
35+50.07	584.05	
41+34.12		
SH 470 – NORTH BOUND and SOUTH BOUND 41+34 12		
	3065.88	
72+00 00		
RAMP A 231+97.08		
	935 42	
241+32 50 STRUCTURE NO. F-16-KY		202.67
243+35 17	1015.88	
253+51 05		
RAMP B 1412+32.10		
	1713.96	
1429+47.06		
RAMP C 423+32 46		
	2717.54	
450+50 00		
RAMP D 1207+17.30		
	1480.33	
1221+97.63 STRUCTURE NO. F-16-KZ		187.08
1223+84.71	923 57	
1233+08.28 STRUCTURE NO. F-16-KX		281.08
1235+89.36	544.76	
1241+34 12		
RAMP F 28+00		
	378 05	
31+78 05		
TOTALS	13,798 15	982.19
SUMMARY	LINEAR FEET	MILES
ROADWAY – NET LENGTH	13,798.15	2 613
MAJOR STRUCTURES	982.19	0.186
PROJECT GROSS LENGTH	14,780 34	2 799

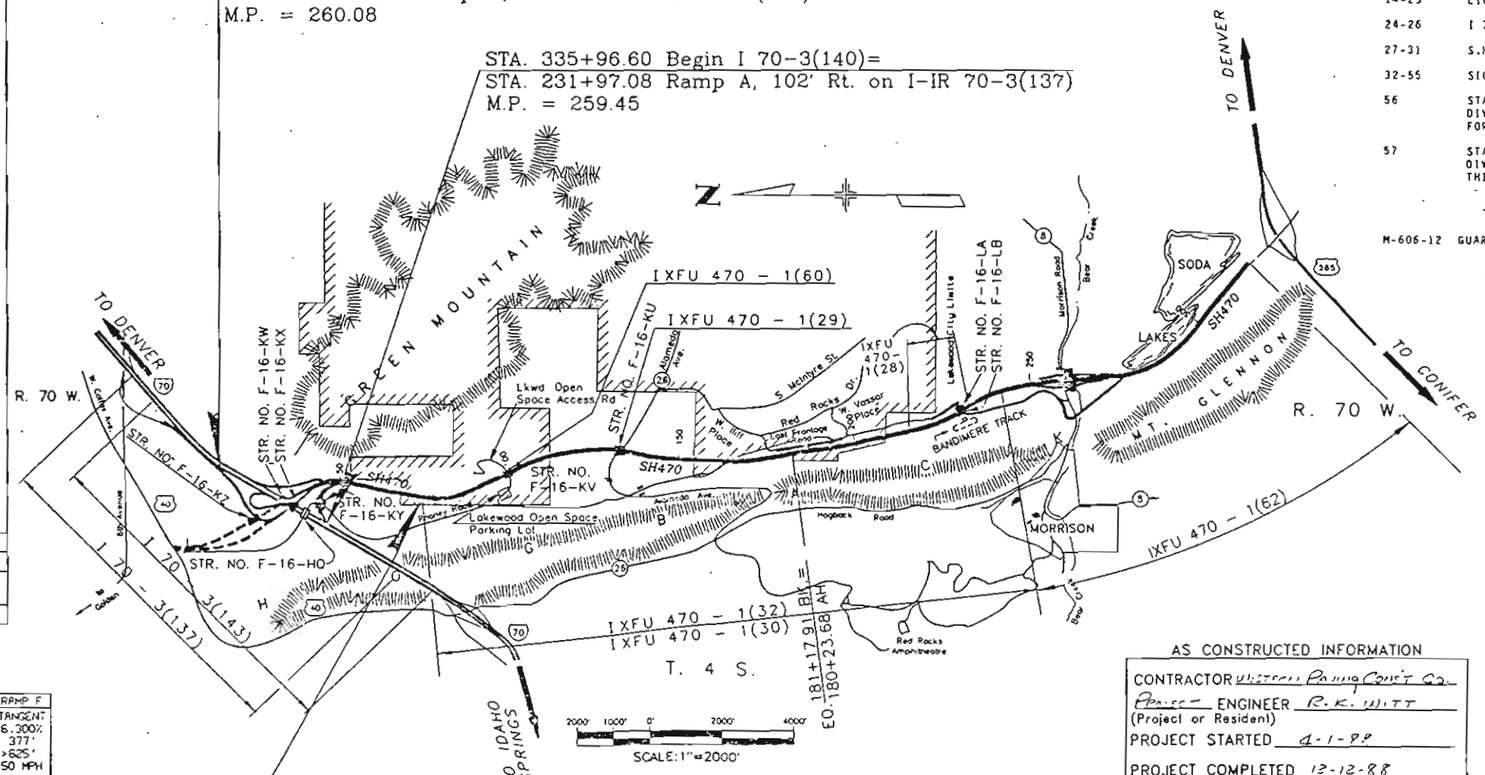
* FOR INFORMATION ONLY – NO I 70 CENTERLINE LENGTH INVOLVED ON THIS PROJECT

DESIGN DATA

	SH 470	RAMP A	RAMP B	RAMP C	RAMP D	RAMP F
Max Degree of Curve	5°00'00"	12°00'00"	20°00'00"	3°30'00"	12°00'00"	TANGENT
Maximum Grade	6.000%	5.728%	6.244%	5.1403%	2.7187%	6.300%
Minimum SSD (Vertical)	565'	290'	>625'	300'	>625'	377'
Minimum SSD (Horizontal)	584'	302'	279'	>625'	250'	>625'
Maximum Design Speed	60 MPH	40 MPH	40 MPH	40 MPH	40 MPH	50 MPH

STA. 369+48.67 End I 70-3(140)=
STA. 1207+17.30 Ramp D, 90' Lt. on I-IR 70-3(143)
M.P. = 260.08

STA. 335+96.60 Begin I 70-3(140)=
STA. 231+97.08 Ramp A, 102' Rt. on I-IR 70-3(137)
M.P. = 259.45



STA. 72+00.00 End Work
on SH 470 Mainline

STA. 181+17.91 Bk = EQ. 180+23.68 Ah

SHEET NO. INDEX OF SHEETS

SHEET NO.	INDEX OF SHEETS
1	TITLE SHEET
2	STANDARD PLANS LIST
3-4	TYPICAL SECTIONS
5	GENERAL NOTES AND TABULATION OF DRAINAGE ITEMS
6-8	SUMMARY OF APPROXIMATE QUANTITIES
9	TABULATION OF SURFACING AND TREATED SUBGRADE
10	TABULATIONS OF GUARD RAIL AND DELINEATORS
11	GUARD RAIL DETAILS FOR OBSTRUCTION IN MEDIAN
12	GUARD RAIL DETAILS - S.H. 470 AND RAMP D GORE AREA AND DETAIL OF MODIFY INLET
13	DETAIL FOR CONNECTION OF GUARD RAIL TYPE 4 TO BRIDGE RAIL TYPE 4 SPECIAL
14-23	LIGHTING PLANS
24-26	I 70/S.H. 470 INTERCHANGE PLAN SHEETS
27-31	S.H. 470 AND RAMP PROFILES
32-55	SIGNING PLANS
56	STANDARD M-203-11 SUPERELEVATIONS OF CURVES - DIVIDED HIGHWAYS - SHOULDER PIVOT (SPECIAL FOR THIS PROJECT)
57	STANDARD M-203-13 SUPERELEVATIONS OF CURVES - DIVIDED HIGHWAYS - CENTER PIVOT (SPECIAL FOR THIS PROJECT)
	NEW AND REVISED STANDARDS
M-606-12	GUARD RAIL TYPE 4 CONCRETE BARRIER (9 SHEETS) 2-18-83

DIVISION OF HIGHWAYS

APPROVED:

Robert L Chamberlain 9/18/87
CHIEF ENGINEER DATE

AS CONSTRUCTED INFORMATION

CONTRACTOR Whitcraft Paving Const Co.
Project ENGINEER R. K. WITT
(Project or Resident)
PROJECT STARTED 4-1-88
PROJECT COMPLETED 12-12-88
AS CONSTRUCTED PLANS APPROVED [signature]
Const Engr 7-19-89
TITLE DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE

_____
DIVISION ADMINISTRATOR

C.D.L.

09/02/87 20:45:03 NSP1:::(SHD/82014/DSTTL) TITLE_140 82014 H101

AS CONSTRUCTED			
NO. REVISIONS 12-12-88	REVISED	VOID	

FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70 - 3(140)	2	57

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THE STANDARD PLAN SHEETS INDICATED HEREON BY A MARKED BOX ARE TO BE USED TO CONSTRUCT THIS PROJECT.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

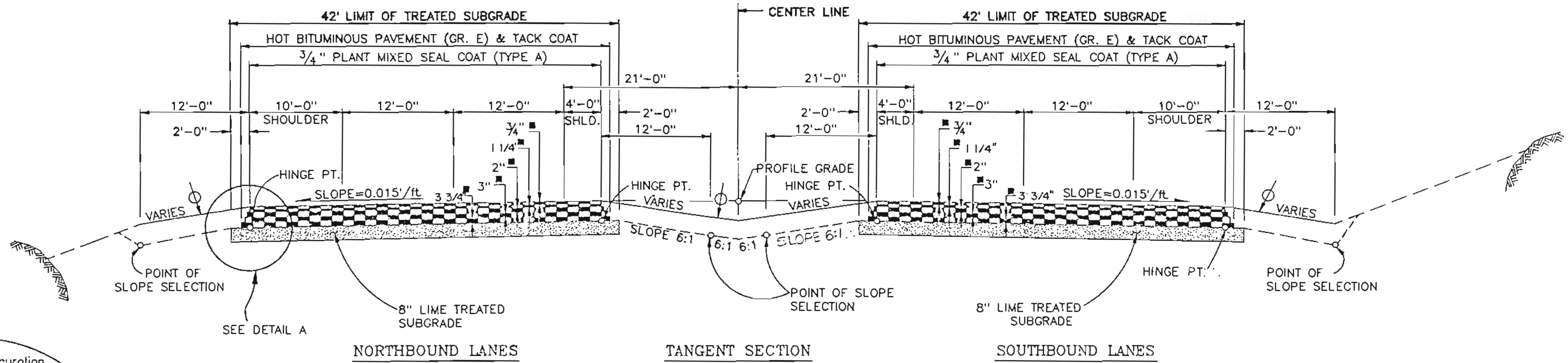
STANDARD PLANS LIST

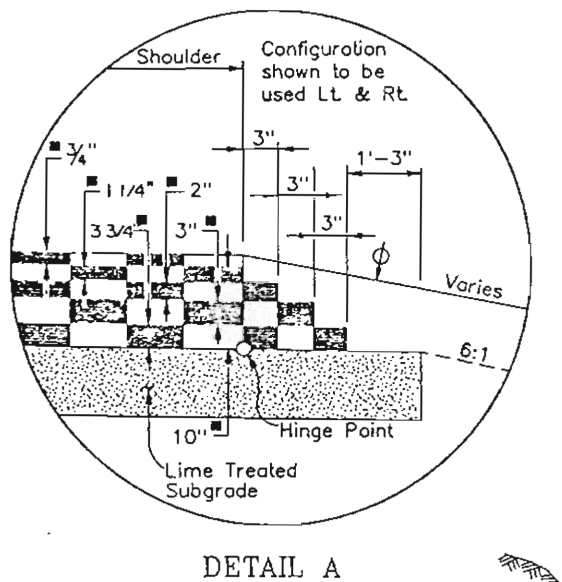
M & S STANDARDS – JANUARY, 1982

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 126:
REV. NOV. 1983:

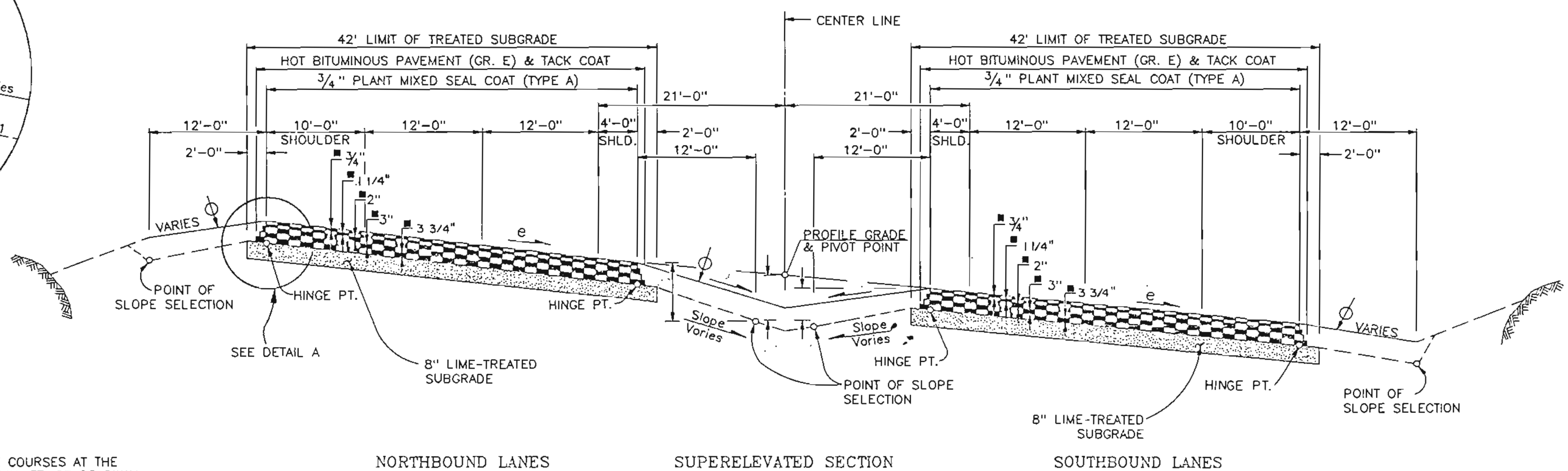
AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS 12-12-88	REVISED	VOID	VIII	COLO.	I 70-3(140)	3

TYPICAL SECTIONS
SH 470
STA. 28+00.00 TO STA. 72+00.00





DETAIL A



TYPICAL SECTION NOTES

ϕ TOPSOIL (4" MINIMUM)

■ APPROXIMATE THICKNESS

MATERIALS SHALL BE PLACED IN SEPARATE COURSES AT THE FOLLOWING APPROXIMATE RATES PER 100 LIN. FT. OF ROADWAY:

		MAINLINE S.H. 470
PLANT MIXED SEAL COAT	TOP LAYER	35 TONS
HOT BITUMINOUS PAVEMENT	FOURTH LAYER	58 TONS
	THIRD LAYER	94 TONS
	SECOND LAYER	143 TONS
	BOTTOM LAYER	181 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.

TABLE FOR MEDIAN SLOPES AND DIMENSIONS

DEGREE OF CURVE	ROADWAY SLOPE	DISTANCE "a"	DISTANCE "b"	DISTANCE "c"	SLOPE △	SLOPE θ
2° 30'	0.073'/'	2.00'	3.24'	4.48'	8.5:1	3.79:1
5° 00'	0.080'/'	2.00'	3.36'	4.72'	8.5:1	3.60:1

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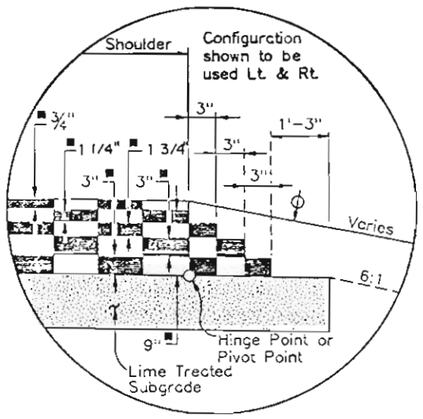
STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO. 121
REV. NOV. 1983

TYPICAL SECTIONS

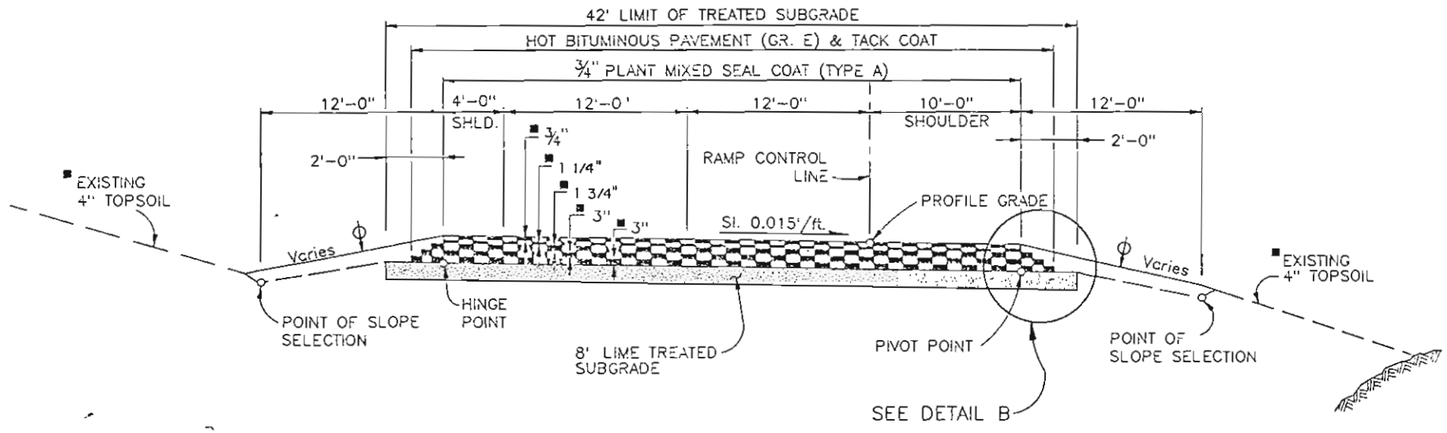
AS CONSTRUCTED	FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS 12.12.88 REVISED VOID	VIII	COLO.	I 70-3(140)	4



DETAIL B

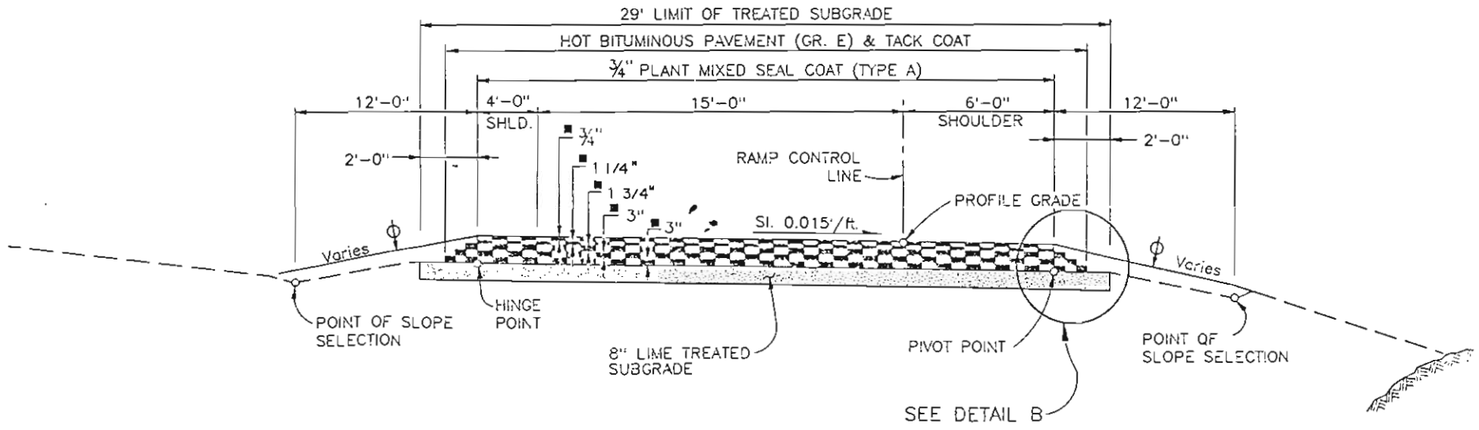
RAMP C & RAMP D

(Note: Ramp D is opposite hand of Ramp C)
(TWO LANES, ONE WAY)



RAMP A, RAMP B & RAMP F

(Note: Ramp B is opposite hand of Ramp A)
(ONE LANE RAMP)



TYPICAL SECTION NOTES

ϕ TOPSOIL (4" MINIMUM)

▪ APPROXIMATE THICKNESS

MATERIALS SHALL BE PLACED IN SEPARATE COURSES AT THE FOLLOWING APPROXIMATE RATES PER 100 LIN. FT. OF ROADWAY:

		RAMPS A & B	RAMPS C & D
PLANT MIXED SEAL COAT	TOP LAYER	11 TONS	17 TONS
HOT BITUMINOUS PAVEMENT	FOURTH LAYER	19 TONS	29 TONS
	THIRD LAYER	27 TONS	41 TONS
	SECOND LAYER	48 TONS	72 TONS
	BOTTOM LAYER	49 TONS	72 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.

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STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 126:
REV. NOV. 1983:

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS	REVISED 12-12-88	VOID	VIII	COLO.	I 70-3(140)	5

GENERAL NOTES

FOR PRELIMINARY PLAN QUANTITIES OF PAVEMENT STRUCTURE MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:

TACK COAT DILUTED EMUL. ASPH. (SLOW-SETTING) @ 0.1 GALS./SQ.YD.
BITUMINOUS PAVEMENT & PLANT MIXED SEAL COAT @ 110 LBS./.SQ.YD./INCH

DILUTED EMULSIFIED ASPHALT FOR TACK COAT SHALL CONSIST OF 1 PART EMULSIFIED ASPHALT AND 1 PART WATER.
RATES OF APPLICATION SHALL BE AS DETERMINED BY THE ENGINEER AT TIME OF APPLICATION.

THE FOLLOWING SHALL BE FURNISHED WITH EACH BITUMINOUS PAVER:

A SKI TYPE DEVICE AT LEAST 30 FEET IN LENGTH.
SHORT SKI OR SHOE.
2500 FEET OF CONTROL LINES AND STAKES.

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

IT IS ESTIMATED THAT 1,434 CU.YDS. OF EMBANKMENT MATERIAL (COMPLETE IN PLACE) WILL BE REQUIRED FOR GUARD RAIL FLARE BERMS AND WILL BE OBTAINED FROM CONTRACTOR'S SOURCE.

THE MINIMUM THICKNESS OF TOPSOIL SHALL BE 4 INCHES. IT IS ~~ESTIMATED THAT 11,511 CU. YDS.~~ 11,507 WILL BE REQUIRED BASED ON AVERAGE THICKNESS AND WILL BE OBTAINED FROM AN UNDESIGNATED SOURCE.

TYPE OF COMPACTION FOR THIS PROJECT WILL BE AASHTO T99.
MINIMUM R VALUE OF EMBANKMENT MATERIAL SHALL BE 5.

TABULATION OF DRAINAGE ITEMS *

LOCATION	SIDE	BITUMINOUS SLOPE AND DITCH PAVING (HAUL & ASPHALT)	CONCRETE SLOPE AND DITCH PAVING (REINFORCED)	RIPRAP	REINFORCED CONCRETE PIPE		24" RCP END SECTION	INLET TYPE C H=5'	◆ MODIFY INLET	18 IN RCPES
					18"	24"				
		TON	CU. YD.	CU. YD.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH
RAMP A										
241+00	RT	10								
244+00	LT & RT			3	80	~~80~~	~~2~~	1		1
I 70										
350+00	RT	10		20						
SH 470										
35±	MEDIAN								1	
67+50	MEDIAN		1.1					1		
67+50 TO 69+50	MEDIAN				200					
69+50	MEDIAN								1	
ROONEY RD. @ BKWY 44+25	LT./RT.				52.5	DELETE MCR 40-17	DELETE MCR 40-18			2
TOTALS		~~20~~ 255.24	~~1.1~~ 6.6	~~23~~ 89	~~390~~ 332.5	~~80~~ 0	~~2~~ 0	~~1~~ 2	~~1~~ 2	3

◆ SEE DETAIL FOR MODIFY INLET

* STRUCTURE EXCAVATION AND STRUCTURE BACKFILL WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK FOR THE DRAINAGE ITEMS.

NOTE: SEE I70/SH470 INTERCHANGE PLAN SHEETS FOR ADDITIONAL INFORMATION.

H OVER CULVERT < 5'
FLOW LINES OF CULVERT AND INLETS TO BE FIELD SET BY THE ENGINEER.

SEEDING, SOIL PREPARATION, FERTILIZING WITH COMMERCIAL FERTILIZER AND MULCHING WILL BE REQUIRED FOR ~~APPROXIMATELY 9 ACRES~~ 15.28 ACRES FOR ROADWAY WITHIN RIGHT-OF-WAY LIMITS ON ALL DISTURBED AREAS NOT SURFACED.

THE FOLLOWING TYPES AND RATES SHALL BE USED:

COMMON NAME	BOTANICAL NAME	RATE PLS/ACRE POUNDS	RATE PLS/ACRE OUNCES
WESTERN WHEATGRASS	AGROPYRON SMITHII	7	
FAIRWAY WHEATGRASS	AGROPYRON CRISTATUM	4	
BUFFALO GRASS (TREATED)	BUCHLOE DACTYLOIDES	6	
BLUE GRAMA V. N.M. NATIVE	BOUTELOUA GRACILIS	3	
LITTLE BLUESTEM V. PASTURA	ANDROPOGON SCOPARIUS	3	
INDIAN RICEGRASS V. PALOMA	ORYZOPSIS HYMENOIDES	2	
SMOOTH BROME V. MANCHAR	BROMUS INERMIS	5	
SIDEOATS GRAMA V. EL RENO	BOUTELOUA CURTIPENDULA	4	
PURPLE PRAIRIE CLOVER	PETALOSTEMUM PURPUREUM		2
BLACK EYED SUSAN	RODBECKIA HIRTA		4
ROCKY MTN. PENSTEMON V. BANDERA	PENSTEMON STRICTUS		4
BLANKET FLOWER	GAILLARDIA ARISTATA		4
RABBIT BRUSH	CHRYSOTHAMNUS NAUSEOSUS		2
THREE LEAF SUMAC	RHUS TRILOBATA		2
TOTAL POUNDS/OUNCE PLS/ACRE SEEDING		35 LB.	2 OZ.

SEEDING APPLICATION: SEED SHALL BE MECHANICALLY DRILLED INTO TOPSOIL TO A DEPTH OF .25"-.50". ON SLOPES GREATER THAN 3:1, SEED SHALL BE HANDBROADCAST AND RAKED TO A DEPTH OF .25"-.50" INTO TOPSOIL.

MULCHING MATERIAL: NATIVE HAY 2 TONS PER ACRE

MULCHING REQUIREMENT AND APPLICATION: NATIVE HAY MECHANICALLY CRIMPED INTO TOPSOIL IN COMBINATION WITH AN APPROVED MULCH TACKIFIER APPLIED AT A RATE SPECIFIED IN THE PROJECT SPECIAL PROVISIONS.

COMMERCIAL FERTILIZER	RATE LBS/ACRE AVAILABLE
AVAILABLE N 18	5[illegible]
AVAILABLE P 46	138
AVAILABLE K O	0

PROJECT TOTALS		
SEEDING	(NATIVE)	9.0 ACRE
MULCHING	(NATIVE HAY)	9.0 ACRE
MULCH TACKIFIER		900 LBS.

IT IS ESTIMATED THAT 5,852 SQ. YDS. OF WATERPROOFING (MEMBRANE) WILL BE REQUIRED ON EXISTING STRUCTURES AS FOLLOWS:

STRUCTURE NO.	WATERPROOFING (MEMBRANE) SQUARE YARD
F-16-KW	2,058
F-16-KX	2,090
F-16-KY	692
F-16-KZ	1,012

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STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 113:
REV. NOV. 1983:

FINAL

SUMMARY OF ~~APPROXIMATE~~ QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED 12-12-88 VOID ☐

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
VIII	COLO.	I 70-3(140)	6

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY PLAN	ROADWAY AS CONST.			STRUCTURE NO. F-16-KW PLAN	STRUCTURE NO. F-16-KW AS CONST.	STRUCTURE NO. F-16-KX PLAN	STRUCTURE NO. F-16-KX AS CONST.	STRUCTURE NO. F-16-KY PLAN	STRUCTURE NO. F-16-KY AS CONST.	STRUCTURE NO. F-16-KZ PLAN	STRUCTURE NO. F-16-KZ AS CONST.	PROJECT TOTALS PLAN	PROJECT TOTALS AS CONST.	DIFF. +/-	% PLAN.
3	1	32	202	REMOVAL OF BARRICADE	EACH	2	2											2	2 ✓	0 ✓	100 ✓
	2	32	202	REMOVAL OF PAVEMENT MARKING	SQ FT	1,170	1,138											1170	1,138 ✓	-32 ✓	97 ✓
	3	32	202	REMOVAL OF SIGN PANEL	EACH	4	4											4	4 ✓	0 ✓	100 ✓
	4	32	202	REMOVAL OF GUARD RAIL TYPE 4	LIN FT	1,442	890											1442	890 ✓	-552 ✓	62 ✓
	5	5	203	EMBANKMENT MATERIAL (COMPLETE IN PLACE)	CU YD	1,434	1,434											1434	1,434 ✓	0 ✓	100 ✓
	6	5	207	TOPSOIL (HAUL)	CU YD	11,511	11,507											11511	11,507 ✓	-4 ✓	99 ✓
	7	5	210	MODIFY INLET	EACH	1	2											1	2 ✓	+1 ✓	200 ✓
	8	5	212	SEEDING (NATIVE)	ACRE	9	15.28											9	15.28 ✓	+6.28 ✓	170 ✓
	9	5	213	MULCHING	ACRE	9	15.28											9	15.28 ✓	+6.28 ✓	170 ✓
	10	5	213	MULCH TACKIFIER	LB	900	1,528											900	1,528	+628	170
	11	9	307	HYDRATED LIME	TON	1,153	975.70											1153	975.70 ✓	-177.3 ✓	85 ✓
	12	9	307	PROCESSING LIME TREATED SUBGRADE (8 INCH)	SQ YD	77,703	80,671											77703	80,671 ✓	+2,968 ✓	104 ✓
	13	9	403	HOT BITUMINOUS PAVEMENT (GRADING E) (HAUL AND ASPHALT)	TON	39,770	39,152.47			141	141	144	144	47	47	69	69	40171	39,553.47 ✓	-617.53 ✓	98 ✓
	14	9	410	PLANT MIXED SEAL COAT (TYPE A) (HAUL AND ASPHALT)	TON	2,926	3,440.17			85	85	86	86	29	29	42	42	3168	3,682.17 ✓	+514.17 ✓	116 ✓
	15	5	411	EMULSIFIED ASPHALT (SLOW-SETTING)	GAL	13,911	7,310											13911	7,310 ✓	-6601 ✓	53 ✓
	16	5	506	RIPRAP	CU YD	23	89											23	89 ✓	+66 ✓	387 ✓
	17	5	507	CONCRETE SLOPE AND DITCH PAVING (REINFORCED)	CU YD	1.1	6.60											1.1	6.6 ✓	+5.5 ✓	600 ✓
	18	5	507	BITUMINOUS SLOPE AND DITCH PAVING (HAUL AND ASPHALT)	TON	20	255.24											20	255.24 ✓	+235.24 ✓	1276 ✓
	19	5	515	WATERPROOFING (MEMBRANE)	SQ YD					2058	2,058	2090	2,090	692	692	1012	1,012	5852	5,852 ✓	0 ✓	100 ✓
	20	5	603	18 INCH REINFORCED CONCRETE PIPE	LIN FT	200	332.50											200	332.50 ✓	+132.5 ✓	166 ✓
	21	5	603	24 INCH REINFORCED CONCRETE PIPE DELETE MCR 40-17	LIN FT	80	0											80	0 ✓	-80	0
	22	5	603	24 INCH REINFORCED CONCRETE END SECTION DELETE MCR 40-18	EACH	2	0											2	0 ✓	-2	0
	23	5	604	INLET TYPE C (5 FOOT)	EACH	1	2									— ✓		1 ✓	2 ✓	+1 ✓	200 ✓
	24	10	606	GUARD RAIL TYPE 3 (6-3 POST SPACING)	LIN FT	1,175	1,775									—		1175 ✓	1,775 ✓	+600 ✓	151 ✓
	25	10	606	GUARD RAIL TYPE 4	LIN FT	1,891	1,921											1891	1,921 ✓	+30 ✓	102 ✓
	26	10	606	END ANCHORAGE TYPE 3E	EACH	9	9											9	9 ✓	0	100
	27	10	606	END ANCHORAGE TYPE 3F	EACH	5	5											5	5 ✓	0 ✓	100 ✓
	28	10	612	DELINEATOR (TYPE I)	EACH	204	320											204	320 ✓	+116 ✓	157 ✓
	29	10	612	DELINEATOR (TYPE II)	EACH	73	73											73	73 ✓	0 ✓	100 ✓
	30	10	612	DELINEATOR (TYPE III) DELETE MCR 40-19	EACH	8	0											8	0	-8	0
4	31	16	613	2 INCH ELECTRICAL CONDUIT	LIN FT	305	130											305	130 ✓	-175 ✓	43 ✓
4	32	16	613	3 INCH ELECTRICAL CONDUIT	LIN FT	280	280											280	280 ✓	0 ✓	100 ✓
4	33	16	613	3 INCH ELECTRICAL CONDUIT (JACKED) DELETE MCR 40-20	LIN FT	40	0											40	0	-40	0
4	34	16	613	DIRECT-BURIAL CABLE	LIN FT	14,180	10,357											14180	10,357 ✓	-3,823 ✓	73 ✓
4	35	16	613	WIRING	L S	0.5	0.5											0.5	0.5 ✓	0 ✓	100 ✓

9-SEP-19" USER$DISK:[DRAW.PJ.82014.ROWY.H101.TAB]C113FA

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
O.O.H. FORM NO. 113
REV. NOV. 1963

FINAL

SUMMARY OF ~~APPROXIMATE~~ QUANTITIES

AS CONSTRUCTED — NO REVISIONS [ ] REVISED [12-12-88] VOID [ ]

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
VIII	COLO.	I 70-3(140)	7

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY PLAN	ROADWAY AS CONST.			STRUCTURE NO. F-16-KW PLAN	STRUCTURE NO. F-16-KW AS CONST.	STRUCTURE NO. F-16-KX PLAN	STRUCTURE NO. F-16-KX AS CONST.	STRUCTURE NO. F-16-KY PLAN	STRUCTURE NO. F-16-KY AS CONST.	STRUCTURE NO. F-16-KZ PLAN	STRUCTURE NO. F-16-KZ AS CONST.	PROJECT TOTALS PLAN	PROJECT TOTALS AS CONST.	DIFF. +/-	% PLAN.
4	36	16	613	LUMINAIRE HIGH PRESSURE SODIUM (50,000 LUMEN)	EACH	7	7											7	7	0	100
	37	16	613	LUMINAIRE HIGH PRESSURE SODIUM (140,000 LUMEN)	EACH	80	80											80	80	0	100
	38	16	613	LUMINAIRE HIGH PRESSURE SODIUM (WALL TYPE)(12,000 LUMEN)	EACH	6	6											6	6	0	100
	39	16	613	LIGHT STANDARD METAL (40 FOOT)	EACH	7	7											7	7	0	100
	40	16	613	LIGHT STANDARD STEEL HIGH MAST (100 FOOT)	EACH	9	9											9	9	0	100
	41	16	613	LIGHT STANDARD STEEL HIGH MAST (120 FOOT)	EACH	1	1											1	1	0	100
	42	16	613	CONCRETE FOUNDATION PAD	EACH	7	7											7	7	0	100
	43	16	613	HIGH MAST FOUNDATION (DRILLED CAISSON) (48 INCH)	LIN FT	159	153											159	153	-6	96
	44	16	613	LOWERING DEVICE	EACH	10	10											10	10	0	100
	45	16	613	PORTABLE POWER UNIT	EACH	1	1											1	1	0	100
	46	16	613	LIGHTING CONTROL CENTER	EACH	2	10											2	10	+8	500
	47		614	FLAGGING	HOUR	3000	524.5											3000	524.5	-2475.5	17
	48		614	TRAFFIC CONTROL SUPERVISOR	DAY	160	47											160	47	-113	29
	49	35	614	SIGN PANEL (CLASS I)	SQ FT	228	313.50											228	313.50	+85.5	138
	50	34	614	SIGN PANEL (CLASS II)	SQ FT	520	852											520	852	+332	164
	51	34 35	614	SIGN PANEL (CLASS III)	SQ FT	1,959	2,135											1959	2,135	+176	109
	52	34	614	TIMBER SIGN POST 6X6 INCH	LIN FT	580	1,037											580	1,037	+457	179
	53	34	614	STEEL SIGN POST (W 10X26)	LIN FT	49	94.50											49	94.50	+45.5	193
	54	34	614	CONCRETE FOOTING (TYPE 6)	EACH	2	4											2	4	+2	200
	55	35	614	CONCRETE FOOTING VI (SPREAD)	EACH	1	1											1	1	0	100
	56	35	614	CONCRETE FOOTING II-S (SPREAD)	EACH	4	4											4	4	0	100
	57	35	614	MASK SIGN LEGEND	EACH	7	6											7	6	-1	86
	58	35	614	MODIFICATION OF SIGN LEGEND	L S	1	1											1	1	0	100
	59	35	614	SIGN BRIDGE STRUCTURE (70 TO LESS THAN 75 FOOT FRAME)	EACH	1	1											1	1	0	100
	60	35	614	SIGN BRIDGE STRUCTURE (80 TO LESS THAN 85 FOOT FRAME)	EACH	1	1											1	1	0	100
	61	35	614	CANTILEVER STRUCTURE (25 TO LESS THAN 30 FOOT FRAME)	EACH	4	4											4	4	0	100
	62	33	614	BARRICADE (TYPE 3 M-A)	EACH	30	34											30	34	+4	113
	63	32	614	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE A)	EACH	8	2											8	2	-6	25
	64	32	614	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE B)	EACH	34	37											34	37	+3	109
	65	32	614	VERTICAL PANEL	EACH	70	79											70	79	+9	113
	66	32	614	VERTICAL PANEL (WITH LIGHT) (FLASHING)	EACH	24	34											24	34	+10	142
	67	32	614	ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL (C TYPE)	EACH	2	2											2	2	0	100

9-SEP-19 'SER$DISK:[DRAW.PJ.82014.RDWY.H101.TAB]C113FB

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
O.O.H. FORM NO. 113:
REV. NOV. 1983:

FINAL

SUMMARY OF ~~APPROXIMATE~~ QUANTITIES

AS CONSTRUCTED
NO REVISIONS ☐ REVISED 12-12-88 VOID ☐

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
VIII	COLO.	I 70-3(140)	8

INDEX BOOK	INDEX PAGE	INDEX SHEET	CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY PLAN	ROADWAY AS CONST.			STRUCTURE NO. F-16-KW PLAN	STRUCTURE NO. F-16-KW AS CONST.	STRUCTURE NO. F-16-KX PLAN	STRUCTURE NO. F-16-KX AS CONST.	STRUCTURE NO. F-16-KY PLAN	STRUCTURE NO. F-16-KY AS CONST.	STRUCTURE NO. F-16-KZ PLAN	STRUCTURE NO. F-16-KZ AS CONST.	PROJECT TOTALS PLAN	PROJECT TOTALS AS CONST.	DIFF. +/-	% PLAN.
4	68	32	614	TRAFFIC CONE	EACH	50	180											50	180	+130	360
	69		620	FIELD LABORATORY (CLASS 2)	EACH	1	1											1	1	0	100
	70		620	SANITARY FACILITY	EACH	1	1											1	1	0	100
	71		625	CONSTRUCTION SURVEYING	L S	0.5	0.5											0.5	0.5	0	100
			626	MOBILIZATION	L S	0.5	0.5											0.5	0.5	0	100
	72	36	627	THERMOPLASTIC PAVEMENT MARKING	SQ FT	16,159	14,241											16159	14,241	+1,918	88
	73	36	627	PREFORMED PLASTIC PAVEMENT MARKING (60 MILS)	SQ FT	1,300	1,330											1300	1,330	+30	102
				FORCE ACCOUNT																	
			F/A01	MINOR CONTRACT REVISIONS	F A	1 $10,000.00	0 $0											1 ($10,000.00)	$0	-1 -$10,000	0 0
			F/A02	ON-THE-JOB TRAINEE	F A	2 $1,600.00	1											2 (1600.00)	1	- 1	50
			F/A03	OBTAIN POWER FROM PUBLIC SERVICE COMPANY FOR SIGNING AND LIGHTING (BY CONTRACTOR)	F A	1 $ 15,000.00	$8,301.00											1 ($15,000.00)	1 ($8301.00)	$ 0 -6699	100 55
	74	5	603	18 IN. RCES MCR 40-3	EACH	0	3												3		
	75		203	BLADING MCR 40-1	HOUR	0	79												79		
	76		104	RESTOCK ELECT. CABLE MCR 40-2	L S	0	1												1		
	77		507	BIT. S&D PAVING (SPEC.) MCR 40-4	TON	0	158.97												158.97		
	78		613	UPGRADE DIR. BUR. CABLE MCR 40-5	L S	0	1												1		
	79		613	POWER PEDESTALS MCR 40-6	EACH	0	10												10		
	80		627	PAVE. MARK. PAINT MCR 40-7	GAL	0	91												91		
	81		614	DRUM CHANNEL. DEVICE MCR 40-9	EACH	0	30												30		
	82		609	CURE TY 6M MCR 40-8	LIN FT	0	705												705		
	83	10	606	END ANCHOR TY 3D MCR 40-13	EACH	0	2												2		
	84		614	FLEX. SIGN POST MCR 40-15	LIN FT	0	144												144		
	85		203	DOZING (LANDSCAPING) MCR 40-14	HOUR	0	35												35		
	86		210	RESET GROUND SIGN MCR 40-16	EACH	0	3												3		
	87		612	REFLECTOR (MED. BARR) MCR 40-10	EACH	0	93												93		
	88		601	STRUC. CONC. COATING MCR 40-11	SQ YD	0	828												828		
	89		614	IMPACT ATTEN. (TEMP.) MCR 40-12	EACH	0	4												4		
	90		613	OVERHEAD SIGN LUM. MCR 40-21	EACH	0	2												2		
	91		108.07	LIQUIDATED DAMAGES	DAY	0	18												18		

9-SEP-1987 'SER$DISK:[DRAW.PJ.82014.RDWY.H101.TAE]C113FC

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO. 126
REV. NOV. 1983

AS CONSTRUCTED				FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS	REVISED 12-12-88	VOID		VIII	COLO.	I 70-3(140)	9

TABULATION OF SURFACING AND TREATED SUBGRADE

LOCATION	SOURCE	QUANTITY – TON						PROCESSING LIME TREATED SUBGRADE
		PLANT MIXED SEAL COAT	HOT BITUMINOUS PAVEMENT (H&A)				HYDRATED LIME	
			TOP	THIRD	SECOND	BOTTOM		
		(TYPE A)(H&A)	GRADING E	GRADING E	GRADING E	GRADING E		SQ. YD.
NB S.H. 470	CONTRACTOR'S							
28+00.00 TO 29+48.00		26	43	93	106	134	10	691
29+48.00 TO 32+25.76		89	149	239	361	455	34	2284
32+25.76 TO 35+62.51 (STR. NO. F-16-KW)		85	141					
35+62.51 TO 38+18.00		49	82	133	201	255	19	1306
38+18.00 TO 47+50.00		162	271	439	666	844	65	4349
47+50.00 TO 50+50.00		78	129	209	318	401	30	2034
50+50.00 TO 54+36.00		127	212	342	517	650	48	3260
54+36.00 TO 63+00.00		206	343	554	840	1059	80	5376
63+00.00 TO 69+00.00		127	211	341	517	654	50	3333
69+00.00 TO 72+00.00		58	96	156	237	299	23	1533
SB S.H. 470								
41+34.12 TO 47+28.00		116	193	312	473	599	46	3067
47+28.00 TO 53+50.05		108	181	293	445	563	43	2903
53+50.05 TO 62+69.45		234	535	629	952	1201	91	6129
62+69.45 TO 68+50.12		112	186	302	458	579	44	2964
68+50.12 TO 72+00.00		61	101	165	250	316	24	1633
RAMP A								
232+13.04 TO 241+18.86		103	173	247	432	440	43	2919
241+18.86 TO 243+48.91 (STR. NO. F-16-KY)		29	47					
243+48.91 TO 253+51.05		115	192	273	477	487	48	3229
RAMP B								
1414+80.00 TO 1428+80.00		160	268	382	667	680	67	4511
1428+80.00 TO 1429+47.06		9	15	21	37	37	3	234
RAMP C								
425+50.00 TO 449+40.00		416	694	984	1709	1730	166	11153
RAMP D								
1209+20.00 TO 1221+83.95		220	367	520	904	915	88	5894
1221+83.95 TO 1224+23.76 (STR. NO. F-16-KZ)		42	69					
1224+23.76 TO 1231+78.00		131	219	310	539	546	52	3520
1231+78.00 TO 1232+94.64		35	58	82	141	142	13	894
1232+94.64 TO 1236+02.93 (STR. NO. F-16-KX)		86	144					
1236+02.93 TO 1241+34.12		123	273	385	501	505	48	3269
RAMP F								
28+00.00 TO 31+78.00		43	73	103	180	184	18	1218
WIDENING FOR GUARD RAIL		18	33	47	78	78		
ESTIMATED FOR IRREGULARITIES		TOTAL GRADING E = 39,553.47 TONS				~~1,375~~		
TOTALS		~~3,168~~ 3,623.47	~~5,499~~	~~7,538~~	~~12,006~~	~~15,128~~	~~1,153~~ 1,375.10	~~77,703~~ 80,931

STABILIZATION IS BASED ON:	S.H. 470	RAMPS
18k ESAL	4,964,000	2,737,500
SERVICEABILITY INDEX	2.5	2.5
REGIONAL FACTOR	1.75	1.75
SUBGRADE "R" VALUE	5	5
WSN	5.38	4.98

STRENGTH COEFFICIENTS	S.H. 470	RAMPS
HOT BITUMINOUS PAVEMENT	0.44	0.44
LIME TREATED SUBGRADE	0.10	0.10
PLANT MIXED SEAL COAT	0.25	0.25

RATE OF APPLICATION OF QUICKLIME = 23.1 LBS./SQ.YD./8" LAYER
RATE OF APPLICATION OF HYDRATED LIME = 29.7 LBS./SQ.YD./8" LAYER
PLAN QUANTITIES BASED ON 29.7 LBS./SQ.YD./8" LAYER

09/02/87 21:53:23 NSP1 :::(SNO/02014/DSTADS) I70_TABA 82014 H101

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 125:
REV. NOV. 1983:

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS	REVISED 12-12-89	VOID	VIII	COLO.	I 70-3(140)	10

TABULATION OF GUARD RAIL

LOCATION	SIDE	GUARD RAIL TYPE 3 (6-3 POST SPACING)	GUARD RAIL TYPE 4	END ANCHORAGE TYPE 3E	END ANCHORAGE TYPE 3F	TYPE 3D
		LIN. FT.	LIN. FT.	EACH	EACH	EACH
RAMP A						
239+39.67 TO 240+90.67 ⧸■	RT.	75	80	1		
232+75 TO 235+75	RT.	200				1
239+69.17 TO 241+20.17 ⧸■	LT.	75	80	1		
235+75 TO 236+50	RT.	75				
243+50.00 ⧸■ TO 244+22.00	RT.		72			
243+51.50 ⧸■ TO 244+23.50	LT.		72			
RAMP D						
1220+17.95 TO 1221+68.95 ⧸■	RT.	75	80	1		
1207+45 TO 1208+70	RT.	125				
1220+63.33 TO 1222+14.33 ⧸■	LT.	75	80	1		
1223+93.07 ⧸■ TO 1224+65.07	LT.		72			
1208+70 TO 1209+70	RT.	100				1
1224+34.76 ⧸■ TO 1225+06.76	RT.		72			
1231+47.36 TO 1232+98.36 ⧸■	RT.	75	80	1		
1231+31.68 TO 1232+82.68 ⧸■	LT.	75	80	1		
1236+16.53 ⧸■ TO 1236+88.53	RT.		72			
1236+00.00 ⧸■ TO 1237+80.79 ◉	LT.	~~50~~ 150	105		1	
NB S.H. 470						
31+11.84 TO 31+83.84 ⧸■	LT.		72			
35+42.23 TO 36+93.23 ⧸■	LT.	75	80	1		
31+22.29 TO 32+12.29	LT.		30			
35+63.89 ⧸■ TO 37+68.89 ◉	RT.	50	130			
53+05.00 TO 55+67.00	MEDIAN*	200	240		2	
54+24.00 TO 55+77.00	LT.	75	92	1		
67+69.00 TO 70+31.00	MEDIAN*	200	240		2	
68+88.00 TO 70+41.00	LT.	75	92	1		
TOTALS		~~1175~~ 1,775	~~1891~~ 1,921	9	5	2

TYPE 3 GUARD RAIL IS TO BE MADE OF CORROSION RESISTANT STEEL.

⧸■ CONNECTS TO BRIDGE RAIL.

* SEE GUARD RAIL DETAILS FOR OBSTRUCTION IN MEDIAN.

◉ SEE GUARD RAIL DETAILS - SH 470 AND RAMP D GORE AREA.

TYPE 4 GUARD RAIL TO BE PAINTED AS PER PROJECT SPECIAL PROVISION, REVISION OF SECTION 601 - STRUCTURAL CONCRETE COATING.

TABULATION OF DELINEATORS

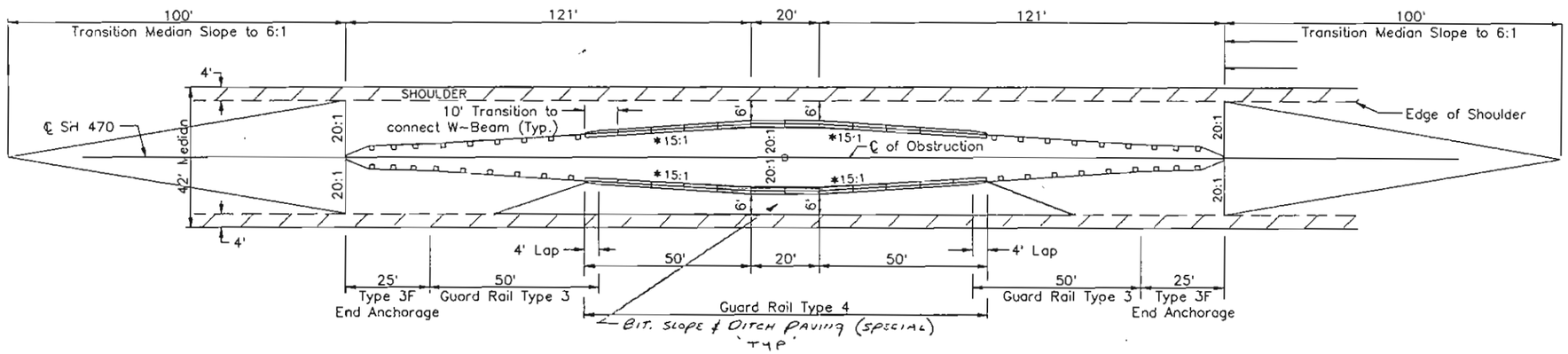
LOCATION	SIDE	DELINEATORS TYPE I		TYPE II		TYPE III	
		EACH		EACH		EACH	
RAMP A							
231+97.08 TO 233+83.87	LT & RT	3		1			
233+83.87 TO 239+69.17	LT	9					
239+69.17 TO 241+20.17	LT					1	
239+39.67 TO 240+90.67	RT					1	
243+51.50 TO 251+70.00	LT	14					
RAMP B							
1415+50.00 TO 1422+32.66	RT	15					
1422+32.66 TO 1429+41.49	RT	13					
RAMP C							
423+32.46 TO 450+50.50	RT	28					
423+32.46 TO 450+50.50	LT	27		1			
RAMP D							
1207+17.30 TO 1211+58.98	RT	5		2			
1208+75.00 TO 1211+58.98	LT	5					
1211+58.98 TO 1216+66.21	LT & RT	10					
1216+66.21 TO 1229+61.05	LT & RT	34				2	
1229+61.05 TO 1231+68.00	LT			2			
1231+68.00 TO 1232+82.68	LT			4		1	
1231+47.36 TO 1232+98.36	RT			4		1	
1236+16.53 TO 1241+28.00	LT & RT	10					
NB S.H. 470							
28+00.00 TO 29+48.00	RT	1					
29+48.00 TO 31+83.84	LT			3			
35+42.23 TO 36+93.23	LT					1	
35+63.89 TO 37+14.89	RT					1	
36+93.23 TO 38+18.00	LT			1			
38+18.00 TO 47+50.00	LT	9					
47+50.00 TO 50+50.00	LT			3			
50+50.00 TO 54+36.00	LT			4			
54+36.00 TO 63+00.00	LT			11			
63+00.00 TO 69+00.00	LT			6			
69+00.00 TO 72+00.00	LT			3			
SB S.H. 470							
41+28.00 TO 47+28.00	LT & RT			12			
47+28.00 TO 51+75.00	LT & RT	2					
51+75.00 TO 62+69.45	LT & RT	11		11			
62+69.00 TO 68+50.12	LT & RT	5		5			
68+50.12 TO 72+00.00	LT & RT	2					
RAMP F							
1228+00.00 TO 1229+61.05	RT	1					
TOTALS		~~204~~ 320		73		~~8~~ 0	

REFLECTORS:
CRYSTAL - 192
YELLOW - 182

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
O.D.H. FORM NO. 126
REV. NOV. 1983

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS ☐	REVISED 12-12-88	VOID ☐	VIII	COLO.	I 70-3(140)	11

ORIGINAL SCALE: 1" = 20'



GENERAL NOTES

* 15:1 Flare Rate Based on a 55 MPH Operating Speed.
Refer to Standards M-606-1 and M-606-12 for additional details.

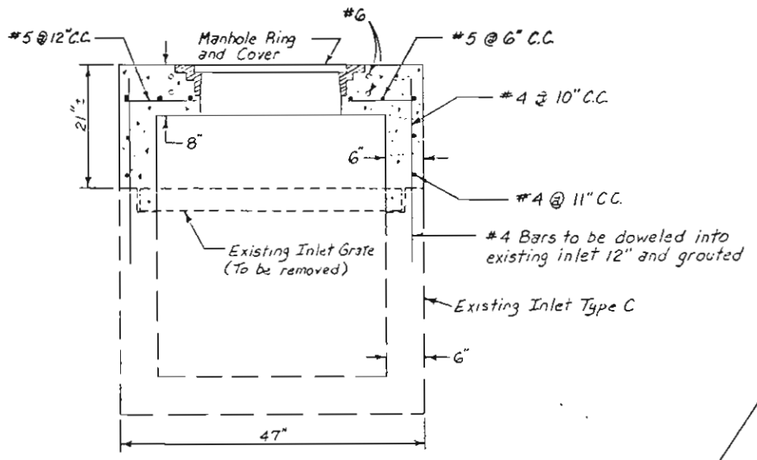
GUARD RAIL DETAILS FOR OBSTRUCTION IN MEDIAN

WO number: . 24/87 21:36:25 _DVA1:(DRAW.PJ.86052.RDWY.M101.DETAIL) GR.DGN

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO. 126
REV. NOV. 1983

AS CONSTRUCTED						
NO REVISIONS 12-12-88	REVISED	VOID	FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
			VIII	COLO.	I 70-3(140)	12

DETAIL OF MODIFY INLET



GENERAL NOTES

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

ALL CONCRETE SHALL BE CLASS A OR B.

REINFORCING BARS SHALL BE DEFORMED AND SHALL BE OF INTERMEDIATE GRADE STEEL.

DIMENSIONS AND WEIGHTS OF TYPICAL MANHOLE RING AND COVER ARE NOMINAL. (SEE STANDARD M-604-12 FOR DETAILS).

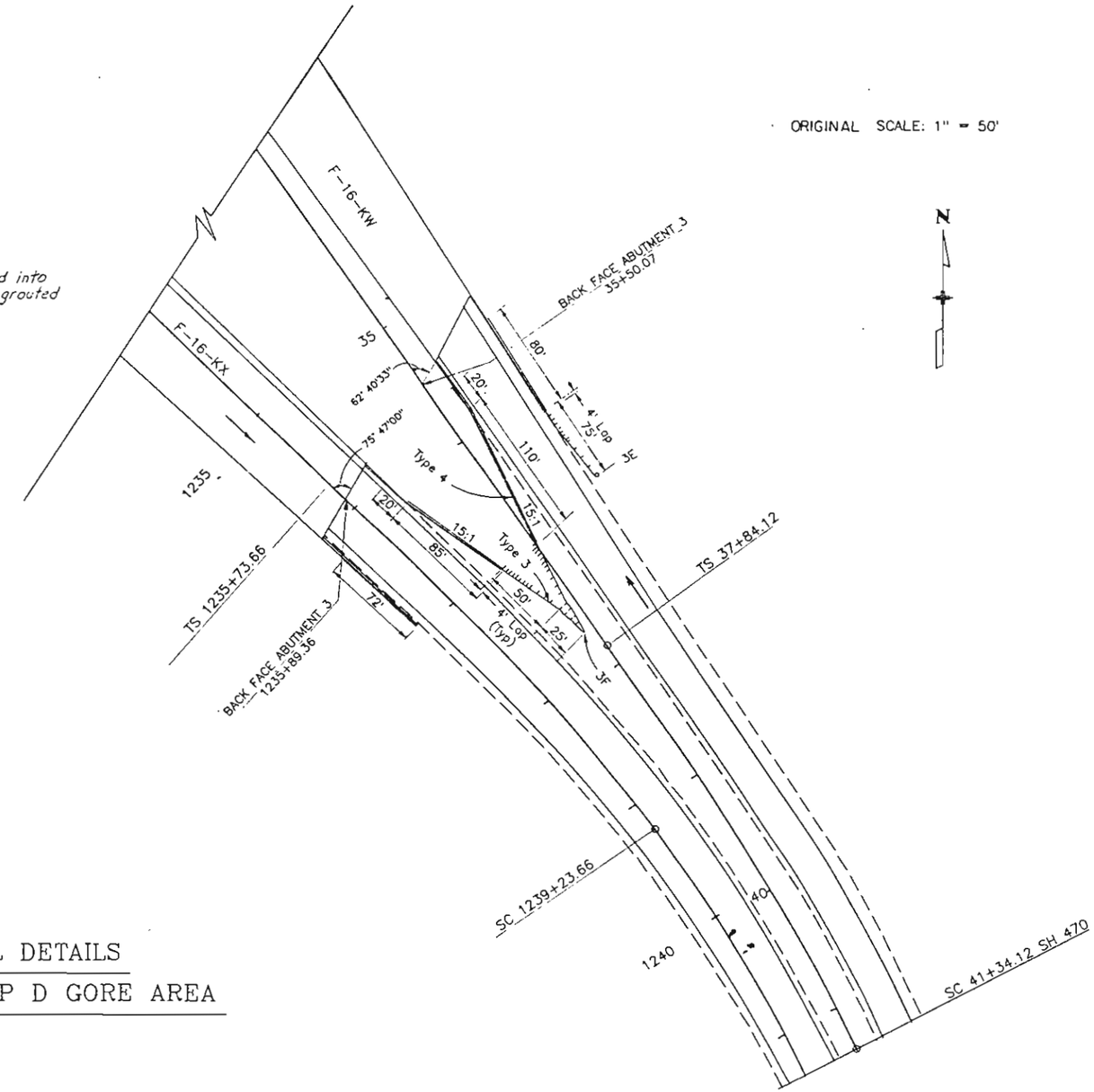
CUT OR BEND BARS TO CLEAR MANHOLE.

CONCRETE, REINFORCING STEEL, REMOVAL OF INLET GRATE, MANHOLE RING AND COVER, AND ANY OTHER WORK NECESSARY TO COMPLETE THE INLET MODIFICATION SHALL BE INCLUDED IN THE COST OF ITEM 210 - MODIFY INLET.

FOR INFORMATION ONLY

CONCRETE	0.6	CU. YD.
REINFORCING STEEL	165	LBS.

ORIGINAL SCALE: 1" = 50'



GUARD RAIL DETAILS

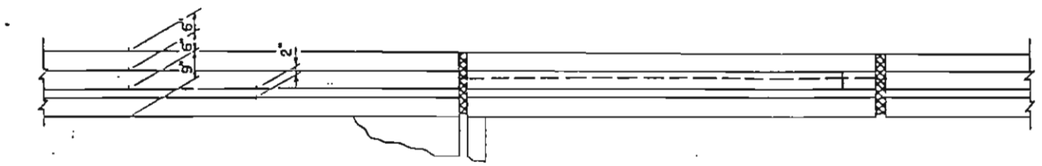
S.H. 470 AND RAMP D GORE AREA

AS CONSTRUCTED			
NO REVISIONS 12-12-87	REVISED	VOID	

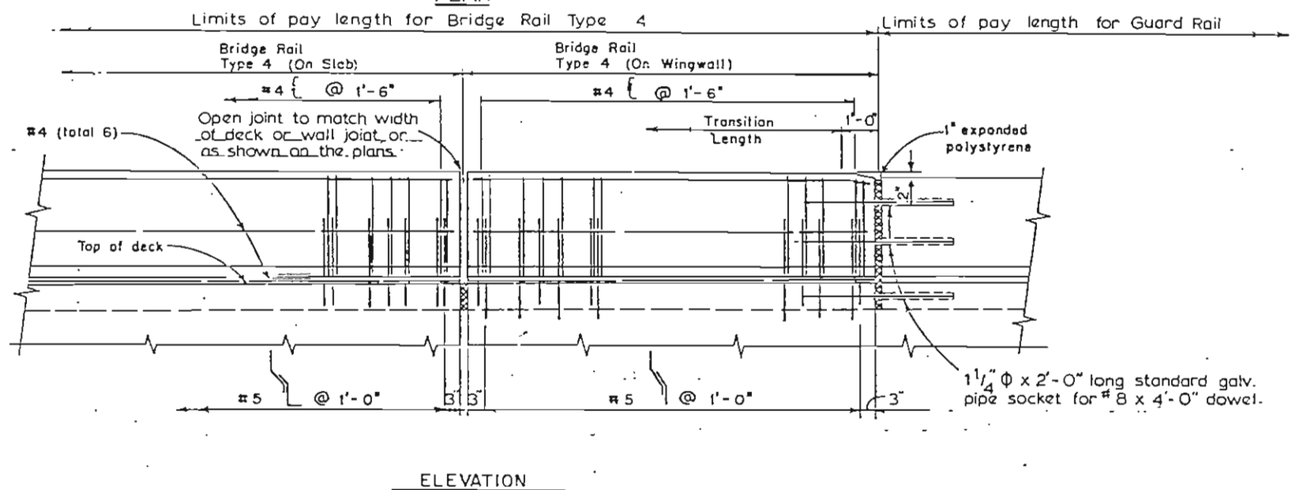
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	13	57

REVISIONS			

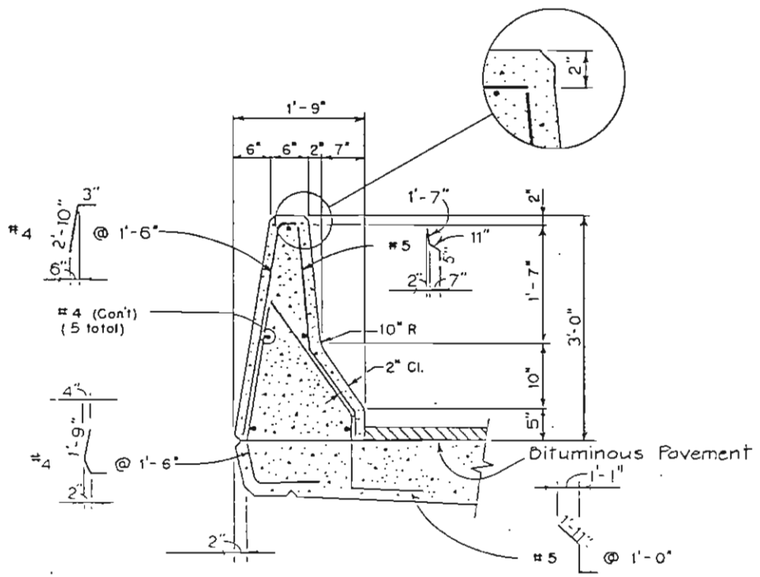
DESIGNED BY	M.D.M.	6-83
CHECKED BY	C. Inc. S.	11
DETAILED BY	K.F.L.	12
CHECKED BY		
QUANTITIES BY	K.L.W.	7-87
CHECKED BY	T.D.	7-87



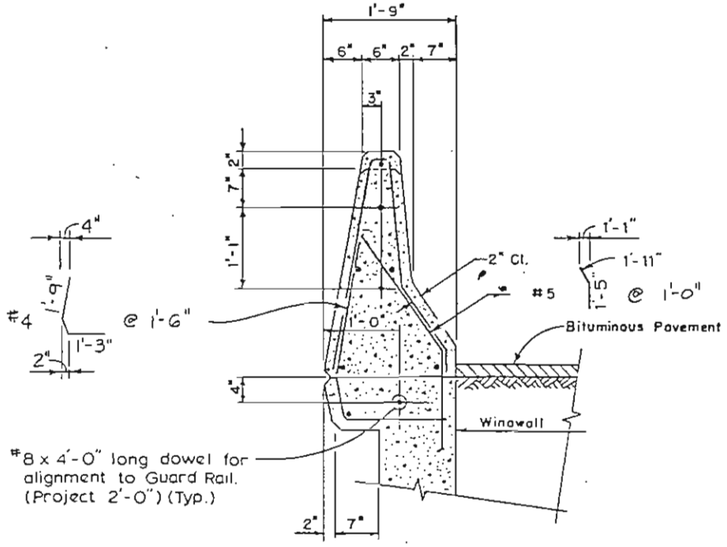
PLAN



ELEVATION



SECTION AT SLAB



SECTION AT WINGWALL

For additional details, see STD. M-606-12.

INFORMATION ONLY

Description	Unit	Per Lin. Ft.
Concrete Class D	Cu. Yd.	0.11
Reinforcing Steel	Lb.	13.8

DIVISION OF HIGHWAYS

DETAIL FOR CONNECTION OF GUARD RAIL TYPE 4 TO BRIDGE RAIL TYPE 4 — SPECIAL

Designer CDOH		Structure Numbers	
Detailer K. Lower			
Drawing Number B	of		Drawings

Revision Dates	(Preliminary Stage Only)							

I 70 & S.H. 470 INTERCHANGE
LIGHTING PLAN

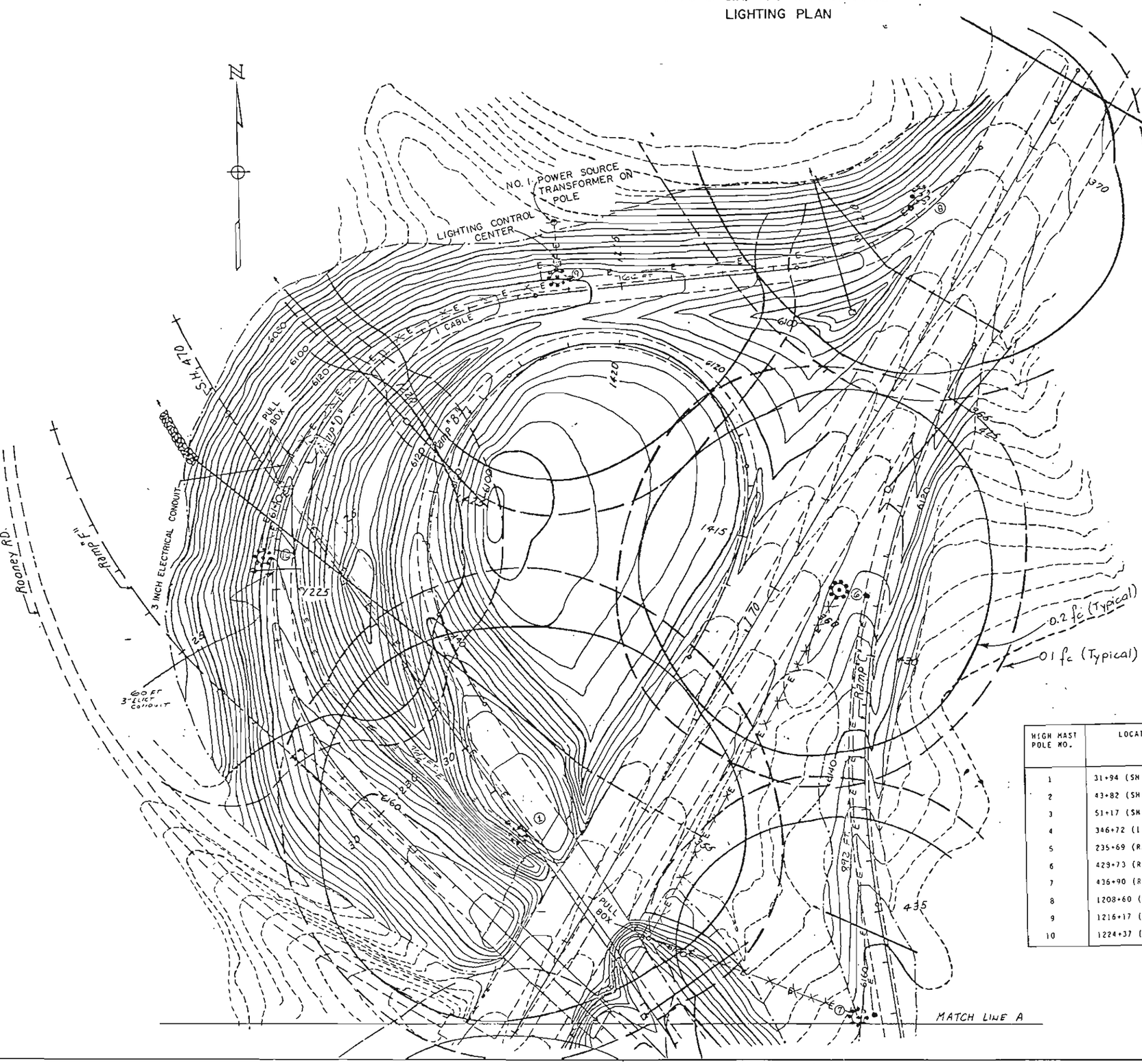
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-3(140)	14	57

AS CONSTRUCTED

NO REVISIONS ☐ REVISED 12-12-85 VOID ☐

----- ORIGINAL CONTOUR
——— FINISHED CONTOUR
4' CONTOUR INTERVAL

NOTE : ALL CONTOURS ARE EXISTING



TABULATION OF HIGH MAST POLE LOCATIONS

HIGH MAST POLE NO.	LOCATION	SIDE	OFFSET LIN. FT.	BASE ELEVATION (TOP OF CAISSON)	HIGH MAST POLE COORDINATES NORTH	EAST
1	31+94 (SH 470-NB)	RT.	6	6134.0	684848.462	2086710.930
2	43+82 (SH 470-SB)	RT.	85	6198.0	683818.665	2087240.693
3	51+17 (SH 470)	LT.	130	6212.0	683090.750	2087434.271
4	346+72 (I 70)	RT.	185	6186.0	684082.758	2086686.297
5	235+69 (RAMP A)	RT.	35	6176.0	683488.698	2086300.941
6	429+73 (RAMP C)	RT.	75	6122.0	685330.988	2087333.699
7	436+90 (RAMP C)	RT.	70	6160.0	684493.634	2087362.524
8	1208+60 (RAMP D)	RT.	35	6100.0	686098.403	2087494.266
9	1216+17 (RAMP D)	RT.	35	6120.0	685934.724	2086790.834
10	1224+37 (RAMP D)	RT.	36	6140.0	685393.982	2086204.907

HIGHWAY, STATE OF COLORADO
NO. 124
977

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	15	57

AS CONSTRUCTED

NO REVISIONS ☐ REVISED 12-12-87 VOID ☐

I 70 & S.H. 470 INTERCHANGE LIGHTING PLAN

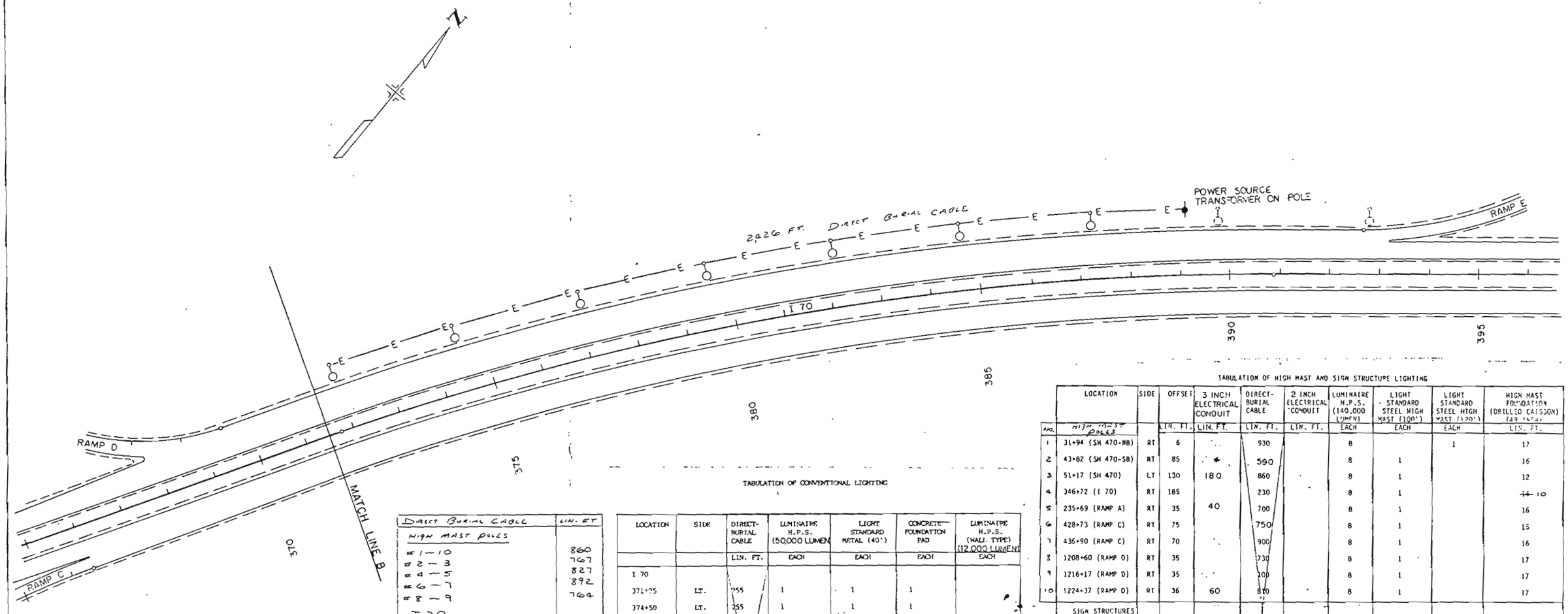
- - - - Original Contour
——— Finished Contour
4' Contour Interval

Note: All Contours Are Existing

AS CONSTRUCTED							
NO REVISIONS		REVISED	12-12-88	VOID			

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	SHEET TOTALS
VIII	COLO.	I 70-3(140)	16	57

I 70 & S.H. 470 INTERCHANGE
LIGHTING PLAN



TABULATION OF CONVENTIONAL LIGHTING

DIRECT BURIAL CABLE	LIN. FT
HIGH MAST POLES	
# 1 — 10	860
# 2 — 3	767
# 4 — 5	827
# 6 — 7	892
# 8 — 9	764
I 70	
314+ — 330+	1,461
372+ — 389+ LT.	2,426
I70 — ROONEY RD.	325
354+(I70) — SIGN # 31	103
C 470	
54+ — 69+	1,471
SIGN # 69 69+50	213
HIGH MAST POLE # 8 — SIGN # 12	248
TOTAL	10,357

LOCATION	SIDE	DIRECT-BURIAL CABLE	LUMINAIRE H.P.S. (50,000 LUMEN)	LIGHT STANDARD METAL (40')	CONCRETE FOUNDATION PAD	LUMINAIRE H.P.S. (WALL TYPE) (12,000 LUMEN)
		LIN. FT.	EACH	EACH	EACH	EACH
I 70						
371+05	LT.	255	1	1	1	
374+50	LT.	255	1	1	1	
377+05	LT.	255	1	1	1	
379+60	LT.	255	1	1	1	
382+15	LT.	255	1	1	1	
384+70	LT.	255	1	1	1	
387+25	LT.	200	1	1	1	
SH 470						
70+00 (C2C)	LT. & RT.					6
TOTALS		11730	7	7	7	6

WIRING FOR LIGHTING WILL BE PAID FOR AS LUMP SUM

TABULATION OF HIGH MAST AND SIGN STRUCTURE LIGHTING

NO.	LOCATION	SIDE	OFFSET	3 INCH ELECTRICAL CONDUIT	DIRECT-BURIAL CABLE	2 INCH ELECTRICAL CONDUIT	LUMINAIRE H.P.S. (140,000 LUMEN)	LIGHT STANDARD STEEL HIGH MAST (100')	LIGHT STANDARD STEEL HIGH MAST (120')	HIGH MAST FOUNDATION (DRILLED CAISSON) (48" DIA.)
	HIGH MAST POLES		LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LIN. FT.
1	31+94 (SH 470-NB)	RT	6		930		8		1	17
2	43+82 (SH 470-SB)	RT	85	*	590		8	1		16
3	51+17 (SH 470)	LT	130	180	860		8	1		12
4	346+72 (I 70)	RT	185		230		8	1		~~16~~ 10
5	235+69 (RAMP A)	RT	35	40	700		8	1		16
6	428+73 (RAMP C)	RT	75		750		8	1		15
7	436+90 (RAMP C)	RT	70		900		8	1		16
8	1208+60 (RAMP D)	RT	35		230		8	1		17
9	1216+17 (RAMP D)	RT	35		200		8	1		17
10	1224+37 (RAMP D)	RT	36	60	810		8	1		17
	SIGN STRUCTURES									
	SH 470									
	54+00 TO 70+00	LT&RT			1800	70				
	54+47 60+18	MED LT&RT				~~155~~				
	69+00	RT				60				
	I 70									
	314+00 TO 348+63	RT			3510	~~40~~				
	337+50	RT				~~50~~				
	354+45	LT			90					
	420+50 TO 425+00	LT			450					
	TOTALS			280	12,450	~~305~~ 130	80	9	1	~~57~~ 53

IT IS ESTIMATED THAT 1 PORTABLE POWER UNIT, 10 LOOPING DEVICES (1 PER HIGH MAST POLE), AND 2 LIGHTING CONTROL CENTERS (LOCATIONS AS SHOWN IN PLANS) WILL BE REQUIRED FOR THIS PROJECT.

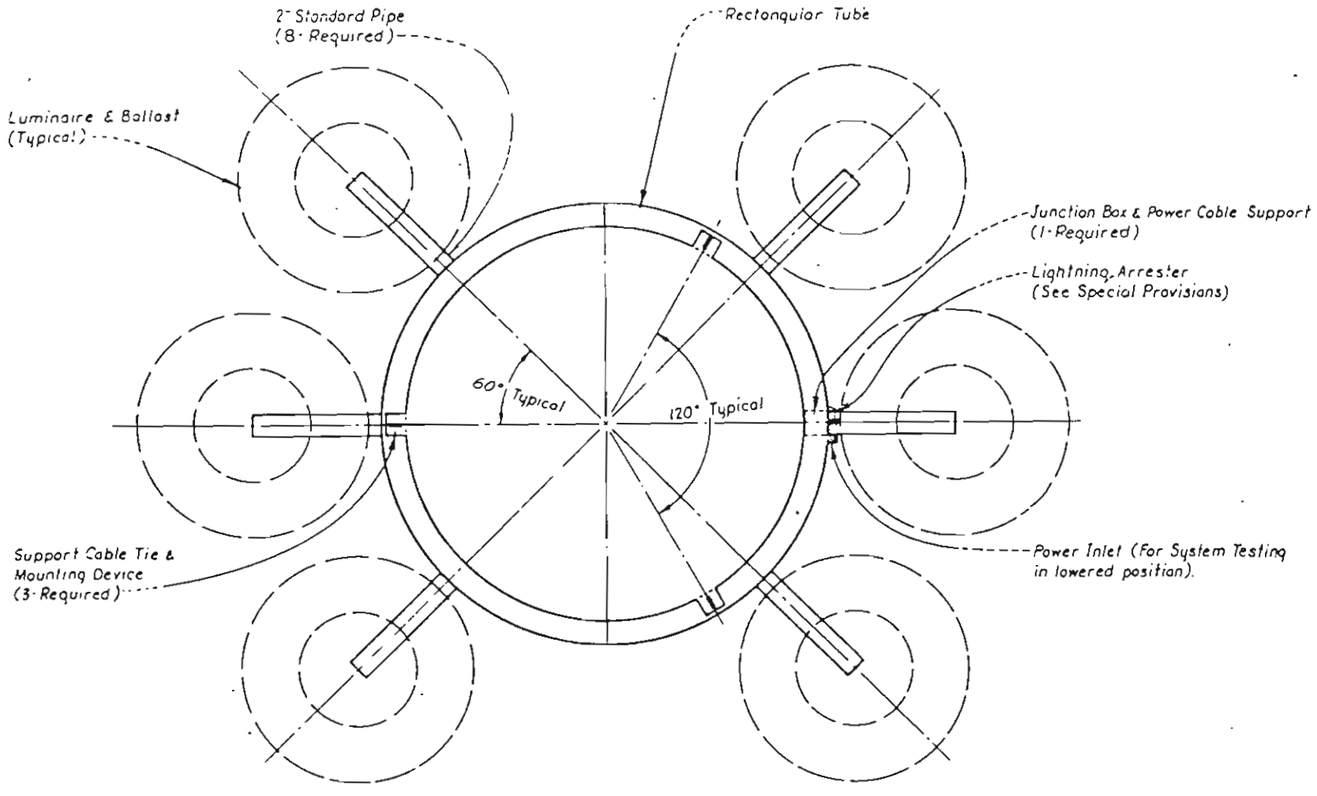
* IT IS ESTIMATED THAT 40 LIN. FT OF 3 INCH ELECTRICAL CONDUIT (JACKED) WILL BE REQUIRED FOR THIS PROJECT DELETED MCR 40-20

AS CONSTRUCTED			
NO REVISIONS	12-12-88	REVISED	VOID

ROADWAY LIGHTING

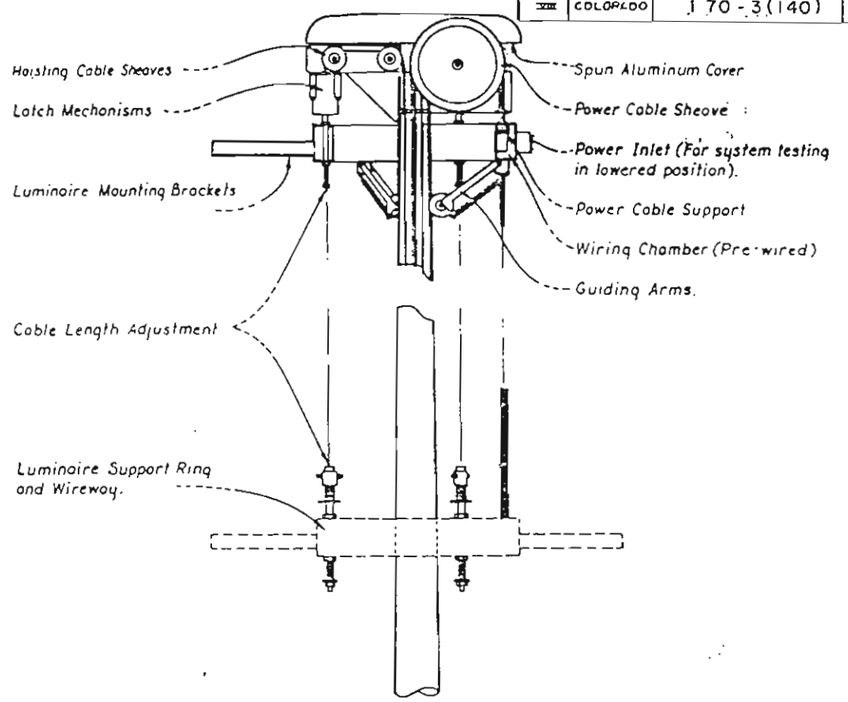
HIGH MAST

FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
XXX	COLORADO	I 70-3(140)	17

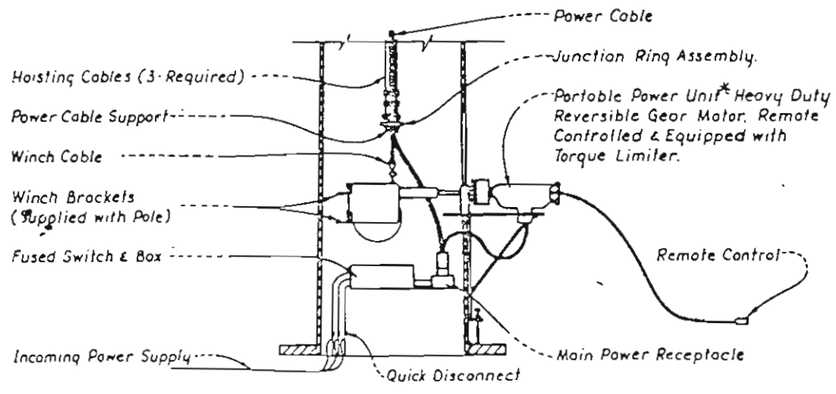


LUMINAIRE SUPPORT ASSEMBLY DETAIL "C"

NOTE: 8 LUMINAIRES THIS PROJECT.



RAISING AND LOWERING DEVICE DETAIL "E"



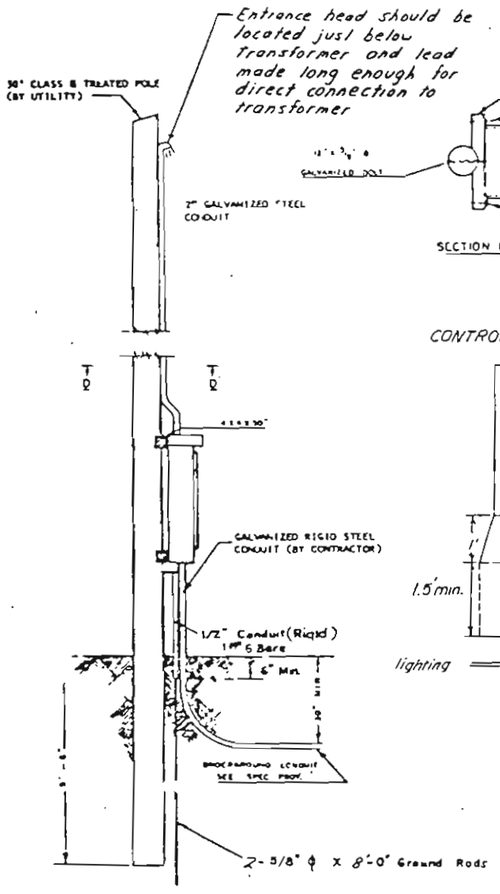
* Plug must fit into main power receptacle

POLE BASE DETAIL "G"

ROADWAY LIGHTING PLAN
HIGH MAST

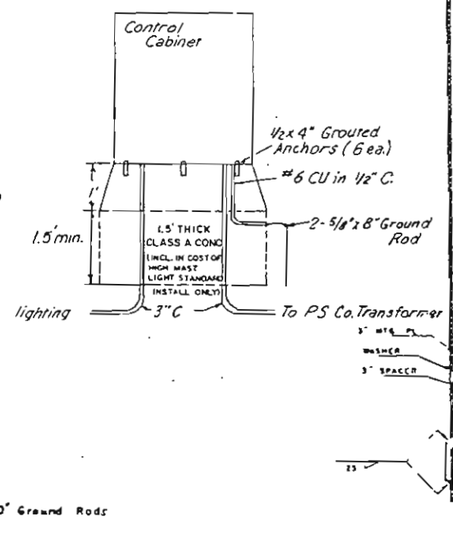
AS CONSTRUCTED			
NO REVISIONS	12-2-88	REVISED	VOID

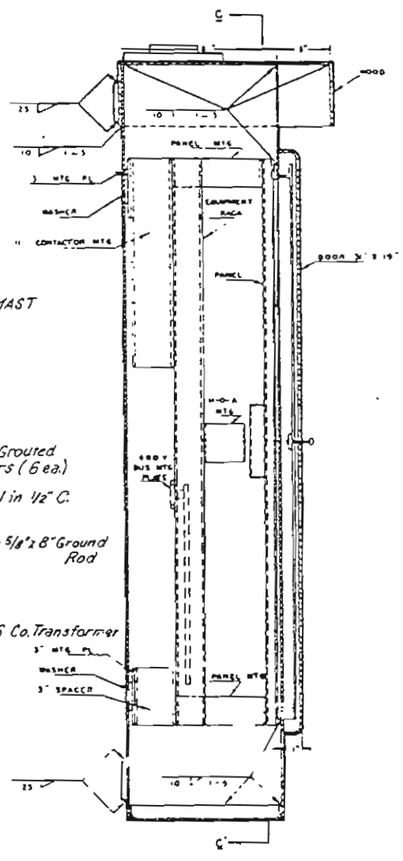
FED ROAD REG NO	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLO.	170-3(140)	18

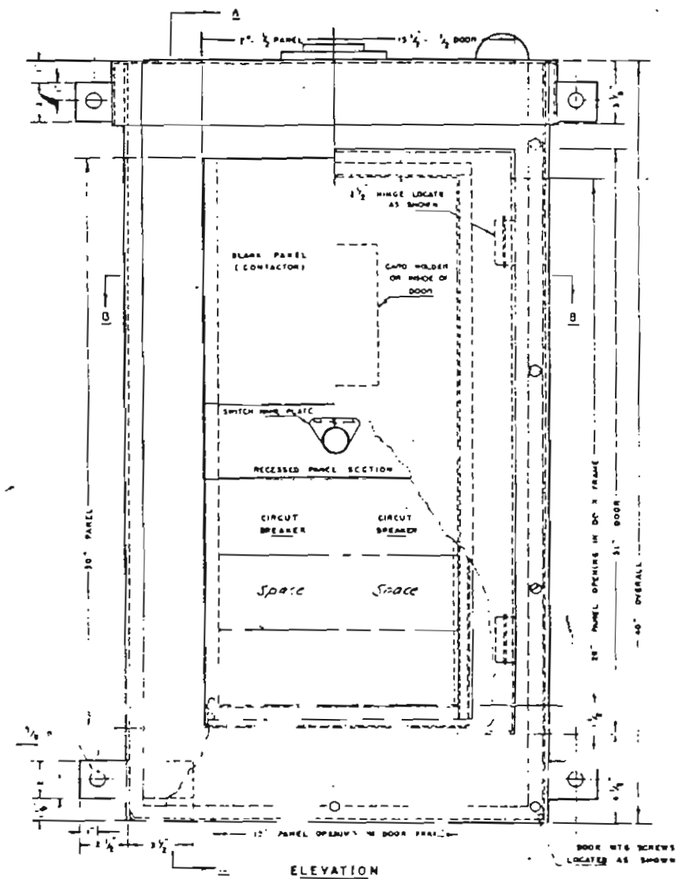


INSTALLATION DETAILS

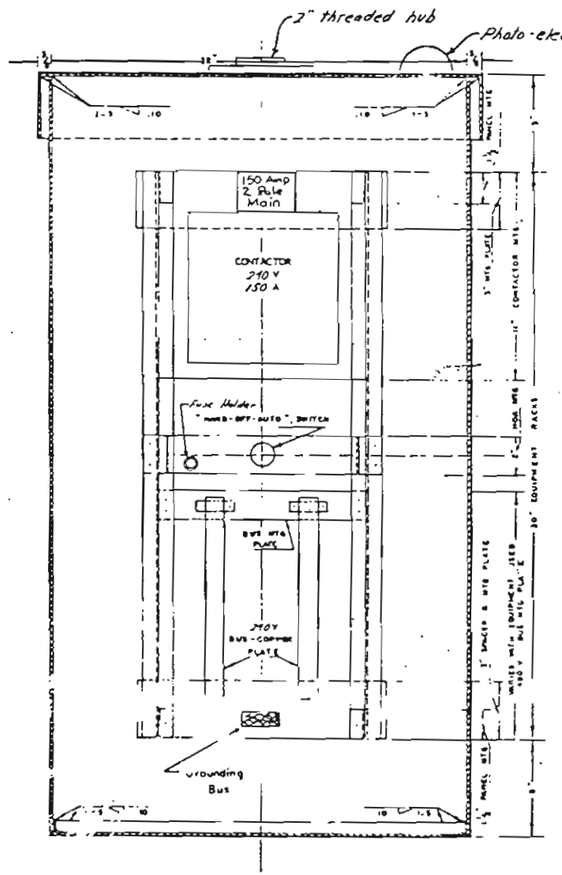
CONTROL CABINETS FOR HIGH MAST







ELEVATION



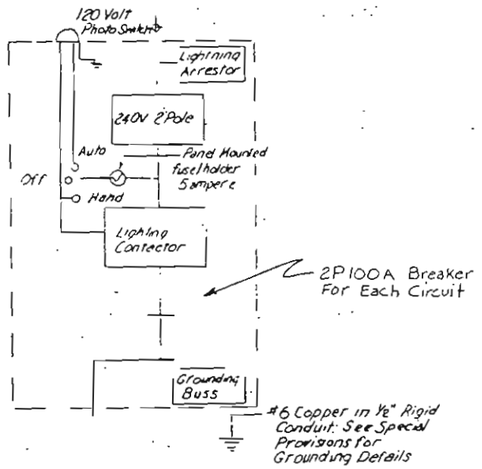
SECTION C-C

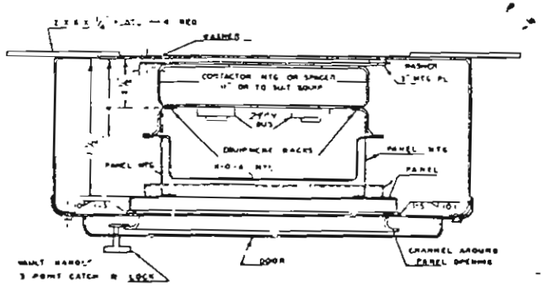
NOTES

DOOR & FRAME	12 GA
CABINET & HOOD	12 GA
PANEL	14 GA
EQUIPMENT RACK & INTERIOR MOUNTING PLATES	12 GA
DOOR, PANEL OPENING & PANEL TO BE CENTERED ON FRONT OF CABINET	
ALL FERROUS SHEET METAL & PLATES TO BE GALVANIZED	
CABINET, HOOD, PANEL, DOOR & FRAME TO BE PAINTED ONE PRIME COAT IN SHOP	
EXTERIOR SURFACE OF CABINET, HOOD, DOOR & FRAME TO BE FIELD PAINTED WITH ALUMINUM PAINT OR AS SPECIFIED	
"OFF-AUTOMATIC SWITCH SHALL BE KEY OPERATED. KEY SHALL NOT BE REMOVABLE IN OFF POSITION	

DIMENSIONS SHOWN ARE TYPICAL AND MAY BE CHANGED TO ALLOW FOR EXACT IN DRAWING OF EQUIPMENT AND FABRICATING TOLERANCES

CABINET WIRING SCHEMATIC





SECTION B-B

LIGHTING CONTROL CENTER

NOTES: (ELECTRICAL SERVICE)

THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE LOCAL UTILITY SERVICING THIS PROJECT. ELECTRICAL POWER SHALL BE FURNISHED AT THE APPROXIMATE LOCATION SHOWN ON THE PLANS TO THE SECONDARY SIDE OF THE TRANSFORMER. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY CABLE, CONDUIT, MOUNTS, CONTROL CABINET AND ALL RELATED PARTS FOR THE "LIGHTING CONTROL CENTER" SHOWN ON THE PLANS AND AS FURTHER DESCRIBED IN THE PLANS.

THE MINIMUM SIZE OF ELECTRICAL CABLE FOR THE PHOTOCELL CIRCUIT SHALL BE NO. 12 AWG. THE MINIMUM SIZE OF CONDUCTOR FURNISHED FOR ELECTRICAL SERVICE SHALL BE NO. 300 MCM COPPER OR NO. 500 MCM ALUMINUM

NOTE: CABINET WILL BE CONSTRUCTED TO TAKE 500 MCM WIRING.

THE LIGHTING CONTROL CENTERS SHALL EACH CONTAIN THE FOLLOWING:

ONE GROUNDING BUSS LOCATED NEAR THE BOTTOM OF THE CABINET. IN ADDITION TO THE TERMINALS NECESSARY FOR CONNECTING THE SERVICE DROP AND CONTROL WIRING THE BUSS SHALL HAVE AT LEAST 4 LUGS FOR TERMINATING UP TO 4/0 ALUMINUM (AL) OR 2/0 COPPER (CU) AND 4 LUGS FOR TERMINATING UP TO NO.6 AL OR CU.

ONE 120 VOLT PHOTO ELECTRIC CONTROL MOUNTED ON TOP OF CONTROL CABINET. IT SHALL BE CANOAL RESISTANT, WEATHERPROOF AND CAPABLE OF OPERATING THE INDUCTIVE LOAD OF THE CONTACTOR.

ONE [illegible] 240 VOLT LIGHTING CONTACTOR WITH A 120 VOLT COIL.

ONE SINGLE POLE 3 POSITION SWITCH WITH PLATE MARKED HAND-OFF-AUTO.

ONE LIGHTNING ARRESTOR

ONE PANEL MOUNTED MINIATURE FUSE AND HOLDER.

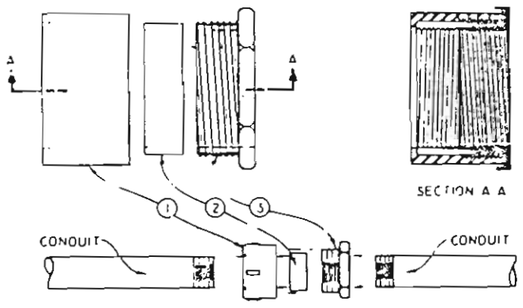
CIRCUIT BREAKERS AS REQUIRED SHALL HAVE LUGS APPROVED FOR AL OR CU WIRE AND BE CAPABLE OF INTERRUPTING AVAILABLE FAULT CURRENT.

ONE THREE-CATCH CABINET LOCK KEYED IF POSSIBLE TO MATCH ONE OF UTILITY COMPANY'S STANDARD KEYS.

ROADWAY LIGHTING
HIGH MAST

AS CONSTRUCTED			
NO REVISIONS	12-12-38	REVISED	VOID

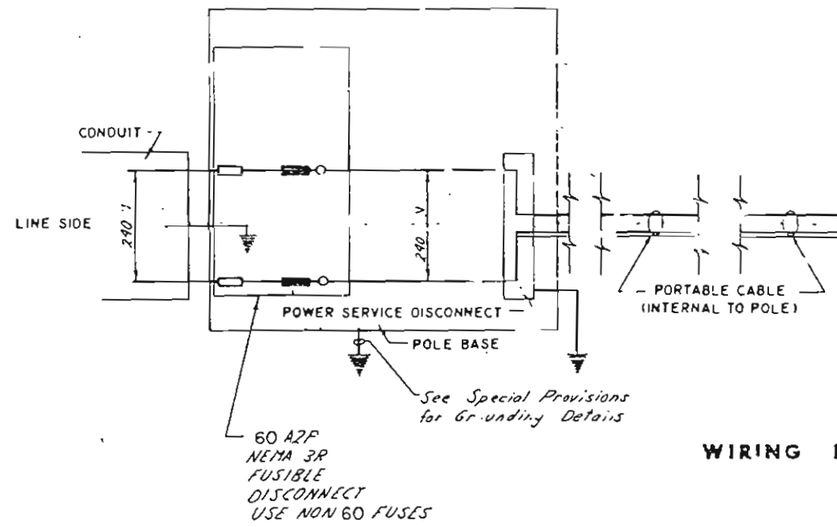
FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	I 70-3(140)	19

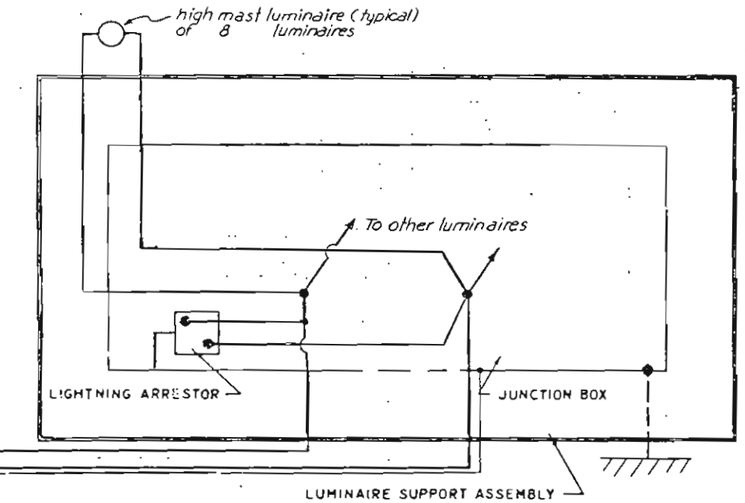


SLEEVE DETAIL

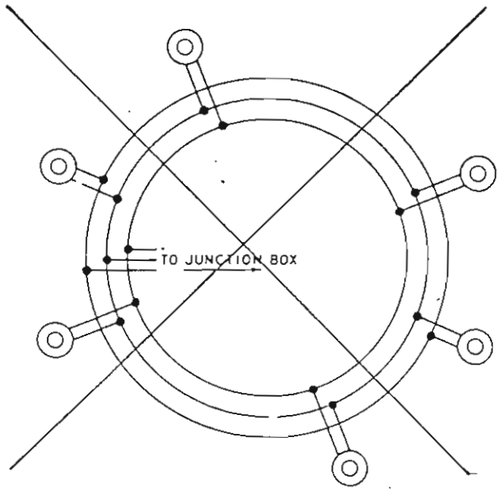
LEGEND

- LUMINAIRE AND BALLAST ASSEMBLIES
- FUSES
- DISCONNECT





WIRING DIAGRAM

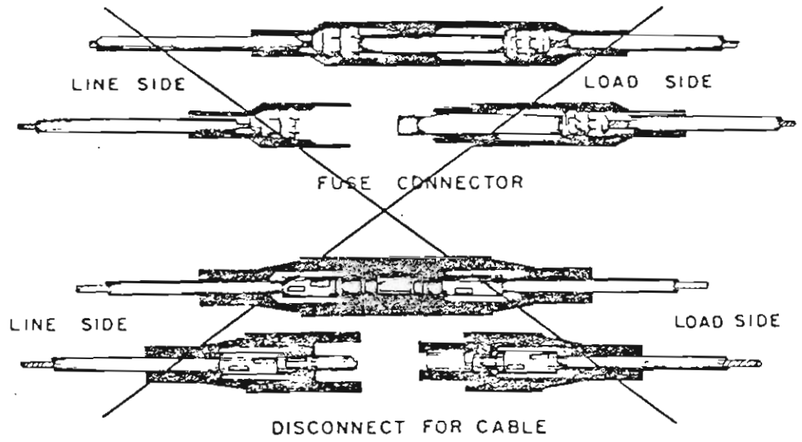


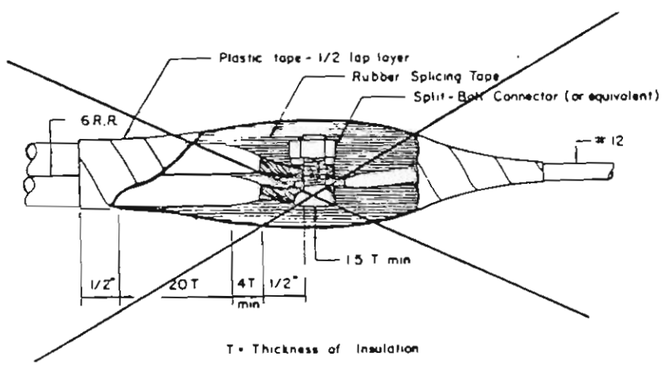
AS CONSTRUCTED						
NO REVISIONS	12-12-88	REVISED		VOID		

FED. ROAD PROJ. NO	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLO.	I 70-3(140)	20

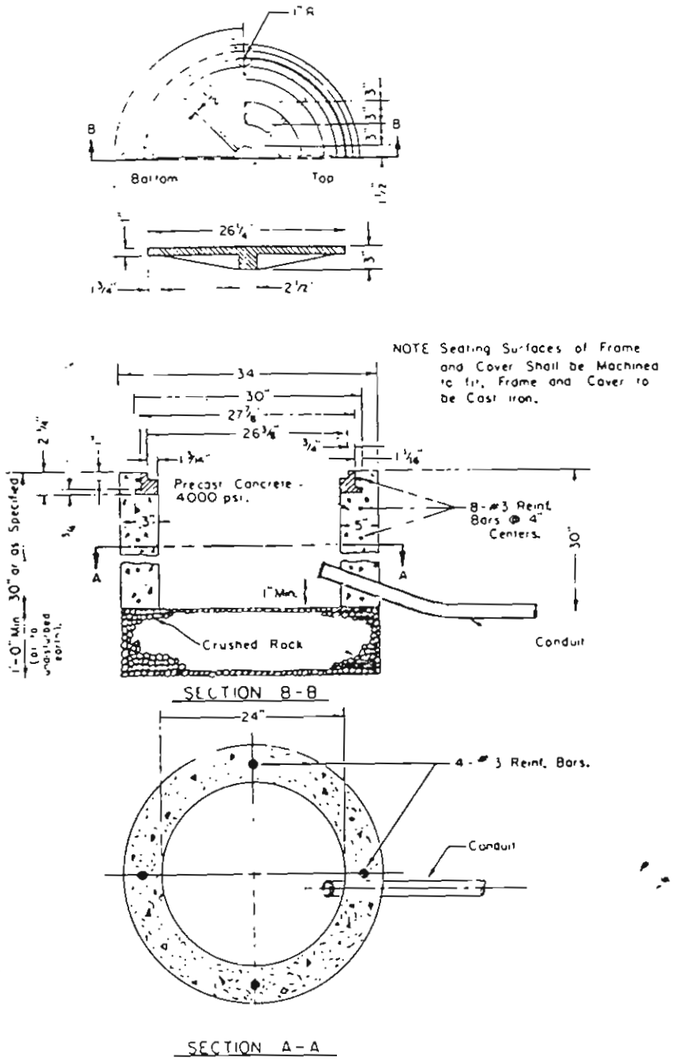
ROADWAY LIGHTING

HIGH MAST

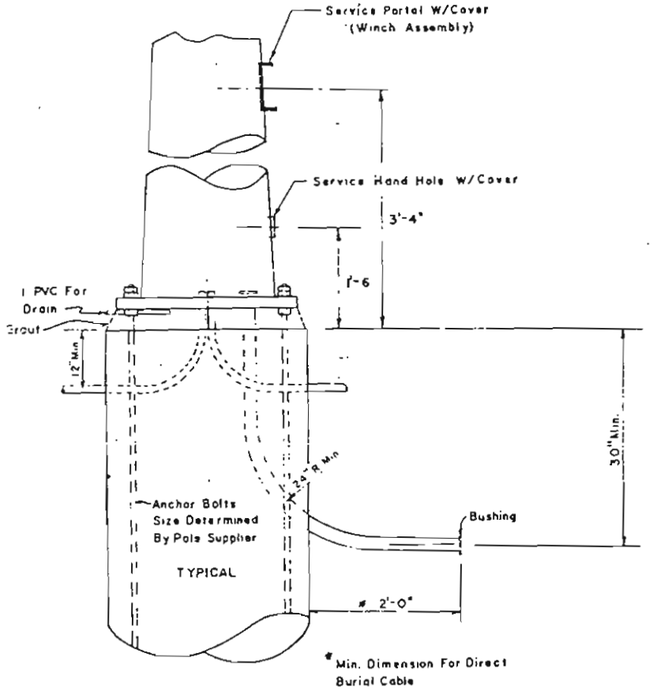




CABLE SPLICE



PULL BOX



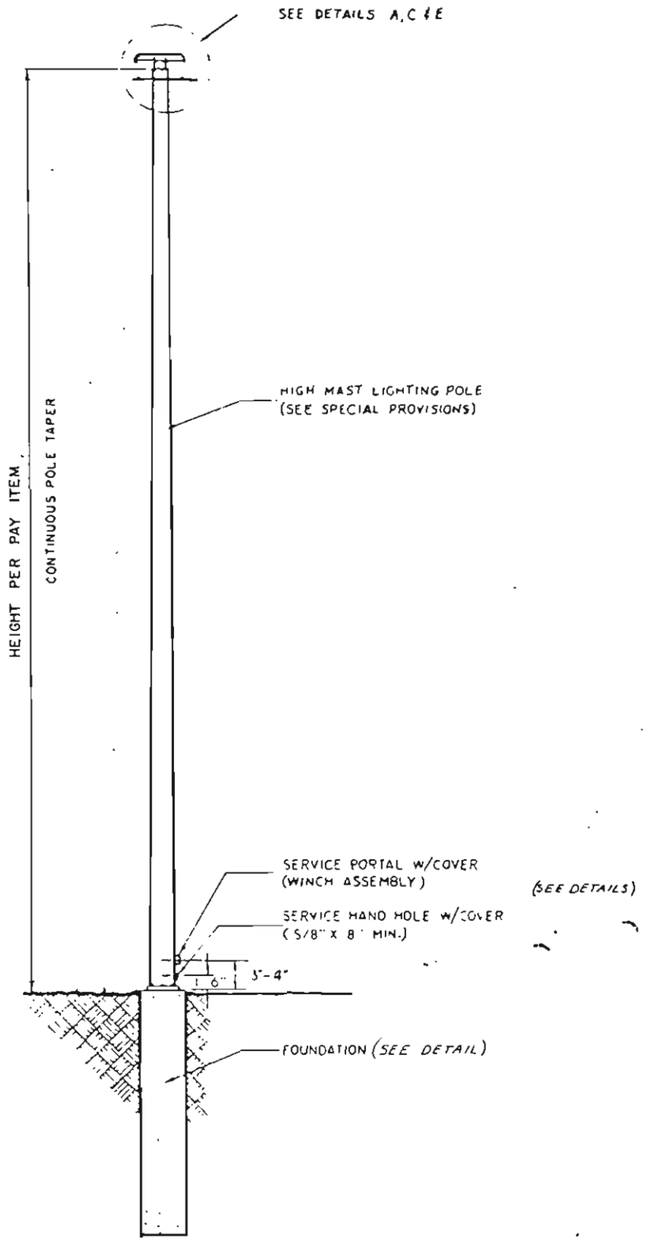
FOUNDATION NOTES

The Working Stress For Class "A" Concrete Shall Be 1200 p.s.i.
The Working Stress For Reinforcing Steel Shall Be 24,000 p.s.i.
Conduit, Ground Rods and Cable Not Shown.

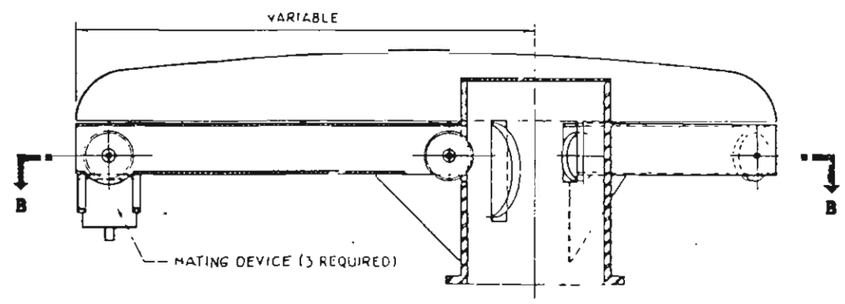
ROADWAY LIGHTING
HIGH MAST

AS CONSTRUCTED			
NO REVISIONS 12-12-88	REVISED	VOID	

FEDERAL ROAD REGION NO	DIVISION	PROJECT NO	SHEET NO.
XXIII	COLORADO	I 70-3(140)	21

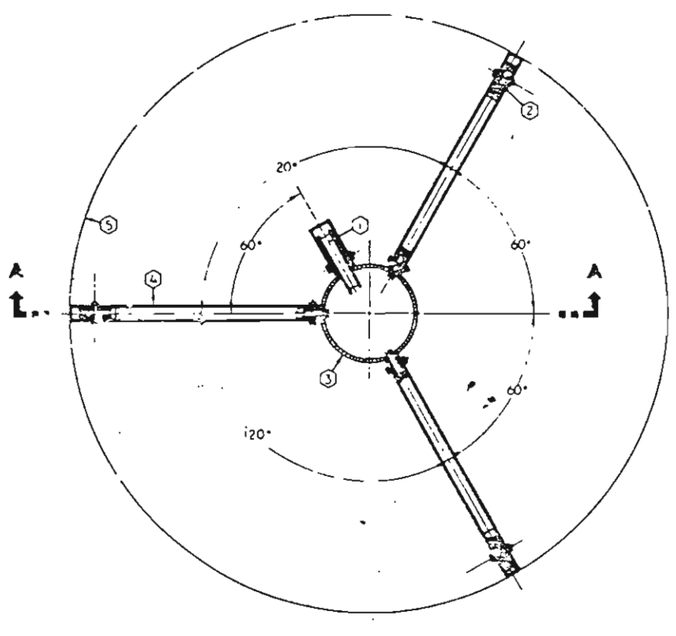


HIGH MAST LIGHTING UNIT



SECTION A - A

DETAIL A ELEVATION POLE TOP ASSEMBLY



SECTION B-B

NOTES

1. MINIMUM 8" DIA CABLE PULLEY (FOR PORTABLE ELECTRICAL CABLE)
2. 4" DIA. SUPPORT CABLE PULLEY (6 REQUIRED)
3. POLE TOP (SCHEDULE 80 PIPE)
4. RECTANGULAR TUBE
5. HOOD

DETAILS FOR THE LOWERING SYSTEM ARE ONLY "FUNCTIONAL DRAWINGS" AND REPRESENT A TYPICAL LAYOUT
REQ'D. 1- POWER CABLE DISCONNECT AT BASE OF POLE

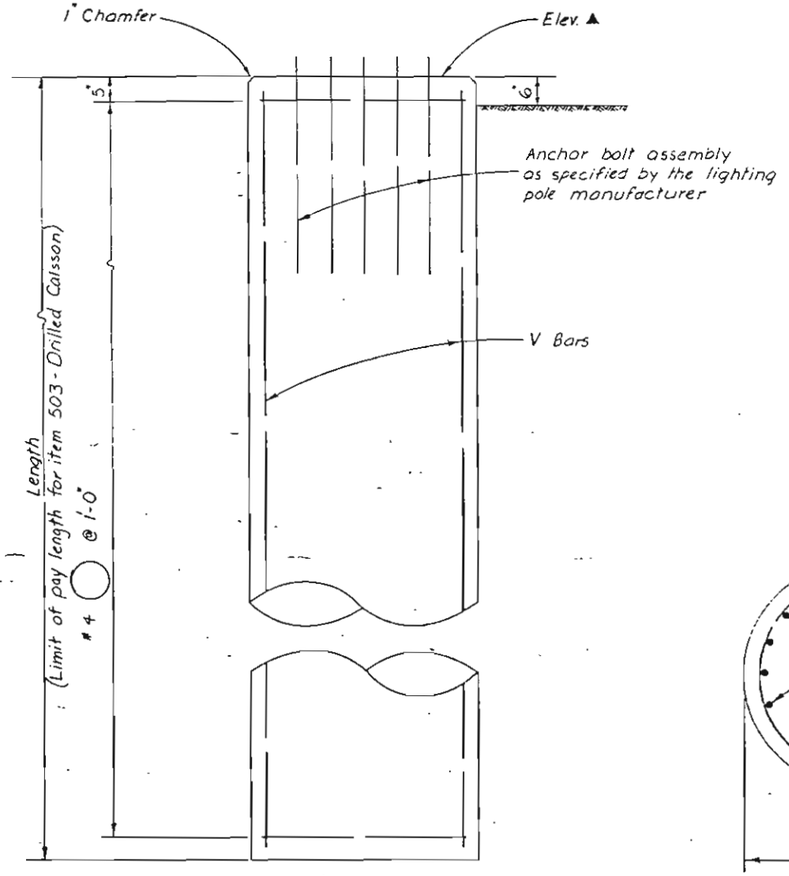
THE CONTRACTOR MAY SUBMIT FOR APPROVAL A LOWERING SYSTEM OF HIS OWN DESIGN PROVIDING IT MEETS THE REQUIREMENTS OF THE SPECIAL PROVISIONS AND AS APPROVED BY PUBLIC SERVICE COMPANY.

High Mast Lighting pole shall be an angular shape and weathering steel

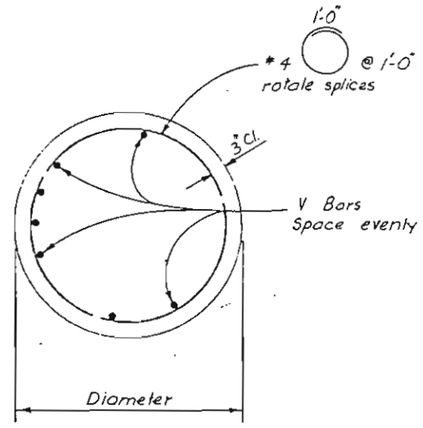
AS CONSTRUCTED			
NO REVISIONS	12-12-88	REVISED	VOID

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	22	57

REVISIONS		



ELEVATION



TYPICAL SECTION

Tower Station	Elev. ▲	Length	Diameter	Total V Bars	Size V Bars
*	*	17'-0"	4'-0"	23	#8
◒	◒	16'-0"	4'-0"	23	#8
51+17, 125' Lt. (470)	6212.0	12'-0"	4'-0"	23	#8
428+73, 75' Rt. (Ramp C)	6122.0	15'-0"	4'-0"	23	#8

Elevations shown shall be verified at time of construction by the Engineer. Concrete shall be Concrete Class A (Bridge).

QUANTITIES (ONE CAISSON)		
Tower Station	Concrete Class A (Cu. Yd.)	Reinforcing Steel (lb)
*	8	1186
◒	8	1115
51+17 125' Lt. (470)	6	858
428+73, 75' Rt. (Ramp C)	7	1044

For information only

* Station 31+94, 6' Rt. (470-NB); Elev. 6134.0
Station 1208+60, 30' Rt. (Ramp D); Elev. 6100.0
Station 1216+17, 30' Rt. (Ramp D); Elev. 6120.0
Station 1224+37, 36' Rt. (Ramp D); Elev. 6140.0

◒ Station 43+82, 75' Rt. (470-SB); Elev. 6198.0
Station 346+72, 185' Rt. (70); Elev. 6186.0
Station 235+69, 30' Rt. (Ramp A); Elev. 6176.0
Station 436+90, 70' Rt. (Ramp C); Elev. 6160.0

DIVISION OF HIGHWAYS

CAISSON DETAIL

Designer	B. Pinkerton	Structure Numbers	
Detailer	B. Pinkerton		

Drawing Number B / of / Drawings

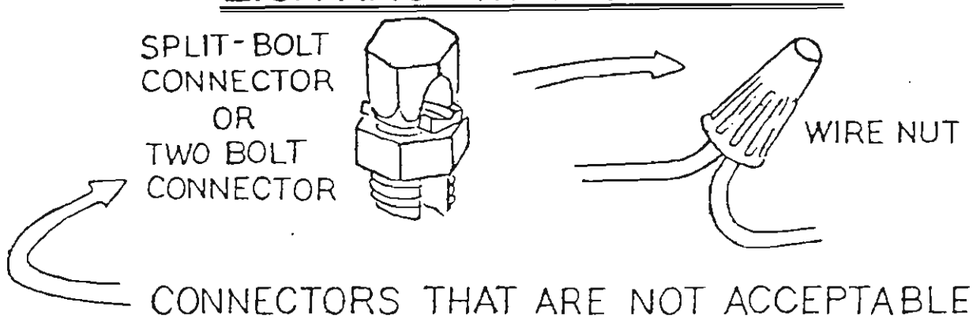
Revision Dates (Preliminary Stage Only)

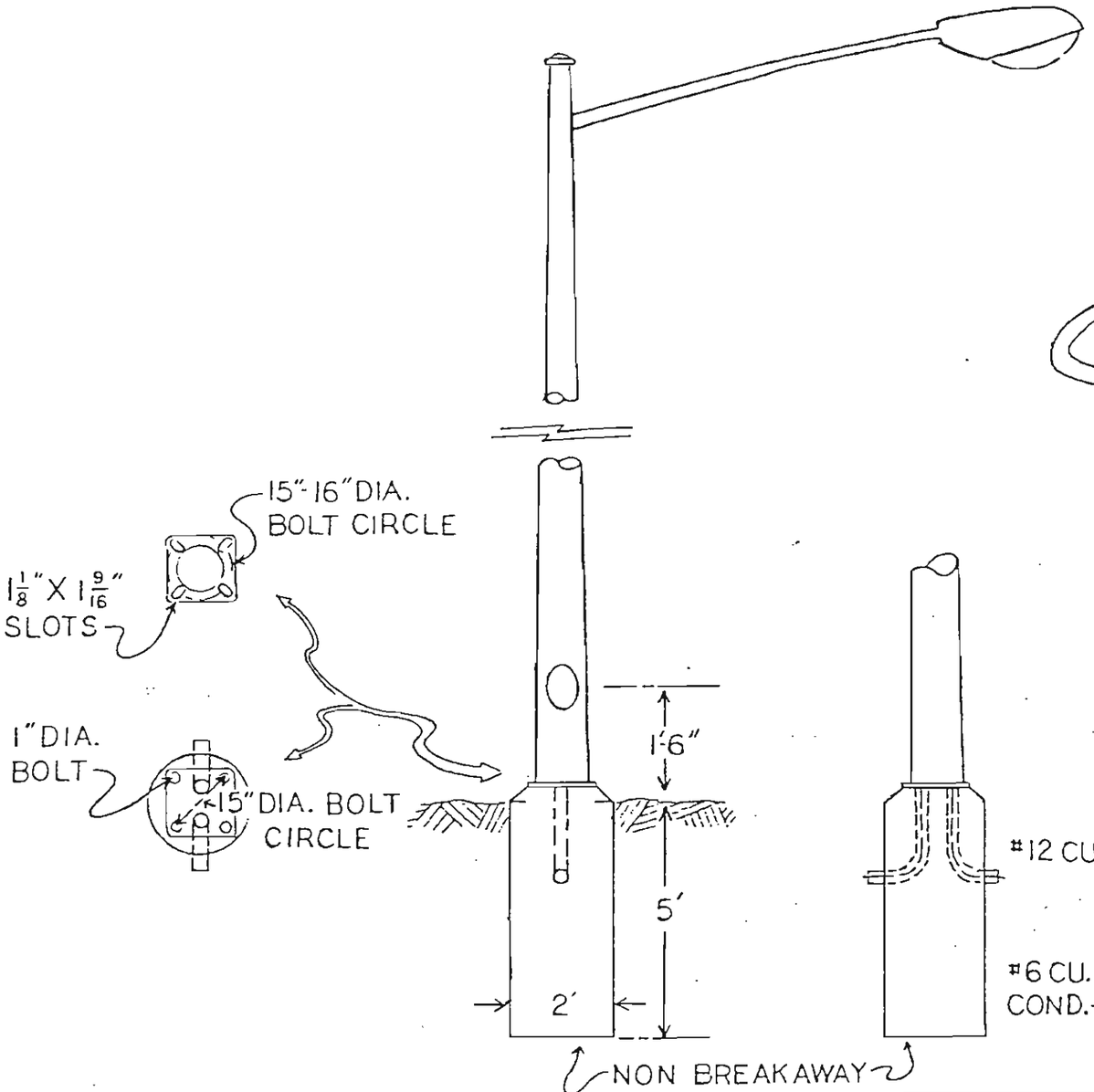
CHECKED BY
DETAILED BY

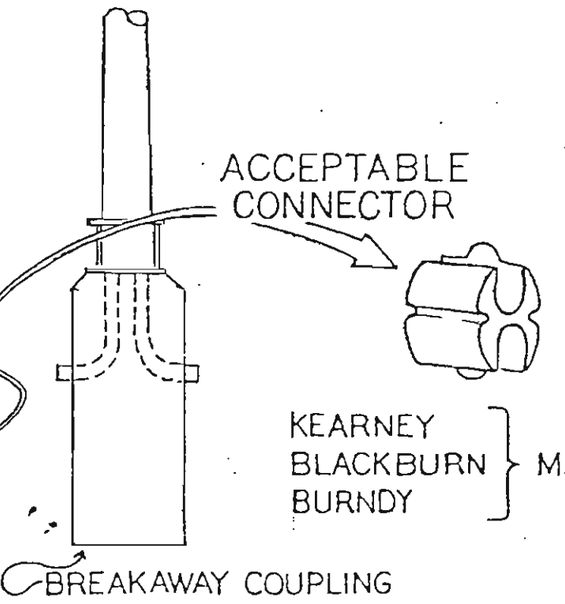
STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
H. D. H. FORM NO. 126
REV. FEB. 1984

AS CONSTRUCTED	FED ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	SHEET TOTALS
NO REVISIONS 12-12-88 REVISED VOID	VIII	COLO.	I 70-3(140)	23	57

LIGHTING WIRING DESIGN







All wiring shall meet the requirements of the National Electrical Safety Code.

	DATE	EXPLANATION		DATE
C.P.E.G.S. NO.		ENGR.	LUCERO	
W.O. J.O. NO.		EST.		
M.S.T. & T. NO.		APPV'D		

PUBLIC SERVICE CO. OF COLORADO

ELEC. DISTRIBUTION ENG. DEPT.

SCALE	SEC.	TWP.	RNG.	QUARTER SEC.	DESCRIPTION
0 N.T.S.					

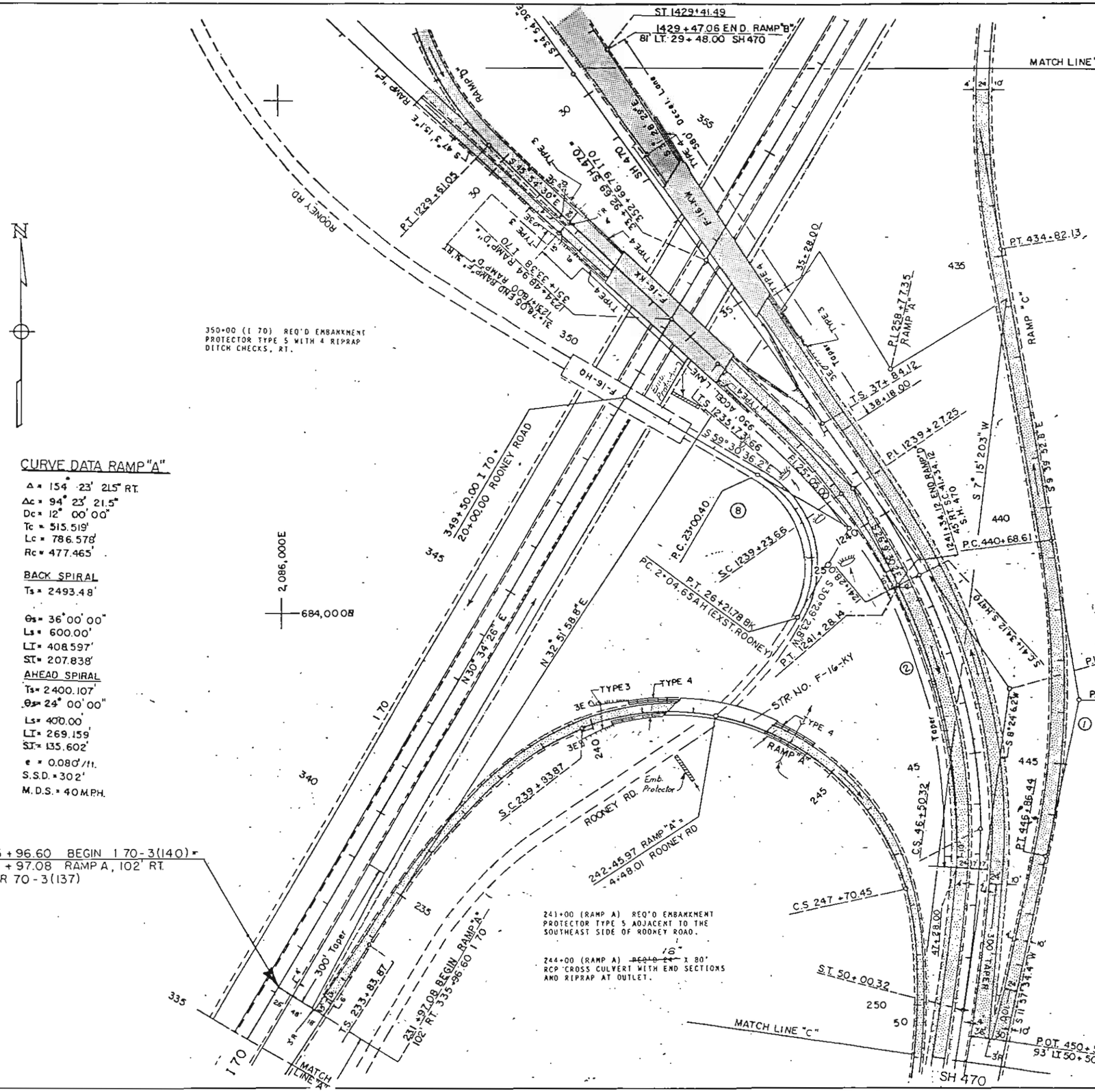
GRID NO.				EXCAVATION PERMIT REQUIRED NO ☐ YES ☐	FEEDER NO.
VER.	HOR.	VER.	HOR.		
				SHEET OF	PRIOR TO SCHEDULING JOB. CALL ENGR. FOR STAKES--

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	24	57

AS CONSTRUCTED

NO REVISIONS ☐ REVISED 12-12-85 VOID ☐

DETAILS OF I70/SH 470 INTERCHANGE



CURVE DATA RAMP "A"

Δ = 154° 23' 21.5" RT.
Δc = 94° 23' 21.5"
Dc = 12° 00' 00"
Tc = 515.519'
Lc = 786.578'
Rc = 477.465'

BACK SPIRAL
Ts = 2493.48'
θs = 36° 00' 00"
Ls = 600.00'
LT = 408.597'
ST = 207.838'

AHEAD SPIRAL
Ts = 2400.107'
θs = 24° 00' 00"
Ls = 400.00'
LT = 269.159'
ST = 135.602'
e = 0.080'/ft.
S.S.D. = 302'
M.D.S. = 40 M.P.H.

STA. 335 + 96.60 BEGIN I 70-3(140)
STA. 231 + 97.08 RAMP A, 102' RT.
ON I-IR 70-3(137)

CURVE DATA SH 470

Δ = 43° 18' 36.2" RT.
Ts = 631.605'
ES = 91.807'
Δc = 25° 48' 36.2"
Dc = 5° 00' 00"
Tc = 262.556'
Lc = 516.201'
Rc = 1145.916'
θs = 8° 45' 00"
Ls = 350.00'
LT = 233.619'
ST = 116.926'
e = 0.080'/ft.
S.S.D = 584'
M.D.S. = 60 M.P.H.

② CURVE DATA RAMP "D"

Δ = 19° 44' 59.8" R.T.
Ts = 353.597' (Back)

Δc = 10° 38' 32.3"
Dc = 5° 12' 15.7"
Tc = 102.539'
Lc = 204.488'
Rc = 1100.919'
θs = 9° 6' 27.5" (Back)
Ls = 350.00' (Back)
LT = 233.643' (Back)
ST = 116.948' (Back)
e = 0.080'/ft.
S.S.D = 584'
M.D.S = 60 M.P.H.

① CURVE DATA RAMP "C"

Δ = 21° 37' 27.2" RT.
D = 3° 30' 00"
T = 312.637'
L = 617.835'
R = 1637.022'
E = 29.586'
e = 0.058'/ft.
S.S.D > 600'
M.D.S. = 50 M.P.H.

⑧ CURVE DATA ROONEY ROAD

Δ = 90° 0' 0.0" RT.
D = 28° 0' 13.7"
T = 204.600'
L = 321.385'
R = 204.600'
E = 84.748'
e = 0.080'/ft.
S.S.D. = 350'
M.D.S. = 25 M.P.H.

PAVING THIS PROJECT

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	25	

AS CONSTRUCTED

NO REVISIONS | REVISED | VOID

DETAILS OF I 70 / SH 470 INTERCHANGE

2,086,000E

687,000N

2,087,000E

687,000N

686,000 N

N

⑦ CURVE DATA RAMP "B" ⑥

Δ = 82° 59' 24.6" LT.	Δ = 159° 03' 30.4" LT.
Δc = 69° 21' 32.2"	Δc = 119° 16' 20"
Dc = 13° 37' 52.4"	Dc = 19° 53' 35.2"
Tc = 290.826'	Tc = 491.624'
Lc = 508.824'	Lc = 599.565'
Rc = 420.328'	Rc = 288.018'
AHEAD SPIRAL	BACK SPIRAL
Ts = 471.135'	Ts = 1800.078'
θs = 13° 37' 52.4"	θs = 40° 00' 00"
Ls = 200.00'	Ls = 400.00'
L.T. = 133.731'	L.T. = 273.809'
S.T. = 67.028'	S.T. = 139.849'
e = 0.069'/ft.	e = 0.079'/ft.
S.S.D. > 600'	S.S.D. = 279'
M.D.S. = 30 M.P.H.	M.D.S. = 30 M.P.H.

⑤ CURVE DATA RAMP "D" ④

Δ = 129° 29' 3.7" LT.	Δ = 53° 0' 7.7" RT.
D = 10° 00' 00"	D = 12° 00' 00"
T = 1214.415'	T = 238.066'
L = 1294.844'	L = 441.684'
R = 572.958'	R = 477.465'
E = 769.832'	E = 56.255'
e = 0.077'/ft.	e = 0.080'/ft.
S.S.D > 600'	S.S.D. > 600'
M.D.S. = 40 M.P.H.	M.D.S. = 40 M.P.H.

③ CURVE DATA RAMP "C"

Δ = 40° 9' 16.6" LT
D = 3° 30' 00"
T = 598.330'
L = 1147.275'
R = 1637.022'
E = 105.918'
e = 0.058'/ft.
S.S.D > 600'
M.D.S = 50 M.P.H.

MATCH LINE "E"

P.I. 1430+47.82

I 70

STA. 369 + 48.67 END I 70-3(140)=
STA. 1207 + 17.30 RAMP D, 90' LT.
ON I-IR 70-3(143)

PC. 1207+17.30 BEGIN RAMP "D"
90' LT. 369+48.67 I 70

PC. 371+76.28

1100' TRANSITION 5 TO 4 LANES

S 51° 30' 55.6" W

CENTER OF GORE AREA = "D"
PT 1211+68.98
90' LT. 1208+69.91 RAMP "D"
81' LT. 367+85.23 I 70

N 30° 34' 26" E

S 30° 34' 26" W

P.C. 1216+66.21

P.I. 1209+55.36

S. 83° 34' 33" W
RAMP "D"

P.I. 1228+80.62

S 45° 54' 30" E

ROONEY RD.

RAMP "A"

RAMP "D"

P.T. 1422+32.66
P.C. 1422+32.66

P.I. 1426+08.45

P.C. 1416+33.10

T.S. 1412+33.10 BEGIN RAMP "B"
78' LT. 357+99.67 I 70

C.S. 1427+41.49

ST 1429+41.49

1429+47.06 END RAMP "B"
81' LT. 29+48.00 SH 470

SH 470

RAMP "B"

RAMP "C"

P.C. 423+32.96 BEGIN RAMP "C"
90' RT. 366+31.08 I 70

P.I. 429+32.15

I 70

MATCH LINE "D"

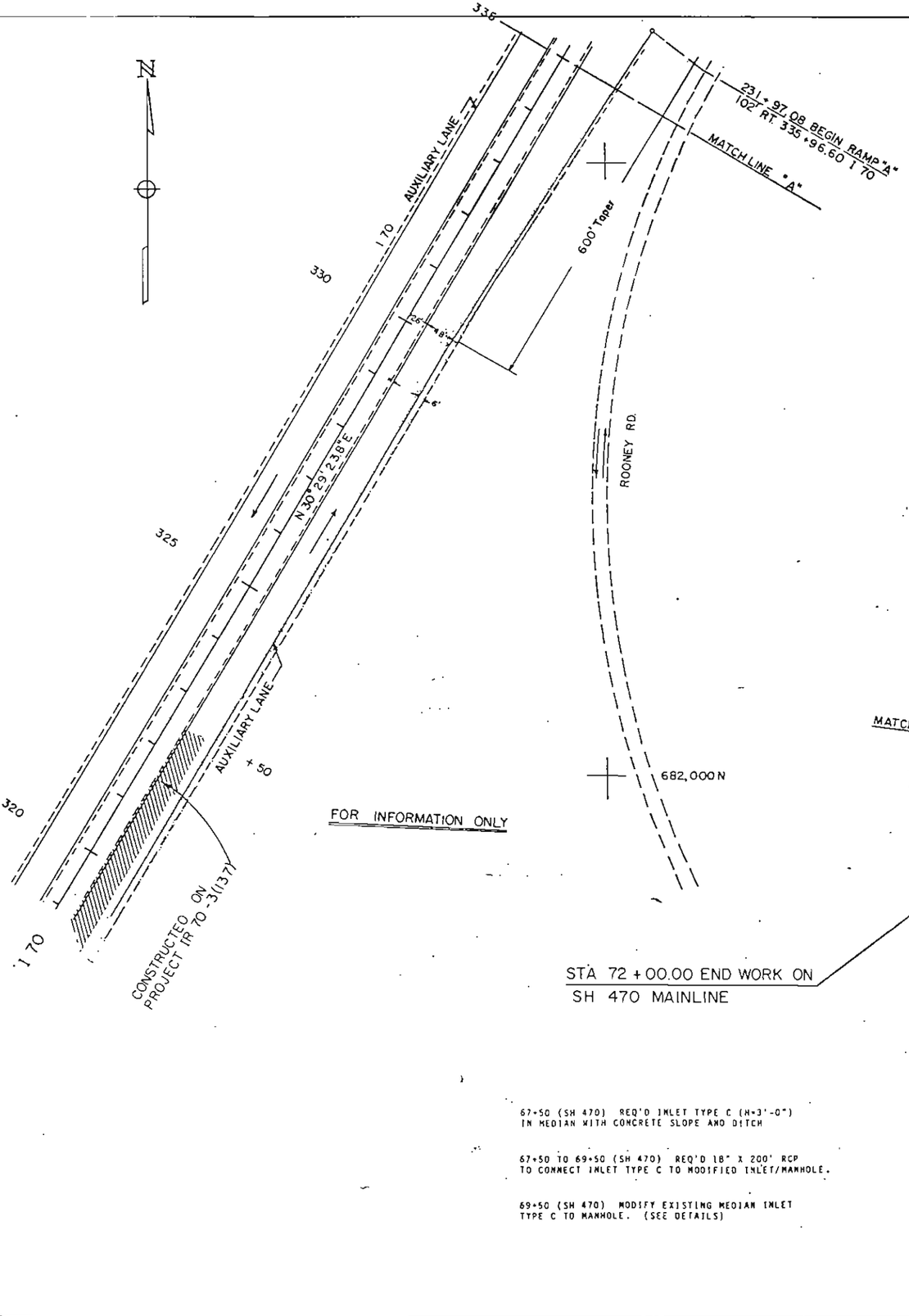
PAVING THIS PROJECT

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	26	57

AS CONSTRUCTED

NO REVISIONS ☐ REVISED 12-88 VOID ☐

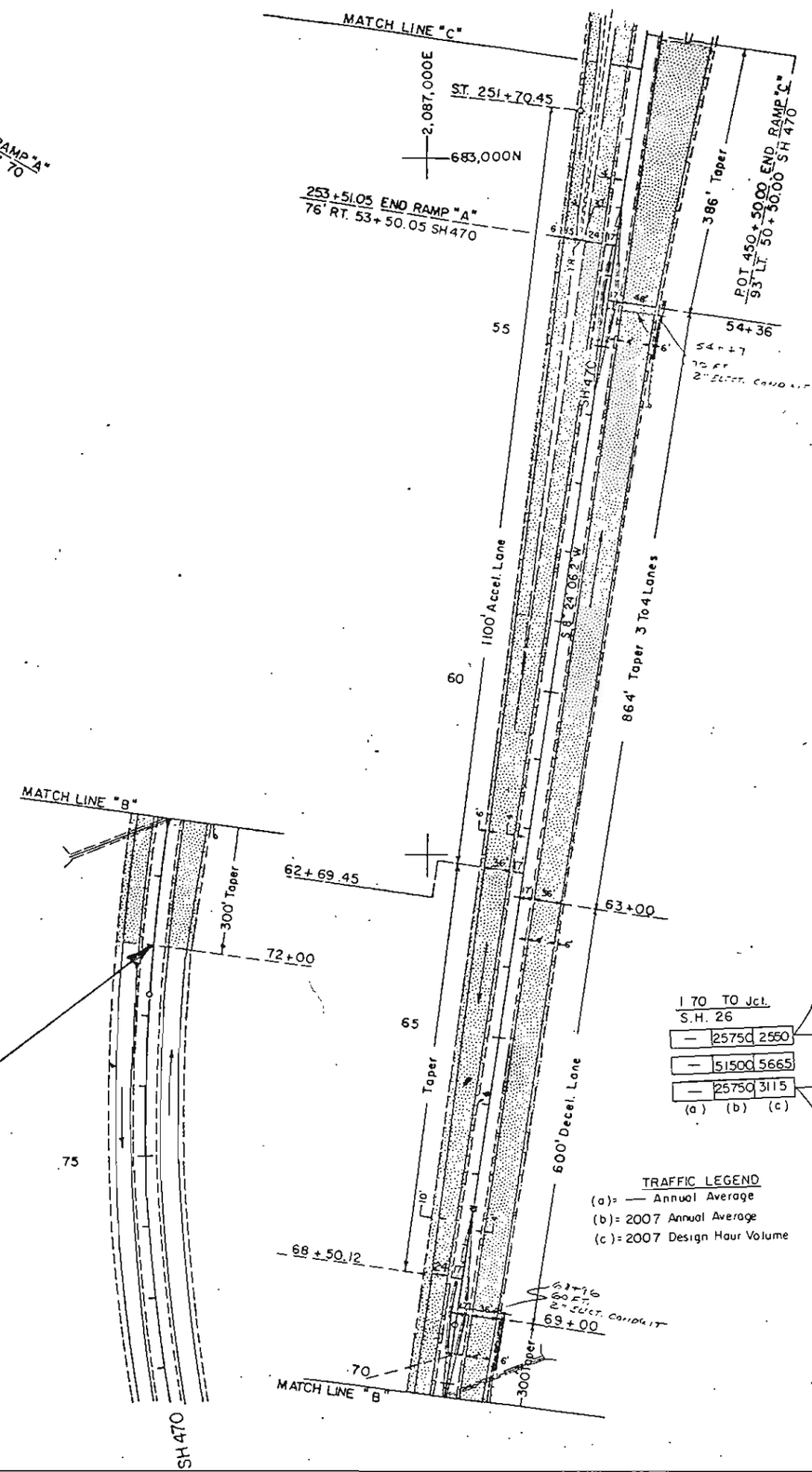
DETAILS OF I70 / SH470

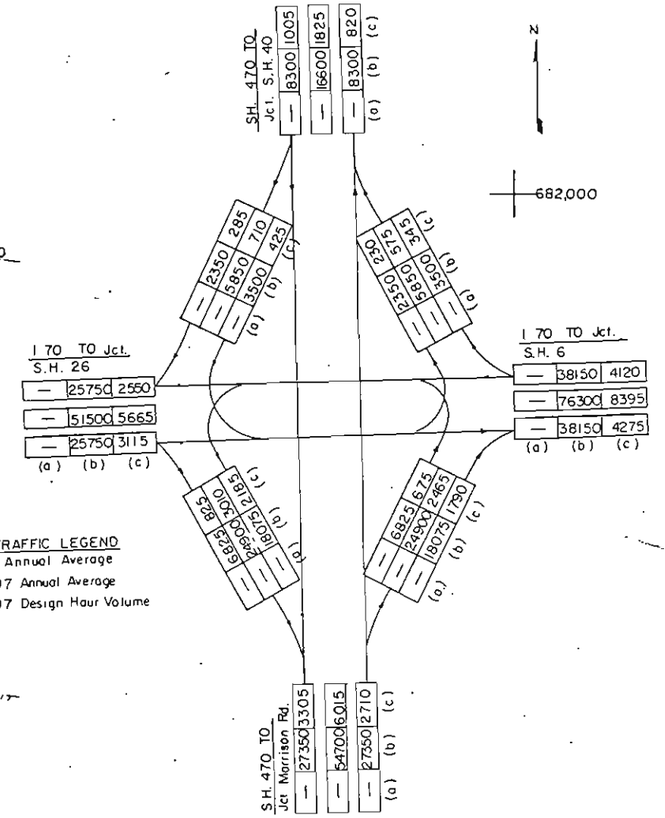


67+50 (SH 470) REQ'D INLET TYPE C (H=3'-0") IN MEDIAN WITH CONCRETE SLOPE AND DITCH

67+50 TO 69+50 (SH 470) REQ'D 18" X 200' RCP TO CONNECT INLET TYPE C TO MODIFIED INLET/MANHOLE.

69+50 (SH 470) MODIFY EXISTING MEDIAN INLET TYPE C TO MANHOLE. (SEE DETAILS)

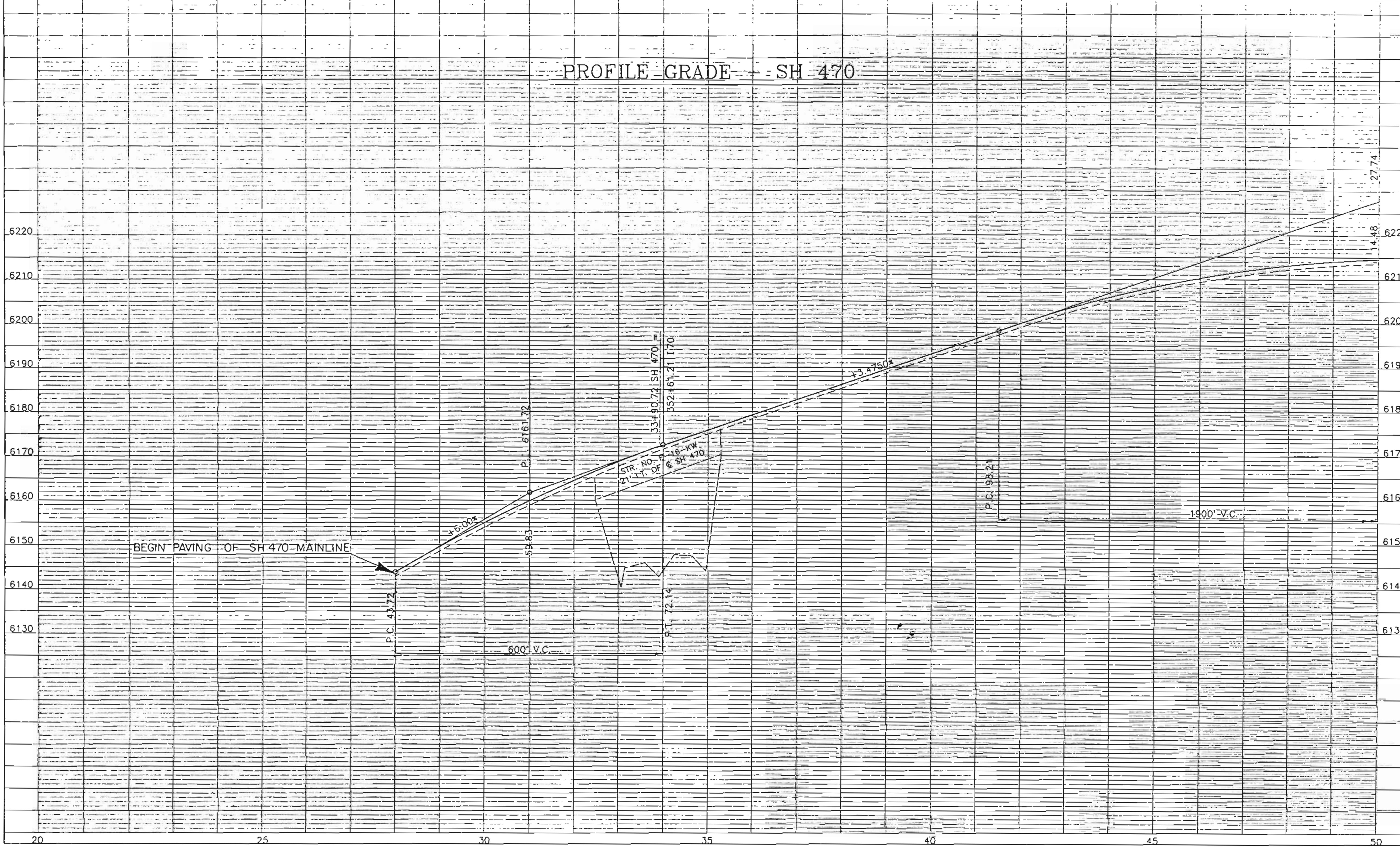




PAVING THIS PROJECT

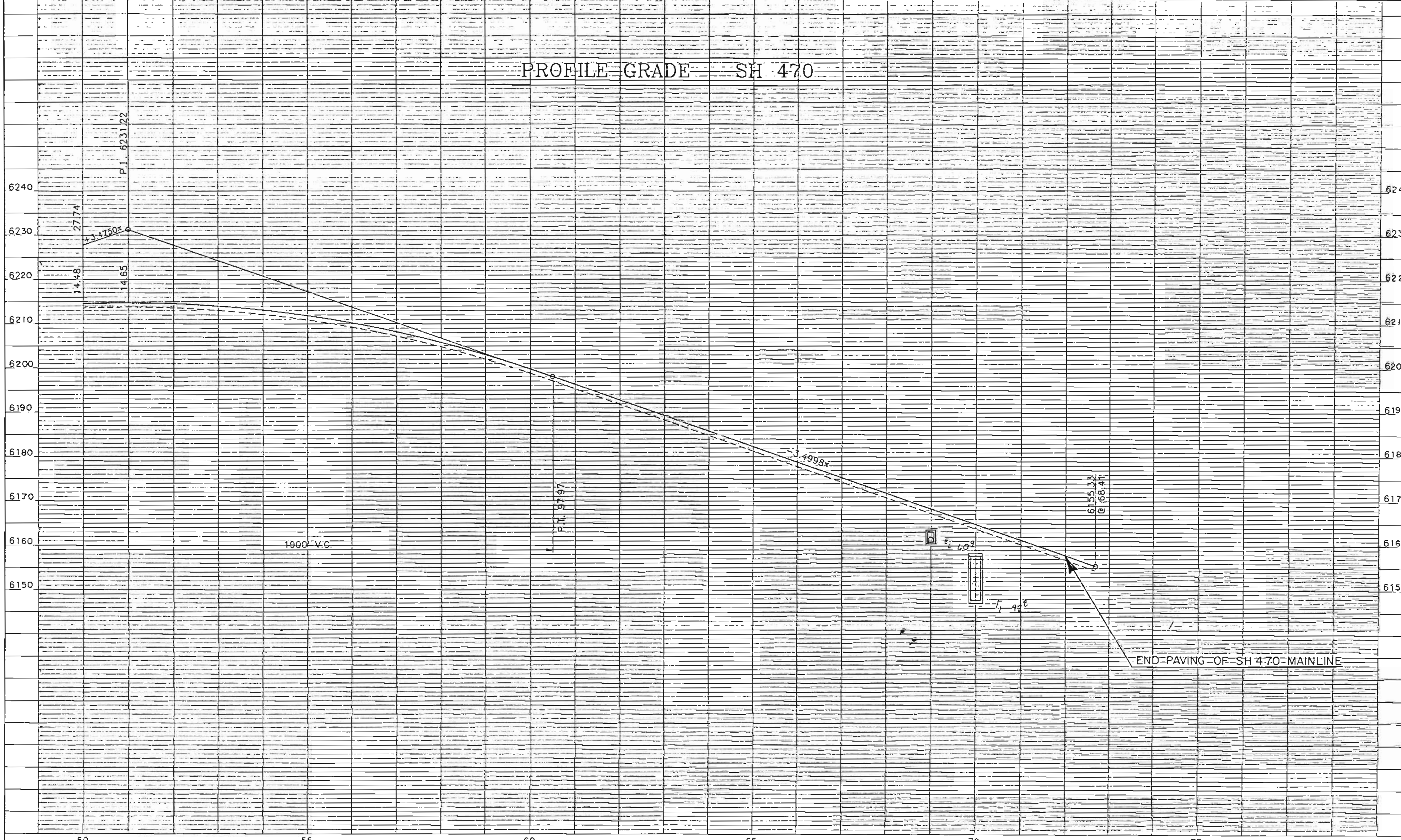
STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO.
REV. NOV. 1983

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS	REVISED	VOID		COLO.	I 70 3(140)	27



STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 1??:
REV. NOV. 1983:

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS [illegible]	REVISED	VOID	VIII	COLO.	I 70-3(140)	28



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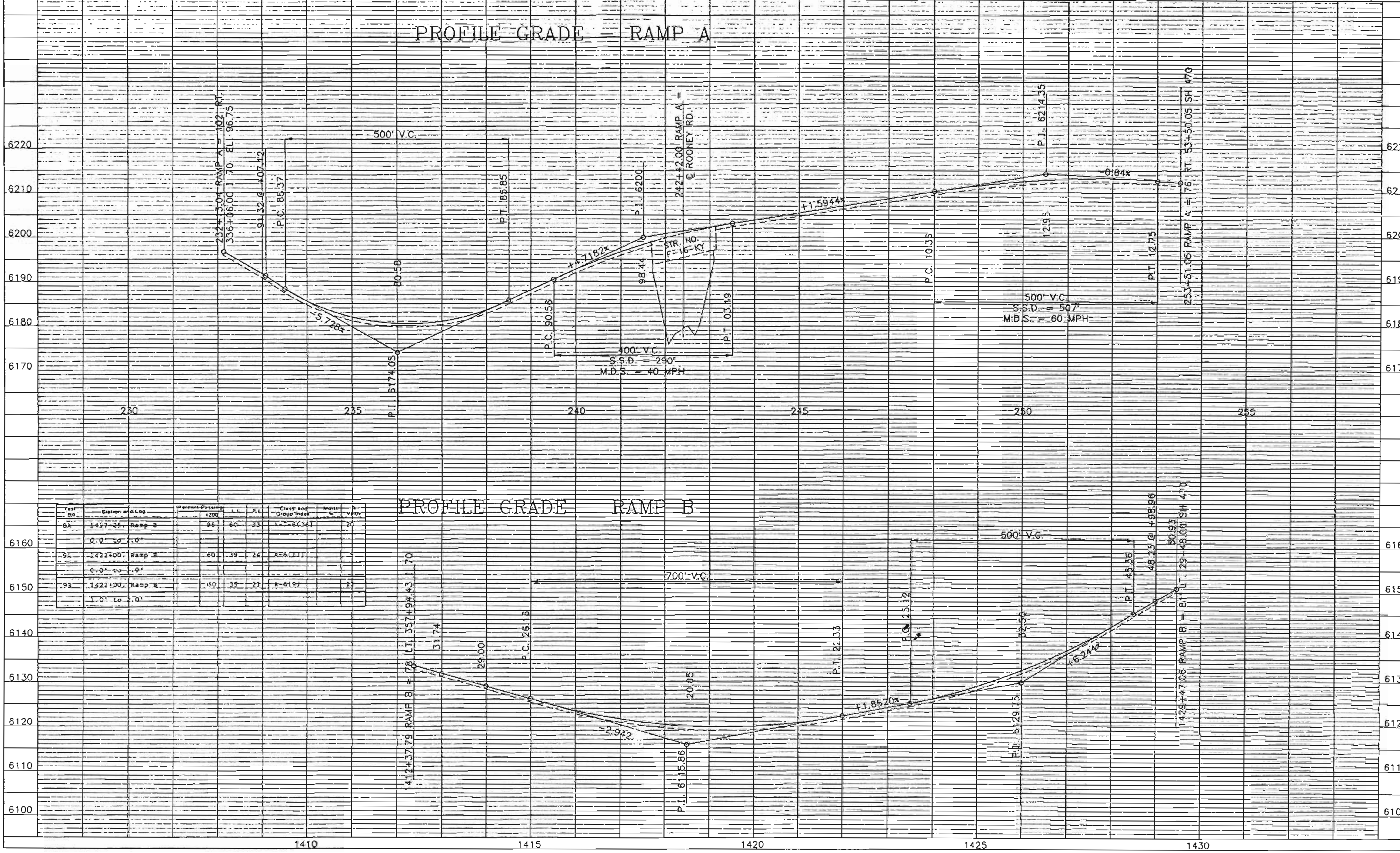
STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS:
DIVISION OF HIGHWAYS:
D.O.H. FORM NO. 146:
REV. NOV. 1983:

AS CONSTRUCTED	FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS 12-12-77 REVISED VOID	VIII	COLO.	I 70-3(140)	29



PROFILE GRADE - RAMP A
500' V.C.
232+13.04 RAMP A = 102' RT. 336+06.00 I 70 EL. 96.75
9.32 @ +07.42
P.C. 86.37
P.T. 85.85
80.56
P.I. 6174.05
-5.726%
+4.7182%
P.C. 90.56
P.I. 6200
98.44
242+42.00 RAMP A = ℄ ROONEY RD.
STR. NO. F-16-KY
P.T. 03.19
400' V.C.
S.S.D. = 290'
M.D.S. = 40 MPH
+1.5944%
P.C. 10.35
P.I. 6214.35
12.95
-0.64%
P.T. 12.75
253+51.05 RAMP A = 76' RT. 53+50.05 SH 470
500' V.C.
S.S.D. = 507'
M.D.S. = 60 MPH
230
235
240
245
250
255
PROFILE GRADE RAMP B
1412+37.79 RAMP B = 78' LT. 357+94.43 I 70
31.74
29.00
P.C. 26.13
700' V.C.
-2.942%
20.05
P.I. 6115.86
P.T. 22.33
+1.8520%
P.C. 25.12
32.50
P.I. 6129.75
500' V.C.
+6.244%
P.T. 45.36
48.25 @ +98.96
50.93
1429+47.06 RAMP B = 81' LT. 29+48.00 SH 470
6220
6210
6200
6190
6180
6170
6160
6150
6140
6130
6120
6110
6100
1410
1415
1420
1425
1430

Test No.	Station and Log	Percent Passing #200	L.L.	P.I.	Class and Group Index	Moist %	R Value
8A	1417+25, Ramp B	95	60	33	A-7-6(26)		20
	0.0' to 2.0'						
9A	1422+00, Ramp B	60	39	24	A-6(11)		9
	0.0' to 1.0'						
93	1622+00, Ramp B	60	35	21	A-6(9)		12
	1.0' to 2.0'						

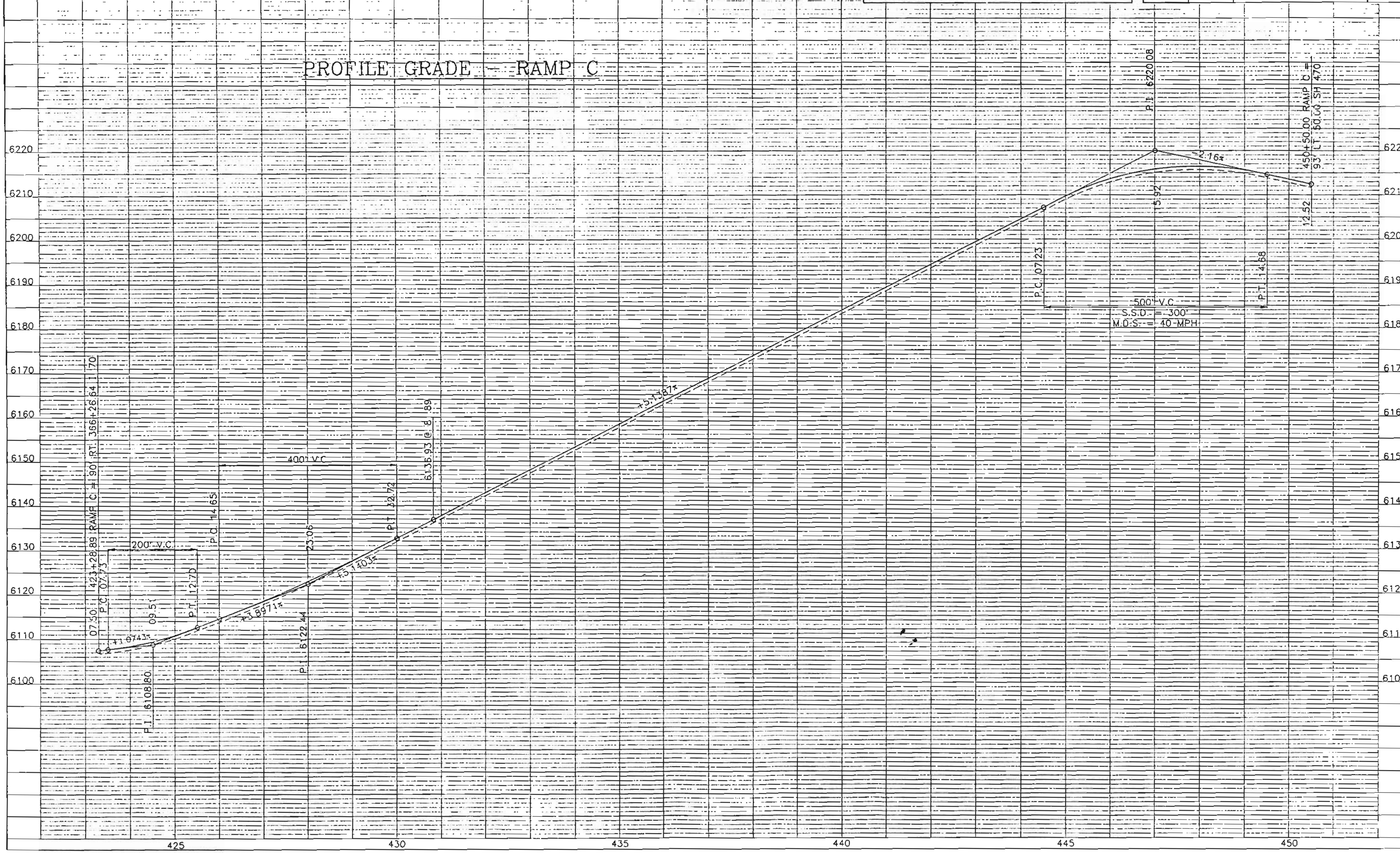
WO number 1/87 12:24:52 _DUR:(DRAW:P.182014.ROWY:H01.PPS) RAMP_AB

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO. 1??
REV. NOV. 1983

AS CONSTRUCTED		
NO REVISIONS 12-12-97	REVISED	VOID

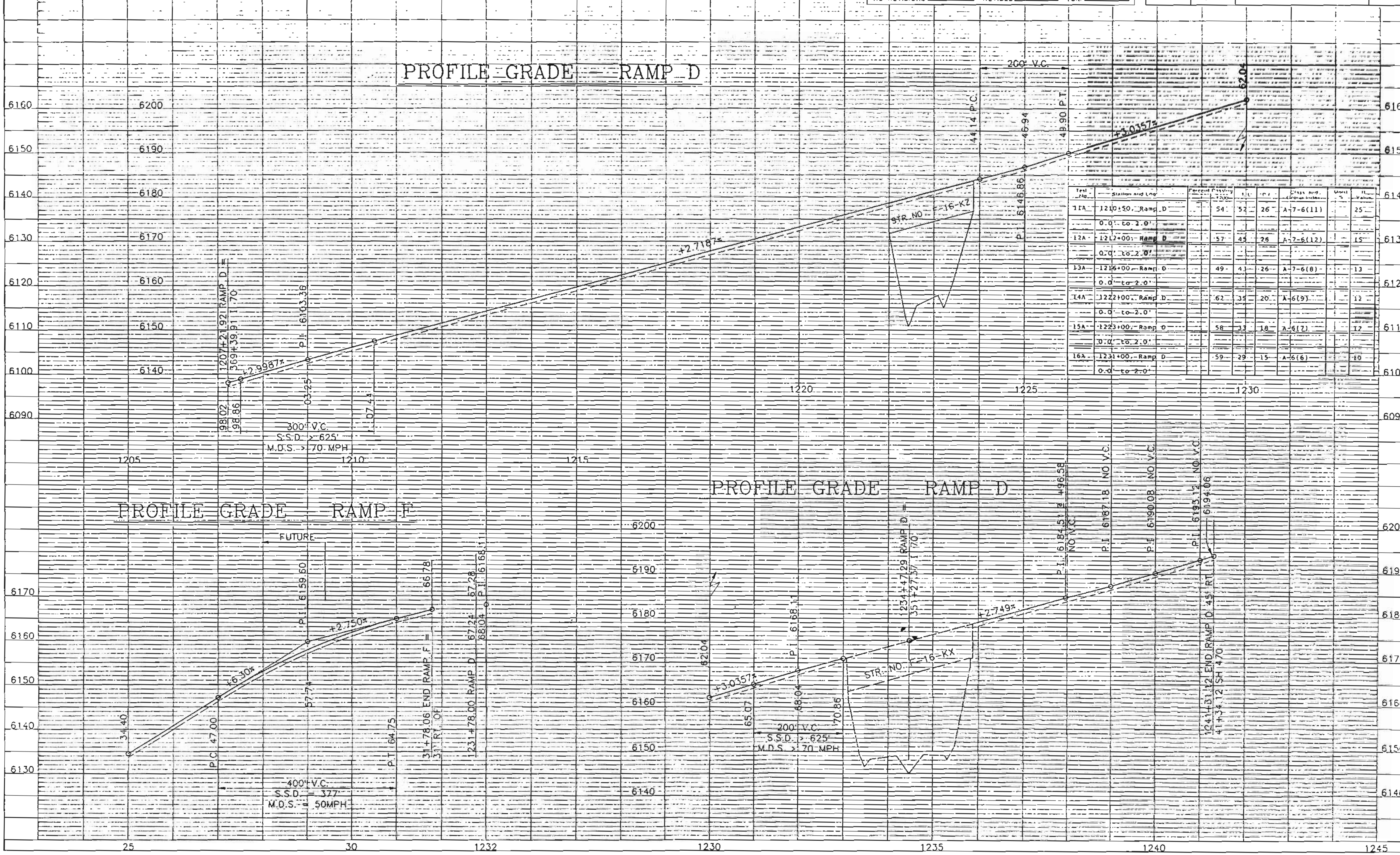
FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
VIII	COLO.	I 70-3(140)	30

PROFILE GRADE – RAMP C



STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D.O.H. FORM NO.
REV. NOV. 1983

AS CONSTRUCTED	FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS 12-12-?? REVISED VOID	VIII	COLO.	I 70-3(140)	31



Test No.	Station and Log	Percent Passing	#200	L.L.	P.I.	Class and Group Index	Moist %	R Value
11A	1210+50, Ramp D		54	52	26	A-7-6(11)		25
	0.0' to 2.0'							
12A	1212+00, Ramp D		57	45	26	A-7-6(12)		15
	0.0' to 2.0'							
13A	1216+00, Ramp D		49	41	26	A-7-6(8)		13
	0.0' to 2.0'							
14A	1222+00, Ramp D		62	35	20	A-6(9)		12
	0.0' to 2.0'							
15A	1223+00, Ramp D		58	33	18	A-6(7)		12
	0.0' to 2.0'							
16A	1231+00, Ramp D		59	29	15	A-6(6)		10
	0.0' to 2.0'							

HQ number 0..27/87 17:51:47 _DUA1:[DRAW.PJ.82011.ROHY.H101.PPS] RAMP.DF

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D. O. H. FORM NO. 826
DEC. 1963

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS ☐	REVISED 12-12-88	VOID ☐	VIII	COLO.	I 70-3(140)	32	57

TABULATION OF SIGNING QUANTITIES

ITEM NO.	ITEM	UNIT	PROJECT TOTALS	
202	REM. BARRICADE	EACH	2	
202	REM. PAVEMENT MARKING	SQ. FT	~~1,170~~	1,138 ⑤
202	REM. SIGN PANEL	EACH	4	
202	REM. GD. RAIL TY 4	LIN. FT.	~~1,442~~	890
614	SIGN PANEL (CL. I)	SQ. FT.	~~228~~	313.5
614	SIGN PANEL (CL. II)	SQ. FT.	~~520~~	852 ③
614	SIGN PANEL (CL. III)	SQ. FT.	~~1759~~	2,135
614	TIMBER SIGN POST (6x6)	LIN. FT.	~~580~~	1037
614	STEEL SIGN POST (W10x26)	LIN. FT.	~~49~~	94.5
614	CONC. FOOTING (TY C)	EACH	~~2~~	4
614	CONC. FOOTING VII (SPREAD)	EACH	1	
614	CONC. FOOTING II-S (SPREAD)	EACH	4	
614	MASK SIGN LEGEND	EACH	~~7~~	6
614	MODIFICATION SIGN LEGEND	LS	1	
614	SIGN BR STR (70<75)	EACH	1	
614	SIGN BR STR (80<85)	EACH	1	
614	CANT STR. (25<30)	EACH	4	
614	BARRICADE (3M-A)	EACH	~~30~~	34
614	CONST TRAF. SIGN (A)	EACH	~~8~~	2
614	CONST TRAF. SIGN (B)	EACH	~~34~~	37
614	VERTICAL PANEL	EACH	~~70~~	79
614	VERTICAL PANEL (LIGHT) (F)	EACH	~~24~~	34
614	FLASH ARROW PANEL (C TY)	EACH	2	
614	TRAFFIC CONE	EACH	~~50~~	180
627	THERMOPLASTIC PVMT MKG	SQ. FT.	~~16,159~~	14,241
627	PLASTIC PVMT MKG (60 MILS)	SQ. FT.	~~1,300~~	1,330

SCHEDULE OF CONSTRUCTION TRAFFIC SIGNS

SIGNS ②④						OTHER DEVICES		
			PANEL SIZE					
SIGN CODE	LEGEND	DIMENSIONS	A	B	C	ITEM	QUANTITY	
48W120-1	ROAD/CONSTRUCTION/(DIST)	48"x48"		~~12~~		ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL (TYPE)	2	
60G20-2	END/CONSTRUCTION	60"x24"		2		VERTICAL PANEL	~~70~~	79
48W4-2(L)	LEFT LANE TRANSITION	48"x48"		4		VERTICAL PANEL (LIGHT) (F)	~~24~~	34
48W4-2(R)	RIGHT LANE TRANSITION	48"x48"		4		TRAFFIC CONE (28")	~~50~~	180
48W20-5( )	( ) LANE/CLOSED/(D) AHEAD	48"x48"		4				
48W20-7a	FLAGGER SYMBOL	48"x48"		4				
48W20-5D	BE/PREPARED/TO/STOP	48"x48"		2				
60G2D-1	ROAD/CONST/ NEXT 3 MILES	60"x36"		2				
BARRICADE	(TY 2)		8					
SIGN TOTALS			~~8~~ 2	~~34~~ 37				

① ALL SPECIAL REQUIREMENTS FOR CONSTRUCTION TRAFFIC CONTROL DEVICES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE ITEM.

② CONSTRUCTION WARNING SIGNS SHALL BE FURNISHED WITH "HIGH BRIGHTNESS ENCAPSULATED TYPE REFLECTIVE SHEETING". SEE SECTION 713 OF THE STANDARD SPECIFICATIONS.

③ W20-5( ) ADVANCE WARNING SIGNS SHALL BE FURNISHED WITH EXCHANGEABLE PLAQUES READING "RIGHT", "LEFT", AND "CENTER", AT NO ADDITIONAL COST.

④ SIGNS MUST BE PERMANENTLY MOUNTED UNLESS OTHERWISE APPROVED BY THE ENGINEER. (SEE STANDARD S-614-1)

⑤ INCLUDES 2-"1 MILES", 2-"2 MILES", 2-"3 MILES" FOR EASTBOUND AND 2-"AHEAD", 2-"½ MILE", 2-"1 MILE" FOR WESTBOUND.

⑥ THE CONTRACTOR WILL BE REQUIRED TO COVER ALL SIGNS WHICH CONFLICT WITH CONSTRUCTION SIGNING AS INCIDENTAL TO TRAFFIC CONTROL.

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D. O. H. FORM NO. 822
DEC. 1983

AS CONSTRUCTED	FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS [ ] REVISED 12-12-87 VOID [ ]	VIII	COLO.	I 70-3(140)	33

TABULATION OF SIGNS

SIGN NO.	SIGN CODE	STATION	SIGN PANEL SIZE	BACK-GROUND COLOR	REMOVE GROUND SIGN (EACH)	RESET GROUND SIGN (EACH)	NO. OF POSTS	LENGTH OF POST	POST TYPE (LIN. FT.)											CONC. FOOTING TYPE (EACH)								SIGN PANEL (SQ. FT.)		
									4 x 4 TIMBER	6 x 6 TIMBER	W6x12 BEAM	W6x15 BEAM	W8x18 BEAM	W8x21 BEAM	W10x22 BEAM	W10x26 BEAM	W12x35 BEAM	W12x40 BEAM	U-2	1	2	3	4	5	6	7	8	CLASS I	CLASS II	CLASS III
1	SEE TABULATION OF OVERHEAD SIGN																													
2	SEE TABULATION OF OVERHEAD SIGN																													
3A	48R3-7aR	320+00 I-70	48"x48"	WHITE			1	19'-0"		19.0																			16.00	
3B	SPECIAL		48"x18"	WHITE																									6.00	
4	SEE TABULATION OF OVERHEAD SIGN																													
5	SEE TABULATION OF OVERHEAD SIGN																													
6	48R3-7aR	330+00 I-70	48"x48"	WHITE				MOUNT ON OVERHEAD SIGN POST																					16.00	
7	48W13-2(40)	334+00 I-70	48"x60"	YELLOW		232	1	18'-6"		18.5																			20.00	
8		I-70 EB @ Ramp A			REMOVE ~~900~~ CONCRETE BARRIER (TEMP)																									
9	SPECIAL	338+40 I-70	9'x5'	GREEN ▲			2	18'-0"		36.0																				45.00
10		1414+80 RAMP "B"			REMOVE BARRICADE (TYPE 3M-B)																									
11	SPECIAL	367+30 I-70	9'x5'	GREEN ▲			2	18'-0"		36.0																				45.00
12	SEE TABULATION OF OVERHEAD SIGN																													
13	SPECIAL	369+50 I-70	60"x48"	WHITE				MOUNT ON OVERHEAD SIGN POST																					20.00	
14					REMOVE ~~542~~ CONCRETE BARRIER (TEMP)																									
15	48W4-2(L)	428+60 RAMP "C"	48" DIAMOND	YELLOW			1	18'-6"		18.5																			16.00	
16	48W4-2(L)	428+60 RAMP "C"	48" DIAMOND	YELLOW			1	18'-6"		18.5																			16.00	
17	48W4-1(R)	362+40 I-70	48" DIAMOND	YELLOW			1	18'-6"		18.5																			16.00	
18	48W4-1(R)	362+00 I-70	48" DIAMOND	YELLOW			1	18'-6"		18.5																			16.00	
19		425+60 RAMP "C"			REMOVE BARRICADE (TYPE 3M-B)																									
20	48W13-2(40)	374+50 I-70	48"x60"	YELLOW			1	18'-6"		18.5																			20.00	
21A	SPECIAL	379+60 I-70	60"x48"	WHITE			1	19'-0"		19.0																			20.00	
21B	SPECIAL		60"x18"	WHITE																									7.50	
22	SEE TABULATION OF OVERHEAD SIGN																													
23A	30M3-2a	377+00 I-70	30"x15"	BLUE			1	16'-0"		16.0																			3.13	
23B	36M1-1(70)		36"x36"	RED&BLUE																									9.00	
24	48R2-1(55)	387+00 I-70	48"x60"	WHITE			1	18'-6"		18.5																			20.00	
25	SPECIAL	406+50 RAMP "E"	13"x11"	GREEN			1-1	22'-6" 26'-6"			MASK SIGN LEGEND					49.0									2					137.00
26	SEE TABULATION OF OVERHEAD SIGN																													
27	SEE TABULATION OF OVERHEAD SIGN																													
28	SEE TABULATION OF OVERHEAD SIGN																													
29	SEE TABULATION OF OVERHEAD SIGN																													
30	30+50 TO 59+50			~~30~~ 34 TYPE 3M-A BARRICADE 100' INTERVALS																										
31	SEE TABULATION OF OVERHEAD SIGN																													
32	48R2-1(55)	1230+00 RAMP "D"	48"x60"	WHITE			1	18'-6"		18.5																			20.00	
33	48R2-1(55)	1231+00 RAMP "D"	48"x60"	WHITE			1	18'-6"		18.5																			20.00	
34	36W1-8	1427+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
35	36W1-8	1426+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
36	36W1-8	1425+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
37	36W1-8	1423+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
38	36W1-8	1422+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
39	36W1-8	1421+00 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
40	36W1-8	1422+50 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
41	36W1-8	1421+50 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
42	36W1-8	1420+50 RAMP "B"	36"x48"	YELLOW ▲			1	17'-6"		17.5																			12.00	
43A	48W1-2aR	36+00	48" DIAMOND	YELLOW			1	19'-0"		19.0																			16.00	
43B	24W13-1(30)		24"x24"	YELLOW																									4.00	
44A	48W1-2aR	36+00	48" DIAMOND	YELLOW			1	19'-0"		19.0																			16.00	
44B	24W13-1(30)		24"x24"	YELLOW																									4.00	

☆ (signs 31–44)

NOTES:

1. POST LENGTHS ARE APPROXIMATE ONLY. EXACT LENGTHS TO BE DETERMINED BY THE ENGINEER.

▲ 2. REFLECTIVE SHEETING SHALL BE HIGH BRIGHTNESS ENCAPSULATED TYPE. SEE SECTION 713 OF THE STANDARD SPECIFICATIONS.

☆ 3. SEE THE PROJECT SPECIAL PROVISION FOR DARK TAN PAINTING.

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D. O. H. FORM NO. 822
DEC. 1983

AS CONSTRUCTED			FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.
NO REVISIONS	REVISED	VOID	VIII	COLO.	I 70-3(140)	34

TABULATION OF SIGNS

SIGN NO.	SIGN CODE	STATION	SIGN PANEL SIZE	BACK-GROUND COLOR	REMOVE GROUND SIGN (EACH)	RESET GROUND SIGN (EACH)	NO. OF POSTS	LENGTH OF POST	POST TYPE (LIN. FT.) 4 x 4 TIMBER	6 x 6 TIMBER	W6x12 BEAM	W6x15 BEAM	W8x18 BEAM	W8x21 BEAM	W10x22 BEAM	W10x26 BEAM	W12x35 BEAM	W12x40 BEAM	U-2	CONC. FOOTING TYPE (EACH) 1	2	3	4	5	6	7	8	SIGN PANEL (SQ. FT.) CLASS I	CLASS II	CLASS III
45A	30M3-4a		30"x15"	BLUE																									3.13	
45B	36M1-1(70)		36"x36"	RED&BLUE																									9.00	
45C	SPECIAL	49+60	30"x24"	BLUE			1	18'-0"		18.0																			5.00	
45D	30M3-2a		30"x15"	BLUE																									3.13	
45E	36M1-1(70)		36"X36"	RED&BLUE																									9.00	
☆ 45F	SPECIAL		30"x24"	BLUE																									5.00	
46	SEE TABULATION OF OVERHEAD SIGN																													
47	48R2-1(40)	41+00	48"x60"	WHITE			1	18'-6"		18.5																			20.00	
48	48R2-1(40)	41+00	48"x60"	WHITE			1	18'-6"		18.5																			20.00	
49	48W4-1(R)	50+00	48" DIAMOND	YELLOW			1	18'-6"		18.5																			16.00	
50	48W13-2(50)	52+00	48"x60"	YELLOW			1	18'-6"		18.5																			20.00	
51	SEE TABULATION OF OVERHEAD SIGN																													
	PROJECT TOTALS									580.0						49.0									2				519.89	227.00
	CHEVRON	RAMP A	36"x48"				4	17.5		70.0																			48.0	
	CHEVRON	RAMP C	36"x48"				7	17.5		122.5																			84.0	
	CHEVRON	RAMP B	36"x48"				6	17.5		105.0																			72.0	
	CHEVRON	RAMP D	36"x48"				4	17.5		70.0																			47.0	
	RT. CURVE ARROW	RAMP A	48"x48"				1	17.5		17.5																			16.0	
	ARROW	RAMP B	24"x48"				1	17.5		17.5																			8.0	
	REV. CURVE ARROW	RAMP C	48"x48"				1	17.5		17.5																			16.0	
	SPEED LIMIT	C470 49+	48"x60"				2	18.5		37.0																			40.0	
	MOTHER CABRINI	I70 340+ LT.	16'x11'													45.5									2					176.0
	PROJECT TOTALS									1037.0						94.5									4				852.0	403.0

NOTES:

1. POST LENGTHS ARE APPROXIMATE ONLY. EXACT LENGTHS TO BE DETERMINED BY THE ENGINEER.

▲ 2. REFLECTIVE SHEETING SHALL BE HIGH BRIGHTNESS ENCAPSULATED TYPE. SEE SECTION 713 OF THE STANDARD SPECIFICATIONS.

☆ 3. SEE THE PROJECT SPECIAL PROVISION FOR DARK TAN PAINTING.

STATE OF COLORADO

AS CONSTRUCTED		
NO REVISIONS ☐	REVISED 12-12-88	VOID ☐

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	35	57

TABULATION OF OVERHEAD SIGNS

SIGN NO.	STATION	SIGN PANEL SIZE	BACK-GROUND COLOR	NO. OF POSTS	TYPE OF POST	STRUCTURE TYPE	FRAME SIZE	STRUCTURE NUMBER	SIGN PANEL CLASS I (SQ. FT.)	~~SIGN PANEL CLASS II (SQ. FT.)~~	SIGN PANEL CLASS III (SQ. FT.)	TYPE OF FOOTING	COMMENTS
1	751+00	13'x12'	GREEN	ON EXISTING SIGN BRIDGE			82'	F-16-GU		156.00	~~159.00~~	EXISTING	REMOVE TWO SIGN PANEL 10'x10' & 12'x12' MASK SIGN LEGEND
2A	314+00	14'x11'	GREEN	1	VI	CANTILEVER	28'	F-16-ML		154.00	~~148.00~~	EXISTING	
2B		13'-8"x2'-6"	YELLOW						34.17				
4	322+00			ON EXISTING BUTTERFLY				F-16-MN					MODIFY LEGEND
5A	330+00	15'x11'	GREEN	1	VI	CANTILEVER	29'	F-16-MO		165.00	~~157.00~~	EXISTING	MASK SIGN LEGEND
5B		14'-8"x2'-6"	YELLOW						36.67				
12A		10'x2'	GREEN								20.00		
12B	369+50	16'x11'	GREEN	ON EXISTING SIGN BRIDGE			103'	F-16-MQ			176.00	EXISTING	MASK SIGN LEGEND
12C		15'-8"x2'-6"	YELLOW						39.17				
22A		10'x2'	GREEN								20.00		
22B	383+00	16'x11'	GREEN	ON EXISTING SIGN BRIDGE			116'	F-16-MR			176.00	EXISTING	MASK SIGN LEGEND
22C		15'-8"x2'-6"	YELLOW						39.17				
26	408+00		ON EXISTING SIGN BRIDGE CANT.				103'	F-16-MT					REMOVE SIGN PANEL (UNMASK SIGN LEGEND)
27	420+50	13'x11'	GREEN	1	VI	CANTILEVER	30'	F-16-MU		143.00	~~137.00~~	EXISTING	MASK SIGN LEGEND
28	125+50	23'x7'	GREEN	ON EXISTING BUTTERFLY			23'	F-16-NR			161.00	EXISTING	
29	199+00			ON EXISTING BUTTERFLY			23'	F-16-NU					REMOVE SIGN PANEL (UNMASK SIGN LEGEND)
31	31+50	15'x9'	YELLOW	1	VI	CANTILEVER	30'	F-16-PX			135.00	VI (SPREAD)	DARK TAN PAINTING
46A		13'x10'	GREEN								130.00		
46B	54+36	16'x10'	GREEN	2	II-S	SIGN BRIDGE	84'	F-16-PY			160.00	II-S (SPREAD)	DARK TAN PAINTING
46C		15'-8"x2'-6"	YELLOW						39.17				
51A	69+00	16'x10'	GREEN	2	II-S	SIGN BRIDGE	72'	F-16-PZ			160.00	II-S (SPREAD)	DARK TAN PAINTING
51B		15'-8"x2'-6"	YELLOW						39.17				
SPEED LIMIT	RAMP A	1'-6"x3'	1 EA.		EXIST.				4.5				
SPEED LIMIT	RAMP C	1'-6"x3'	2 EA.		EXIST.				9.0				
HAZ. PANEL	RAMP B	1'x3'	12 EA.		FLEX.				36.0				
HAZ. PANEL	RAMP D	1'x3'	12 EA.		FLEX.				36.0				
TOTAL PANEL FOR OVERHEAD SIGNS									~~227.52~~ 312.5		~~1732.00~~ 1759.00		

NOTES. FOR OVERHEAD SIGNS

1. PANELS FOR OVERHEAD SIGNS SHALL BE SHEET ALUMINUM. SEE "CLASS III SIGNS, SHEETS 1 AND 2" INCLUDED IN THE PLANS FOR PANEL AND BACKING ZEE REQUIREMENTS. ~~SEE DEPARTMENT STANDARD "CLASS II GROUND SIGN INSTALLATIONS" FOR CLASS II PANELS, PANELS SHALL HAVE 3 ALUMINUM BACKING ZEES SPACED AT 2'-6". SEE DEPARTMENT STANDARD "CLASS I GROUND SIGN INSTALLATIONS" FOR CLASS I PANEL REQUIREMENTS, MINIMUM THICKNESS IS REDUCED TO 0.080".~~

2. CLASS III AND CLASS I PANELS SHALL HAVE A SMOOTH SURFACE TYPE REFLECTIVE SHEETING BACKGROUND. ~~CLASS II PANELS SHALL HAVE HIGH BRIGHTNESS ENCAPSULATED TYPE REFLECTIVE SHEETING.~~

3. LEGEND AND BORDER FOR GREEN BACKGROUND SIGNS SHALL BE SYSTEM 1 OR SYSTEM 2 AND FOR YELLOW BACKGROUND SIGNS SHALL BE SYSTEM 4. SEE SECTION 713 OF THE STANDARD SPECIFICATIONS.

4. SEE THE PROJECT SPECIAL PROVISION FOR MASK SIGN LEGEND (PERMANENT).

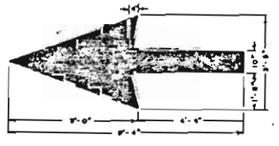
5. SEE THE PROJECT SPECIAL PROVISIONS FOR DARK TAN PAINTING.

TABULATION OF PAVEMENT MARKINGS

AS CONSTRUCTED									
NO REVISIONS		REVISED	12-12-28	VOID		FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
						VIII	COLORADO	I 70-3(140)	36	57

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 4 INCH	YELLOW SOLID 4 INCH	YELLOW BROKEN 4 INCH	WHITE SOLID 8 INCH	YELLOW SOLID 8 INCH	WHITE SOLID 8 INCH	YELLOW SOLID 8 INCH	WHITE SOLID 12 INCH	WHITE SOLID 24 INCH
322+40 to 330+00	I-70 E.B.			760								
330+00 to 337+80	I-70 E.B.	780					1,560					
363+60 to 366+00	I-70 E.B.	480					240					
366+00 to 367+70	I-70 E.B.	170		170								
358+00 to 360+30	I-70 W.B.	460					230					
367+20 to 369+50	I-70 W.B.	230					690					
369+70 to 372+50	I-70 W.B.	300		300			300					
372+50 to 384+50	I-70 W.B.	1200		1850								
253+10 to 252+90	RAMP "A"	1910	1910									
426+20 to 427+40	RAMP "C"	140	140									
427+20 to 449+40	RAMP "C"	2200	2200	2200								
1209+40 to 1210+00	RAMP "D"	60	60	60								
1210+00 to 1232+00	RAMP "D"	2200	2200	2200								
1232+00 to 1240+00	RAMP "D"	800	800	800					240			
1214+80 to 1430+00	RAMP "B"	1520	1520									
30+00 to 40+00	C-470 W.B.	1000	1000							320		
40+00 to 54+50	C-470 W.B.	1450	1450				250			250		
49+50 to 54+50	DECEL LANE W.B.		500	500			1000					
40+00 to 54+50	C-470 E.B.	1450	1450	1450					40			
54+50 to 72+00	C-470 E.B. & W.B.	3500	3500	3500						100		
54+50 to 69+00	DECEL LANE W.B.			1450								
53+00 to 59+50	ACCEL LANE E.B.	650					650					
59+50 to 63+00	ACCEL LANE E.B.			350								
PROJECT TOTAL (LINER FEET)		20,500	16730	15,590			4,670		280	670		
THERMOPLASTIC PAVEMENT MARKING (SQ. FT.)		6,834	5,577				3,114		187	447	TOTAL = 14,241	FT²
PLASTIC PAVEMENT MARKING (60 MILS) (SQ. FT.)				1,300							TOTAL = 1,330	FT²

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 4 INCH	YELLOW SOLID 4 INCH	YELLOW BROKEN 4 INCH	WHITE SOLID 8 INCH	YELLOW SOLID 8 INCH	WHITE SOLID 8 INCH	YELLOW SOLID 8 INCH	WHITE SOLID 12 INCH	WHITE SOLID 24 INCH



PAVEMENT MARKING ARROW DETAIL

NOTES:

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

▲ = THERMOPLASTIC PAVEMENT MARKING

● = PLASTIC PAVEMENT MARKING (60 MILS)

■ = ~~PLASTIC PAVEMENT MARKING (90 MILS)~~

SUMMARY OF PAVEMENT MARKING QUANTITIES

COLOR	PAINT (GAL.)	THERMOPLASTIC (SQ. FT.)	PLASTIC PVMT MKG. (60 MILS) (SQ FT.)	~~PLASTIC PVMT MKG (90 MILS) (SQ FT.)~~
YELLOW		6,024		
WHITE		10,135	1,300	
TOTAL		~~16,159~~ 14,241	~~1,300~~ 1,330	

CLASS III SIGNS - SHEET 1

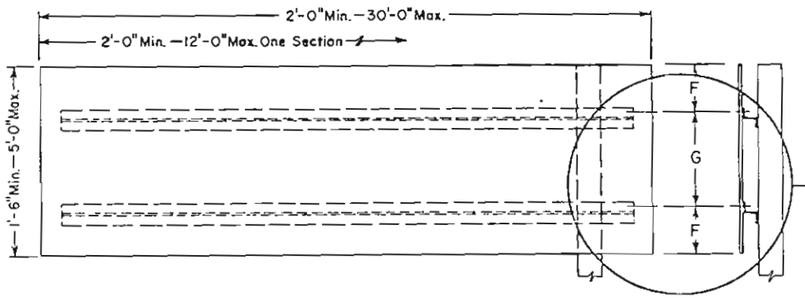
AS CONSTRUCTED							
NO REVISIONS	12-12-84	REVISED		VOID			

FEDERAL ROAD REGION NO	DISTRICT	PROJ. NO	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	37	57

REVISIONS		

TYPICAL PANEL ELEVATIONS

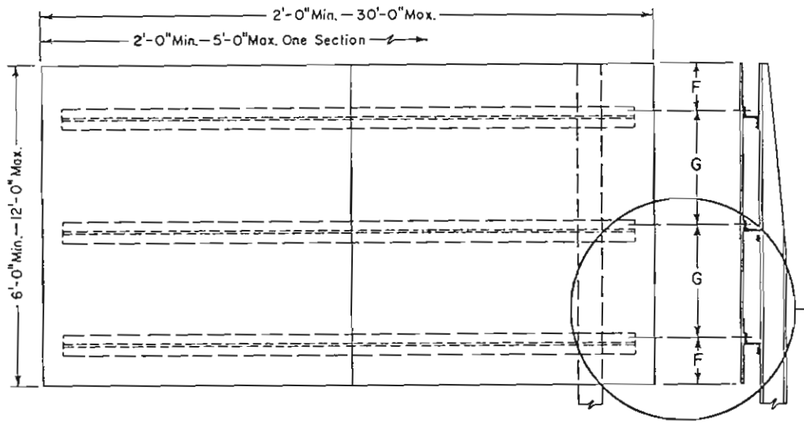
HORIZONTAL SECTIONS



SECTIONS REQUIRED
Height x 2'-0" to 12'-0" = 1 Section
Height x 12'-6" to 24'-0" = 2 Sections
Height x 24'-6" to 30'-0" = 3 Sections

SEE TYPICAL DETAIL ON SHEET 2

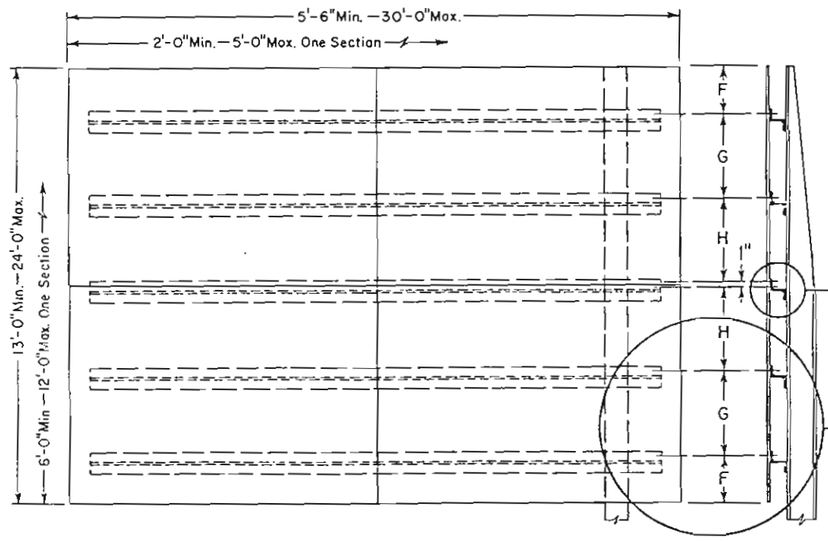
VERTICAL SECTIONS



SECTIONS REQUIRED
Height x 2'-0" to 5'-0" = 1 Section
Height x 5'-6" to 10'-0" = 2 Sections
Height x 10'-6" to 15'-0" = 3 Sections
Height x 15'-6" to 20'-0" = 4 Sections
Height x 20'-6" to 25'-0" = 5 Sections
Height x 25'-6" to 30'-0" = 6 Sections

SEE TYPICAL DETAIL ON SHEET 2

MULTI-VERTICAL SECTIONS



SECTIONS REQUIRED
Height x 5'-6" to 10'-0" = 4 Sections
Height x 10'-6" to 15'-0" = 6 Sections
Height x 15'-6" to 20'-0" = 8 Sections
Height x 20'-6" to 25'-0" = 10 Sections
Height x 25'-6" to 30'-0" = 12 Sections

SEE TYPICAL SEAM CLOSURE ZEE DETAIL ON SHEET 2

SEE TYPICAL DETAIL ON SHEET 2

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.
2. SEE THE APPLICABLE STANDARDS FOR SIGN PLACEMENT, FOOTING DETAILS AND POST SPACING TABLE.
3. A (No. 6) 90° COUNTERSUNK ALUMINUM LOCKBOLT FASTENER SHALL BE USED TO FASTEN THE SIGN PANEL TO THE BACKING ZEE. A HEX-HEAD BOLT WITH NUT AND WASHERS SHALL BE USED TO FASTEN THE BACKING ZEE TO A TIMBER POST OR TO A STEEL POST.
4. A FLAT WASHER SHALL BE PLACED BETWEEN THE BOLT HEAD AND THE BACKING ZEE. A LOCK WASHER SHALL BE PLACED UNDER THE NUT ON A STEEL POST OR A BACKING ZEE. A CI Ogee WASHER SHALL BE PLACED UNDER THE BOLT HEAD ON A TIMBER POST.
5. THE EXPOSED LOCKBOLT HEADS ON THE FACE OF THE SIGN PANEL SHALL BE COVERED WITH REFLECTIVE SHEETING (TO BE A PART OF THE LOCKBOLT HEAD) TO MATCH THE BACKGROUND COLOR OF THE SIGN.
6. ALL EXPOSED SIGN PANEL SECTION JOINTS, EXCEPT THE MULTI-VERTICAL SECTIONS HORIZONTAL SEAM, SHALL BE COVERED ON THE BACKSIDE OF THE SIGN PANEL WITH AN ALUMINUM CLOSURE STRIP. CLOSURE STRIPS SHALL BE BONDED TO THE SIGN PANEL WITH AN EPOXY RESIN WHICH MEETS THE REQUIREMENTS SPECIFIED IN ASTM DESIGNATION — D 1763, PART 9. ALL BONDED SURFACES SHALL BE CLEAN AND FREE OF ANY FOREIGN MATTER.
7. SIGN PANELS SHALL BE CONSTRUCTED FROM THE LEAST NUMBER OF SECTIONS. THE SECTIONS SHALL BE AS LARGE AS POSSIBLE AND AS NEARLY EQUAL IN SIZE AS POSSIBLE, ACCORDING TO THE LIMITS SHOWN.
8. FOR ADDITIONAL POST AND PANEL INFORMATION SEE THE "TABULATION OF SIGNS" INCLUDED IN THE PLANS.

SPACING TABLE FOR ALUMINUM BACKING ZEES

	SIGN NO.	PANEL SIZE	NO. OF ZEES	ZEE SIZE	OVERHANG "F"	SPACING "G"	SPACING "H"
*	1	13' x 12'	5	3" x 2 11/16" x 2.33	1'—0"	2'—6"	——
*	2	14' x 11'	5	3" x 2 11/16" x 2.33	1'—2"	2'—2"	——
*	5	15' x 11'	5	3" x 2 11/16" x 2.33	1'—2"	2'—2"	——
	9, 11	9' x 5'	2	3" x 2 11/16" x 2.33	1'—3"	2'—6"	——
*	12A, 22A	10' x 2'	2	3" x 2 11/16" x 2.33	0'—5"	1'—2"	——
*	12B, 22B	16' x 11'	5	3" x 2 11/16" x 2.33	1'—2"	2'—2"	——
	25	13' x 11'	5	3" x 2 11/16" x 3.38	1'—2"	2'—2"	——
*	27	13' x 11'	5	3" x 2 11/16" x 2.33	1'—2"	2'—2"	——
*	28	23' x 7'	3	3" x 2 11/16" x 2.33	1'—0"	2'—6"	——
*	31	15' x 9'	4	3" x 2 11/16" x 2.33	1'—3"	2'—2"	——
*	46A	13' x 10'	4	3" x 2 11/16" x 2.33	1'—3"	2'—6"	——
*	46B, 51	16' x 10'	4	3" x 2 11/16" x 2.33	1'—3"	2'—6"	——

* OVERHEAD SIGN PANEL

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CLASS III SIGNS
SHEET ALUMINUM
PANELS

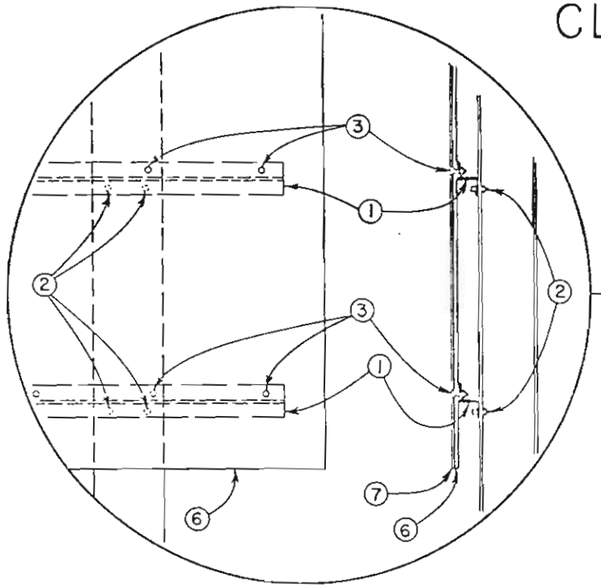
CLASS III SIGNS - SHEET 1

CLASS III SIGNS - SHEET 2

AS CONSTRUCTED					
NO REVISIONS	12-12-84 REVISED		VOID		

FEDERAL ROAD REGION NO	DISTRICT	PROJ NO	SHEET NO	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	38	57

REVISIONS		



TYPICAL ELEVATION DETAIL

FABRICATION NOTES

(1) BACKING ZEE. See "SPACING TABLE". Aluminum Alloy 6061-T6. Each zee to be provided with a 9/16" x 2" horizontal slot for each post mounting bolt. The length of each zee to be 1" less than the sign panel width.

(2) 3/8" ø HEX-HEAD BOLT. With nut and washers; 2 per backing zee per post are required.

(3) 3/8" ø (No. 6) 90° COUNTERSUNK ALUMINUM LOCKBOLT FASTENER.

(4) 2" x 0.080" ALUMINUM CLOSURE STRIP.

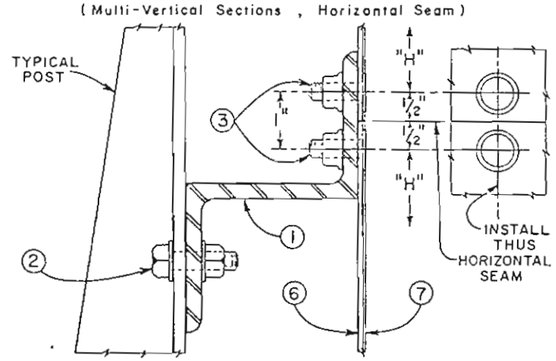
(5) 1/8" ø x 3/8" UNIVERSAL-HEAD, HOLLOW SHANK ALUMINUM RIVET.

(6) SHEET ALUMINUM. 0.125" minimum thickness.

(7) NON-EXPOSED LENS REFLECTIVE SHEETING. To have a dry (heat activated) adhesive backing.

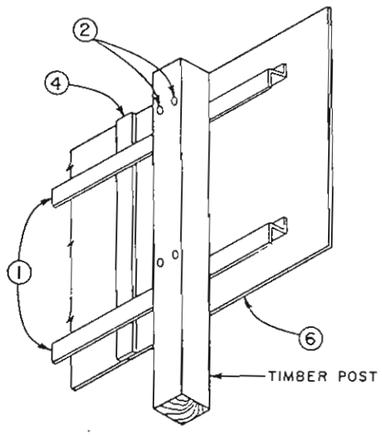
TYPICAL DETAIL SEAM CLOSURE ZEE

(Multi-Vertical Sections, Horizontal Seam)

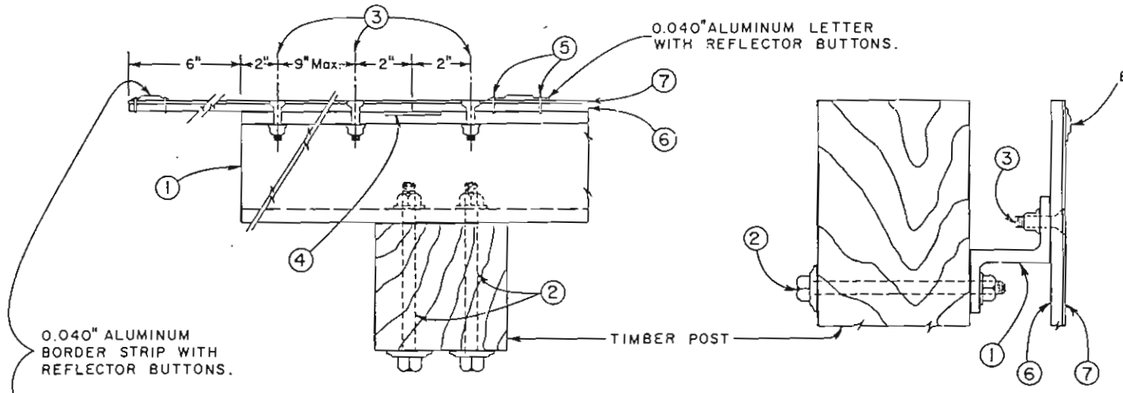


TYPICAL TIMBER POST INSTALLATION

TYPICAL VIEW

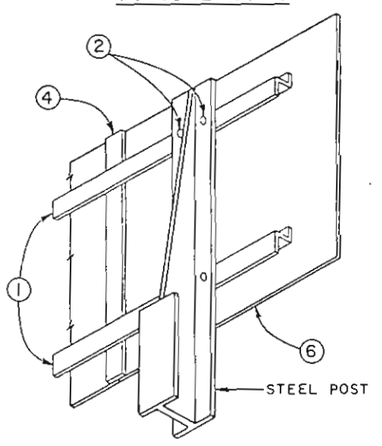


PANEL FABRICATION AND MOUNTING DETAILS

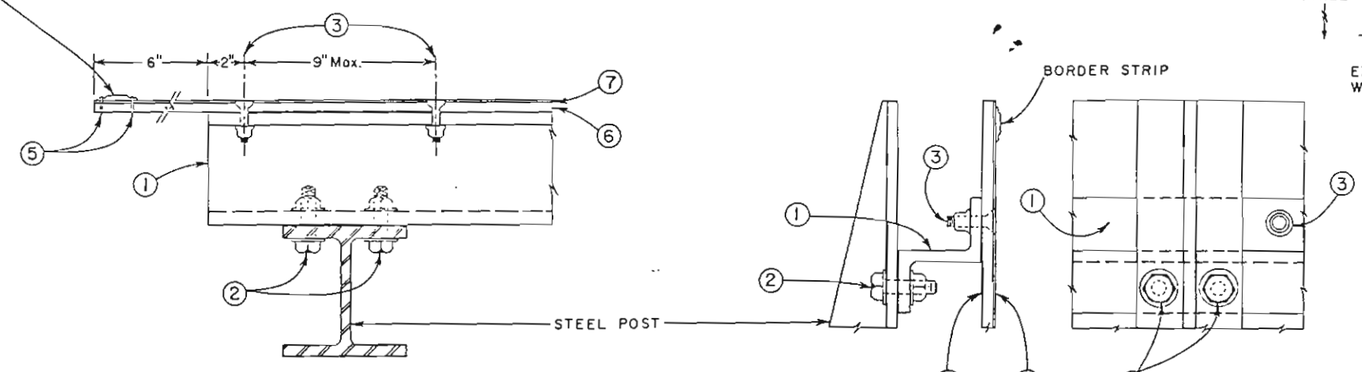


TYPICAL STEEL POST INSTALLATION

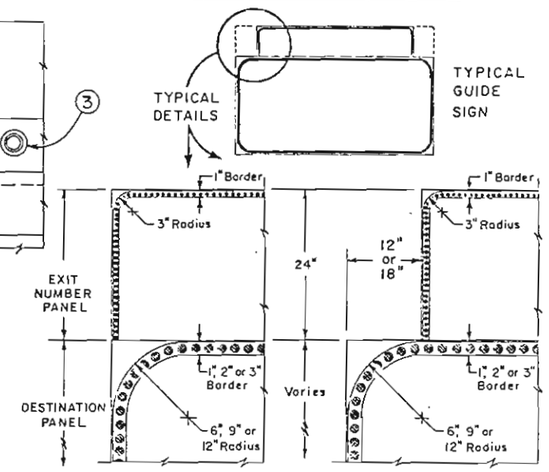
TYPICAL VIEW



PANEL FABRICATION AND MOUNTING DETAILS



TYPICAL BORDER DETAILS EXIT NUMBER PANELS



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CLASS III SIGNS
SHEET ALUMINUM
PANELS

CLASS III SIGNS - SHEET 2

AS CONSTRUCTED
NO REVISIONS 12-12-88 REVISED VOID

STANDARD S-614-5

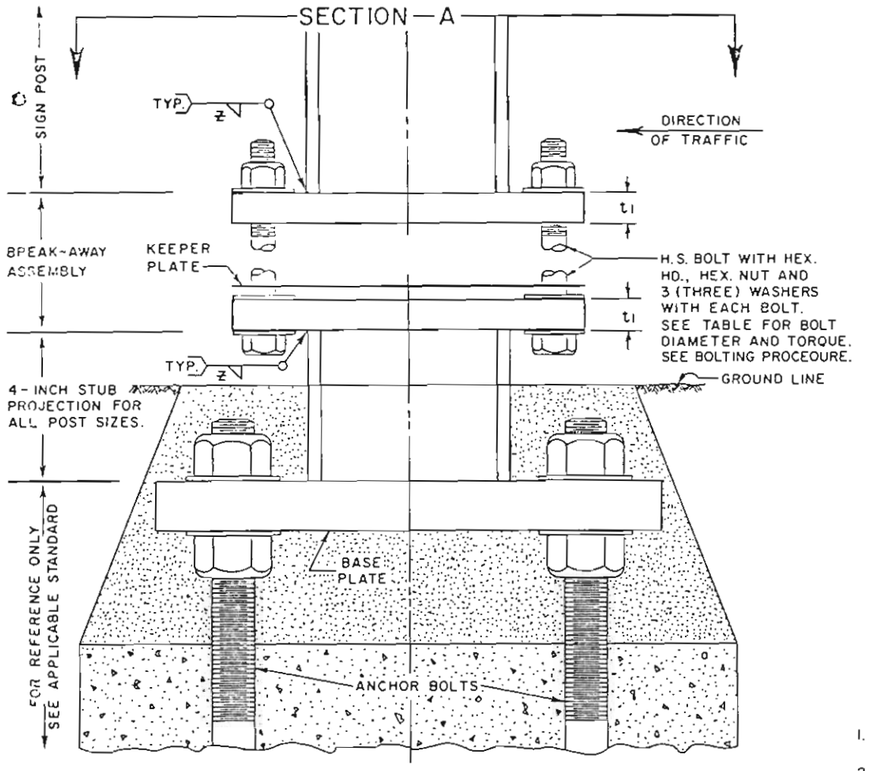
(SHEET 1 OF 2 SHEETS) JANUARY 1982

SPECIAL FOR THIS PROJECT

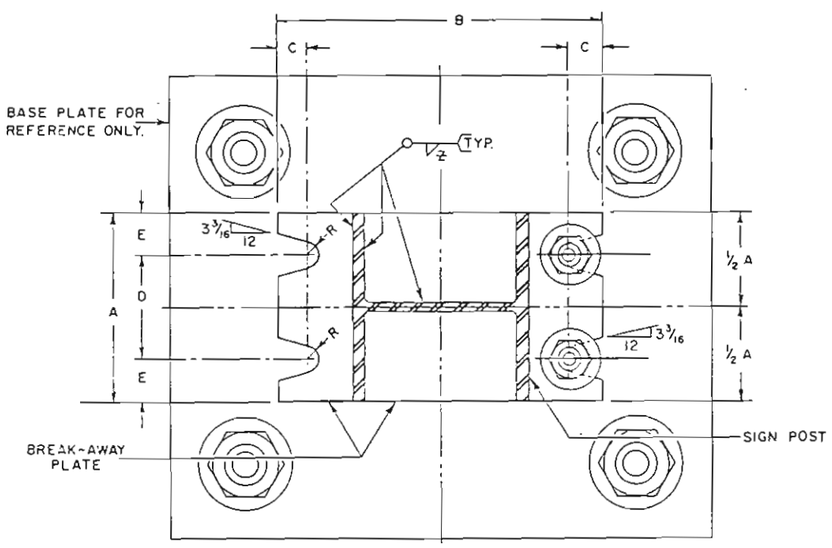
FEDERAL ROAD REGION NO	DIVISION	PROJ NO	SHEET NO	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	39	≤ 7

REVISIONS		

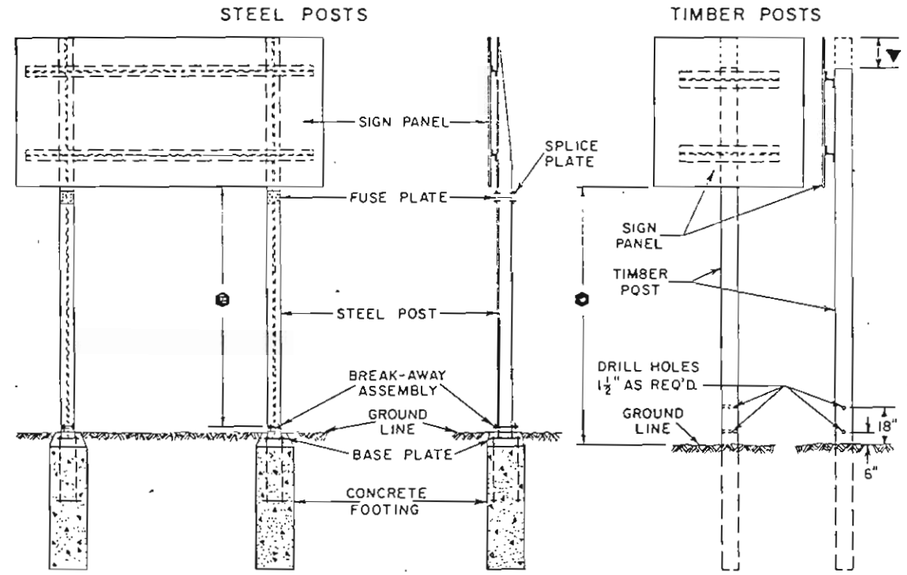
TYPICAL ELEVATION STEEL POST ASSEMBLY



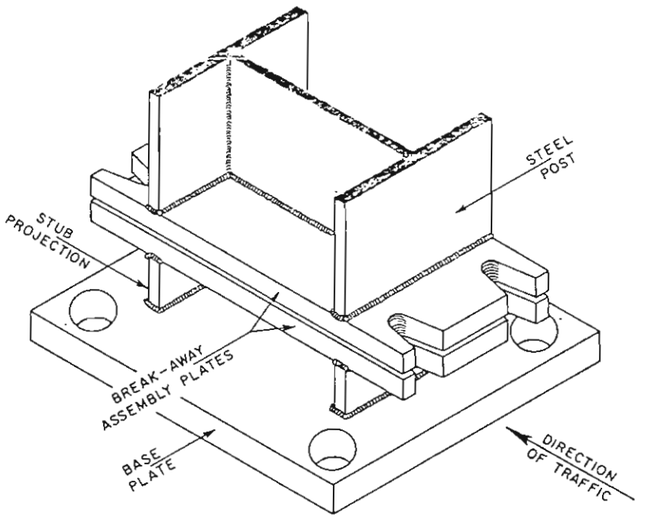
TYPICAL SECTION -A-



TYPICAL BREAK-AWAY SIGN SUPPORT INSTALLATIONS



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 AASHTO "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. Steel fuse plates and splice plates shall conform to ASTM – A36.
5. All high strength bolts, nuts and washers shall conform to ASTM – A325. Washers used in the Break-Away Plate and Fuse Plate assemblies shall be of sufficient strength to prevent any deflection or "cupping" into the slotted grooves under bolt torquing.
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 except of fuse plate may be drilled or sub-punched and reamed.
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. A "Keeper Plate" of thin (28-gage) galvanized sheet metal, fabricated to match break-away plate dimensions but with holes rather than slots, shall be used to restrain bolt loosening due to wind vibration.
11. High strength bolts in the break-away assembly shall be tightened only to the torque shown in the table. DO NOT OVERTIGHTEN.
12. The "STUB POST" and one "BREAK-AWAY PLATE" are considered part of the footing. The other "BREAK-AWAY PLATE" and all nuts, bolts, washers and keeper plate for fastening the break-away plates are considered to be a part of the post.
13. 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.
14. For all base plate and footing work see the applicable Standard included in the plans.
15. For additional information, refer to "Tabulation of Signs" and "Cross Sections for Class III Signs" included in the plans.
16. ▼ Timber post flush with top of sign panel for direct mount and 3 3/16" minimum above bolt for backing zee mount.
17. ⬢ Minimum post length from bottom of sign panel to break-away assembly or ground line shall be 7' (in no case shall a backing zee be placed below the fuse plates).

BREAK-AWAY PLATE DATA TABLE

POST SIZE \ DIMENSION	BOLT SIZE AND TORQUE	A	B	C	D	E	t1	WELD ≠	R	STUB POST LENGTH
W 12 x 40	7/8" ø x 3¾" 1,135 In. Lb.	8"	19¼"	1⅝"	4"	2"	1¼"	⅜"	15/32"	0'-4"
W 12 x 35	¾" ø x 3½" 750 In. Lb.	6½"	17"	⅞"	3½"	1½"	1"	5/16"	13/32"	0'-4"
W 10 x 26		5¾"	14⅞"	⅞"	3¼"	1¼"	1"	5/16"	13/32"	0'-4"
W 10 x 22		5¾"	14⅜"	⅞"	3¼"	1¼"	1"	5/16"	13/32"	0'-4"
W 8 x 21		5¼"	12⅜"	⅞"	2¾"	1¼"	1"	5/16"	13/32"	0'-4"
W 8 x 18	5/8" ø x 2¾" 450 In. Lb.	5¼"	12"	¾"	3"	1⅛"	¾"	¼"	11/32"	0'-4"
W 6 x 15		6"	10"	¾"	3¾"	1⅛"	¾"	¼"	11/32"	0'-4"
W 6 x 12		5"	10"	¾"	2¾"	1⅛"	¾"	¼"	11/32"	0'-4"

BOLTING PROCEDURE FOR BREAK-AWAY PLATE ASSEMBLY

1. Assemble post to stub with bolts – one flat washer on each bolt top and bottom, and one flat washer and the keeper plate 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 to prevent nut loosening.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS

Designed By: J. J.B.
Made By: F. J.B
Checked By: J. E.M.

Approved By: W. L. Tucker
Staff Traffic & Safety Projects Engineer
Date: January, 1980

STANDARD S-614-5

AS CONSTRUCTED			
NO REVISIONS	12-12-83	REVISED	VOID

STANDARD S-614-5

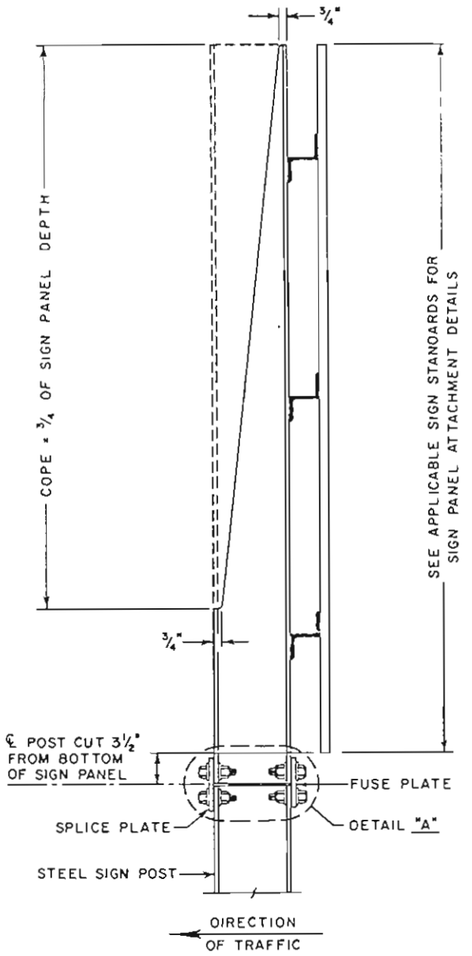
(SHEET 2 OF 2 SHEETS)
JANUARY 1982

SPECIAL FOR THIS PROJECT

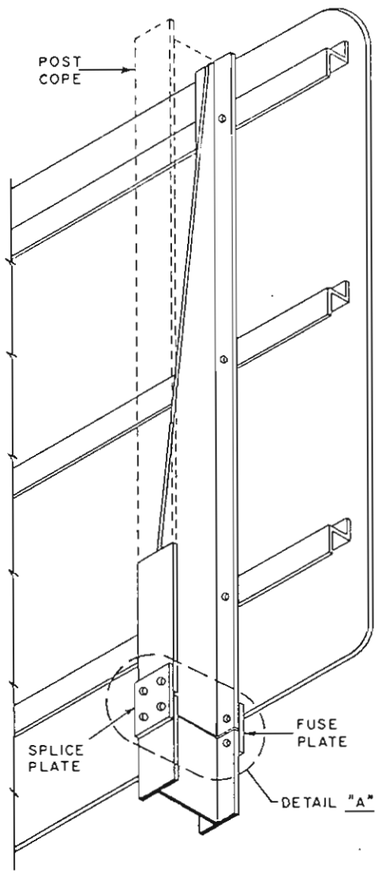
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	40	57

REVISIONS		

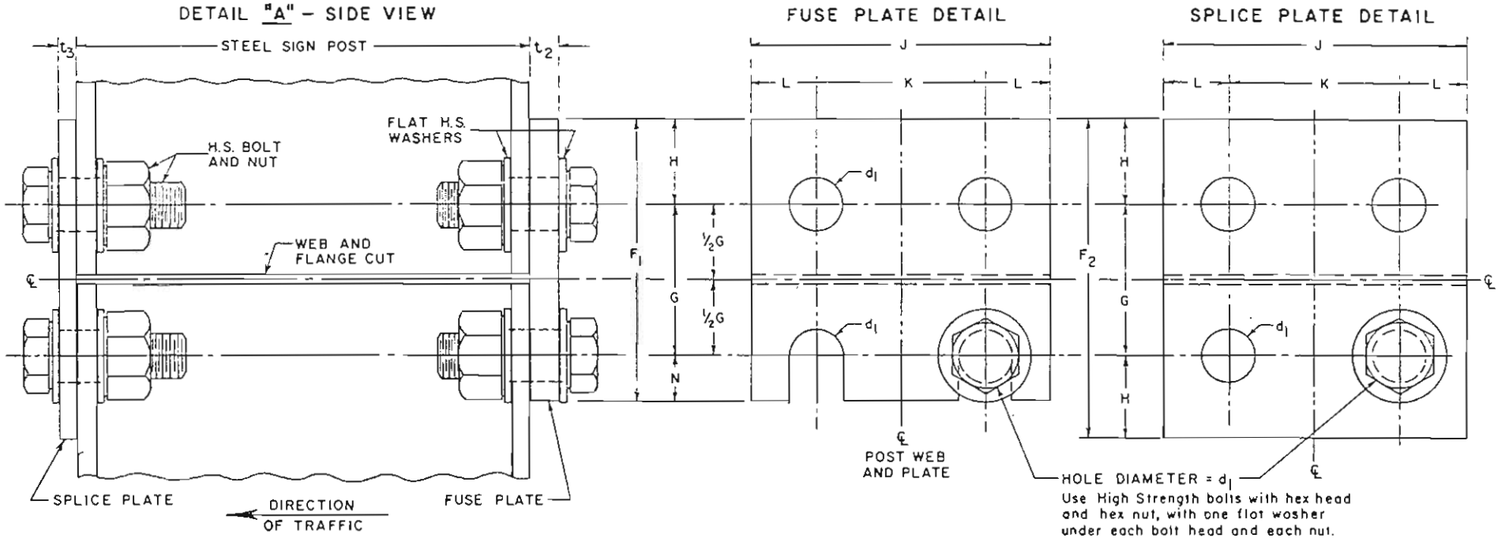
TYPICAL SIDE VIEW FUSE PLATE AND POST COPE



TYPICAL PROJECTED VIEW FUSE PLATE AND POST COPE



TYPICAL FUSE AND SPLICE PLATE HINGE DETAILS



FUSE AND SPLICE PLATE HINGE DATA TABLE

SIZE / POST	F_1	F_2	G	H	J	K	L	N	d_1	t_2	t_3	BOLT SIZE	MINIMUM RESIDUAL BOLT TENSION	FABRICATION NOTES
W12 x 40	6"	6¾"	3¼"	1¾"	8"	4"	2"	1"	15/16"	5/8"	7/16"	⅞"ø x 2½"	36,050 LBS.	Fuse plate and its post flange holes shall be drilled, not punched. 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. Burr threads at junction with nut to prevent nut loosening.
W12 x 35	5⅜"	6"	3"	1½"	6½"	3½"	1½"	⅞"	15/16"	9/16"	7/16"	⅞"ø x 2½"	36,050 LBS.	
W10 x 26	5⅜"	6"	3"	1½"	5¾"	2¾"	1½"	⅞"	15/16"	9/16"	7/16"	⅞"ø x 2½"	36,050 LBS.	
W10 x 22	5⅜"	6"	3"	1½"	5¾"	2¾"	1½"	⅞"	15/16"	9/16"	⅜"	⅞"ø x 2¼"	36,050 LBS.	
W8 x 21	4⅞"	5½"	2½"	1½"	5¼"	2¾"	1¼"	⅞"	15/16"	9/16"	⅜"	⅞"ø x 2¼"	36,050 LBS.	
W8 x 18	4½"	5"	2½"	1¼"	5¼"	2¾"	1¼"	¾"	13/16"	½"	⅜"	¾"ø x 2"	28,400 LBS.	
W6 x 15	4½"	5"	2½"	1¼"	6"	3½"	1¼"	¾"	13/16"	½"	¼"	¾"ø x 1¾"	28,400 LBS.	
W6 x 12	3¾"	4¼"	2"	1⅛"	4"	2¼"	⅞"	⅝"	11/16"	⅜"	¼"	⅝"ø x 1¾"	19,200 LBS.	

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS

Designed By: J.J.B
Made By: F.J.B
Checked By: J.E.M

Approved By: [signature]
Staff Traffic & Safety Projects Engineer
Date: January, 1980

OVERHEAD SIGNS — SHEET 1

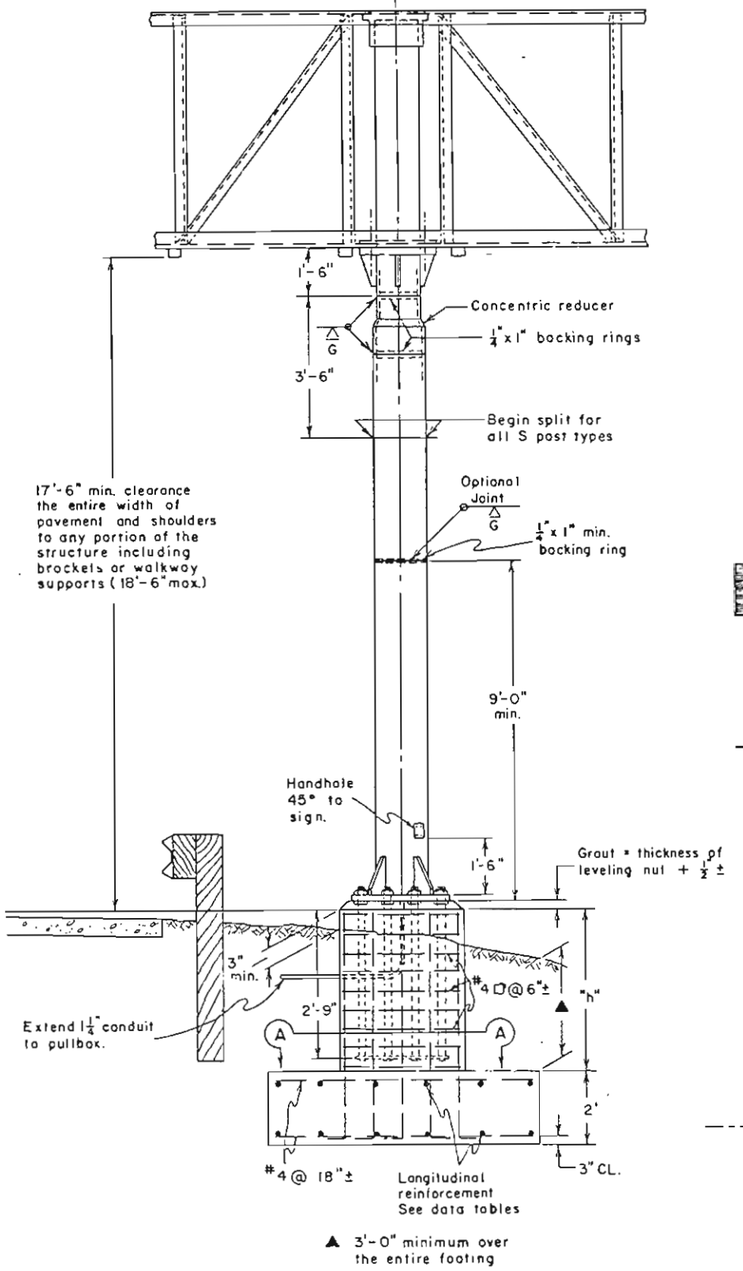
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	41	57

AS CONSTRUCTED

NO REVISIONS [ ] REVISED [ ] VOID [ ]

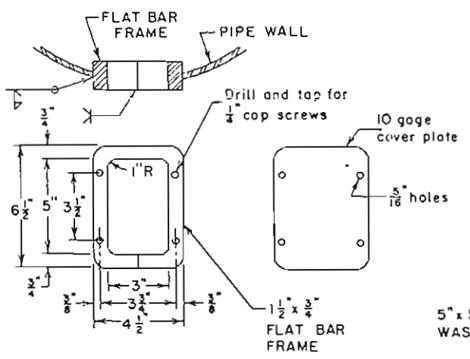
REVISIONS		

ELEVATION



▲ 3'-0" minimum over the entire footing

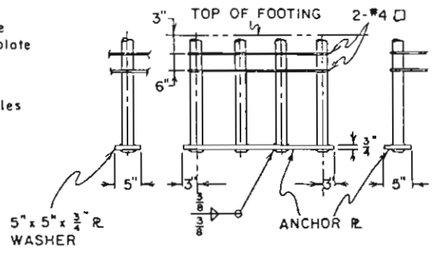
HANDHOLE DETAILS



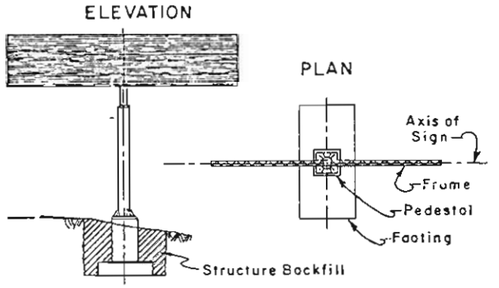
ANCHORAGE DETAILS

SIDE BOLT (Type II thru VII only — 2 Required)

FRONT & BACK BOLTS (All Types — 2 Required shown for 4 bolts and similar for 2 and 3 bolts)

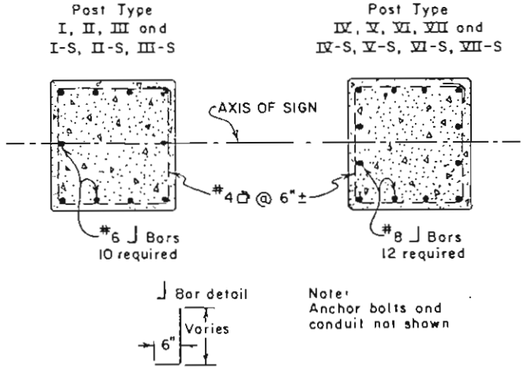


TYPICAL VIEWS



NOTE:
ANGLE IRON TRUSS BOX STRUCTURES ARE NOT PERMITTED. SEE THE PROJECT SPECIAL PROVISION REQUIRING TUBULAR DESIGN.

SECTION A-A



GENERAL NOTES

1. All work shall be done in accordance with Standard Specifications applicable to the project and "Standard Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals", A.A.S.H.T.O. current issue.
2. Wind loading 35 P.S.F. normal to panel area.
3. UNIT STRESSES:
   a. Structural steel: F_s = 18,000 P.S.I.
   b. Reinforced concrete: F_s = 20,000 P.S.I.
   c. Footing soil pressure: 1 1/4 TONS / SQ. FT.
   d. Allowable unit stresses due to wind load or wind load in combination with other forces are increased 33 1/3 %.
4. For reinforcement, embedment is clear to outside of bar and is 2" to main reinforcement, except as shown.
5. Base plates, pedestals, and footings, longer sides shall be normal to the axis of sign.
6. Backfill shall be in place prior to erection of post.
7. On single post sign structures, the post shall be raked out of plumb, with the use of the leveling nuts to make the bottom of the sign frame level.
8. Ground one post of each structure.
9. Tapered tube of equivalent size and thickness may be substituted for pipe post
10. For SIGN BRIDGES only, a constant diameter pipe post of the base section size may be used in lieu of the two diameter sections shown.

TABULATION OF POSTS AND PEDESTALS

	SIGN NO	STRUCTURE TYPE	POST TYPE	PEDESTAL HEIGHT "h" ONE POST	TWO POSTS L1.	TWO POSTS R1.
*	2	CANTILEVER	VI	5'-6	EXISTING	
*	5	CANTILEVER	VI	12'-0	EXISTING	
*	27	CANTILEVER	VI	4'-6"	EXISTING	
	31	CANTILEVER	VI	6'-6		
	46	SIGN BRIDGE	II-S	—	7'-0" ▲	7'-0"
	51	SIGN BRIDGE	II-S	—	6'-6" ▲	7'-0"

* ONLY POSTS, FRAME AND SIGN PANEL ARE REQUIRED, FOOTINGS ARE FROM PREVIOUS PROJECT.

▲ POST LENGTH TO BE REDUCED 2'-8" (THE NORMAL CONCRETE MEDIAN BARRIER HEIGHT TO WHICH THE PEDESTAL IS TO BE BUILT).

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

OVERHEAD SIGNS POSTS & FOOTINGS (SPREAD)

OVERHEAD SIGNS — SHEET 2

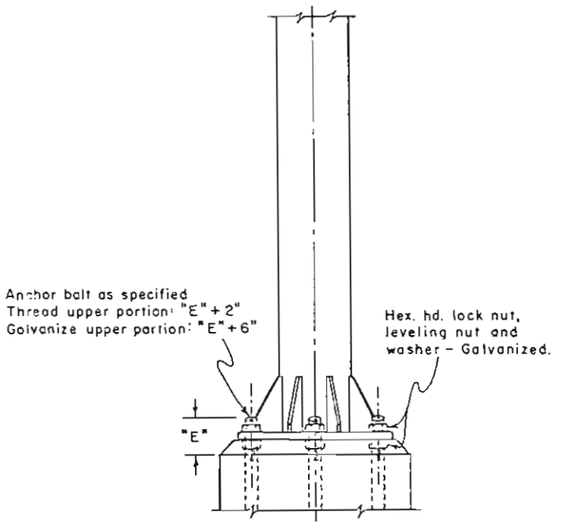
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I70-3(140)	42	57

AS CONSTRUCTED

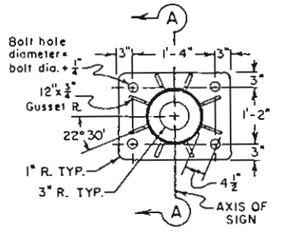
NO REVISIONS 12-12-77 REVISED ____ VOID ____

REVISIONS		

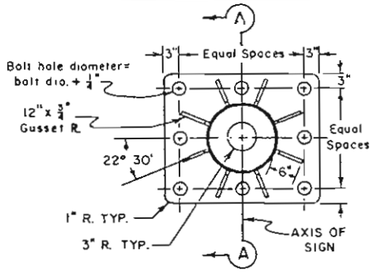
POSTS TYPES I - VII & BASE PLATES



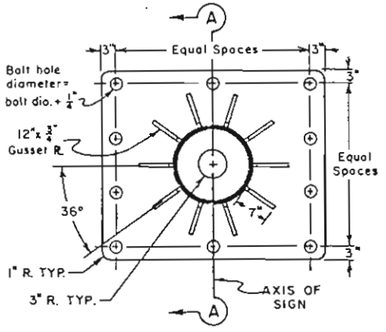
4 ANCHOR TYPE



8 ANCHOR TYPE

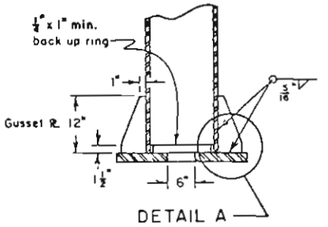


10 ANCHOR TYPE

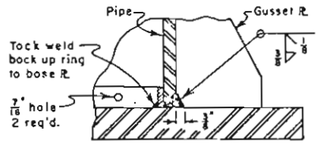


SECTION A-A

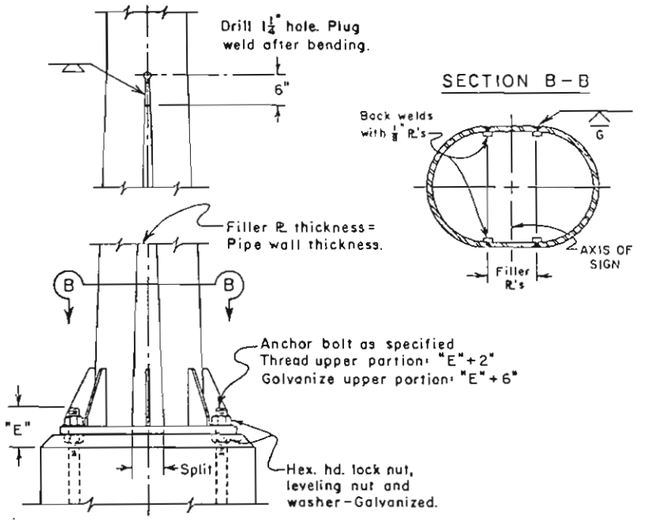
COMMON TO ALL TYPES



DETAIL A

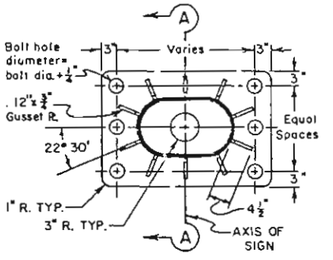


POSTS TYPES I-S - VII-S & BASE PLATES

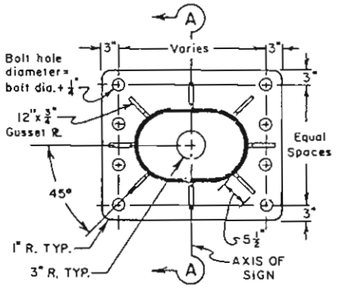


SECTION B-B

6 ANCHOR TYPE



8 ANCHOR TYPE



TYPES I THRU VII DATA TABLE

POST TYPE	PIPE SIZES		REDUCER LENGTH	"E"	BASE PLATE SIZE	ANCHOR BOLTS	PEDESTAL SIZE	FOOTING SIZE	LONGITUDINAL FOOTING REINFORCEMENT	
	BASE SECTION	UPPER SECTION							TOP	BOTTOM
I	10" Std. @ 40.48	8" Std. @ 28.55	7"	8"	1'-10" x 1'-8" x 1 1/2"	4 - 2" Φ	2'-5" x 2'-3"	5'-0" x 9'-0"	6-#4 bars	6-#4 bars
II	12" Std. @ 49.56	10" Std. @ 34.24	8"	7 1/2"	2'-4" x 2'-1" x 1 1/2"	8 - 1 3/4" Φ	2'-11" x 2'-8"	6'-0" x 10'-0"	6-#4 bars	6-#4 bars
III	14" O.D. @ 72.09	12" Std. @ 43.77	1'-1"	8 1/2"	2'-7" x 2'-3" x 1 3/4"	8 - 2" Φ	3'-2" x 2'-10"	7'-0" x 12'-0"	6-#5 bars	6-#5 bars
IV	16" O.D. @ 82.77	14" O.D. @ 54.57	1'-2"	8 1/2"	3'-1" x 2'-9" x 2"	10 - 2" Φ	3'-8" x 3'-4"	7'-0" x 13'-0"	6-#5 bars	6-#5 bars
V	18" O.D. @ 93.45	16" O.D. @ 62.58	1'-3"	8 1/2"	3'-3" x 3'-0" x 1 3/4"	10 - 2" Φ	3'-10" x 3'-7"	8'-0" x 14'-0"	7-#5 bars	7-#6 bars
VI	20" O.D. @ 104.13	18" O.D. @ 70.59	1'-8"	8 1/2"	3'-3" x 3'-0" x 2"	10 - 2" Φ	3'-10" x 3'-7"	9'-0" x 15'-0"	6-#6 bars	6-#7 bars
VII	24" O.D. @ 125.49	20" O.D. @ 78.60	1'-8"	10"	3'-7" x 3'-3" x 2 1/2"	10 - 2 1/4" Φ	4'-3" x 3'-11"	10'-0" x 17'-0"	7-#6 bars	7-#8 bars

TYPES I-S THRU VII-S DATA TABLE

POST TYPE	PIPE SIZES		REDUCER LENGTH	"E"	SPLIT	BASE PLATE SIZE	ANCHOR BOLTS	PEDESTAL SIZE	FOOTING SIZE	LONGITUDINAL FOOTING REINFORCEMENT	
	BASE SECTION	UPPER SECTION								TOP	BOTTOM
I-S	10" Std. @ 40.48	8" Std. @ 28.55	7"	6 1/2"	4"	2'-1" x 1'-9" x 1 1/2"	6 - 1 1/2" Φ	2'-7" x 2'-3"	5'-0" x 10'-0"	5-#4 bars	5-#6 bars
II-S	12" Std. @ 49.56	10" Std. @ 34.24	8"	7 1/2"	5"	2'-5" x 1'-11" x 1 1/2"	6 - 1 3/4" Φ	3'-0" x 2'-6"	6'-0" x 11'-0"	6-#4 bars	6-#7 bars
III-S	14" O.D. @ 72.09	12" Std. @ 43.77	1'-1"	8 1/2"	5"	2'-9" x 2'-0" x 2"	6 - 2" Φ	3'-4" x 2'-7"	7'-0" x 13'-0"	7-#4 bars	7-#8 bars
IV-S	16" O.D @ 82.77	14" O.D. @ 54.57	1'-2"	8 1/2"	6"	2'-11" x 2'-7" x 2"	8 - 2" Φ	3'-6" x 3'-2"	8'-0" x 14'-0"	8-#5 bars	8-#9 bars
V-S	18" O.D. @ 93.45	16" O.D. @ 62.58	1'-3"	8 1/2"	7"	3'-1" x 2'-9" x 2"	8 - 2" Φ	3'-8" x 3'-4"	8'-0" x 16'-0"	8-#5 bars	8-#9 bars
VI-S	20" O.D. @ 104.13	18" O.D. @ 70.59	1'-8"	8 1/2"	8"	3'-5" x 2'-9" x 2"	8 - 2" Φ	4'-0" x 3'-4"	9'-0" x 17'-0"	9-#5 bars	9-#10 bars
VII-S	24" O.D. @ 125.49	20" O.D. @ 78.60	1'-8"	9 1/2"	8"	3'-9" x 3'-3" x 2"	8 - 2 1/4" Φ	4'-5" x 3'-11"	10'-0" x 18'-0"	10-#6 bars	10-#11 bars

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

OVERHEAD SIGNS
POSTS &
FOOTINGS (SPREAD)

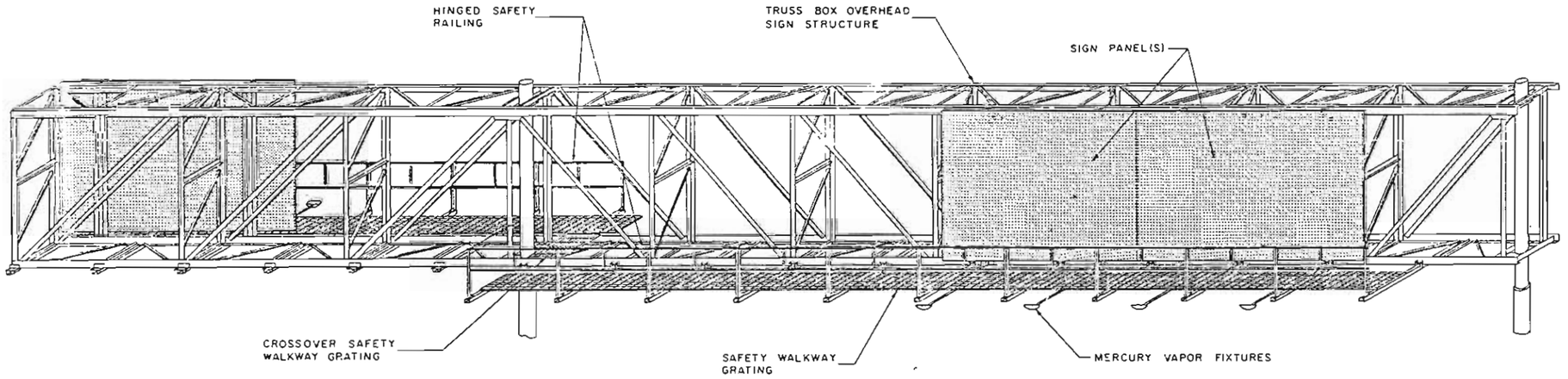
OVERHEAD SIGNS - SHEET 3

FEDERAL ROAD REGION NO	DIVISION	PROJ. NO	SHEET NO	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	43	57

REVISIONS		

AS CONSTRUCTED			
NO REVISION		REVISED	VOID

NOTE:
ANGLE IRON TRUSS BOX STRUCTURES ARE NOT PERMITTED. SEE THE PROJECT SPECIAL PROVISION REQUIRING TUBULAR DESIGN.



TYPICAL VIEW OF ASSEMBLED MEMBERS

TYPICAL CANTILEVER SIGN STRUCTURE SHOWN

GENERAL NOTES

1. All work shall be done in accordance with:
   (a) the Standard Specifications applicable to the project.
   (b) the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the Federal Highway Administration, and the latest revision of the Colorado Supplement thereto.
   (c) AASHO specifications for the design and construction of Structural Supports for Highway Signs.
2. Safety walkway grating shall be welded-type with 1¼" x ⅛" bearing bars at 1 3/16" centers and 3/16" dia. (or equal) crossbars at 4" centers.
3. Brackets to be evenly spaced with a maximum center to center spacing of 5'-6".
4. Bolts, nuts, washers, etc. shall be galvanized or cadmium plated.
5. Walkway grating, brackets and railing shall be painted in accordance with Section 509, wiring shall be in accordance with Section 613.
6. Crossover safety walkway to be used when sign bridges have sign panels facing two directions.

LIGHTING NOTES

1. Fixtures shall be watertight, dustproof and designed for ease of lamp replacement.
2. Lamp shall be of the Mercury Vapor type (400 Watt). Lamps and ballasts shall be designed to operate over an ambient temperature range of -25° F to +120° F.
3. Ballasts shall operate from a 120 volt, 60 hz., single phase source with a regulated output of ± 12%. Ballasts shall be housed in a watertight dustproof enclosure.
4. The type, number and spacing of fixtures shall be per manufactures specifications to maintain a maximum initial illumination of the sign face of 30 foot candles to 60 foot candles with a maximum uniformity ratio (maximum illumination / minimum illumination) of 5:1.
5. Fixture and mounting details will be subject to approval by the Engineer.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
LIGHT FIXTURE
AND
SAFETY WALKWAY
DETAILS

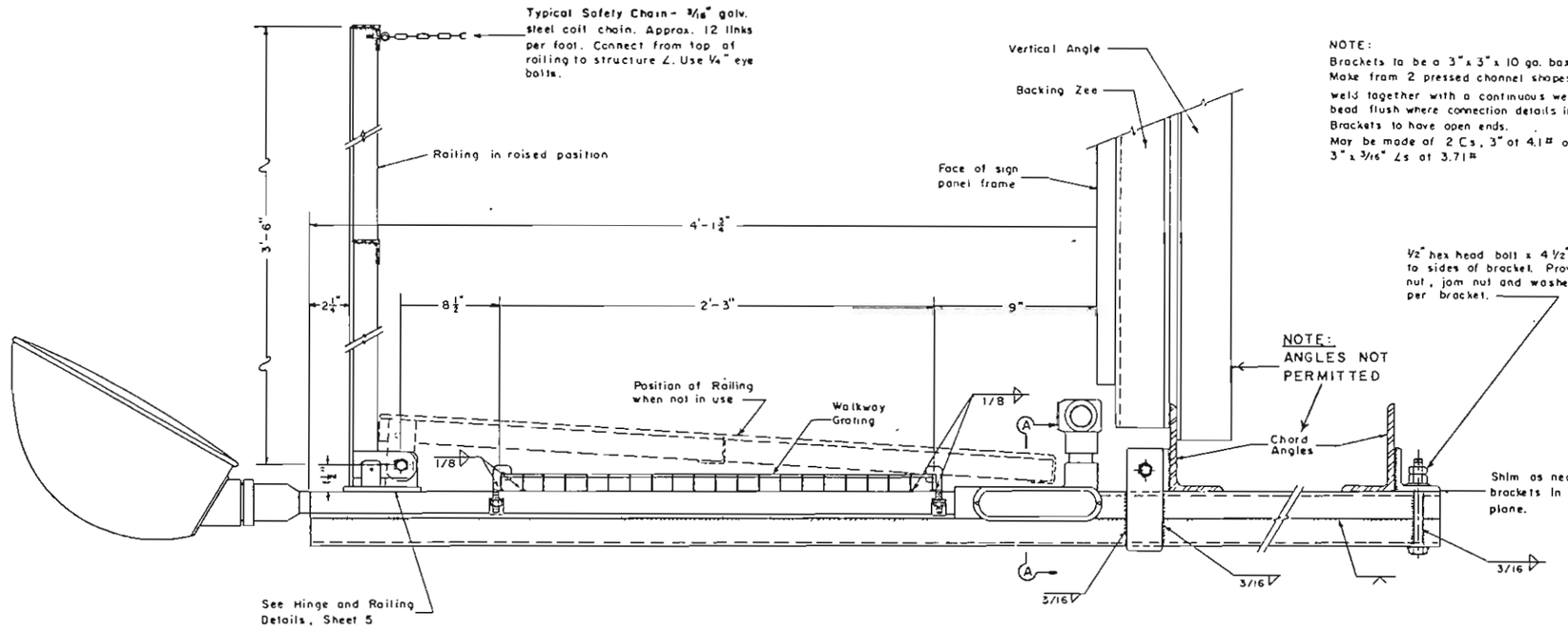
OVERHEAD SIGNS - SHEET 4

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	44	57

REVISIONS		

AS CONSTRUCTED

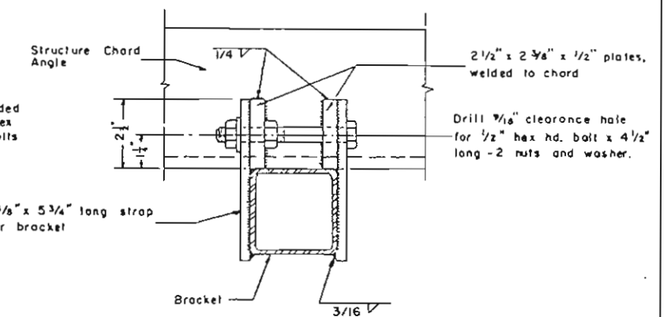
NO REVISIONS 12-12-66 REVISED ☐ VOID ☐



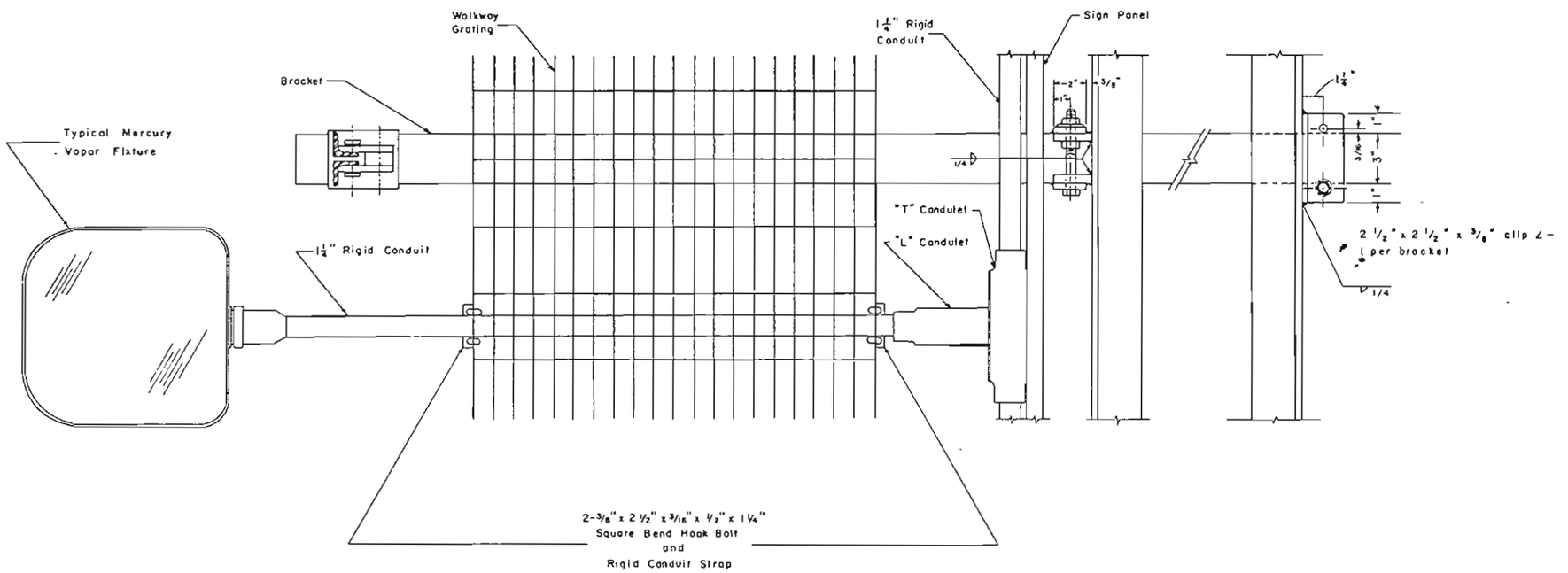
NOTE:
Brackets to be a 3" x 3" x 10 ga. box section. Make from 2 pressed channel shapes and weld together with a continuous weld. Grind bead flush where connection details interfere. Brackets to have open ends.
May be made of 2 Cs, 3" at 4.1# or 2-3" x 3" x 3/16" ∠s at 3.71#

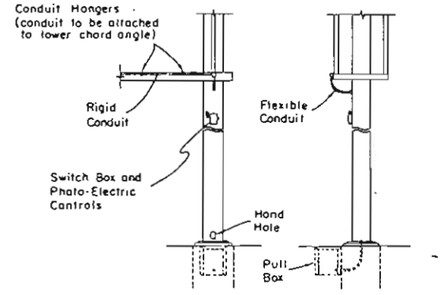
NOTE:
ANGLES NOT PERMITTED

1/2" hex head bolt x 4 1/2" long, welded to sides of bracket. Provide 1/2" hex nut, jam nut and washer. Two bolts per bracket.



SECTION A-A





TYPICAL ELECTRICAL CONNECTION DETAIL

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
LIGHT FIXTURE
AND
SAFETY WALKWAY
DETAILS

SHEETS
STATE OF COLORADO

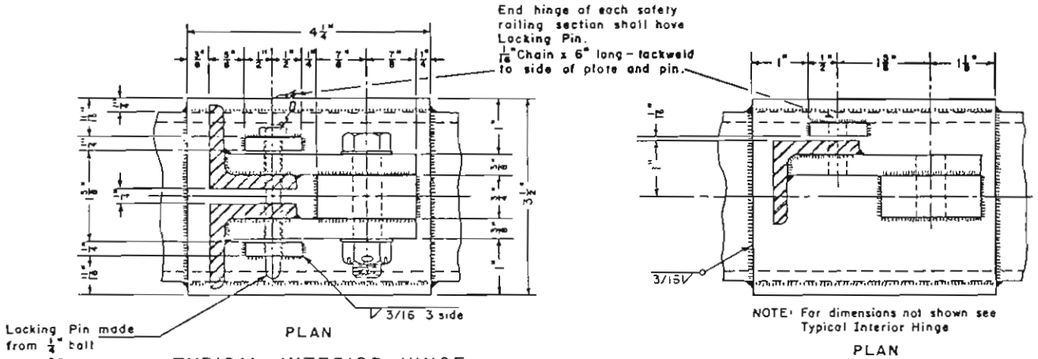
OVERHEAD SIGNS - SHEET 5

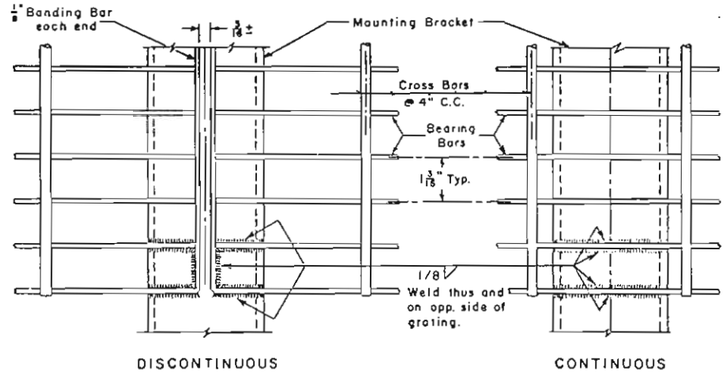
FEDERAL ROAD REGION NO	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	45	57

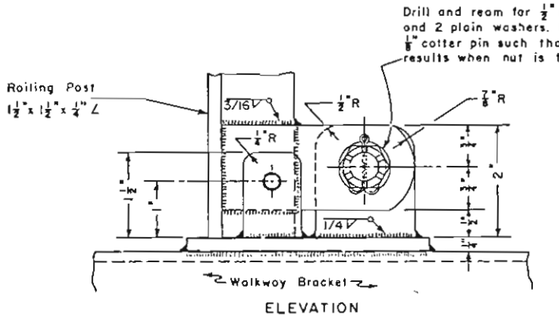
REVISIONS			

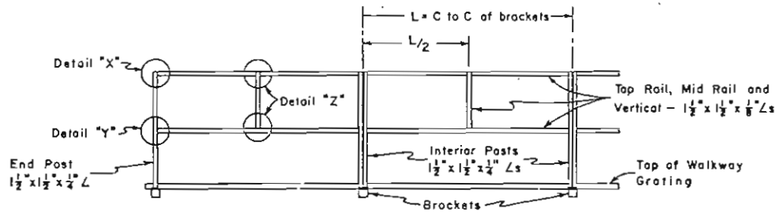
AS CONSTRUCTED

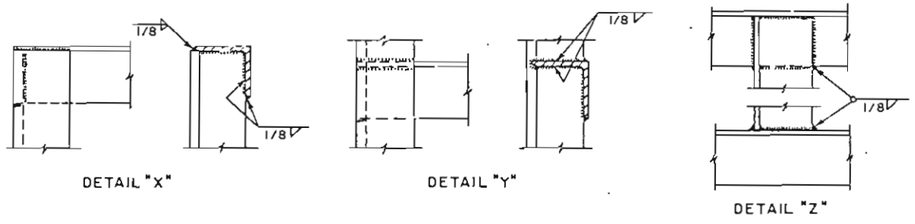
NO REVISION 12-12-74 REVISED VOID

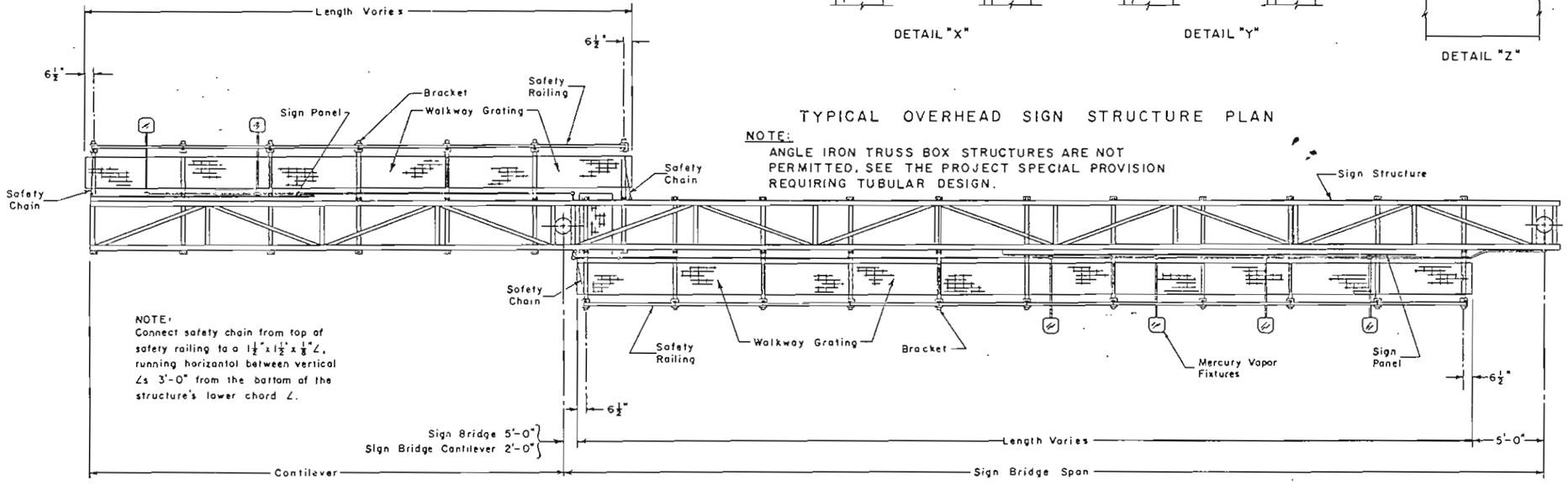










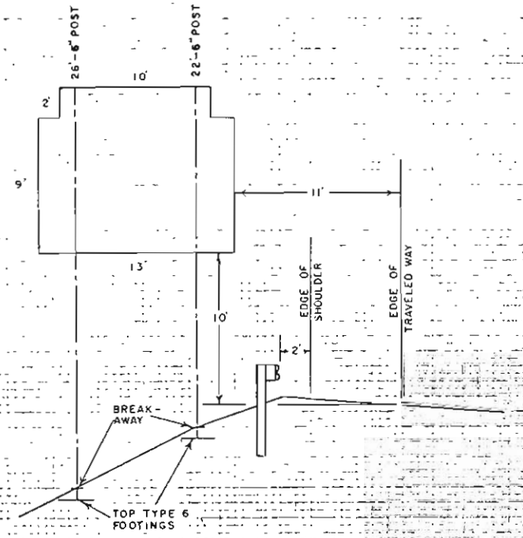


DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

LIGHT FIXTURE
AND
SAFETY WALKWAY
DETAILS

CROSS SECTIONS AT CLASS III & OVERHEAD SIGN LOCATIONS

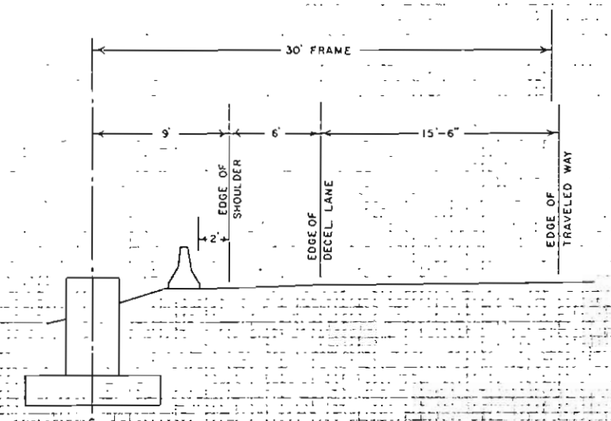
AS CONSTRUCTED
NO REVISIONS ☐ REVISED 12-12-83 VOID ☐



SIGN NO. 25

~~STA. 406+50 RAMP "E"~~

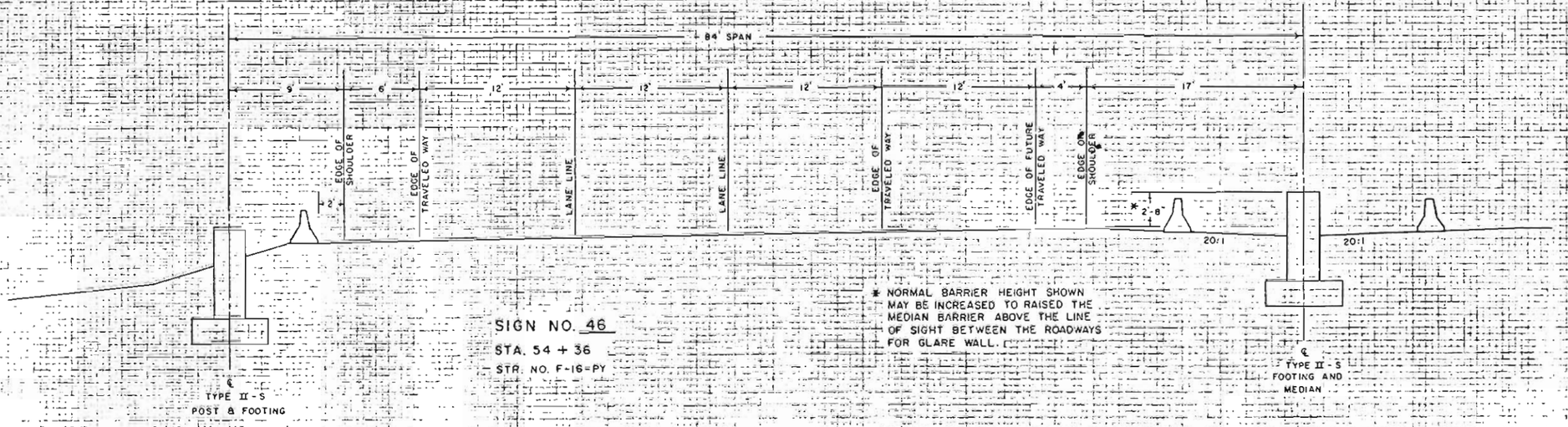
STA. 408+35 RAMP E



SIGN NO. 31

STA. 31+50 W.B.

STR. NO. F-16-PX



SIGN NO. 46

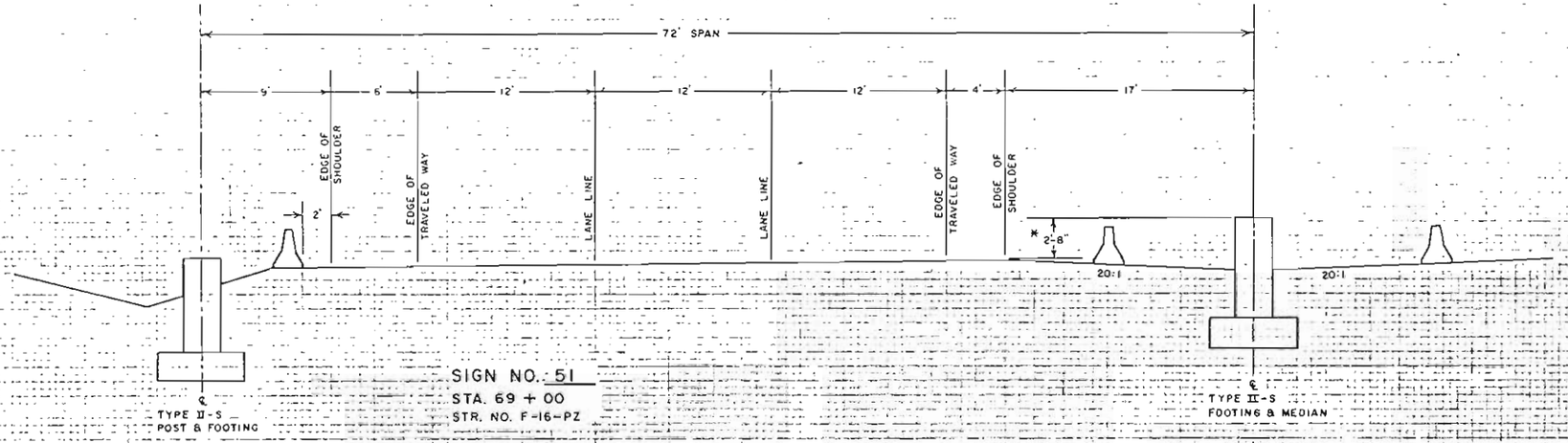
STA. 54 + 36

STR. NO. F-16-PY

* NORMAL BARRIER HEIGHT SHOWN MAY BE INCREASED TO RAISED THE MEDIAN BARRIER ABOVE THE LINE OF SIGHT BETWEEN THE ROADWAYS FOR GLARE WALL.

CROSS SECTIONS AT OVERHEAD SIGN LOCATIONS

AS CONSTRUCTED			
NO REVISIONS	12-12-88	REVISED	VOID



SIGN NO. 51
STA. 69 + 00
STR. NO. F-16-PZ

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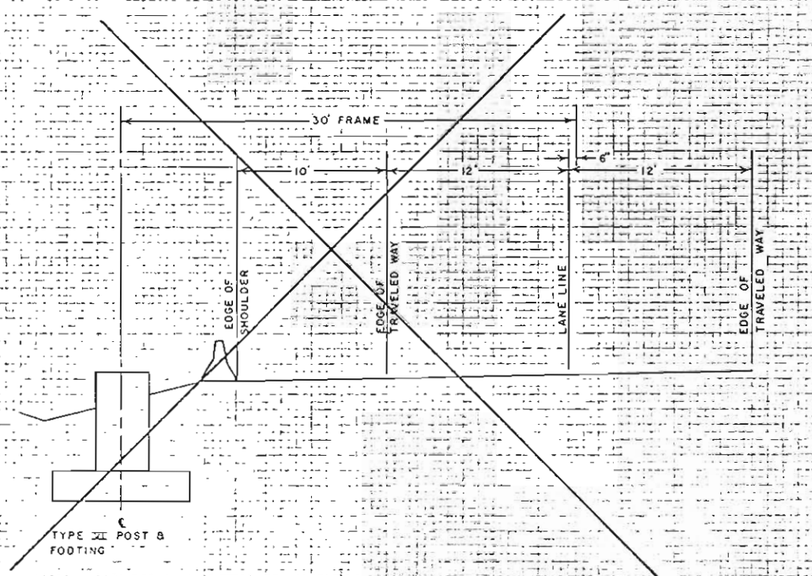
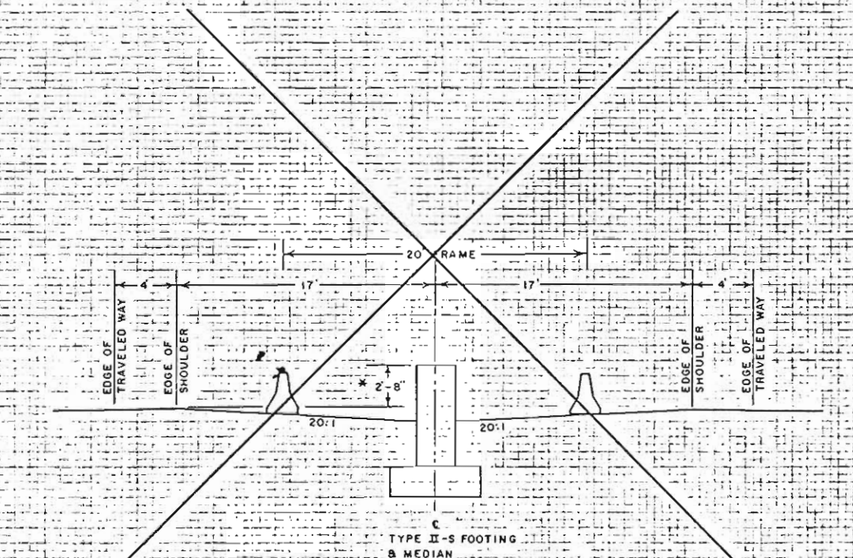


SIGN NO. ____
STA. 100+50
STR. F-16-QA



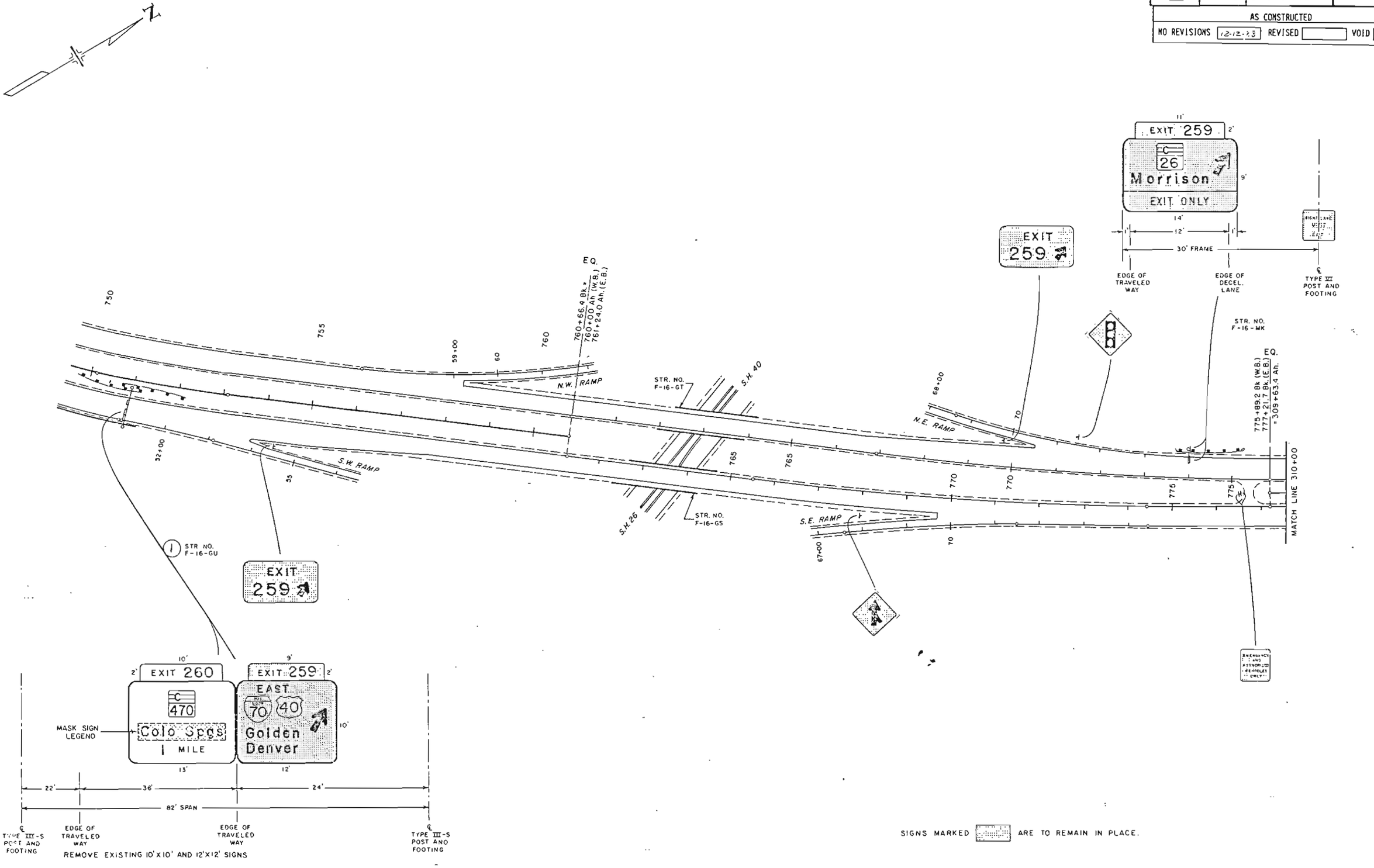
SIGN NO. ____
STA. 147+00
STR. NO. F-16-QB

I-70 AT U.S. 40, S.H. 26 INTERCHANGE (EXIT 259)

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	48	57

AS CONSTRUCTED

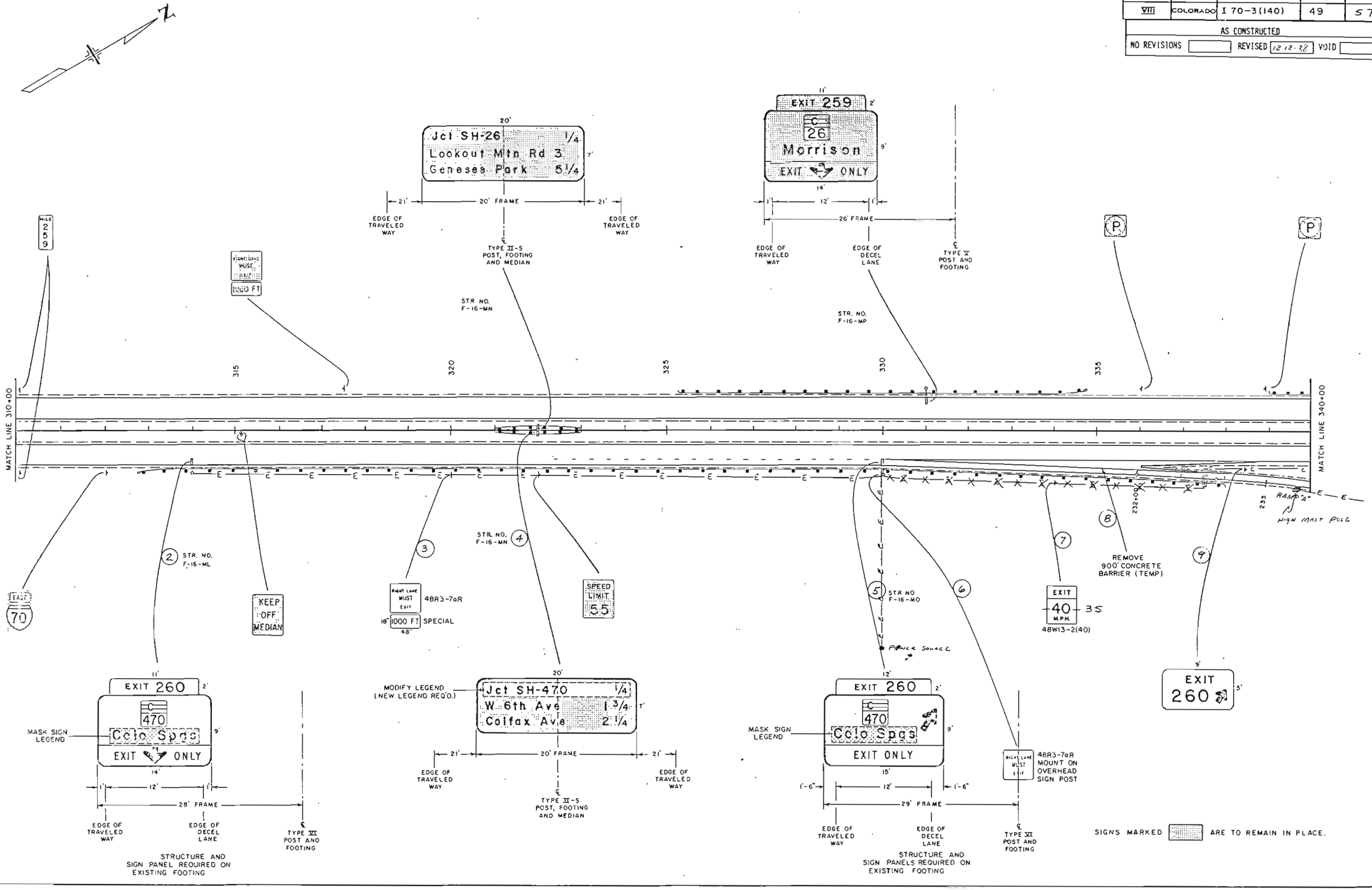
NO REVISIONS 12-12-73 REVISED ____ VOID ____



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	49	57

AS CONSTRUCTED

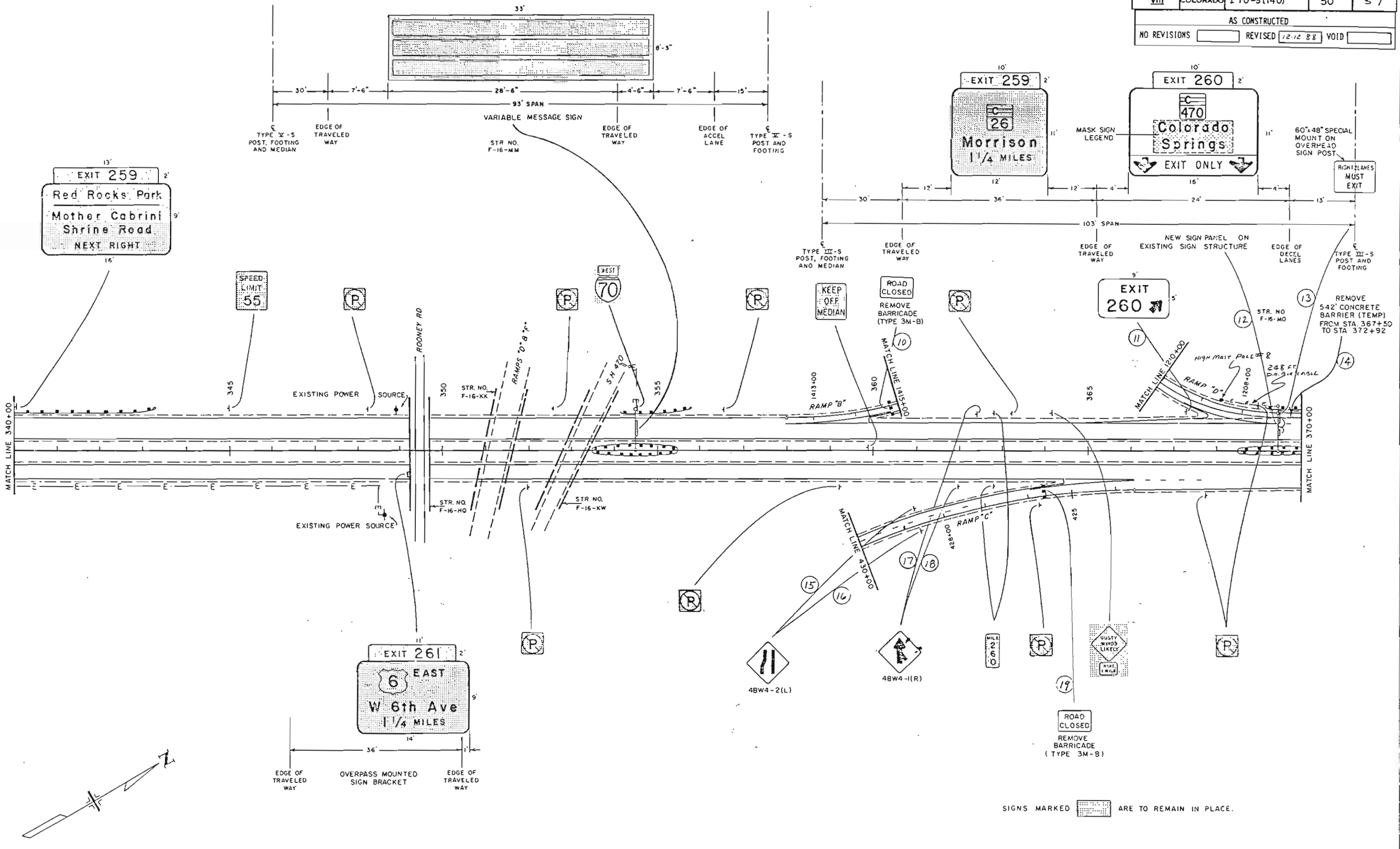
NO REVISIONS ☐ REVISED 12-12-88 VOID ☐



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	50	57

AS CONSTRUCTED

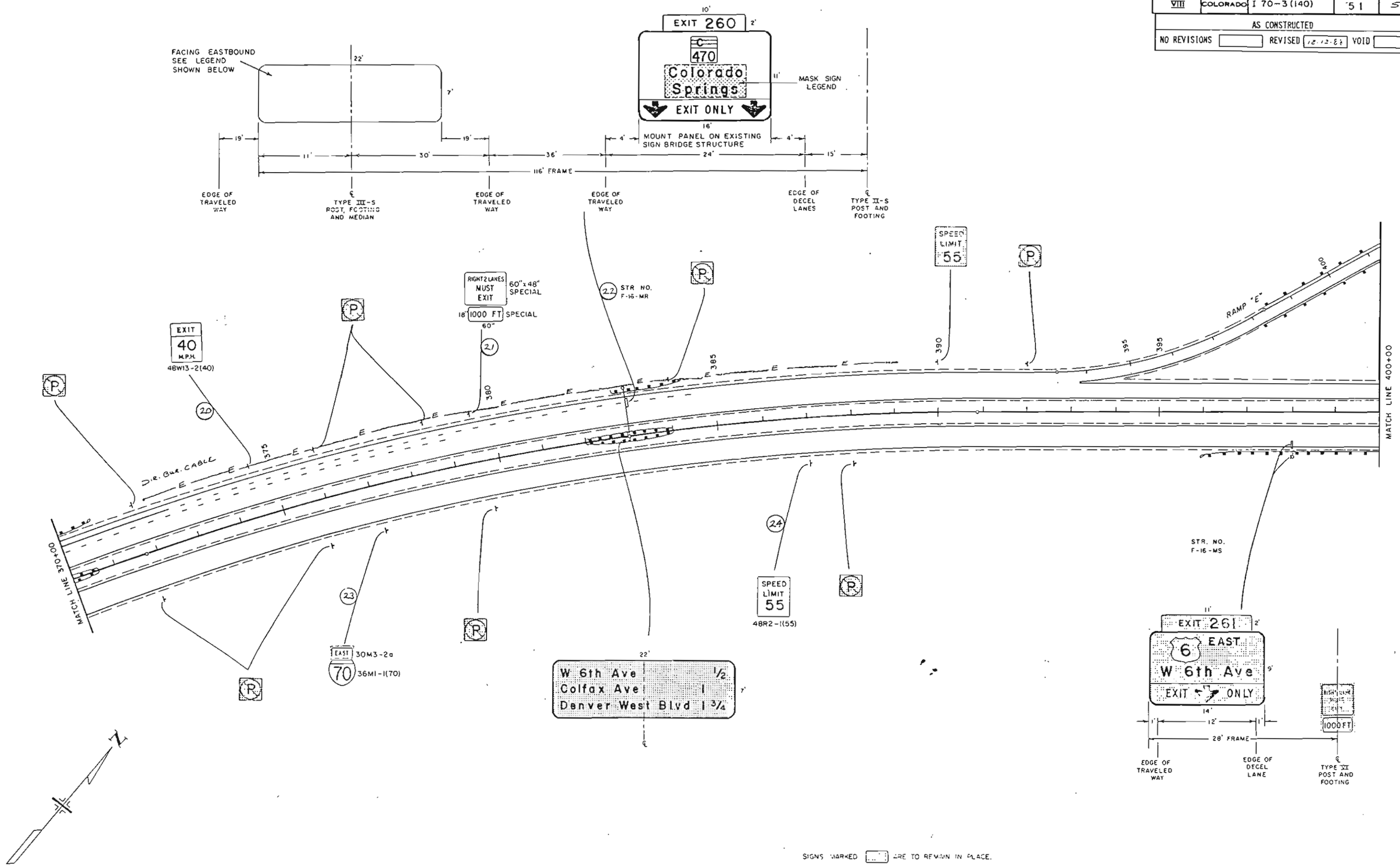
NO REVISIONS ☐ REVISED 12-12 88 VOID ☐



FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	51	57

AS CONSTRUCTED

NO REVISIONS ☐ REVISED 12-12-83 VOID ☐



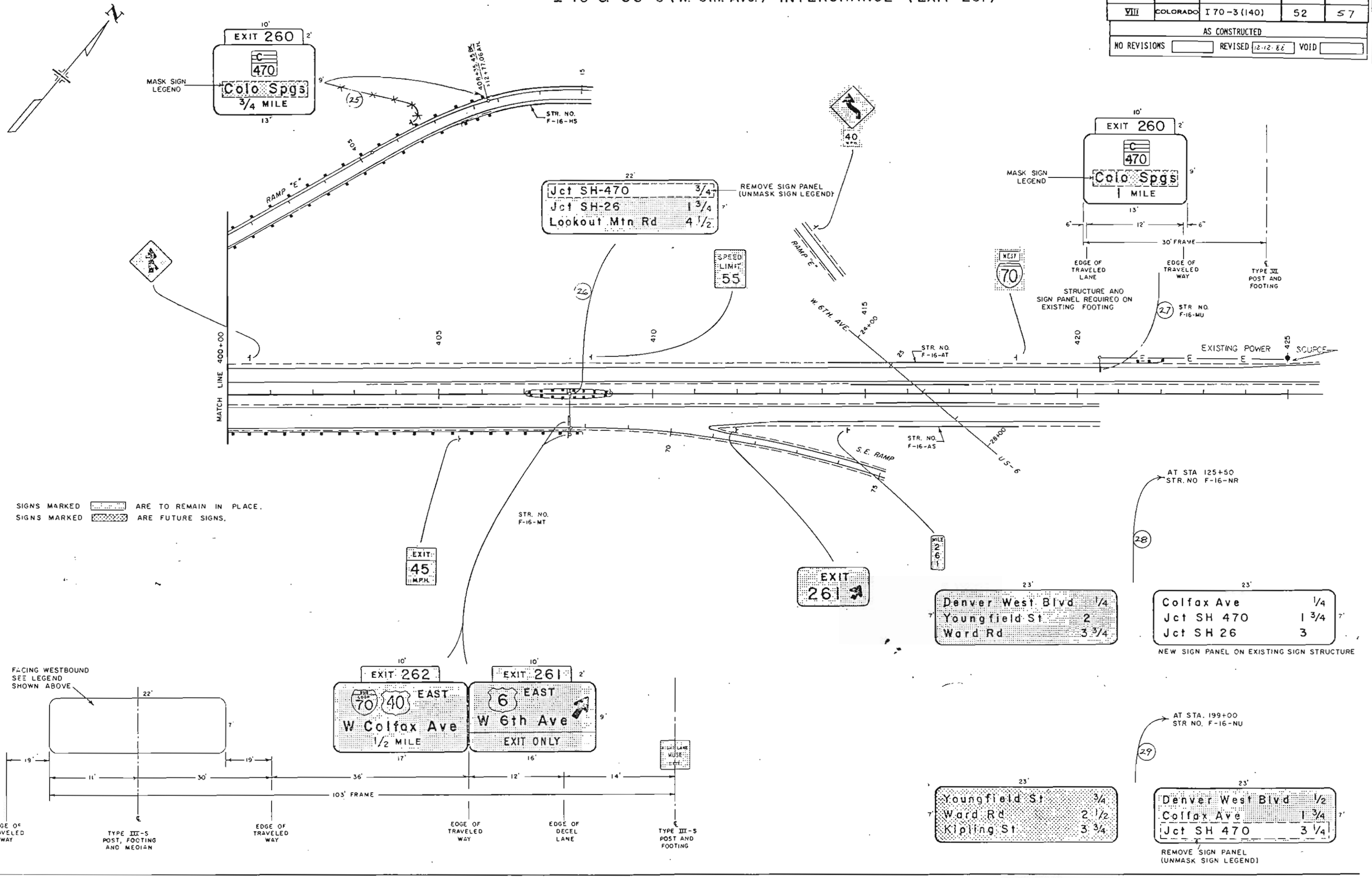
SIGNS MARKED [...] ARE TO REMAIN IN PLACE.

I-70 & US-6 (W. 6th. Ave.) INTERCHANGE (EXIT 261)

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO	I 70-3(140)	52	57

AS CONSTRUCTED

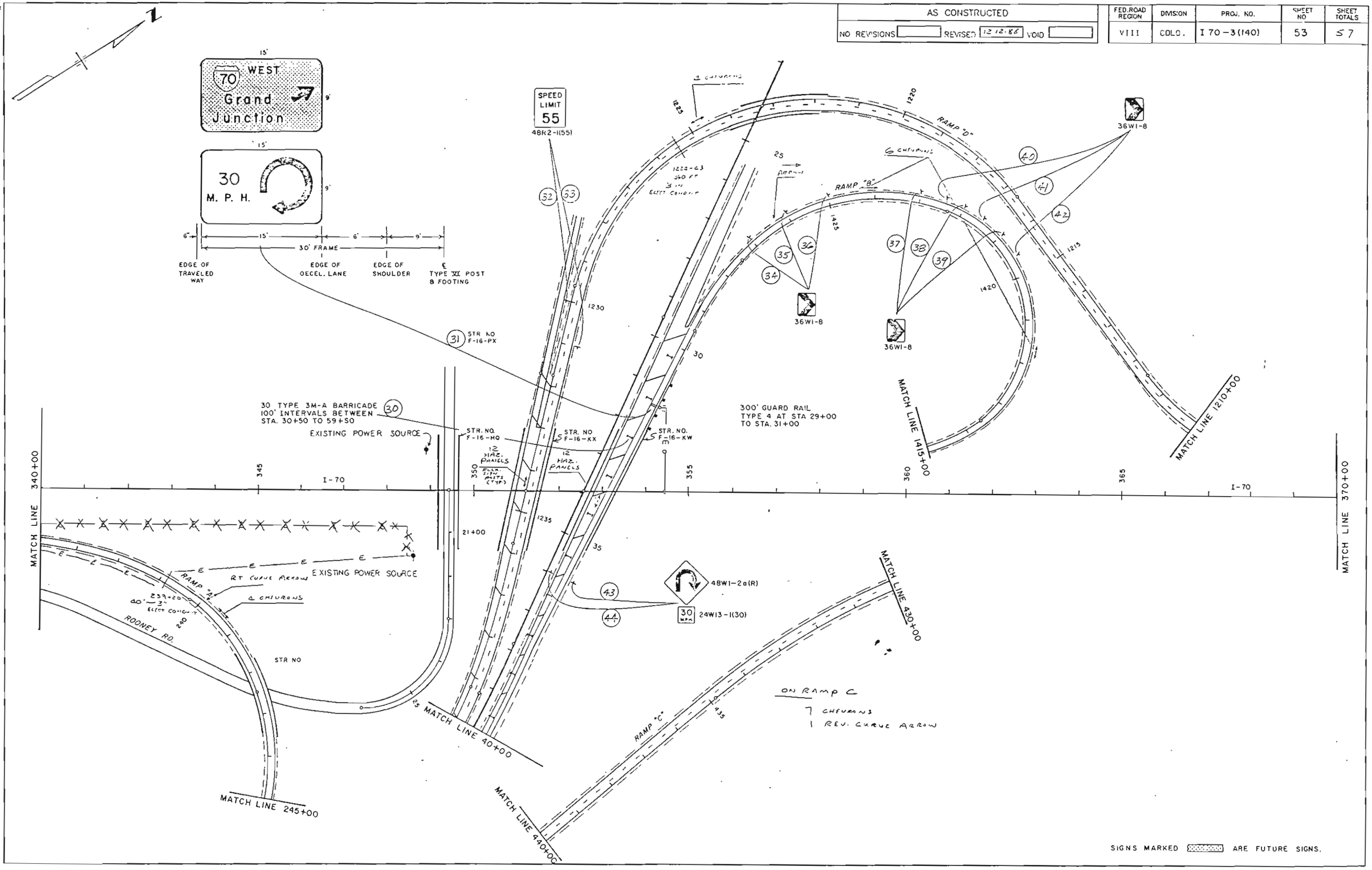
NO REVISIONS ☐ REVISED 12-12-82 VOID ☐



STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
S. O. M. FORM NO. 1700
REV. FEB. 1984

AS CONSTRUCTED
NO REVISIONS ☐ REVISED 12-12-86 VOID ☐

FED.ROAD REGION	DIVISION	PROJ. NO.	SHEET NO	SHEET TOTALS
VIII	COLO.	I 70-3(140)	53	57

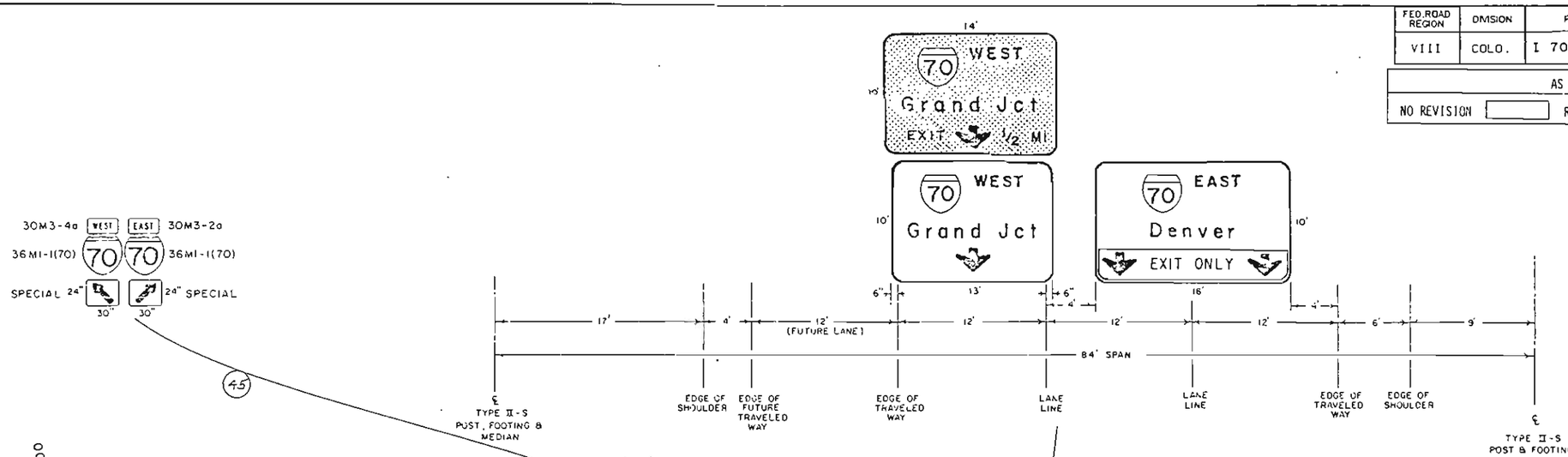


STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
J. O. H. FORM NO. 1705
REV. FEB. 1984

FED.ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	SHEET TOTALS
VIII	COLO.	I 70-3(140)	54	57

AS CONSTRUCTED

NO REVISION ☐ REVISED 12-13-85 VOID ☐

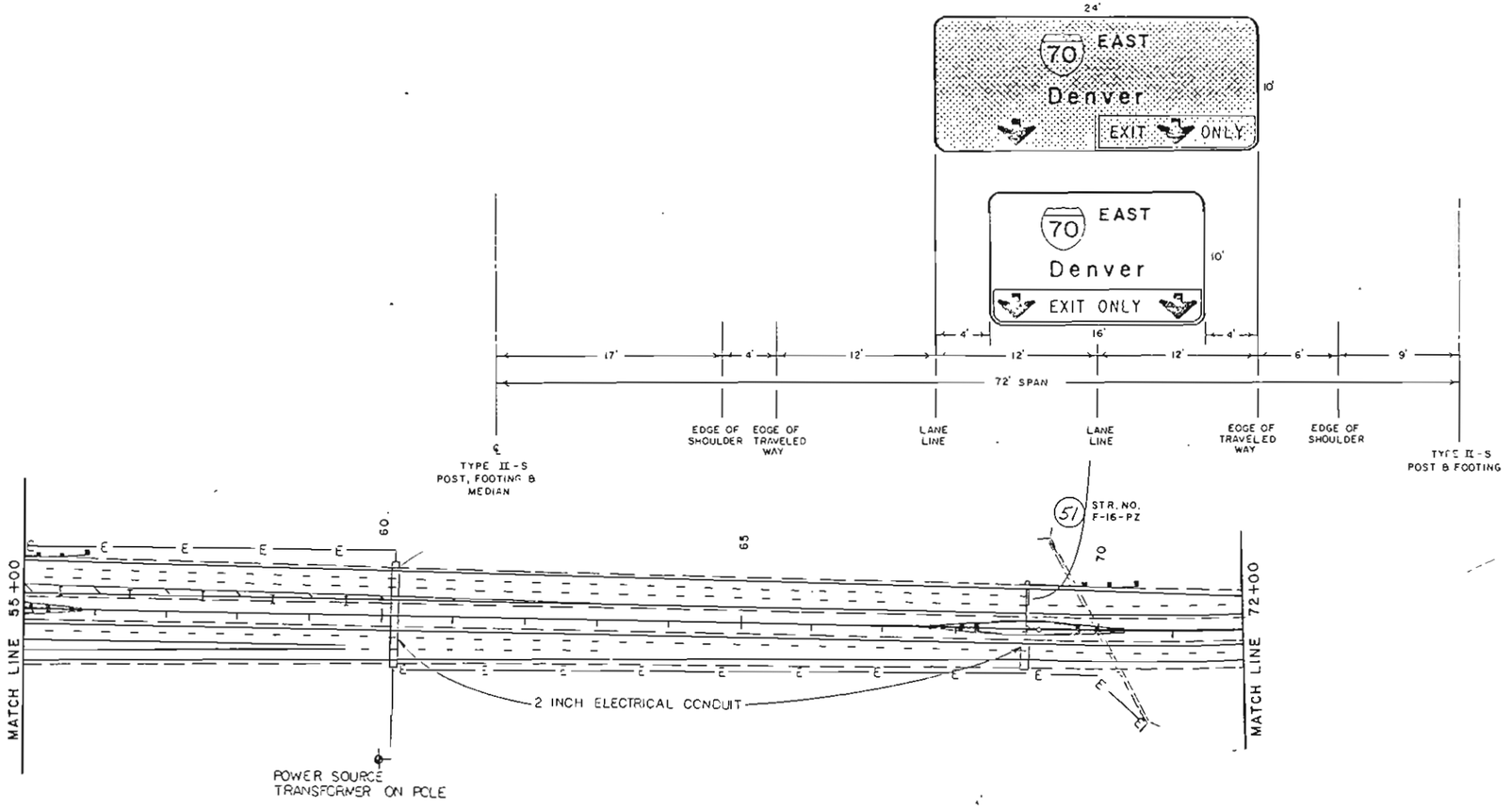


SIGNS MARKED ▨ ARE FUTURE SIGNS.

STATE OF COLORADO
STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
D. O. H. FORM NO. 136
REV. FEB. 1994

AS CONSTRUCTED					
NO REVISIONS 12-12-96	REVISED		VOID		

FED.ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	SHEET TOTALS
VIII	COLO.	I 70-3(140)	55	57



SIGNS MARKED ▨ ARE FUTURE SIGNS.

AS CONSTRUCTED			
NO REVISIONS	12-12-87	REVISED	VOID

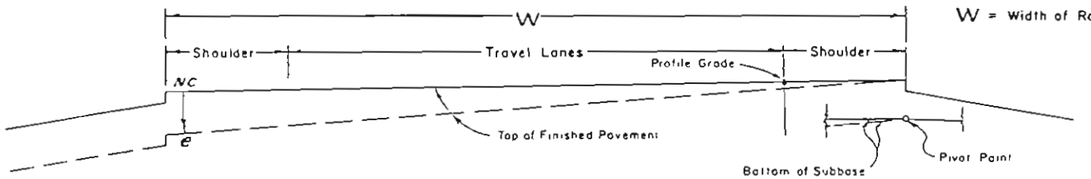
STANDARD M-203-11

(JANUARY, 1982)

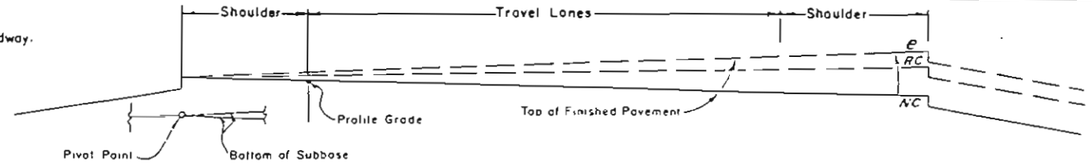
(SPECIAL FOR THIS PROJECT)

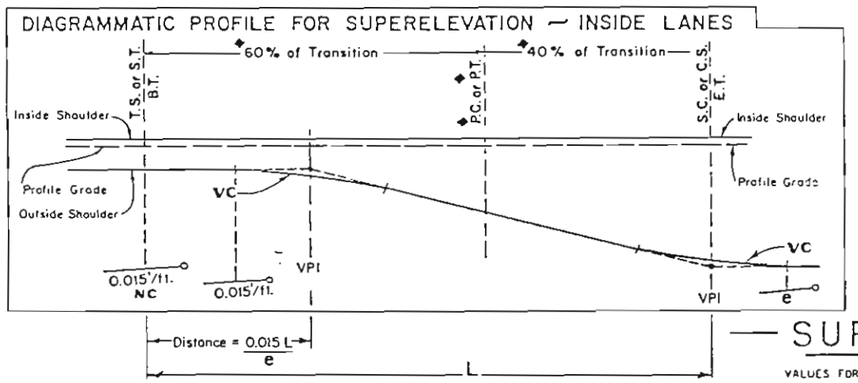
FEDERAL ROAD REGION NO	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	170-3(140)	56

REVISIONS	



W = Width of Roadway.

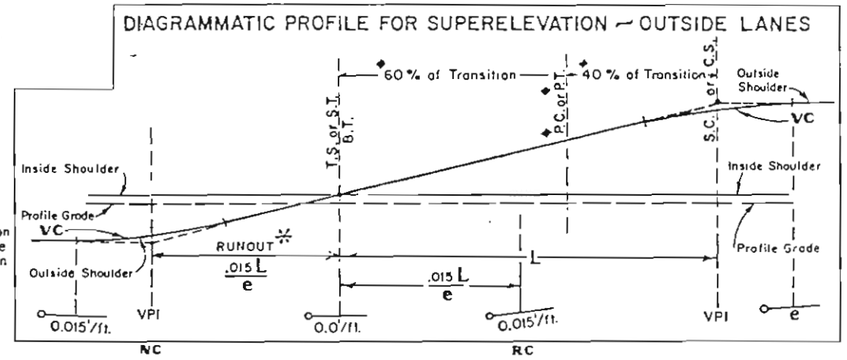




◆ When Curve is Not Spirolled

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

o = Pivot



VC — TO OBTAIN SMOOTH PROFILES ON PAVEMENT EDGES, VERTICAL CURVES MAY BE INSERTED AT THE ANGULAR BREAK POINTS AT THE LOCATIONS SHOWN HERE. UNLESS RESTRAINING CONDITIONS EXIST, THE LENGTH OF VERTICAL CURVE SELECTED, IN FEET, SHOULD BE NO LESS THAN NUMERICALLY EQUAL TO THE DESIGN SPEED, AND NO MORE THAN $\frac{.03\,L}{e}$.

* — RUNOUT LENGTH SHOULD USUALLY BE $.015L/e$. WHEN CONDITIONS ARE SUCH THAT THIS LENGTH IS NOT SUITABLE, THE DESIGNER SHALL CHOOSE ANOTHER LENGTH TO SUIT CONDITIONS.

— SUPERELEVATION RATES —

VALUES FOR DESIGN ELEMENTS RELATED TO DESIGN SPEED AND HORIZONTAL CURVATURE FOR A FOUR LANE DIVIDED HIGHWAY

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	290	.065	320
2° 00'	2865'	RC	100	.027	125	.038	150	.051	210	.057	250	.063	290	.072	310	.076	380
2° 30'	2292'	.021	100	.033	125	.046	170	.060	240	.066	290	.073	330	.078	370	.080	400
3° 00'	1910'	.025	100	.038	125	.053	190	.067	270	.073	320	.078	350	.080	380	.080	400
3° 30'	1637'	.028	100	.042	140	.058	210	.073	300	.077	330	.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	350	D max=3.5°					
6° 00'	955'	.043	120	.061	190	.077	280	.080	320	D max=4.5°							
7° 00'	819'	.048	130	.067	210	.079	280	D max=5.0°									
8° 00'	716'	.052	140	.073	220	.080	290										
9° 00'	637'	.056	150	.075	240	D max=7.5°											
10° 00'	573'	.059	160	.077	240												
11° 00'	521'	.063	170	.078	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'	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	.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	.058	260	.065	310	.071	350
2° 00'	2865'	RC	100	.028	125	.042	150	.058	230	.066	290	.074	330	.082	390	.089	440
2° 30'	2292'	.021	100	.034	125	.051	180	.069	280	.077	330	.086	390	.094	450	.099	490
3° 00'	1910'	.023	100	.040	125	.059	210	.079	320	.087	380	.094	420	100	480	100	500
3° 30'	1637'	.029	100	.046	140	.067	240	.087	350	.093	400	.099	450	100	480	100	500
4° 00'	1432'	.033	100	.051	160	.073	260	.093	380	.098	420	.100	450	D max=3.0°		D max=3.0°	
5° 00'	1146'	.040	110	.061	190	.084	300	.099	400	.100	430	100	430				
6° 00'	955'	.046	120	.070	220	.092	330	.100	410	D max=4.5°		D max=5.0°					
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=8.5°											
11° 00'	521'	.073	200	.097	310												
12° 00'	477'	.077	210	.099	310												
13° 00'	441'	.080	220	.100	320												
14° 00'	409'	.083	220	.100	320												
16° 00'	358'	.089	240	D max=13.5°													
18° 00'	318'	.093	250														
20° 00'	286'	.097	260														
22° 00'	260'	.099	270														
24° 00'	239'	.100	270														
		.100	270														
		D max=25.0°															

$e_{max} = 0.10$

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'	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	.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	230	.070	300	.078	350	.087	410	.095	470
2° 30'	2292'	.022	100	.037	125	.055	200	.076	310	.085	370	.093	430	.103	500	.113	560
3° 00'	1910'	.026	100	.044	140	.065	230	.088	360	.097	420	.108	490	.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	190	.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=3.5°			
6° 00'	955'	.049	130	.079	230	.107	390	.120	490	.120	520	D max=4.0°					
7° 00'	819'	.055	150	.088	250	.114	410	.120	490	D max=5.0°							
8° 00'	716'	.062	170	.096	300	.119	430	D max=6.0°									
9° 00'	637'	.068	190	.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	.118	370												
14° 00'	409'	.093	250	.120	380												
16° 00'	358'	.101	270	.120	380												
18° 00'	318'	.108	290	D max=11.5°													
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

L = LENGTH OF SUPERELEVATION RUNOFF
NC = NORMAL SECTION
RC = REVERSE SLOPE (APPLICABLE TO OUTSIDE LANES ONLY)

SPIRALS DESIRABLE BUT NOT 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
SHOULDER PIVOT

Designed by JHK	Approved by [signature]
Made by ALM	Staff Design Engr.
Checked by DLV	Date: October 22, 1971

AS CONSTRUCTED			
NO REVISIONS	12-12-87	REVISED	VOID

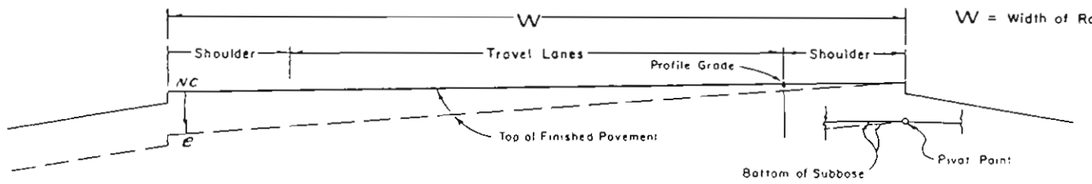
STANDARD M-203-11

(JANUARY, 1982)

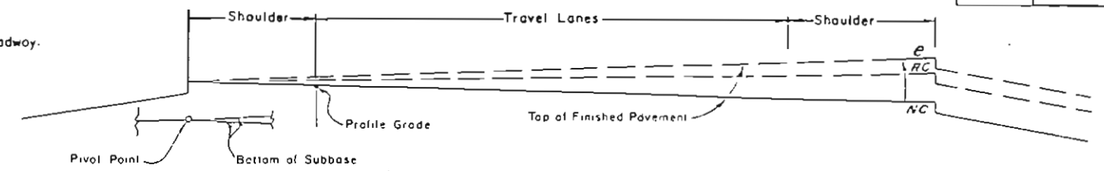
(SPECIAL FOR THIS PROJECT)

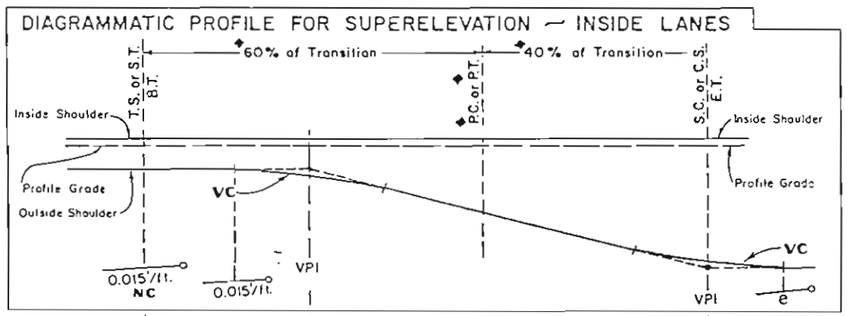
FEDERAL ROAD REGION NO	DIVISION	PROJECT NO.	SHEET NO.
VIII	COLORADO	170-3(140)	56

REVISIONS	



W = Width of Roadway.

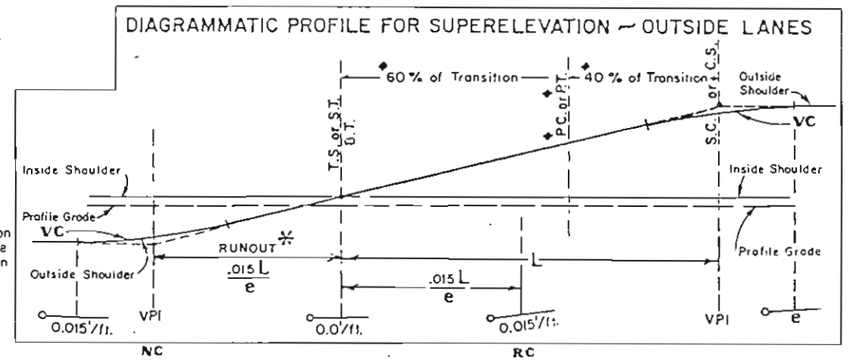




◆ When Curve is Not Spiralled

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

o = Pivot



VC — TO OBTAIN SMOOTH PROFILES ON PAVEMENT EDGES, VERTICAL CURVES MAY BE INSERTED AT THE ANGULAR BREAK POINTS AT THE LOCATIONS SHOWN HERE. UNLESS RESTRAINING CONDITIONS EXIST, THE LENGTH OF VERTICAL CURVE SELECTED, IN FEET, SHOULD BE NO LESS THAN NUMERICALLY EQUAL TO THE DESIGN SPEED, AND NO MORE THAN $\frac{.03\,L}{e}$.

* — RUNOUT LENGTH SHOULD USUALLY BE $.015L/e$. WHEN CONDITIONS ARE SUCH THAT THIS LENGTH IS NOT SUITABLE, THE DESIGNER SHALL CHOOSE ANOTHER LENGTH TO SUIT CONDITIONS.

— SUPERELEVATION RATES —

VALUES FOR DESIGN ELEMENTS RELATED TO DESIGN SPEED AND HORIZONTAL CURVATURE FOR A FOUR LANE DIVIDED HIGHWAY

Use in Mountainous Areas and Areas where Icing Conditions Frequently Exist

D	R	V = 30 MPH		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET
0° 15'	22918'	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	210
0° 30'	11459'	NC	0	NC	0	NC	0	RC	135	RC	190	RC	200	.022	220	.021	210
0° 45'	7639'	NC	0	NC	0	RC	130	.022	135	.025	190	.029	200	.032	220	.036	240
1° 00'	5730'	NC	0	RC	125	.021	130	.029	135	.033	190	.038	200	.043	220	.047	240
1° 30'	3820'	RC	100	.021	125	.030	130	.040	135	.046	200	.053	240	.060	290	.063	320
2° 00'	2865'	RC	100	.027	125	.038	130	.051	210	.057	250	.065	290	.072	340	.076	380
2° 30'	2292'	.021	100	.033	125	.046	170	.060	240	.066	290	.073	330	.078	370	.080	400
3° 00'	1910'	.025	100	.038	125	.053	190	.067	270	.073	320	.078	350	.080	380	.080	400
3° 30'	1637'	.028	100	.043	140	.058	230	.073	300	.077	330	.080	360	.080	380	D max=3.5°	
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	350	D max=2.5°					
6° 00'	955'	.043	120	.061	190	.077	280	.080	320	D max=2.5°							
7° 00'	819'	.048	130	.067	210	.079	280	D max=3.0°									
8° 00'	716'	.052	140	.071	220	.080	290										
9° 00'	637'	.056	150	.075	240	D max=3.5°											
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		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET
0° 15'	22918'	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	210
0° 30'	11459'	NC	0	NC	0	NC	0	RC	175	RC	190	RC	200	.022	220	.021	210
0° 45'	7639'	NC	0	NC	0	RC	150	.021	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	.058	260	.065	310	.073	350
2° 00'	2865'	RC	100	.028	125	.042	150	.058	230	.066	290	.074	330	.082	390	.089	440
2° 30'	2292'	.021	100	.034	125	.051	180	.069	280	.077	330	.086	390	.094	450	.098	490
3° 00'	1910'	.025	100	.040	125	.059	210	.079	320	.087	360	.091	420	.100	480	.100	500
3° 30'	1637'	.029	100	.046	140	.067	240	.087	350	.093	400	.099	450	.100	480	.100	500
4° 00'	1432'	.033	100	.051	160	.073	260	.093	380	.098	420	.100	450	D max=3.0°		D max=3.0°	
5° 00'	1146'	.040	110	.063	190	.084	300	.099	400	.100	430	.100	430				
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'	.069	180	.093	290	D max=8.5°											
11° 00'	521'	.073	200	.097	310												
12° 00'	477'	.077	210	.099	310												
13° 00'	441'	.080	220	.100	320												
14° 00'	409'	.083	220	.100	320												
16° 00'	358'	.089	240	D max=13.5°													
18° 00'	318'	.093	250														
20° 00'	286'	.097	260														
22° 00'	260'	.099	270														
24° 00'	239'	.100	270														
		.100	270														
		D max=25.0°															

$e_{max} = 0.10$

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		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET
0° 15'	22918'	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	NC	0	RC	210
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	.042	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'	.026	100	.044	140	.065	230	.088	360	.097	420	.108	490	.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	.113	470	.120	520	.120	540	D max=2.5°			
6° 00'	955'	.049	130	.079	250	.107	390	.120	490	.120	520	D max=4.0°					
7° 00'	819'	.055	130	.085	220	.114	410	.120	490	D max=5.0°							
8° 00'	716'	.062	170	.096	200	.119	430	D max=6.0°									
9° 00'	637'	.068	170	.103	320	.120	430										
10° 00'	573'	.074	200	.108	240	.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

L — LENGTH OF SUPERELEVATION RUNOFF
NC — NORMAL SECTION
RC — REVERSE SLOPE (APPLICABLE TO OUTSIDE LANES ONLY)

SPIRALS DESIRABLE BUT NOT 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
SHOULDER PIVOT

Designed by WFK	Approved by
Made by RLW	Staff Design Engr.
Checked by DLV	Date: October 22, 1971

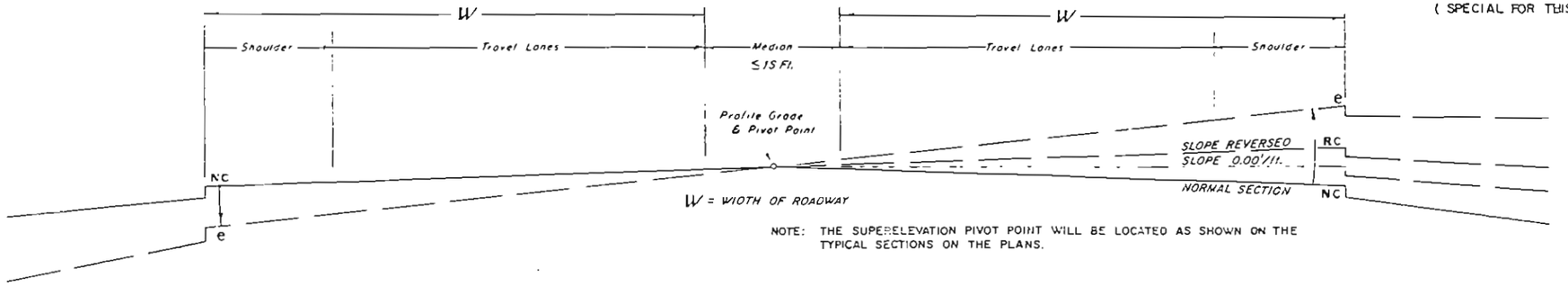
AS CONSTRUCTED		
NO REVISIONS 12-2-81	REVISED	VOID

STANDARD M-203-13

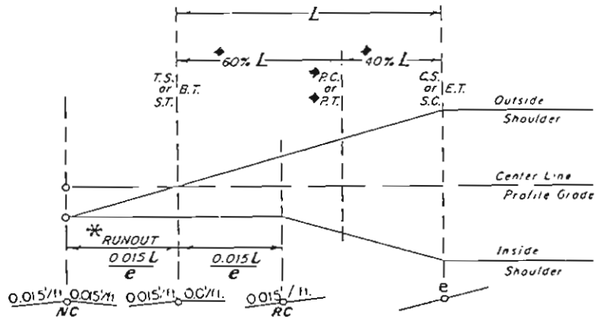
(JANUARY, 1982)
(SPECIAL FOR THIS PROJECT)

FEDERAL ROAD REGION NO	DIVISION	PROJ NO	SHEET NO	TOTAL SHEETS
VIII	COLORADO	I 70 - 3(140	57	57

REVISIONS		



NOTE: THE SUPERELEVATION PIVOT POINT WILL BE LOCATED AS SHOWN ON THE TYPICAL SECTIONS ON THE PLANS.

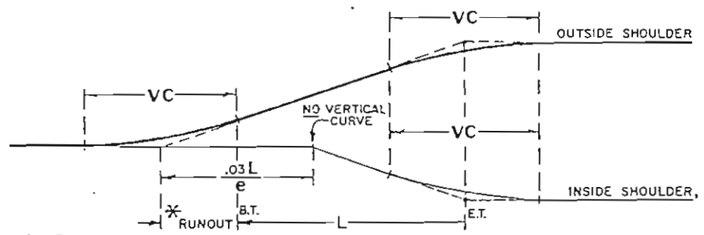


o = PIVOT

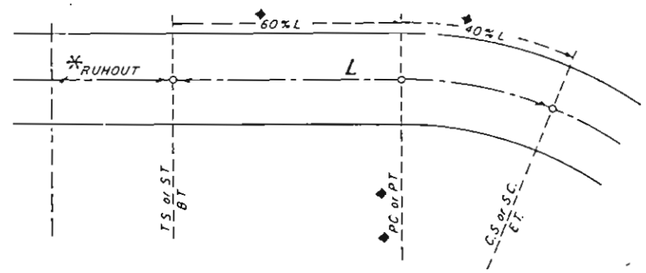
◆ – WHEN CURVE IS NOT SPIRALLED.

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

* RUNOUT LENGTH SHOULD USUALLY BE $.015\,L/e$. WHEN CONDITIONS ARE SUCH THAT THIS LENGTH IS NOT SUITABLE, THE DESIGNER SHALL CHOOSE ANOTHER LENGTH TO SUIT CONDITIONS.



VC – TO OBTAIN SMOOTH PROFILES ON PAVEMENT EDGES, VERTICAL CURVES MAY BE INSERTED AT THE ANGULAR BREAK POINTS AT THE ENDS OF RUNOUT AND RUNOFF. UNLESS RESTRAINING CONDITIONS EXIST, THE LENGTH OF VERTICAL CURVE SELECTED, IN FEET, SHOULD BE NO LESS THAN NUMERICALLY EQUAL TO THE DESIGN SPEED, AND NO MORE THAN $.03\,L/e$.



SUPERELEVATION RATES

VALUES FOR DESIGN ELEMENTS RELATED TO DESIGN SPEED AND HORIZONTAL CURVATURE FOR A FOUR LANE DIVIDED HIGHWAY WITH CENTER PIVOT POINT AND NARROW MEDIAN.

Use in Mountainous Areas and Areas where Icing Conditions Frequently Exist

D	R	V = 30 MPH		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	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	.023	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	210	.060	230	.065	320
2° 00'	2865'	RC	100	.027	125	.038	150	.051	210	.057	250	.065	290	.072	310	.076	340
2° 30'	2292'	.021	100	.033	125	.046	170	.060	240	.066	290	.073	330	.078	370	.080	400
3° 00'	1910'	.025	100	.038	125	.053	190	.067	270	.073	320	.078	350	.078	390	.080	400
3° 30'	1637'	.025	100	.043	140	.058	210	.073	300	.077	338	.080	360	.080	380	D MAX=22.5°	
4° 00'	1432'	.032	100	.047	150	.063	230	.077	310	.078	340	.080	360	D MAX=21.0°			
5° 00'	1146'	.035	100	.055	170	.071	260	.080	320	.080	350	D MAX=15.5°					
6° 00'	955'	.043	120	.063	190	.077	280	.080	320	D MAX=12.5°							
7° 00'	819'	.048	130	.067	210	.079	280	D MAX=10.0°									
8° 00'	716'	.052	140	.071	220	.080	290										
9° 00'	637'	.056	150	.075	240	D MAX=9.5°											
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°													
15° 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		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	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	.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	.058	260	.065	310	.071	350
2° 00'	2865'	RC	100	.028	125	.042	150	.058	230	.066	290	.074	330	.082	390	.089	440
2° 30'	2292'	.021	100	.034	125	.051	180	.069	280	.077	320	.086	380	.094	450	.098	490
3° 00'	1910'	.025	100	.040	125	.059	210	.079	320	.087	360	.094	420	100	480	100	500
3° 30'	1637'	.029	100	.046	140	.067	240	.087	350	.093	400	.099	450	100	480	100	500
4° 00'	1432'	.033	100	.051	160	.073	260	.093	380	.098	420	.100	450	D MAX=3.0°		D MAX=3.0°	
5° 00'	1146'	.038	110	.061	190	.084	300	.099	400	100	430	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=3.5°									
8° 00'	716'	.059	150	.084	260	.100	360										
9° 00'	637'	.064	170	.089	280	100	360										
10° 00'	573'	.068	180	.093	290	D MAX=8.5°											
11° 00'	521'	.073	200	.097	310												
12° 00'	477'	.077	210	.099	310												
13° 00'	441'	.080	220	100	320												
14° 00'	409'	.083	220	100	320												
15° 00'	358'	.089	240	D MAX=13.5°													
18° 00'	318'	.093	250														
20° 00'	286'	.097	260														
22° 00'	260'	.099	270														
24° 00'	239'	.100	270														
		.100	270														
		D MAX=25.0°															

$e_{max} = 0.10$

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		V = 40 MPH		V = 50 MPH		V = 60 MPH		V = 65 MPH		V = 70 MPH		V = 75 MPH		V = 80 MPH	
		e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	L-FEET	e	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	.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	.043	190	.053	230	.059	270	.065	310	.072	340
2° 00'	2865'	RC	100	.030	125	.045	180	.062	250	.070	300	.078	330	.087	410	.095	470
2° 30'	2292'	.022	100	.037	125	.055	200	.076	310	.085	370	.095	420	.105	500	.113	560
3° 00'	1910'	.026	100	.044	140	.065	220	.088	360	.097	420	.108	490	.117	560	.129	600
3° 30'	1637'	.030	100	.050	140	.074	270	.098	400	.107	460	.118	520	.129	570	.129	600
4° 00'	1432'	.034	100	.057	190	.082	300	.106	430	.116	490	.128	540	129	570	D MAX=3.0°	
5° 00'	1146'	.042	110	.068	210	.096	350	.117	470	.128	520	129	540	D MAX=3.5°			
6° 00'	955'	.049	130	.079	250	.107	390	129	490	.128	520	D MAX=4.0°					
7° 00'	819'	.055	130	.088	280	.114	410	129	490	D MAX=5.0°							
8° 00'	716'	.062	170	.096	300	.119	430	D MAX=6.0°									
9° 00'	637'	.068	190	103	320	129	430										
10° 00'	573'	.074	200	108	340	129	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	129	380												
15° 00'	358'	.101	270	129	390												
18° 00'	318'	.108	290	D MAX=11.5°													
20° 00'	286'	.113	310														
22° 00'	260'	117	320														
24° 00'	239'	.129	320														
		.129	320														
		D MAX=26.5°															

$e_{max} = 0.12$

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

L – LENGTH OF SUPERELEVATION RUNOFF
NC – NORMAL SECTION
RC – REVERSE SLOPE (APPLICABLE TO OUTSIDE LANES ONLY)

SPIRALS DESIRABLE BUT NOT 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
CENTER PIVOT

Designed by TAL | Approved by [signature]
Made by JRB | Staff Design Engr.
Checked by CEH | Date: 9/21/81

SION OF HIGHWAYS, STATE OF COLORADO
H FORM NO 126
V. FEB., 1977

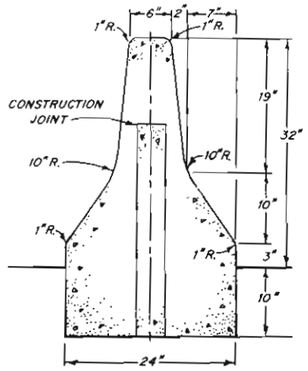
DETAILS FOR CAST IN PLACE CONCRETE BARRIER

STANDARD M-606-12

(SHEET 1 OF 9)

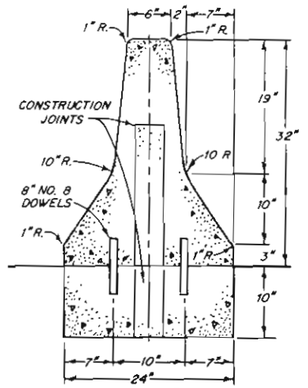
FEDERAL ROAD REGION NO	DIVISION	PROJ. NO.	SHEET NO	TOTAL SHEETS
VIII	COLORADO			

REVISIONS



STYLE CA

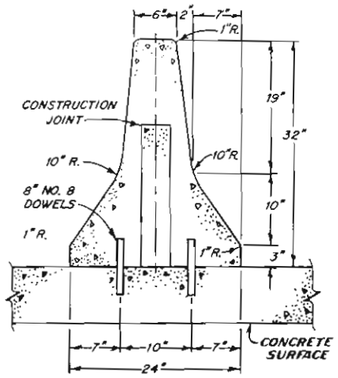
MONOLITHIC BARRIER



STYLE CA (OPT.)

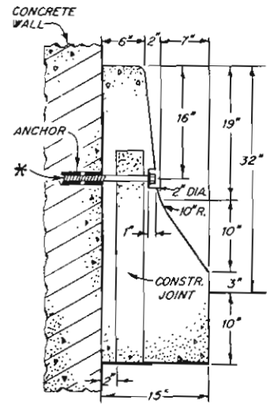
TWO PIECE DOWELLED BARRIER

(OPTIONAL)



STYLE CC

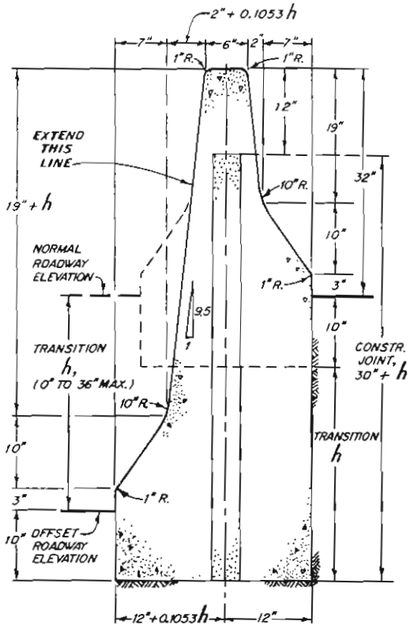
BARRIER DOWELLED TO CONCRETE SURFACE



STYLE CD

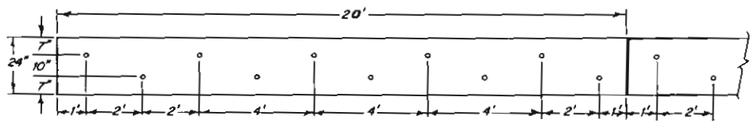
BARRIER AGAINST WALL

* 3/4" DIA. x 12" LONG GALVANIZED ANCHOR BOLT AND WASHER, MECHANICALLY FASTENED AT 2'-6" CTRS.; USE ONLY WHEN CALLED FOR ON PLANS.



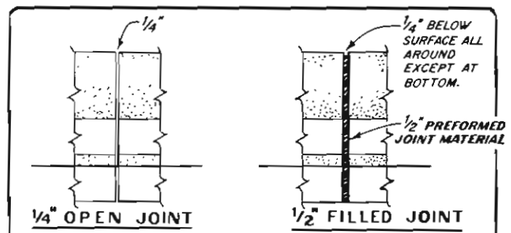
STYLE CE

BARRIER FOR OFFSET ROADWAYS



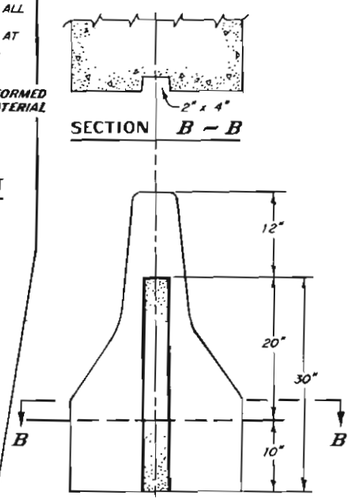
DOWEL PLACEMENT LAYOUT

(FOR STYLE CA (OPT.) OR CC BARRIERS)



TYPICAL TRANSVERSE JOINTS

REQUIRED AT 20 FT. INTERVALS FOR ALL STYLES OF CAST IN PLACE BARRIER



CONSTRUCTION JOINT

SHALL BE USED AT THE END OF A DAYS POUR OR AFTER 30 MIN. INTERRUPTION.

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**.

PAVEMENT SHALL BE PATCHED ALONG THE BARRIER FOUNDATION TO MATCH EXISTING ASPHALT SURFACE.

TYPE 4 BARRIER MAY BE CAST IN PLACE OR PRECAST UNLESS A SPECIFIC STYLE OF BARRIER IS SPECIFIED ON THE PLAN.

DOWEL BARS MAY BE PLACED IN WET CONCRETE OR GROUTED IN HOLES DRILLED IN EXISTING CONCRETE.

ALL INCIDENTAL WORK AND MATERIALS SUCH AS DOWELS, GROUT, ANCHORS, BOLTS, PINS, JOINT MATERIAL, EXCAVATION FOR BASE, ETC. SHALL BE INCLUDED IN THE COST OF BARRIER.

PRECAST BARRIER:

ALL EXPOSED LOOPS SHALL BE THOROUGHLY CLEANED AND PAINTED IN ACCORDANCE WITH SECTION 509.

NUTS, WASHERS, LIFTING HARDWARE, CONNECTING PINS, DRIFT PINS AND ANCHOR BOLTS SHALL BE GALVANIZED.

TRIANGULAR SPACE IN BASE OF BARRIER IS TYPICAL, CIRCULAR ARC OR RECTANGULAR SHAPE WILL BE PERMITTED.

DRAINAGE SLOTS MAY BE OMITTED ON:

1. MEDIAN INSTALLATION WITH INLET DRAINAGE.
2. SHOULDER BARRIER ON HIGH EDGE OF SUPERELEVATED SHOULDER.
3. MEDIAN BARRIER ON CREST VERTICAL CURVE.
4. PERMANENT BARRIER.

STYLE **CE** BARRIER SHALL BE CAST IN PLACE UNLESS OTHERWISE PERMITTED.

THE JOINT BETWEEN CAST IN PLACE AND PERMANENT PRECAST BARRIER SHALL INCLUDE ALL RECESSES, LOOP REBARS AND PINS TO MAKE A PROPER MATCHING JOINT.

MIXING GUARD RAIL TYPES:

THIS STANDARD SHOWS THE DETAILS FOR VARIOUS USAGES OF GUARD RAIL, TYPE 4, CONCRETE BARRIER.

THE PLANS WILL INDICATE THE LOCATIONS ON THE PROJECT WHERE GUARD RAIL TYPES 3 OR 4 ARE REQUIRED.

WHEN GUARD RAIL, TYPE 3, W-BEAM IS TO BE USED AS AN END TREATMENT TO CONCRETE BARRIER OR AT A LOCATION SHOWN ON THE PLAN, REFER TO THE W-BEAM GUARD RAIL STANDARD FOR DETAILS.

WHEN BRIDGE RAIL IS DIFFERENT FROM ROADWAY RAIL, THE BRIDGE PLANS WILL SHOW THE CONNECTION DETAILS.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL-TYPE 4 CONCRETE BARRIER

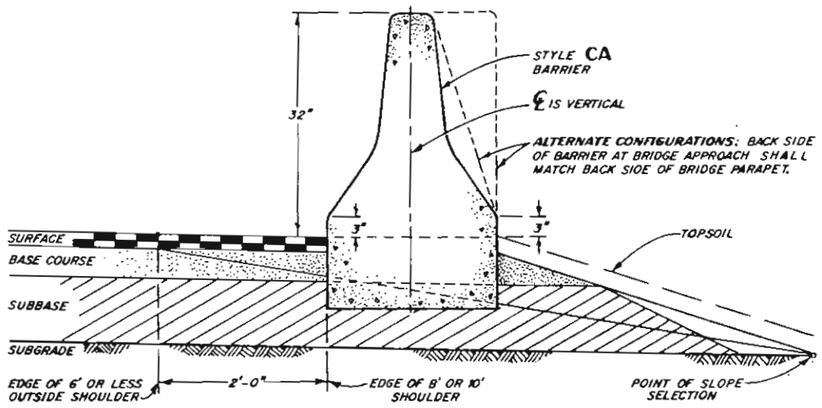
APPROVED BY:	STANDARD PLAN NO.
K. T. Mauro, STAFF DESIGN ENGINEER	M-606-12
DATE: FEBRUARY 18, 1983	SHEET 1 OF 9

STANDARD M-606-12
(SHEET 2)

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

REVISIONS		

DETAILS FOR CAST IN PLACE CONCRETE BARRIER (CONT'D.)

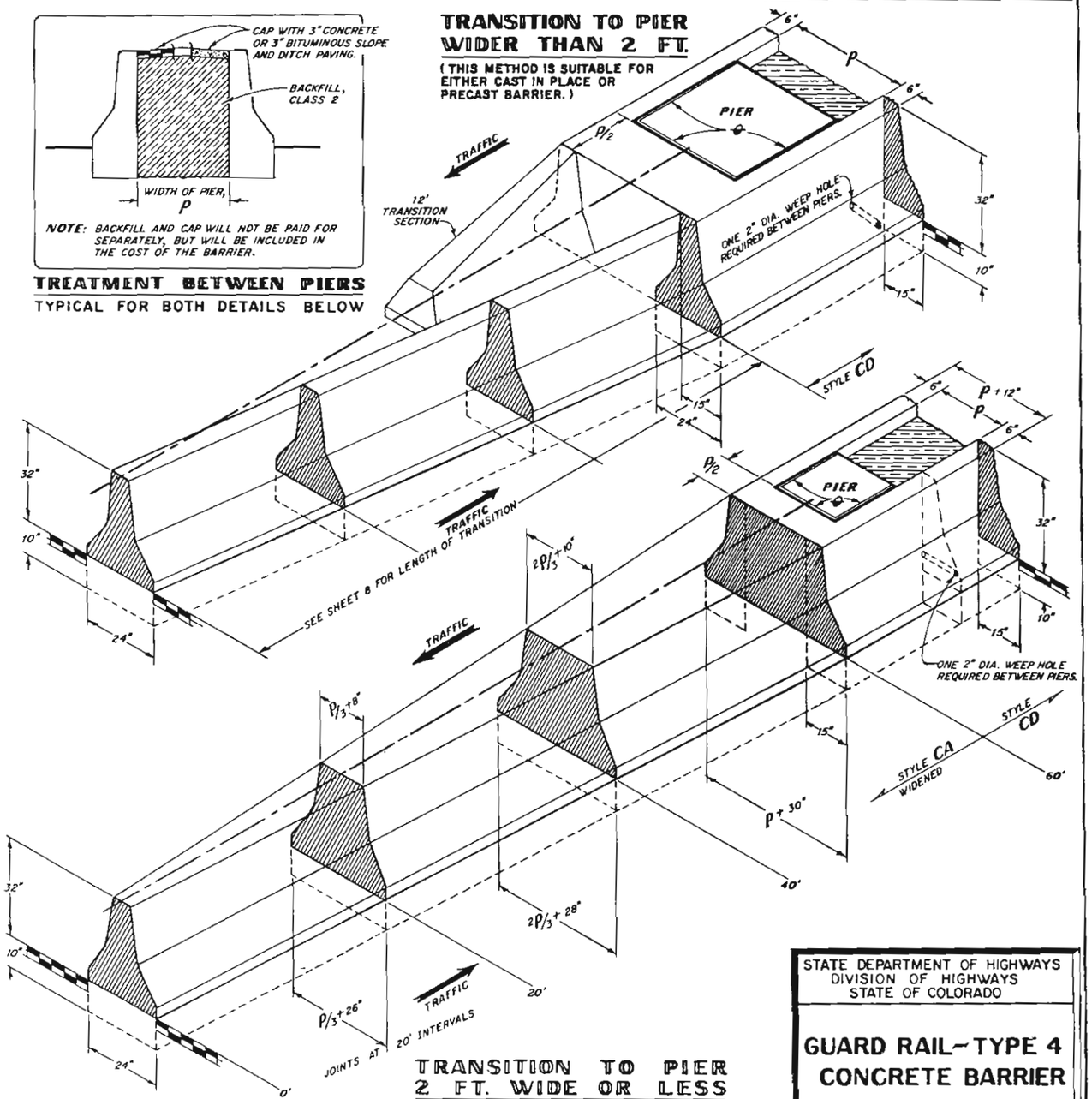


CAST IN PLACE BARRIER ON SHOULDER

NOTE: BACKFILL AND CAP WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE COST OF THE BARRIER.

TREATMENT BETWEEN PIERS
TYPICAL FOR BOTH DETAILS BELOW

TRANSITION TO PIER WIDER THAN 2 FT.
(THIS METHOD IS SUITABLE FOR EITHER CAST IN PLACE OR PRECAST BARRIER.)

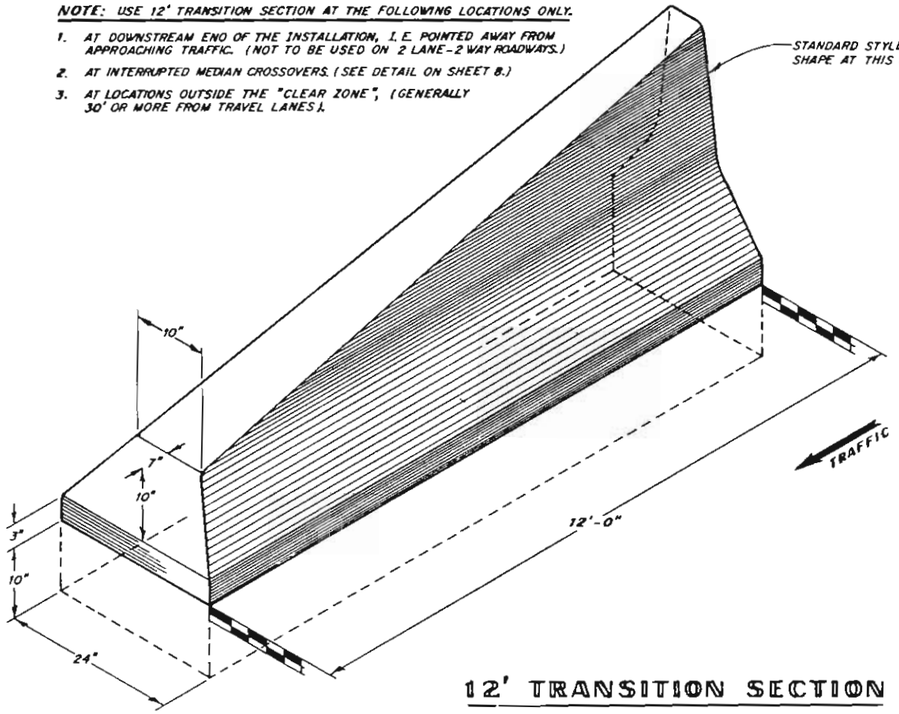


TRANSITION TO PIER 2 FT. WIDE OR LESS

½" PREFORMED JOINT MATERIAL.

NOTE: USE 12' TRANSITION SECTION AT THE FOLLOWING LOCATIONS ONLY.

1. AT DOWNSTREAM END OF THE INSTALLATION, I.E. POINTED AWAY FROM APPROACHING TRAFFIC. (NOT TO BE USED ON 2 LANE-2 WAY ROADWAYS.)
2. AT INTERRUPTED MEDIAN CROSSOVERS. (SEE DETAIL ON SHEET 8.)
3. AT LOCATIONS OUTSIDE THE "CLEAR ZONE", (GENERALLY 30' OR MORE FROM TRAVEL LANES).



12' TRANSITION SECTION

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL-TYPE 4 CONCRETE BARRIER

APPROVED BY: K.G. Mauro
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO. M-606-12
SHEET 2 OF 9

DIVISION OF HIGHWAYS, STATE OF COLORADO
FORM NO. 136
REV. FEB., 1977

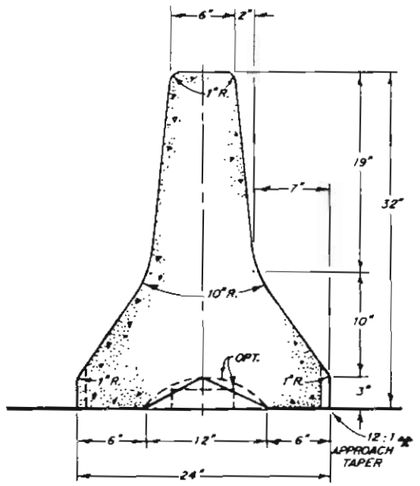
DETAILS FOR PRECAST CONCRETE BARRIER

STANDARD M - 606 - 12

(SHEET 3)

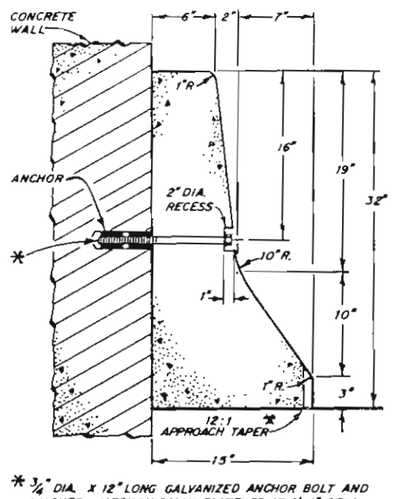
FEDERAL ROAD REGION NO.	DIVISION	PROJ NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS		



STYLE PA

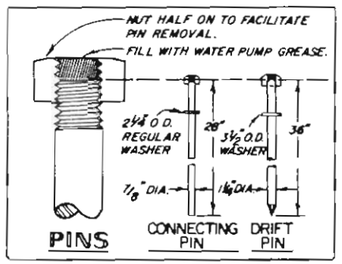
PRECAST BARRIER

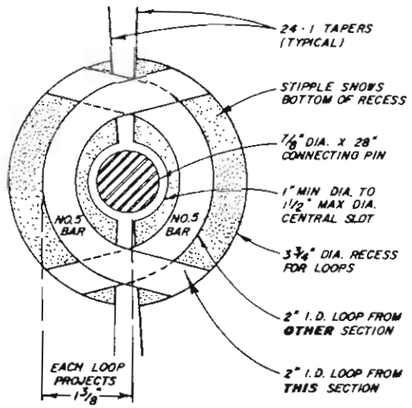


* 3/4" DIA. X 12" LONG GALVANIZED ANCHOR BOLT AND WASHER, MECHANICALLY FASTENED AT 2'-6" CTRS.; USE ONLY WHEN CALLED FOR ON PLANS.

STYLE PD

PRECAST BARRIER AGAINST WALL

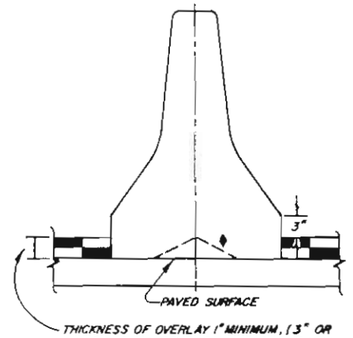




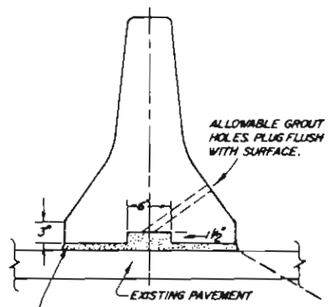
VIEW A - A

BARRIER CONNECTION

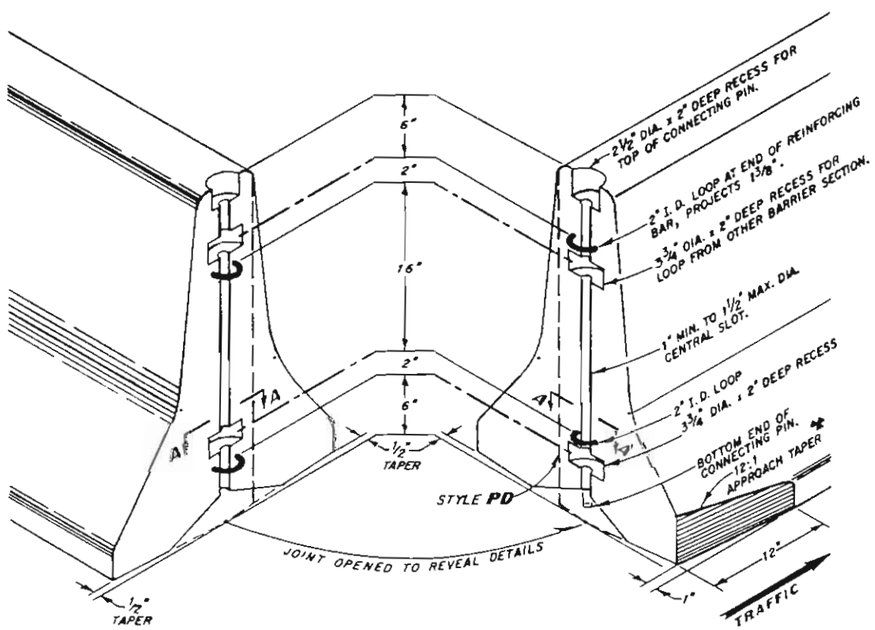
(FOR STYLE **PA** OR **PD**)



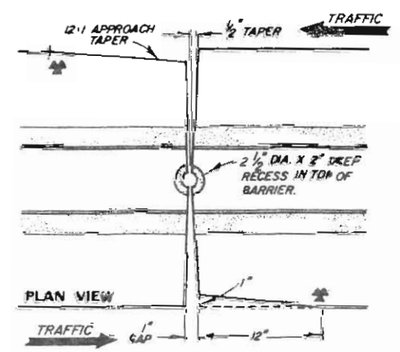
ADJACENT OVERLAY



GROUT BED

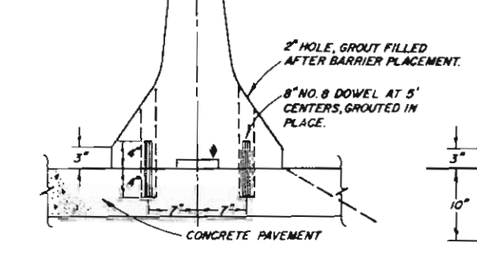


JOINT IN STYLES PA AND PD



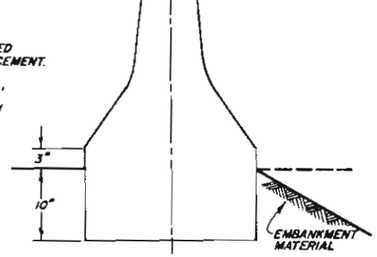
* A 1" IN 12" TAPER WILL BE REQUIRED AT **ALL TRAFFIC APPROACH CORNERS** OF PRECAST BARRIER SECTIONS TO ELIMINATE SNAGGING OF SNOW PLOW BLADE (BOTH STYLE PA AND PD BARRIERS.)

JOINT IN PRECAST BARRIER



* SHAPE OF LONGITUDINAL SPACE IS OPTIONAL OR MAY BE OMITTED.

DOWELLED TO PAVEMENT



EXCAVATION FOR BASE WILL BE INCLUDED IN THE COST OF BARRIER.

BARRIER WITH BASE

ANCHOR DETAILS FOR PERMANENT BARRIERS

NOTES:

1. ONE OF THE FOUR ALTERNATE ANCHOR DETAILS SHALL BE USED WHEN PRECAST BARRIER IS INSTALLED AS A PERMANENT BARRIER. STYLE **PA** DIMENSIONS APPLY AND THE BARRIER SHALL BE CAST WITH EXTRA FEATURES OF DOWEL HOLES, EXTRA BASE DEPTH, MODIFIED OR NO LONGITUDINAL SPACE IN BASE, ETC. AS NEEDED TO PROVIDE THE ANCHOR DETAIL TO BE CONSTRUCTED.
2. THESE ANCHOR DETAILS MAY BE USED FOR SHOULDER OR MEDIAN LOCATIONS EXCEPT THE ADJACENT OVERLAY ALTERNATE WHICH IS FOR MEDIANS ONLY.
3. THE 12:1 APPROACH TAPER ON BARRIER BOTTOM IS NOT REQUIRED ON PERMANENT BARRIERS.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL - TYPE 4
CONCRETE BARRIER

APPROVED BY: K. B. Mayes
STATE DESIGN ENGINEER
DATE: FEBRUARY 18, 1963

STANDARD PLAN NO. M-606-12
SHEET 3 OF 19

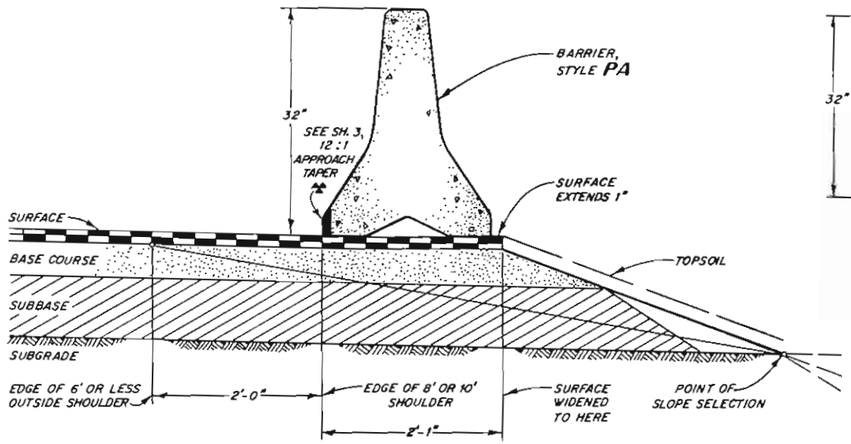
ISION OF HIGHWAYS, STATE OF COLORADO
D. H. FORM NO. 126
EV. FEB., 1977

STANDARD M-606-12
(SHEET 4)

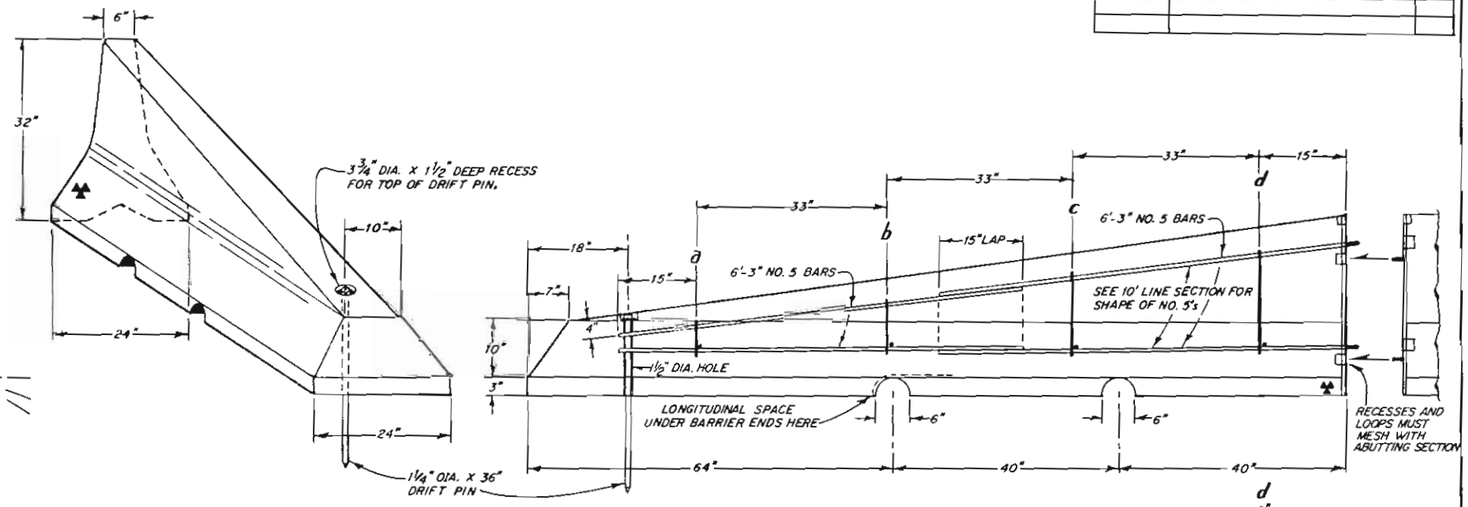
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS		

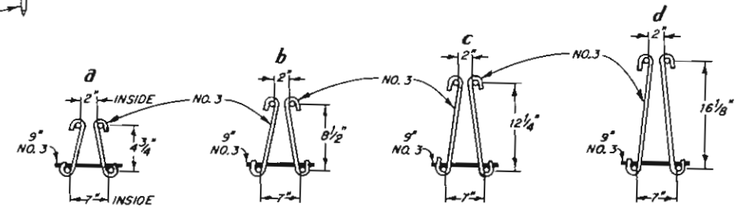
DETAILS FOR PRECAST CONCRETE BARRIER (CONT'D.)



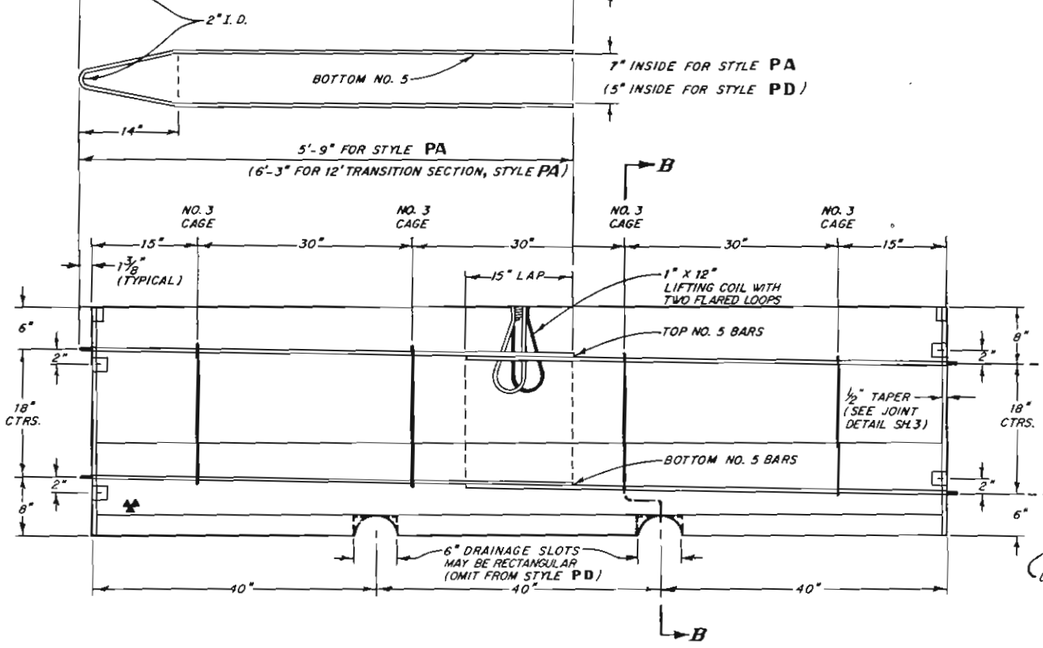
PRECAST CONCRETE BARRIER ON WIDENED SHOULDER



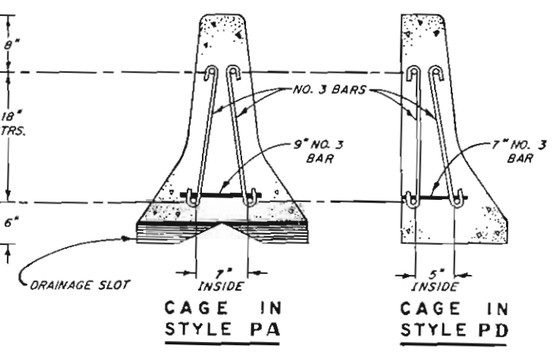
NOTES ON SHEET 2 DESCRIBING THE USES OF CAST IN PLACE 12' TRANSITION SECTION APPLY FOR PRECAST ALSO.



12' TRANSITION SECTION FOR STYLE PA BARRIER



10' LINE SECTION — FOR STYLE PA OR PD



SECTIONS B — B

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL-TYPE 4 CONCRETE BARRIER

APPROVED BY: L. P. Mauro
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

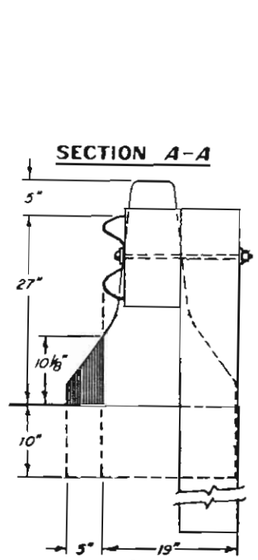
STANDARD PLAN NO
M-606-12
SHEET 4 OF 9

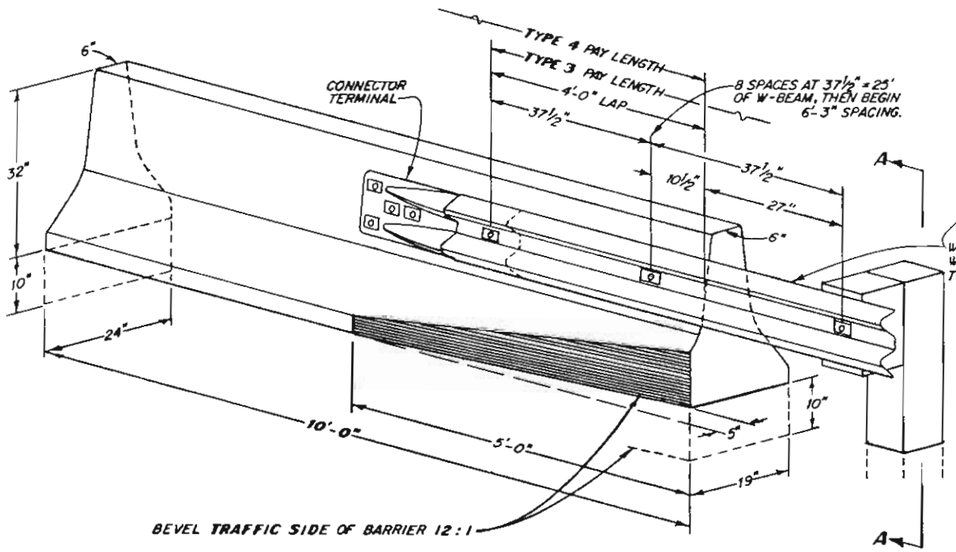
STANDARD M-606-12

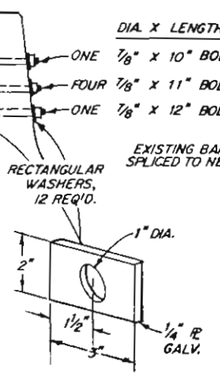
(SHEET 5)

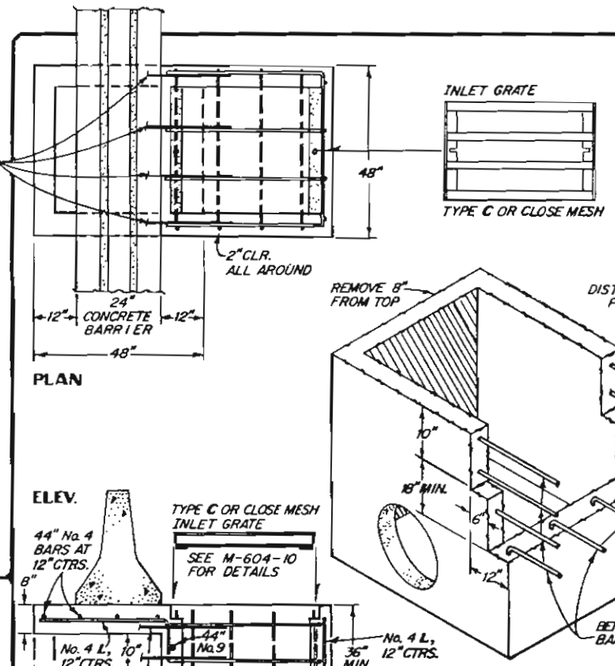
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

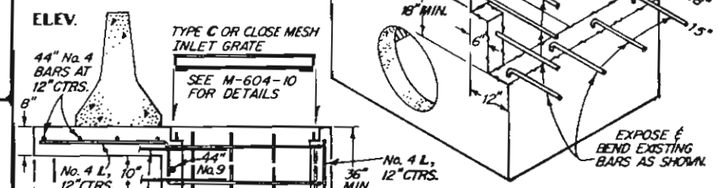
REVISIONS		

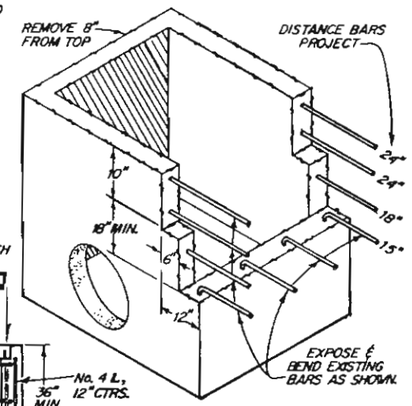










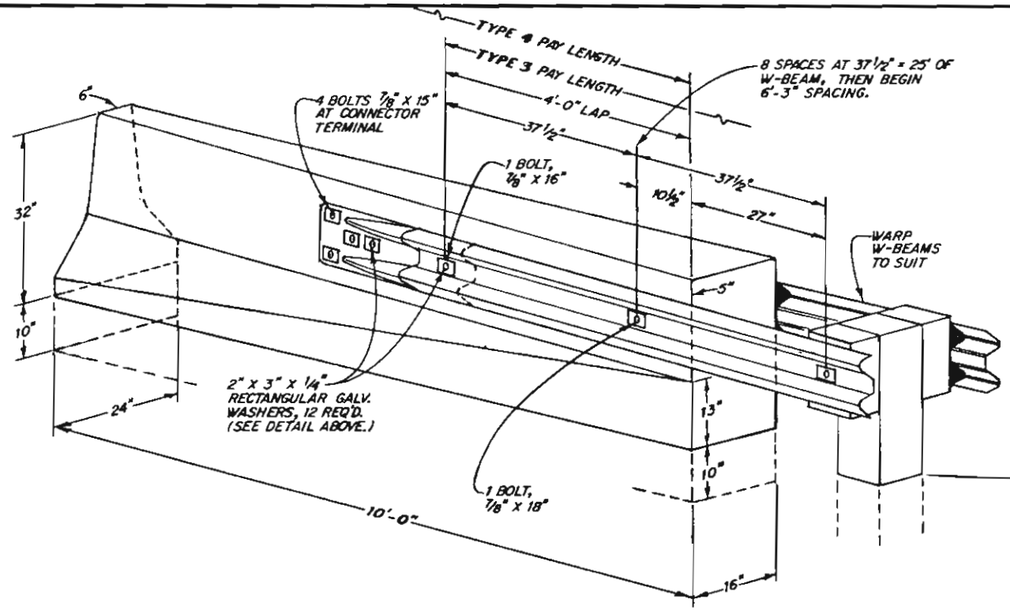


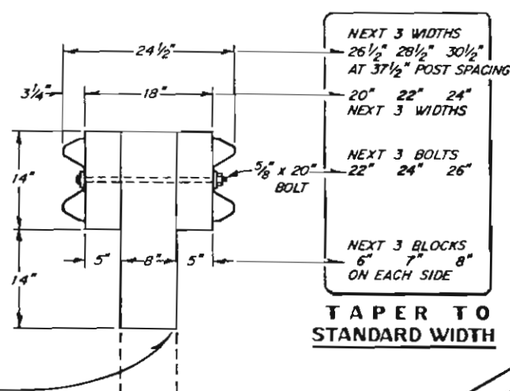
EXISTING INLET PREPARED TO RECEIVE EXTENSION

TREATMENT AT INLET

SHOWING EXTENSION OF EXISTING INLET

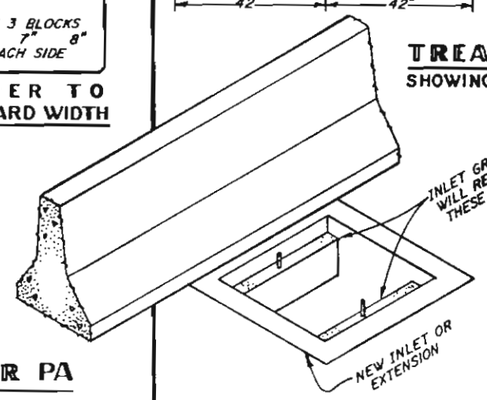
10' TRANSITION TO CONNECT SINGLE W-BEAM TO CONCRETE BARRIER - STYLE CA OR PA





TAPER TO STANDARD WIDTH

10' TRANSITION TO CONNECT DOUBLE W-BEAM TO CONCRETE BARRIER - STYLE CA OR PA



STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL-TYPE 4 CONCRETE BARRIER

APPROVED BY: K.J. Mauro
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO. M-606-12
SHEET 5 OF 9

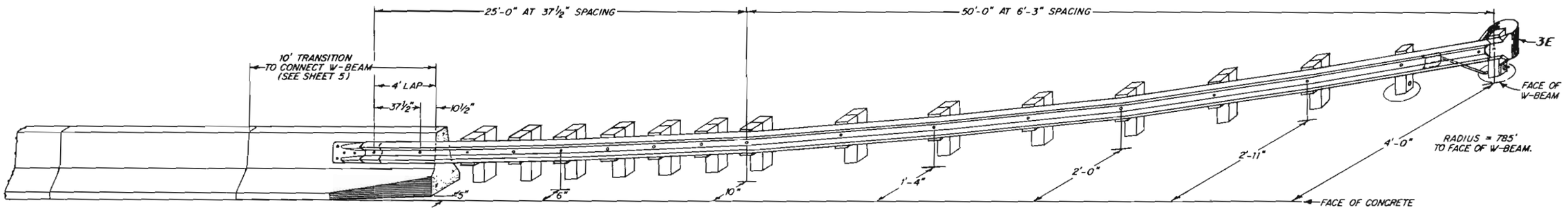
VISION OF HIGHWAYS, STATE OF COLORADO
O. M. FORM NO. 126
EV. FEB., 1977

STANDARD M-606-12

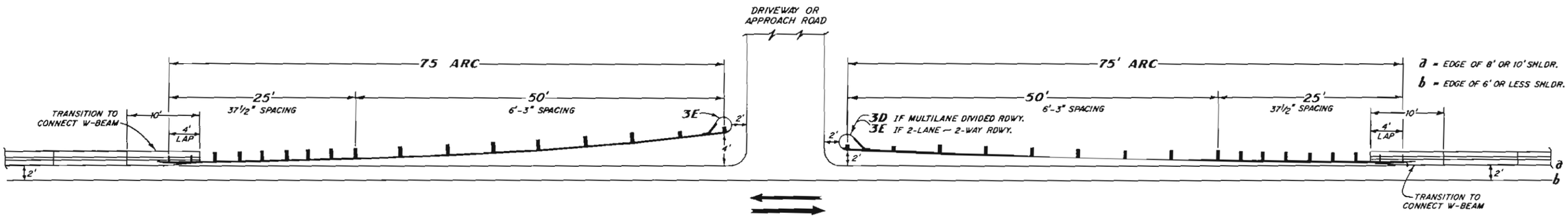
(SHEET 6)

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

REVISIONS		



CONCRETE BARRIER WITH TYPE 3 FLARE



LAYOUT FOR INTERRUPTED SHOULDER BARRIER

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL—TYPE 4 CONCRETE BARRIER

APPROVED BY: K. J. Mauff
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO
M-606-12
SHEET 6 OF 9

VISION OF HIGHWAYS, STATE OF COLORADO
O. R. POSAL NO. 134
E FEB., 1977

MULTILANE DIVIDED HIGHWAYS
(DEPRESSED MEDIAN)

STANDARD M - 606 - 12
(SHEET 7)

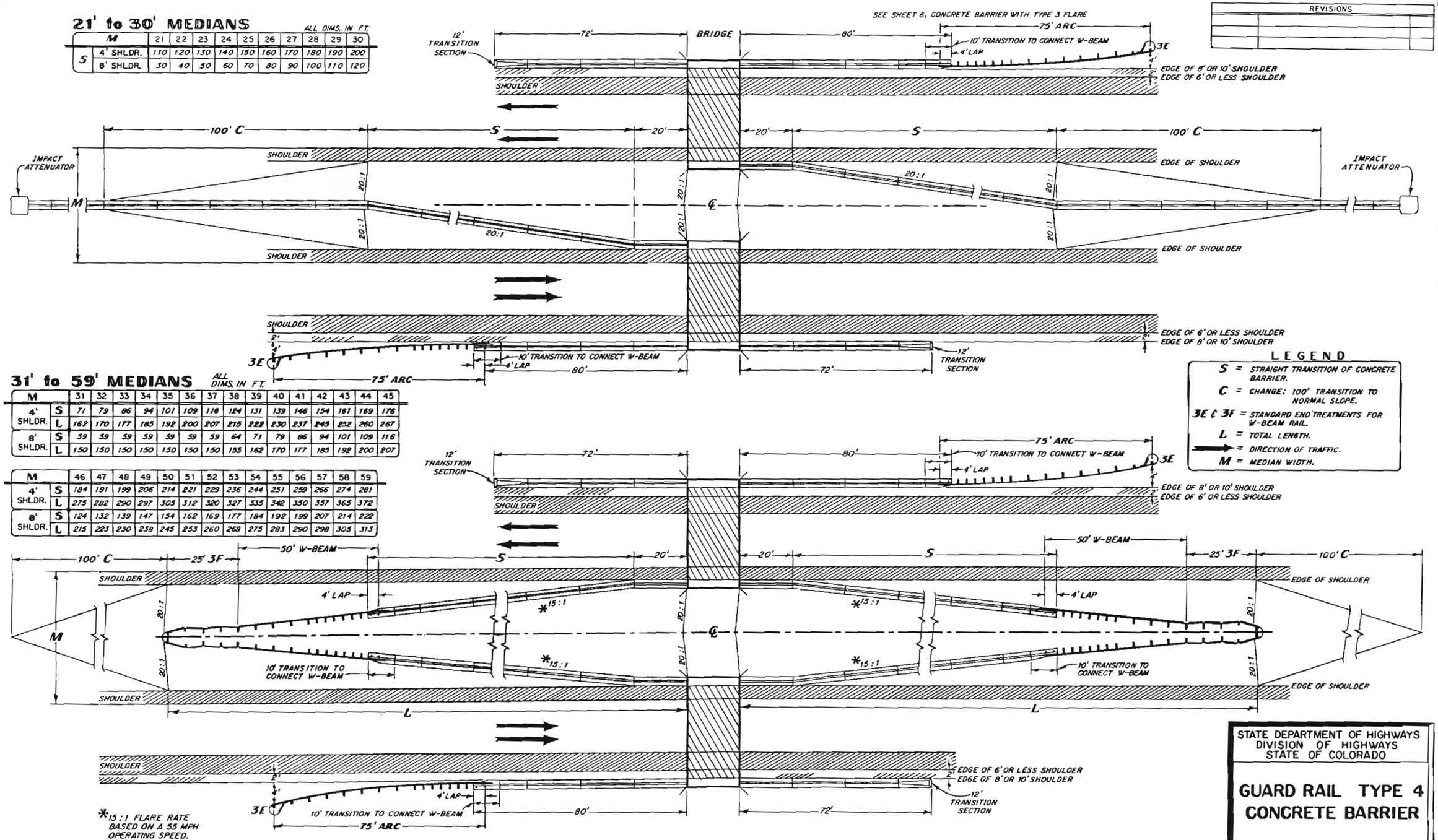
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS		

21' to 30' MEDIANS

ALL DIMS. IN FT.

	M	21	22	23	24	25	26	27	28	29	30
S	4' SHLDR.	110	120	130	140	150	160	170	180	190	200
	8' SHLDR.	30	40	50	60	70	80	90	100	110	120



31' to 59' MEDIANS

ALL DIMS. IN FT.

	M	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
4' SHLDR.	S	71	79	86	94	101	109	116	124	131	139	146	154	161	169	176
	L	162	170	177	185	192	200	207	215	222	230	237	245	252	260	267
8' SHLDR.	S	59	59	59	59	59	59	59	64	71	79	86	94	101	109	116
	L	150	150	150	150	150	150	150	155	162	170	177	185	192	200	207

	M	46	47	48	49	50	51	52	53	54	55	56	57	58	59
4' SHLDR.	S	184	191	199	206	214	221	229	236	244	251	259	266	274	281
	L	275	282	290	297	305	312	320	327	335	342	350	357	365	372
8' SHLDR.	S	124	132	139	147	154	162	169	177	184	192	199	207	214	222
	L	215	223	230	238	245	253	260	268	275	283	290	298	305	313

LEGEND

- **S** = STRAIGHT TRANSITION OF CONCRETE BARRIER.
- **C** = CHANGE: 100' TRANSITION TO NORMAL SLOPE.
- **3E & 3F** = STANDARD END TREATMENTS FOR W-BEAM RAIL.
- **L** = TOTAL LENGTH.
- → = DIRECTION OF TRAFFIC.
- **M** = MEDIAN WIDTH.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL TYPE 4 CONCRETE BARRIER

APPROVED BY: K. G. Mozar
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO M-606-12
SHEET 7 OF 9

DIVISION OF HIGHWAYS, STATE OF COLORADO
C. R. FORM NO. 126
REV. FEB., 1977

MULTILANE DIVIDED HIGHWAYS

DEPRESSED MEDIAN (CONTINUED)

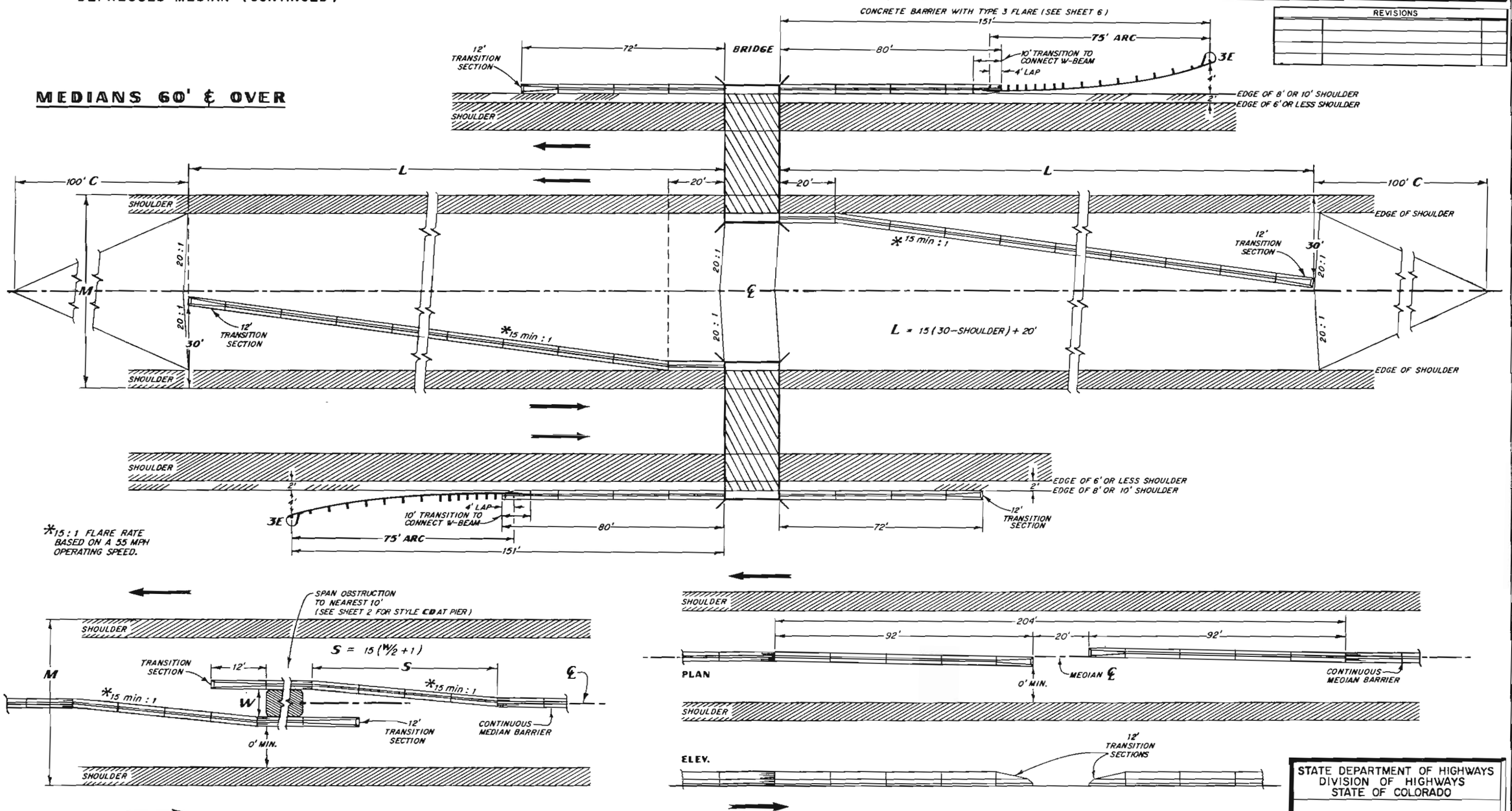
STANDARD M-606-12

(SHEET 8)

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

REVISIONS		

MEDIANS 60' & OVER



*15 : 1 FLARE RATE BASED ON A 55 MPH OPERATING SPEED.

BARRIER AT MEDIAN OBSTRUCTION

INTERRUPTED MEDIAN BARRIER

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL-TYPE 4 CONCRETE BARRIER

APPROVED BY: K. F. Mowat
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO. M-606-12
SHEET 8 OF 9

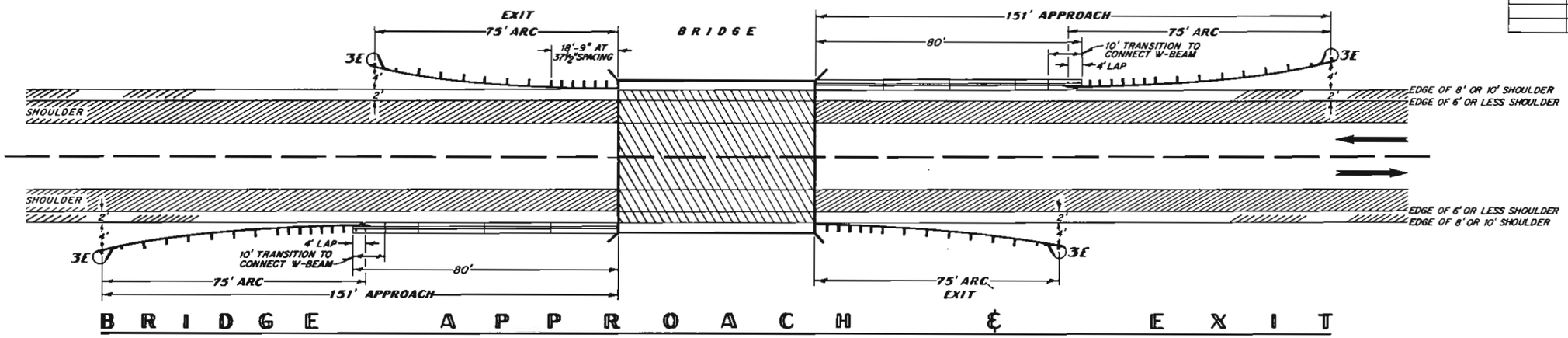
2 LANE – 2 WAY HIGHWAYS

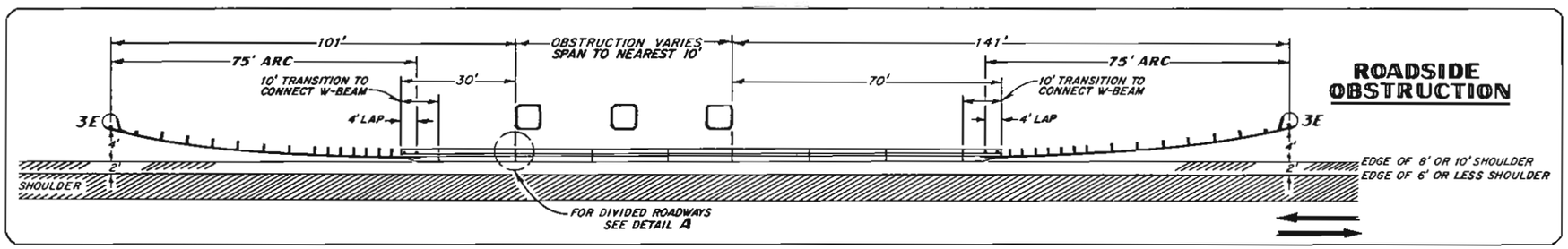
STANDARD M-606-12

(SHEET 9 OF 9)

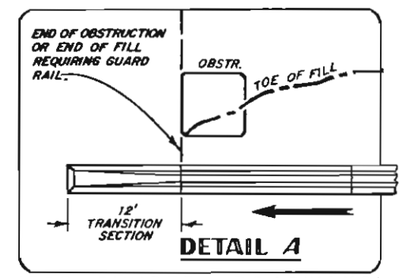
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
VIII	COLORADO			

REVISIONS		



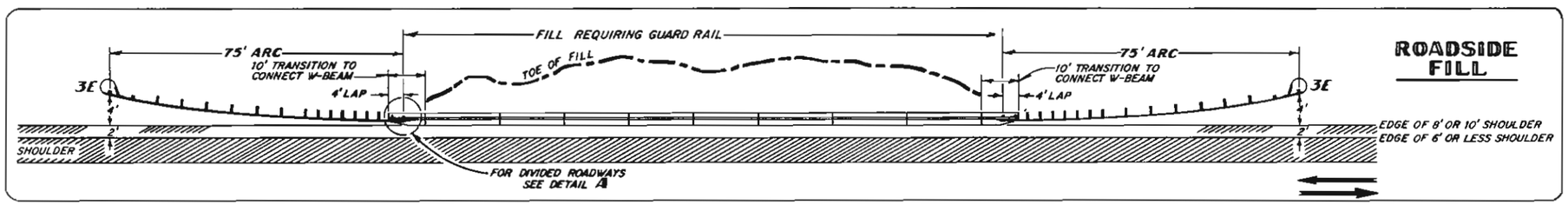


ROADSIDE OBSTRUCTION

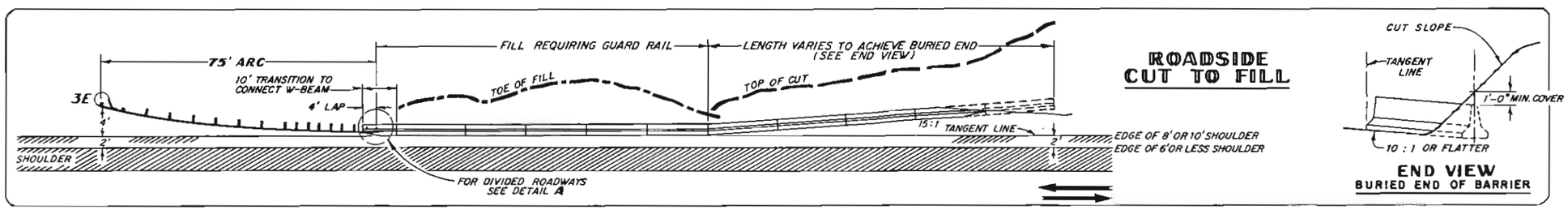


DETAIL A

(FOR DIVIDED ROADWAYS)



ROADSIDE FILL



ROADSIDE CUT TO FILL

END VIEW
BURIED END OF BARRIER

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

GUARD RAIL – TYPE 4 CONCRETE BARRIER

APPROVED BY:
STAFF DESIGN ENGINEER
DATE: FEBRUARY 18, 1983

STANDARD PLAN NO
M-606-12
SHEET 9 OF 9