

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 001-1(14)	1	

COLORADO DEPARTMENT OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. U 001-1(14) STATE HIGHWAY NO. 4 MESA COUNTY

INDEX OF SHEETS

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M-12-D8
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SCALES OF ORIGINAL DRAWINGS

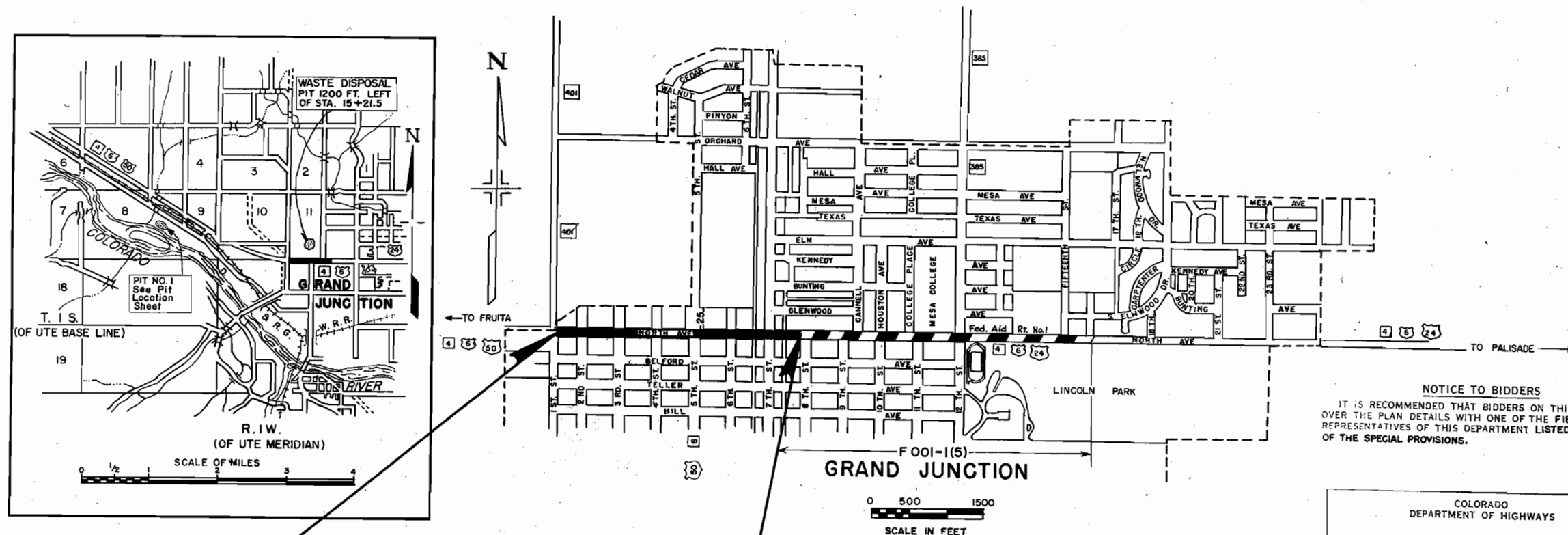
ON PLAN. 1 IN. 50 FT.
ON PROFILE. 1 IN. 50 FT. HORIZONTAL
1 IN. 5 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 3,231.0 Ft. = 0.612 Miles.
NET LENGTH OF PROJECT }

CONVENTIONAL SIGNS

CENTER LINE
RIGHT OF WAY LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
LAND LINES
RAILROAD
BARBED WIRE FENCE
COMBINATION WIRE FENCE
SNOW FENCE
TELEPHONE & TELEGRAPH LINES
POWER LINE
DETOUR
PRESENT ROAD (Plan Sheets)

TABULATION OF LENGTH & DESIGN DATA

STATION	ROADWAY LIN. FT.	
STA. 6+60.0 BEGIN U 001-1(14)= Sta. 26+39.8 on Approach to Project F 001-1(12)	3,231.0	
STA. 38+91.0 END U 001-1(14)= Sta. 38+91.0 Begin F 001-1(5).		
TOTAL	3,231.0	
SUMMARY		
ROADWAY	LIN. FT.	MILES
	3,231.0	0.612
TOTAL NET & GROSS LENGTH	3,231.0	0.612
DESIGN DATA		
Maximum Degree of Curve	Tangent.	
Maximum Grade	3.19%	
Minimum N.P.S.D. Horizontal	—	
Minimum N.P.S.D. Vertical	355'	
Maximum Design Speed	30 M.P.H.	



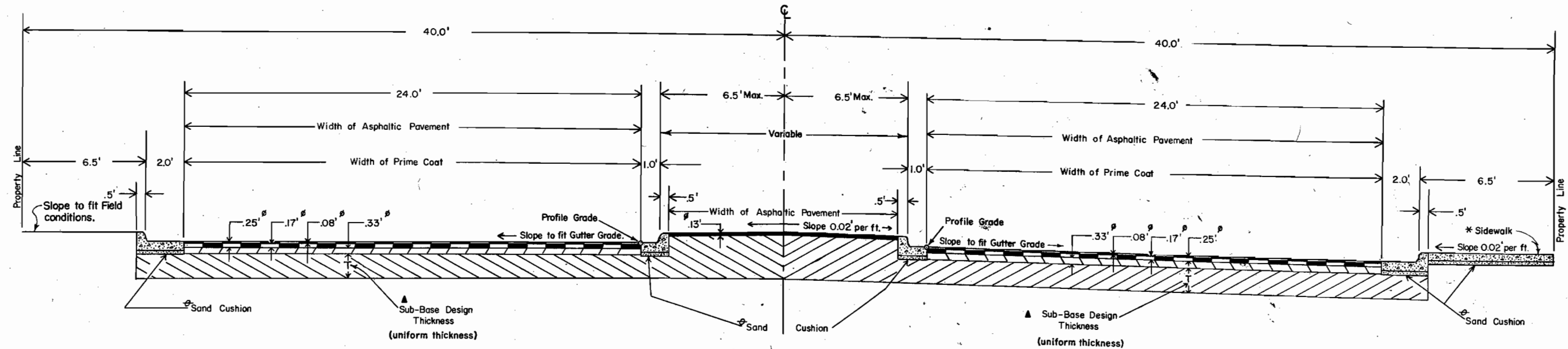
NOTICE TO BIDDERS
IT IS RECOMMENDED THAT BIDDERS ON THIS PROJECT GO OVER THE PLAN DETAILS WITH ONE OF THE FIELD REPRESENTATIVES OF THIS DEPARTMENT LISTED ON PAGE 10 OF THE SPECIAL PROVISIONS.

COLORADO
DEPARTMENT OF HIGHWAYS
APPROVED: *Mark A. ...* 10-2-57
CHIEF ENGINEER DATE

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED: _____
DIVISION ENGINEER DATE

TYPICAL SECTIONS OF IMPROVEMENT

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- NOTE:
- Approximate Thickness.
 - The material placed directly below the surfacing material, is to be constructed of Sub-Base material at locations designated in the Sub-Base material Plan. Estimated quantities involved in this operation and thickness of material required are tabulated in the Sub-Base Plan.
 - See Detail Sheet for sidewalks.
 - To be used where required by Soil Conditions, as determined by the Engineer.

The lower layer of Asphaltic Pavement shall be completed for full width before upper layer of Asphaltic Pavement is placed. Paving joints in upper layer will overlap a minimum of 1 ft. over joints in lower layer.

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted June 1, 1952.

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

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

Any necessary adjustment of underground telephone cable at Sta. 32+, or gas lines, will be made at the owner's expense.

Meter boxes, turn-off valves and fire hydrants will be adjusted by City of Grand Junction.

All broken concrete and excavated material removed from the Project shall be hauled to the waste pit indicated on the Title Sheet. Haul route restricted to Third Street. The Contractor will be required to place the concrete near the bottom of the pit so that it will have a cover of finer material.

For preliminary plan quantities of Asphaltic Road Materials the following rates of application were used:

PRIME COAT @ 0.40 Gals. per Sq. Yd.
PAVING ASPHALT @ 5.70 % by Weight.

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

All street intersections are to be stabilized and paved to end of curb radius.

Approximate 58' compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin. ft.:

Plant Mix Asphaltic Surfacing Course (Top .08' Layer) 29 tons.
Plant Mix Asphaltic Surfacing Course (Bottom .17' Layer) 58 tons.
Bottom Course 107 tons.

80
13
67

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT					PROJECT TOTALS
11a 11b 11c	REMOVING CATCH BASINS REMOVAL OF MANHOLES REMOVAL OF SIPHON HEADWALLS	EACH EACH EACH					10 1 2
11d 11e 11f 11g	REMOVING CONCRETE CURB & GUTTER REMOVING CONCRETE DRIVEWAY REMOVING CONCRETE SIDEWALK REMOVING CONCRETE VALLEY GUTTER	LIN. FT. SQ. YD. SQ. FT. LIN. FT.					4,603 1,805 14,997 977
11h	ADJUST MANHOLE RING & COVER	EACH					9
13c 13d	UNCLASSIFIED EXCAVATION UNCLASSIFIED DITCH EXCAVATION	CU. YD. CU. YD.					21,000 10
13a	STRIPPING	CU. YD.					1,000
14e	UNCLASSIFIED STRUCTURAL EXCAVATION	CU. YD.					70
16a 16c	STRUCTURE BACKFILL (CLASS 1) MECHANICAL TAMPING	CU. YD. HOUR					50 10
17c 17d	ROLLING WITH FLAT WHEELED ROLLER (TANDEM) ROLLING WITH FLAT WHEELED ROLLER (THREE (3) WHEEL)	HOUR HOUR					80 20
17e 17ex	ROLLING WITH RUBBER TIRED ROLLER (ONE (1) UNIT) ROLLING WITH RUBBER TIRED ROLLER (TWO (2) UNIT)	HOUR HOUR					70 20
17h 17i 17j 17lx	FURNISHING FLAT WHEELED ROLLER (TANDEM) FURNISHING FLAT WHEELED ROLLER (THREE (3) WHEEL) FURNISHING RUBBER TIRED ROLLER (ONE (1) UNIT) FURNISHING RUBBER TIRED ROLLER (TWO (2) UNIT)	EACH EACH EACH EACH					- - - -
17k	WETTING	M GAL.					410
18a	STATION YARD OVERHAUL	STA. YD.					213,000
18b 18c	YARD MILE OVERHAUL TON MILE OVERHAUL	YD. MI. TON MI.					2,700 81,800
23a	SUB-BASE MATERIAL (CLASS 1)	TON					22,600
26c	GRAVEL OR CRUSHED ROCK SURFACING (GRADING C)	TON					4,700
30x 32ax	ASPHALTIC ROAD MATERIAL MC (PRIME) PLANT MIXED ASPHALTIC SURFACING	GAL. TON					9,280 3,880
37ax 37c	CONCRETE PAVEMENT (DRIVEWAYS) SAND CUSHION	SQ. YD. CU. YD.					1,520 360
46a	CLASS "A" CONCRETE	CU. YD.					15
47 48c	REINFORCING STEEL STEEL PLATE COVERS	LB. EACH					2,000 2
55b	18" CORRUGATED METAL SIPHON PIPE	LIN. FT.					22
84c 84cx	CONCRETE COMBINATION CURB & GUTTER (2' GUTTER) CONCRETE COMBINATION CURB & GUTTER (1' GUTTER)	LIN. FT. LIN. FT.					5,833 4,995
86 132cc 132ce	CONCRETE SIDEWALKS 8" CONCRETE PIPE SEWER 12" CONCRETE PIPE SEWER	SQ. FT. LIN. FT. LIN. FT.					13,800 684 60
132cx1 132cx 132m	24" REINFORCED CONCRETE PIPE SEWER INLET GRATING & FRAME (CURB TYPE) MANHOLES	LIN. FT. EACH EACH					2,803 16 6
	FORCE ACCOUNT	LUMP SUM					-
	MISCELLANEOUS FORCE ACCOUNT	LUMP SUM					-
	WORK BY STATE FORCES	LUMP SUM LUMP SUM LUMP SUM					- - -
	SIGNING & STRIPING ENTIRE PROJECT REMOVE & RESET FLASHING AMBER LIGHT REMOVE & RESET TRAFFIC CONTROL DEVICES	LUMP SUM LUMP SUM LUMP SUM					- - -
	ALTERNATE BIDS TO BE RECEIVED						
132pxk	THE FOLLOWING ITEM IS TO BE BID UPON IN LIEU OF ITEM 132cx1: 30" ASBESTOS BONDED CORRUGATED METAL PIPE SEWER (BITUMINOUS COATED)	LIN. FT.					2,803

NON-FEDERAL AID.

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
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LIST OF STRUCTURES

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LOCATION	DESCRIPTION	REMOVING CATCH BASINS	EXCAVATION			UNCLASSIFIED STRUCTURAL EXCAVATION	STRUCTURE BACKFILL	MECH. TAMPING	GRAVEL OR CRUSHED ROCK SURFACING	INLET GRATING & FRAME (CURB TYPE)	CONCRETE		REINFORCING STEEL	MANHOLE	CORRUGATED METAL SIPHON PIPE		REINFORCED CONCRETE PIPE SEWER		CONCRETE PIPE SEWER		METAL APRONS FOR C.M.P. CULVERTS	MISCELLANEOUS					
			CUBIC YARDS								CUBIC YARDS	CUBIC YARDS			CUBIC YARDS	CL "A"	CL "B"	LBS.	EACH	18"			LINEAR FEET		24"	8"	12"
			NO.	UNCL.	EMB.																		UNCL. DITCH	CL "1"			
6+47 6+60 6+47 to 10+39 6+																		390				1-Adjust Manhole Ring & Cover.					
6+82 7+00 9+72		1 1			5	3 3 17	2 2 10			1 1	0.62 0.62 4.38		93 93 487						56	60		Remove & Reset Traffic Control Devices (State Forces)					
10+30 10+39 10+39 to 15+20														1				476				2-Remove Siphon Headwalls. 2-Steel Plate Covers. 1-Adjust Manhole Ring & Cover.					
10+59 15+20 15+20 to 20+02		1				6	4			2	1.24		186						34 54								
15+24 15+41 15+47		1				3 3	2 2			1 1	0.62 0.62		93 93							36 58		1-Adjust Manhole Ring & Cover.					
20+02 20+02 to 24+83 20+05														1				476				1-Adjust Manhole Ring & Cover.					
20+23 24+22 24+35 24+83 24+		1 1				6	4			2	1.24		186						36 58			1-Adjust Manhole Ring & Cover.					
24+83 to 29+64 25+07 25+12																		476				Remove & Reset Traffic Control Devices (State Forces)					
29+64 29+64 to 34+78 29+84		1				6	4			2	1.24		186						42 64			1-Adjust Manhole Ring & Cover.					
29+88 34+ 34+30 34+55														1				509				Remove & Reset Traffic Control Devices (State Forces) 2-Adjust Manhole Ring & Cover.					
34+78 34+88 35+00		1				3 3	2 2			1 1	0.62 0.62		93 93							44 56 44		1-Remove Manhole.					
36+55 38+ 38+91					9																	1-Adjust Manhole Ring & Cover. Reset Flashing Amber Light (State Forces)					
39+54 39+71		1				3	3			1	0.74		93							18							
TOTALS		10			5	65	43	6		16	14.42		1,975	6	22			2,803		684	60						

quantities included in Surfacing Plan

quantities included in Surfacing Plan.
Allowance for Connecting Band.
on - Federal Aid.
included in Profile Quantities.

SURFACING PLAN

It is estimated that material for Sub-Base and Surfacing for the project is available in the vicinity of the pit indicated in the following tabulations. Estimated quantities involved in these operations are shown below. Alteration of the Sub-Base or Surfacing Plan as here outlined will be allowed only on written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	QUANTITY				OVERHAUL		
		AVAILABLE	TONS — GRADING-C		BOTTOM COURSE	TON MILES		BOTTOM COURSE
			TOP COURSE			TOP COURSE		
			UPPER 0.08'	LOWER 0.17'		UPPER 0.08'	LOWER 0.17'	
APPROACH TO PROJECT, STA. 6+ 6+60.0 TO 10+40.0 (1ST TO 2ND) 10+40 TO 15+21.5 (2ND TO 3RD) 15+21.5 TO 20+03.3 (3RD TO 4TH)	PIT NO. 1 2.68 MI. TO STA. 6+60	200,000 CU. YDS.	9 110 140 140	-- 220 279 279	-- 407 515 516	24 299 392 404	-- 598 781 886	-- 1,105 1,441 1,491
20+03.3 TO 24+84.0 (4TH TO 5TH) 24+84.0 TO 29+66.0 (5TH TO 6TH) 29+66.0 TO 34+57.0 (6TH TO 7TH)	R = 78		139 140 142	279 280 285	514 516 525	414 430 449	831 860 901	1,532 1,585 1,661
34+57.0 TO 38+91.0 (7TH TO END OF PROJECT) APPROACH TO PROJECT, STA. 38+ ESTIMATED FOR STREET INTERSECTIONS			126 62 157	252 124 313	464 231 583	410 205 489	819 410 935	1,508 764 1,741
ESTIMATED FOR LEFT TURN LANES ESTIMATED FOR MEDIANS (.13' THICK)			91 129	183	340	272 385	546	1,015
TOTALS			1,385	2,494	4,611	4,153	7,487	13,843

SUB-BASE PLAN

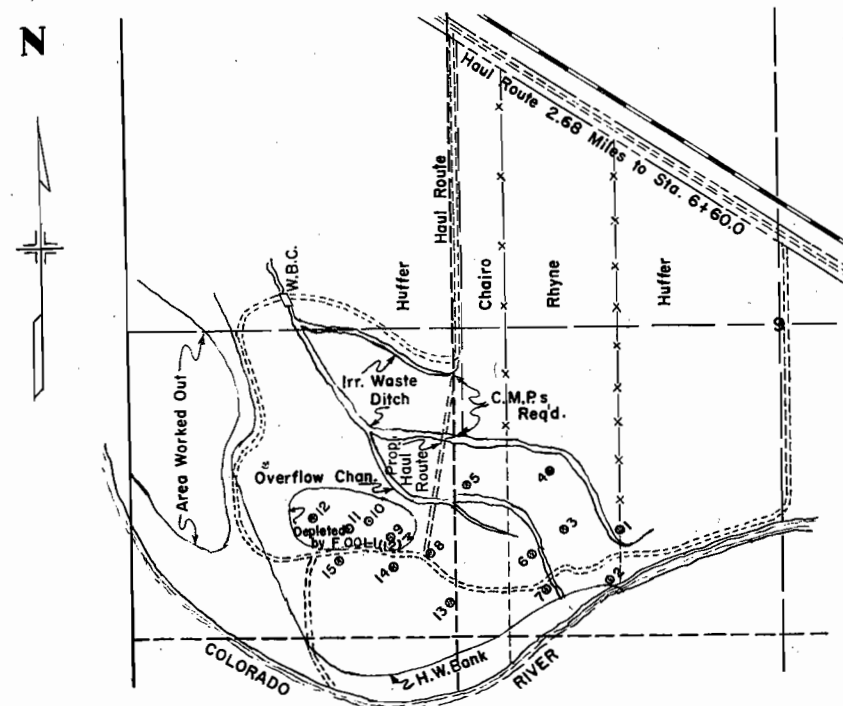
MATERIAL TO BE PLACED	SOURCE	QUANTITY AND THICKNESS			OVERHAUL
		AVAILABLE	CLASS I		TON MILES
			*THICKNESS-"T"	TONS	
6+60 TO 20+00 20+00 TO 30+00 30+00 TO 35+00 35+00 TO 38+91 ESTIMATED FOR STREET APPROACHES	PIT NO. 1 2.68 MI. TO STA. 6+60	200,000 CU. YDS.	17" 10" 17" 14"	8,616 3,780 3,215 2,068 1,127	24,185 11,446 10,195 6,731 3,324
APPROACH TO PROJECT, STA. 38+ ESTIMATED FOR CORRECTING IRREG. IN SUBGRADE ESTIMATED FOR MEDIAN ISLANDS	R = 75		14"	851 1,966 926	2,814 5,870 2,772
TOTALS				22,549	67,337

*Based on Curve "D".

LOCATION OF MATERIAL PITS

PIT No.1

LOCATION: NW 1/4 SW 1/4 ~~NE 1/4 SW 1/4~~, Sec. 9, T. 1S., R. 1W., Ute Co.
OWNERS: Edna K. & Ed. D. Huffer and Joe Chairo and George F. Rhyme
QUANTITY AVAILABLE: 200,000 Cu. Yds.
PROPOSED USE: STRUCTURE BACKFILL, SUB-BASE MATERIAL,
AGGREGATE FOR PLANT MIXED ASPHALTIC SURF-
ACING & SURFACING
HAUL DISTANCE: 2.68 MILES TO STA. 6+60.0
Estimated for Stripping Overburden: 1,000 Cu. Yds.

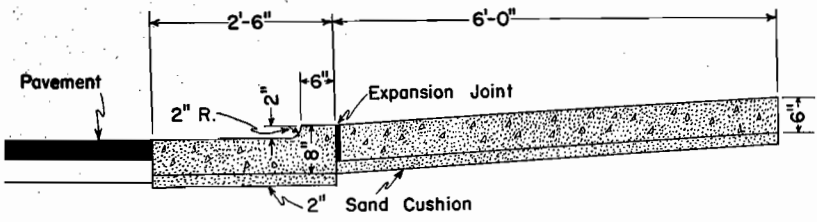


FIELD SAMPLE No. 638

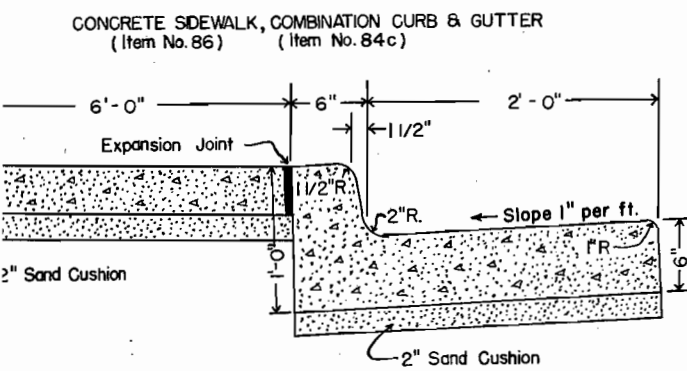
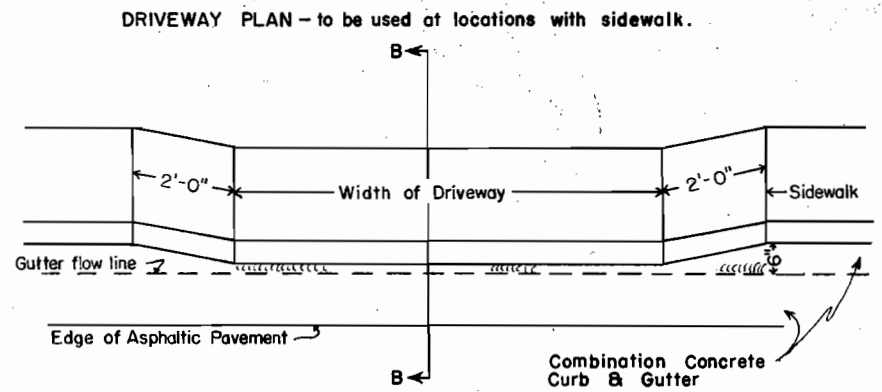
TEST No.	DEPTH	DESCRIPTION	TEST No.	DEPTH	DESCRIPTION
1	0.0-3.5'	Overburden	10	0.0-1.5'	Overburden
1-A	3.5-8.0'	Sand & Gravel	10-A	1.5-8.0'	Sand & Gravel
1-B	8.0-10+	Sand & Gravel	10-B	8.0-10+	Sand & Gravel
2	0.0-2.0'	Overburden	11	0.0-1.5'	Overburden
2-A	2.0-7.5'	Sand & Gravel	11-A	1.5-9.0'	Sand & Gravel
2-B	7.5-10+	Sand & Gravel	11-B	9.0-12.0'	Sand & Gravel
3	0.0-6.0'	Overburden	12	0.0-3.0'	Overburden
3-A	6.0-7.7'	Sand & Gravel	12-A	3.0-9.0'	Sand & Gravel
3-B	7.7-10+	Sand & Gravel	12-B	9.0-12+	Sand & Gravel
4	0.0-7.0'	Overburden	13	0.0-1.0'	Overburden
4-A	7.0-10+	Mostly Sand	13-A	1.0-5.0'	Sand & Gravel
5	0.0-9+	Overburden	13-B	5.0-10.0'	Sand & Gravel
6	0.0-2.5'	Overburden	14	0.0-2.8'	Overburden
6-A	2.5-9.0'	Sand & Gravel	14-A	2.8-6.5'	Sand & Gravel
6-B	9.0-12+	Sand & Gravel	14-B	6.5-10.0'	Sand & Gravel
7	0.0-6.0'	Sand & Gravel, Exp. Bank	15	0.0-3.0'	Overburden
8	0.0-2.8'	Overburden	15-A	3.0-7.5'	Sand & Gravel
8-A	2.8-8.0'	Mostly Sand & fine Gravel	15-B	7.5-10+	Sand & Gravel
9	0.0-1.0'	Overburden	Note: All samples lettered "B" are below present water table.		
9-A	1.0-4.5'	Sand & Gravel			
9-B	4.5-10+	Sand & Gravel			

DETAILS OF MISCELLANEOUS CONCRETE STRUCTURES

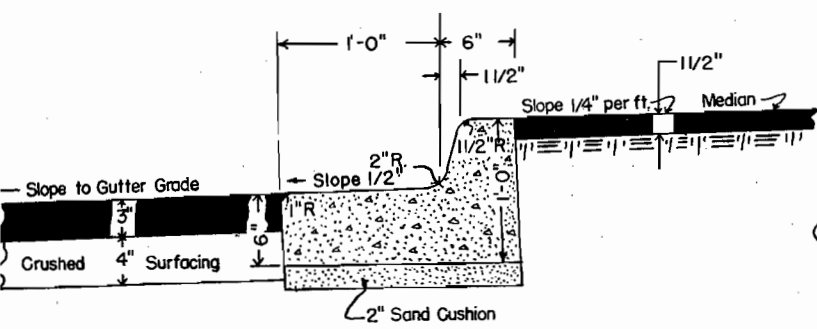
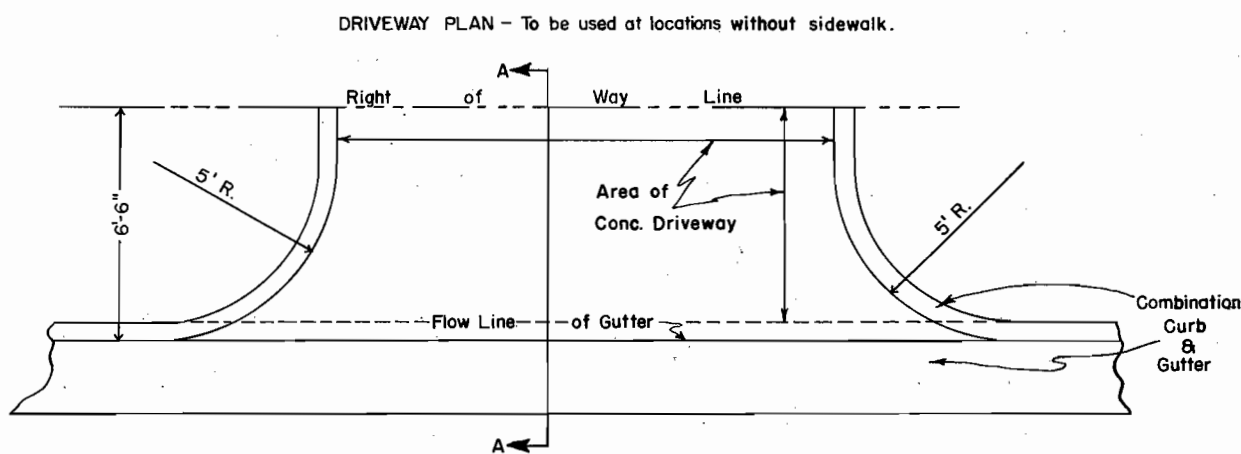
FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
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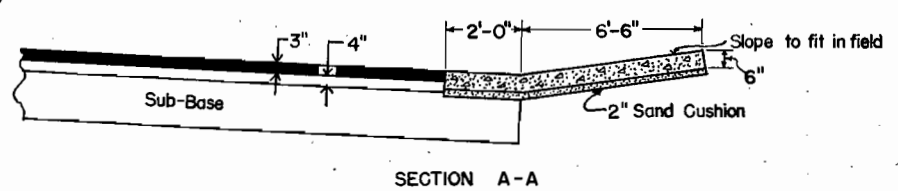
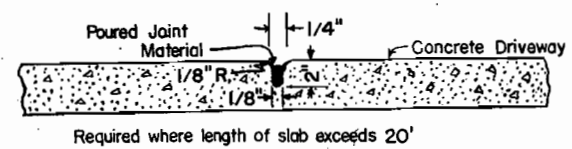
SECTION B-B



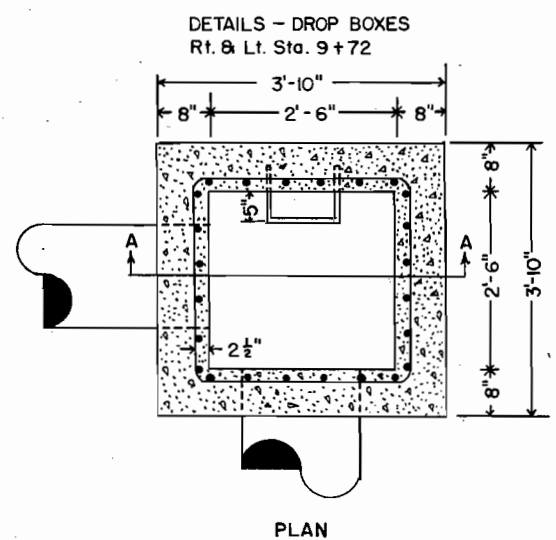
12" GUTTER - Item No. 84cx.



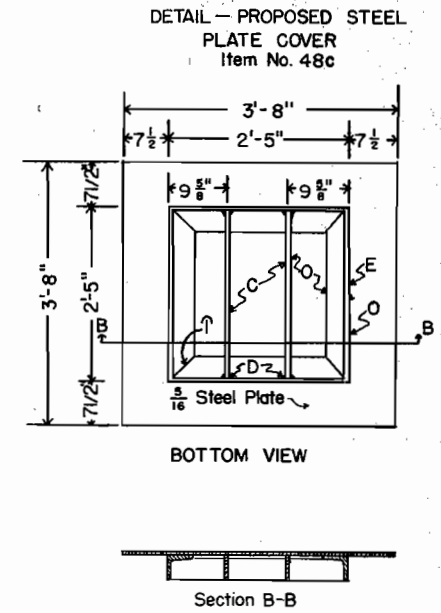
TRANSVERSE WEAKENED PLANE JOINT



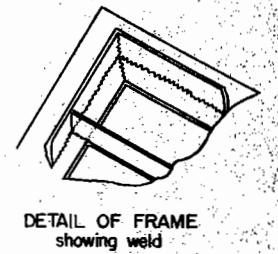
SECTION A-A



PLAN



BOTTOM VIEW



DETAIL OF FRAME showing weld

NOTE: All concrete shall be Class "A" and air entrained as specified. All walls shall have forms on both sides. Bevel all exposed corners to a 1" face. All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with the station number and bar designation. All reinforcing steel bars shall conform to ASTM specification. A 305-50T or latest revision thereof. Adjust "H" of Siphon Drop, Rt. to fit slope of driveway.

QUANTITIES PER BOX

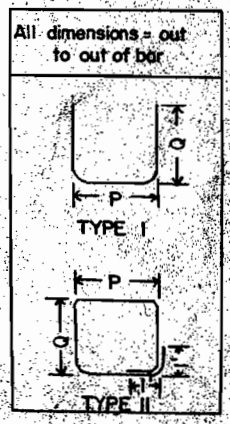
H	CLASS "A" CONCRETE CU. YDS.	REINF. STEEL LB.
6'-6"	2.11	235
7'-0"	2.27	252

* Volume occupied by pipes has been deducted.

MARK	SIZE	No. REQD.	LENGTH	TYPE	DIMENSIONS	
					P	Q
601	3/4" x	*3	*3	2'-6"	I	1'-0"
401	1/2" x	*12	*13	13'-3"	II	2'-11"
402	1/2" x	*12	*12	*14'-8"	I	2'-10"
						*6'-0"
						*6'-6"

* H = 6'-6"
* H = 7'-0"

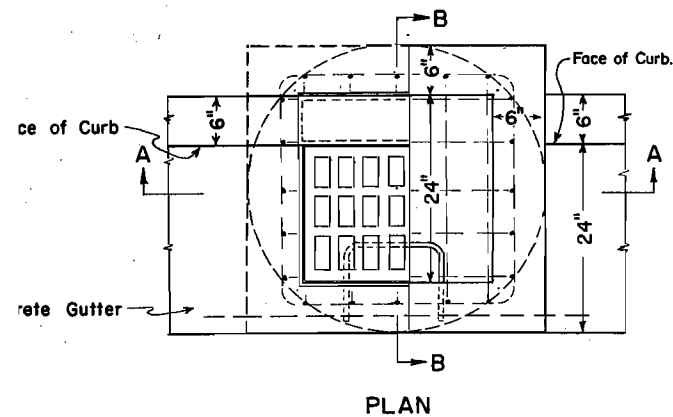
BENDING DIAGRAM



TYPE I

TYPE II

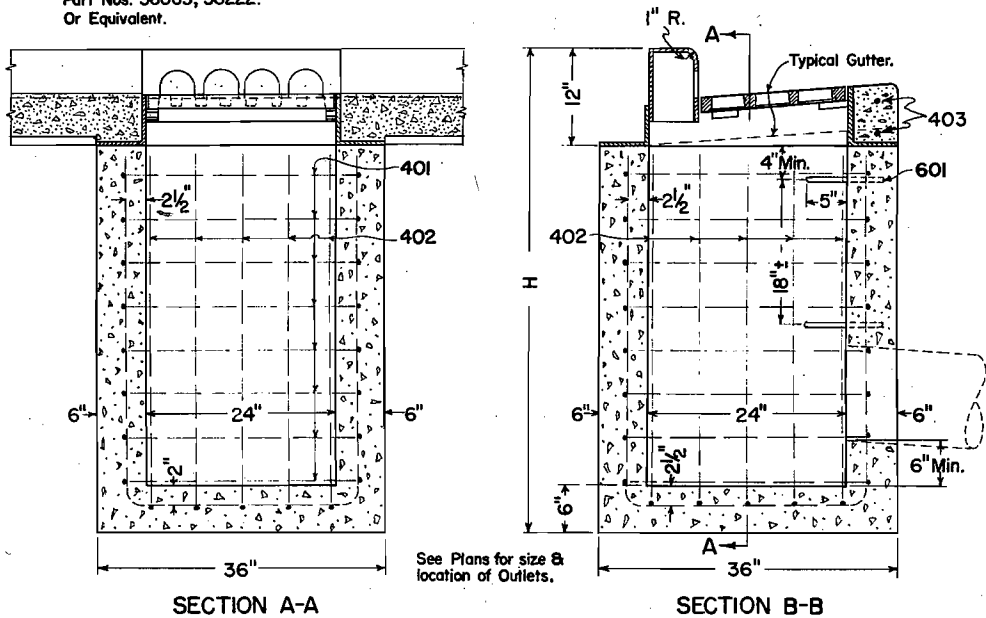
CURB TYPE CONCRETE INLET



QUANTITIES		
H	CLASS "A" CONCRETE CU. YDS.	REINFORCING STEEL LBS.
3'-0"	0.43	64 Lbs.
4'-0"	0.62	93 Lbs.

Includes 1% allowance for overrun.
Volume occupied by 8" Concrete Pipe Sewer has been deducted.

INLET GRATING & FRAME (Curb Type), Item 132 gz.
Ref. H.W. Clark Co., Mattoon, Illinois.
Part Nos. 36065, 36222.
Or Equivalent.



BAR LIST FOR H=3'-0"

MARK	SIZE	NO. REQ'D	LENGTH	TYPE	DIMENSIONS		BENDING DIAGRAM
					L	M	
601	3/4" ϕ	*Note	2'-6"	I	1'-0"	0'-10"	
401	1/2" ϕ	3	11'-7"	II	2'-6"	2'-6"	
402	1/2" ϕ	10	5'-3"	I	2'-5"	1'-6"	
403	1/2" ϕ	2	4'-0"	Straight			

*Omit 601 when H is 4'-0" or less.
*These dimensions to be increased in increments of 6" for H over 3'-0".
Add one 401 for each 6" additional height over H=3'-0".
Cut or bend bars around pipes as required.
All dimensions are out to out of bor.

Concrete shall be Class "A" and air entrained as specified. All walls shall have on both sides. Bevel all exposed corners to a 1" face.
Reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with station number and bar designation.
Reinforcing steel bars shall conform to A.S.T.M. specification A 305-50T or revision thereof.
Castings shall be painted with two coats of asphalt or cool tar and oil.

SUMMARY OF EARTHWORK QUANTITIES

EXCAVATION		
FROM CROSS SECTIONS	18352 CU. YDS.	
ESTIMATED FOR SUBSIDENCE	1835 CU. YDS.	
TOTAL	20187 CU. YDS.	
STATION YARD OVERHAUL		
FROM MASS DIAGRAM	192360 STA. YDS.	
ESTIMATED FOR SUBSIDENCE	19236 STA. YDS.	
ESTIMATED FOR STRUCTURE BACKFILL	473 STA. YDS.	
TOTAL	212069 STA. YDS.	
YARD MILE OVERHAUL		
FROM MASS DIAGRAM	2348 YD. MI.	
ESTIMATED FOR SUBSIDENCE	235 YD. MI.	
ESTIMATED FOR STRUCTURE BACKFILL	115 YD. MI.	
TOTAL	2698 YD. MI.	

SUMMARY OF CONCRETE REMOVALS AND REQUIREMENTS

STATION	SIDE	REMOVALS				* REQUIREMENTS						
		REMOVE CONCRETE CURB & GUTTER	REMOVE CONCRETE DRIVEWAYS	REMOVE CONCRETE SIDEWALKS	REMOVE CONCRETE VALLEY GUTTER	CONCRETE COMB.CURB & GUTTER (1' GUTTER)	CONCRETE COMB.CURB & GUTTER (2' GUTTER)	CONCRETE PAVEMENT (DRIVEWAYS)	CONCRETE SIDEWALK	Ø SAND CUSHION		
		LIN. FT.	SQ. YD.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	SQ. FT.	CU. YDS.		
6 + 60.0 to 10 + 40.0 (First St. to Second St.) Median Islands	LT. RT.	302 189	141 148	-- --	14 112		305 282	67 108	-- --	24		
10 + 40.0 to 15 + 21.5 (Second St. to Third St.) Median Islands	LT. RT.	178 400	209 114	-- --	179 --		371 402	139 84	-- --	31		
15 + 21.5 to 20 + 03.3 (Third St. to Fourth St.) Median Islands	LT. RT.	106 401	92 160	-- 1,150	332 --		377 469	128 96	-- 1,691	43		
20 + 03.3 to 24 + 84.0 (Fourth St. to Fifth St.) Median Islands	LT. RT.	200 382	224 194	-- 2,141	184 --		350 479	158 79	-- 1,756	44		
24 + 84.0 to 29 + 66.0 (Fifth St. to Sixth St.) Median Islands	LT. RT.	480 448	-- 56	2,190 2,250	-- --		463 480	-- 75	2,553 1,794	52		
29 + 66.0 to 34 + 57.0 (Sixth St. to Seventh St.) Median Islands	LT. RT.	138 370	288 129	534 2,256	99 --		331 468	171 115	-- 1,518	45		
34 + 57.0 to 38 + 91.0 (Seventh to Eighth St.) Median Islands	LT. RT.	386 455	13 23	2,229 2,095	57 --		418 418	43 22	1,986 2,178	49		
Estimated for Repairing Aprons at Service Stations APPROACH TO PROJECT	RT. LT.	126 42	14 --	150 --	-- --		151 69	222 8	324	6		
TOTALS		4,603	1,805	14,997	977	4,995	5,833	1,515	13,800	294		

* For Details see Sheet No. 7. For Location see Sheet Nos. 10, 11, 12.
 Ø 2" Sand Cushion to be used where required by Soil Conditions, as determined by the Engineer.

STA. 6+60⁰ BEGIN PROJ. U 001-1(14)=
Sta. 26+39.8 on Approach to Project F001-1(12)

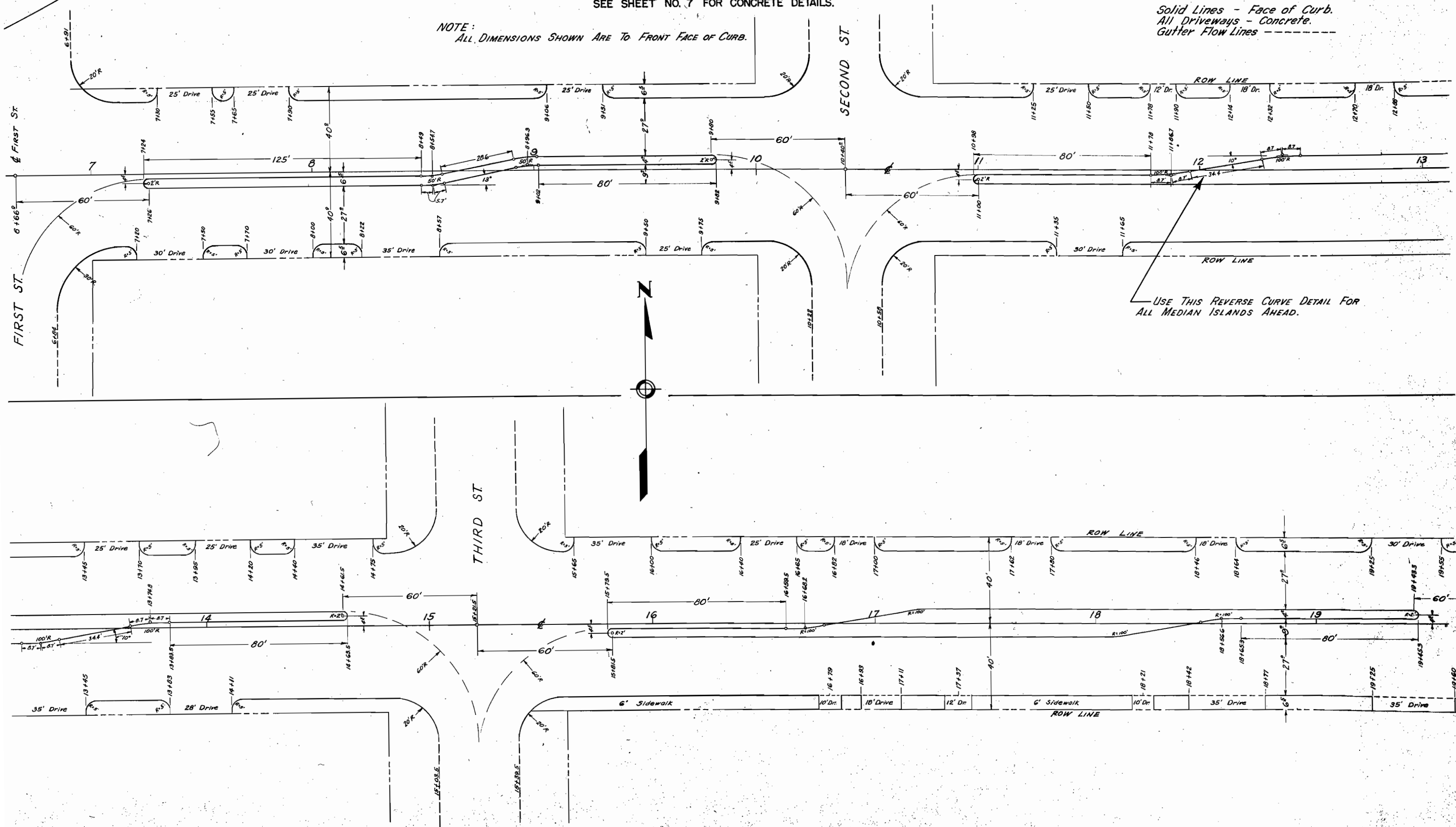
DETAILS-NORTH AVE, FIRST ST. TO FOURTH ST.

SEE SHEET NO. 7 FOR CONCRETE DETAILS.

NOTE:
ALL DIMENSIONS SHOWN ARE TO FRONT FACE OF CURB.

LEGEND - FIRST ST. to EIGHTH ST.

Solid Lines - Face of Curb.
All Driveways - Concrete.
Gutter Flow Lines - - - - -



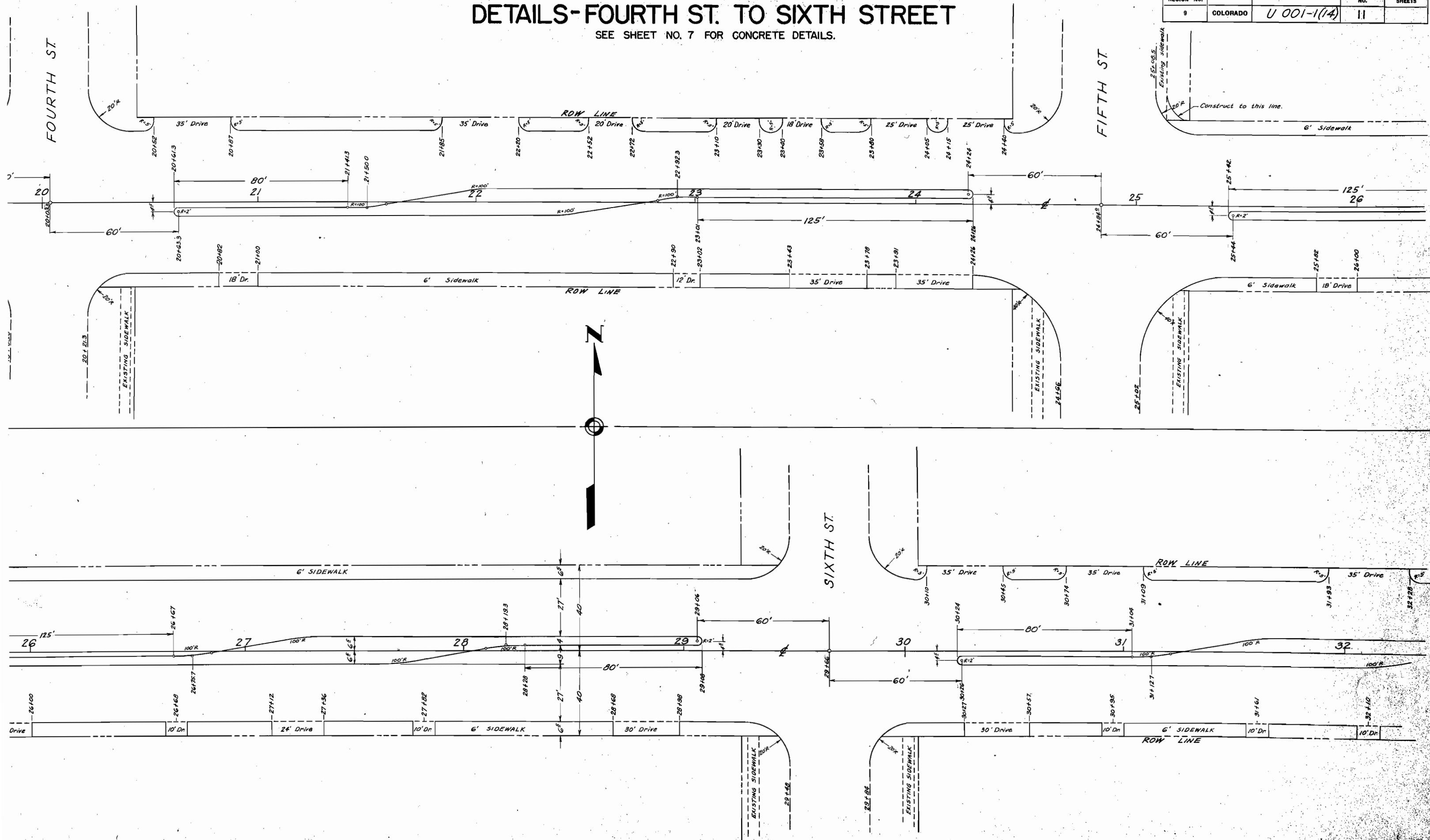
SEE SHEET NO. 7 FOR CONCRETE DETAILS.

25' O.B.S.
Existing sidewalk

20'

Construct to this line.

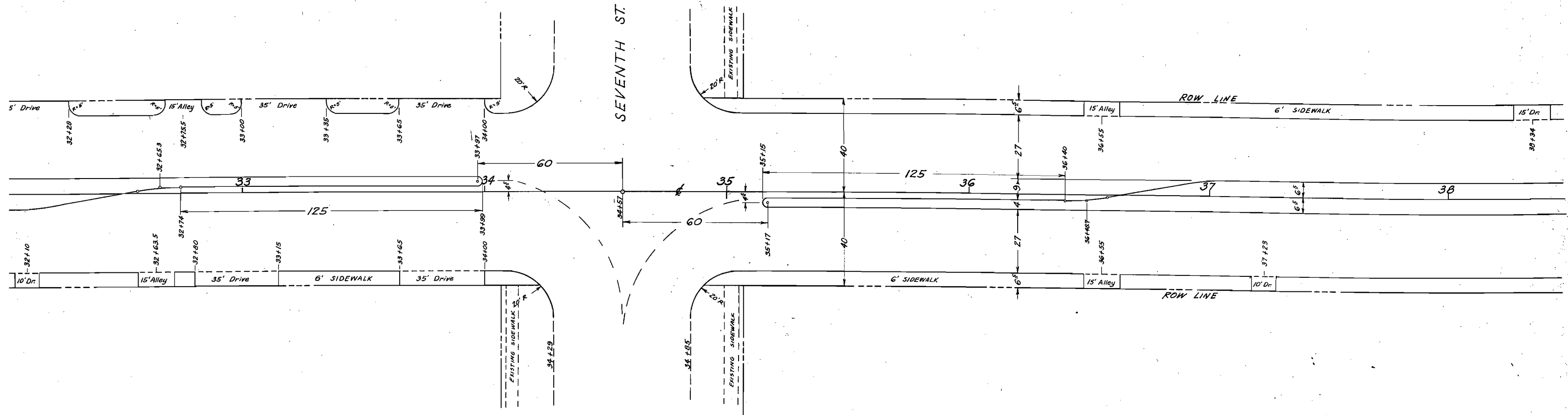
6' Sidewalk



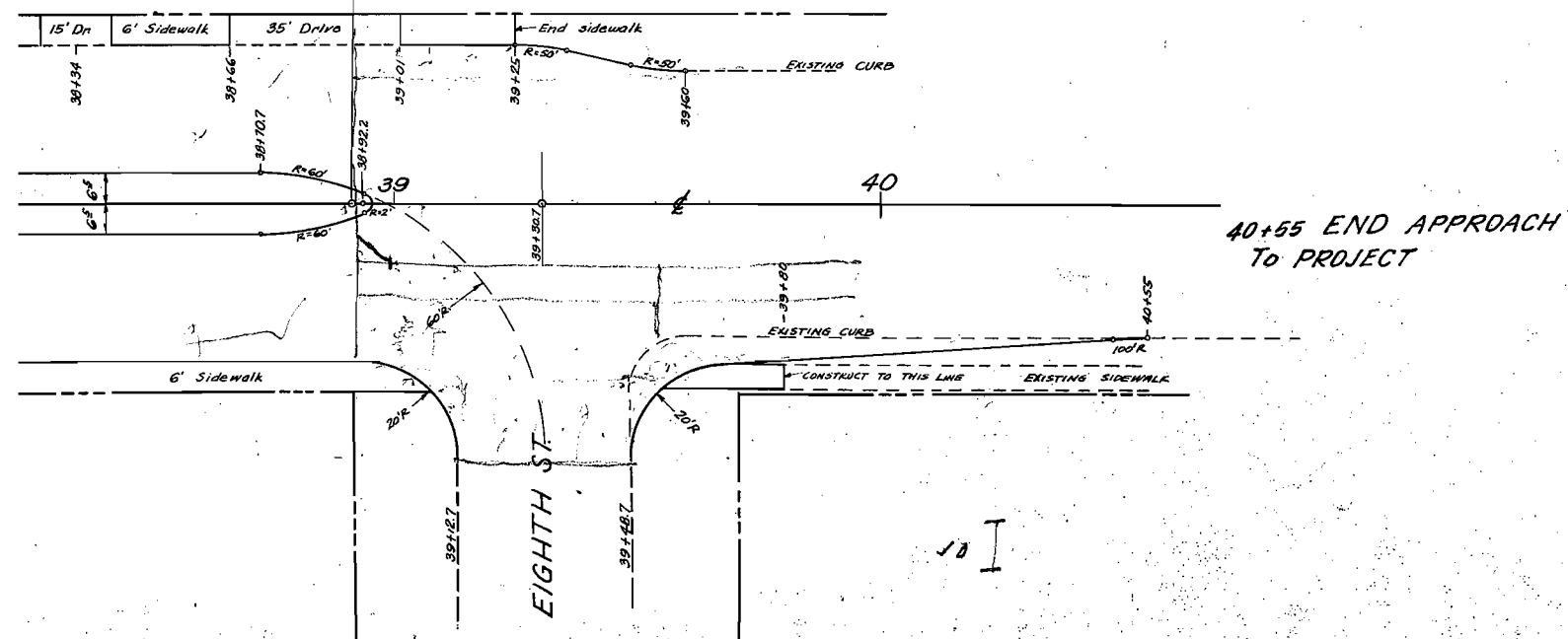
DETAILS-SEVENTH ST. TO EIGHTH ST.

SEE SHEET NO.7 FOR CONCRETE DETAILS.

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	U 001-1(14)	12	



STA. 38+91⁰ END PROJ. U 001-1(14)
BEGIN PROJ. F 001-1(5)



DETAILS OF MANHOLE

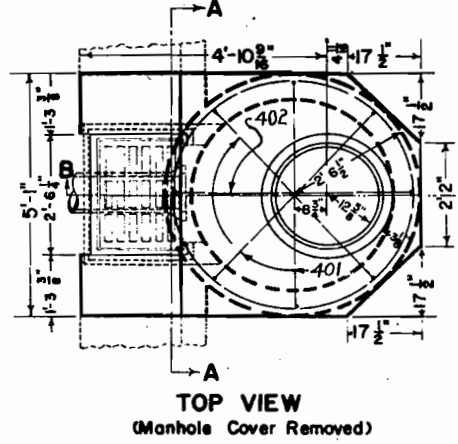
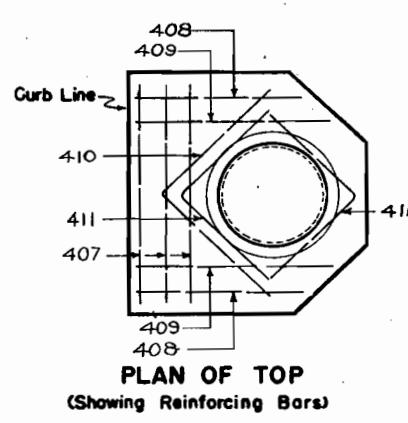
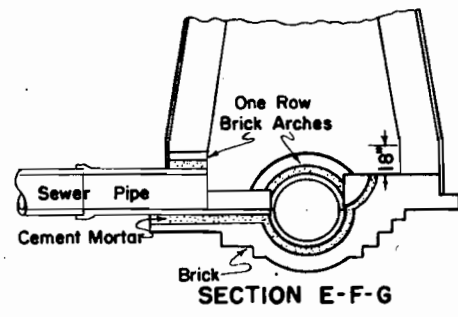
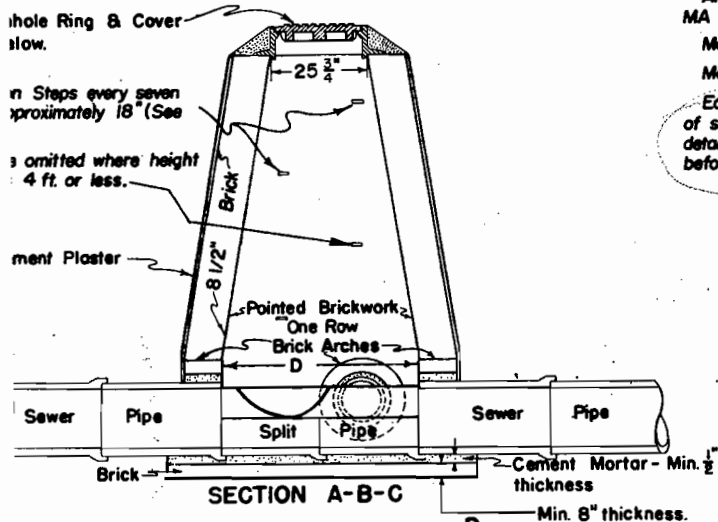
STANDARD M-12-D-8
NO. 8 CONCRETE INLET

FEDERAL ROAD DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	2001-1(14)	13

REV. FOR SPECS. - 9/26/52 - E.E.O.
REV. MANHOLE RING & COVER - 11/5/54 - J.C.R.
Rev. 5-2-56, Deleted Finish Note, J.C.R.

NOTE:

All brick in manholes to conform to requirements of Grade MA of A.A.S.H.O. Designation M-91-42.
Manhole bottoms may be either brick or concrete.
Manhole benches shall be of brick as specified.
Equivalent reinforced concrete manholes may be used in lieu of standard masonry manhole. However all departures from details shown hereon must be approved by the Department before being used.



BAR LIST FOR H=6'-6"

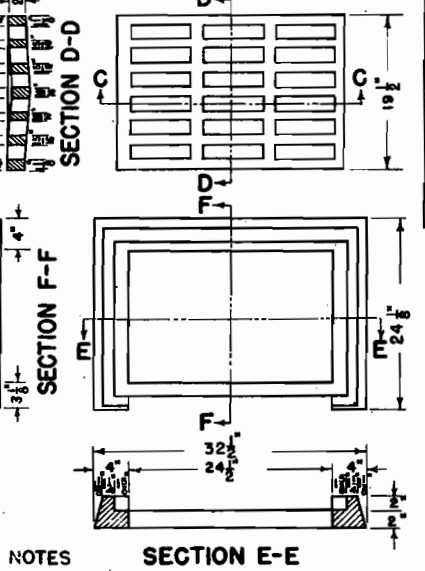
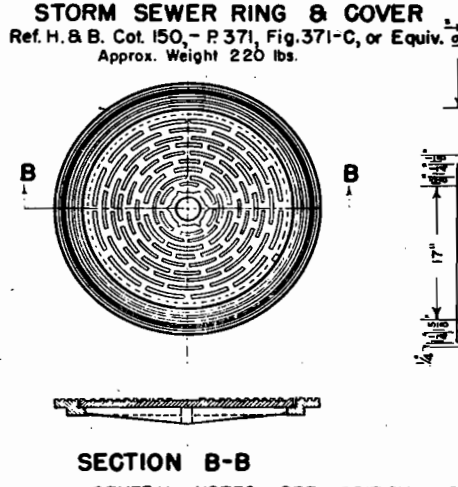
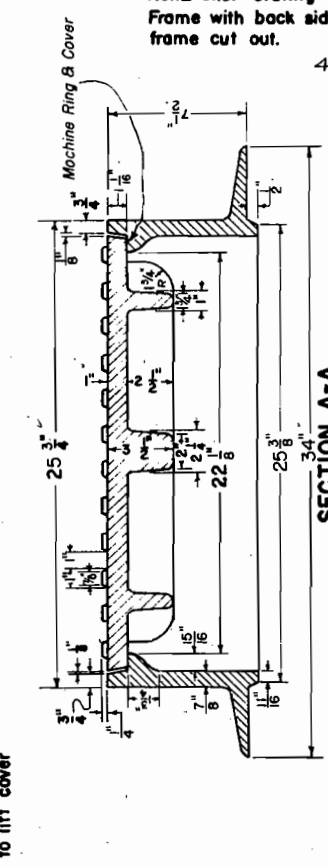
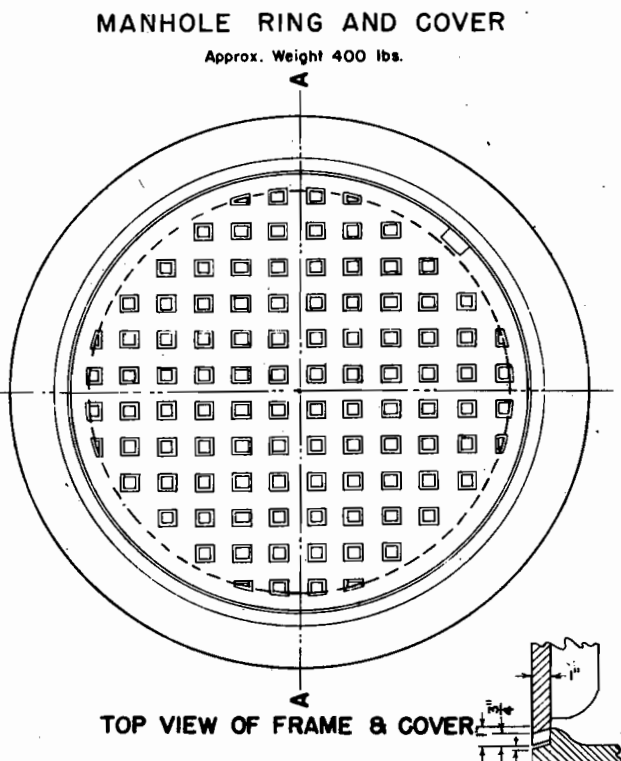
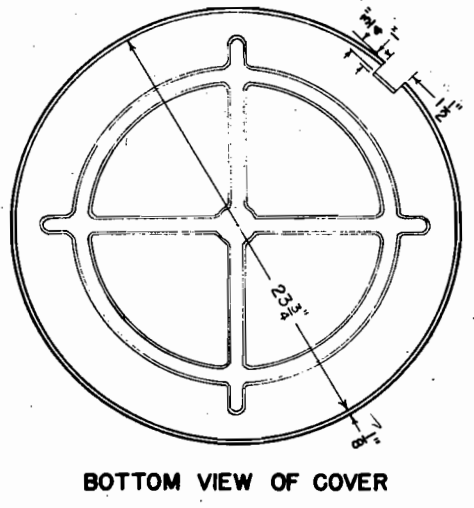
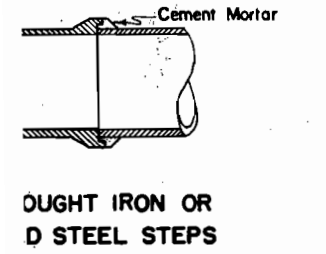
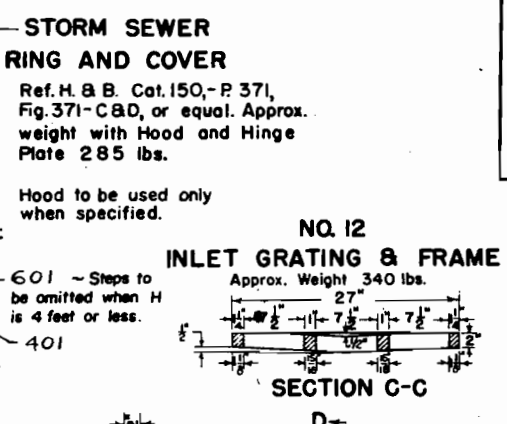
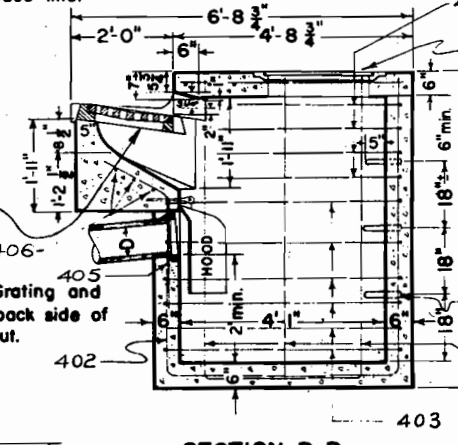
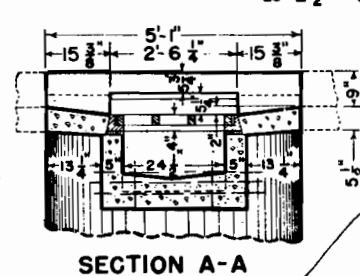
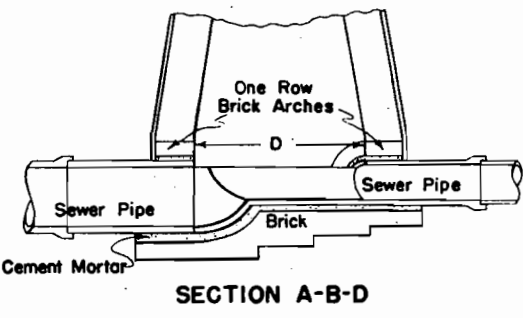
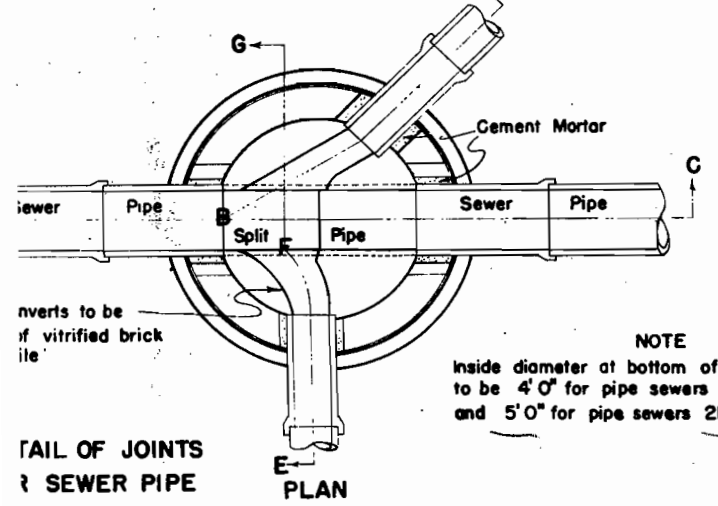
MARK	SIZE	NO. REQD.	LENGTH	TYPE	DIMENSIONS			TOTAL LENGTH	BENDING DIAGRAM ALL DIMENSIONS ARE OUT TO OUT OF BAR
					a	b	c		
401	1/2" ϕ	3	16'-10"	I	6'-2"	4'-7"	6'-2"	50'-6"	
402	1/2" ϕ	1	14'-4"	I	6'-2"	4'-7"	6'-2"	14'-4"	
403	1/2" ϕ	6	16'-9"	II	4'-8"	-	-	100'-6"	
404	1/2" ϕ	4	10'-11"	III	4'-8"	-	-	43'-8"	
405	1/2" ϕ	3	2'-6"	I	0'-10"	1'-0"	0'-10"	7'-6"	
406	1/2" ϕ	2	3'-6"	IV	2'-0"	1'-6"	-	7'-0"	
407	1/2" ϕ	3	2'-4"	Str.	-	-	-	7'-0"	
408	1/2" ϕ	3	4'-7"	Str.	-	-	-	13'-9"	
409	1/2" ϕ	2	3'-4"	Str.	-	-	-	6'-8"	
410	1/2" ϕ	1	6'-6"	V	3'-3"	3'-3"	-	6'-6"	
411	1/2" ϕ	2	5'-0"	V	2'-6"	2'-6"	-	10'-0"	

These dimensions to be increased in increments of 6" for H above 6'-6".
Add 1- 403 for each 6" additional height above 6'-6".
Additional 601 required as follows:
H= 7'-6" to 8'-6" 1 bar;
H= 9'-0" to 10'-0" 2 bars;
Cut or bend bars around pipes as required.

STORM SEWER RING AND COVER
Ref. H. & B. Cat. 150, - P. 371, Fig. 371-CBD, or equal. Approx. weight with Hood and Hinge Plate 285 lbs.
Hood to be used only when specified.

NO. 12 INLET GRATING & FRAME
Approx. Weight 340 lbs.

NOTE: ALL REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. SPECIFICATION A-305-50 T OR LATEST REVISION THEREOF.



QUANTITIES

H	CLASS "A" CONCRETE *CU. YDS.	REINFORCING * STEEL
6' 6"	2.4	192 lbs.
7' 0"	2.5	206 "
7' 6"	2.7	224 "
8' 0"	2.8	238 "
8' 6"	2.9	252 "
9' 0"	3.0	270 "
9' 6"	3.2	284 "
10' 0"	3.3	298 "

*Includes 1% allowance for overrun.
*Volume for inlet - volume occupied by pipes to be deducted for pay quantity of concrete.

COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD
NO. 8 CONCRETE INLET,
MANHOLE & PIPE JOINTS
ON SEWERS

Designed by A.P.G.
Made by A.P.G.
Check design A.Z.
Check details C.R.S.

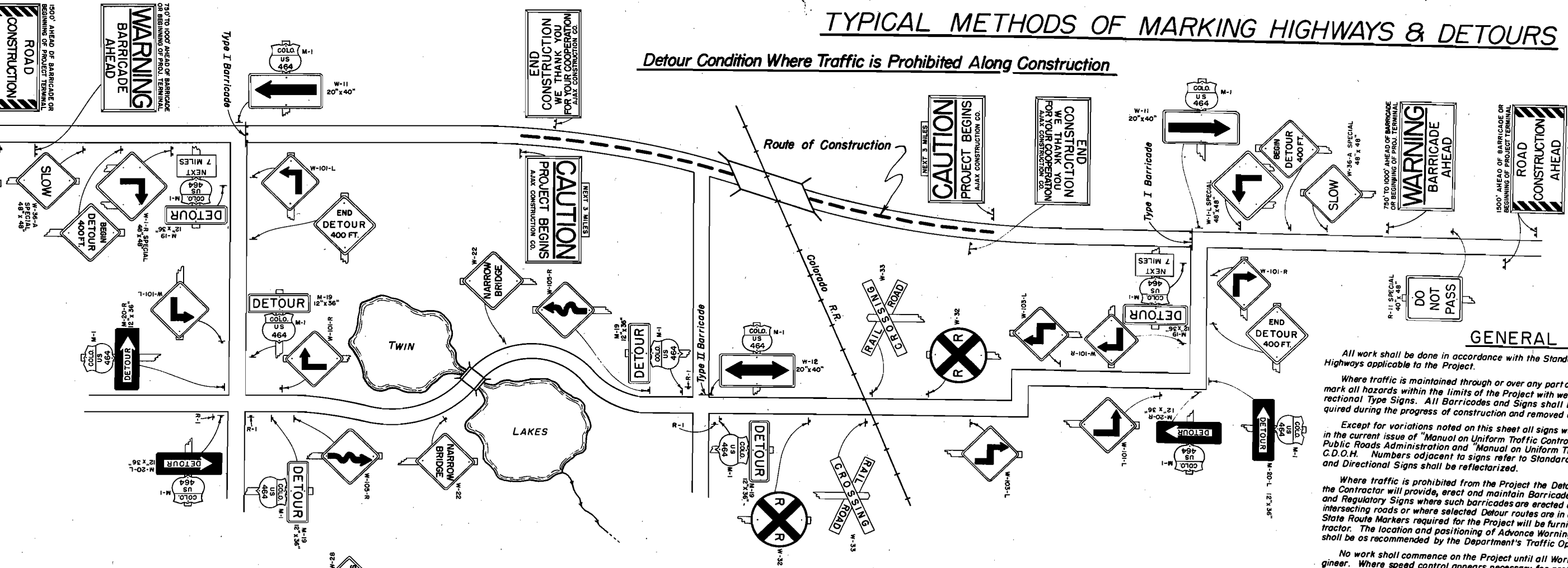
Approved by *Pd Bailey*
Bridge Engineer
Date JUL 10, 1951.

GENERAL NOTES - SEE ADDITIONAL GEN. NOTES
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.
All reinforced concrete shall be class "A", AND AIR-ENTRAINED AS SPECIFIED.
All concrete walls shall be formed on both sides.
All exposed concrete corners shall be beveled to a 1" face.
All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with BAR designation and station number.
All castings shall be painted with two coats of asphalt or coal tar and oil.

FED. ROAD DIV. NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	26001-1164 14	

TYPICAL METHODS OF MARKING HIGHWAYS & DETOURS

Detour Condition Where Traffic is Prohibited Along Construction



GENERAL NOTES

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

Where traffic is maintained through or over any part of the Project, the Contractor will be required to mark all hazards within the limits of the Project with well maintained Barricades, Warning Signs and Directional Type Signs. All Barricades and Signs shall be moved, added to, changed or removed as required during the progress of construction and removed entirely when project is completed.

Except for variations noted on this sheet all signs will be in conformity with the specification outlined in the current issue of "Manual on Uniform Traffic Control Devices for Streets & Highways" by the U.S. Public Roads Administration and "Manual on Uniform Traffic Control Devices for Streets and Highways," C.D.O.H. Numbers adjacent to signs refer to Standards in the manual. Standard Warning, Regulatory and Directional Signs shall be reflectorized.

Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor will provide, erect and maintain Barricades complete with approved Directional Arrows and Regulatory Signs where such barricades are erected and maintained at the ends of the Project and intersecting roads or where selected Detour routes are in advance of the actual project terminal. U.S. or Contractor. The location and positioning of Advance Warning Signs, Barricades and Speed Control Signs shall be as recommended by the Department's Traffic Operations Section.

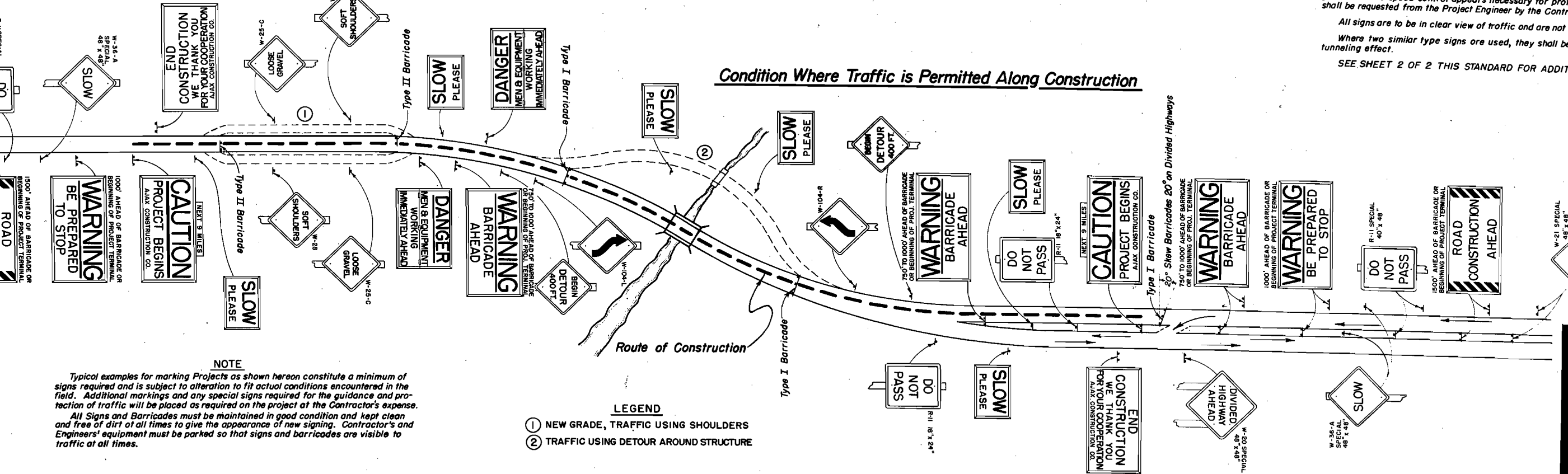
No work shall commence on the Project until all Warning Signs are in place and approved by the Engineer. Where speed control appears necessary for protection of the travelling public, such speed control shall be requested from the Project Engineer by the Contractor.

All signs are to be in clear view of traffic and are not to be obstructed by equipment, weeds or otherwise.

Where two similar type signs are used, they shall be placed approximately 75 feet apart to avoid a tunneling effect.

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

Condition Where Traffic is Permitted Along Construction



NOTE

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

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

LEGEND

- ① NEW GRADE, TRAFFIC USING SHOULDERS
- ② TRAFFIC USING DETOUR AROUND STRUCTURE

COLORADO
DEPARTMENT OF HIGHWAYS

Standard Roadway
Construction Traffic Signs

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

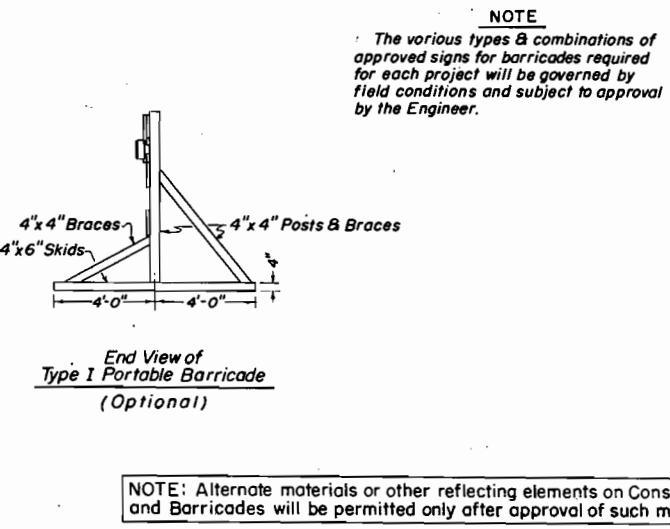
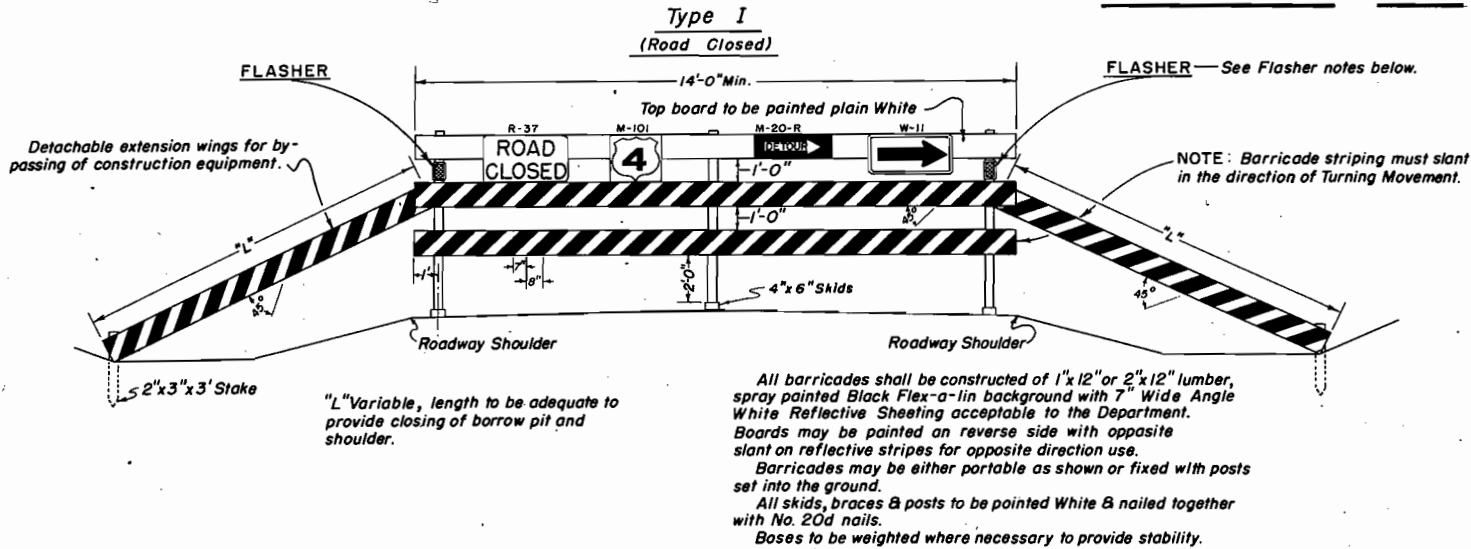
STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-B
(SHEET 2 OF 2 SHEETS)

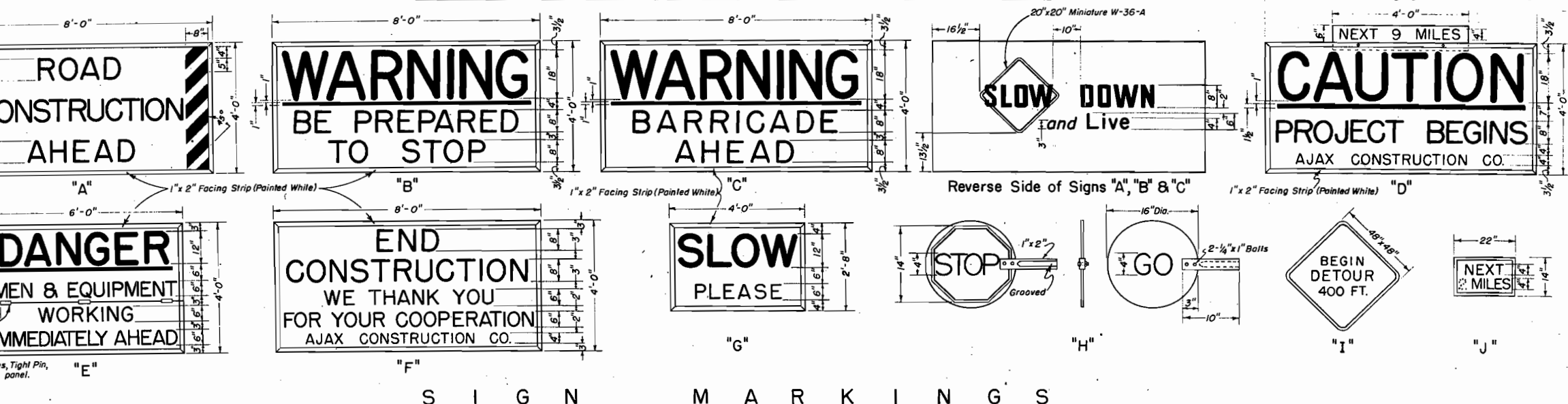
FED. ROAD DIV. NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	2001-1/44	15

Rev. 7-10-56, Reflective Materials, L.N.P.

DETAILS OF BARRICADES



DETAILS OF CONSTRUCTION SIGNS



Construction Signs "A" through and including "G" shall be made of 3/4" Plywood or other material after approval by the Department, and as per details above. Signs shall be reflectorized reflective sheeting or other reflective materials of types approved by the Department.

CONSTRUCTION SIGN "A" - Wide Angle White background with painted Black lettering code stripes of 4" Wide Angle White placed over Black painted vertical stripes spaced 1000 feet apart. This sign is the First advance warning sign and shall be placed 1500 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way.

CONSTRUCTION SIGN "B" - The word "WARNING" and 1" underline shall be painted on a 23" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a strip of Wide Angle White. This sign is the Second advance warning sign and shall be placed 1000 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way on divided highways and singly on two-lane highways.

CONSTRUCTION SIGN "C" - The word "WARNING" and 1" underline shall be painted on a 23" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a strip of Wide Angle White. This sign is the Third advance warning sign in cases where codes are used and shall be placed 750 to 1000 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way on divided highways and singly on two-lane highways.

REVERSE SIDES OF SIGNS "A", "B" and "C" - The word "SLOW" shall be painted on a background of Wide Angle Yellow. This sign shall be used frequently within the limits of the Project.

CONSTRUCTION SIGN "D" - The word "CAUTION" and 1 1/2" underline shall be painted on a 24 1/2" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a strip of Wide Angle White. This sign will be provided with a detachable 1" material mounted on back of sign with 2-1/4" x 2" bolts. This board shall be painted White Black lettering. (Indicate to the nearest Mile). This sign shall be placed to mark the Beg. of the Project. To be placed singly and may be placed opposite barricade if desirable.

CONSTRUCTION SIGN "E" - The word "DANGER" and 1" underline shall be painted on a 17 1/2" strip of Wide Angle Flat Top Red. Balance of lettering painted Black on a 27 1/2" strip of Wide Angle White. The sign is of the hinged and fold type to facilitate the closing down of sign when the need is not prevalent. This sign shall be placed 500 feet ahead of the situation on hand.

CONSTRUCTION SIGN "F" - The words "END CONSTRUCTION" and "CONTRACTORS NAME" shall be painted Black on strips 22" and 6 1/2" respectively of Wide Angle White. Balance of lettering shall be painted White on a 16 1/2" strip of Wide Angle Flat Top Red. This sign shall be placed to mark the Ending of the Project. To be placed singly and may be placed opposite barricade if desirable.

CONSTRUCTION SIGN "G" - The words "SLOW" and "PLEASE" shall be painted Black on a background of Wide Angle Yellow. This sign shall be used frequently within the limits of the Project.

CONSTRUCTION SIGN "H" - This sign shall be made of Plastic or other light-weight material, painted Red background with White lettering on the "STOP" side and painted Green background with White lettering on the "GO" side. Handle to be grooved on one side to indicate reading of sign to flagman. This sign will be used whenever flagmen are necessary. Sign to be reflectorized if used to stop traffic at night.

DETOUR WARNING SIGN "I" - To be of 3/8" (Minimum) plywood or No. 16 (Minimum) gauge metal with Black painted letters on a Wide Angle Yellow background.

CONSTRUCTION SIGN "J" - 3 1/4" x 9" metal slides to be placed between "NEXT" and "MILES", spaced so as to accommodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor. Numerals calculated to the nearest Mile.

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

Flares and Torches shall be of the oil burning type approved by the Department and shall be placed 3 feet to 5 feet ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from the use thereof. Flashers used on Type I Barricade shall be of the Battery or Electrical Type. The illuminating element in a flashing amber beacon or signal shall be flashed continuously at a rate between 50 or 60 flashes per minute which will be clearly distinguishable to traffic. The duration in which Flashers will be left in operation will be governed by field conditions and subject to approval by the Engineer.

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

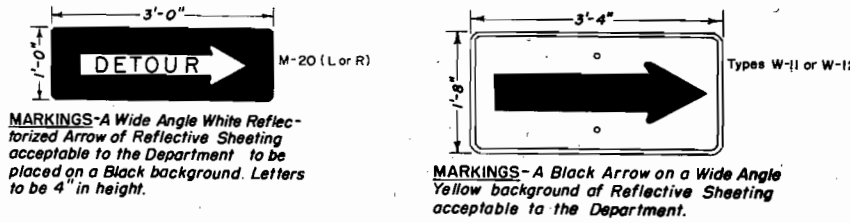
The Department shall furnish and install the following as required outside the limits of the Project:

1. "ROAD CONSTRUCTION AHEAD"..... Minimum 4
2. "WARNING BE PREPARED TO STOP"..... Minimum 2
3. "WARNING BARRICADE AHEAD"..... As Required
4. Standard Warning & Directional Signs..... As Required

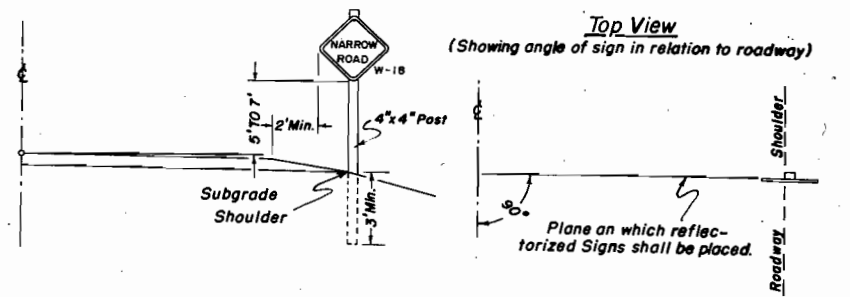
The Contractor shall furnish and install the following as required within the limits of the Project:

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

Details of Reflectorized Arrows



Position of Signs Relative to Roadbed & Hazards



NOTE: Warning Signs to be made of 3/8" (Min.) plywood or No. 16 Gauge (Min.) metal and shall be reflectorized. Location to be governed by field conditions. Exact location to be staked by the Engineer. In all cases warning signs are to be placed well in advance of hazard, the distance depending on topography, and existing approach speeds.

COLORADO
DEPARTMENT OF HIGHWAYS

Standard Roadway
Construction Traffic Signs

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

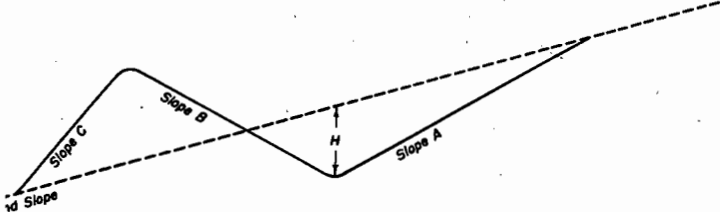
STANDARD TYPES of DITCHES and CONSTRUCTION METHODS

STANDARD M-107-C

FED. ROAD DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9.	COLO.	16	16

DETAILS for CONTOUR INTERCEPTING DITCHES

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

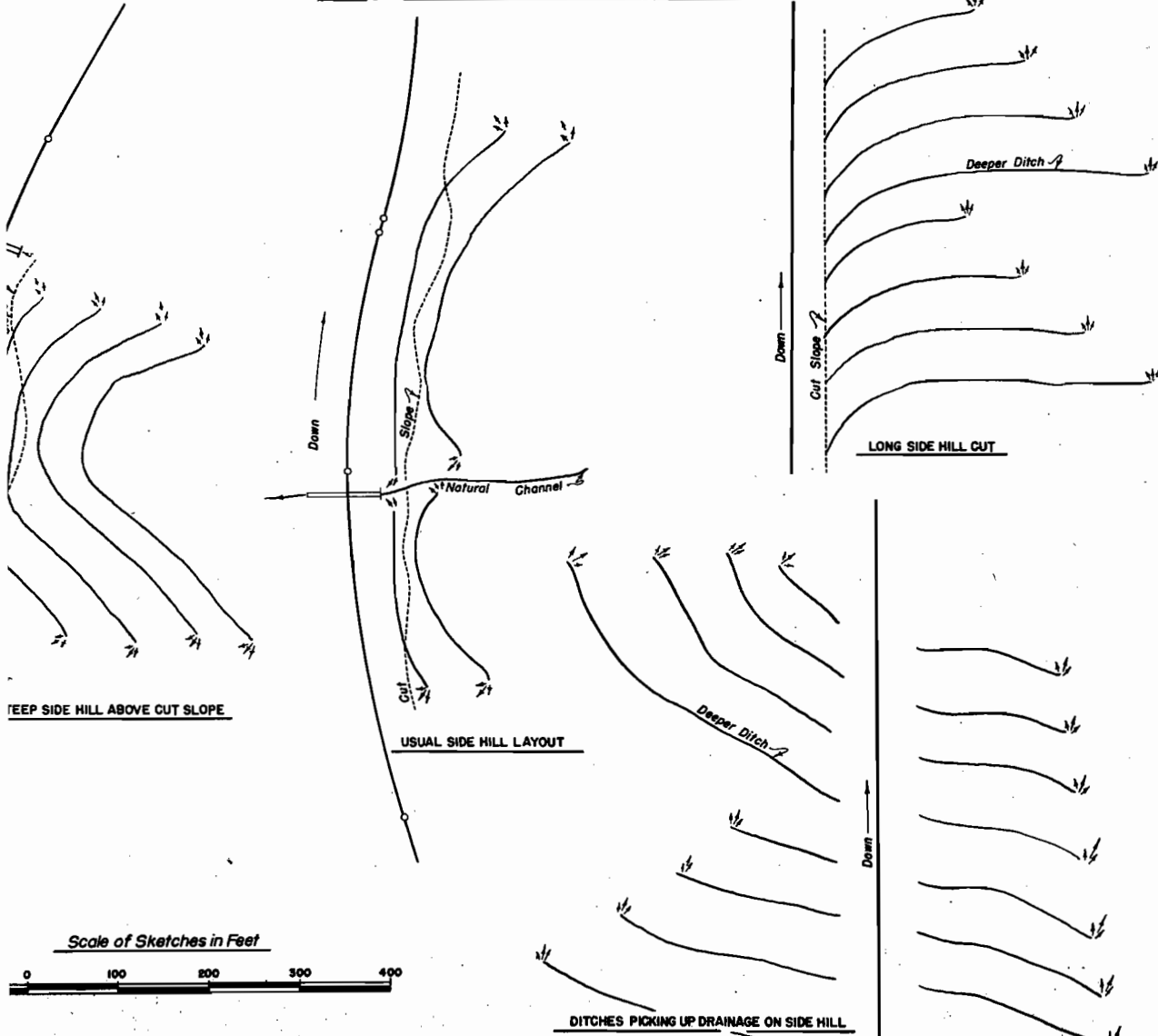
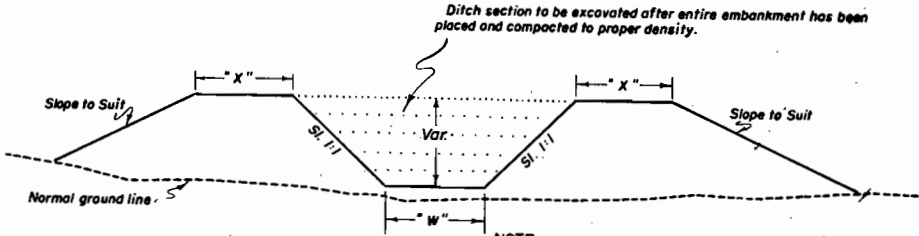


Table of Slopes and Yardages

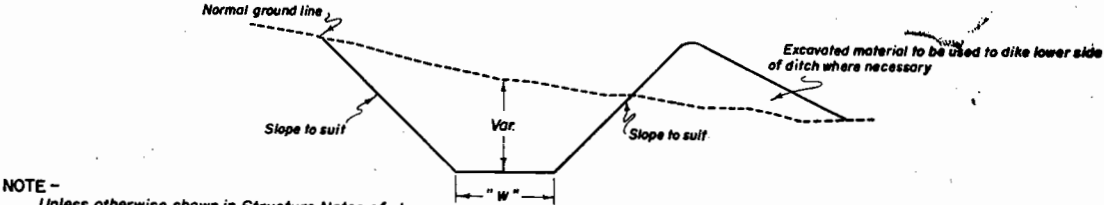
SLOPES				H	Cubic Yards per 100 lin. ft. of Ditch
Ground	A	B	C		
5:1 Or Flatter	2:1	4:1	2:1	15"	16
				18"	23
				21"	32
				15"	15
				18"	22
				21"	30
		3:1	2:1	15"	14
				18"	20
				21"	27
				15"	13
				18"	19
				21"	25
4:1	2:1	4:1	1-1/2:1	15"	12
				18"	18
				21"	25
				15"	12
				18"	17
			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



For Embankment Sections (Generally for use in Irrigation Ditches & Channel Changes)



For Cut Sections

GENERAL NOTES

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

COLORADO STATE HIGHWAY DEPARTMENT

Standard Types of Ditches and Construction Methods

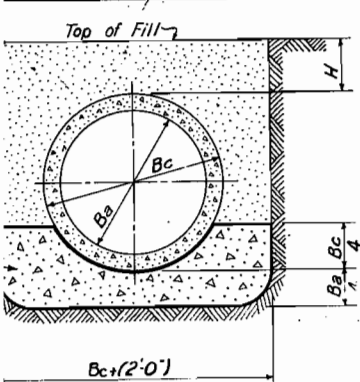
Designed by C.G.M. Made by C.G.M. Checked by

Approved by *[Signature]* Engineer, Surveys & Plans Date: Aug. 18, 1950

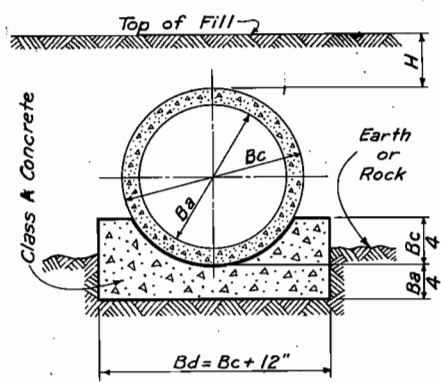
STANDARD M-112-E

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	12-001-1 (14)	17	

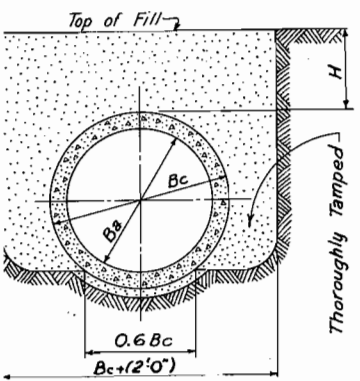
Rev. by P.C. 7-1-52 Added 84" Pipe
Rev. by R.T.T. 8-6-56 Backfill & Excavation
Rev. by G.R.L. 6-25-57 Minimum Fill



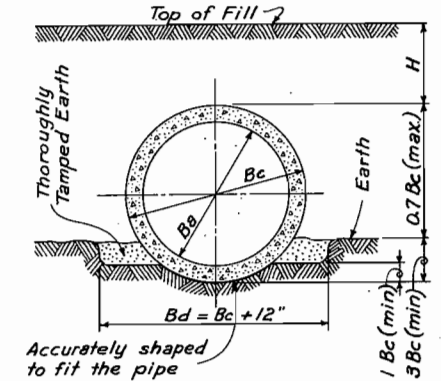
CONCRETE CRADLE BEDDING IN TRENCHES



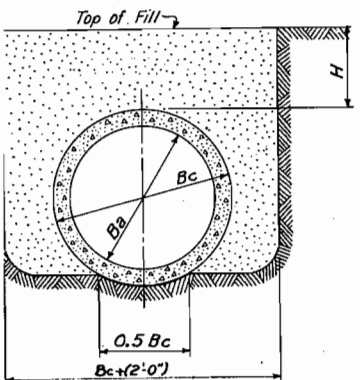
CONCRETE CRADLE BEDDING IN FILLS



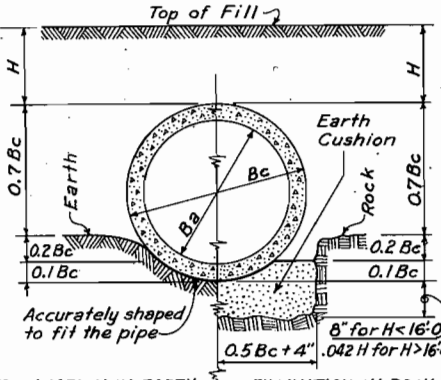
FIRST CLASS BEDDING IN TRENCHES



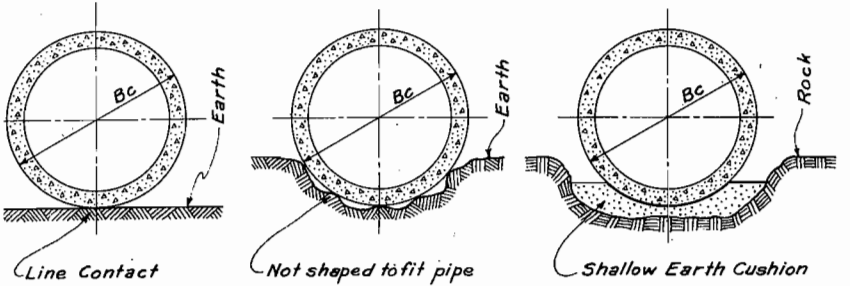
FIRST CLASS BEDDING IN FILLS



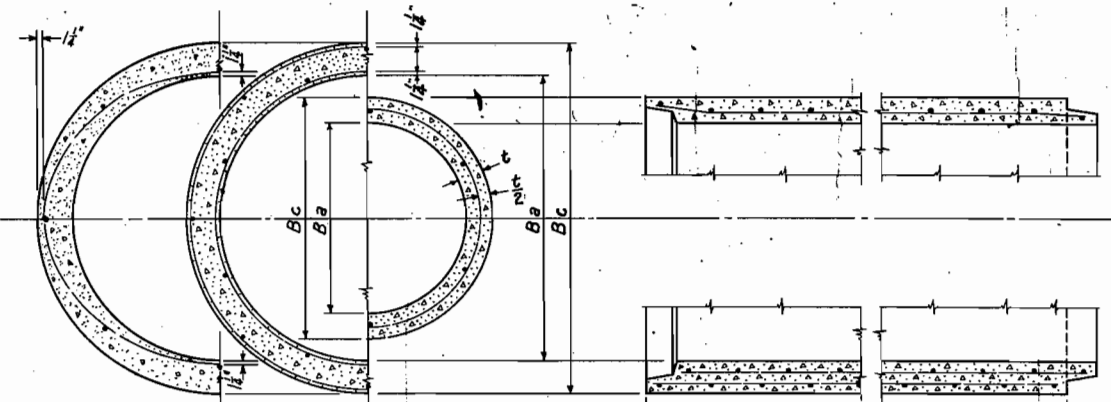
ORDINARY BEDDING IN TRENCHES



ORDINARY BEDDING IN FILLS



IMPERMISSIBLE BEDDINGS IN TRENCHES OR FILLS
THESE THREE TYPES SHALL NOT BE USED



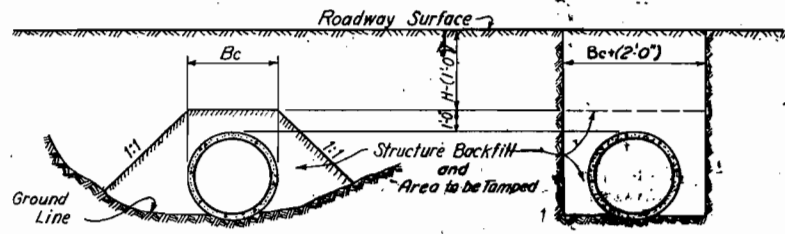
PIPE CROSS SECTIONS
LONGITUDINAL SECTIONS

Where two lines of steel are contemplated a single line placed elliptically may be used, and the area of this shall be at least 50% of the total steel area required for two lines of reinforcement. Pipe with elliptical reinforcing shall have the word "Top" or "Bottom" clearly stenciled on the inside of the pipe at the correct place to indicate the proper position when laid.

If machine made pipe is used a modified bell will be acceptable to the department.

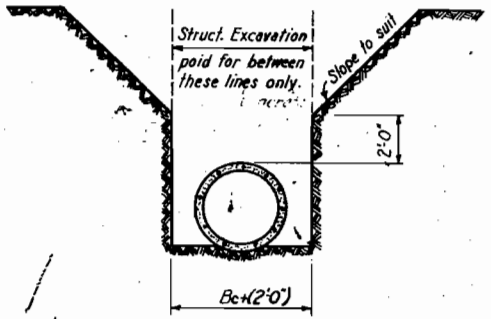
CONCRETE COLLAR

Where the flow line grade of the pipe is 10% or greater, all pipe shall be the bell and spigot type or shall be tongue and groove pipe with concrete collars as detailed above or a type approved in writing by the Engineer.



STRUCTURE BACKFILL AND MECHANICAL TAMPING DIAGRAM

All material that is to be mechanically tamped shall be placed in horizontal layers not more than 6 inches in depth and tamped before the next layer is placed. Backfill for all types of bedding shall be brought up uniformly on each side of the pipe to maintain equal lateral pressures against the pipe. All Structure Backfill shall conform to the specifications for Class 1 Backfill.



Where it is necessary to bed the pipe in a deep trench the contractor may, for his own convenience and at his own expense, slope the cut from a point 2'0" above the top of the pipe as shown above.

GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado State Highway Department applicable to the project.

Reinforced Concrete Culvert Pipe shall conform to A.A.S.H.O. M41-49.

Reinforced Concrete Sewer Pipe shall conform to A.A.S.H.O. M87-49.

Unreinforced Concrete Sewer Pipe shall conform to A.A.S.H.O. M86-49.

The type of Pipe Joint used and the field construction there-of to make the joint reasonably water-tight shall be submitted to the Department for approval.

Unless otherwise noted the type of bedding shall be Ordinary Bedding. When the maximum fill height as noted hereon, for this type of bedding, is exceeded then that type of bedding which is indicated by the allowable fill height shall be used.

All culverts shall have headwalls or flared end sections if and as shown on the plans in accordance with Department Standards.

For size, type and location of pipe see plan sheets for project.

Supporting soils shall be composed of firm and uniform material throughout the entire length of Culvert. The soil shall be accurately shaped to fit the Pipe in accordance with the bedding conditions shown.

The Pipe shall be laid with the Bell or Groove end placed upstream.

If the desired fill height for pipe in a fill exceeds that given in the table, new embankment may be constructed to an elevation of two feet above the top of the pipe; a trench may then be excavated in the embankment and the pipe installed in accordance with a pipe in a trench. This work shall conform to the requirements for "Embankments" as shown in the specifications.

* Bc Int. Diameter (Inches)	Bc Ext. Diameter (Inches)	Three Edge Bearing Point Load (Pounds)	Max. depth of fill "H" in ft. for 3 types of bedding	Concrete Cradle			First Class			Ordinary		
				Pipe in Trench	Pipe in Fills	Pipe in Trench	Pipe in Fills	Pipe in Trench	Pipe in Fills	Pipe in Trench	Pipe in Fills	Pipe in Trench
12	16	2250	3500	30	No Limit	19	No Limit	16	No Limit	16	No Limit	16
15	19	2625	4065	28	No Limit	18	No Limit	15	No Limit	15	No Limit	15
18	23	3000	4500	28	No Limit	18	No Limit	15	No Limit	15	No Limit	15
24	30	3000	5000	22	44	14	18	12	12	12	12	12
30	37	3375	5750	21	25	14	15	12	12	12	12	12
36	44	4050	6600	21	17	14	14	12	12	12	12	12
42	51	4725	7350	22	17	14	13	12	12	12	12	12
48	58	5400	8000	22	17	14	13	12	12	12	12	12
54	65	5850	9000	22	17	14	12	12	12	12	12	12
60	72	6000	10000	21	15	14	11	12	12	12	12	12
66	79	6300	11000	20	15	13	10	12	12	12	12	12
72	86	6600	12000	20	14	13	10	11	11	11	11	11
84	100			24	20	13	10	10	10	10	10	10
24	30	4000	6000	29	No Limit	18	No Limit	15	No Limit	15	No Limit	15
30	37	5000	7500	30	No Limit	19	No Limit	16	No Limit	16	No Limit	16
36	44	6000	9000	30	No Limit	19	No Limit	16	No Limit	16	No Limit	16
42	51	7000	10500	31	No Limit	20	No Limit	17	No Limit	17	No Limit	17
48	58	8000	12000	31	No Limit	20	No Limit	17	No Limit	17	No Limit	17
54	65	9000	13500	32	No Limit	20	No Limit	17	No Limit	17	No Limit	17
60	72	9000	15000	29	No Limit	19	No Limit	16	No Limit	16	No Limit	16
66	79	9500	16500	28	No Limit	19	No Limit	16	No Limit	16	No Limit	16
72	86	9900	18000	28	No Limit	18	No Limit	15	No Limit	15	No Limit	15
84	100			46	No Limit	22	No Limit	18	No Limit	18	No Limit	18
12	16	1800	2700	24	No Limit	15	No Limit	12	No Limit	12	No Limit	12
15	19	2000	3000	22	No Limit	14	No Limit	11	No Limit	11	No Limit	11
18	23	2200	3300	21	No Limit	13	No Limit	11	No Limit	11	No Limit	11
21	26	2400	3600	20	No Limit	13	No Limit	10	No Limit	10	No Limit	10
24	30	2400	3600	18	No Limit	12	No Limit	10	No Limit	10	No Limit	10
27	33	2550	3800	18	No Limit	11	No Limit	9	No Limit	9	No Limit	9
30	37	2700	4050	17	No Limit	11	No Limit	9	No Limit	9	No Limit	9
33	40	2850	4300	17	No Limit	11	No Limit	9	No Limit	9	No Limit	9
36	44	3000	4500	16	No Limit	11	No Limit	8	No Limit	8	No Limit	8
42	51	3200	4800	16	No Limit	10	No Limit	7	No Limit	7	No Limit	7
48	58	3400	5100	15	No Limit	9	No Limit	7	No Limit	7	No Limit	7
54	65	3700	5550	15	No Limit	9	No Limit	7	No Limit	7	No Limit	7
60	72	4000	6000	15	No Limit	9	No Limit	7	No Limit	7	No Limit	7
66	79	4250	6350	15	No Limit	9	No Limit	6	No Limit	6	No Limit	6
72	86	4500	6750	15	No Limit	8	No Limit	6	No Limit	6	No Limit	6
4	5	1000		35	No Limit	24	No Limit	20	No Limit	20	No Limit	20
6	7	1100		31	No Limit	20	No Limit	17	No Limit	17	No Limit	17
8	9	1300		28	No Limit	18	No Limit	15	No Limit	15	No Limit	15
10	11	1400		25	No Limit	16	No Limit	13	No Limit	13	No Limit	13
12	14	1500		23	No Limit	14	No Limit	12	No Limit	12	No Limit	12
15	17	1750		21	No Limit	13	No Limit	11	No Limit	11	No Limit	11
18	21	2000		21	No Limit	13	No Limit	11	No Limit	11	No Limit	11
21	24	2200		20	No Limit	12	No Limit	11	No Limit	11	No Limit	11
24	28	2400		19	No Limit	12	No Limit	10	No Limit	10	No Limit	10

* Note: External diameter of pipe shown in the table is approximate only, having been determined by using 3000 lbs. per sq. in. concrete. If greater strength concrete is used this diameter may be decreased accordingly.

Minimum Depth of Fill over Concrete Pipe.
Main Roadways 2 Foot
Approach Roadways 1 Foot

COLORADO
STATE HIGHWAY DEPARTMENT
REINF. CONCRETE CULVERT PIPE
STD. STRENGTH 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 84"
EXTRA STR. 24", 30", 36", 42", 48", 54", 60", 66", 72", 84"
CONCRETE SEWER PIPE
REINF. 12", 15", 18", 21", 24", 27", 30", 33", 36", 42", 48", 54", 60", 66", 72", 84"
UNREINF. 4", 6", 8", 10", 12", 15", 18", 21", 24"
Designed by W.W.D. Made by W.W.D. Checked by R.C.
Approved by *[Signature]* Bridge Engineer
Date: *Mar. 28, 1958*

STANDARD C.M.P. SIPHON with METAL APRONS for INLETS & OUTLETS

STANDARD M-124-A

Rev. 5-23-56, J.C.R., Valve Notes
Rev. 4-12-57, E.L.H., Added Rolled Angle Flanges and
Water-tight Connecting Band with Neoprene Gasket

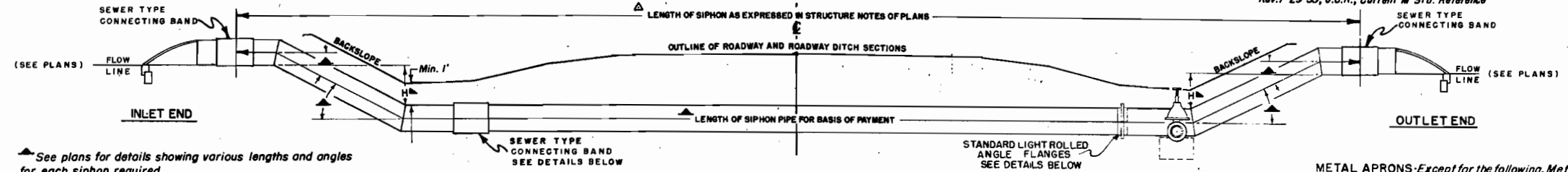
FED. ROAD DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	1200-117	18

Rev. 8-10-51, C.G.M., Added "H" Dimension, Note, and Flow Line to Cross Sectional View.
Rev. 9-5-52, J.C.R., Revised Connecting Bands
Rev. 3-19-53, T.M.C., Revised Quantities and Table of Dimensions
Rev. 7-23-54, J.C.R., Galvanizing of Rods Used with Connecting Band
Rev. 7-29-55, J.C.R., Current M 51's Reference

BOLTING:

Trash guard to be shop fitted to apron after guard and apron are fabricated.

Cross Sectional View Showing Typical Relationship of Siphon to Roadway

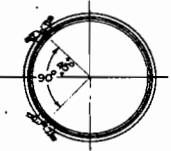


See plans for details showing various lengths and angles for each siphon required.
A tolerance of 2"± will be permitted in angles of sections of pipe to be fabricated.
See plans for "H" value at inlet and outlet for each siphon.

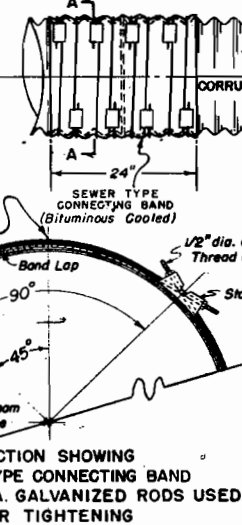
A maximum tolerance of 4 inches will be allowed in total length of siphon.

CONNECTING BAND NOTES:

1. Rivet siphon pipe complete, standard practice, then flatten outside rivet heads to 1/8"± (See detail this sheet)
2. Roll band sheet to one inch larger diameter than siphon pipe. Deform to fit struted pipe shape.
3. Before installing band, paint inside of asphalt coated band and outside of asphalt coated siphon pipe with kerosene or distillate as this makes them slippery and allows the band to be pulled up tight.
4. Use sewer type connecting bands, corrugations of connecting bands must mesh with corrugations of metal siphon pipe.



SECTION A-A



PLAN

QUANTITIES FOR ONE SIPHON

DIAMETER OF SIPHON	Item 55 CORR. METAL SIPHON PIPE	Item 85 TRASH GUARD	Item 95 METAL APRONS FOR C.M.P. SYPHONS	Item 110P METAL DRAIN PIPE	Item 110V CAST IRON VALVE & VALVE BOX
	LIN. FT.	EACH	EACH	LIN. FT.	EACH
12"	16 Ga. as req'd.	2 - 32 lbs. Each	2 - 12"	2" dia. as req'd.	1 - 2"
15"	16 Ga. as req'd.	2 - 46 lbs. Each	2 - 15"	2" dia. as req'd.	1 - 2"
18"	16 Ga. as req'd.	2 - 62 lbs. Each	2 - 18"	4" dia. as req'd.	1 - 4"
21"	16 Ga. as req'd.	2 - 84 lbs. Each	2 - 21"	4" dia. as req'd.	1 - 4"
24"	14 Ga. as req'd.	2 - 98 lbs. Each	2 - 24"	4" dia. as req'd.	1 - 4"
30"	14 Ga. as req'd.	2 - 130 lbs. Each	2 - 30"	6" dia. as req'd.	1 - 6"
36"	12 Ga. as req'd.	2 - 187 lbs. Each	2 - 36"	6" dia. as req'd.	1 - 6"
42"	12 Ga. as req'd.	2 - 229 lbs. Each	2 - 42"	6" dia. as req'd.	1 - 6"

METAL APRONS-Except for the following, Metal Aprons used on C.M.P. Siphons shall be of the same specifications as those shown on the Standard Sheet included in plans for Metal Aprons.

1. Dimension Van Standard M-102-H shall be 24" for all sizes for Siphons.
2. Circular Section to be close riveted and soldered to Apron to prevent leakage, also the Circular Section is to be Asphalt Coated.

3. Galvanized Toe Plates will be required on all sizes.

4. The galvanized Top Finish Plate normally required on all Metal Aprons will not be required. This unit is eliminated to facilitate installation of the Trash Guard Hinge. Use only when Trash Guard is not required.

TRASH GUARDS-Structural Steel Trash Guards conforming to details shown on this sheet shall be painted as per specifications for Structural Steel. These specifications may be found under the item "Paints and Painting".

CAST IRON VALVE & VALVE BOX-Buffalo pattern, adjustable cast iron valve box with min. of 5-1/2" inside dia. and No. 6 base. (Or acceptable equivalent).

Standard flanged iron body gate valve with brass trim and fittings. Acceptable: Crane No. 461 and Iowa List 12. (Note: Other equivalent valves must be approved by the Department prior to installation).

METAL DRAIN PIPE-Metal Drain Pipe conforming to specifications shall be used in the following sizes:

18" & 24" Dia. Siphon - 4" Dia. Drain Pipe with 4" Valve & Drain
30" & 36" Dia. Siphon - 6" Dia. Drain Pipe with 6" Valve & Drain
CORRUGATED METAL SIPHON PIPE-Siphon Pipe conforming to specifications shall be double riveted along the longitudinal seams and riveted at three (3) inch centers along circumferential seams.

Items shown include all items required to install one complete siphon, except for Structural Excavation, Structure Backfill, Mechanical Tamping and Unclassified Ditch Excavation when required.

2. BUFFER PLATE & STAPLE SECTION to be shop-fitted with trash guard into 1/4" dia. rivets to be used at locations detail below. Offsetting of rivets from plate may be necessary in order to allow trash guard to set flush on buffer plate.

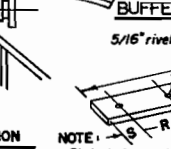
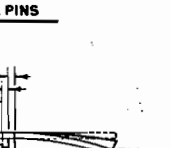
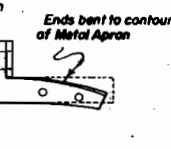
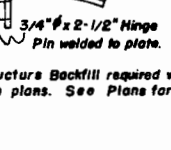
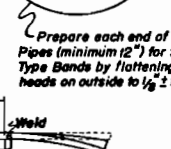
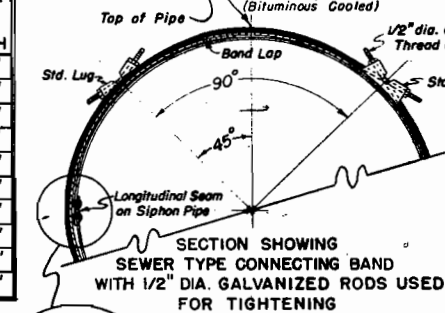
BUFFER PLATE & STAPLE SECTION (Install only when Trash Guard is required)

GALVANIZED TOE PLATE, REQUIRED FOR ALL SIZES

QUANTITIES FOR CONNECTING BANDS

PIPE DIA.	1-PIECE BAND SHEET LENGTH	1-PIECE BAND NOMINAL LAP	1-PIECE GALV. ROD LENGTH
8"	31"	3"	3'-3"
10"	38"	3"	3'-10"
12"	44"	3"	4'-4"
15"	56"	5 1/2"	5'-1"
18"	66"	6"	5'-11"
21"	76"	6"	6'-8"
24"	86"	6"	7'-6"
30"	104"	6"	9'-0"
36"	123"	6"	10'-8"
42"	143"	6"	12'-3"

* Rod length computed for Std. 3" Lug.



Illustrative Sketch of Metal Apron with Trash Guard Installed

is shown below to be furnished and installed as part of Trash Guard Unit. The cost of all assemblies, installing, bolting, washers, rivets, painting, labor and equipment necessary shall be included for payment in bid price \$5, Trash Guards.

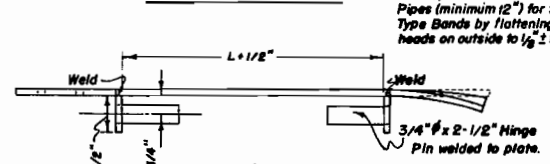
TABLE OF DIMENSIONS

DIAM. OF SIPHON	A	B	C	D	E	F	G	H	J	K	L	P	R	S
12"	2"	14"	1"	4"	2-1/2"	15"	11"	5"	10"	2"	5"	14"	4"	1"
15"	4"	19"	1-1/2"	6"	2-3/4"	21-1/2"	14"	7"	11"	3"	7"	22"	4"	1"
18"	6"	25"	1"	10"	2-1/2"	30"	15"	11"	12"	3"	9"	26"	6-1/2"	1"
21"	7"	30"	3/4"	13"	2-1/2"	37"	21"	10"	14"	7"	10"	33"	5"	1-1/2"
24"	8"	34-1/2"	1/2"	14"	2-1/2"	39"	23"	12"	17"	6"	10"	37"	5"	1"
30"	12"	41"	1-1/4"	15"	2-1/2"	43"	27"	19"	20"	7"	18"	39"	6 1/2"	1"
36"	14"	51"	1-1/4"	21"	2-1/2"	58"	32"	23"	24"	8"	20"	54"	6"	1"
42"	19"	59"	1-1/4"	25"	2-1/2"	68"	37"	27"	28"	9"	23"	64"	5 1/8"	1-1/4"

All dimensions shown above to have 1/2"± tolerance except dimensions A & L.

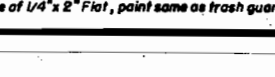
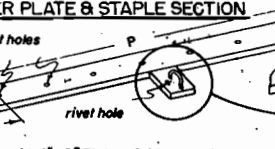
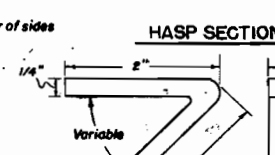
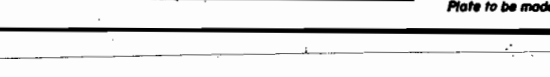
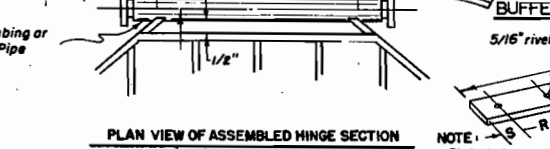
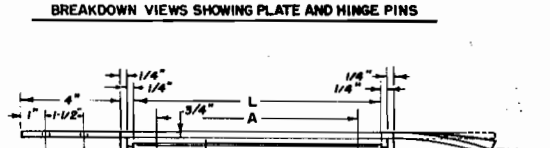
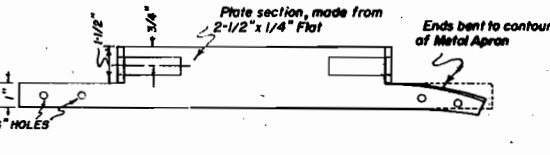
Details of Parts for Trash Guard Assembly

TRASH GUARD HINGE



NOTE: Trash Guard to be of all welded construction with hinge section and hasp attached, making one integral unit.
4 - 3/8" dia. x 1" galvanized machine bolts with flat and lock washers, to be provided for mounting Trash Guard to Apron.

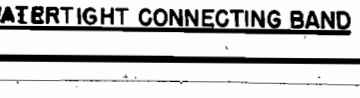
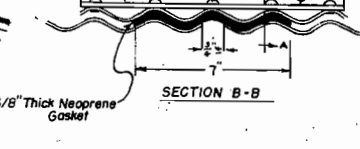
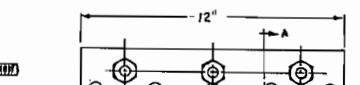
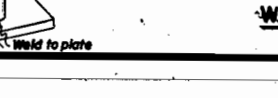
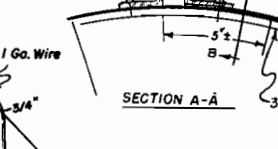
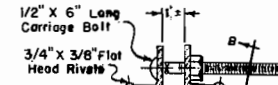
Additional Structure Backfill required when Cast Iron Valve & Valve Box is called for on plans. See Plans for quantities and Close.



Details for Installing Valve, Valve Box, Metal Drain Pipe & Metal Apron at Outlets

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.
Trash Guards, Metal Drain Pipe and Cast Iron Valve and Valve Boxes will be furnished when called for on plans.
Alternate equivalent hardware and fittings will be accepted subject to the Engineer's approval.
Siphon pipe sections shall be joined by using sewer type connecting bands, water tight connecting bands with neoprene gaskets or rolled flanges as shown.



PIPE DIA.	BOLT LENGTH	SHEET LENGTH	GASKET DIA.
8"	6"	33 1/2"	8 1/2"
10"	6"	40"	10 1/2"
12"	6"	46"	12 1/2"
15"	6"	55"	15"
18"	6"	65"	18"
21"	6"	74 1/2"	20 1/2"
24"	6"	83"	23 1/2"
30"	6"	102 1/2"	29"
36"	6"	126 1/2"	35"
42"	6"	150 1/2"	40 1/2"
48"	6"	180 1/2"	48"
54"	6"	210 1/2"	54"
60"	6"	240 1/2"	60"
66"	6"	270 1/2"	66"
72"	6"	300 1/2"	72"
78"	6"	330 1/2"	78"
84"	6"	360 1/2"	84"

COLORADO DEPARTMENT OF HIGHWAYS

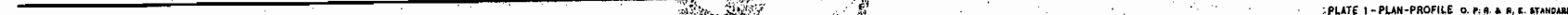
Standard C.M.P. Siphon with Metal Aprons for Inlets & Outlets

Designed by T.C.V.
Made by C.G.M.
Checked by M.R.H.

Approved by J.M. McLaughlin
Engineer, Surveys & Plans
Date: Sept. 18, 1950

Soil data shown on the Plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense, stable embankments.

LEGEND—
Water Meter
Mail Box
Fire Hydrant
Manhole
Sign
Light Pole
Catch Basin
Water Shutoff



24"x416" R.C.P. Sewer, Lt.

STREET

FOURTH

20+05 ~ Adjust
Manhole Ring & Cover, Lt.

- LEGEND-
- Water Meter Box
 - Mail Box
 - Fire Hydrant
 - Manhole
 - Sign
 - Light Pole
 - Catch Basin
 - Traffic Control
 - Water Shutoff

20+23 ~ Reg'd. Curb Type
Conc. Inlet, Lt. & Rt. (H=4' Lt.)
(H=4' Rt.) (Details on Sheet
No. 8) # 8"x36" C.P.S. Lt. &
8"x58" C.P.S. Rt. Connections
to Manhole Lt. of Sta 20+02.
Remove Catch Basin, Lt.

24+22 ~ Adjust
Manhole Ring & Cover, Lt.
24+35 ~ Remove
Catch Basin, Lt.
24+83 ~ Reg'd. Manhole, Lt.

24+ ~ Remove & Reset Traffic
Control Devices (State Forces).

STREET

FIFTH

24+83 to 29+64 ~ Reg'd.
24"x476" R.C.P. Sewer, Lt.
25+07 ~ Adjust Manhole
Ring & Cover, Lt.

25+12 ~ Reg'd. Curb Type
Conc. Inlet, Lt. & Rt. (H=4' Lt.)
(H=4' Rt.) (Details on Sheet
No. 8) # 8"x42" C.P.S. Lt. &
8"x64" C.P.S. Rt. Connections
to Manhole Lt. of Sta 24+83.
Remove Catch Basin, Lt.



MARTINS
MORTUARY

Public Service Co.

29+64 ~ Reg'd. Manhole, Lt.

STREET

SIXTH

29+64 to 34+78 ~ Reg'd.
24"x509" R.C.P. Sewer, Lt.

29+84 ~ Reg'd. Curb
Type Conc. Inlet, Lt. (H=4')
(Details on Sheet No. 8)
8"x44" C.P.S. Connection
to Manhole Lt. of Sta 29+64.

29+88 ~ Reg'd. Curb Type
Conc. Inlet, Rt. (H=4') (Details
on Sheet No. 8) # 8"x56" C.P.S.
Connection to Manhole Lt.
of Sta. 29+64.

FLEET SERVICE

FLEET SERVICE

Motel Units

COLORADO
MOTEL

Motel Units

STANDARD
STATION

34+30 ~ Reg'd. Curb
Type Conc. Inlet, Lt.
(H=4') (Details on Sheet
No. 8) # 8"x44" C.P.S.
Connection to Manhole
Lt. of Sta. 34+55.
Remove Catch Basin, Lt.

34+ ~ Remove & Reset Traffic
Control Devices (State Forces).

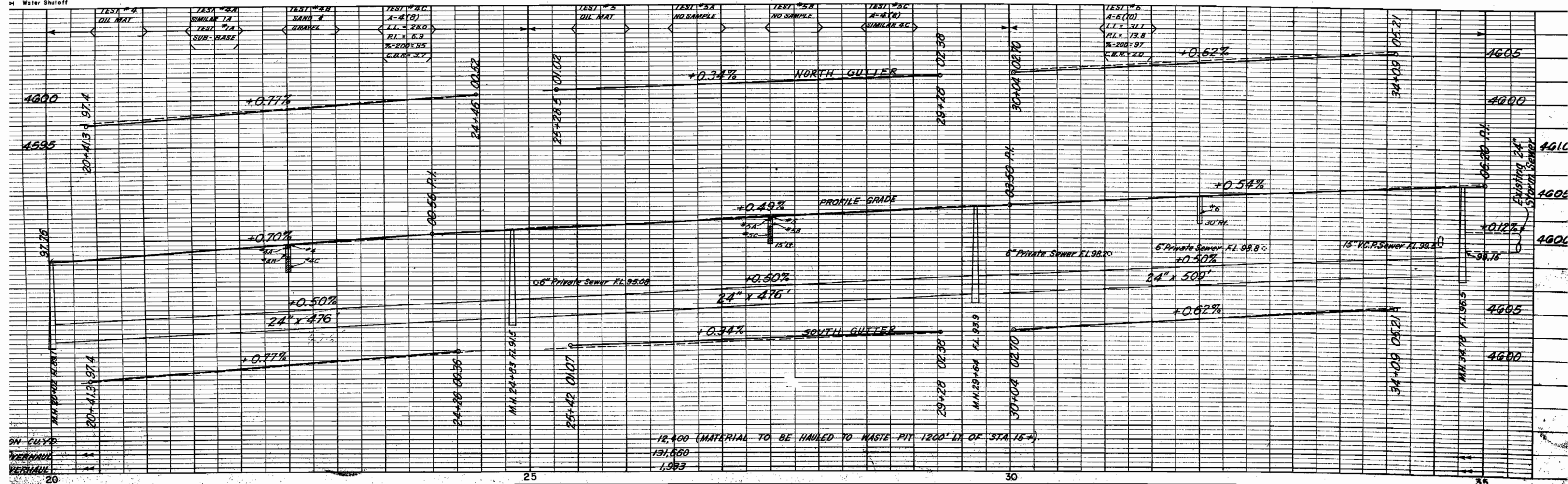
STREET

SEVENTH

34+88 ~ Reg'd. Curb Type
Conc. Inlet, Rt. (H=4')
(Details on Sheet No. 8)
8"x52" C.P.S. Connection
to Manhole, Sta. 34+55.

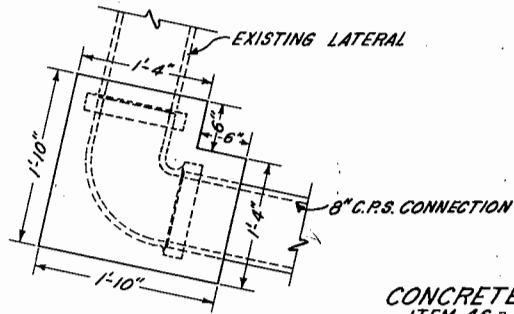
35+00 ~ Reg'd. Curb Type Conc. Inlet, Lt.
(H=4') (Details on Sheet No. 8) # 8"x32"
C.P.S. Connection to Manhole Lt. of Sta. 34+78.
Remove Catch Basin, Lt.

FED. ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	U 001-1 (14)	20	



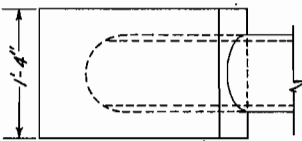
FED. ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	U 001-1 (14)	21	

DETAIL OF CONCRETE COLLAR
RT. OF STA. 39+54



CONCRETE
ITEM 46a
0.12 Cu. Yd.

TOP VIEW



NOTE: 1-90° elbow
to be included in
price bid for
Item 132 cc.

SIDE VIEW

