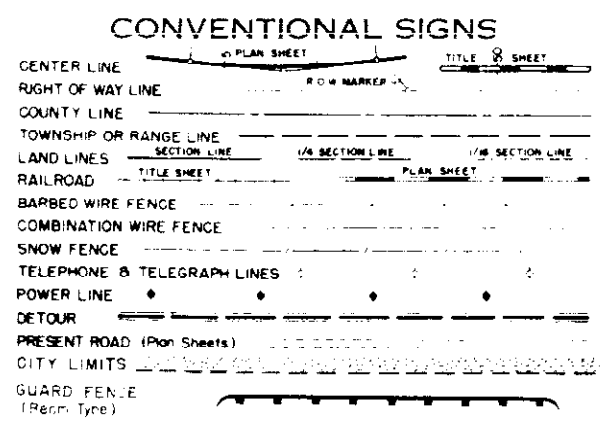


4,300

COLORADO DEPARTMENT OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED COLORADO PROJECT NO. C 04-0038-01 STATE HIGHWAY NO. 38 EL PASO COUNTY



SCALES OF ORIGINAL DRAWINGS
 IN PLAN: 1 IN. = 100 FT.
 IN PROFILE: 1 IN. = 10 FT. HORIZONTAL
 1 IN. = 10 FT. VERTICAL
 GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
 CROSS LENGTH OF PROJECT: 3,309.5 FT. = 0.627 MI.
 NET LENGTH OF PROJECT: 3,309.5 FT. = 0.627 MI.

INDEX OF SHEETS

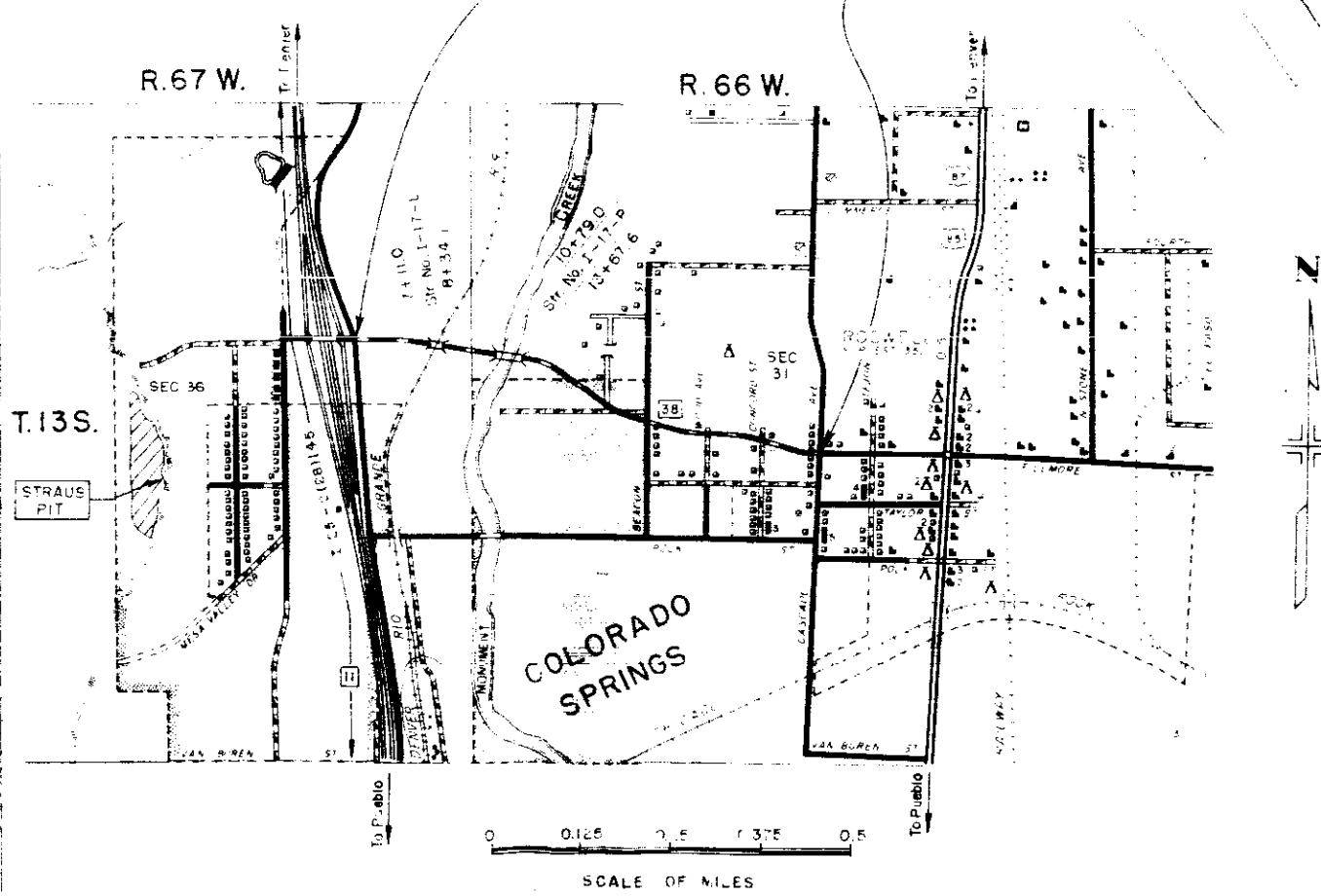
SHEET NO.	DESCRIPTION	REFERENCE
1	SKETCH MAP, TITLE PAGE & TABULATION OF LENGTH & DESIGN DATA	
2	TYPICAL CROSS SECTION & GENERAL NOTES	
3	SUMMARY OF APPROXIMATE QUANTITIES	
4	SURFACING & SUB-BASE MATERIAL PLANS, TABULATION OF METAL PLATE GUARD FENCE, ASPHALTIC SHOULDER ROLL & SUMMARY OF EARTHWORK QUANTITIES	
5	LIST OF STRUCTURE QUANTITIES	
6-10	DETAIL OF BRIDGE, STA. 74	
11-17	DETAIL OF BRIDGE, STA. 104	
18	DETAILS SHOWING PORTIONS OF STRUCTURE TO RECEIVE CLASS "I" SURFACE FINISH	
19	STANDARD METHODS FOR SUPERELEVATION & WIDENING OF CURVES (CROWNED HIGHWAYS)	M-1-D
20	STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT & WIDENING AT BRIDGES AND AT CREST OF GRADES	M-2-EN
21	STANDARD LETTERS & FIGURES FOR YEAR NUMBERS AND STRUCTURE NUMBERS	M-10-D
22	STANDARD NO. 8 CONCRETE INLET, MANHOLE & PIPE JOINTS ON SEWERS	M-12-E-8
23	STANDARD EMBANKMENT PROTECTORS	M-13-C
24	STANDARD METAL PLATE GUARD FENCE (BEAM TYPE)	M-21-C
25-26	STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS	M-29-C
27	STANDARD CURBS AND GUTTERS	M-45-A
28	STANDARD METHODS OF BACKFILL AROUND STRUCTURES	M-60-R
29	STANDARD TYPES OF DITCHES AND CONSTRUCTION METHODS	M-107-D
30	REINFORCED CONCRETE CULVERT PIPE AND CONCRETE SEWER PIPE	
31-33	ALIGNMENT PLAN & PROFILE	M-112-5
33-47	CROSS SECTIONS	
20A	STANDARD MARKER POSTS & BENCH MARKS	M-7-D

Sta. 3+10 Beg. C 04-0038-01 Opposite
Sta. 94+12.3 I 25-2(28)145

Sta. 36+24 End C 04-0038-01

TABULATION OF LENGTH & DESIGN DATA

STATION	DESCRIPTION	ROADWAY Lin. Ft.	BRIDGE Lin. Ft.
3+10	Beg. Proj. C 04-0038-01 Opposite Sta. 94+12.3 I 25-2(28)145	401.0	
7+11.0	Beg. Bridge D & R.G.W. Railroad Str. No. I-17-L		123.1
8+34.1	End Bridge	244.9	
10+79.0	Beg. Bridge Monument Creek Str. No. I-17-P		286.6
13+67.6	End Bridge	74.7	
14+42.3 Bk = 14+46.8 Ah	EQUATION	452.2	
18+99.0	City Limits	513.3	
24+12.3	City Limits	1,211.7	
36+24.0	End Proj. C 04-0038-01		
TOTALS		2,897.8	411.7
SUMMARY			
Total Roadway		2,897.8	0.549
Total Bridges		411.7	0.078
TOTAL Gross & Net		3,309.5	0.627
DESIGN DATA			
Maximum Degree of Curve		6°45'	
Maximum Grade		4.24%	
Minimum N.P.S.D. Horizontal		520'	
Minimum N.P.S.D. Vertical		290'	
Maximum Design Speed		40 MPH	

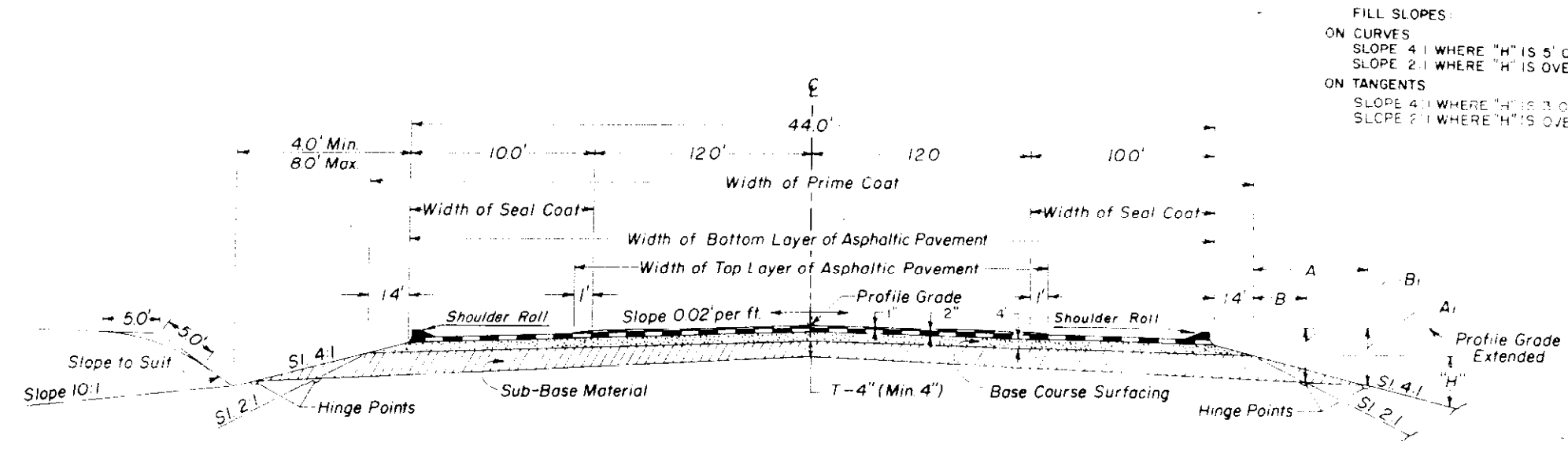


SEE SPECIAL PROVISIONS FOR NOTICE TO BIDDERS

COLORADO
DEPARTMENT OF HIGHWAYS

APPROVED: *Walter E. Johnson* 10-24-60
CHIEF ENGINEER DATE

TYPICAL CROSS SECTION OF IMPROVEMENT



FILL SLOPES:
ON CURVES
SLOPE 4:1 WHERE "H" IS 5' OR LESS
SLOPE 2:1 WHERE "H" IS OVER 5'
ON TANGENTS
SLOPE 4:1 WHERE "H" IS 3' OR LESS
SLOPE 2:1 WHERE "H" IS OVER 3'

EXCAVATION OR BORROW BELOW 4:1 SLOPE AND/OR 10:1 SLOPE WILL NOT BE PERMITTED.

THE DEPTH AND WIDTH OF THE SIDE DITCH SHALL BE VARIED WHERE NECESSARY IN ORDER TO PROVIDE PROPER DRAINAGE AND/OR ENTRANCE TO DRAINAGE STRUCTURES.

MATERIAL ABOVE THE SUBGRADE IS TO BE CONSTRUCTED OF SUB-BASE MATERIAL AT LOCATIONS DESIGNATED IN SUB-BASE MATERIAL TABULATION. ESTIMATED QUANTITIES INVOLVED IN THIS OPERATION AND THICKNESS OF MATERIAL REQUIRED ARE TABULATED IN THE SUB-BASE MATERIAL PLAN

THICKNESS OF SUB-BASE, SURFACING & ASPHALTIC PAVEMENT MATERIALS AS SHOWN ON PLANS IS APPROXIMATE ONLY. THESE MATERIALS ARE TO BE PLACED ON THE BASIS OF TONNAGES SHOWN ON PLANS

GENERAL NOTES

THIS PROJECT IS TO BE CONSTRUCTED IN CONFORMITY WITH THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS, ADOPTED JANUARY 1, 1958

ALL QUANTITIES ON PRELIMINARY PLANS ARE TO BE CONSIDERED APPROXIMATE ONLY

ALL POLES AND UTILITIES ENCRDACHING ON CONSTRUCTION ARE TO BE MOVED OR ADJUSTED BY THE OWNERS.

FOR PRELIMINARY PLAN QUANTITIES OF ASPHALTIC ROAD MATERIALS AND STONE SCREENINGS, THE FOLLOWING RATES OF APPLICATION WERE USED:

PRIME COAT MC	0.40 GALS PER SQ YD
ASPHALTIC PAVEMENT	110.0 lbs. / Sq. Yd. / In
SEAL COAT RC	0.23 GALS PER SQ YD
STONE SCREENINGS TYPE I	25 LBS PER SQ YD

RATE OF APPLICATION AND GRADE OF ASPHALTIC MATERIAL SHALL BE AS DETERMINED BY THE ENGINEER AT TIME OF APPLICATION.

APPLICATION METHODS, FOR LIQUID ASPHALTIC ROAD MATERIAL, WHICH RESULT IN THE DISCOLORATION OF CONCRETE PAVEMENT, CURBS OR GUTTERS WILL NOT BE PERMITTED.

WHEN ORDERED BY THE ENGINEER, TACK COAT WILL BE APPLIED BETWEEN PAVEMENT COURSES TO IMPROVE BOND. ASPHALT WILL BE PLACED AT THE APPROXIMATE RATE OF 0.07 TO 0.10 GALS/SQ. YD. IF REQUIRED.

THE FORCE ACCOUNT ITEM 'CLEARING OF BUILDING SITES, INCLUDING REMOVAL OF FOUNDATION AND APPURTENANCES,' SHALL INCLUDE REMOVAL OF ALL FOUNDATIONS, WELLS, OUTHOUSES AND OTHER APPURTENANCES NOT REMOVED BY THE OWNER, AND ANY NECESSARY BACKFILLING OF OF CELLARS, CESS POOLS, WELLS, ETC., TO PROVIDE NEAT ROAD-SIDE CONDITIONS. IT IS ESTIMATED THAT THIS ITEM APPLIES AT THE FOLLOWING LOCATIONS: Sta. 21+ , 23+ , 26+ & 32+ to 36+.

HINGE POINTS FOR SUB-BASE

DESIGN THICKNESS	T-4	SLOPE				TON/STA
		4:1	2:1	2:1	2:1	
16"	12'	7.0	-2.8	3.2	-2.6	454

Based on 4:1 Slope

APPROXIMATE 7" COMPACTED THICKNESS OF GRAVEL OR CRUSHED ROCK SURFACING SHALL BE PLACED IN SEPARATE COURSES AT THE FOLLOWING RATES PER 100 LIN. FT. OF ROADWAY:

ASPHALTIC PAVEMENT	TOP LAYER	16 TONS
	BOTTOM LAYER	54 TONS
BASE COURSE		100 TONS

NOTE

BOTTOM LAYER OF BITUMINOUS SURFACING SHALL BE COMPLETED FOR FULL WIDTH BEFORE TOP LAYER OF BITUMINOUS SURFACING IS PLACED. PAVING JOINTS IN TOP LAYER WILL OVERLAP MIN. 1 FT. OVER JOINTS IN BOTTOM LAYER

SUMMARY OF APPROXIMATE QUANTITIES

ITEM No.	ITEM	UNIT	STATE		CITY & COUNTY ROADWAY	PROJECT TOTALS
			ROADWAY	Bridge Sta. 7+	Bridge Sta. 10+	
10	Clearing and Grubbing Entire Project	Lump Sum	→			→
11	Removing Concrete Curb & Gutter	Lin. Ft.				35
11	Reset Mail Boxes	Lump Sum				→
12	Removing Fence	Lin. Ft.	1,000			1,300
12	Removing and Rebuilding Guard Fence	Lin. Ft.	100			100
13	Unclassified Excavation	Cu. Yd.	134,300	2,500		153,000
13	Unclassified Ditch Excavation	Cu. Yd.				10
14	Unclassified Structural Excavation - Miscellaneous	Cu. Yd.	20			70
14	Unclassified Structural Excavation - Bridges	Cu. Yd.		30	140	170
16	Structure Backfill (Class I)	Cu. Yd.			90	140
17	Compaction (Standard)	Cu. Yd.	140,500			162,000
17	Wetting	M. Gal.	5,680			6,720
18	Station Yard Overhaul	Sta. Yd.	1,472,700			1,545,000
18	Yard Mile Overhaul	Yd. Mi.	49,200			52,800
23	Sub-base Material (Class 2)	Ton	4,620			14,500
26	Gravel or Crushed Rock Surfacing (Grading C)	Ton	1,070			3,240
29	Asphalt (85-100 Penetration) (Tack Coat)	Ton	2			3
30	Asphaltic Road Material MC (Prime)	Gal.	2,000			7,100
30	Asphaltic Road Material RC	Gal.	500			1,600
31	Stone Screenings (Type I)	Ton	30			90
32	Plant Mixed Asphaltic Surfacing	Ton	650			2,150
32	Plant Mixed Asphaltic Shoulder Roll	Ton	20			30
42	Treated Bridge Timber	M Ft. bm.		0.4	0.3	0.7
46	Class "A" Concrete	Cu. Yd.	2	150	450	603
47	Reinforcing Steel	Lb.		33,700	81,700	115,400
48	Structural Steel	Lb.		70,600	217,700	288,300
52	18" Reinforced Concrete Culvert Pipe (Class II)	Lin. Ft.				96
52	36" Reinforced Concrete Culvert Pipe (Class III)	Lin. Ft.				100
53	12" Corrugated Metal Culvert Pipe	Lin. Ft.	268			296
61	Steel Piling (10 BP 42)	Lin. Ft.		368		368
61	Steel Piling (12 BP 53)	Lin. Ft.		470	516	986
65	Concrete Slope and Ditch Paving (Wire Mesh)	Cu. Yd.		185		185
65	Concrete Slope and Ditch Paving	Cu. Yd.	25			25
67	Riprap	Cu. Yd.			850	850
75	Metal Plate Guard Fence (Beam Type)	Lin. Ft.	1,700	50		2,700
75	Metal Plate Guard Rail (Beam Type)	Lin. Ft.		238	570	808
80	Sheet Copper	Lb.		4	4	8
84	Concrete Gutter (4 Foot)	Lin. Ft.				30
89	Drain Pipe (4" x 2'-0")	Each		24		24
93	Metal Embankment Protectors (Type 3)	Each	5			7
132	Manholes	Each	1			1
160	Drilled Caissons (36" dia.)	Lin. Ft.			108	108
	FORCE ACCOUNT	Lump Sum	→			→
	Clearing of Building Sites, etc.	Lump Sum	→			→
	Installing Guard Rail under R.R. Overpass, & Remove and Restore Signal & Communication Line. (by D. & R. G.W.R.R. Forces).	Lump Sum	→			→
	STATE FORCES	Lump Sum	→			→
	Signing and Striping Entire Project	Lump Sum	→			→
	RIGHT OF WAY	Lump Sum	→			→
	Construction Easement	Lump Sum	→			→

SURFACING PLAN

	STATION	SOURCE	TONS USED	
			Plant Mixed	Base Course
State	3 + 10 ~ 7 + 11.0	Undesignated	281	401
	8 + 34.1 ~ 10 + 79.0		173	245
	13 + 67.6 ~ 14 + 42.38k		53	75
	14 + 46.8Ah ~ 16 + 50 From List of Structures		143	204 138
City	16 + 50 ~ 24 + 12.3		534	763
	From List of Structures		10	17
County	From List of Structures	1	96	170
	24 + 12.3 ~ 36 + 24.0		849	1,212
TOTALS (State)			650	1,063
TOTALS (City)			544	780
TOTALS (County)			945	1,382

SUB-BASE PLAN

	STATION	SOURCE	THICK- NESS	TONS USED Sub- Base
State	3 + 10 7 + 11.0	Undesignated	16"	1,821
	8 + 34.1 10 + 79.0			1,112
	13 + 67.6 14 + 42.38k			339
	14 + 46.8Ah 16 + 50			923
	Estimate for Irregularities			420
City	16 + 50 24 + 12.3			3,461
	Estimate for Irregularities			347
County	24 + 12.3 36 + 24.0			5,502
	Estimate for Irregularities			551
TOTAL (State)				4,615
TOTAL (City)				3,808
TOTAL (County)				6,053

⊕ Approximate Thickness Based on Curve "D"

SUMMARY OF EARTHWORK QUANTITIES

	State	City	County	Project Totals
EXCAVATION				
From Cross Sections	-	2,292	7,678	9,970
Borrow	121,692	-	3,776	125,468
Estimate for Subsidence	12,170	230	1,147	13,545
List of Structures as Excavation	-	-	965	965
List of Structures as Embankment	-	30	-	30
Estimate for Cut Slope Treatment	-	10	10	20
TOTALS Cu Yds	133,862	2,562	13,574	149,998
EXCAVATION				
From Cross Sections	-	2,292	7,678	9,970
Borrow	121,692	-	3,776	125,468
TOTALS Cu Yds	121,692	2,292	11,454	135,438
EMBANKMENT x Factor				
Cu Yds	121,692	1,259	12,487	135,438
EMBANKMENT				
From Cross Sections	105,819	1,095	10,859	117,773
STATION YARD OVERHAUL				
From Mass Diagram	1,338,612	230	65,354	1,404,226
Estimate for Subsidence	133,861	23	6,538	140,422
TOTALS Sta Yds	1,472,473	253	71,922	1,544,648
YARD WIDE OVERHAUL				
From Mass Diagram	44,643	-	3,265	47,908
Estimate for Subsidence	4,464	-	327	4,791
TOTALS Yd Mi	49,107	-	3,592	52,699
UNCLASSIFIED DITCH EXCAVATION				
Intercepting Ditches				
STATION SIDE				
0 0			0	
Sub-Total			0	
From List of Structures			5	
TOTAL Cu Yds			5	5
COMPACTION				
Total unclassified Excavation	133,862	2,562	13,574	149,998
Base of Cuts & Fills	5,616	1,694	3,591	11,201
TOTALS Cu Yds	139,678	4,256	17,165	161,099

ASPHALTIC SHOULDER ROLL

	STATION	SIDE	LIN. FT. ★
State	3 + 20 ~ 5 + 00	Lt. & Rt.	360
	5 + 00 ~ 6 + 00	Rt.	100
	6 + 00 ~ 7 + 11	Lt. & Rt.	122
	8 + 34 ~ 10 + 79.0	Lt. & Rt.	488
	13 + 67.6 ~ 14 + 00	Lt. & Rt.	64
	14 + 00 ~ 16 + 25	Rt.	221
County	32 + 00 ~ 35 + 25	Lt. & Rt.	650
TOTAL (State)			1,355
TOTAL (County)			650

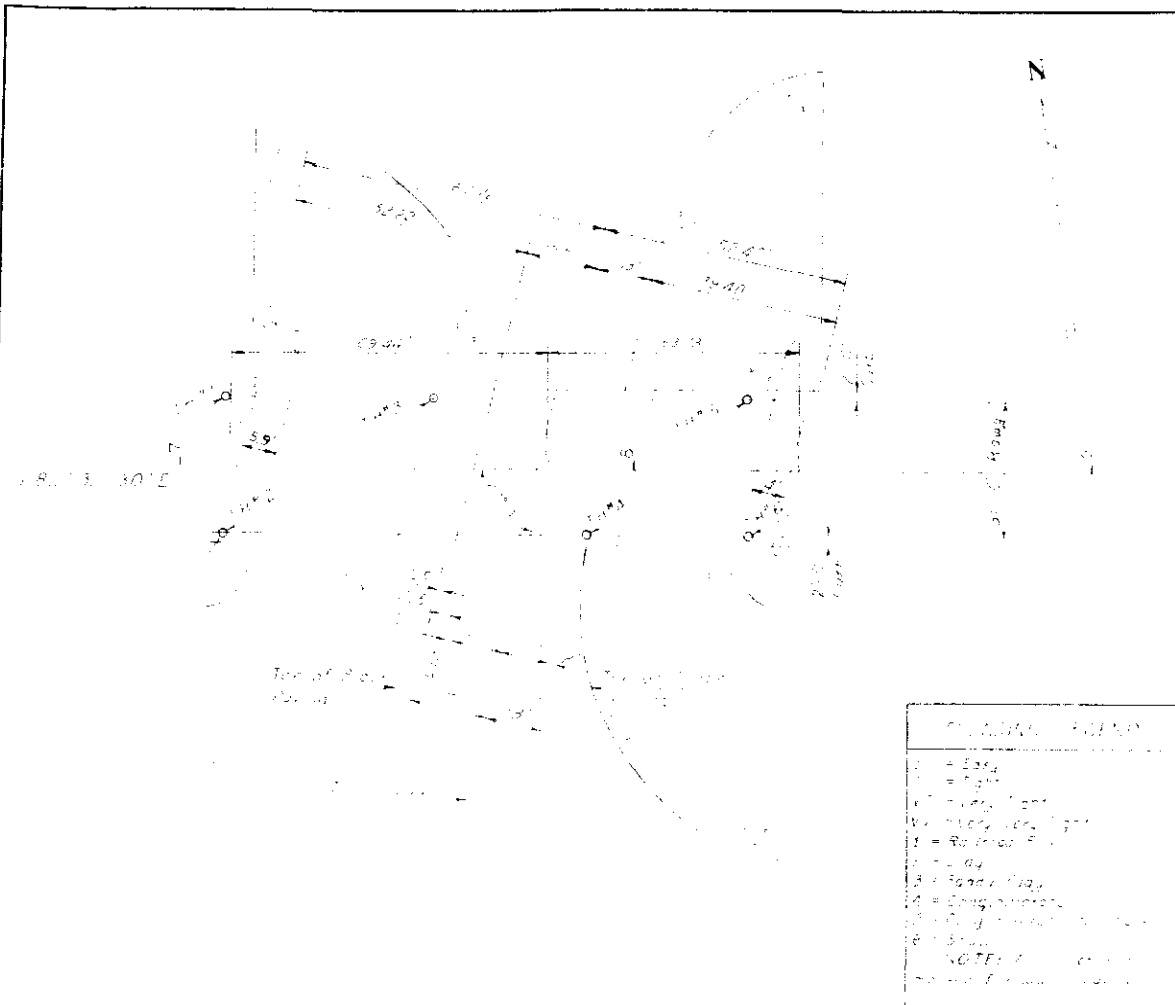
★ State: 1,355 Lin. Ft. = 20 Tons
County: 650 Lin. Ft. = 10 Tons

METAL PLATE GUARD FENCE

	STATION	SIDE	Rebuilt Guard Fence Lin. Ft.	Metal Plate Guard Fence Lin. Ft.
State	3 + 10 ~ 3 + 48.5	Lt. & Rt.	100	
	3 + 48.5 ~ 6 + 98.5	Lt. & Rt.		700
	8 + 46.6 ~ 10 + 66.6	Lt. & Rt.		450
	13 + 80 ~ 16 + 50	Lt. & Rt.		550
County	31 + 50 ~ 36 + 00	Lt. & Rt.		900
TOTALS (State)				1,700
TOTALS (County)				900

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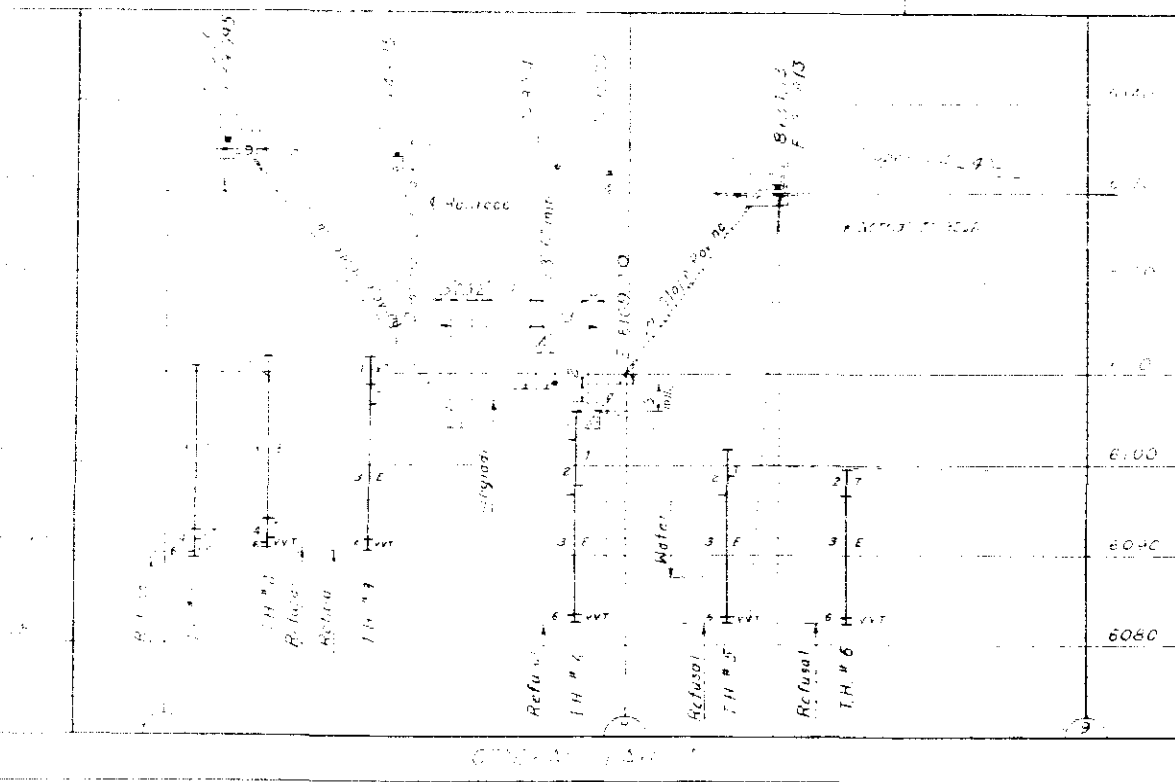
Class II Class III



ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Deck	Sq. Yd.	127.7	1.50	191.55
2	Pier	Sq. Yd.	6.7	1.50	10.05
3	Abutment	Sq. Yd.	134.4	1.50	201.60
4	Bridge Centerline	Sq. Yd.	134.4	1.50	201.60
5	Roadway Centerline	Sq. Yd.	134.4	1.50	201.60
6	Right of Way	Sq. Yd.	134.4	1.50	201.60
7	Left of Way	Sq. Yd.	134.4	1.50	201.60
8	Bridge Approach	Sq. Yd.	134.4	1.50	201.60
9	Bridge Foundation	Sq. Yd.	134.4	1.50	201.60
10	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
11	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60
12	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
13	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60
14	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
15	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60

3. In case of bridge, the bridge shall be constructed in accordance with the design of the bridge engineer and the design of the bridge engineer shall be approved by the bridge engineer.

4. In case of bridge, the bridge shall be constructed in accordance with the design of the bridge engineer and the design of the bridge engineer shall be approved by the bridge engineer.



ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
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10	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
11	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60
12	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
13	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60
14	Bridge Pier Foundation	Sq. Yd.	134.4	1.50	201.60
15	Bridge Abutment Foundation	Sq. Yd.	134.4	1.50	201.60

GENERAL NOTES

1. The bridge shall be constructed in accordance with the design of the bridge engineer and the design of the bridge engineer shall be approved by the bridge engineer.

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LOADING DATA

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COLORADO
DEPARTMENT OF HIGHWAYS

BRIDGE ENGINEER

DESIGNED BY

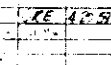
MADE BY

CHECKED BY

DATE

DEPT OF HIGHWAY
B K 117
33

SNW	48.7
RE	42.5



100



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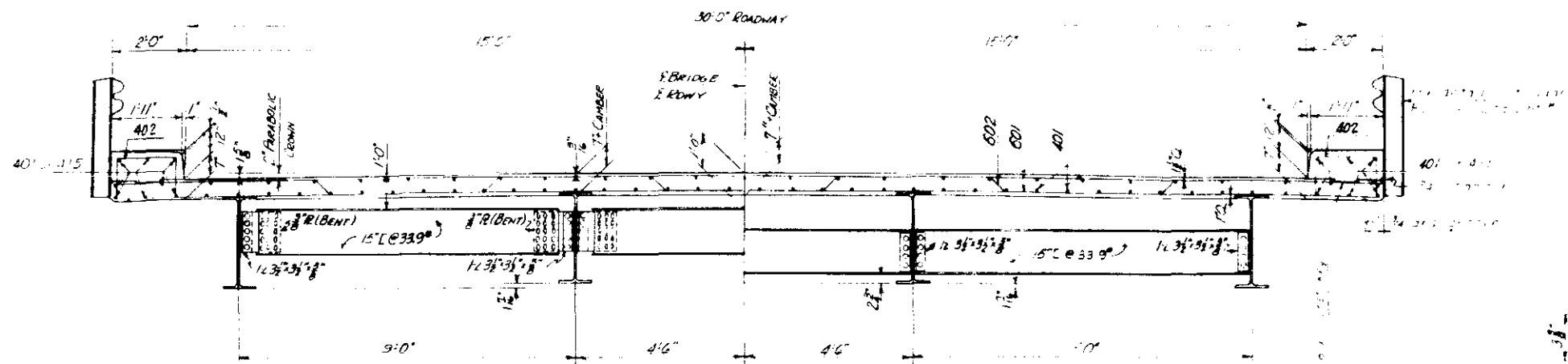


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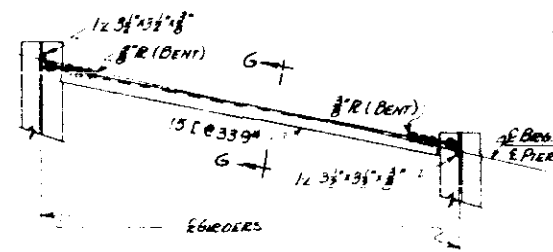
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Notes: 1. This drawing is for a bridge over a creek. 2. The bridge is to be constructed of steel. 3. The bridge is to be constructed of steel. 4. The bridge is to be constructed of steel.



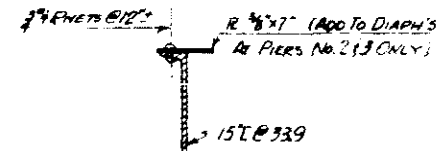
THIS HALF SHOWING END DIAPHRAGMS MARK D1

THIS HALF SHOWING INTERIOR DIAPHRAGMS MARK D2

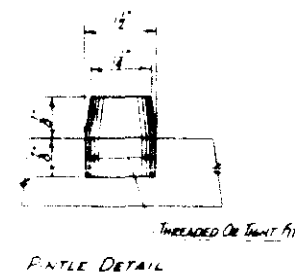


SECTION BB

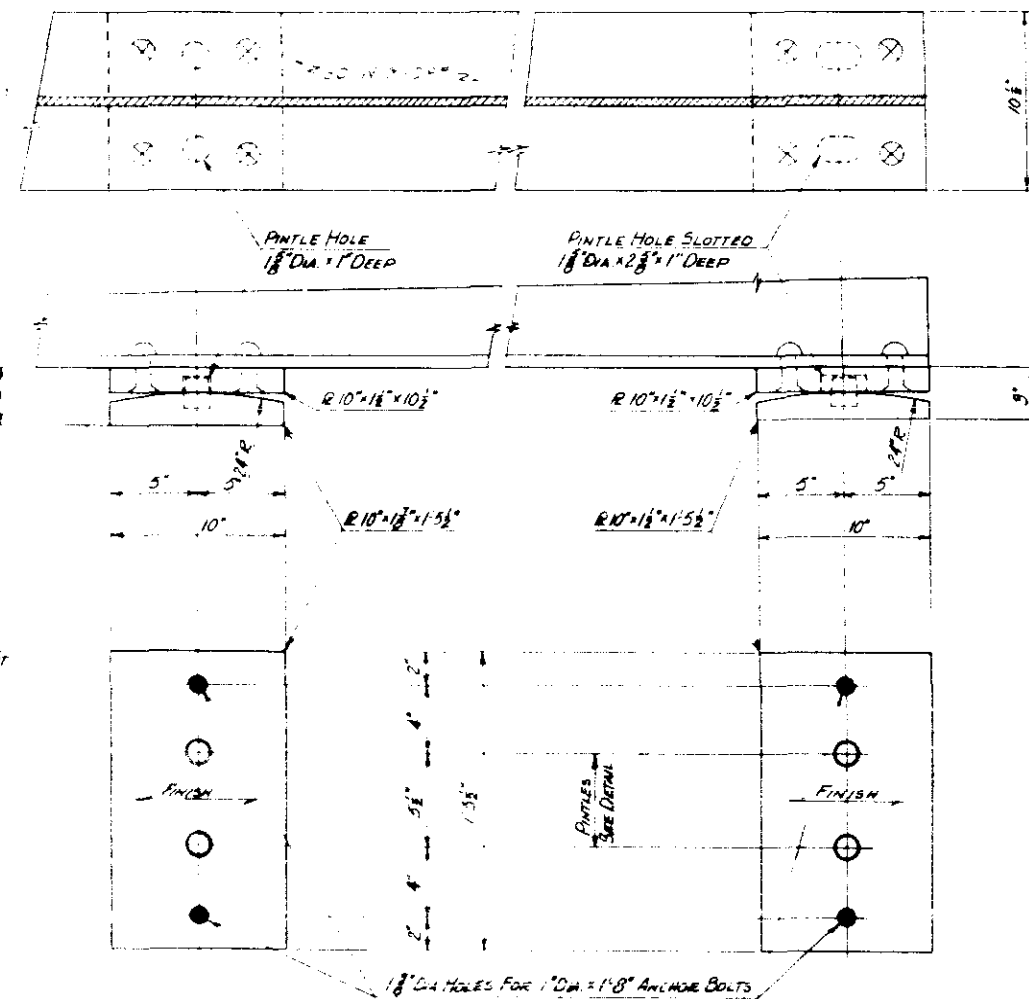
PLAN DIAPHRAGM MARK D1
ADD R 1/2" x 1/2" AS SHOWN SEC 66 FOR DIAPHS
AT PIER NO 2 & 3 ONLY.



SECTION G-G



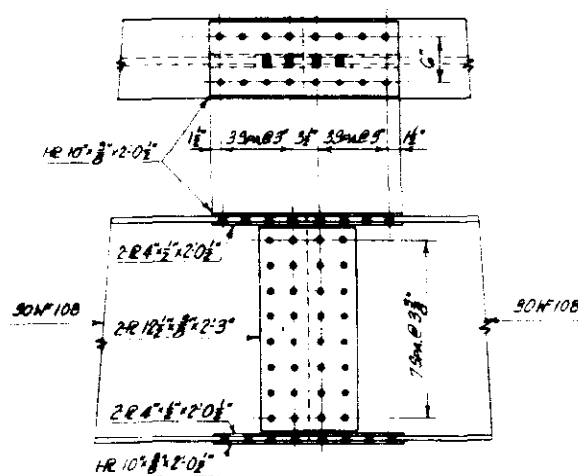
PINTLE DETAIL



FIXED BEARING
AT PIERS NO 2 & NO 3
8 REQD

EXPANSION BEARING
AT ABUTS. NO 1 & NO 4
8 REQD.

BEARING DETAILS



SPLICE DETAIL

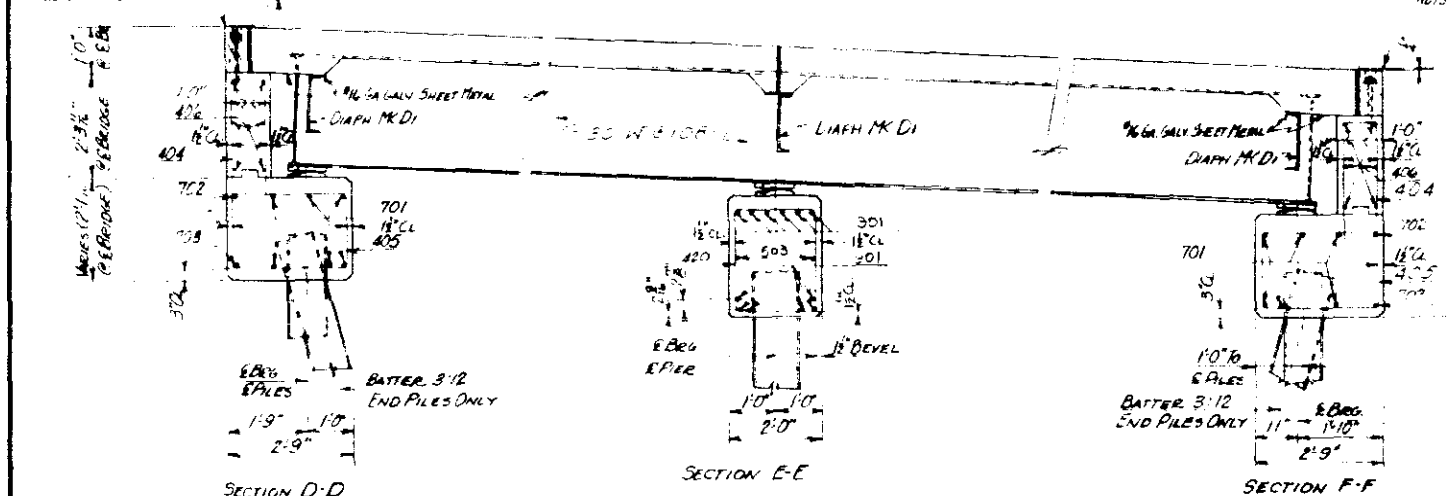
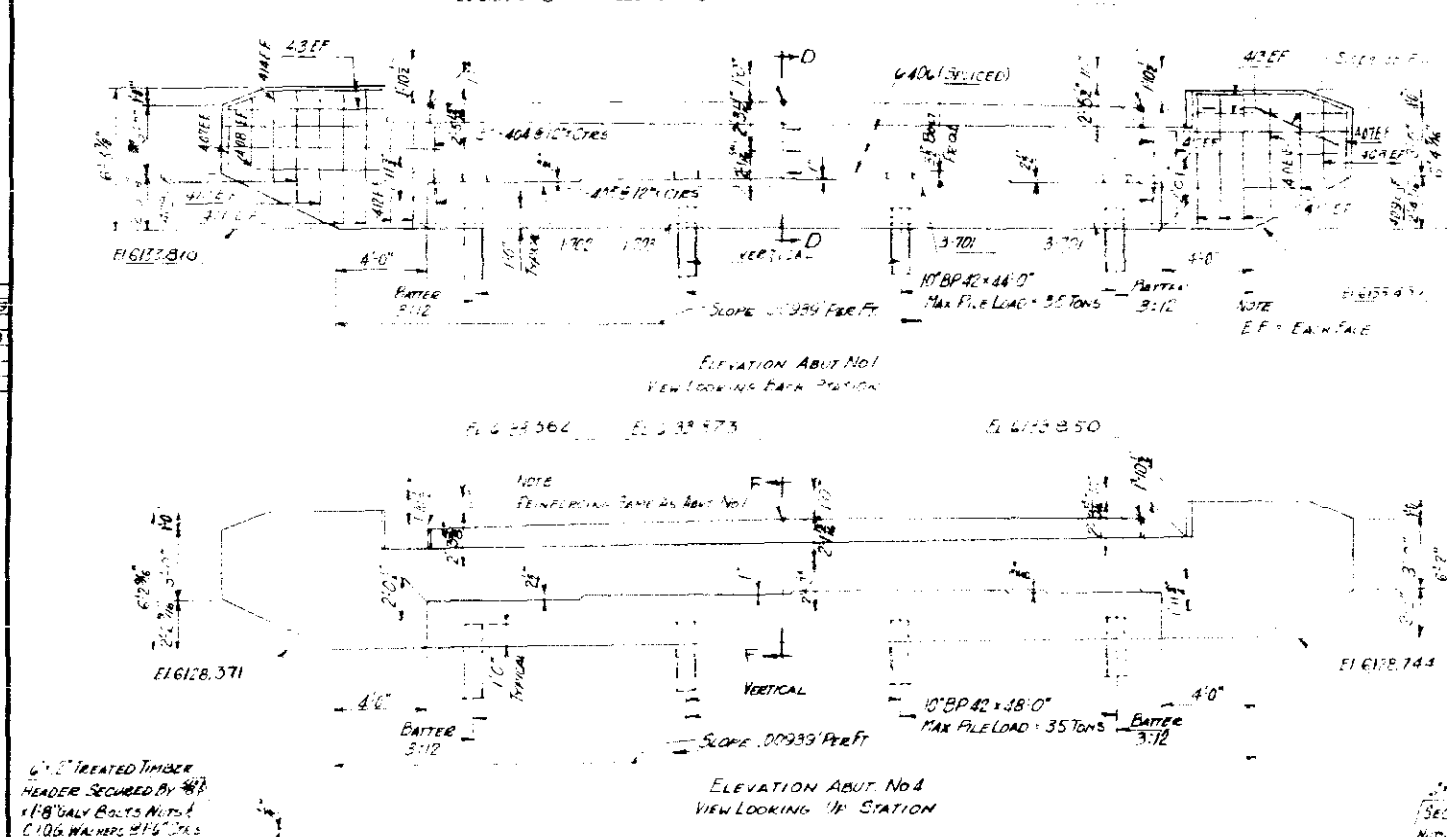
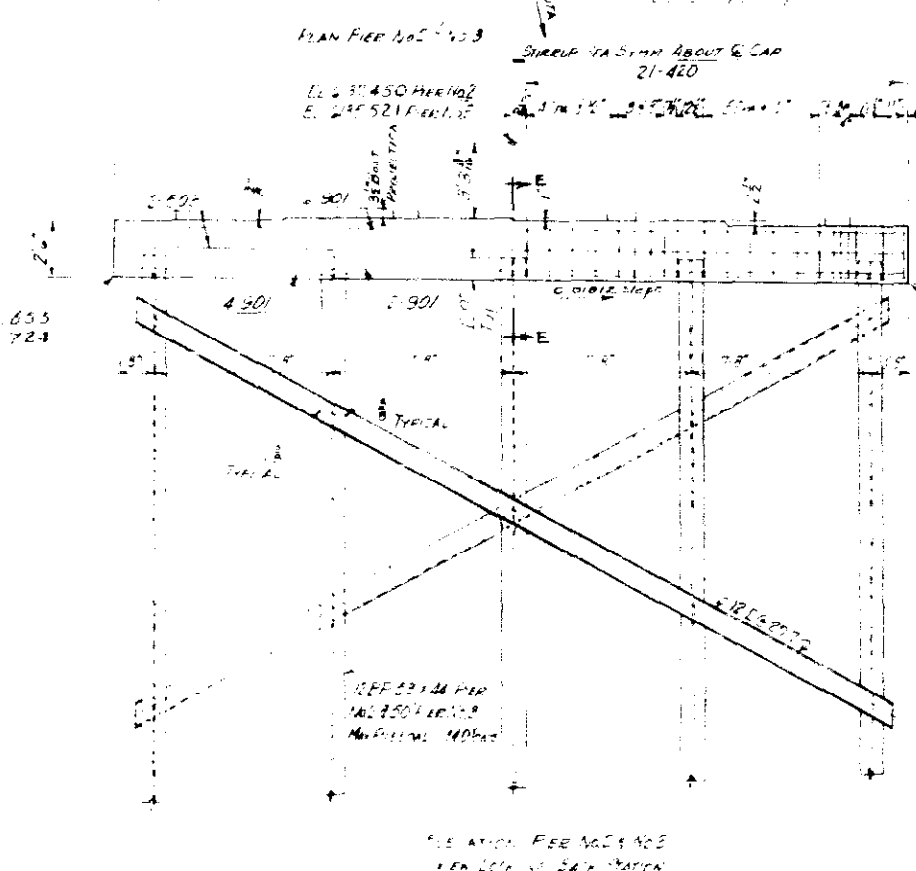
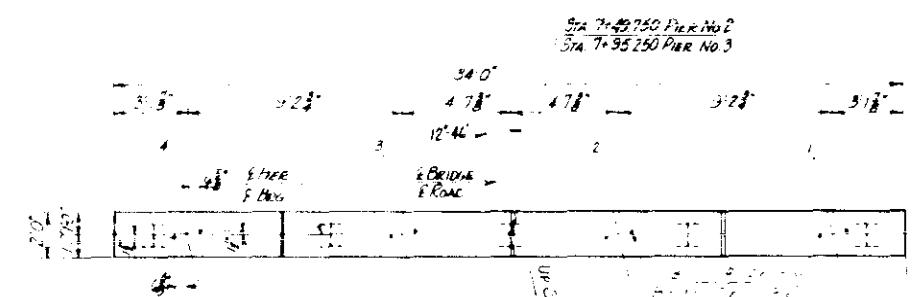
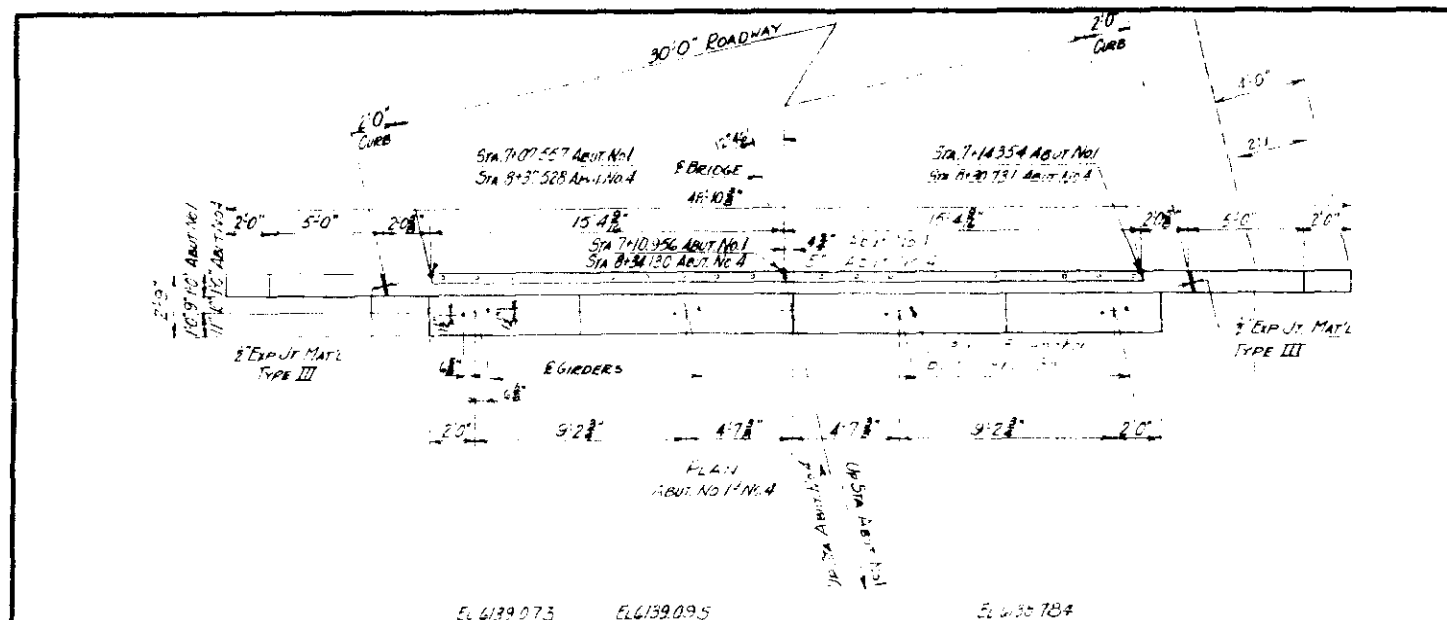
ALL RIVETS 3/4" SUBPUNCH HOLES 1/2" x 1/2" REAM TO
1/8" WITH PARTS ASSEMBLED. NO BEAM BLOCKING
STRINGERS TO BE STRAIGHT.

COLORADO
DEPARTMENT OF HIGHWAYS
SUPERSTRUCTURE DETAILS

Across D.F.R.R.
Sta. 10+00 to 10+100
Near COLO SPRING Sec. 36 T. 35 S. R. 67W
Designed by J.E.H.
Checked by J.E.H.
Approved by J.E.H.
Date: 12/27/1960

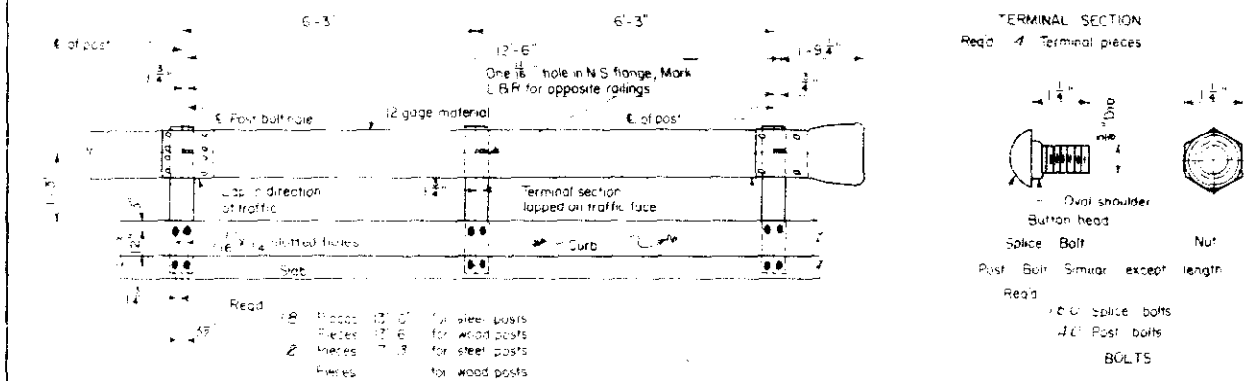
STRUCTURE NO. I-17-L

REP. ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLD.	004 1038-01	9	

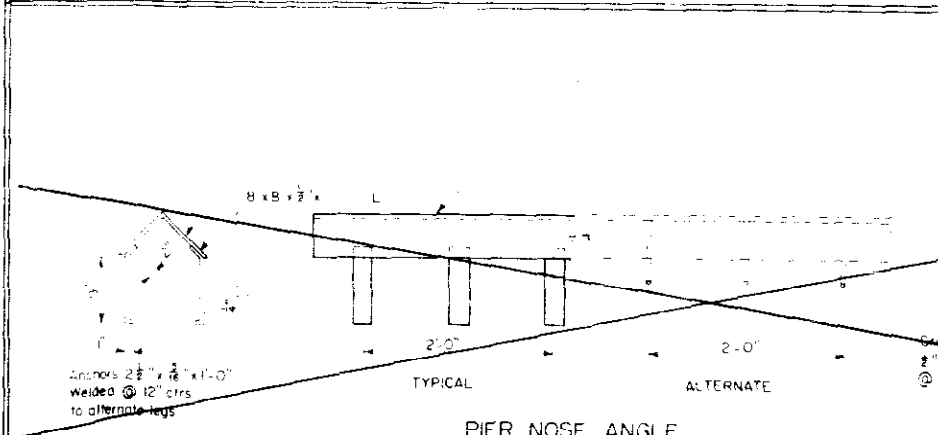
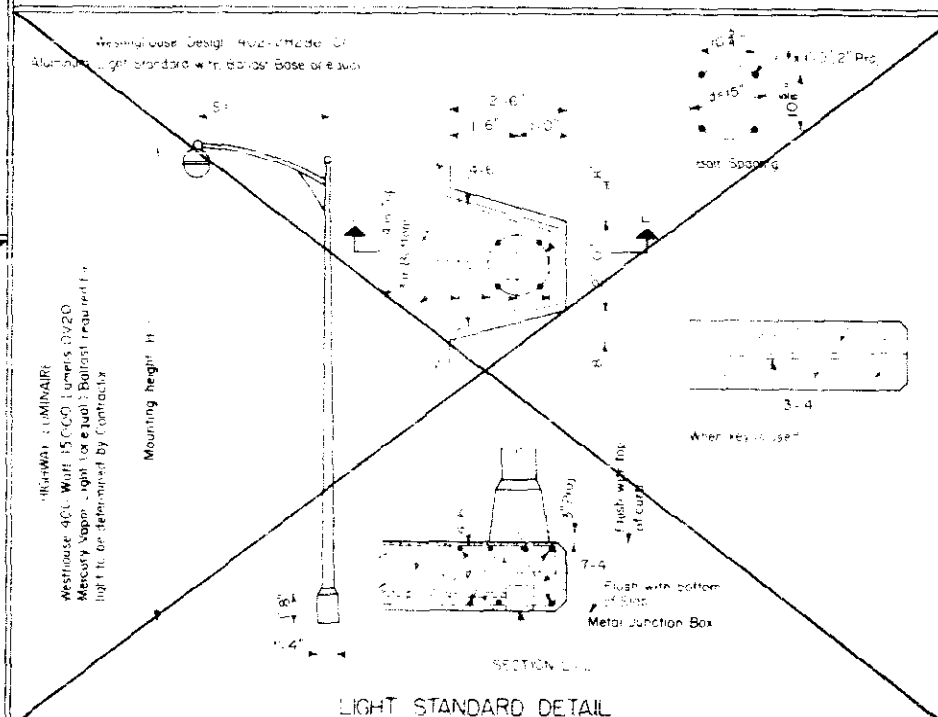
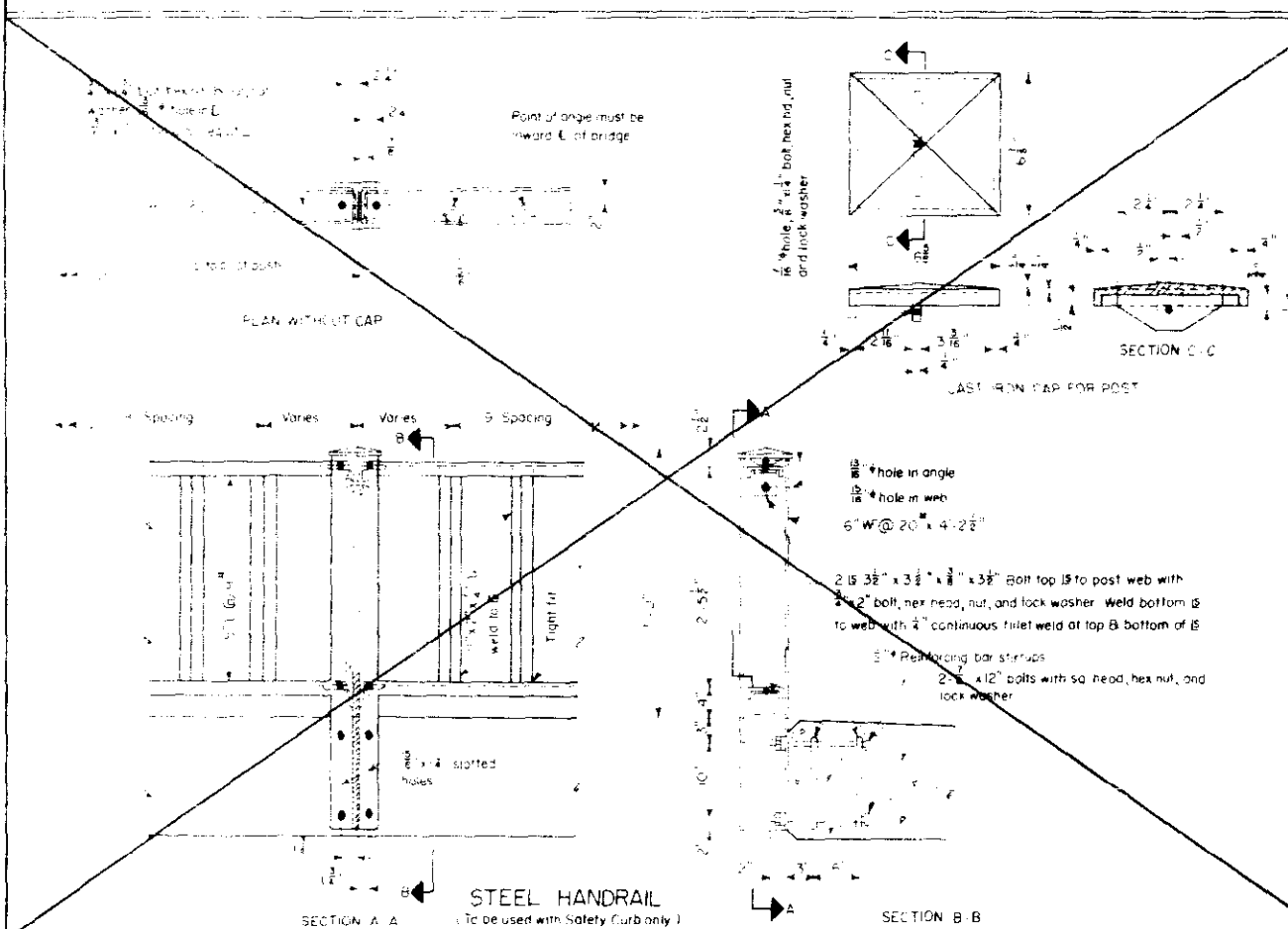


COLORADO DEPARTMENT OF HIGHWAYS DETAILS ABOUT NO. 1 NO. 4 DETAILS PIERS NO. 2 & NO. 3	
Account <u>DFG RR</u> Date <u>7-12-56</u> to <u>8-31-56</u> Name <u>OLD SPRINGS</u> Sec. <u>26</u> T. <u>33</u> R. <u>67N</u>	Designed by <u>GWN</u> Made by <u>JPE</u> Checked by _____ Approved by <u>Ed Newton</u> Bridge Engineer Date <u>Sept 27, 1960</u>

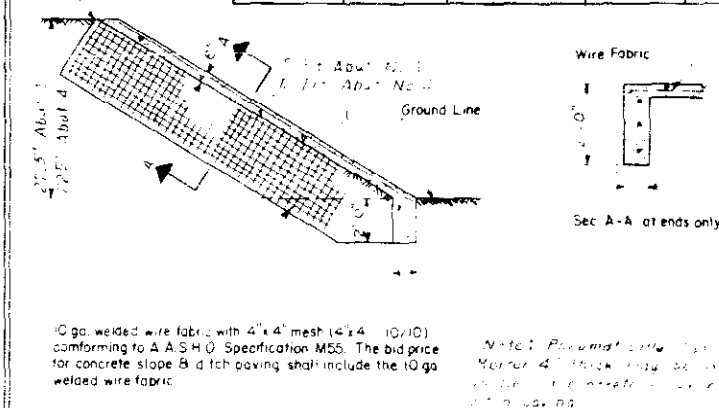
STRUCTURE NO. I-17-L



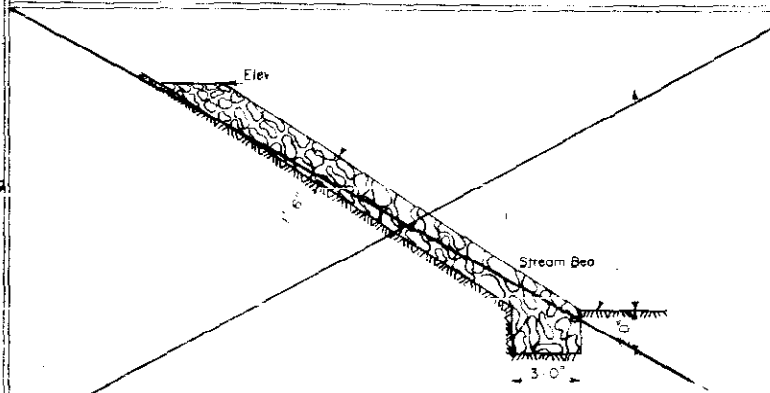
METAL PLATE GUARD RAIL



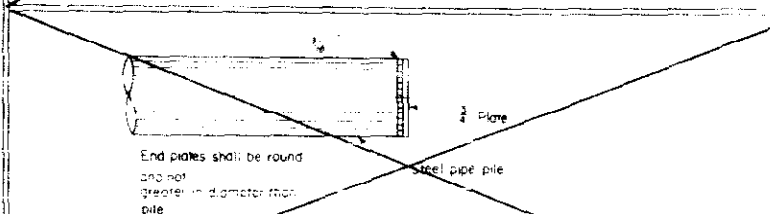
FED. ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	00-0038 01	10	



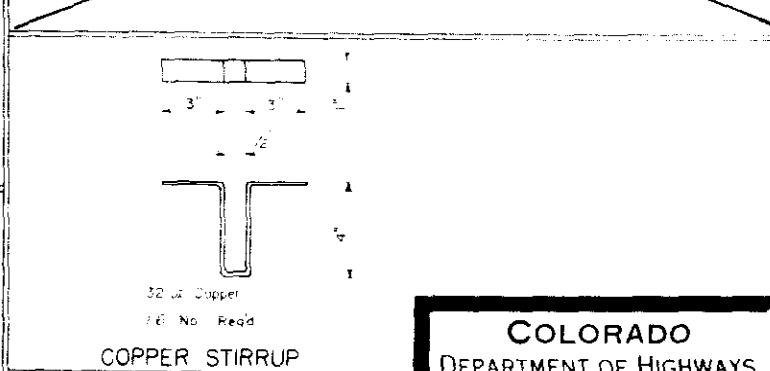
CONCRETE SLOPE & DITCH PAVING DETAIL



DETAIL OF RIPRAP



END PLATES FOR PIPE PILES



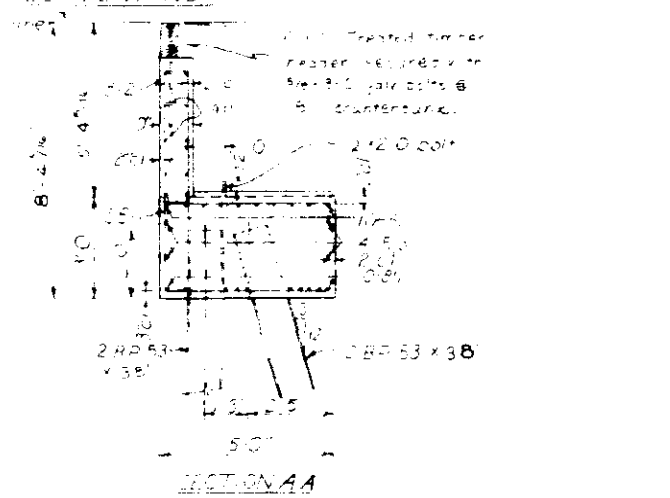
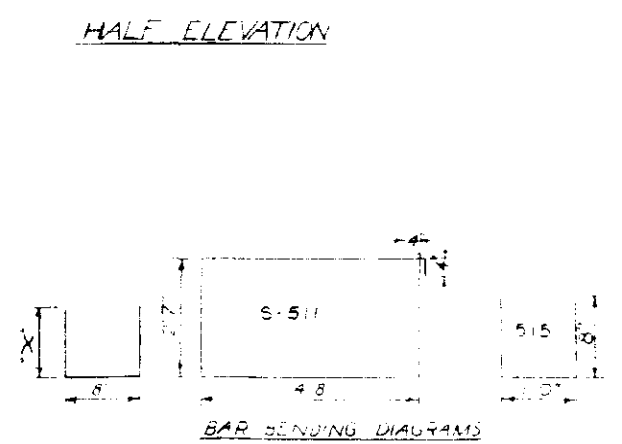
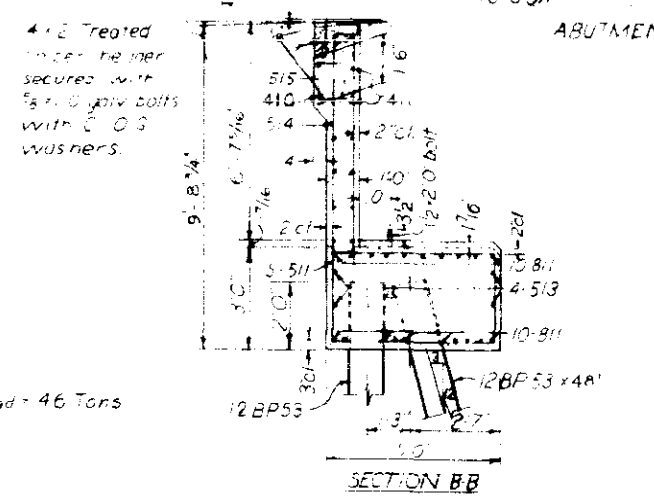
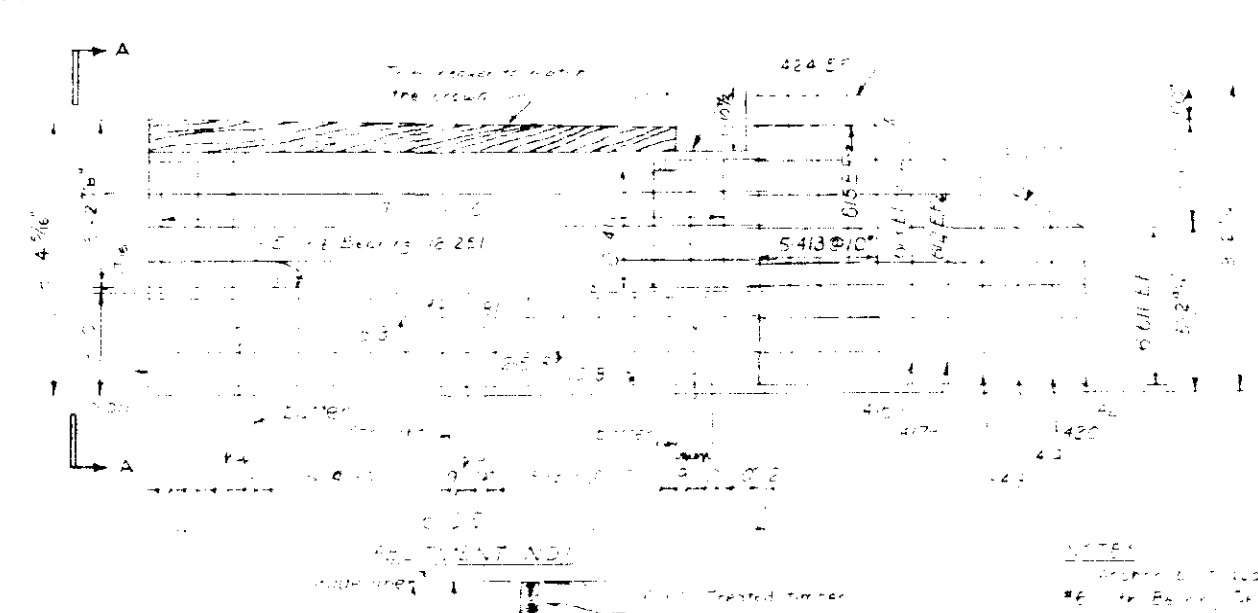
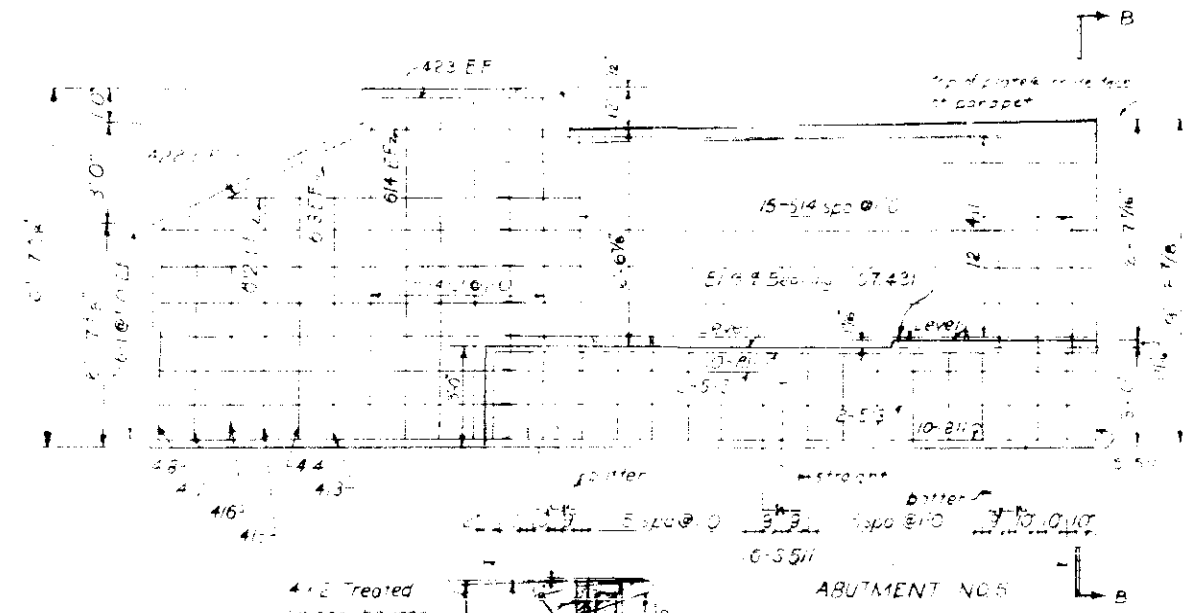
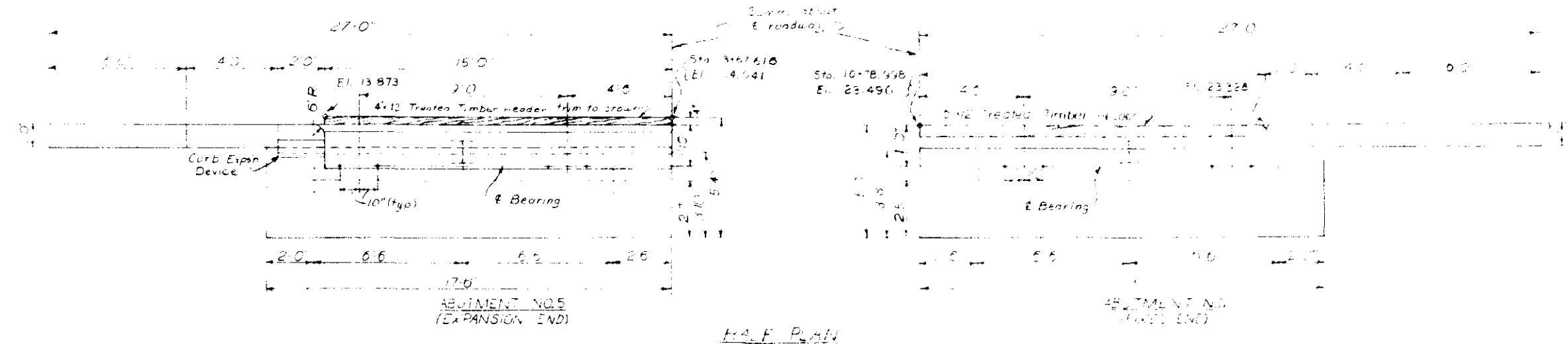
COLORADO
DEPARTMENT OF HIGHWAYS

MISCELLANEOUS BRIDGE DETAILS

Across D. B. R. W. R. R.
Sta 7+1.86 to 7+31.2
Near CR. S. R. S. Sec 36 T. 35 R. 67

Designed by Made by D. J. S. Checked by	Approved by <u>Edmund Bell</u> Bridge Engineer Date <u>Jan 27, 1960</u>
---	---

STRUCTURE NO 1-17-L



Notes:
Max pile load = 46 Tons

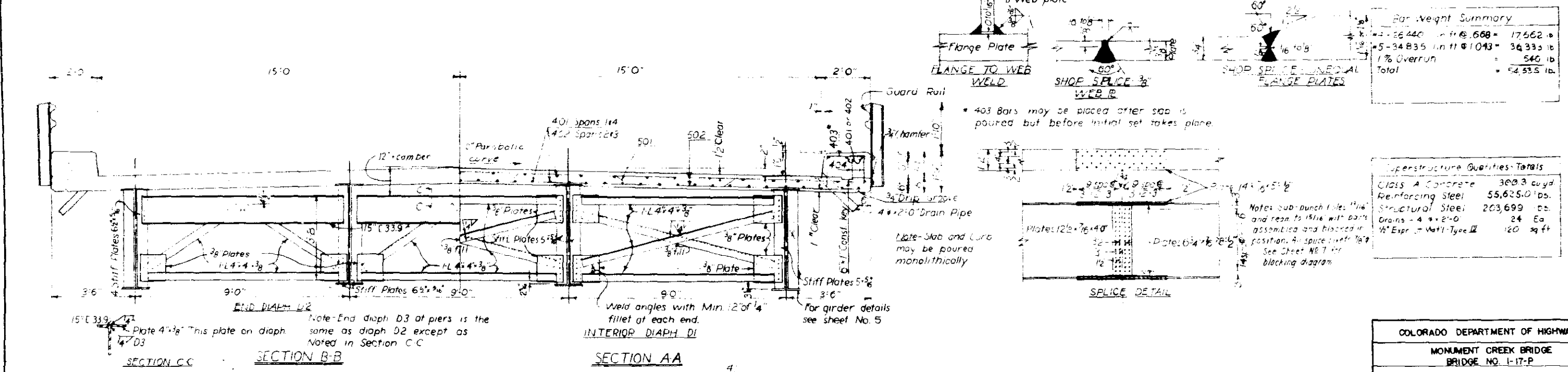
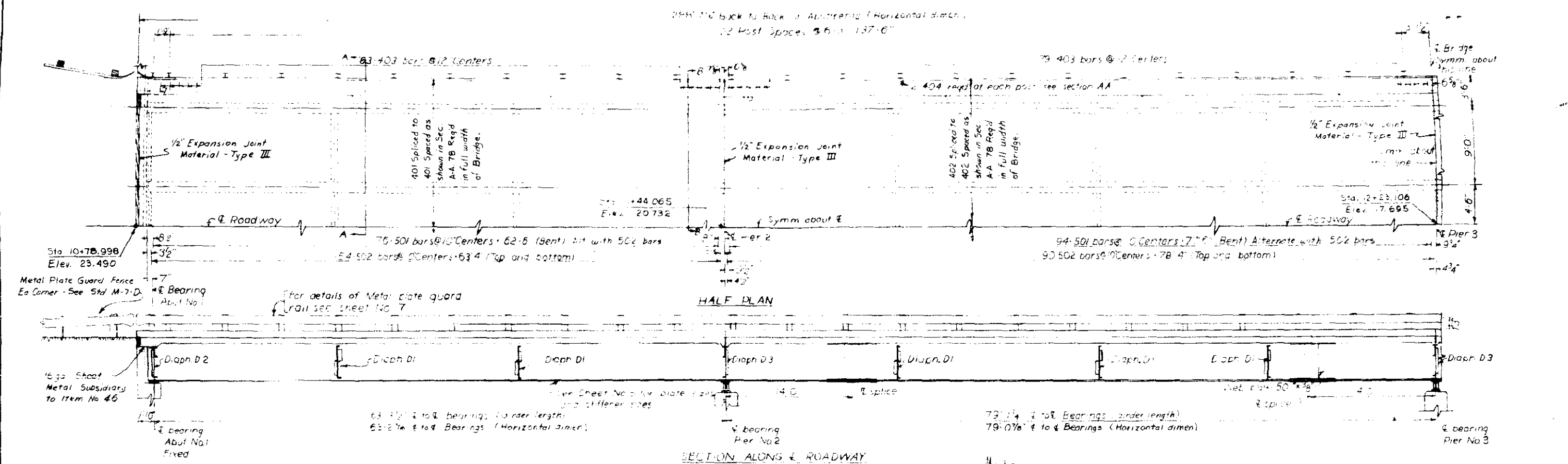
NOTES:
1. All quantities are based on the plan and section views.
2. See sheet 10-17-P for details of the bridge structure.

BAR WEIGHT SUMMARY - BOTH ABUTMENTS	
#B-1887 1/2" x 2 1/2" x 1/2"	3,703 lbs.
#B-7 1/2" x 1/2" x 1/2"	169 lbs.
#B-2 3/4" x 1/2" x 1/2"	220 lbs.
#A-890 1/2" x 1/2" x 1/2"	1,129 lbs.
Total	5,192 lbs.

QUANTITIES BOTH ABUTMENTS	
Structural Excavation Class	6.4 cu yds
Structural Backfill	87 cu yds
Class A Concrete	656 cu yds
Reinforcing Steel	8,192 lbs.
Steel Piles 12BP53	5.6 lin ft
Treated Timber Header	300 lin ft

		ABUTMENT REINFORCING SCHEDULE																									
Mark		410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	5/11	5/2	5/3	5/4	5/5	6/1	6/2	6/3	6/4	6/5	6/11
Shape		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Size		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Length		29'-6"	35'-0"	2'-0"	15'-0"	17'-0"	16'-0"	15'-0"	14'-0"	13'-0"	12'-0"	11'-0"	10'-0"	7'-0"	5'-8"	3'-6"	15'-2"	10'-2"	34'-8"	14'-2"	2'-4"	10'-8"	8'-4"	6'-8"	5'-8"	3'-6"	34'-8"
No per Abut No 1		~	10	~	10	~	~	2	2	2	2	2	2	4	~	4	33	34	4	~	~	24	4	4	~	4	20
No per Abut No 5		2	12	12	2	2	2	2	2	2	~	~	~	4	4	~	33	~	4	30	30	28	4	4	4	~	20
No per this sheet		2	22	13	12	2	2	4	4	4	2	2	2	8	4	4	66	34	8	30	30	52	8	8	4	4	40
Total length this sheet		59'-0"	770'-0"	24'-0"	216'-0"	34'-0"	32'-0"	60'-0"	56'-0"	52'-0"	24'-0"	22'-0"	20'-0"	56'-0"	22'-8"	14'-0"	1001'-0"	345'-8"	277'-4"	425'-0"	70'-0"	554'-8"	28'-8"	53'-4"	22'-8"	14'-0"	138'-0"
Dimension "X"		~	~	10'-2"	8'-8"	8'-2"	7'-8"	7'-2"	6'-8"	6'-2"	5'-8"	5'-2"	4'-8"	~	~	~	~	4'-9"	~	6'-9"	~	~	~	~	~	~	~

FED. ROAD DIST. NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	C-94-01-31	14	



SLAB REINFORCING SCHEDULE									
Bar No	401	402	403	404		501	502		
Size	4	4	4	4		5	5		
Shape									
No. Reqd	312	468	568	192		340	688		
Length	32'-8"	27'-9"	4'-4"	4'-2"		34'-11"	33'-6"		

COLORADO DEPARTMENT OF HIGHWAYS

MONUMENT CREEK BRIDGE

BRIDGE NO. 1-17-P

SUPERSTRUCTURE DETAILS

SCALE

ROBERT L. MOORE

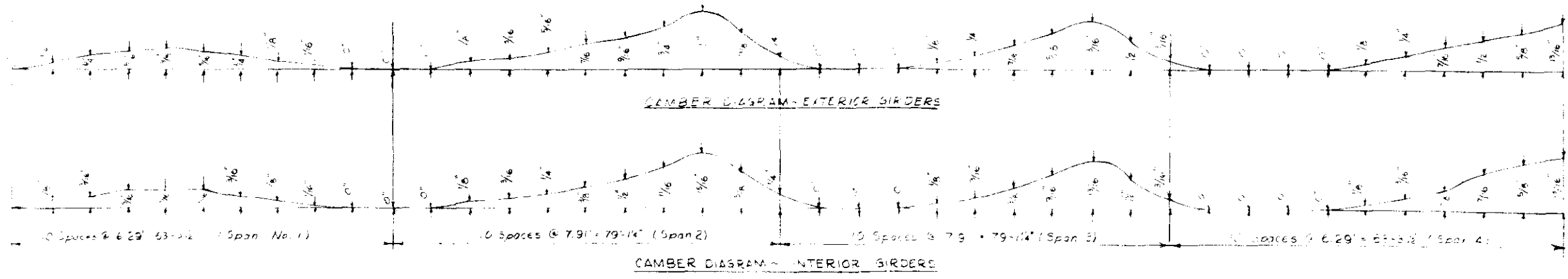
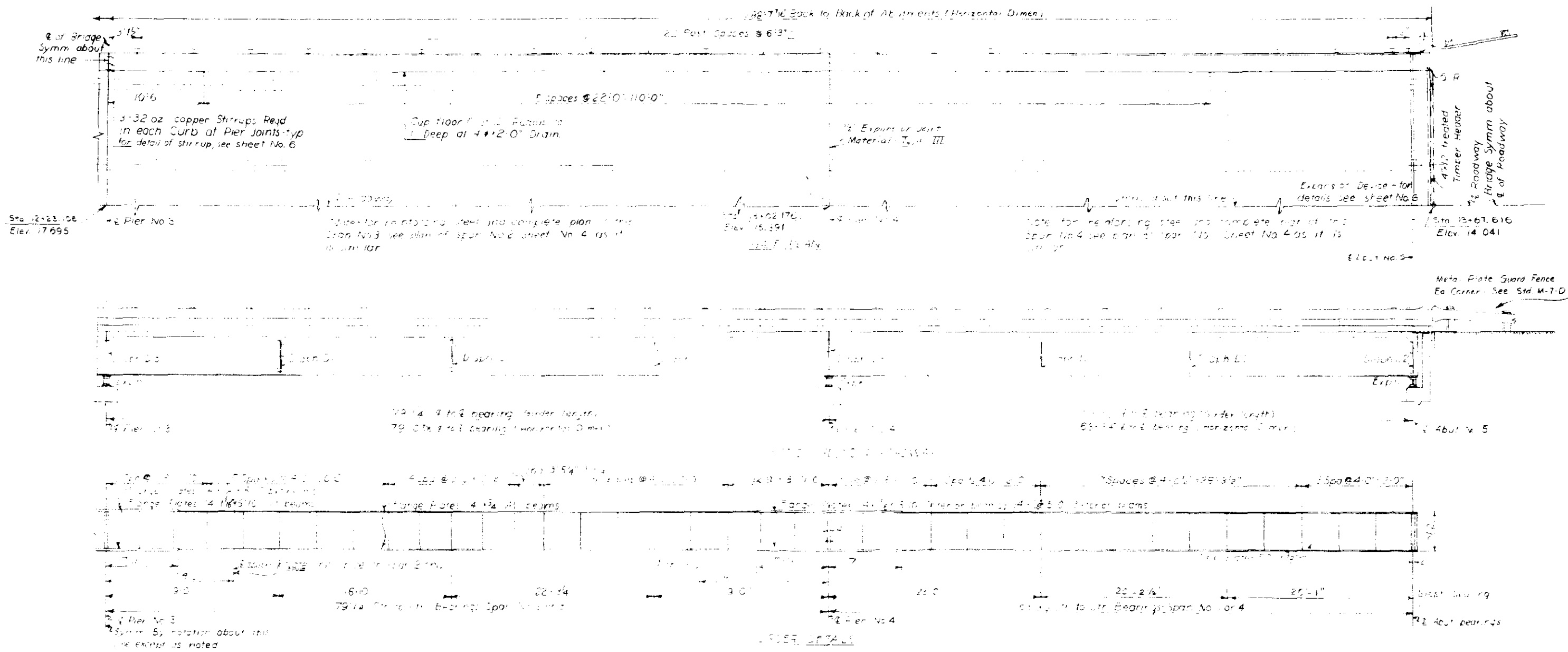
CONSULTING ENGINEERS

COLORADO SPRINGS, COLO.

DATE: AUGUST, 1960

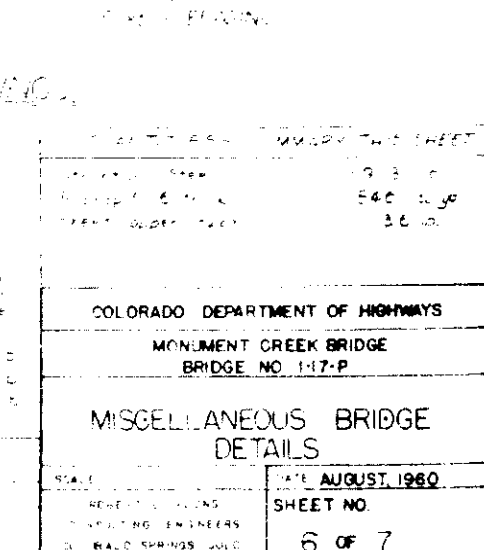
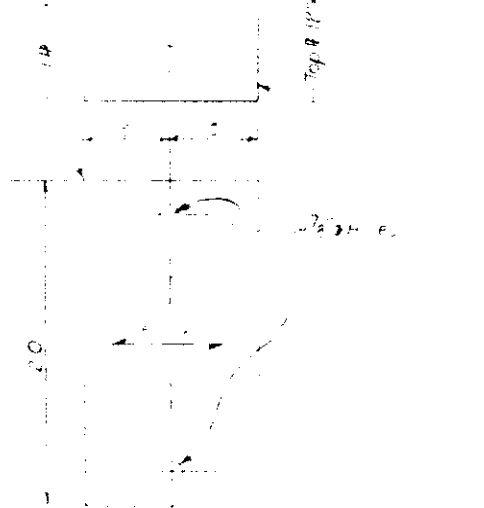
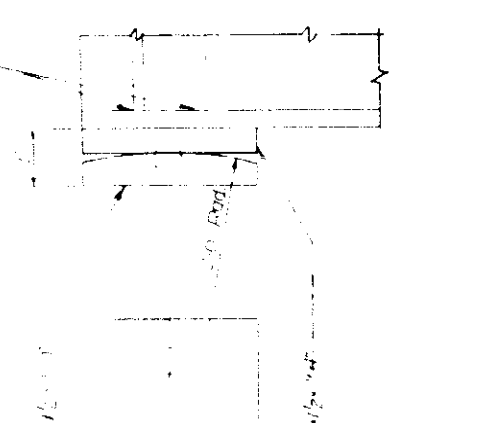
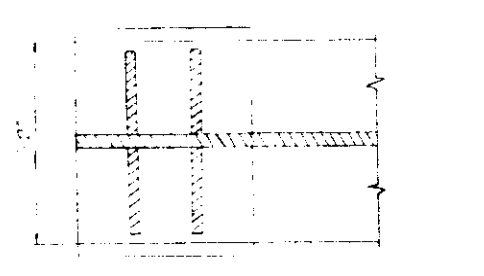
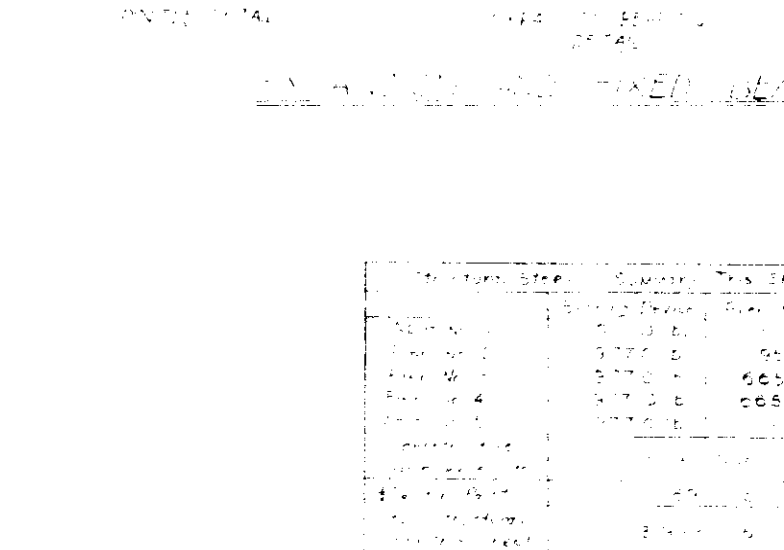
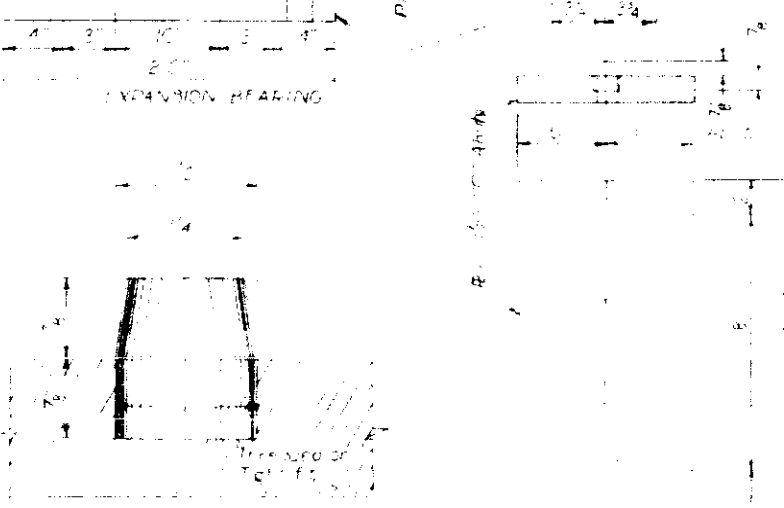
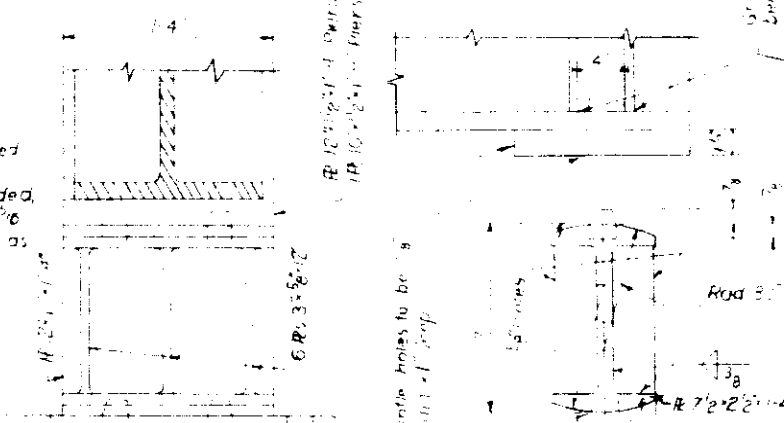
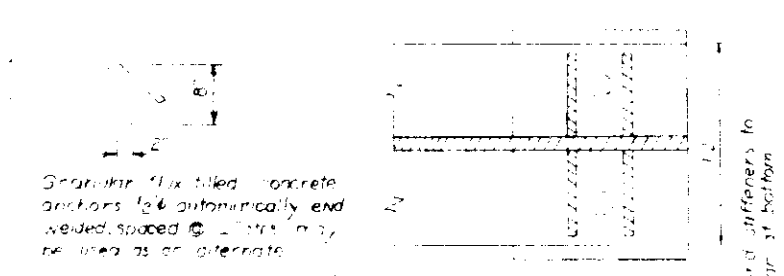
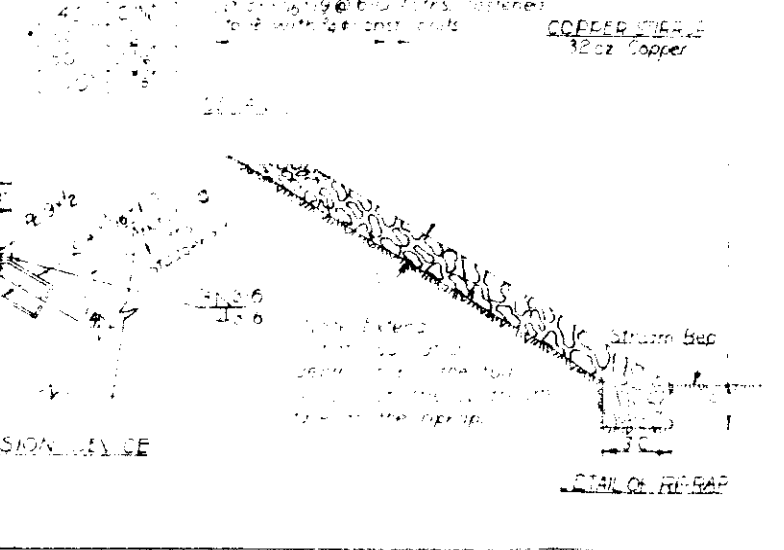
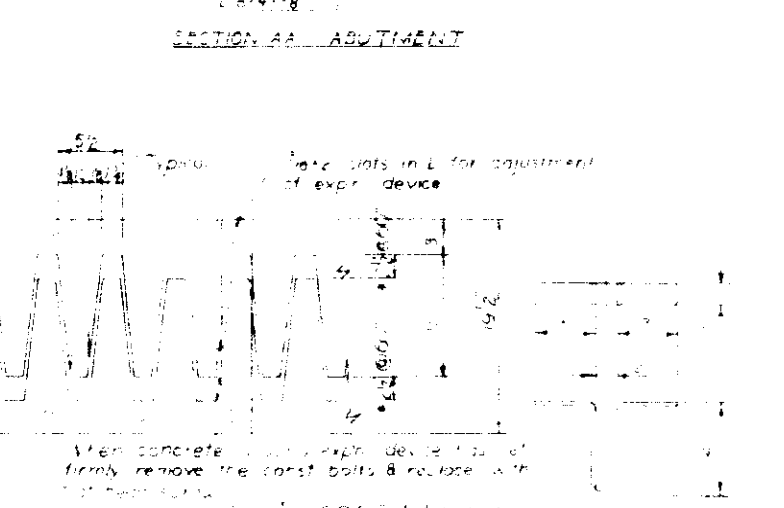
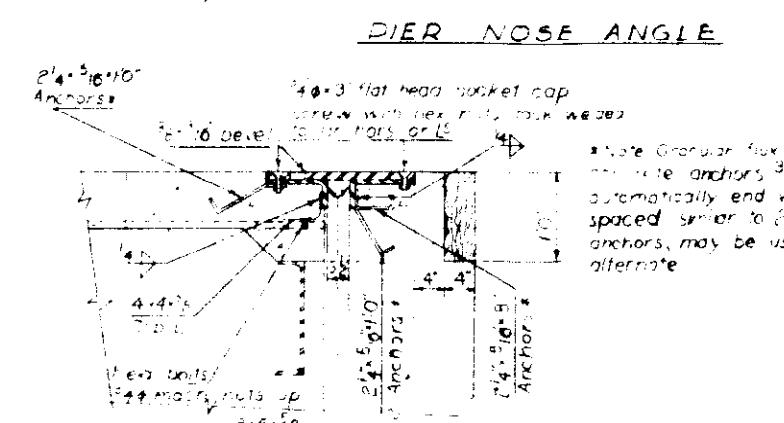
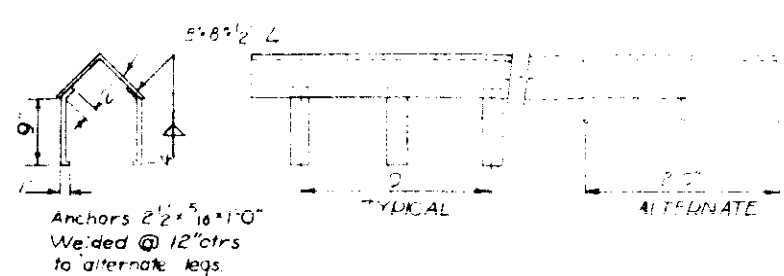
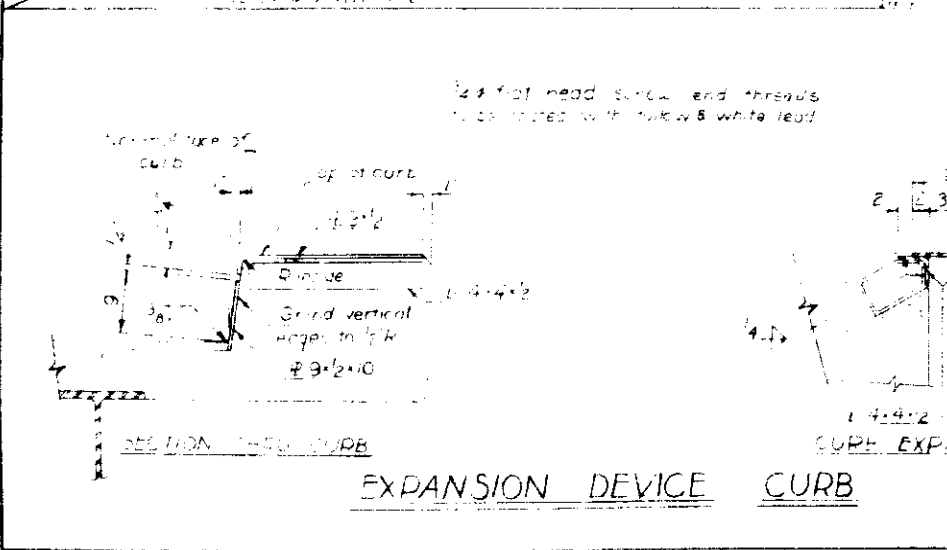
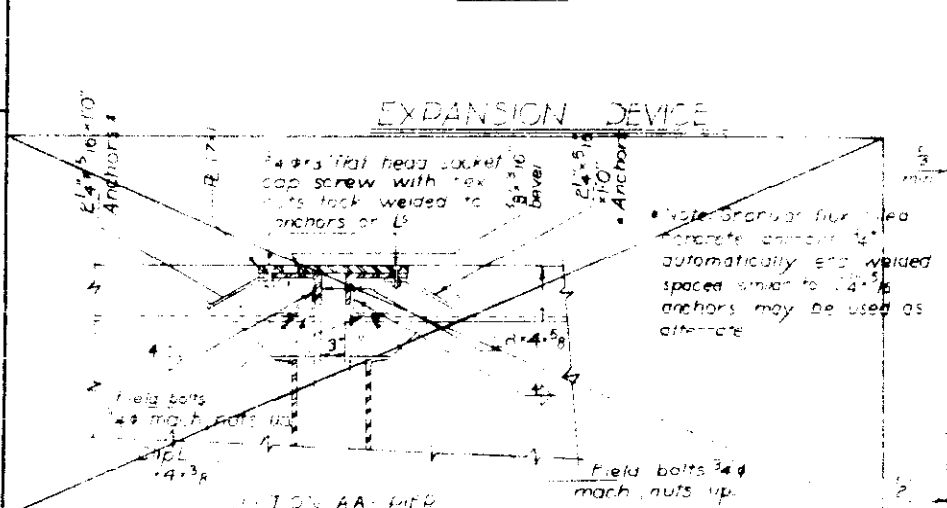
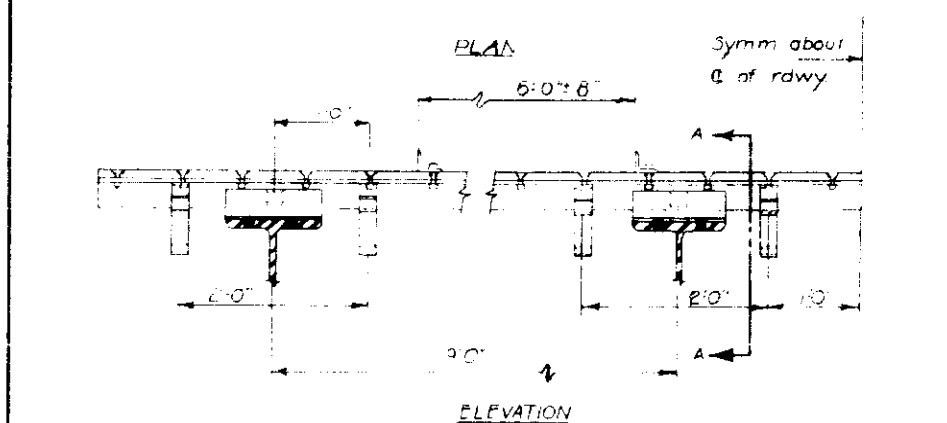
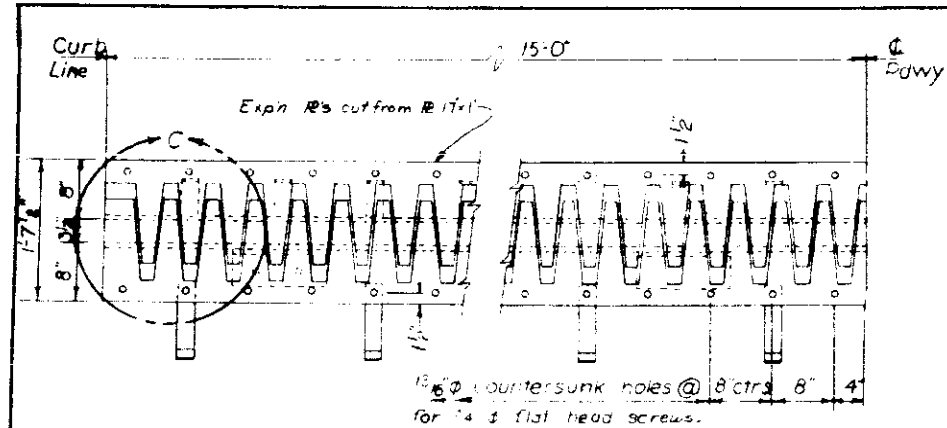
SHEET NO.

4 OF 7

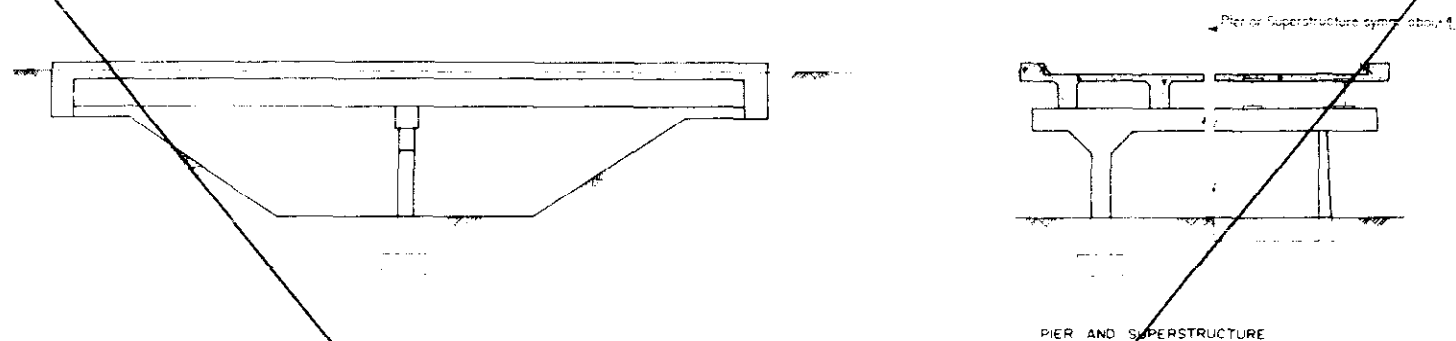


NOTES:
 See sheet 4 for total Superstructure quantities
 See sheet No. 7 for Girder Stiffener Details & Beam Blocking Diagram.

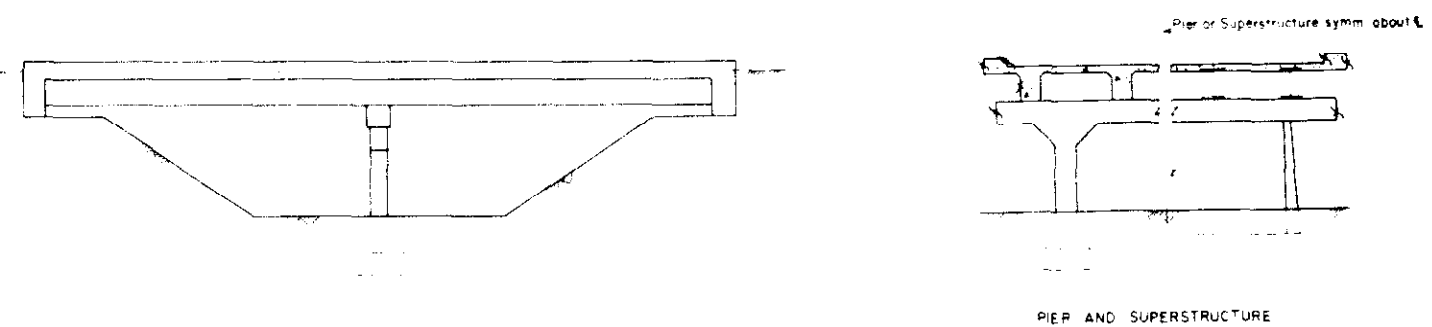
COLORADO DEPARTMENT OF HIGHWAYS	
MONUMENT CREEK BRIDGE	
BRIDGE NO. 1-17-P	
SUPERSTRUCTURE DETAILS	
SCALE	DATE AUGUST, 1960
ROBERT L. KOONS CONSULTING ENGINEERS COLORADO SPRINGS, COLO.	SHEET NO. 5 OF 7



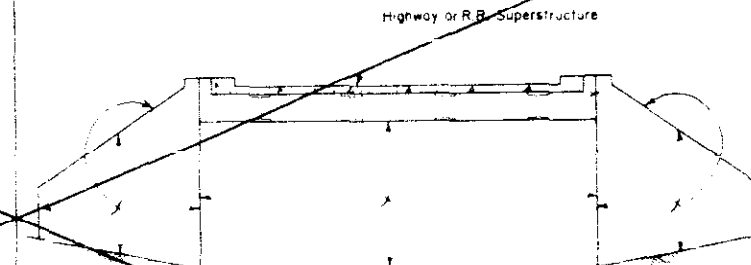
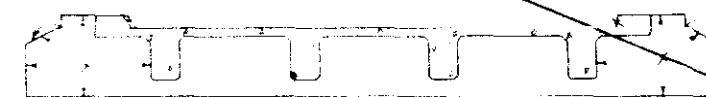
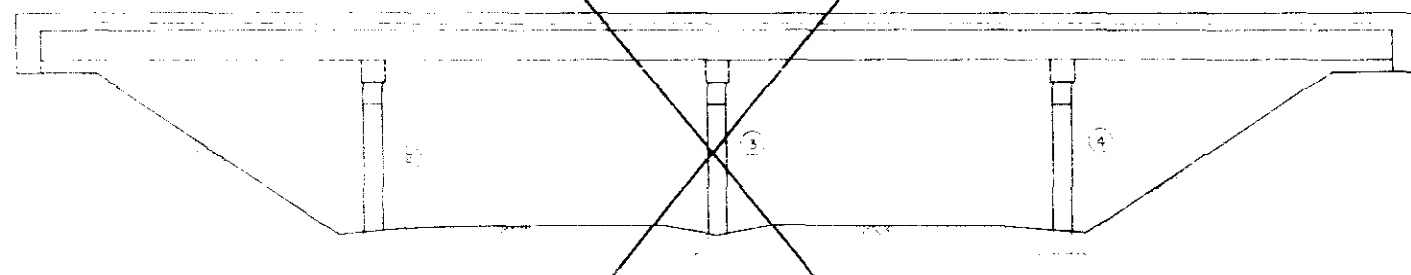
FED. ROAD REGION NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	C 34-2038 C.	18	



RURAL STREAM CROSSING

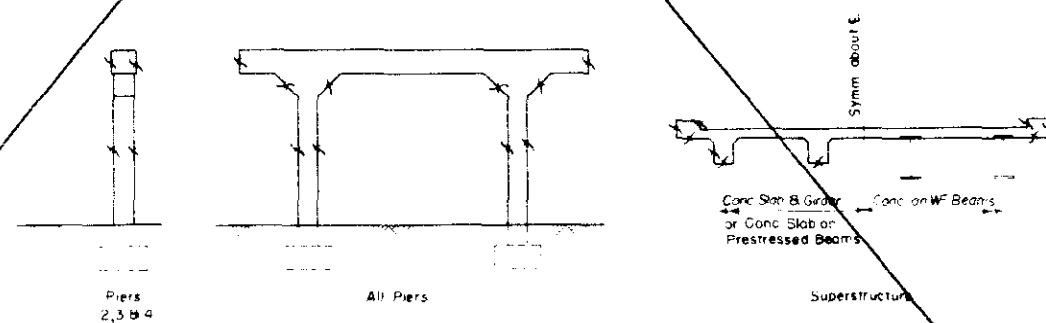


URBAN STREAM CROSSING OR NEAR URBAN AREA



STUB ABUTMENTS
(Underpass Only)

CANTILEVER ABUTMENTS
(Underpass Only)

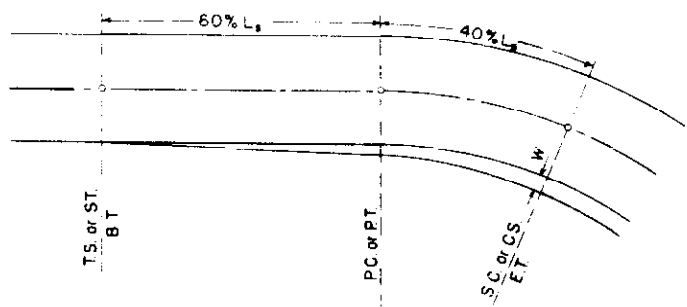
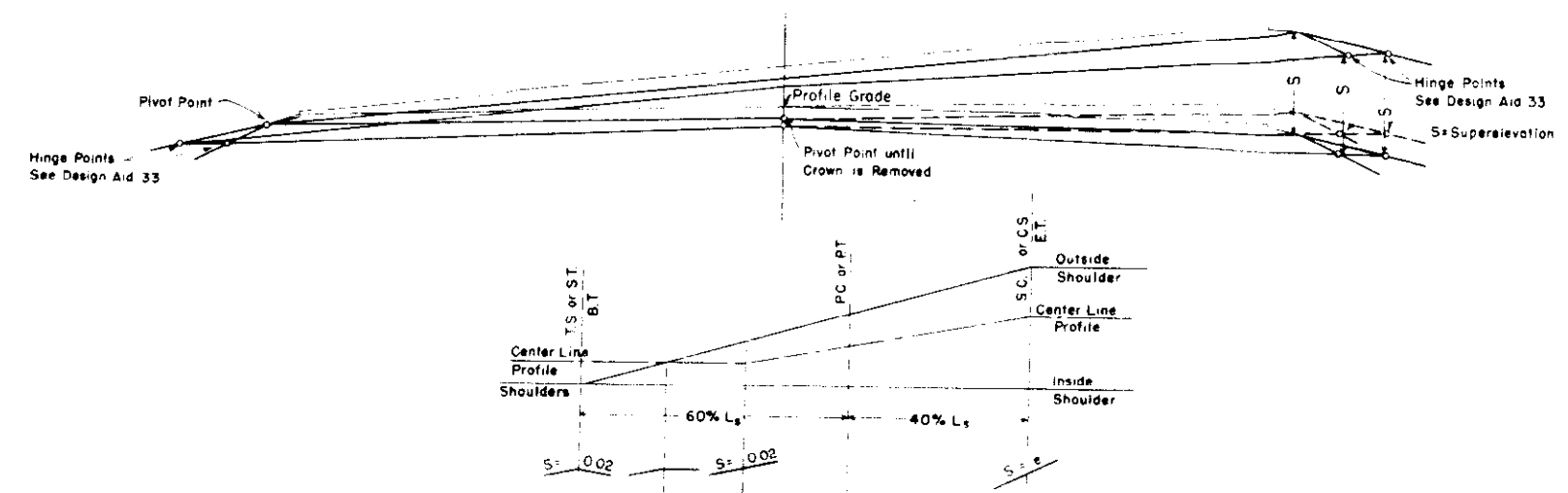


In case of round columns the whole column shall receive Class "I" finish on all Piers

UNDERPASS

COLORADO DEPARTMENT OF HIGHWAYS	
DETAILS SHOWING PORTIONS OF STRUCTURE TO RECEIVE CLASS "I" SURFACE FINISH.	
Mendocino Creek Across Sta. Near Colo Springs Sec. 36 T. 13S. R. 6W	
Designed by A.D.N.	Approved by <i>[Signature]</i> Bridge Engineer
Made by R.R.A.-J.B.	Checked by <i>[Signature]</i>
Date: 12/19/60	

STRUCTURE NO. *I-17 P*
I 17 L



PAVEMENT WIDENING

Pavement Width	20 Ft	22 Ft	24 Ft
Degree of Curve			
0° - 3°	0 Ft	0 Ft	0 Ft
4° - 6°	20 Ft	0 Ft	0 Ft
7° - 10°	25 Ft	0 Ft	0 Ft
11° - 17°	30 Ft	20 Ft	0 Ft
18° - 21°	35 Ft	25 Ft	0 Ft
22° - Up	40 Ft	30 Ft	20 Ft

Widening is to be on the inside edge of the pavement and the transition is to extend over the same transition length as the superelevation.

REVISIONS

No.	Description	Date

SUPERELEVATION RATES FOR TWO LANE CROWNED SECTION TABLE 1

Degree of Curve	Maximum Superelevation = 0.08			Maximum Superelevation = 0.10		
	Super Rate Ft./Ft.	Maximum Design Speed M.P.H.	Minimum Transition or Spiral Length	Super Rate Ft./Ft.	Maximum Design Speed M.P.H.	Minimum Transition or Spiral Length
0° - 5°	0.020	Normal Crown	> 70'	0.020	> 70'	100'
0° - 30'	0.020	> 70'	100'	0.020	> 70'	100'
0° - 45'	0.020	> 70'	100'	0.020	> 70'	100'
1° - 00'	0.028	> 70'	150'	0.028	> 70'	150'
2° - 00'	0.038	> 70'	200'	0.038	> 70'	200'
3° - 00'	0.047	> 70'	250'	0.047	> 70'	250'
4° - 00'	0.057	> 70'	300'	0.057	> 70'	300'
5° - 00'	0.079	70	350'	0.079	70	350'
6° - 00'	0.080	66	350'	0.100	69	400'
7° - 00'	0.080	60	300'	0.100	63	350'
8° - 00'	0.080	55	300'	0.100	58	350'
9° - 00'	0.080	52	300'	0.100	54	300'
10° - 00'	0.080	49	300'	0.100	51	300'
11° - 00'	0.080	46	250'	0.100	48	300'
12° - 00'	0.080	44	250'	0.100	46	300'
13° - 00'	0.080	42	250'	0.100	44	300'
14° - 00'	0.080	41	250'	0.100	42	250'
15° - 00'	0.080	39	250'	0.100	41	250'
16° - 00'	0.080	38	250'	0.100	39	250'
17° - 00'	0.080	37	250'	0.100	38	250'
18° - 00'	0.080	36	200'	0.100	37	250'
19° - 00'	0.080	35	200'	0.100	36	250'
20° - 00'	0.080	34	200'	0.100	35	250'
21° - 00'	0.080	33	200'	0.100	34	200'
22° - 00'	0.080	32	200'	0.100	33	200'
23° - 00'	0.080	31	200'	0.100	32	200'
24° - 00'	0.080	31	200'	0.100	32	200'
25° - 00'	0.080	30	200'	0.100	31	200'

NOTE—Plains Areas use 0.10 Maximum Superelevation Rate.
Mountainous Areas & areas where icing conditions frequently exist, use 0.08 Maximum Superelevation Rate.

SUPERELEVATION RATES FOR SPECIAL CASES TABLE 2

Degree of Curve	30 MPH		35 MPH		40 MPH		45 MPH		50 MPH		55 MPH		60 MPH	
	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral	Required Super Rate Ft./Ft.	Minimum Transition or Spiral
0° - 5°	Normal Crown		Normal Crown		Normal Crown		Normal Crown		Normal Crown		Normal Crown		N.C.	
0° - 30'	0.020		0.020		0.020		0.020		0.020		0.020		0.020	100'
0° - 45'	0.020		0.020		0.020		0.020		0.020		0.020		0.020	100'
1° - 00'	0.028		0.028		0.028		0.028		0.028		0.028		0.028	100'
2° - 00'	0.038		0.038		0.038		0.038		0.038		0.038		0.038	100'
3° - 00'	0.047		0.047		0.047		0.047		0.047		0.047		0.047	100'
4° - 00'	0.057		0.057		0.057		0.057		0.057		0.057		0.057	100'
5° - 00'	0.079		0.079		0.079		0.079		0.079		0.079		0.079	100'
6° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
7° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
8° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
9° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
10° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
11° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
12° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
13° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
14° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
15° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
16° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
17° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
18° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
19° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
20° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
21° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
22° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
23° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
24° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'
25° - 00'	0.080		0.080		0.080		0.080		0.080		0.080		0.080	100'

NOTE—Transition or Spiral Lengths are shown in the tables for 2 Lane Crowned Highways.
For 3 Lane Crowned Highways use 12 times the lengths shown, rounded to the nearest 50 feet.
For 4 Lane Crowned Highways use 15 times the lengths shown, rounded to the nearest 50 feet.
Width of Crowned Highway to be figured for Superelevation—left pivot point to right pivot point.
May be used on City Streets & Interchanges.

FORMULAE FOR TABLES
 $D = \frac{85.950(e+f)}{V^2}$
 $L_s = \frac{16.70V^3}{e}$
D = Degree of Curve
e = Superelevation Rate—Ft. per Ft. of Width
f = Side Friction Factor (varies from 0.12 at 70 M.P.H. to 0.16 at 30 M.P.H.)
V = Velocity—M.P.H.
L_s = Spiral Length—Feet
Note for Table II—A straight line transition was used for e from 0.02 to 0.06.

COLORADO DEPARTMENT OF HIGHWAYS
METHODS FOR SUPERELEVATION & WIDENING OF CURVES CROWNED HIGHWAYS

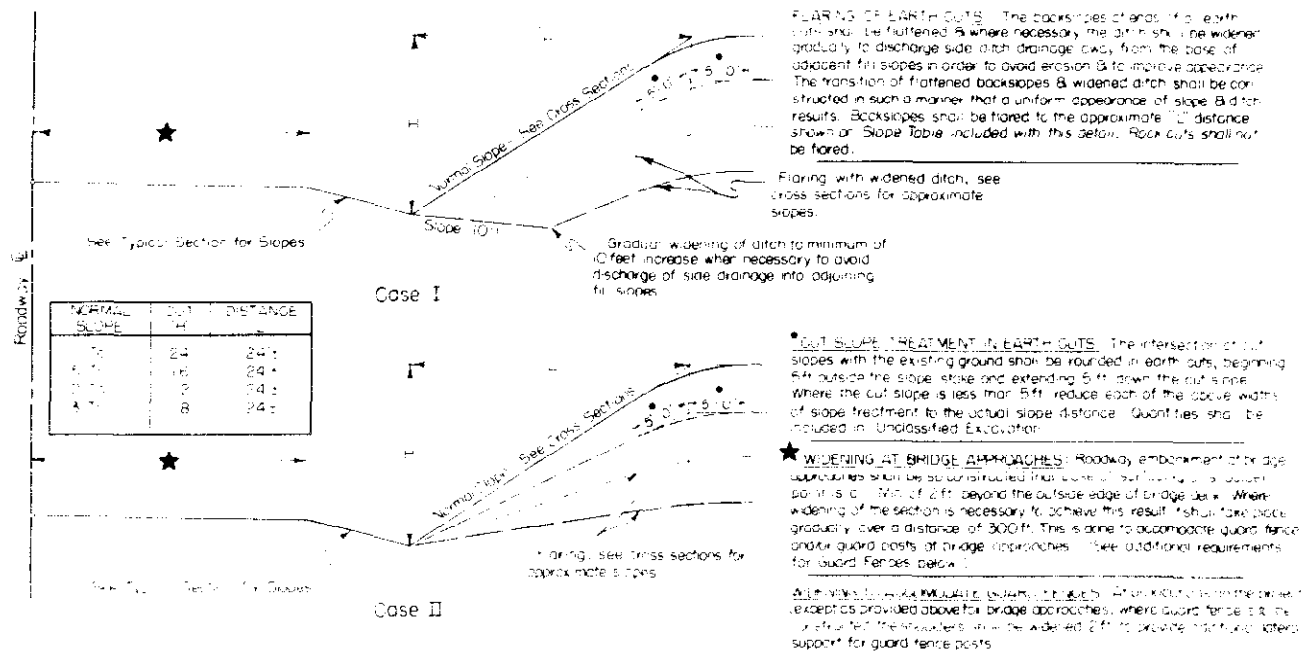
Designed by R.W.L. Approved by
Made by S.B.L.
Checked by L.E.O. Date

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

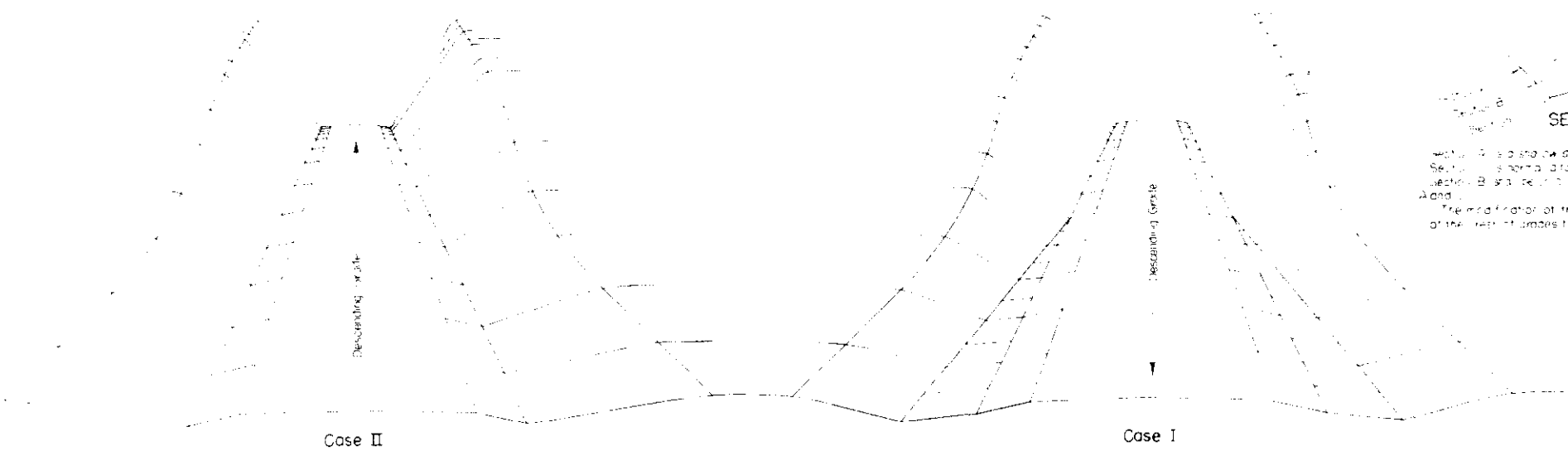
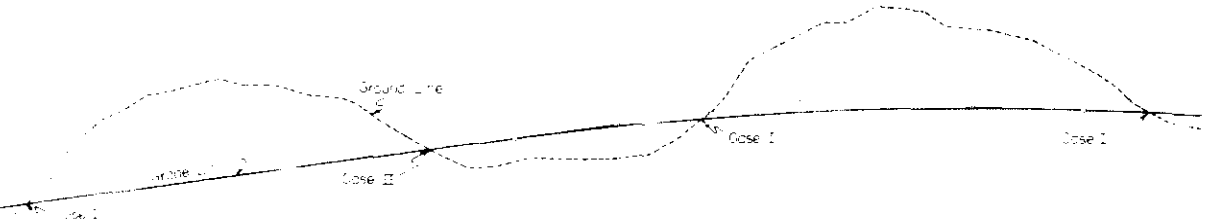
STANDARD M-2-EN

PROJECT NO	SHEET NO
C04-0038-01	20

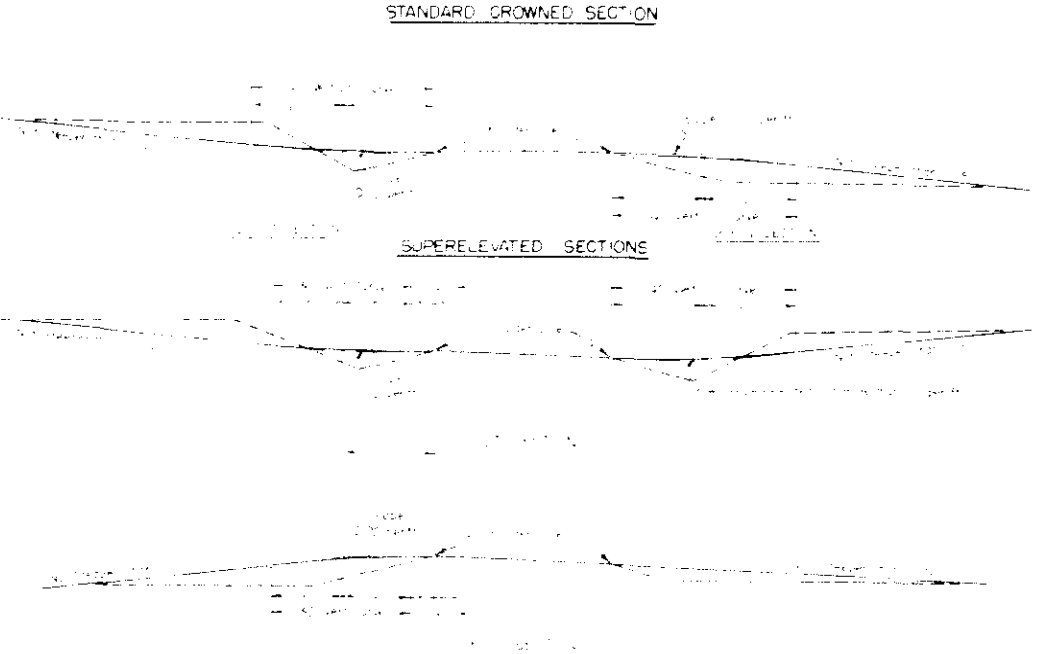
GENERAL DETAILS FOR FLARING OF EARTH CUTS, CUT SLOPE TREATMENT & WIDENING AT BRIDGES



PLAN OF FLARING IN EARTH CUTS

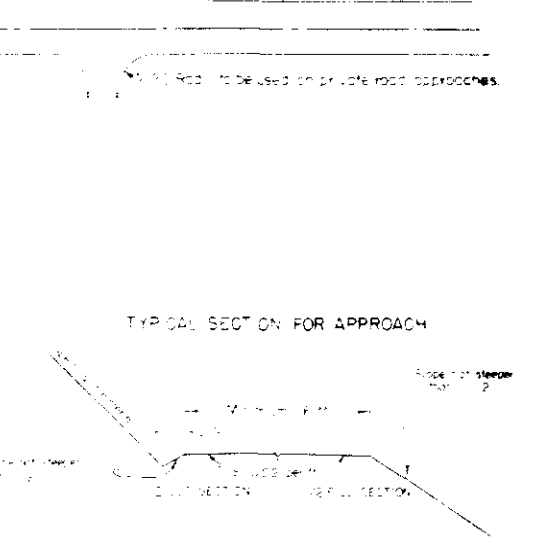


TYPICAL PLANS FOR SIDE APPROACH ROADS



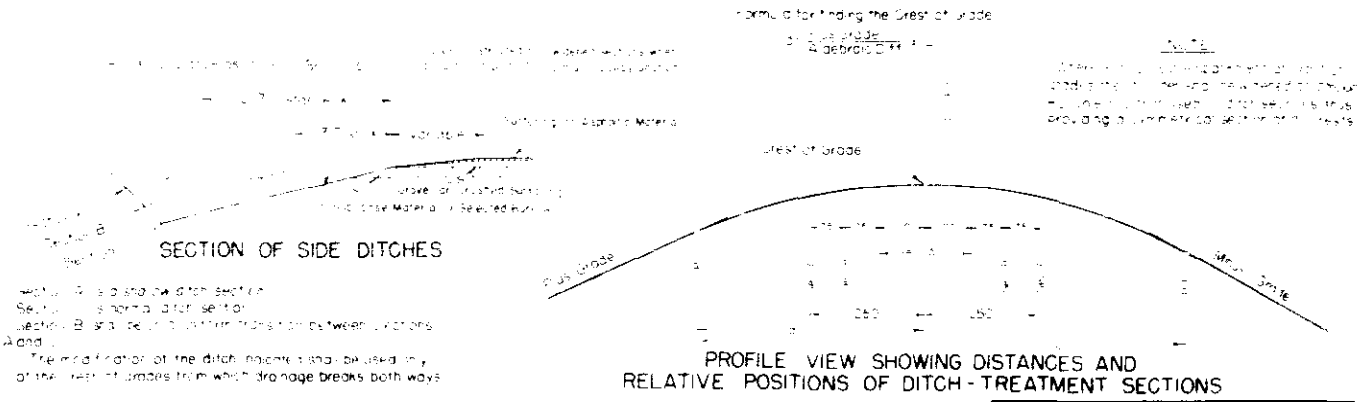
1. SIDE DITCHES: To be located at greatest feasible distance from the roadway shoulder consistent with good practice. Minimum of 20 ft from shoulder shall be observed, whenever possible.

2. Roadside ditch shall intersecting roads, except private approaches, and may be varied to suit local conditions.



NOTE: When a ditch is located within the top of a shoulder, it shall be located at least 2 ft from the edge of the shoulder. When a ditch is located outside the shoulder, it shall be located at least 20 ft from the edge of the shoulder. The new construction shall be less than sixteen (16) feet from the edge of the shoulder.

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES



GENERAL NOTES

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

2. Side approach roads in the project shall be Grade 5, surfaced with a 4" non-thickness of concrete or 6" of bituminous, extending laterally to the right of way line. Bituminous shall be 6" thick and required to be applied in one or more lifts in the following manner:

3. The maximum grades shown are to be the existing grades for road approaches. Road approaches of grades will be determined where otherwise in the grades as shown would cause damage to or safety of traffic under what satisfactory conditions, grades less than the maximum shown may be used wherever feasible.

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

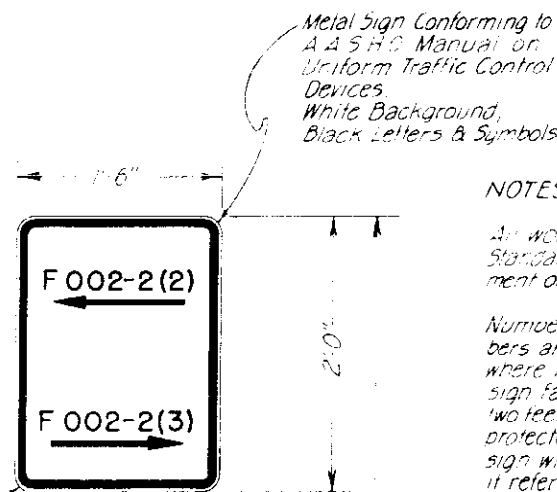
Designed by	Checked by
Made by	Drawn by
Checked by	Drawn by

PROJECT MARKER POST

RIGHT OF WAY MARKER POST

STANDARD M-7-D

FEDERAL ROAD DIST. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLORADO	C 04-0038-01	20A



Metal Sign Conforming to AASHTO Manual on Uniform Traffic Control Devices. White Background, Black Letters & Symbols.

NOTES FOR PROJECT MARKER POSTS

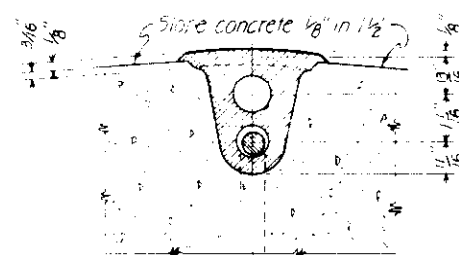
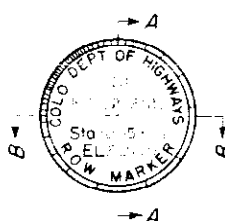
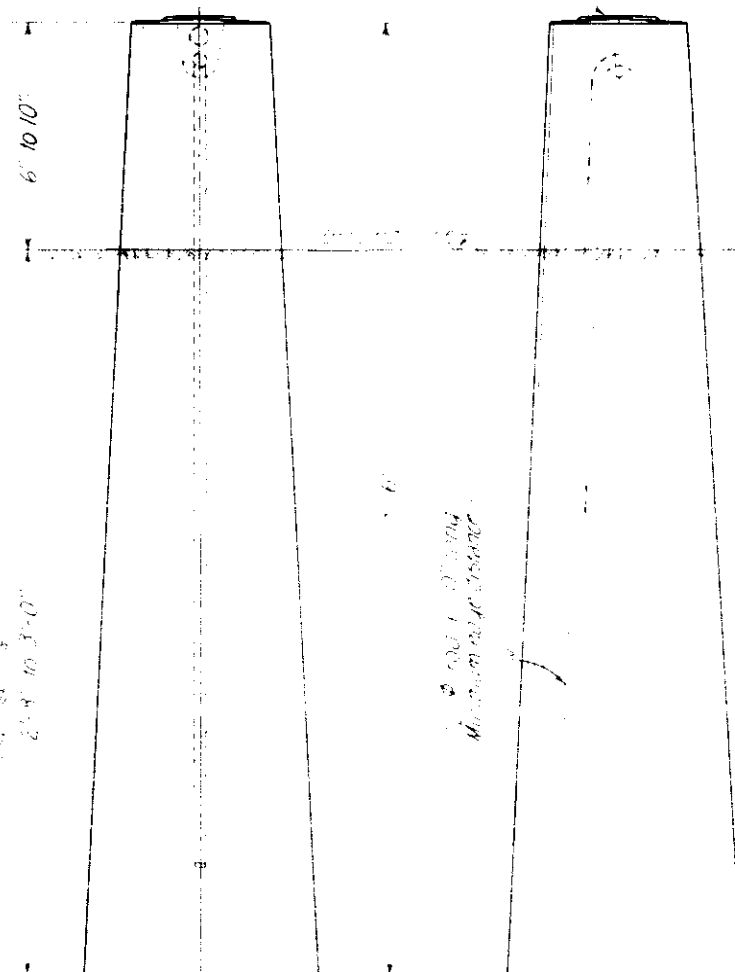
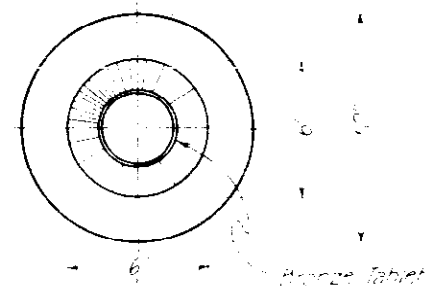
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to this project.

Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed. Post is to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will indicate properly the projects to which it refers.

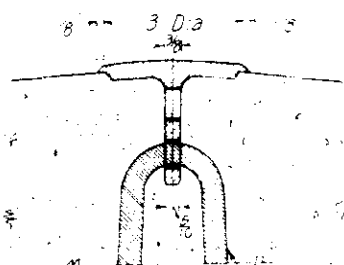
NOTES FOR R.O.W. MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project. Posts shall be made of Class A Concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.

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



SECTION B-B



SECTION A-A

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

BENCH MARK

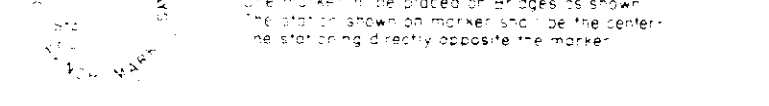
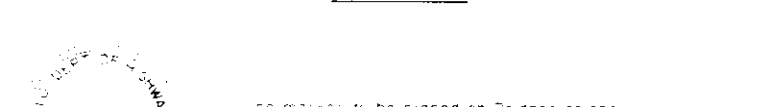
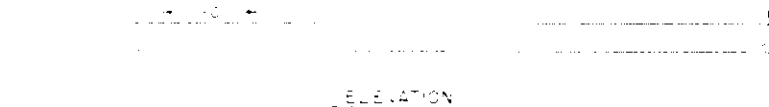
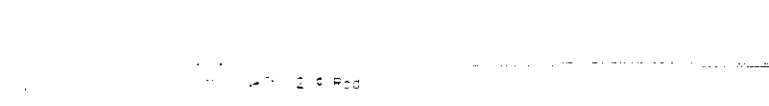
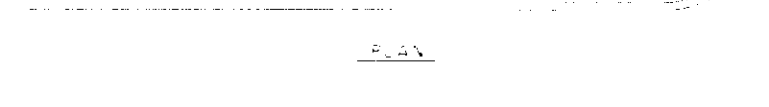
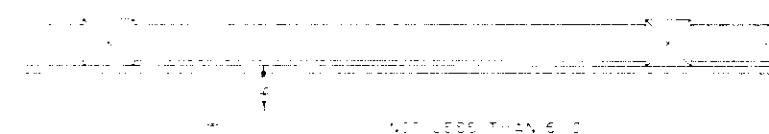
All work shall be done in accordance with Standard Specifications of the Colorado Department of Highways applicable to the project.

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

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

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

Note: Where 2 1/2 inch safety curbs are used a black marker in center of curb.



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

COLORADO DEPARTMENT OF HIGHWAYS STANDARD MARKER POSTS AND BENCH MARKS

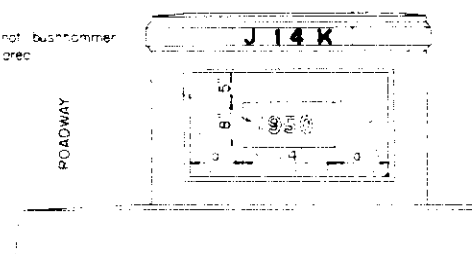
Designed by REL Approved by
Made by EEO
Checked by REL Date: 1953



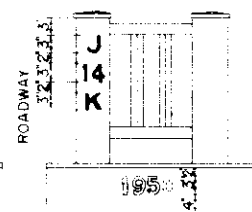
abcdefghijklmnopqrstuvwxyz

White Background

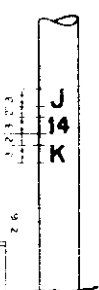
Do not bushhammer
this area



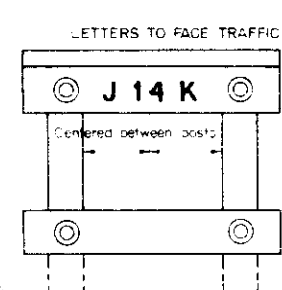
TYPICAL FOR CONCRETE ENDPOST



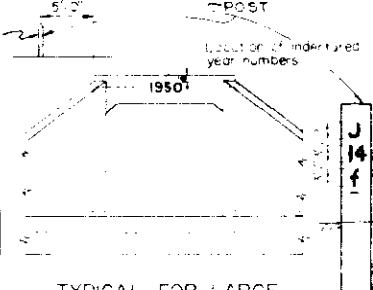
TYPICAL FOR STEEL
HANDRAIL END POST



TYPICAL
FOR
SIGN POSTS



TYPICAL FOR TIMBER WING
HANDRAIL



TYPICAL FOR LARGE
BOX CULVERTS &
STRUCTURES WITHOUT
END POSTS

SAMPLE BRIDGE NUMBER

GENERAL NOTES

SAMPLE YEAR NUMBER

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT. 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 TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MAJOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MINOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MINOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MINOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS.

THE CORRECT NUMBER FOR EACH BRIDGE STRUCTURE IS SHOWN ON THE PLANS. THE NUMBERS FOR MAJOR STRUCTURES OF OVER 20 FEET CLEAR SPAN SHALL BE UPPER CASE LETTERS. THE NUMBERS FOR MINOR STRUCTURES OF 6 TO 20 FEET CLEAR SPAN SHALL BE LOWER CASE LETTERS. SMALL BRIDGES SHALL BE CONSIDERED AS MAJOR STRUCTURES AND SHALL BE UPPER CASE LETTERS. THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MAJOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MINOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS. IN THE EVENT OF A MINOR STRUCTURE, THE YEAR NUMBERS SHALL BE RECESSED IN CONCRETE TO A MINIMUM AS SHOWN IN THE PLANS.

AFTER THE WHITE BACKGROUND HAS DRIED SUFFICIENTLY, THE CORRECT STRUCTURE NUMBER SHALL BE CAREFULLY STENCILED ON IT, WITH TWO COATS OF "SECOND FIELD" COATS, MARK OR EXTERIOR BLACK PAINT, MAINTAINING SPECIFIED UNDER TENDERS PAINTS AND PAINTING. THE WRITS OF THE STENCILED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND TO MAKE SOLID FIGURES.

SUFFICIENT TIME BETWEEN SUGGESTIVE COATS SHALL BE ALLOWED TO PERMIT THOROUGH DRYING.

THE COST OF PAINTING OF STRUCTURE NUMBERS AND FURNISHING AND PLACING POSTS FOR STRUCTURE NUMBERS SHALL BE CONSIDERED SUBSIDIARY WORK AND SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS AND WILL NOT BE PAID FOR AS A SEPARATE ITEM.

GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado Department of Highways applicable to the Project

All concrete for inlets and drains shall be Class "A"

All exposed corners shall be beveled

All construction joints shall be thoroughly cleaned before fresh concrete is poured

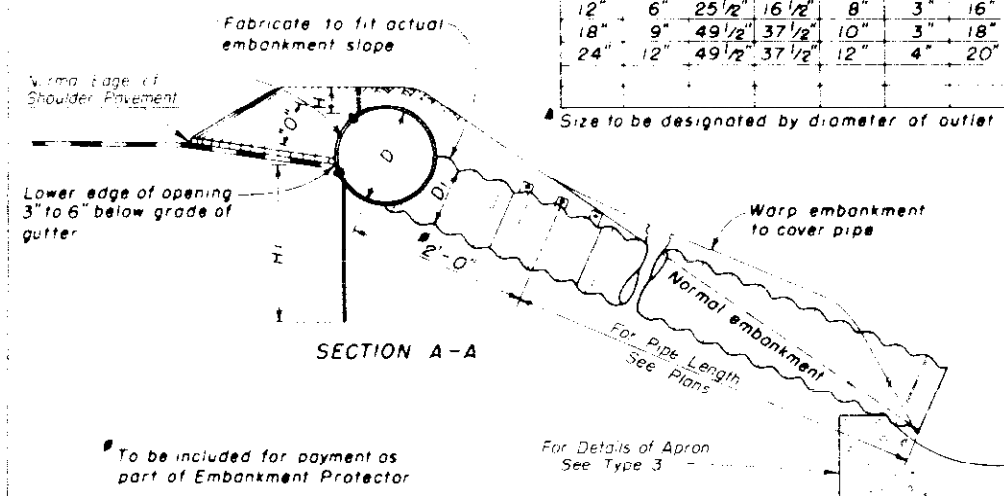
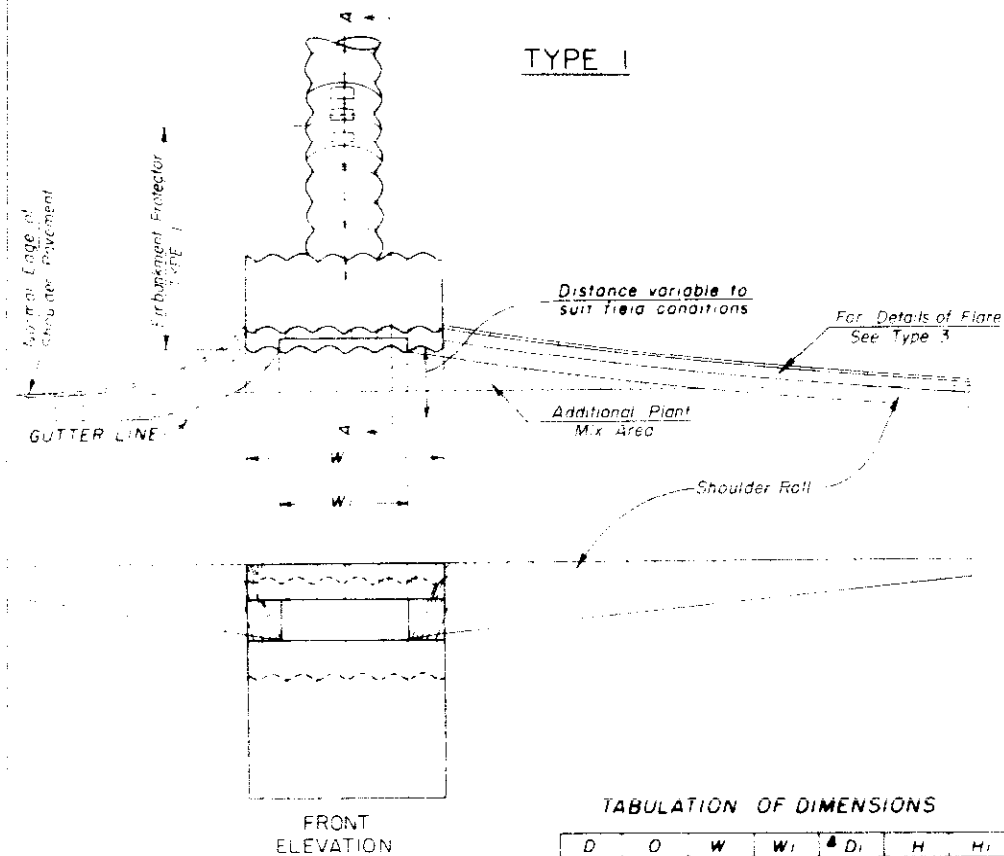
All walls shall have forms on both sides

For size and location of protectors, see List of Structures

Structure backfill material is not to be used in connection with these Structures. Embankment material shall be used for backfilling and shall be included in price bid for these Structures.

STANDARD M-13-C

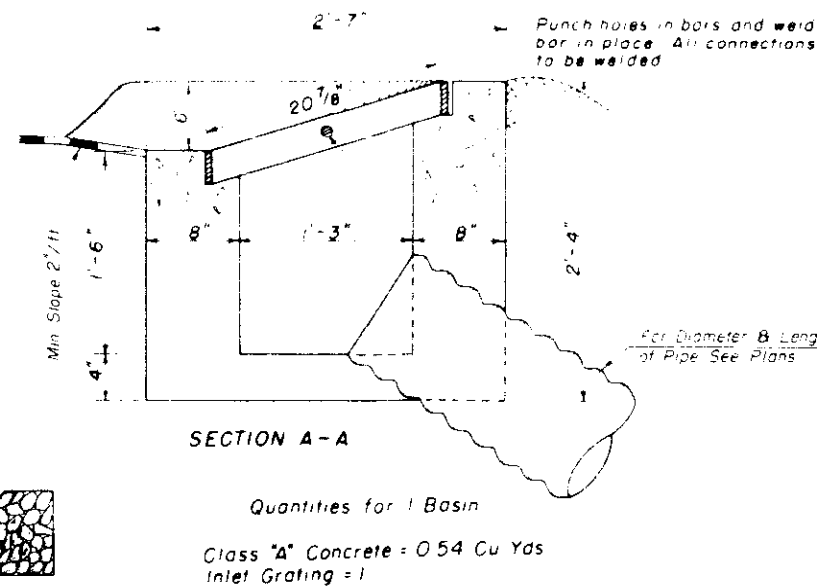
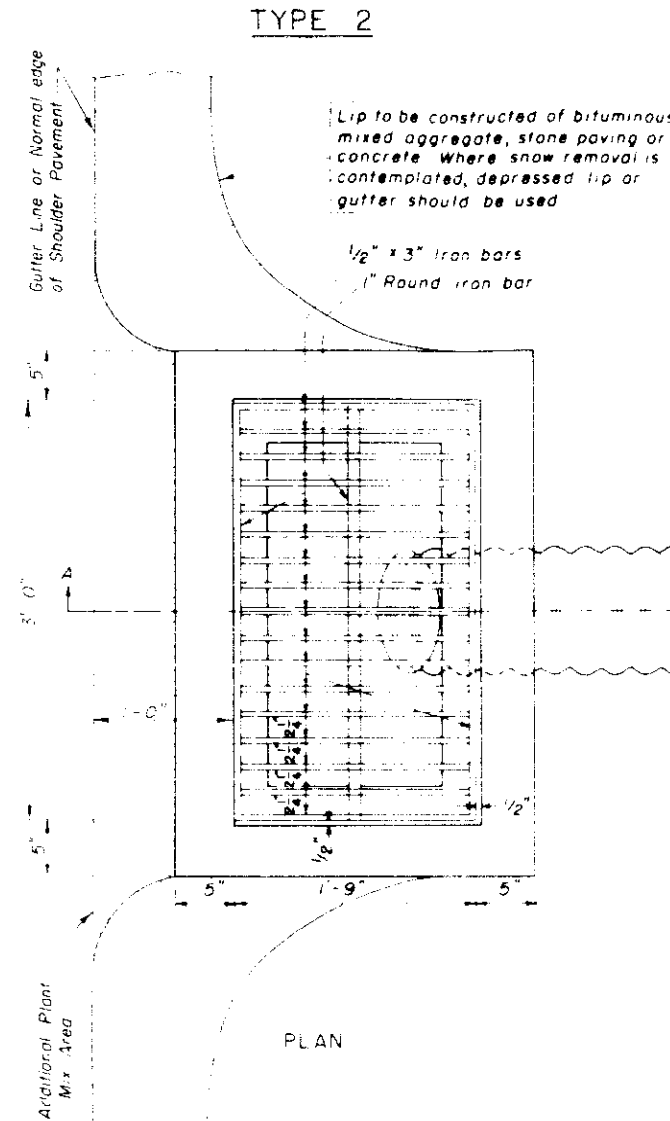
REGION NO.	DIVISION	PROJECT NO.	SHEET NO.
9	RDG	C04-0038-01	23
REVISIONS			
7-17-59	GENERAL	TYPE NO 1	HEP
10-27-59	NOTE ON TYPE NO 1		EEQ
1-13-59	REV TYPE NO 3		EEQ
10-1-60	GENERAL		DRS



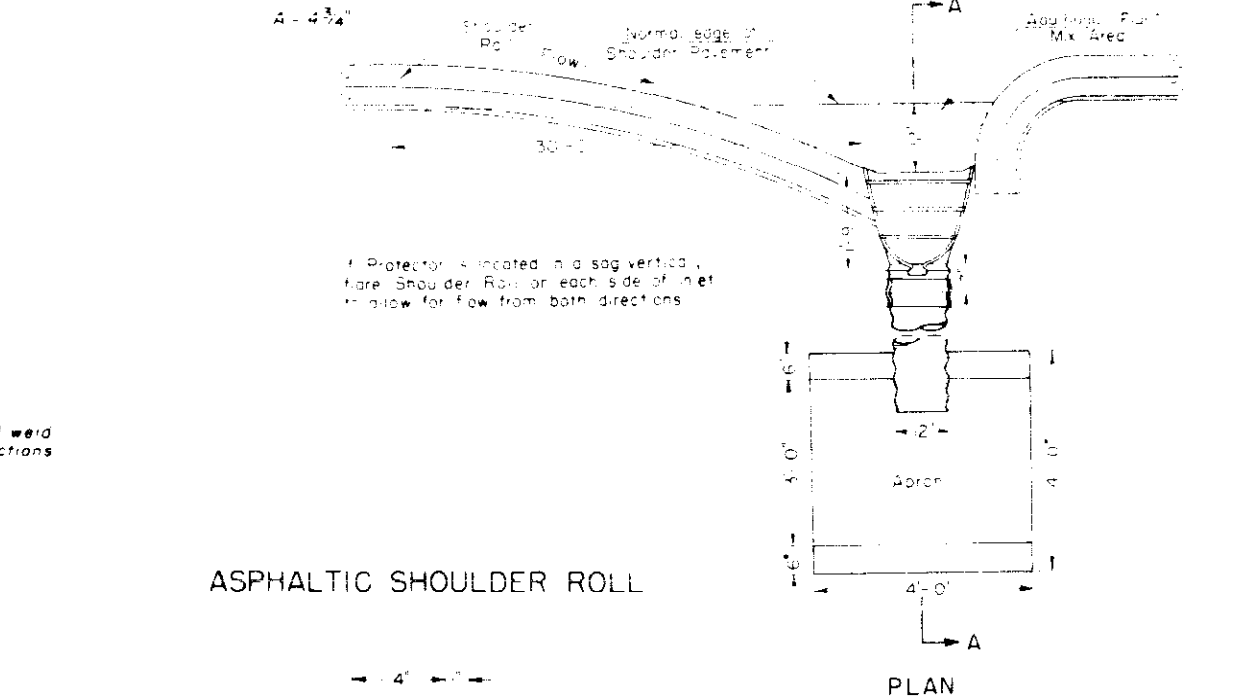
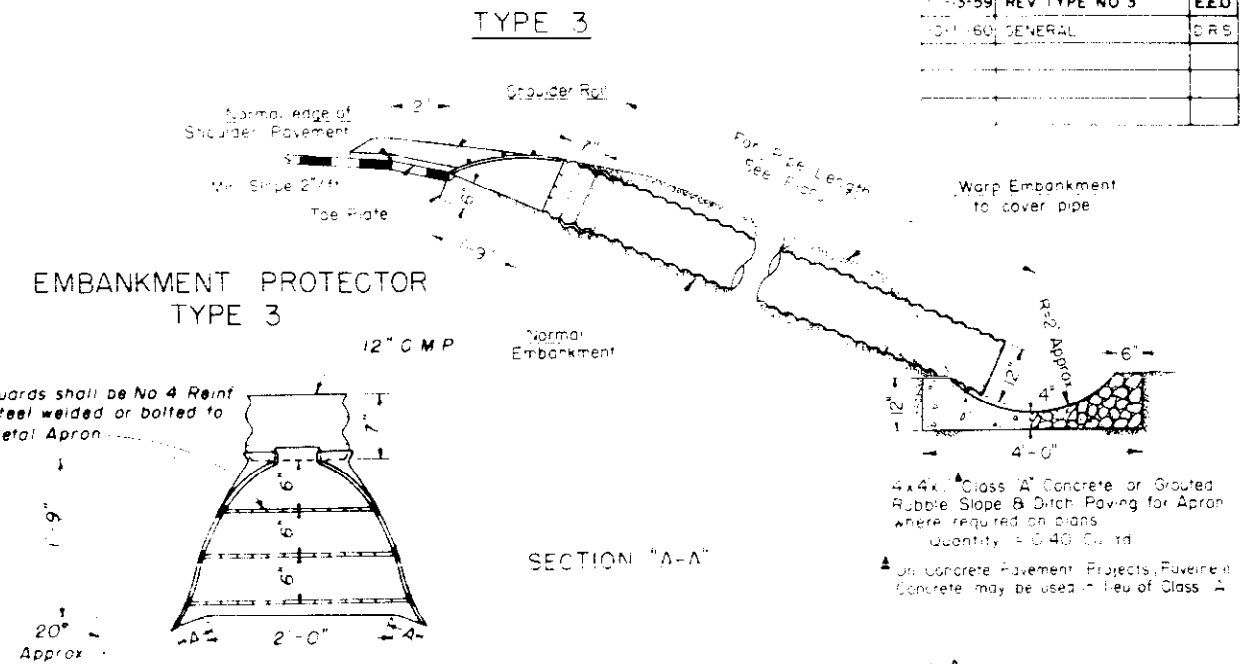
TABULATION OF DIMENSIONS

D	O	W	W _i	D _i	H	H _i
12"	6"	25 1/2"	16 1/2"	8"	3"	16"
18"	9"	49 1/2"	37 1/2"	10"	3"	18"
24"	12"	49 1/2"	37 1/2"	12"	4"	20"

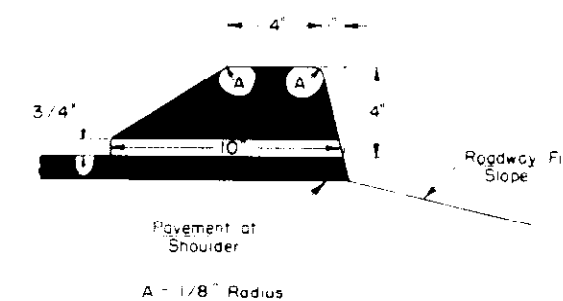
Size to be designated by diameter of outlet



Class "A" Concrete = 0.54 Cu Yds
Inlet Grating = 1



ASPHALTIC SHOULDER ROLL



NOTE: 0.647 X Specific Gravity of Briquette = Tons per Station

COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD
EMBANKMENT
PROTECTORS

Designed by TEF
Checked by EEO
Approved by Date November 1959

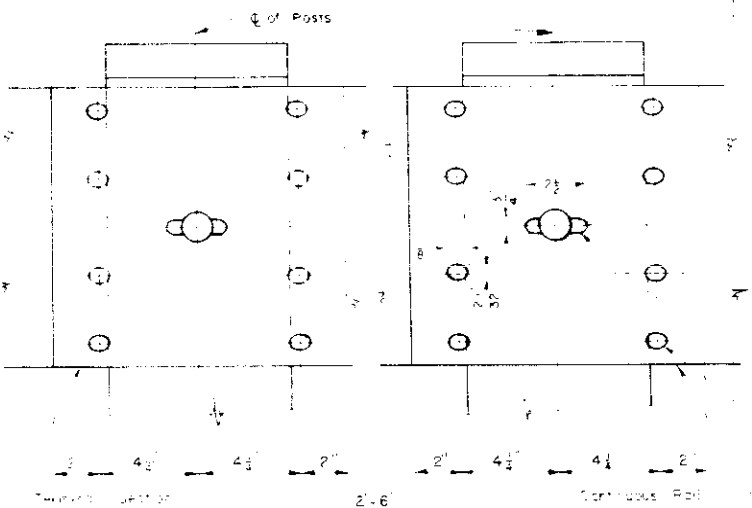
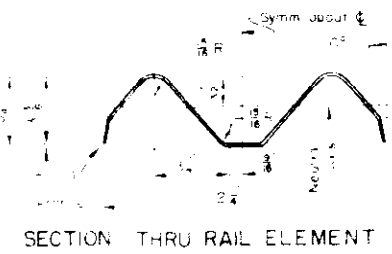
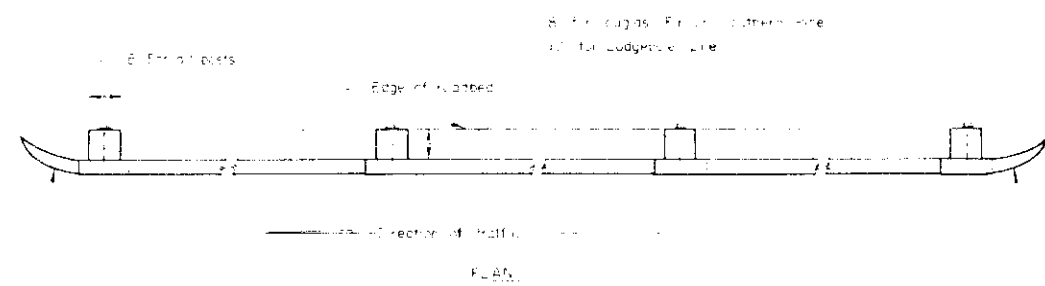
STANDARD M-21-D

PROJECT NO. SHEET NO.

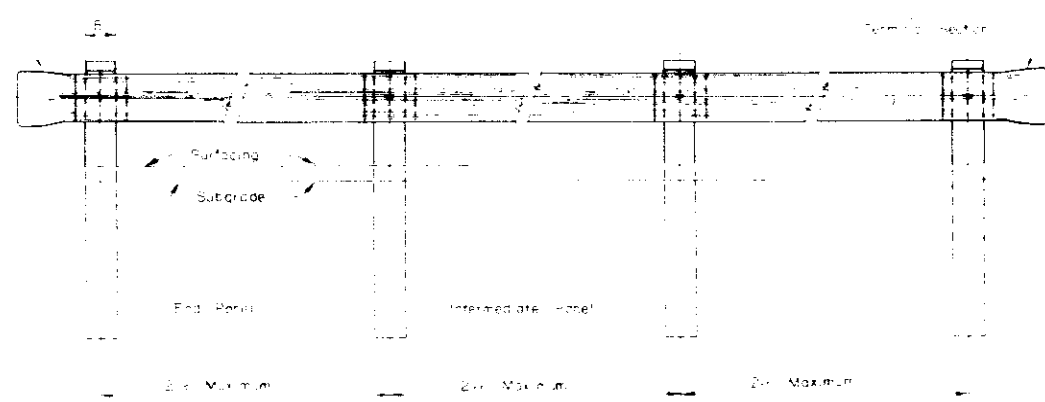
004-0038-01 24

REVISIONS

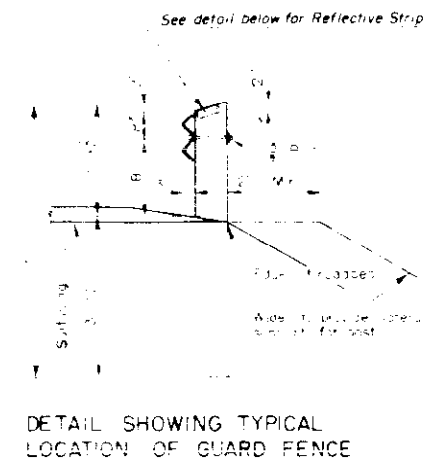
8-8-59 Added front of sheet E.H.H.
12-16-59 Changed D.J.S.
5-17-60 Revised dimension L.C.D.



DETAIL OF RAIL SPLICE

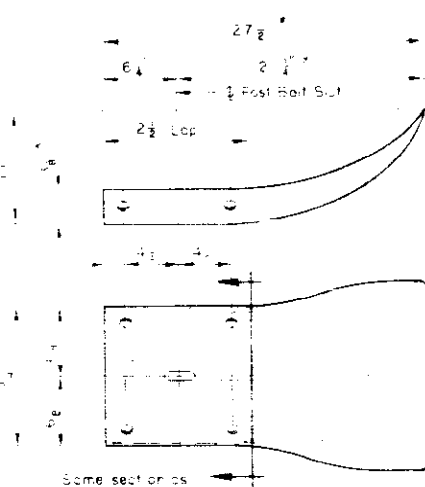


TYPICAL METAL PLATE GUARD RAIL

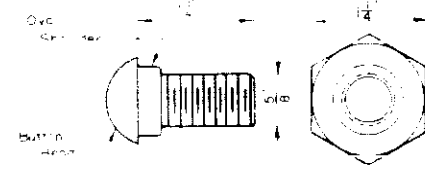


DETAIL SHOWING TYPICAL LOCATION OF GUARD FENCE

INSTALLATION DETAILS OF REFLECTORIZED STRIP (Work by State Forces)



DETAIL OF TERMINAL SECTION



SPLICE BOLT NUT

GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado Department of Highways, 1956 Edition.
All wood posts shall be close-grained Douglas Fir of the Coast Region, Lense Longleaf or Shortleaf Southern Pine or Lodgepole Pine.
All wood posts shall be square-headed, full sawn, with tops beveled as shown. All bolt holes are to be drilled 1/8 inch larger than diameter of bolt before treatment is applied. All wood posts shall be pressure treated to the 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 center line of the roadway.
All wood posts shall be set and tamped in place and shall be in the line and proper as directed by the Engineer.
Where sidewalks are constructed adjacent to the lane for traffic, guard fence shall be placed in such a 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.

METAL PLATE GUARD FENCE (STEEL) SPECIFICATIONS

Metal plate guard rail shall be painted in accordance with standard specifications.
Metal plate guard rail galvanized in accordance with Table I of ASTM A-93 may be furnished in lieu of painting requirements.
Metal plates shall not be lighter than No. 12 U.S. standard gauge.
Standard galvanized wrought steel washers shall be used under all bolt heads and nuts coming in contact with wood posts.

METAL PLATE GUARD FENCE (ALUMINUM) SPECIFICATIONS

Aluminum plates shall have a nominal thickness of not less than 0.125 inches.
No painting of the aluminum guard rail elements, end sections or fasteners will be required.

MATERIAL SPECIFICATIONS

The following members shall be of the alloy and temper specified, and shall conform to the ASTM specification listed below:

Member	Alloy	ASTM Specification
Rail elements	2024-T3 Alclad	B 209
Terminal sections	2024-T42 Alclad	B 209
Bolts	2024-T4 204 Aluminite finish	B 211
Nuts	6061-T6	B 211
Washers	2024-T4 Alclad	B 211

Dimensions marked by (*) may vary by no more than 1/2 inch

COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD
METAL PLATE GUARD FENCE
(BEAM TYPE)

Approved by: [Signature]
Checked by: [Signature]
Date: 11/15/1956

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-C
(SHEET 1 OF 2 SHEETS)

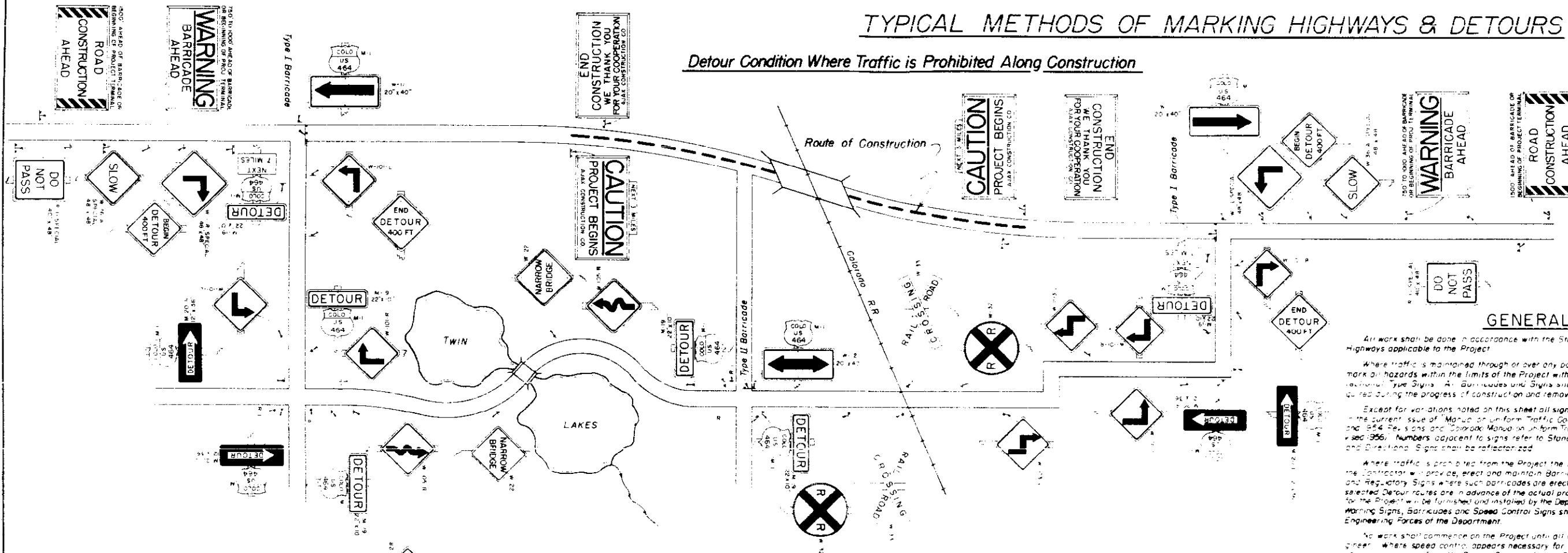
FED. ROAD DIST. NO.	DIST. NO.	PROJECT NO.	SHEET NO.
9	COLD	C04-0038-01	25

REVISIONS

02-58 General JCR

TYPICAL METHODS OF MARKING HIGHWAYS & DETOURS

Detour Condition Where Traffic is Prohibited Along Construction



GENERAL NOTES

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

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

Except for variations noted on this sheet all signs will be in conformity with the specification outlined in the current issue of "Manual on Uniform Traffic Control Devices for Streets & Highways, PRA August 1948 and 1954 Editions and "Colorado Manual on Uniform Traffic Control Devices for Streets & Highways CDOT 1952 Revised 1956". Numbers adjacent to signs refer to Standards in the manual. Standard Warning, Regulatory and Directional Signs shall be reflectorized.

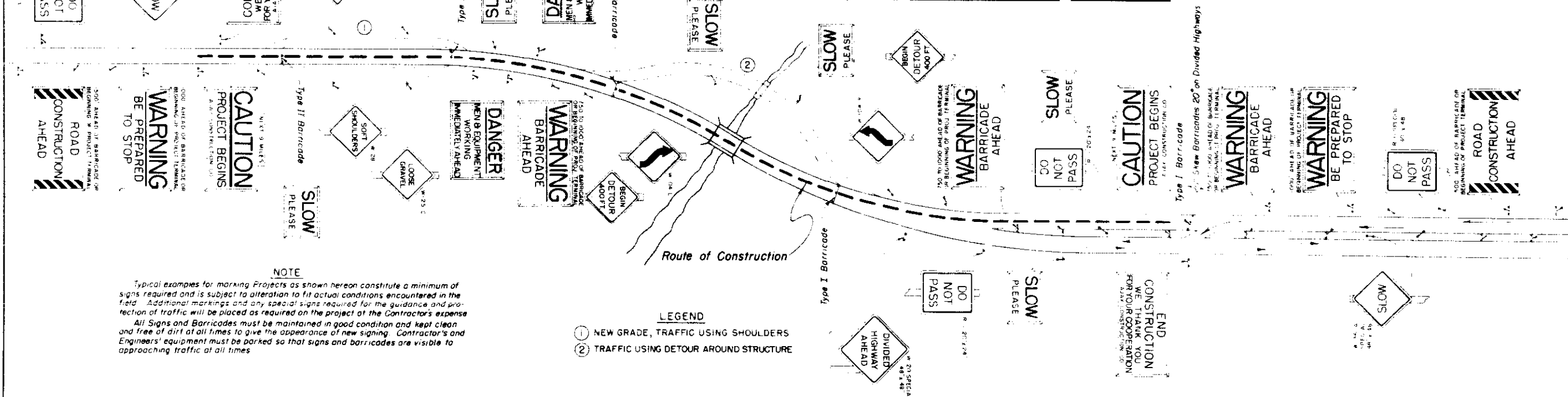
Where traffic is prohibited from the Project the Detour will be marked by the Department except that the Contractor will provide, erect and maintain Barricades complete with approved Directional Arrows and Regulatory Signs where such barricades are erected and maintained at the ends of the Project or where selected detour routes are in advance of the actual project terminal. U.S. or State Route Markers required for the Project will be furnished and installed by the Department. The location and positioning of Advance Warning Signs, Barricades and Speed Control Signs shall be as recommended by the appropriate District Engineering Forces of the Department.

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

4. Signs are to be in clear view of approaching traffic and are not to be obstructed by equipment, weeds or other wise. Where two identical type signs are used for dual posting they are to be staggered on the two sides of the highway for at least a distance of 75 to avoid a tunneling effect.

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

Condition Where Traffic is Permitted Along Construction



NOTE

Typical examples for marking Projects as shown hereon constitute a minimum of signs required and is subject to alteration to fit actual conditions encountered in the field. Additional markings and any special signs required for the guidance and protection of traffic will be placed as required on the project at the Contractor's expense. All Signs and Barricades must be maintained in good condition and kept clean and free of dirt at all times to give the appearance of new signing. Contractor's and Engineer's equipment must be parked so that signs and barricades are visible to approaching traffic at all times.

LEGEND

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

COLORADO
DEPARTMENT OF HIGHWAYS

Standard Roadway
Construction Traffic Signs

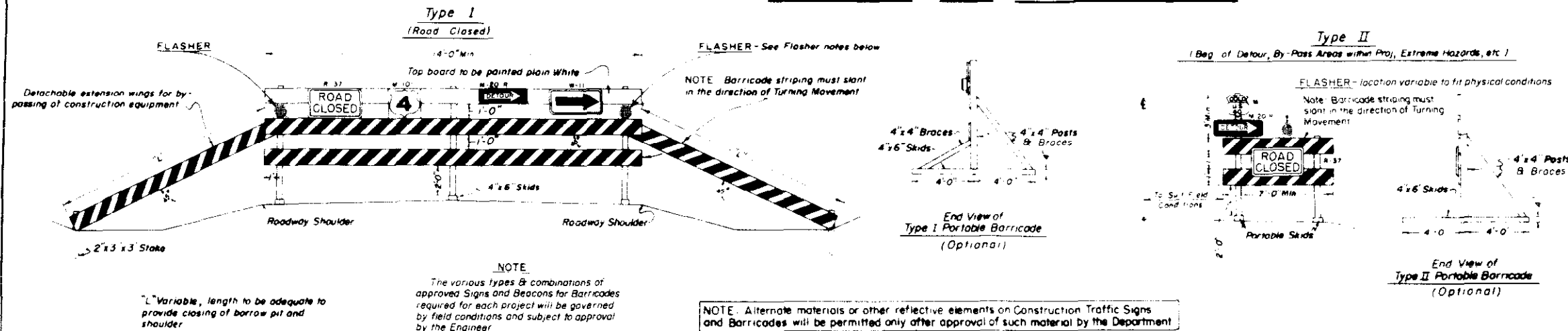
Designed by JCR
Made by JCR
Checked by JCR
Approved by J. J. J. J.
Engineer, Survey & Plans
Date: July 22, 1955

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

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

PROJECT NO. 07-003B-01
SHEET NO. 26
Rev 10-23-58 HJR

DETAILS OF BARRICADES



SPECIFICATIONS

PAINT - All paint and methods of painting shall be in conformity with the Standard Specifications of the Colorado Department of Highways for painting of Timber Structures

STRIPING - Planking and Wings shall be painted with Maintenance Flat Black on both sides before adding any one of the following acceptable Reflective Strips

- (a) Wide Angle White, 7" strip, spaced 8" apart
- (b) Flat Top Silver, 3" strip, spaced 7" apart
- (c) Direct Prisms of Glass Beads in Paint, 3" strip, spaced 7" apart

Stripes shall be applied on both front and back of barricades for opposite direction use

Division of traffic will be accomplished as follows

- 1- Stripes for barricades diverting traffic to the left shall start on the right hand side of the lower plank and progress to the left. Traffic diversion to the right will be just the opposite
- 2- Stripes on barricades diverting traffic in both directions shall begin at the center of the lower plank and progress in both directions

TIMBER - All timber used shall conform to the Standard Specifications for Miscellaneous Untreated Timber

Planking	1 x 2 or 2 x 2	545
Posts (Barricades)	6 x 6	545
Posts (Signs)	4 x 4	545

The Reflective Stripes on planking & wings on barricades shall be reflectorized with White or Silver Reflective Material of a type acceptable to the Department

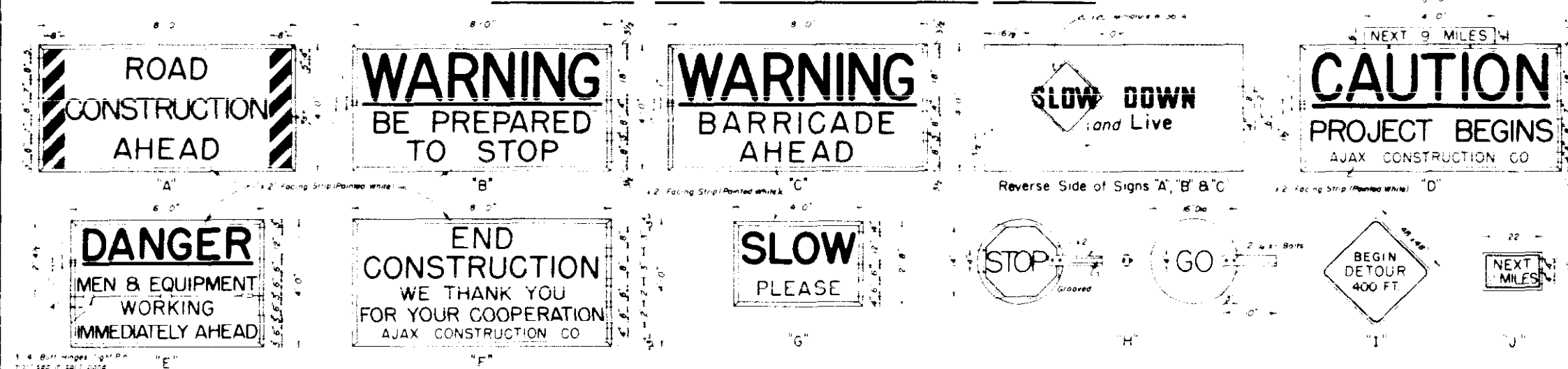
Barricades may be either portable as shown or fixed with posts set into the ground

All skids, braces and posts to be painted white and nailed together with No 20d nails

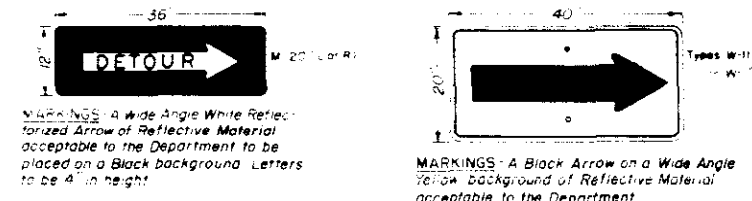
Bases to be weighted where necessary to provide stability

When this method is used as described above or when white binder and beads are applied to planking and wings, alternate black stripes using Maintenance Flat Black paint shall be applied over the reflective material in the prescribed pattern. All measurements for striping are to be made along the horizontal axis of the board

DETAILS OF CONSTRUCTION SIGNS



Details of Reflectorized Arrows



DETAILS OF SIGN AND BEACON FABRICATION AND USAGE

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

CONSTRUCTION SIGN "A" - Wide Angle White background with painted Black lettering. Barricade stripes of 4" Wide Angle White placed over Black painted vertical stripes spaced as shown above. This sign is the first advance warning sign and shall be placed 1500 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way in all cases

CONSTRUCTION SIGN "B" - Apply top 23" strip of Flat Top Silver, reversed screened or sprayed with Transparent Red Paint allowing the words "WARNING" and 1-inch Underline to remain as Flat Top Silver. Balance of lettering painted Black on a 22" strip of Wide Angle White. This sign is the second advance warning sign and shall be placed 1000 feet ahead of barricade or beginning of project terminal, and on both sides of the travelled way on divided highways and singly on two-lane highways

CONSTRUCTION SIGN "C" - Apply top 23" strip of Flat Top Silver, reversed screened or sprayed with Transparent Red Paint allowing the words "WARNING" and 1-inch Underline to remain as Flat Top Silver. Balance of lettering painted Black on a 22" strip of Wide Angle White. This sign is the third advance warning sign in cases where barricades are used and shall be placed 750 to 1000 feet ahead of barricade or beginning of project terminal and on both sides of the travelled way on divided highways and singly on two-lane highways

REVERSE SIDES OF SIGNS "A", "B" and "C" - The word "SLOW" shall be painted Black and superimposed over a White background

CONSTRUCTION SIGN "D" - Apply top 24 1/2" strip of Flat Top Silver, reversed screened or sprayed with Transparent Red Paint allowing the words "CAUTION" and 1/2-inch Underline to remain as Flat Top Silver. Balance of lettering painted Black on a 20 1/2" strip of Wide Angle White. This sign will be provided with a detachable 1" material board mounted on back of sign with 2-1/4 x 2" bolts. This board shall be painted white with Black lettering (indicate to the nearest Mile). This sign shall be placed to mark the Beginning of the Project. To be placed singly and may be placed opposite barricade if desirable

CONSTRUCTION SIGN "E" - Apply top 17 1/2" strip of Flat Top Silver, reversed screened or sprayed with Transparent Red Paint allowing the words "DANGER" and 1-inch Underline to remain as Flat Top Silver. Balance of lettering painted Black on a 27 1/2" strip of Wide Angle White. The sign is of the hinged and fold type to facilitate the closing down of sign when the need is not present. This sign shall be placed 500 feet ahead of the situation on hand

CONSTRUCTION SIGN "F" - The words "END CONSTRUCTION" and "CONTRACTORS NAME" shall be painted Black on strips 22" and 6 1/2" respectively of Wide Angle White. For balance of lettering, apply 16 1/2" strip of Flat Top Silver, reversed screened or sprayed with Transparent Red Paint allowing "WE THANK YOU FOR YOUR COOPERATION" remaining in Flat Top Silver. This sign shall be placed to mark the Ending of the Project. To be placed singly and may be placed opposite barricade if desirable

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

All of the preceding signs shall be fastened to 2-4 x 4" posts set 4 feet in the ground with a minimum of 3-1/4" x 4" nailing strips on the back. Bottom of sign to be not less than 36" above the ground

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

DETOUR WARNING SIGN "I" - To be of 3/4" (Min.) plywood or No 16 (Min.) gauge metal with Black painted letters on a Wide Angle Yellow Background

CONSTRUCTION SIGN "J" - 36 x 9" metal signs to be placed between "NEXT MILES" spaced so as to accommodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor. Numerals calculated to the nearest Mile

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

FLARES AND TORCHES shall be either of the oil burning or electrical type approved by the Department and shall be placed 3 feet to 5 feet ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from the use thereof

FLASHERS used on Type I or II Barricade shall be of the Battery or Electrical Type and shall have no less than 12,566 sq. inches of light area (4" dia. lens). The illuminating element in a flashing amber beacon or signal shall be flashed continuously at a rate between 50 or 60 flashes per minute which will be clearly distinguishable to traffic. The duration in which Flashers will be left in operation will be governed by field conditions and subject to approval by the Engineer

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

The Department shall furnish and install the following as required OUTSIDE THE LIMITS of the Project

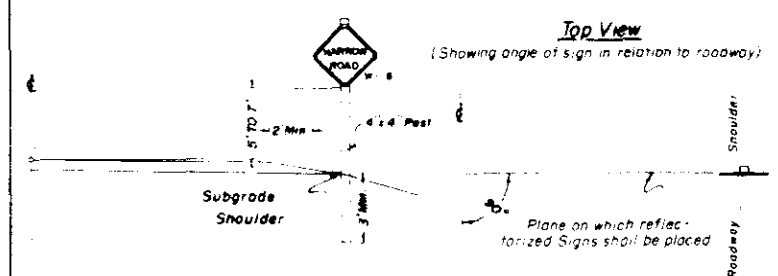
1. ROAD CONSTRUCTION AHEAD	Minimum 4
2. WARNING BE PREPARED TO STOP	Minimum 2
3. WARNING BARRICADE AHEAD	As Required
4. Standard Warning & Directional Signs	As Required

The Contractor shall furnish and install the following as required WITHIN THE LIMITS of the Project

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

including Type I Barricade located immediately inside of Project terminal points

Position of Signs Relative to Roadbed & Hazards



NOTE: Warning Signs to be made of 3/4" (Min.) plywood or No 16 Gauge (Min.) metal and shall be reflectorized

Location to be governed by field conditions

Exact location to be staked by the Engineer

In all cases warning signs are to be placed well in advance of hazard, the distance depending on topography, and existing approach speeds

COLORADO DEPARTMENT OF HIGHWAYS

Standard Roadway Construction Traffic Signs

Designed by JCR
Made by JCR
Checked by

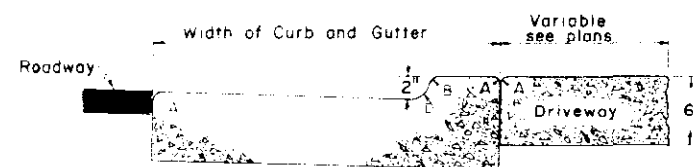
Approved by J. Fisher
Engineer, Surveys & Plans
Date: July 22, 1955

STANDARD CURBS AND GUTTERS

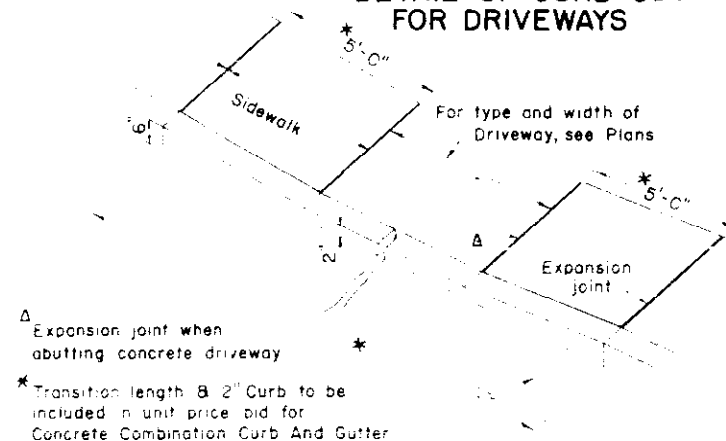
STANDARD M-45-A

REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
	COLD	C04-0038-01	27

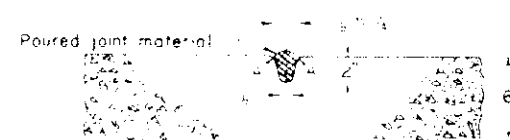
CONCRETE PAVEMENT (DRIVEWAYS)



DETAIL OF CURB CUT FOR DRIVEWAYS

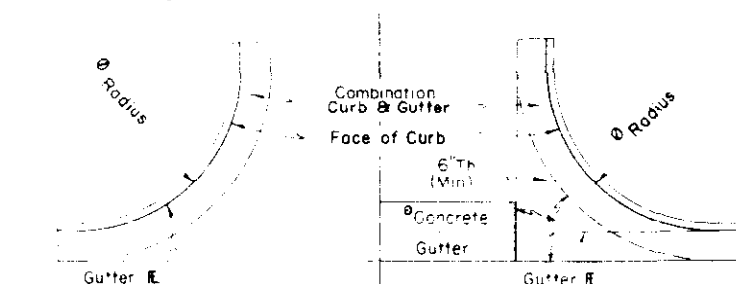


TRANSVERSE WEAKENED PLANE JOINT FOR CONCRETE PAVEMENT (DRIVEWAYS)



This joint required where length of slab exceeds 15 feet.

CONSTRUCTION OF CONCRETE GUTTERS AT INTERSECTIONS

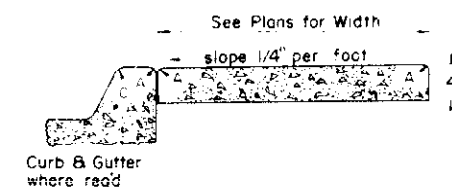


Length of Radius as shown elsewhere on Plans

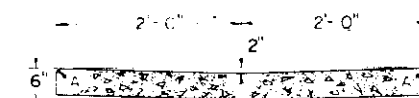
This section to be built when Concrete Gutter is not required.

This section to be built when Concrete Gutter is required.

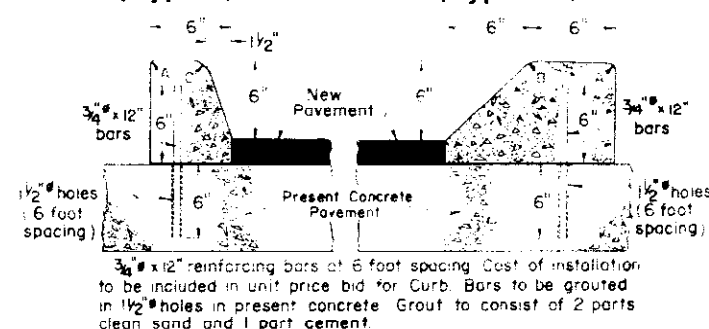
CONCRETE SIDEWALKS



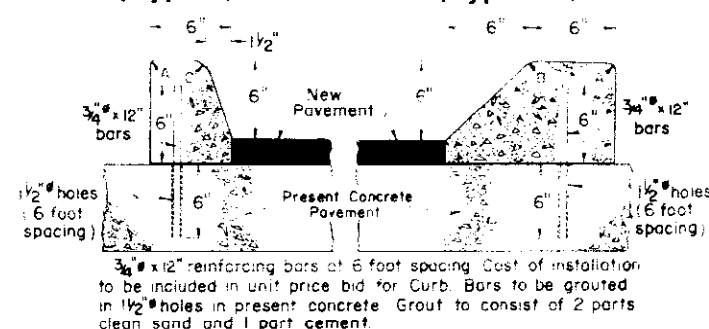
CONCRETE GUTTER



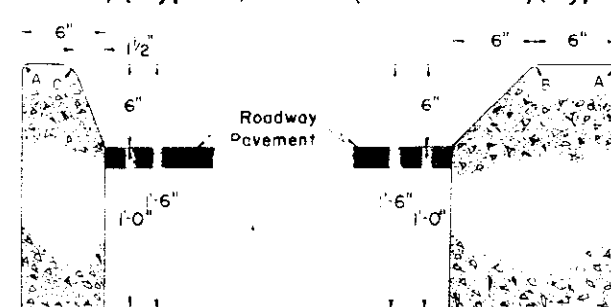
CONCRETE CURB (6" Barrier-Doweled) (Type I)



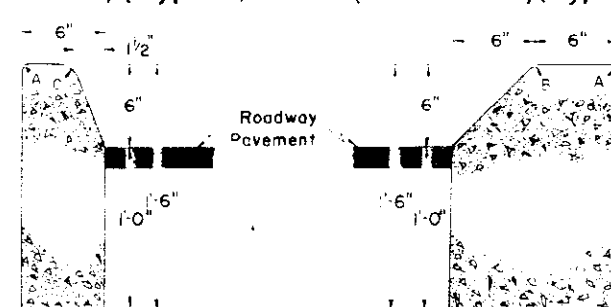
CONCRETE CURB (6" Mountable-Doweled) (Type I-M)



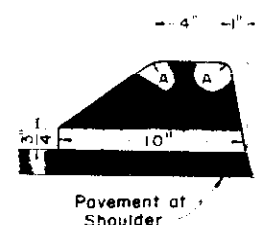
CONCRETE CURB (6" Barrier) (Type II)



CONCRETE CURB (6" Mountable) (Type II-M)



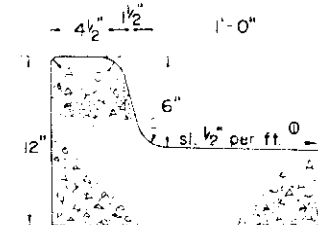
ASPHALTIC SHOULDER ROLL



NOTE:
0.647 x Specific Gravity of Asphalt = Tons per Station.

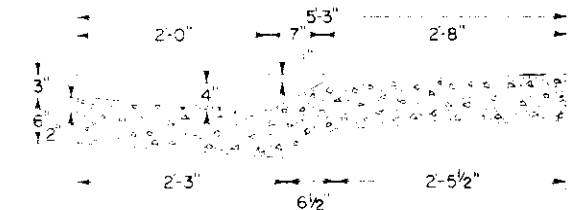
Roadway fill slope

CONCRETE COMBINATION CURB AND GUTTER (6" Barrier-1' Gutter) (Type I)

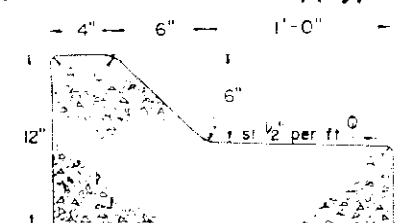


LEGEND FOR RADII	
A	1/8"
B	1/4"
C	1/2"
D	1 1/2"

CONCRETE COMBINATION CURB, GUTTER AND SIDEWALK (TYPE II-M)

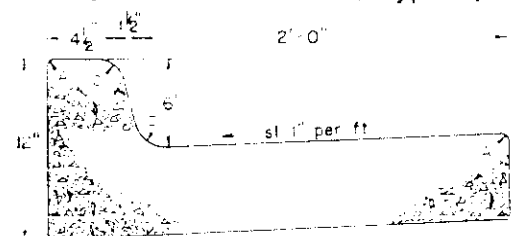


CONCRETE COMBINATION CURB AND GUTTER (6" Mountable-1' Gutter) (Type I-M)

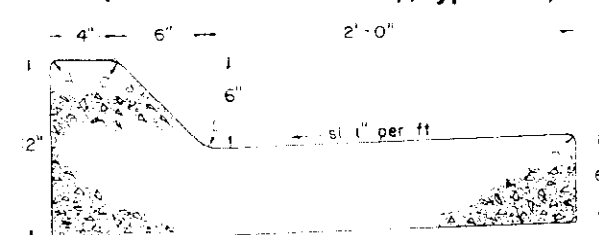


Slope in opposite direction when required for curves or warped pavement sections

CONCRETE COMBINATION CURB AND GUTTER (6" Barrier-2' Gutter) (Type II)



CONCRETE COMBINATION CURB AND GUTTER (6" Mountable-2' Gutter) (Type II-M)



GENERAL NOTES

All work shall be done in accordance with the Specifications of the Colorado Department of Highways.

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

COLORADO
DEPARTMENT OF HIGHWAYS

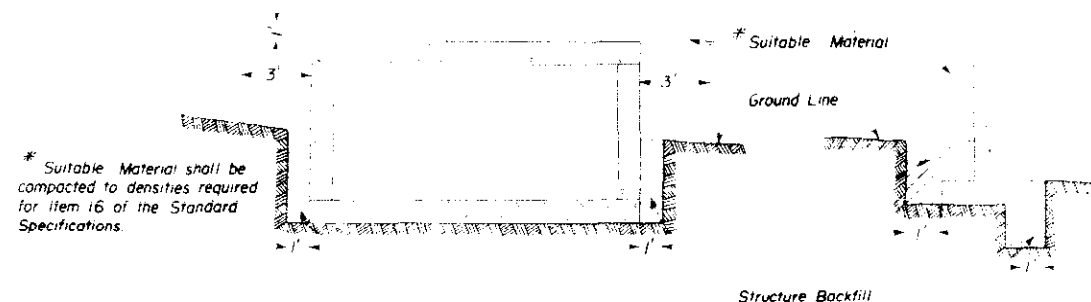
STANDARD
CURBS AND GUTTERS

Designed by: [Signature]
Checked by: [Signature]
Approved by: [Signature]
Date: 12-19-57

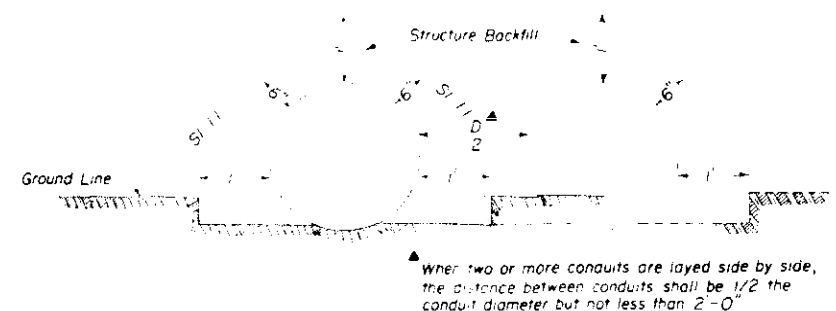
STANDARD M-60-B

FEED ROAD REG. NO.	DIVISION	PROJECT NO.	SHEET NO.
9	COLO.	C04-0038-01	28
REVISION 2-9-59 Dbl Cond & Cond in Tr. H.E.P.			

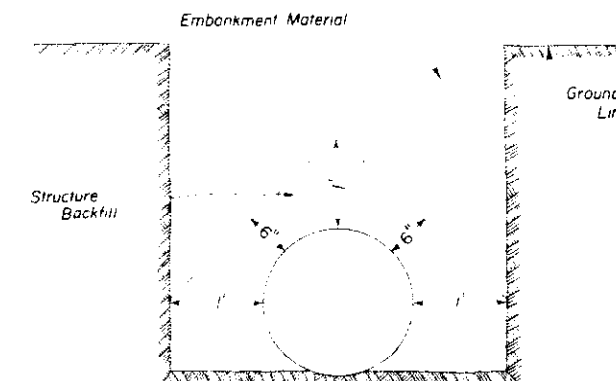
CONCRETE BOX CULVERTS & WINGWALLS



CIRCULAR CONDUIT

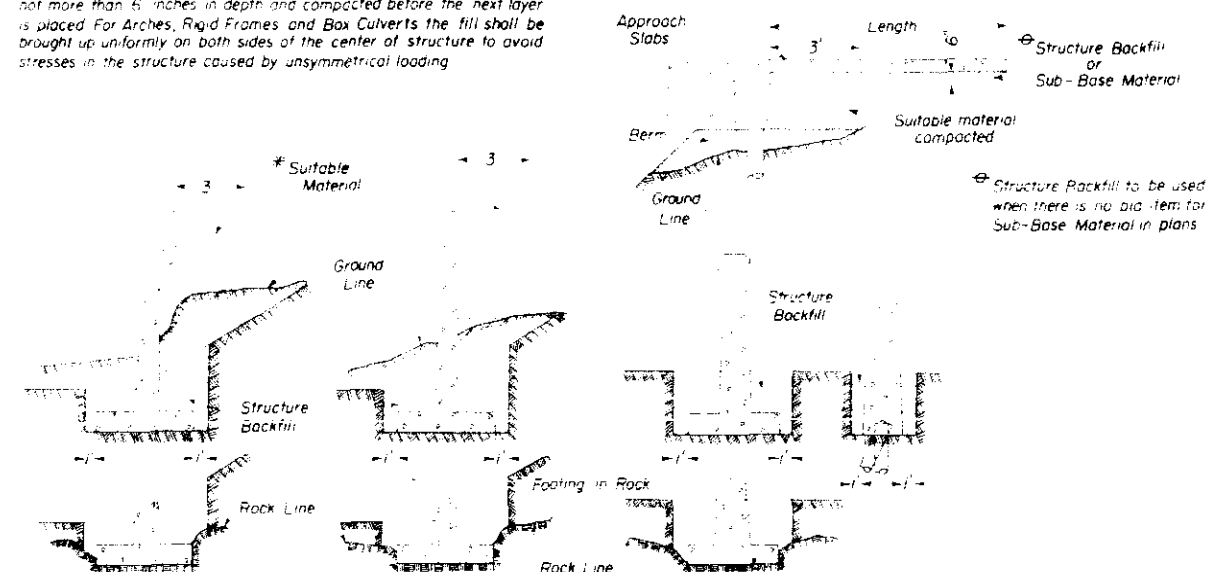


SIPHONS OR CONDUIT IN TRENCH



PIERS, ABUTMENTS, RETAINING WALLS ETC.

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



ELLIPTICAL OR ARCH CONDUIT



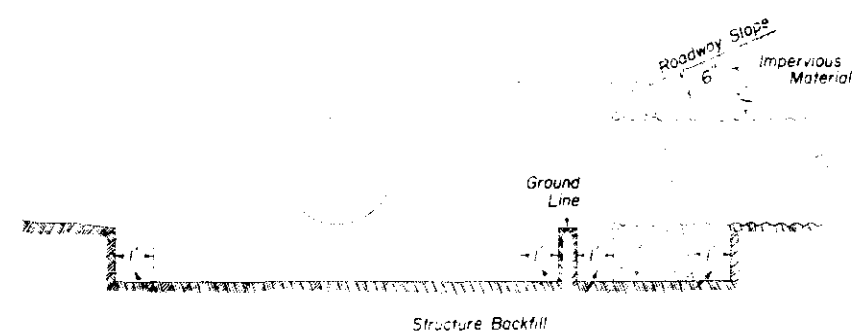
GENERAL NOTES

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

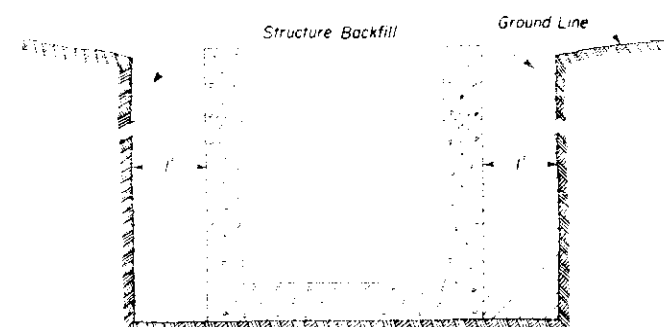
If, in the opinion of the Engineer, the material beneath the Structure is of such character as to cause unequal settlement along the length of the Structure, the material shall be removed to such a depth ordered, and backfilled with gravel or other suitable material and compacted in accordance with Item 16 of the Standard Specifications.

Suitable Material shall be any "Unclassified Excavation" material developed on the project except large rock, boulders or other materials considered by the Engineer to be undesirable for backfill around culverts, boxes etc.

HEADWALLS AND END OF CULVERTS



DROP INLETS, DIVISION BOXES, INTERCEPTING HEADWALLS ETC.



COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD METHODS
OF BACKFILL
AROUND STRUCTURES

Designed by H.E.P. | Approved by D.E. [Signature]
Made by D.M.E. | Bridge Engineer
Checked by L.E.O. | Date: May 3, 1959

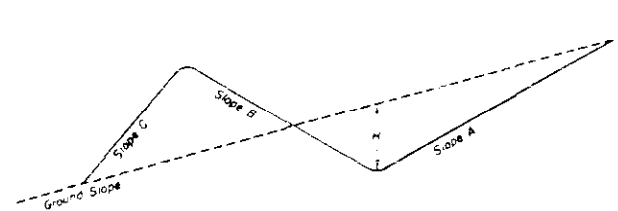
STANDARD TYPES *of* DITCHES *and* CONSTRUCTION METHODS

STANDARD M-107-D

REG. NO. 9	DIVISION C.O.D.O.	PROJECT NO. C04-0038-01	SHEET NO. 29
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DETAILS *for* CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



PURPOSE & USE OF THE TABLE

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

Typical Construction Layouts

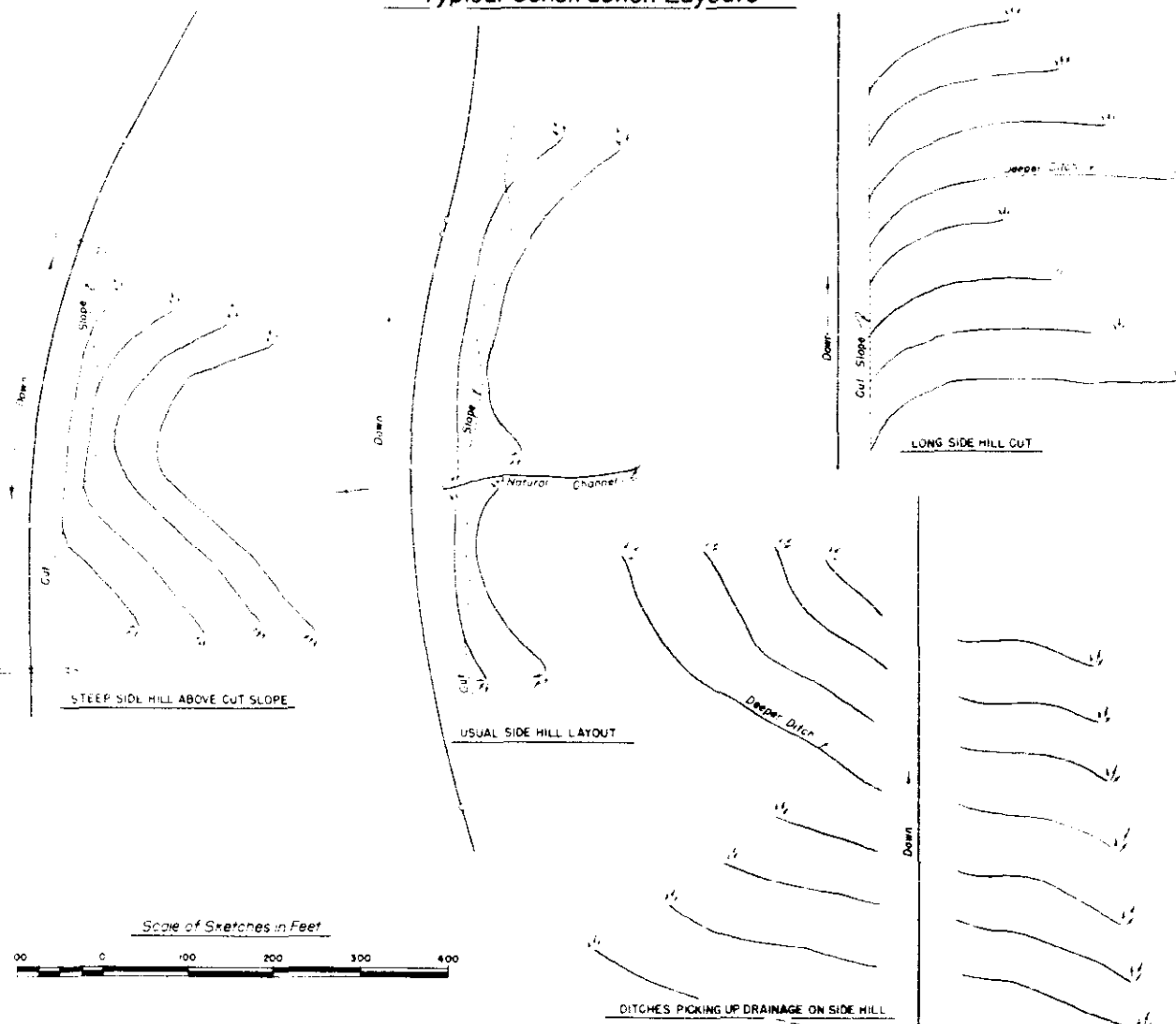
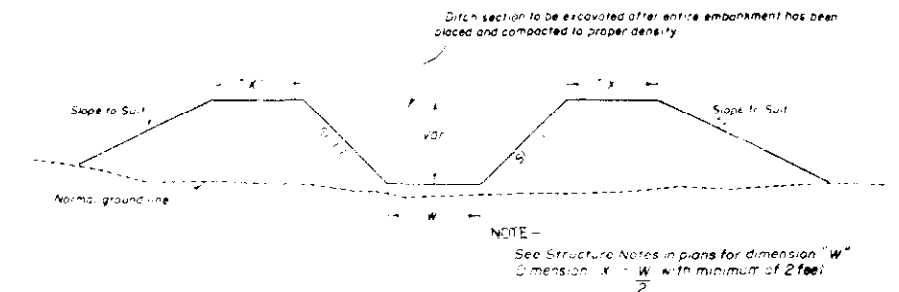


Table of Slopes and Yardages

Ground	SLOPES			H	Cubic Yards per 100 lin. ft. of Ditch
	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
	1-1/2:1	2:1		15"	14
				18"	20
				21"	27
		1-1/2:1		15"	13
				18"	19
				21"	25
4:1	2:1	4:1	2:1	15"	12
				18"	17
				21"	23
		3:1		15"	10
				18"	15
				21"	20
	1-1/2:1	1-1/2:1		15"	10
				18"	14
				21"	19
		2:1		15"	7
				18"	24
				21"	32
3:1	2:1	4:1	2:1	15"	15
				18"	22
				21"	30
		3:1		15"	5
				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	1-1/2:1	2:1	1-1/2:1	15"	1
				18"	16
				21"	21
		1-1/2:1		15"	10
				18"	14
				21"	20
1-1/2:1	1:1	1-1/2:1	1:1	15"	22
				18"	31
				21"	43
		2:1		15"	21
				18"	30
				21"	41
1:1	1-1/2:1	1-1/2:1	1-1/2:1	15"	20
				18"	29
				21"	40
		2:1		15"	13
				18"	19
				21"	26
1-1/2:1	1:1	1-1/2:1	1:1	15"	12
				18"	17
				21"	24
		1-1/2:1		15"	12
				18"	17
				21"	23
1-1/2:1	1:1	1-1/2:1	1:1	15"	20
				18"	29
				21"	40
		1-1/2:1		15"	20
				18"	28
				21"	39
1-1/2:1	1:1	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
		1-1/2:1		15"	11
				18"	16
				21"	21

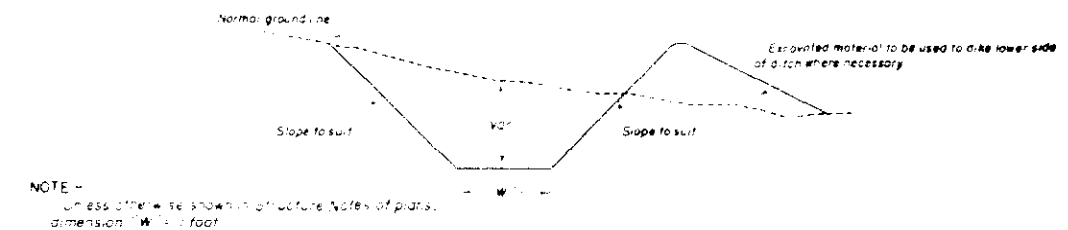
▲ Slopes are approximate and may be varied to suit conditions encountered during construction

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



For Embankment Sections

Generally for use in Irrigation Ditches & Channel Changes



For Cut Sections

GENERAL NOTES

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

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

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

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

The following horizontal spacing of ditches is recommended

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

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

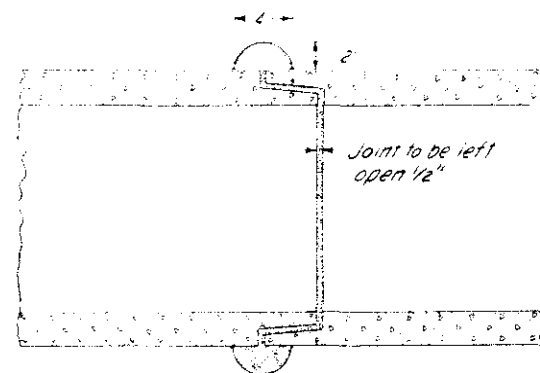
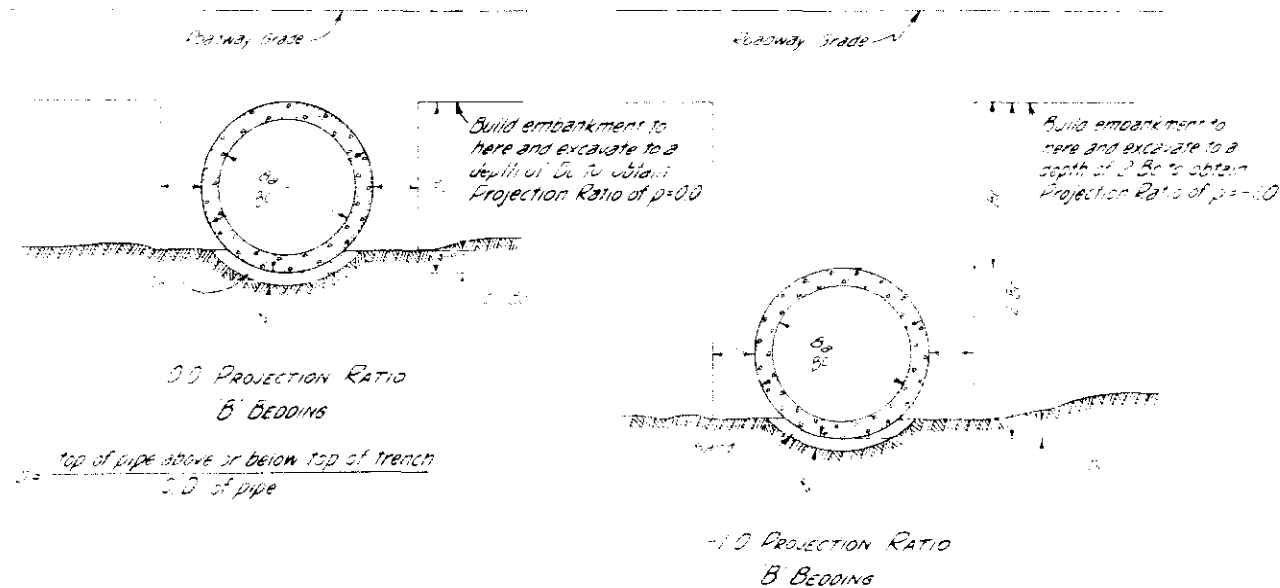
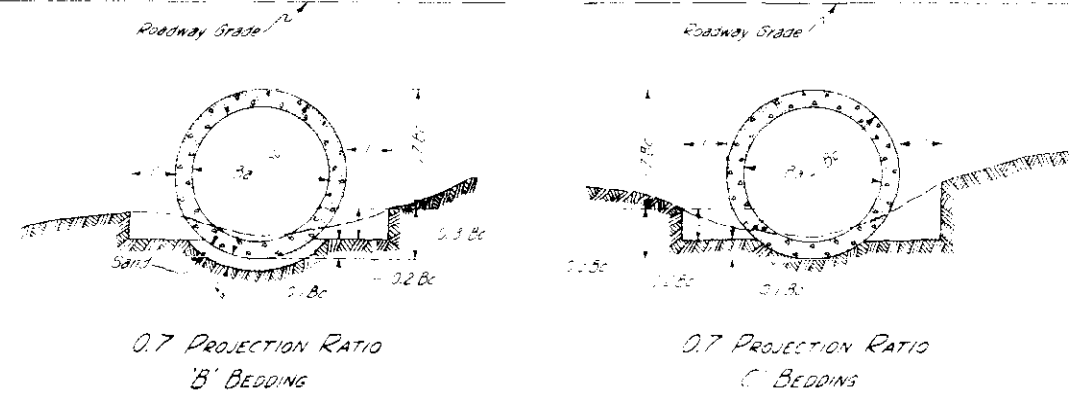
COLORADO
DEPARTMENT OF HIGHWAYS

Standard Types of Ditches
and
Construction Methods

Designed by CGM
Made by CGM
Checked by
Approved by B. M. H. [Signature]
Engineer, Surveys & Plans
Date Aug. 2, 1950

STANDARD M-112-G

PROJECT NO. **C04-0038-01 30**



CONCRETE OR MORTAR PIPE JOINT

Where the flow line grade of the pipe is 10% or greater, all pipe shall be the Bell and Spigot type or shall be Tongue and Groove pipe with concrete collars as detailed above or a type approved in writing by the Engineer.

GENERAL NOTES

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

The height of fill for each culvert shall determine the bedding and class of concrete pipe to be used (See table herewith). Location, length and inside diameter of pipe, and class of pipe required shall be shown on plans.

Type 'B' bedding is to be used in solid rock.

Details for placement of structure backfill materials are shown elsewhere in plans.

When projection ratios of 0.0 or -1.0 are used, backfilling above structure backfill material shall be made with materials excavated in order to produce the projection ratio. Cost of this backfilling is to be included in the contract unit price for Item 52.

If material does not stand with a vertical face when attempting to produce 0.0 or -1.0 projection ratios, this standard is not applicable.

APPROVED COMBINATIONS OF HEIGHT OF FILL - PROJECTION RATIO - BEDDING - CLASS

86	HEIGHT OF FILL	PROJECTION RATIO	BEDDING	CLASS
2	* 7	0.7	C	I
	7-10	0.7	C	II
	10-12	0.7	C	III
	12-14	0.7	C	IV
	14-16	0.7	C	V
4	16-18	0.7	C	VI
	18-20	0.7	C	VII
	20-22	0.7	C	VIII
	22-24	0.7	C	IX
	24-26	0.7	C	X
6	* 8	0.7	C	I
	8-11	0.7	C	II
	11-14	0.7	C	III
	14-16	0.7	C	IV
	16-18	0.7	C	V
8	18-20	0.7	C	VI
	20-22	0.7	C	VII
	22-24	0.7	C	VIII
	24-26	0.7	C	IX
	26-28	0.7	C	X
10	* 10	0.7	C	I
	10-11	0.7	C	II
	11-12	0.7	C	III
	12-14	0.7	C	IV
	14-16	0.7	C	V
12	16-18	0.7	C	VI
	18-20	0.7	C	VII
	20-22	0.7	C	VIII
	22-24	0.7	C	IX
	24-26	0.7	C	X
14	* 12	0.7	C	I
	12-14	0.7	C	II
	14-16	0.7	C	III
	16-18	0.7	C	IV
	18-20	0.7	C	V
16	20-22	0.7	C	VI
	22-24	0.7	C	VII
	24-26	0.7	C	VIII
	26-28	0.7	C	IX
	28-30	0.7	C	X
18	* 14	0.7	C	I
	14-16	0.7	C	II
	16-18	0.7	C	III
	18-20	0.7	C	IV
	20-22	0.7	C	V
20	22-24	0.7	C	VI
	24-26	0.7	C	VII
	26-28	0.7	C	VIII
	28-30	0.7	C	IX
	30-32	0.7	C	X
22	* 16	0.7	C	I
	16-18	0.7	C	II
	18-20	0.7	C	III
	20-22	0.7	C	IV
	22-24	0.7	C	V
24	24-26	0.7	C	VI
	26-28	0.7	C	VII
	28-30	0.7	C	VIII
	30-32	0.7	C	IX
	32-34	0.7	C	X
26	* 18	0.7	C	I
	18-20	0.7	C	II
	20-22	0.7	C	III
	22-24	0.7	C	IV
	24-26	0.7	C	V
28	26-28	0.7	C	VI
	28-30	0.7	C	VII
	30-32	0.7	C	VIII
	32-34	0.7	C	IX
	34-36	0.7	C	X
30	* 20	0.7	C	I
	20-22	0.7	C	II
	22-24	0.7	C	III
	24-26	0.7	C	IV
	26-28	0.7	C	V
32	28-30	0.7	C	VI
	30-32	0.7	C	VII
	32-34	0.7	C	VIII
	34-36	0.7	C	IX
	36-38	0.7	C	X
34	* 22	0.7	C	I
	22-24	0.7	C	II
	24-26	0.7	C	III
	26-28	0.7	C	IV
	28-30	0.7	C	V
36	30-32	0.7	C	VI
	32-34	0.7	C	VII
	34-36	0.7	C	VIII
	36-38	0.7	C	IX
	38-40	0.7	C	X
38	* 24	0.7	C	I
	24-26	0.7	C	II
	26-28	0.7	C	III
	28-30	0.7	C	IV
	30-32	0.7	C	V
40	32-34	0.7	C	VI
	34-36	0.7	C	VII
	36-38	0.7	C	VIII
	38-40	0.7	C	IX
	40-42	0.7	C	X
42	* 26	0.7	C	I
	26-28	0.7	C	II
	28-30	0.7	C	III
	30-32	0.7	C	IV
	32-34	0.7	C	V
44	34-36	0.7	C	VI
	36-38	0.7	C	VII
	38-40	0.7	C	VIII
	40-42	0.7	C	IX
	42-44	0.7	C	X
46	* 28	0.7	C	I
	28-30	0.7	C	II
	30-32	0.7	C	III
	32-34	0.7	C	IV
	34-36	0.7	C	V
48	36-38	0.7	C	VI
	38-40	0.7	C	VII
	40-42	0.7	C	VIII
	42-44	0.7	C	IX
	44-46	0.7	C	X
50	* 30	0.7	C	I
	30-32	0.7	C	II
	32-34	0.7	C	III
	34-36	0.7	C	IV
	36-38	0.7	C	V
52	38-40	0.7	C	VI
	40-42	0.7	C	VII
	42-44	0.7	C	VIII
	44-46	0.7	C	IX
	46-48	0.7	C	X
54	* 32	0.7	C	I
	32-34	0.7	C	II
	34-36	0.7	C	III
	36-38	0.7	C	IV
	38-40	0.7	C	V
56	40-42	0.7	C	VI
	42-44	0.7	C	VII
	44-46	0.7	C	VIII
	46-48	0.7	C	IX
	48-50	0.7	C	X
58	* 34	0.7	C	I
	34-36	0.7	C	II
	36-38	0.7	C	III
	38-40	0.7	C	IV
	40-42	0.7	C	V
60	42-44	0.7	C	VI
	44-46	0.7	C	VII
	46-48	0.7	C	VIII
	48-50	0.7	C	IX
	50-52	0.7	C	X
62	* 36	0.7	C	I
	36-38	0.7	C	II
	38-40	0.7	C	III
	40-42	0.7	C	IV
	42-44	0.7	C	V
64	44-46	0.7	C	VI
	46-48	0.7	C	VII
	48-50	0.7	C	VIII
	50-52	0.7	C	IX
	52-54	0.7	C	X
66	* 38	0.7	C	I
	38-40	0.7	C	II
	40-42	0.7	C	III
	42-44	0.7	C	IV
	44-46	0.7	C	V
68	46-48	0.7	C	VI
	48-50	0.7	C	VII
	50-52	0.7	C	VIII
	52-54	0.7	C	IX
	54-56	0.7	C	X
70	* 40	0.7	C	I
	40-42	0.7	C	II
	42-44	0.7	C	III
	44-46	0.7	C	IV
	46-48	0.7	C	V
72	48-50	0.7	C	VI
	50-52	0.7	C	VII
	52-54	0.7	C	VIII
	54-56	0.7	C	IX
	56-58	0.7	C	X
74	* 42	0.7	C	I
	42-44	0.7	C	II
	44-46	0.7	C	III
	46-48	0.7	C	IV
	48-50	0.7	C	V
76	50-52	0.7	C	VI
	52-54	0.7	C	VII
	54-56	0.7	C	VIII
	56-58	0.7	C	IX
	58-60	0.7	C	X
78	* 44	0.7	C	I
	44-46	0.7	C	II
	46-48	0.7	C	III
	48-50	0.7	C	IV
	50-52	0.7	C	V
80	52-54	0.7	C	VI
	54-56	0.7	C	VII
	56-58	0.7	C	VIII
	58-60	0.7	C	IX
	60-62	0.7	C	X
82	* 46	0.7	C	I
	46-48	0.7	C	II
	48-50	0.7	C	III
	50-52	0.7	C	IV
	52-54	0.7	C	V
84	54-56	0.7	C	VI
	56-58	0.7	C	VII
	58-60	0.7	C	VIII
	60-62	0.7	C	IX
	62-64	0.7	C	X
86	* 48	0.7	C	I
	48-50	0.7	C	II
	50-52	0.7	C	III
	52-54	0.7	C	IV
	54-56	0.7	C	V
88	56-58	0.7	C	VI
	58-60	0.7	C	VII
	60-62	0.7	C	VIII
	62-64	0.7	C	IX
	64-66	0.7	C	X
90	* 50	0.7	C	I
	50-52	0.7	C	II
	52-54	0.7	C	III
	54-56	0.7	C	IV
	56-58	0.7	C	V
92	58-60	0.7	C	VI
	60-62	0.7	C	VII
	62-64	0.7	C	VIII
	64-66	0.7	C	IX
	66-68	0.7	C	X
94	* 52	0.7	C	I
	52-54	0.7	C	II
	54-56	0.7	C	III
	56-58	0.7	C	IV
	58-60	0.7	C	V
96	60-62	0.7	C	VI
	62-64	0.7	C	VII
	64-66	0.7	C	VIII
	66-68	0.7	C	IX
	68-70	0.7	C	X
98	* 54	0.7	C	I
	54-56	0.7	C	II
	56-58	0.7	C	III
	58-60	0.7	C	IV
	60-62	0.7	C	V
100	62-64	0.7	C	VI
	64-66	0.7	C	VII
	66-68	0.7	C	VIII
	68-70	0.7	C	IX
	70-72	0.7	C	X

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

At 90,000
chestnut

$\Delta = 8^{\circ} 16' 30'' R$
 $D = 6^{\circ} 45'$
 $T = 61.4$
 $C = 122.6'$
 $R = 848.9'$
 $S = 0.0321$
 $T_{\text{obs}} = 00$
 $MDS = 40 \text{ MHz}$
 $MDS(1,2) = 0$

SE 1/4, Sec. 36
T.13S., R.67W

SW 1/4, Sec. 3
T 13 S. R 66 W

EQUATION

Sanitary Sewer 

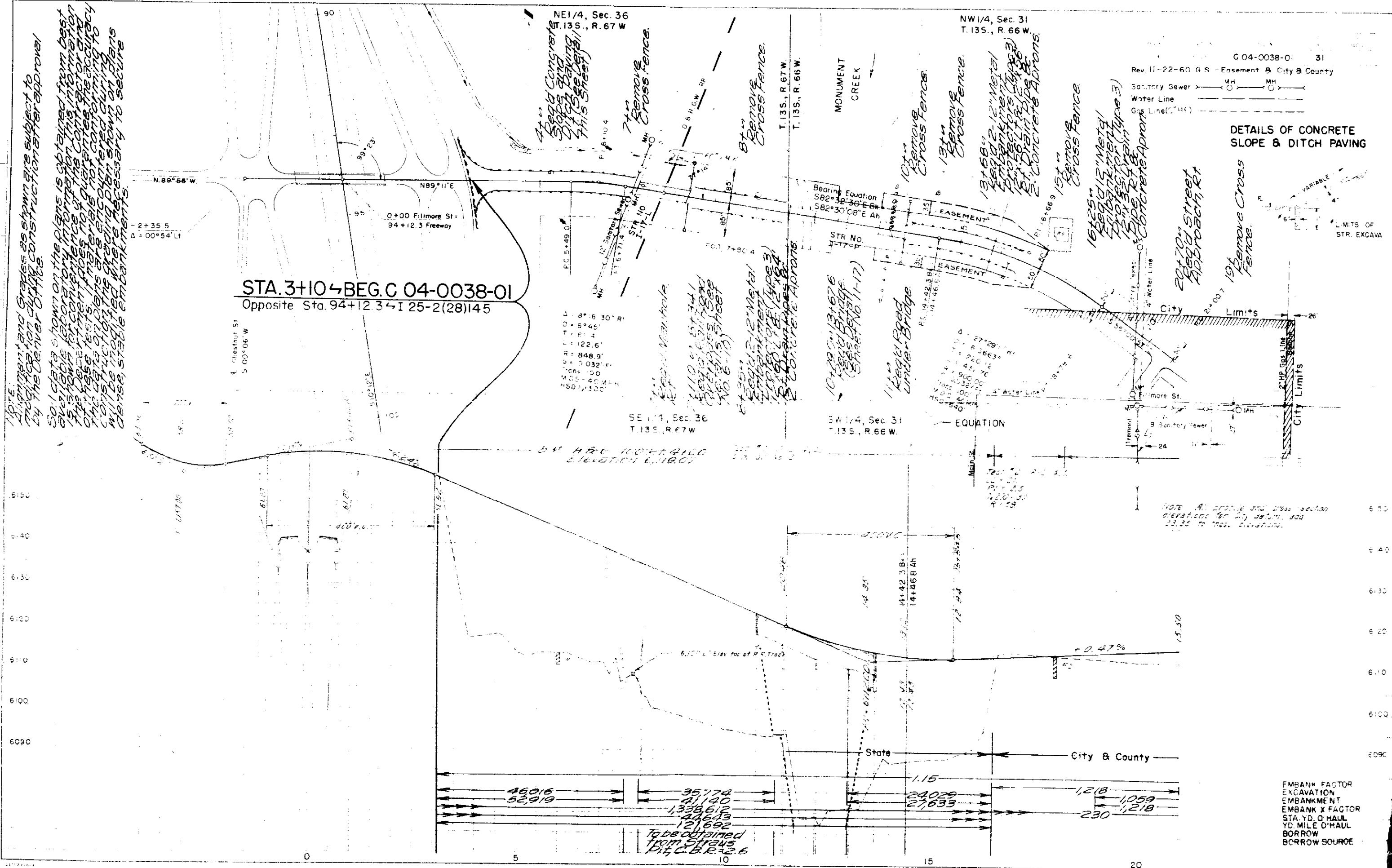
DETAILS OF CONCRETE
SLOPE & DITCH PAVING

19+ Remove Cross
Fence.

Limit+

NOTE: All profile and cross section elevations for City datum, add 22.35 to these elevations.

EMBANK FACTOR
 EXCAVATION
 EMBANKMENT
 EMBANK X FACTOR
 STA. YD. O'HAUL
 YD. MILE O'HAUL
 BORROW
 BORROW SOURCE



PLAN
NO. 22231
DATE

PROFILE
NO. 22231
DATE

Rev. 11-22-60 G.S. - City & County
Sanitary Sewer
Water Line
Gas Line (2" HP)
Telephone Line

