

AS CONSTRUCTED
REVISED DATE

第 13 卷

(P-T) Rev Standard Dates - 12-9-68 - JLC

INDEX OF SHEETS

PLAN AND PROFILE OF PROPOSED
FEDERAL AID PROJECT NO. F006-1(36)
STATE HIGHWAY NO. 3
ADAMS COUNTY

SCALES OF ORIGINAL DRAWINGS
 ON PLAN 1" = 50 FT
 ON PROFILE 1" = 100 FT HORIZONTAL
 1" = 1 FT VERTICAL
 GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD

CONTRACTOR: HERREN-STRONG INC.
RESIDENT ENGINEER: R. J. BRASHER
DATE COMPLETED: JUNE 13, 1969

SHEET NO

1. TITLE PAGE, SKETCH MAP & TABULATION OF LENGTH & DESIGN DATA.
2. TYPICAL SECTIONS, GENERAL NOTES AND DETAILS OF CONCRETE DITCH LINING
3. SUMMARY OF APPROXIMATE QUANTITIES (11.1.1)
4. STRUCTURE QUANTITIES
5. SUMMARY OF EARTHWORK QUANTITIES, BASE COURSE AND SURFACING PLAN, TOPSOIL, R.O.W. MARKERS, TABULATION OF CONCRETE CURB AND GUTTER, BROMLEY LANE PROFILE, BRIGHTON BLVD. CONNECTION PROFILE
6. BROMLEY LANE INTERSECTION DETAIL
7. PLAN SHEET
8. ¹²~~8.5~~ CROSS SECTIONS ALONG MAIN LINE
9. ¹⁴~~9.1~~ CROSS SECTIONS ALONG BROMLEY LANE
10. ¹⁵~~10.1~~ CROSS SECTIONS ALONG BRIGHTON BLVD.
11. ¹⁶~~11.1~~ CROSS SECTIONS FOR TIE-INS
12. ¹⁷~~12.1~~ CROSS SECTIONS OF DRAINAGE PIT

~~| | |
|---------|---|
| M-203-B | APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, BRIDGE & CREST WIDENING |
| M-203-C | DITCH TYPES |
| M-206-A | EXCAVATION ON BACKFILL FOR STRUCTURES |
| M-403-M | METAL CURB & GUTTER - M-200 LOADING |
| M-500-G | STEPS FOR MANHOLES AND INLETS |
| M-500-F | MANHOLES |
| M-500-E | GRABS AND BUCKERS |
| M-612-A | MARKED PLOTS AND BENCH MARKS |
| M-614-A | TIMBER BARRICADES |
| M-614-B | CONSTRUCTION IDENTIFICATION SIGNS |
| M-615-B | TRAFFIC C SIGNING FOR HIGHWAY CONSTRUCTION |~~

2 SHEETS

JULY 30, 1968

JULY 23, 1968

NOV, 1, 1968

JUL 23 1968

JULY 23, 1968

2007	24	1500
2008	24	1500

JULY 22, 1968

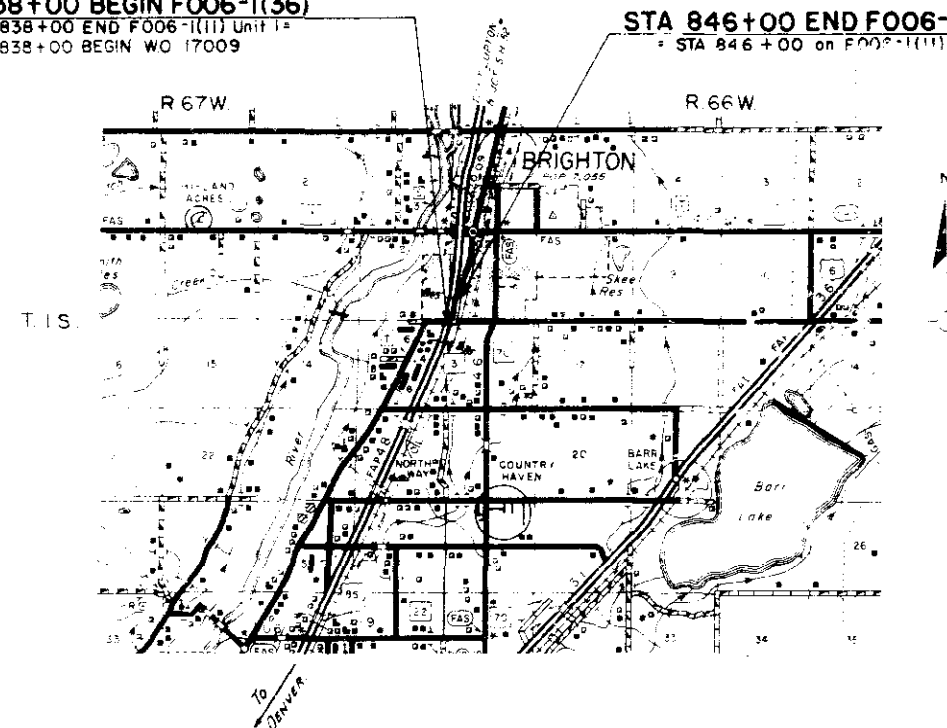
NOV 15, 1968

JULY 26, 1956

JUL 2. 1955

STA. 838+00 BEGIN F006-1(36)
= STA 838+00 END F006-1(11) Unit 1=
838+00 BEGIN WO 17009

STA 846+00 END F006-1(3G)
= STA 846+00 on F006-1(11) Unit 2



STATION	ROADWAY	
	LIN FT	
838+00 BEGIN F006-I(36)=		
838+00 END F006-I(11) Unit 1=		
838+00 BEGIN W/O 17009		
	292.8	
840+82.8 END W/O 17009=		
840+82.8 BEGIN F006-I(11) Unit 2		
	517.2	
846+00 END F006-I(36)=		
846+00 on F006-I(11) Unit 2		
TOTAL	800.0	

SUMMARY

TOTAL NET & GROSS LENGTH OF PROJECT

800 LIN FT.
0.52 MILES

DESIGN DATA

MAXIMUM DEGREE OF CURVE	1°00'
MAXIMUM GRADE	0.50 %
MINIMUM H.S.S.D.	> 1300'
MINIMUM V.S.S.D.	> 1300'
MAXIMUM DESIGN SPEED	70 MPH

INACTIVE 250 1970

J. L. CARUTHERS, JR.

SEE SPECIAL PROVISIONS FOR
NOTICE TO BIDDERS

DIVISION OF HIGHWAYS	
APPROVED	
<i>Charles E. Shumate</i>	9-4-6
CHIEF ENGINEER	DATE
By: <i>L. L. Bower</i>	Deputy Chief L.
DEPARTMENT OF TRANSPORTATION	
FEDERAL HIGHWAY ADMINISTRATION	
BUREAU OF PUBLIC ROADS	
APPROVED	DATE
DIVISION ENGINEER	

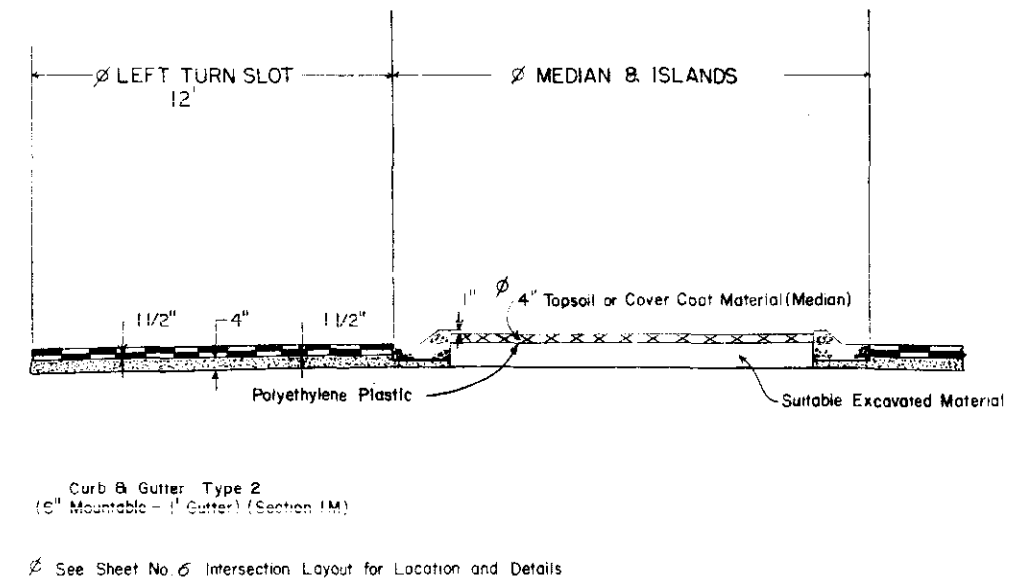
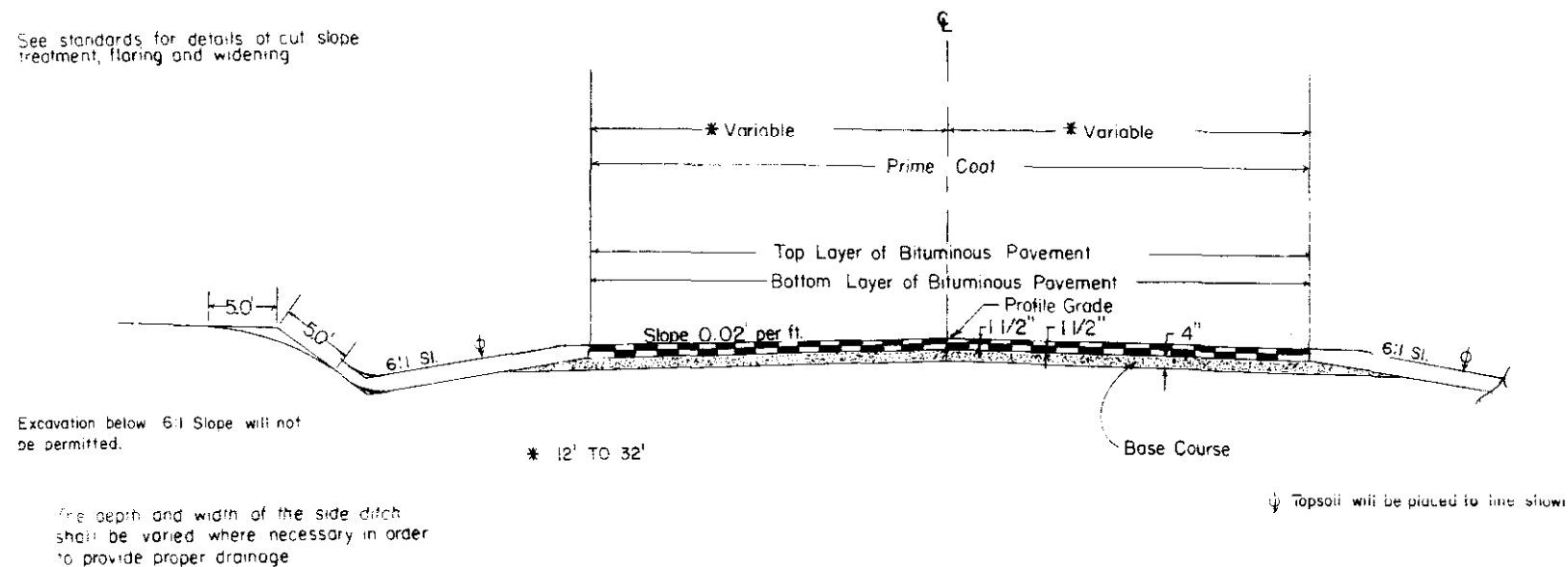
M.C.

AS CONSTRUCTED
REVISED DATE JUN 13 1969

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F 006-1(36)	2	

Ø **TYPICAL SECTION**
(Bromley Lane & Brighton Boulevard)

See standards for details of cut slope treatment, flaring and widening



GENERAL NOTES

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

PRIME COAT MC @ 0.32 GALS. PER SQ. YD.
* TACK COAT (EMUL. ASPH.) @ 0.10 GALS. PER SQ. YD.
* Diluted Emul. Under C.C. (100%)

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

~~DILUTED EMULSIFIED ASPHALT SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS ORDERED.~~

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

ROAD APPROACHES WHICH REQUIRE BITUMINOUS PAVEMENT SHALL BE PRIMED AND A 2" THICKNESS OF PAVEMENT PLACED AS FOLLOWS:

PUBLIC APPROACHES AND ENTRANCES TO BUILDINGS OR RESIDENCES SHALL BE 50 FT. OUT FROM EDGE OF SHOULDER OR TO THE RIGHT OF WAY LINE WHICHEVER IS LESS. FIELD ENTRANCES SHALL BE PAVED 4 FT. OUT FROM EDGE OF SHOULDER.

THE FORCE ACCOUNT ITEM, "CLEARING OF BUILDING SITES, ETC." SHALL INCLUDE REMOVAL OF ALL FOUNDATIONS, WELLS, BUILDINGS AND OTHER APPURTENANCES NOT REMOVED BY THE OWNER, AND ANY NECESSARY BACKFILLING OF CELLARS, CESSPOOLS, WELLS, ETC. TO PROVIDE NEAT ROADSIDE CONDITIONS. IT IS ESTIMATED THAT THIS ITEM APPLIES AT THE FOLLOWING LOCATIONS:

B41+ TO B42+, RT. OF MAIN LINE

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

FULL DEPTH OF ALL EMBANKMENTS

BASES OF CUTS 1 FOOT

BASES OF FILLS 1 FOOT

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

THE MINIMUM THICKNESS OF TOPSOIL SHALL BE 4 INCHES.

GAUDD POSTS, DELINEATORS, FENCE AND STATE SIGNS WILL BE REMOVED BY STATE FORCES.
DELINEATORS WILL BE PLACED BY STATE FORCES.

IT IS ESTIMATED THAT 90 HOURS OF FLAGGING FOR CONTROLLING TRAFFIC WILL BE REQUIRED FOR THIS PROJECT

BREAK POINTS ON SLOPES AND IN BOTTOMS OF DITCHES SHALL BE ROUNDED ON CONSTRUCTION FOR A PLEASING APPEARANCE.

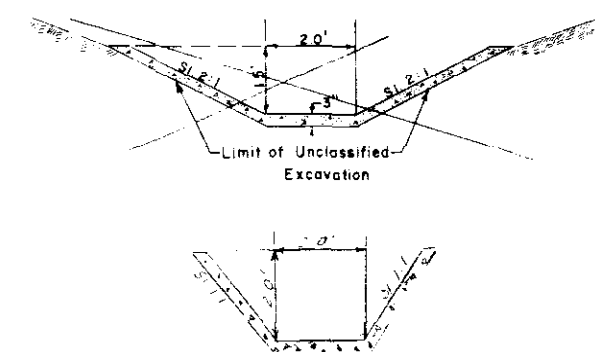
CONTRACTOR MUST USE CAUTION NOT TO DISTURB EXISTING SOD WHICH DOES NOT LIE WITHIN CONSTRUCTION AREA.

IT IS ESTIMATED THAT 210 SQ. YDS. OF MEDIAN AREA WILL REQUIRE SOIL STERILANT TREATMENT AND POLYETHYLENE PLASTIC

IT IS ESTIMATED THAT 2800 SQ. YDS. OF ASPHALT MAT WILL BE REMOVED ON THIS PROJECT.

DETAILS OF CONCRETE DITCH LINING

STA 2+45 TO 4+00 (BROMLEY LANE)



SUMMARY OF ^{FINAL} APPROXIMATE QUANTITIES

AS CONSTRUCTED
REVISED DATE JUN 13 1969

Rev. Utilities - 12-9-68 - J.L.C.

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
1	COLORADO	F 006-1 (36)	3	

ITEM NO.	ITEM	UNIT	QUANTITY			INDEX	PROJECT TOTALS	
			PLAN	FINAL	DIFF.		PLAN	FINAL
202	Removal of Structure	Each	1	2	+ 1	Book 3, Page 24	1	2
202	Removal of Curb and Gutter	Lin. Ft.	646	711	+ 65	Book 3, Page 20	646	711
202	Removal of Asphalt Mat	Sq. Yd.	2,800	2,963	+ 163	Book 3, Page 21	2,800	2,963
203	Unclassified Excavation (Haul)	Cu. Yd.	2,000	1,795	- 205	Book 2 - X Sect. Sheets B-14	2,000	1,795
203	Borrow (Haul)	Cu. Yd.	200	420	+ 220	Book 3, Page 38 & 39 Sheet #10	200	420
203	Embankment (Modified)	Cu. Yd.	4,000	2,691	- 1,309	Book 2 - X Sect. Sheets B-14* * As Per Special Provision Base of Cuts & Fills Embankment Paid Plan Quantity Est.	4,000	2,691
207	Topsoil (Haul)	Cu. Yd.	500	410	- 90	Book 3, Pages 38 & 39 X-section Sheet #5	500	410
208	Soil Sterilization	Sq. Yd.	210	224	+ 14	Book 3, Page 40	210	224
209	Wetting	M Gal.	110	20	- 90	Book 3, Page 78	110	20
304	Aggregate Base Course (Class 6) (Haul)	Ton	1,300	1,350.06	+ 50.06	Book 3, Page 31	1,300	1,350.06
409	Non-Continuous Pavement (Grading E) (Haul and Asphalt)	Ton	900	1,113.00	+ 213.00	Scale Book 2, Book 4	900	1,113.00
409	Cover Coat Material (Median)	Ton	50	40.90	- 9.60	Scale Book	50	40.90
411	Emulsified Asphalt (SS-1)	Gal.	700	0	- 700	CL #16093	700	0
411	Liquid Asphaltic Material (MC-70)	Gal.	2,200	1,768	- 432	Book 3, Page 34 & 35 Scale Book	2,200	1,768
507	Concrete Slope and Ditch Paving	Cu. Yd.	14	12.05	- 1.95	Book 3, Page 25	14	12.05
603	15 Inch Corrugated Steel Pipe Special	Lin. Ft.	12	72	+ 60	Book 3, Page 20 CL #16061	12	72
604	Manhole Slab Base (5 Foot)	Each	2	2	0	Book 3, Page 40	2	2
609	Curb and Gutter Type 2 (Sect. on I-M)	Lin. Ft.	957	957	0	Book 3, Page 41	957	957
610	Right of Way Marker	Each	3	3	0	Book 3, Page 18	3	3
614	Flagging	Hr.	100	90	- 10	Re H. Form 7	100	90
614	Barrier (Class II - Type F-6)	Each	1	1	0	Book 3, Page 8	1	1
617	Field Laboratory	Each	1	0	- 1	CL #16093	1	0
626	Mobilization	L.S.	•				•	
FORCE ACCOUNT								
	Clearing of Building Sites, etc	L.S.	•				•	
	Removal of Concrete Slab		•					
	Adjust Sewer Manhole and Reset Fire Hydrant (Work by City of Brighton)	L.S.	•				•	
STATE FORCES								
	Signing and Striping Entire Project (Non Federal Aid)	L.S.	•				•	
	Reset Detectors (Non Federal Aid)	L.S.	•				•	
	Transplanting Trees (Non Federal Aid)	L.S.	•				•	
	Signalization (Federal Aid)	L.S.	•				•	
	Furnishing and Installing Identification Sign	Each	3				3	
RIGHT OF WAY								
	Right of Way Entire Project	L.S.	•				•	

Power lines and Telephone Lines Relocated at no cost to project.

STRUCTURE QUANTITIES

AS CONSTRUCTED
REVISED DATE JUN 13 1968

FED. ROAD REGION NO.	DIVISION	PROJECT NUMBER	SHEET NO.
9	COLO.	F 006 - I (36)	4

LOCATION	DESCRIPTION	REMOVAL OF STRUCTURES	UNCLASSIFIED EXCAVATION		STRUCTURE EXCAVATION	STRUCTURE BACKFILL	GRAVEL OR CRUSHED ROCK SURFACING	ASPHALTIC SURFACING	COVER COAT MATERIAL (MEDIAN)	CONCRETE SLOPE & DITCH PAVING	CULVERT PIPE		"H" OVER CULVERT	MISCELLANEOUS
			CUBIC YARDS								CORRUGATED STEEL PIPE			
			EXCAV.	EMB.										
												NO.		
											15"	INDEX		
838 + 836+00 to 838+00	Req'd Identification Sign <i>Book 3, Page 7</i> Req'd. Approach to Project		φ	φ			▲	▲				<i>Book 3, Page 7</i>		1- Identification Sign (State Forces) φ Quantities in Roadway X-Section ▲ Quantities in Base Course & Surfacing Plan
839+85 to 840+35 841+15 to 841+65	Req'd. Cover Coat Material in Raised Median Req'd. Cover Coat Material in Existing Raised Median		φ						15*			<i>Scale Book</i> <i>Scale Book</i>		φ Quantity in Roadway X-Section
841 + to 844 + 846 +	Req'd. Grading for Draining the Area between Main Line and Brighton Blvd. Connection and Place 4" Topsoil on this area. Req'd Identification Sign		φ	φ								<i>Covered in x-section quantities</i> <i>Covered in Top Soil quantities</i> <i>Book 3, Page 7</i>		φ Quantities in Roadway X-Sections and in Top Soil Tabulation 1- Identification Sign (State Forces)
843+50 (Brighton Blvd.) 843 + (Brighton Blvd.)	Req'd. Timber Barricade Req'd. Manhole Slab Base (H=5') (To be placed on Existing Sewer Cleanout)											<i>Book 3, Page 18</i> <i>Book 3, Page 19</i>		1- Barricade (Class II - Type F-6) 1- Manhole Slab Base (H=5')
0+50 (Bromley Lane) 1+30 (Bromley Lane)	Req'd. Raised Islands Lt. & Rt. (Cover Coat Material) Adjust Sewer Manhole			10φ					9*			<i>Scale Book</i> <i>Book 3, Page 20</i>		Adjust Sewer Manhole (Force Acct.) (Work to be done by Brighton Utilities)
1+70 (Bromley Lane) 1+75 (Bromley Lane)	Reset Fire Hydrant, Lt. Req'd. Raised Island Lt. (Cover Coat Material)			5φ					2*			<i>Book 3, Page 20</i> <i>Scale Book</i>		Reset Fire Hydrant, Lt. (Force Acct.) (Work to be done by Brighton Utilities)
2+00 (Bromley Lane) 2+30 (Bromley Lane)	Req'd. Road Approach, Rt. (W= 35') Req'd. Raised Island, Lt. (Cover Coat Material)		15φ	5φ			25φ	13φ	2*			<i>Covered in x-section quantities</i> <i>Scale Book</i>		
2+45 (Bromley Lane)	Remove 4 ft. of 15" C.S.P. Lt. Req'd. Manhole Slab Base (H=5') Extend 15" C.S.P. 12' Rt.	1			** 3*	** 2*					12 72	<i>Book 3, Page 20</i> <i>Book 3, Page 20</i> <i>Book 3, Page 20</i>	2	1- Manhole Slab Base (H=5')
2+45 to 4+00 (Bromley Lane) 3+80 (Bromley Lane)	Relocate Irrigation Ditch, Rt. (W= 2') Req'd. Road Approach, Lt. (W= 35')		φ	15φ			30φ	15φ		14 12.05		<i>Book 3, Page 25</i> <i>Covered in x-section quantities</i>		φ Quantity in Roadway X-Sections
5 + (Bromley Lane)	Req'd Identification Lt.											<i>deleted Book 3, Page 7</i>		1- Identification Sign (State Forces) * These Quantities were not separated by Areas. φ These Quantities are included in Roadway Quantities and not separated.
		2 1	30φ	20φ	** 3*	** 2*	55φ	28φ	40.4 43	12.05 14	72 72			

* Structure Excavation and Structure Backfill will not be paid for separately
but will be included in the price bid for Item 603.

FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F 006-1(36)	5	

SUMMARY OF EARTHWORK QUANTITIES

UNCLASSIFIED EXCAVATION (HAUL)

- Roadway (From Cross Sections)
- ▲ Est. for Subsidence
- ▲ Structure Quantities as Emb.
- ▲ Structure Quantities as Excav.

Total for Pay Quantity

BORROW (HAUL)

(Undesignated)

Total for Pay Quantity

EMBANKMENT (MODIFIED)

(MOISTURE AND DENSITY CONTROL)

- Roadway Embankment (Net)
- Bases of Cuts and Fills

Total for Pay Quantity

ROADWAY BALANCE QUANTITIES (INFORMATION ONLY)

EXCAVATION

- Unclassified
- Borrow

Total

EMBANKMENT (from Cross Sections)

Roadway - Total

EMBANKMENT x FACTOR

Roadway - Total

▲ Quantities not used for Earthwork Balance

R.O.W. MARKERS

Book 3, PAGE 28

STATION	SIDE	NO.	
BROMLEY LANE			
1 + 59.2 (50' Rt.)	Rt.	1	
4 + 08.9 (50' Rt.)	Rt.	1	
4 + 32.7 (50' Lt.)	Lt.	1	
TOTAL		3	

BASE COURSE AND SURFACING COURSE PLAN

A.B.C. CLASS 6
Scale Books, Book 3, Page 31 & Scale Book
H.B.P. Grading "E"
Book 4 & 5, 502/e Book

STATION TO STATION		SOURCE	AGGREGATE BASE COURSE CLASS 6	TONS USED	
				HOT BITUMINOUS PAVEMENT BOTTOM LAYER GRADING E	TOP LAYER GRADING E
MAIN LINE.					
838 + 00 to 845 + 50			120*	50**	50**
BROMLEY LANE					
0 + 60 to 4 + 00		UNDESIGNATED	538*	215**	215**
BRIGHTON BLVD.					
841 + 50 to 846 + 00		UNDESIGNATED	378*	146**	146**
Estimated for:					
Correcting Irregularities			104*		
From List of Structures			55*		28**
Appr. to Project			20*	7**	7**
TOTALS			1,350.06	548	565
			1,215	418	446

Quantities based on - B.C. = 1.8 Tons per Cu.Yd. - P.M. = 110 lbs. per Sq.Yd. 1" Thick.
* A.B.C. CLASS 6 was not separated by Areas.
** H.B.P. Grade "E" was not separated by Areas.

TABULATION OF CONCRETE CURB & GUTTER

Book 3, PAGES 40 & 41

STATION	SIDE	REMOVE CURB & GUTTER		BUILD CURB & GUTTER TYPE 2 SEC. 1M	
		PLAN	FINAL	PLAN	FINAL
		LIN. FT.	LIN. FT.		
MAIN LINE					
839+86 to 840+61	Median	+50	154		
840+31	Rt.	+++	113		
842+76 to 843+12	Median	-50	56		
842+32 to 843+41	Rt.	270	272		
843+28 to 843+56	Median	-65	68		
838+00 to 840+38	Median			-480	462
842+76 to 844+00	Median Lt.			+24	125
843+02 to 844+00	Median Rt.			-98	104
BROMLEY LANE ISLANDS					
0+46 (32' Lt. & Rt.)	Lt. & Rt.			+50	172
1+62 (32' Lt.)	Lt.	0	48	47	96
2+20 (32' Lt.)	Lt.			58	74
TOTALS					
		-646	711	-957	1033

AS CONSTRUCTED
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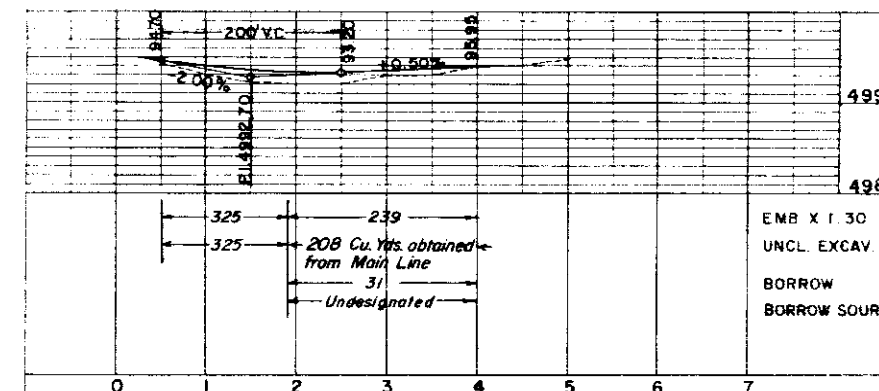
TOPSOIL

Book 3, Page 38 & 39 Sheet # 1/5

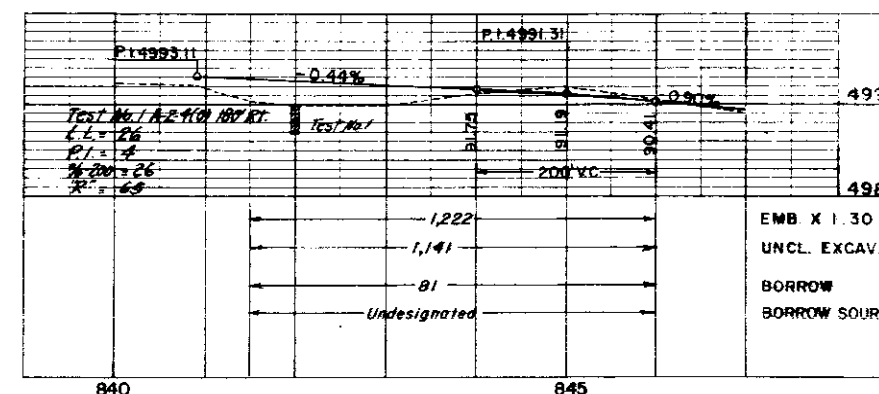
STATION	SIDE	THICKNESS	TOPSOIL	
			CU. YD.	
MAIN LINE				
838 +00 to 839 +85	Median	4"	35 *	
841 + to 844 +	Bet M.L. & Brighton Blvd.	4"	250*	
842 +76 to 844 +00	Median	4"	25 *	
BROMLEY LANE				
0 +60 to 4 +00	Lt. & Rt.	4"	45 *	
BRIGHTON BLVD.				
841 +60 to 846 +00	Lt. & Rt.	4"	85 *	
TOTAL			410	440

* TOPSOIL WAS NOT SEPARATED BY AREA ON PROJ.

BROMLEY LANE PROFILE



BRIGHTON BLVD. CONNECTION



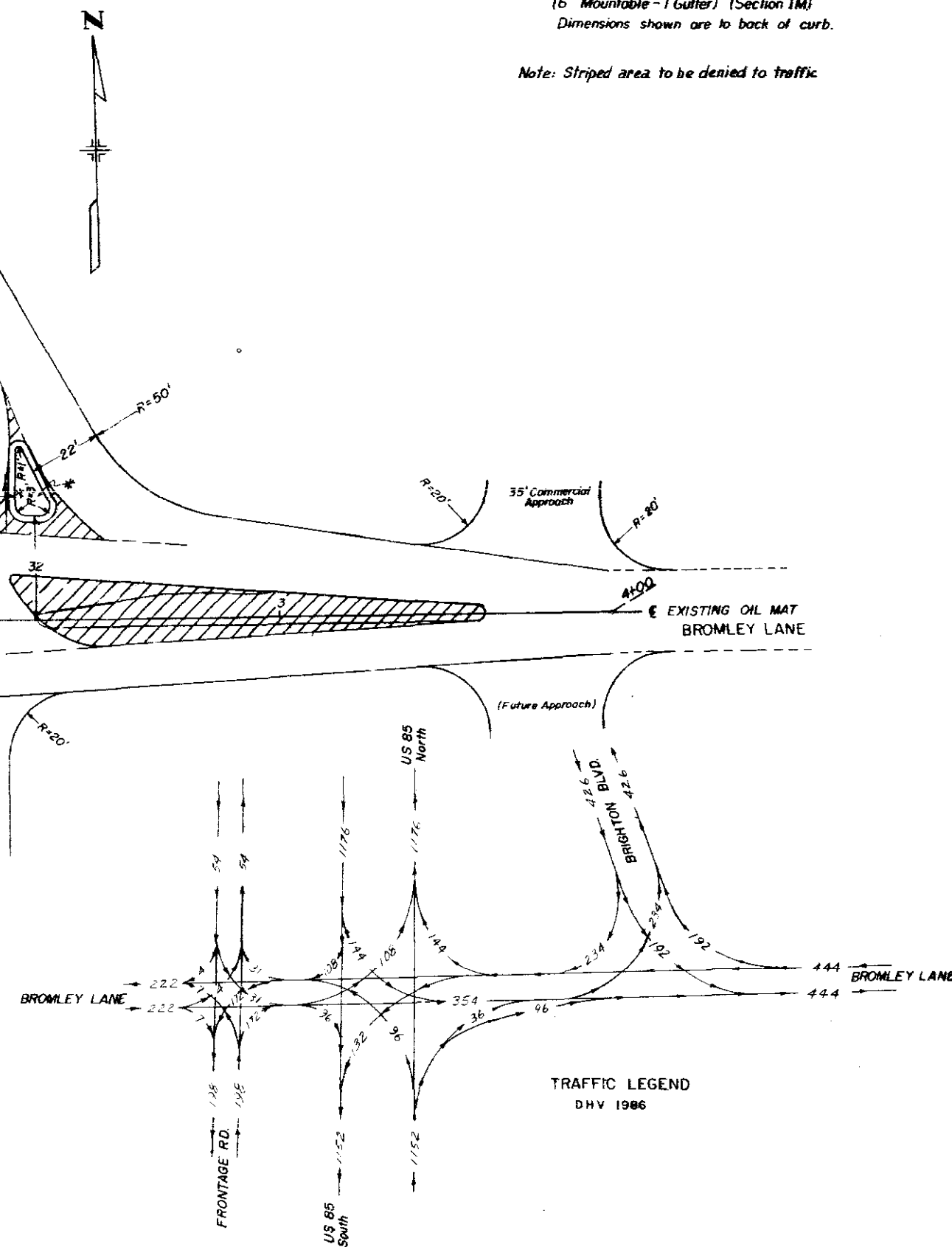
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F 006-1 (36)	6	

BROMLEY LANE INTERSECTION DETAIL

Curb and Gutter shall be Type 2
(6" Mountable - 1' Gutter) (Section 1M)
Dimensions shown are to back of curb.

Note: Striped area to be denied to traffic

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* Cover Coat Material (Median) is to be placed in areas indicated.

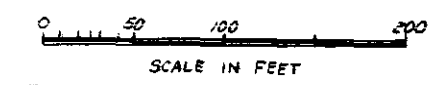
TRAFFIC LEGEND
DHV 1986

Worksheet No. 28038 - Alignment
28039 - Topog. & Ties

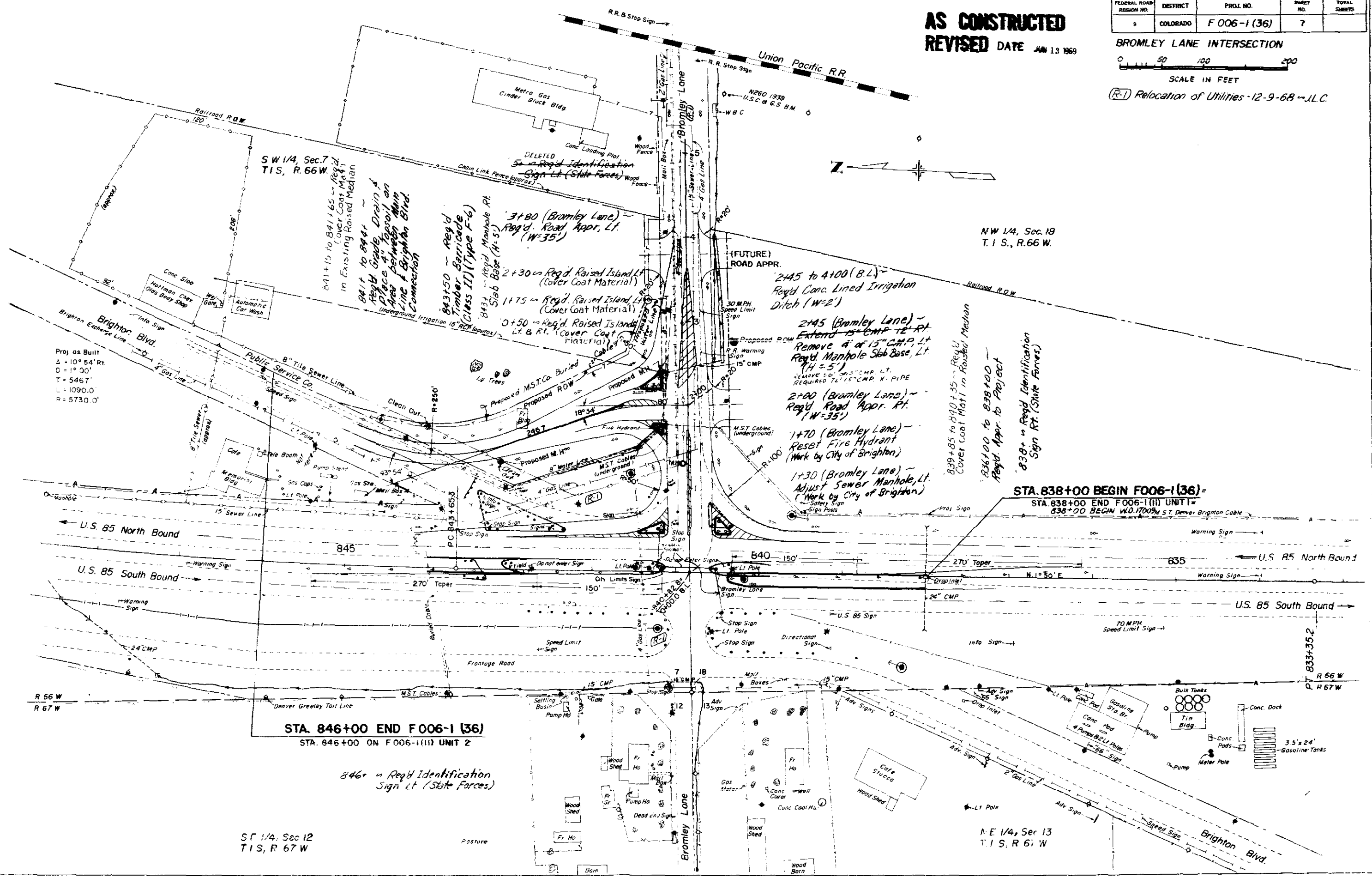
AS CONSTRUCTED
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FEDERAL ROAD DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9 COLORADO	F 006-1 (36)	7	

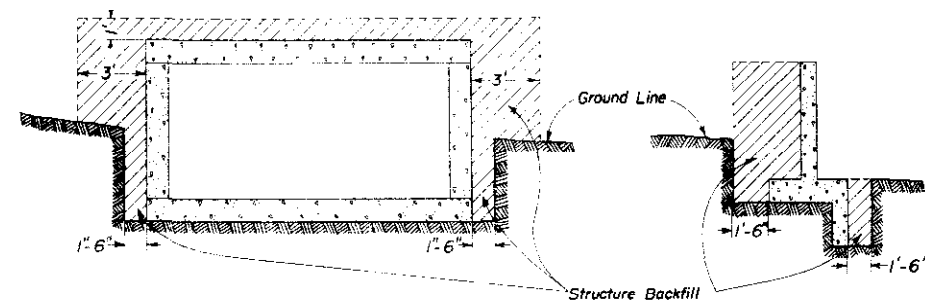
BROMLEY LANE INTERSECTION



(R-1) Relocation of Utilities - 12-9-68 - J.L.C.

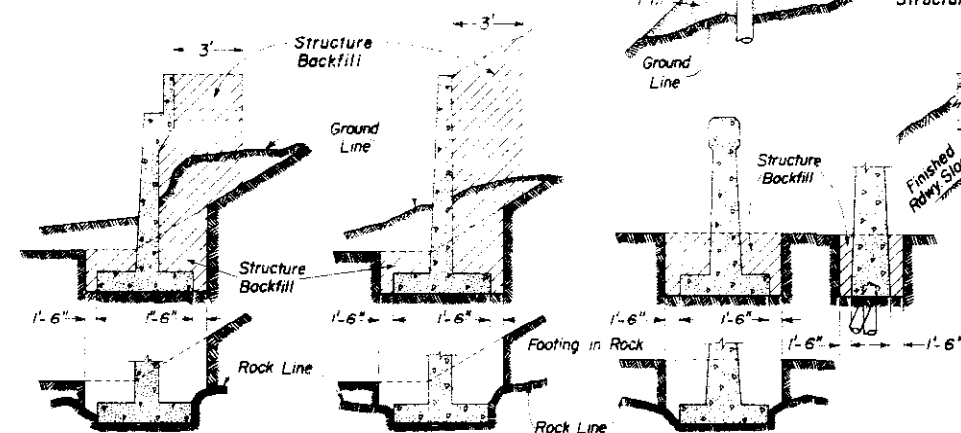


CONCRETE BOX CULVERTS & WINGWALLS

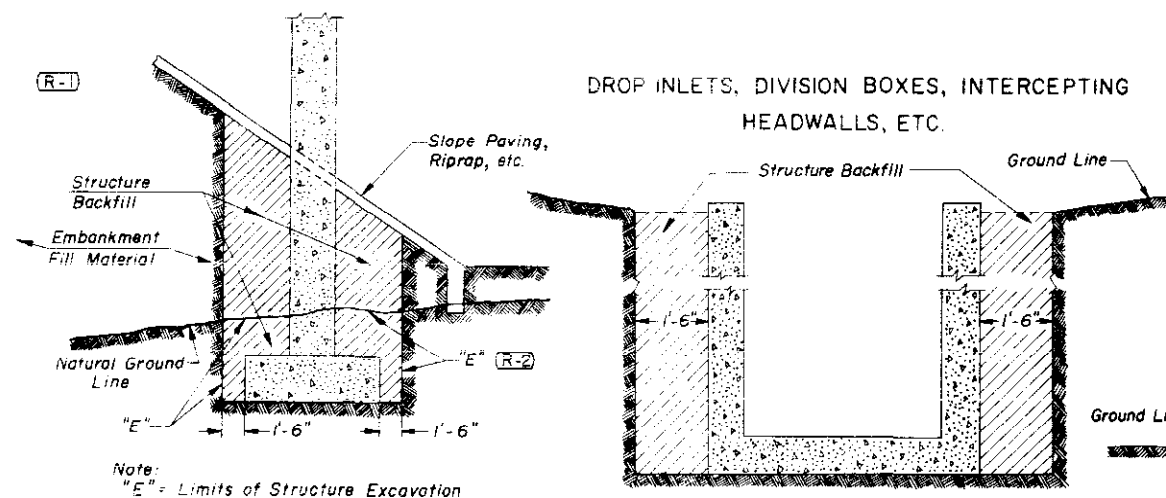


PIERS, ABUTMENTS, RETAINING WALLS ETC.

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



DROP INLETS, DIVISION BOXES, INTERCEPTING HEADWALLS, ETC.



Note: "E" = Limits of Structure Excavation

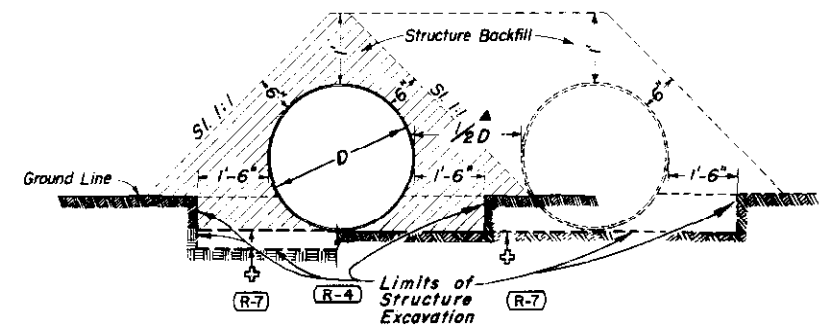
STANDARD M-206-A

(JULY 1, 1965)
(SHEET 1 OF 2 SHEETS)

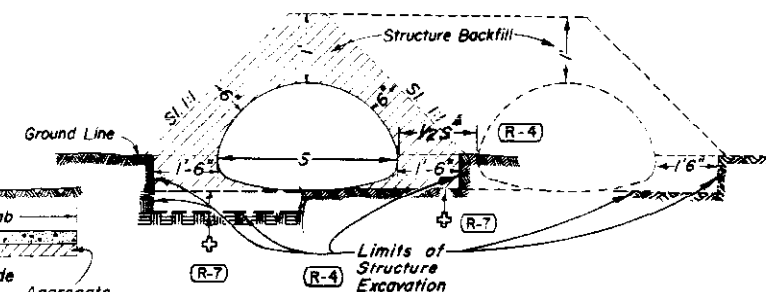
FED. ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
1	COLO.		

REVISION	DATE	BY
(R-1) 10-20-65 ADDED PIER VIEW	MR.H.	
(R-2) 12-7-65 STR. EXCV	MR.H.	
(R-3) 4-25-66 Class 2 Backfill (Trench)	MR.H.	
(R-4) 3-17-67 Conduit, Underdrn, Box	MR.H.	
(R-5) 4-26-68 Limit Str. Excavation	MR.H.	
(R-6) 7-23-68 Dept. Name, Gen'l. Note	MR.H.	
(R-7) 11-1-68 Limit Str. Excavation	MR.H.	

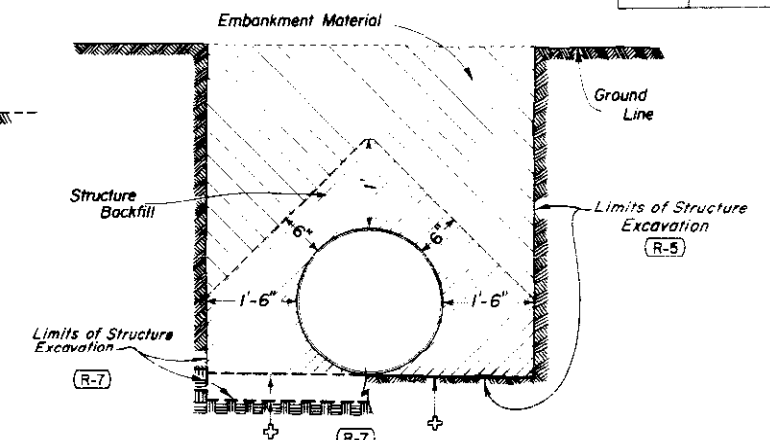
CIRCULAR CONDUIT



ELLIPTICAL OR ARCH CONDUIT



SIPHONS OR CONDUIT IN TRENCH



NOTES:

When two or more conduits are laid side by side they shall be spaced so that adjacent sides of pipe shall be $\frac{1}{2}$ the Diameter or Span or 3 feet apart whichever is less. Minimum spacing shall not be less than 1 foot.

For additional culvert installation details see M Standards for metal, concrete, or structural plate pipe culverts.

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

GENERAL NOTES

All work shall be done according to the Standard Specifications applicable to the Project.

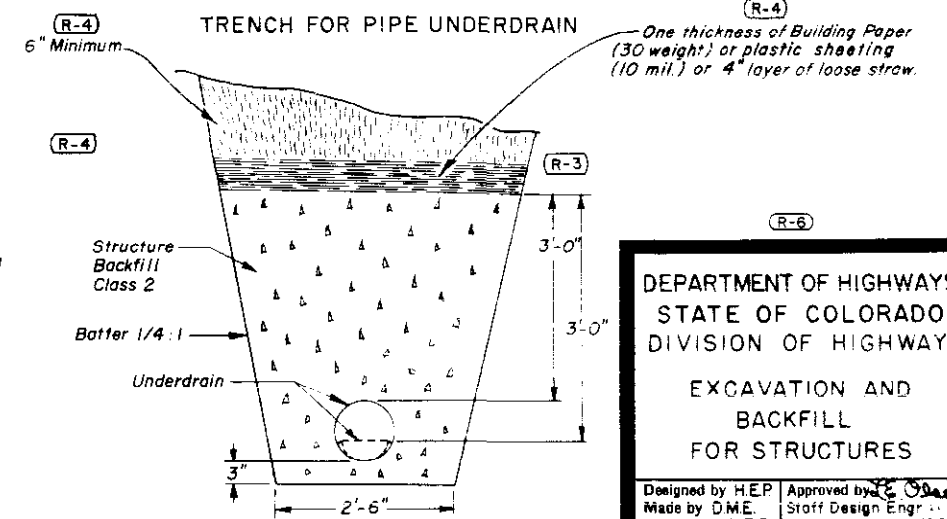
Where the roadway cross section is in fill, excavation for concrete footings (except those in rock or those on piles) and for box culverts shall be done according to the following:

Embankment shall be built up and compacted to a point one foot above the bottom of the box or one foot above the bottom of the footing. The trench shall then be excavated to accommodate construction of the box or footing.

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

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

TRENCH FOR PIPE UNDERDRAIN



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

EXCAVATION AND BACKFILL FOR STRUCTURES

Designed by H.E.P. Approved by L.E.O.
Made by D.M.E. Staff Design Engr.
Checked by L.E.O. Date: July 1, 1965

STANDARD M-206-A

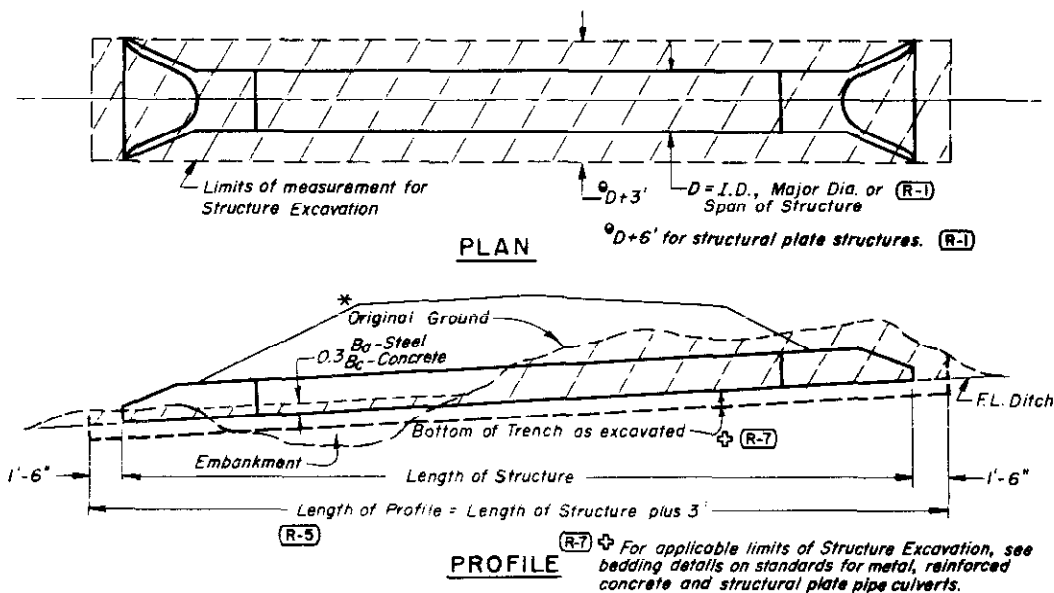
(SHEET 2)

(JULY 1, 1965)

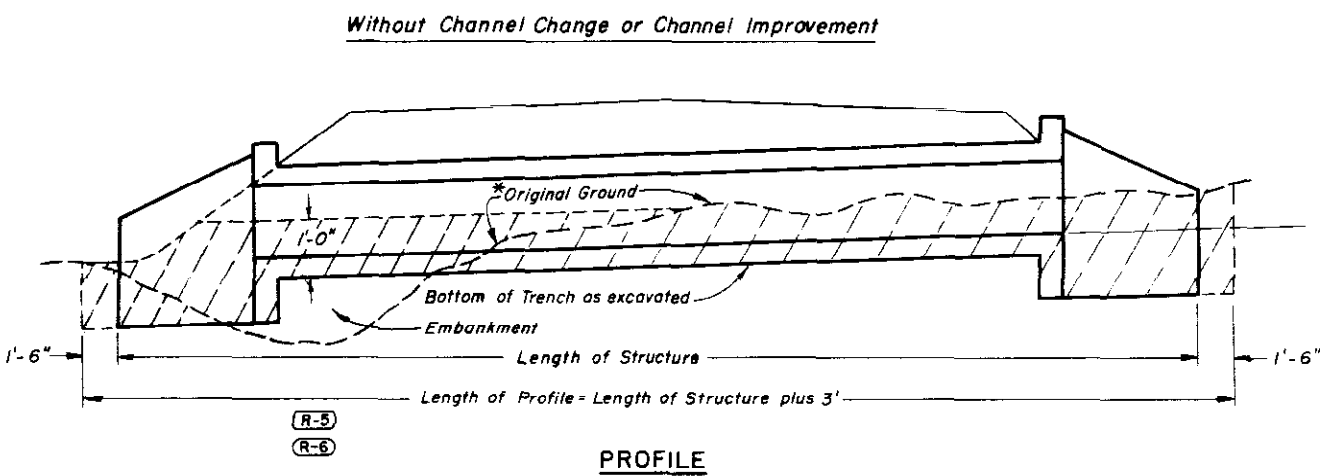
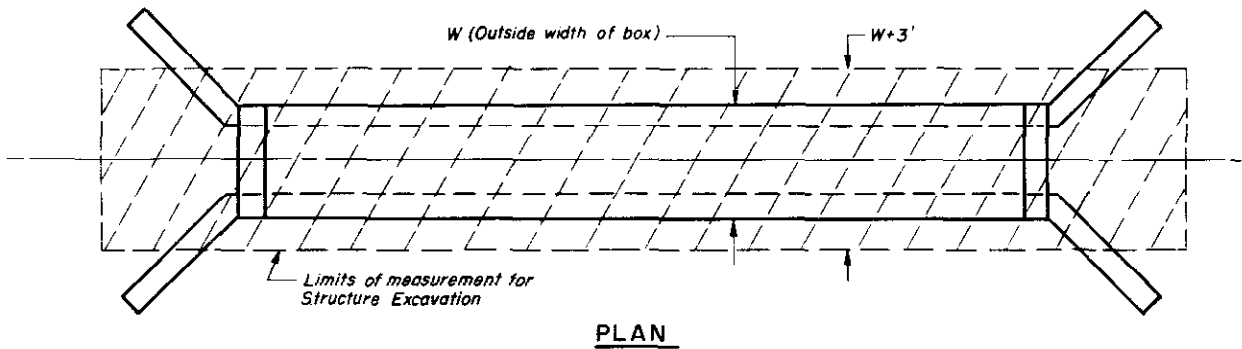
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO			

REVISIONS:			
(R-1)	3-17-67	I. U. on Pipe Culvert Span or D.	M.R.H.
(R-5)	4-26-68	Structure Excavation in Fill	M.R.H.
(R-6)	7-23-68	Dept. Name & Detail	M.R.H.
(R-7)	11-1-68	Limit Str. Excavation	M.R.H.

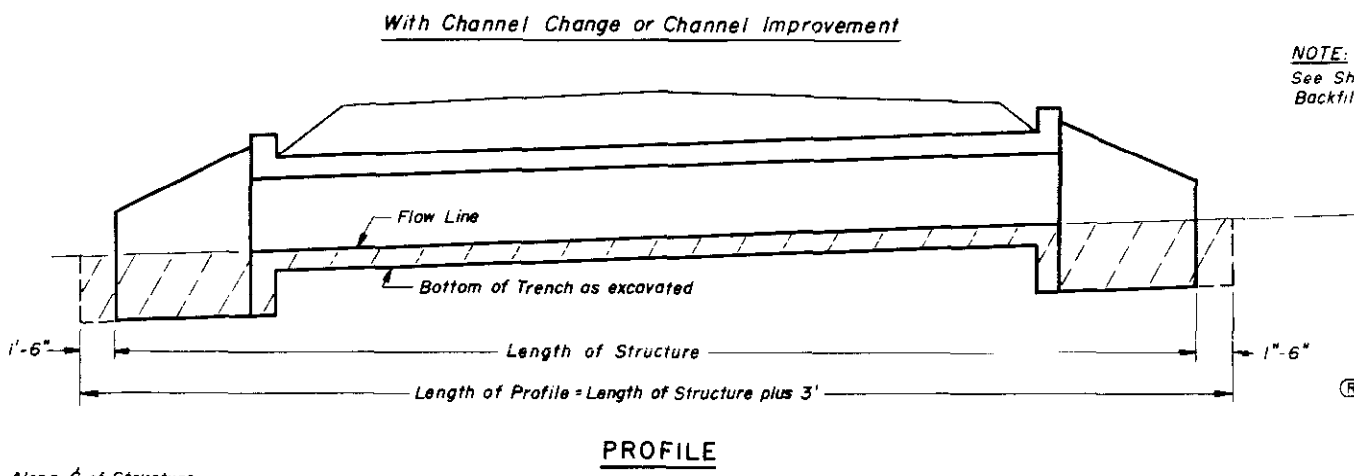
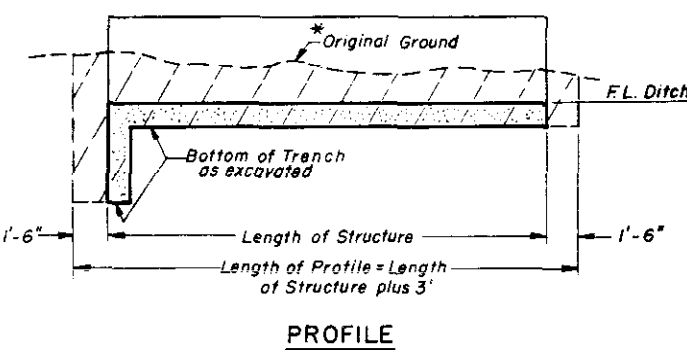
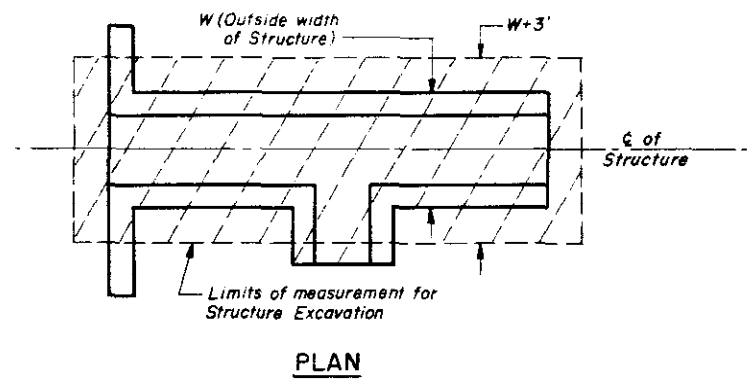
STRUCTURE EXCAVATION MEASUREMENT FOR PIPE CULVERTS



STRUCTURE EXCAVATION MEASUREMENT FOR CONCRETE BOX CULVERTS



STRUCTURE EXCAVATION MEASUREMENT FOR DIVERSION OR DIVISION BOXES



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

* Along C of Structure
Areas to be used for Structure Excavation computations.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

EXCAVATION AND
BACKFILL
FOR STRUCTURES

Designed by: M.R.H. Approved by: *[Signature]*
Made by: H.P.B. Staff Design Engr.
Checked by: Date: July 1, 1965

STANDARD M-603-M
(MARCH 20, 1967)

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

REVISIONS			
(R-1)	4-5-68	Added notes.	M.R.H.
(R-2)	7-23-68	Dept. Name & Note	M.R.H.

FILL HEIGHT AND GAGE TABLES FOR METAL CULVERT PIPE (RIVETED, WELDED OR HELICAL FABRICATION)

TABLE I
CORRUGATED STEEL PIPE
(2" x 1/2") OR (2-2/3" x 1/2") CORRUGATIONS

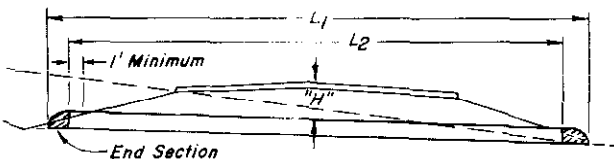
PIPE SIZE (B ₀) Inches	AREA (Sq.Ft.)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET															
		1 to 10	10+ 15	15+ 20	20+ 25	25+ 30	30+ 35	35+ 40	40+ 45	45+ 50	50+ 55	55+ 60	60+ 70	70+ 80	80+ 90	90+ 100	
		G A G E															
12	0.8	16	16	16	16	16	16	16	16	16	16	16	16	16	14	12	
15	1.2	16	16	16	16	16	16	16	16	16	16	16	16	16	14	12	
18	1.8	16	16	16	16	16	16	16	16	16	16	14	14	12	12	10	
24	3.1	16	16	16	16	16	16	14	12	10	10	8					
30	4.9	16	16	16	16	14	14	12	12	10	8						
36	7.1	16	16	16	16	14	12	10	8								
42	9.6	16	16	16	16	16	14	12	10	8							
48	12.6	16	16	16	16	16	14	12	10	8							
54	15.9	14	14	14	14	14	12	10	8								
60	19.6	12	12	12	12	12	10	8									
66	23.8	12	12	12	12	10	8										
72	28.3	10	10	10	10	8											
78	33.0	8	8	8	8												
84	38.0	8	8	8													

See General Note.

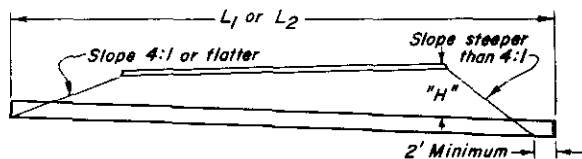
TABLE II
CORRUGATED STEEL PIPE ARCH
(2" x 1/2") OR (2-2/3" x 1/2") CORRUGATIONS

PIPE SIZE Span- Rise (Inches)	AREA (Sq.Ft.)	CORNER RADIUS (Inches)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET						
			1.5 to 7	7+ to 8	8+ to 9	9+ to 10	10+ to 12	12+ to 13	
			GAGE						
18 x 11	1.1	3 1/2	16	16	16	16	16	16	
22 x 13	1.6	4	16	16	16	16	16		
25 x 16	2.2	4	16	16	16	16			
29 x 18	2.8	4 1/2	16	16	16				
36 x 22	4.4	5	16	16	16				
43 x 27	6.4	5 1/2	16						
50 x 31	8.7	6	14						
58 x 36	11.4	7	12						
65 x 40	14.3	8	12						
72 x 44	17.6	9	10						

METAL CULVERT WITH END SECTIONS



METAL CULVERT WITHOUT END SECTIONS



"H" = Maximum height of fill over top of Culvert, including pavement.

L₁ = Length of Culvert to be measured when placed in accordance with Section 617.

L₂ = Length of pipe to be measured when placed in accordance with Section 603.

(R-1) Length of extension, when placed in accordance with Section 617, shall be the actual number of feet of new culvert required.

TABLE III
CORRUGATED STEEL PIPE
RIVETED OR HELICAL FABRICATION
3" x 1" CORRUGATIONS

PIPE SIZE (B ₀) Inches	AREA (Sq. Ft.)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET															
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 45	45+ to 50	50+ to 55	55+ to 60	60+ to 70	70+ to 80			
36	7.1	16	16	16	16	16	14	14	12	12	12	10	8				
42	9.6	16	16	16	16	16	14	14	12	12	12	10	8				
48	12.6	16	16	16	16	16	14	14	12	12	12	10	8				
54	15.9	16	16	16	16	16	14	14	12	12	10	8					
60	19.6	16	16	16	16	16	14	14	12	12	10	8					
66	23.8	16	16	16	16	16	14	14	12	12	10	8					
72	28.3	16	16	16	16	16	14	14	12	12	10	8					
78	33.0	16	16	16	16	16	14	14	12	10	8						
84	38.0	14	14	14	14	14	12	12	10	8							
90	44.0	14	14	14	14	14	12	12	10	8							
96	50.3	12	12	12	12	12	10	8									
102	57.0	12	12	12	12	12	10	8									
108	64.0	12	12	12	12	10	8										
114	70.9	10	10	10	10	8											
120	78.6	10	10	10	10	8											

5/16" rivets or helical fabrication shall be used on pipes with gages to the left of or above the heavy solid line.

3/8" rivets or helical fabrication shall be used on pipes with gages to the right of or below the heavy solid line.

TABLE IV
CORRUGATED STEEL PIPE
* SPOT WELDED OR BOLTED (1/2" ASTM A 325 BOLTS) FABRICATION
3" x 1" CORRUGATIONS

PIPE SIZE (B ₀) Inches	AREA (Sq Ft.)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET															
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 45	45+ to 50	50+ to 55	55+ to 60	60+ to 70	70+ to 80	80+ to 90	90+ to 100	
GAGE																	
36	7.1	16	16	16	16	16	16	14	14	14	12	12	12	12	10		
42	9.6	16	16	16	16	16	16	16	14	14	12	12	12	10	8		
48	12.6	16	16	16	16	16	14	14	14	12	12	12	10	8			
54	15.9	16	16	16	16	16	14	14	12	12	10	10					
60	19.6	16	16	16	16	14	14	12	12	10	8						
66	23.8	16	16	16	14	14	12	12	10	8							
72	28.3	16	16	16	14	14	12	12	10								
78	33.0	16	16	16	14	12	12	10	8								
84	38.0	14	14	14	14	12	12	10									
90	44.0	14	14	14	14	12	12	10									
96	50.3	12	12	12	12	12	10	8									
102	57.0	12	12	12	12	12	10	8									
108	64.0	12	12	12	12	12	10										
114	70.9	10	10	10	10	10	8										
120	78.6	10	10	10	10	10											

----- See General Note.

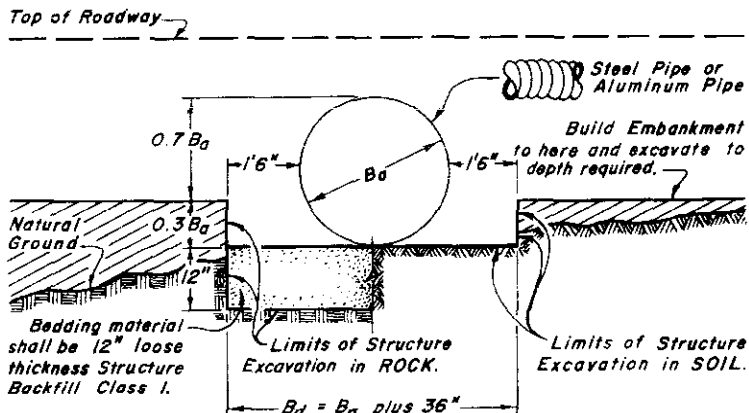
* 3/8" rivets may be used on pipes with gages to the left of or above the heavy solid line.

5/16" rivets may be used on pipes with gages to the right of or below the heavy solid line.

TABLE V
CORRUGATED STEEL PIPE ARCH
(R-2)
3" x 1" CORRUGATIONS

PIPE SIZE Span- Rise (Inches)	AREA (Sq.Ft.)	CORNER RADIUS (Inches)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET						
			1.5 to 10	10+ to 11	11+ to 12	12+ to 14	14+ to 15		
GAGE									
43 x 27	6.4	7 3/4	16	16	16				
50 x 31	8.7	9	16	16	16				
58 x 36	11.4	10 1/2	16	16	16				
65 x 40	14.3	12	16	16	16				
72 x 44	17.6	13 1/4	16	16	16				
73 x 55	22.0	18	16	16	16	16	16		
81 x 59	26.0	18	14	14	14	14	14		
87 x 63	31.0	18	14	14	14	14	14		
95 x 67	35.0	18	12	12	12				
103 x 71	41.0	18	12	12					

INSTALLATION OF METAL CULVERT PIPE



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

TABLE VI
CORRUGATED ALUMINUM PIPE
2-2/3" x 1/2" CORRUGATIONS

PIPE SIZE (B ₀) Inches	AREA (Sq. Ft.)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET															
		1 to 10	10+ to 15	15+ to 20	20+ to 25	25+ to 30	30+ to 35	35+ to 40	40+ to 45	45+ to 50	50+ to 55	55+ to 60	60+ to 70	70+ to 80			
12	0.8	16	16	16	16	16	16	14	12	12	12	12	12				
18	1.8	16	16	16	16	16	16	14	12	10	8						
24	3.1	16	16	16	16	16	16	14	12	10	8						
30	4.9	16	16	16	16	16	16	14	12	10	8						
36	7.1	16	16	16	16	16	16	14	12	10	8						
42	9.6	16	16	16	16	16	16	14	12	10	8						
48	12.6	12	12	12	12	12	10	8									
54	15.9	12	12	12	12	10	8										
60	19.6	10	10	10	10	8											
66	23.8	10	10	10	10	8											
72	28.3	8	8	8	8												

See General Note.

TABLE VII
CORRUGATED ALUMINUM PIPE ARCH
2-2/3" x 1/2" CORRUGATIONS

PIPE SIZE Span- Rise (Inches)	AREA (Sq.Ft.)	CORNER RADIUS (Inches)	HEIGHT OF FILL OVER TOP OF PIPE IN FEET						
			1.5 to 7	7+ to 9	9+ to 11	11+ to 13	13+ to 14	14+ to 15	
			GAGE						
18 x 11	1.1	4 3/4	16	16	16	16	16	16	
22 x 13	1.6	4 3/4	16	16	16	16	16		
25 x 16	2.2	4 1/2	16	16	16	16			
29 x 18	2.8	4 1/2	16	16	16				
36 x 22	4.4	5	16	16					
43 x 27	6.4	5 1/2	14						
50 x 31	8.7	6	12						
58 x 36	11.4	7	10						
65 x 40	14.3	8	10						
72 x 44	17.6	9	8						

GENERAL NOTES

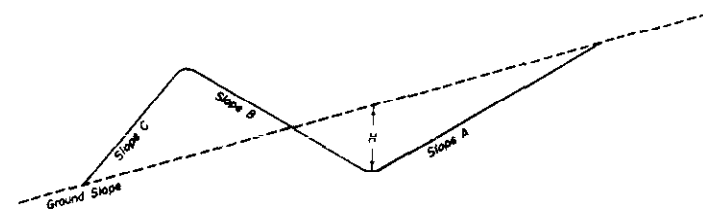
STANDARD TYPES *of* DITCHES *and* CONSTRUCTION METHODS

STANDARD M-203-C
(JULY 1, 1965)

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

DETAILS *for* CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



PURPOSE & USE OF THE TABLE

The primary purpose of the information for Contour and Intercepting Ditches shown on this sheet is to serve as a guide in construction and to readily arrive at yardages of excavation involved. Foremost consideration in constructing these ditches is given first to the natural ground line slope confronted in construction, thence to the other values shown on the Typical Section. By properly arriving at the combination of values shown on the Typical Section and in the Table for a specified condition, the number of cubic yards of excavation per 100 lin. ft. of ditch may be read under the appropriate column for this item.

Typical Construction Layouts

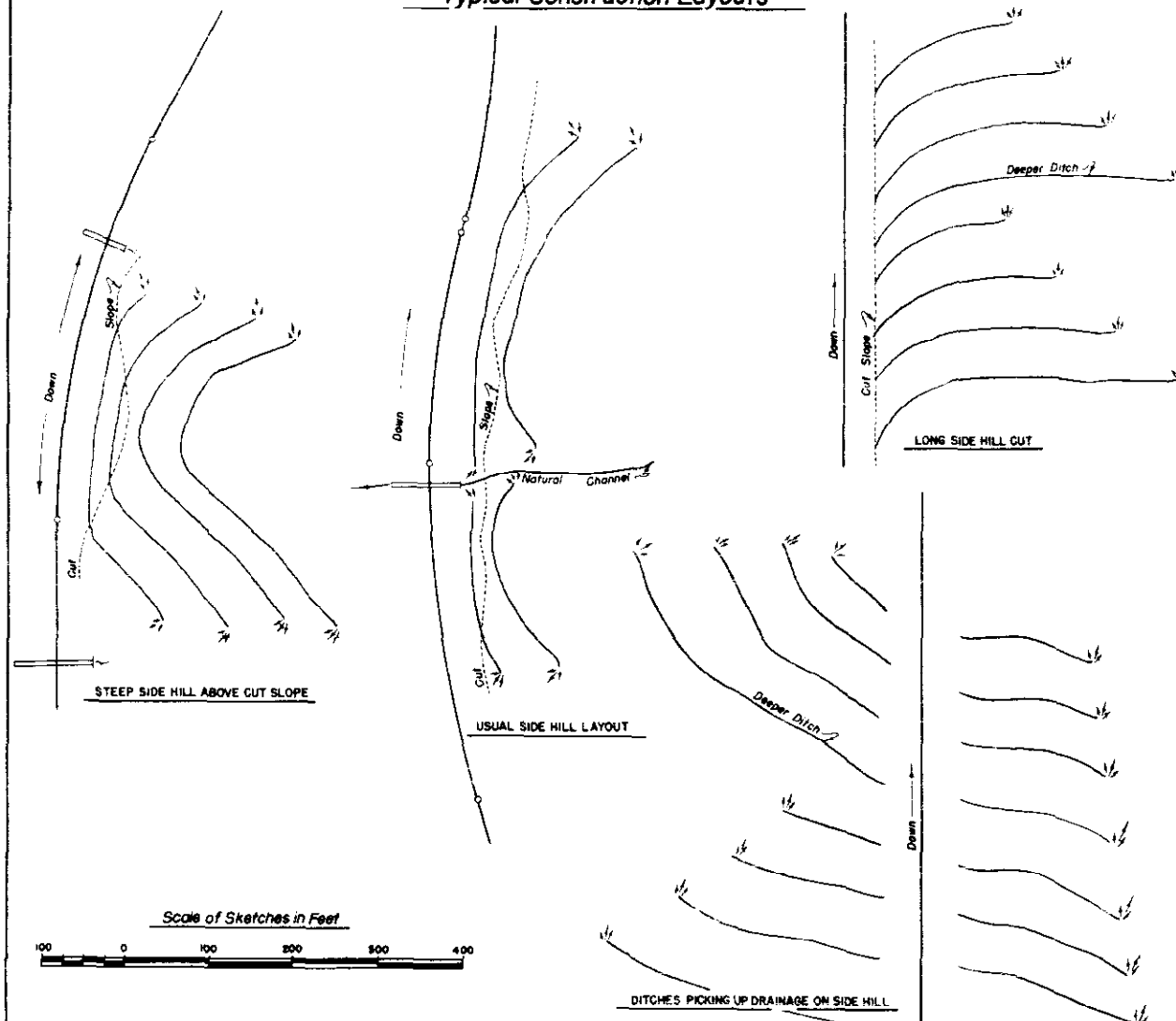
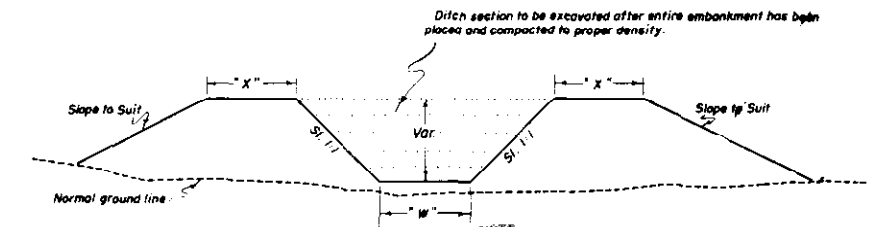


Table of Slopes and Yardages

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

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

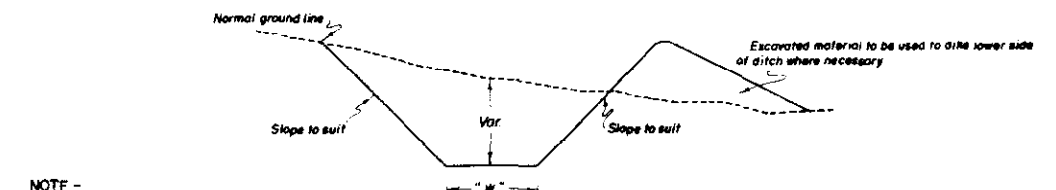
TYPICAL SECTIONS *for* DRAINAGE, IRRIGATION DITCHES *and* CHANNEL CHANGES



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

For Embankment Sections

(Generally for use in irrigation Ditches & Channel Changes)



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

For Cut Sections

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

GENERAL NOTES

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

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

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

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

The following horizontal spacing of ditches is recommended:

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

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

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

DITCH TYPES

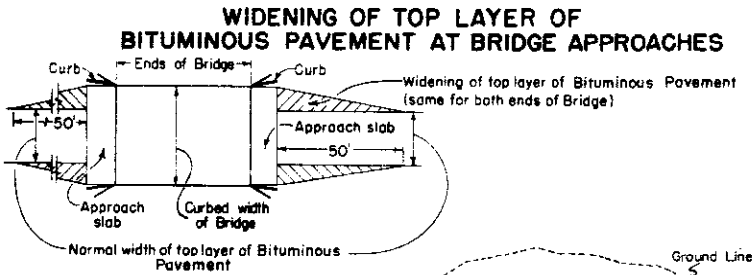
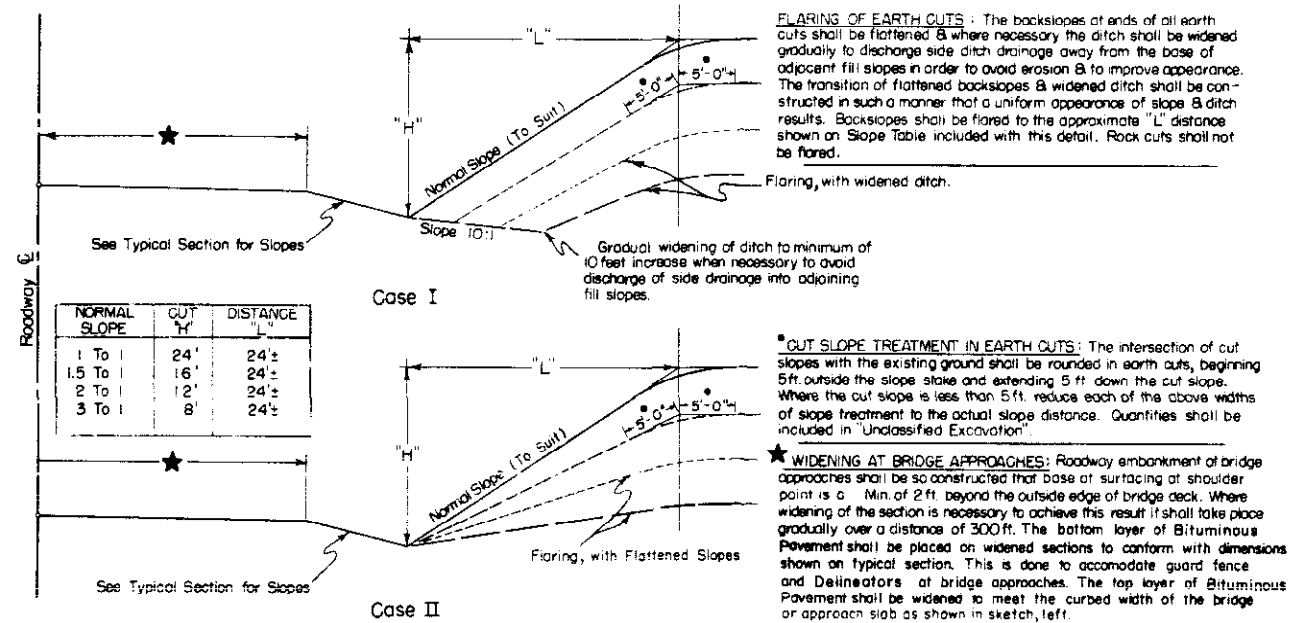
Designed by C.G.M. Approved by *[Signature]*
Made by C.G.M. Staff Design Engr.
Checked by Date: July 1, 1965

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

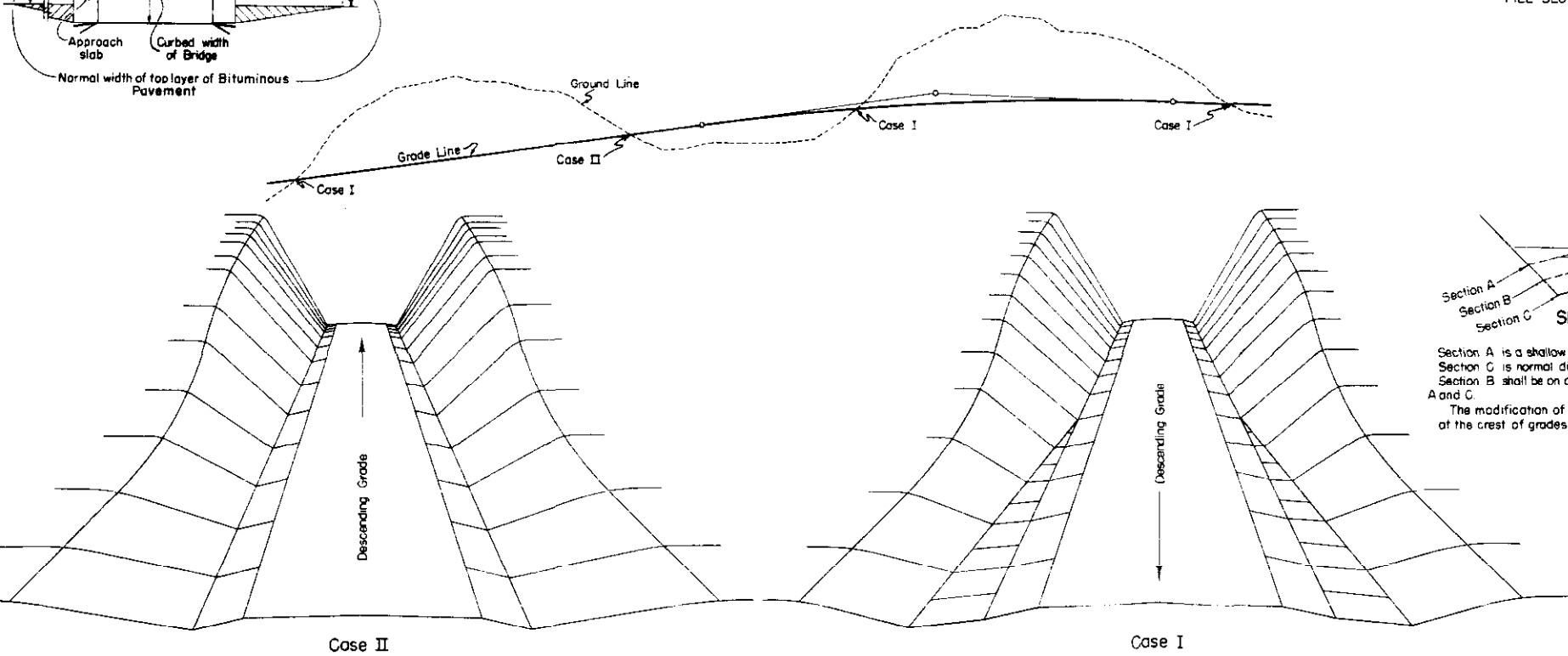
STANDARD M-203-B
(JULY 1, 1965)

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

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

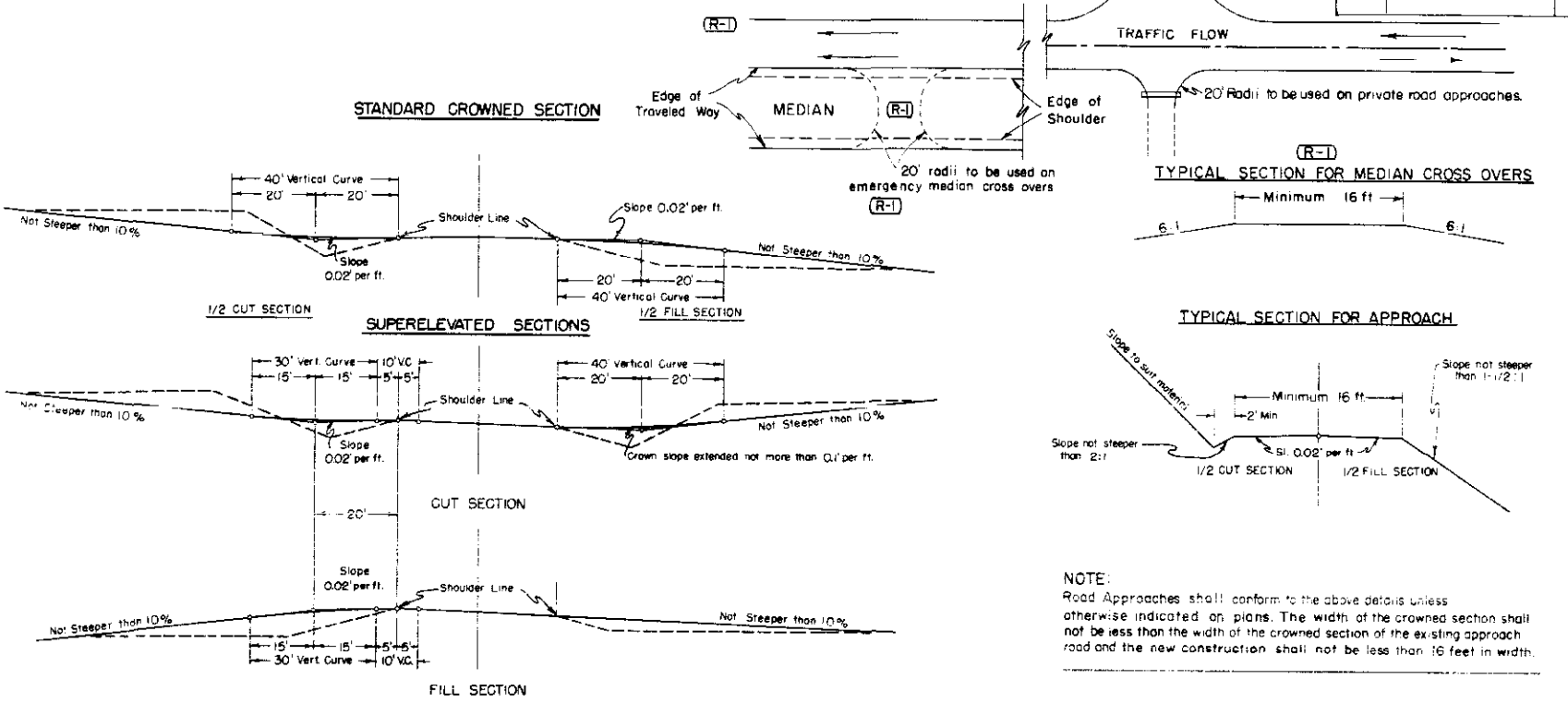


PLAN OF FLARING IN EARTH CUTS



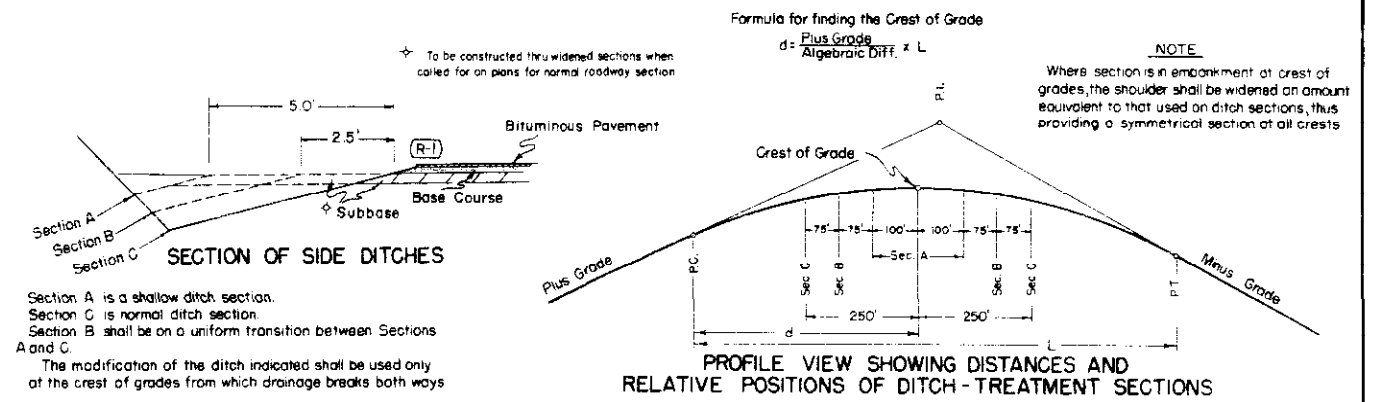
TYPICAL PLANS FOR SIDE APPROACH ROADS AND EMERGENCY MEDIAN CROSS OVERS

Where practical Side Drains are to be placed in line with the roadway ditches.
50' Radii to be used on all intersecting roads except private approaches. Radii may be varied to suit field conditions.



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

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES
(TO BE USED ONLY WHERE SIGHT DISTANCE AT CREST OF GRADE IS 600 FT. OR LESS)



GENERAL NOTES

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

All side approach roads to the Project shall be Gravel Surfaced with a 4 inch thickness of Aggregate Base Course extending approximately to the Right of Way Line. Estimated tonnage and class of material required for this operation are shown in the Aggregate Base Course Plan.

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

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

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

Designed by A.Z.
Made by SUM & AB
Checked by C.R.S.

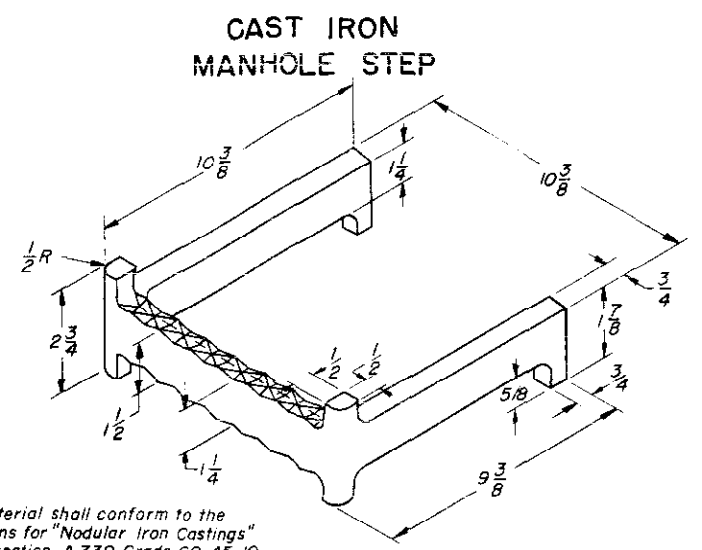
Approved by [Signature]
Staff Design Engr.
Date: July 1, 1965

STANDARD M-604-D

(JULY 1, 1965)

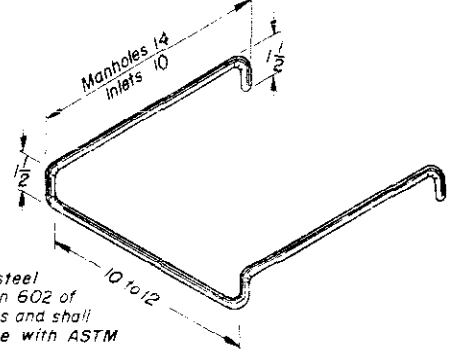
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO			

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



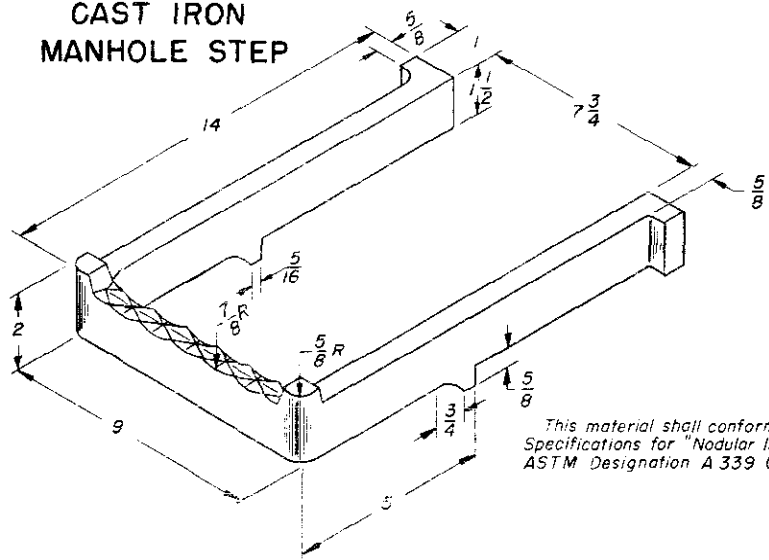
This material shall conform to the Specifications for "Nodular Iron Castings" ASTM Designation A 339 Grade 60-45-10

MILD STEEL MANHOLE OR INLET STEP



Step shall be 3/4 Dia. steel bars conforming to Section 602 of the Standard Specifications and shall be galvanized in accordance with ASTM Designation A 123.

CAST IRON MANHOLE STEP



This material shall conform to the Specifications for "Nodular Iron Castings" ASTM Designation A 339 Grade 60-45-10.

GENERAL NOTES

- All work shall be done according to the Standard Specifications applicable to the project.
- Steps shall be included in the cost of "Manholes" or "Inlets".
- All dimensions shown in inches.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

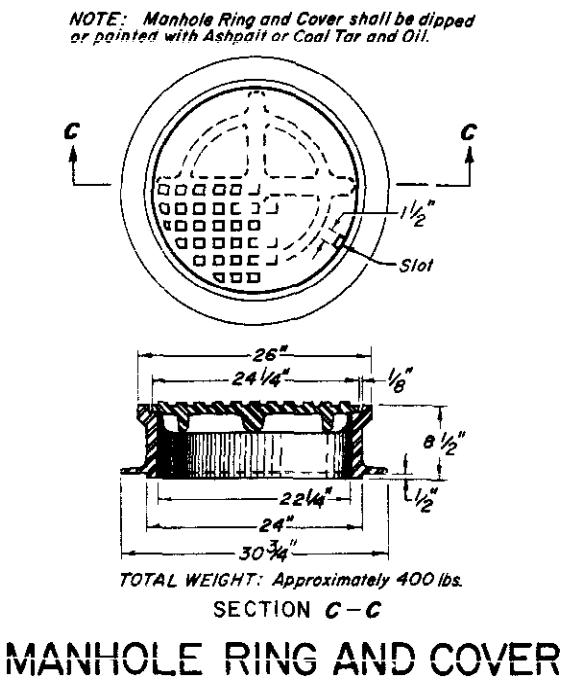
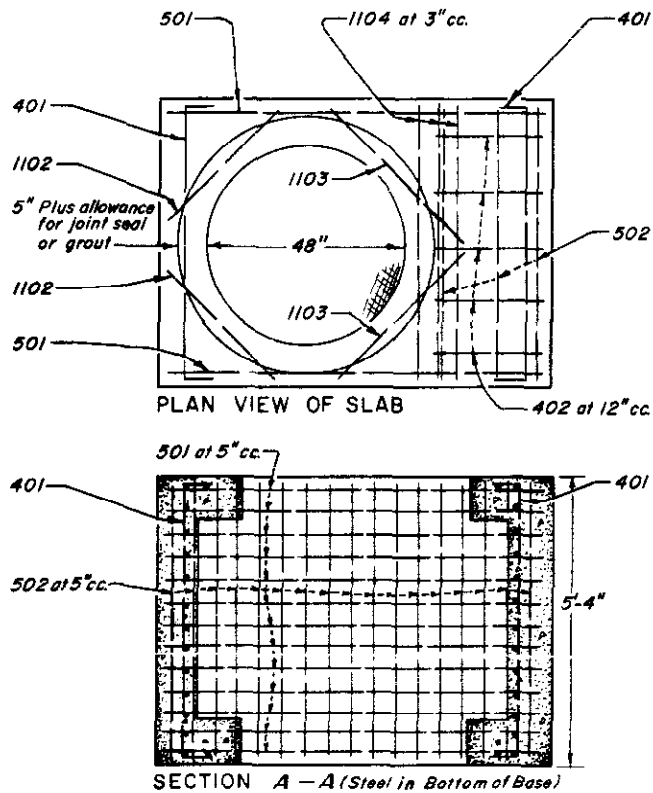
STEPS FOR MANHOLES
AND INLETS

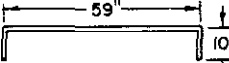
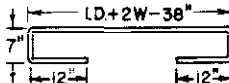
Designed by: M.R.H. Approved by:
Made by: H.R.B. Staff Design Engr.
Checked by: Date: July 1, 1965

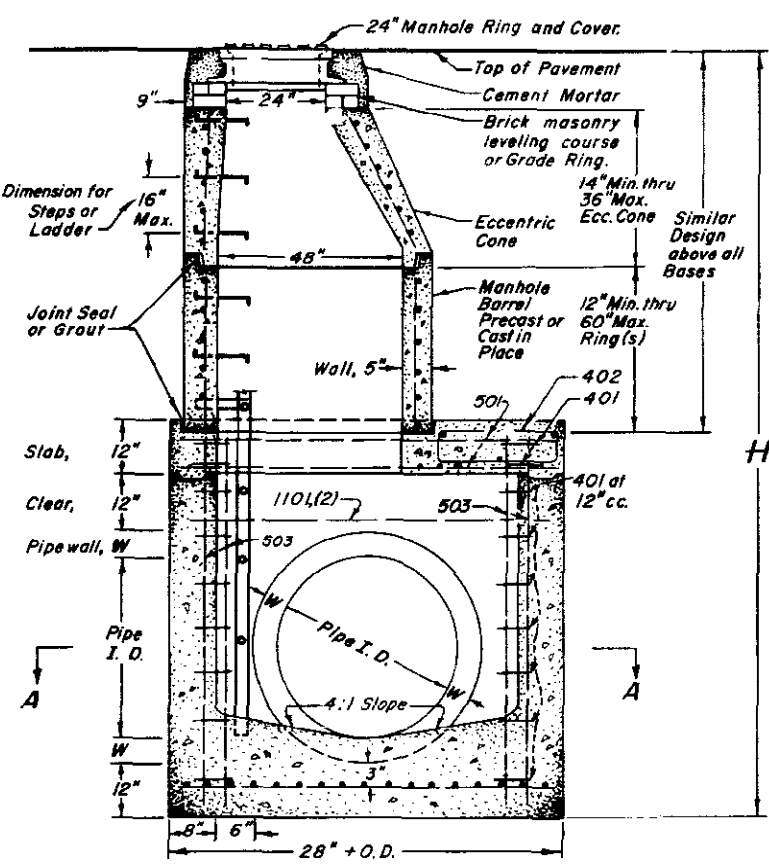
STANDARD M-604-E
(OCTOBER 11, 1967)

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

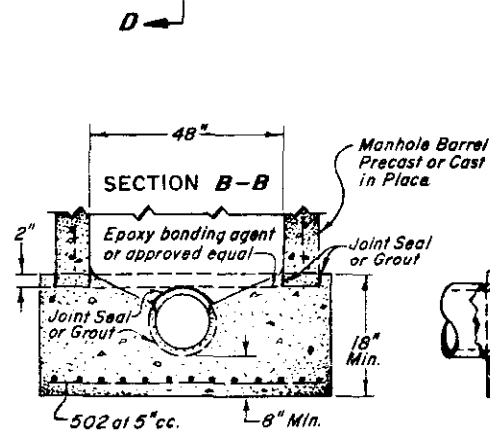
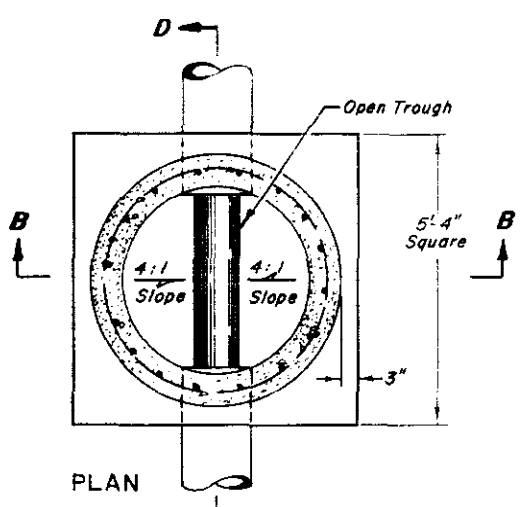
REVISIONS			
(R-1)	7-24-68	Dept. Name	M.R.H.



QUANTITIES FOR CONCRETE MANHOLE BOX BASE											
MARK	SIZE	TYPE	Lb./Ft.	BARS	I.D. → 36"	48"	60"	72"	84"	96"	FORMULAS
401	4	II	0.67	{ NO. REQ'D. LENGTH WEIGHT, lbs.	16 6'-7" 70.4	18 6'-7" 79.2	20 6'-7" 88.0	22 6'-7" 96.8	25 6'-7" 110.0	27 6'-7" 118.8	401 Number Bars Required = $\left(\frac{12 + I.D. + 2W}{6}\right) + 6$
402	4	III	0.67	{ NO. REQ'D. LENGTH WEIGHT, lbs.	0 0 0	5 4'-10" 16.2	5 6'-0" 20.0	5 7'-2" 23.9	5 8'-4" 27.8	5 9'-6" 31.7	402 Bar Length = I.D. + 2W
501	5	I	1.04	{ NO. REQ'D. LENGTH WEIGHT, lbs.	17 5'-8" 100.5	17 6'-10" 121.2	17 8'-0" 141.9	17 9'-2" 162.5	17 10'-4" 183.2	17 11'-6" 203.9	501 Bar Length = 24" + I.D. + 2W
502	5	I	1.04	{ NO. REQ'D. LENGTH WEIGHT, lbs.	15 5'-0" 78.2	19 5'-0" 99.1	23 5'-0" 120.0	27 5'-0" 140.8	31 5'-0" 161.7	34 5'-0" 177.3	502 Number Bars Req'd. = $\left(\frac{17 + I.D. + 2W}{5}\right) + \left(\frac{I.D. - 36}{12}\right) + 3$
503	5	I	1.04	{ NO. REQ'D. LENGTH WEIGHT, lbs.	30 6'-2" 193.0	30 7'-4" 229.5	30 8'-6" 266.0	30 9'-8" 302.5	30 10'-10" 339.5	30 12'-0" 376.5	503 Bar Length = 30" + I.D. + 2W
1101	11	I	5.31	{ NO. REQ'D. LENGTH WEIGHT, lbs.	4 8'-8" 120.5	4 8'-10" 145.2	4 9'-0" 170.0	4 9'-2" 194.8	4 10'-4" 219.6	4 11'-6" 244.4	1101 Bar Length = 24" + I.D. + 2W
1102	11	I	5.31	{ NO. REQ'D. LENGTH WEIGHT, lbs.	2 2'-6" 26.6	2 2'-6" 26.6	2 2'-6" 26.6	2 2'-6" 26.6	2 2'-6" 26.6	2 2'-6" 26.6	BENDING TYPE I 
1103	11	I	5.31	{ NO. REQ'D. LENGTH WEIGHT, lbs.	2 3'-6" 37.2	2 3'-6" 37.2	2 3'-6" 37.2	2 3'-6" 37.2	2 3'-6" 37.2	2 3'-6" 37.2	
1104	11	I	5.31	{ NO. REQ'D. LENGTH WEIGHT, lbs.	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	TYPE II 
REINFORCING STEEL—Pounds—Total					706.1	833.9	949.1	1064.8	1185.3	1295.1	TYPE III 
CONCRETE — Cubic Yards — Total					4.2	5.3	6.6	8.0	9.5	11.1	
NOTE: Quantities are based on same size pipe entrance to and exit from base and a 4 ft. manhole entrance into top slab of base.											



CONCRETE MANHOLE AND BOX BASE
(Typical for Conduit 36" I.D. and Larger.)



CONCRETE SLAB BASE
(Typical for Conduit Smaller than 36" I.D.)

GENERAL NOTES

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

Since all pipe entries into the base are variable, the dimensions shown are typical. Actual dimensions and quantities for concrete and reinforcement shall be as required in the work.

Design is based on straight runs of conduit or change in direction under 45°.

All bars shall be a minimum 2" clear.

Precast Manholes shall conform to ASTM Designation C 478.

Cast in place Manholes shall be Class "A" concrete.

The following alternate materials for Manholes may be used when design details for construction are included in the plans:

MATERIAL	CONFORMANCE	DESIGNATION
Clay or Shale Brick	AASHTO	M 91
Concrete Brick	ASTM	C 55, Grade A
Concrete Masonry Block	ASTM	C 139
Corrugated Steel Unit	AASHTO	M 36

All pipe entries into the base of Manhole shall be connected by open gutter adjusted for pipe size, shape, slope and direction of flow.

Alternate designs will be permitted after approval by the Department.

Steps or Ladder will be required when Manhole depth exceeds 3'-6".

(R-1)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

MANHOLES

Designed by M.R.H. Approved by J.R.B.
Made by J.R.B. Staff Design Engineer
Checked by R.S.M. Date: October 11, 1967

STANDARD CURBS AND GUTTERS

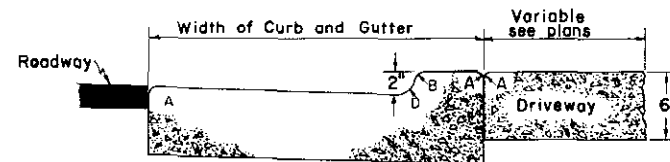
STANDARD M-609-A

(JULY 1, 1965)

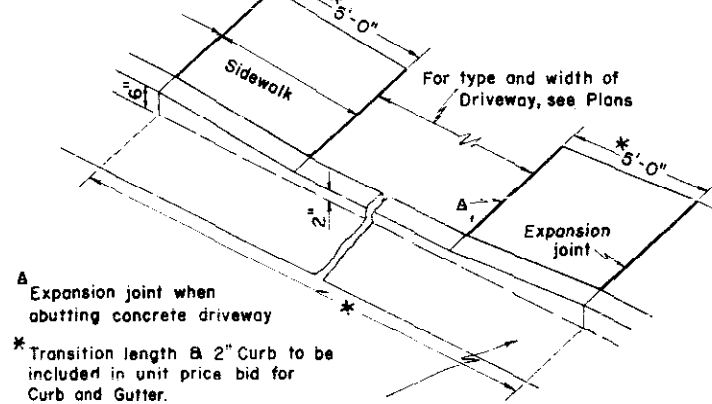
FED. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.		

REVISIONS			
(R-1)	11-16-65	Subtitles.	M.R.H.
(R-2)	2-14-66	General Notes.	M.R.H.
(R-3)	7-19-68	Dept. Name and Rev. Gen'l. Note.	M.R.H.

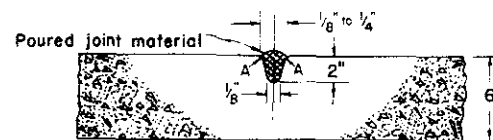
CONCRETE PAVEMENT (DRIVEWAYS)



DETAIL OF CURB CUT FOR DRIVEWAYS

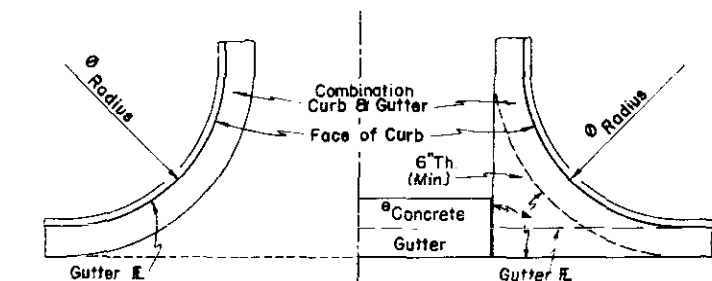


TRANSVERSE CONTRACTION JOINT FOR CONCRETE PAVEMENT (DRIVEWAYS)



This joint required where length of slab exceeds 15 feet.

CONSTRUCTION OF CONCRETE GUTTERS AT INTERSECTIONS

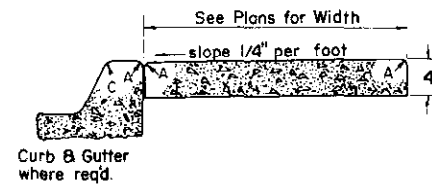


Length of Radius as shown elsewhere on Plans.

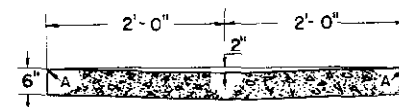
This section to be built when Concrete Gutter is not required.

This section to be built when Concrete Gutter is required.

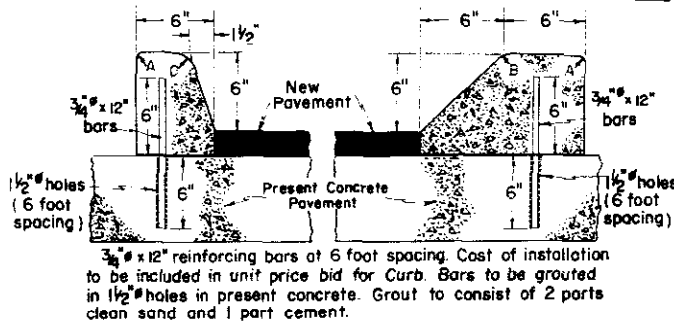
CONCRETE SIDEWALK



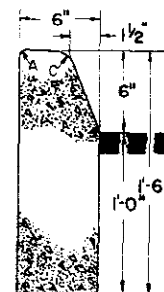
GUTTER Type 2 (4' Foot) (R-1)



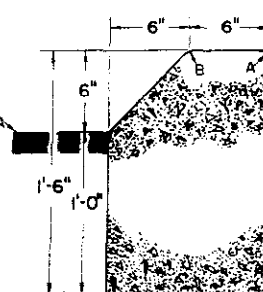
CURB Type 4 (6" Barrier) (Section B) (R-1)



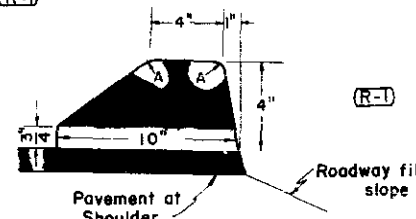
CURB Type 2 (6" Barrier) (Section B) (R-1)



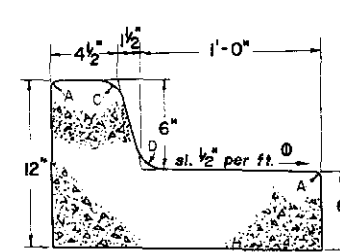
CURB Type 2 (6" Mountable) (Section M) (R-1)



CURB Type 6 (4" Mountable) (Section M) (R-1)

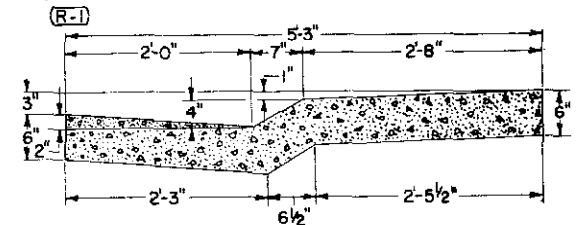


CURB AND GUTTER Type 2 (6" Barrier - 1' Gutter) (Section IB) (R-1)

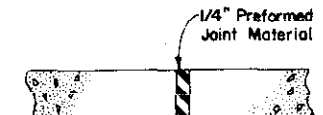


LEGEND FOR RADII	
A	= 1/8"
B	= 1"
C	= 1 1/2"
D	= 1 1/2" to 2'

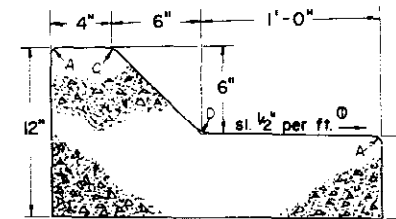
CURB AND GUTTER (Type 2) (4" Mountable with Sidewalk) (Section MS) (R-1)



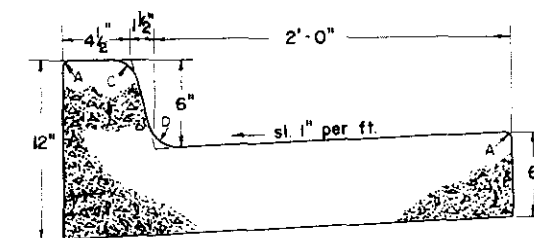
SIDEWALK EXPANSION JOINT



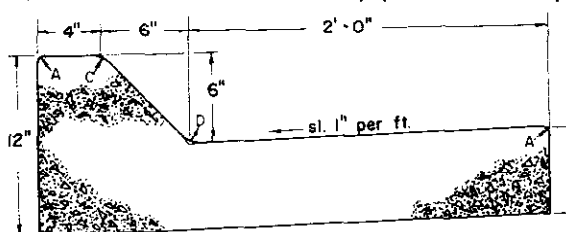
CURB AND GUTTER Type 2 (6" Mountable - 1' Gutter) (Section IM) (R-1)



CURB AND GUTTER Type 2 (6" Barrier - 2' Gutter) (Section II B) (R-1)



CURB AND GUTTER Type 2 (6" Mountable - 2' Gutter) (Section II M) (R-1)



GENERAL NOTES

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

On Curves 3 degrees and sharper, Curbs and/or Gutters are to be placed on the Arc of the Curve unless otherwise noted on plans. A maximum chord length of 10 feet may be used when the degree of curve is less than 3 degrees.

Expansion joints shall be installed between concrete curb and any fixed structure, sidewalk or bridge. Expansion joint material shall be 1/2" thick and shall extend the full depth of contact surface.

(R-3)

(R-2)

Concrete shall be Class "A" or Class "D".

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

CURBS AND GUTTERS

Designed by *W.D.*
Made by *W.D.*
Checked by *C.R.S.*
Approved by *W.D.*
Staff Design Engr.
Date: July 1, 1965

RIGHT OF WAY MARKER POST STANDARD M-612-A

(JULY 1, 1965)

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

REVISIONS			
(R-1)	5-2-66	R.O.W. Marker Note	M.R.H.
(R-2)	7-24-68	Dept. Name	M.R.H.

BENCH MARK

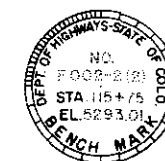
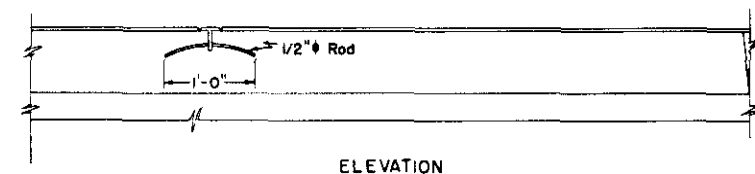
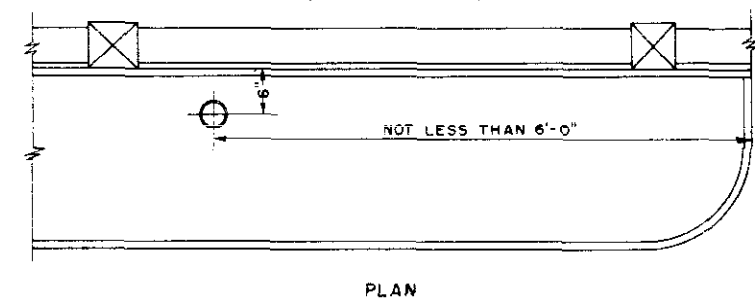
All work shall be done in accordance with Standard Specifications applicable to the project.

All exposed surfaces of the bronze tablet are to be ground to a smooth surface. All letters are to be depressed a minimum of $\frac{1}{16}$ inch. Information on the bronze tablet indicated by pin lines is to be stamped in field by the engineering party after marker is placed. $\frac{3}{16}$ inch letters and figures to be used. Project designation on tablets shall be properly shown (i.e.; I for Fed. Aid Interstate, F for Fed. Aid Primary, S for Fed. Aid Secondary, etc. & C for State Projects. See details below).

Bronze Bench Mark Tablets will be furnished by the Department at no expense to the Contractor.

Installation of Bronze Bench Mark Tablets will not be paid for directly, but shall be included in the price bid for Concrete.

Note: Where 2'-0" safety curbs are not used place marker in center of curb.



One marker to be placed on Bridges as shown. The station shown on marker shall be the center-line stationing directly opposite the marker.

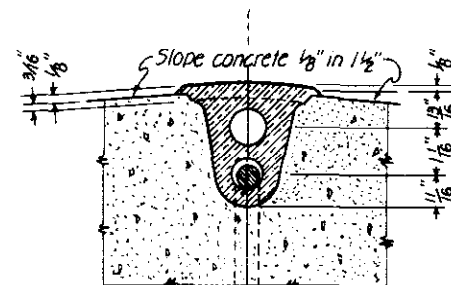
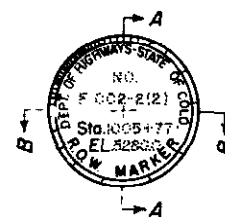
NOTES FOR R.O.W. MARKER POSTS

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

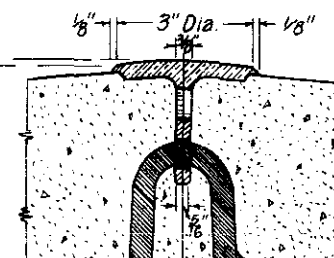
Posts shall be made of class 'A' Concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.

(R-1) Light weight aggregate conforming to ASTM Designation C-330 will be allowed.

All exposed surfaces of the bronze tablet are to be ground to a smooth surface. All letters are to be depressed a minimum of $\frac{1}{16}$ inch. Information on the bronze tablet indicated by pin lines is to be stamped in field by the engineering party after post is placed. $\frac{3}{16}$ inch letters and figures to be used. Project designations on tablets shall be properly shown (i.e.; I for Fed. Aid Interstate, F for Fed. Aid Primary, S for Fed. Aid Secondary, etc. & C for State Projects. See detail below.)



SECTION B-B



SECTION A-A

Omit and use 12" x 1/2" bar for Bench Mark Tablet.

DETAIL OF BRONZE TABLET FOR RIGHT OF WAY MARKER POST AND BENCH MARK

(R-2)

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

MARKER POSTS
AND
BENCH MARKS

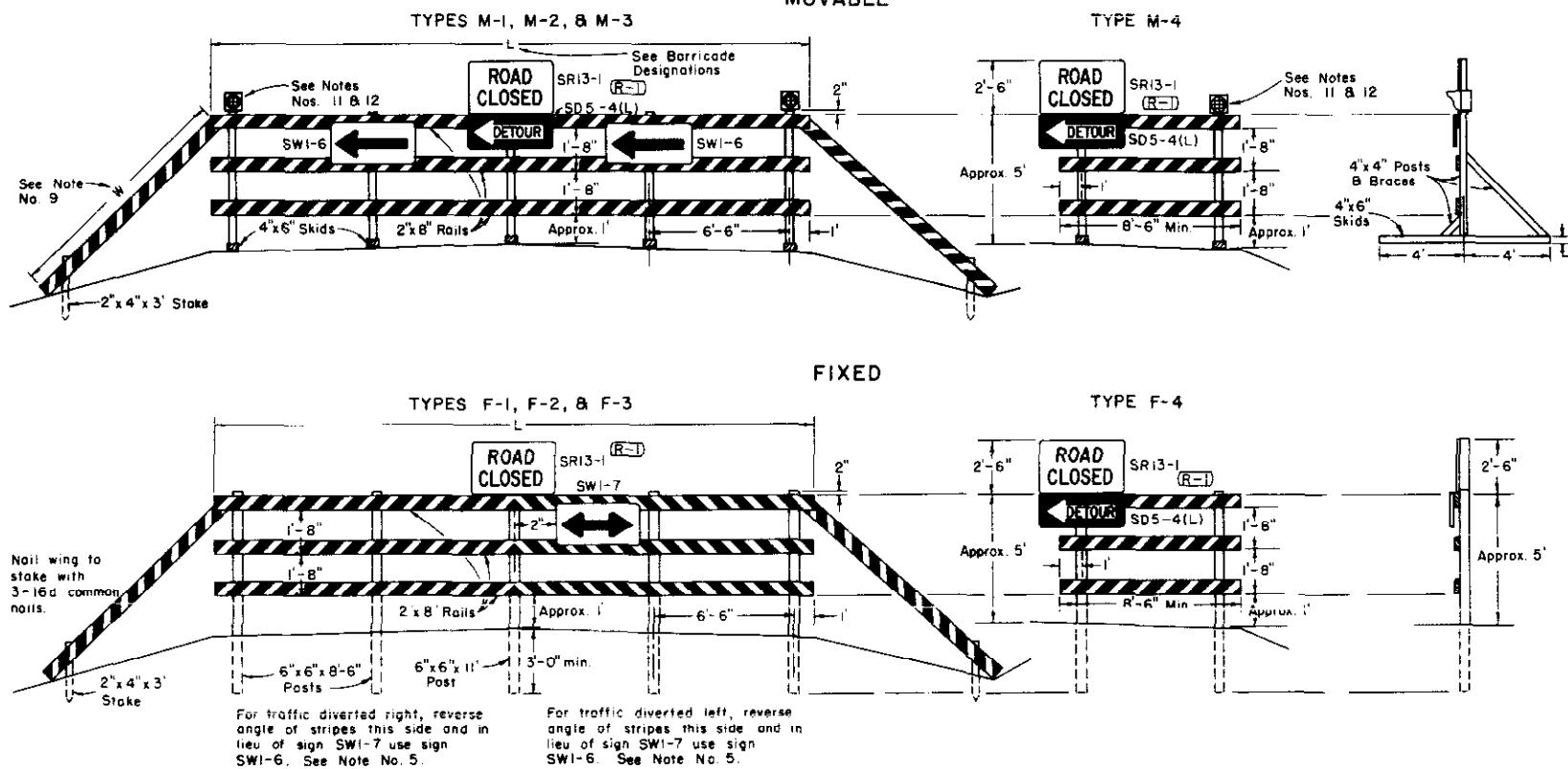
Designed by R.E.L. Approved by J.E.O.
Made by E.E.C. Staff Design Engr.
Checked by R.E.L. Date: July 1, 1965

CLASS I BARRICADES (3 RAILS)

STANDARD M-614-A (JULY 1, 1965)

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

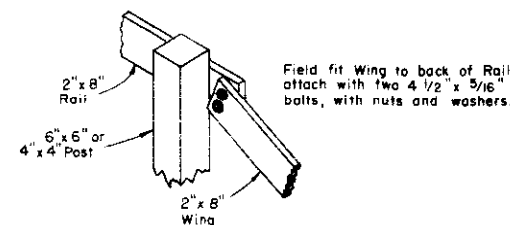
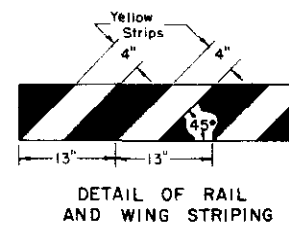
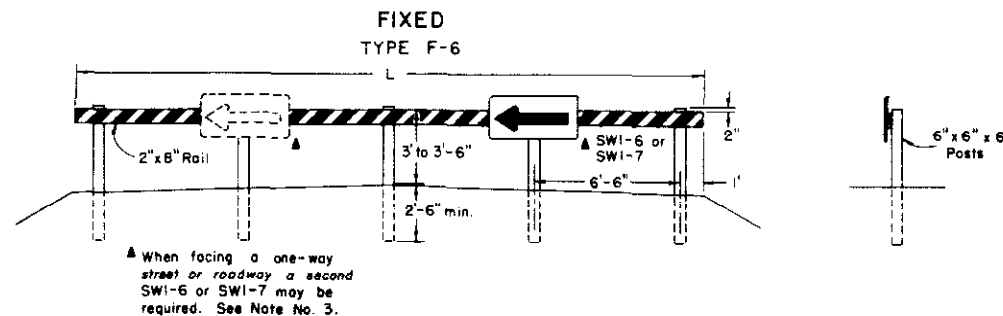
REVISIONS			
Rev.	Date	Rev. Dept. Name & Code Nos.	JLS
(R-1)	11-15-68		



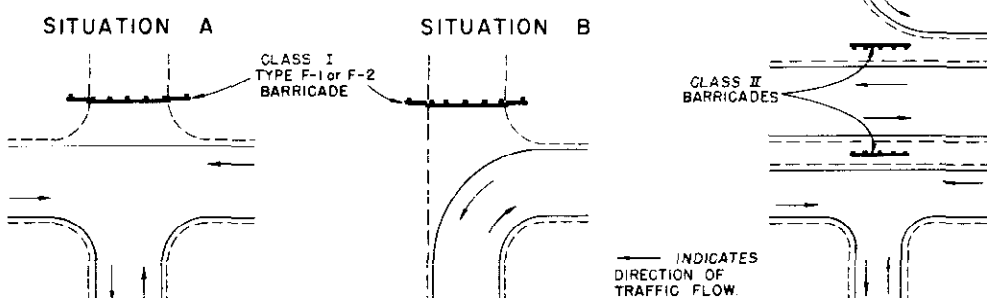
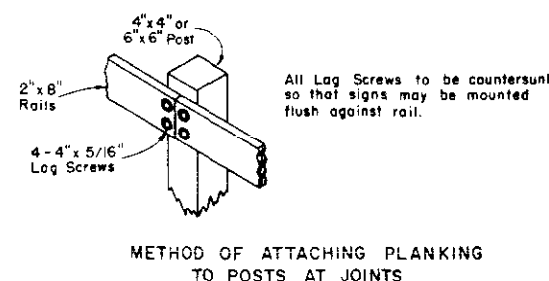
GENERAL NOTES

- All work shall be done in accordance with the Standard Specifications applicable to the Project.
- All signs and sign materials shall conform to the standards set forth in the "Manual on Uniform Traffic Control Devices for All Classes of Streets and Highways" published by the Department of Highways and this standard.
- The various types and combinations of approved Signs and Beacons for Barricades required for each project shall be governed by field conditions and subject to approval by the Engineer. All traffic controls shall be placed for best visibility and legibility and maintained in good condition at all times. Oversigning is to be avoided.
- Painting shall conform with Subsection 508.08 of the Standard Specifications. All skids, braces, and posts shall be painted with 2 coats of "Exterior Black Paint." Planking and wings on all barricades shall be painted with 2 coats of "Exterior Black Paint" on all sides before adding reflective strips. Reflective strips shall be "cut from smooth surface yellow reflective sheeting" of a type approved by the Department.
- Each barricade rail shall be striped on the face side only with reflective yellow strips slanting downward at a 45° angle toward the side to which traffic is to turn or pass. See "DETAIL OF RAIL AND WING STRIPING."
- When barricades are designated on plans the portion of the posts below ground line shall either be dipped in or painted with hot creosote oil. The portion of the post above ground line shall be painted with 2 coats of "Exterior Black Paint."
- All skids, braces, and posts shall be nailed together with No. 20d nails. All screws, bolts, nuts, and washers shall be galvanized or cadmium plated. Skids (bases) of movable barricades shall be weighted where necessary to provide stability.
- All timber used shall conform to the Standard Specifications for Miscellaneous Untreated Timber S4S. Timber shall conform to Construction grade Paragraph 123B or 125B of Standard No. 15 Grading & Dressing Rule for West Coast Douglas Fir (1956) or Dense Structural 5B and LL Structural 5B Paragraph 284 or 285 of 1956 Grading Rules for Southern Pine.
- Detachable extension wings for bypassing of construction equipment are permitted. "W" is variable, length shall be adequate to provide closing of borrow pit and/or shoulder as required.
- Alternate materials or other reflective elements on Traffic signs or Barricades will be permitted only after approval of such material by the Department in writing.
- A Flashing Beacon for use on Barricades is a section of a standard traffic signal head or a similar-type device having a yellow lens in the face, which is illuminated by intermittent flashes. Where commercial power is not available, the beacon may be adapted to operate from storage batteries. Each signal unit lens shall have a visible diameter of not less than 8 inches. Each unit complete shall be of such design as to render the lens when illuminated clearly visible to traffic facing the signal at all distances up to 1000 feet under all atmospheric conditions except dense fog. The color of the yellow lens for caution shall be in accordance with Technical Report No. 1 of the Institute of Traffic Engineers. All beacon flashers shall be equipped with filters for suppression of radio interference. The illuminating element in a flashing yellow beacon shall be flashed at a rate of not less than 50 times nor more than 60 times per minute. The illuminated period of each flash shall be not less than half and not more than two-thirds of the total cycle. The use of Flashing Beacons will be governed by field conditions. Flashing Beacons when warranted generally should be operated continuously throughout the 24 hours of the day. Warrant for Flashing Beacons may be found in Sec. 3G of the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision).
- Flashers are portable, power-operated, lens-directed, enclosed lights, illuminated by rapid intermittent flashes of short duration. Flashers may be used in connection with barricades when approved by the Engineer. An array of random flashers which tends to obscure rather than delineate the traveled way will not be permitted. The use of flashers on a job will be governed by Sec. 5D of the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision). The color of the light emitted by a flasher shall be yellow.
- Flashing Beacons and Flashers, when used, shall be positioned above the top rail of the barricades to produce the most effective results.
- Barricades used as "Traffic Controls for Highway Construction" are not to be paid for separately.
- Barricades will be paid for separately when designated on plans as bid items.
- For additional general information on control of traffic through work areas refer to the "Manual on Uniform Traffic Control Devices for Streets and Highway", Part II, published by the U.S. Department of Commerce, Bureau of Public Roads, June, 1961 (or latest revision).

CLASS II BARRICADE (1 RAIL)



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



BARRICADE DESIGNATIONS						
Class	Type		Roadway Width	L	Description	
	Movable	Fixed				
(R-1) I	M-1	F-1	26'-34'	28'	Barricade complete with SR13-1 sign and SW1-6 or SW1-7 signs as required.	
I	M-2	F-2	35'-44'	41'	Barricade complete with SR12-1 sign and SW1-6 or SW1-7 signs as required.	
(R-1) I	M-3	F-3	Variable	28'	Barricade (without extension wings) complete with SR13-1 sign and SW1-6 or SW1-7 signs as required.	
I	M-4	F-4	Variable	Variable 8'-6" min.	Wing Barricade (signs only as appropriate).	
II	-	F-6	Variable	28'	Barricade complete with appropriate signs.	

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

TIMBER BARRICADES

Designed By: D.R.W.
Made By: JLS
Checked By: JLS

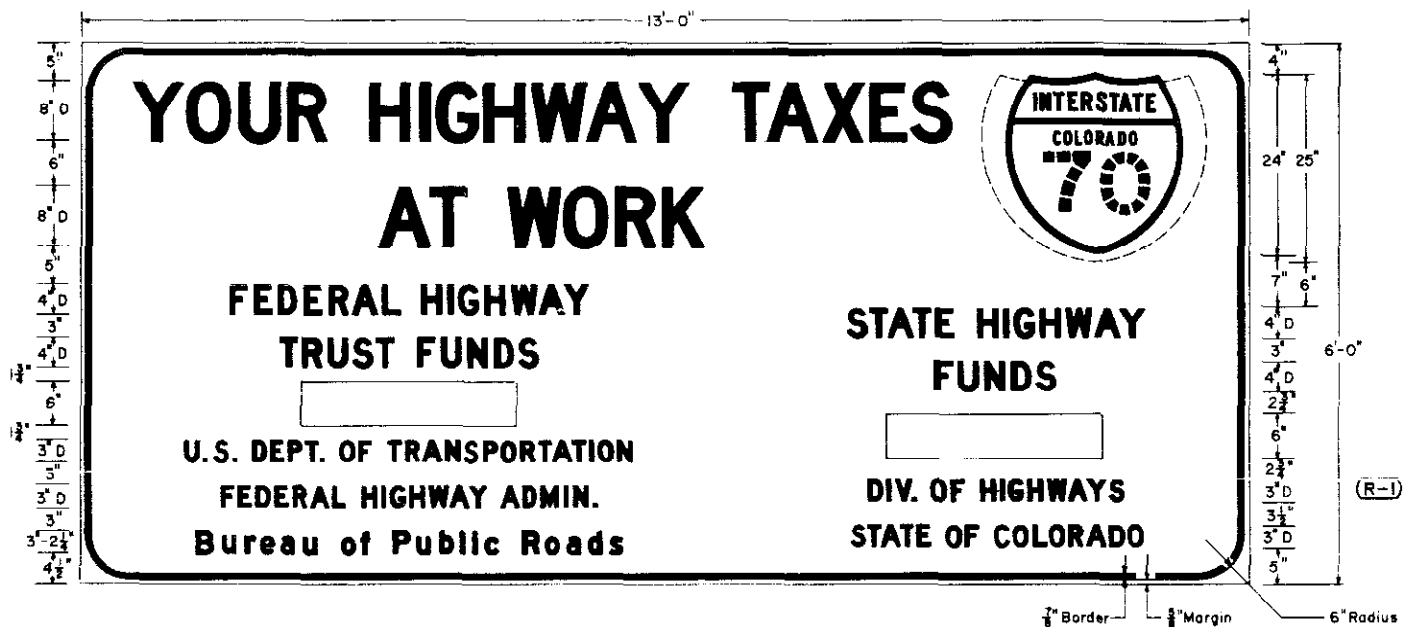
Approved By: [Signature]
Date: JULY 1, 1965

STANDARD M-614-IC

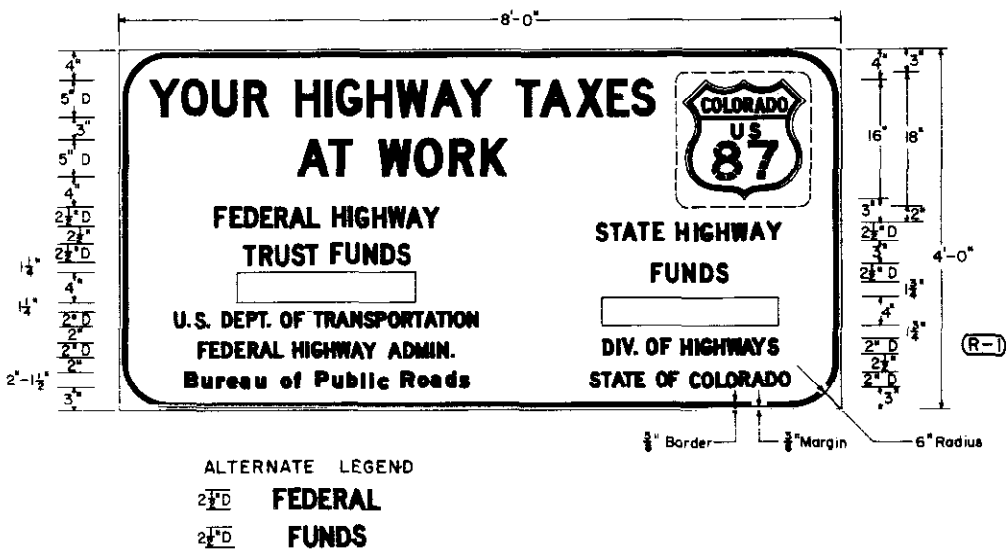
JULY 5, 1968
(SHEET 1 OF 2 SHEETS)

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

REVISIONS		
(R-1)	7-26-68	Rev. Legend and Notes G.W.F.

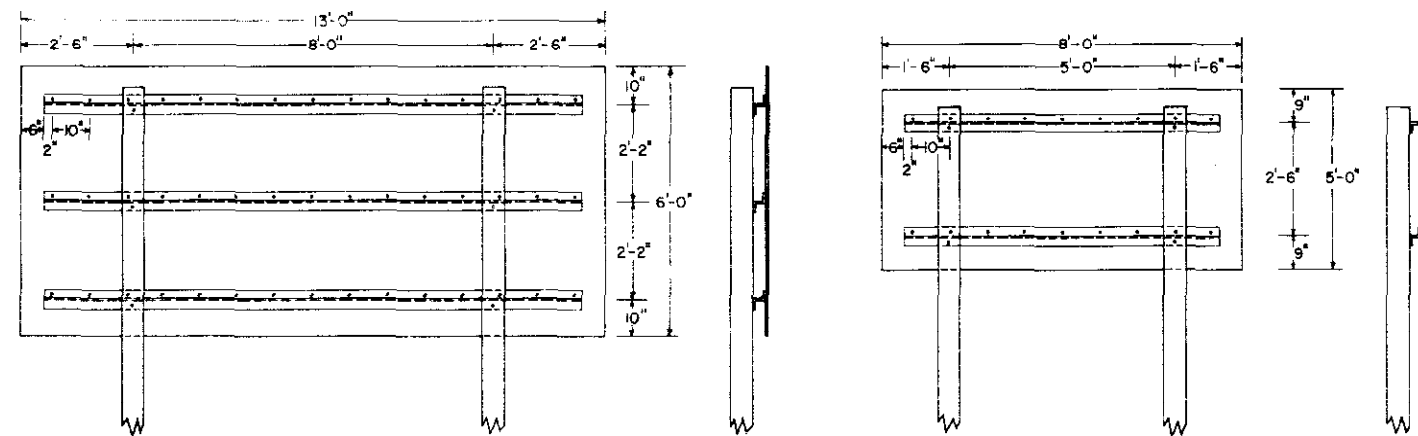


ALTERNATE LEGEND
4" D FEDERAL
4" D FUNDS



ALTERNATE LEGEND
2 1/2" D FEDERAL
2 1/2" D FUNDS

FABRICATION DETAILS



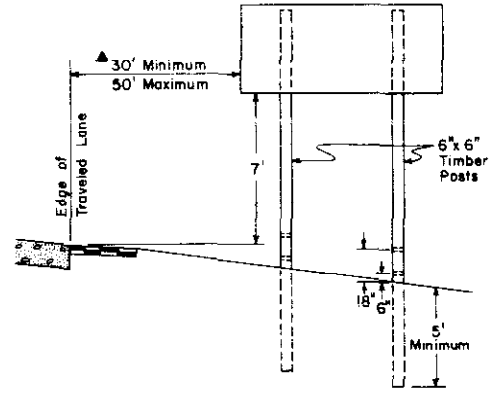
"AMOUNT OF FUNDS" PLAQUE DETAILS



GENERAL NOTES

1. These signs shall be furnished and installed by state forces
2. All work shall be done in accordance with Standard Specifications applicable to the Project.
3. Signs are to be placed facing traffic approaching the Project. They shall be installed at a location where they will not obscure or detract from the effectiveness of other official signs.
4. The lateral placement may be reduced to a minimum of 2 ft. outside of the shoulder edge where necessary to fit field conditions.
5. When these signs are used on Beautification Projects, the words "HIGHWAY" and "TRUST" in lines 3 and 4 shall be deleted and the words "FEDERAL" and "FUNDS" shall be used in accordance with the spacing as shown under "Alternate Legend".
6. Sign panel shall be fabricated with 5/8" plywood.
7. Route Marker plaques and "Amount of Funds" plaques shall be sheet aluminum 0.080" min. thickness.
8. Signs shall have a screen processed black legend and border on a plain white background. "Amount of Funds" plaques shall have a screen processed black legend on a plain white background.
9. Route Marker plaques shall be plain as indicated on the applicable standards.
10. Backing zees shall be 3" x 2 3/4" x 1/4". Steel zees shall weigh 6.7 lbs. per ft. and aluminum zees shall be of 6061-T6 alloy weighing 2.33 lbs. per ft.
11. Posts shall be 6" x 6", S4S timber, painted white.
12. Each timber post shall be provided with two 2" diameter holes through the neutral axis, one at 6" and one at 18" above the ground level. The inside portion of each 2" diameter hole shall be painted white.
13. Panels shall be fastened to backing zees with 1/4" thrust head lockbolt fasteners.
14. Backing zees shall be fastened to posts with 3/8" machine bolts.
15. Route Marker plaques and "Amount of Funds" plaques shall be fastened to the sign panels with 5/8" #9 round head wood screws.
16. Exposed lockbolt fastener heads and wood screw heads on the face of the sign shall be dipped or painted to match the surrounding color.
17. The underground portion of each timber post shall be treated with creosote.
18. Where a third governmental agency is shown as participating, its official name should be included centrally in lines 6, 7, and 8.
19. It will not be necessary to change DEPT. to DIV. on any existing signs.

INSTALLATION DETAIL



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

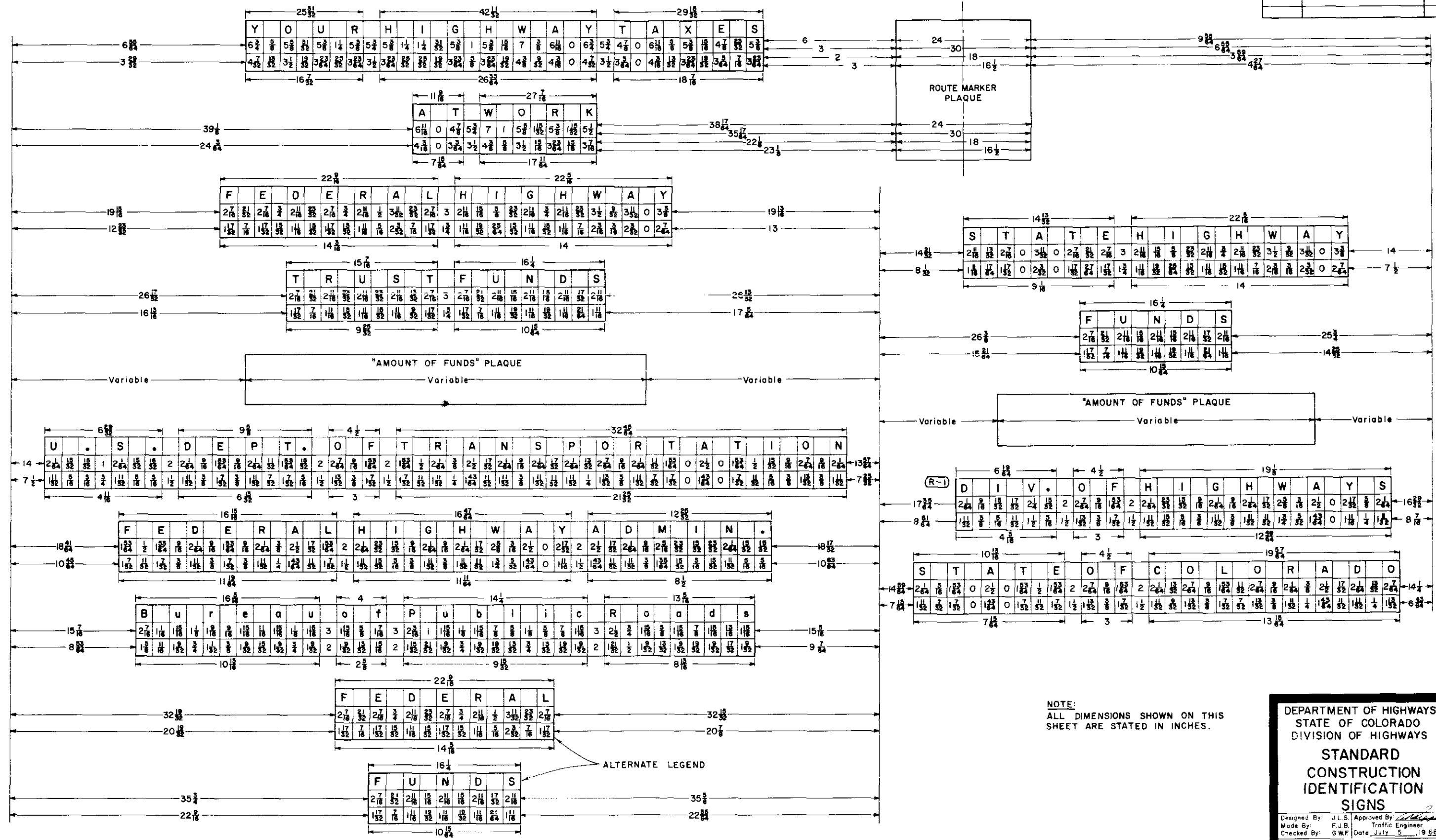
STANDARD
CONSTRUCTION
IDENTIFICATION
SIGNS

Designed By: J.L.S. Approved By: J.L.S.
Made By: F.J.B. Traffic Engineer
Checked By: G.W.F. Date: July 5, 1968

STANDARD M-614-IC

JULY 5, 1968
(SHEET 2 OF 2 SHEETS)

FEDERAL ROAD DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9 COLORADO			
REVISIONS			
(R-1)	7-26-68	Rev. Legend	G.W.F.



NOTE:
ALL DIMENSIONS SHOWN ON THIS
SHEET ARE STATED IN INCHES.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

**STANDARD
CONSTRUCTION
IDENTIFICATION
SIGNS**

Designed By: J.L.S. Approved By: *[Signature]*
Made By: F.J.B. Traffic Engineer
Checked By: G.W.F. Date: July 5, 1968

STANDARD M-614-TB

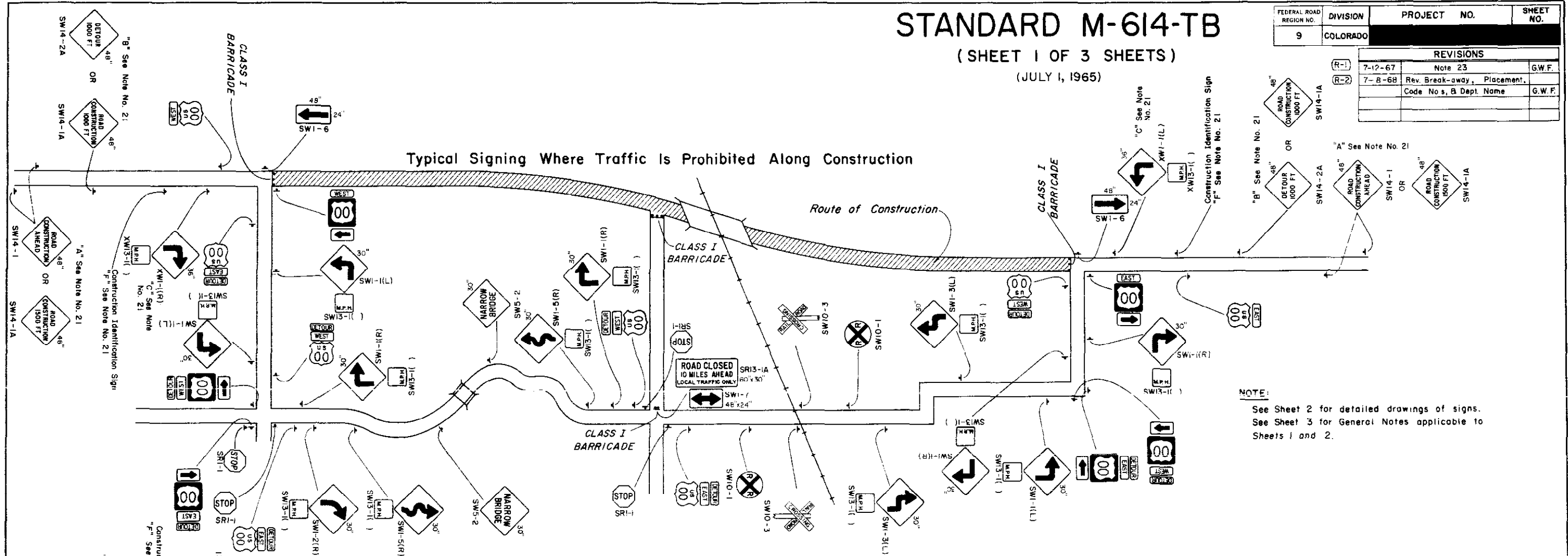
(SHEET 1 OF 3 SHEETS)

(JULY 1, 1965)

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

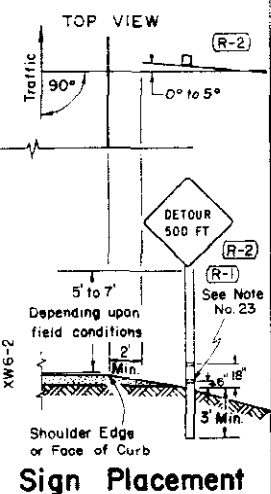
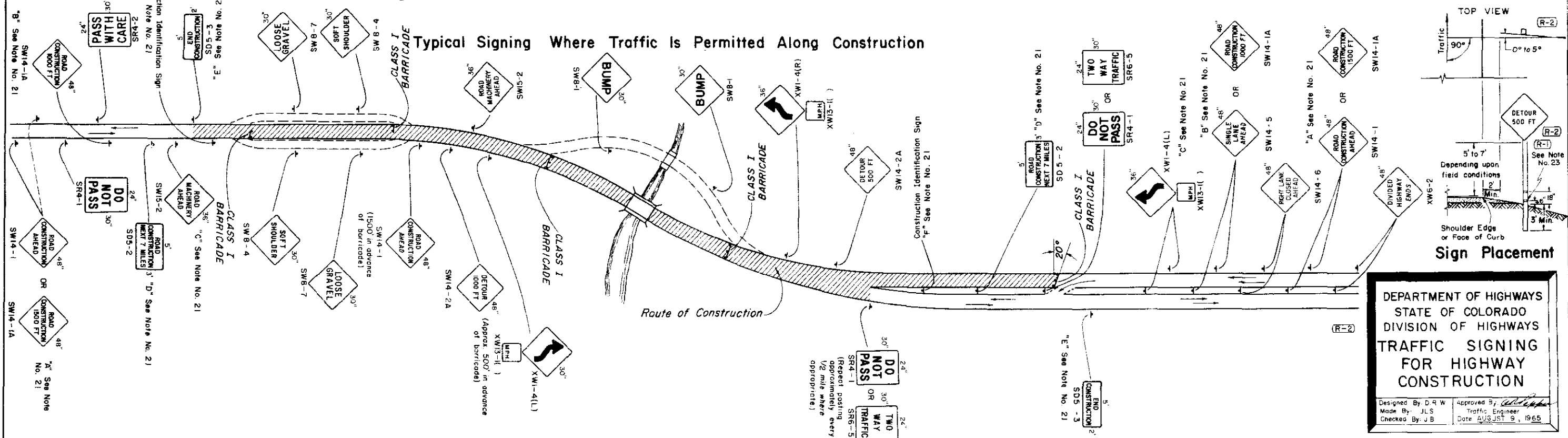
REVISIONS		
R-1	7-12-67	Note 23
R-2	7-8-68	Rev. Break-away, Placement, Code No's, & Dept. Name
		G.W.F.
		G.W.F.

Typical Signing Where Traffic Is Prohibited Along Construction



NOTE:
See Sheet 2 for detailed drawings of signs.
See Sheet 3 for General Notes applicable to Sheets 1 and 2.

Typical Signing Where Traffic Is Permitted Along Construction



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
TRAFFIC SIGNING
FOR HIGHWAY
CONSTRUCTION

Designed By: D.R.W.
Made By: J.L.S.
Checked By: J.B.

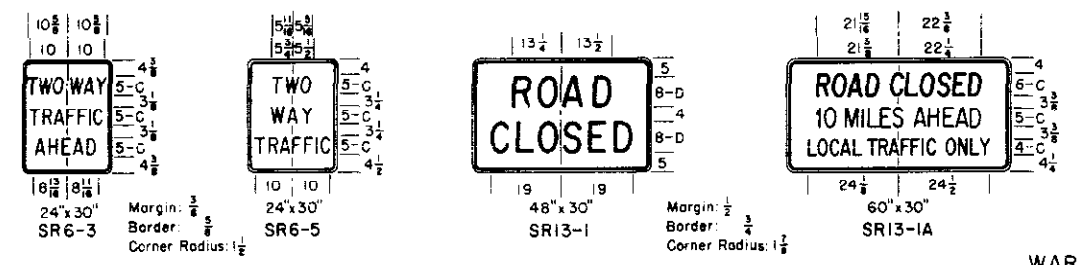
Approved By: [Signature]
Traffic Engineer
Date: AUGUST 9, 1965

STANDARD M-614-TB
(SHEET 2 OF 3 SHEETS)
(JULY 1, 1965)

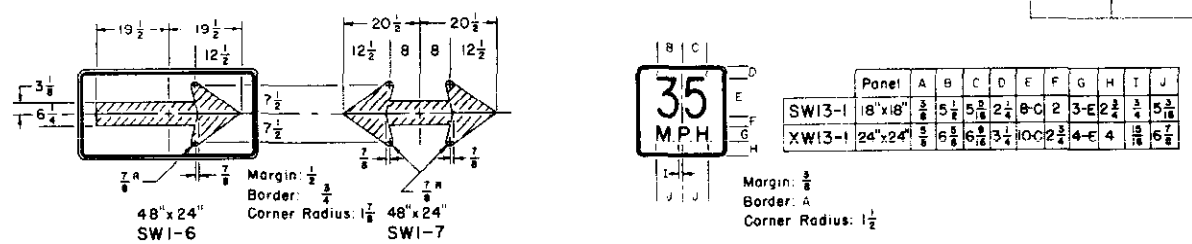
FEDERAL ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO		

REVISIONS				
(R-1)	7-12-67			M.R.H.
(R-2)	7-8-68	Rev. Code No. & Dept Name		G.W.F.

REGULATORY SIGNS
See Note No. 9



WARNING SIGNS
See Note No. 10



WARNING SIGNS
See Note No. 10

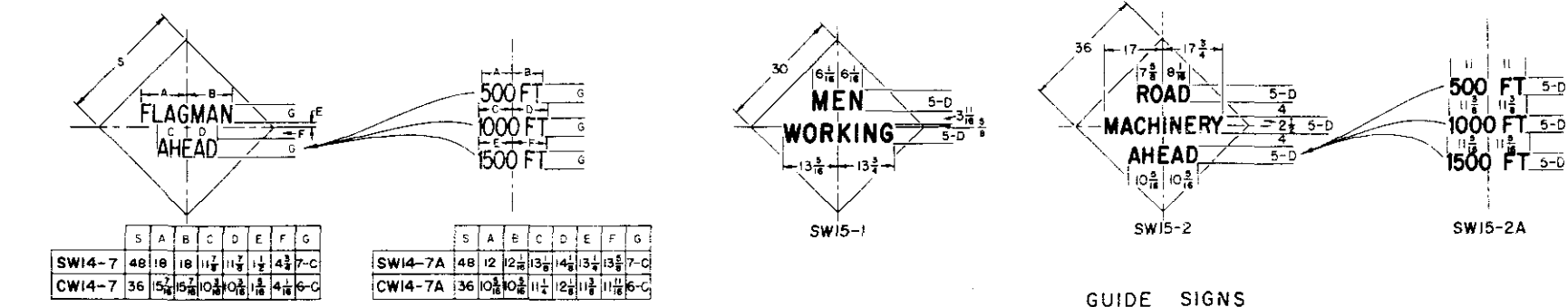
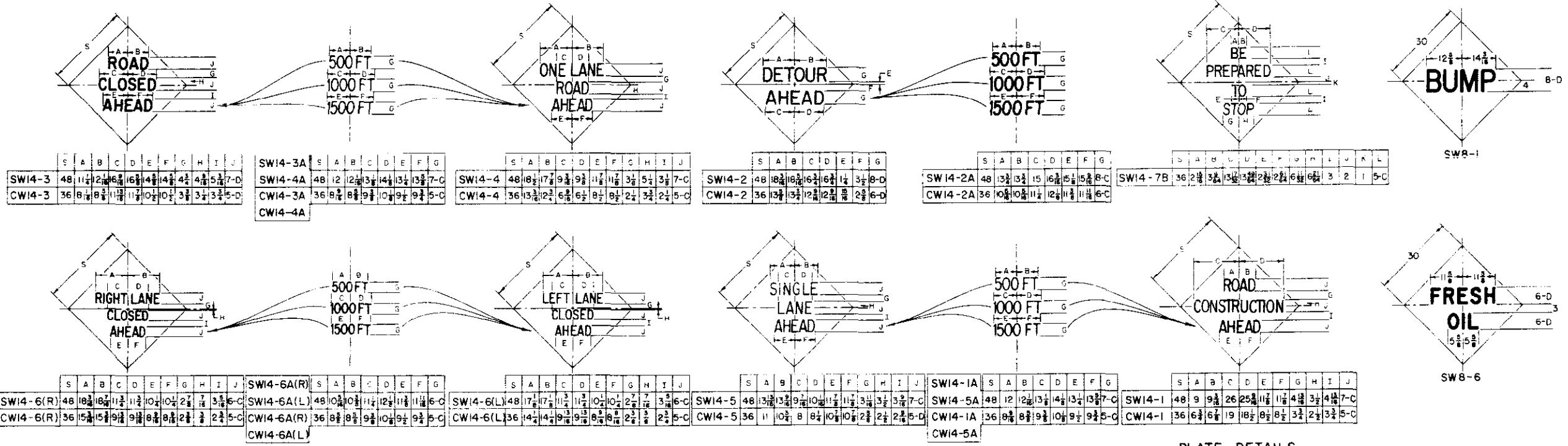
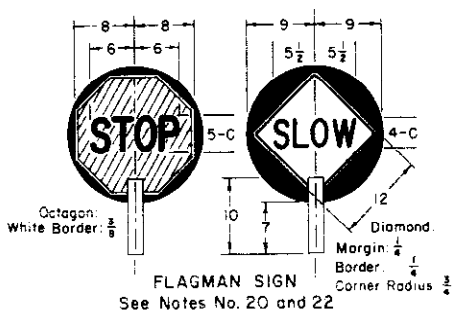
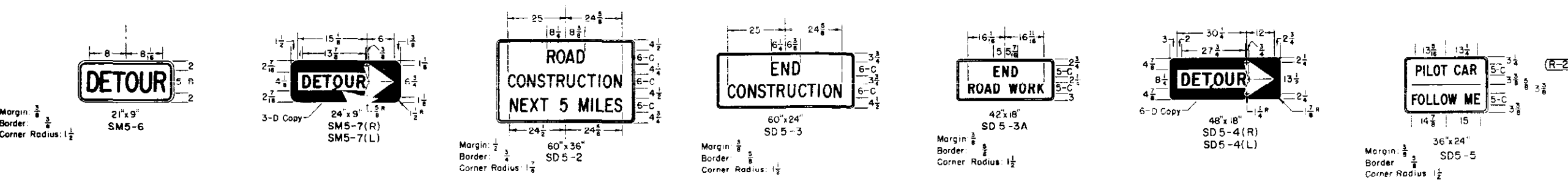


PLATE DETAILS



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

GUIDE SIGNS
See Note No. 11



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
TRAFFIC SIGNING
FOR HIGHWAY
CONSTRUCTION

Designed By: U.R.W.
Checked By: U.B.
Approved By: Traffic Engineer
Date: AUGUST 9, 1965

STANDARD M-614-TB

(SHEET 3 OF 3 SHEETS)

(JULY 1, 1965)

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

REVISIONS			
(R-1)	7-12-67	Added Note 23	G.W.F.
(R-2)	7-8-68	Rev. Note 23 & Dept. Name -	
		Deleted Note	G.W.F.

GENERAL NOTES

- All work shall be done in accordance with: (a) the Standard Specifications applicable to the Project, and (b) the "Manual on Uniform Traffic Control Devices for all Classes of Streets and Highways" published by the Department of Highways.
- Where traffic is maintained through or over any part of the Project the Contractor will be required to mark all hazards within the limits of the Project (including connecting roads) with well-maintained Barricades, Warning, and Guide Signs. All Barricades and Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when the Project is completed.
- Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor shall provide, erect and maintain Barricades, complete, (when required) at the ends of the Project, ends of the Detour and connecting roads. All U. S. or State Route Markers required for the Project will be furnished and installed by the Department. The location and positioning of Warning Signs, Barricades, and Regulatory Signs shall be as recommended by the appropriate District Engineering Forces of the Department.
- Work on the Project shall not be started until all required signs are in place and approved by the Engineer. Where speed control appears necessary such speed control shall be requested from the Engineer by the Contractor. Control of speed through a construction zone may be achieved by Advisory Speed plates in conjunction with Warning Signs (SW13-1 for use with 30" Warning Signs and XW13-1 for use with 36" and 48" Warning Signs). The Advisory Speed plate is to be posted only at those locations where the safe speed is lower than the imposed Regulatory speed limit.
- All Signs and Barricades shall be placed for best visibility and legibility, maintained in good condition and kept clean and free of dirt at all times. Contractor's and Engineer's vehicles and equipment must be parked so that signs and barricades are visible to approaching traffic at all times.
- Where two identical signs are used for dual posting they are to be staggered on the two sides of the roadway for a minimum distance of 75' to avoid a tunneling effect.
- Examples for marking Projects, as shown on Sheet 1, are typical of signs required and are subject to alteration to fit actual conditions encountered in the field. Locations for control devices are to be staked by the Engineer. In all cases Warning signs are to be placed well in advance of the hazard, the distance depending on topography and existing approach speeds. Additional markings and any special signs required for the guidance and protection of traffic will be placed as required on the Project at the Contractor's expense.
- Desirable sizes for signs are shown on Sheet 1 of this Standard. Larger or smaller signs shall be used where warranted. Detailed dimensions for signs normally used in connection with construction are shown on Sheet 2 of this Standard. For information on standard roadway signs not detailed on this Standard see the "Manual on Uniform Traffic Control Devices for all Classes of Streets and Highways" published by the Department of Highways.
- Signs with the prefix "R" in the sign code are Regulatory signs and as such impose legal compulsions or restrictions on drivers and should only be used as authorized by the Engineer.
- Signs with the prefix "W" in the sign code are Warning signs and are used to alert traffic to existing or potentially hazardous conditions.
- Signs with the prefix "D" or "M" in the sign code are Guide signs. Those with the prefix "D" convey general information and those with the prefix "M" are used for marking the traffic route.
- All signs shall be reflectorized unless otherwise specified on plans. Regulatory and Guide signs (unless otherwise specified) shall have a screen processed black legend and border on a white flexible reflective sheeting, non-exposed lens background. The back side of Regulatory and Guide signs shall be painted with two coats of "Exterior Sign White Paint." Warning signs shall have a screen processed black legend and border on a highway yellow flexible reflective sheeting, non-exposed lens background. The back side of Warning signs shall be painted with two coats of "Federal Yellow Synthetic Sign Enamel."
- Painting for wood surfaces shall conform with Section 508 of the Standard Specifications.
- Posts for regulatory, warning, and guide signs will normally be 4"x4" or 6"x6" and shall conform to the Standard Specifications for Untreated Timber-S4S. Timber shall conform to Construction grade Paragraph 123B or 125B of Standard No. 15 Grading & Dressing Rules for West Coast Douglas Fir (1956) or Dense Structural 5B and LL Structural 5B Paragraph 284 or 285 of 1956 Grading Rules for Southern Pine. Posts shall be painted with one coat of "White Wood Primer" and one coat of "Outside White Paint."
- Sign panels furnished by the Contractor for use only during construction may be fabricated from plywood, aluminum, steel or other suitable material but shall be stable and durable enough to meet other requirements of this Standard.
- All material shall be sound and durable. Barricades, signs, symbols, and lettering shall be of good workmanship. Uneven lettering will not be accepted.
- Alternate methods of processing signs or the substitution of symbols or other reflecting elements for painted symbols will be permitted only after approval by the Department.
- Torches and Lanterns shall be either of the fuel-burning or battery-powered type approved by the Department. Particular care shall be taken to protect all signs and barricades from smoke and smudge.
- Barricades, Flashing Beacons and Flashers - Refer to appropriate "M" Standard (Timber Barricades) for details.
- Flagman Sign - This sign shall have a black painted background on both sides to form a contrast for the octagonal Stop sign and the diamond Warning sign. The "STOP" sign shall be fabricated by reverse screen process using transparent red paint on smooth surface silver reflective sheeting. The "SLOW" side of the Flagman Sign shall be black process paint on smooth surface yellow reflective sheeting. Handle to be grooved on one side to indicate reading of sign to Flagman.
- Sign "A": This is the first advance warning sign and shall be placed 1,500 feet ahead of Barricade or project terminal. Postings are required on both sides of the roadway on divided highways. Dual posting is required where warranted on two-lane, two-way highways.
Sign "B": This is the second advance warning sign and shall be placed 1,000 feet ahead of barricade or project terminal. Postings are required on both sides of the roadway on divided highways and singly on two-lane, two-way highways.
Sign "C": This is the third advance warning sign in cases where barricades are used and shall be placed 500 to 750 feet ahead of barricade or potentially hazardous condition. Postings are required on both sides of the roadway on divided highways and singly on two-lane, two-way highways.
Sign "D": SD5-2 - This sign shall be placed to mark the beginning of a Project of more than 2 miles in extent, where traffic is maintained through the project. It shall be placed singly and near the beginning of construction.
Sign "E": SD5-3 - This sign shall be placed to mark the end of the Project. It shall be placed singly and may be placed opposite barricade if desirable.
Sign "F": Construction identification signs shall be furnished and installed by the Department on all Federal-Aid and Forest Highway Projects where actual construction is in progress and visible to highway users. These signs should be located so as not to obscure or detract from the effectiveness of other official signs. Where two or more projects are contiguous the appropriate data may be included in one set of signs. Refer to appropriate "M" Standard (Identification Signs) for sign details.
Signs A through F shall be furnished, installed and maintained by the Department.
- When Flags are used in lieu of the Flagman Sign, they shall be a minimum of 18"x18", made of a good grade of bright red material, and fastened securely to a staff of approximately 3 foot length. The free edge should be weighted to insure that the flag will hang vertically, even in heavy winds.
- Each 6"x6" timber sign post shall be provided with two 2" diameter holes through the neutral axis normal to the roadway, one hole at 6" and one hole at 18" above the ground level. The 4"x4" timber posts shall not be provided with any type of break-away device. The inside portion of each 2" diameter hole shall be painted white. The underground portion of each timber post shall be treated with creosote.

(R-2)

(R-2)

DEPARTMENT OF HIGHWAYS	
STATE OF COLORADO	
DIVISION OF HIGHWAYS	
TRAFFIC SIGNING	
FOR HIGHWAY	
CONSTRUCTION	
Designed By D.R.W.	Approved By <i>[Signature]</i>
Made By J.L.S.	Traffic Engineer
Checked By J.B.	Date AUGUST 9, 1965