FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) UNIT 2 UI 002-2(8) SEC. 2, 2ND CONTRACT UI 002-2(17) UNIT 3	1	

2.020802

2020802

INDEX OF SHEETS

COLORADO
DEPARTMENT OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED
COMBINED FEDERAL AID PROJECT NUMBER
UI 002-2(23) UNIT 2
UI 002-2(8) SEC. 2, 2ND CONTRACT
UI 002-2(17) UNIT 3

STATE HIGHWAY NO. 185
CITY AND COUNTY OF DENVER

SCALES OF ORIGINAL TRACINGS
ON PLAN 1" = 100'
ON PROFILE 1" = 100' HORIZONTAL
ON PROFILE 1" = 10' VERTICAL

		(23) UNIT 2	(8) SECT 2 SEC CONT.	(17) UNIT 3	TOTALS
GROSS LENGTH OF PROJECT	LIN. FT.	3,490.0	3,585.73	3,440.31	10,516.04
	MILES	0.661	0.679	0.652	1.992
NET LENGTH OF PROJECT	LIN. FT.	832.5	3,585.73	3,052.39	7,470.62
	MILES	0.158	0.679	0.578	1.415

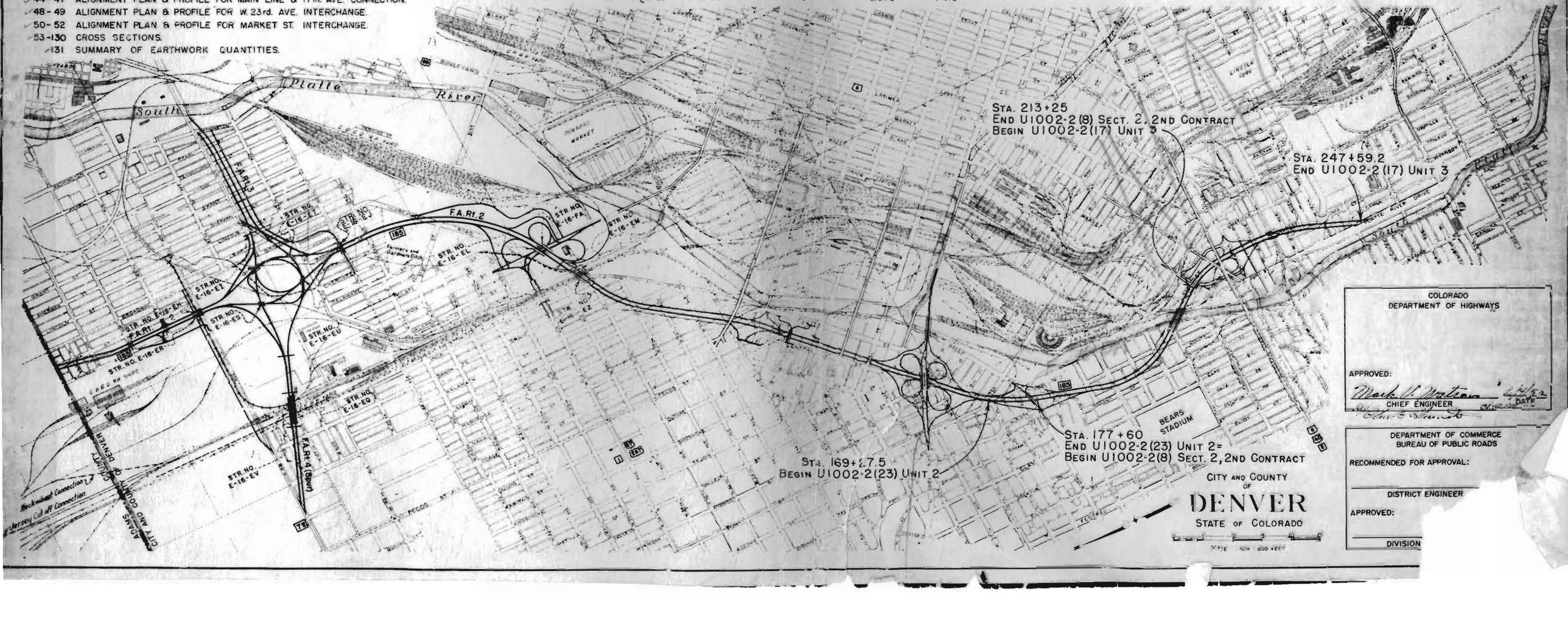
CONVENTIONAL SIGNS

	PLAN SHEET	TITLE SHEET
CENTER LINE OF SURVEY	120	
RIGHT OF WAY LINE		
SECTION LINE		
ONE-QUARTER SECTION LINE		
ONE-SIXTEENTH SECTION LINE		
PROPERTY LINES & TRACTS		
CITY LIMITS LINE		
RAILROAD TRACKS (E)		

NOTICE TO BIDDERS:

It is recommended that bidders on this project go over the plan details with one of the following field representatives of this Department:

D.W. Ormsbee, Urban Engineer, Denver
F. K. Merten, Construction Engineer, Denver
W.B. White, Resident Engineer, Denver



COLORADO
DEPARTMENT OF HIGHWAYS

APPROVED:

Mark W. Watson 4/23/53
CHIEF ENGINEER DATE

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL:

DISTRICT ENGINEER

APPROVED:

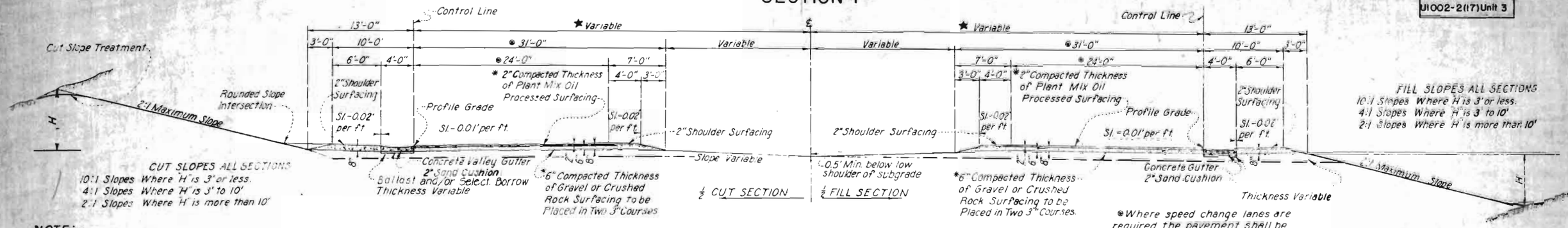
DIVISION

FED. ROAD DIST. NO.	STATE	PROJ. No.	SHEET NO.	TOTAL SHEETS
8	COLO.	UI 002-2(23) Unit 2	2	
		UI 002-2(8) Sect. 2 Sec. Contr.		
		UI 002-2(17) Unit 3		

NOTE:
See Standard M-2-DM for details of cut slope treatment, flaring and widening for guard fence.

TYPICAL SECTIONS

SECTION 1



CUT SLOPES ALL SECTIONS
10:1 Slopes Where 'H' is 3' or less.
4:1 Slopes Where 'H' is 3' to 10'
2:1 Slopes Where 'H' is more than 10'

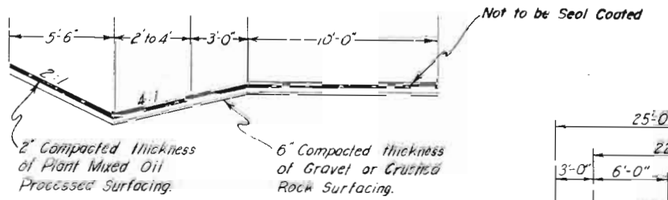
FILL SLOPES ALL SECTIONS
10:1 Slopes Where H is 3' or less.
4:1 Slopes Where H is 3' to 10'
2:1 Slopes Where H is more than 10'

Where speed change lanes are required the pavement shall be widened 10' outside of control line. Concrete gutter and shoulder to be constructed in same relation to either widened or standard pavement.

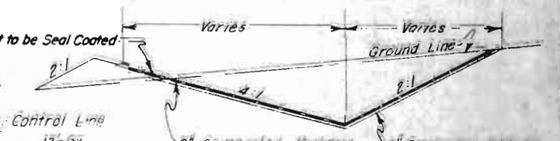
NOTE:
The upper portion of subgrade is to be constructed of Ballast Material and / or Selected Borrow at locations designated in Tabulation of Surfacing. Estimated quantities involved in this operation and thickness of material required are tabulated on sheet no. 12.
Thickness shown is subject to change during construction.

Excavation or Borrow below 4:1 slope and/or 10:1 slope will not be permitted

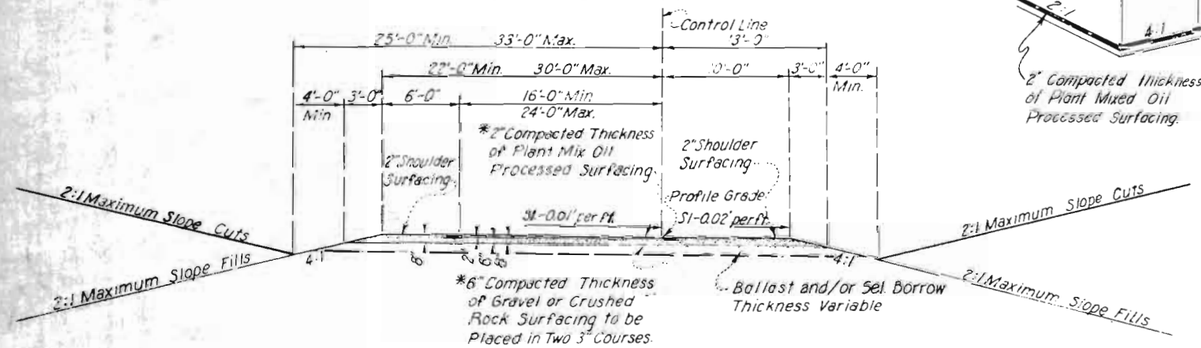
TYPICAL SECTION FOR ROADWAY DITCH PAVING



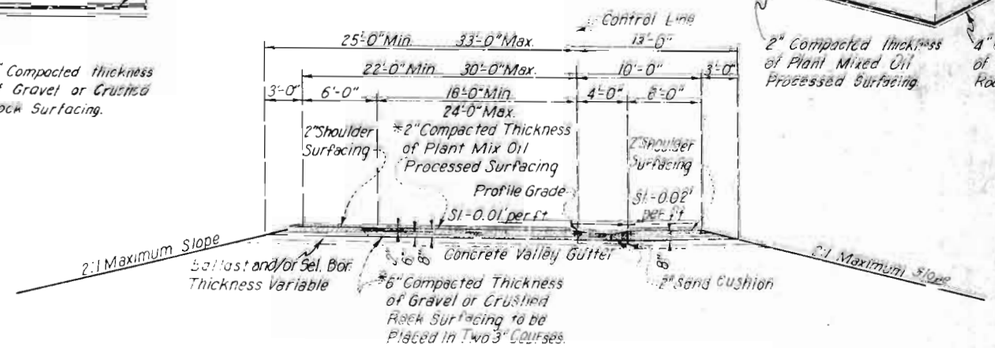
TYPICAL SECTION—INTERCEPTING DITCHES



SECTION 2-A

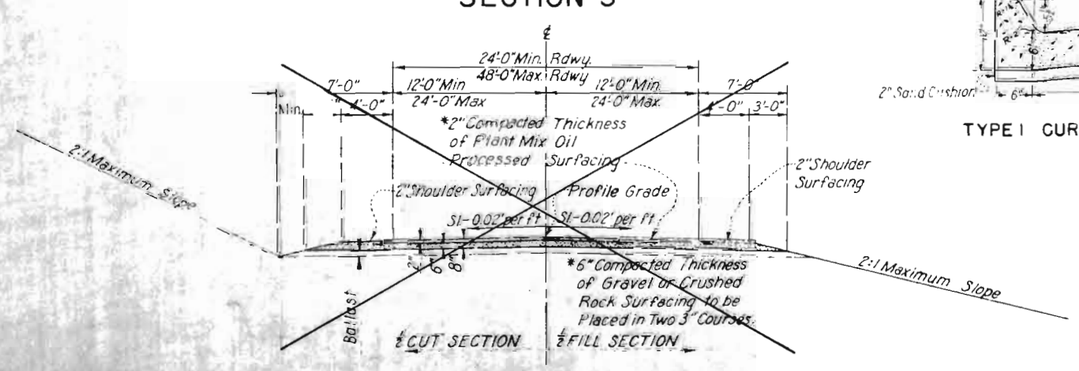


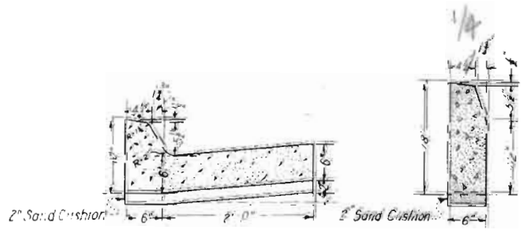
SECTION 2-B

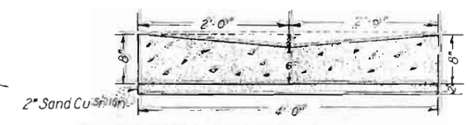


NOTE: *Concrete Pavement will be required in some locations. For locations and details see Sheets No. 12 and 32.*

SECTION 3

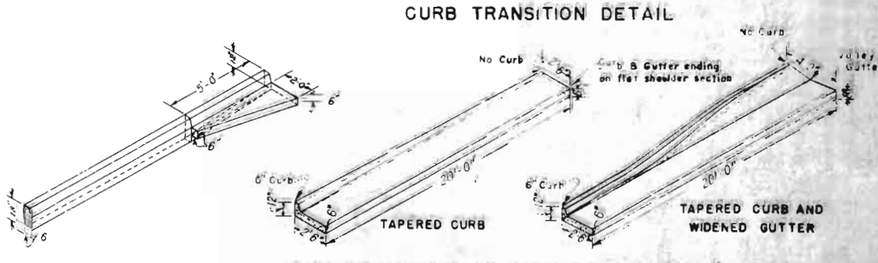






DETAIL OF CONCRETE GUTTER

CURB TRANSITION DETAIL



Curbs shall not end abruptly but shall be tapered to Zero height over a distance of 20 ft. as shown above.

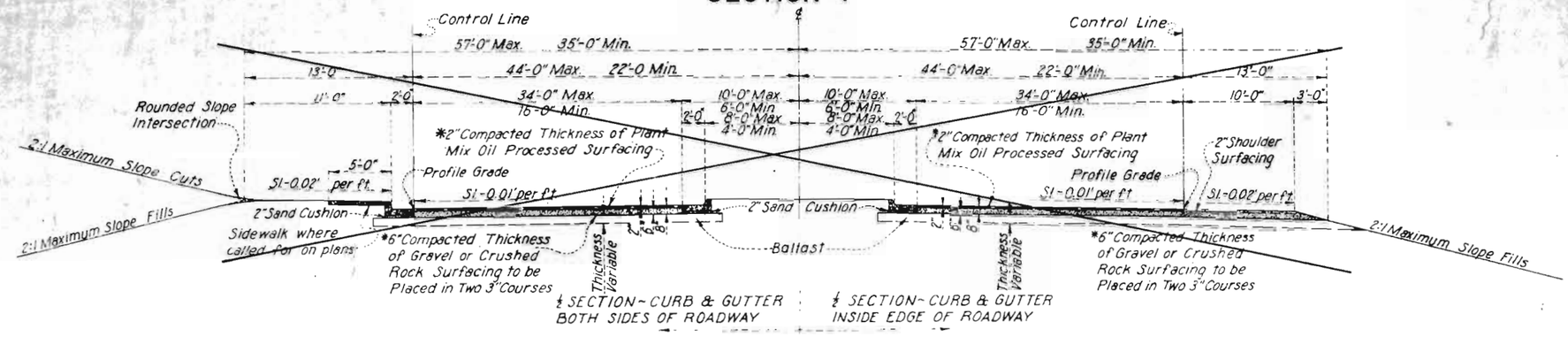
On High Side of Superelevated Curves the Gutter shall have the same slope as the Pavement.

All Transitions are to be included and paid for as Concrete Combination Curb and Gutter.

FED. ROAD DIV. NO.	STATE	PROJ. No.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2	3	
		UI 002-2(8) Sect. 2, 2nd Contr.		
		UI 002-2(17) Unit 3		

TYPICAL SECTIONS

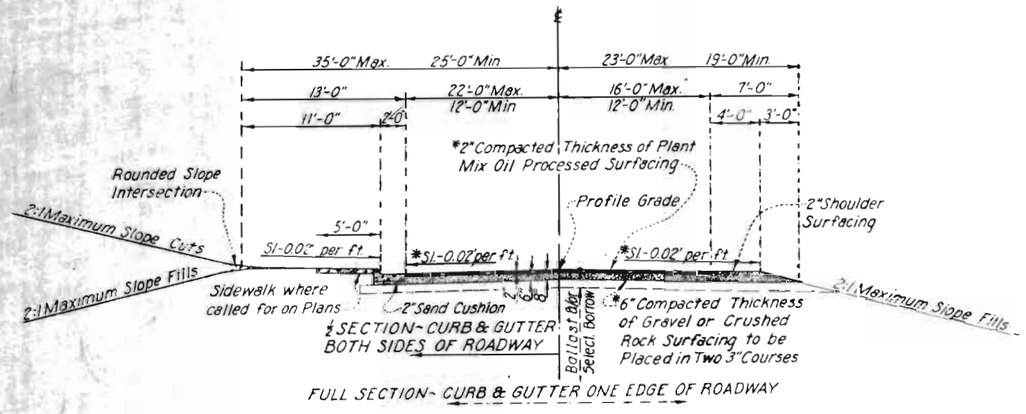
SECTION 4



CUT SLOPES ALL SECTIONS
10:1 Slopes Where "H" is 3' or less.
4:1 Slopes Where "H" is 3' to 10'
2:1 Slopes Where "H" is more than 10'

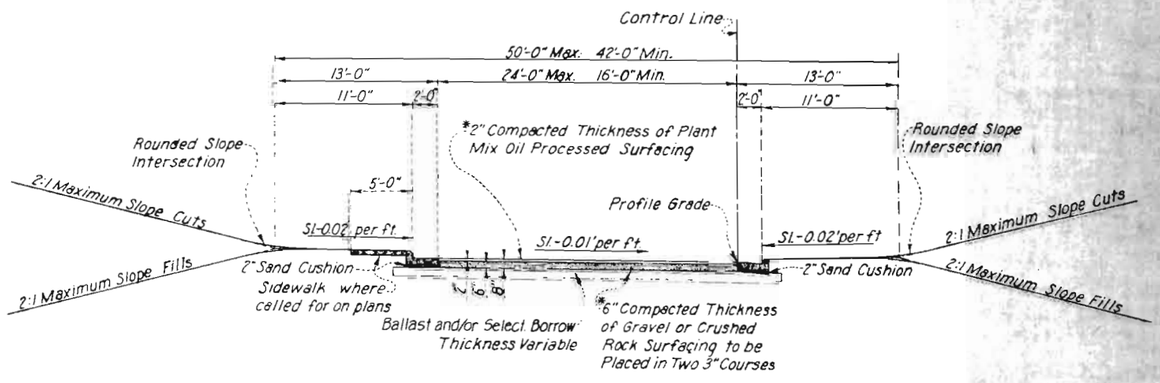
FILL SLOPES ALL SECTIONS
10:1 Slopes Where "H" is 3' or less.
4:1 Slopes Where "H" is 3' to 10'
2:1 Slopes Where "H" is more than 10'

SECTION 5



*Any change in the crown to meet existing streets shall take place gradually over sufficient distance to provide a smooth riding connection.

SECTION 6



TABULATION OF SECTIONS				
TYPICAL SECT. NO.	LOCATION	STA. TO STA.	PAVEMENT WIDTH	REMARKS
1	Main Highway	169+27.5 to 247+59.2	2 at 24'	98' Min. distance between control lines
2A&2B	West 23rd Avenue Interchange		See Plans	
5	West 23rd Avenue		32'	Curb & Gutter both sides
6	23rd Avenue Interchange		See Plans	Connection from 23rd ave. and/or Water st. to ramps

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department adopted January 1, 1948.

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

All concrete used on this project shall be "Air Entrained Concrete".

Payment for overhaul will be based on measurement along the centerline of the project.

All curves are to be superelevated and widened as provided by the Standard Superelevation sheet included with the plans.

At Bridge Approaches, the Prime Coat, Oil Mat, Seal Coat and Stone Screenings shall be widened to meet the curbed width of the bridge and shall take place gradually over a distance of 300', each way from the Bridge ends.

For preliminary plan quantities of asphaltic road materials, plant mixed oil processed surfacing, asphalt & stone screenings the following rates of application were used:

Prime Coat (over concrete) RC	at	.15 gal. per sq.yd.
Prime Coat (over other areas) MC	at	.40 gal. per sq.yd.
Plant Mixed Oil Processed Surfacing	at	108 lbs. per sq.yd. per 1" thickness
Asphalt (120-150 Penetration)	at	6.5 lbs. per sq.yd. per 1" thickness
Seal Coat RC	at	.25 gal. per sq.yd.
Stone Screenings (Type 2)	at	25 lbs. per sq.yd.

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

The Prime Coat, Oil Mat, Seal Coat and Stone Screenings shall be placed over the curbed width of the bridges at sta. 176 + and sta. 204+ to sta. 209+.

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	ROADWAY UI002-2(23) UNIT NO. 2	BRIDGE 23rd. AVE.	ROADWAY UI 002-2(8) SECT. 2 2ND. CONTR.	BRIDGE PLATTE RIVER	ROADWAY UI002-2(17) UNIT NO. 3	PROJECT TOTALS
10a	Clearing and Grubbing entire Project	Lump Sum	●		●		●	●
11n(1)	Raise Manhole Ring and Cover – 1 ft.	Each	2					2
11n(2)	Raise Manhole Ring and Cover – 2 ft.	Each	1					1
11n(7)	Raise Manhole Ring and Cover – 7 ft.	Each			1			1
11n(11)	Raise Manhole Ring and Cover – 11 ft.	Each			1			1
11x	Removal of Obstructions	Lump Sum	●		●		●	●
13c	Unclassified Excavation	Cu.Yd.	262,650		93,350			356,000
13d	Unclassified Ditch Excavation	Cu.Yd.	500		100			600
13x	Selected Borrow	Cu.Yd.	4,200		5,800			10,000
14a	Dry Rock Excavation (Str.)	Cu.Yd.	190	20				210
14b	Dry Common Excavation (Str.)	Cu.Yd.	285	305				590
14c	Wet Rock Excavation (Str.)	Cu.Yd.	190	90				280
14d	Wet Common Excavation (Str.)	Cu.Yd.	285	15				300
16a	Structure Backfill (Class 1)	Cu.Yd.	400	290				690
16d	Mechanical Tamping	Hour	40	30				70
17ax	Rolling with Tamping Roller (2 unit)	Hour	20		220		860	1,100
17ay	Rolling with Tamping Roller (4 unit)	Hour	10		55		215	280
17b	Rolling with Flat Wheeled Roller	Hour	100	1	150	3	26	280
17c	Rolling with Rubber Tired Roller	Hour	110	5	150	5	30	300
17dx	Furnishing Tamping Roller (2 unit)	Each	0.1		0.2		0.7	1
17dy	Furnishing Tamping Roller (4 unit)	Each	0.1		0.2		0.7	1
17e	Furnishing Flat Wheeled Roller	Each	0.3	0.05	0.5	0.05	0.1	1
17f	Furnishing Rubber Tired Roller	Each	0.3	0.05	0.5	0.05	0.1	1
17g	Wetting	M Gal.	765		2,620		6,665	10,050
18a	Station Yard Overhaul	Sta. Yd.	46,500		568,500		3,023,000	3,638,000
18b	Yard Mile Overhaul	Yd. Mi.	2,200		3,800		217,600	223,600
19a	Placing Topsoil	Cu. Yd.	2,650		5,350			8,000
23a	Ballast (Class 1)	Ton	20,700		32,670		3,630	57,000
26b	Gravel or Crushed Rock Surfacing (Grading B)	Ton	8,775		13,450		1,475	23,700
29c	Asphalt (120-150 Penetration)	Ton	155	10	175	20		360
30x	Asphaltic Road Material MC (Prime)	Gal.	6,575		12,100		1,625	20,300
30y	Asphaltic Road Material RC	Gal.	5,400	400	6,200	1,100		13,100
31d	Stone Screenings (Type 2)	Ton	220	15	305	40		580
32a	Plant Mixed Oil Processed Surfacing	Ton	1,900	100	2,615	295		4,910
32y	Plant Mixed Oil Processed Ditch Paving	Sq Yd	3,850		80			3,930
37a	Concrete Pavement	Sq. Yd.	5,370		480			5,850
37c	Sand Cushion	Cu. Yd.	410		170			580
46a	Class "A" Concrete	Cu. Yd	325	1,075				1,400
47x	Reinforcing Steel – Transport and Place	Lb.	45,800	221,500				267,300
61x	Steel Piling – Transporting and Driving	Lin.Ft.		626				626
75c	Metal Plate Guard Fence (Beam Type)	Lin.Ft.			168			168
76f	Combination Wire Fence With Metal Posts	Lin.Ft.	650		2,750			3,400
78a	Chain Link Wire Mesh Fence	Lin.Ft.	1,080		2,200			3,280
84a	Concrete Curb	Lin.Ft.	120		1,195			1,315
84b	Concrete Gutter	Lin.Ft.	1,295		4,145			5,440
84c	Concrete Combination Curb and Gutter	Lin.Ft.	2,243		1,340			3,583
90b	Electrical Conduit with Junction Boxes	Lin.Ft.		275				275
91x	Steel Railing – Transport and Place	Lin.Ft.		507				507
92	Timber Guard Posts	Each	30		30			60
101a	3" Gate Valve and Valve Box	Each	5		20			25
101xa	3" Galvanized Iron Water Pipe	Lin.Ft.	12		63			75
102a	3" Cast Iron Water Pipe	Lin.Ft.	514		1,536			2,050
102b	6" Cast Iron Water Pipe	Lin.Ft.	902		2,577			3,479
130a(3)	Drop Inlets (Type 1) 3 ft. Deep	Each	1		1			2
130a(4)	Drop Inlets (Type 1) 4 ft. Deep	Each			1			1
130a(5)	Drop Inlets (Type 1) 5 ft. Deep	Each			1			1
130a(6)	Drop Inlets (Type 1) 6 ft. Deep	Each			1			1
130b(2)	Drop Inlets (Type 1A) 2 ft. Deep	Each	1		1			2
130b(3)	Drop Inlets (Type 1A) 3 ft. Deep	Each	1		4			5
130b(4)	Drop Inlets (Type 1A) 4 ft. Deep	Each			3			3
130b(5)	Drop Inlets (Type 1A) 5 ft. Deep	Each			2			2
130b(14)	Drop Inlets (Type 1A) 14 ft. Deep	Each			1			1
130c(3)	Drop Inlets (Type 1B) 3 ft. Deep	Each			1			1
130c(4)	Drop Inlets (Type 1B) 4 ft. Deep	Each	2					2
130e(2)	Drop Inlets (Type 2) 2 ft. Deep	Each			2			2
130e(3)	Drop Inlets (Type 2) 3 ft. Deep	Each	1		1			2
130e(4)	Drop Inlets (Type 2) 4 ft. Deep	Each			2			2
130e(5)	Drop Inlets (Type 2) 5 ft. Deep	Each			1			1
130f(3)	Drop Inlets (Type 2A) 3 ft. Deep	Each	1					1
130f(7)	Drop Inlets (Type 2A) 7 ft. Deep	Each	1					1
*132ca	12" Reinforced Concrete Pipe Storm Sewer (3' to 12' deep)	Lin.Ft.	781		1,320			2,101
*132cb	15" Reinforced Concrete Pipe Storm Sewer (3' to 16' deep)	Lin.Ft.			450			450
*132cc	18" Reinforced Concrete Pipe Storm Sewer (7' to 12' deep)	Lin.Ft.	560		170			730
*132cd	24" Reinforced Concrete Pipe Storm Sewer (3' to 16' deep)	Lin.Ft.			130			130
*132ce	27" Reinforced Concrete Pipe Storm Sewer (6' to 15' deep)	Lin.Ft.			188			188
*132cf▲	36" Reinforced Concrete Pipe Storm Sewer (8' to 10' deep)	Lin.Ft.	194					194
132ma(6)	Manholes (Type 1) 6 ft. Deep	Each			1			1
132ma(7)	Manholes (Type 1) 7 ft. Deep	Each	1		1			2
132ma(9)	Manholes (Type 1) 9 ft. Deep	Each			1			1
132ma(11)	Manholes (Type 1) 11 ft. Deep	Each	3		1			4
132ma(12)	Manholes (Type 1) 12 ft. Deep	Each	1					1
132ma(21)	Manholes (Type 1) 21 ft. Deep	Each	1					1
132mb(8)	Manholes (Type 1A) 8 ft. Deep	Each	1					1
132mc(11)	Manholes (Type 2) 11 ft. Deep	Each	1					1
132mc(18)	Manholes (Type 2) 18 ft. Deep	Each	1					1
132mc(24)	Manholes (Type 2) 24 ft. Deep	Each	1					1
132me(10)	Manholes (Type 5A) 10 ft. Deep	Each	1					1
132mf(10)	Manholes (Type 5B) 10 ft. Deep	Each	1					1
132mf(11)	Manholes (Type 5B) 11 ft. Deep	Each	1					1
132mf(15)	Manholes (Type 5B) 15 ft. Deep	Each	1					1
132mx(23)	Manholes (Comb. of Types 2 and 1A) 23 ft. Deep	Each	1					1
132va	8" Vitrified Pipe Sanitary Sewer (12' deep)	Lin.Ft.	26					26
132vb	12" Vitrified Pipe Sanitary Sewer (9' to 24' deep)	Lin.Ft.	484		300			784
132vc	15" Vitrified Pipe Sanitary Sewer (10' to 38' deep)	Lin.Ft.	1,068					1,068
140	Fireproof Steel Doors	Each		2				2
	STATE FURNISHED MATERIAL							
47	Reinforcing Steel	Lb	47,400	221,500	4,300			273,200
61a	Steel Piling	Lin.Ft.		626				626
91d	Steel Railing	Lin.Ft.		507				507
	30' Poles	Each	25		55			80
	35' Poles	Each	4		4			8
	16,000 L. Mercury Vapor Luminaires	Each	29		59			88
	4,000 L. Incandescent Luminaires	Each	2					2
	FORCE ACCOUNT							
	Rolling Dump Area	Lump Sum	●		●			●
	Relocating R.R. Spur (Work by D&I.M. Forces)	Lump Sum					●	●

* Depth of Trench is shown for information only

▲ Special Radius

FED. ROAD DIV. NO.	DISTRICT	PROJECT NUMBER			SHEET NO.	TOTAL SHEETS
9	COLORADO	UI 002-2(8) SECT. 2 - 2ND CONTR.	UI 002-2(17) UNIT NO. 3	UI 002-2(23) UNIT NO. 2	4	

Rev. 7-28-52, State Furnished Material, J.C.R.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.		SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2	UI 002-2(17) Unit 3	5	
		UI 002-2(8) Sect. 2 2nd. Contract			

STORM SEWERS

NUMBER	LOCATION	TYPE: INLET	TYPE: MAN-HOLE	TYPE: OUTLET	INVERT ELEVATION	RIM ELEVATION	DEPTH	SIZE OF PIPE LIN. FT. 12"	15"	18"	24"	27"	36"	6'X4' CONC. BOX	DEPTH OF TRENCH – SHOWN FOR INFORMATION ONLY 3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	22'	24'	26'	MISCELLANEOUS
60	7th St. & Water	In place			5187.6	5197.0								310									22	22	22	22	24	24	18	20	24	46	40	26	
61	21' Lt. 169+97 E. Line		5B		5190.5	5201.0	10.5							170									85	85											
62	22' Rt. 12+55 SW-1		5B		5193.0	5207.8	14.8							56									13	43											
63	82' Rt. 12+20 SW-1		5B		5220.2	5230.0	9.8																											
63-A	118' Rt. 12+00 SW-1		5A		5225.0	5234.5	9.5							60							40	20													ϕ36" Reinf. Conc. Pipe Storm Sewer 100' Radius.
64	140' Rt. 14+20 SW-1		1A		5227.3	5235.0	7.7						194							*52	*70	*72													*36" Reinf. Conc. Pipe Storm Sewer 30' Radius.
1	124' Rt. 13+37 NW-1	1B			5231.0	5235.0	4.0	16								16																			Tap in new line
2	90' Rt. 13+38 NW-1	1B			5231.0	5235.0	4.0	15								15																			
3	See M.H. No. 64				5227.3	5235.0																													
3 to 4										60										60															
4	102' Rt. 14+68 NW-1		1		5227.6	5235.0	7.4			240										240															
5	88' Rt. 16+98 NW-1	2A			5228.2	5235.0	6.8			260									110	8	10	10	12	110											
6	100' Rt. 19+60 NW-1		1		5229.1	5240.0	10.9																											
7 to 61								198							30	35	35	35	15	15	15	18													
7	17' Rt. 2+59 NE-1	2A			5191.8	5194.8	3.0	46								46																			
8	33' Lt. 2+50 NE-1	1A			5193.0	5196.0	3.0																												
9	Centerline 27+00 23rd Water Line	M.H. in place			5191.7																														Two taps in M.H. Rim raised 1.0 ±
10	Delete																																		
9 to 11								242								60	54	48	60	20															
11	3' Rt. 174+42 E Line	2			5192.4	5195.0	2.6	52							52																				
12	49' Rt. 174+42 E Line	1A			5192.6	5194.6	2.0	52							52																				
13	3' Rt. 174+42 W Line	1			5194.4	5197.4	3.0																												
14	7' Lt. 28+68 23rd Avenue	M.H. in place						130								10	25	20	25	20	25	5													Rim raised 1.9 ±
15	E. End 23rd Ave. Underpass							30								30																			
16	E. End 23rd Ave. Underpass																	5	4	4	4	4													
17	160' Rt. 2+76 SE-1	M.H. in place			5182.0	5193.0						140						9	9	9	9	4	18	23	28	25	25								Tap in M.H.
18	17' Rt. 2+90 SE-1	1A			5184.2	5188.8	4.6					48					8	30	30	30	30														
19	36' Rt. 3+00 SE-1		1		5185.0	5193.9	8.9		168							18	30	30	30	30															
20	3' Rt. 178+25 E. Line	2			5187.8	5191.8	4.0		52							52																			
21	49' Rt. 178+25 E. Line	1A			5188.3	5190.8	2.5	52							52																				
22	3' Rt. 178+74 W. Line	1			5191.3	5193.8	2.5																												
19 to 23											130							130																	
23	12' Rt. 179+95 W. Line		1		5187.0	5194.0	7.0		230						25	10	10	10	15	5	5	5	5	35	25	20	40	20							
24	170' Rt. 178+26 W. Line	M.H. in place			5215.9	5241.0	24.1																												Tap in M.H.
24-A	17' Lt. 34+60± 23rd Ave.	1B			5225.2	5228.0	2.5																												Set over Outlet Line of Pres. Inlet
23 to 25								205									135	70																	
25	3' Rt. 182+00 W. Line	1			5189.7	5195.2	5.5	60									60																		
25-A	49' Rt. 182+24 W. Line	1A			5190.5	5192.5	2.0																												
23 to 26								124									60	51	13																
26	40' Lt. 3+00 SW-1		1		5203.0	5209.0	6.0	58									37	21																	
27	18' Rt. 3+00 SW-1	1A			5205.0	5210.2	5.0	60								44	16																		
28	76' Rt. 2+93 SW-1		1		5226.5	5237.0	10.5	36								36																			
28-A	104' Rt. 2+66 SW-1	1A			5232.5	5236.0	3.5																												
29 to 31								45									18	3	3	3	18														
29	46' Lt. 185+80 E. Line		Manhole in Place														52																		Rim Raised 7.0' ±.
31	3' Lt. 186+00 E. Line	1			5190.8	5195.8	5.0	52																											
31-A	3' Rt. 14+00 W. 17th. Ave. Conn.	2			5185.7	5188.7	3.0			170																									
32	49' Rt. 186+00 E. Line	1A			5191.4	5194.4	3.0																												
35	28' Lt. 190+62 E. Line				5181.4	5197.0	15.6	30									30																		Tap existing line
36	3' Lt. 190+75 E. Line	2			5193.9	5198.4	4.5	52									52																		
37	49' Rt. 190+75 E. Line	1A			5194.8	5197.8	3.0															22													Tap existing line
38	20' Lt. 195+10 E. Line				5182.1	5198.0	15.9	22																											
39	3' Lt. 195+10 E. Line	2			5196.3	5200.3	4.0	52								26	26																		
39-A	3' Lt. 2+23 Y Conn.	2			5197.4	5199.4	2.0	10																											
40	49' Rt. 195+10 E. Line	1A			5196.6	5200.1	3.5																												
40-A	60' Rt. 196+20 W. Line	1A			5182.3	5195.8	13.5	40																											
41	3' Lt. 199+85 E. Line	1			5201.5	5205.0	3.5	36								36																			
41-A	3' Rt. 5+60 W. 17th. Ave. Conn.	2			5193.9	5195.9	2.0	10																											
42	49' Rt. 199+85 E. Line	1A			5202.0	5205.0	3.0	52								52																			End pipe 8' Outside Toe - Conc. Apron
43	See 62				5193.0	5207.0																													
43 to 44								248								25	25	25	25	25	25	25	25	48											
44	17' Rt. 15+00 NW-1	1A			5196.8	5200.8	4.0	76								76																			Equals No. 60
45	300' Lt. 171+50 E. Line	In Place			5187.6	5197.0																													
	NOTE: Structural Excavation is estimated to be 60% Common and 40% Rock, each of which is estimated to be 50% Dry and 50% Wet.																																		
								2101	460	730	130	188	194	596																							

FEDERAL HIGHWAY DIVISION NO.	DISTRICT	PROJ. NO.		SHEET NO.	TOTAL SHEETS
9	COLO	UI 002-2(23) Unit 2	UI 002-2(23) Unit 2	6	
		UI 002-2(8) Sect. 2 2nd. Contract			

SANITARY SEWERS

NUMBER	LOCATION	TYPE: INLET	TYPE: MAN-HOLE	TYPE: OUTLET	INVERT ELEVATION	RIM ELEVATION	DEPTH	SIZE OF PIPE LIN. FT. 8"	12"	15"	DEPTH OF TRENCH – SHOWN FOR INFORMATION ONLY 9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	MISCELLANEOUS
A	0+00 NE-1		In place		5185.9	5200.0																											
A to B										428								30		30		30	50	58	30	35	30	35	30	50	20		Inlet tap 1 concrete plug - inlet raise rim 1'±
B	23' Rt. 14+70 NW-1		2		*5194.5	5205.0	10.5																										
B to C										86													35	15	25	11							
C	110' Rt. 14+75 NW-1	Comb	2 & 1A		*5213.0	5236.0	23.0																										
C to D								26						26																			
D	146' Rt. 14+75 NW-1		1		5226.0	5237.0	11.0																										
C to E									230											34		126	70										
E	120' Rt. 12+30 NW-1		2		*5217.0	5235.0	18.0																										
C to F										230													230										
F	97' Rt. 16+95 NW-1		1		5214.2	5235.0	20.8																										
F to G										294													150	144									
G	100' Rt. 19+90 NW-1		2		*5216.0	5240.0	24.0			30		30																					
H	125' Rt. 20+05 NW-1				5230.0	5240.0	10.0																										M.H. in place. Tap in Manhole.
G to I									190			15		30		30		30		30		30	25										
I	16' Rt. 33+90 23rd Ave. Ctr. Line	1			5117.4	5128.0	11.6																										1 concrete plug - outlet
I to J	Rem. pres. line & relay with 12" pipe.								64		10	27		27																			1 inlet tap
J	16' Rt. 34+55 23rd Ave. Ctr. Line	1			5117.7	5129.0	11.3																										
J to K									300		28	110		162																			
N	@ 191+33 W Line				5182.3	5190.0 old	7.7																										Raise rim 10.9 ±
	TOTALS							26	784	1068																							

* Outlet elevation of Manhole – See Plan for elevation of feeder lines

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		7	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

LEGEND

SANITARY SEWERS

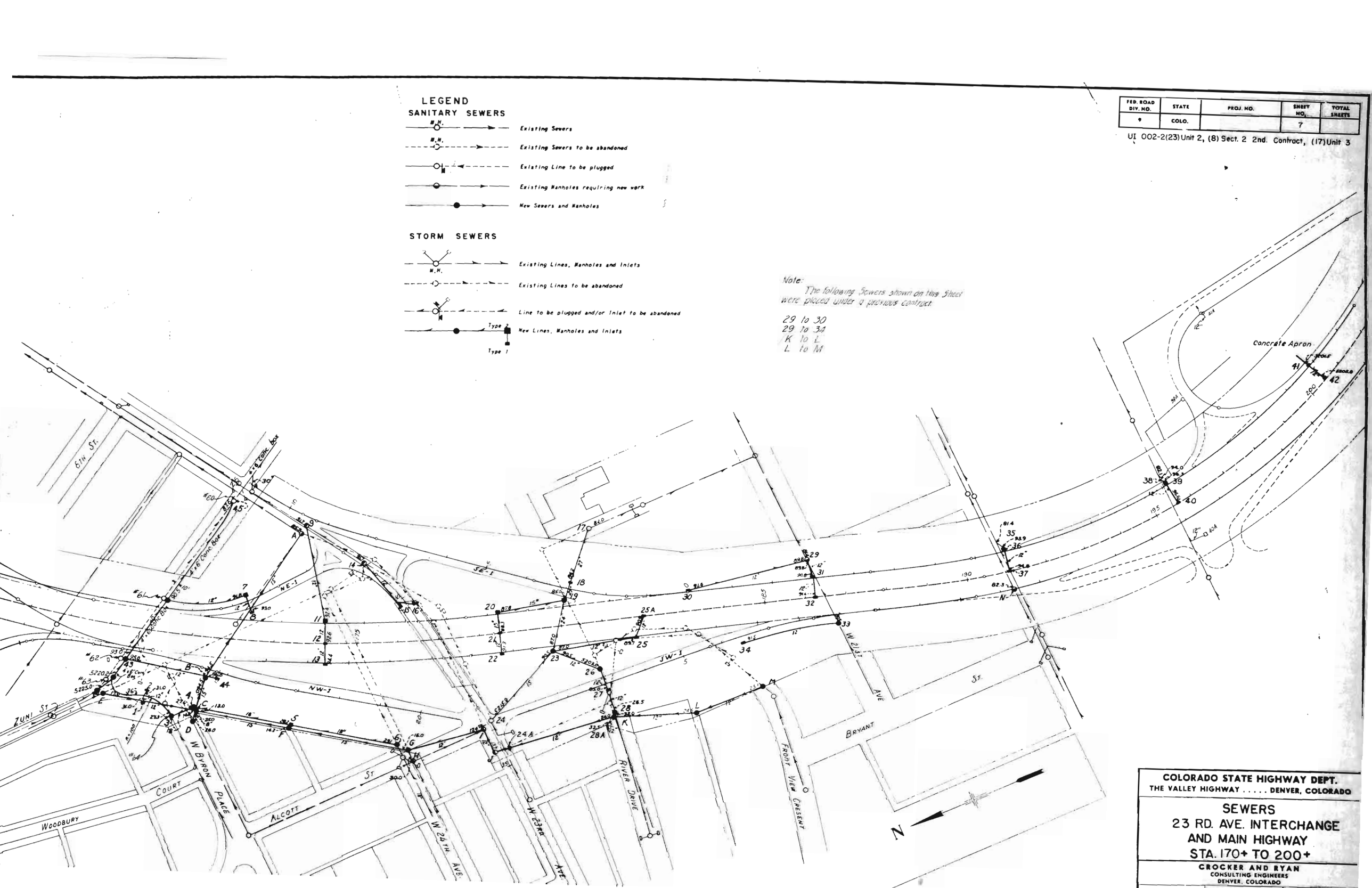
- Existing Sewers
- Existing Sewers to be abandoned
- Existing Line to be plugged
- Existing Manholes requiring new work
- New Sewers and Manholes

STORM SEWERS

- Existing Lines, Manholes and Inlets
- Existing Lines to be abandoned
- Line to be plugged and/or Inlet to be abandoned
- New Lines, Manholes and Inlets (Type 2 / Type 1)

Note:
The following Sewers shown on this sheet were placed under a previous contract

29 to 30
29 to 34
K to L
L to M



COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

SEWERS
23 RD. AVE. INTERCHANGE AND MAIN HIGHWAY
STA. 170+ TO 200+

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

Rev. 11-6-51 — Sewers & Manholes — J.C.R.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2 (17)	8	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

NOTE: No Sewers to be placed beyond Platte Arches this Contract.

LEGEND
STORM SEWERS

- Existing Lines, Manholes and Inlets
- Existing Lines to be abandoned
- Line to be plugged and/or Inlet to be abandoned
- New Lines, Manholes and Inlet. (Type 2, Type 1)

LEGEND
SANITARY SEWERS

- Existing Sewers
- Existing Sewers to be abandoned
- Existing Line to be plugged
- Existing Manholes requiring new work
- New Sewers and Manholes

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

SEWERS
MARKET ST. INTERCHANGE AND MAIN HIGHWAY STA. 200+ TO 230+

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.		SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2	UI 002-2(17) Unit 3	9	
		UI 002-2(8) Sect. 2 2nd Contract			

SPRINKLER SYSTEM

MAINS AND PRIMARY LATERALS ONLY

STATION	LOCATION	6" C.I. MAIN	3" C.I. LATERAL		3" GATE VALVE	▲ 6" METER BOX COMP.	* 3" TEE & RISER	3" G.I. PIPE	
170+38	East Line	360				1			
172+58	East Line	300	140		2		2	6	
175+58	East Line	242	138		2		2	6	
178+00	East Line	348	138		2		2	6	
181+48	East Line	310	148		2		2	6	
184+58	East Line	300	158		2		2	6	
187+58	East Line	289	138		2		2	6	
190+47	East Line	276	138		2		2	6	
193+23	East Line	282	200		2		3	9	
196+05	East Line	280	170		2		2	6	
198+85	East Line		170		2		2	6	
27+42	Survey Centerline 23rd Ave.		58		1				
27+98	" " "		56		1				
28+67	" " "		82		1				
34+35	" " "		40		1				
198+85	East Line	282							
201+67	East Line	210	138		2		2	6	
203+77	East Line		138		2		2	6	
	TOTALS	3479	2050		28	1	25	75	

* To be included in price bid for 3" C.I. Pipe

▲ All meter boxes will be furnished complete and installed by the Denver Water Department.

TIMBER GUARD POSTS

An estimated 60 Timber Guard Posts will be required on this project. Locations will be staked by the Engineer at time of construction.

TABULATION OF COMBINATION CURB AND GUTTER AND VALLEY GUTTER

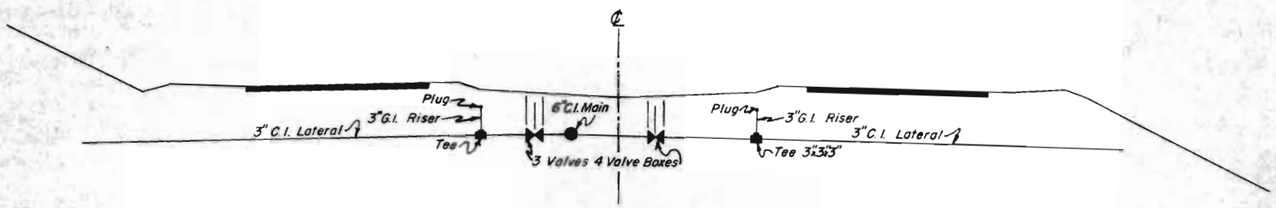
LOCATION	STATION	STATION	CURB AND GUTTER LINEAR FEET	4' VALLEY GUTTER LINEAR FEET	CURB LINEAR FEET	REMARKS
East Line	171+80	179+45		765		Flare to end of curb return
	180+85				120	Ramp approach
	182+80	196+90		1484		
	199+87.5	203+72.75		386		Ramp approach to bridge end
	Lt 195+90	198+10	490			Island
West Line	171+95				120	Ramp approach
	172+65	184+50		1185		Curb return to ramp flare
23rd Ave. and Water Street	Rt. 27+24.3		101			Water street to N.E. I ramp
	Rt. 28+00		125			Dividing island
	Rt. 29+85.6		230			N.E. I ramp to bridge end
	Lt. 25+42		222			S.E. I ramp to Water Street
	Lt. 27+31		516			Dividing island
	Lt. 32+78.5		148			Bridge end - 23rd Ave. to S.W. I
	Lt. 34+43		83			23rd Ave. to S.W. I ramp
	Rt. 32+52.9		98			Bridge end - 23rd Ave. to N.W. I ramp
N.W. I Ramp	Rt. 20+84		60			N.W. I ramp to Allcott Street
N.E. I	2+59	4+78.8		220		
W. Byron Place			660			W. Byron Place to Zuni Street
W. 17th Ave. Connection	0+00	14+00		1400		
N-19 Station opposite West Line	191+75	194+75	300			
West Line Nose with N-19	192+				50	
N-19 Station opposite West Line	191+60	194+75			325	
N-19 to S-19 Sta. opp. West Line	194+75	200+10			700	
N-19 Sta. opposite West Line	194+75	195+25	150			
S-19 Sta. opposite West Line	197+50	200+25	400			
TOTALS			3,583	5,440	1,315	

FENCING REQUIREMENTS

STATION	SIDE	METAL PLATE GUARD FENCE LIN. FT.	COMBINATION WIRE FENCE LIN. FT.	CHAIN LINK FENCE LIN. FT.
204+	MEDIAN	84		
209+	MEDIAN	84		
170+00 to 176+50	MEDIAN		650	
177+10 to 204+40	MEDIAN		2750	
SE-1 0+00 to 10+80	RIGHT			1080
178+50 to 198+00	WEST			2200
TOTAL		168	3400	3280

Rev. 7-28-52, Gas Line Added, J.C.R.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(6) Sec. 2 2nd Contract	10	
		UI 002-2(23) Unit 2		
		UI 002-2(17) Unit 3		



TYPICAL SECTION
SHOWING
PRIMARY LATERALS

To be rerouted by Public Service Company at no cost to project.

To be lowered by Water Dept. at no cost to project.

WATER ST.
8TH. ST.
7TH. ST.
W. 21ST.
S.E.-1
N.E.-1
N.W.-1
S.W.-1
W. BYRON PLACE
COURT
WOODBURY
ALCOTT
W. 24TH
RIVER DRIVE
FRONT VIEW CRESENT
BRYANT AVE
ST.

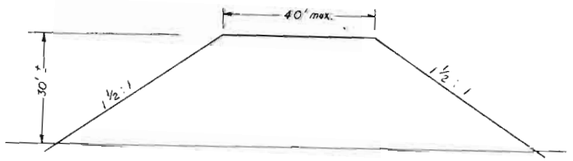
COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

SPRINKLER SYSTEM

CROCKER AND RYAN
CONSULTING ENGINEERS

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(8) Sec. 2, 2nd Contract	11	
		UI 002-2(17) Unit 3		
		UI 002-2(23) Unit 2		

Detour added Sept. 23, 1952 D.W.O.



TYPICAL SECTION

Scale 1"=20'

Note

Approximately 60,000 cu.yds. of material from the excavation between Sta. 165 and 184 is to be placed in the Colfax Viaduct detour embankment as indicated.
Embankment will be approximately 30 ft. in height.
Surface width varying from 25 ft. to 40 ft.
side slopes 1½ to 1.
Finishing of detour roadway including subbase material, surfacing, and oil mat may be required to be placed

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

SPRINKLER SYSTEM

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

TABULATION OF SURFACING

LOCATION	STA.	STA.	LENGTH	BASE COURSE GRAVEL SURF. 6" TH.		SHOULDER COURSE GRAVEL SURF. 2" TH.		BALLAST 12" TH.	PLANT MIXED OIL PROCESSED SURFACING			PRIME COAT		REMARKS
				WIDTH	TONS	WIDTH	TONS	TONS	WIDTH	SQ. YDS.	TONS	WIDTH	SQ. YDS.	
East Main Line														
	165+00	166+90.9	190.9	24	145	Var.	15	646	24	509	55.0	26	551	Approach to project
	166+90.9	170+00	309.1	37	361	11	37	1044	24	824	89.0	26	893	Beginning of ramp to end of ramp
	170+00	171+09	109.0	29.5	46	4.5	3	368	24	291	31.4	26	144	Beginning of ramp to flare
	171+09	171+80	71.0	—	—	—	—	240	24	189	20.4	28	—	Flare to beginning of valley gutter
177+60 End (23)	171+80	179+45	765.0	37	111	11	11	2582	24	2040	220.3	26	274	Beginning of gutter to end of gutter
	179+45	180+15	70.0	29.5	65	4.5	4	236	24	187	20.2	26	202	Beginning of curb return to flare
	180+15	182+91.9	276.9	29.5	258	4.5	14	935	24	738	79.7	26	780	Flare to beginning of ramp
	182+91.9	203+80.8	2088.9	37	2434	11	247	7005	24	5571	601.7	26	6034	Beginning of ramp to bridge end
	170+50	178+50				Var	▲1024					Var.	≠2,328	2134 Sq. Yds. Conc. Pavement
West Main Line														
	165+00	169+50	450.0	39	553	Var.	55	1530	34	1700	183.6	36	1800	Approach to project
	169+50	172+65	315.0	39.5	62	4.5	3	1272	34	1190	128.5	36	200	Beg. of ramp to flare & beg. gutter
177+60 End (23)	172+65	184+54	1189.0	37	704	11	72	4020	24	3171	342.5	26	1745	Beginning of gutter to end of gutter
	184+54	185+24	70.0	41	91	15	12	236	24	187	20.2	28	218	End of gutter to flare
	185+24	187+85.8	261.8	29.5	244	45	13	885	24	698	75.4	26	756	Flare to end of ramp
	187+85.8	205+88.6	1802.8	41	2327	15	290	6090	24	4808	519.3	28	5608	End of ramp to bridge end
	170+00	178+50				Var.	▲1093					Var.	≠2750	2267 Sq. Yds. Conc. Pavement
23rd and Woter Street Interchange (Included in (23))														
N.E. I Ramp														
	0+00	1+02	102.0	Var.	98	—	—	345	Var.	344	37.2	Var.	344	Water St. approaches to full width
	1+02	2+51	149.0	39	183	17	28	465	20	331	35.7	24	397	Full width
	2+51	4+78.8	227.8	Var.	—	Var.	—	770	Var.	405	43.7	Var.	—	Full width to end of ramp
	2+	4+				Var.	▲156						≠ 427	375 Sq. Yds. Conc. Pavement
S.E. I Ramp														
	0+00	3+80	380.0	Var.	329	Var.	40	650	Var.	616	66.5	Var.	644	Beginning of ramp to full width
	3+80	6+40	260.0	39	320	17	48	811	20	578	62.4	24	693	Full width to beginning of ramp on lt.
	6+40	7+77	137.0	31.5	136	10.5	16	427	20	304	32.8	22	335	Full width to beginning of choke
	7+77	11+16.8	339.8	Var.	145	Var.	12	575	Var.	383	41.4	Var.	400	Beginning of choke to end of romp
S.E. I Ramp to 23rd Ave.				Var.	49	—	—	200	Var.	172	18.6	Var.	172	Connection road
S.W. I Ramp														
	0+00	0+72	720	Var.	58	—	—	244	Var.	202	21.8	Var.	202	Approach to full width
	0+72	5+70.9	498.9	39	613	17	91	1058	20	1109	119.8	24	1330	Full width
	5+70.9	9+85.0	414.1	Var.	308	Var.	47	460	Var.	461	49.8	Var.	556	Full width to end of ramp
N.W. I														
	12+55.2	16+02	346.8	Var.	51	Var.	3	1174	Var.	912	98.5	Var.	127	Beginning of ramp to full width
	16+02	18+84	282.0	43	249	17	34	952	24	752	81.2	28	572	Full width
	18+84	21+43.5	259.5	Var.	271	Var.	34	876	Var.	584	63.1	Var	646	Full width to end of ramp at 23rd
	13+	17+00				Var.	▲515						≠1158	1,067 Sq. Yds. Conc. Pavement
Allcott St. to 23rd Ave.				Var.	40	—	—	210	Var.	140	15.1	Var.	140	Approach Connection
23rd Avenue														
	25+00	29+98.4	498.4	36	565	—	—	2010	36	1994	215.4	36	1994	Beg. of construction to bridge end
	BRIDGE									909	98.2		≠ 909	
	32+65.7	34+45	179.3	36	204	—	—	724	36	717	77.4	36	717	Bridge end to end of construction
West 17th Ave. Connection (Included in (8))														
including dec. lane	0+00	15+94.1	1594.1	Var.	2494	Var.	225	5758	Var.	5313	573.8	Var.	5667	
"Y" Conn. 17th Ave.														
including acel. lane	0+00	2+23	223.0	Var.	399	—	—	884	Var.	1085	117.2	Var.	1185	
N. 19th Ave. Conn.	0+00	7+50	750.0	Var.	775	Var.	105	1872	Var.	1600	172.8	Var.	1733	
S. 19th Ave. Conn.	0+00	6+20	620.0	Var.	672	Var.	91	1623	Var	1653	178.5	Var.	1791	
Platte River Arches										2718	293.5		≠2718	
East Main Line	208+66.8	215+11.5	644.7	41	835	—	—	2179	—	—	—	28	2006	Bridge end to end of future bridge
213+25 End (8)	215+11.5	217+00	188.5	47	279	—	—	640	—	—	—	38	796	Future br. end to full taper width
	217+00	218+95.7	195.7	51	315	—	—	665	—	—	—	38	826	Full taper to ramp approach
	218+95.7	220+38	142.3	29.5	133	—	—	484	—	—	—	26	411	Ramp approach to ramp flare
West Main Line														
213+25 End (8)	210+65.5	216+52	586.5	37	685	—	—	1986	—	—	—	26	1695	Bridge end to end of future bridge
	216+52	217+00	48.0	37	56	—	—	163	—	—	—	26	139	Future br. end to beginning of taper
	217+00	218+50	150.0	42	199	—	—	510	—	—	—	31	517	Beginning taper to full width
	218+50	221+81.4	331.4	47	491	—	—	1126	—	—	—	36	1325	Full width beginning ramp
Plant Mixed Oil Processed Roadway Ditches														
Lt. of East Line	166+00	170+50	450.0	22.5	#329	—	—	—	22.5	•1125	—	22.5	1125	
Rt. of West Line	166+00	170+00	400.0	22.5	#293	—	—	—	22.5	•1000	—	22.5	1000	
Plant Mixed Oil Processed Intercepting Ditches														
Rt. N.W. 23rd Ave.	14+00	21+00	700.0	10	#144	—	—	—	10	•778	—	10	778	
Rt. S.W. 23rd Ave.	1+00	9+50	850.0	10	#182	—	—	—	10	•944	—	10	944	
19th Ave. Connection Rt.	196+00			Var.	# 15				Var.	• 75	—	Var.	75	Collection Ditch for Inlet No. 40 A.
										•3,922			≠10,290	
TOTALS					19,316		4,338	56,930		45,997	4901.6		50,487	

≠ To be prime coated with RC asphaltic road material
• Ditches are not to be seal coated
4" Base Course Surfacing
▲ Approximate 10" thickness Shoulder Course.

SUMMARY OF SURFACING QUANTITIES

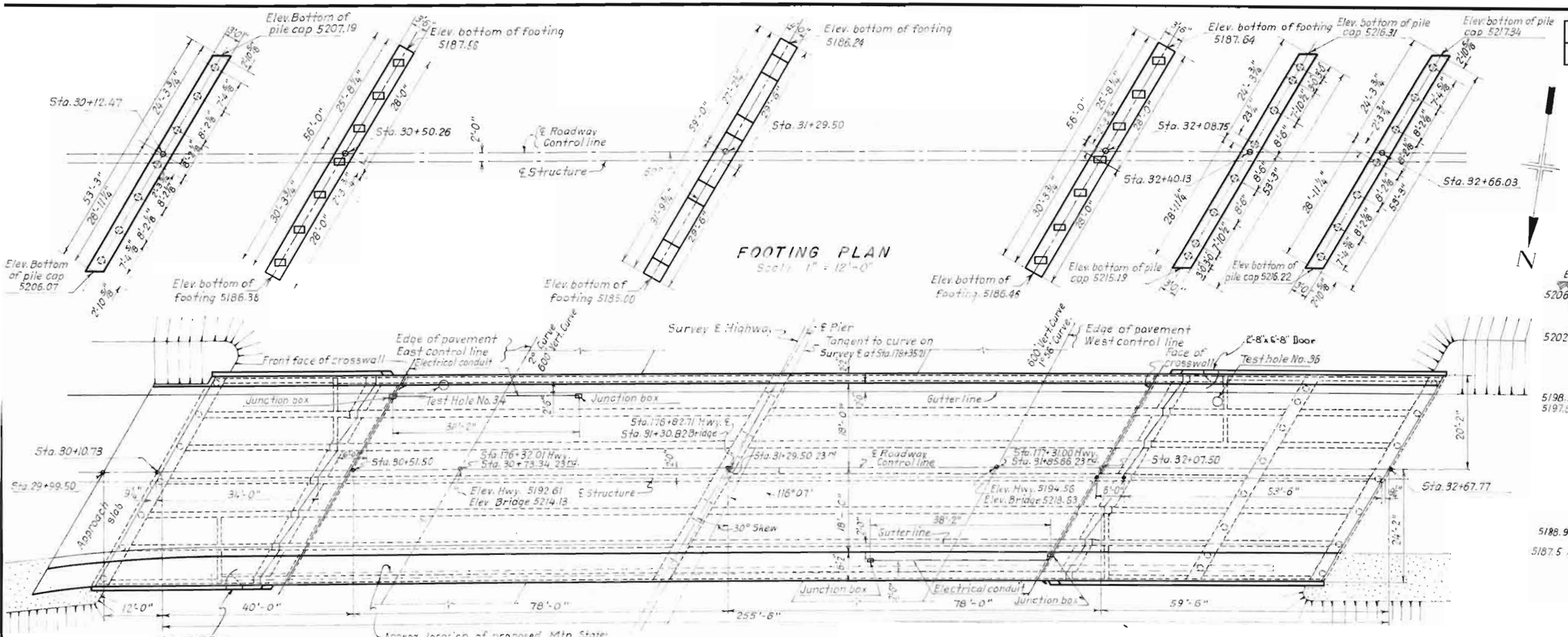
No.	Item	Unit	(23)	23rd ave. Bridge	(8)	Platte River Arches	(17)	Project Totals
13x	Selected Borrow	Cu.Yd.	4200	0	5800	0	0	10,000
23a	Ballast (Class 1)	Ton	20,700	0	32,670	0	3,630	57,000
26b	Gravel or Crushed Rock Surfacing (Grading B)	Ton	8,775	0	13,450	0	1,475	23,700
29c	Asphalt (120-150 Penetration)	Ton	155	10	175	20	0	360
30x	Asphaltic Road Material MC (Prime)	Gal.	6575	0	12,100	0	1,625	20,300
30y	Asphaltic Road Material RC (Prime & Seal)	Gal.	5400	400	6200	1100	0	13,100
31d	Stone Screenings (Type 2)	Ton	220	15	305	40	0	580
32a	Plant Mixed Oil Processed Surfacing	Ton	1,900	100	2,615	295	0	4,910
32y	Plant Mixed Oil Processed Ditch Paving	Sq.Yd.	3,850	0	80	0	0	3,930
37a	Concrete Pavement	Sq.Yd.	5,370	0	480	0	0	5,850
37c	Sand Cushion	Cu.Yd.	410	0	170	0	0	580

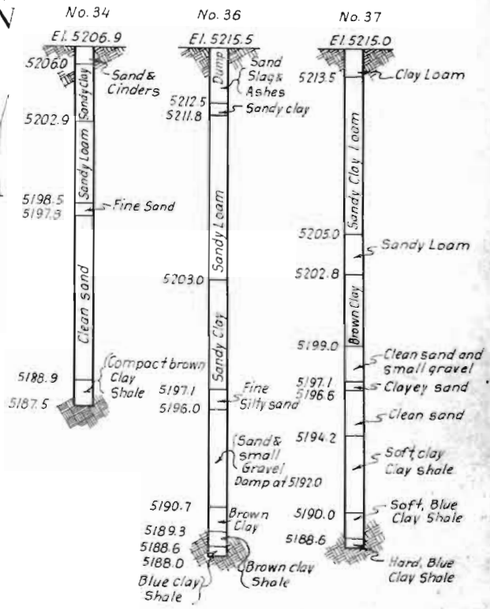
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(123) UNIT 2 UI 002-2(81) SECT 2 SECOND CONTRACT UI 002-2(17) UNIT 3	12	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

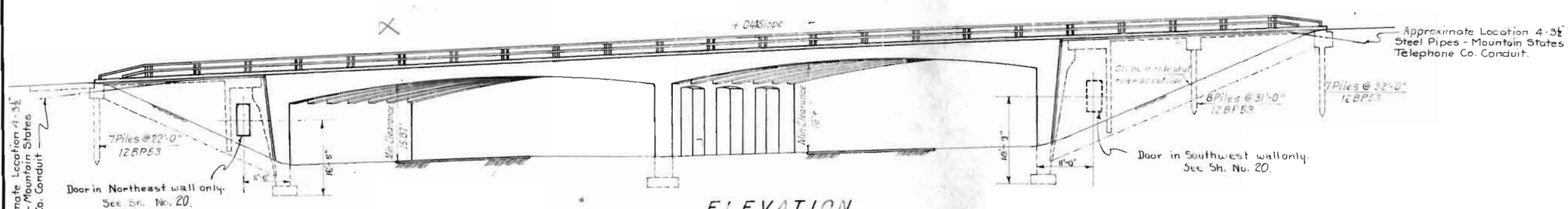
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		13	

Rev. HML. 2-21-51 Added Tele. Co. Clay Conduit
Rev. JVG. 2-26-51 Added door in Abutments
Rev. ADN. 10-10-52 Added Steel Tel. Conduit.
Rev. 1-5-53 Dim. & Elev. F.K.M.





LOG OF TEST HOLES
Scale 1/4" = 1'-0"



ELEVATION
Scale 1/4" = 1'-0"

Design Specifications: 1941 A.A.S.H.O.

H-20 Loading - f_c = 1000 lbs. p.s.i. + f_s = 18,000 lbs. p.s.i.
Max. Allowable soil pressure = 5 tons per sq. ft.
Max. Allowable load per Pile = 40 tons
25 lbs. per Sq. ft. wearing surface in Dead Load.
Max. Pier footing pressure = 7580 lbs. per. sq. ft.
Max. Abutment footing pressure = 6570 lbs. per. sq. ft.

NOTE: Telephone Conduit Shown on plans is to be furnished & installed by others

Wearing surface not included in bridge contract.

NOTE: Reinforcing Steel, Steel Piling & Steel Railing are State Furnished Material.

Estimate of Quantities

Item No.	Item	Unit	Mid. Section	East Abutment	West Abutment	Approach Slabs	Totals
140	Dry rock excavation	Cu. yds.	5	5	5		15
146	Dry common excavation	Cu. yds.	185	37	78		301
146c	Wet rock excavation	Cu. yds.	73	5	5		83
146d	Wet common excavation	Cu. yds.	5	5	5		15
160	Mechanical tamping	Hour	18	7	5		30
161	Str. Backfill	Cu. Yds.	175	66	47		288
140	Fireproof Steel door	Each		1	1		2
460	Class A concrete	Cu. yds	744	120	193	18	1075
461	Reinforcing steel +1%	Lb	165,560	21,560	30,880	3,450	221,500
61a	Steel piling	Lin. ft		154	472		626
90b	Elect. conduit with junction boxes	Lin. ft.	275				275
							507

NOTE: The following reinforcing bars will be furnished with the 6 foot± radius bend partially completed C-85, C-95, CA95, CA105, CB85, CB95, and CB105 The contractor will be required to complete the bend on these bars to fit the structures

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

GENERAL PLAN AND ELEVATION

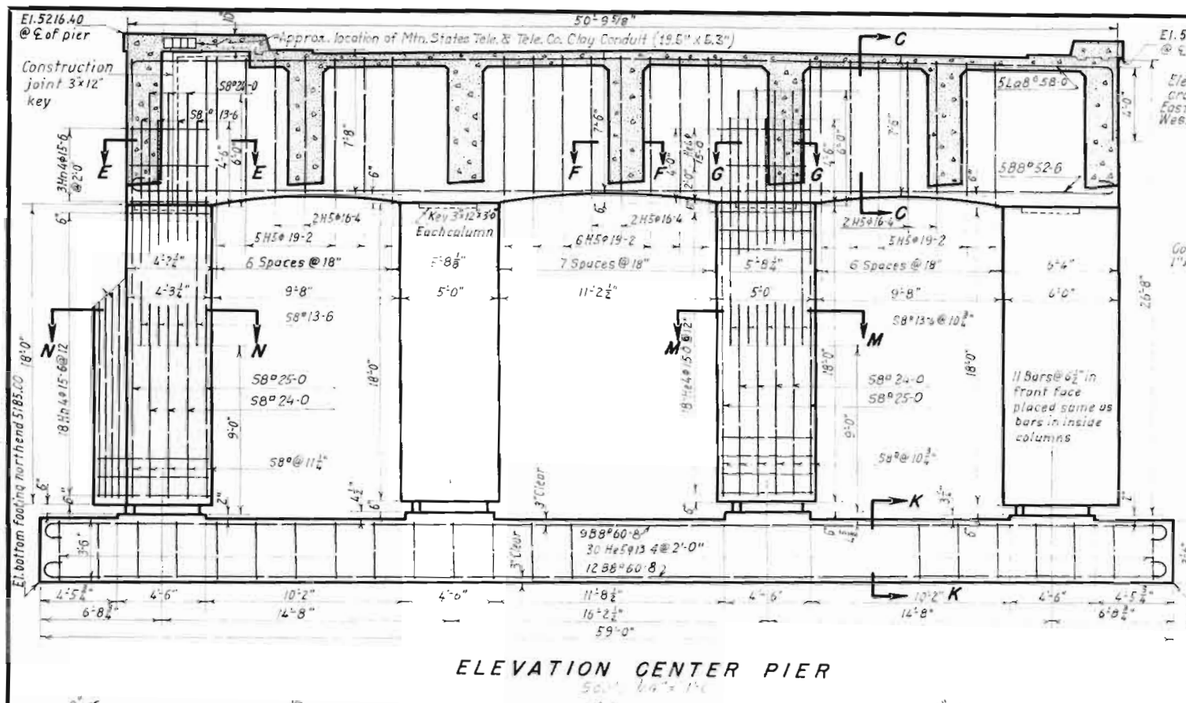
STRUCTURE NO. F-16-DA

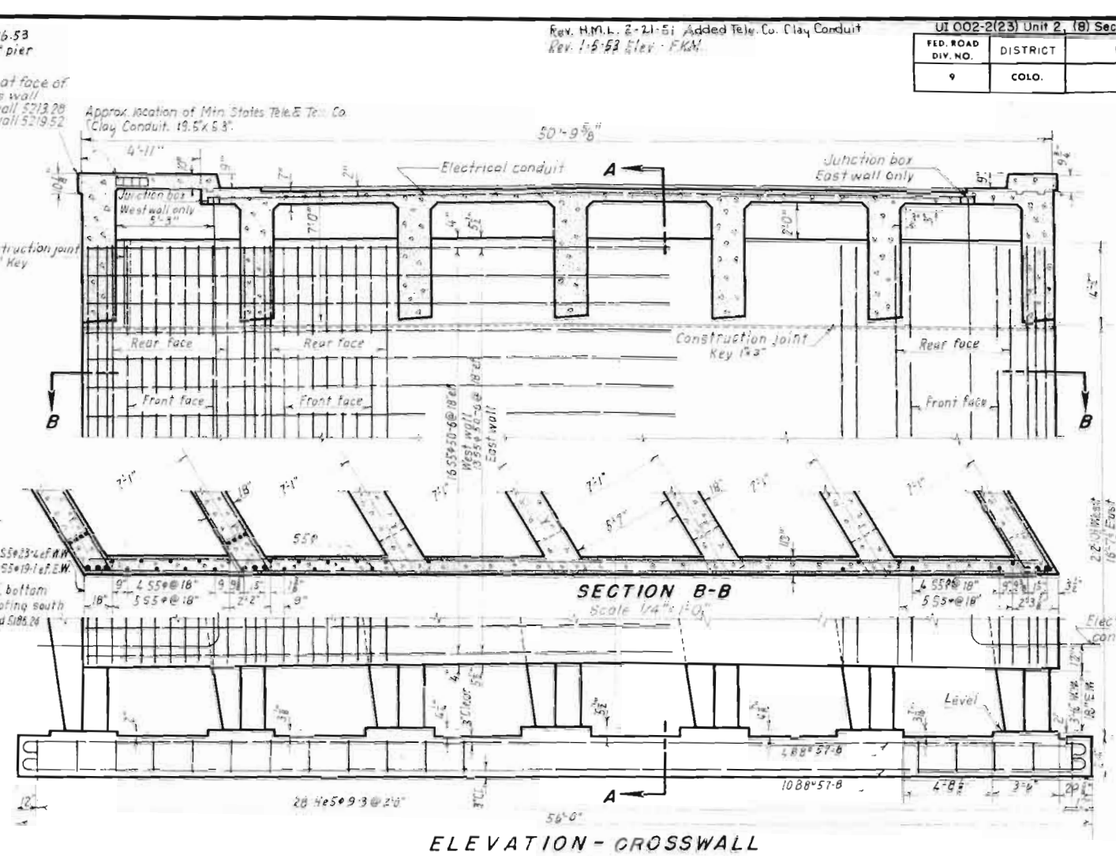
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

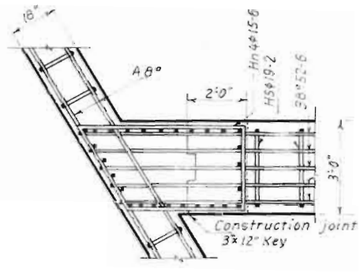
Rev. H.M.L. 2-21-51 Added Tele. Co. Clay Conduit
Rev. 1-16-53 Elev. - F.K.N.

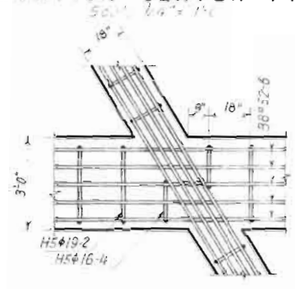
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

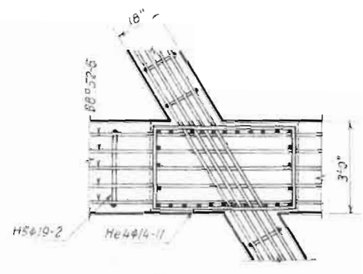
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		14	

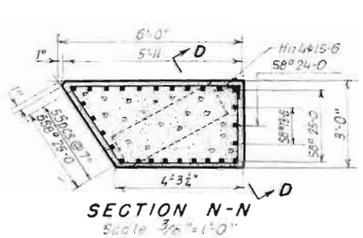


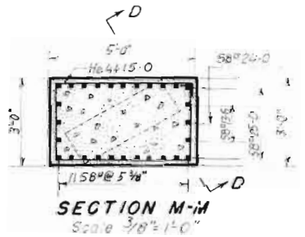


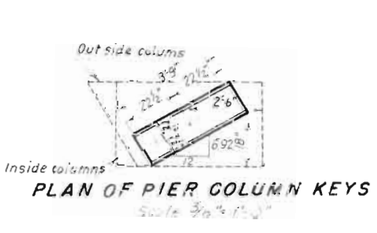


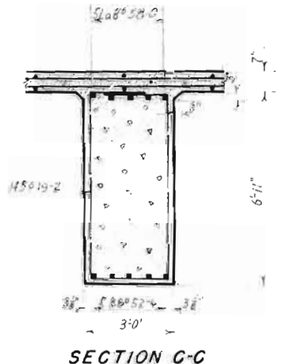


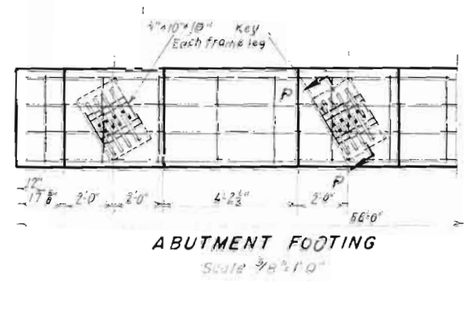


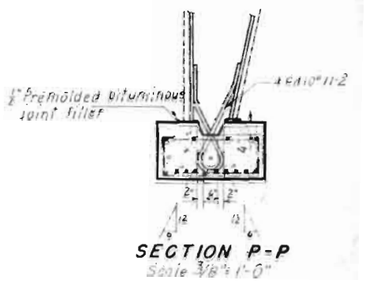


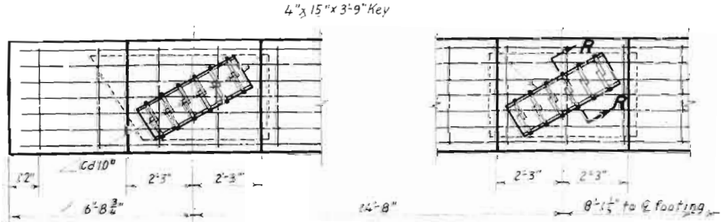


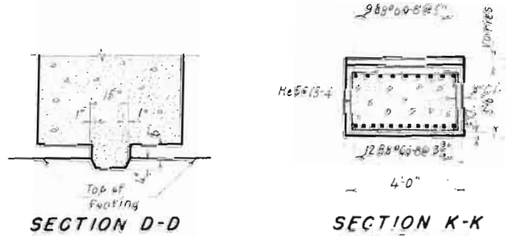












Note:
Clear distance from face of concrete to steel slab 1", all others 2" except as noted.
Chamfer all exposed corners 3/4".

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORAD

TWENTY THIRD AVENUE UNDERPAS
CROSSWALLS, PIER
& FOOTINGS

STRUCTURE NO. F-16-DA

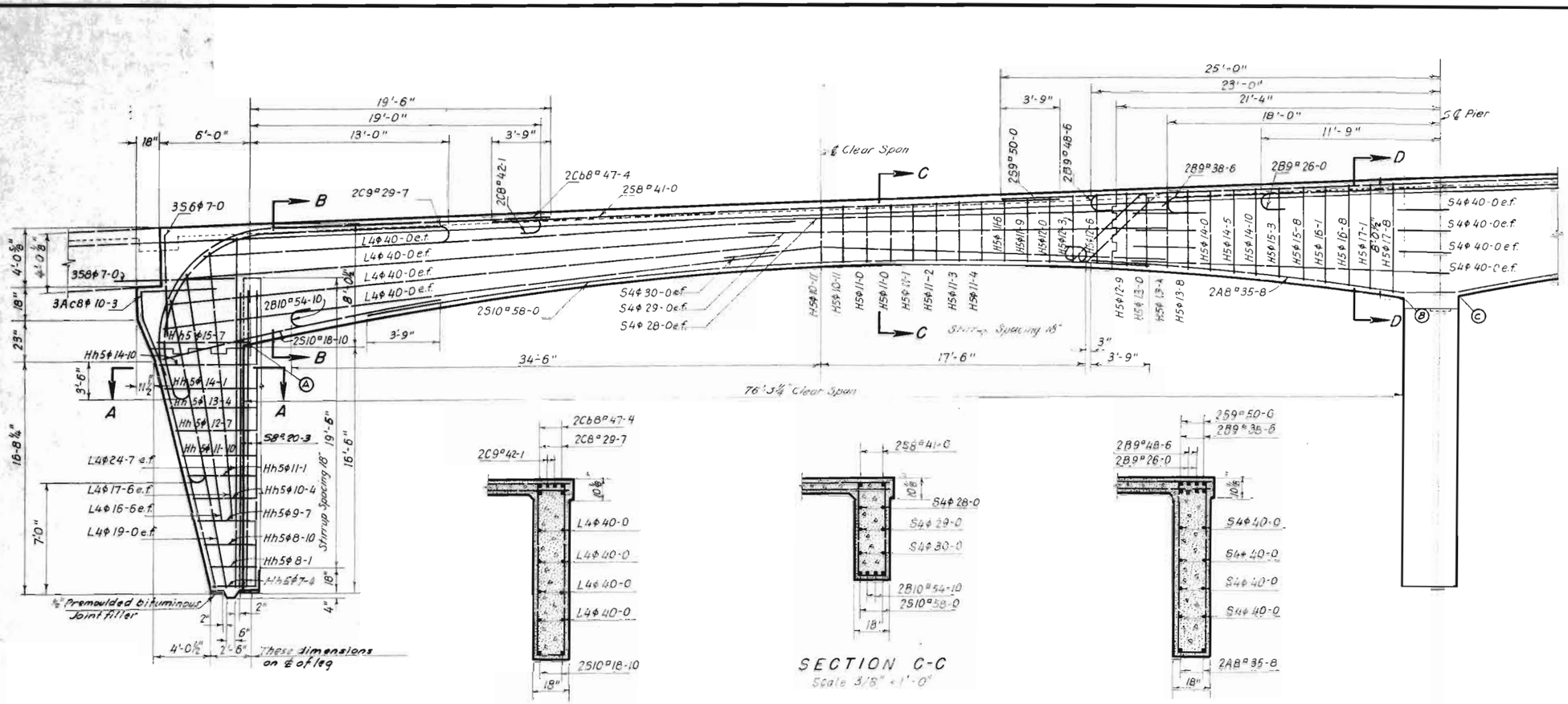
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG. NO.

A.R.W.Ir-ich

UI 002-2(23) Unit 2, (8) Sect. 2 2nd Contract, (17) Unit 3

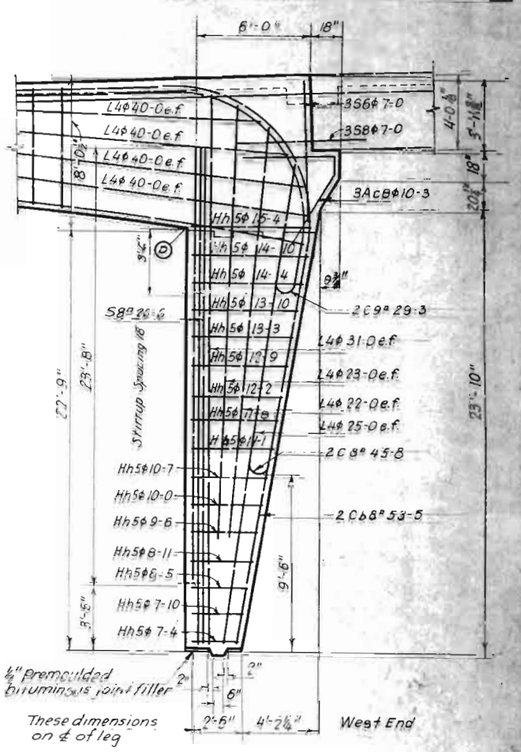
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		15	



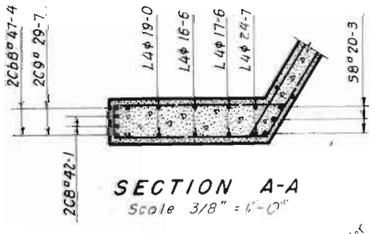
SECTION B-B
Scale 3/8" = 1'-0"

SECTION C-C
Scale 3/8" = 1'-0"

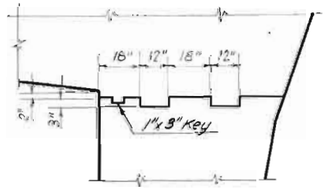
SECTION D-D
Scale 3/8" = 1'-0"



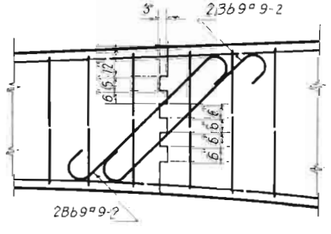
ELEVATION
Scale 1/4"=1'-0"



SECTION A-A
Scale 3/8" = 1'-0"



DETAIL OF CONSTRUCTION JOINT THRU LEG
Scale 3/8" = 1'-0"



DETAIL OF CONSTRUCTION JOINT THRU GIRDER
Scale 3/8" = 1'-0"

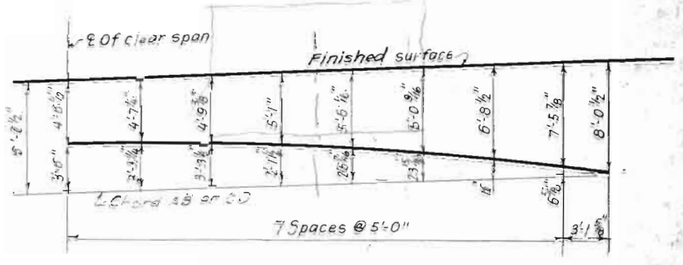
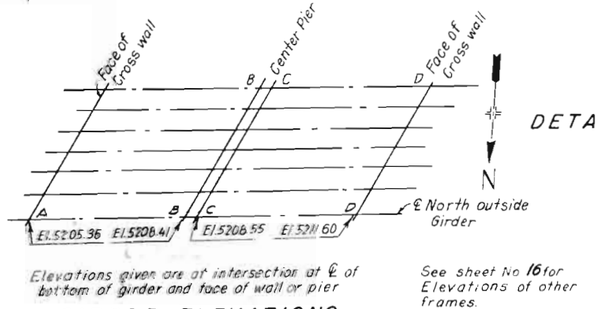


DIAGRAM OF GIRDER DEPTHS
Scale 3/16" = 1'-0"

Diagram symmetrical about ℄ of clear spdh.
Dimensions are on Girder ℄.
Depths of faces shall be adjusted to allow for ½" transverse slope at roadway surface.



Elevations given are at intersection at ℄ of bottom of girder and face of wall or pier

See sheet No 16 for Elevations of other frames.

GIRDER ELEVATIONS

Note:
Clear distance between layers of steel: Legs and bottom of girders 2"; Top of girders governed by slab steel.
Clear distance from face of concrete to steel: Slab 1", all others 2" except as noted.
Chamfer all exposed corners ¾"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

NORTH OUTSIDE FRAME

STRUCTURE NO. F-16-DA

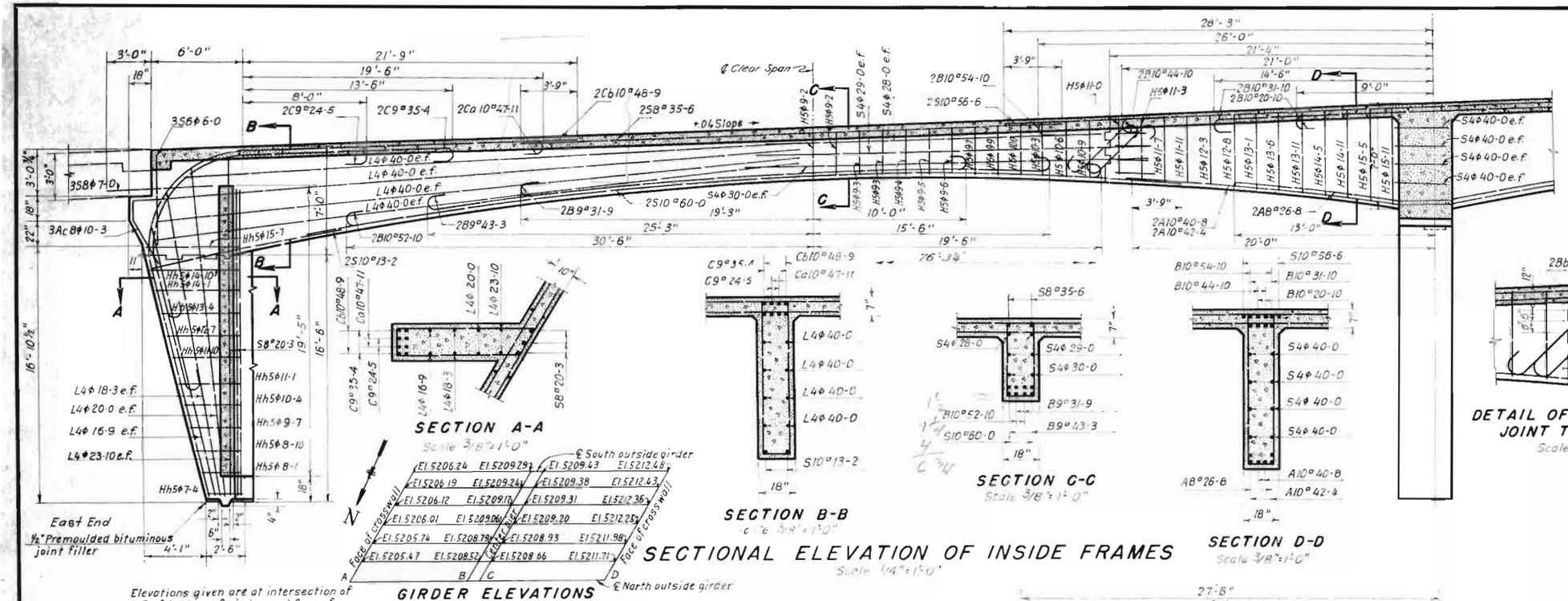
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG. NO.

G. R. Chown

UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		16	



Note:
Clear distance from surface of concrete to steel: Slab 1". All others 2".
Clear distance between layers of steel: Legs and bottoms of girders 2½" tops of girders: Governed by slab steel.
Bevel all exposed corners of concrete ¾"

G.R. Choun

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS
INSIDE FRAMES
SOUTH OUTSIDE FRAME

STRUCTURE NO. F-16-DA

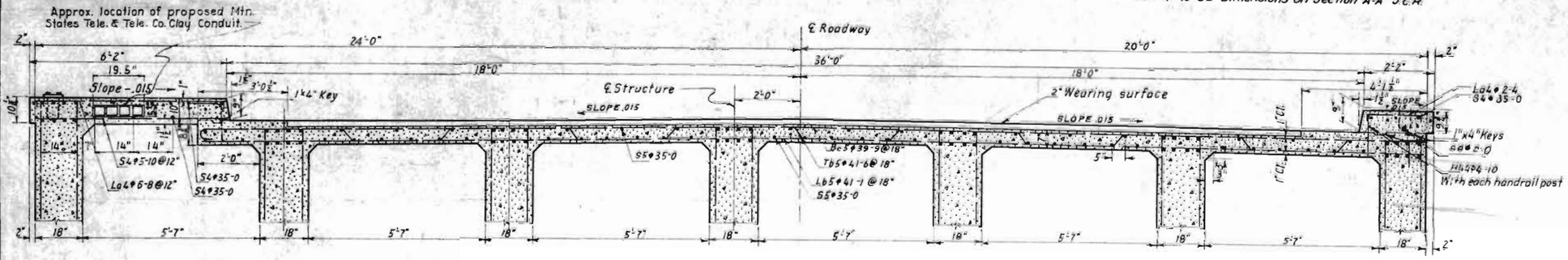
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

MARK	Top	Bottom
	Ba5@4-0	S5@3-5
	Ba5@4-8	S5@4-1
	Ba5@5-4	S5@4-9
	Ba5@6-0	Lb5@7-11
	Tc5@6-9	
	Ba5@7-4	S5@6-9
	Ba5@8-0	Lb5@9-11
	Tc5@8-9	
	Ba5@10-2	S5@9-7
	Ba5@10-10	Lb5@12-9
	Tc5@12-5	
	Ba5@12-2	S5@11-7
	Ba5@12-10	Lb5@14-9
	Tc5@14-7	
	Ba5@14-2	S5@13-7
	Ba5@14-10	Lb5@16-9
	Tc5@16-7	
	Ba5@17-8	S5@17-1
	Ba5@18-4	Lb5@20-3
	Tc5@20-3	
	Ba5@19-0	S5@18-5
	Ba5@19-8	Lb5@21-8
	Tc5@22-5	
	Ba5@21-0	S5@20-5
	Ba5@21-8	Lb5@23-7
	Tc5@26-2	
	Ba5@24-6	S5@23-11
	Ba5@25-2	Lb5@27-1
	Tc5@28-2	
	Ba5@26-6	S5@25-11
	Ba5@27-2	Lb5@29-1
	Tc5@30-5	
	Ba5@28-6	S5@27-11
	Ba5@30-8	Lb5@32-7
	Tc5@34-1	
	Ba5@32-0	S5@31-5
	Ba5@32-8	Lb5@34-7
	Tc5@36-1	
	Ba5@34-0	S5@33-5
	Ba5@34-8	Lb5@36-7
	Tc5@38-2	
	L5@35-0	S5@34-4
	L5@34-4	S5@33-8
	TF5@35-0	
	L5@33-0	S5@32-4
	L5@32-5	S5@31-9
	TF5@33-0	
	L5@31-1	S5@30-5
	L5@30-5	S5@29-9
	TP5@29-3	
	L5@27-7	S5@26-11
	L5@27-0	S5@26-4
	TF5@27-4	
	L5@25-8	S5@25-0
	L5@25-0	S5@24-4
	TF5@25-2	
	L5@23-8	S5@23-0
	L5@21-6	S5@20-10
	TF5@21-6	
	L5@20-2	S5@19-6
	L5@19-6	S5@18-10
	TF5@18-4	
	L5@18-2	S5@17-6
	L5@17-6	S5@16-10
	TF5@17-4	
	L5@14-8	S5@14-0
	L5@14-0	S5@13-4
	TF5@13-8	
	L5@12-8	S5@12-0
	L5@12-0	S5@11-4
	TF5@11-6	
	L5@10-8	S5@10-0
	L5@10-0	S5@9-4

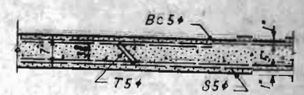
Rev. 3-15-51 J.V.G. Added: Tele. Co. Clay Conduit
Rev. 7-10-52 Dimensions on Section A-A J.C.R.

UI 002-2(23) Unit 2, (8) Sect 2 2nd. contract (17) Unit 3

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		17	

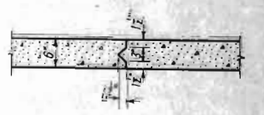


SECTION A-A
Scale 1/2" = 1'-0"

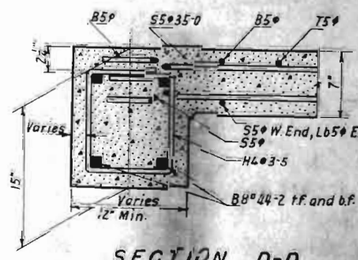


TYPICAL SLAB DETAIL
Scale 3/4" = 1'-0"

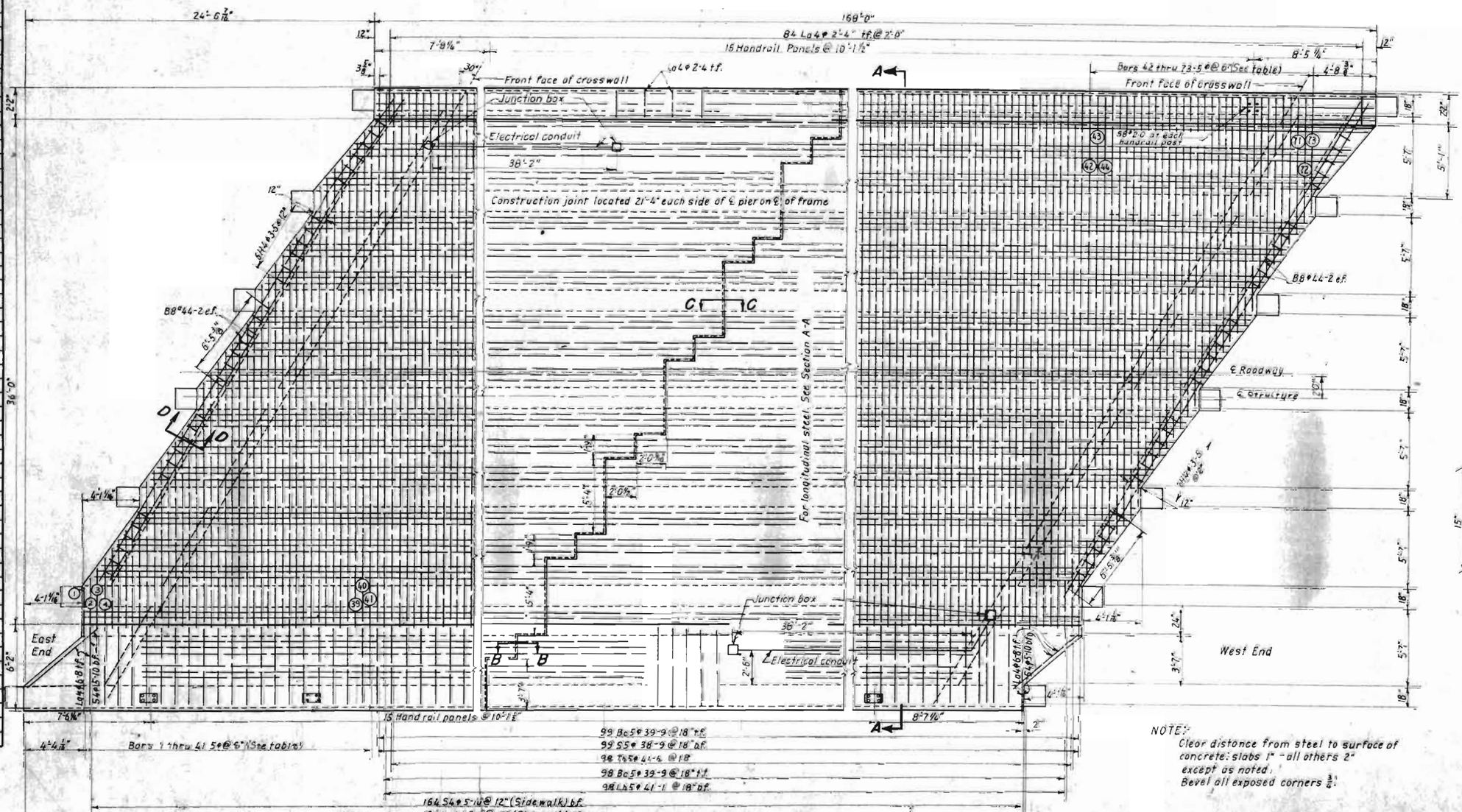
SECTION C-C
Scale 3/4" = 1'-0"



SECTION B-B
Scale 3/4" = 1'-0"



SECTION D-D
Scale 1½" = 1'-0"



NOTE:
Clear distance from steel to surface of concrete: slabs 1" - all others 2" except as noted.
Bevel all exposed corners ¾".

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY, ... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

DECK

STRUCTURE NO. F-10-DA

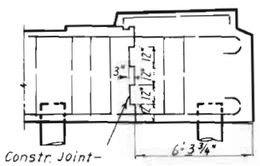
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

Rev. Rml. 2-21-51 Added Tele. Co. Clay Conduit
" JVB. 2-26-51 Added Door in Abutment.

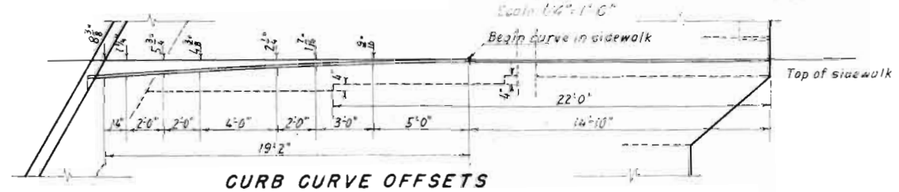
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		18	

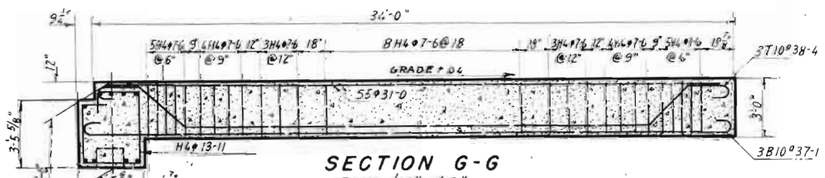
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

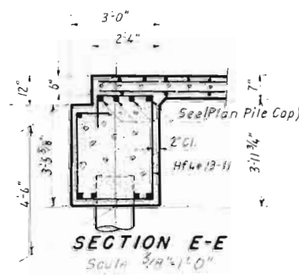
MARK No.	Bottom	Top
1	Tc5#7-8	
2	Lb5#9-11	Ba5#8-5
3	S5#8-8	Ba5#9-3
4	Tc5#10-3	
5	Lb5#12-4	Ba5#10-10
6	S5#11-1	Ba5#11-8
7	Tc5#12-10	
8	Lb5#14-11	Ba5#13-5
9	S5#13-7	Ba5#14-2
10	Tc5#15-6	
11	Lb5#17-5	Ba5#15-11
12	S5#16-2	Ba5#16-9
13	Tc5#18-2	
14	Lb5#19-11	Ba5#18-5
15	S5#18-8	Ba5#19-3
16	Tc5#20-9	
17	Lb5#22-6	Ba5#21-0
18	S5#21-3	Ba5#21-10
19	Tc5#23-4	
20	Lb5#24-11	Ba5#23-5
21	S5#23-8	Ba5#24-3
22	Tc5#26-1	
23	Lb5#27-6	Ba5#26-0
24	S5#26-3	Ba5#26-10
25	Tc5#28-10	
26	Lb5#30-1	Ba5#28-7
27	S5#28-10	Ba5#29-5
28	Tc5#31-5	
29	Lb5#32-8	Ba5#31-2
30	S5#31-5	Ba5#32-0
31	Tc5#34-2	
32	Lb5#35-3	Ba5#33-9
33	S5#34-0	Ba5#34-7
34	Tc5#36-11	
35	Lb5#37-10	Ba5#36-4
36	S5#36-7	Ba5#37-2
37	Tc5#39-8	
38	Lb5#40-5	Ba5#38-11
39	S5#34-9	Ba5#35-4
40	S5#34-0	Ba5#34-7
41	Tc5#35-5	
42	S5#32-8	Ba5#33-3
43	S5#32-0	Ba5#32-7
44	Tc5#33-3	
45	S5#30-8	Ba5#31-3
46	S5#30-0	Ba5#30-7
47	Tc5#29-6	
48	S5#27-0	Ba5#27-7
49	S5#26-4	Ba5#26-11
50	Tc5#27-4	
51	S5#24-11	Ba5#25-6
52	S5#24-2	Ba5#24-9
53	Tc5#25-1	
54	S5#22-10	Ba5#23-5
55	S5#20-8	Ba5#21-3
56	Tc5#21-5	
57	S5#19-3	Ba5#19-10
58	S5#18-7	Ba5#19-2
59	Tc5#19-4	
60	S5#17-2	Ba5#17-9
61	S5#16-6	Ba5#17-1
62	Tc5#17-1	
63	S5#13-8	Ba5#14-3
64	S5#13-0	Ba5#13-7
65	Tc5#13-4	
66	S5#11-7	Ba5#12-2
67	S5#10-10	Ba5#11-5
68	Tc5#11-1	
69	S5#9-5	Ba5#10-0
70	S5#8-9	Ba5#9-2

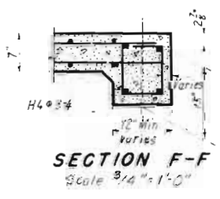


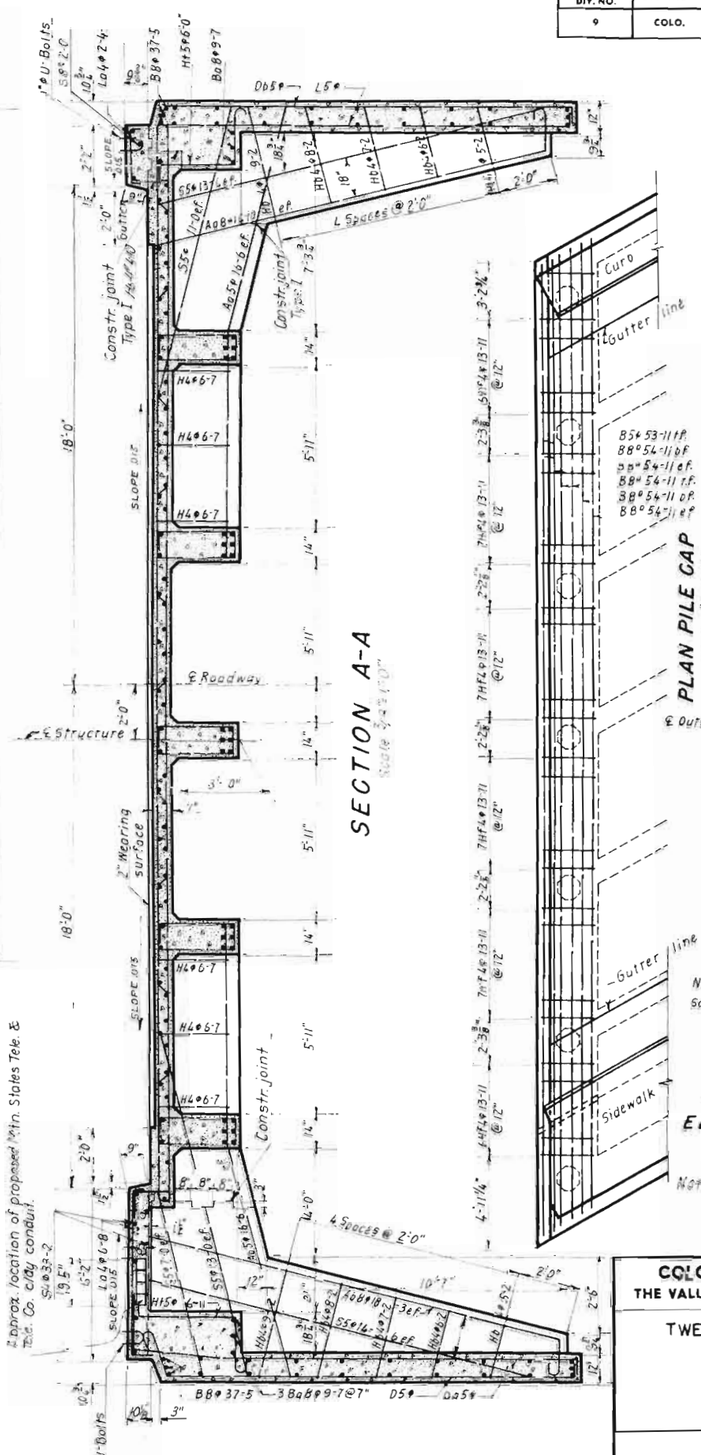
DETAIL "B"
Scale 1/4" = 1'-0"

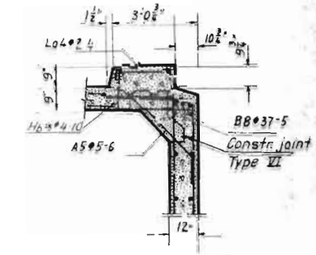


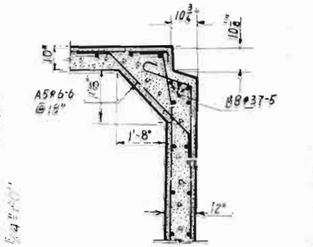


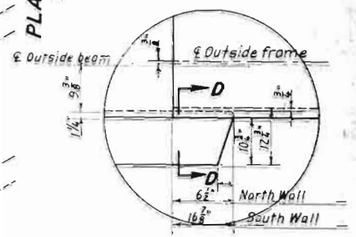


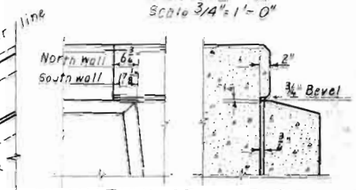












Note: Clear distance to concrete: Slab 1", all others 2" except as noted.
Clear distance between layers of steel in beams 2½". Top of beams governed by slab steel.
Chamfer all exposed corners ¾".

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

EAST ABUTMENT
(EXCEPT WING WALLS)

STRUCTURE NO. F-16-DA

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

A.R.Ullrich

Rev. H.M.L. - 2-21-51 Added Telc. Co. Clay conduit. UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3
Rev. JVG. 2-26-51 Added Door to Abutment.
Rev. 10-10-52 Removed Telc. Conduit. Sec AA.

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		19	

SECTION C-C
Scale 1"= 1'-0"

PLAN
Scale 1/4" = 1'-0"

SECTION F-F
Scale 1/4" = 1'-0"

SECTION D-D
Scale 3/8" = 1'-0"

SECTION E-E
Scale 3/8" = 1'-0"

SECTION B-B
Scale 3/8" = 1'-0"

SECTION A-A
Scale 3/8" = 1'-0"

DETAIL A

SECTION H-H ELEVATION

MARK			MARK		
No.	Bottom	Top	No.	Bottom	Top
1	S5@3-1	Ba5@3-8	40	Lb5@37-4	Ba5@35-10
2	S5@3-9	Ba5@4-4	41	Tc5@38-0	
3	S5@4-5	Ba5@5-0	42	S5@37-4	Ba5@37-11
4	Lb5@7-2	Ba5@5-8	43	Tc5@38-8	
5	Tc5@6-7		44	S5@35-7	Ba5@36-2
6	S5@6-6	Ba5@7-1	45	S5@34-9	Ba5@35-4
7	Lb5@9-3	Ba5@7-9	46	Tc5@35-11	
8	Tc5@8-8		47	S5@33-0	Ba5@33-7
9	S5@8-7	Ba5@9-2	48	S5@32-2	Ba5@32-9
10	Lb5@12-9	Ba5@11-3	49	Tc5@33-2	
11	Tc5@12-3		50	S5@30-5	Ba5@31-0
12	S5@12-0	Ba5@12-7	51	S5@29-7	Ba5@30-2
13	Lb5@14-9	Ba5@13-3	52	Tc5@30-7	
14	Tc5@14-5		53	S5@27-10	Ba5@28-5
15	S5@14-0	Ba5@14-7	54	S5@27-0	Ba5@27-7
16	Lb5@16-9	Ba5@15-3	55	Tc5@27-10	
17	Tc5@16-5		56	S5@25-3	Ba5@25-10
18	S5@17-3	Ba5@17-10	57	S5@24-5	Ba5@25-0
19	Lb5@20-1	Ba5@18-7	58	Tc5@25-1	
20	Tc5@20-0		59	S5@22-8	Ba5@23-3
21	S5@19-6	Ba5@20-1	60	S5@21-10	Ba5@22-5
22	Lb5@22-4	Ba5@20-10	61	Tc5@22-4	
23	Tc5@22-5		62	S5@20-1	Ba5@20-6
24	S5@21-9	Ba5@22-4	63	S5@19-3	Ba5@19-10
25	Lb5@24-8	Ba5@23-2	64	Tc5@19-7	
26	Tc5@26-2		65	S5@17-6	Ba5@18-1
27	S5@25-3	Ba5@25-10	66	S5@16-8	Ba5@17-3
28	Lb5@28-1	Ba5@26-7	67	Tc5@17-0	
29	Tc5@28-5		68	S5@14-11	Ba5@15-6
30	S5@27-5	Ba5@28-0	69	S5@14-1	Ba5@14-8
31	Lb5@30-2	Ba5@28-8	70	Tc5@14-3	
32	Tc5@30-7		71	S5@12-4	Ba5@12-11
33	S5@29-7	Ba5@30-1	72	S5@11-6	Ba5@12-1
34	Lb5@33-9	Ba5@32-3	73	Tc5@11-6	
35	Tc5@34-2		74	S5@9-9	Ba5@10-4
36	S5@32-10	Ba5@33-5	75	S5@8-11	Ba5@9-6
37	Lb5@35-7	Ba5@34-1	76	Tc5@8-11	
38	Tc5@36-2		77	S5@7-2	Ba5@7-9
39	S5@34-8	Ba5@35-3			

Note:
Bevel all exposed corners of concrete 3/4".
Clear distance from surface of concrete to reinf. steel, slab 1"; bottom of pile cap 3", all others 2".

N.D. = North diaphragm.
S.D. = South diaphragm.
Steel same in each except as noted.

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

WEST ABUTMENT
(EXCEPT WING WALLS)

STRUCTURE NO. F-16-DA

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

A.P. Ullrich

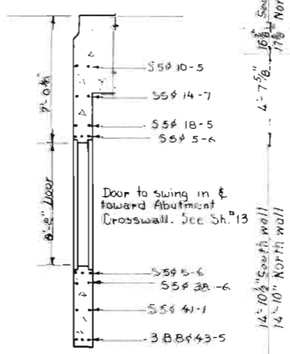
Rev. JVG. 2-26-51 Placed door in Abutments

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

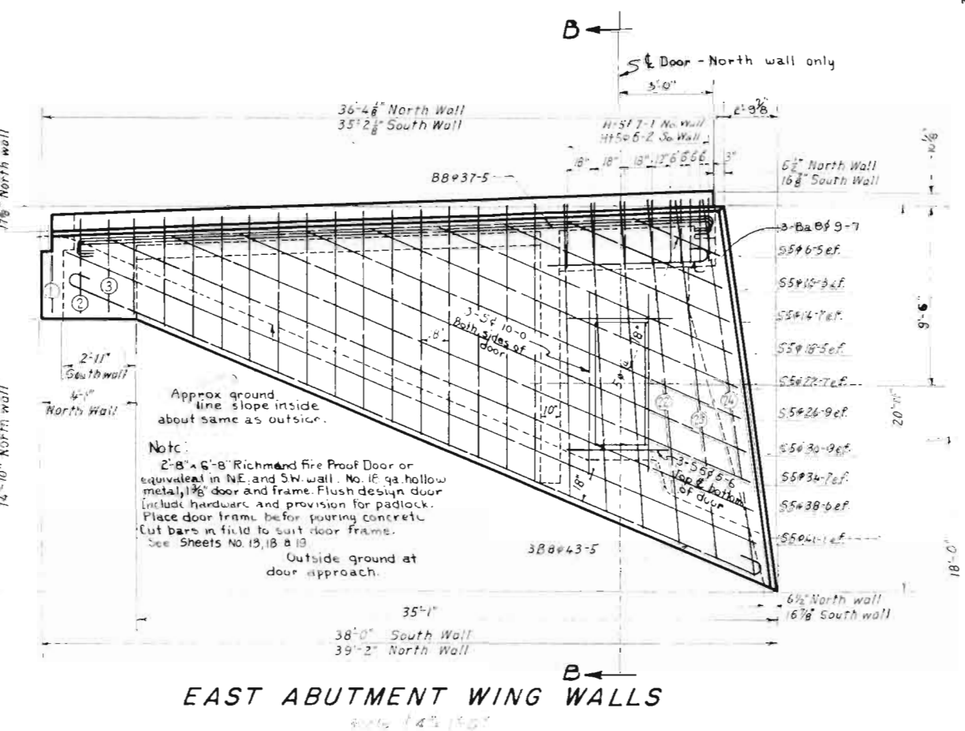
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		20	

	NORTH WALL EAST ABUT. MARK		SOUTH WALL EAST ABUT. MARK	
No.	Inside Face	Outside Face	Inside Face	Outside Face
1	Da5@6-2	D5@7-1	—	—
2	Da5@6-2	D5@7-1	L5@4-6	Db5@7-1
3	Da5@6-2	D5@7-1	L5@4-6	Db5@7-1
4	Da5@7-0	D5@7-11	L5@5-4	D05@8-0
5	Da5@7-10	D5@8-9	L5@6-2	Db5@8-9
6	Da5@8-7	D5@9-6	L5@6-11	Db5@9-6
7	Da5@9-3	D5@10-2	L5@7-7	Db5@10-2
8	Da5@10-0	D5@10-11	L5@8-4	Db5@11-0
9	Da5@10-8	D5@11-7	L5@9-0	Db5@11-7
10	Da5@11-5	D5@12-4	L5@9-9	Db5@12-4
11	Da5@12-2	D5@13-1	L5@10-6	Db5@13-1
12	Da5@12-10	D5@13-9	L5@11-2	Db5@13-9
13	Da5@13-6	D5@14-5	L5@11-10	Db5@14-5
14	Da5@14-3	D5@15-2	L5@12-7	Db5@15-2
15	Da5@14-11	D5@15-10	L5@13-3	Db5@15-10
16	Da5@15-8	D5@16-7	L5@14-0	Db5@16-7
17	Da5@16-5	D5@17-4	L5@14-9	Db5@17-4
18	Da5@17-1	D5@18-0	L5@15-5	Db5@18-0"
19	Da5@17-10	D5@18-9	L5@16-2	Db5@18-9
20	Da5@18-8	D5@19-7	L5@17-0	Db5@19-7
21	Da5@19-6	D5@20-5	L5@17-10	Db5@20-5
22	Da5@20-4	D5@21-3	L5@18-8	Db5@21-3
23	Da5@21-3	D5@22-2	L5@19-5	Db5@22-2
24	Da5@22-2	D5@23-1	L5@20-6	Db5@23-1

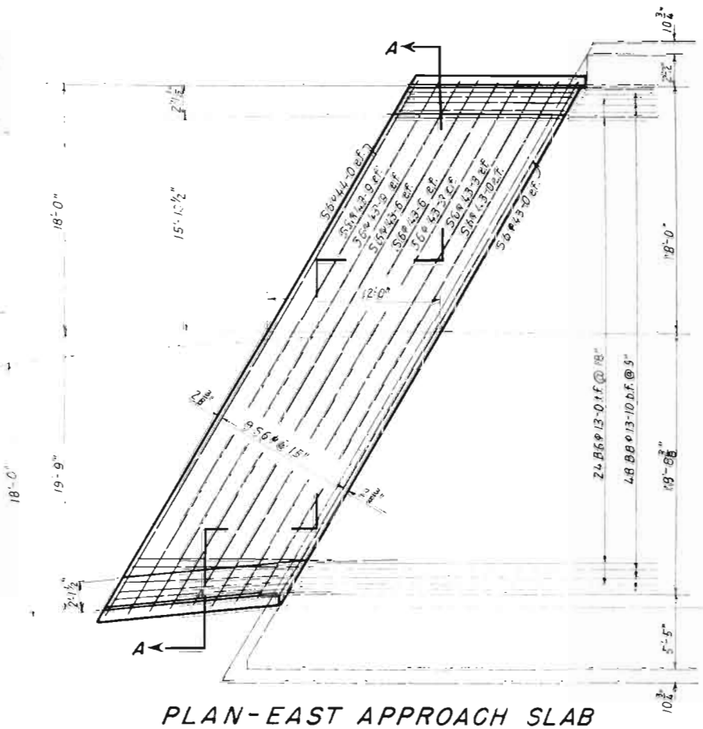
	NORTH WALL WEST ABUT. MARK		SOUTH WALL WEST ABUT. MARK	
No.	Inside Face	Outside Face	Inside Face	Outside Face
1	Da5@26-11	D5@27-9	L5@25-3	Db5@27-8
2	Da5@25-11	D5@26-11	L5@24-5	Db5@26-10
3	Da5@25-3	D5@26-2	L5@23-8	Db5@26-1
4	Da5@24-5	D5@25-5	L5@22-11	Db5@25-4
5	Da5@23-8	D5@24-7	L5@22-1	Db5@24-6
6	Da5@22-11	D5@23-10	L5@21-4	Db5@23-9
7	Da5@22-3	D5@23-2	L5@20-8	Db5@23-1
8	Da5@21-8	D5@22-7	L5@20-1	Db5@22-6
9	Da5@21-1	D5@22-10	L5@19-6	Db5@21-11
10	Da5@20-5	D5@21-5	L5@18-11	Db5@21-4
11	Da5@19-10	D5@20-10	L5@18-4	Db5@20-9
12	Da5@19-3	D5@20-3	L5@17-9	Db5@20-2
13	Da5@18-8	D5@19-8	L5@17-2	Db5@19-7
14	Da5@18-1	D5@19-1	L5@16-7	Db5@19-0
15	Da5@17-6	D5@18-6	L5@16-0	Db5@18-5
16	Da5@16-11	D5@17-11	L5@15-5	Db5@17-10
17	Da5@16-5	D5@17-4	L5@14-10	Db5@17-3
18	Da5@15-10	D5@16-9	L5@14-3	Db5@16-8
19	Da5@15-3	D5@16-2	L5@13-8	Db5@16-1
20	Da5@14-8	D5@15-7	L5@13-1	Db5@15-6
21	Da5@14-1	D5@15-0	L5@12-6	Db5@14-11
22	Da5@13-5	D5@14-5	L5@11-11	Db5@14-4
23	Da5@12-10	D5@13-10	L5@11-4	Db5@13-9
24	Da5@12-3	D5@13-3	L5@10-9	Db5@13-2
25	Da5@11-8	D5@12-8	L5@10-2	Db5@12-7
26	Da5@11-1	D5@12-1	L5@9-7	Db5@12-0
27	Da5@10-6	D5@11-6	L5@9-0	Db5@11-5
28	Da5@9-11	D5@10-11	L5@8-5	Db5@10-10
29	Da5@9-4	D5@10-4	L5@7-10	Db5@10-3
30	Da5@8-9	D5@9-8	L5@7-2	Db5@9-7
31	Da5@8-2	D5@9-1	L5@6-7	Db5@9-0
32	Da5@7-7	D5@8-6	L5@6-10	Db5@8-5
33	Da5@7-0	D5@7-11	L5@5-5	Db5@7-10
34	Da5@6-5	D5@7-4	L5@4-10	Db5@7-3
35	Da5@6-2	D5@7-1	L5@4-4	Db5@6-9
36	Da5@6-2	D5@7-1	L5@4-4	Da5@6-9
37	—	—	L5@4-4	Db5@4-9



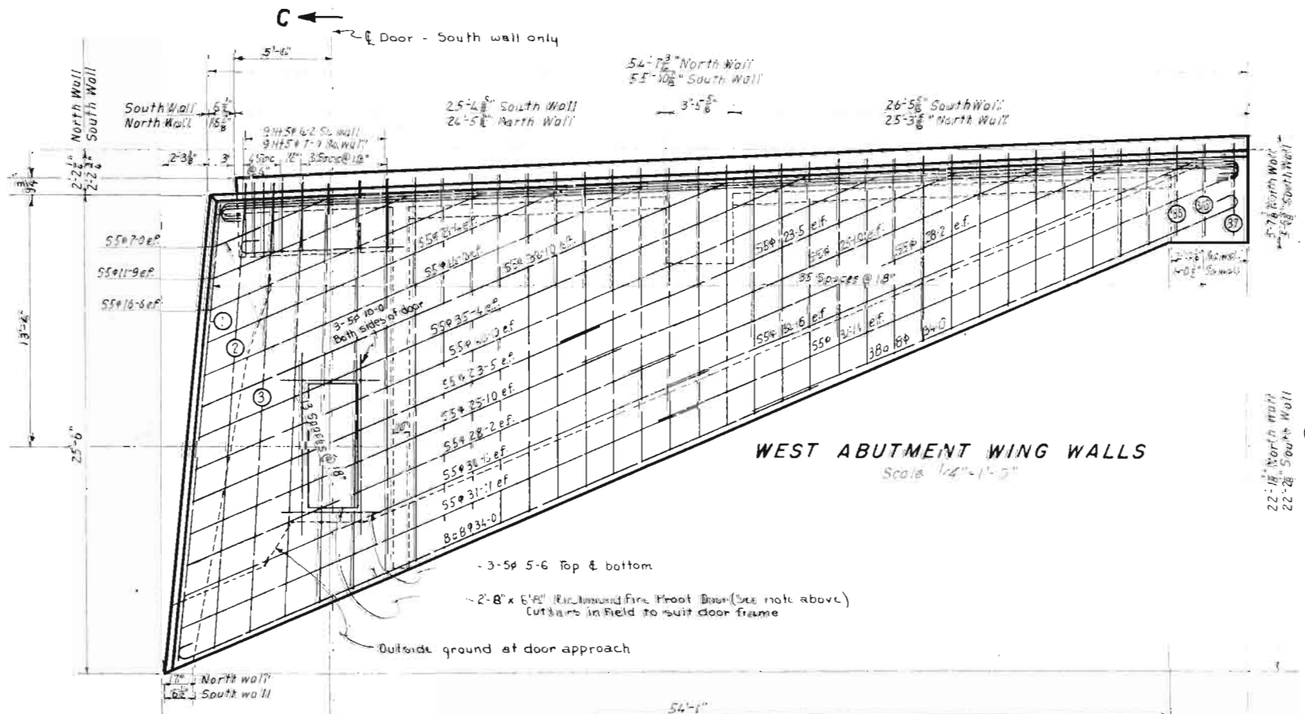
SECTION B-B



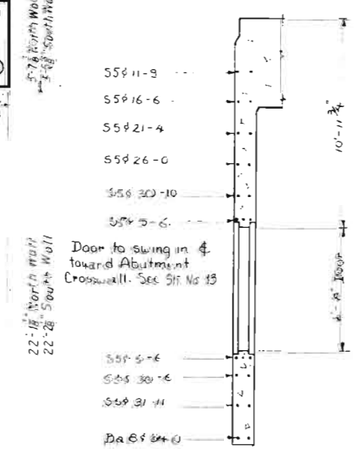
EAST ABUTMENT WING WALLS



PLAN - EAST APPROACH SLAB



WEST ABUTMENT WING WALLS



SECTION C-C

Note:
Clear distance from face of concrete to steel also all others 2" except as noted
Chamfer all exposed corners ¾"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS
WING WALLS
APPROACH SLAB
STRUCTURE NO. F-16-DA

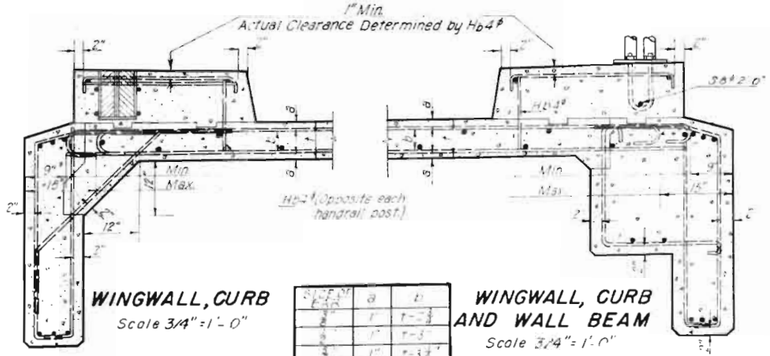
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG NO.

ARUTrich

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		21	

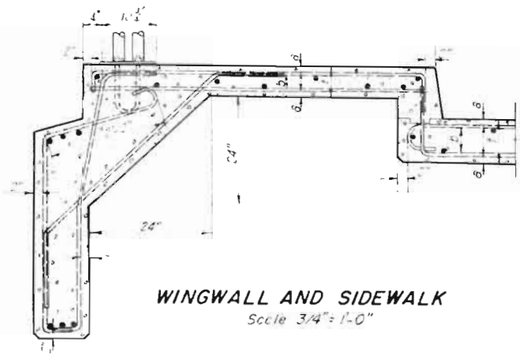
UI 002-2(23)Unit 2, (8)Sect. 2 2nd. Contract, (17) Unit 3



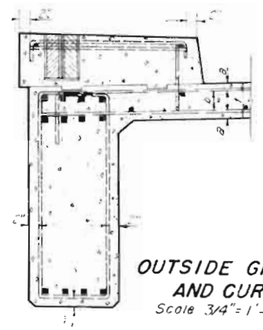
WINGWALL, CURB
Scale 3/4" = 1'-0"

WINGWALL, CURB AND WALL BEAM
Scale 3/4" = 1'-0"

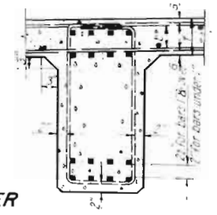
SIZE OF BAR	a	b
3/8"	1"	1'-3"
1/2"	1"	1'-3"
5/8"	1"	1'-3½"
3/4"	1½"	1'-4"
7/8"	1½"	1'-4½"
1"	1½"	1'-5"
1⅛"	1½"	1'-5½"
1¼"	1½"	1'-6"



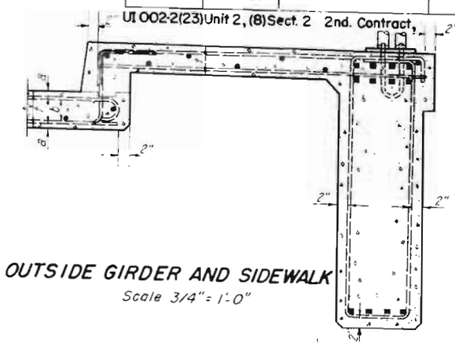
WINGWALL AND SIDEWALK
Scale 3/4" = 1'-0"



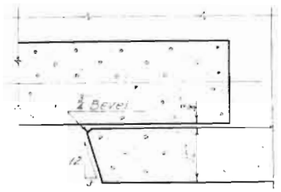
OUTSIDE GIRDER AND CURB
Scale 3/4" = 1'-0"



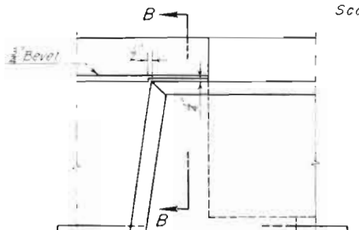
SECTION INSIDE GIRDER
Scale 3/4" = 1'-0"

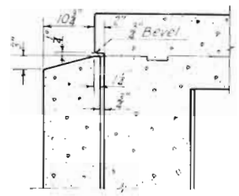


OUTSIDE GIRDER AND SIDEWALK
Scale 3/4" = 1'-0"

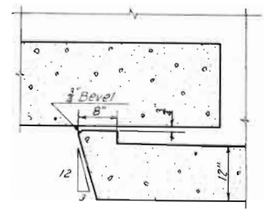


SECTION A-A



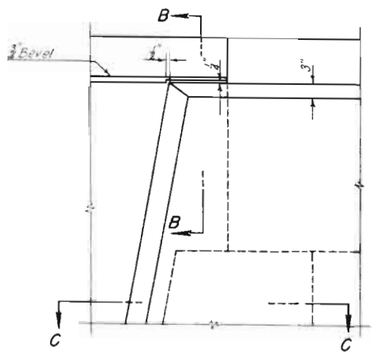


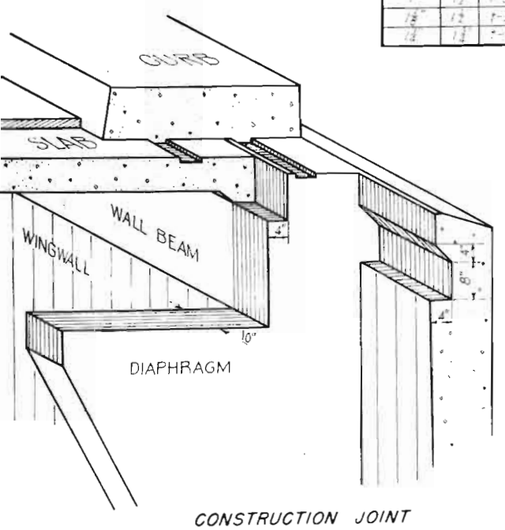
SECTION B-B



SECTION C-C

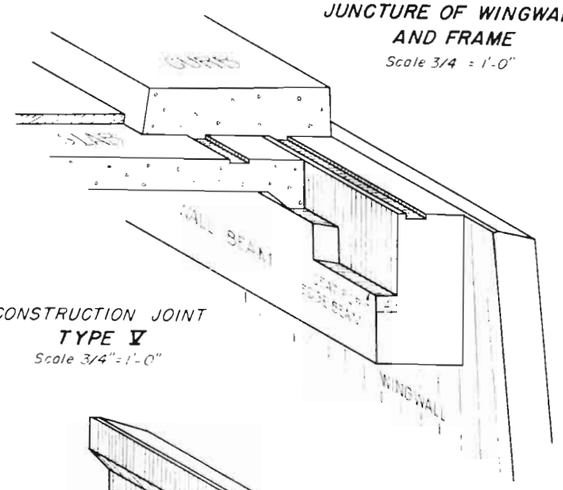
JUNCTURE OF WINGWALL AND FRAME
Scale 3/4" = 1'-0"



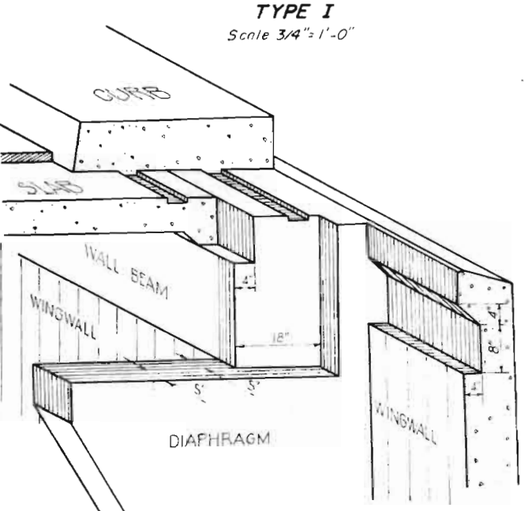


CONSTRUCTION JOINT
TYPE I
Scale 3/4" = 1'-0"

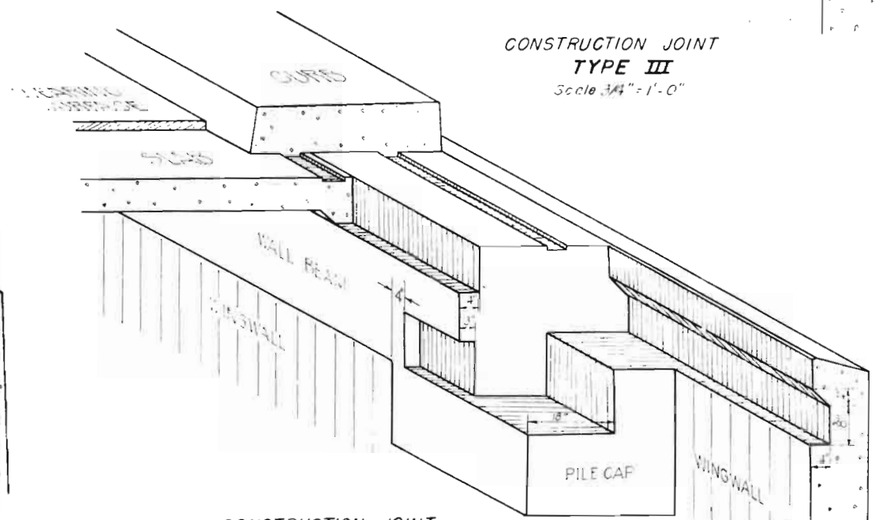
CONSTRUCTION JOINT
TYPE III
Scale 3/4" = 1'-0"



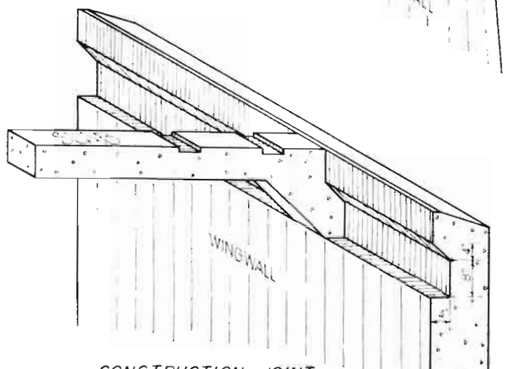
CONSTRUCTION JOINT
TYPE V
Scale 3/4" = 1'-0"



CONSTRUCTION JOINT



CONSTRUCTION JOINT
TYPE IV



CONSTRUCTION JOINT
TYPE VI

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

BRIDGE STANDARDS

DETAILS FOR

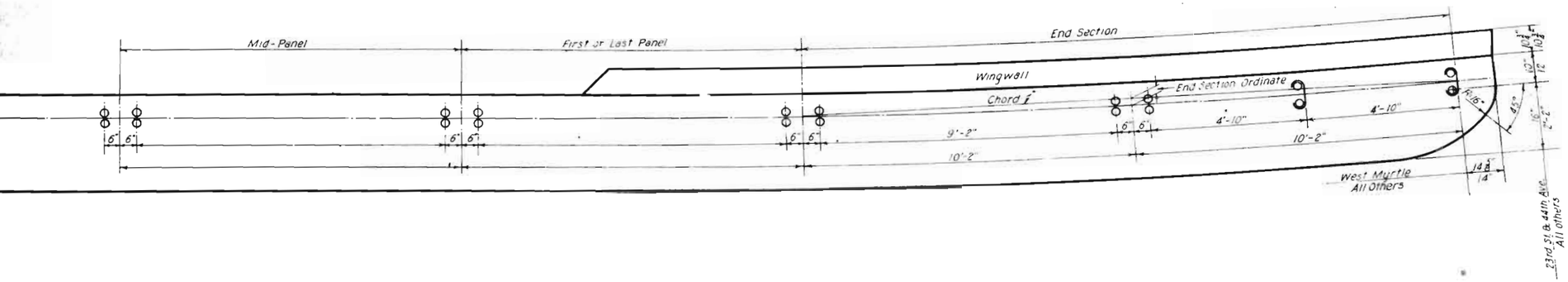
RIGID FRAME BRIDGES

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

Rev. 1-26-49 · Grate Dims & Frame dims. A.D.H.
Rev. 2-24-49, E.F.S. (Dimensions handrail - 46" Ave. NE)

FED. ROAD DIV. NO.	STATE	PROJ. NO	SHEET NO.	TOTAL SHEETS
9	COLO.		22	

U1002-2(23), Unit 2, (8) Section 2, Second Contract (17) Unit 3



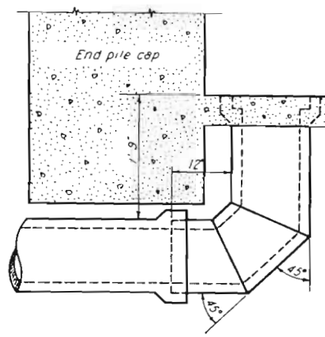
RAILING DATA

BRIDGE	TYPE OF ANCHORAGE	RAILING	NO OF LINES	END SECTION ORDINATE	END SECTION	FIRST PANEL or PANELS	MID-PANELS	LAST PANEL or PANELS	END SECTION	LINE TOTAL	BRIDGE TOTAL
C&S, D&RGSL.	Socket	North side	2	3"	20'-4"	11'-0 3/8"	39@10'-4 1/4" *	7'-9"	20'-4"	463'-3 1/4"	1853'-1 1/4"
		South side	2	3"	20'-4"	10'-4 5/8"	40@10'-0 3/8" †	9'-9"	20'-4"	463'-3 1/4"	
48th AVE.	Socket	All sides	4	3"	20'-4"	10'-1 5/8"	13@10'-5 3/4"	10'-4 5/8"	20'-4"	197'-8"	790'-8"
46th AVE. N.E.	Socket	East side	1	North end 3" South end 3"	20'-4"	10'-3 1/4"	14@10'-3"	10'-3 1/4"	20'-4"	204'-8 1/2"	412'-7 1/2"
		West side	1	North end 3" South end 4"	20'-4"	10'-4 1/2"	14@10'-5 1/2"	10'-4 1/2"	20'-4"	207'-11"	
46th AVE. N.W.	Socket	East side	1	North end 3" South end 3 1/4"	20'-4"	10'-6"	9@10'-3"	10'-6"	20'-4"	153'-11"	310'-4"
		West side	1	North end 3" South end 3"	20'-4"	10'-5 1/4"	9@10'-6 1/2"	10'-5 1/4"	20'-4"	156'-5"	
46th AVE. S.E.	Socket	North side	1	East end 3 1/4" West end 3 1/2"	20'-4"	10'-2 3/8"	14@10'-2 3/4"	10'-2 3/8"	20'-4"	204'-4"	404'-0 3/4"
		South side	1	East end 2 1/4" West end 2 1/2"	20'-4"	10'-7 1/2"	13@10'-7 1/2"	10'-7 1/2"	20'-4"	199'-8 3/4"	
46th AVE. S.W.	Socket	North side	1	East end 4" West end 4"	20'-4"	4@10'-2"	10@10'-7 1/2"	10'-7"	20'-4"	198'-2"	390'-6 5/8"
		South side	1	East end 2 1/4" West end 3"	20'-4"	10'-1 3/8"	13@10'-1 3/8"	10'-1 3/8"	20'-4"	192'-4 5/8"	
44th AVE.	Base Plate and Bolt	Both sides	2	0	20'-4"	10'-2 1/4"	14@10'-6 1/4"	10'-2 1/4"	20'-4"	208'-4"	416'-8"
FOX ST.(NORTH)	Socket	North side	1	East end 3 1/4" West end 3"	20'-4"	10'-6 7/8"	16@10'-6 1/4"	10'-6 7/8"	20'-4"	230'-1 1/2"	458'-10 3/8"
		South side	1	East end 2 1/2" West end 3"	20'-4"	9'-9"	17@9'-11"	9'-9"	20'-4"	228'-9"	
FOX ST.(SOUTH)	Socket	North side	1	East end 3 1/4" West end 3"	20'-4"	10'-4 3/8"	17@10'-5 1/4"	10'-4 5/8"	20'-4"	238'-10 5/8"	473'-9 5/8"
		South side	1	East end 3" West end 3"	20'-4"	10'-3"	17@10'-2 5/8"	10'-2 3/8"	20'-4"	234'-10 1/8"	
C&S, D&RGSL, C&S.	Socket	All sides	4	3"	20'-4"	10'-4 1/4"	28@10'-5 1/4"	10'-4 1/4"	20'-4"	354'-7"	1418'-4"
18th ST.	Socket	Both sides	2	East end 3 1/4" West end 0	20'-4"	10'-3"	15@10'-3"	10'-4"	20'-4"	215'-0"	430'-0"
15th ST.	Base Plate and Bolt	Both sides	2	0	20'-4"	10'-0 1/2"	14@10'-0 1/2"	10'-0 1/2"	20'-4"	203'-8"	407'-4"
23rd AVE.	Base Plate and Bolt	Both sides	2	0	20'-4"	10'-0 3/8"	19@10'-1 1/4"	10'-0 3/8"	20'-4"	253'-2"	506'-4"
SPEER BLVD	Socket	All sides	4	3"	20'-4"	10'-2 1/4"	18@10'-5 1/4"	10'-8 1/2"	20'-4"	255'-2"	1020'-8"
PLATTE RIVER	Socket	East side	2	3"	20'-4"	16@10'-6 1/4"	14@10'-6" ‡	9@10'-6 3/8"	20'-4"	450'-7 3/8"	1802'-4 3/8"
		West side	2	3"	20'-4"	14@10'-4"	14@10'-6" ‡	11@10'-9"	20'-4"	450'-7"	
MARKET ST.(EAST)	Socket	East side	1	North end 2 1/4" South end 2 1/2"	20'-4"	9'-3 1/4"	15@10'-3 3/8"	9'-3 1/4"	20'-4"	213'-11"	428'-2"
		West side	1	North end 3" South end 3 1/2"	20'-4"	11'-0 1/2"	15@10'-2"	10'-0 1/2"	20'-4"	214'-3"	
MARKET ST.(WEST)	Socket	East side	1	North end 2 1/4" South end 2 1/2"	20'-4"	9'-11 3/8"	14@9'-11 3/8"	9'-11 3/8"	20'-4"	199'-10"	400'-10"
		West side	1	North end 3" South end 3"	20'-4"	10'-2"	14@10'-0"	10'-2"	20'-4"	201'-0"	
MYRTLE PLACE	Socket	All sides	4	3"	20'-4"	10'-4 1/4"	11@10'-4 1/2"	10'-4 1/4"	20'-4"	176'-6"	707'-0"

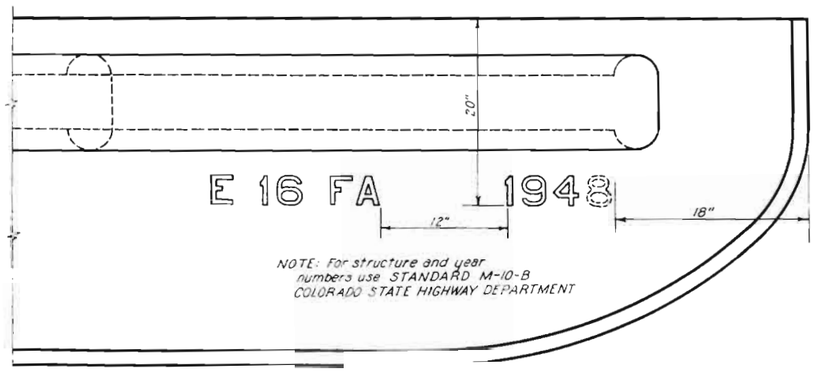
* Deck expansion joints between 21st and 22nd panels.

† Deck expansion joint between 22nd and 23rd panels

‡ Deck expansion joint at each end of these 14 panels.

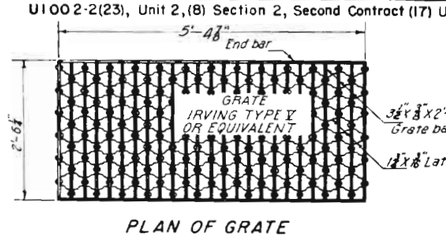


BRIDGE DRAIN OUTLET ELBOW
Scale 3/4" = 1'-0"

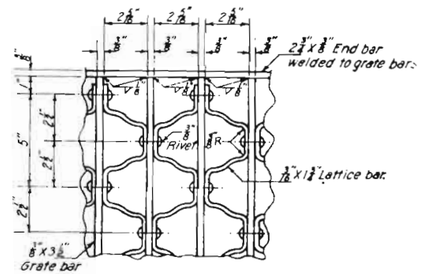


NOTE: For structure and year numbers use STANDARD M-10-8 COLORADO STATE HIGHWAY DEPARTMENT

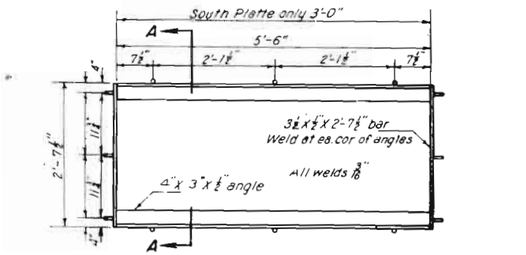
YEAR AND BRIDGE NO. POSITIONS



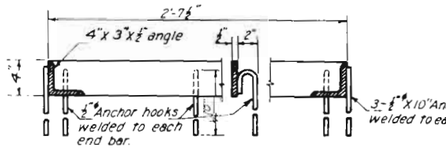
PLAN OF GRATE



DETAIL OF GRATE



PLAN OF FRAME



SECTION A-A

BRIDGE DRAIN GRATES AND FRAMES
Scale 1/2" = 1'-0"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

BRIDGE STANDARDS

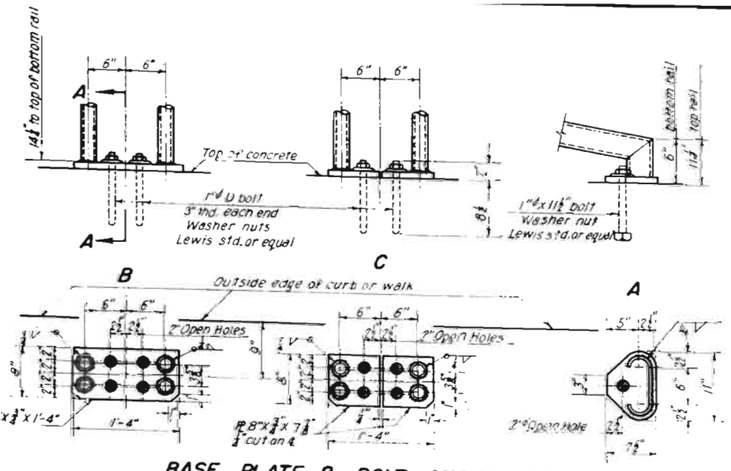
RAILING DATA
BRIDGE DATA, NUMBER POSITIONS

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

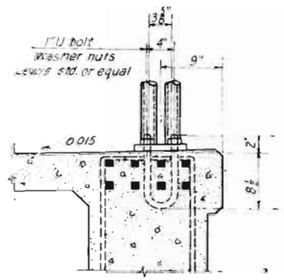
DWG. NO.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		22A	

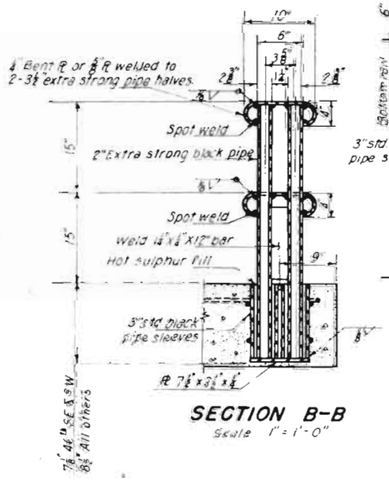
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



BASE PLATE & BOLT ANCHORAGES
Scale 1" = 1'-0"

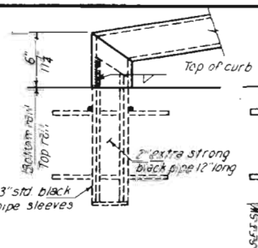


SECTION A-A

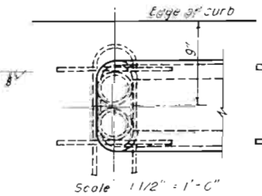


SECTION B-B
Scale 1" = 1'-0"

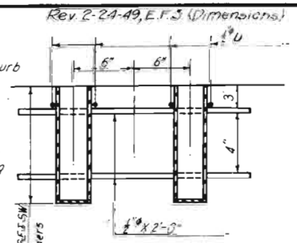
DETAILS FOR STEEL RAILING



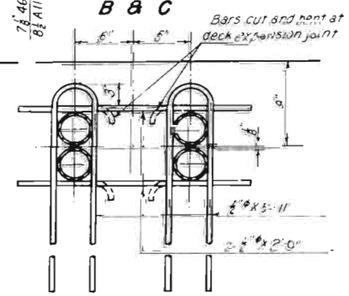
A



Scale 1 1/2" = 1'-0"

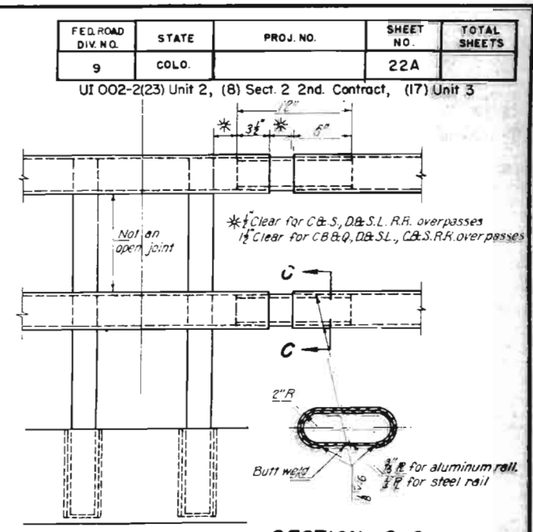


B & C



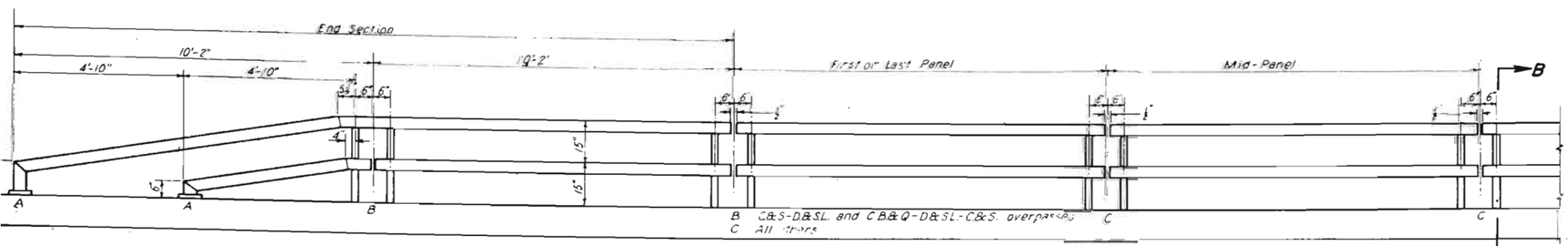
Scale 1 1/2" = 1'-0"

SOCKET ANCHORAGES

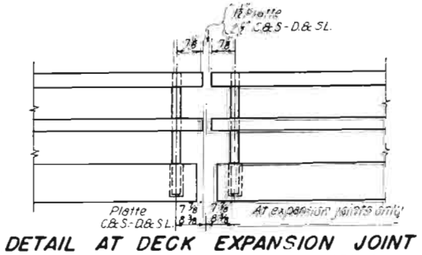


SECTION C-C

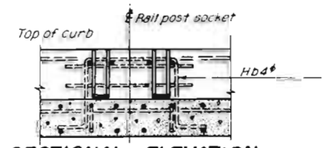
TELESCOPING EXPANSION JOINT
FOR C&S-D&SL AND CB&Q-D&SL-C&S OVERPASSES ONLY
Scale 1 1/2" = 1'-0"



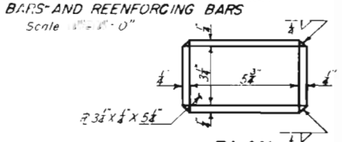
RAILING ELEVATION



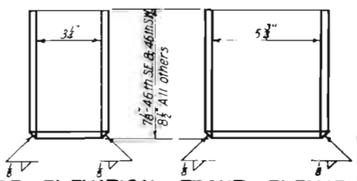
DETAIL AT DECK EXPANSION JOINT
C&S-D&SL AND PLATTE RIVER BRIDGES ONLY
Scale 1/2" = 1'-0"



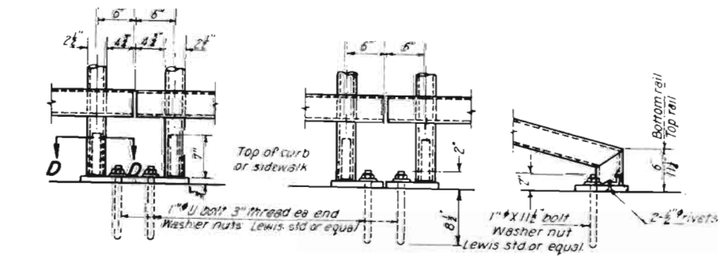
SECTIONAL ELEVATION
SHOWING ARRANGEMENT OF ANCHOR BARS AND REENFORCING BARS
Scale 1" = 1'-0"



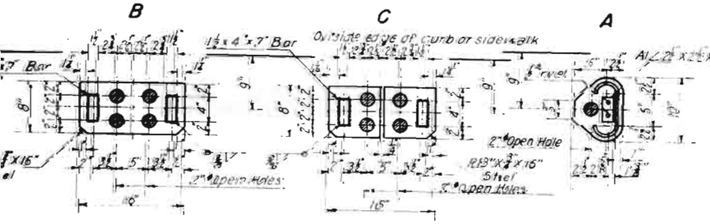
PLAN



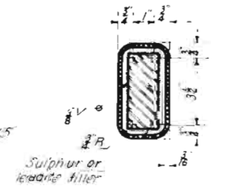
SIDE ELEVATION FRONT ELEVATION
RAIL POST SOCKET DETAILS
Scale 3" = 1'-0"



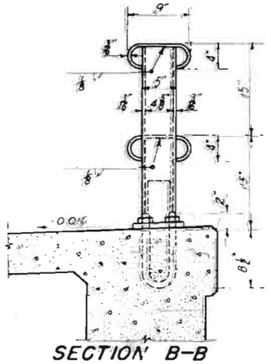
B C A



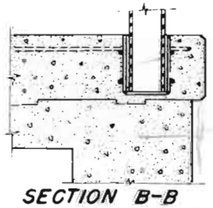
BASE PLATE & BOLT ANCHORAGES
Scale 1" = 1'-0"



SECTION D-D
Scale 3" = 1'-0"

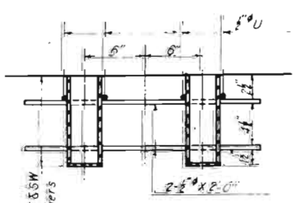


SECTION B-B
BOLT ANCHORAGE

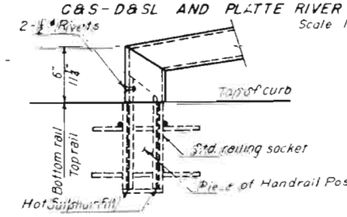


SECTION B-B
SOCKET ANCHORAGE
Scale 1 1/2" = 1'-0"

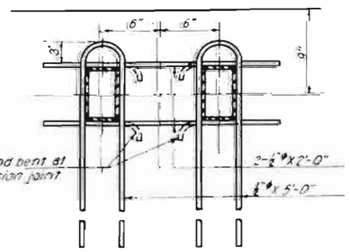
DETAILS FOR ALUMINUM RAILING

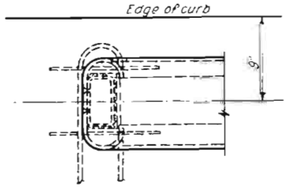


B & C



A





SOCKET ANCHORAGES
Scale 1½" = 1'-0"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

BRIDGE STANDARDS

RAILINGS

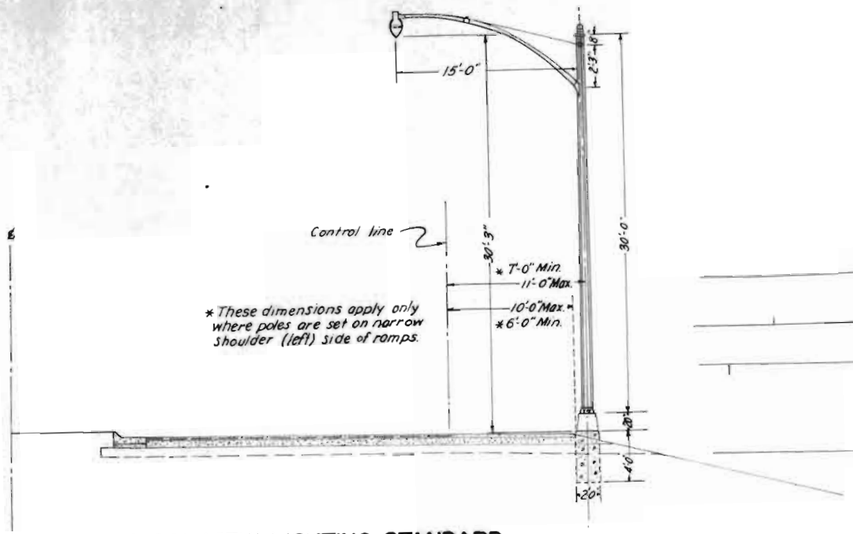
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE	SHEET 3 OF 3	DWG NO.

Rev. 7-28-52, Typical Lighting Views, J.C.R.

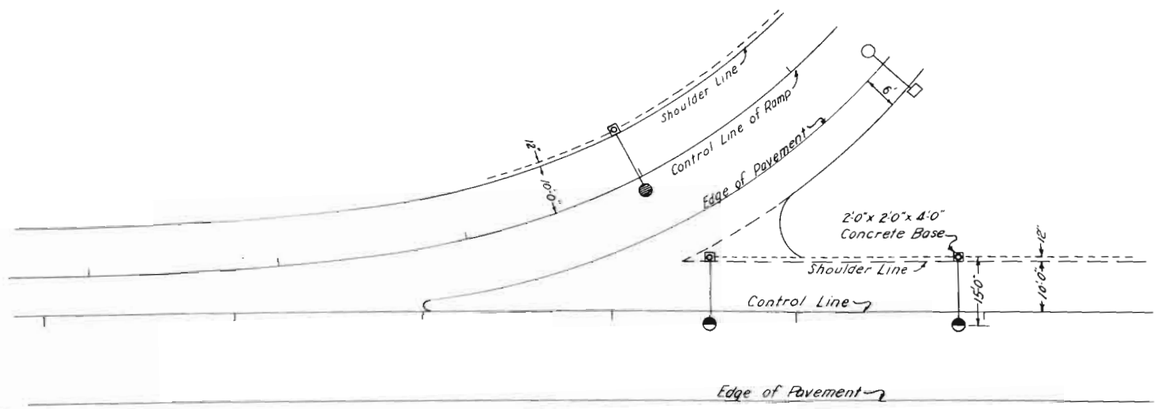
FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		23	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



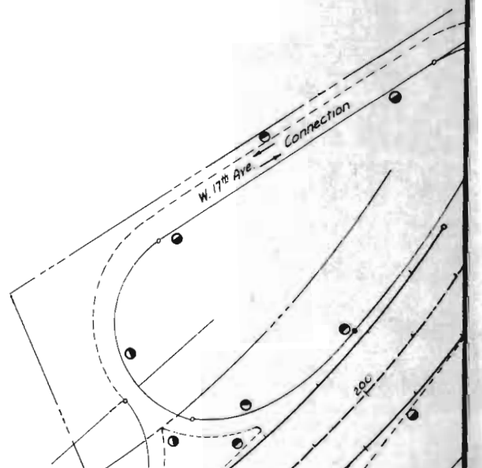
TYPICAL VIEW LIGHTING STANDARD

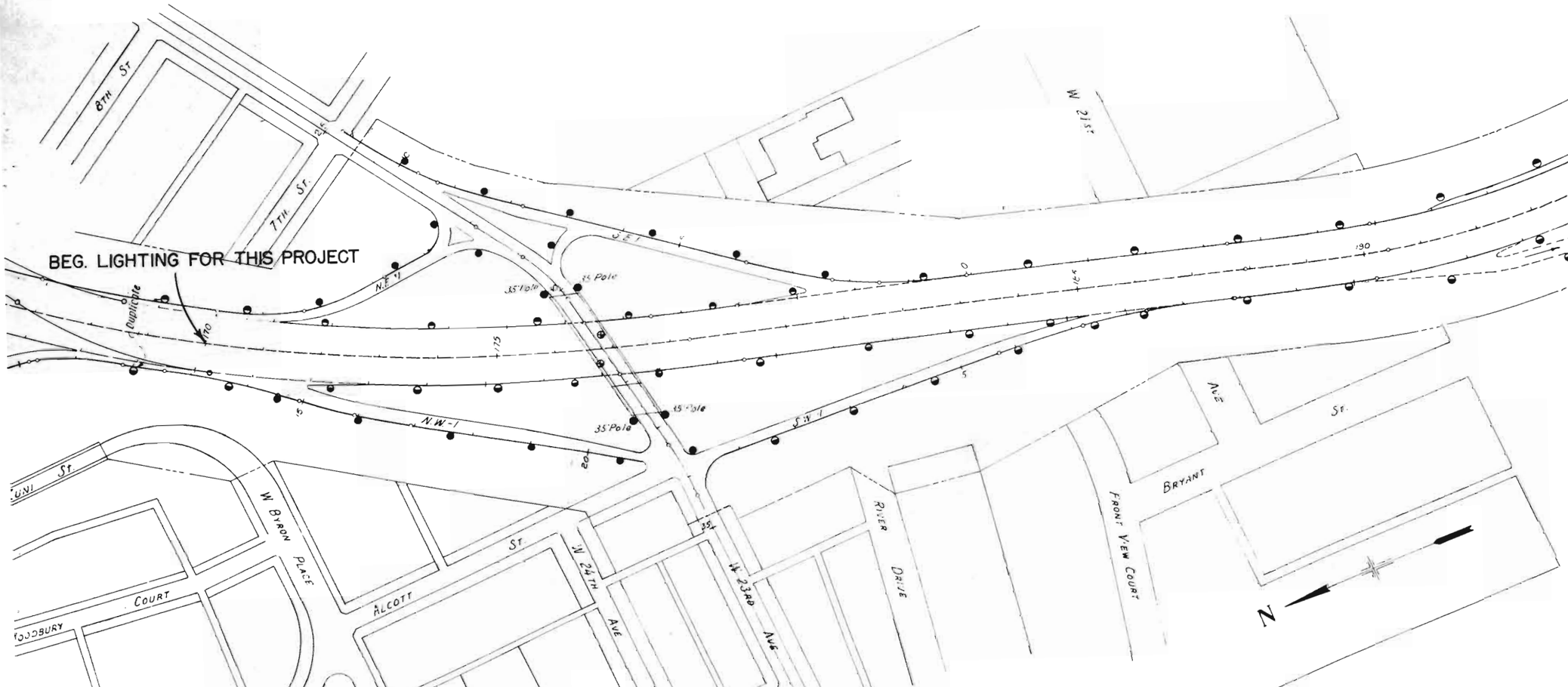
NO SCALE



TYPICAL LIGHTING LAYOUT

SPACING VARIES AS SHOWN ON PLAN SHEETS





SYMBOL	PROJECT SUMMARY	
●	16,000 L Merc Vapor	88
	30' Poles	80
	35' Poles	8
⊗	4,000 L Incandescent	2

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

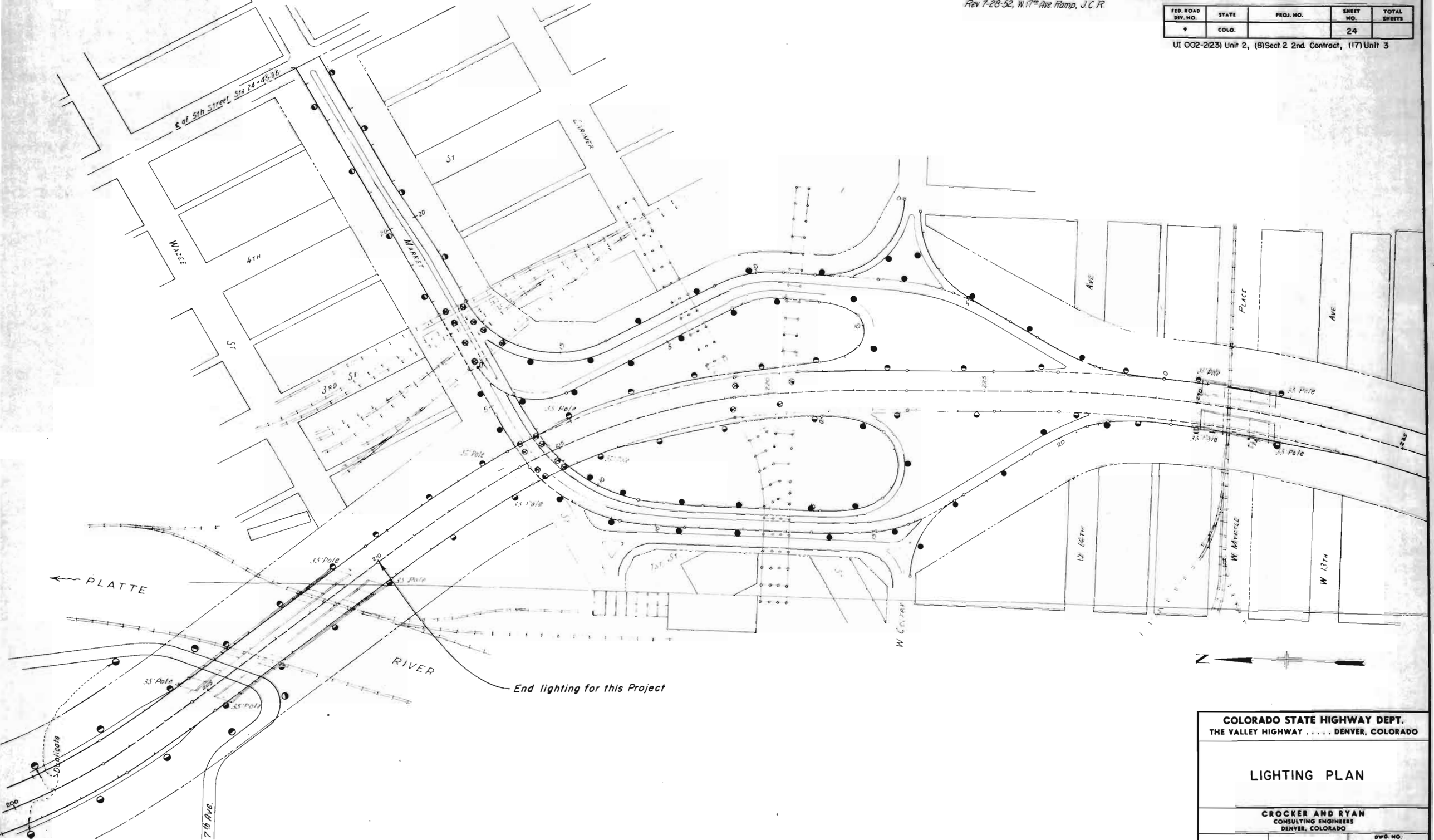
LIGHTING PLAN

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

Rev 7-28-52, W. 17th Ave Ramp, J.C.R.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		24	

UI 002-2(23) Unit 2, (8)Sect 2 2nd. Contract, (17) Unit 3



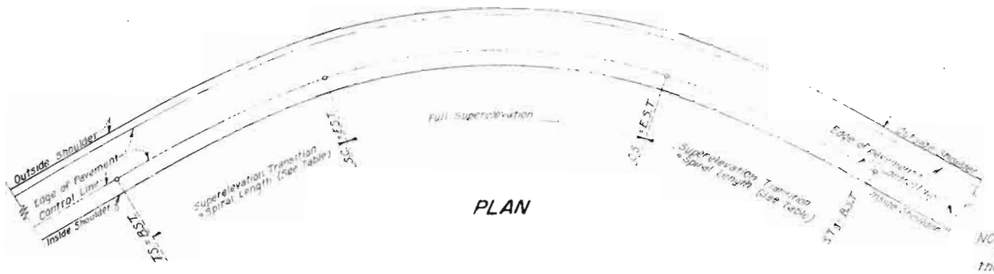
COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

LIGHTING PLAN

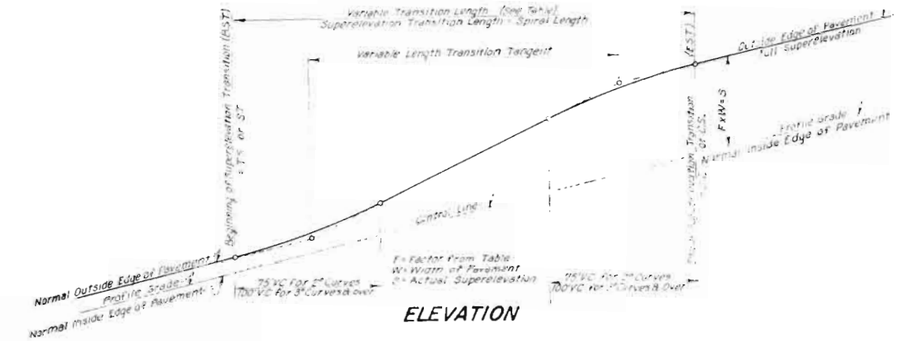
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG. NO.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2	25	
		UI 002-2(8) Sect. 2 2nd Contract		
		UI 002-2(17) Unit 3		



PLAN



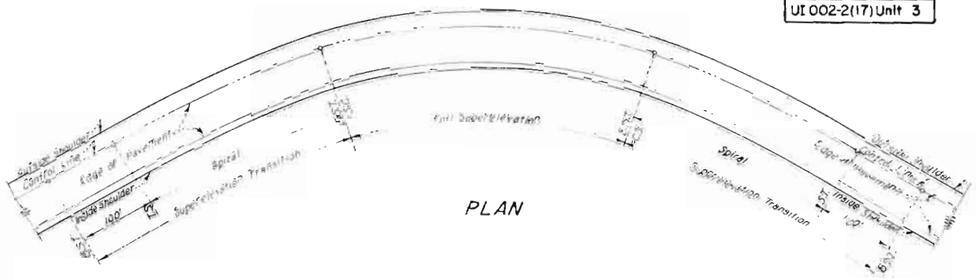
ELEVATION

NOTE: CASE I
The normal roadway slope is approximately equal to the superelevation for a 1° curve. Therefore no superelevation is required for 1° curves.
For curves of over 1° the factors shown in the table for Case I include the normal roadway slope of .02 Ft. per Ft. thereby giving values of actual superelevation at any point on the transition.

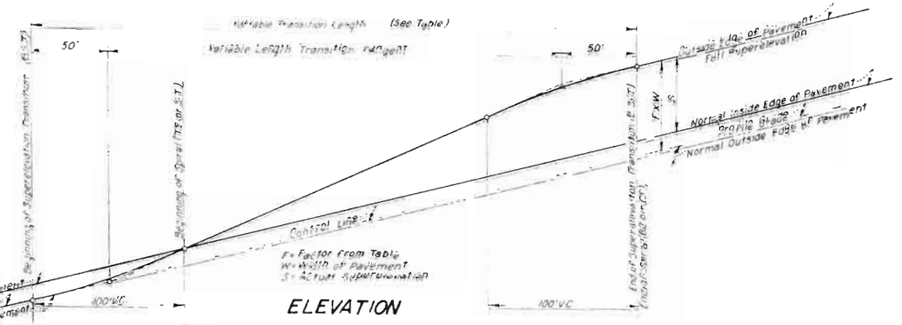
NOTE: CASE II
In order that the opposing slope of the normal roadway be eliminated before entering the horizontal curve, Case II superelevation transitions shall begin on the tangent one hundred feet (100') from the T.S. and/or S.T. of the spiral. Case II superelevation, calculated as indicated in the table, is to be added to the normal, low edge of pavement.

NOTE: CASE I & II
On curves where no spirals are used the superelevation transition shall be on the tangent approaching each end of the curve. Full superelevation to coincide with the P.C. or P.T. of such curve.

* Shoulders having slopes adverse to or greater than normal pavement slope shall be raised to coincide with the pavement slope at beginning of transition. Raising of shoulder to take place gradually over a distance of not less than 50ft.

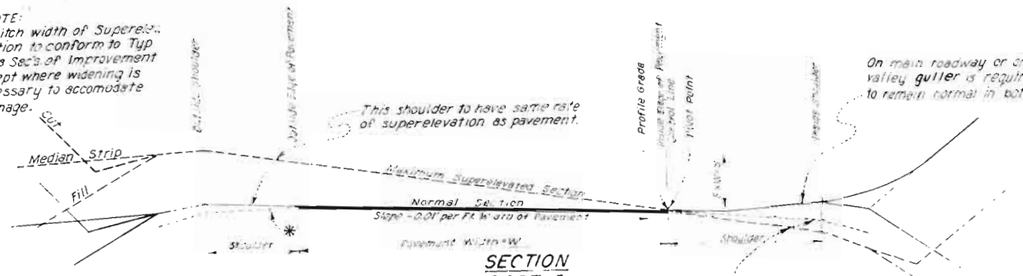


PLAN



ELEVATION

NOTE:
Ditch width of Superelev. Section to conform to Typ. Cross Sects of Improvement except where widening is necessary to accomodate drainage.



SECTION
CASE I

SUPERELEVATION TRANSITION

CURVES HAVING SUPERELEVATION IN SAME DIRECTION AS NORMAL ROADWAY SLOPE

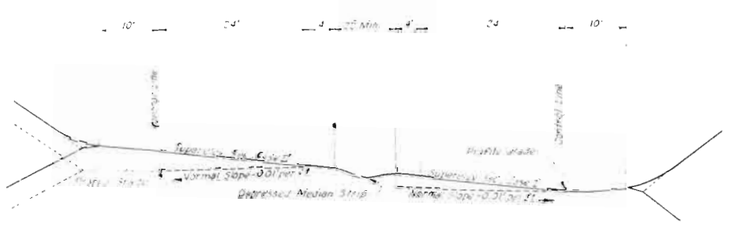
SUPERELEVATION TABLE

DEG. OF CURVE		PROPORTIONAL DISTANCE FROM BEGINNING OF TRANSITION									
CASE I	CASE II	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Max. 1.0
		RATE OF SUPERELEVATION (IN FEET) PER FT. WIDTH OF ROADWAY									
	1°	0.00042	0.00168	0.00378	0.00672	0.01050	0.01428	0.01722	0.01932	0.02058	0.02100
2°		0.01071	0.01134	0.01239	0.01386	0.01575	0.01764	0.01911	0.02016	0.02079	0.02100
	2°	0.00066	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
3°		0.01092	0.01218	0.01428	0.01727	0.02100	0.02478	0.02772	0.02982	0.03108	0.03150
	3°	0.00095	0.00378	0.00855	0.01470	0.02100	0.02730	0.03330	0.03822	0.04106	0.04200
4°		0.01116	0.01313	0.01641	0.02100	0.02625	0.03150	0.03603	0.03938	0.04134	0.04200
	4°	0.00129	0.00515	0.01155	0.01990	0.02625	0.03360	0.04095	0.04736	0.05124	0.05250
5°		0.01165	0.01409	0.01906	0.02520	0.03150	0.03780	0.04410	0.04872	0.05166	0.05250
	5°	0.00168	0.00672	0.01470	0.02310	0.03150	0.04095	0.04830	0.05628	0.06132	0.06300

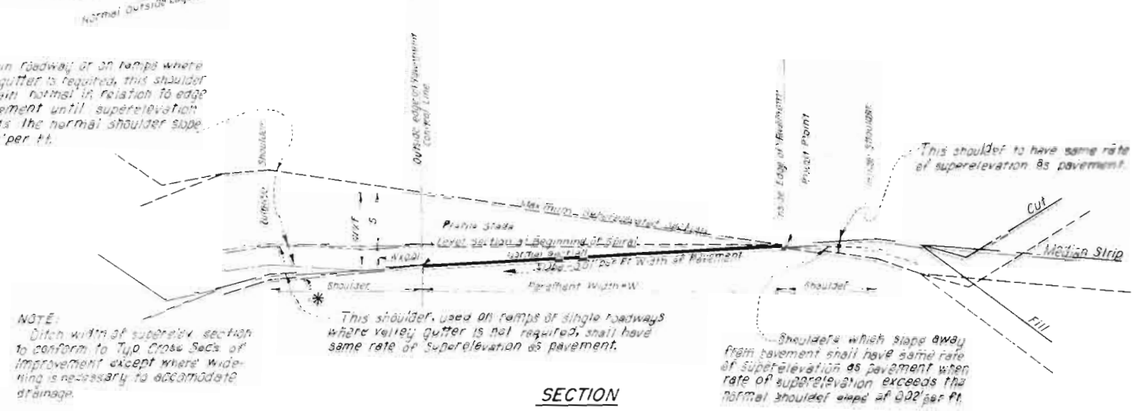
FACTORS SHOWN IN ABOVE TABLE ARE BASED ON THE FOLLOWING TRANSITION LENGTHS

DEG. OF CURVE	LENGTH OF SPIRAL	LENGTH OF SUPERELEVATION TRANSITION	
		CASE I	CASE II
1 Degree	None	None	200'
2 Degrees	150'	150'	240'
3 Degrees	200'	200'	300'
4 Degrees	250'	250'	350'
5 Degrees	300'	300'	400'

* ... to be added to normal low elev. of edge of pavement.



TYPICAL SUPERELEVATED SECTION
OF
4 LANE DIVIDED HIGHWAY



SECTION
CASE II

SUPERELEVATION TRANSITION

CURVES HAVING SUPERELEVATION IN OPPOSITE DIRECTION TO NORMAL ROADWAY SLOPE

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

METHODS FOR SUPERELEVATION OF CURVES

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE ____ SHEET ____ OF ____ DWG. NO.

F.A.U. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	[illegible]	26	

UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3

BAR LIST FOR 6×4 BOX.

JW.B E.J.S.

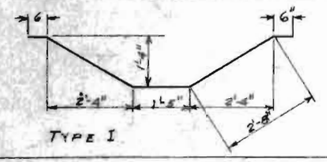
MARK	SIZE	NO REQ'D	LENGTH	TYPE	TOTAL LENGTH	REMARKS
700	7/8" ϕ	258	40'-0"	STR	10320	LONGITUDINAL STEEL
						IN ROOF, FLOOR & WALLS
						FOR ALL SECTIONS.
	FOR	SECTIONS	"A"			
701	7/8" ϕ	426	7'-0"	STR	2982	FOR ROOF
702	7/8" ϕ	426	7'-9"	I	3302	FOR FLOOR
400	1/2" ϕ	426	3'-9"	STR	1598	FOR WALLS
	FOR	SECTIONS	"B"			
701	7/8" ϕ	172	7'-0"	STR	1204	FOR ROOF
702	7/8" ϕ	172	7'-9"	I	1333	FOR FLOOR
400	1/2" ϕ	172	3'-9"	STR	645	FOR WALLS
	FOR	SECTIONS	"C"			
701	7/8" ϕ	74	7'-0"	STR	518	FOR ROOF
702	7/8" ϕ	74	7'-9"	I	574	FOR FLOOR
400	1/2" ϕ	74	3'-9"	STR	278	FOR WALLS
	FOR	SECTION	"D"			
701	7/8" ϕ	58	7'-0"	STR	406	FOR ROOF
702	7/8" ϕ	58	7'-9"	I	450	FOR FLOOR
400	1/2" ϕ	58	3'-9"	STR	218	FOR WALLS
	FOR	5 MANHOLES *			60, 61, 62, 68 & 69a	TYPE 5-B.
703	7/8" ϕ	20	3'-3"	STR	65	ACROSS CORNERS.
401	1/2" ϕ	60	7'-0"	STR	420	VERT. IN WALLS.

NO STEP BARS INCLUDED FOR MANHOLES.

BAR SUMMARY.

21,154 Lin Ft 7/8" ϕ @ 2.044 Lbs/Lin.Ft =	43,239 lbs
3159 Lin.Ft 1/2 ϕ @ 0.668 Lbs/Lin.Ft =	2,110 Lbs.
OVERRUN = ± 1% =	451 Lbs.
TOTAL =	45800 Lbs

BAR BENDING DIAGRAM FOR 6'×4' BOX.



ALL REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. SPECIFICATIONS A 305 - 50T OR THE LATEST REVISION THEREOF.
ALL DIMENSIONS ARE OUT TO OUT OF BARS.

BAR LIST FOR TYPE 1 DROP INLETS

JW.B E.J.S.

No & DEPTH: 1- 2'-6"; 1-3'-0"; 1-3'-6"; 1-5'-0"; 1-5'-6".

MARK	SIZE	NO REQ'D	LENGTH	TYPE	DIMENSIONS ℓ	m	n	r	REMARKS.
405	1/2" ϕ	32	14'-10"	II	4'-6 1/2"	2'-4 1/2"	6"		Common to all Depths
406	1/2" ϕ	30	5'-10"	STR					Floors
407	1/2" ϕ	50	3'-8"	STR					Floors
408	1/2" ϕ	8	2'-10"	STR					For 2'-6" Depth
409	1/2" ϕ	16	4'-4"	III	2'-8"				
410	1/2" ϕ	8	3'-4"	STR					For 3'-0" Depth
411	1/2" ϕ	16	4'-10"	III	3'-2"				
412	1/2" ϕ	8	3'-10"	STR					For 3'-6" Depth
413	1/2" ϕ	16	5'-4"	III	3'-8"				
414	1/2" ϕ	8	5'-4"	STR					For 5'-0" Depth
415	1/2" ϕ	16	6'-10"	III	5'-2"				
416	1/2" ϕ	8	5'-10"	STR					For 5'-6" Depth
417	1/2" ϕ	16	7'-4"	III	5'-8"				
600	3/4" ϕ	3	2'-6"	IV					Steps for 3'-0 & 5'-6" Depth

SUMMARY FOR TYPE 1 DROP INLETS.

1470 Lin Ft 1/2" ϕ @ 0.668 Lbs/Lin Ft =	982 Lbs.
8 Lin Ft 3/4" ϕ @ 1.502 Lbs/Lin Ft =	12 Lbs.
OVERRUN = ± 1% =	6 Lbs
TOTAL =	1000 Lbs

BAR LIST FOR TYPE 1A DROP INLETS

JW.B E.J.S.

No & DEPTH: 2-2'-0"; 1-2'-6"; 4-3'-0", 2-3'-6"; 1-4'-0"; 1-4'-6"; 1-5'-0"; 1-13'-6"

MARK	SIZE	NO REQ'D	LENGTH	TYPE	DIMENSIONS ℓ	m	n	r	REMARKS.
405	1/2" ϕ	85	14'-10"	II	4'-6 1/2"	2'-4 1/2"	6"		Common to all Depths
406	1/2" ϕ	78	5'-10"	STR					FLOORS
407	1/2" ϕ	130	3'-8"	STR					FLOORS
418	1/2" ϕ	40	2'-2"	STR					For 2'-0" Depth
419	1/2" ϕ	20	2'-8"	STR					For 2'-6" Depth
420	1/2" ϕ	80	3'-2"	STR					For 3'-0" Depth
407	1/2" ϕ	40	3'-8"	STR					For 3'-6" Depth
421	1/2" ϕ	20	4'-2"	STR					For 4'-0" Depth
422	1/2" ϕ	20	4'-8"	STR					For 4'-6" Depth
423	1/2" ϕ	20	5'-2"	STR					For 5'-0" Depth
424	1/2" ϕ	20	13'-8"	STR					For 13'-6" Depth
600	3/4" ϕ	8	2'-6"	IV					For Steps
									1 For 4'-6", 1 For 5'-0"
									& 6 For 13'-6" Depth

SUMMARY FOR TYPE 1A DROP INLETS

3284 Lin Ft 1/2" ϕ @ 0.668 Lbs/Lin Ft =	2,194 Lbs
20 Lin Ft 3/4" ϕ @ 1.502 Lbs/Lin Ft =	30 Lbs
OVERRUN = ± 1% =	20 Lbs
TOTAL =	2244 Lbs.

BAR LIST FOR TYPE 1B DROP INLETS

JW.B E.J.S.

No & DEPTH: 1-2'-6"; 2-4'-0"

MARK	SIZE	NO REQ'D	LENGTH	TYPE	DIMENSIONS ℓ	m	n	r	REMARKS
405	1/2" ϕ	18	14'-10"	II	4'-6 1/2"	2'-4 1/2"	6"		Common to all Depths
406	1/2" ϕ	18	5'-10"	STR					Floors
407	1/2" ϕ	30	3'-8"	STR					Floors
419	1/2" ϕ	8	2'-8"	STR					For 2'-6" Depth.
408	1/2" ϕ	4	2'-10"	STR					
425	1/2" ϕ	8	3'-4	V	1'-10"				
421	1/2" ϕ	16	4'-2"	STR					For 4'-0" Depth.
426	1/2" ϕ	8	4'-4"	STR					
427	1/2" ϕ	16	4'-10"	V	3'-4"				

SUMMARY FOR TYPE 1B DROP INLETS

720 Lin.Ft. 1/2" ϕ @ 0.668 Lbs/Lin.Ft. =	481 Lbs.
OVERRUN = ± 1%	4 Lbs.
TOTAL =	485 Lbs.

BAR LIST FOR TYPE 2 DROP INLETS

JW.B.

No & DEPTH: 2-2'-0"; 1-2'-6"; 1-3'-0", 2-4'-0"; 1-4'-6"

MARK	SIZE	NO REQ'D	LENGTH	TYPE	DIMENSIONS ℓ	m	n	r	REMARKS.
428	1/2" ϕ	34	19'-0"	II	4'-7"	4'-5"	6"		Common to all Depths
429	1/2" ϕ	70	5'-9"	STR					Floors
430	1/2" ϕ	63	5'-11"	STR					Floors
601	3/4" ϕ	28	5'-3"	STR					At Top of Inlet
431	1/2" ϕ	32	2'-10 1/2"	VI	2'-3"	8"		1 1/2"	For 2'-0" Depth
432	1/2" ϕ	16	3'-4 1/2"	VI	2'-9"	8"		1 1/2"	For 2'-6" Depth
433	1/2" ϕ	16	3'-10 1/2"	VI	3'-3"	8"		1 1/2"	For 3'-0" Depth
434	1/2" ϕ	32	4'-10 1/2"	VI	4'-3"	8"		1 1/2"	For 4'-0" Depth
435	1/2" ϕ	16	5'-4 1/2"	VI	4'-9"	8"		1 1/2"	For 4'-6" Depth
436	1/2" ϕ	8	2'-4"	STR					For 2'-0" Depth
408	1/2" ϕ	4	2'-10"	STR					For 2'-6" Depth
410	1/2" ϕ	4	3'-4"	STR					For 3'-0" Depth
426	1/2" ϕ	8	4'-4"	STR					For 4'-0" Depth
437	1/2" ϕ	4	4'-10"	STR					For 4'-6" Depth
600	3/4" ϕ	1	2'-6"	IV					Step for 4'-6" Depth

SUMMARY FOR TYPE 2 DROP INLETS

1969 Lin Ft 1/2" ϕ @ 0.668 Lbs./Lin Ft =	1315 Lbs.
150 Lin Ft 3/4" ϕ @ 1.502 Lbs/Lin Ft =	225 Lbs.
OVERRUN = ± 1% =	15 Lbs
TOTAL =	1555 Lbs

BAR LIST FOR TYPE 2A DROP INLETS

JW.B E.J.S.

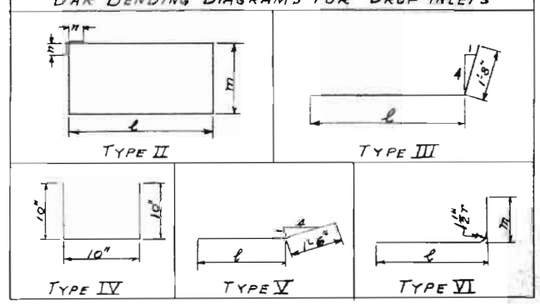
No & DEPTH: 1-3'-0"; 1-6.8'.

MARK	SIZE	NO REQ'D	LENGTH	TYPE	DIMENSIONS ℓ	m	n	r	REMARKS.
428	1/2" ϕ	16	19'-0"	II	4'-7"	4'-5"	6"		Common to all Depths
429	1/2" ϕ	20	5'-9"	STR					Floors
430	1/2" ϕ	18	5'-11"	STR					Floors
601	3/4" ϕ	8	5'-3"	STR					Top of Inlet
433	1/2" ϕ	16	3'-10 1/2"	VI	3'-3"	8"		1 1/2"	For 3'-0" Depth
438	1/2" ϕ	16	7'-7 1/2"	VI	7'-0"	8"		1 1/2"	For 6.8' Depth
410	1/2" ϕ	4	3'-4"	STR					For 3'-0" Depth
439	1/2" ϕ	4	7'-2"	STR					For 6.8' Depth
600	3/4" ϕ	3	2'-6"	IV					Steps For 6.8' Depth

SUMMARY FOR TYPE 2A DROP INLETS

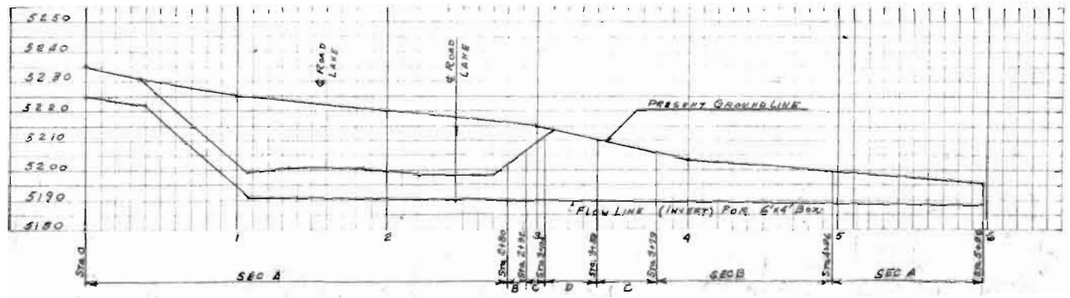
753 Lin Ft 1/2" ϕ @ 0.668 Lbs/Lin.Ft. =	503 Lbs.
50 Lin Ft 3/4" ϕ @ 1.502 Lbs/Lin Ft =	75 Lbs
OVERRUN = ± 1% =	2 Lbs
TOTAL =	580 Lbs

BAR BENDING DIAGRAMS FOR DROP INLETS



ALL DIMENSIONS ARE OUT TO OUT OF BARS.

SECTION	HEIGHT INVERT TO GRADE	T	BAR SPACING FLOOR & ROOF	BAR SPACING WALLS
A	0' To 14'	8"	11"	22"
B	14' To 18'	9"	9"	18"
C	18' To 22'	10"	8 1/2"	17"
D	22' To 26'	11"	7 1/2"	15"



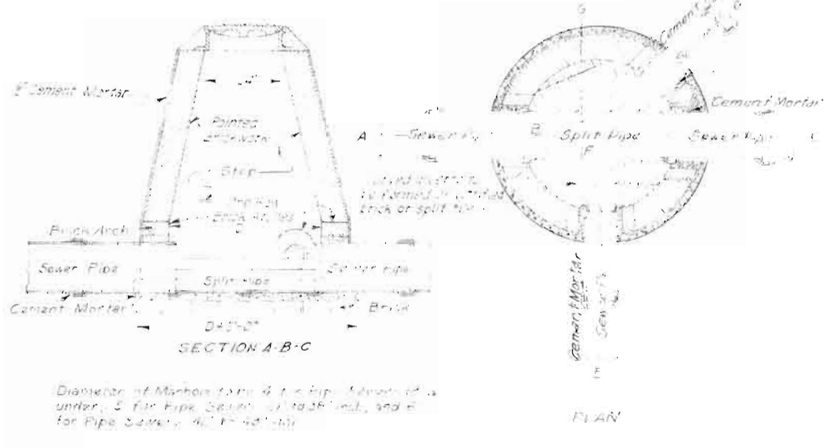
	INITIAL	DATE
DESIGNED	J.W.B	2-61-62
CHECKED		
DRAWN	J.W.B	2-62-62
TRACED		
CHECKED		

COLORADO
STATE HIGHWAY DEPARTMENT.
BAR LIST, BENDING DIAGRAM AND PROFILE FOR 6'×4' CONCRETE STORM SEWER BOX-UNDER VALLEY HIGHWAY NEAR 23RD AVE & PLATTE IN DENVER - COLO.

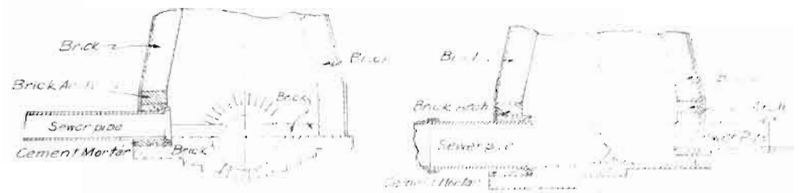
Designed By J.W.B
Made By J.W.B
Approved By R.L. Bailey
Bridge Engineer

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		27	

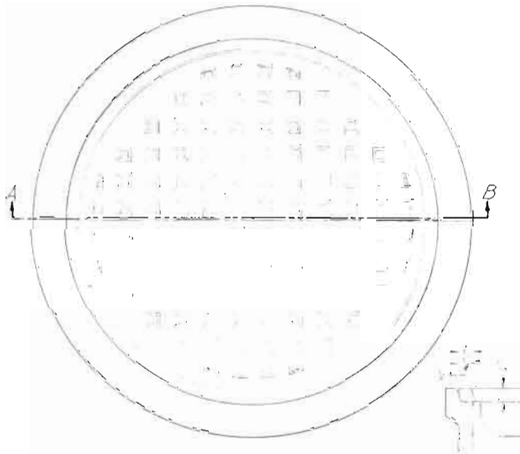
UI 002-2(23) Unit 2, (8) Sect 2 2nd Contract, (17) Unit 3



Diameter of Manhole to be 5' for Pipe Sewers 36" and under, 6' for Pipe Sewers 42" to 48" incl., and 8' for Pipe Sewers 54" to 84" incl.

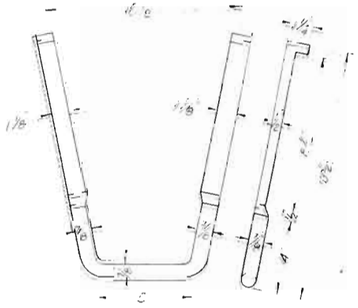


TYPE I MANHOLE (STORM & SANITARY)



Frame weighs 224#
Cover weighs 176#
Dipped & Painted with Asphalt Varnish Tar & Oil

DETAILS OF MANHOLE RING & COVER



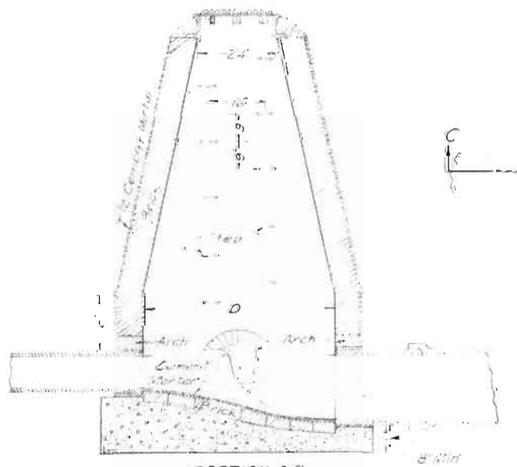
Scale 3"-1'-0"

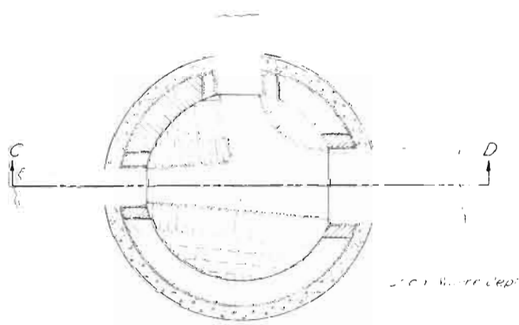
This Step to be used for all Types Manholes

GENERAL NOTES

All manholes shall conform to the requirements of grade MA of AASHO Designation M 91-42. Manhole bottoms may be of either brick or concrete. Manhole benches shall be of brick or concrete.

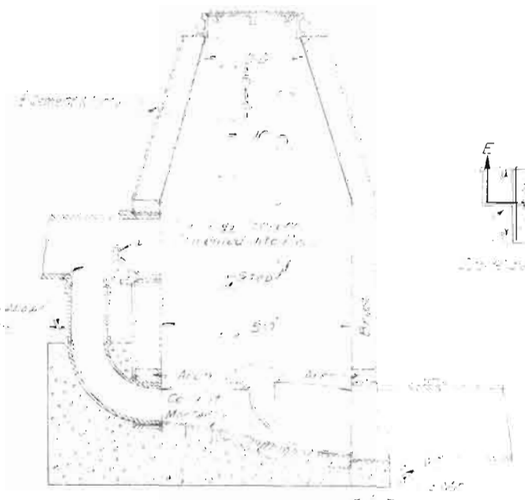
Alternate designs for Manholes using Precast Concrete Blocks, Cast in place Concrete, or Precast Concrete Manholes will be permitted after approval of Details by the Department.

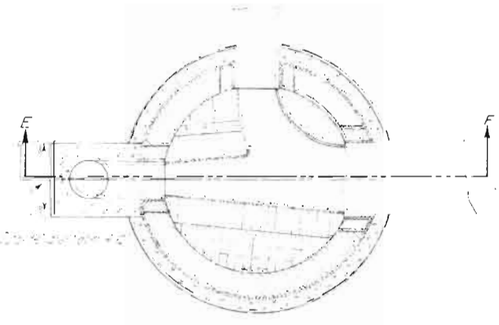




Diameter of Manhole to be 5' for Pipe Sewers 36" and Under and 6' for Pipe Sewers 42" to 48"

TYPE I-A MANHOLE
Scale ½" = 1'-0"





TYPE 2 MANHOLE (SANITARY ONLY)
Scale ½" = 1'-0"

SANITARY & STORM SEWERS

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . DENVER, COLORADO

MANHOLE DETAILS
TYPE 1, 1A AND 2

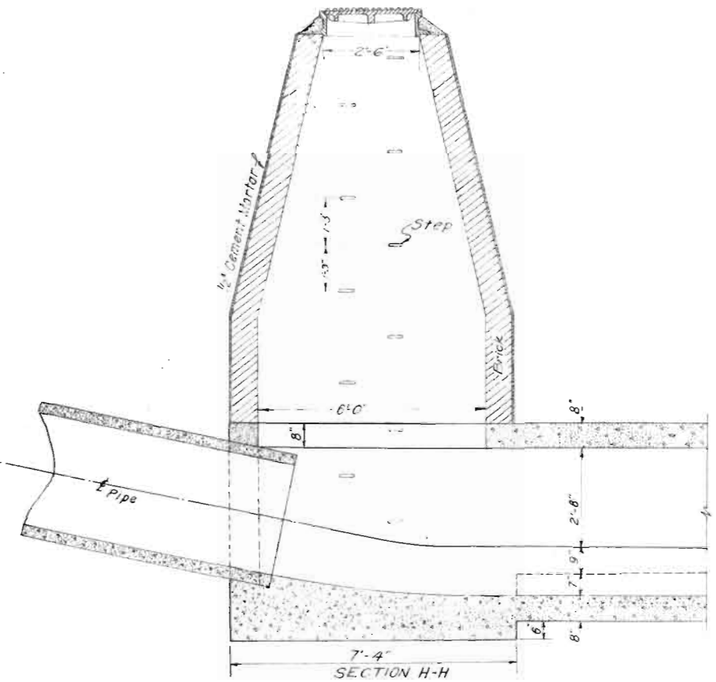
STRUCTURE NO.

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

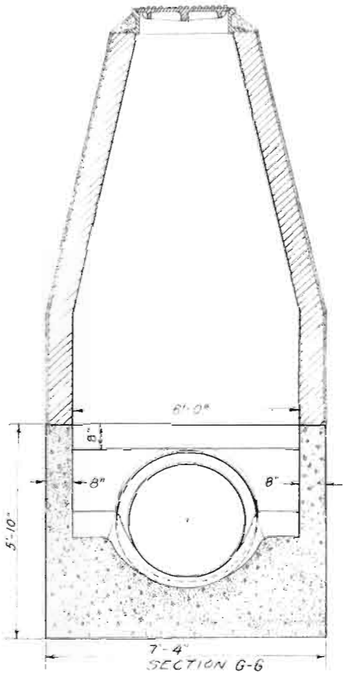
DATE | SHEET OF | DWG. NO.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		28	

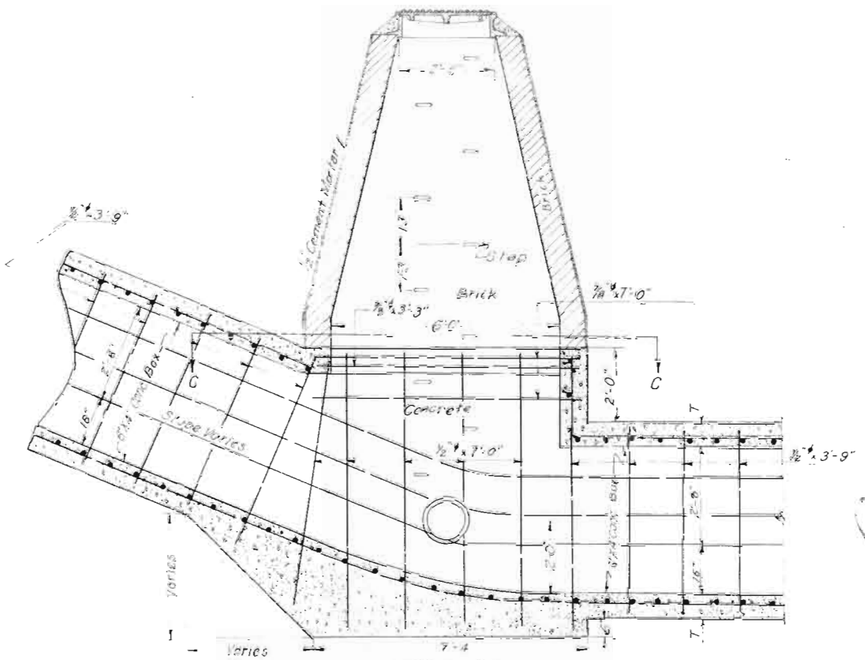
UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3



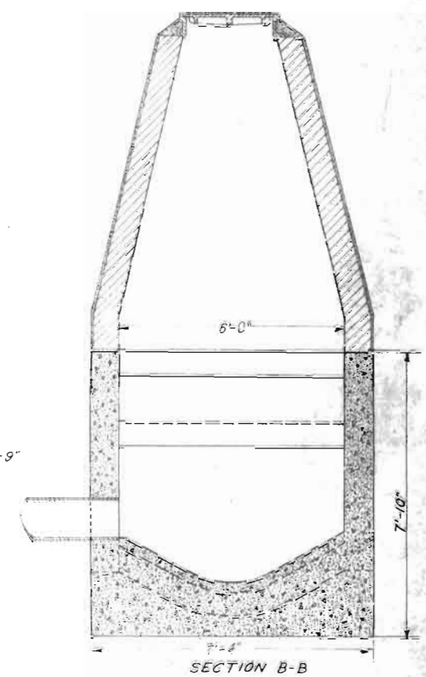
SECTION H-H



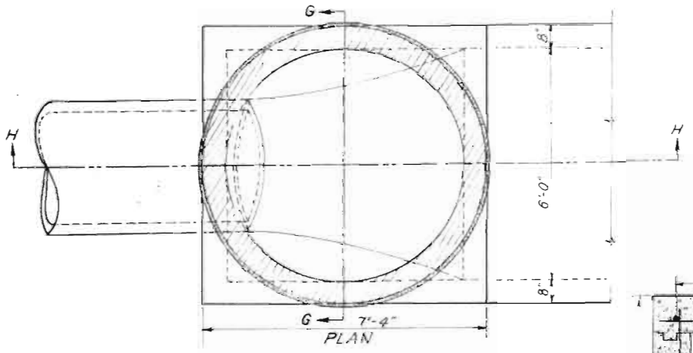
SECTION G-6



SECTION A-A



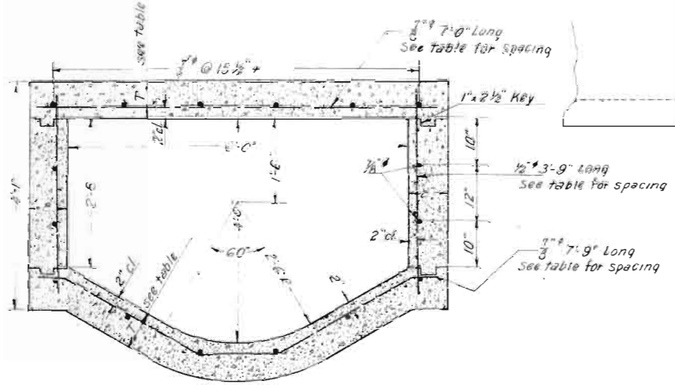
SECTION B-B



PLAN

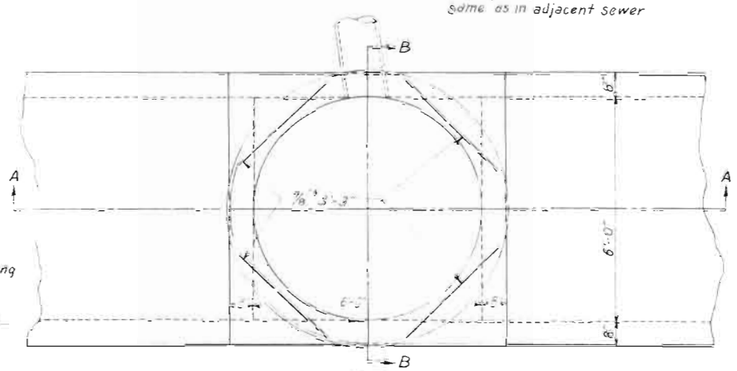
TYPE 5A MANHOLE (STORM SEWER)
(Same steel as type 5-B manhole)
Scale: ½" = 1'-0"

HT INVERT TO GRADE	T	BAR SPACING	
		FLOOR AND ROOF	WALLS
0' to 14'	8"	11"	22"
14'+ to 18'	9"	9"	18"
18'+ to 22'	10"	8½"	17"
22'+ to 26'	11"	7½"	15"



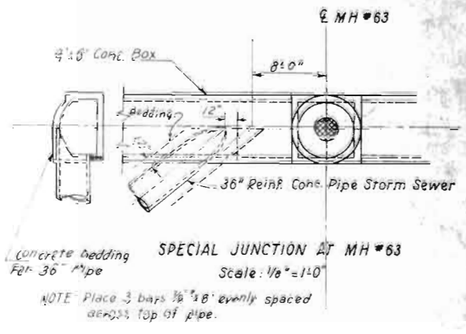
SECTION OF 4'-0"X 6'-0" CONC. BOX.

Bar Spacing thru manhole
Same as in adjacent Sewer



SECTION C-C

TYPE 5-B MANHOLE (STORM SEWER MH 61, 62, 63
S.W. OUTER LOOP - SPEER BLVD. INTERCHANGE.)
Scale: ½" = 1'-0"



SPECIAL JUNCTION AT MH #63
Scale: ⅛" = 1'-0"

NOTE: Place 3 bars ⅝" ϕ 8' evenly spaced across top of pipe.

COLORADO STATE HIGHWAY DEPT.
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MANHOLES
TYPE 5-A AND 5-B

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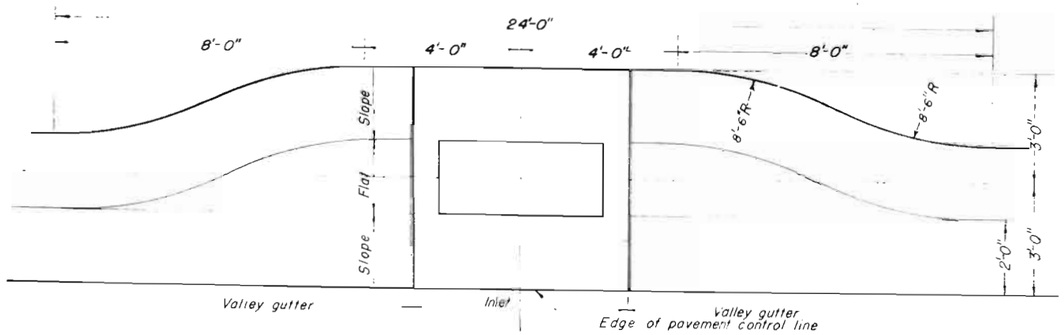
DENVER, COLORADO

DWG. NO.

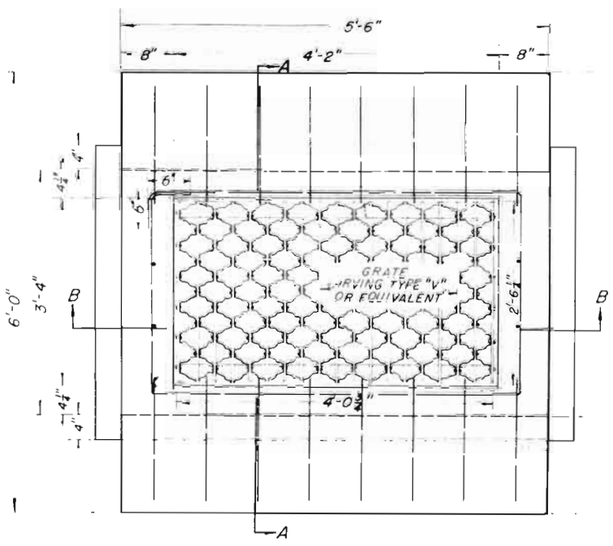
Rev. 3-26-52 ELP — Dim. & Note.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		29	

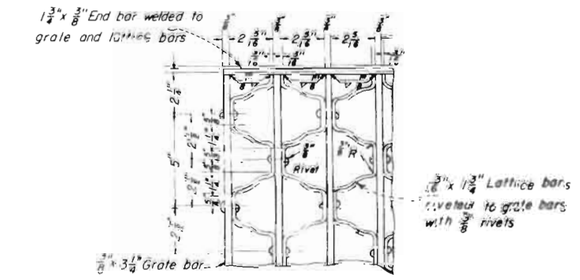
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



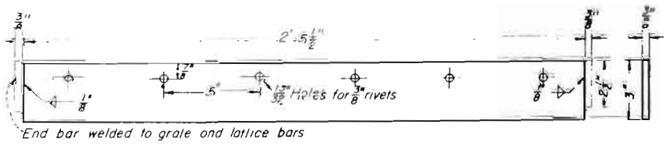
PLAN OF WIDENING OF VALLEY GUTTER AT INLETS
Scale $\frac{1}{8}$" = 1'-0"



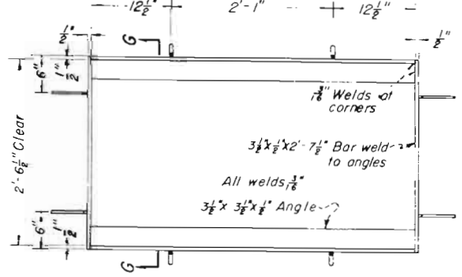
PLAN
DROP INLET TYPE I
Scale 1" = 1'-0"



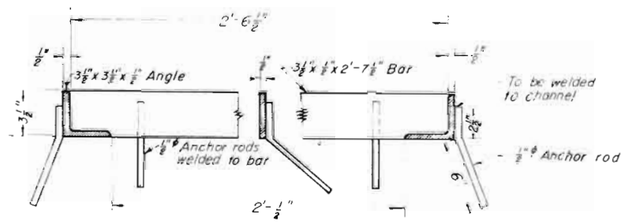
ENLARGED PLAN
CORNER OF GRATE
Scale 3" = 1'-0"



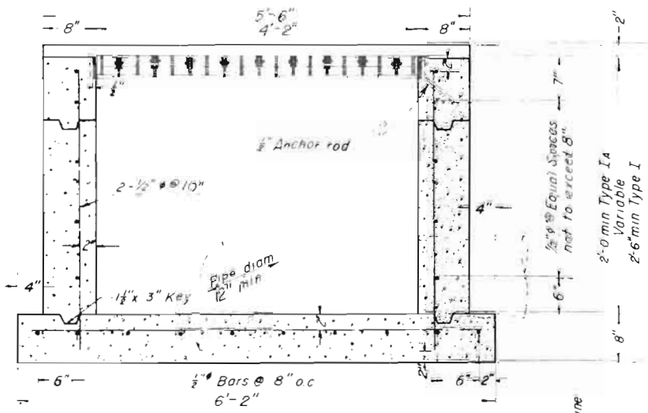
DETAIL
GRATE BAR
Scale: 3" = 1'-0"



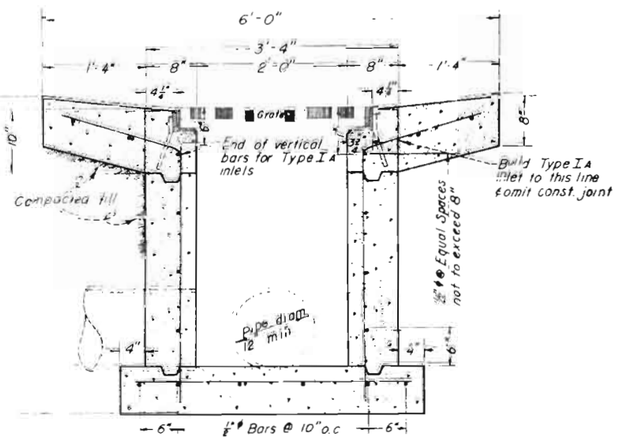
PLAN OF FRAME
Scale 1"=1'-0"



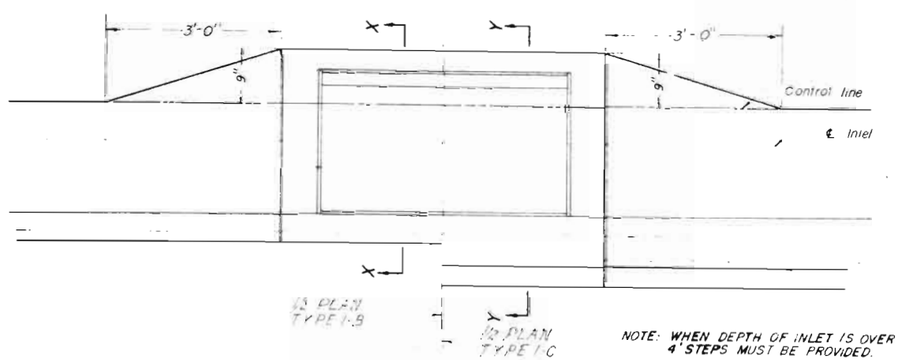
SECTION G - G
Scale 2" = 1'-0"



SECTION B - B
Scale 1" = 1'-0"

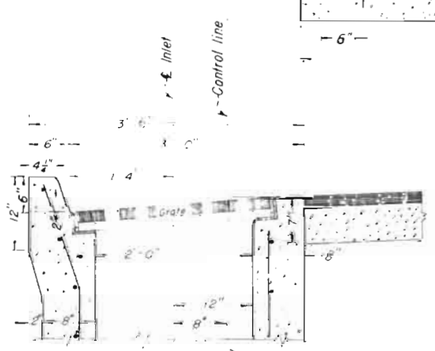


SECTION A - A
Scale 1" = 1'-0"



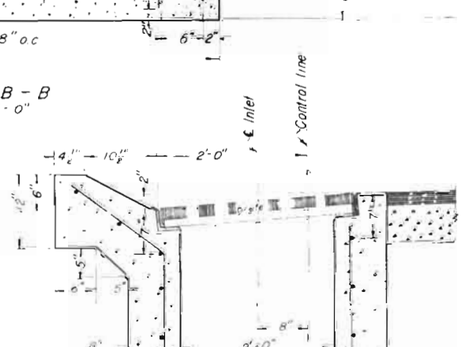
DROP INLETS IN CURB & GUTTER
Scale ⅜" = 1'-0"

NOTE: WHEN DEPTH OF INLET IS OVER 4' STEPS MUST BE PROVIDED.



TYPE I-B
SECTION X - X
Scale 1" = 1'-0"

NOTE: Lower portion of Types I-B & I-C same as Type I



TYPE I-C
SECTION Y - Y
Scale 1" = 1'-0"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

DROP INLET DETAILS

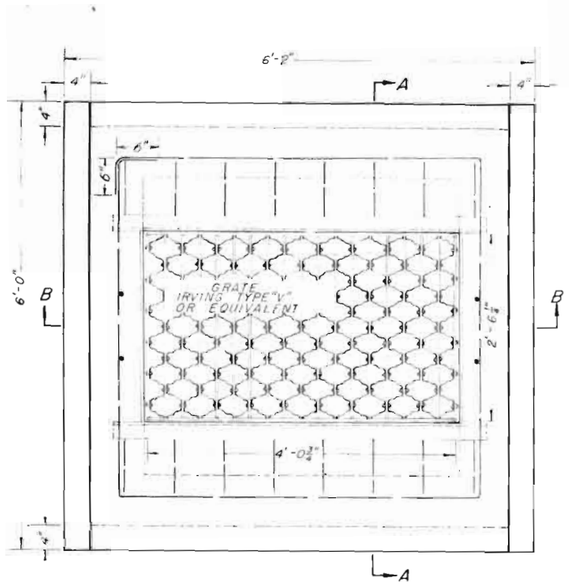
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE .....
SHEET 1 OF 2
DWG. NO.

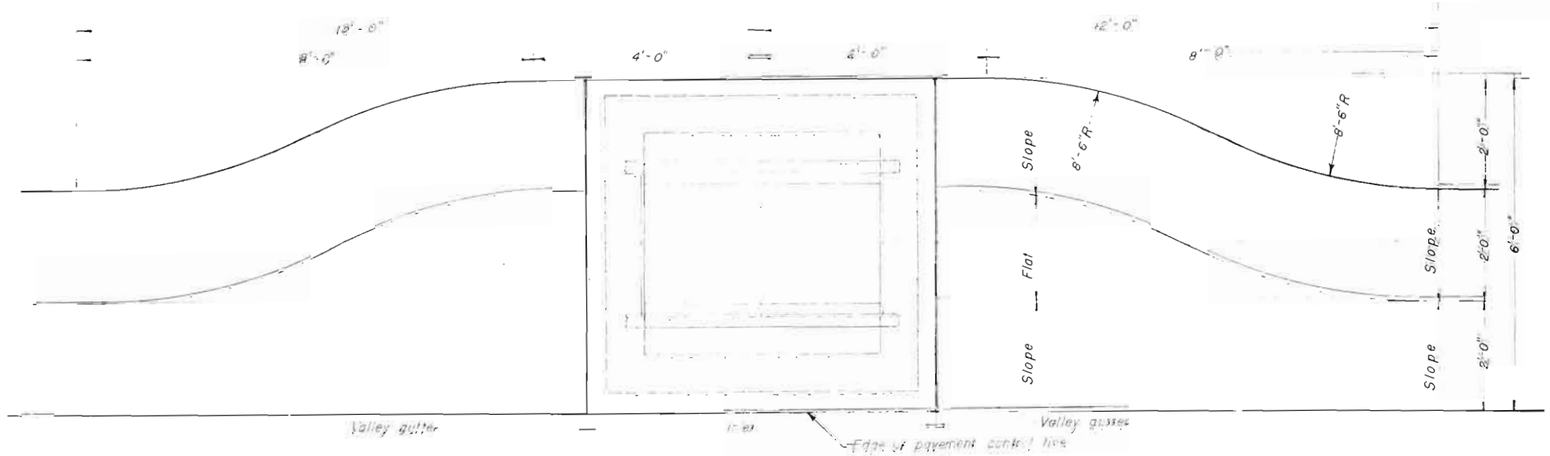
Rev.-1-26-49- Frame Angle Dim. ADN
Rev. 3-26-52 Exp. Jt. Dim & Note.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		30	

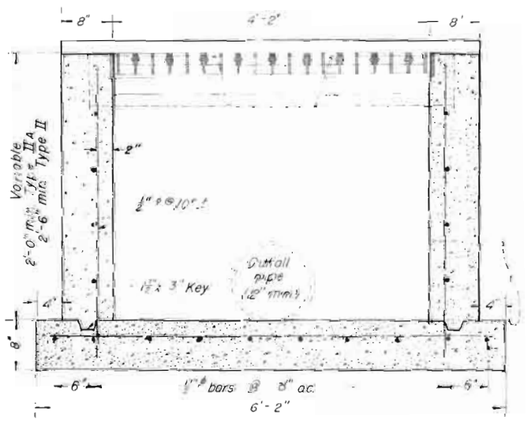
UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3



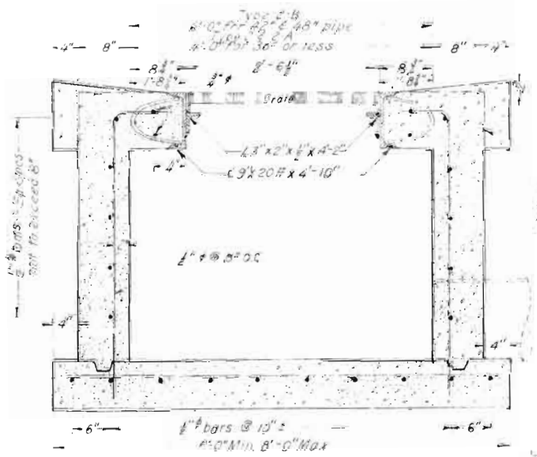
PLAN
DROP INLET TYPE 2
Scale 1" = 1'-0"



PLAN OF WIDENING OF
VALLEY GUTTER AT INLETS
Scale 3/4" = 1'-0"

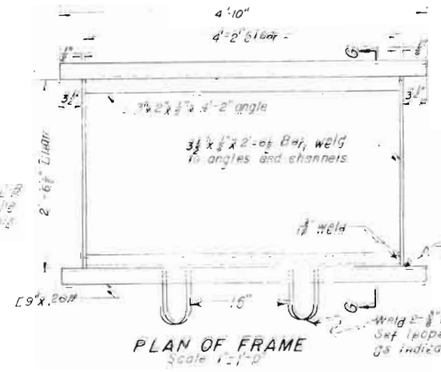


SECTION B-B
Scale 1" = 1'-0"

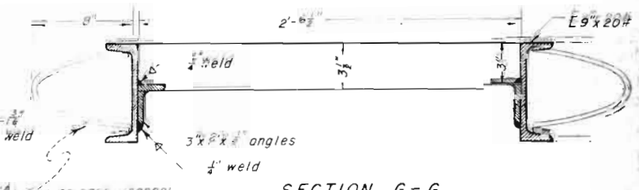


SECTION A-A
Scale 1" = 1'-0"

NOTE: WHEN DEPTH OF INLET IS OVER
4' STEPS MUST BE PROVIDED.

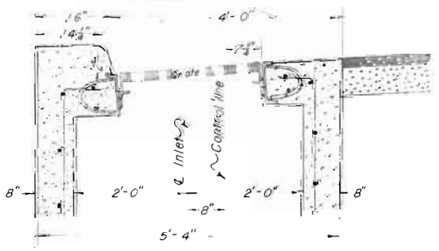


PLAN OF FRAME
Scale 1" = 1'-0"

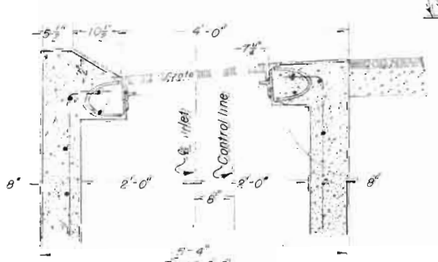


SECTION G-G

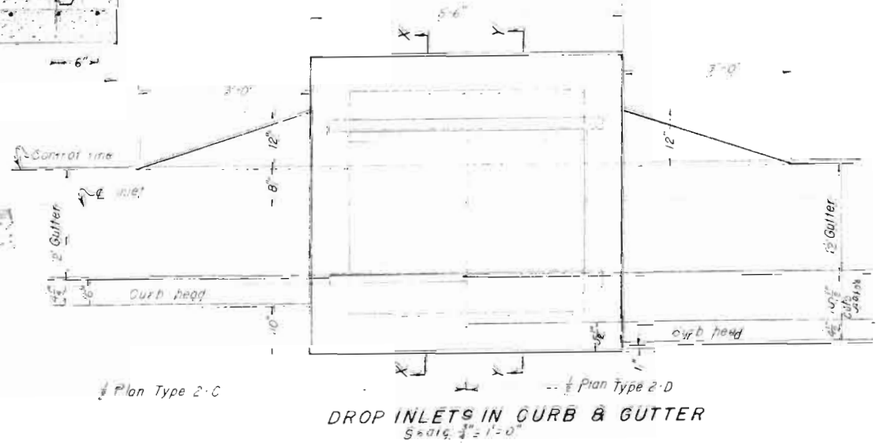
Weld 2 - 3/4" ø loops to each channel
Set loops at 15° angle to vertical
as indicated on sec B-B.



Type 2-C
SECTION X-X
Scale 3/4" = 1'-0"



Type 2-D
SECTION Y-Y
Scale 3/4" = 1'-0"



½ Plan Type 2-C

½ Plan Type 2-D

DROP INLETS IN CURB & GUTTER
Scale 3/4" = 1'-0"

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

DROP INLET DETAILS

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG. NO.

REVISIONS

Rev. 7-3-51, C.G.M., Alternate Gate Note
Rev. 5-2-52, J.D.F., Combination Fence

FED. ROAD DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COL.(9)	31	

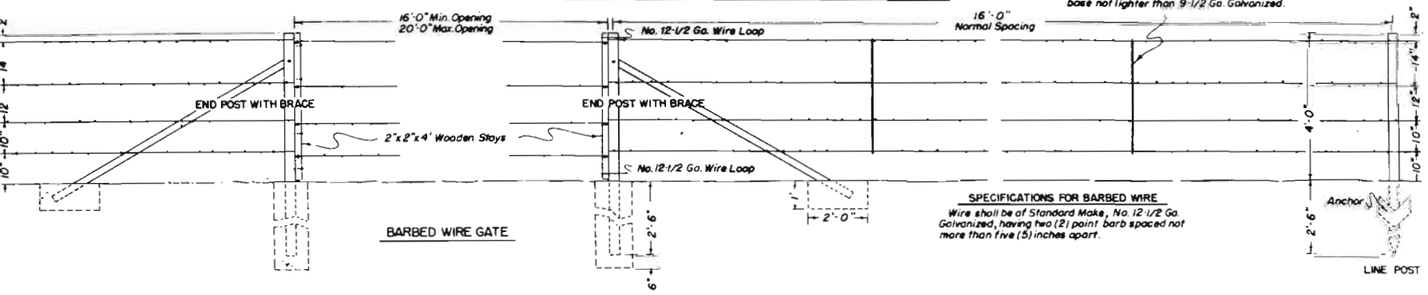
UI 002-2(23) Unit 2, (8) Sect. 2 2nd Contract, (17) Unit 3

Standard Wire Fence With Metal Posts

STANDARD M-27-C

Special Revision for Valley Highway

BARBED WIRE FENCE WITH METAL POSTS



SPECIFICATIONS FOR BARBED WIRE

Wire shall be of Standard Make, No. 12-1/2 Ga. Galvanized, having two (2) point barb spaced not more than five (5) inches apart.

SPECIFICATIONS

CORNER POSTS -
TYPE - 2-1/2"x2-1/2"x1/4" Structural Steel Angles
WGT. - 4.1 lbs./lin.ft., Min.
LENGTH - 6'-6" Min.
NO. BRACES - 2

LINE POSTS -
TYPE - Structural Steel "Tees"
WGT. - 1.4 lbs./lin.ft., Min.
LENGTH - 6'-6" Min.
ANCHOR - Securely fastened, with bearing surface sufficient to resist movement of post.

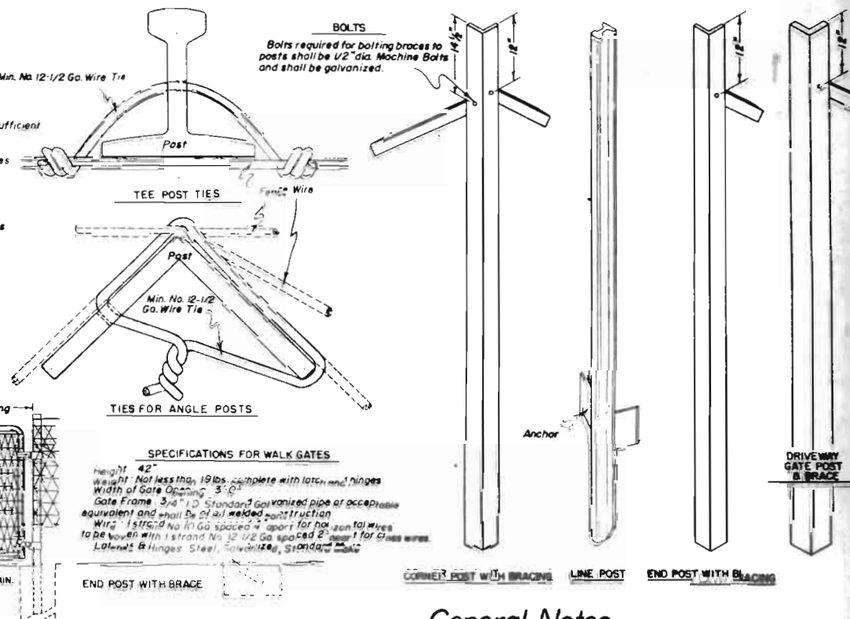
END POSTS -
TYPE - 2-1/2"x2-1/2"x1/4" Structural Steel Angles
WGT. - 4.1 lbs./lin.ft.
LENGTH - 6'-6" Min.
NO. BRACES - 1

DRIVEWAY GATE POSTS -
TYPE - 2-1/2"x2-1/2"x3/8" Structural Steel Angles
WGT. - 5.9 lbs./lin.ft.
LENGTH - 6'-6" Min.
NO. BRACES - 1

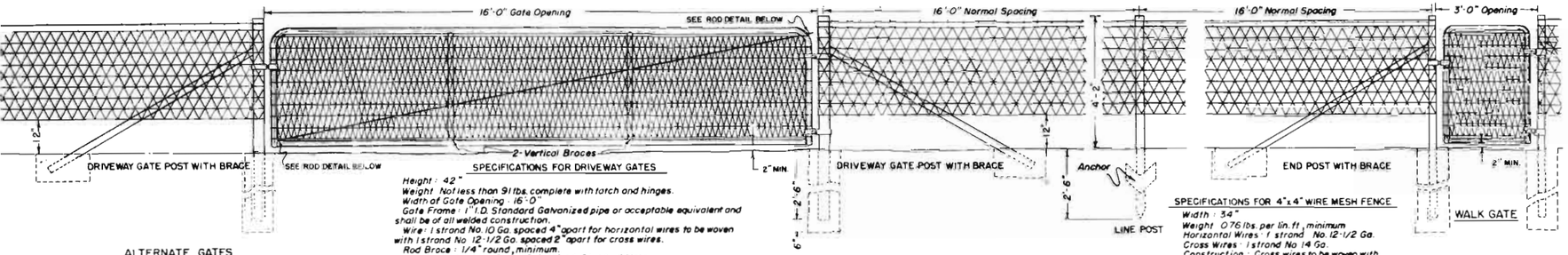
BRACES -
TYPE - 2"x2"x1/4" Structural Steel Angles
WGT. - 3.19 lbs./lin.ft.
LENGTH - Same as corner and end posts used

TEE & ANGLE POST TIES
Min. No. 12-1/2 ga. Galvanized wire or acceptable equivalent.
Min. 4 ties per post for Comb. Wire.
Min. 1 tie per Barbed Wire per post.

Typical Metal Posts & Fence Clamps



COMBINATION WIRE FENCE WITH METAL POSTS



SPECIFICATIONS FOR DRIVEWAY GATES

Height: 42"
Weight: Not less than 91 lbs. complete with torch and hinges.
Width of Gate Opening: 16'-0"
Gate Frame: 1" I.D. Standard Galvanized pipe or acceptable equivalent and shall be of all welded construction.
Wire: 1 strand No. 10 Ga. spaced 4" apart for horizontal wires to be woven with 1 strand No. 12-1/2 Ga. spaced 2" apart for cross wires.
Rod Brace: 1/4" round, minimum.
Latches & Hinges: Steel, Galvanized, Standard Make

SPECIFICATIONS FOR 4"x4" WIRE MESH FENCE

Width: 34"
Weight: 0.76 lbs. per lin. ft., minimum
Horizontal Wires: 1 strand No. 12-1/2 Ga.
Cross Wires: 1 strand No. 14 Ga.
Construction: Cross wires to be woven with horizontal wires making a one piece fabric.

SPECIFICATIONS FOR WALK GATES

Height: 42"
Weight: Not less than 19 lbs. complete with latch and hinges
Width of Gate Opening: 3'-0"
Gate Frame: 3/4" I.D. Standard Galvanized pipe or acceptable equivalent and shall be of all welded construction
Wire: 1 strand No. 10 Ga. spaced 4" apart for horizontal wires to be woven with 1 strand No. 12-1/2 Ga. spaced 2" apart for cross wires.
Latches & Hinges: Steel, Galvanized, Standard Make

ALTERNATE GATES

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

General Notes

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

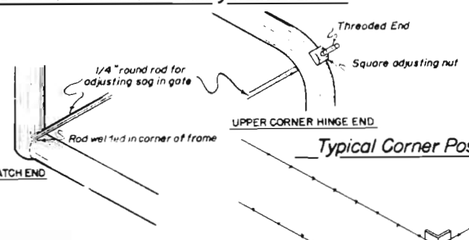
All posts and braces shall be of the types and weights as shown on this sheet or acceptable equivalents. Posts and braces to be of structural steel hot dip galvanized or painted with an approved waterproof asphalt or mineral paint. Holes to be provided in end, corner and gate posts as detailed hereon.

Wire mesh used in Combination Wire Fence as shown above shall be galvanized. Wire mesh used in walk & and driveway gates shall be galvanized or painted with an approved waterproof asphalt or mineral paint.

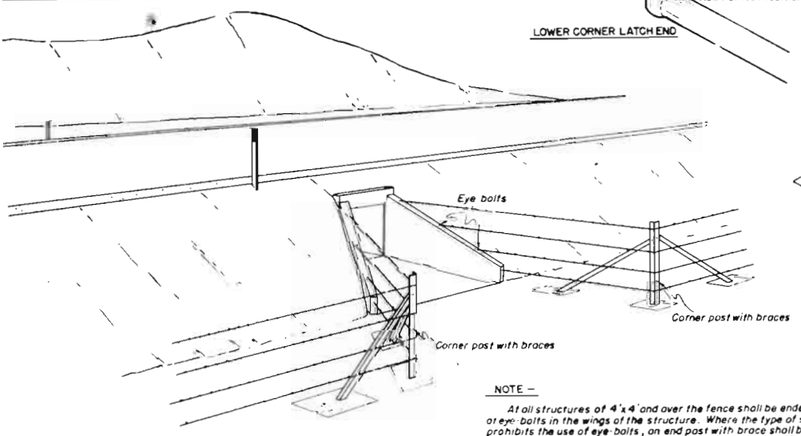
Fence wire to be placed on either road or field side of posts depending on local conditions, ie. On curves the wire should be placed on inside of post which would prevent tension on fence ties. This will also apply where wind drift, tumble weeds or other conditions would exert unusual pressure against the wire.

In lieu of Galvanized Finish on Gate Frames, Cadmium Plated Pipe or Aluminum Painting with zinc chromate Primer as per specifications will be considered to be equivalent.

Detail of Rod Brace & Driveway Gate Frame



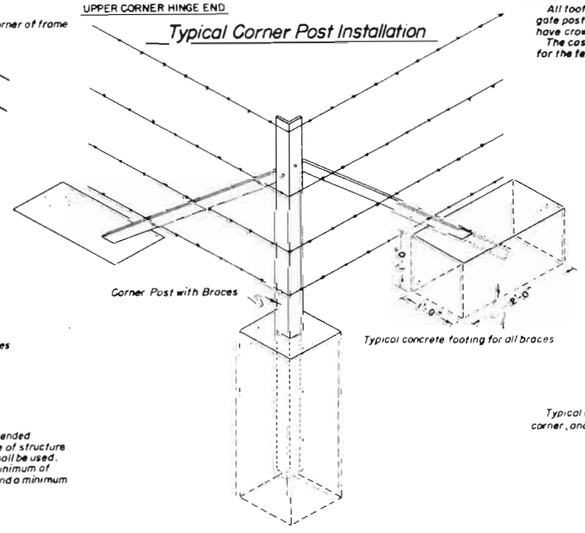
Pictorial Sketch Showing Typical Fence Installation At Structures



NOTE -

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

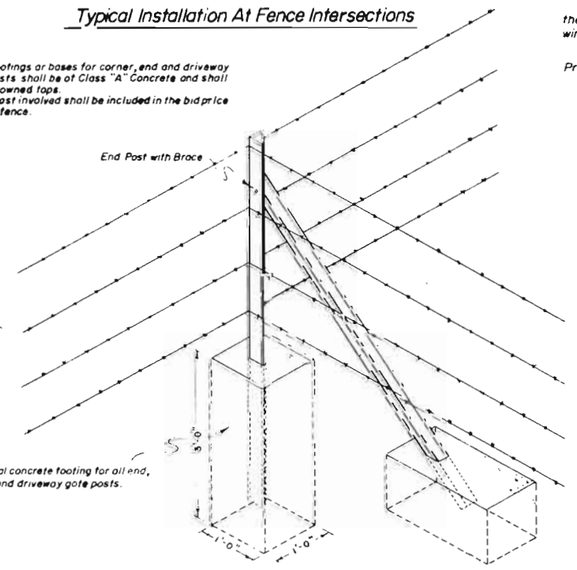
Typical Corner Post Installation



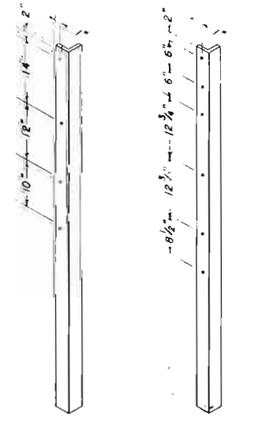
Typical Installation At Fence Intersections

NOTE -

All footings or bases for corner, end and driveway gate posts shall be of Class "A" Concrete and shall have crowned tops.
The cost involved shall be included in the bid price for the fence.



Spacing of Holes for Fastening Fence Wire to End, Corner, & Gate Posts



NOTE -

All holes to be ½" Diameter. Fence wire to be securely fastened with No. 12½ ga (Min.) Galvanized Wire bound around fence wire and passed through hole in post.
Holes may be in either leg of angle post. For convenience, the Department will approve the use of angle posts with holes spaced for barbed wire fence on one leg and Combination wire fence on the other leg.

COLORADO
STATE HIGHWAY DEPARTMENT

Standard Wire Fence With Metal Posts

Designed by C.G.M.	Approved by [illegible]
Made by C.G.M.	Engineer, Surveys & Plats
Checked by	Date: Mar. 1, 1950

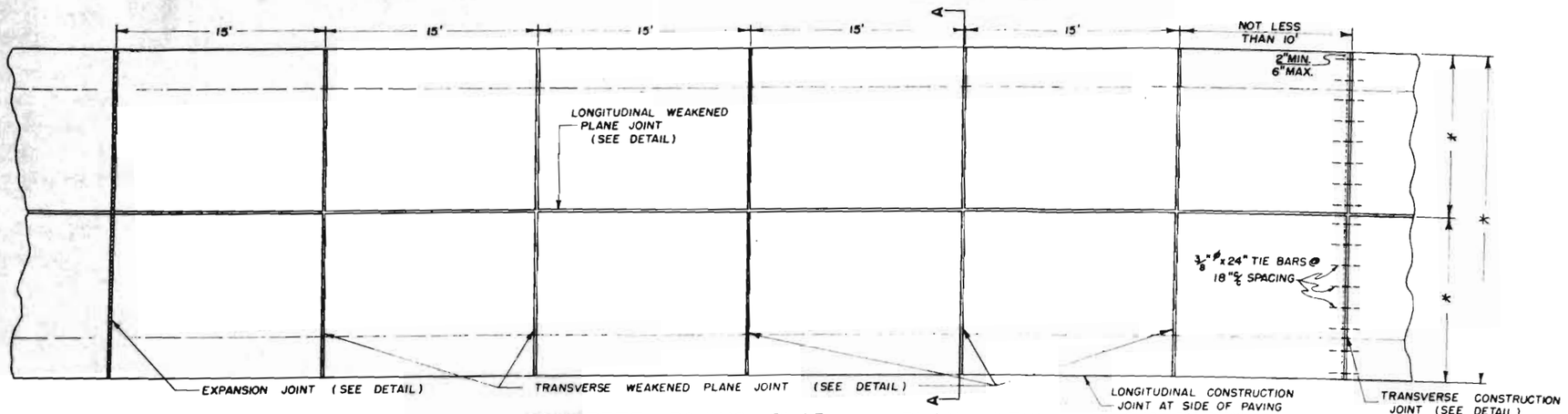
REVISIONS

Rev 7-28-52, Deleted Dowels, J.C.R.

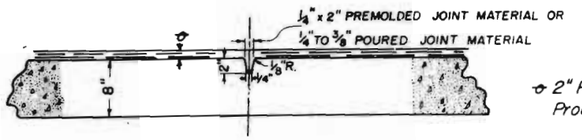
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		32	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3
Rev. for Valley Highway

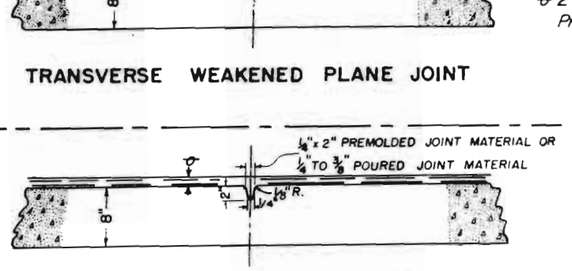
CONCRETE PAVEMENT JOINT DETAILS



CONCRETE PAVING SLAB — PLAN VIEW



TRANSVERSE WEAKENED PLANE JOINT

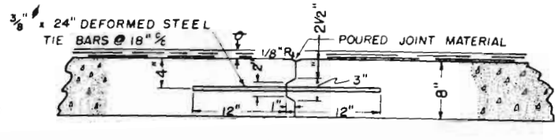


LONGITUDINAL WEAKENED PLANE JOINT

To be constructed:

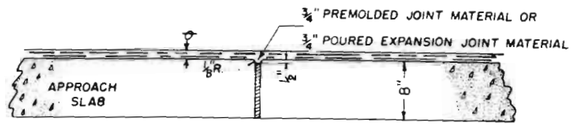
1. To divide lanes (as shown above).
2. Along Centerline of Four-Lane Project between medians at intersections when median is over 15' ft. wide.

ø 2" Plant Mixed Oil Processed Surfacing



TRANSVERSE CONSTRUCTION JOINT

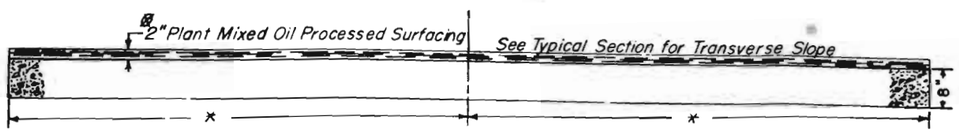
Required where pour is interrupted more than thirty(30) minutes and where distance from preceding joint is not less than ten (10) feet. If transverse construction joint occurs at normal spacing for transverse weakened plane joint 1/2 the length of bars are to be treated with a coating of heavy oil to break bond



EXPANSION JOINT

To be used as joint between structure approach slabs and pavement.

* Note :-
See Typical Section for Dimensions



END VIEW PERPENDICULAR TO ℄ AT A-A

ø 8" Concrete Pavement with 2" thickness of Plant Mixed Oil Processed Surfacing shall be used in lieu of the 6" thickness of Gravel or Crushed Rock Surfacing and 2" thickness of Plant Mixed Oil Processed Surfacing at locations indicated in the tabulation of Concrete Pavement on Sheet No. 12. Width of Concrete Pavement shall in all cases conform to the pavement width indicated in the Tabulation of Sections on Sheet No. 3

GENERAL NOTES

The cost of all tie bars and expansion joint material shall be included in the contract unit price per square yard for "Concrete Pavement."

All bars must be accurately and firmly supported in proper position by means of metal chairs or other approved devices until concrete has been cured.

Steel tie bars shall not be treated to break bond except at joints as indicated

Edges of weakened plane joints using premolded joint material shall be finished to radius indicated on details.

The Contractor will be required to remove and replace at his own expense, any pavement in which tie bars assume a final position other than that shown on the plans.

REVISIONS
Rev 12-15-47 W.P.M. J.P.K.
Rev 7-1-49 J.R.E.
Rev. 9-14-50 J.E.R.

STANDARD M-10-B.

FED. ROAD DIST. NO.	STATE	COMB. PROJ. U-002-2	SHEET NO.	TOTAL SHEETS
8	COLO.	(23)-(1)-(17)	33	

1 2 3 4 5 6 7 8 9 0 .

A B C D E F G H I J K L

M N O P Q R S T U V W

a f g l

abcdefghijklmnopqrstuvwxyz

J 14 K 1950

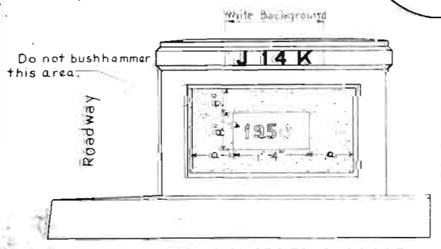
2" 1⅛" 2"

SAMPLE BRIDGE NUMBER

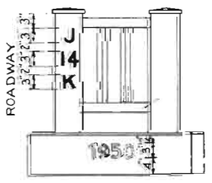
SAMPLE YEAR NUMBER

Scale in Inches

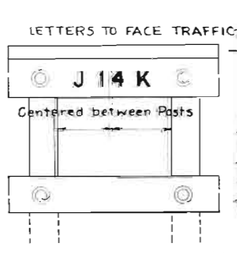
SECTION



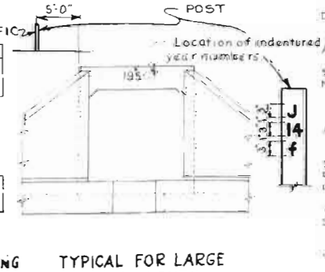
TYPICAL FOR CONCRETE ENDPOST



TYPICAL FOR STEEL HANDRAIL END POST



TYPICAL FOR TIMBER WING HANDRAIL



TYPICAL FOR LARGE BOX CULVERTS

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JANUARY 1ST 1946.

COMPENSATION FOR THIS WORK SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS AND WILL NOT BE PAID FOR AS A SEPARATE ITEM.

THE SIZE, SHAPE AND SPACING OF THE LETTERS AND FIGURES SHALL BE IN ACCORDANCE WITH THE FULL SIZE SHOWN ON THIS SHEET. ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

THE YEAR NUMBERS ARE RECESSED IN CONCRETE ⅜" MINIMUM AS SHOWN INTO THE PANELS OF THE ENDPOST ON THE RIGHT HAND SIDE OF EACH BRIDGE END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS AS SHOWN ON PLAN DETAILS. NUMBERS TO BE MADE OF WOOD METAL OR OTHER SUITABLE MATERIAL AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED. THE YEAR NUMBER OF EACH STRUCTURE SHALL CORRESPOND WITH THE YEAR IN WHICH THE CONCRETE IS POURED.

THE STRUCTURE NUMBER SHALL BE STENCILED ON THE RIGHT HAND SIDE OF EACH BRIDGE END AS SHOWN ON THIS STANDARD AND AS SPECIFIED. FOR MAJOR STRUCTURES OVER 20'-0" CLEAR SPAN.

THE CORRECT NUMBER FOR EACH BRIDGE IS SHOWN IN THE LOWER RIGHT HAND CORNER OF THE DETAIL SHEETS FOR THAT BRIDGE.

A PROPER WHITE BACKGROUND RECTANGULAR IN SHAPE AND EXTENDING THREE INCHES BEYOND THE LIMITS OF THE NUMBER SHALL BE PAINTED WITH TWO COATS OF ACCEPTABLE WHITE PAINT UNLESS AN APPROVED WHITE CONCRETE PAINT IS USED. BEFORE PAINTING THE SURFACE MUST BE THOROLY BRUSH CLEANED AND PROPERLY SIZED. ON TIMBER HANDRAILS THE WHITE PAINT USED ON THE BRIDGE WILL BE SATISFACTORY.

AFTER THE WHITE BACKGROUND HAS DRIED SUFFICIENTLY, THE CORRECT STRUCTURE NUMBER SHALL BE CAREFULLY STENCILED ON IT, WITH TWO COATS OF SECOND FIELD COAT DARK OR EXTERIOR BLACK PAINT (PAINT) AS SPECIFIED UNDER ITEM 38 PAINTS AND PAINTING. THE BRACES OF THE STENCILED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND TO MAKE SOLID FIGURES.

SUFFICIENT TIME (A THIRTY DAYS) SHALL BE ALLOWED TO PERMIT THORO DRYING.

MINOR STRUCTURES WITH CLEAR SPANS OF 10 TO 20 FEET INCLUSIVE SHALL BE STENCILED WITH STRUCTURE NUMBER THUS W-18-E ON 3" STEEL MARKER POSTS WHERE PROVIDED AND AS SHOWN ON STATE HIGHWAY STD. M 23-A

COLORADO STATE HIGHWAY DEPARTMENT

STANDARD LETTERS AND FIGURES FOR YEAR NUMBERS AND STRUCTURE NUMBERS

Designed by G.H.D.
Made by W.P.M.
Checked by
Approved by C.D. Bailey Bridge Engineer
Date: June 1, 1946

REVISIONS Rev 12-13-41 W.J.P.R.M.

STANDARD M-112-D

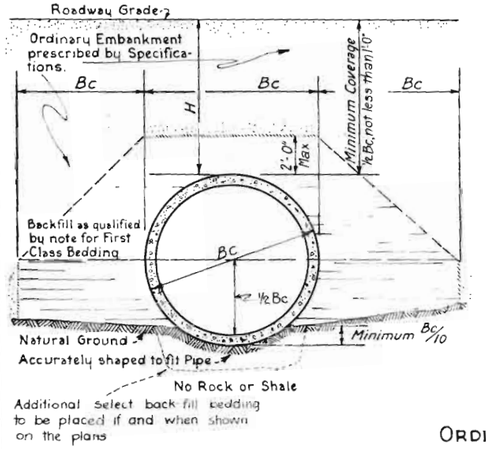
Rev 2-2-42 Addn notes H.C.C.
Rev 3-6-42. Sketch for calc. str. exc. in cut. G.R.B.
Rev. 4-20-42. W.G.S. Unreinforced Concrete Pipe notes.
Rev. 8-15-44. A.L.P. Replaced "mechanical Tamping with Selected Mat'l".

Revision: To conform to A.S.T.M. spec. C-76-41 by A.C.C. 12-30-41.
Rev. To include 12", 15" & 18" Dia. Pipe. H.C.C. 1-20-42.

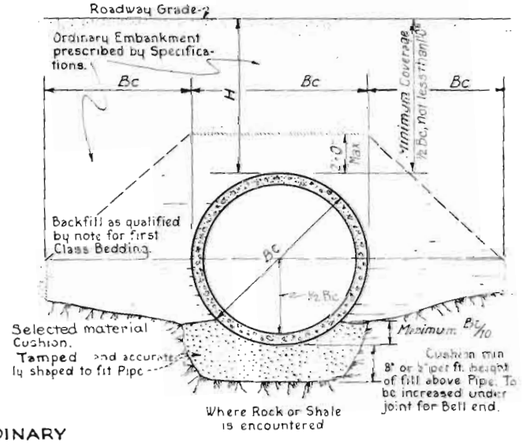
FED. ROAD DIST. NO.	STATE	COMB. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	(23)-1(8)-(17)	34	

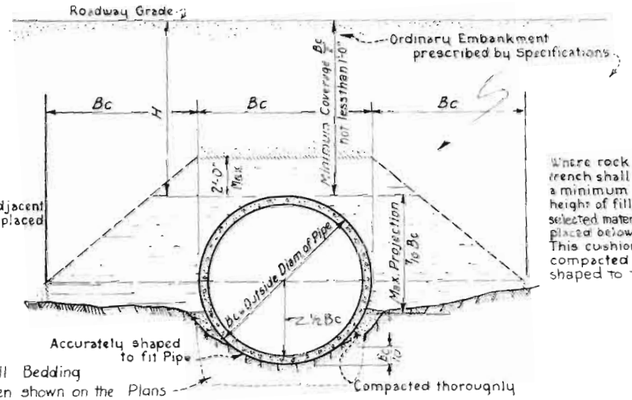
TYPES OF BEDDING

NOTE: Backfill layers for all Types of Bedding must be placed simultaneously on each side of the pipe to maintain equal lateral pressures



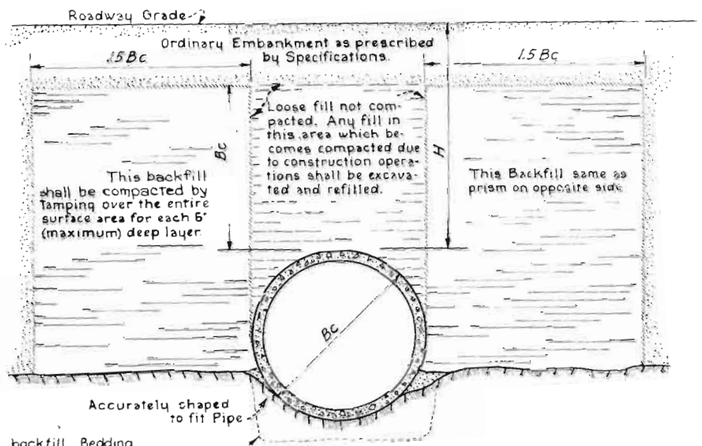
ORDINARY





FIRST CLASS

Where rock is encountered a trench shall be excavated so that a minimum of 8" or ¼" per foot height of fill over Pipe, of fine selected material cushion may be placed below the Pipe at all points. This cushion to be thoroughly compacted and accurately shaped to fit pipe.



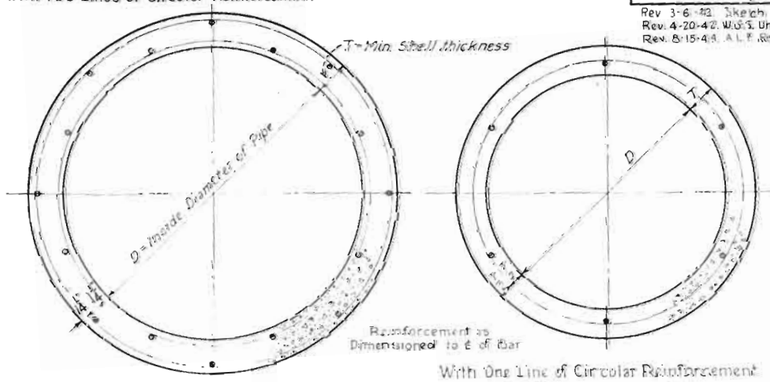
SPECIAL

A construction which consists of Ordinary Bedding or First Class Bedding combined with Special Backfilling, as noted above, to be used when height "H" exceeds limits noted in Table for Ordinary or First Class Bedding.

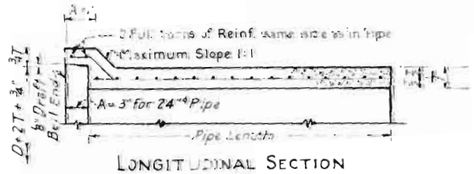
NOTE: When Special Bedding is called for or is implied by the maximum fill height limits the placement of the pipe and the backfill shall not be done except in the presence of the Engr.

PIPE CROSS SECTIONS

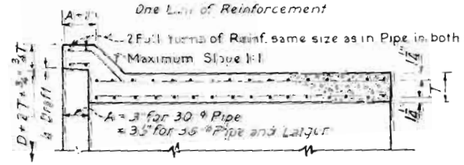
With Two Lines of Circular Reinforcement



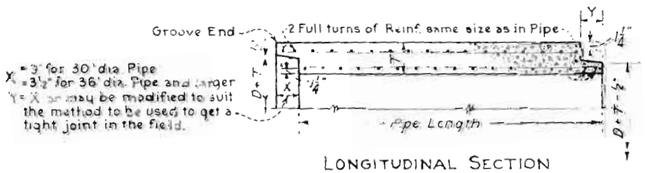
With One Line of Circular Reinforcement



LONGITUDINAL SECTION
One Line of Reinforcement



LONGITUDINAL SECTION
Two Lines of Reinforcement
BELL AND SPIGOT TYPE OF JOINT



LONGITUDINAL SECTION
TONGUE AND GROOVE TYPE OF JOINT

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted January 1st 1948.

Circular Reinforcement shall be Cold Drawn Steel Wire. If Billet Steel of Hard or Intermediate Grade is used the steel area shall be increased by 37.5 per cent. Longitudinal Reinforcement shall be Billet Steel of Intermediate Grade.

The type of Pipe Joint used and the field construction thereof 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 concrete headwalls if and as shown on the plans in accordance with the Dept ment's Standard Dwg. M-102

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 hereon.

Special attention is directed to the Laying Requirements noted where rock or rock projections are encountered in the Pipe bed.

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

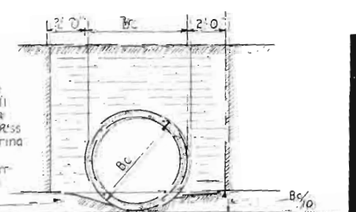
All excavation and work required for bedding and shaping, except for the volume of selected material, shall be included in Contract Unit Price for Reinforced Conc. Pipe.

Unreinforced Concrete Pipe

Unreinforced Concrete Pipe will be accepted in the following sizes 12", 15", 18".
Unreinforced Concrete Pipe shall meet the same specifications and may be of the same minimum thickness as shown for Reinforced Concrete Pipe. It will be noted however that Unreinforced Concrete Pipe is required to meet the same Three-edged Bearing Tests as specified for Reinforced Concrete Pipe. Thickness of pipe may be increased as required in order to satisfy the Three-edged Bearing Tests.

The same General Notes, Specifications, Bedding, Details, etc. shall apply to Unreinforced Concrete Pipe as is noted for Reinforced Concrete Pipe, excepting only those details and requirements which refer specifically to reinforcement.

Special bedding, as specified not included in structural exc



TYPICAL DIAGRAM SHOWING METHOD OF CALCULATING STRUCTURAL EXCAVATION WHEN PIPE IS IN CUT

STRUCTURE NO.

STANDARD STRENGTH REINF. CONCRETE CULVERT PIPE

Based on Concrete with an Ultimate Compressive Strength of 3500 #/in² and the Three-Edged Bearing Tests in Table I, A.A.S.H.O. Specification M-41-46

Max. Fill Height above Top of Pipe for Standard Pipe	D Inches	T Inches	Circular Reinforcement Sq. Ins. per Lin. Ft. of Pipe	Longitudinal Reinforcement, Min. Total Area Reqd.
Fill height not limited for 12", 15" & 18" dia. pipes	12	2	1 Line 0.07	0.13 SQ. IN.
	15	2¼	1 Line 0.09	0.18 " "
	18	2½	1 Line 0.12	0.24 " "
Type of Bedding Ordinary H = 16 feet First Class H = 19 feet	24	3	1 Line 0.17	0.38 " "
	30	3½	1 Line each 0.22	0.55 " "
	36	4	2 Lines " 0.18	0.75 " "
	42	4½	2 " " 0.21	0.98 " "
	48	5	2 " " 0.25	1.25 " "
	54	5½	2 " " 0.30	1.57 " "
	60	6	2 " " 0.33	1.92 " "
	66	6½	2 " " 0.37	2.21 " "
	72	7	2 " " 0.40	2.67 " "
	78	7½	2 " " 0.43	3.03 " "
	84	8	2 " " 0.46	3.64 " "

EXTRA STRENGTH REINF. CONCRETE CULVERT PIPE

Based on Concrete with an Ultimate Compressive Strength of 4500 #/in² and the Three-Edged Bearing Tests in Table II, A.A.S.H.O. Specification M-41-46

Max. Fill Heights above Top of Pipe for Extra Strength Pipe	D Inches	T Inches	Circular Reinforcement Sq. Ins per Lin. Ft. of Pipe	Longitudinal Reinforcement, Min. Total Area Reqd.
Type of Bedding Ordinary H = 16 feet First Class H = 19 feet Ordinary Special H = 24 ft. First Class Special H = 30 ft.	24	3	1 Line 0.26	0.38 SQ. IN.
	30	3½	1 Line each 0.31	0.55 " "
	36	4	2 Lines " 0.28	0.75 " "
	42	4½	2 " " 0.33	0.98 " "
	48	5	2 " " 0.38	1.25 " "
	54	5½	2 " " 0.44	1.57 " "
	60	6	2 " " 0.50	1.92 " "
	66	6½	2 " " 0.56	2.21 " "
	72	7	2 " " 0.60	2.67 " "
	78	7½	2 " " 0.65	3.03 " "
	84	8	2 " " 0.72	3.64 " "

COLORADO
STATE HIGHWAY DEPARTMENT
UNREINFORCED CONCRETE PIPE.
SIZES: 12", 15", 18".
REINFORCED CONCRETE PIPE
STANDARD & EXTRA STRENGTH
SIZES: 12", 15", 18", 24", 30", 36", 42", 48", 54" 60" 66", 72", 78", 84"

Designed by
Made by W.G.S
Checked by

Approved by P. D. Bailey
Bridge Engineer

FED. ROAD DIVISION NO.	DISTRICT	COMB. PROJ. F-1002-2	SHEET NO.	TOTAL SHEETS
9	COLO.	(23)-(8)-(17)	35	

Rev. 2-13-52, C.G.M., Added Note Re Reflector Buttons on Divided Highway

STANDARD TIMBER GUARD POSTS

STANDARD M-19-C

SPECIFICATIONS

POSTS - Lodgepole Pine, Southern Yellow Pine or West Coast Douglas Fir, not less than six (6) inches in diameter. All posts shall be pressure treated after being peeled and shaved in accordance with specifications.

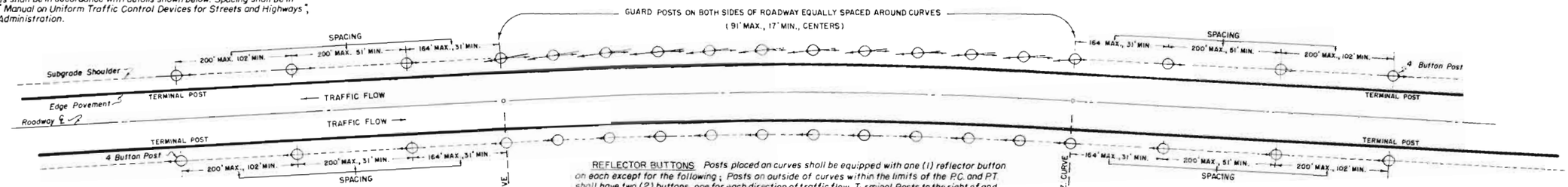
REFLECTOR BUTTONS - No. 1 Stimsonite reflector buttons or an acceptable equivalent including reflectorized sheeting or prefabricated delineator units. Holes drilled in posts to accomodate reflector buttons shall be 1/16" diameter less than the base of the button.

PAINTING (WORK BY STATE FORCES) - Posts shall be painted with aluminum paint and a black band placed around each post as per details on this sheet. Number of coats and type of paint applied shall be in accordance with specifications.

DATE NAILS (WORK BY STATE FORCES) - Nails shall be installed one (1) per post and driven flush. Cost of furnishing and installing to be charged to Engineering Costs.

Typical Installation on Curves

INSTALLATION of guard posts on curves shall be in accordance with details shown below. Spacing shall be in conformity with Section 157, Table I of "Manual on Uniform Traffic Control Devices for Streets and Highways", issue of Aug. 1948 by the Public Roads Administration.



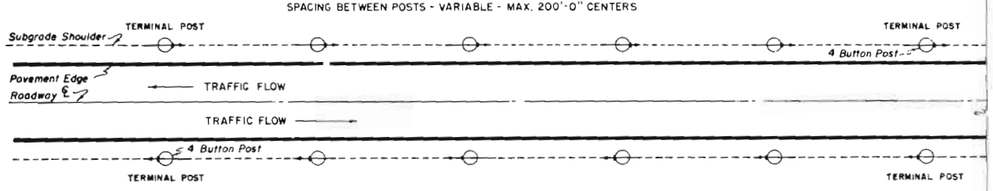
REFLECTOR BUTTONS Posts placed on curves shall be equipped with one (1) reflector button on each except for the following; Posts on outside of curves within the limits of the P.C. and P.T. shall have two (2) buttons, one for each direction of traffic flow. Terminal Posts to the right of, and facing approaching traffic, shall be equipped with four (4) buttons.

Reflector Buttons on posts to the right of and facing approaching traffic shall be placed on a line parallel to the roadway centerline. Buttons on posts on the outside of curves, to the left of and facing approaching traffic, shall be placed at angles whereby reflection is attained at a distance of 500 feet.

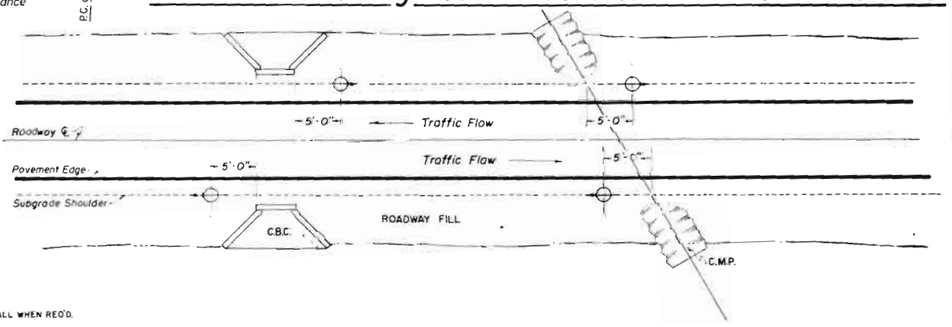
On Divided Highways, Reflector Buttons will not be required on back side of posts.

Method of Placement on Tangents

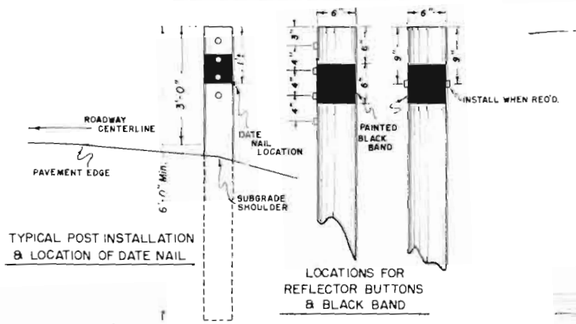
INSTALLATION of guard posts on tangents shall be in conformity with details shown below and in accordance with the following; Reflector Buttons shall be installed one (1) to each post except terminal posts to the right of and facing approaching traffic, which will have four (4) buttons. All buttons shall be placed on a line parallel to the roadway centerline



Plan View Showing Placement at Isolated Minor Structures

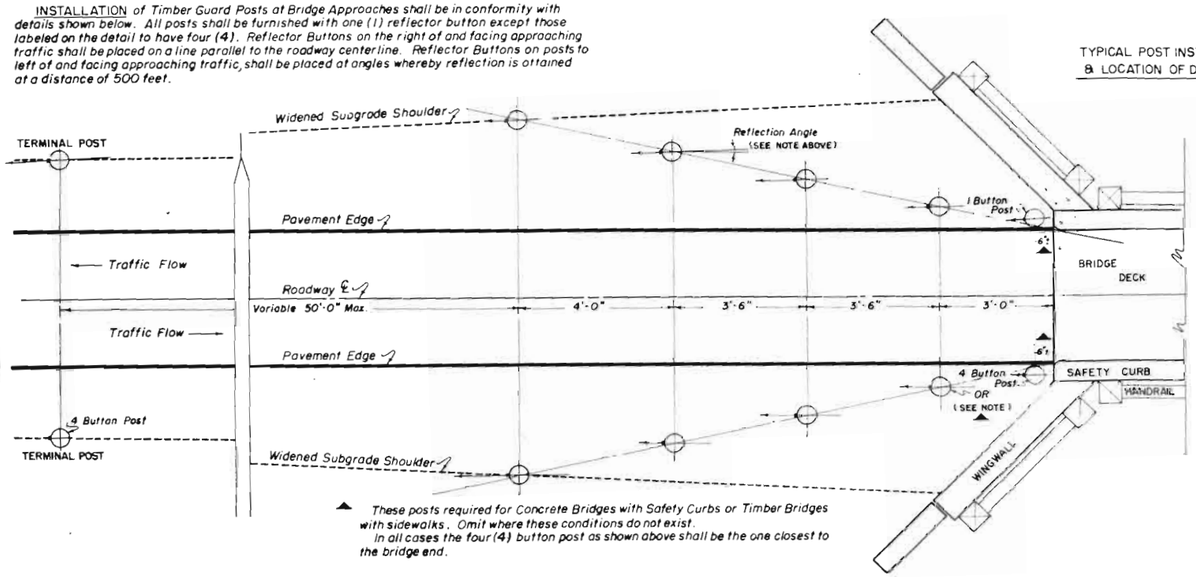


DETAILS OF POSTS



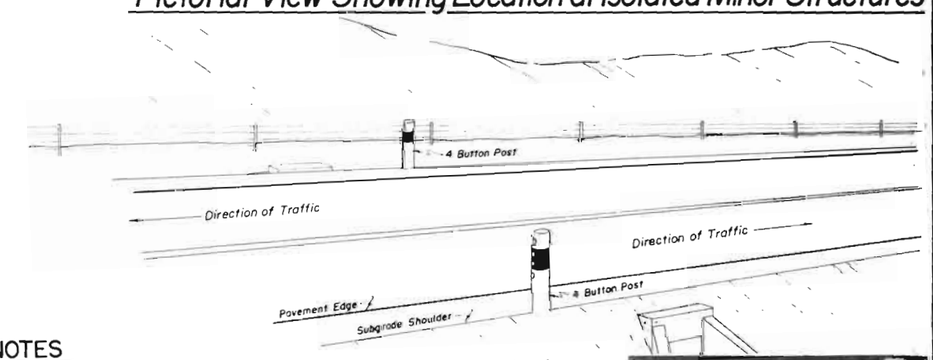
Typical Installation at Bridge Approaches

INSTALLATION of Timber Guard Posts at Bridge Approaches shall be in conformity with details shown below. All posts shall be furnished with one (1) reflector button except those labeled on the detail to have four (4). Reflector Buttons on the right of and facing approaching traffic shall be placed on a line parallel to the roadway centerline. Reflector Buttons on posts to left of and facing approaching traffic, shall be placed at angles whereby reflection is attained at a distance of 500 feet.



▲ These posts required for Concrete Bridges with Safety Curbs or Timber Bridges with sidewalks. Omit where these conditions do not exist.
In all cases the four (4) button post as shown above shall be the one closest to the bridge end.

Pictorial View Showing Location at Isolated Minor Structures



GENERAL NOTES

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

All posts shall be set and tamped in, plumb and firm, to the line and grades established by the Engineer.

In all instances a test shall be made to assure the maximum effect from reflective units.

The number, location and spacing of guard posts will be shown on plans.

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD
TIMBER GUARD POSTS

Designed by C.G.M.
Made by C.G.M.
Approved by A. Julian
Engineer, Surveys & Plans

REVISIONS

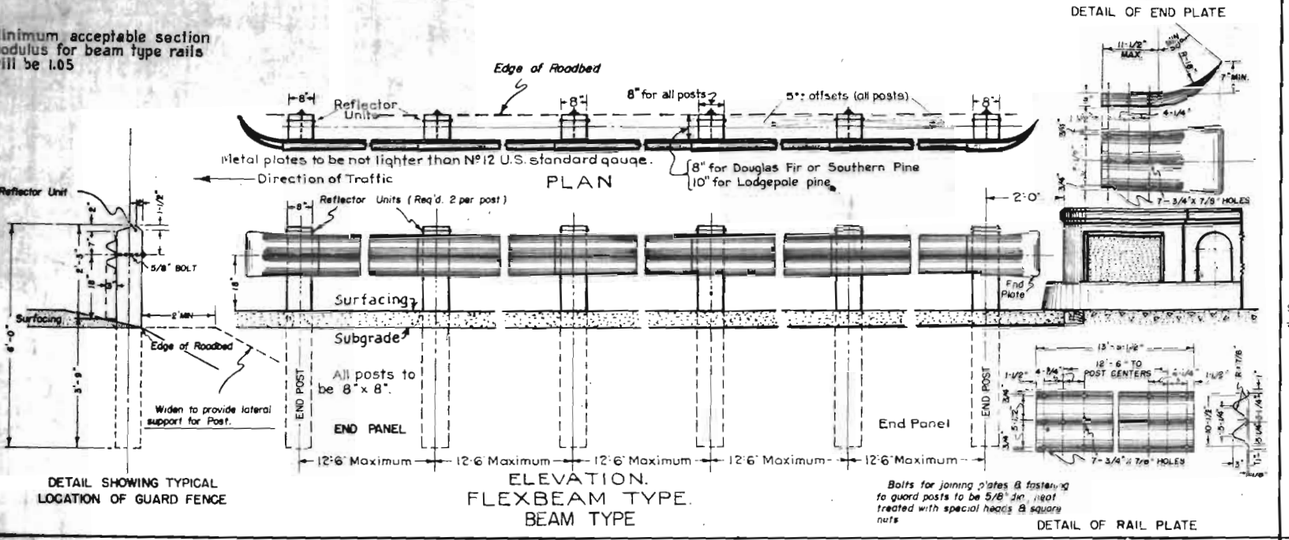
Rev. 11-24-39 Reflector Units
Rev. 3-25-40 W.G.S. Bolt Spacing Flexbeam Type.
Rev. 6-3-40 A.Z. Detail of rail element and offset spring.
Rev. 12-13-47 m.j.p.
Rev. 10-21-48 - C.G.M. - Revised Flexbeam Type Fence.
Rev. 12-3-48 - C.G.M. - Item No. 8 Title Block
Rev. 5-10-49, C.G.M., Fence Types, Notes, Title
Rev. 7-18-49 E.E.O.
Rev. 12-27-49, C.G.M., Added Date Nail Detail
Rev. 6-15-51 - E.A.R. - Flexbeam Type & Notes
Rev. 6-15-40 Minimum diameter for posts. P.B.B.
Rev. 9-21-39 Square Posts. P.B.B.
Rev. 6-14-40 - A.Z. - 1940 Specs. - Changed timber post details. & Location of guard fence.

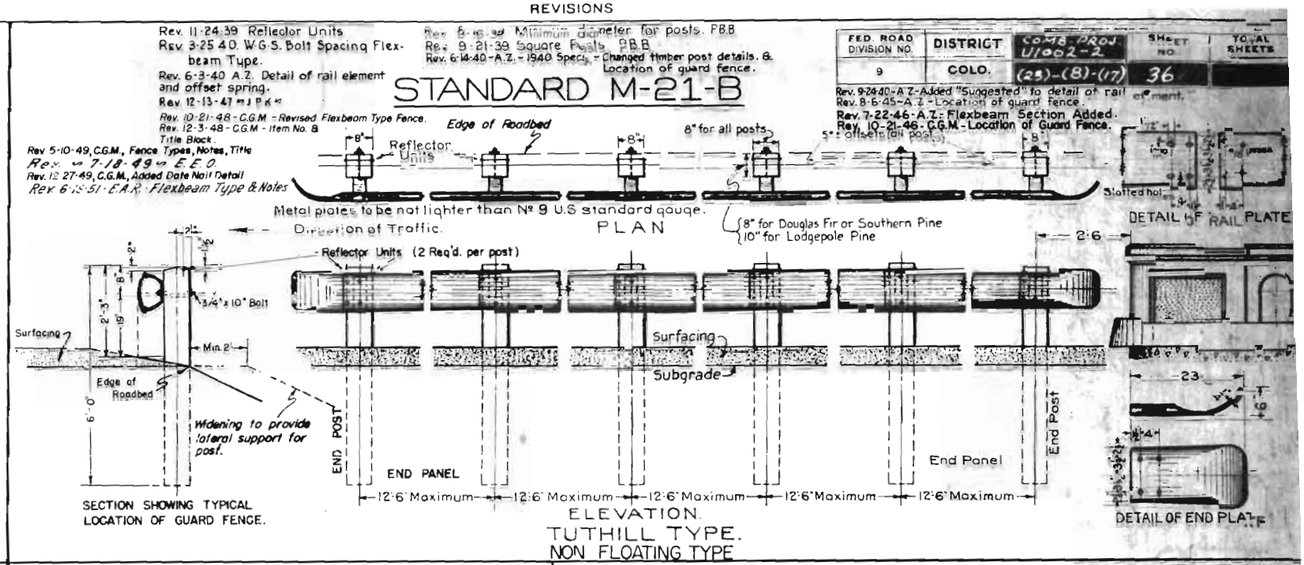
STANDARD M-21-B

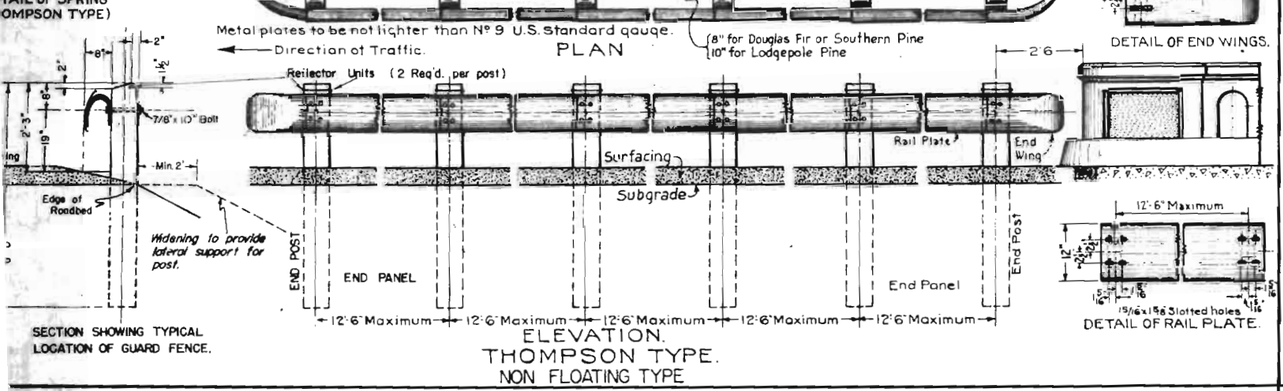
FED. ROAD DIVISION NO.	DISTRICT	COMB. PROJ. U1002-2	SHEET NO.	TOTAL SHEETS
9	COLO.	(28)-(8)-(17)	36	

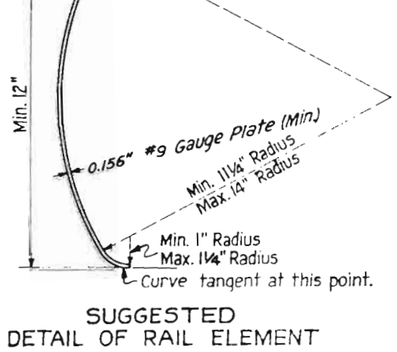
Rev. 9-24-40 - A.Z. - Added "Suggested" to detail of rail element.
Rev. 8-6-45 - A.Z. - Location of guard fence.
Rev. 7-22-46 - A.Z. - Flexbeam Section Added.
Rev. 10-21-46 - C.G.M. - Location of Guard Fence.

Minimum acceptable section
odulus for beam type rails
ill be 1.05

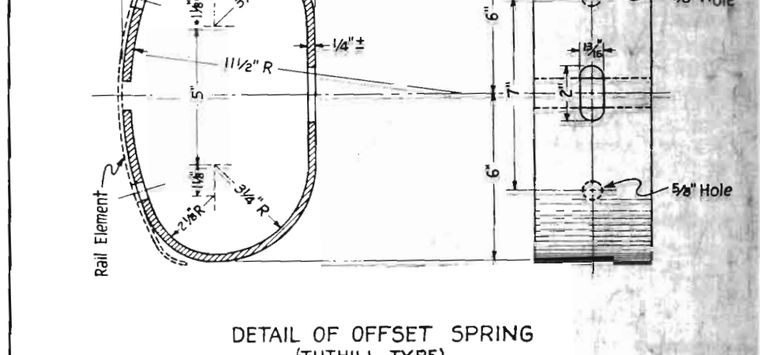






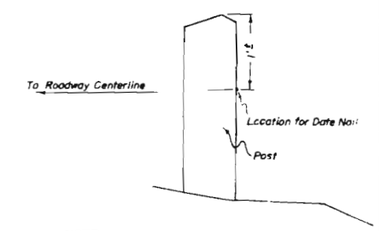


SUGGESTED
DETAIL OF RAIL ELEMENT



DETAIL OF OFFSET SPRING
(TUTHILL TYPE)

Detail for Placing Date Nails



NOTE:
Date Nails shall be placed on every post and shall be driven flush.
Date Nails to be furnished and installed by State Forces as part of Engineering Costs.

GENERAL NOTES

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

All wood posts shall be close grained Douglas Fir of the Coast Region, Dense Longleaf or Shortleaf Southern Pine, or Lodgepole Pine.

Only one type of metal plate guard fence or posts may be used on a project.

In lieu of the metal plate guard fence types as shown on this drawing, other equivalent types of metal plate guard fence approved by the department and complying with the specifications may be used.

All wood posts shall be square edged, full sawn, with tops beveled as shown. All bolt holes are to be drilled 1/16" larger than diameter of bolt before treatment is applied. All wood posts shall be pressure treated for the full length of the posts as provided for in the Specifications.

Timber posts fabricated from Douglas Fir or Southern Pine shall be 8"x8" square. Timber posts fabricated from Lodgepole Pine shall be 8"x10" and shall be installed with the 8" face parallel to the centerline of the roadway.

A 2'-0 test specimen, for the type of Guard Rail used, must be submitted to the Laboratory for required tests.

All wood posts shall be set and tamped in, plumb and firm, to the lines and grades as directed by the engineer.

All metal connecting devices, hardware and supports shall be hot dip galvanized, except that offset spring fittings may be electro-plated. Metal plates shall not be galvanized, but shall be painted as provided for in the specifications.

Metal plates shall not be lighter than that shown on this sheet for each type and in no case to be lighter than Nº 12 U.S. standard gauge.

The length of guard fence to be paid for and designated on plans shall be measured from center to center of end posts.

Standard galvanized cast iron O.G. or galvanized malleable cast washers shall be used under all bolt heads and nuts coming in contact with wood posts.

Where sidewalks are constructed adjacent to the lane for traffic, guard fence shall be placed in such manner that the fence lies on the line between the sidewalk area and the normal roadway shoulder.

Where guard fences are constructed on the approaches to bridges with sidewalks, the fence at bridge shall be placed in line with the face of the curbing on the bridge.

Reflector Units shall be "Signal Service" No. ALA-11 (White Crystal) of the Signal Service Corporation, Elizabeth, New Jersey, or an acceptable equivalent.

GEN. NOTES (CONT.)

Reflector Units in all posts shall be placed in such position that the units will function at a distance of 500 feet.

On tangents the Reflector Units shall be placed at an angle of approximately five degrees to a line parallel to the centerline of the highway.

In all instances a test shall be made to assure the position of the Reflector Units to be the most effective possible.

The diameter of holes drilled in the posts shall be approximately one-sixteenth (1/16) inch less than the diameter of the signal button base. In all instances the hole shall be enough undersize that the button when driven into the post shall have complete bond with the post and be securely locked in correct position.

COLORADO
STATE HIGHWAY DEPARTMENT

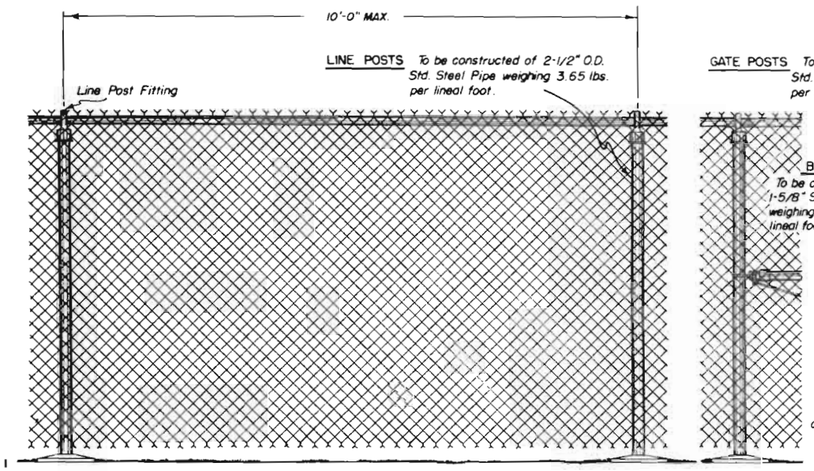
STANDARD
METAL PLATE GUARD FENCE
BEAM AND
NON FLOATING TYPES

Designed by A.G.K.	Approved by John S. Marshall
Made by A.G.K.	
Checked by	Date: January 1st 1948

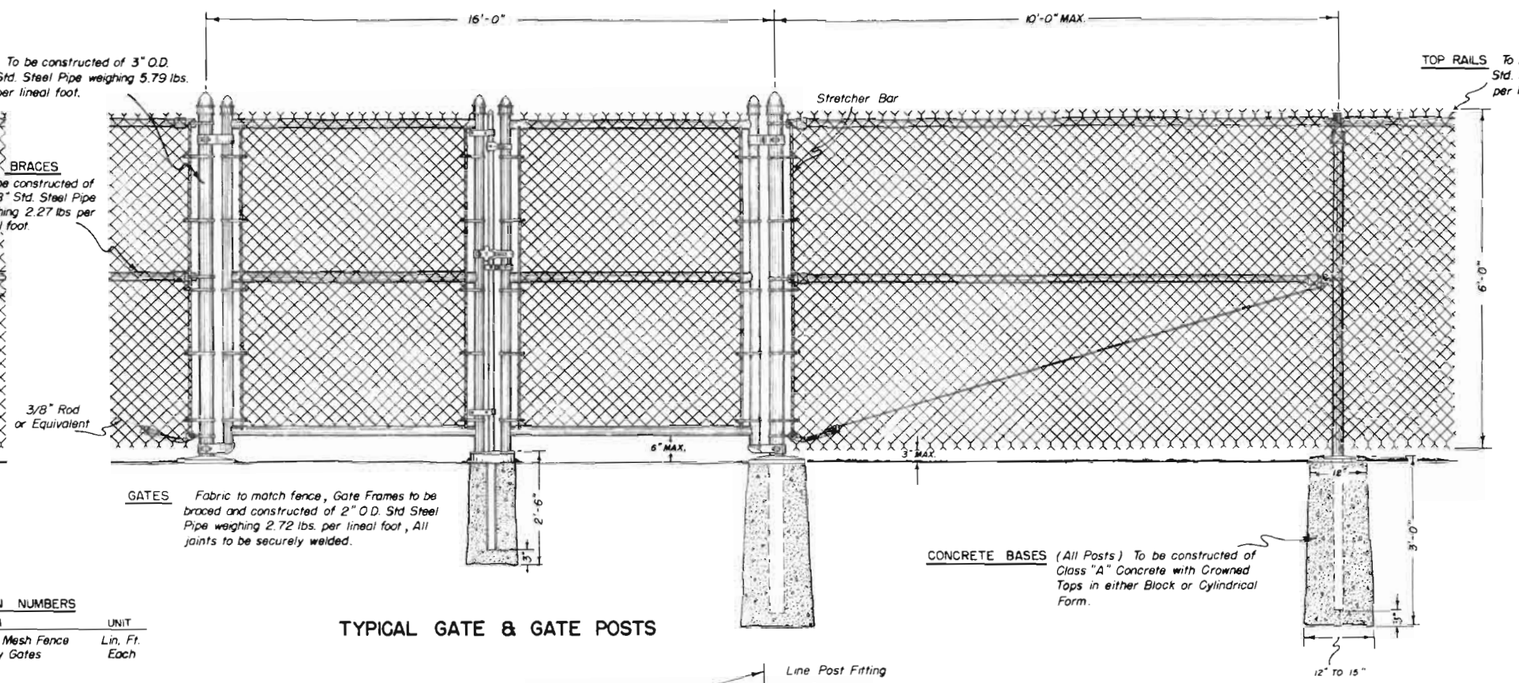
STANDARD M-26-B

FED. ROAD DIST. NO.	STATE	COMB. PROJ.	SHEET NO.	TOTAL SHEETS
3	COLO.	(23)-(8)-(17)	37	

Rev. 9-6-49 J.P.K. Additional General Notes
Rev. - 8-23-50 - E.A.R. - Width of Gate Opening



TYPICAL LINE POSTS

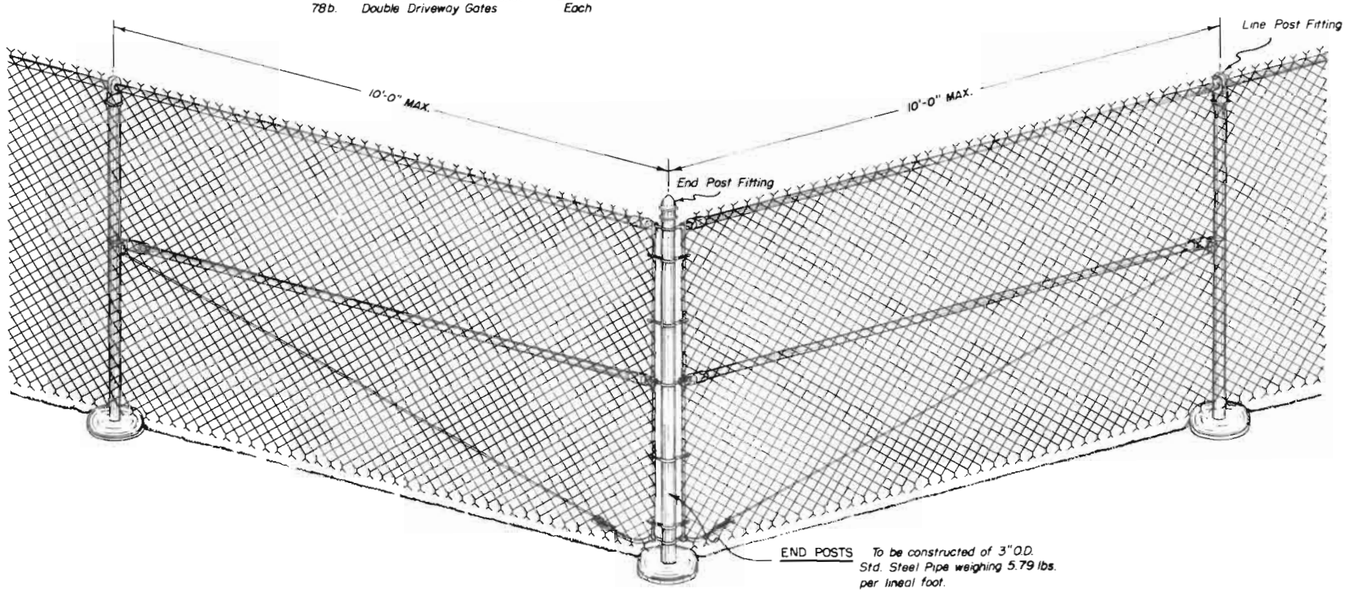


GATES Fabric to match fence, Gate Frames to be braced and constructed of 2" O.D. Std Steel Pipe weighing 2.72 lbs. per lineal foot, All joints to be securely welded.

TYPICAL GATE & GATE POSTS

SPECIFICATION NUMBERS

ITEM NO.	ITEM	UNIT
78a.	Chain Link Wire Mesh Fence	Lin. Ft.
78b.	Double Driveway Gates	Each



TYPICAL CORNER SECTION WITH END POST & BRACES

GENERAL NOTES

All Work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.

All Steel; Fabric, Pipe, Posts & Hardware required in the construction of this fence shall be Galvanized by the "Hot Dip Process".

All Gate and Fence Fabric used in the construction of this fence is to be of Chain Link Copper Bearing No. 9 Guage Wire woven into 2" Mesh and 6'-0" in height with a Barbed Finish on the top and bottom selvage. All Fabric shall be Galvanized after fabrication.

Weights of Pipe as shown are the minimum allowed for the Nominal Diameters designated.

Splicing of Fabric Sections other than at Line Posts will not be permitted.

Wire Mesh Fabric shall be securely fastened to all Line Posts, Rails and Braces with No. 7 (B & S) Guage Aluminum and/or No. 12-1/2 (W & M) Guage Galvanized Steel Wire and spaced at a minimum of 6 per 10 feet Horizontally & 1 per foot Vertically. Suitable Attachment Bands shall be used on all Gate Posts, End Posts Braces & Stretcher Bars.

Alternate Equivolent Standard Fittings, Gates, Posts and Rails of other than Pipe Sections will be acceptable subject to the Engineers approval.

See Plan Sheets for Locations, Number of Gates and Length of Fence required.

End Posts with Braces, Stretcher Bars and Fittings, corresponding to details shown hereon for Typical Corner Section with End Posts and Braces, are to be used in fence at intervals of not more than four hundred (400) feet.

COLORADO
STATE HIGHWAY DEPARTMENT

CHAIN LINK WIRE MESH
(SCHOOL) FENCE

Designed by A.Z.
Made by C.G.M.
Checked by J.S.M.
Approved by [illegible]
Design Engineer
Date: 9-6-49

Rev. 10-25-50-C.G.M., Accel. Lanes, Ballast note re widen crest grades.

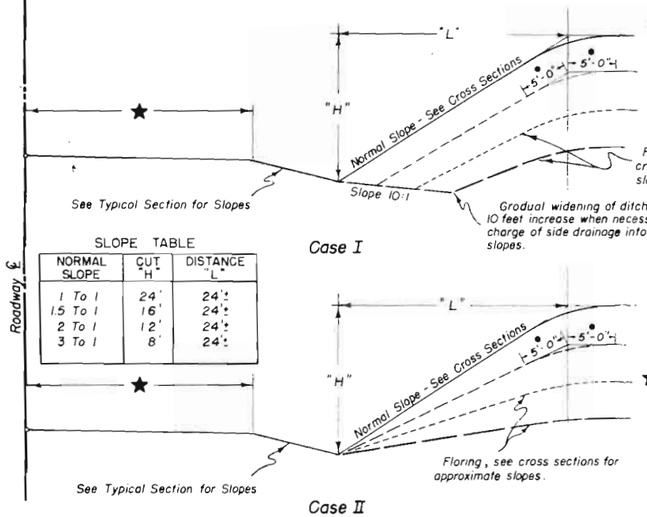
STANDARD M-2-DM

Rev 7-12-49, C.G.M., Details for widening at Crest of Grades
Rev. 12-7-49, C.G.M., Rev notes re Type I Rd. Apprs. & widen at Bridge Apprs., added note re accell & decell. lanes.

FED. ROAD DIVISION NO.	DISTRICT	COLO. PROJ.	SHEET NO.	TOTAL SHEETS
9.	COLO.	(25)-(6)-(17)	38	

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

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



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

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

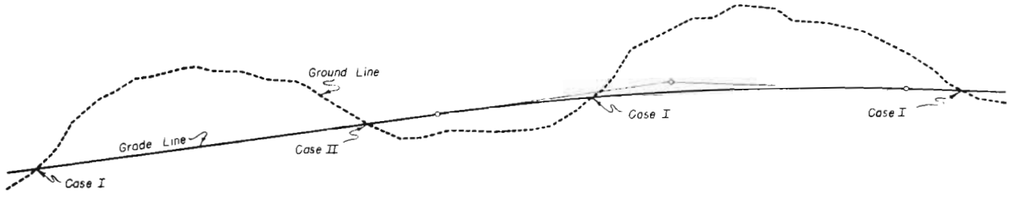
Flaring with widened ditch, see cross sections for approximate slopes.

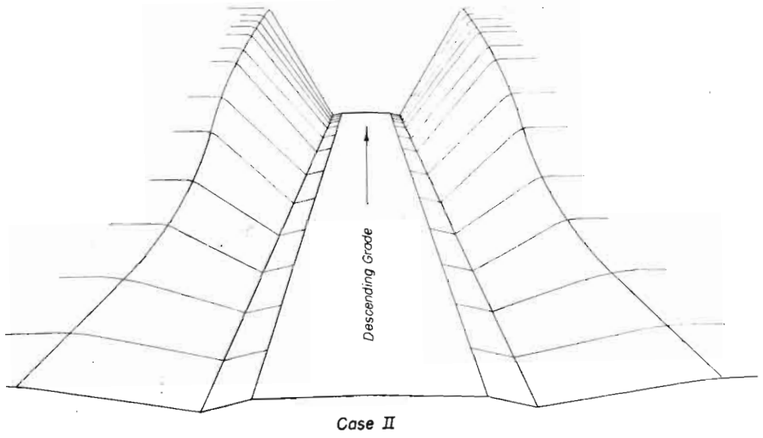
• CUT SLOPE TREATMENT IN EARTH CUTS: *The intersection of cut slopes with the existing ground shall be rounded in earth cuts, beginning 5 ft. outside the slope stake and extending 5 ft. down the cut slope. Where the cut slope is less than 5 ft. reduce each of the above widths of slope treatment to the actual slope distance. Quantities shall be included in "Unclassified Excavation".*

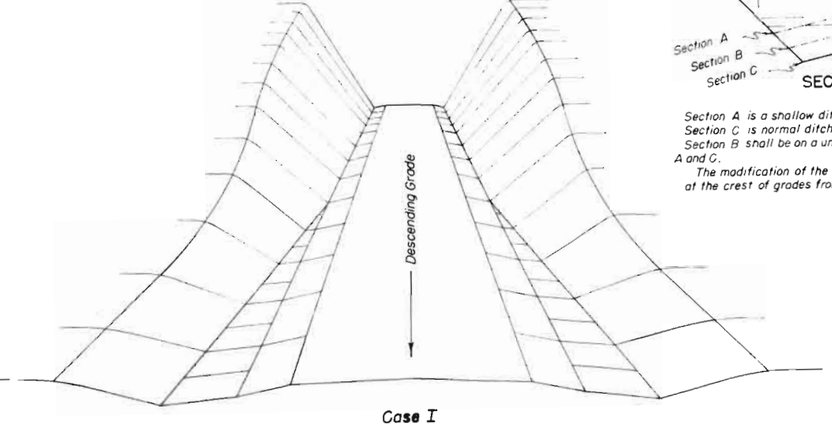
★ WIDENING AT BRIDGE APPROACHES: *Roadway embankment at bridge approaches shall be so constructed that the finish point of the subgrade shoulder is a Min. of 2 ft. beyond the outside edge of bridge deck. Where widening of the section is necessary to achieve this result it shall take place gradually over a distance of 300 ft. This is done to accomodate guard fence and/or guard or marker posts at bridge approaches. (See additional requirements for Guard Fences below.)*

WIDENING TO ACCOMODATE GUARD FENCES: *At all locations on the project (except as provided above for bridge approaches) where guard fence is to be constructed the shoulders shall be widened 2 ft. to provide additional lateral support for guard fence posts.*

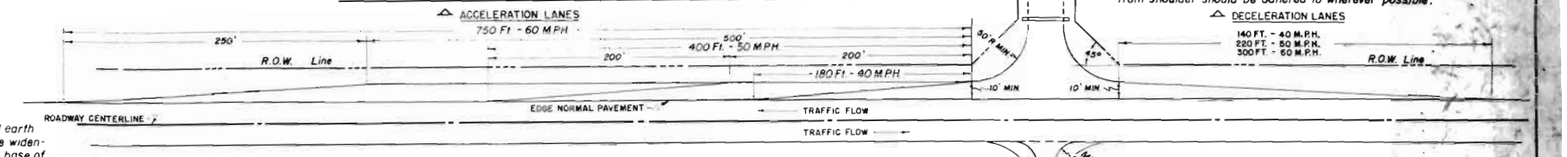
PLAN OF FLARING IN EARTH CUTS





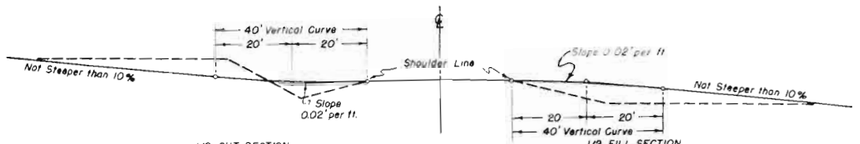


TYPICAL PLANS FOR SIDE APPROACH ROADS

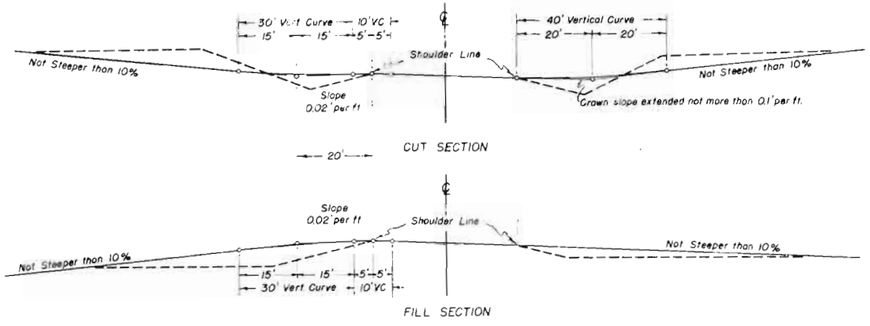


▲ *Values shown are general, see plans for specific requirements of each Type I Road Approach.*

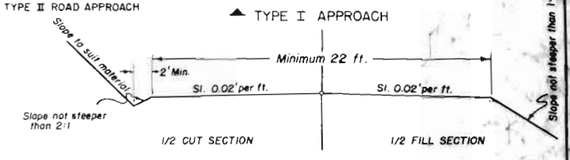
STANDARD CROWNED SECTION



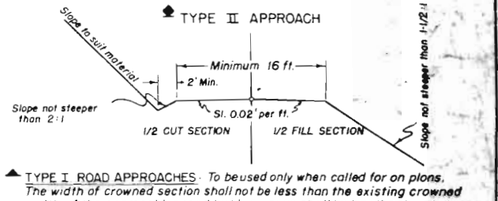
SUPERELEVATED SECTIONS



▲ TYPE I APPROACH



◆ TYPE II APPROACH



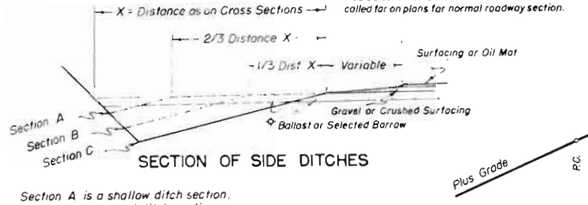
▲ TYPE I ROAD APPROACHES: *To be used only when called for on plans. The width of crowned section shall not be less than the existing crowned width of the approaching road but in no case shall be less than twenty two (22) feet.*

◆ TYPE II ROAD APPROACHES: *To be used at all places which are not indicated as "Type I Road Approaches." The width of crowned section shall not be less than the existing crowned width of the approaching road but in no case shall be less than sixteen (16) feet.*

▲ 20 FT. RADII: *To be used only on private road approaches.*

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

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

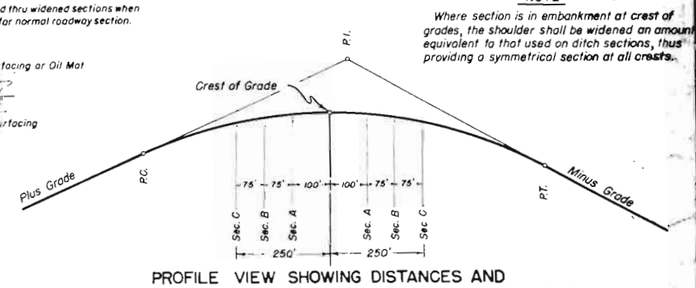


SECTION OF SIDE DITCHES

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

NOTE

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



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

GENERAL NOTES

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

All side approach roads to the Project shall be Gravel Surfaced with a four (4) inch thickness of "Gravel or Crushed Rock Surfacing" extending approximately to the Right of Way Line. Estimated tonnage & type of material required for this operation are shown in the Surfacing Plan.

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

COLORADO
STATE HIGHWAY DEPARTMENT

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

Designed by A.Z.	Approved by [signature]
Made by C.G.M.	Engineer Director & Chief
Checked by	

REVISIONS

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

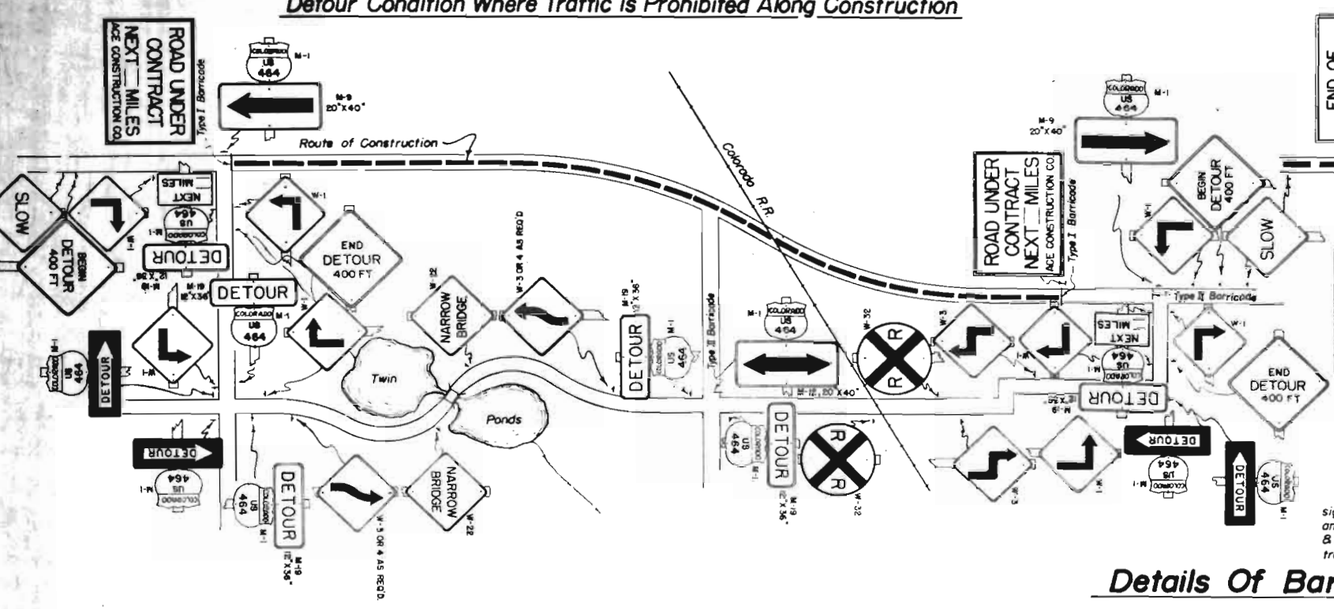
STANDARD M-2-DS

FED. ROAD DIVISION NO.	DISTRICT	COMB. PROJ. 1/002-2	SHEET NO.	TOTAL SHEETS
9	COLO.	(23)-(8)-(17)	39	

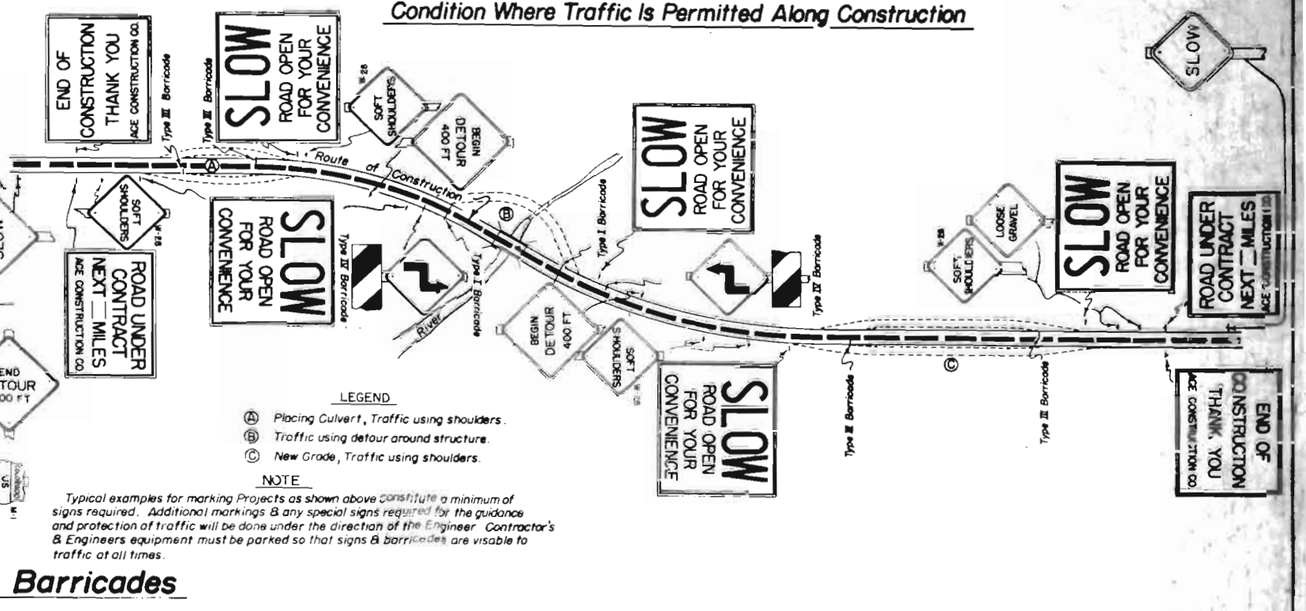
REV. - 8/16/49 - E.E.O.
REV. - 2/3/50 - E.A.R.

Typical Methods Of Marking Highways & Detours

Detour Condition Where Traffic Is Prohibited Along Construction



Condition Where Traffic Is Permitted Along Construction



LEGEND

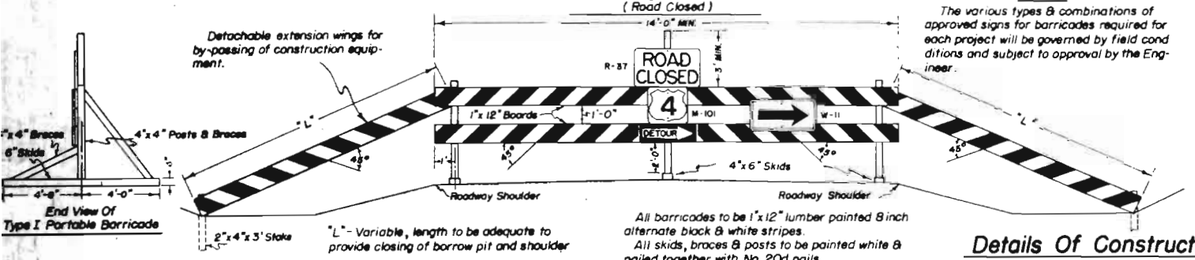
- (A) Placing Culvert, Traffic using shoulders.
- (B) Traffic using detour around structure.
- (C) New Grade, Traffic using shoulders.

NOTE

Typical examples for marking Projects as shown above constitute a minimum of signs required. Additional markings & any special signs required for the guidance and protection of traffic will be done under the direction of the Engineer. Contractor's & Engineers equipment must be parked so that signs & barricades are visable to traffic at all times.

Details Of Barricades

Type I
(Road Closed)

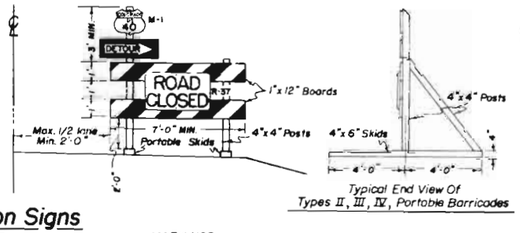


NOTE

The various types & combinations of approved signs for barricades required for each project will be governed by field conditions and subject to approval by the Engineer.

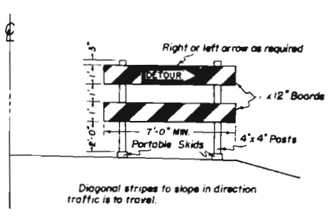
All barricades to be 1"x12" lumber painted 8 inch alternate black & white stripes.
All skids, braces & posts to be painted white & nailed together with No. 20d nails.
Bases to be weighted where necessary to provide stability

Type II
(Beginning of Detour for Through Traffic)



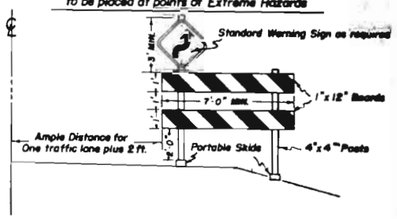
Typical End View Of Types II, III, IV, Portable Barricades

Type III
(Both Ends of By-Pass Areas within Project)

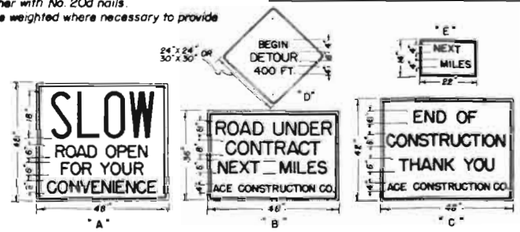


Diagonal stripes to slope in direction traffic is to travel.

Type IV
Supplement to Advance Warning Signs, to be placed at points of Extreme Hazards



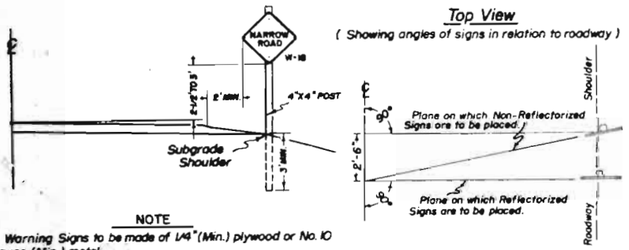
Details Of Construction Signs



MARKINGS

Construction Sign "A" - to be of 1" material painted White, the word "SLOW" lettered in Red, balance of lettering to be Black.
Construction Signs "B", "C", "E" - to be of 1" material painted White, all lettering to be Black.
Detour Warning Sign "D" to be of 1/4" (min.) plywood or No. 10 (min.) gauge metal, painted Yellow, all lettering to be Black.
Construction Signs - "B", "E" - 3/4"x 9" metal slides to be placed between words "Next & Miles" spaced so as to accomodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor.
Signs to be fastened to 2- 4"x4" posts set 4 ft. in the ground with a minimum of 3 cleats on the back.

Position Of Signs Relative To Roadbed & Hazards

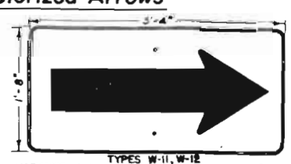


NOTE

Warning Signs to be made of 1/4" (Min.) plywood or No. 10 Gauge (Min.) metal.
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.

Details Of Reflectorized Arrows

MARKINGS *A White Reflectorized Arrow of "Scotchlite" Reflective Sheeting or suitable equivalent to be placed on a*



TYPES W-11, W-12

MARKINGS *A Black Arrow on a "Highway Yellow" background of "Scotchlite" Reflective Sheeting or suitable equivalent.*

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department 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 painted, well maintained Barricades, Warning Signs and Directional Type Signs. All Barricades & Signs shall be moved, added to, changed or removed as required during the progress of construction.

All Warning & Directional Type Signs will be "Reflectorized" with "Scotchlite" Reflective Sheeting or a suitable equivalent. Except for variations noted on this sheet all signs will be in conformity with the specifications outlined in "Manual on Uniform Traffic Control Devices for Streets & Highways" issue of August 1948 by the U.S. Public Roads Administration. U.S. or State Route Markers required for the Project will be furnished by the Department and installed by the Contractor. Numbers adjacent to signs refer to Standards in the Manual

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

1.	All Barricades	As Required
2.	"SLOW, ROAD OPEN FOR YOUR CONVENIENCE" Signs	Minimum 2
3.	Standard Warning & Directional Signs	As Required
4.	"ROAD UNDER CONTRACT, NEXT __ MILES, CONTRACTORS NAME" Signs	Minimum 2
5.	Approved Directional Arrows for Barricades	As Required
6.	"END OF CONSTRUCTION, THANK YOU, CONTRACTORS NAME" Signs	Minimum 2
7.	Torches and Flares as follows: Type I Barricades	Minimum 3
	Type III, IV Barricades	Minimum-1
	Standard Warning Signs	Minimum-1

Where traffic is prohibited from the Project, the Detour will be marked by the Department except for Barricades complete with approved Warning Signs & Arrows which will be provided, erected & maintained by the Contractor at ends of Project and intersecting roads

All lumber used shall be of sound durable material. Barricades, Signs, Symbols & Lettering conforming to styles noted hereon will be well painted & maintained. Uneven or smeared lettering will not be accepted.

Flares and Torches shall be of the Oil Burning Type approved by the Department and shall be placed 3 ft. to 5 ft. ahead of the ship [illegible]

COLORADO
STATE HIGHWAY DEPARTMENT

Standard Roadway Construction Traffic Signs

Designed by
Made by C.G.M.
Approved [illegible]
Engineer

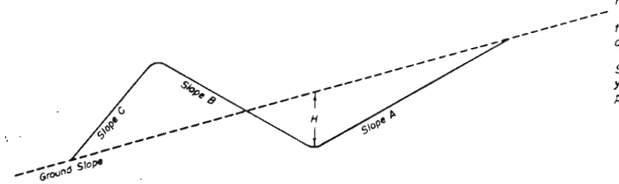
STANDARD TYPES of DITCHES and CONSTRUCTION METHODS

STANDARD M-107-C

FED. ROAD DIVISION NO.	DISTRICT	COMB. PROJ. U902-2	SHEET NO.	TOTAL SHEETS
9.	COLO.	(23)-(8)-(17)	40	

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.

Table of Slopes and Yardages

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

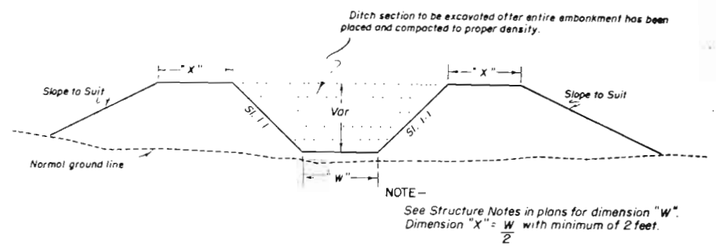
▲ *Slopes are approximate and may be varied to suit conditions encountered during*

Typical Construction Layouts

Scale of Sketches in Feet

100 0 100 200 300 400

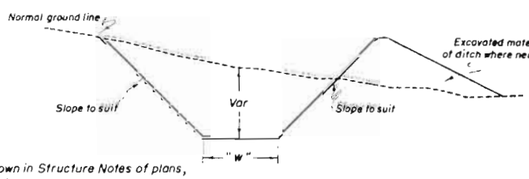
TYPICAL SECTIONS for DRAINAGE, IRRIGATION DITCHES and CHANNEL CHANGES



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

For Embankment Sections

(Generally for use in Irrigation Ditches & Channel Changes)



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

For Cut Sections

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. | Approved by [illegible]

Rev. 7-28-52, R.O.W. & Access Ramps, J.C.R.
Rev. 11-5-52, Added R.O.W. Parcels Lt. 169+, J.C.R.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		41	

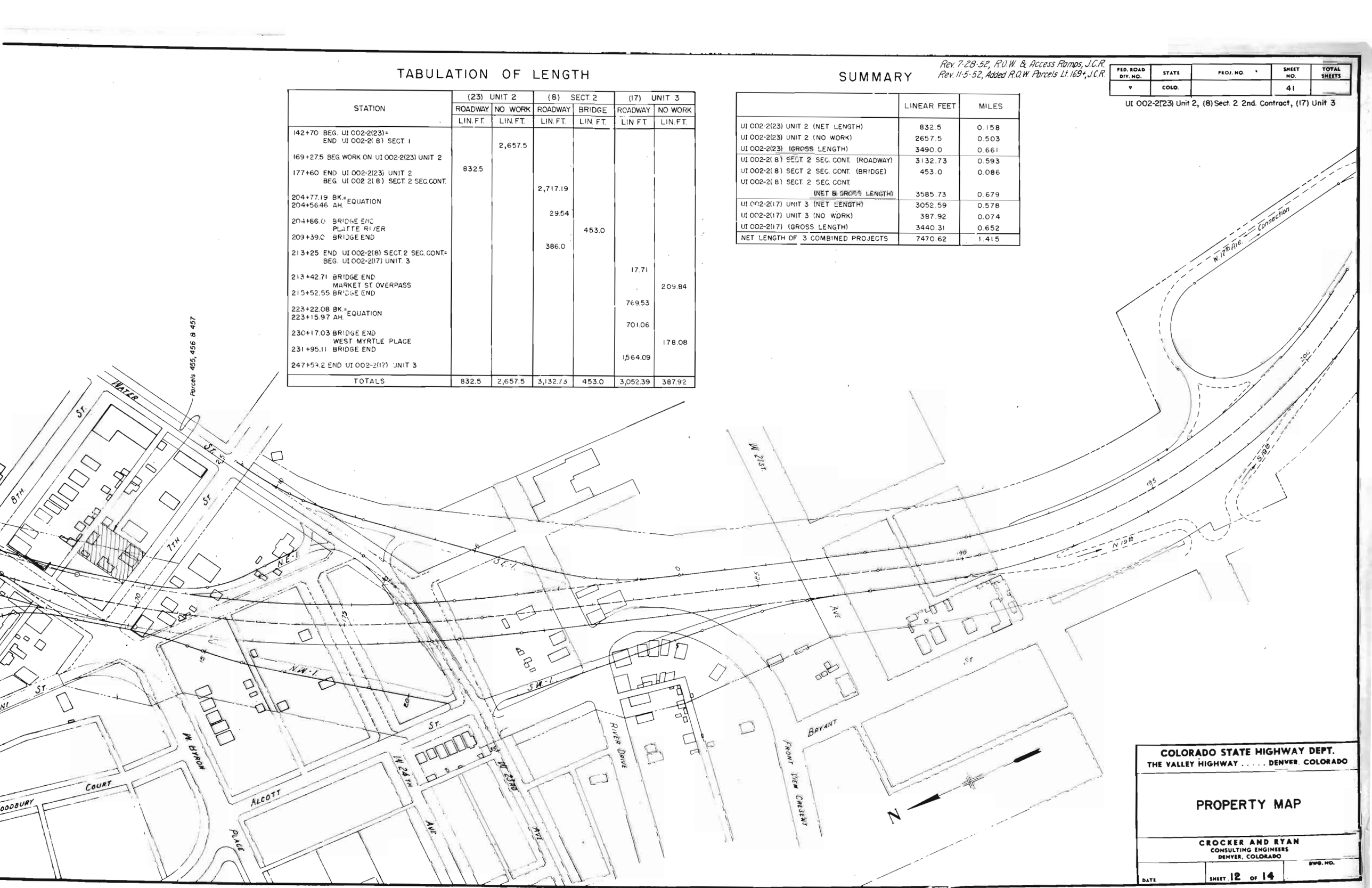
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

TABULATION OF LENGTH

STATION	(23) UNIT 2		(8) SECT. 2		(17) UNIT 3	
	ROADWAY	NO WORK	ROADWAY	BRIDGE	ROADWAY	NO WORK
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.
142+70 BEG. UI 002-2(23)= END UI 002-2(8) SECT. 1		2,657.5				
169+27.5 BEG. WORK ON UI 002-2(23) UNIT 2	832.5					
177+60 END UI 002-2(23) UNIT 2 BEG. UI 002-2(8) SECT. 2 SEC. CONT.			2,717.19			
204+77.19 BK.=EQUATION 204+56.46 AH.			29.54			
204+86.0 BRIDGE END PLATTE RIVER				453.0		
209+39.0 BRIDGE END			386.0			
213+25 END UI 002-2(8) SECT. 2 SEC. CONT= BEG. UI 002-2(17) UNIT. 3					17.71	
213+42.71 BRIDGE END MARKET ST. OVERPASS						209.84
215+52.55 BRIDGE END					769.53	
223+22.08 BK.=EQUATION 223+15.97 AH.					701.06	
230+17.03 BRIDGE END WEST MYRTLE PLACE						178.08
231+95.11 BRIDGE END					1,564.09	
247+53.2 END UI 002-2(17) UNIT 3						
TOTALS	832.5	2,657.5	3,132.73	453.0	3,052.39	387.92

SUMMARY

	LINEAR FEET	MILES
UI 002-2(23) UNIT 2 (NET LENGTH)	832.5	0.158
UI 002-2(23) UNIT 2 (NO WORK)	2657.5	0.503
UI 002-2(23) (GROSS LENGTH)	3490.0	0.661
UI 002-2(8) SECT. 2 SEC. CONT. (ROADWAY)	3132.73	0.593
UI 002-2(8) SECT 2 SEC. CONT. (BRIDGE)	453.0	0.086
UI 002-2(8) SECT. 2 SEC. CONT. (NET & GROSS LENGTH)	3585.73	0.679
UI 002-2(17) UNIT 3 (NET LENGTH)	3052.59	0.578
UI 002-2(17) UNIT 3 (NO WORK)	387.92	0.074
UI 002-2(17) (GROSS LENGTH)	3440.31	0.652
NET LENGTH OF 3 COMBINED PROJECTS	7470.62	1.415



COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

PROPERTY MAP

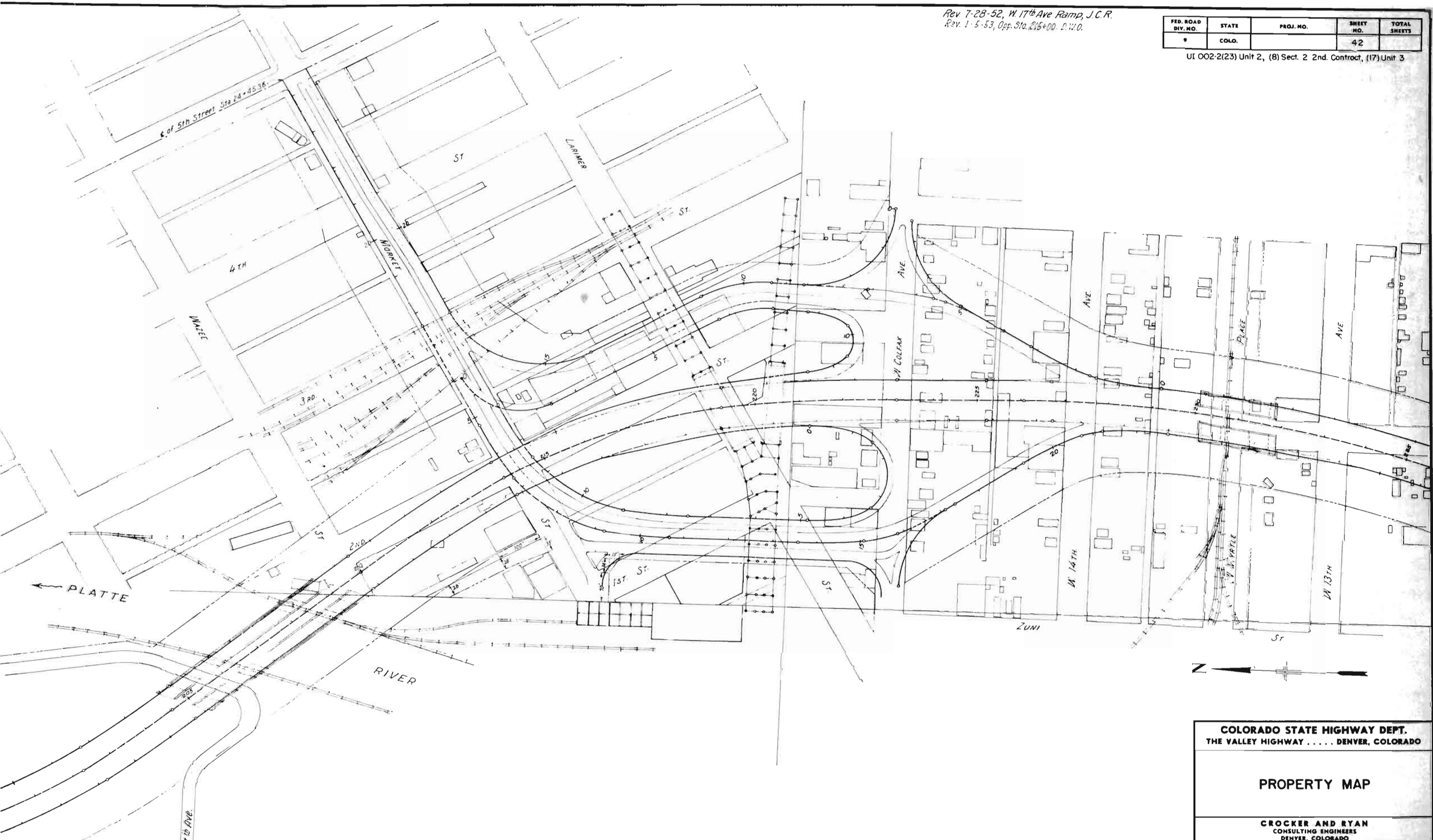
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE | SHEET 12 OF 14 | DWG. NO.

Rev. 7-28-52, W. 17th Ave Ramp, J.C.R.
Rev. 1-5-53, Opp. Sta. 215+00. D.W.O.

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		42	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

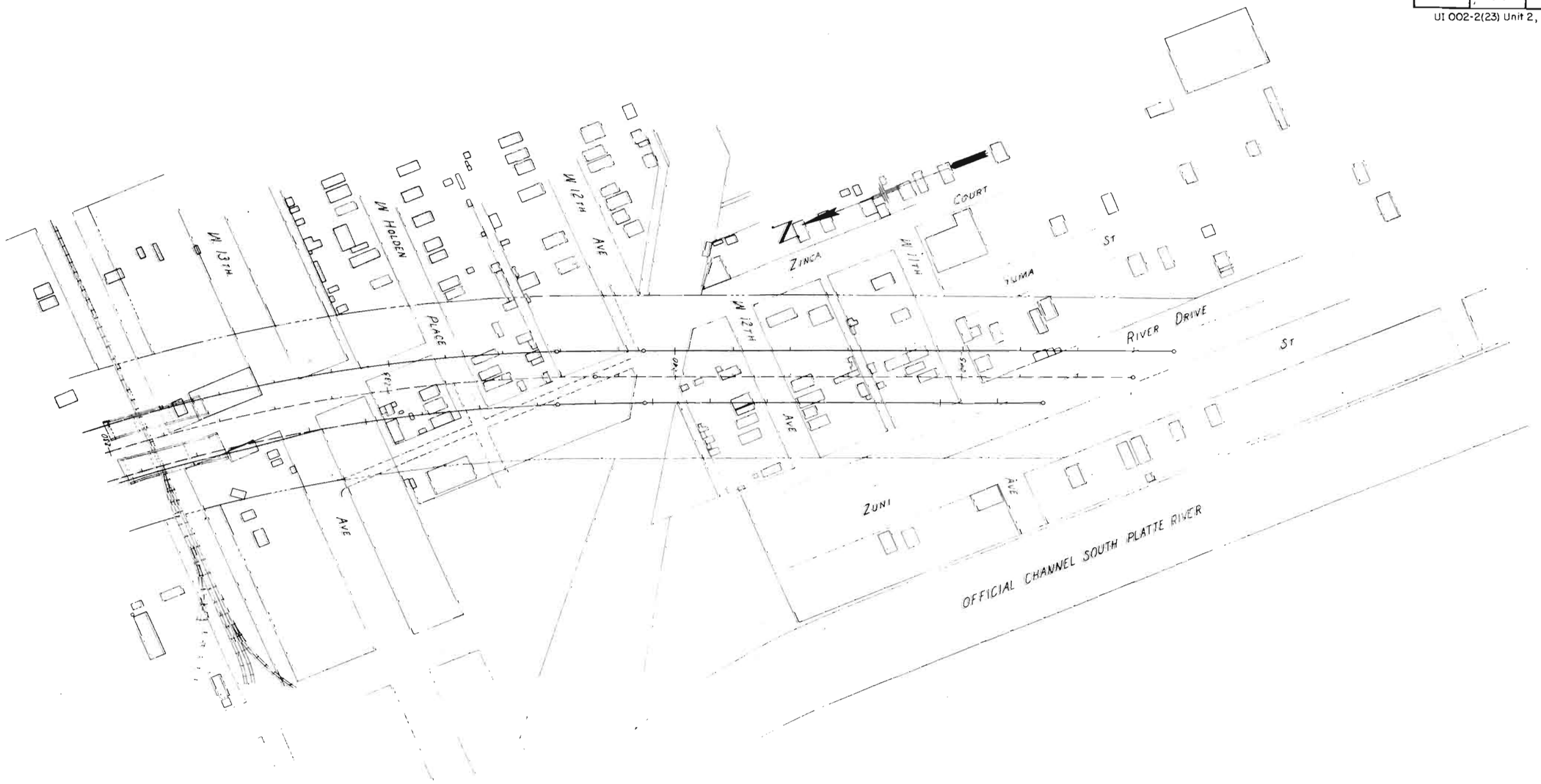
PROPERTY MAP

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DWG. NO.

FED. ROAD INV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		43	

UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3



COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

PROPERTY MAP

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE

SHEET 14 OF 14

DWG. NO.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2, (8) Sect 2 2nd Contract, (17) Unit 3	44	

CROCKER AND RYAN
GENERAL CONTRACTORS

169+27.5 BEG. UI 002-2(23) UNIT 2

APPROACH TO PROJECT

177+60 END UI 002-2(23) UNIT 2 =
BEG. UI 002-2(8) SECT. 2
SEC. CONTRACT

PLATTE ST.
NORTH
CENTRAL ST.
UMATILLA
VALLEJO
W 28th AVE.
WYANDOT
ZUNI
ALCOTT
CRESCENT DRIVE
WATER ST.
Edge of Pavt. N Rdwy
To 14th St. Viaduct
Edge of Pavt S Rdwy
Extension of E. Speer Blvd From West of Zuni St.
Sta. 158+76.22 Hwy. = Sta. 19+43.26 Speer Blvd.
E-16-EW
E-16-EO
E-16-FW
E-16-FO
E-16-DA
EAST LINE
WEST LINE
Surveyed Line
111°27'30"
T.S 163+04.83
S.C. 164+54.83
P.C. 163+92.71
C.S. 164+55.04
P.C. 165+30.2
P.I. 171+17.06
P.I. 171+29.66
P.I. 171+42.26
P.I. 33+87.97
C.S. 177+44.54
P.T. 178+35.21
C.S. 177+97.28
S.T. 178+97.54
S.T. 179+47.05
Sta 176+32.01 = Sta 30+73.34
Sta 176+82.71 = Sta 31+30.42
Sta 177+31.09 = Sta 31+85.66
150.45'

EAST LINE

Δ	28°51'11"
D	2°
Ls	150'
Ts	812.02'
Es	92.60'
Lc	1292.5'
R	2865.0'

θs	1°30'
p	0.33'
k	75'
Xc	149.99'
Yc	1.31'
L.T.	100.0'
S.T.	50.01'

WEST LINE

Δ	28°51'11"
D	1°56'
Ls	150'
Ts	837.43'
Es	96.80'
Lc	1342.22'
R	2865.0'

θs	1°27'
p	0.32'
k	75'
Xc	149.99'
Yc	1.26'
L.T.	100'
S.T.	50.0'

℄ Between Roadways

Δ	28°51'11"
D	2°
T	736.9'
L	1442.2'
R	2865.0'
E	93.25'

EAST LINE PROFILE

Test Hole No. 10
Sta 151+54 - on East Line
11.5 to 96.5
Class A-2F

Test Hole No. 11
Sta. 155+50 - on East Line
08.5 to 97.5 — Class A-2F
97.5 to 103.5 — Class A-6
03.5 to 90.5 — Class A-2F
LL 26.0 | PI 11.4 | *200 36.1%
LL 50.4 | PI 29.4 | *200 84.3%
+2.00

Test Hole No. 13
Sta. 167+00 - on East Line
14.5 to 01.5 — Class A2-6 — LL 40.6 — PI 24.3 — *200 47.4%
01.5 to 98.5 — Class A-6 — LL 39.5 — PI 21.4 — *200 70.6%

Test Hole No. 15
Sta. 169+50 - on East Line
17 to 00.5 — Class A2F — LL 22.9 — PI N.P. — *200 31.6%
00.5 to 08.5 — Class A6 — LL 37.6 — PI 20.9 — *200 57.8%
08.5 to 09.5 — *200 10.9%

Test Hole No. 14
Sta. 165+00 - on West Line
Similar to Hole No 13 - No Sample Taken

WEST LINE PROFILE

Test Hole No. 9
Sta. 151+06 - on West Line
15.0 to 94.0 — Class A2F — PI 3.1 — *200 34.8%
94.0 to 91.0 — Class A2F — LL 20.0 — PI N.P. — *200 25.9%
91.0 to 88.0 — Class A-3 — *200 5.9%

Test Hole No. 12
Sta. 155+30 - on West Line
13.5 to 01.5 — Class A2F — LL 30.6 — PI 15.3 — *200 40.5%
01.5 to 98.5 — Class A6 — LL 66.5 — PI 41.0 — *200 86.1%

Existing Grade - Platte St.
Grade to be constructed on this Project
+1.8%
+1.20%
+0.40%
-0.60%
400' V.C.
600' V.C.
200' V.C.
100' V.C.
5220
5210
5200
5190
5180
5230

Rev. 7-28-52, Ramps N-19 & S-19, J.C.R.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO	SHEET NO.	TOTAL SHEETS
9	COLO.	UI 002-2(23) Unit 2, (8) Sect 2 2nd. Contract, (17) Unit 3	45	

CROCKER AND RYAN CONSULTING ENGINEERS

①	②	③	④	Ⓨ
Δ_c = 136°48'	Δ = 06°42'	Δ = 124°	Δ = 50°22'	Δ = 99°56'
Δ = 196°48'	D = 20°	D = 120°	D = 35°	D = 44°
D = 4°	T = 57.96'	T = 83.60'	T = 70.90'	T = 155.02'
D_c = 46°	L = 133.5'	L = 103.33'	L = 132.34'	L = 227.12'
L_s = 150'	R = 286.5'	R = 47.75'	R = 150.79'	R = 130.23'
LT = 171.17'		E = 18.90'	E = 19.84'	
ST = 100.87'				
L_c = 310.91'				
R_1 = 1432.5'				
R_2 = 130.23'				

EAST LINE			
Δ	57°22'11"	θ_s	5°
D	4°	p	1.82'
L_s	250'	k	124.97'
T_s	909.65'	X_c	249.81'
E_s	202.46'	Y_c	7.27'
L_c	1184.2'	L.T.	166.73'
R_c	1432.5'	S.T.	83.39'

WEST LINE			
Δ	57°22'11"	θ_s	4°41'
D	3°45'	p	1.70'
L_s	250'	k	124.97'
T_s	961.88'	X_c	249.83'
E_s	215.67'	Y_c	6.82'
L_c	1280.0'	L.T.	166.73'
R_c	1528.0'	S.T.	83.39'

℄ Between Roadways			
Δ	57°22'11"	θ_s	5°
D	4°	p	1.82'
L_s	250'	k	124.97'
T_s	909.65'	X_c	249.81'
E_s	202.46'	Y_c	7.27'
L_c	1184.2'	L.T.	166.73'
R_c	1432.5'	S.T.	83.39'

P.I. 196+50.50
35°12
P.I. 197+02.64
P.I. 197+53.40

EAST LINE PROFILE

WEST LINE PROFILE

Existing Ground Line

NOTE:
Grades to be constructed as shown for this Project

Build to P.T.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLO.		46	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

Rev. Feb. 25 1953 — Urban Division - (C.D.H.) Bridges

Note: For Location of Steel Sta. Joining Cofferdam see sheet No. 50

Sta. 213+25
End UI002-2(8) Section 2 Second Contract
Begin UI 002-2(17) Unit 3

EAST LINE
Δ 37°01' Rt.
D 3°52'
Ls 400'
Ts 697.47'
Es 85.56'
Lc 557.32'
Rc 1481.8'
Bs 7°44'
P 4.50'
k 199.88'
Xc 399.27'
Yc 17.99'
LT 266.92'
ST 133.57'

EAST LINE
Δ 25°00' Rt.
D 1°56'
Ls 150'
Ts 732.12'
Es 72.29'
Lc 1143.10'
Rc 2963.80'
Bs 1°24'
P 0.32'
k 75'
Xc 149.99'
Yc 1.27'
LT 100.0'
ST 50.0'

WEST LINE
Δ 25°00'
D 1°56'
Ls 150'
Ts 710.16'
Es 69.9'
Lc 1100.0'
Rc 2865.0'
Bs 1°30'
P 0.33'
k 75'
Xc 149.99'
Yc 1.31'
LT 100.0'
ST 50.0'

FIRST WEST LINE
Δ 37°01' Rt.
D 4°08'
Ls 400'
Ts 665.54'
Es 80.68'
Lc 495.56'
Rc 1386.09'
Bs 8°16'
P 4.80'
k 199.86'
Xc 399.16'
Yc 19.20'
LT 266.96'
ST 133.60'

Between Roadways
Δ 37°01' Rt.
D 4°
Ls 400'
Ts 680.96'
Es 525.42'
Lc 1432.5'
Bs 8°
P 4.61'
k 199.87'
Xc 399.22'
Yc 18.59'
LT 266.94'
ST 133.58'

Between Roadways
Δ 25°00' Rt.
D 2°
L 635.1'
R 1250'
E 69.55'

EQUATION
S.T. 223+22.08 Bk =
223+15.97 Ah
S.T. 223+80.87
COLFAX

P.I. 216+35.81
P.I. 216+77.62
P.I. 217+50.85
P.I. 232+33.65
P.I. 232+43.21
P.I. 232+96.23
P.I. 85.70
P.I. 84.15

S.C. 213+36.34
C.S. 218+95.66
S.T. 222+95.60
T.S. 225+01.51
S.C. 226+51.51
C.S. 219+80.87
219+72.18
PC. 226+51.11
T.S. 225+56.09
S.C. 221+36.09
C.S. 237+94.63
S.T. 239+44.63
C.S. 238+36.09
P.T. 238+58.11
S.T. 239+86.09
S.C. 213+85.31
C.S. 213+96.60
T.S. 209+38.34
S.C. 209+96.66

F-16-DQ
F-16-DR
F-16-DN
F-16-DO
F-16-DC
F-16-DM
F-16-EC
F-16-ED

THIRD ST.
MARKET ST.
LAKIMER ST.
VIVIAN ST.
COLFAX
F-15-DO
AVE.
WEST ZUNI ST.
ROBIN PLACE
W. 12th AVE.
EAST SECOND AVE.
WAZEE ST.
Surveyed Line
EAST LINE
WEST LINE
R.R. Service Road
Proposed Spur Track
Known Spur Track

EAST LINE PROFILE

1000 V.C.
Existing Ground Line
3.0%
0.70%
3.60%
93.95
F-16-DN
F-16-DO
F-16-DQ
800' V.C.
F-16-DC
F-16-EC

NOTE:
Grade beyond Sta. 210+ to be determined by Engineer during Construction.

R.R. SERVICE ROAD PROFILE

Existing Ground Line
3.72%
F-16-DR
F-16-DB

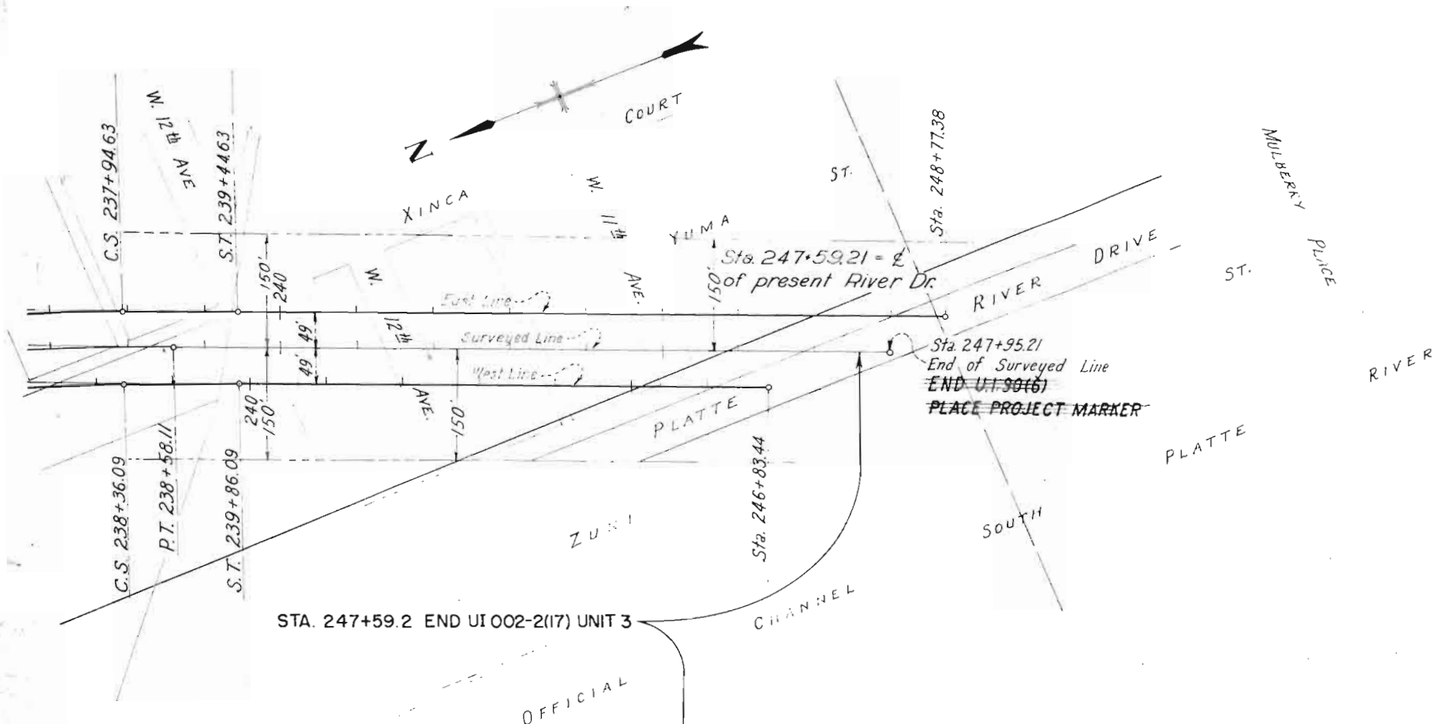
WEST LINE PROFILE

900 V.C.
5.36%
99.27
F-16-DN
F-16-DO
800' V.C.
F-16-DM
F-16-EC

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		47	

W. D. RYAN ENGINEER

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



STA. 247+59.2 END UI 002-2(17) UNIT 3

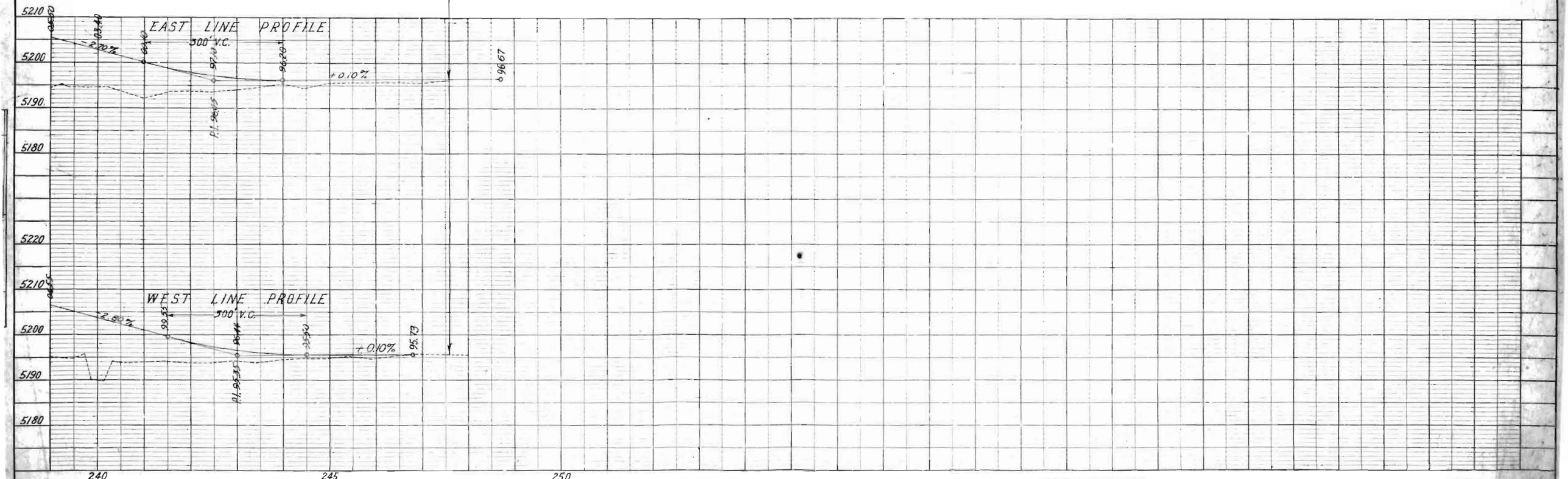


PLATE 1 - PLAN-PROFILE O. P. R. & R. S. STANDARD

FED. ROAD DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		48	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

N

STA. 169+27.5 BEG. UI 002-2(23) UNIT 2

STA. 177+60 END UI 002-2(23) UNIT 2
BEG. UI 002-2(8) SECT. 2 SEC. CONT.

RAMP NE-1

①		
L_s 150'	Δ 37°30'	L_s 150'
θ_s 19°30'	D 2°	θ_s 18°
θ_c 16°30'	D_2 2°	p 3.91
p_s 3.59'	T_s 150.28'	k 74.75'
X_c 148.36'	T_{s_2} 158.07'	X_c 149.23'
Y_c 18.18'	L_c 0	Y_c 15.60'
L.T. 97.02'		L.T. 100.52'
S.T. 54.46		S.T. 50.47'

RAMP SE-1

②	③
Δ 23°00'	Δ 18°59'
D 10°	D 10°
L_s 150'	L_s 150'
T_s 191.86'	T_s 171.02'
E_s 13.40'	E_s 9.59'
L_c 80.00'	L_c 39.83'
R_c 573.00'	R_c 573.00'
θ_s 7°30'	θ_s 7°30'
p 1.64'	p 1.64'
k 74.96'	k 74.96'
X_c 149.74'	X_c 149.74'
Y_c 6.54'	Y_c 6.54'
L.T. 100.09'	L.T. 100.09'
S.T. 50.08'	S.T. 50.08'

RAMP NW-1

④ & ⑤
Δ 8°00
D 8°
L_s 100'
T_s 100.11'
E_s 2.32'
L_c 0
θ_s 4°
p 0.58'
k 49.99'
X_c 99.95'
Y_c 2.33'
LT 66.68'
ST 33.35'

RAMP SW-1

⑥
Δ 13°12'18"
D 8°
L_s 150'
T_s 207.63'
E_s 9.15'
L_c 414.10'
R_c 1146.00'
θ_s 3°45'
p 0.82'
k 74.99'
X_c 149.94'
Y_c 3.27'
L.T. 100.12'
S.T. 50.02'

23rd AVE.

⑦	⑧
Δ 21°54'	Δ 8°10'
D 20°	D 8°
T 55.43'	T 51.13'
E 5.31'	E 4.82'
L 109.36'	L 102.08'
R 286.50'	R 716.25'

EAST LINE HWY

⑨
Δ 28°51'
D 2°
L_s 150'
T_s 812.02'
E_s 93.60'
L_c 1492.50'
R_c 2865.00'
θ_s 1°30'
p 0.33'
k 75.00'
X_c 149.99'
Y_c 1.31'
LT 100'
ST 50'

WEST LINE HWY

⑩
Δ 28°51'
D 1°56'
L_s 150'
T_s 837.43'
E_s 96.80'
L_c 1342.22'
R_c 2963.80'
θ_s 1°27'
p 0.32'
k 75.00'
X_c 149.99'
Y_c 1.26'
L.T. 100'
S.T. 50'

50 0 100 200
SCALE, IN FEET

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

W. 23RD AVE. INTERCHANGE

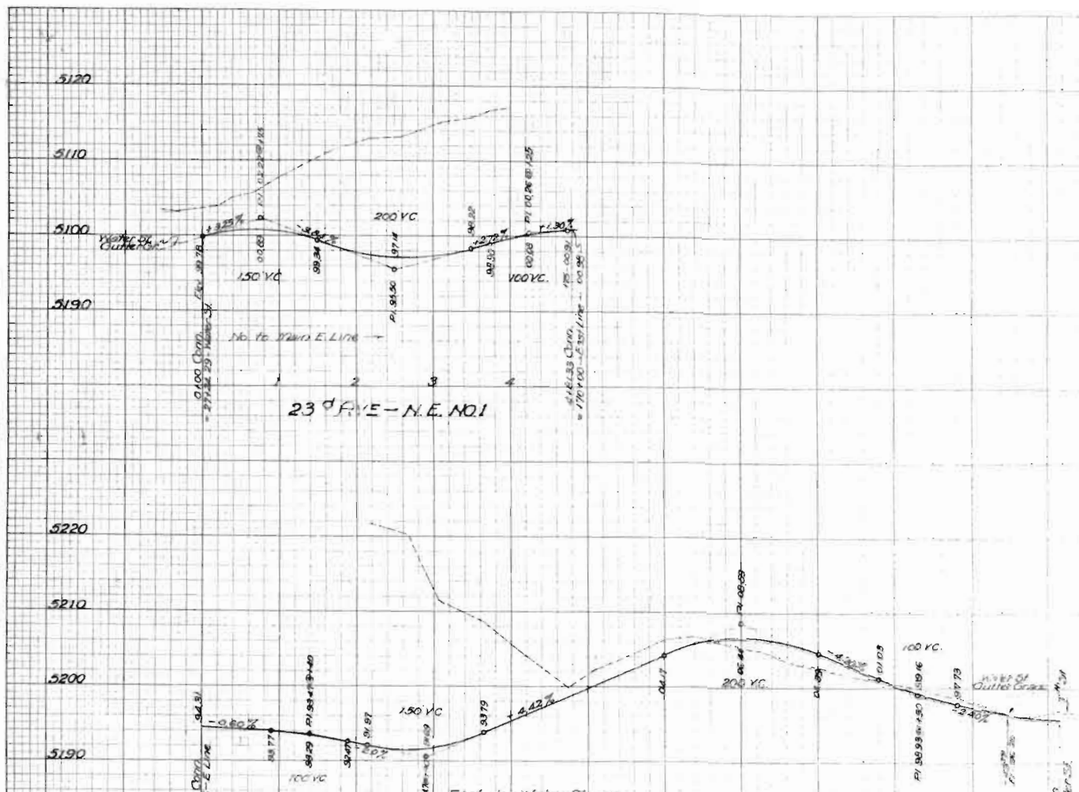
GENERAL PLAN

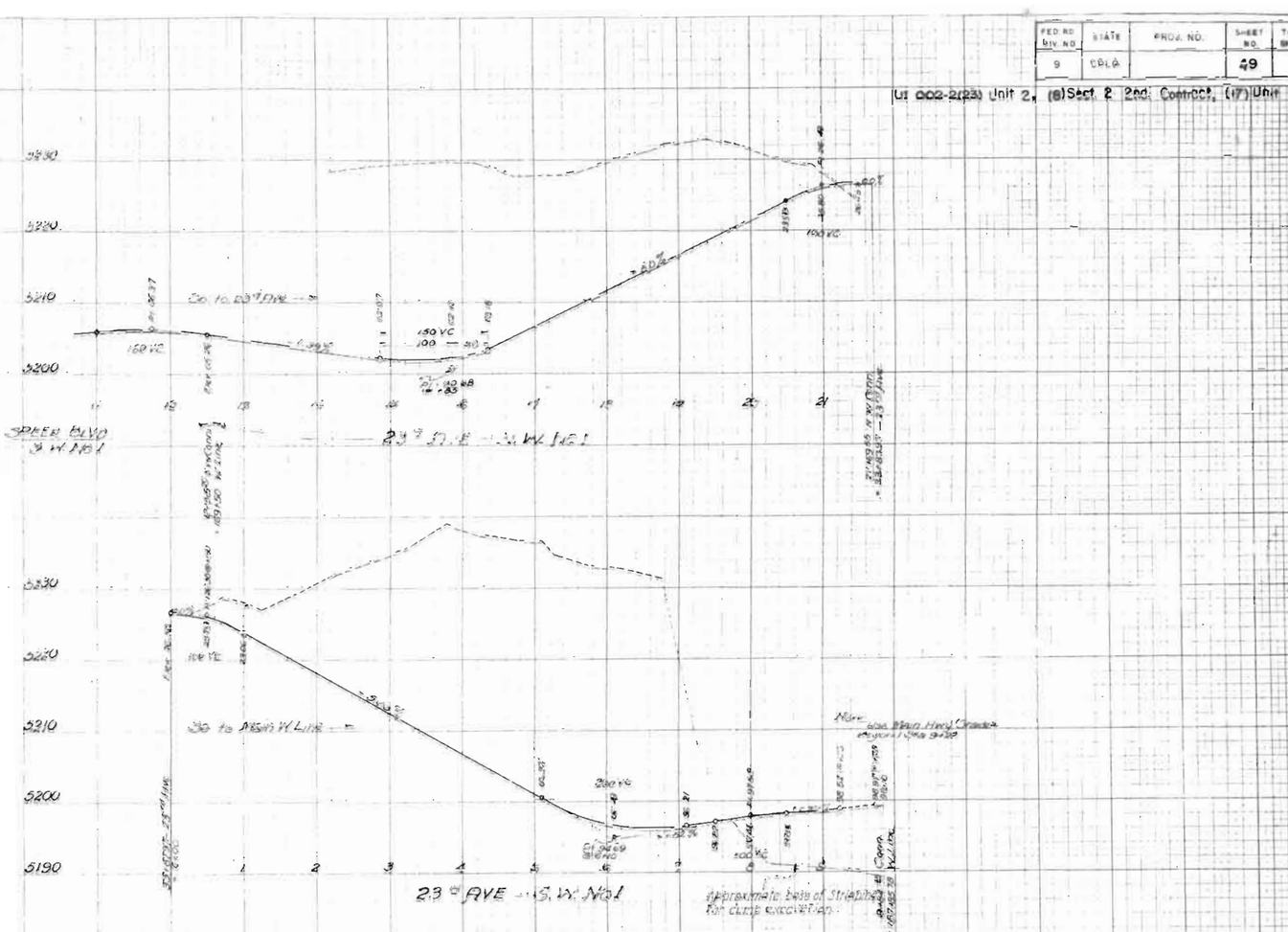
CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

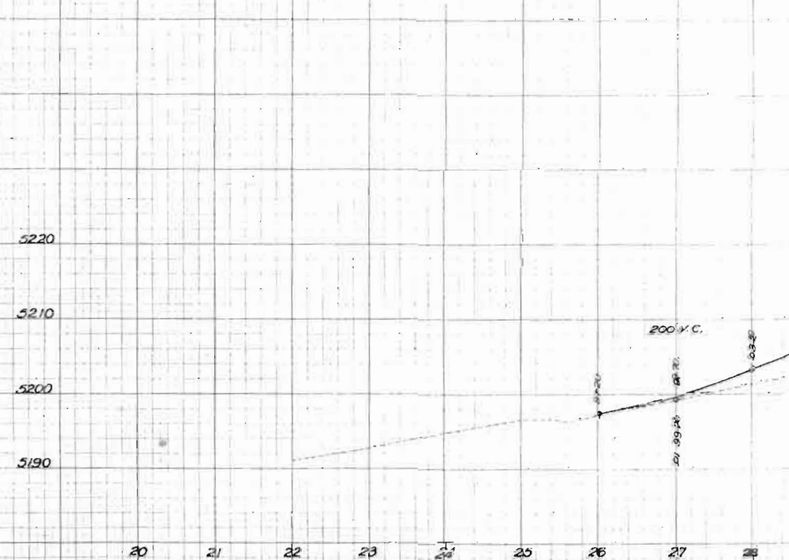
DATE | SHEET 1 OF 2 | DWG. NO.

FED. RD. DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		49	

U-I 002-2(23) Unit 2, (6) Sect. 2 2nd. Contract, (17) Unit 3







W. 23rd Ave. INTERCHANGE

SHEET 2 OF 8

FED. INSTAID DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
V	COLO.		50	

UI 002-2(23) Unit 2, (8) Sect. 2 2nd Contract, (17) Unit 3

Rel: Apr. 21, 1949 - Urban Division (CSHD) - Cofferdam,
Rev. Feb. 24, 1950 - " " " - Alignment,
Rev. Feb. 25, 1953 - " " " (CSHD) - Bridges

ROAD SE-1

①	②	③	④
Δ 3°00'	Δ 25°02'	Δ 32°52'	Δ 89°01'
D_a 15°00'	D_a 15°00'	D_a 20°00'	D_a 24°00'
L_s 150.0	L_s 150	T_s 84.56	T 238.13
T_s 160.13	T_s 136.76	L 164.33	L 374.38
E_s 11.8	E_s 12.59	R 286.70	R 238.75
L_s 16.67	L 23.58		I 88.45
D_a 11°15'	D_a 11°15'		
p 2.45	p 2.45		
k 74.90	k 74.90		
X_s 149.42	X_s 149.42		
Y_s 9.79	Y 11.01		
LT 100.20	LT 101.76		
ST 50.18	ST 51.18		

ROAD SE-2

⑤	⑥	⑦
Δ 89°51'	Δ 32°52'	Δ 167°03'
I 38°00'	D 20°00'	R_s 90°00'
T 51.37	T 84.56	L 1000
P 150.0	L 164.33	I 66°11'
L 236.46	R 286.70	L_s 85.61
		R_s 63.61
		D_a 45°00'
		p 1.71
		k 42.81
		X_s 31.51
		Y 25.04
		T 69.98
		ST 35.48

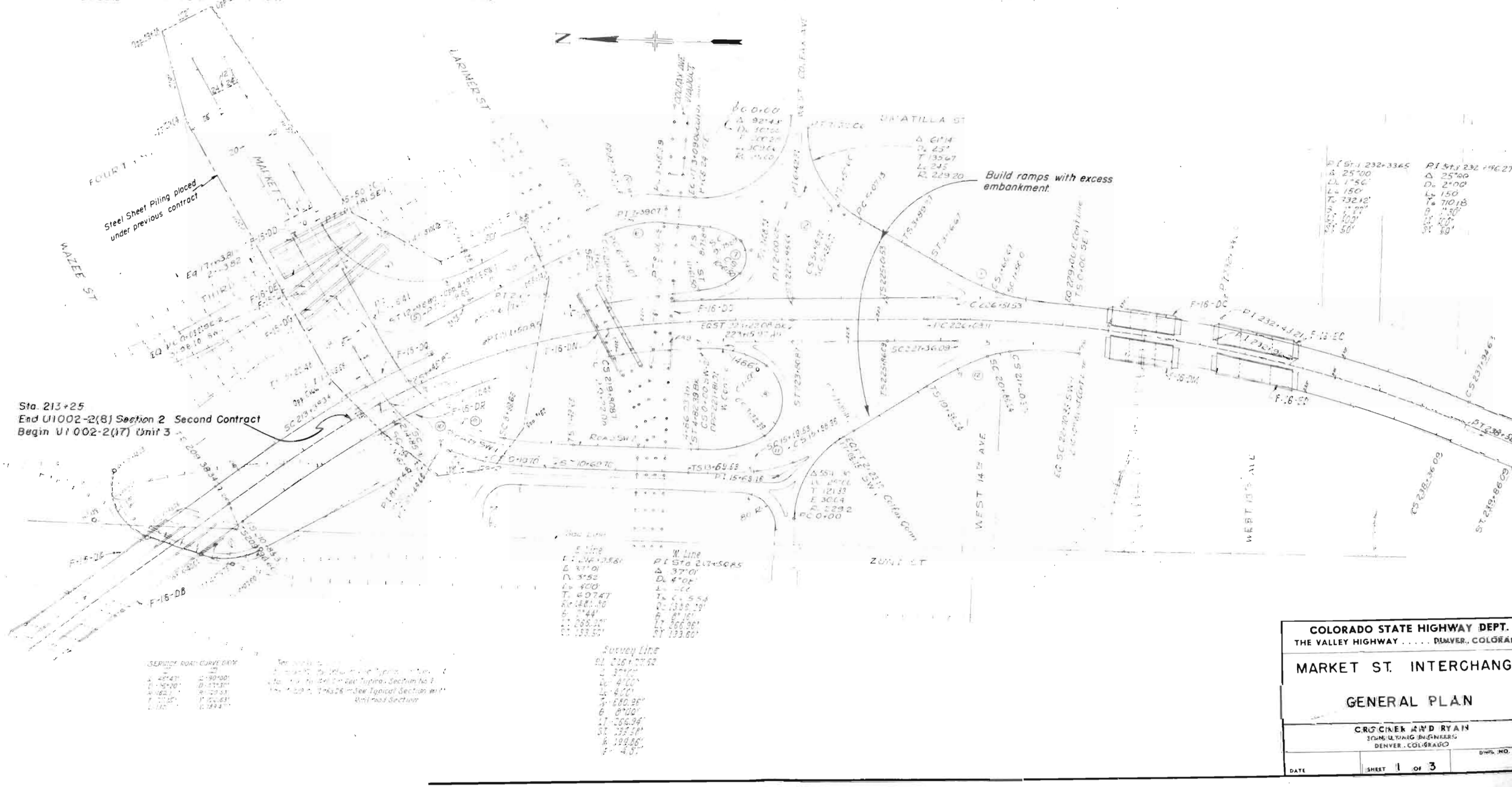
ROAD SW-2

⑧	⑨
L_s 150	Δ 33°35'
θ_s 4°17'16"	D_a 15°00'
θ_s 37°22.30"	E_s 61.31
p 0.03	L_s 156
X_s 149.97	T_s 295.00
Y_s 39.13	L_c 242.22
LT 39.91	θ_s 11°15'
ST 50.15	p 2.45
Δ 16°33'30"	k 74.90
D 4°10'	R 742.90
D_c 4°46'	X_s 149.42
	Y 9.79
	LT 100.20
	ST 50.18

ROAD SW-1

⑩	⑪	⑫
Δ 59°35'	Δ 34°18.30"	L_s 150
V_a 15°00'	D_a 15°00'	θ_s 16°52.15"
L 150	L_s 150	θ_s 33°29.42"
E 44.00	T_s 193.03	D_a 2.84
F 61.31	E_s 21.32	X 148.85
L_c 242.22	L 18.83	Y 16.62
θ_s 11°15'	θ_s 11°15'	LT 95.98
p 2.45	p 2.45	ST 64.93
k 74.90	k 74.90	Δ 38°32'
V_s 149.42	X_s 149.42	D_c 2°00.45
Y_s 9.79	Y_s 9.79	D_a 20°00'
LT 100.20	LT 108.20	
ST 50.18	ST 50.18	

⑫
T_s 177.28
L_s 184.43
L_c 34.03
Q 28.65
L_s 150
D_a 15°00'
p 3.26
k 74.83
Y_s 14.898
θ_s 4.63
T 146.96
ST 50.33



COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY . . . . . DENVER, COLORADO

MARKET ST. INTERCHANGE

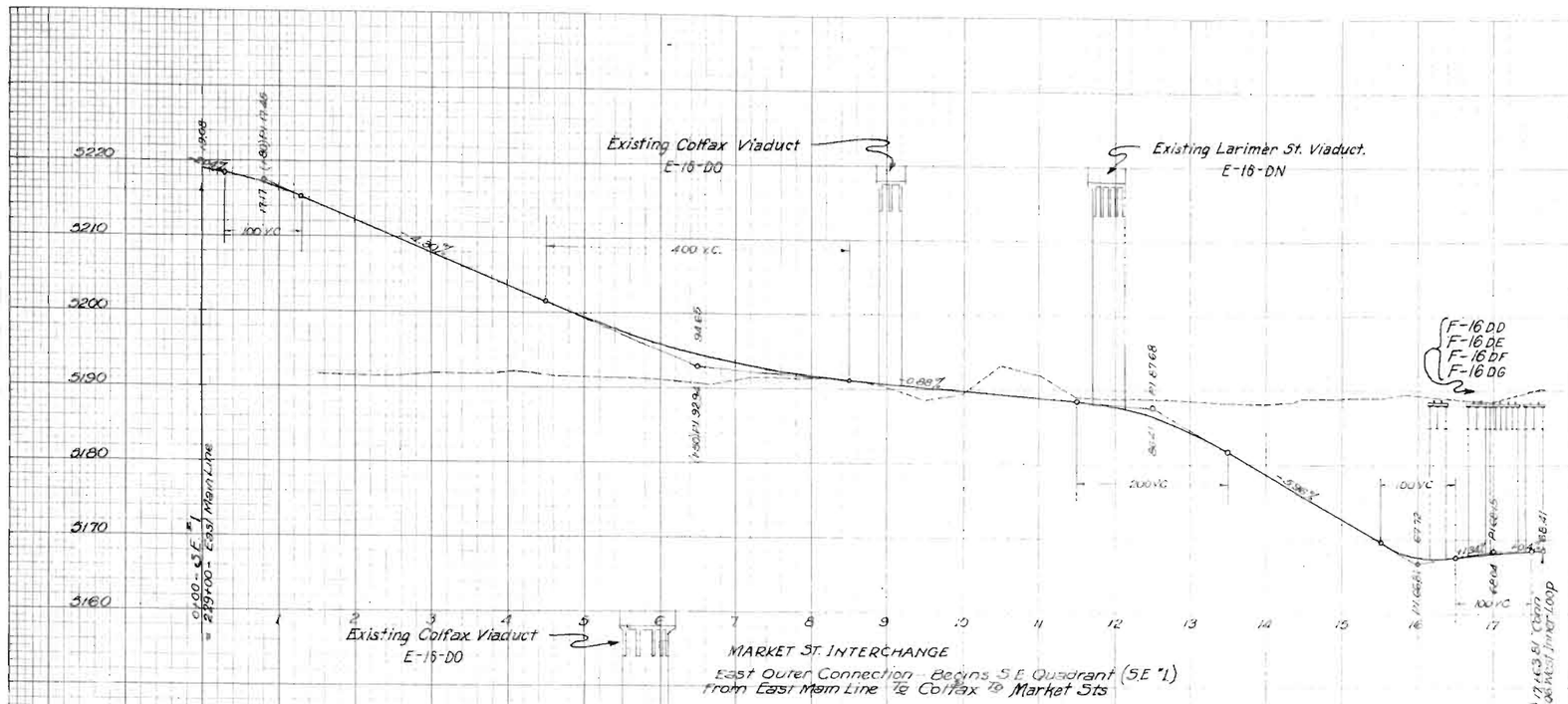
GENERAL PLAN

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE | SHEET 1 OF 3 | DWG. NO.

FED. RD. DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		51	

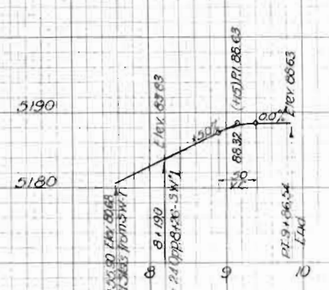
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



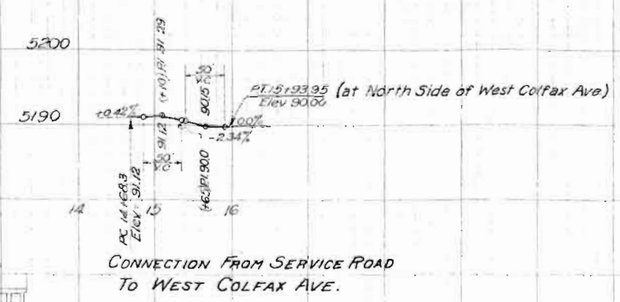
SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	PROJ. NO.	SHEET NO.	TOT. SHE
9	COLO.		52	

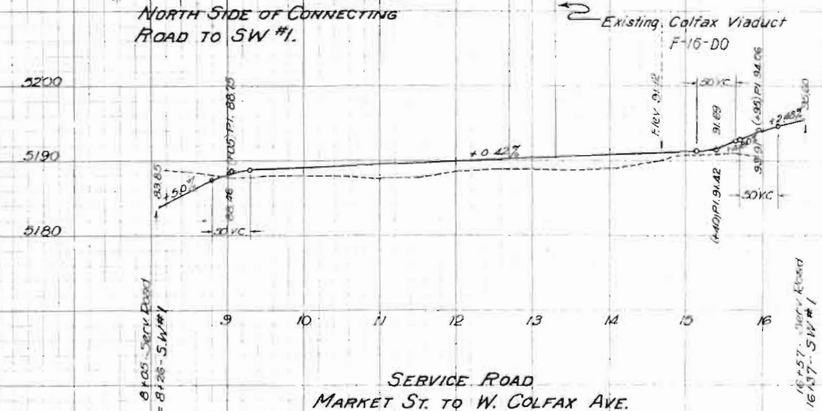
UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3



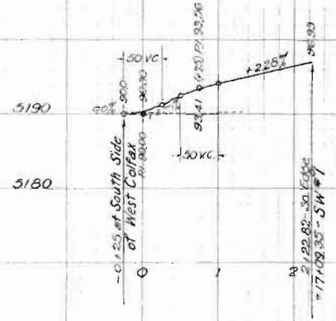
NORTH END OF SERVICE ROAD
NORTH SIDE OF CONNECTING
ROAD TO SW #1.



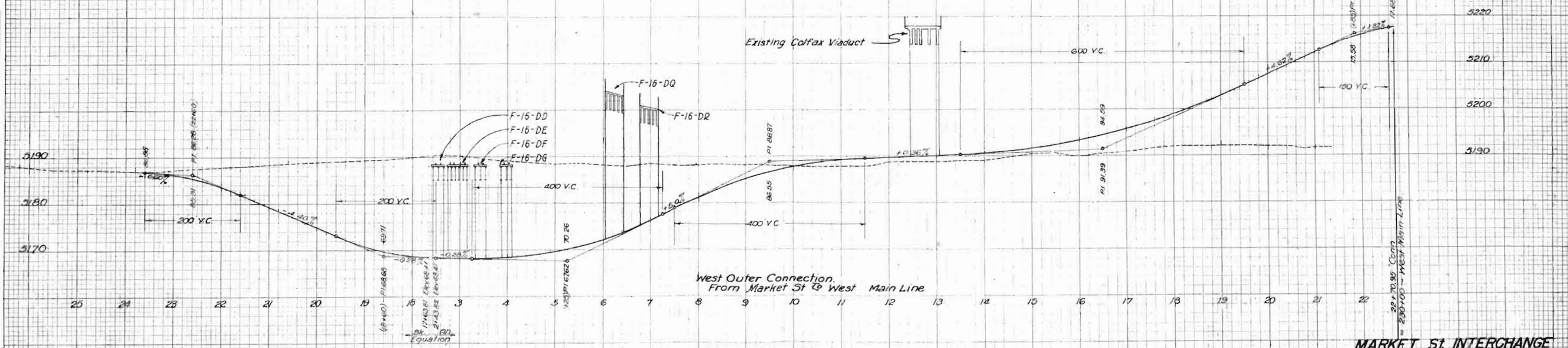
CONNECTION FROM SERVICE ROAD
TO WEST COLFAX AVE.



SERVICE ROAD
MARKET ST. TO W. COLFAX AVE.



CONNECTION FROM
WEST COLFAX AVE. TO S.W. #1



West Outer Connection.
From Market St to West Main Line

MARKET ST. INTERCHANGE

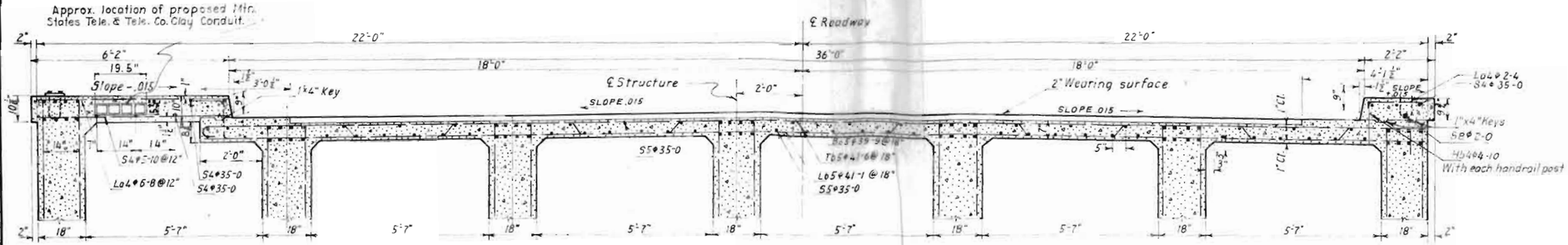
Rev. 3-15-51 JVG. Added. Tele. Co. Clay Conduit

UI 002-2(23) Unit 2, (8) Sect. 2 2nd. Contract, (17) Unit 3

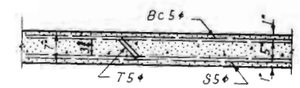
FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.		17	

MARK Top	MARK Bottom
Ba5#4-0	S5#3-5
Ba5#4-8	S5#4-1
Ba5#5-4	S5#4-9
Ba5#6-0	Lb5#7-11
Tc5#6-9	
Ba5#7-4	S5#6-9
Ba5#8-0	Lb5#9-11
Tc5#8-9	
Ba5#10-2	S5#9-7
Ba5#10-10	Lb5#12-9
Tc5#12-5	
Ba5#12-2	S5#11-7
Ba5#12-10	Lb5#14-9
Tc5#14-7	
Ba5#14-2	S5#13-7
Ba5#14-10	Lb5#16-9
Tc5#16-7	
Ba5#17-8	S5#17-1
Ba5#18-4	Lb5#20-3
Tc5#20-3	
Ba5#19-0	S5#18-5
Ba5#19-8	Lb5#21-8
Tc5#22-5	
Ba5#21-0	S5#20-5
Ba5#21-8	Lb5#23-7
Tc5#26-2	
Ba5#24-6	S5#23-11
Ba5#25-2	Lb5#27-1
Tc5#28-2	
Ba5#26-6	S5#25-11
Ba5#27-2	Lb5#29-1
Tc5#30-5	
Ba5#28-6	S5#27-11
Ba5#30-8	Lb5#32-7
Tc5#34-1	
Ba5#32-0	S5#31-5
Ba5#32-8	Lb5#34-7
Tc5#36-1	
Ba5#34-0	S5#33-5
Ba5#34-8	Lb5#36-7
Tc5#38-2	
L5#35-0	S5#34-4
L5#34-4	S5#33-8
TF5#35-0	
L5#33-0	S5#32-4
L5#32-5	S5#31-5
TF5#33-0	
L5#31-1	S5#30-5
L5#30-5	S5#29-9
TF5#29-3	
L5#27-7	S5#26-11
L5#27-0	S5#26-4
TF5#27-4	
L5#25-8	S5#25-0
L5#25-0	S5#24-4
TF5#25-2	
L5#23-8	S5#23-0
L5#21-6	S5#20-10
TF5#21-6	
L5#20-2	S5#19-6
L5#19-6	S5#18-10
TF5#19-4	
L5#18-2	S5#17-6
L5#17-6	S5#16-10
TF5#17-4	
L5#14-8	S5#14-0
L5#14-0	S5#13-4
TF5#13-8	
L5#12-8	S5#12-0
L5#12-0	S5#11-4
TF5#11-6	
L5#10-8	S5#10-0
L5#10-0	S5#9-4

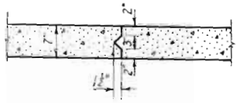
A.R. Ulrich



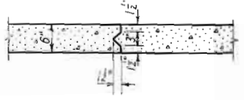
SECTION A-A
Scale 1/2" = 1'-0"



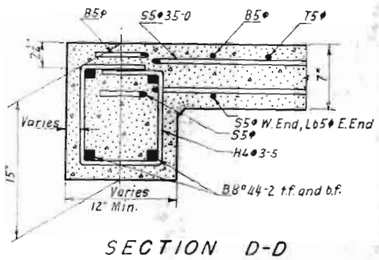
TYPICAL SLAB DETAIL
Scale 3/4" = 1'-0"



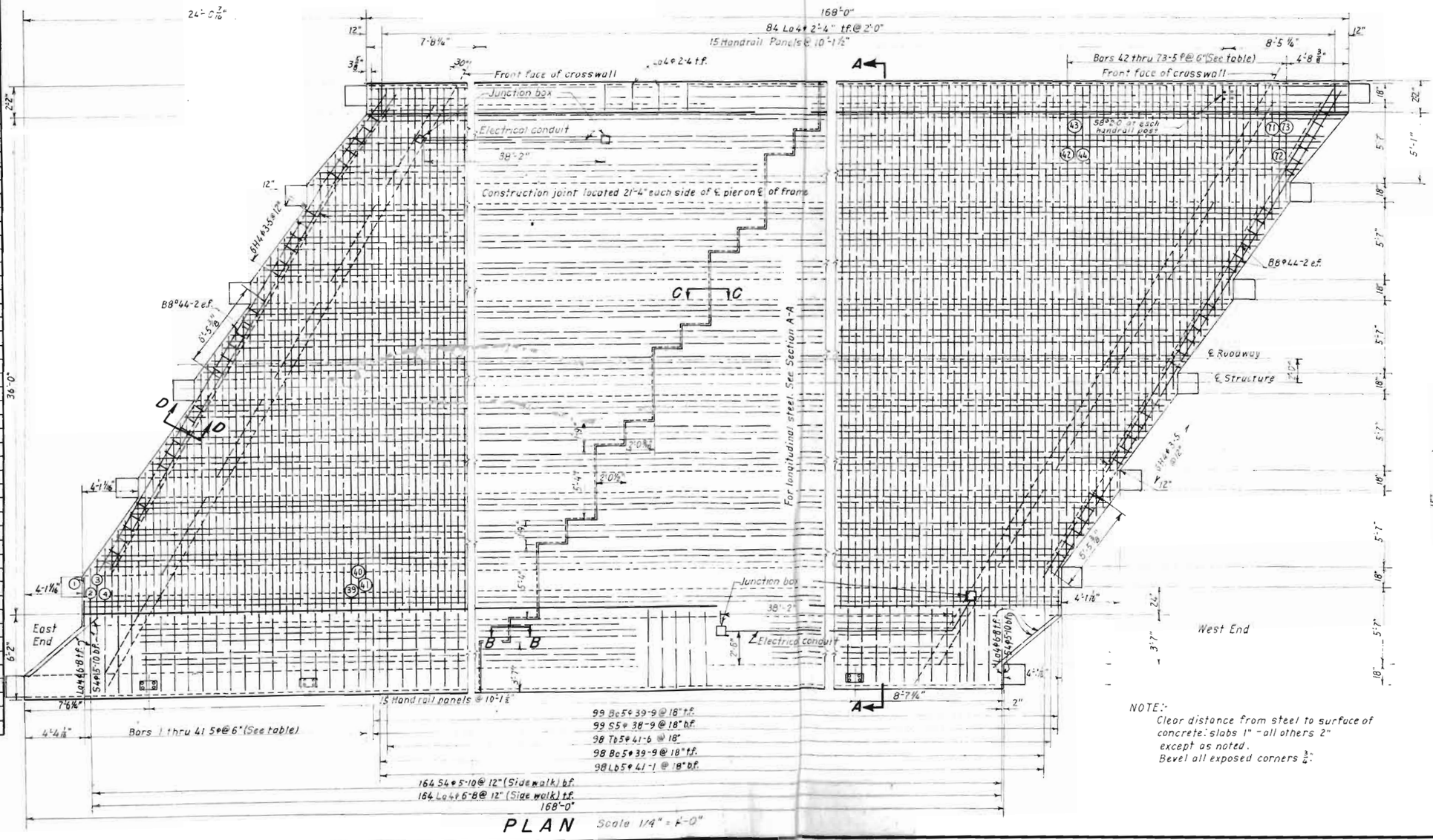
SECTION C-C
Scale 3/4" = 1'-0"



SECTION B-B
Scale 3/4" = 1'-0"



SECTION D-D
Scale 1 1/2" = 1'-0"



PLAN Scale 1/4" = 1'-0"

NOTE:-
Clear distance from steel to surface of concrete: slabs 1" - all others 2" except as noted.
Bevel all exposed corners ¾".

COLORADO STATE HIGHWAY DEPT.
THE VALLEY HIGHWAY ..... DENVER, COLORADO

TWENTY THIRD AVE. UNDERPASS

DECK

STRUCTURE NO. F-16-DA

CROCKER AND RYAN
CONSULTING ENGINEERS
DENVER, COLORADO

DATE | SHEET 5 OF 8 | DWG. NO. -