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COLORADO DEPARTMENT OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. F.I. 002-2 (25) UNIT 2 STATE HIGHWAY NO. 1 EL PASO COUNTY

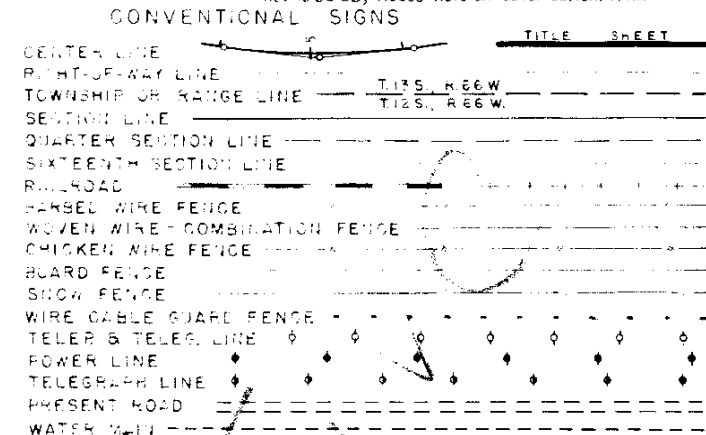
SCALE OF ORIGINAL DRAWING
ON PLAN 1" = 100 FT.
ON PROFILE 1" = 100 FT. HORIZONTAL
1" = 10 FT. VERTICAL

GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
RAILS LENGTH OF PROJECT = 2162.3 feet = 4.04 miles
NET LENGTH OF PROJECT



FED. ROAD DIV. NO. 9
DIST. COLO.
PROJECT NO. F.I. 002-2 (25)
Unit 2
SHEET NO. 1

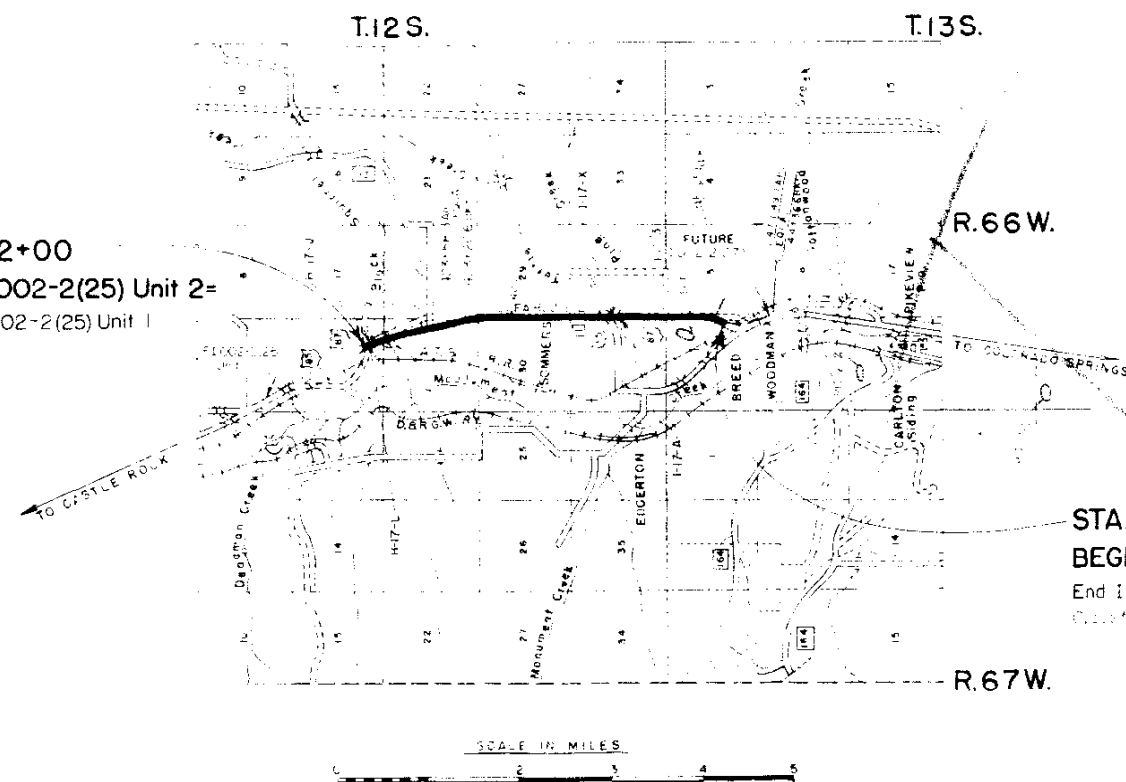
Rev 12-11-53, For Current "M" Stds., J.C.R.
Rev 1-12-54, Added Signing & Striping Sheet to Index, J.C.
Rev 12-30-58, Added Note on Construction, R.M.



NOTE: This Project re-constructed on New Alignment by the Department of the Air Force - Sta 284+00 to Sta 425+29.66 Bk = 426+28.16 Ah.
(Dept. Project No. W-23-07-02). Access controlled by Air Force.

TABULATION OF LENGTH & DESIGN DATA

STATION	ROADWAY		BRIDGES	
	48' WIDE DIVIDED L.N.F.T.	24' WIDE L.N.F.T.	LIN.F.T.	LOADING
275+00 Begin F.I. 002-2 (25) Unit 2 End F.I. 002-2 (27) (Future Construction) - Opposite Sta 276+21 of F.A.P. 116-C				
299+65				
320+00		2035.0		
• 345+98.8				
• 347+41.2 - Bridges	408.8		142.4	H-20SI6-44
351+50		5600.0		
407+50				
423+20.6 Bk. - Equo.	1570.6			
423+58.3 Ah. -				
	6008.2			
• 483+66.5 - Bridges			103.7	H-20SI6-44
• 484+70.2				
	729.8			
492+00 End F.I. 002-2 (25) Unit 2 Begin F.I. 002-2 (25) Unit 1				
TOTALS	13,781.2	7,635.0	246.1	
SUMMARY		LIN. FT.	MILES	
F.I. 002-2 (25) Unit 2, 24' Roadway		7635.0	1.446	
F.I. 002-2 (25) Unit 2, 48' Roadway		13,781.2	2.610	
F.I. 002-2 (25) Unit 2, Bridges		246.1	0.047	
TOTALS		21,662.3	4.103	
DESIGN DATA				
Maximum Degree of Curve		2°		
Maximum Grade		4%		
Minimum N.P.S.D. - Horizontal		800'		
Minimum N.P.S.D. - Vertical		725'		
Maximum Design Speed		70MPH		



STA. 492+00
END F.I. 002-2 (25) Unit 2 =
Begin F.I. 002-2 (25) Unit 1

STA. 275+00
BEGIN F.I. 002-2 (25) Unit 2 =
End F.I. 002-2 (27) (Future Construction) =
COLORADO STATE F.A.P. 116-C

NOTE: It is recommended that bidders on this project go over the plan details with one of the following field representatives of this Department:
J.A. Solomonson - Construction Engineer, Pueblo, Colo.
D.R. Mitchell - Resident Engineer, Colorado Springs, Colo.

COLORADO
DEPARTMENT OF HIGHWAYS

APPROVED _____
CHIEF ENGINEER

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED _____
DISTRICT ENGINEER

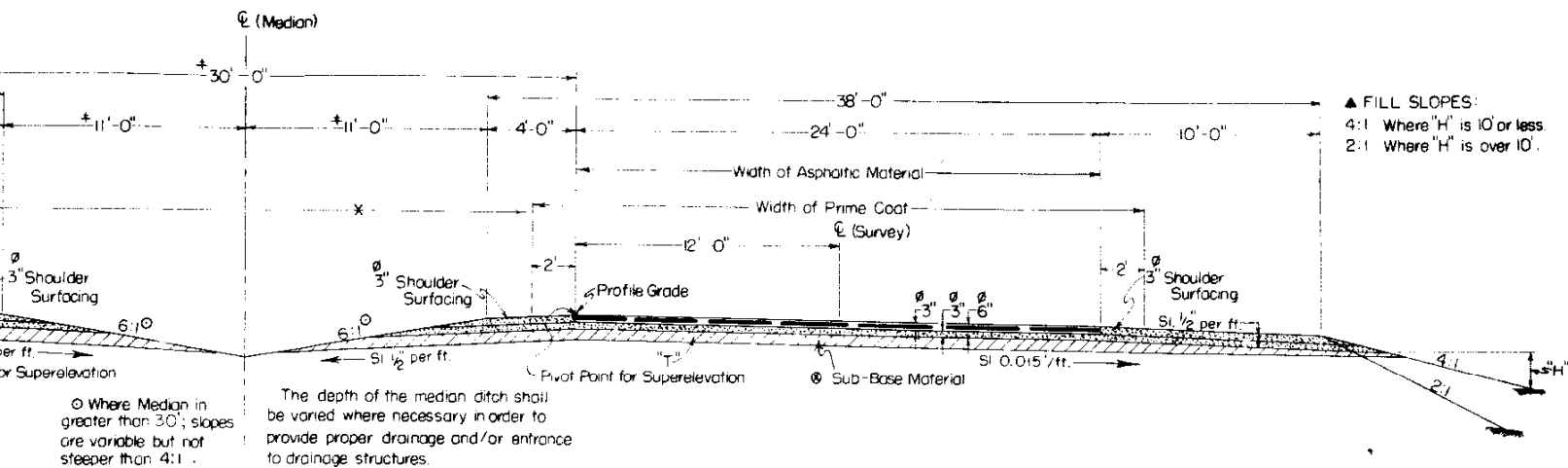
*NOTE: Stations shown are for North Bound Lane

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
1	COLORADO	F.I. 002-2 (25)	2	
Unit 2				

Rev. 12-11-53, For Current Std. M-2-EM, J.C.R.

TYPICAL SECTION "A" (48' Roadway-Divided)

275+00 to 299+65
320+00 to 351+50
407+50 to 492+00



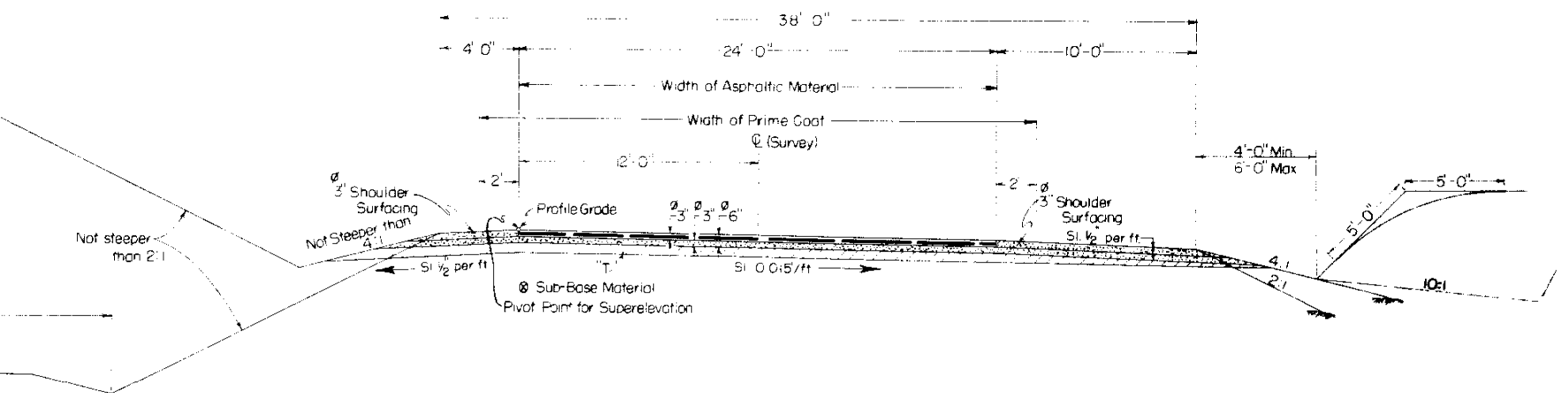
▲ FILL SLOPES:
4:1 Where "H" is 10' or less
2:1 Where "H" is over 10'.

○ Where Median in greater than 30'; slopes are variable but not steeper than 4:1.
The depth of the median ditch shall be varied where necessary in order to provide proper drainage and/or entrance to drainage structures.

* Where roadway grades are greater than 2%, the median shall be prime coated at the rate of 0.20 gals. per square yard.

TYPICAL SECTION "B" (24' Roadway)

299+65 to 320+00
351+50 to 407+50



FENCING REQUIREMENTS

STATION	SIDE	REMOVE FENCE		STATION	SIDE	REMOVE & REBUILD FENCE		BUILD FENCE				GATES							
		LIN. FT.				LIN. FT.		LIN. FT.		LIN. FT.		NO.		NO.					
		24' Rdwy	48' Rdwy			24' Rdwy	48' Rdwy	24' Roadway	48' Roadway	24' Roadway	48' Roadway	24' Rdwy	48' Rdwy	24' Rdwy	48' Rdwy				
275+00 to 284+30	Lt.		965	275+00 to 291+15	Lt.														
311+ to 313+	X	330		291+15 to 299+65	Lt.		850												
345+40 to 347+30	Lt.		190	299+65 to 312+40	Lt.	1275													
351+ (Co. Road)	Lt.	70		312+40 to 318+50	Lt.	150													
366+15	Lt.	130		318+50 to 320+00	Lt.														
366+20 to 390+00	Lt.	2380		285+62	Lt.														
368+30 to 370+50	Lt.	220		320+00 to 341+10	Lt.		210												
				343+40 to 345+40	Lt.		220												
				347+30 to 348+00	Lt.		100												
				338+ to 351+50 (Co. Road)	Lt-Rt		2550*												
				313+00	Lt.														
351+50 to 360+40	Lt.	40		357+50 to 360+40	Lt.	290													
371+75 to 394+85	Lt.	2360		390+00	Lt.														
390+00 to 402+92	Lt-Rt	1422		371+75 to 394+85	Lt.			2310											
395+82 to 402+20	Lt.	760		392+90	Lt.														
402+90 to 404+25	Lt.	190		395+82 to 402+20	Lt.			638											
406+23 to 407+50	Lt.	127		402+20 to 404+25	Lt.			205											
406+80 to 407+50	Lt.	70		403+20	Lt.														
407+50 to 420+00	Lt-Rt	1400		406+80 to 407+50	Lt.			70											
407+50 to 414+40	Lt.	800		407+00	Lt.														
418+85 to 420+00	Lt.	190		407+50 to 414+40	Lt.			690											
422+45	X	710		418+85 to 440+40	Lt.			2155											
424+25	X	200		419+00	Lt.														
427+30	X	280		422+50	Lt.														
430+90	X	260		424+75	Lt.														
439+ to 447+	Lt-Rt	1700		440+40 to 447+10	Lt.			670											
452+ to 470+	Lt	1370		447+35 to 460+10	Lt.			1275											
275+00 to 284+30	Rt.	1080		460+10 to 461+00	Lt.		90												
360+00 to 366+20	Rt.	620		461+00 to 483+50	Lt.			2250											
420+ to 424+	Rt.	410		Bridge															
435+ to 436+	Rt.	120		484+60 to 487+00	Lt.			240											
446+ (Co. Road)	Rt.	740		486+75	Lt.														
451+80 to 475+40	Rt.	1780		275+00 to 285+20	Rt.			1135											
485+00 to 487+00	Rt.	200		286+00 to 288+50	Rt.			230											
				292+60 to 299+65	Rt.		705												
				299+65 to 320+00	Rt.	2035													
				320+00 to 346+10	Rt.		2690												
				347+50 to 351+50	Rt.		490												
				351+50 to 360+00	Rt.		850												
				360+00 to 405+80	Rt.		4580												
				371+10	Rt.														
				406+23	Rt.														
				406+23 to 407+50	Rt.		127												
				407+50 to 425+20	Rt.			1770											
				426+40 to 446+20	Rt.			1980											
				446+ (Co. Road)	Rt.			840	180										
				447+10 to 483+75	Rt.			3690											
				484+80 to 487+50	Rt.			350											
TOTALS		8719	2395	TOTALS		3750	8805	8575	205	18230	850	4	1	5	2				

It is estimated that 20 Line Posts on 24 Roadway and 50 Line Posts on the 48 Roadway will be required for removing and rebuilding fence. Line Posts shall be the same type and size as those in rebuilt fence. * Portion of rebuilt fence to be obtained from Rt. of 351+ to 360+.

R.O.W. MARKERS

STATION	NO. SIDE			
	24' RDWY		48' RDWY	
	Lt.	Rt.	Lt.	Rt.
279+00				
290+65.1				
307+36.7				
319+00				
324+00				
345+00				
358+00				
370+00				
384+00				
397+00				
413+00				
424+00				
437+00				
450+00				
463+00				
477+00				
TOTALS	6		0	

REMOVE OR BREAK CONCRETE PAVEMENT

STATION	24 ROADWAY		48 ROADWAY	
	SQ. YDS.		SQ. YDS.	
	REMOVE	BREAK	REMOVE	BREAK
289+00 to 299+50			2,100	
321+25 to 334+50			2,650	
334+50 to 336+83				470
338+20 to 342+00				760
342+00 to 349+75			1,550	
407+75 to 425+00			3,410	
TOTALS			9,710	1,230

GENERAL NOTES

- This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways adopted June 1, 1952.
- All quantities on preliminary plans are to be considered approximate only.
- All poles encroaching on construction are to be moved by the owners.
- All G.M.P. Side Drains shall be laid with Metal Aprons on both ends unless otherwise noted on the plans.
- Culverts projecting from embankments shall be covered with approximately 6 inches of embankment material in such a manner that a minimum of pipe shall be exposed in the completed work. This shall be accomplished by warping embankment slopes around and adjacent to the culvert.
- Approximate location and quantities involved in construction of intercepting ditches are tabulated on Summary of Earthwork Quantities sheet.
- All curves are to be superelevated and widened as provided by the Standard Superelevation sheets included with the plans.
- For preliminary plan quantities of Asphaltic Road Materials, the following rates of application were used:
PRIME GOAT M.C. at 0.40 Gals. per Sq. Yd.
- Paving Asphalt (For Asphaltic Concrete Pavement) 85-100 Penetration 6.25 Lbs./Sq. Yd./Inch
- Rate of application and grade of Asphaltic Material shall be as determined by the Engineer at time of application.
- Side approach roads to the project (as directed by the Engineer) shall be primed to approximately 50 feet out from the edge of the pavement or to the Right of Way line, whichever is less. The Rd Appr. Sta 286+ Rt & the Temporary Approach at 295+ Rt shall be Asphalt Concrete Paved. Median Crossings to be Asphalt Concrete Paved.
- All Concrete Box Culverts shall be built with a headwall on each end, unless otherwise noted on the plans.
- All signs encroaching on construction are to be moved by the owners.
- All guard fence encroaching on construction shall be removed by the Maintenance Department.
- Concrete Cross Culverts shall be laid with a Flared End Section at each end (that at Median Inlet), unless otherwise noted on the plans.
- It is estimated that the old road shall be obliterated at the following locations:
290+ to 293+ , Rt
421+ to 425+ , Rt
486+ to 492+ , Lt & Rt.
- The force account item, "Clearing of Building Sites, including Removal of Foundations and Appurtenances," shall include removal of all foundations, wells, cuthouses and other appurtenances not removed by the owner, and any necessary backfilling of cellars, cess pools, wells, etc., to provide neat roadside conditions. It is estimated that this item applies at the following locations:
277+ , Lt
280+ , Rt
402+ to 406+ , Lt & Rt
421+ , Lt
429+ , Lt
297+ , Lt
- At Bridge Approaches, the Asphaltic Surfacing shall be widened to meet the curbed width of the bridge and shall take place gradually over a distance of 300 Ft., each way from the Bridge ends. The Prime Coat shall be widened beyond Mat as indicated on Typical Section.
- At locations where the pavement on the present road is removed to allow for placement of structures, the roadbed shall be replaced with materials conforming to the typical section for the project.

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO	ITEM	UNIT	ROADWAY		BRIDGES				PROJECT TOTALS
			24' WIDE	48' WIDE DIVIDED	STA. 345+		STA. 483+		
					South Bound	North Bound	South Bound	North Bound	
10c	Clearing and Grubbing Entire Project	Lump Sum	• (provided)	• (provided)					•
11a	Removal of Partions of Bridge, Sta. 337+	Lump Sum	• (provided)	• (provided)					•
11b	Removal of Partions of Bridge, Sta. 484+ Ft.	Lump Sum	• (provided)	• (provided)					•
11c	Removal of 12 Structures	Lump Sum	• (provided)	• (provided)					•
11d	Removing and Resetting Mail Boxes	Lump Sum	• (provided)	• (provided)					•
11e	Removing Concrete Pavement	Sq. Yd.	2	9,800					9,800
11f	Bracking Concrete Pavement	Sq. Yd.		1,300					1,300
11g	Remove Guard Posts	Each	•	61					63
11h	Remove 3x2x48 Concrete Box Culvert, Sta. 311+	Lump Sum	•	•					•
11i	Remove 6x4x54 Concrete Box Culvert, Sta. 409+	Lump Sum	•	•					•
11j	Remove and Rebuild Cattle Guard	Each	1	•					1
11k	Plug Culverts	Each	1	2					3
11m	Transplanting Trees	Each	413	104					517
11n	Remove 72' x 80' C.M.P. Culvert, Sta. 484+	Lump Sum	50	•					•
11o	Transplanting Shrubs	Each	•	•					•
12a	Removing Fence	Lin. Ft.	8,800	12,470					21,200
12b	Removing and Rebuilding Fence	Lin. Ft.	3,800	9,900					13,700
12c	Removing and Resetting Gates	Each	2	•					2
12d	Line Posts	Each	20	50					70
13c	Unclassified Excavation	Cu. Yd.	48,500	341,360	42,500	42,500	17,140		492,000
13d	Unclassified Ditch Excavation	Cu. Yd.	490	610					1,100
13s	Stripping	Cu. Yd.	3,600	13,400					17,000
14a	Dry Rock Excavation (Str.)	Cu. Yd.	75	115					190
14b	Dry Common Excavation (Str.)	Cu. Yd.	670	980	15	10	10	10	1,710
14c	Wet Rock Excavation (Str.)	Cu. Yd.	10	20	40	90	110		310
14d	Wet Common Excavation (Str.)	Cu. Yd.	75	115	300	100	75	75	760
16a	Structure Backfill (Class 1)	Cu. Yd.	410	940	135	95	160	160	1,900
16c	Mechanical Tamping	Hour	60	195	15	20	25	25	340
17a	Rolling with Tamping Roller (Two(2)Unit)	Hour	57	543	15	15	15	15	630
17b	Rolling with Tamping Roller (Four(4) Unit)	Hour	10	90	5	5			110
17c	Rolling with Flat Wheeled Roller (Tandem)	Hour	70	260					330
17d	Rolling with Flat Wheeled Roller (Three(3)Wheel)	Hour	57	213					270
17e	Rolling with Rubber Tired Roller	Hour	20	80					100
17f	Furnishing Tamping Roller (Two(2)Unit)	Each	010	086	002	002			1
17g	Furnishing Tamping Roller (Four(4)Unit)	Each	010	086	002	002			1
17h	Furnishing Flat Wheeled Roller (Tandem)	Each	040	160					2
17i	Furnishing Flat Wheeled Roller (Three(3)Wheel)	Each	020	080					1
17j	Furnishing Rubber Tired Roller	Each	020	080					1
17k	Wetting	M. Gal.	1,245	10,185	135	135			11,700
17k	Rolling with Heavy Rubber Tired Roller	Hour	67	633					700
17y	Furnishing Heavy Rubber Tired Roller	Each	010	090					1
18a	Station Yard Overhaul	Sta. Yd.	69,150	1,616,650	12,920	12,920	2,000	18,800	1,965,000
18b	Yard Mile Overhaul	Yd. Mile	600	30,000	200	200	600	600	32,200
18c	Ton Mile Overhaul	Ton Mile	80,000	341,900					421,900
19a	Placing Topsoil	Cu. Yd.	3,600	15,200					18,800
23a	Sub-Base Material (Class II)	Ton	12,200	48,900					61,100
26c	Gravel or Crushed Rock Surfacing (Grading C)	Ton	8,700	31,300					40,000
29b	Asphalt (85-100 Penetration)	Ton	220	810					1,030
30x	Asphaltic Road Material MC (Prime)	Gal.	11,820	41,480					53,300
34d	Asphaltic Concrete Pavement (Surface Type B)	Ton	3,480	12,810					16,290
46a	Class "A" Concrete	Cu. Yd.	10	288	329	320	218	212	1,377
47	Reinforcing Steel	Lb.	980	33,920	30,900	30,200	29,280	28,920	153,300
48	Structural Steel	Lb.			117,600	117,600	66,700	66,700	368,600
52c	24" Reinforced Concrete Culvert Pipe	Lin. Ft.	212	1,168					1,380
52d	30" Reinforced Concrete Culvert Pipe	Lin. Ft.	240	120					360
52ax	30" Reinforced Concrete Culvert Pipe (Extra Strength)	Lin. Ft.	268	248					248
52b	36" Reinforced Concrete Culvert Pipe	Lin. Ft.	60	•					268
52d	48" Reinforced Concrete Culvert Pipe	Lin. Ft.	•	•					50
53b	18" Corrugated Metal Culvert Pipe	Lin. Ft.	20	310					336
53c	24" Corrugated Metal Culvert Pipe	Lin. Ft.	54	90					90
53d	30" Corrugated Metal Culvert Pipe	Lin. Ft.	•	•					54
60x	Drilling Holes to Facilitate Pile Driving	Lin. Ft.	10	170	100	100	100	100	200
61a	Steel Piling (10" BP at 42")	Lin. Ft.	8,600	18,300	700	300	420	260	1,690
61c	Steel Piling (12" BP at 53")	Each	300	900					26,900
63	Grouted Rubble Slope and Ditch Paving (12" thick)	Sq. Yd.	10	170	210	180	324	324	1,200
67a	Riprap	Cu. Yd.	•	•					9
76c	Barbed Wire Fence with Metal Posts	Each	6	10					16
76f	Combination Wire Fence with Metal Posts	Each	12	274	6	6	5	5	22
76g	Barbed Wire Gates	Each	1	•					286
76h	Driveway Gates	Each	•	•					•
81b	Right of Way Markers	Each	6	10					20
89a	Drain Pipe (Concrete Floor) (4" x 2'-0")	Each	12	•					3
92	Timber Guard Posts	Each	•	•					•
95b	Metal Aprons for 18" Corrugated Metal Pipe Culverts	Each	•	•					•
95c	Metal Aprons for 24" Corrugated Metal Pipe Culverts	Each	•	•					•
121a	Standard Galvanized Pipe	Lin. Ft.	450	450					450
132gb	No. 13 Inlet Grating and Frame	Each	1	1					1
132gk	Inlet Grating and Frame (Median)	Each	10	10					16
142a	Timber Barricades, Type I	Each	6	2					2
142b	Timber Barricades, Type III	Each	1	1					1
152c	Flored End Sections for 24" Reinforced Concrete Culvert Pipe	Each	3	18					21
152d	Flored End Sections for 30" Reinforced Concrete Culvert Pipe	Each	3	4					7
152e	Flored End Sections for 36" Reinforced Concrete Culvert Pipe	Each	4	•					4
152g	Flored End Sections for 48" Reinforced Concrete Culvert Pipe	Each	2	•					2
159	Metal Sheet Piling	Lin. Ft.	390	900					1,290
207	Blading	Hour	67	633					700
81a	Project Markers (State Forces)	Each	•	•					•
20a	FORCE ACCOUNT Clearing of Building Sites, including Removal of Foundations & Appurtenances. Obiterating Old Road Relocate M.S.T. & T. Line (work by M.S.T. & T. Co. forces)	Lump Sum	•	•					•
53w	NON-FEDERAL AID Signing and Striping (State Forces) Relocating Signs (Austin Sign Co.) Relocating Power Line (Mountain View Elec. Ass'n, Inc.) 8" Corrugated Metal Culvert Pipe	Lump Sum	•	•					•
		Lump Sum	•	•					•
		Lump Sum	•	•					•
		Lin. Ft.	•	•					318

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F.I. 002-2(25) Unit 2	4	

All Concrete Pipes shall be Standard Strength, except as noted on Extra Strength.

LIST OF STRUCTURES

FED. ROAD DISTRICT NO.	DISTRICT	PROJECT NO.	SHEET NO.
8	COLO.	FI 002-2 (25) Unit 2	5

LOCATION	DESCRIPTION	REMOVE STRUCTURE	EXCAVATION			STRUCTURAL EXCAVATION	STRUCTURE BACKFILL	MECH. TAMING	GRAVEL OR CRUSHED ROCK SURFACING	GROUTED RUBBLE SLOPE & DITCH PAVING (12" THICK)	CONCRETE	INLET GRATING & FRAME (MEDIAN)	REIN. STEEL	CORRUGATED METAL CULVERT PIPE				REINFORCED CONCRETE CULVERT PIPE				FLARED END SECTIONS				METAL APPROX. FOR C.M.P. CULVERTS	MISCELLANEOUS	
			CUBIC YARDS											LIN. FT.				LIN. FT.				NO.						
			NO.	KIND	UNCL.									8"	18"	24"	30"	24"	30"	36"	48"	24"	30"	36"	48"			18"
275+00 to 285+50	Project Marker, Rt. Metal Sheet Piling in Roadway Ditches, Lt. & Rt. Cross Culvert & No. 3 Median Inlet (H=5'-0") & Ditches. Paving at Inlet.	(Quantities in Tabulation)		20	75	47	7		30	1.08		156															1-Project Marker (State Forces) ✓ 1-No 13 Inlet Grating & Frame ✓	
276+40, 279+50 & 283+00	Remove 3/4" x 140' Water Line Lay 3/4" x 150' Galvanized Iron Pipe Encased in 8" G.M.P. at Each Place. Side Drain 200' Rt. & Approach to Present Road. Road Approach, Lt. Median X-ing.	3 Water Lines		420	126	100	5	0					106														3/4" x 150' Standard Galvanized Iron Pipe	
285+62					4	13	2	128					108															
286+50	Cross Culvert (both lanes) & Type "A" Median Inlet (H=6'-0") Inlet, Lt. & Drain Ditch, Rt. Type I Timber Barricade, Lt. Transplant 104 Trees. Type I Timber Barricade, Lt.			100	20	50	7			1.51		149															1-Type I Timber Barricade ✓ Transplant 104 Trees ✓ 1-Type I Timber Barricade	
291+ to 299+ & 348+ to 351+ & 294+ to 298+00	Road Approach, Lt. & Median X-ing. Cross Culvert (both lanes) & Type "B" Median Inlet (H=4'-6"). Ditches. Temporary Approach			15	60	85	6	128		1.44		139																
298+30				500				500																				
299+ to 314+ & 299+ to 335+ & 351+ to 366+ & 311+00	Transplant Shrubs Transplant 413 Trees Remove 3x2x48' C.B.C., Lt. Cross Culvert (both lanes) & Ditches. Road Approaches, Lt. & Rt. Median X-ing. Road Approach to Private Road, Rt. Cross Culvert & Type "A" Median Inlet (H=6'-0"). Inlet, Rt. Drain Ditch, Lt. (W=2') Cross Culvert (N.B. Lane) & Ditches. (W=2') Dike at Inlet & Outlet. Paving at Outlet Dike.			50	25	120	8	6																				Transplant 50 Shrubs ✓ Transplant 413 Trees ✓ Remove 3x2x48' C.B.C. So. Bound Lane ✓
313+00				10			4	20																				
312+40					105	135	4	6		1.41		149																
313+36				60	30	85	9		10																			
319+50																												
325+00 to 330+ & 325+00 & 343+ & 351+	Frontage Road, Lt. Side Drain & Road Approach, Lt. Median X-ing Side Drain in Median. Temporary Approaches, Lt. & Remove Temporary Approaches, Lt.			300		2	1	270																				
334+50				60				71																				
335+20				450	300			200																				
336+50	Road Approach, Lt. & Median X-ing. Cross Culvert (S.B. Lane) & Type "B" Median Inlet (H=4'-6"). Outlet. Remove 24'x22' & 18'x G.M.P. Plug 2'x2' C.B.C.	2 G.M.P.'s		50	2	35	6	71		1.53		139																Plug 2'x2' C.B.C.
337+90	Remove Portions of Bridge, Lt. Cross Culvert (both lanes) 1st. Class Bedding in Trench. Ditches (W=2). County Road Relocation, Lt. with Approaches. Remove 15'x60' Side Drain, Lt.					(QUANTITIES IN SUMMARY)																						30'x248' Extra Strength Reinf. Conc. Culv. Pipe
339+ to 351+ & 341+00				2200	20	250	18	0																				
343+85	Plug 6'x7'x42' C.B.C. Remove 15'x20' Side Drain, Lt. Remove & Rebuild 6'x9' Cattle Guard, Lt. Road Approach Left of County Road.	1 G.M.P.		25				10																				Plug 6'x7' C.B.C. Remove & Rebuild Cattle Guard
346+18																												
345+ to 347+ & 351+20	4 Bridge Approach Slabs on Rt. & Lt. Lanes. Channel Change, Lt. & Rt. (W=50'). Dike, Rt. Paving at Median. 2 Bridges. Side Drain & Approach to County Road, Lt. Median X-ing. Side Drain in Median. Side Drain & Road Approach, Rt.			120	(BRIDGE QUANTITIES IN SUMMARY)	13	23	159																				
359+00	Cross Culvert (N.B. Lane) & Type "B" Median Inlet (H=4'-6").					50	4			1.53		139																
361+ to 370+ & 371+00 & 371+40 & 373+50	Metal Sheet Piling in Roadway Ditches, Lt. & Rt. Road Approaches, Lt. & Rt. Median X-ing. Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=6'-6"). Ditches (W=2'). Plug 36'x50' G.M.P. Cross Culvert, Lt.			45	80	100	9	96		1.97		184																Plug 36' C.M.P.
388+70					45	125	7	6		1.85		184																
392+ to 407+ & 392+90	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=6'-6"). Ditches (W=2') Frontage Road, Lt. with Approaches. Remove 15'x20' Side Drain & 15'x24' Side Drain, Lt.	2 G.M.P.'s		480				868																				

LIST OF STRUCTURES

Tabulation Continued from Sheet No. 5

FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
3.	COLO.	F.I. 002-2 (25) Unit 2	6	

LOCATION	DESCRIPTION	REMOVE STRUCTURE NO. KIND	EXCAVATION		STRUCTURAL EXCAVATION	STRUCTURE BACKFILL	MECH. TAMPING HOURS	GRAVEL OR CRUSHED ROCK SURFACING TONS	GROUTED RUBBLE SLOPE & DITCH PAVING (12" THICK) SQ. YDS.	CONCRETE CUBIC YARDS	INLET GRATING & FRAME (MEDIAN) NO.	REINF. STEEL LBS.	CORRUGATED METAL GULVERT PIPE LIN. FT.				REINFORCED CONCRETE GULVERT PIPE LIN. FT.				FLARED END SECTIONS NO.				METAL APRONS FOR C.M.P. GULVERTS NO.		MISCELLANEOUS				
			CUBIC YARDS		CUBIC YARDS	CUBIC YARDS																									
			UNCL.	EMB.	EMB.	CL. 1										8"	18"	24"	30"	24"	30"	36"	48"	24"	30"	36"		48"	18"	24"	
401+00	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=5'-0")				160	66	9			1.47		155																			
401+ to 405+	Cross Culvert Under Frontage Road, Lt. & Type "B" Median Inlet (H=5'-6"). Ditches. (W=2). (No Apron at Outlet)			15	40	22	3	6		1.65		161			54																
403+20	Grade Median to Drain Back.		+																												
405+90	Remove 12' x 18' Side Drain, Lt. Side Drain in Approach to Frontage Road, Lt. (No Aprons) Approach to Frontage Road, Lt. Median X-ing. County Road Appr., Rt.	I C.M.P.			10	7	1																								
407+ to 409+	Grade Median to Drain Ahead		+																												
409+00	Remove 6x4x54 C.B.C. & 48x 56' Cross Culvert, Lt. 6x6x138' C.B.C. Cross Culvert (Both Lanes) & Inlet. (W=6). Type "A" Median Inlet in Top of C.B.C. (H=2'-0")	I C.M.P.			300	61	53			124.3		12,646																		Remove 6x4' C.B.C.	
415+ to 427+	Frontage Road, Lt. with Approaches. Remove 24' x 38' Cross Culvert, Rt.	I C.M.P.		1510				703																							
422+50	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=4'-6"). Ditches. Cross Culvert in Frontage Road, Lt. (No Apron at Outlet)	I C.M.P.			25	126	9			144		139													2						
425+50	Side Drains & Road Approaches, Lt. & Rt. Median X-ing & Side Drain in Median.			25	6	25	4	159																							
435+20	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=6'-6"). Ditches.			2	25	56	8	159		1.95		184													2						
446+88	Approach to Frontage Road, Lt. Connection to S.H. 83, Rt. (700' long) Median X-ing.			750				474																							
447+ to 452+	Frontage Road, Lt. with Approaches.			420				410																							
447+35	Cross Culvert (Both Lanes) & Type "A" Median Inlet (H=5'-0"). Ditches.			4	53	56	8	410		1.26		126													2						
455+70	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=8'-6"). Ditches.			2	20	60	9	102		2.49		230													2						
460+00	Road Approaches, Lt. & Rt. Median X-ing			135				102																							
467+00	Cross Culvert (Both Lanes) & Type "B" Median Inlet (H=6'-6"). Ditches. (W=2)			3	32	60	9	102		1.85		184													2						
478+ to 481+	Fill Channel, Lt. & Rt.			*																											
478+80	Cross Culvert (Both Lanes). 1st. Class Bedding in Trench. Riprap at Outlet.				20	74	11																			2			5 Cu. Yds Riprap.		
481+00	Cross Culvert (S.B. Lane) & Type "A" Median Inlet (H=4'-6"). Outlet.			5	10	20	3			1.22		110														1					
483+50	Type III Timber Barricade on Present Road, 150' Rt.																													Type III Timber Barricade	
483+ to 484+	4 Bridge Approach Slabs on Rt. & Lt. Lanes. Channel Change (W=40'). Paving of Median. 2 Bridges. Remove 72x80' C.M.P. Cross Culvert and Portions of present Bridge. Remove present Detour, Rt.			3000					70	60.8		7880																			
486+75	Side Drain & Road Approach, Lt. Median X-ing & Side Drain in Median.			920	5	17	2	102																							
492+00	Approach to Project.			100				100																							
TOTALS (24' Roadway)		3		325	865	300	825	409	54	1218	10	9.88	6	972	26	54	212	240	268	60	3	3	4	2							
TOTALS (48' Roadway)		9		5150	8150	845	1207	838	184	3592	170	287.87	10	33,002	318	310	90	1,68	120		18	4			20	3					

▲ Structural Excavation is estimated to be 90% Common and 10% Rock, each of which is estimated to be 90% Dry and 10% Wet.
 ● Quantities included in Surfacing Plan
 + Quantities included in Profile Quantities
 * To be obtained from Channel Excavation.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	F.I. 002-2 (25)	7	
		Unit 2		

It is estimated that material for Gravel Surfacing and Sub-base Material for the project is available in the vicinity of the pits indicated in the following tabulations. Estimated quantities involved in this operation are shown below
 Alteration of these Plans as here outlined will be allowed only on written permission from the Department.

SURFACING PLAN

MATERIAL TO BE PLACED	SOURCE	AVAILABLE	QUANTITY TONS USED GRADING C				OVERHAUL TON MILE			
			24' Roadway		48' Roadway		24' Roadway		48' Roadway	
			BASE COURSE	SHOULDER AREAS	BASE COURSE	SHOULDER AREAS	BASE COURSE	SHOULDER AREAS	BASE COURSE	SHOULDER AREAS
275+00 to 299+65 299+65 to 320+00 320+00 to 345+70 Bridge	PIT NO. 1 4.02 mi. from Sta 275+00	47,000 Cu. Yds.	1,465	529	3,525	1,282	6,866	2,479	15,019	5,462
347+69 to 351+50 351+50 to 407+50 407+50 to 483+38 Bridge	"R" = 78		4,032	1,456	545	198	24218	8,745	2,965	1,077
484+98 to 492+00					1,004	365			8,096	2,942
Road Approach to Present Road Sta. 285+82 Relocating County Road Sta. 339+ to 351+					200	15			849	64
From List of Structures			1,218		3,592		7,350		20,876	
SUB-TOTALS			6,715	1,985	24,158	7,122	38,434	11,224	149,334	44,874
TOTALS			8,700		31,280		49,658		194,208	

NOTE: Surfacing for shoulder areas not to be placed across road approaches.

SUB-BASE MATERIAL PLAN

MATERIAL TO BE PLACED	SOURCE	AVAILABLE	QUANTITY AND THICKNESS				OVERHAUL TON MILE	
			THICKNESS "T"	CLASS				
				24' ROADWAY	48' ROADWAY	24' ROADWAY	48' ROADWAY	
275+00 to 299+65	PIT NO. 2 2.78 mi. from Sta. 275+00 "R" = 71	60,000 Cu. Yds.	6"		6,976		20,991	
299+65 to 320+00			6"	2,890		9,928		
320+00 to 345+76 Bridge			6"		7,273		9,195	
347+18 to 351+50 351+50 to 407+50	PIT NO. 3 0.32 mi. from Sta. 283+	35,000 Cu. Yds.	6"		1,078		1,705	
407+50 to 483+67 Bridge	"R" = 70		6"		21,367		72,499	
484+70 to 492+00			15"		5,756		24,203	
Estimated for Correcting Irregularities in Sub-Grade					1,084	4,245	2,701	12,859
Estimated for Median Crossings					200	652	498	1,975
Replacing Material over Conc. Str's placed under Present Road Approach to Project, Sta. 492					30	410	75	1,755
Connecting Road at Sta. 285+82 Temporary Approach Sta. 295+						320		127
						750		2370
TOTALS					12,156	48,827	30,281	147,679

▲ Based on Curve "D"

TIMBER GUARD POSTS

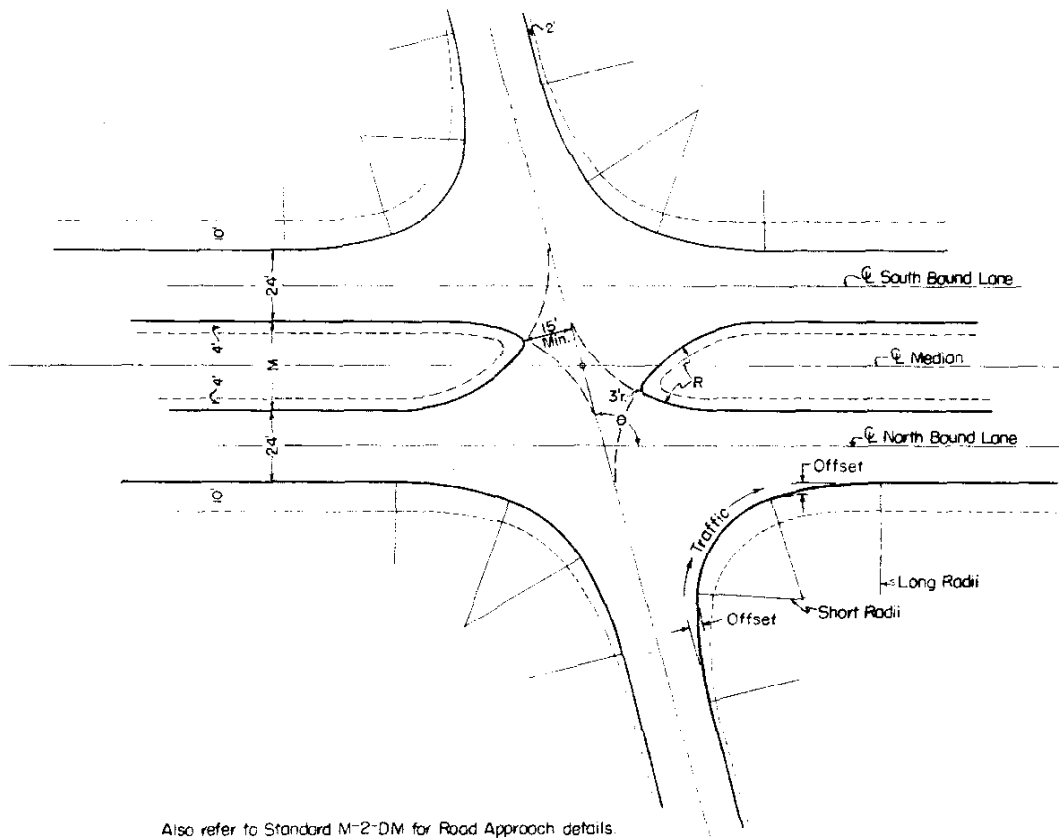
STATION	SPACING	LANE	NEW POSTS				REMOVE							
			24' Roadway		48' Roadway		24' Roadway		48' Roadway					
			L	R	L	R	L	R	L	R				
336+30 to 340+30														
342+60 to 346+00														
408+ to 412+ 422+ 373+														
285+73 to 299+61	2° Curve							18	18					
300+25 to 304+82	2° Curve							3	3					
336+50 to 340+00	50'							8						
344+90 to 345+40								2						
345+08 to 345+58								2						
346+87 to 347+51								6						
347+05 to 347+69								6						
410+32 to 428+13	2° Curve							20	20					
477+73 to 482+00	1° Curve							4						
477+73 to 483+61	1° Curve							5						
482+89 to 483+39								2						
483+07 to 483+57								2						
484+47 to 485+11								6						
484+65 to 485+29								6						
486+02 to 488+10	1° Curve							2						
486+21 to 488+10	1° Curve							3						
285+73 to 299+61	2° Curve							18	18					
295+ to 297+								10						
299+61 to 304+82	2° Curve							3	3					
337+00 to 345+00	50'							17						
345+26 to 345+90								6						
345+44 to 346+08								6						
347+36 to 347+86								2						
347+54 to 348+04								2						
410+32 to 428+13	2° Curve							20	20					
477+73 to 482+00	1° Curve							3						
482+94 to 483+58								6						
483+37 to 483+76								6						
484+65 to 485+15								2						
484+83 to 485+33								2						
485+86 to 488+10	1° Curve							3						
486+24 to 488+10	1° Curve							3						
TOTALS								12	274	2			61	

* See Detail Drawing for Spacing, Sheet 8a.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	F.I. 002-2 (25)	8	

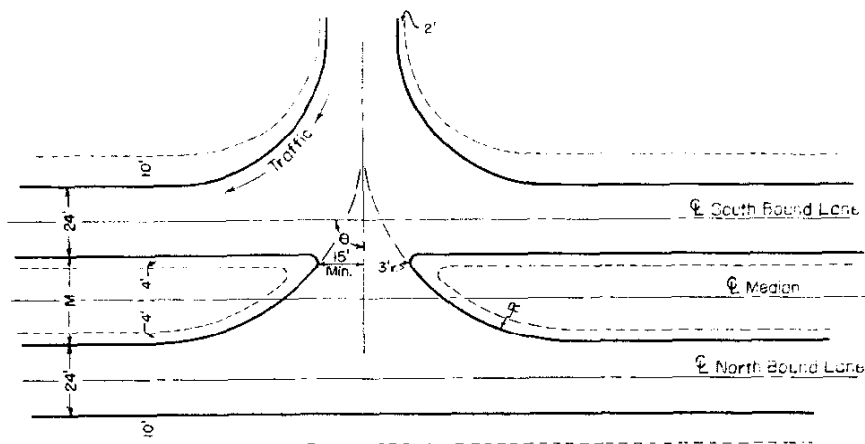
Unit 2

TYPE "A" TYPICAL LAYOUT OF ROAD APPROACHES FROM BOTH SIDES



Also refer to Standard M-2-DM for Road Approach details.

TYPE "B" TYPICAL LAYOUT OF 90° ROAD APPROACHES FROM ONE SIDE ONLY



TYPE "A" APPROACHES
NOTE: At crossings from both sides, the Nose should be established with two radii = R and a Tip with 3' radius.

ANGLE OF TURN (Degrees)	3-CENTER COMPOUND CURVE RADII (Feet)	OFFSET (Feet)
105 to 110	100 - 35 - 100	3
70 to 75	120 - 45 - 120	2
90	Δ	

Δ Use { 50' radius for 30' Approach
20' radius for 16' Approach.

MEDIAN CROSSINGS

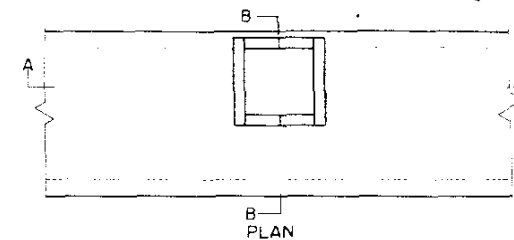
STATION	MED WIDTH "M" (Feet)	"R" (Feet)	APPROACH		
			SIDE	TYPE	SKEW (°)
285+70	30	50 Bk 60 Ah	Lt & Rt	A	(Lt Side) 110 Lt (Rt Side) 90 Rt
298+00	45	92	Lt	B	90
313+00	58	74	Lt & Rt	A	90
330+15	56	107	Lt	B	90
334+65	56	107	Lt	B	90
351+25	53	70	Lt & Rt	A	90
371+00	47	65	Lt & Rt	A	90
406+00	39	58	Lt & Rt	A	90
425+50	30	50	Lt & Rt	A	90
447+00	30	50	Lt & Rt	A	75 Lt
460+00	30	50	Lt & Rt	A	74 Lt
486+75	30	70	Lt	B	90

TYPE "B" APPROACHES
NOTE: At right angle approaches from one side only, the Nose should be established with a radius = R and a Tip with 3' radius.

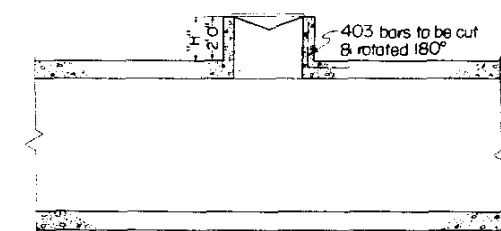
DETAILS FOR ADAPTING TYPE "A" MEDIAN INLET TO TOP OF 6'x6' C.B.C.

STA. 409+

See Standard M-46-A for details of Inlet & Grating.

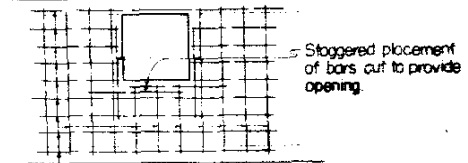


PLAN



SECTION A-A

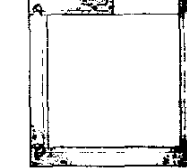
DETAILS OF BAR PLACEMENT AROUND INLET OPENINGS INTO NEW STRUCTURES



Staggered placement of bars cut to provide opening.

Reinf. Bars as req'd. by Standard M-103-H.

401 & 402 bars to be cut & rotated 180°.



SECTION B-B

401 & 402 bars to be tied to reinf. bars in wall of C.B.C.

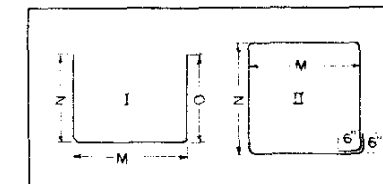
QUANTITIES REQUIRED
✓ 0.5 Cu Yds. Class "A" Concrete
✓ 60 lbs. Reinf. Steel

BAR LIST FOR H = 2'-0" (Type "A")

MARK	NO. REQ'D	KIND	DIMENSIONS			LENGTH
			M	N	O	
401	2	I	3'-5"	1'-3"	1'-3"	5'-10"
402	2	I	3'-5"	1'-6"	1'-6"	6'-4"
403	5	I	3'-6"	1'-7"	1'-7"	6'-7"
404	2	II	3'-7"	3'-7"		15'-4"

NOTE: All reinforcing bars to be 1/2" #.

BENDING DIAGRAMS

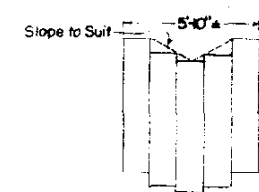


All dimensions out to out of bars.

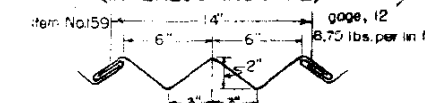
METAL SHEET PILING REQ'D. IN ROADWAY SIDE DITCHES

(Not in Median)

TYPICAL SECTION OF DITCH CHECK



TYPICAL SECTION OF METAL SHEETING (INTERLOCKING TYPE)

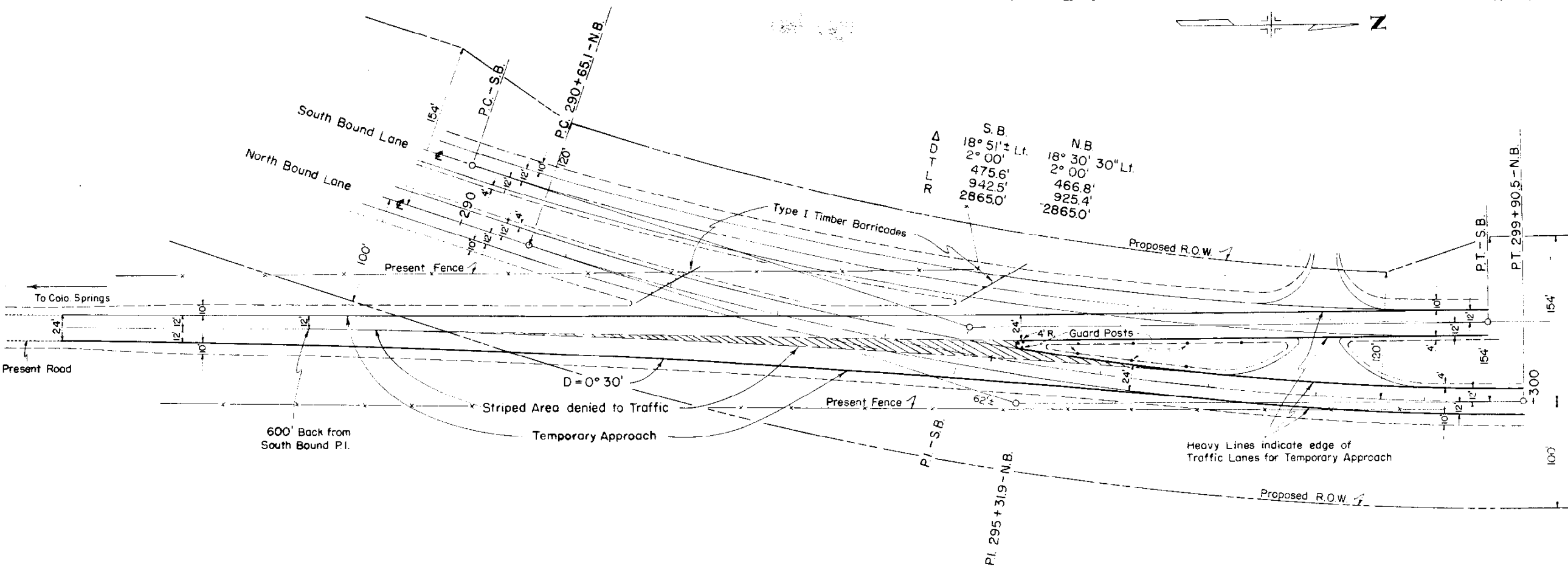
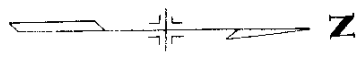


R'dway	STATION	SIDE	Distance Between Checks	Total Lr. Ft. of Sheet Piling	No. of Checks
48'	275+00 to 285+	Rt & Lt	75'	900	30
24'	361+00 to 370+	Rt	75'	390	13
	Total			1,290	43

NOTE: An acceptable equivalent sheet piling may be substituted after written approval by the Engineer.

TEMPORARY APPROACH STA. 295±

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F.I. 002-2 (25)	8a	
			Unit 2	



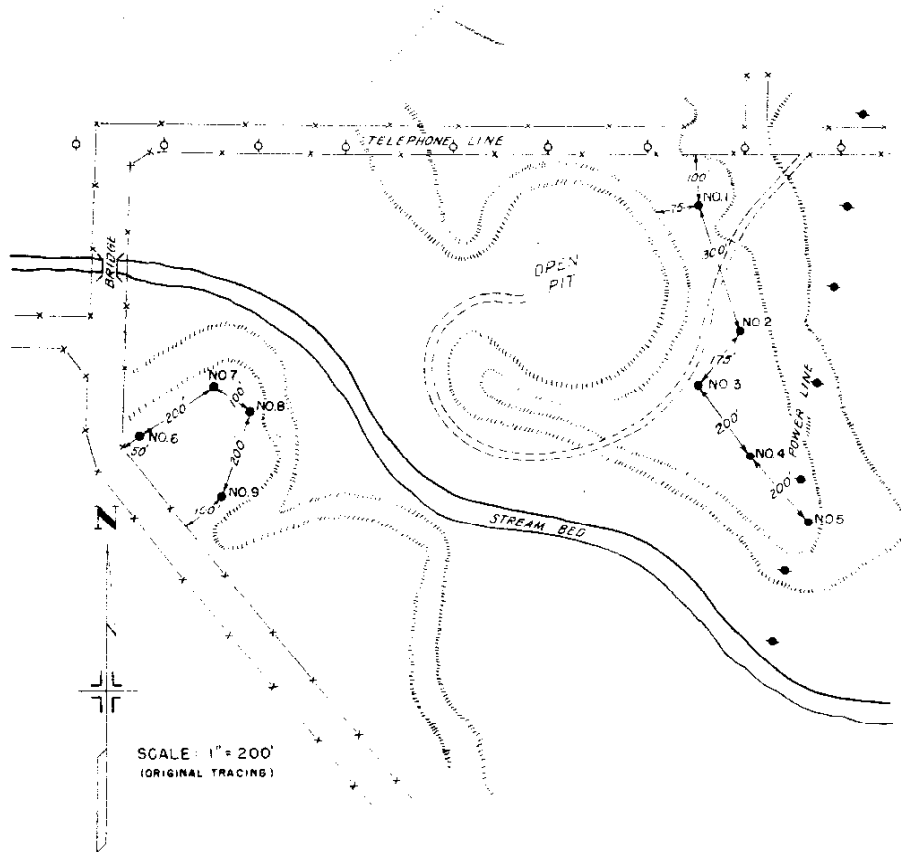
Heavy Lines indicate edge of Traffic Lanes for Temporary Approach

PIT LOCATIONS

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	COLORADO	F1 002-2 (25) UNIT #2	9	

PIT NO. 1

- ✓ Location: N.W. 1/4 Sec. 30, T. 13 S., R. 66 W.
- ✓ Owner: Holland Dairy Farm Co.
- ✓ Quantity Available: 47,000 Cu. Yds.
- ✓ Proposed Use: Surfacing and Structure Backfill
- ✓ Haul Distance: 4.02 Miles to Sta. 275+00
- ✓ Sample Nos. 1109 and 2554
- ✓ Stripping estimated at 6,000 Cu. Yds.

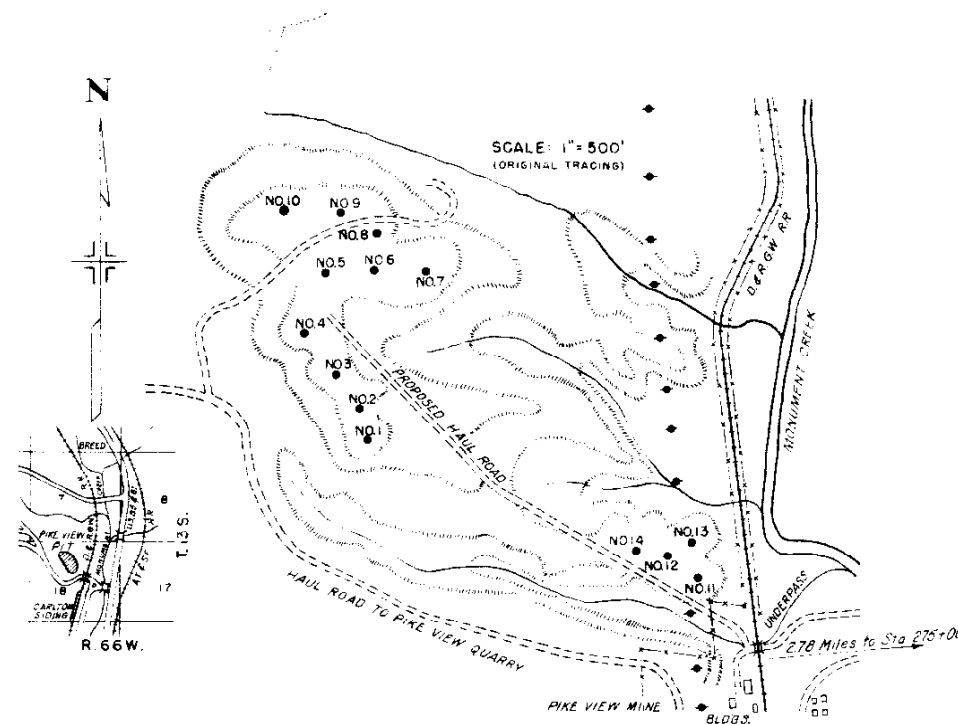


FIELD SAMPLE NO. 1109

TEST NO.	DEPTH	DESCRIPTION
1	0.0 - 1.5	Overburden
1-A	1.5 - 13.0+	Sand and gravel.
2	0.0 - 2.0	Overburden
2-A	2.0 - 9.0	Sand and gravel.
2-B	9.0+	Clay
3	0.0 - 1.0	Overburden
3-A	1.0 - 6.0	Sand and gravel.
3-B	6.0+	Clay
4	0.0 - 1.0	Overburden
4-A	1.0 - 5.0	Sand and gravel.
4-B	5.0+	Clay
5	0.0 - 0.7	Overburden.
5-A	0.7 - 3.0	Sand and gravel.
5-B	3.0+	Clay and soft sandstone.

PIT NO. 2

- ✓ Location: N.W. 1/4 Sec. 18, T. 13 S., R. 66 W.
- ✓ Owner: Pikes Peak Fuel Co.
- ✓ Quantity Available: 60,000 Cu. Yds.
- ✓ Proposed Use: Sub base Material & Structure Backfill
- ✓ Haul Distance: 2.78 Miles to Sta. 275+00
- ✓ Sample No. 1110
- ✓ Stripping estimated at 6,000 Cu. Yds.

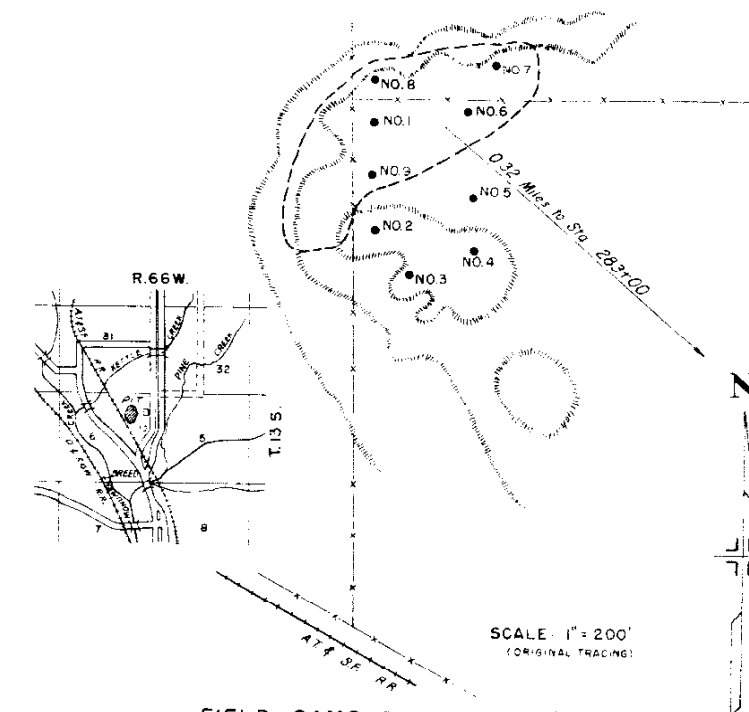


FIELD SAMPLE NO. 1110

TEST NO.	DEPTH	DESCRIPTION	TEST NO.	DEPTH	DESCRIPTION
1	0.0 - 13.0	Sand and gravel.	7-B	6.0+	Sandy clay.
2	0.0 - 10.0	Sand and gravel.	8	0.0 - 0.5	Grassroots
2-A	10.0+	Soft sandstone and clay.	8-A	0.5 - 5.0	Sand and gravel. Sim. No. 6-A
3	0.0 - 5.0	Grassroots	8-B	5.0+	Sandy clay.
3-A	0.5 - 10.0	Sand and gravel.	9	0.0 - 0.5	Grassroots
4	0.0 - 0.5	Grassroots	9-A	0.5 - 12.0	Sand and gravel.
4-A	0.5 - 10.0	Sand and gravel.	10	0.0 - 1.5	Overburden
4-B	10.0+	Sandy silty clay.	10-A	1.5 - 10.0	Sand and gravel.
5	0.0 - 1.0	Overburden	11	0.0 - 1.5	Overburden
5-A	1.0 - 9.0	Sand and gravel. Sim. No. 4-A	11-A	1.5 - 13.0	Sand and gravel.
5-B	9.0+	Sandy silty clay.	12	0.0 - 6.0+	Sandy soil.
6	0.0 - 1.5	Overburden	13	0.0 - 1.0	Overburden. Sim. No. 11
6-A	1.5 - 10.0	Sand and gravel.	13-A	1.0 - 10.0	Sand and gravel. Sim. No. 11A
7	0.0 - 1.0	Overburden. Similar No. 6	13-B	10.0+	Sandy clay.
7-A	1.0 - 6.0	Sand and gravel. Similar No. 6-A	14	0.0 - 8.0+	Sandy soil. Similar No. 12

PIT NO. 3

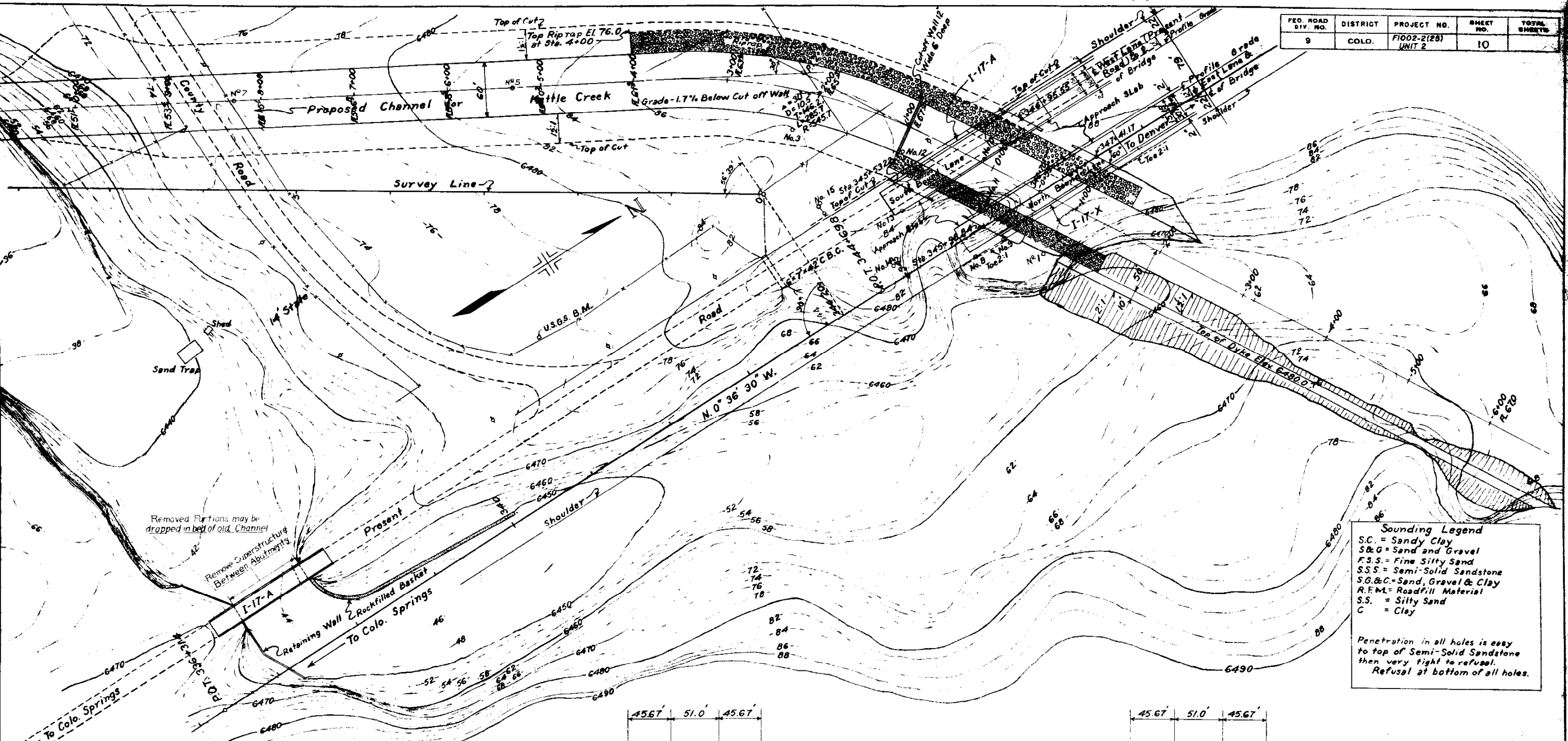
- ✓ Location: N.E. 1/4 Sec. 6, T. 13 S., R. 66 W.
- ✓ Owner: American Machine and Foundry Company
- ✓ Quantity Available: 35,000 Cu. Yds.
- ✓ Proposed Use: Sub base Material & Structure Backfill
- ✓ Haul Distance: 0.32 Miles to Sta. 283+00
- ✓ Sample No. 1103
- ✓ Stripping estimated at 5,000 Cu. Yds.



FIELD SAMPLE NO. 1103

TEST NO.	DEPTH	DESCRIPTION
1	0.0 - 3.0	Sand, gravel and binder.
1-A	3.0 - 7.0	Sand, gravel and plastic binder.
1-B	7.0	Clay
2	0.0 - 5.0	Sand
2-A	5.0 - 12.0	Sand, gravel and plastic binder.
3	0.0 - 2.0	Sand, gravel and binder.
3-A	2.0 - 9.0	Sand, gravel and plastic binder.
3-B	9.0	Clay
4	0.0 - 2.0	Sand, gravel and binder.
4-A	2.0 - 13.0	Sand, gravel and plastic binder.
5	0.0 - 3.0	Overburden
5-A	3.0 - 9.0	Sand and gravel.
5-X		Rock from the hole for crushing.
6	0.0 - 2.0	Overburden
6-A	2.0 - 8.5	Sand, gravel and plastic binder
6-B	8.5	Clay
7	0.0 - 2.5	Sand, gravel and binder.
7-A	2.5 - 8.0	Sand, gravel and plastic binder.
7-B	8.0	Clay
8	0.0 - 2.5	Sand, gravel and binder.
8-A	2.5 - 8.0	Sand, gravel and plastic binder.
8-B	8.0	Clay
9	0.0 - 2.0	Overburden
9-A	2.0 - 9.0	Sand and gravel.
9-B	9.0	Soft sandstone.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25) UNIT 2	10	

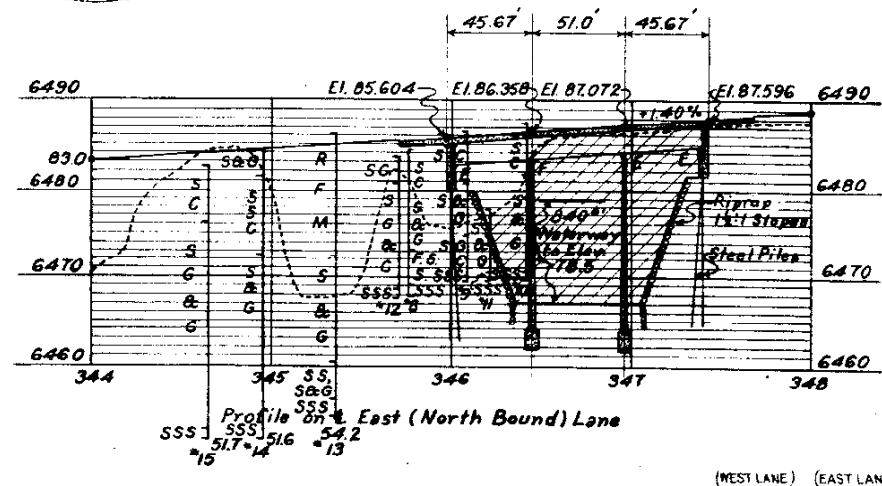
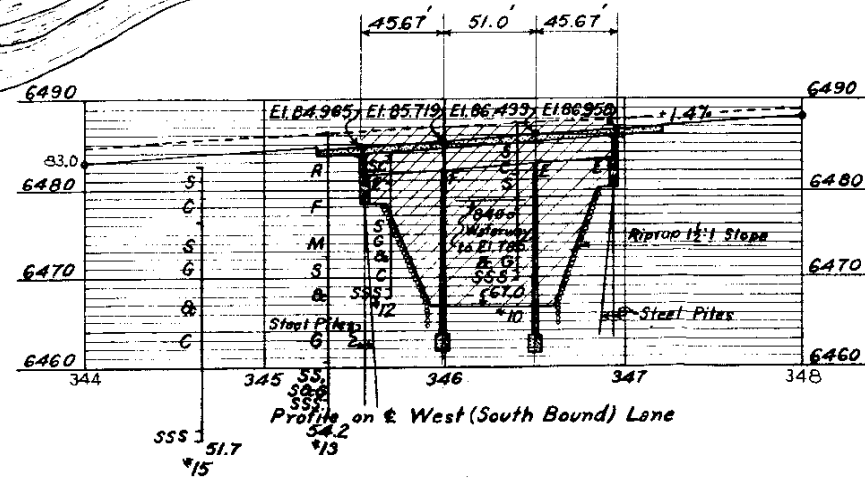


Sounding Legend
 S.C. = Sandy Clay
 S&G = Sand and Gravel
 F.S.S. = Fine Silty Sand
 S.S.S. = Semi-Solid Sandstone
 S.G.&C. = Sand, Gravel & Clay
 R.F.M. = Roadfill Material
 S.S. = Silty Sand
 C = Clay

Penetration in all holes is easy to top of Semi-Solid Sandstone then very tight to refusal.
 Refusal at bottom of all holes.

6485.4	6485.2	6481.0	6474.7
SANDY CLAY	SANDY CLAY & SAND	SANDY CLAY	SANDY CLAY
SAND & PEA GRAVEL	SILTY SANDY CLAY	SANDY CLAY	SANDY CLAY
SAND & BROWN CLAY	SANDY CLAY	SANDY CLAY	SANDY CLAY
SEMI-SOLID FINE GRAIN SANDSTONE	SANDY CLAY	SANDY CLAY	SANDY CLAY
SILTY CLAY SHALE (HARD)	SANDY CLAY	SANDY CLAY	SANDY CLAY
SEMI-SOLID FINE GRAIN SANDSTONE	SANDY CLAY	SANDY CLAY	SANDY CLAY
ALT. LAYERS SANDSTONE & CLAY SHALE	SANDY CLAY	SANDY CLAY	SANDY CLAY
SANDY CLAY SHALE (VERY HARD)	SANDY CLAY	SANDY CLAY	SANDY CLAY

- REFERENCE DRAWINGS
- SHEET NO 10 SITUATION PLAN
 - SHEET NO 11 SUMMARY OF QUANTITIES AND DETAILS OF PIER 2 & PIER 3
 - SHEET NO 12 SUPERSTRUCTURE PLANS
 - SHEET NO 13 SUPERSTRUCTURE PLANS AND DETAILS
 - SHEET NO 14 DETAILS OF ABUTMENTS



COLORADO DEPARTMENT OF HIGHWAYS
 3 SPAN (43'-5"0", 43'-6") CONTINUOUS CONCRETE & I-BEAM BRIDGES
 30'-0" ROADWAY 60° SKEW
 SITUATION PLAN

Across Kettle Creek
 STA. WEST LANE: 445+00 TO 445+00
 STA. EAST LANE: 445+00 TO 445+00
 Near Road See Sheet 11 & 12

Plotted by A.B.N. Approved by [Signature]
 Made by A.B.N. Bridge Engineer
 Checked by [Signature] Date: May 10, 1953.

STRUCTURE NO. I-17-A & I-17-X

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2 (25) UNIT 2	11	

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	WEST LANE BRIDGE					EAST LANE BRIDGE					CHANG. TOTAL NET CHANGE	TOTAL BOTH BRIDGES LUMP SUM	APPR. SLABS	
			SUPER	ABUT.	PIER 2	PIER 3	ABUT.	TOTAL	SUPER	ABUT.	PIER 2	PIER 3				ABUT.
11a	REMOVAL OF PORTIONS OF BRIDGE	LUMP SUM														
13c	UNCLASSIFIED EXCAVATION	CU.YD.												85000	85000	
14a	DRY ROCK EXC. (STR.)	CU.YD.														
14b	DRY COMMON EXC. (STR.)	CU.YD.		12				12							36	
14c	WET ROCK EXC. (STR.)	CU.YD.			20	20					20	20			80	
14d	WET COMMON EXC. (STR.)	CU.YD.			50	50					50	50			100	220
16a	STRUCTURE BACKFILL (CLASS I)	CU.YD.		12	40	40			12		40	40			92	30
16c	MECHANICAL TAMPING	HR.		1	4	4			1		4	4			16	3
18a	STA. YARD OVERHAUL	STAYD.								7	4	4			1	29
18b	YARD MILE OVERHAUL	YD.MI.														13
46a	CLASS 'A' CONCRETE	CU.YD.	123.4	17.2	78.6	78.6	17.4	315.2	123.4	17.4	80.7	80.7	17.4	319.6	14.2	649
47	REINFORCING STEEL	L.B.	20730	1570	3165	3165	1570	30200	20730	1570	3165	3165	1570	30200	620	61020
48	STRUCTURAL STEEL	L.B.	115,000	635	625	625	635	117520	115,000	635	630	630	635	117530	235050	
61c	STEEL PILING (12 BF 53)	LN.FT.		120				210		90				90	180	390
67a	RIPRAP	CU.YD.													1000	1000
89a	DRAIN PIPE 4" DIA. x 2'-0"	EACH		6				6		6				6		12
*	2" EXPN. JOINT MATL.	SQ.FT.		80				80		80				80		160

BAR LIST FOR ABUTMENTS

MARK	SIZE	NUMBER REQ'D.	LENGTH	TYPE	DIMENSIONS
410	2"	38	38	IV	2'-4" x 1'-7"
411	2"	35	35	V	10'-8" x 1'-7"
412	2"	13	13	VI	6'-8" x 0'-8"
413	2"	2	2	VII	9'-8" x 0'-8"
414	2"	2	2	VIII	11'-2" x 0'-8"
415	2"	18	18	STR.	26'-1" x 0'-8"
416	2"	2	2	STR.	6'-4" x 0'-8"
417	2"	2	2	STR.	5'-6" x 0'-8"
510	3/8"	35	35	VII	1'-8" x 0'-8"
601	3/8"	4	4	STR.	24'-3" x 0'-8"
602	3/8"	2	2	STR.	24'-3" x 0'-8"
603	3/8"	5	5	STR.	39'-8" x 0'-8"

BAR SUMMARY FOR ONE ABUTMENT

1413 LN.FT.	2"	35	0.668	LBS PER FT.	344	
79	2"	13	1.043		82	
352	2"	2	1.502		529	
					+1% OVERRUN	15
TOTAL FOR ONE ABUTMENT					570	

BAR LIST FOR PIERS

MARK	SIZE	NUMBER REQ'D.	LENGTH	TYPE	DIMENSIONS
420	2"	7	7	STR.	39'-4" x 0'-11"
421	2"	38	38	STR.	35'-6" x 0'-11"
422	2"	2	2	VIII	5'-3" x 0'-11"
440	2"	2	2	VIII	5'-3" x 0'-11"
515	3/8"	40	40	STR.	6'-0" x 0'-11"
516	3/8"	72	72	STR.	3'-10" x 0'-11"
517	3/8"	74	74	STR.	17'-10" x 0'-11"

BAR SUMMARY FOR ONE PIER

1824 LN.FT.	2"	38	0.668	LBS PER FT.	1218	
1836	2"	2	1.043		145	
					+1% OVERRUN	32
TOTAL FOR ONE PIER					3165	

BAR LIST FOR ONE SUPERSTRUCTURE

MARK	SIZE	NO. REQ'D.	LENGTH	TYPE	SPLICED
401	2"	248	22'-6"	STR.	SPLICED
402	2"	134	25'-9"	STR.	SPLICED
403	2"	20	23'-0"	STR.	SPLICED
404	2"	60	4'-2"	IV	0'-8" x 1'-1"
501	3/8"	110	38'-10"	STR.	
502	3/8"	110	40'-10"	STR.	
503	3/8"	111	39'-11"	STR.	
504	3/8"	60	4'-2"	III	3'-0" x 1'-2"

BAR SUMMARY FOR ONE SUPERSTRUCTURE

9741 LN.FT.	2"	38	0.668	LBS PER FT.	6507	
13444	2"	2	1.043		14022	
					+1% OVERRUN	201
TOTAL FOR ONE SUPERSTRUCTURE					20730	

BAR LIST FOR ONE APPROACH SLAB

MARK	SIZE	NO. REQ'D.	LENGTH	TYPE
520	2"	21	29'-8"	STR.
521	2"	2	2'-0"	STR.
536	2"	1	19'-10"	STR.
537	2"	1	20'-3"	STR.
595	2"	1	37'-4"	STR.

BAR SUMMARY FOR ONE APPROACH SLAB

2531 LN.FT.	2"	38	0.668	LBS PER FT.	2702	
					+1% OVERRUN	28
TOTAL FOR ONE APPROACH SLAB					2730	

BAR LIST FOR CHANNEL CHANGE CUTOFF WALL

MARK	SIZE	NO. REQ'D.	LENGTH	TYPE
445	2"	12	32'-2"	STR.
520	2"	64	5'-4"	STR.

BAR SUMMARY FOR CHANNEL CHANGE CUTOFF WALL

386 LN.FT.	2"	38	0.668	LBS PER FT.	256	
341	2"	12	1.043		356	
					+1% OVERRUN	6
TOTAL					620	

LOADING DATA

LIVE LOAD - A.A.S.H.O. H-20 - S16-44
 DEAD LOAD ASSUMES 15 LBS PER SQ.FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1" WORN CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA

A.A.S.H.O. 1953 UNIT STRESSES EXCEPT AS NOTED
 REINFORCING STEEL f_c = 20,000 LBS. PER SQ. IN.
 STRUCTURAL STEEL f_c = 18,000 LBS. PER SQ. IN.
 f_c = 1000 LBS. PER SQ. IN.

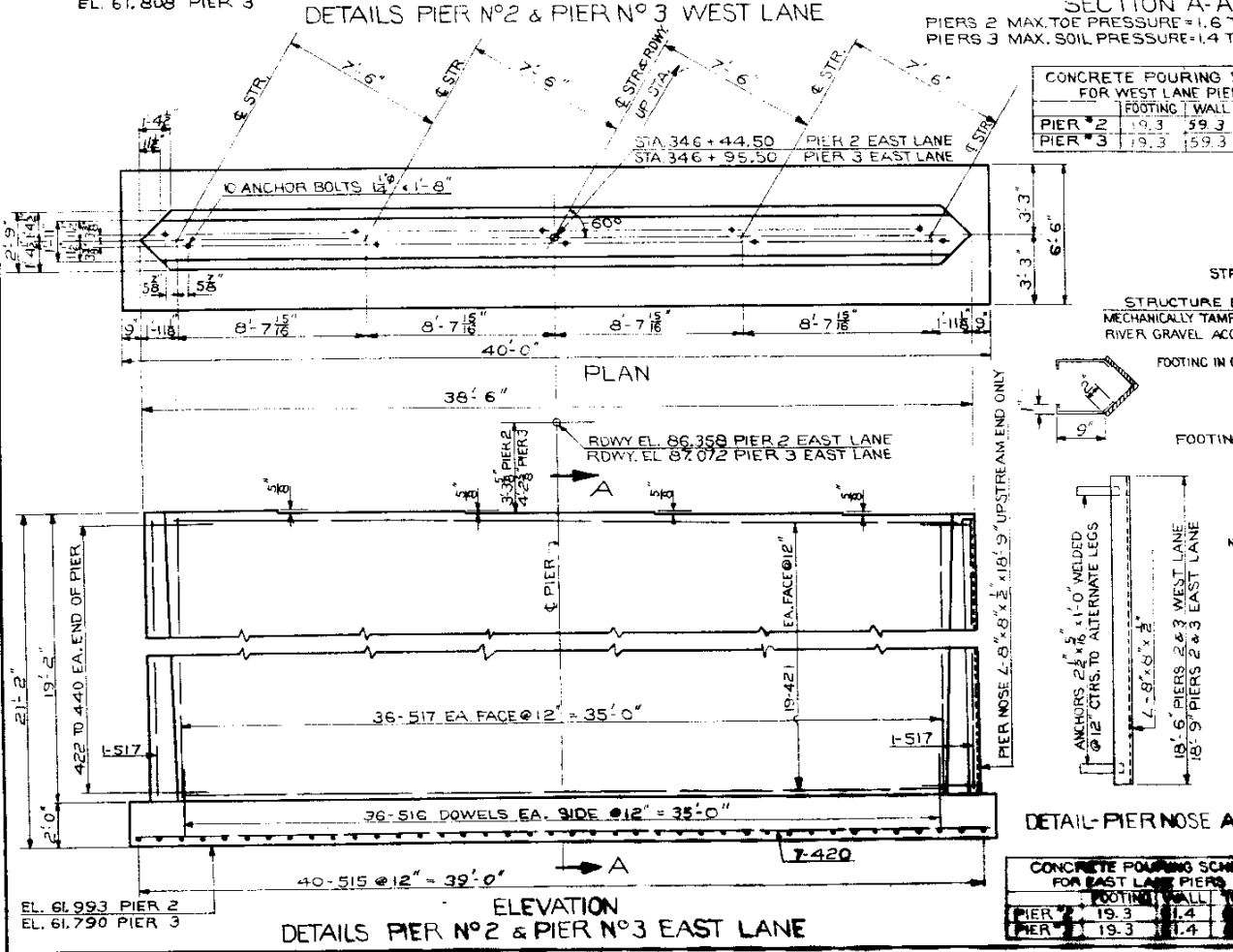
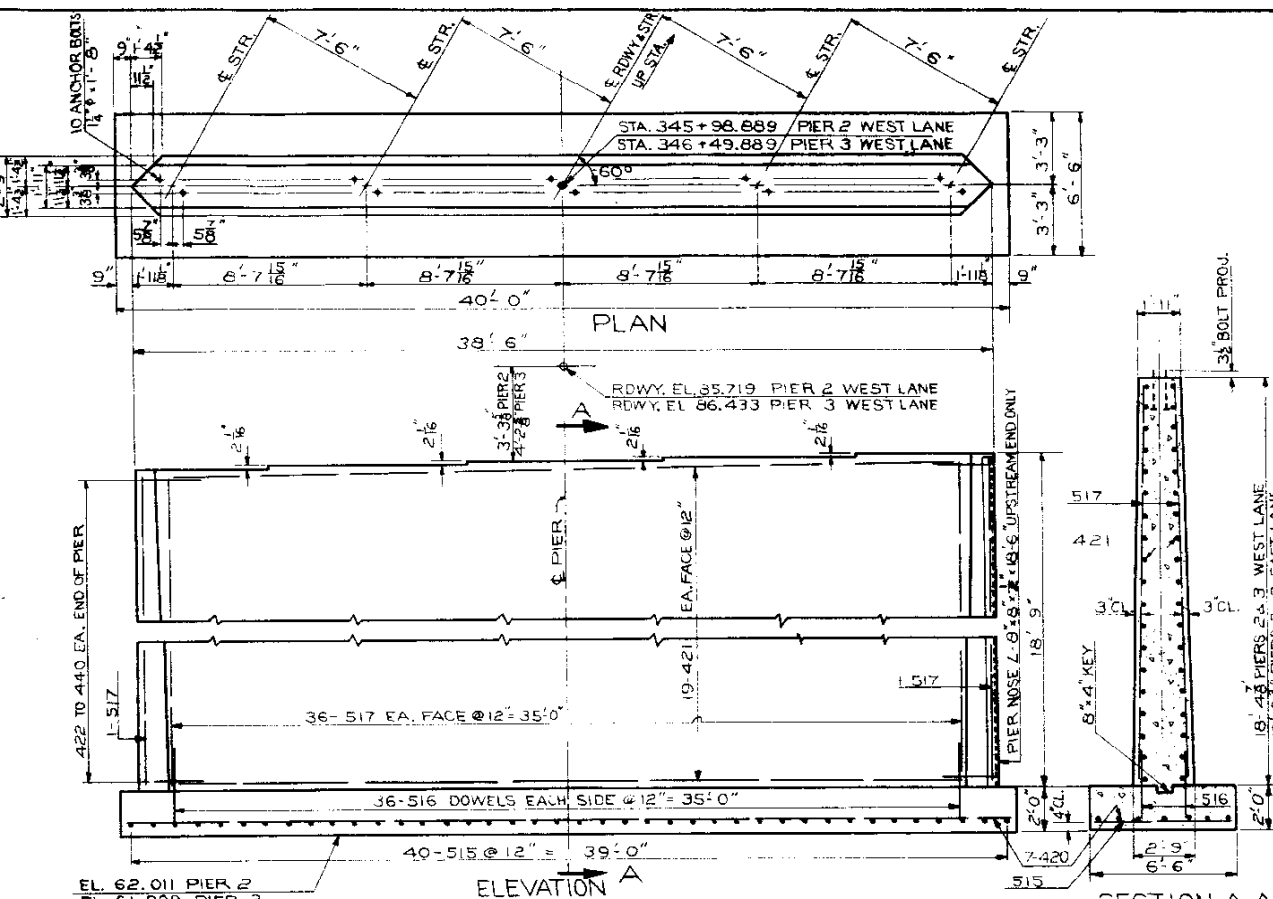
COLORADO DEPARTMENT OF HIGHWAYS

3 SPAN (43'-6", 51'-0", 43'-6") CONTINUOUS
 CONCRETE & I-BEAM BRIDGES
 30'-0" ROADWAY 60° SKEW

SUMMARY OF QUANTITIES, BARLISTS, & PIER DETAILS

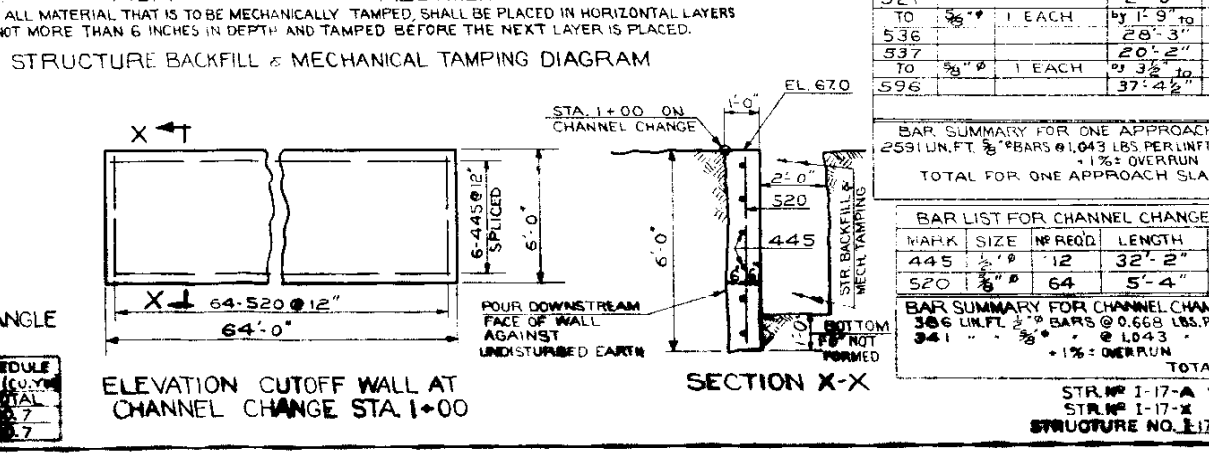
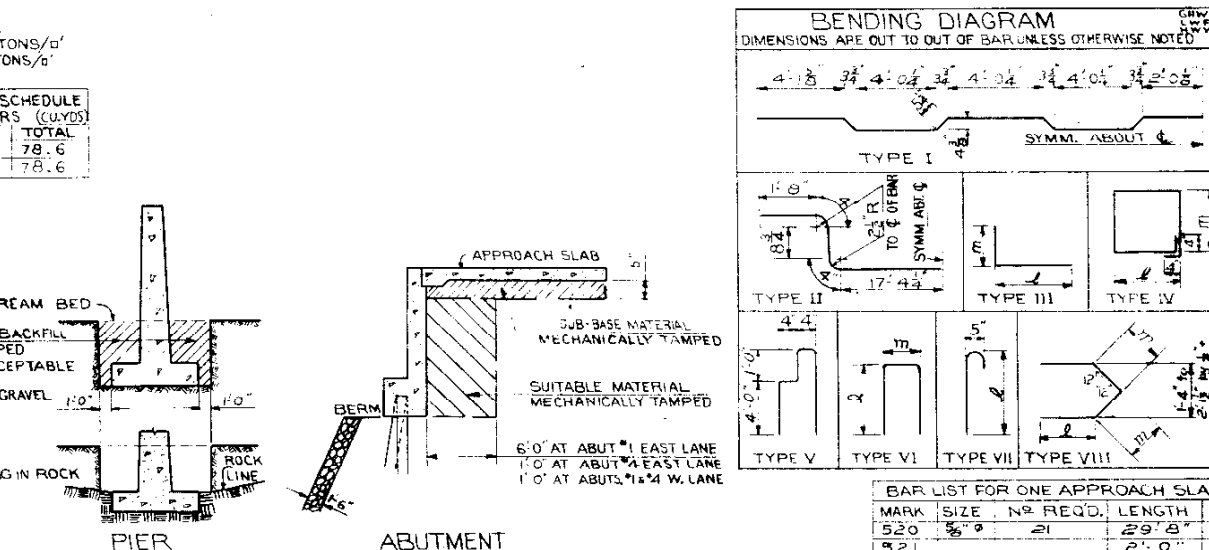
Across KETTLE CREEK
 STA. WEST LANE 345 + 98.889 TO 346 + 49.889
 STA. EAST LANE 345 + 98.889 TO 346 + 49.889
 NAME BRIDGE 300-11-17-A, 17-B, 17-C

Designed by GHW
 Made by GHW
 Checked by GHW
 Approved by *[Signature]*
 Bridge Engineer
 Date: *Apr 10, 1953*



GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS, APPLICABLE TO THE PROJECT. ALL CONCRETE SHALL BE CLASS 'A' AND AIR ENTRAINED AS SPECIFIED. ALL CONCRETE SURFACES EXPOSED TO VIEW SHALL RECEIVE CLASS '1' SURFACE FINISH EXCEPT THE UNDERSIDE OF FLOOR SLABS AND ABUTMENT FACES BETWEEN OUTSIDE STRINGERS, CONCRETE GIRDETS, FLOOR SLABS, AND CURBS, SHALL BE POURED MONOLITHICALLY. FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIPLAP OR TONGUE AND GROOVE LUMBER S3S UNLESS FACED WITH PANEL BOARD. FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED. JOINTS AND DEPTH OF FOOTING SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATION A-305-50 T OR THE LATEST REVISION THEREOF, AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT. PRIMARY BARS SHALL NOT BE SPLICED AND SECONDARY BARS WHEN SPLICED SHALL LAP 20 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR. ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM, UNLESS OTHERWISE NOTED, EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED. HANDRAIL BOLTS SHALL HAVE HEX HEADS, NUTS, AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED, AND ALL RIVETS, EXCEPT AS NOTED, ARE 3/4" DIA. AND SHALL BE POWER DRIVEN. WHEN TREATED TIMBER OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CREOSOTE OIL. WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.



CONCRETE POURING SCHEDULE FOR WEST LANE PIERS (CU.YDS)

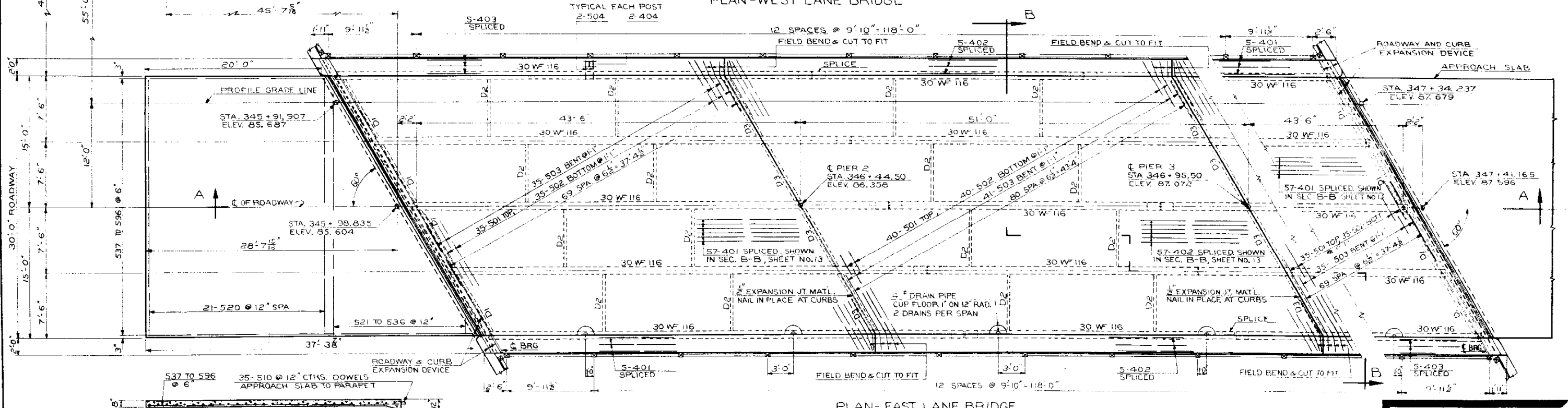
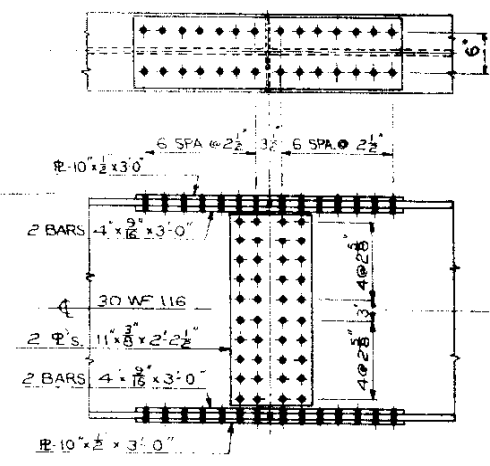
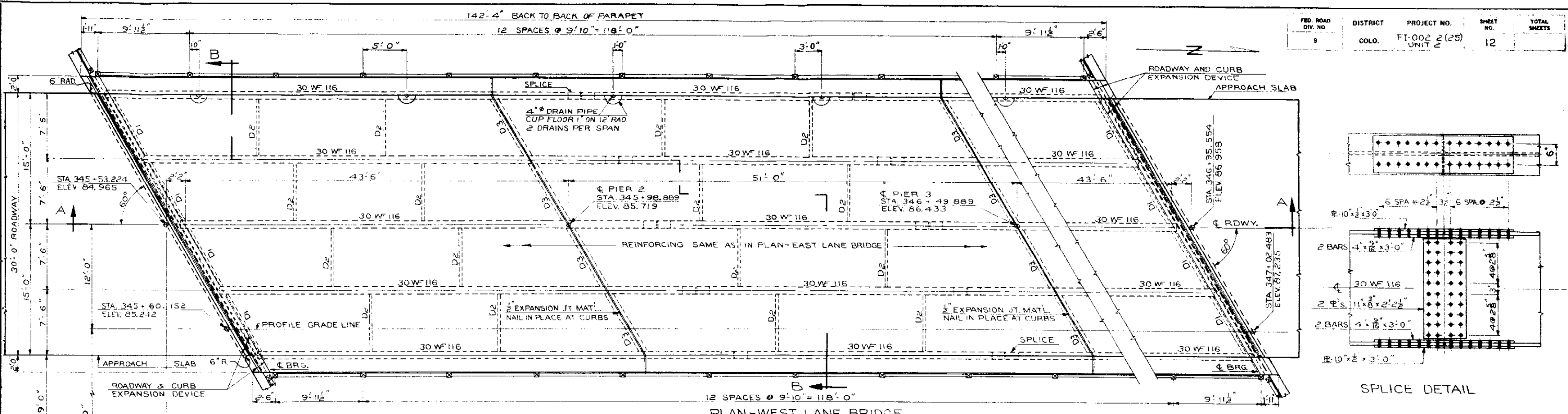
PIER	FOOTING WALL	TOTAL
PIER 2	19.3	59.3
PIER 3	19.3	59.3

CONCRETE POURING SCHEDULE FOR EAST LANE PIERS (CU.YDS)

PIER	FOOTING WALL	TOTAL
PIER 2	19.3	59.3
PIER 3	19.3	59.3

REVISIONS

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FT-002 2 (25) UNIT 2	12	



SECTION OF APPROACH SLAB ALONG ϕ OF ROADWAY

ALL APPROACH SLABS IDENTICAL.

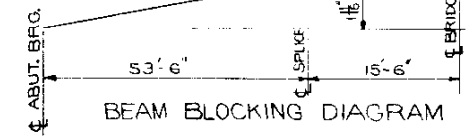
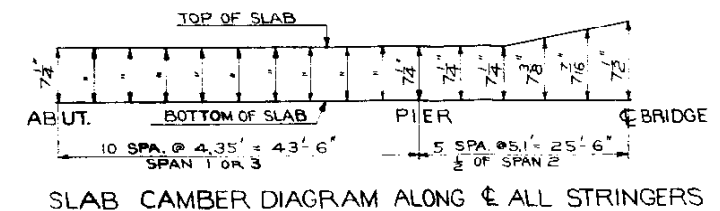
CONCRETE POURING SCHEDULE FOR ONE SUPERSTRUCTURE

SPAN #1 = 38.90 CU.YDS.

SPAN #2 = 45.60 CU.YDS.

SPAN #3 = 38.90 CU.YDS.

ONE APPROACH SLAB = 21.75 CU.YDS.



STRUCTURE No I-17-A ON WEST LANE (SOUTH BOUND)

STRUCTURE No I-17-X ON EAST LANE (NORTH BOUND)

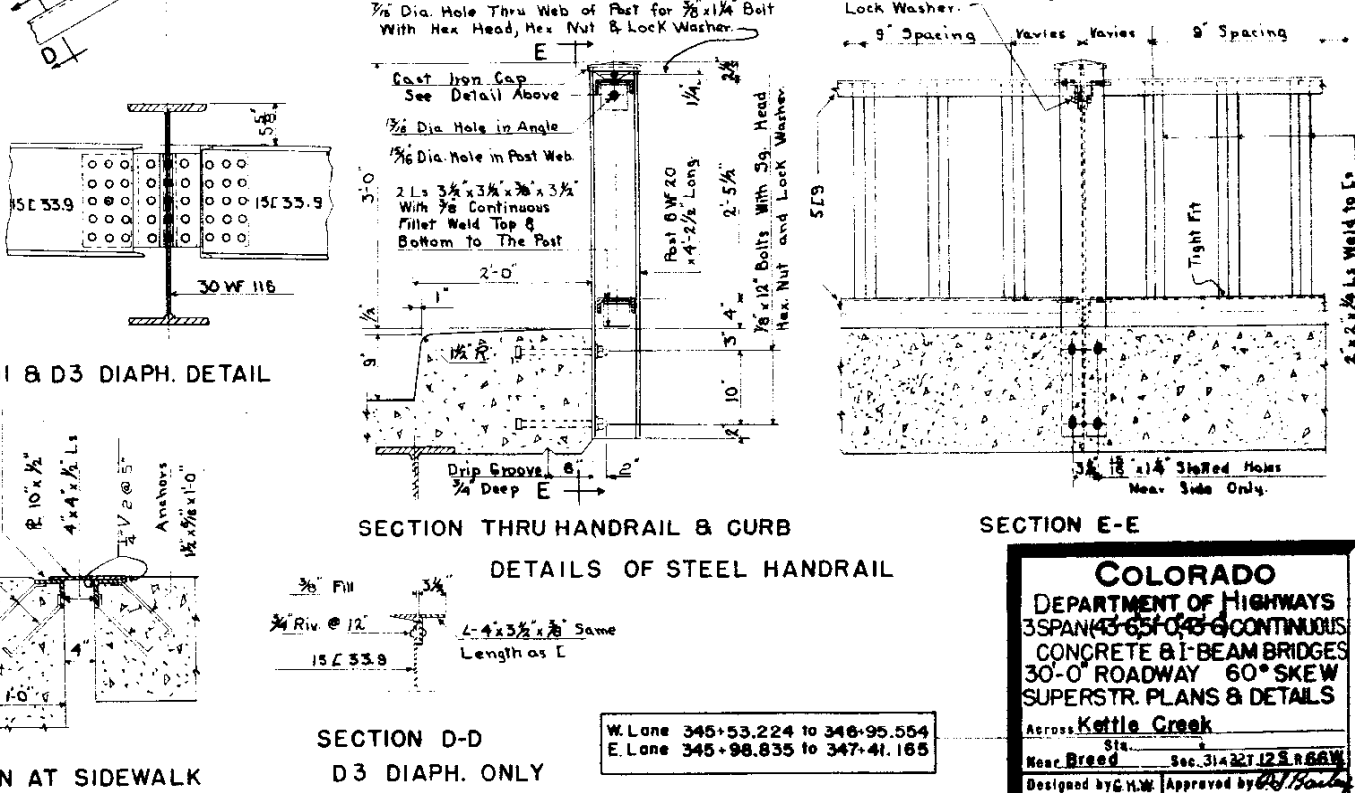
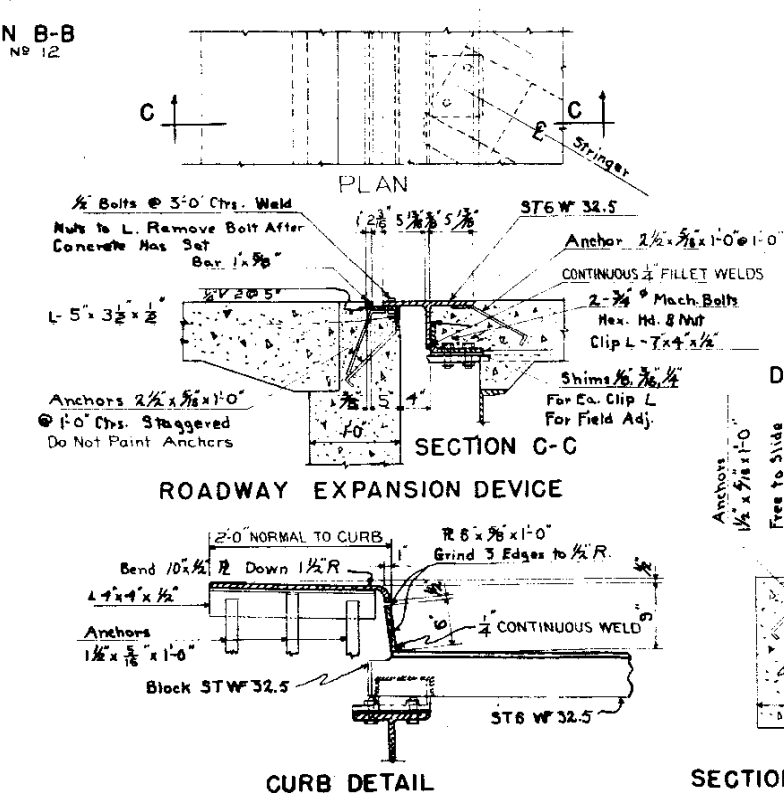
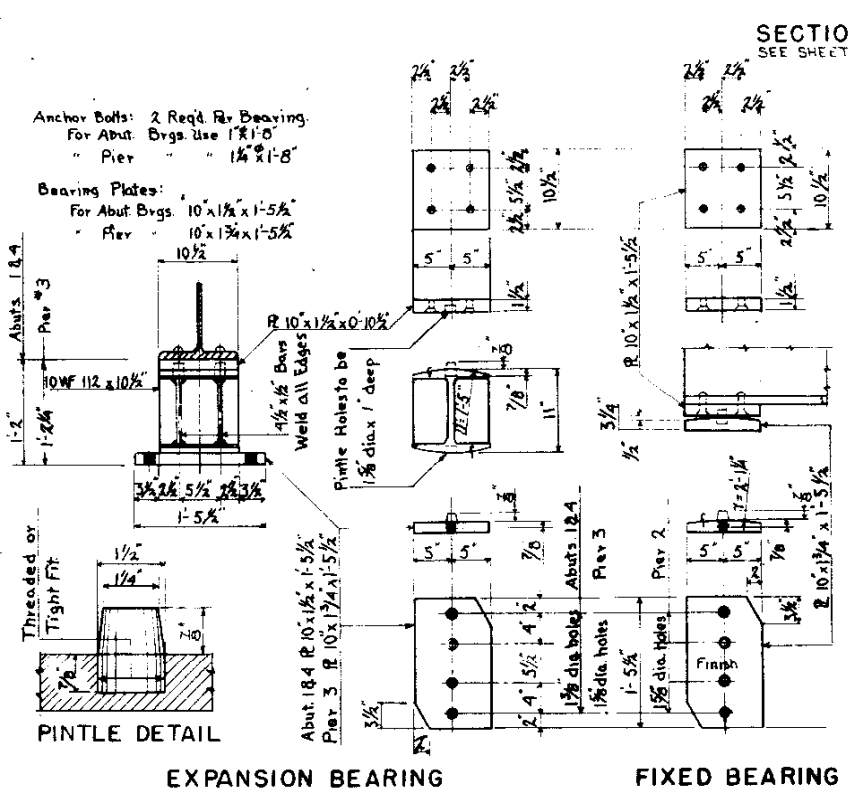
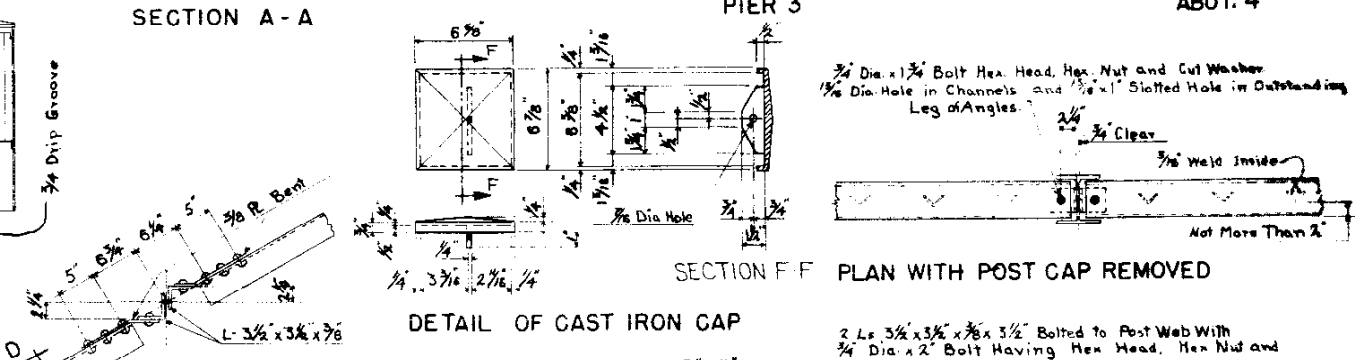
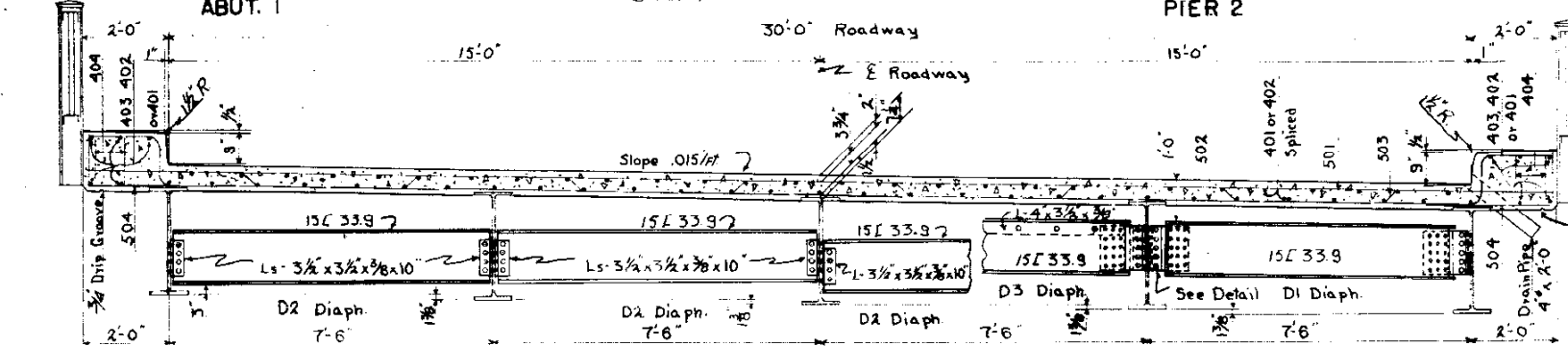
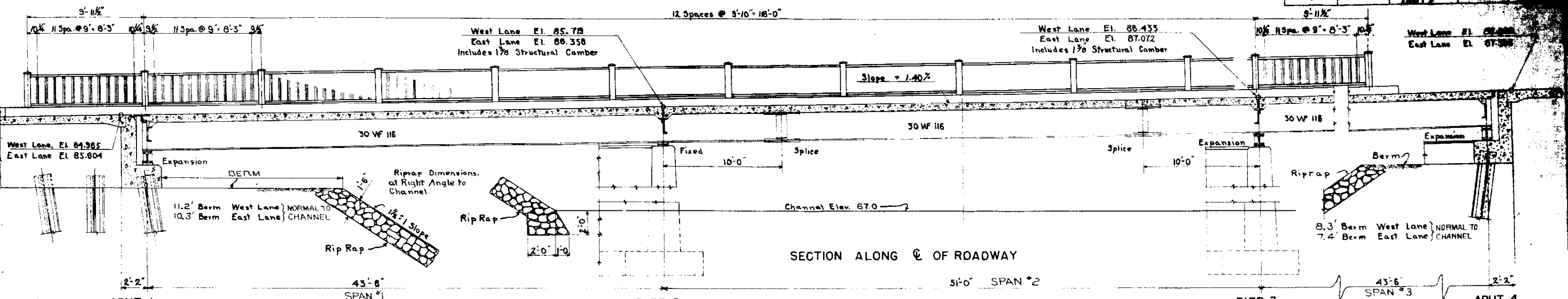
STRUCTURE NO. I-17-A & I-17-X

COLORADO
DEPARTMENT OF HIGHWAYS
 3 SPANS (43'6", 51'0", 43'6") CONTINUOUS
 CONCRETE & I BEAM BRIDGES
 30'0" ROADWAY 60° SKEW
 SUPERSTRUCTURE PLANS

Across KETTLE CREEK
 STA. WEST LANE: 345+53.224 TO 346+95.554
 STA. EAST LANE: 345+98.835 TO 347+41.165
 Near BREED Sec. 31 & 32 T. 12 S. R. 66 W.

Designed by CHW
 Made by LWF
 Checked by [Signature]
 Approved by [Signature] Bridge Engineer
 Date: Aug. 10, 1953.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.
9	COLO.	1100-2(20)

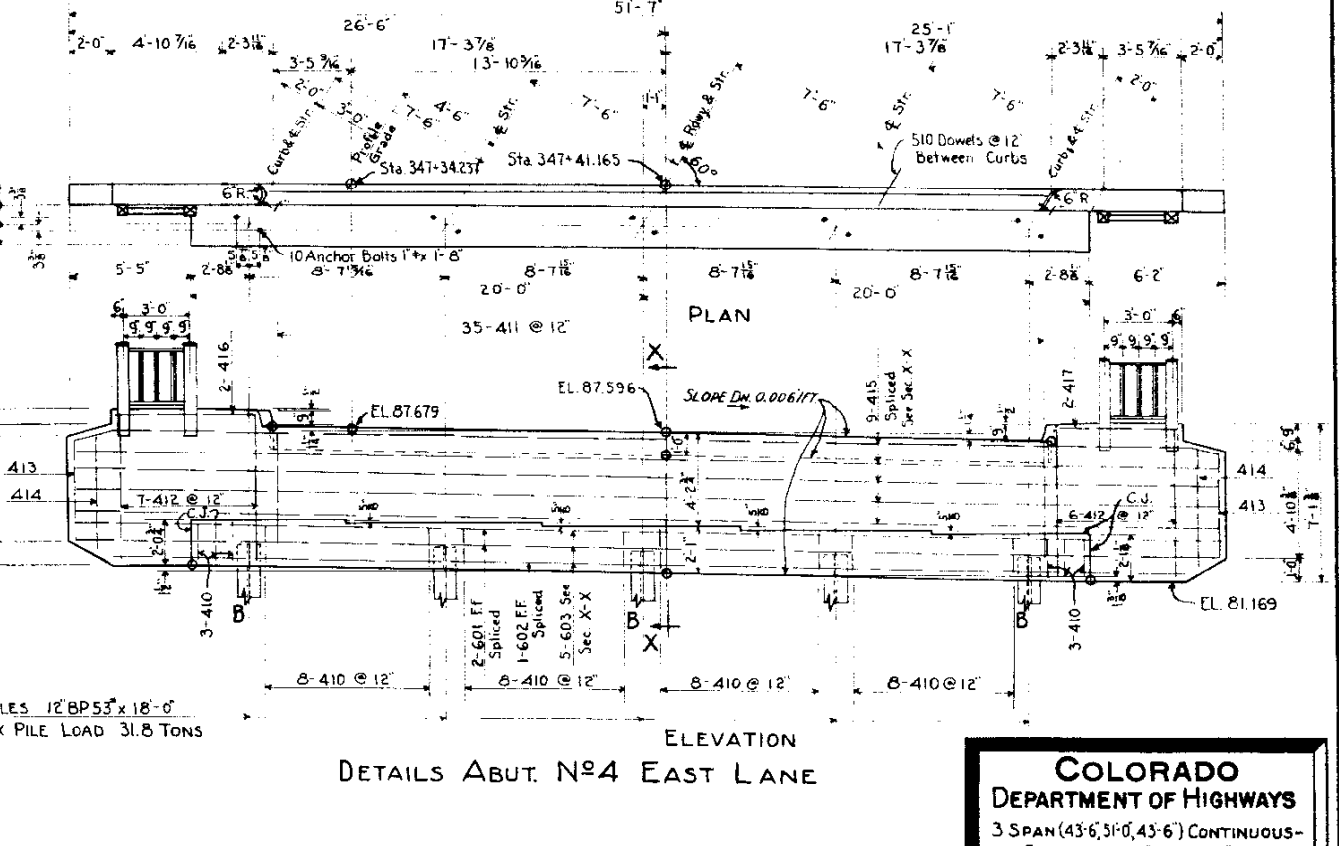
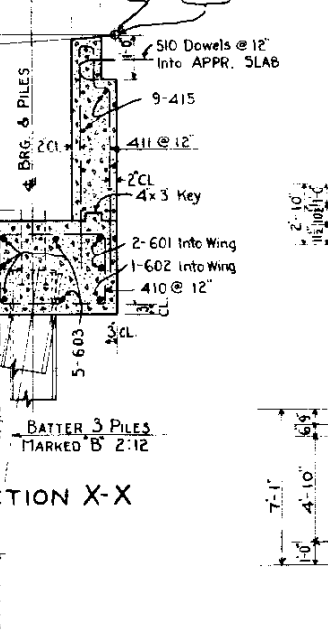
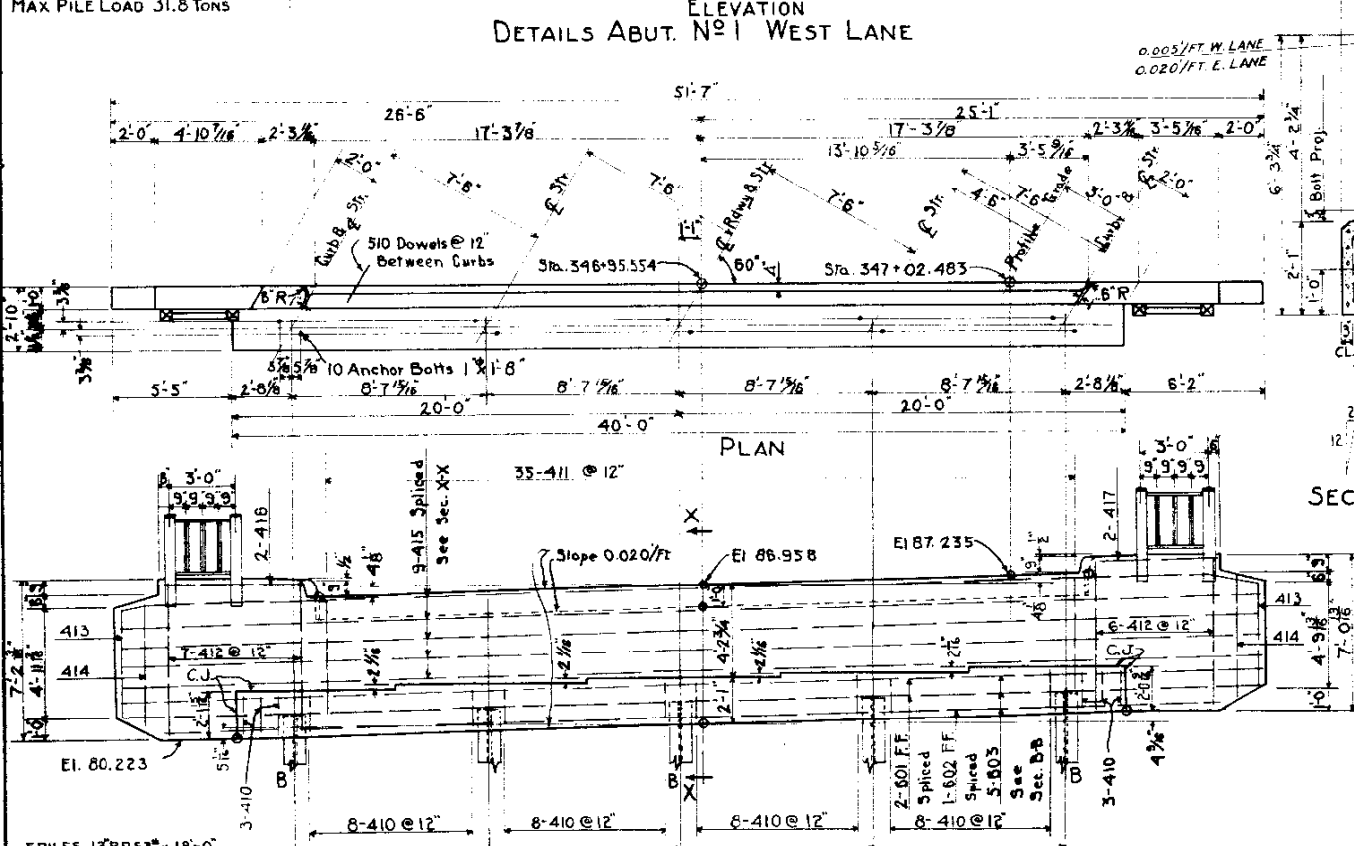
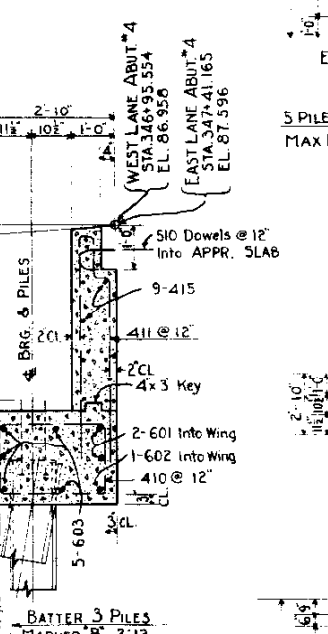
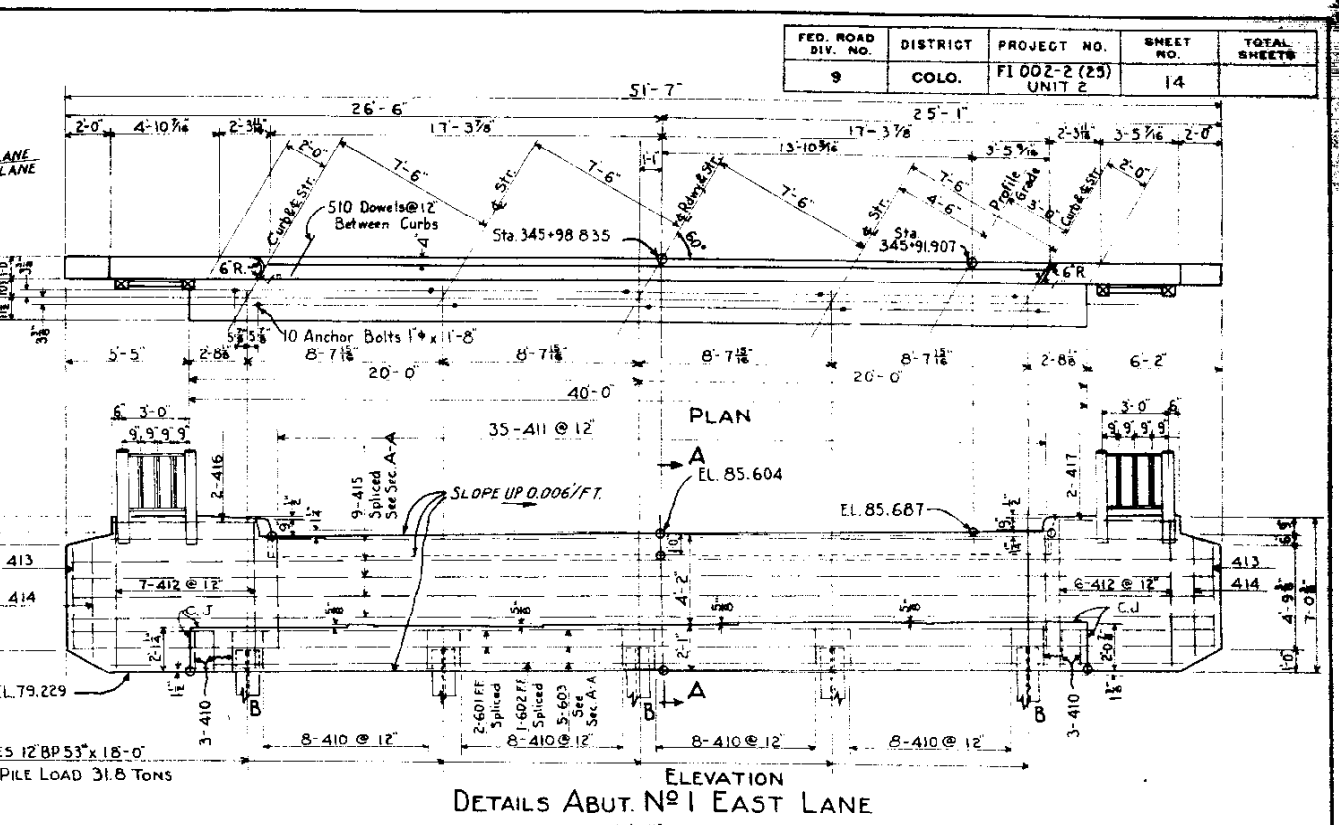
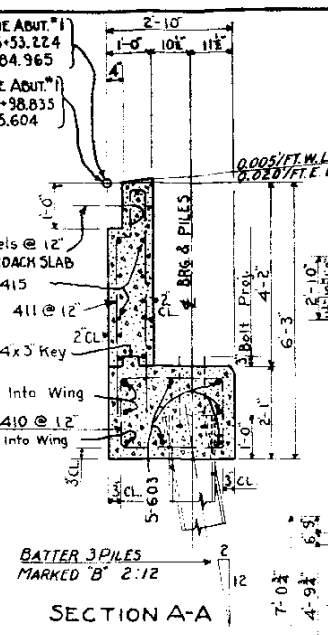
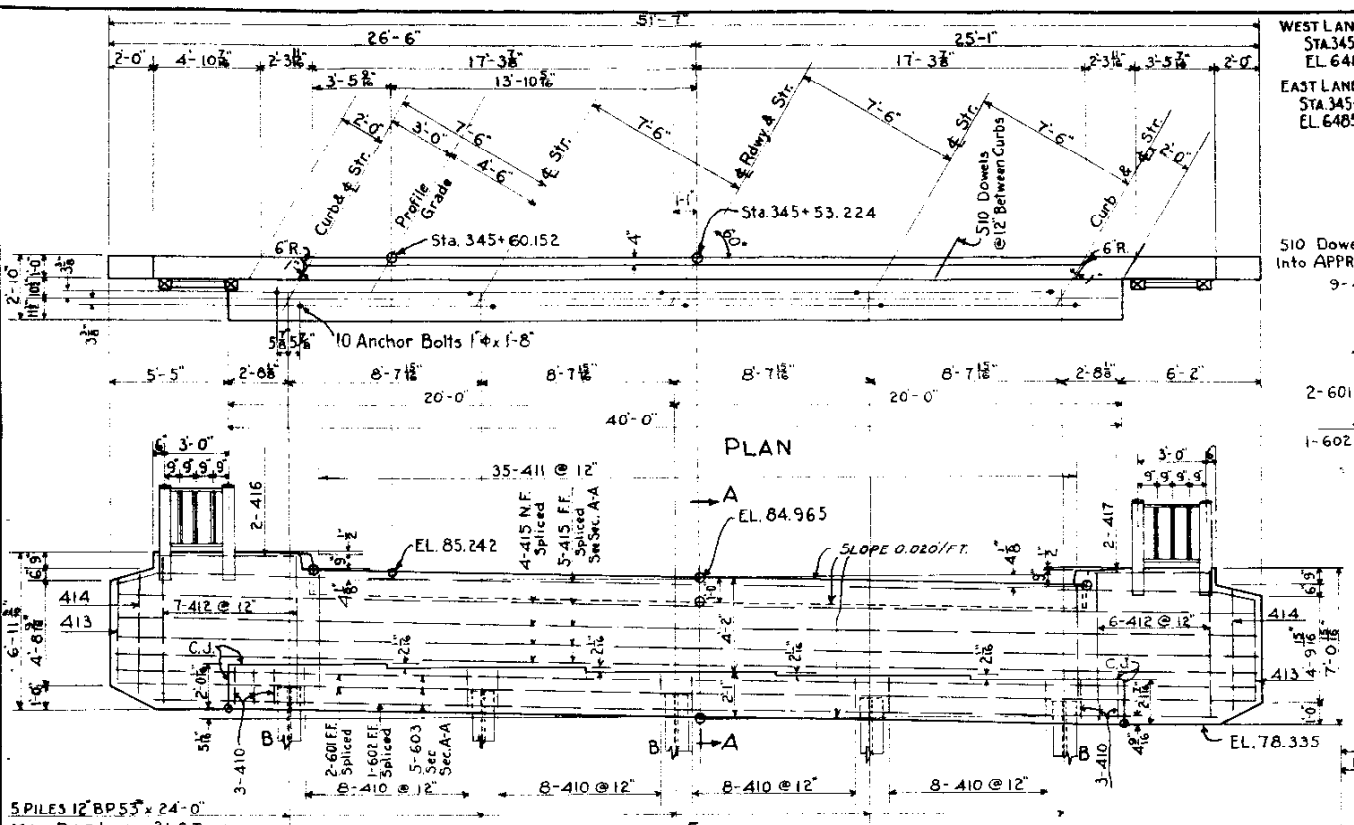


W.Lane 345+53.224 to 346+95.554
E.Lane 345+98.835 to 347+41.165

COLORADO
DEPARTMENT OF HIGHWAYS
3 SPAN 43'-8" 51'-0" 43'-6" CONTINUOUS
CONCRETE & I-BEAM BRIDGES
30'-0" ROADWAY 60° SKEW
SUPERSTR. PLANS & DETAILS
Across Kettle Creek
Near Breed Sta. 314+27.125 R. 66W
Designed by G.H.W. Bridge Engineer
Made by L.W.P.
Checked by Date: Aug. 12, 1953

STRUCTURE NO. I-17-A B I-17-X

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2 (25) UNIT 2	14	



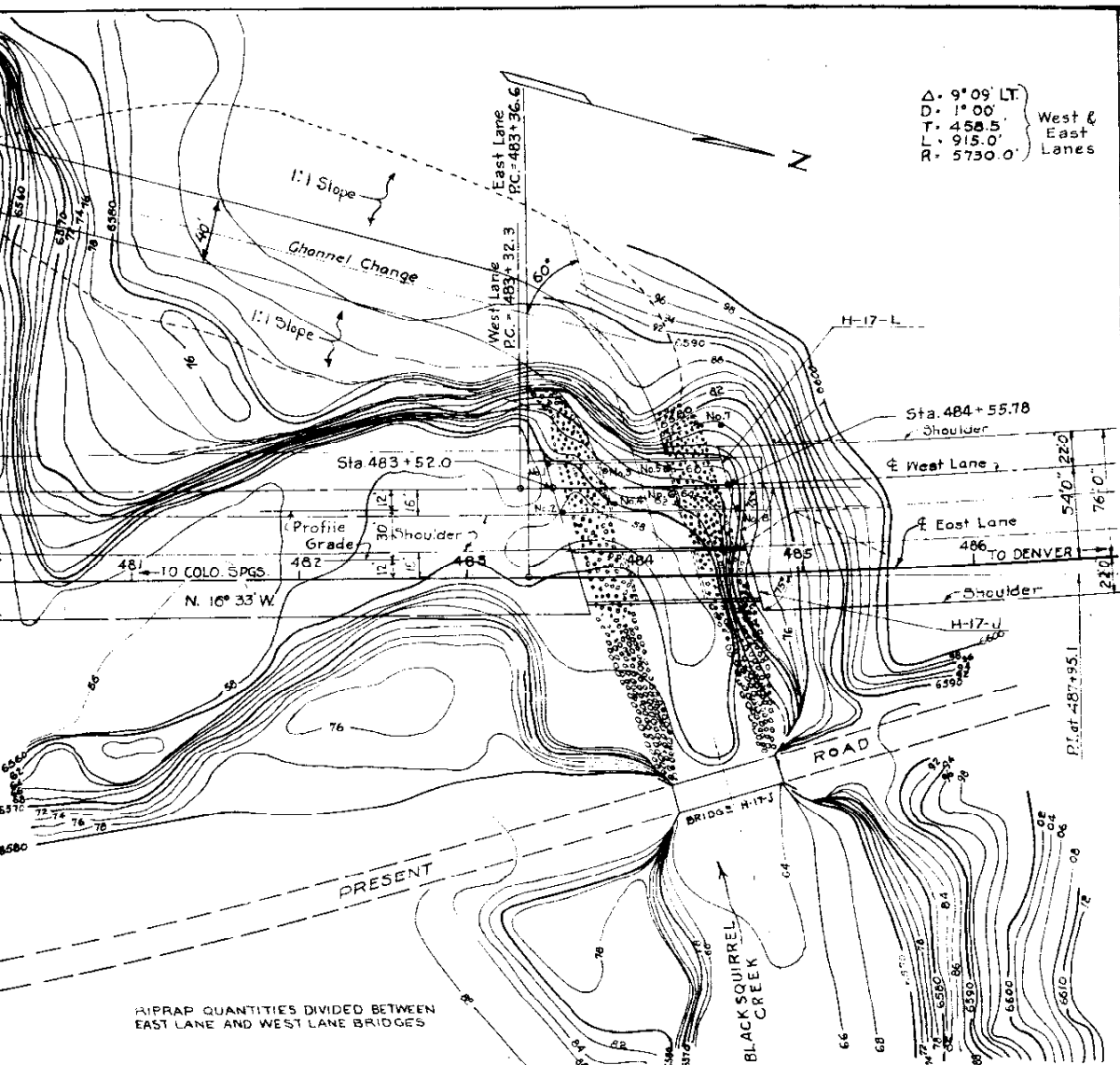
	CONCRETE	
	CAP	PARAPET & WINGS
ABUT. NO. 1 WEST LANE	8.70 Cu.Yd.	8.50 Cu.Yd.
ABUT. NO. 4 WEST LANE	8.80 "	8.60 "
ABUT. NO. 1 EAST LANE	8.80 "	8.60 "
ABUT. NO. 4 EAST LANE	8.80 "	8.60 "

COLORADO DEPARTMENT OF HIGHWAYS
 3 SPAN (43'-6", 31'-0", 43'-6") CONTINUOUS-CONCRETE & I-BEAM BRIDGES
 30'-0" ROADWAY 60° SKEW
 DETAILS 4 ABUTS.

Across Kettle Creek
 West Lane 345+53.224 to 346+95.554
 East Lane 345+98.835 to 347+41.165
 Near Breed See 81-125, W 66M

Designed by GHW Approved by *[Signature]*
 Made by GHW Bridge Engineer
 Checked by *[Signature]* Date: *Aug. 12, 1953.*

West Lane East Lane
 STRUCTURE NO. I-17-A & I-17-X



LWF J.W.B. M.G.D.

BAR LIST - SUPERSTRUCTURE, ABUTMENTS, PIERS

MARK	SIZE	LENGTH	TYPE	LOCATION						
				SUPER	ABUT. No.	PIER No. 2	PIER No. 3	ABUT. No. 4	2	1
				No. Req'd.	No. Req'd.	No. Req'd.	No. Req'd.	No. Req'd.	No. Req'd.	No. Req'd.
401	3/4"	31'-11"	Str.	71						
402	3/4"	37'-6"	Str.	81						
403	3/4"	30'-11"	Str.	81						
404	3/4"	32'-3"	Str.	10						
405	3/4"	4'-2"	III	44					8	1-1"
406	3/4"	5'-6"	Str.		4					
407	3/4"	5'-6"	Str.		4					
408	3/4"	46'-8"	Str.		4				4	
409	3/4"	9'-2"	V		9					4'-3" 6"
410	3/4"	8'-8"	V		1					4'-0" 0"
411	3/4"	9'-2"	V		1					4'-3" 0"
412	3/4"	6'-2"	V		1					2'-9" 0"
413	3/4"	5'-0"	V		36					2'-6" 0"
415	3/4"	8'-10"	III		43				43	1'-8" 2-3"
416	3/4"	7'-8"	V							3'-6" 0"
420	3/4"	42'-8"	Str.		1					
421	3/4"	44'-6"	Str.		1					
422	3/4"	6'-2"	Str.						4	
423	3/4"	8'-0"	Str.						4	
424	3/4"	35'-0"	Str.						1	
425	3/4"	1'-9"	Str.						31	
426	3/4"	8'-2"	V						32	5'-9" 0"
427	3/4"	11'-2"	V						13	5'-3" 0"
428	3/4"	10'-8"	V						1	5'-0" 0"
431	3/4"	19'-6"	Str.			30	30			
432	3/4"	21'-8"	Str.			24	24			
433	3/4"	33'-8"	Str.			2	2			
434	3/4"	12'-11"	VI			4	4			
435	3/4"	7'-2"	to					1 ea.	1 ea.	by 1/2"
436	3/4"	by 2' to III								by 1/2"
437	3/4"	11'-8"	to							2'-9" 2-9"
438	3/4"	6'-0"	to							1'-6" 1-1"
439	3/4"	by 2' to VII						1 ea.	1 ea.	by 1/2"
490	3/4"	12'-6"	to							2'-10" 2-9"
501	3/4"	33'-0"	Str.	82						
502	3/4"	36'-7"	Str.	82						
503	3/4"	35'-11"	Str.	81						
504	3/4"	3'-11"	IV	44						2'-9" 0" 10"
507	3/4"	23'-8"	Str.		2				2	
508	3/4"	2'-0"	Str.	31	(Dowels)					31
511	3/4"	5'-9"	Str.			28	28			
1001	3/4"	32'-3"	Str.			12	12			
1002	3/4"	21'-9"	Str.			3	3			
1003	3/4"	30'-0"	Str.			1	1			
515	3/4"	10'-0"	III			39	39			3'-0" 1-8"
701	3/4"	42'-8"	Str.		2					2
702	3/4"	46'-0"	Str.		1					1
901	3/4"	42'-8"	Str.		2					2
1101	3/4"	33'-8"	Str.			10	10			

LWF J.W.B. M.G.D.

BAR LIST - 2 APPROACH SLABS

MARK	SIZE	LENGTH	TYPE	No. Req'd.
536	3/4"	29'-6"	Str.	34
537	3/4"	24'-0"	Str.	2 ea.
543	3/4"	4'-0"	Str.	2 ea.
544	3/4"	24'-0"	Str.	2 ea.
5103	3/4"	16'-0"	Str.	60
508	3/4"	2'-0"	Str.	60

LWF J.W.B. M.G.D.

BAR SUMMARY ABUT. No. 1

1002 Lin. Ft. $\frac{1}{2}$ " @ 0.668 Lbs./Lin. Ft. = 670 Lbs.

47 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 49 Lbs.

182 Lin. Ft. $\frac{1}{2}$ " @ 2.044 Lbs./Lin. Ft. = 270 Lbs.

85 Lin. Ft. $\frac{1}{2}$ " @ 3.400 Lbs./Lin. Ft. = 289 Lbs.

± 1% Overrun = 14 Lbs.

Total = 1290 Lbs.

LWF J.W.B. M.G.D.

BAR SUMMARY PIER No. 2

1775 Lin. Ft. $\frac{1}{2}$ " @ 0.668 Lbs./Lin. Ft. = 1186 Lbs.

552 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 576 Lbs.

337 Lin. Ft. $\frac{1}{2}$ " @ 5.313 Lbs./Lin. Ft. = 1791 Lbs.

482 Lin. Ft. $\frac{1}{2}$ " @ 4.303 Lbs./Lin. Ft. = 2074 Lbs.

± 1% Overrun = 53 Lbs.

Total = 5680 Lbs.

LWF J.W.B. M.G.D.

BAR SUMMARY PIER No. 3

1775 Lin. Ft. $\frac{1}{2}$ " @ 0.668 Lbs./Lin. Ft. = 1186 Lbs.

552 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 576 Lbs.

337 Lin. Ft. $\frac{1}{2}$ " @ 5.313 Lbs./Lin. Ft. = 1791 Lbs.

482 Lin. Ft. $\frac{1}{2}$ " @ 4.303 Lbs./Lin. Ft. = 2074 Lbs.

± 1% Overrun = 53 Lbs.

Total = 5680 Lbs.

LWF J.W.B. M.G.D.

BAR SUMMARY ABUT. No. 4

1223 Lin. Ft. $\frac{1}{2}$ " @ 0.668 Lbs./Lin. Ft. = 817 Lbs.

111 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 116 Lbs.

132 Lin. Ft. $\frac{1}{2}$ " @ 2.044 Lbs./Lin. Ft. = 270 Lbs.

85 Lin. Ft. $\frac{1}{2}$ " @ 3.400 Lbs./Lin. Ft. = 289 Lbs.

± 1% Overrun = 18 Lbs.

Total = 1510 Lbs.

LWF J.W.B. M.G.D.

BAR SUMMARY 2 APPR SLABS

3784 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 3895 Lbs.

± 1% Overrun = 45 Lbs.

Total = 3940 Lbs.

LWF J.W.B. M.G.D.

BAR SUMMARY SUPERSTRUCTURE

8314 Lin. Ft. $\frac{1}{2}$ " @ 0.668 Lbs./Lin. Ft. = 5554 Lbs.

8668 Lin. Ft. $\frac{1}{2}$ " @ 1.043 Lbs./Lin. Ft. = 9062 Lbs.

± 1% Overrun = 144 Lbs.

Total = 14760 Lbs.

REVISIONS

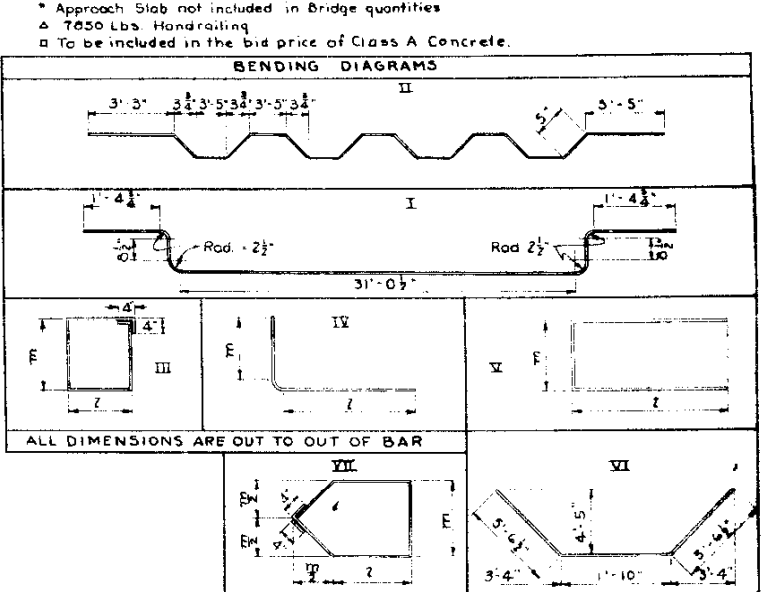
FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	DATE
9	COLO.	F1002-2(100)2	15

M.G.D. LWF J.W.B. A.L.P.

SUMMARY OF QUANTITIES FOR STR. NE H-17-L

Item	Description	Unit	Super	Abut. No. 1	Pier No. 2	Pier No. 3	Abut. No. 4	Totals
13c	Unclassified Excavation	Cu. Yd.						30000
14a	Dry Rock Excav. (Str.)	Cu. Yd.			5.0	5.0		10
14b	Dry Common Excav. (Str.)	Cu. Yd.			5.0	5.0		10
14c	Wet Rock Excav. (Str.)	Cu. Yd.			25.0	25.0		110
14d	Wet Common Excav. (Str.)	Cu. Yd.			70.0	3.0		75
16a	Structure Backfill (Class II)	Cu. Yd.			82.0	78.0		160
16c	Mechanical Tamping	Hr.		4	0	0	5	25
46a	Class A Concrete	Cu. Yd.	94.6	13.2	43.7	43.7	16.1	211.3
47	Reinforcing Steel (1/2" Overlap)	Lb.	14760	1290	5680	5680	1510	28920
48	Structural Steel (1/2" for Paint)	Lb.	64560	365	470	470	555	66460
61a	Steel Piling (10 B.P. 42")	Lin. Ft.			204			120
67a	Riprap	Cu. Yd.			140			120
69a	Drain Pipe - 4" x 2'-0"	Each	5					5
60x	Drilling Holes to Facilitate Pile Driving	Lin. Ft.						100
18a	Station Yard Overhaul	Sta. Yd.						18,800
18b	Yard Mile Overhaul	Yd. Mi.						600
2	EXP. JT. MAT'L (TYPE I, A.A.S.H.O. M-153-52)	Sq. Ft.	75					75

* Approach Slab not included in Bridge quantities
 Δ 7850 Lbs. Handrailing
 □ To be included in the bid price of Class A Concrete.



REFERENCE DRAWINGS

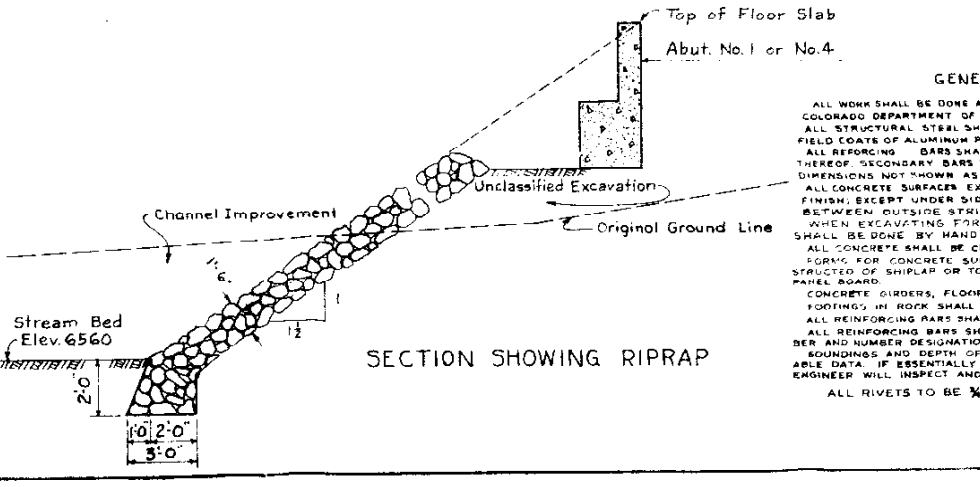
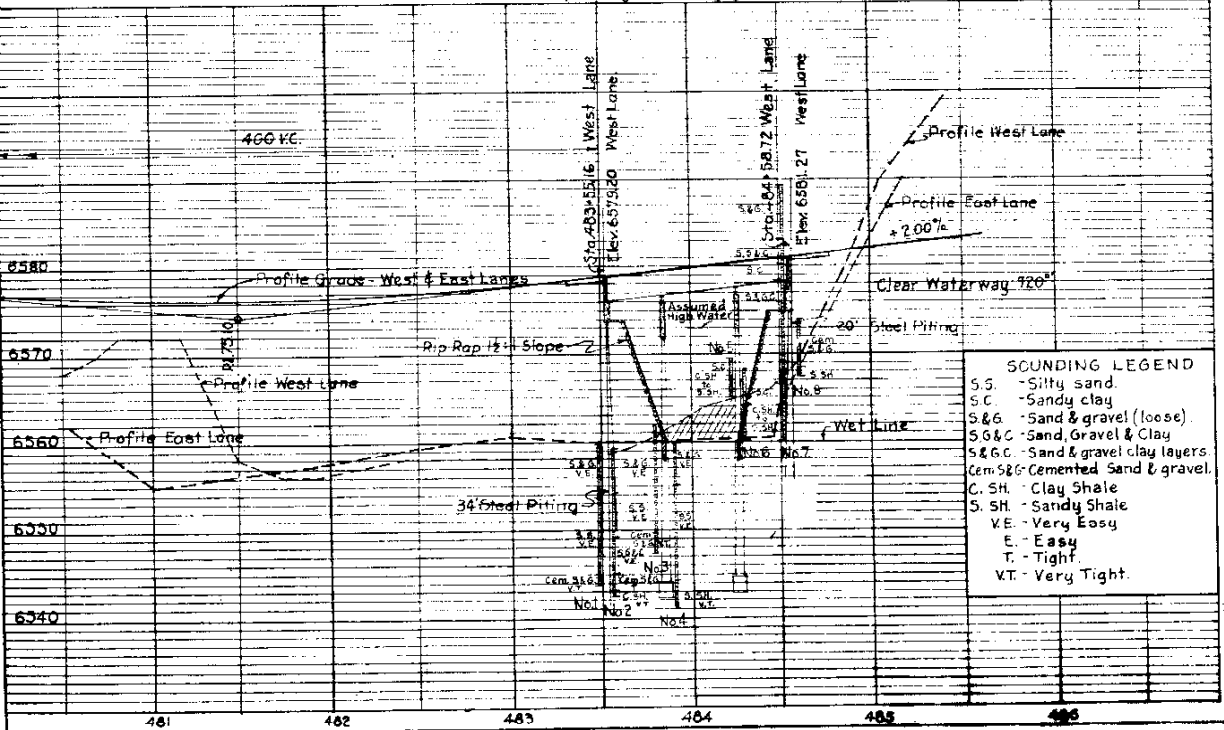
Sheet 16 Details Superstructure
 Sheet 17 Details Exp. Device, Splice, Appr. Slabs, Mechanical Tamping.
 Sheet 18 Details Abutments No. 1 & No. 4, Handrail, Bearings
 Sheet 19 Detail Piers No. 2 & No. 3

LOADING DATA

LIVE LOAD - A.A.S.H.O. H-20 S16-44
 DEAD LOAD - ASSUMES 15 LBS PER SQ. FT. ADDITION
 ALL WEARING SURFACES WHICH INCLUDES THE 2" THICK CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA

A.A.S.H.O. 1955 UNIT STRESSES, EXCEPT AS NOTED.
 f_c = 1000 lbs per sq. in.
 f_s = 18000 lbs per sq. in.
 (Reinforcing) f_s = 20000 lbs per sq. in.
 n = 10



GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.
 ALL STRUCTURAL STEEL SHALL RECEIVE ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM PAINT, EXCEPT ALL UNEXPOSED STEEL PILING NEED NOT BE PAINTED.
 ALL REINFORCING BARS SHALL CONFORM TO A.S.T.M. SPEC. A-305-80 OR LATEST REVISION THEREOF. SECONDARY BARS WHEN SPLICED SHALL BE LAPPED TO DIAMETERS. ALL BAR DIMENSIONS NOT SHOWN AS CLEAR (CL) ARE TO CENTER LINE OF BAR.
 ALL CONCRETE SURFACES EXPOSED TO VIEW SHALL RECEIVE CLASS '1' SURFACE FINISH, EXCEPT UNDER SIDES OF FLOOR SLABS AND ABUTMENT FACES BETWEEN OUTSIDE STRINGERS.
 WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.
 ALL CONCRETE SHALL BE CLASS 'A' AND AIR ENTRAINMENT AS SPECIFIED.
 FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIP LAP OR TONGUE AND GROOVE LUMBER S3S UNLESS FACED WITH PANEL BOARD.
 CONCRETE ORDERS, FLOOR SLABS AND CURB SHALL BE POURED MONOLITHICALLY. FOOTINGS IN ROCK SHALL BE POURED OUT TO THE ROCK AND NOT FORMED.
 ALL REINFORCING BARS SHALL BE INTERMEDIATE GRADE.
 ALL REINFORCING BARS SHALL BE DEFORMED AND TAGGED WITH THE STATION NUMBER AND NUMBER DESIGNATION. MAIN BARS SHALL NOT BE SPLICED.
 SOUNDINGS AND DEPTH OF FOOTINGS SHOWN ARE ACCORDING TO THE BEST AVAILABLE DATA. IF ESSENTIALLY DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.
 ALL RIVETS TO BE 3/4" DIA. ALL RIVETS TO BE POWER DRIVEN.

COLOPADO DEPARTMENT OF HIGHWAYS

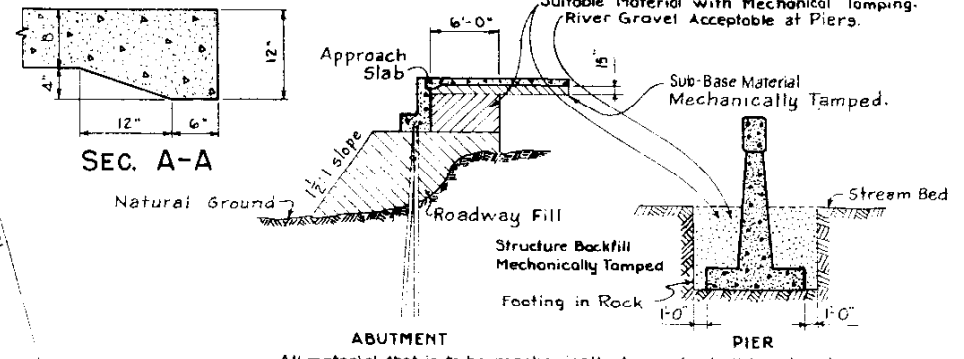
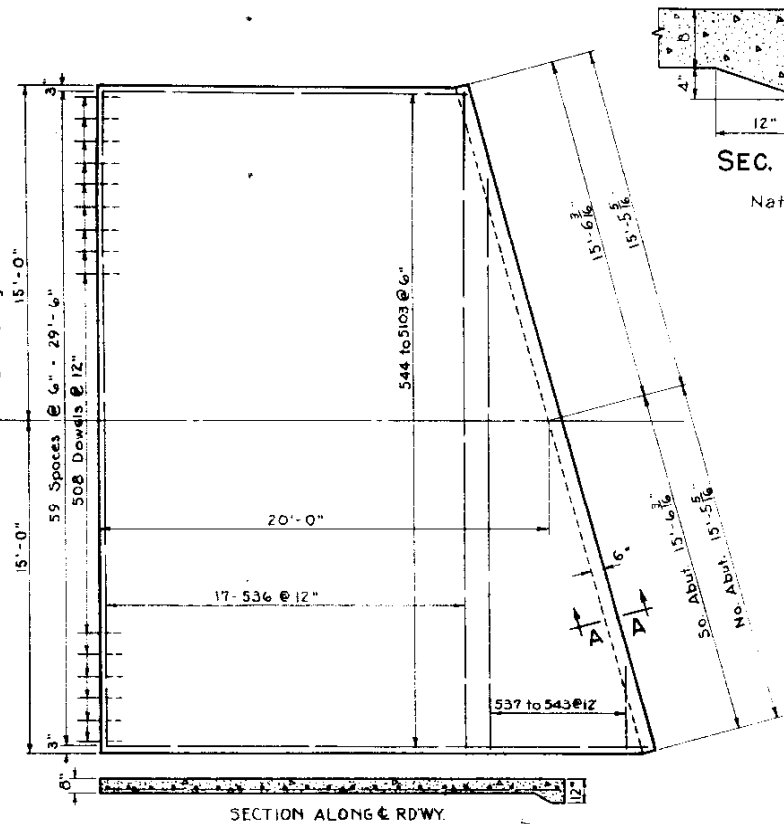
3 SPAN (31'-30'-31') CONTINUOUS CONCRETE SLAB & I BEAM

50'-0" CLEAR RDWY. 75' SKEW LAYOUT - GENERAL NOTES - BAR LISTS - SUMMARY OF QUANTITIES

Across Black Squirrel Creek
 Sta. 483+52.00 to 484+55.78
 Near Husted Sec. 18 T. 12 S. R. 64 W.

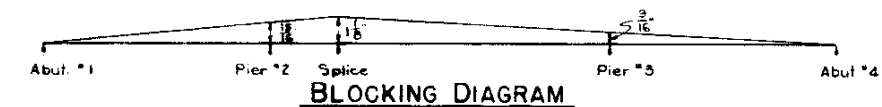
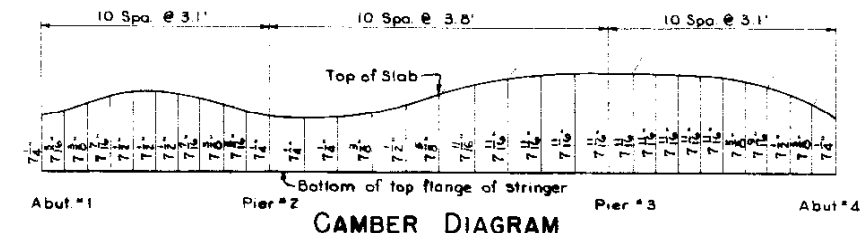
Designed by E.F.S. Approved by W.L.P.
 Made by W.L.P. Checked by Date: 7-18-1988

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25)Unit 2	17	

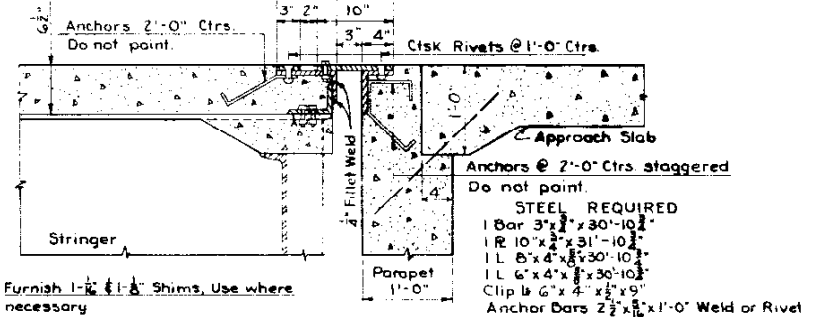
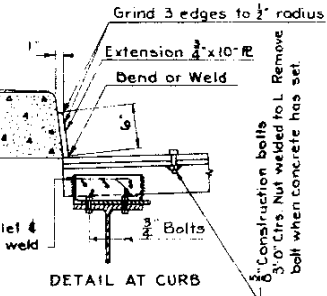
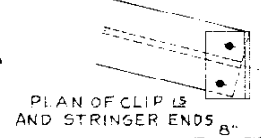


ABUTMENT
All material that is to be mechanically tamped, shall be placed in horizontal layers not more than 6 inches in depth and tamped before next layer is placed. Rolling equipment shall not be used within 6 ft. of walls.

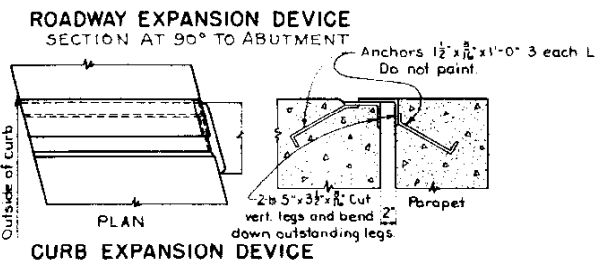
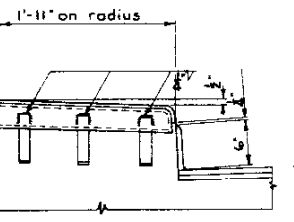
STRUCTURE BACKFILL & MECHANICAL TAMPING DIAGRAMS



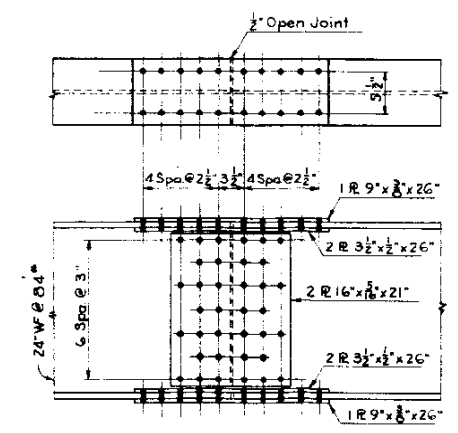
**APPROACH SLABS
No. & So. ABUTMENTS**



- STEEL REQUIRED**
- 1 Bar 3" x 30'-10"
 - 1 R 10" x 31'-10"
 - 1 L 6" x 4" x 30'-10"
 - 1 L 6" x 4" x 30'-10"
 - Clip 6" x 4" x 9"
 - Anchor Bars 2 1/2" x 1'-0" Weld or Rivet



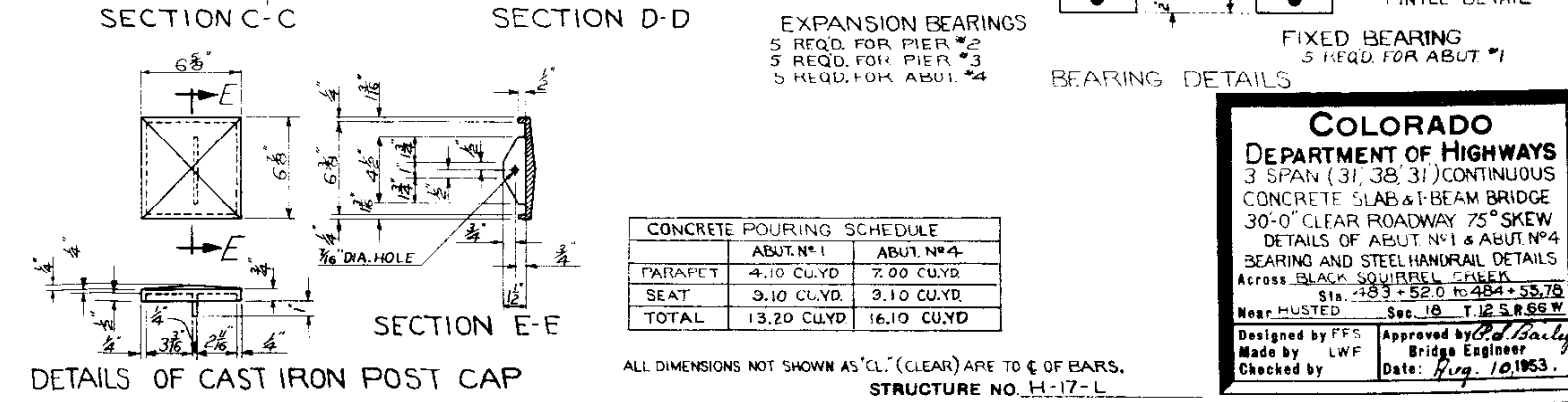
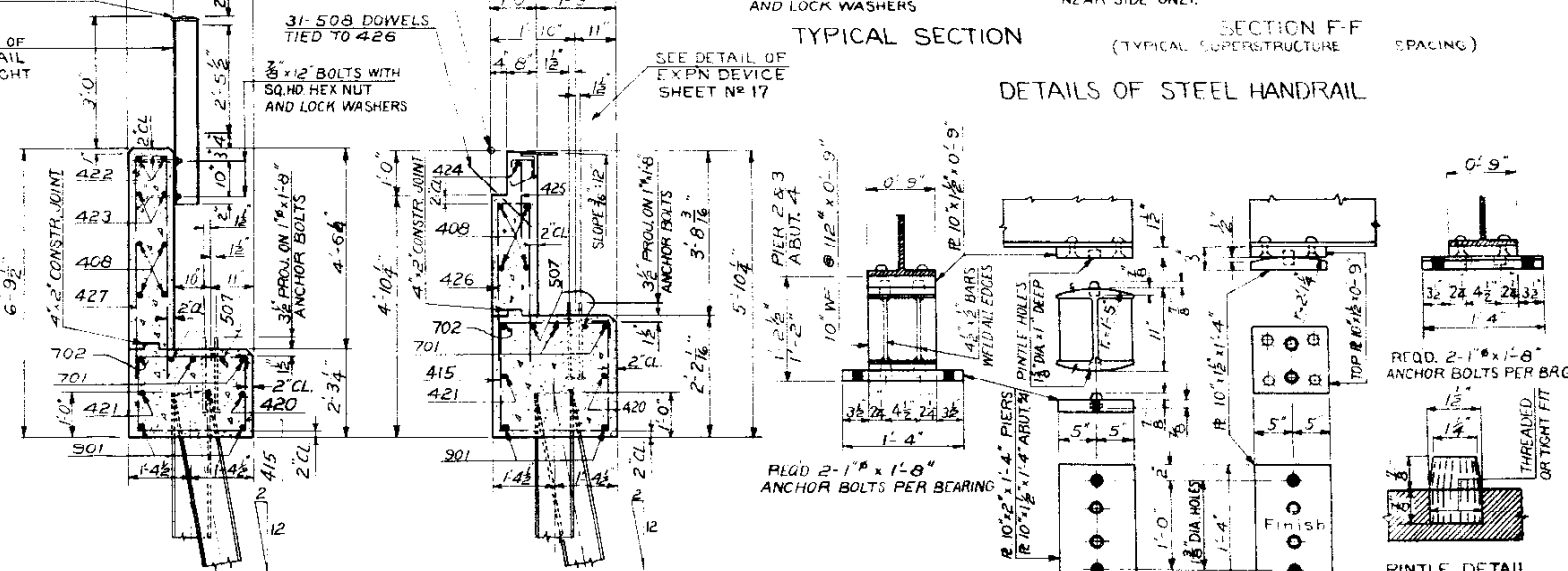
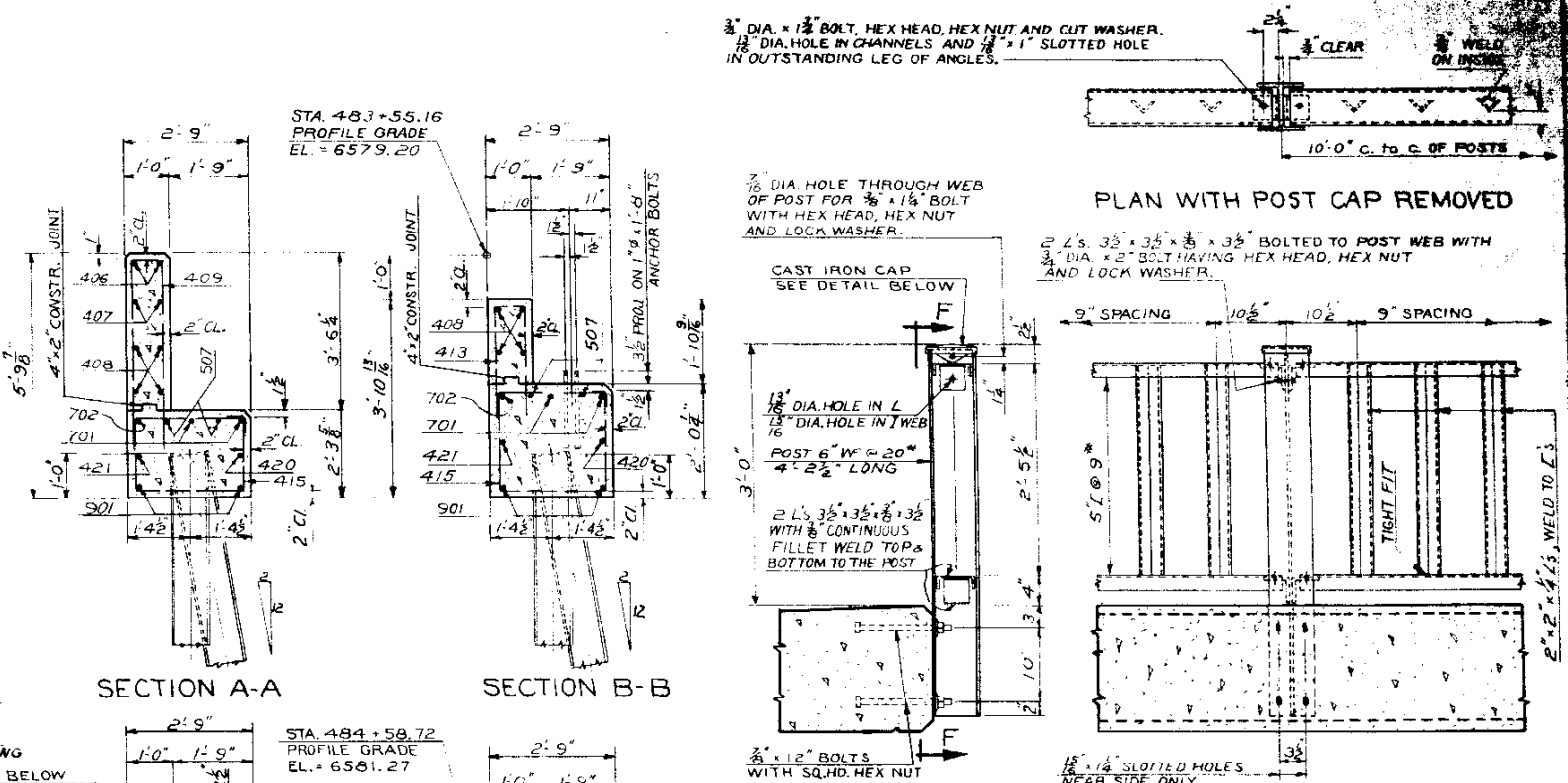
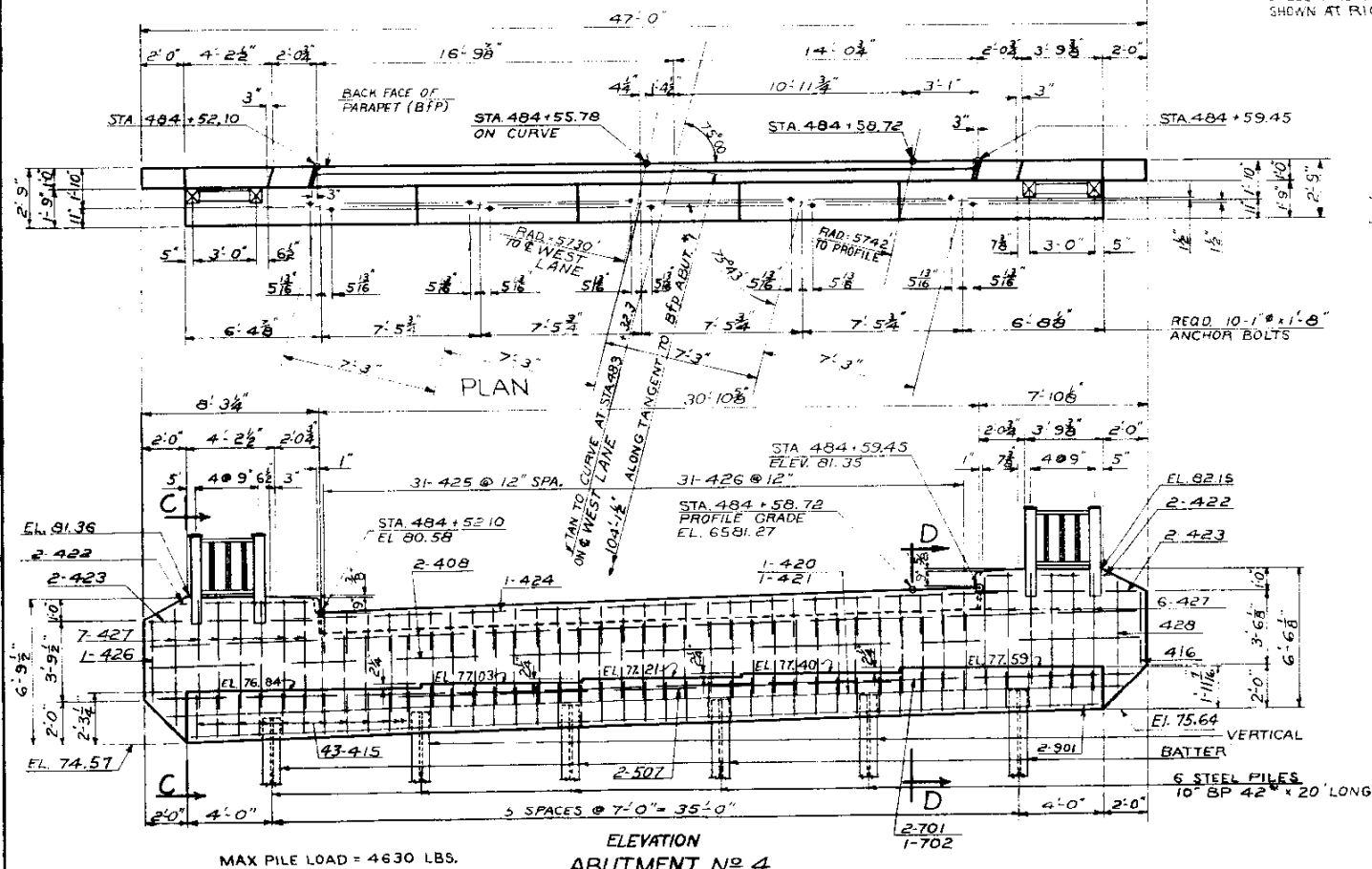
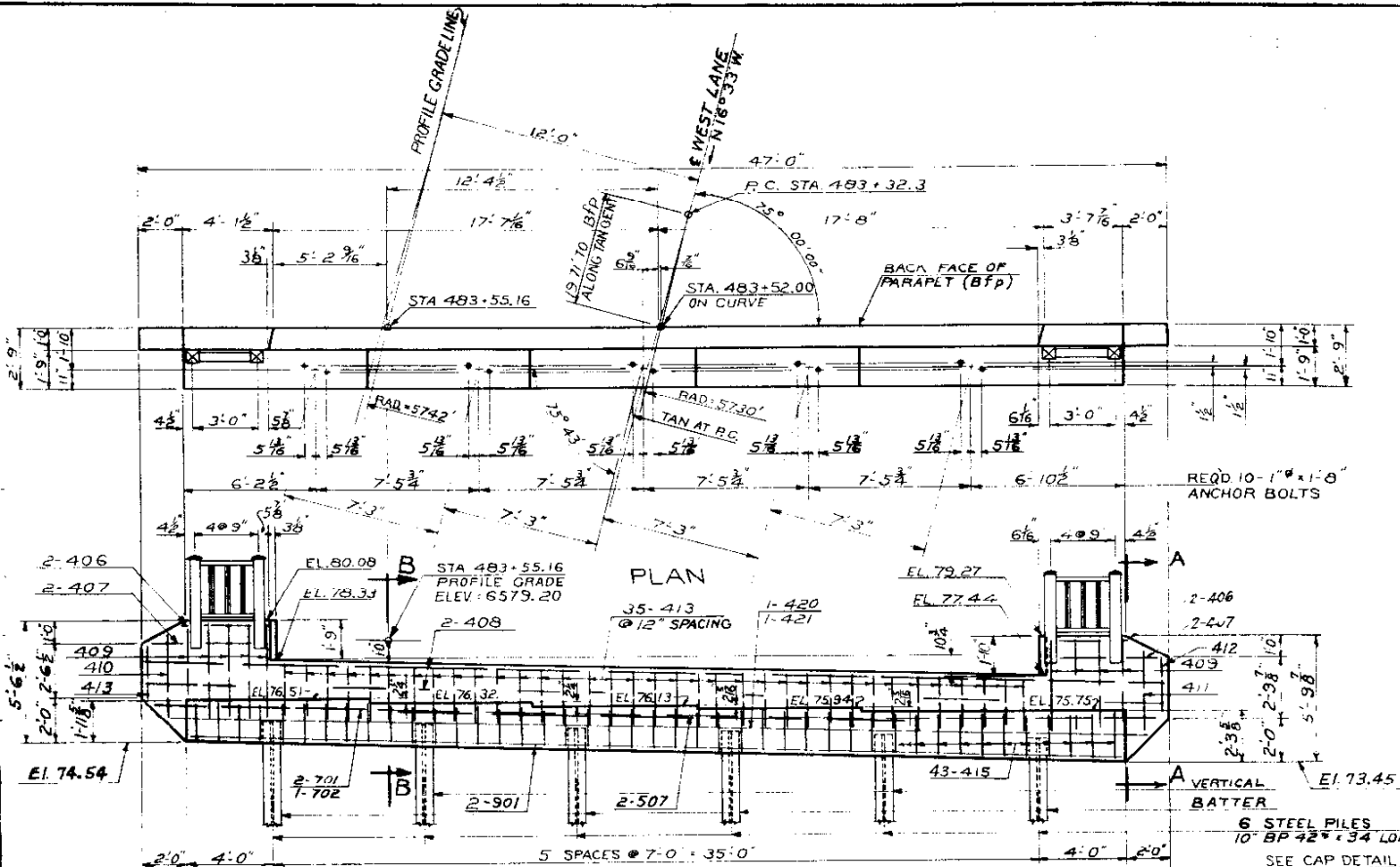
DETAILS OF ABUTMENT EXPANSION DEVICE



WEB SPLICE

COLORADO
DEPARTMENT OF HIGHWAYS
 3 SPAN (31'-38'-31') CONTINUOUS
 CONCRETE SLAB & I BEAM
 30'-0" CLEAR ROWY. 75° SKEW
 APPROACH SLAB-WEB SPLICE
 & EXPANSION JOINT DETAILS
 Across BLACK SQUIRREL CREEK
 Sta. 483+52.00 TO 484+55.74
 Near MUSTED Sec 16 T 12 S R 66 W
 Designed by E.F.S. Approved by *W.L.P.*
 Made by W.L.P. Bridge Engineer
 Checked by *E.S.* Date: *2-2-1968*

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET
9	COLO.	F1102-2123	
		UNIT NO. 2	

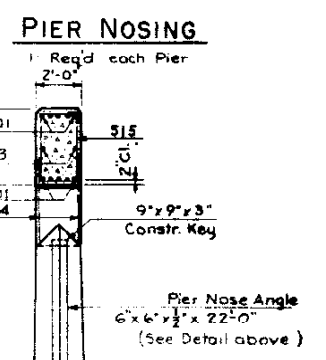
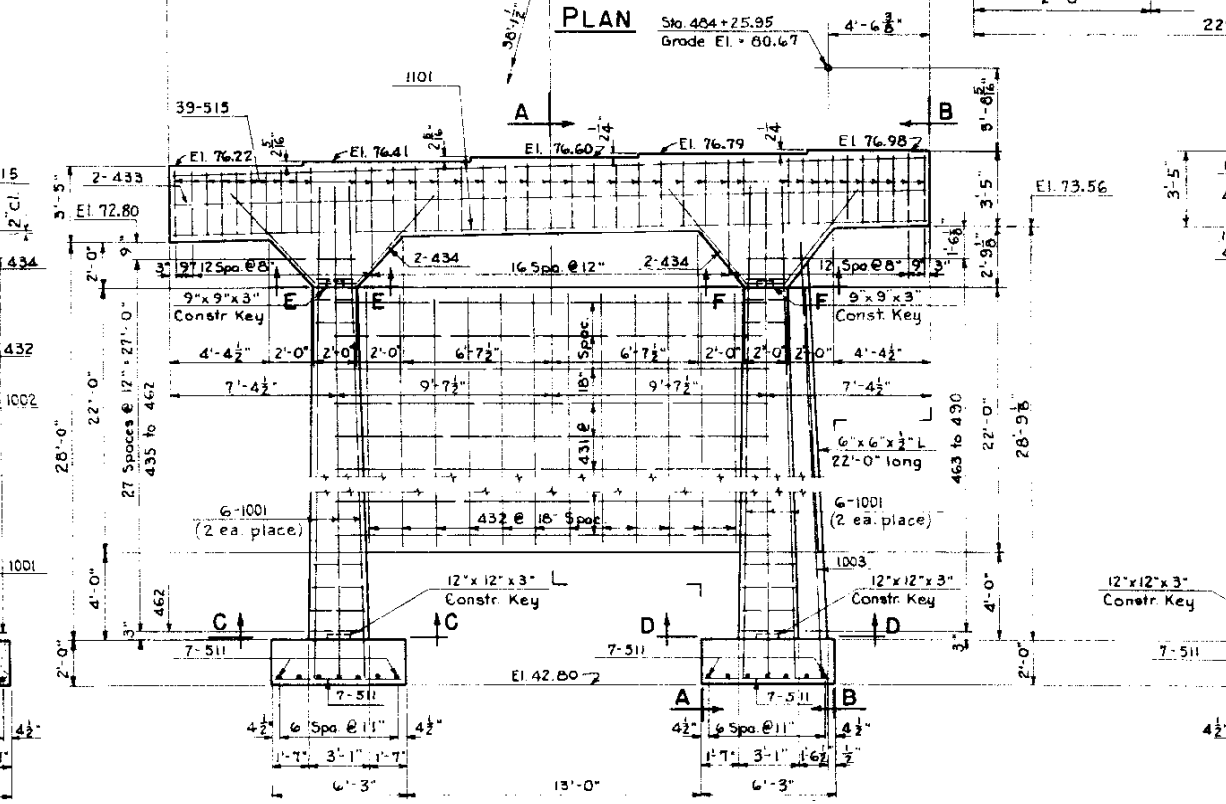
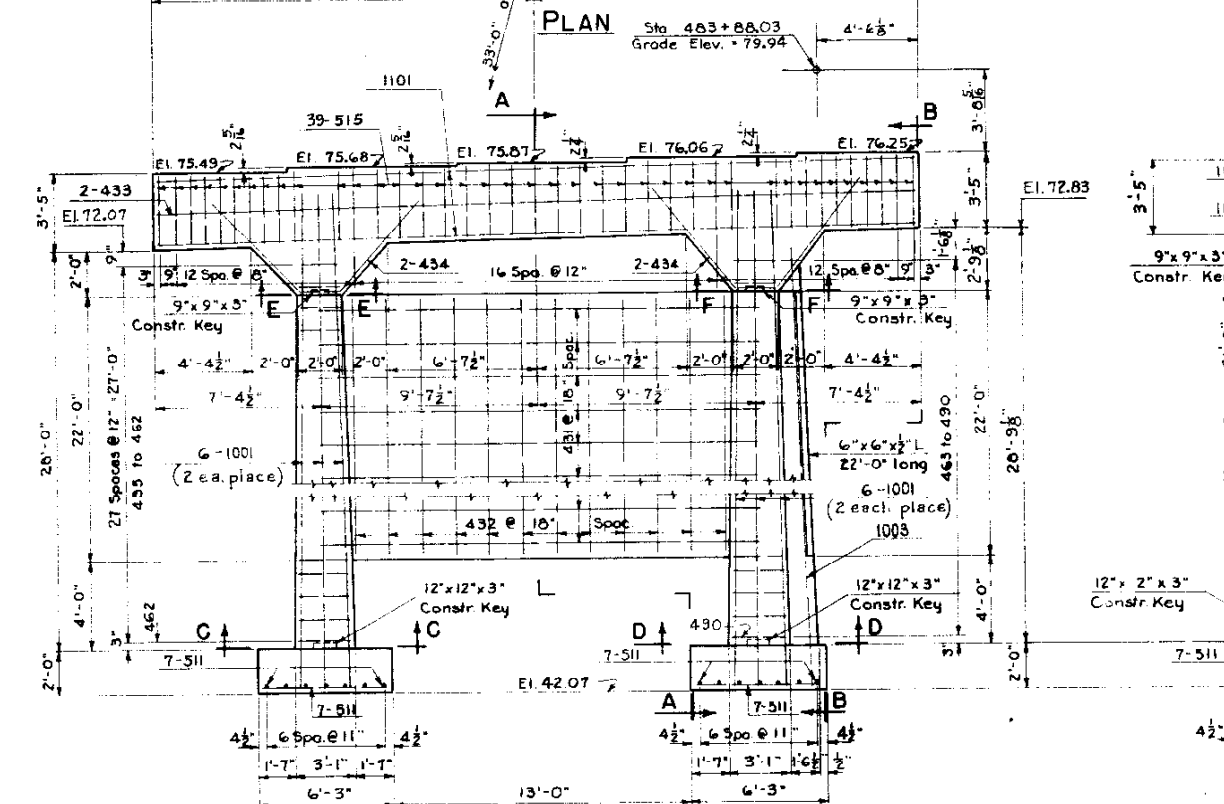
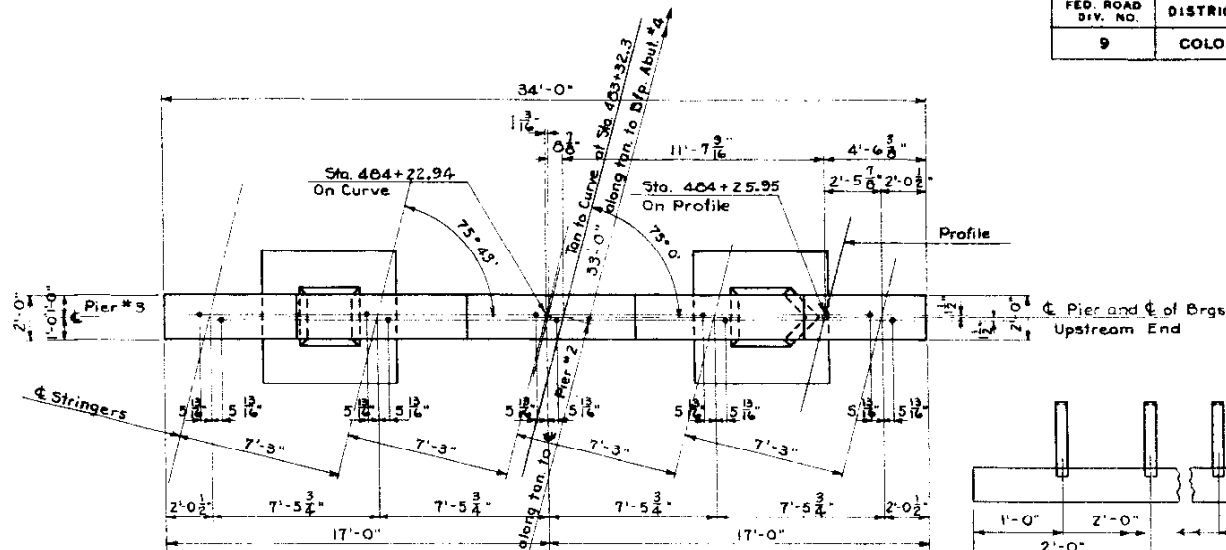
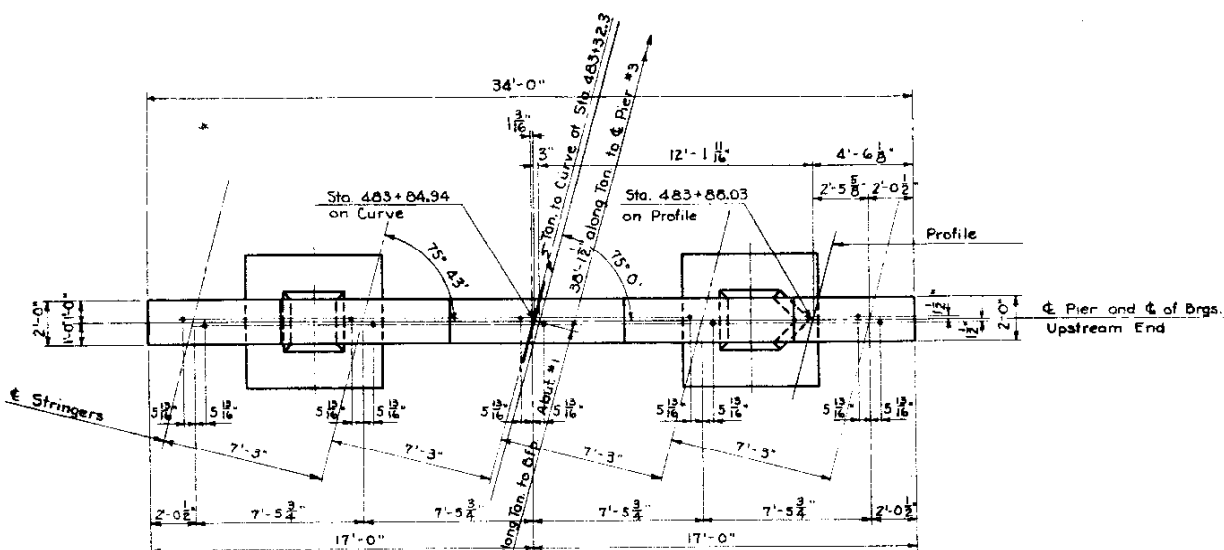


	ABUT. NO. 1	ABUT. NO. 4
PARAPET	4.10 CU. YD.	7.00 CU. YD.
SEAT	3.10 CU. YD.	3.10 CU. YD.
TOTAL	13.20 CU. YD.	16.10 CU. YD.

COLORADO
DEPARTMENT OF HIGHWAYS
 3 SPAN (31', 38', 31') CONTINUOUS
 CONCRETE SLAB & T-BEAM BRIDGE
 30'-0" CLEAR ROADWAY 75° SKEW
 DETAILS OF ABUT. NO. 1 & ABUT. NO. 4
 BEARING AND STEEL HANDRAIL DETAILS
 Across BLACK SQUIRREL CREEK
 Sta. 483+52.0 to 484+55.75
 Near HUSTED Sec. 16 T. 12 S. R. 66 W.
 Designed by FFS
 Made by LWF
 Checked by
 Approved by *Ed Bailey*
 Bridge Engineer
 Date: Aug. 10, 1953.

ALL DIMENSIONS NOT SHOWN AS 'CL.' (CLEAR) ARE TO C. OF BARS.
 STRUCTURE NO. H-17-L

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.
9	COLO.	F1062-2(79)Unit 2	15



ELEVATION
PIER NO. 2

SECTION A-A

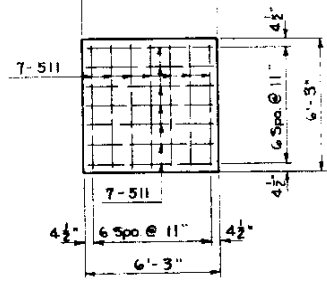
ELEVATION
PIER NO. 3

SECTION B-B

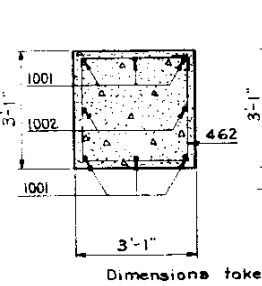
Max. Footing Pressure = 5930 Lbs. per Sq. Ft.

Max. Footing Pressure = 5930 Lbs. per Sq. Ft.

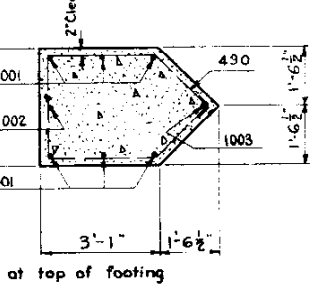
Note: All Stations calculated on and Projected from West Lane.



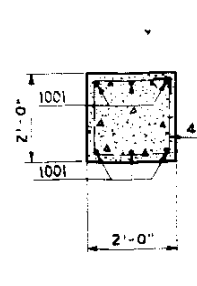
FOOTING PLAN
Same for all footings



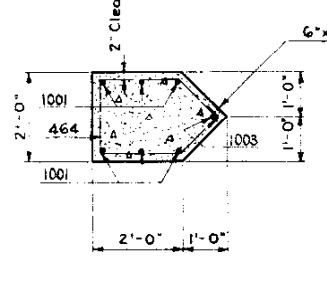
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

	PIER 2	PIER 3
FOOTINGS	5.8 Cu. Yd.	5.8 Cu. Yd.
COLUMNS	14.2 " "	14.2 " "
CAP	10.0 " "	10.0 " "
WALL	13.7 " "	13.7 " "
TOTAL	43.7 " "	43.7 " "

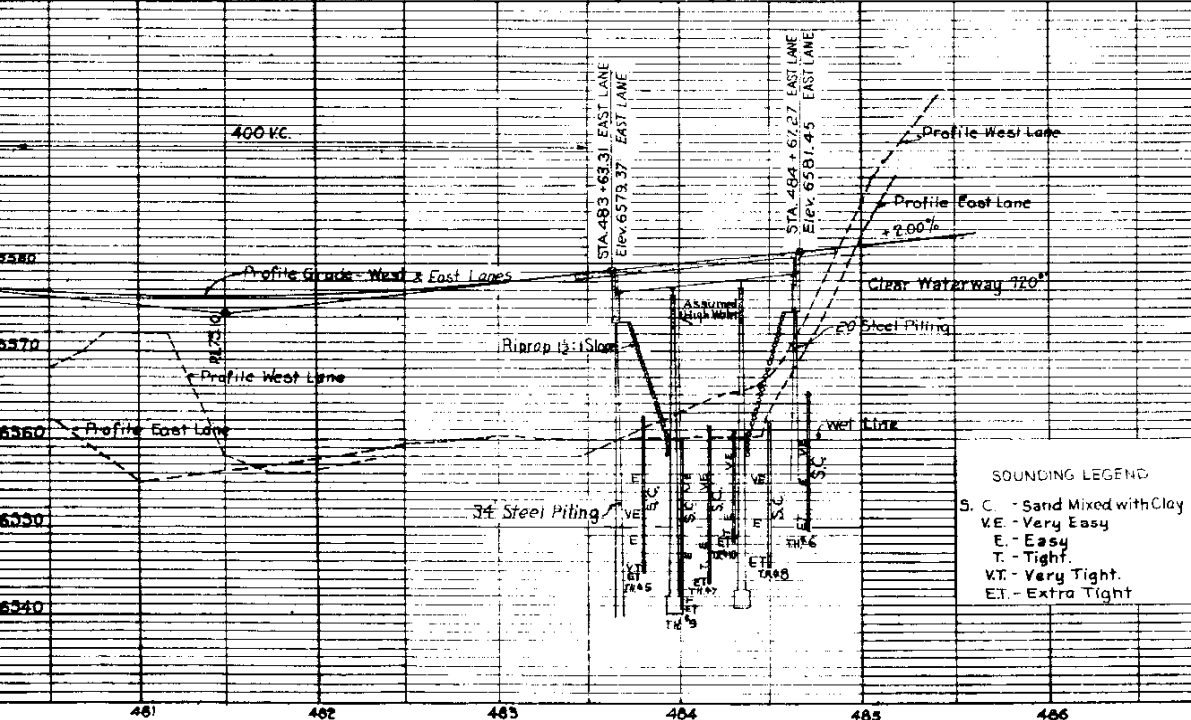
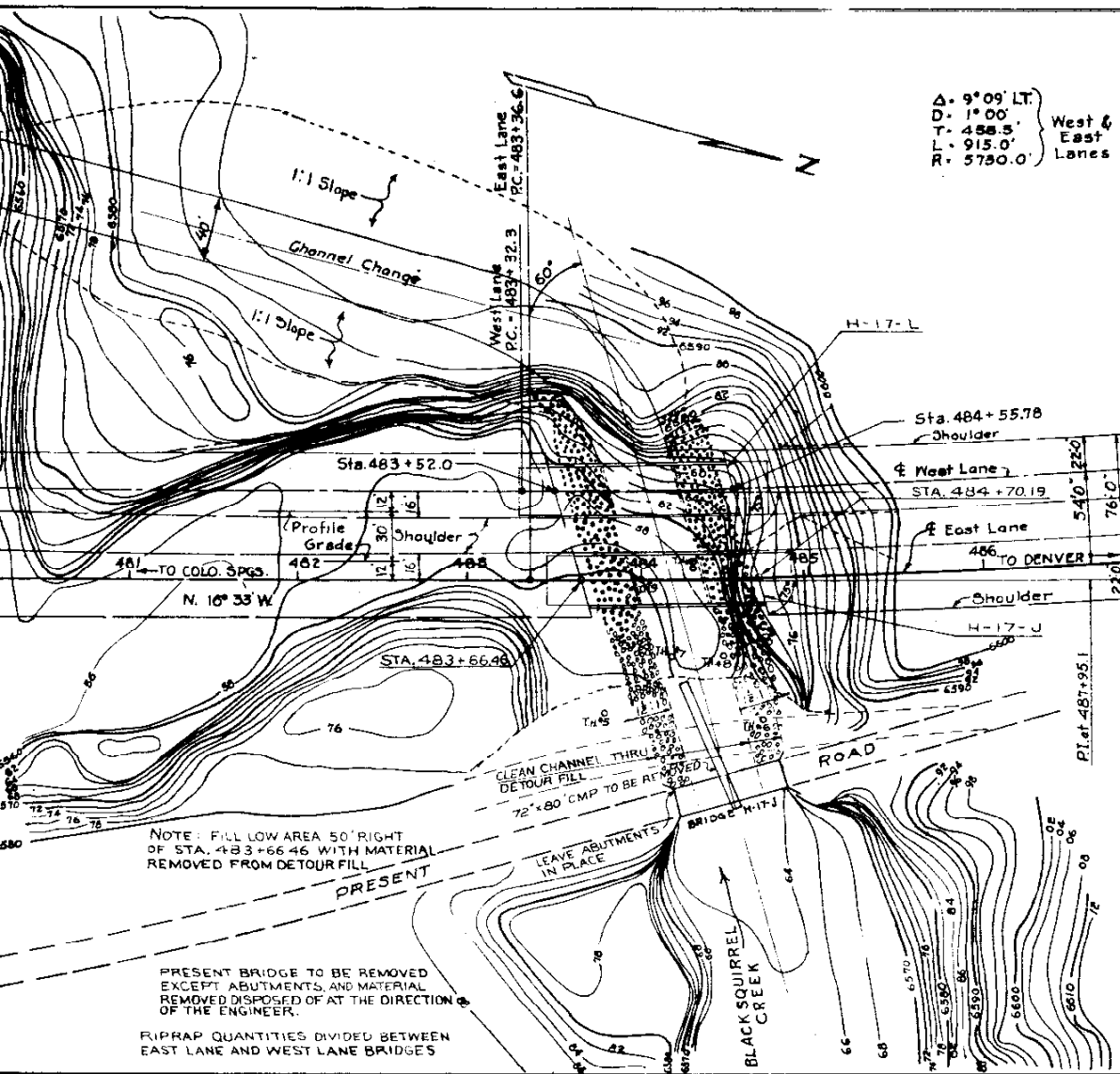
All dimensions not shown as "CL" are to ϕ of bars.

COLORADO
DEPARTMENT OF HIGHWAYS

3 SPAN (31'-38'-31') CONTINUOUS
CONCRETE SLAB & I BEAM
30'-0" CLEAR RDWY. 75° SKEW
DETAILS OF PIERS 2 & 3

Across Black Squirrel Creek
Sta. 483+52.0 to 484+55.78
Near Husted, Sec. 18, T. 12.3 N. R. 68W

Designed by E.F.S. Approved by *Ed Bailey*
Made by L.M.F. Bridge Engineer
Checked by *[Signature]* Date: *Aug. 10, 1963.*



L.W.F. J.W.B. M.G.D.

BAR LIST - SUPERSTRUCTURE ABUTMENTS, PIERS		LOCATION			
MARK	SIZE	LENGTH	TYPE		
		SUPER	ABUT No. 1		
		No. Req'd	No. Req'd		
401	1/2"	31'-11"	Str	71	
402	1/2"	37'-6"	Str	81	
403	1/2"	50'-11"	Str	81	
404	1/2"	32'-3"	Str	10	
405	1/2"	4'-2"	III	44	8'-1'-1"
406	1/2"	3'-6"	Str		4
407	1/2"	3'-6"	Str		4
408	1/2"	4'-6"	Str		4
409	1/2"	9'-2"	V		9
410	1/2"	8'-8"	V		1
411	1/2"	9'-2"	V		1
412	1/2"	6'-2"	V		1
413	1/2"	3'-8"	V		36
415	1/2"	8'-10"	III		43
416	1/2"	7'-8"	V		1
417	1/2"	11'-10"	III		1
418	1/2"	12'-0"	III		1
420	1/2"	42'-8"	Str		1
421	1/2"	44'-6"	Str		1
422	1/2"	6'-2"	Str		4
423	1/2"	6'-0"	Str		4
424	1/2"	33'-0"	Str		1
425	1/2"	1'-9"	Str		31
426	1/2"	8'-2"	V		52
427	1/2"	11'-2"	V		13
428	1/2"	10'-8"	V		1
431	1/2"	19'-6"	Str		30
432	1/2"	21'-8"	Str		24
433	1/2"	33'-8"	Str		2
434	1/2"	12'-11"	VI		4
435	1/2"	7'-2"	Str		1
to	1/2"	by 2" to III		1 ea.	1 ea.
462	1/2"	11'-8"	Str		1
463	1/2"	8'-0"	Str		1
to	1/2"	by 2" to VII		1 ea.	1 ea.
490	1/2"	12'-6"	Str		1
491	1/2"	13'-1"	VII		1
492	1/2"	13'-3"	VII		1
501	1/2"	33'-0"	Str		82
502	1/2"	36'-7"	I		82
503	1/2"	33'-11"	II		81
504	1/2"	3'-11"	IV		44
507	1/2"	23'-3"	Str		2
508	1/2"	2'-0"	Str		31
515	1/2"	10'-0"	III		39
516	1/2"	6'-6"	STR		32
701	1/2"	42'-8"	STR		2
702	1/2"	46'-0"	STR		1
901	1/2"	42'-8"	STR		2
1002	1/2"	34'-6"	STR		12
1003	1/2"	31'-0"	STR		1
1004	1/2"	20'-0"	STR		3
1101	1/2"	33'-8"	STR		10

L.W.F. J.W.B. M.G.D.

BAR LIST - 2 APPROACH SLABS		LOCATION			
MARK	SIZE	LENGTH	TYPE		
		SUPER	ABUT No. 1		
		No. Req'd	No. Req'd		
336	1/2"	29'-6"	Str		34
337	1/2"	26'-0"	Str		2 ea.
343	1/2"	4'-0"	Str		2 ea.
344	1/2"	24'-0"	Str		2 ea.
5105	1/2"	16'-0"	Str		60
508	1/2"	2'-0"	Str		

L.W.F. J.W.B. M.G.D.

BAR SUMMARY ABUT. No. 1	
1002 Lin. Ft.	480 @ 0.668 Lbs./Lin. Ft. = 670 Lbs.
47 Lin. Ft.	48 @ 1.043 Lbs./Lin. Ft. = 49 Lbs.
132 Lin. Ft.	48 @ 2.044 Lbs./Lin. Ft. = 270 Lbs.
65 Lin. Ft.	48 @ 3.400 Lbs./Lin. Ft. = 289 Lbs.
± 1% Overrun = 14 Lbs.	
Total	1290 Lbs.

L.W.F. J.W.B. M.G.D.

BAR SUMMARY PIER No. 2	
1025 Lin. Ft.	48 @ 0.668 Lbs./Lin. Ft. = 1219 Lbs.
598 Lin. Ft.	48 @ 1.043 Lbs./Lin. Ft. = 624 Lbs.
505 Lin. Ft.	48 @ 4.303 Lbs./Lin. Ft. = 2173 Lbs.
337 Lin. Ft.	48 @ 5.313 Lbs./Lin. Ft. = 1791 Lbs.
± 1% Overrun = 53 Lbs.	
Total	5860 Lbs.

L.W.F. J.W.B. M.G.D.

BAR SUMMARY ABUT. No. 4	
1223 Lin. Ft.	48 @ 0.668 Lbs./Lin. Ft. = 817 Lbs.
111 Lin. Ft.	48 @ 1.043 Lbs./Lin. Ft. = 116 Lbs.
132 Lin. Ft.	48 @ 2.044 Lbs./Lin. Ft. = 270 Lbs.
65 Lin. Ft.	48 @ 3.400 Lbs./Lin. Ft. = 289 Lbs.
± 1% Overrun = 18 Lbs.	
Total	1510 Lbs.

L.W.F. J.W.B. M.G.D.

BAR SUMMARY 2 APPR SLABS	
3734 Lin. Ft.	48 @ 1.043 Lbs./Lin. Ft. = 3895 Lbs.
± 1% Overrun = 45 Lbs.	
Total	3940 Lbs.

L.W.F. J.W.B. M.G.D.

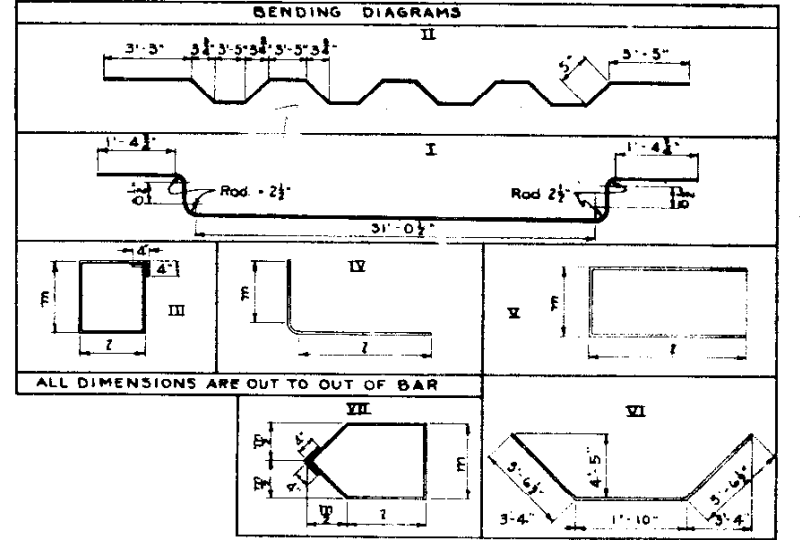
BAR SUMMARY SUPERSTRUCTURE	
8314 Lin. Ft.	48 @ 0.668 Lbs./Lin. Ft. = 5554 Lbs.
6666 Lin. Ft.	48 @ 1.043 Lbs./Lin. Ft. = 9062 Lbs.
± 1% Overrun = 144 Lbs.	
Total	14760 Lbs.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25)M17-2	20	

M.G.D. L.W.F. J.W.B. A.S.H. G.A.R. B.D.E.

SUMMARY OF QUANTITIES FOR STR NO H-17-J									
Item	Description	Unit	Super	Abut No. 1	Pier No. 2	Pier No. 3	Abut No. 4	Total	App. Slabs
14a	Dry Rock Excav. (Str.)	Cu. Yd.			5.0	5.0		10	
14b	Dry Common Excav. (Str.)	Cu. Yd.			5.0	5.0		10	
14c	Wet Rock Excav. (Str.)	Cu. Yd.			25.0	65.0		90	
14d	Wet Common Excav. (Str.)	Cu. Yd.			70.0	5.0		75	
16a	Structure Backfill (Class)	Cu. Yd.			82.0	78.0		160	
16c	Mechanical Tamping	Hr.			8	8	5	25	5
46a	Class 'A' Concrete	Cu. Yd.	94.6	13.2	46.8	46.8	16.1	217.5	30.8
47	Reinforcing Steel	Lb.	14760	1290	5860	5860	1510	29280	3940
48	Structural Steel	Lb.	64550	565	470	470	585	66660	
61a	Steel Piling (10 BPE 42")	Lin. Ft.			204			180	324
67a	Riprap	Cu. Yd.			200			220	420
69a	Drain Pipe - 4" x 2'-0"	Each			5			5	
60x	Drilling Holes to facilitate Pile Driving	Lin. Ft.						100	100
11a	Removal of PORTIONS OF BRIDGE	L.S.							Lump Sum
a	1/2" Galv. Sheet Metal	Sq. Ft.			55			55	
11a	Remove 12" x 80' C.M.P.	L.S.							Lump Sum
18a	Station Yard Overhaul	Sta. Yd.						2000	
18b	Yard Mile Overhaul	Yd. Mi.						600	
a	1/2" EXPN. JOINT MAT'L. (TYPE 1, AASHO M-153-S2)	Sq. Ft.			75			75	

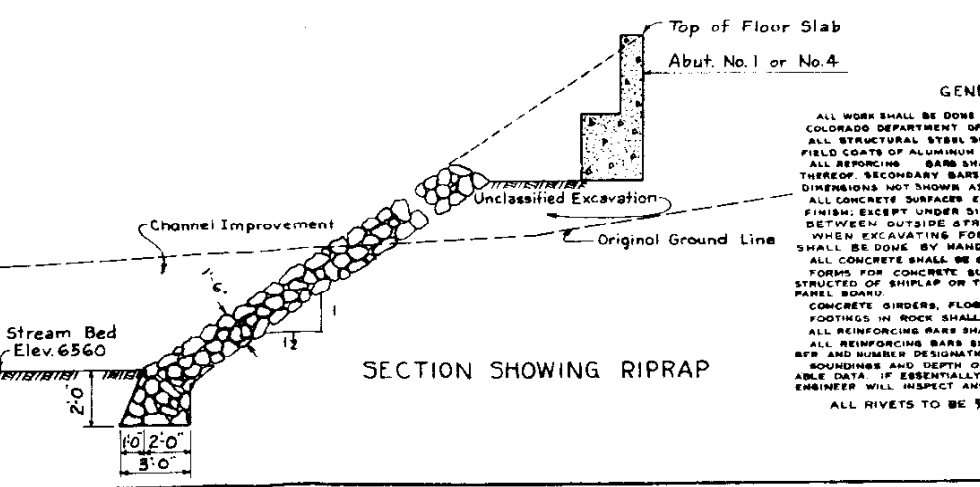
* Approach Slab not included in Bridge quantities ± 1% added for overrun
 † 8500 Lbs. Handrail
 ‡ To be included in the bid price of Class A Concrete
 § To be included in the bid price of Class A Concrete



REFERENCE DRAWINGS
 Sheet 21 Details Superstructure
 Sheet 22 Details Exp. Device, Splice, Appr Slabs, Mechanical Tamping
 Sheet 23 Details Abutments No. 1 & No. 4, Handrail, Bearings
 Sheet 24 Detail Piers No. 2 & No. 3

LOADING DATA.
 LIVE LOAD - A, A, B, H, D, H, 20, S16, 44
 DEAD LOAD - ASSUMES 8 LBS PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 8" RICH CONCRETE MONOLITHIC WEARING SURFACE SHOWING.

DESIGNING DATA.
 A.A.S.H.O. 1955 UNIT STRESSES, EXCEPT AS NOTED.
 f_c = 1000 lbs. per sq. in.
 f_s = 18000 lbs. per sq. in.
 f_s (Reinforcing) = 20000 lbs. per sq. in.
 n = 10



COLORADO DEPARTMENT OF HIGHWAYS

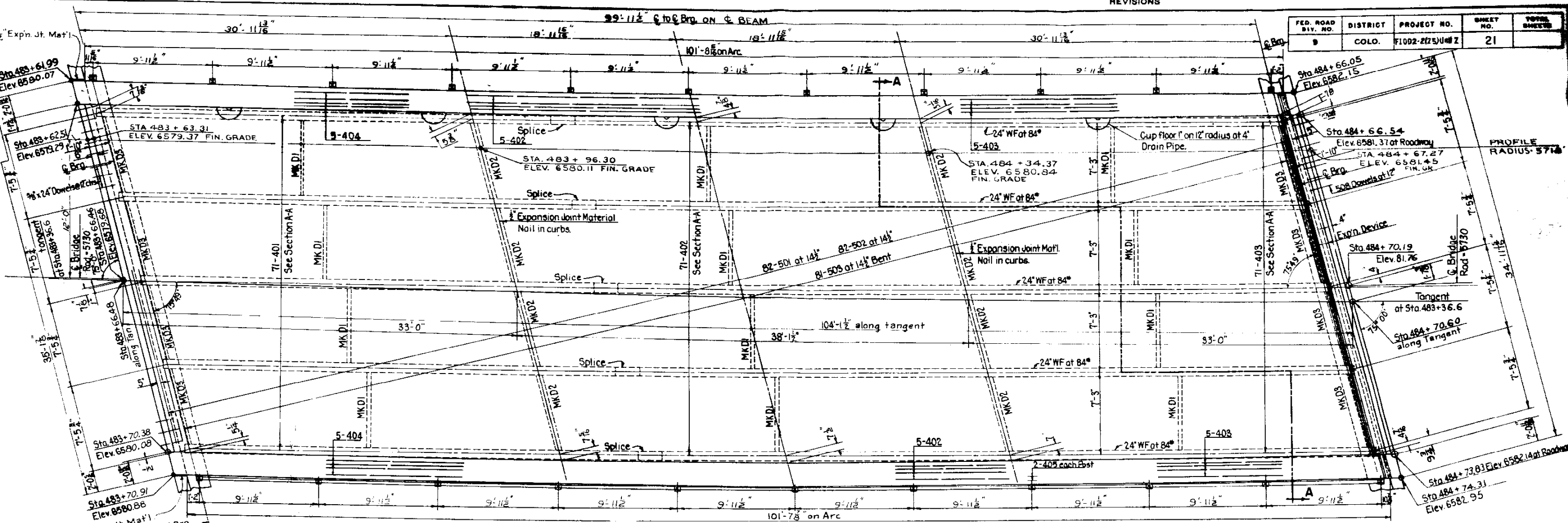
3 SPAN (31'-30'-31') CONTINUOUS CONCRETE SLAB & I BEAM
 LAYOUT - GENERAL NOTES - BAR LISTS - SUMMARY OF QUANTITIES

Across Black Squirrel Creek
 Sta. 483+66.46 to 484+70.19
 Near Husted Sec. 18, T. 125 R. 64W

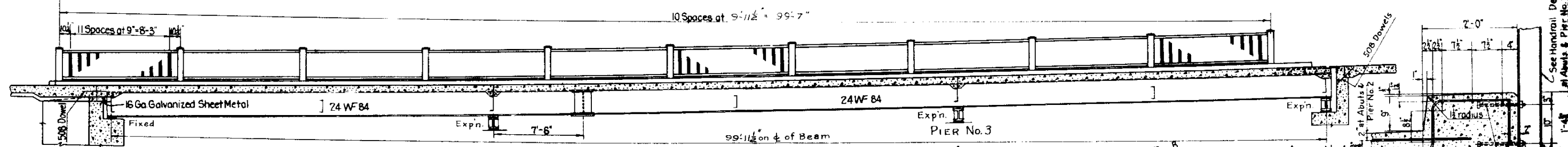
Designed by E.F.S. Approved by *[Signature]*
 Made by W.L.P. Bridge Engineer
 Checked by *[Signature]* Date: *[Date]*

STRUCTURE NO. H-17-J

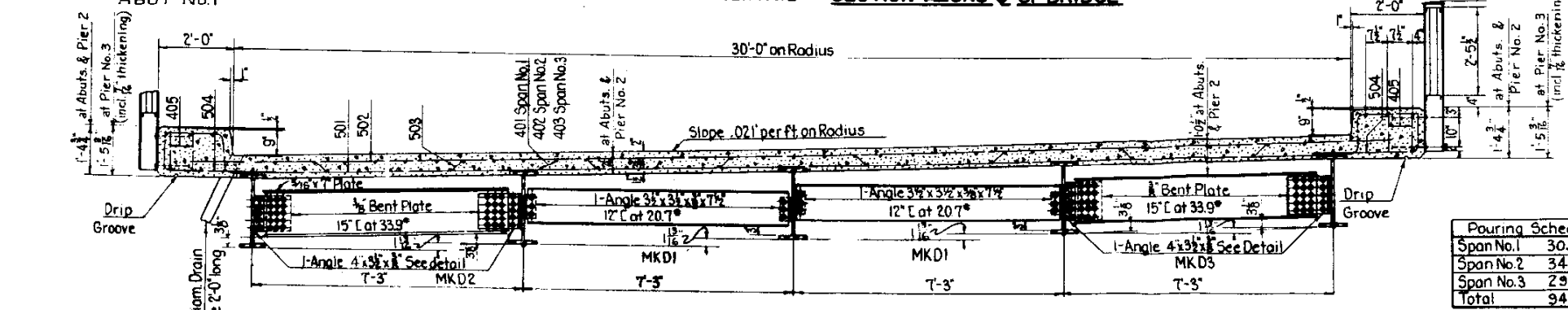
FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2725UM#2	21	



PLAN



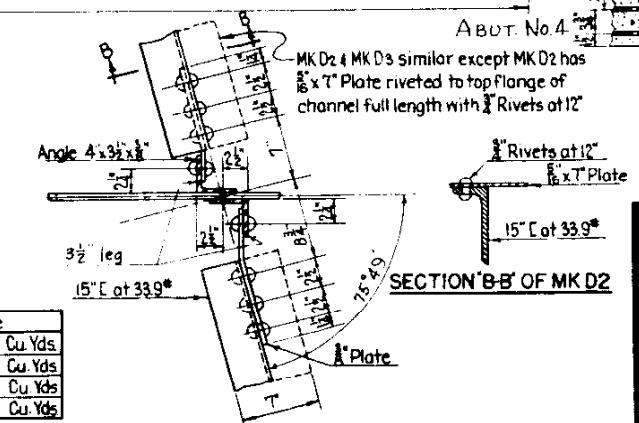
SECTION ALONG C OF BRIDGE



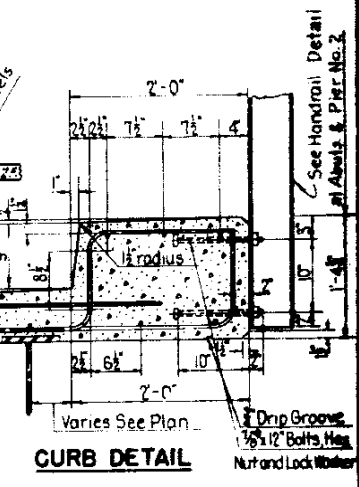
SECTION A-A

Pouring Schedule		
Span No. 1	30.2	Cu. Yds
Span No. 2	34.9	Cu. Yds
Span No. 3	29.5	Cu. Yds
Total	94.6	Cu. Yds

All bar dimensions to C of bar unless marked (CL) clear.



DETAIL CONNECTION MK D2 & MK D3



CURB DETAIL

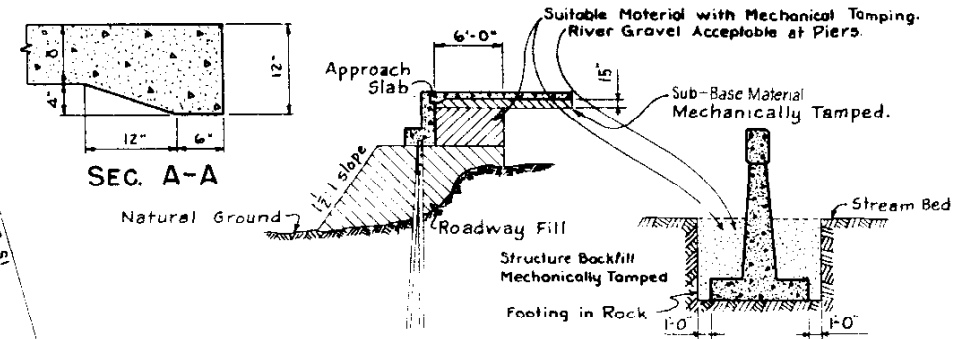
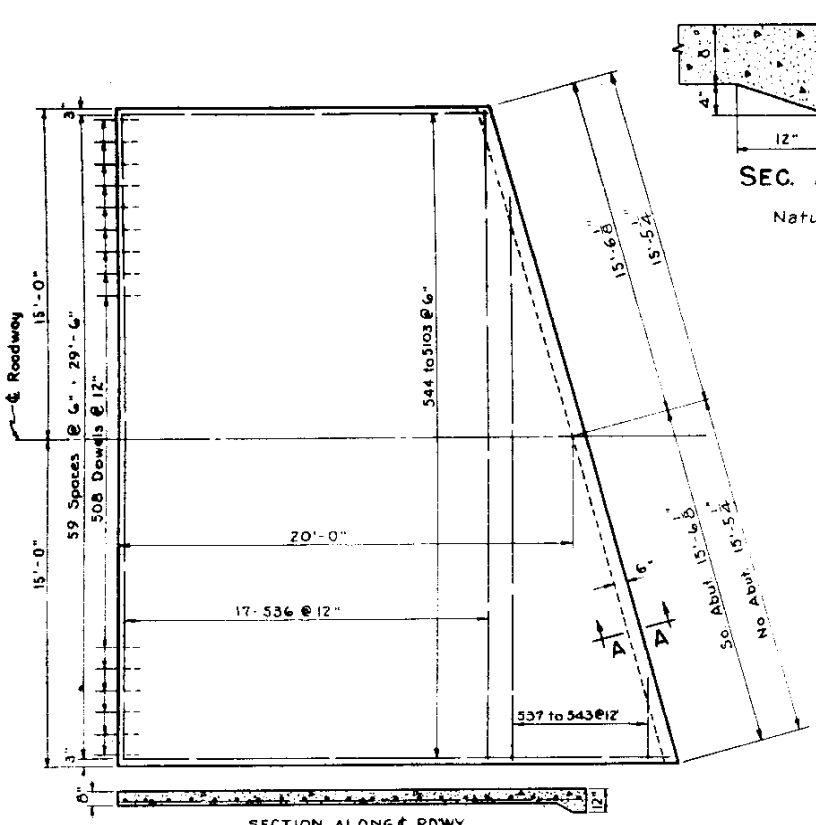
COLORADO
 DEPARTMENT OF HIGHWAYS
 3-SPAN (31'-38'-31') CONTINUOUS
 CONCRETE SLAB & BEAM
 30'-0" CLEAR RDWY. 75° SKEW
 SUPERSTRUCTURE DETAILS

Across Black Squirrel Creek
 Sta 483+66.46 to 484+70.19
 Near Husted See 16 T. 75 N. 68 W.

Designed by E.F.S. Approved by *W.L.P.*
 Made by W.L.P. Bridge Engineer
 Checked by *W.L.P.* Date: Aug 10, 1938.

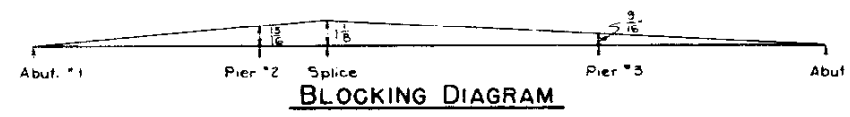
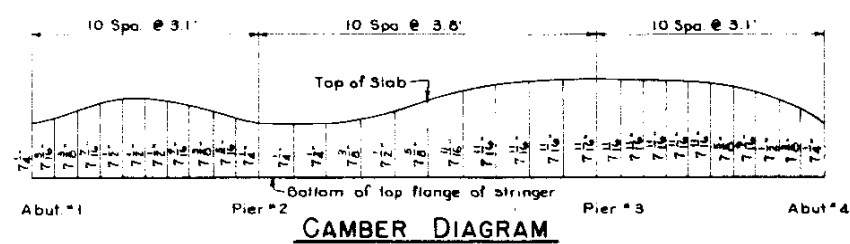
STRUCTURE NO. H-17-J

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2 (25) Unit 2	22	

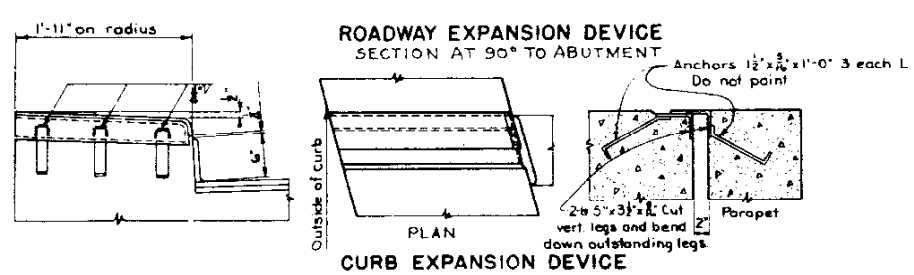
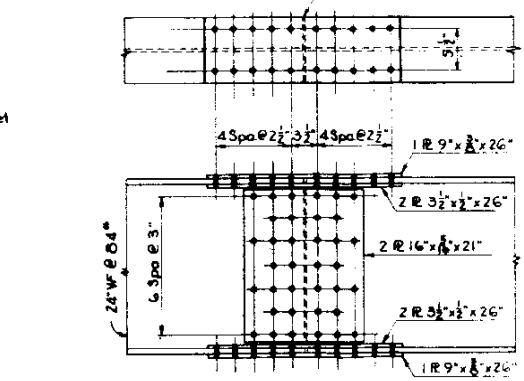
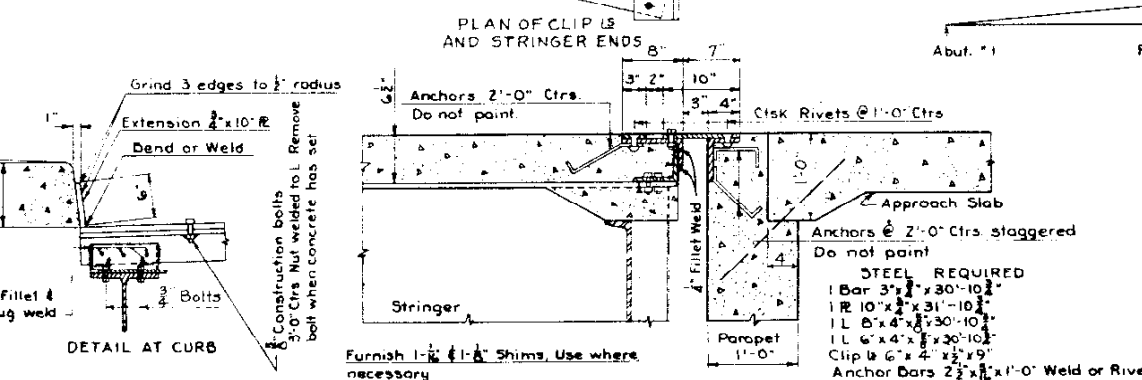


ABUTMENT
 All material that is to be mechanically tamped, shall be placed in horizontal layers not more than 4 inches in depth and tamped before next layer is placed. Rolling equipment shall not be used within 6ft. of walls.

STRUCTURE BACKFILL & MECHANICAL TAMPING DIAGRAMS



APPROACH SLABS
 No. & So. ABUTMENTS

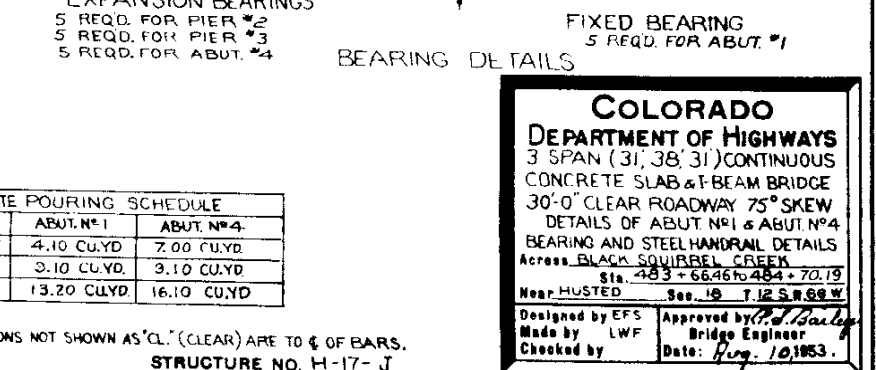
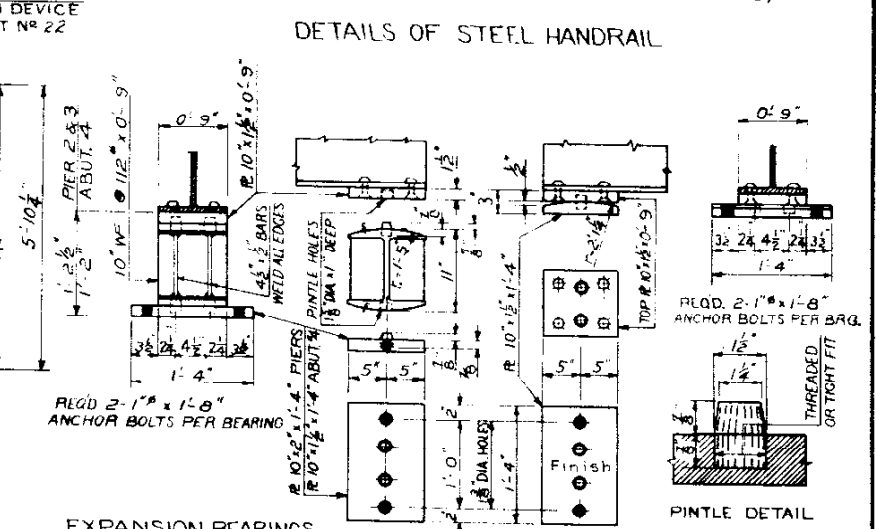
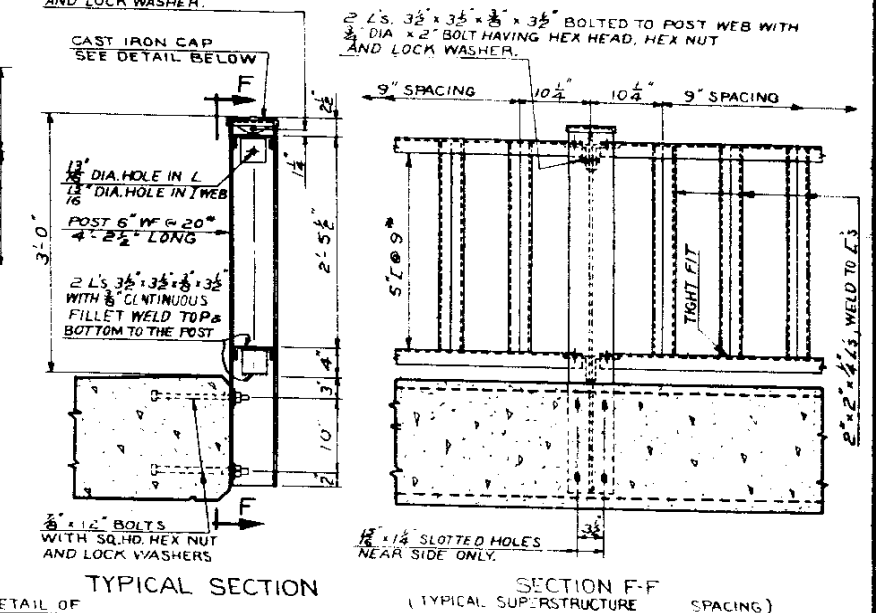
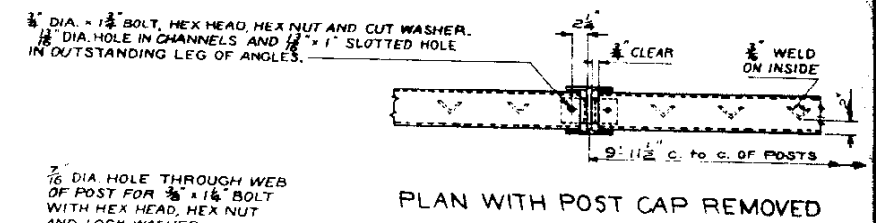
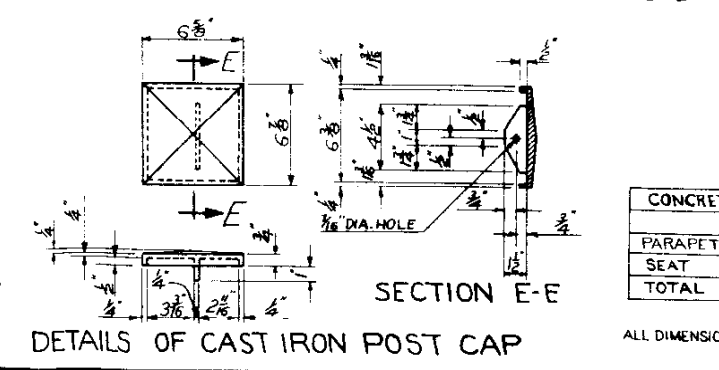
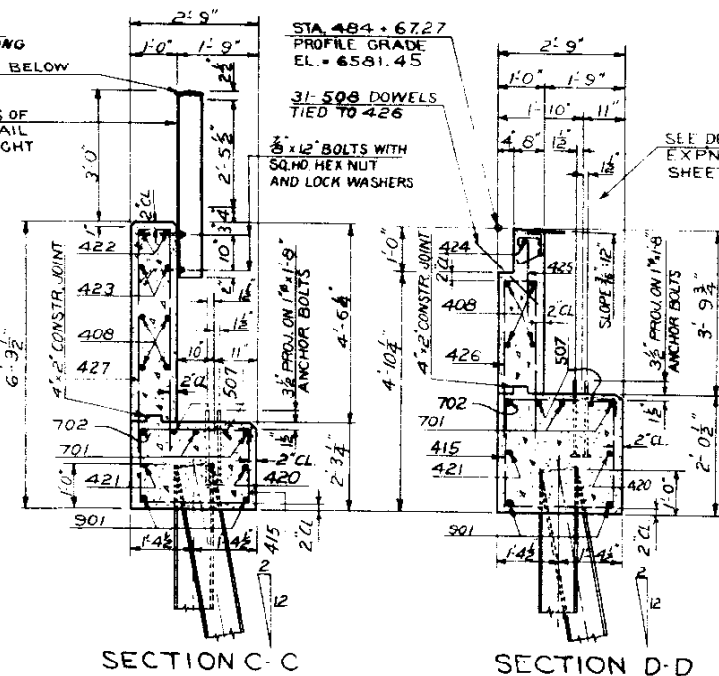
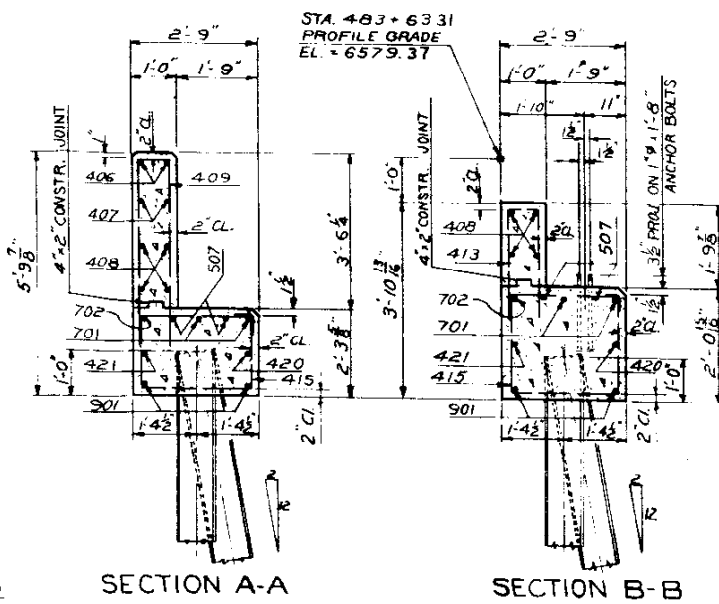
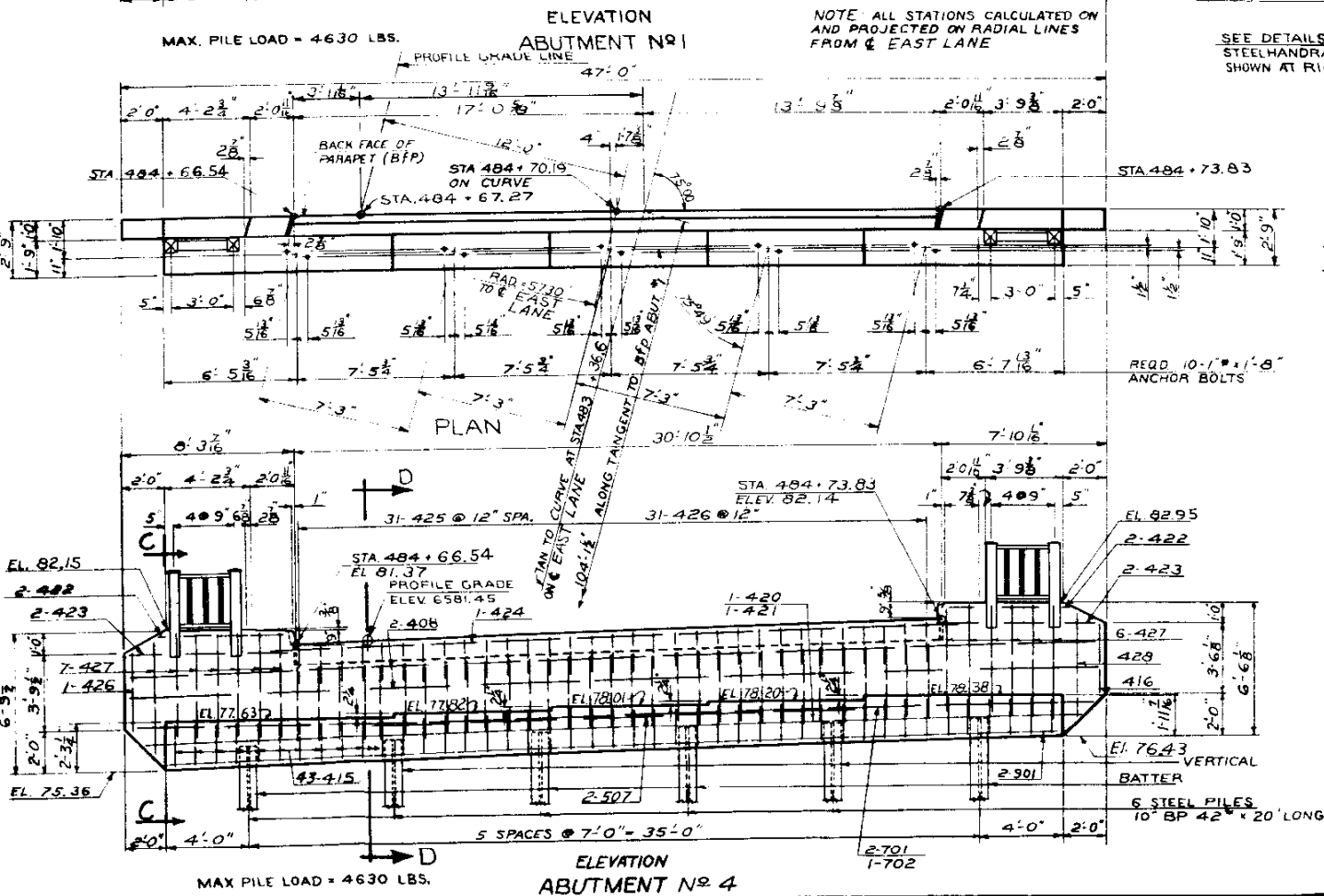
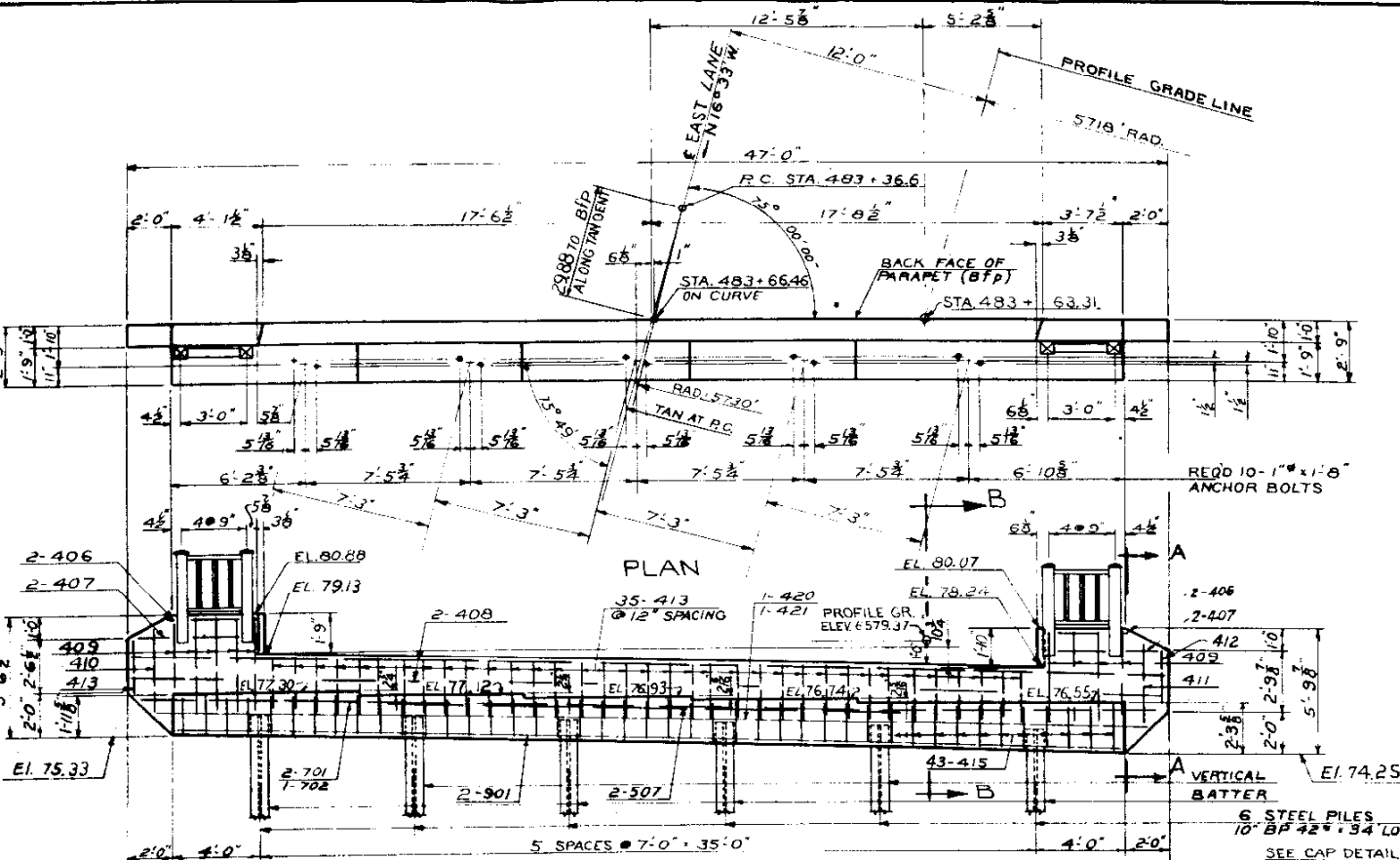


DETAILS OF ABUTMENT EXPANSION DEVICE

WEB SPLICE

COLORADO
 DEPARTMENT OF HIGHWAYS
 3 SPAN (31'-38'-31') CONTINUOUS
 CONCRETE SLAB & I BEAM
 30'-0" CLEAR RDWY. 75° SKEW
 APPROACH SLAB-WEB SPLICE
 & EXPANSION JOINT DETAILS
 Across BLACK SQUIRREL CREEK
 Sta. 483+66.46 TO 484+70.19
 Near HUSTED Sec. 18 T. 12 S. R. 66 W.
 Designed by E.F.S. Approved by P. Bailey
 Made by W.L.P. Bridge Engineer
 Checked by Date: Aug 10, 1953.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25) UNIT # 2	23	

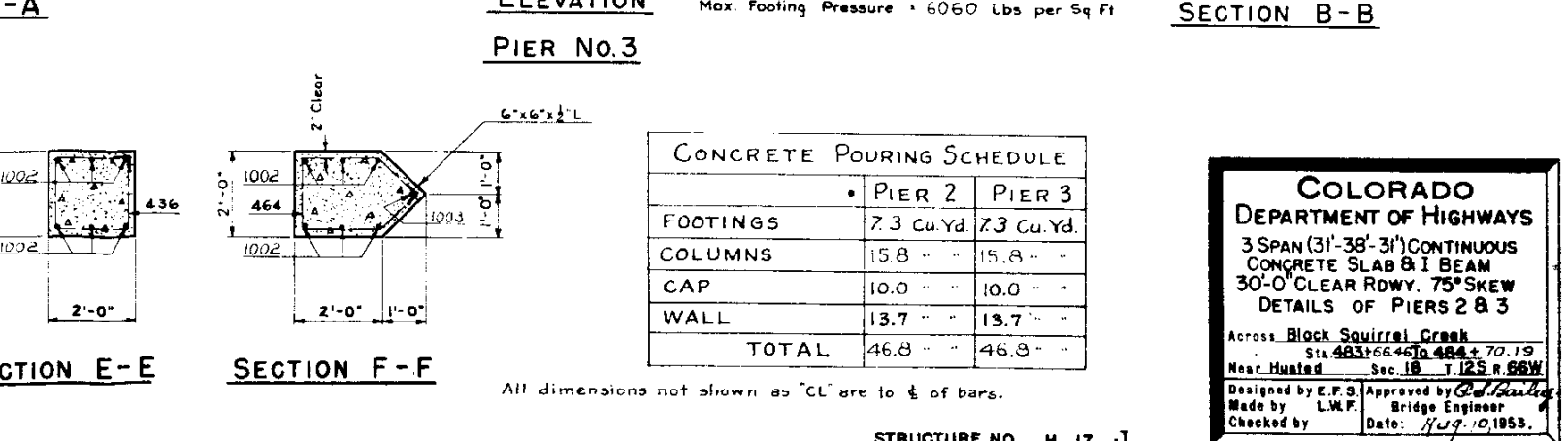
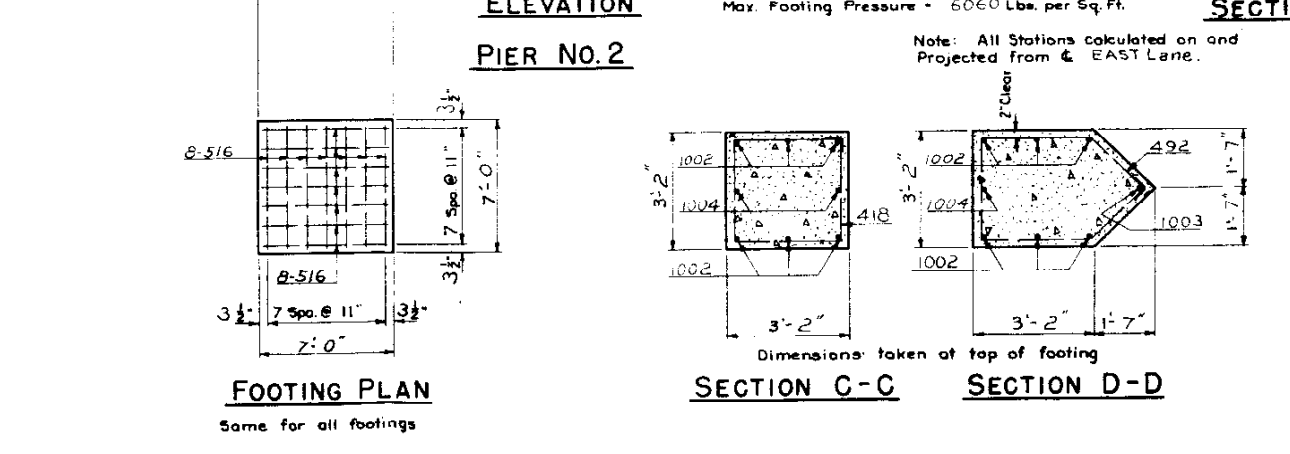
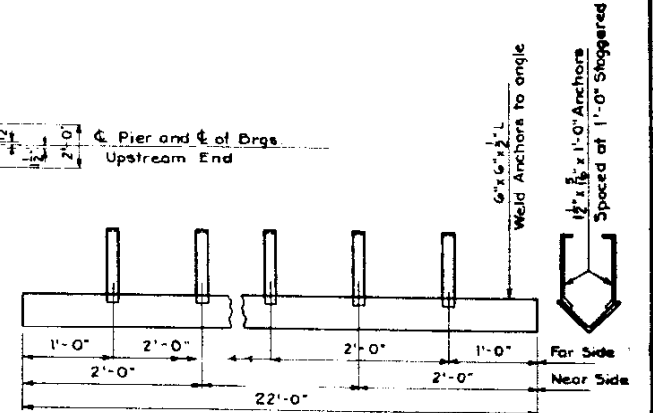
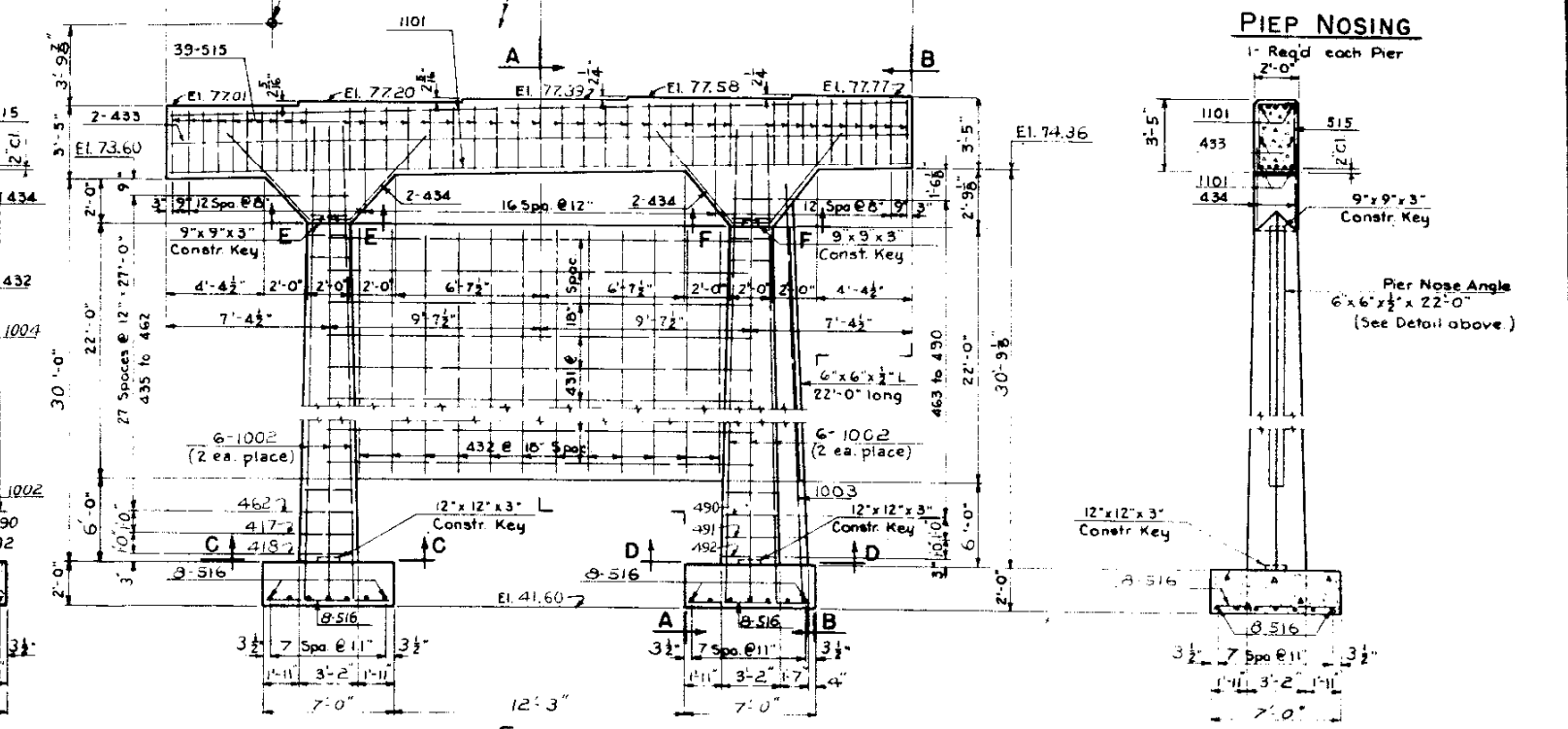
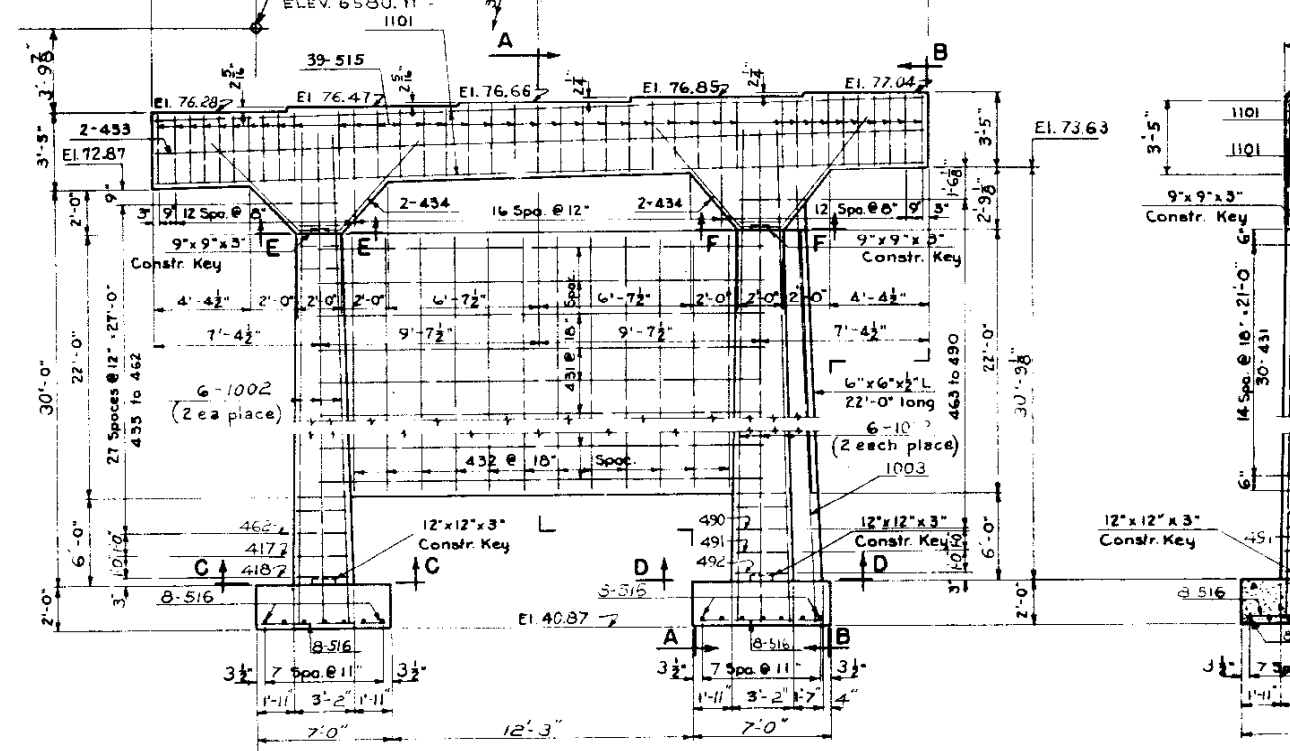
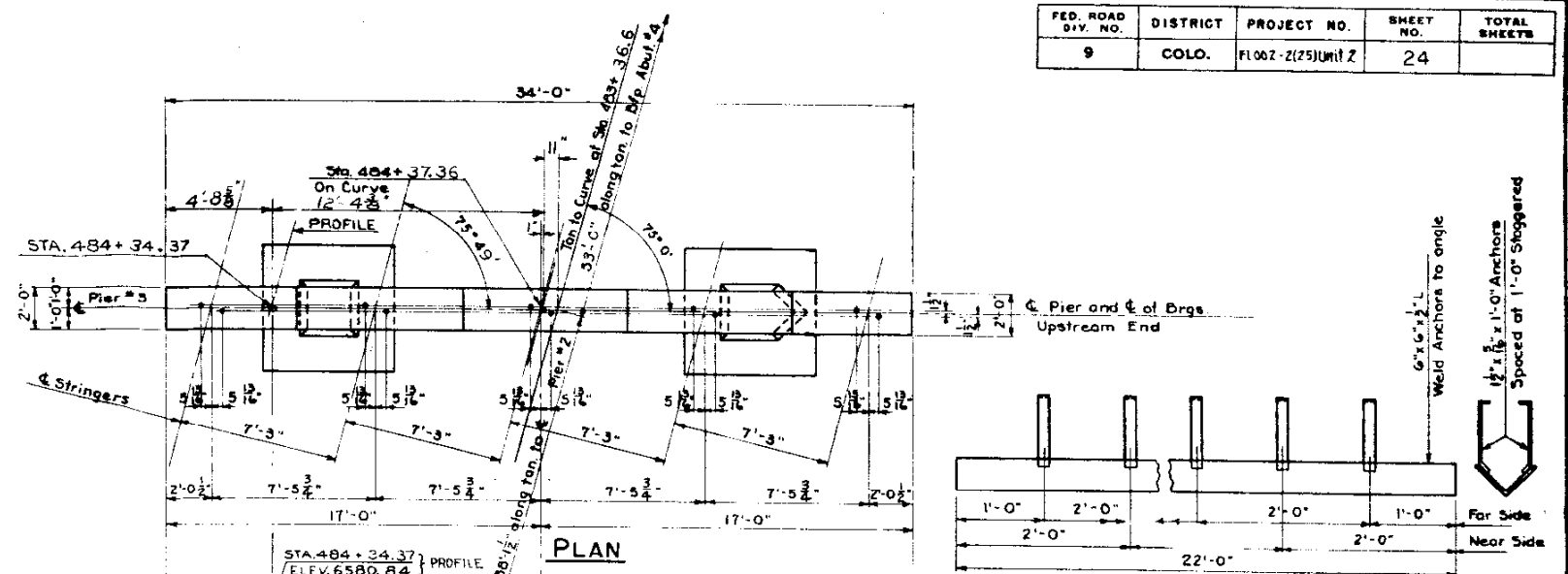
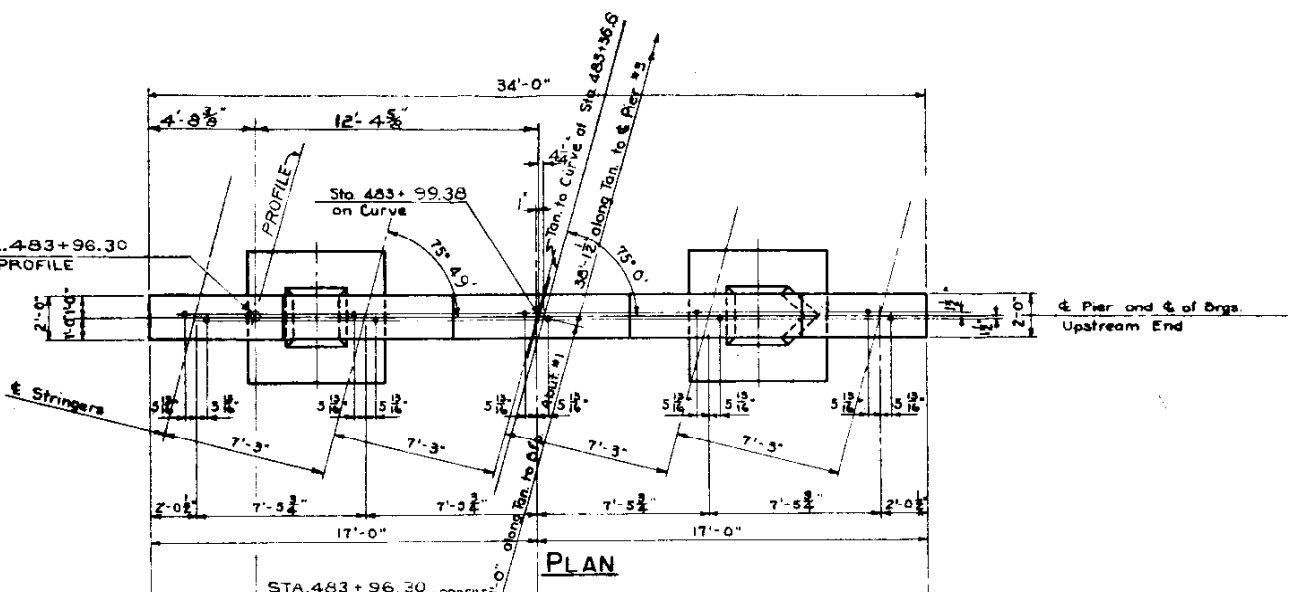


CONCRETE POURING SCHEDULE		
	ABUT. NO. 1	ABUT. NO. 4
PARAPET	4.10 CU.YD.	7.00 CU.YD.
SEAT	3.10 CU.YD.	3.10 CU.YD.
TOTAL	13.20 CU.YD.	16.10 CU.YD.

ALL DIMENSIONS NOT SHOWN AS 'CL.' (CLEAR) ARE TO FACE OF BARS.
STRUCTURE NO. H-17-J

COLORADO
DEPARTMENT OF HIGHWAYS
3 SPAN (31'-38'-31') CONTINUOUS
CONCRETE SLAB & T-BEAM BRIDGE
30'-0" CLEAR ROADWAY 75° SKEW
DETAILS OF ABUT. NO. 1 & ABUT. NO. 4
BEARING AND STEEL HANDRAIL DETAILS
Across BLACK SQUIRREL CREEK
Sta. 483+66.46 to 484+70.19
Near HUSTED See 10 T. 12 S. 89 W.
Designed by EFS Approved by P. J. Bachy
Made by LWF Bridge Engineer
Checked by Date: Aug. 10, 1953.

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25)Unit 2	24	



CONCRETE POURING SCHEDULE		
	PIER 2	PIER 3
FOOTINGS	7.3 Cu. Yd.	7.3 Cu. Yd.
COLUMNS	15.8 "	15.8 "
CAP	10.0 "	10.0 "
WALL	13.7 "	13.7 "
TOTAL	46.8 "	46.8 "

COLORADO
DEPARTMENT OF HIGHWAYS
3 SPAN (31'-38'-31') CONTINUOUS
CONCRETE SLAB & I BEAM
30'-0" CLEAR ROWY. 75° SKEW
DETAILS OF PIERS 2 & 3

Across Black Squirrel Creek
Sta. 483+66.46 to 484+70.19
Near Hunted Sec. 18 T. 125 R. 96W

Designed by E.F.S. Approved by *Ed. Bentley*
Made by L.W.F. Bridge Engineer
Checked by Date: Aug. 10, 1953.

All dimensions not shown as "CL" are to $\frac{1}{2}$ of bars.

STRUCTURE NO. H-17-J

REVISIONS
 Rev 12-13-87 J.P.K.
 Rev 7-1-89 J.E.E.
 Rev 9-14-88 J.E.R.
 Rev 7-10-92 T.M.C.

STANDARD M-10-B

FED. ROAD DIST. NO. 3
 STATE COLORADO
 PROJECT NO. 117

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 b c d e f g h i j k l m n o p q r s t u v w x y z
 J 14 K 1 9 5 0

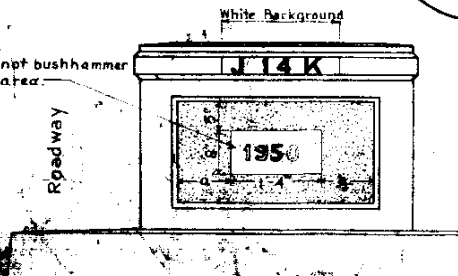
SAMPLE BRIDGE NUMBER

GENERAL NOTES

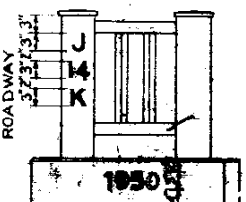
SAMPLE YEAR NUMBER

SECTION

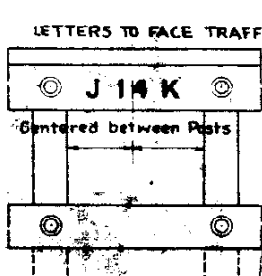
ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.
 COMPENSATION FOR THIS WORK SHALL BE INCLUDED IN THE ORIGINAL CONTRACT ITEMS AND WILL NOT BE PAID FOR AS A SEPARATE ITEM. THE SIZE, SHAPE AND SPACING OF THE LETTERS 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 3/8" MINIMUM AS SHOWN IN THE PANEL 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. 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 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 THOROUGHLY DRIED, 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 (N.M.M.) AS SPECIFIED UNDER ITEM 98 PAINTS AND FINISHES. THE BRACES OF THE STENCILED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND TO MAKE SOLID FIGURES.
 SUFFICIENT TIME BETWEEN SUCCESSIVE COATS SHALL BE ALLOWED TO PERMIT THORO DRYING.
 MINOR STRUCTURES WITH CLEAR SPANS 12 TO 20 FEET INCLUSIVE SHALL BE STENCILED WITH STRUCTURE NUMBER THUS W-18-2 ON 3" STEEL MARKER POSTS WHERE PROVIDED AND AS SHOWN ON STATE HIGHWAY STD. M-23-A.



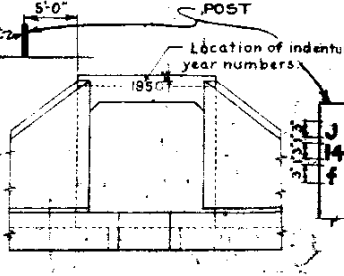
TYPICAL FOR CONCRETE ENDPOST



TYPICAL FOR STEEL HANDRAIL END POST



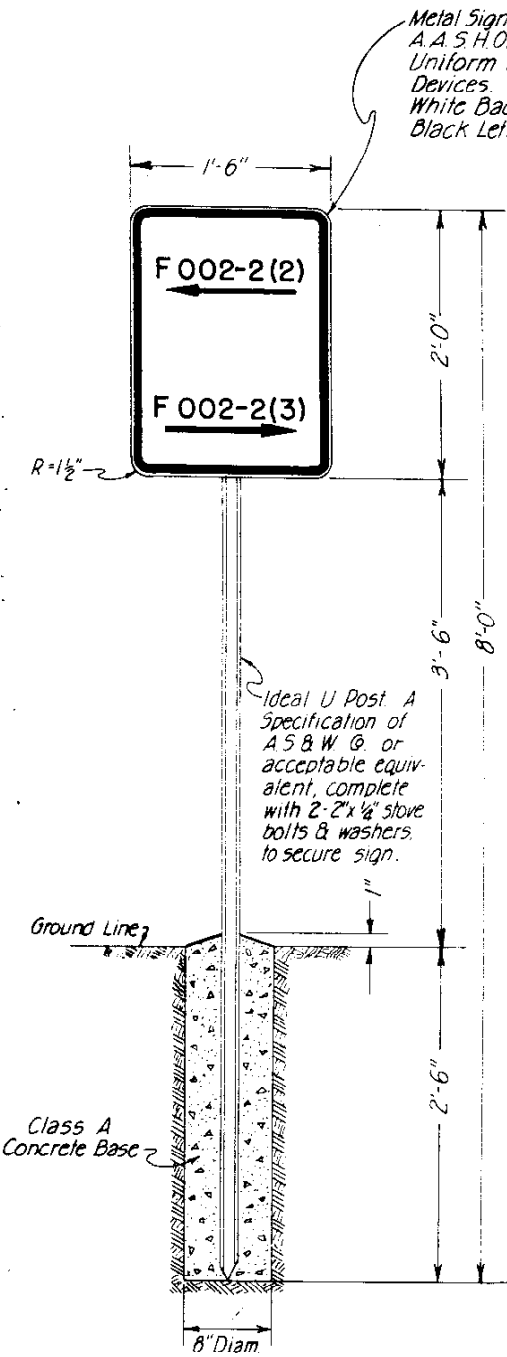
TYPICAL FOR TIMBER ENDPOST



TYPICAL FOR LABEL ON CULVERTS

COLORADO DEPARTMENT OF HIGHWAYS
 STANDARD LETTERS AND YEAR NUMBERS FOR STRUCTURES

PROJECT MARKER POST



NOTES FOR PROJECT MARKER POSTS

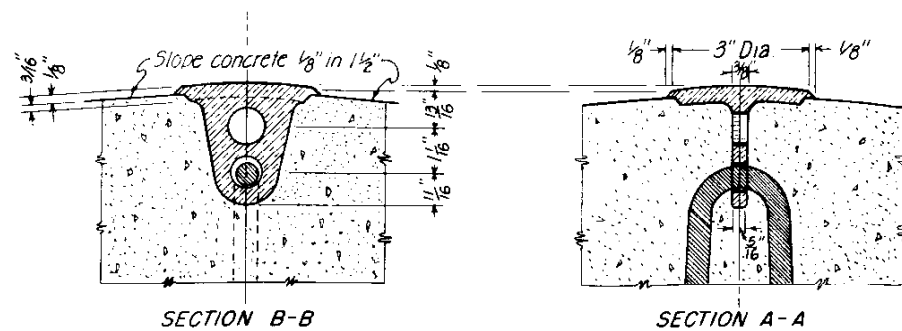
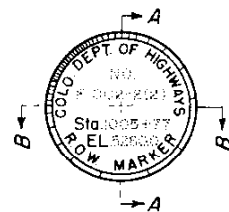
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to this project.

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

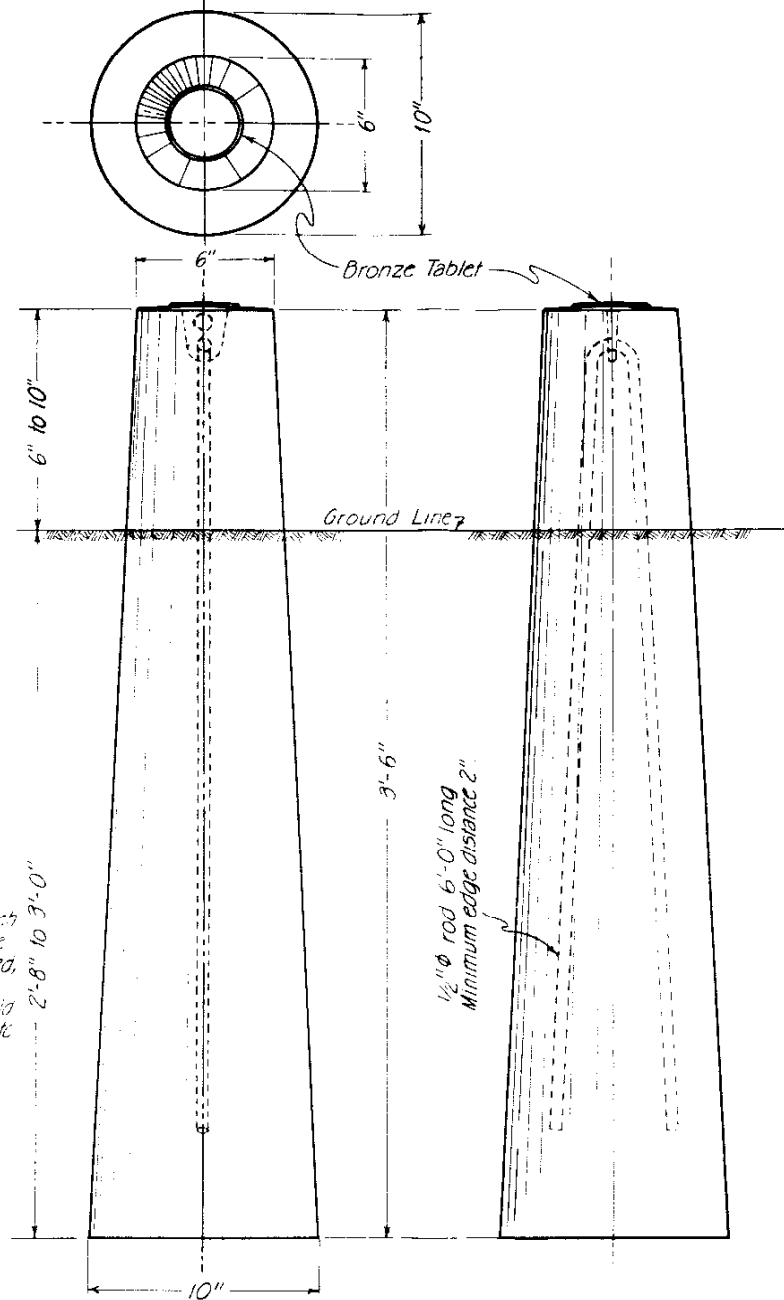
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project. Posts shall be made of Class 'A' Concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed 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 1/8 inch. Information on the bronze tablet indicated by pin lines is to be stamped in field by the engineering party after post is placed. 3/16 inch letters and figures to be used. Project designations on tablets shall be properly shown. (i.e., I for Fed Aid Interstate, F for Fed Aid Primary, S for Fed Aid Secondary, etc. B, C for State Projects, see detail below.)



DETAIL OF BRONZE TABLET FOR RIGHT OF WAY MARKER POST

RIGHT OF WAY MARKER POST

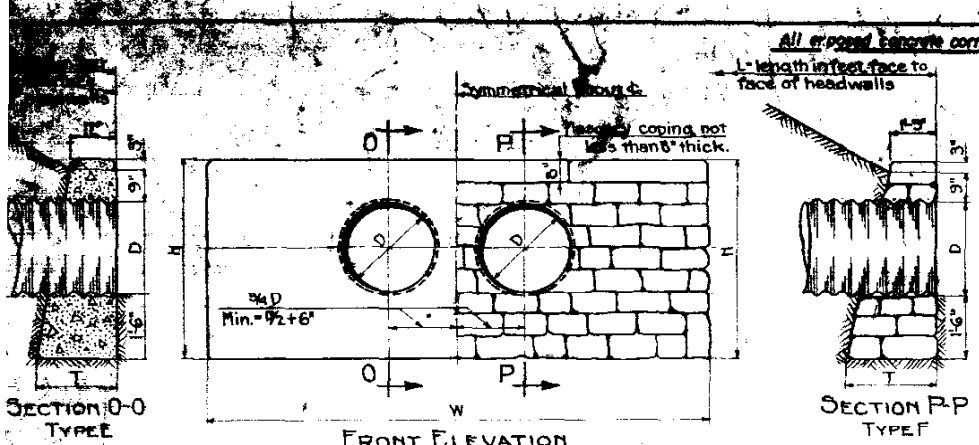


STANDARD M-7-C

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F1002-2(25) #2	26	

COLORADO DEPARTMENT OF HIGHWAYS STANDARD MARKER POSTS

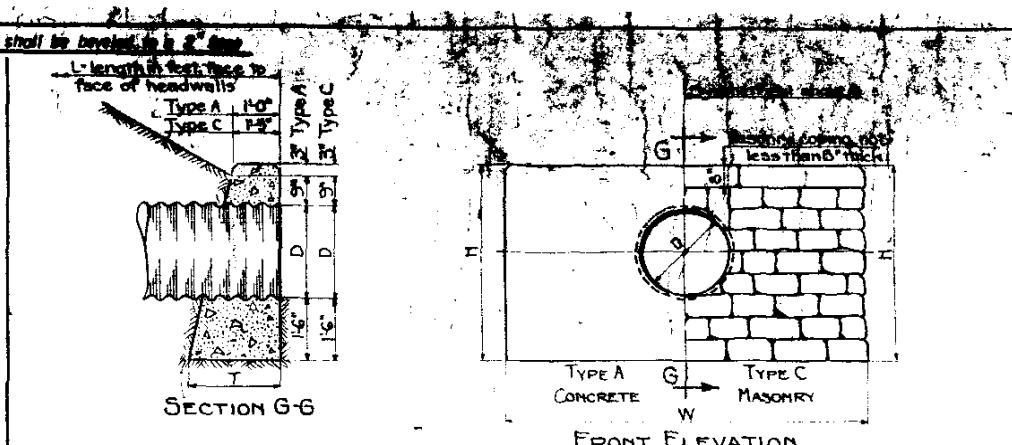
Designed by R.E.L. Approved by *A. Julian*
 Made by E.E.O. Date: Nov. 13, 1953
 Checked by R.E.L.



STANDARD HEADWALLS FOR DOUBLE CORRUG. METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

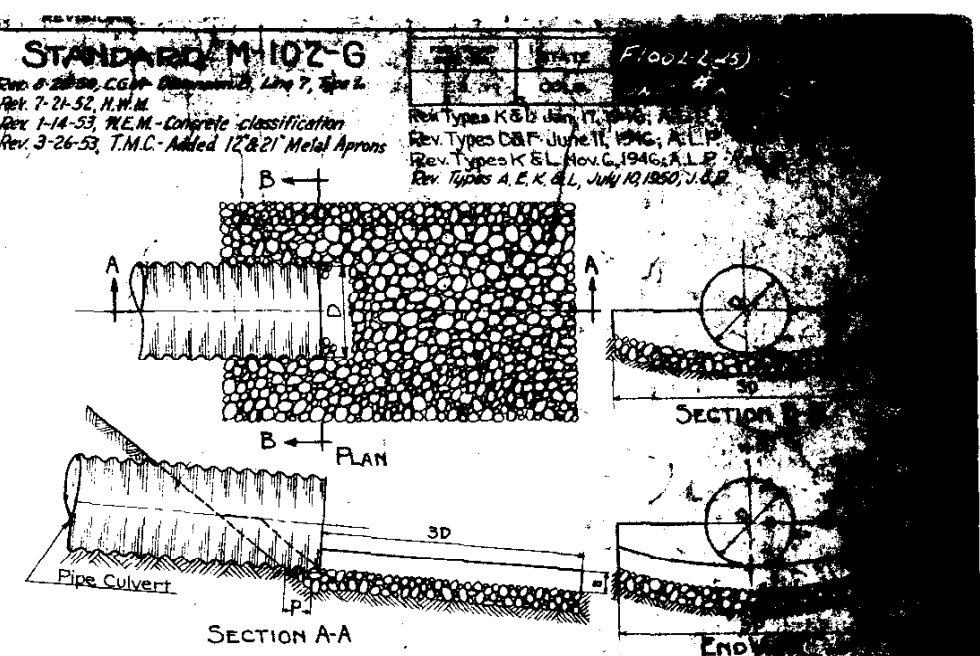
TYPE E		BOTH TYPES				TYPE F	
D. DIAM.	T	W	H	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY	T	D. DIAM.
12"	1-6"	7-6"	3-9"	16 GAGE	3.1 Cu. Yds.	2'-0"	15"
15"	1-7"	8-6"	4-0"	2xL = Lin. Ft.	3.8 Do	2'-1"	18"
18"	1-10"	10-6"	4-6"	14 Do	5.5 Do	2'-4"	24"
21"	1-12"	12-9"	5-0"	14 Do	7.5 Do	2'-6"	30"
24"	1-14"	15-0"	5-6"	12 Do	10.0 Do	2'-8"	36"
27"	1-16"	17-3"	6-0"	12 Do	12.8 Do	2'-10"	42"
30"	1-17"	19-6"	6-6"	12 Do	16.3 Do	3'-0"	48"



STANDARD HEADWALLS FOR SINGLE CORRUG. METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

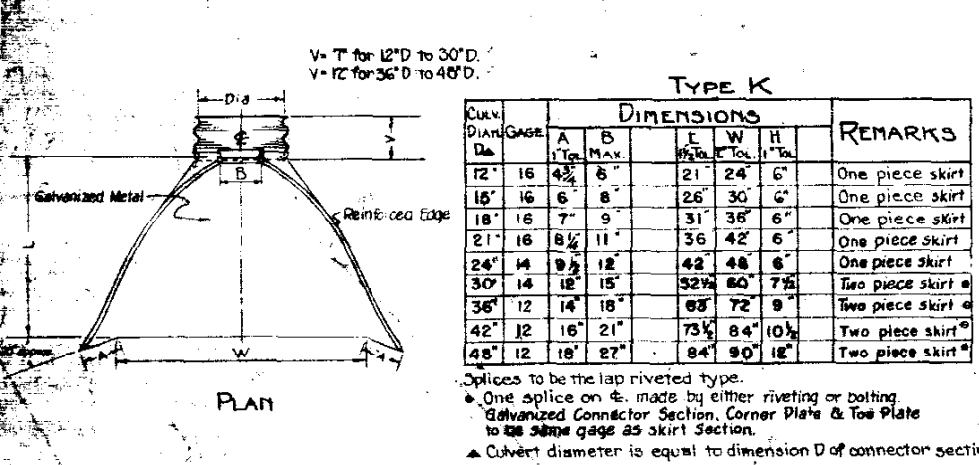
TYPE A		BOTH TYPES				TYPE C	
D. DIAM.	T	W	H	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY	T	D. DIAM.
15"	1-6"	5-3"	3-9"	16 GAGE	2.2 Cu. Yds.	2'-0"	15"
18"	1-7"	6-0"	4-0"	L = Lin. Ft.	2.8 Do	2'-1"	18"
24"	1-10"	7-6"	4-6"	14 Do	4.1 Do	2'-4"	24"
30"	1-12"	9-0"	5-0"	14 Do	5.6 Do	2'-6"	30"
36"	1-14"	10-6"	5-6"	12 Do	7.4 Do	2'-8"	36"
42"	1-16"	12-0"	6-0"	12 Do	9.2 Do	2'-10"	42"
48"	1-17"	13-6"	6-6"	12 Do	11.5 Do	3'-0"	48"



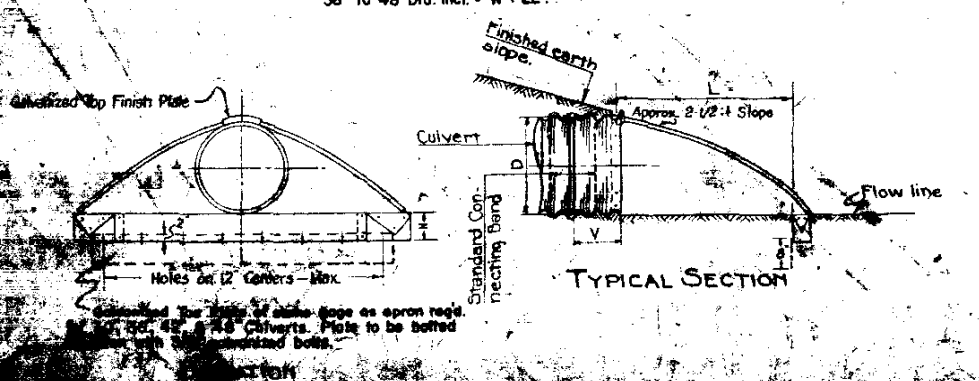
STANDARD GROUTED RUBBLE APRON FOR PIPE

SQUARE YARDS GROUTED RUBBLE SLOPE AND DITCH PAVING

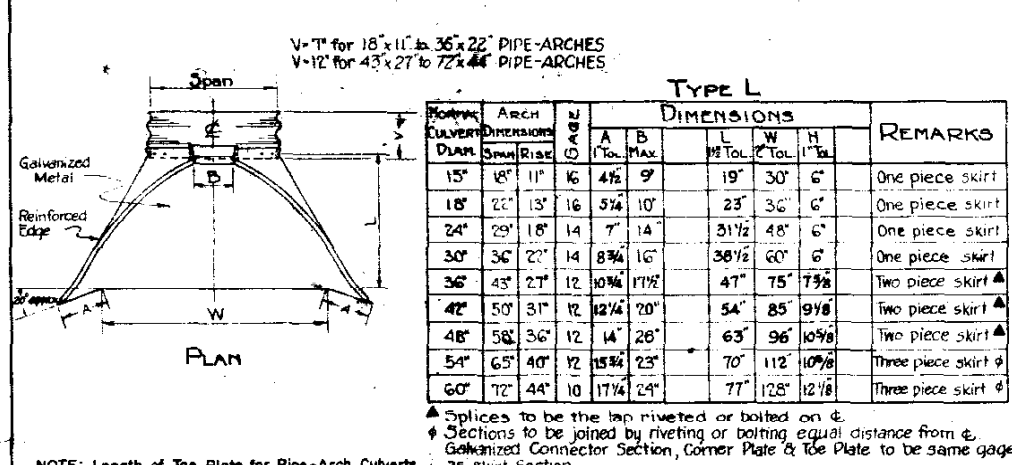
FILL	D	15'	18'	24'	30'	36'	42'	48'	54'	60'
1:1	2'-0"	3	4	6	9	12	17	21	27	33
2:1	2'-0"	3	4	7	10	13	18	23	30	37
3:1	2'-0"	3	4	7	11	15	20	25	31	38
4:1	2'-0"	3	5	8	12	16	22	28	34	41



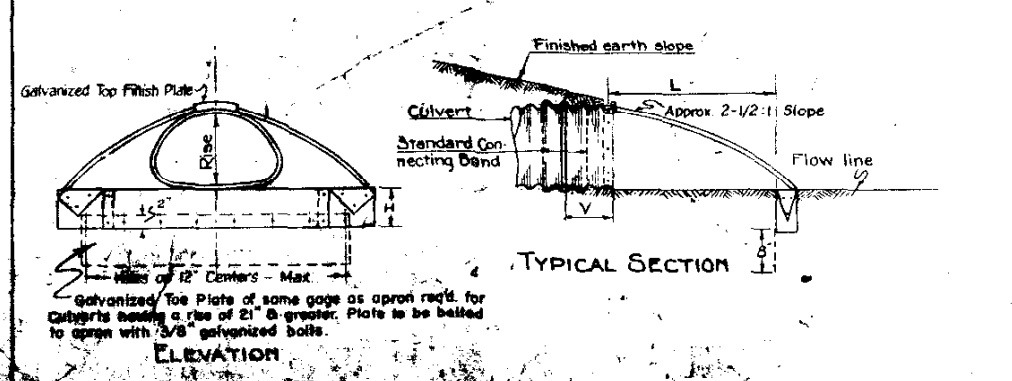
NOTE: Length of Toe Plate for Culverts 15" to 30" Dia. incl. "W" = 10" 36" to 48" Dia. incl. "W" = 22"



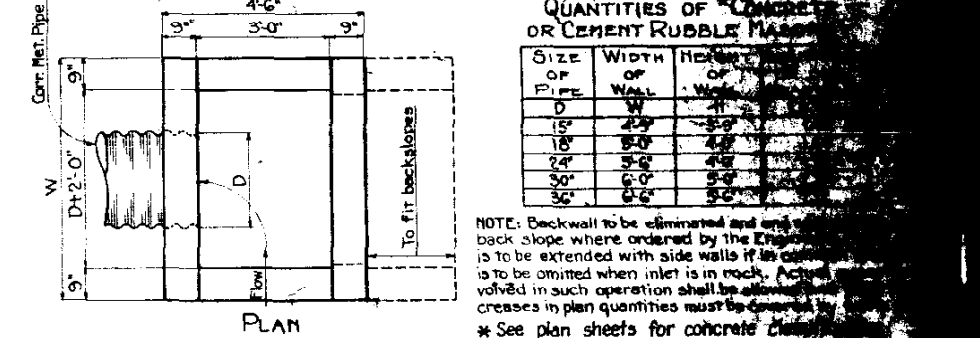
TYPICAL SECTION



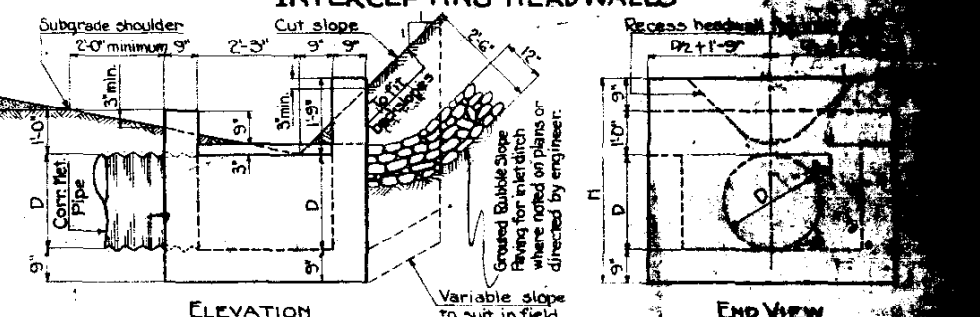
NOTE: Length of Toe Plate for Pipe-Arch Culverts with rise of 11" to 27" incl. "W" = 10" 31" to 44" incl. "W" = 18"



TYPICAL SECTION



INTERCEPTING HEADWALLS



GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado Department of Highways applicable to the Project. All exposed concrete surfaces shall receive class 1 surface finish. All construction joints shall be thoroughly cleaned before fresh concrete is poured. All walls shall have forms on both sides. The minimum fill over top of culverts shall be 1'-0". When culvert is skewed, headwalls shall be placed parallel to center of roadway. Minimum grade of pipe shall be 1%. For size and location of culverts see plan sheets for project. Footings, in general, shall be poured out to rock and not finished. Mechanical fasteners, as provided, shall be from the list of manufacturers. Details shall be as shown.

COLORADO DEPARTMENT OF HIGHWAYS

STANDARD HEADWALLS

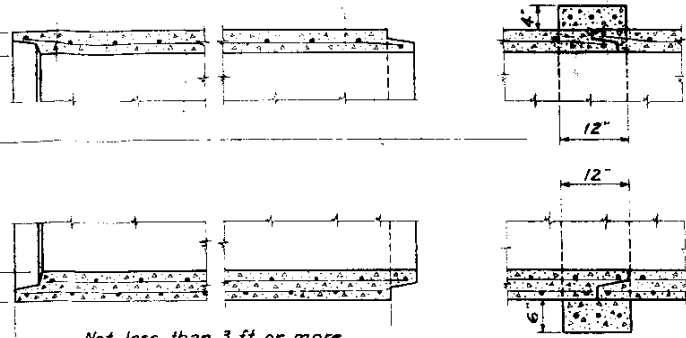
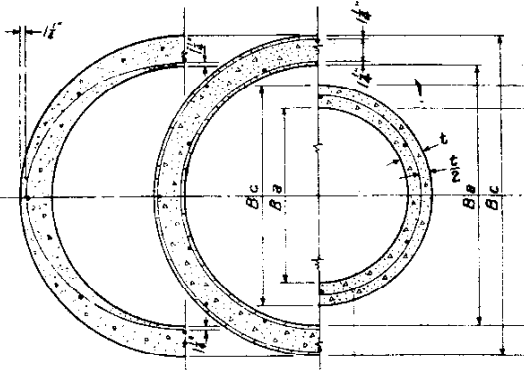
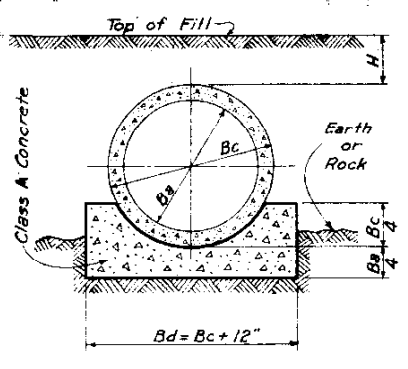
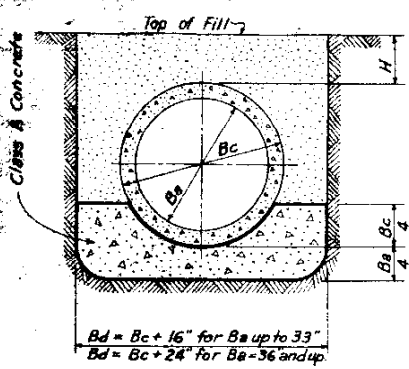
INTERCEPTING HEADWALLS

GROUTED RUBBLE APRONS

STANDARD M-112-E

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.
9	COLO.	110023

Rev. by P.C. 7-1-52 Added 84" Pipe



Sections with elliptical reinforcement or two lines of circular reinforcement

Section with one line of circular reinforcement

Not less than 3 ft. or more than 8 ft. in length.

PIPE CROSS SECTIONS

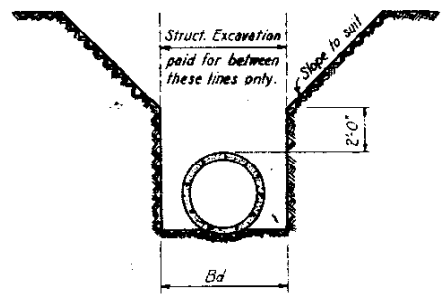
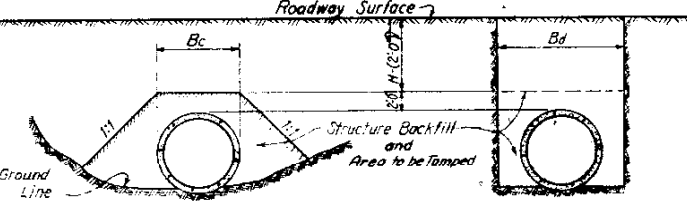
LONGITUDINAL SECTIONS

CONCRETE COLLAR

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

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

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



STRUCTURE BACKFILL AND MECHANICAL TAMPING DIAGRAM

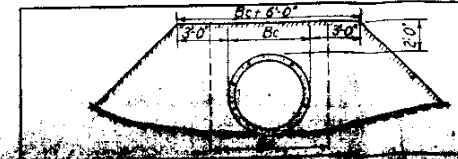
All material that is to be mechanically tamped shall be placed in horizontal layers not more than 6 inches in depth and tamped before the next layer is placed. Backfill for all types of bedding shall be brought up uniformly on each side of the pipe to maintain equal lateral pressures against the pipe.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

Where it is necessary to bed the pipe in a deep trench the contractor may, for his own convenience and at his own expense, slope the cut from a point 2'-0" above the top of the pipe as shown above. Note: For Concrete Sewer Pipe Structural Excavation is not a separate pay item.

GENERAL NOTES

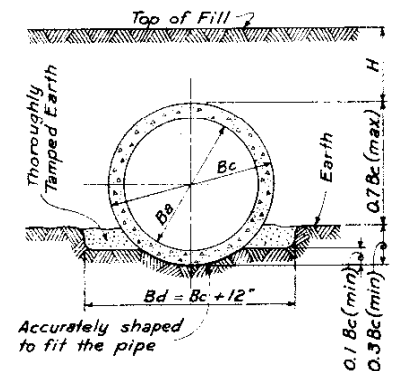
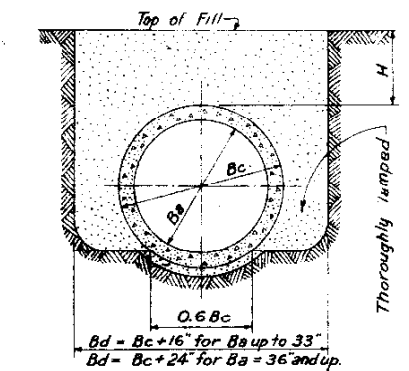
All work shall be done according to the Standard Specifications of the Colorado State Highway Department applicable to the project. Reinforced Concrete Culvert Pipe shall conform to A.A.S.H.O. M41-49. Reinforced Concrete Sewer Pipe shall conform to A.A.S.H.O. M87-49. Unreinforced Concrete Sewer Pipe shall conform to A.A.S.H.O. M86-49. The type of Pipe Joint used and the field construction there-of to make the joint reasonably water-tight shall be submitted to the Department for approval. Unless otherwise noted the type of bedding shall be Ordinary Bedding. When the maximum fill height as noted hereon, for this type of bedding, is exceeded then that type of bedding which is indicated by the allowable fill height shall be used. All culverts shall have headwalls or flared end sections if and as shown on the plans in accordance with Department Standards. For size, type and location of pipe see plan sheets for project. Supporting soils shall be composed of firm and uniform material throughout the entire length of Culvert. The soil shall be accurately shaped to fit the Pipe in accordance with the bedding conditions shown. The Pipe shall be laid with the Bell or Groove end placed upstream.

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



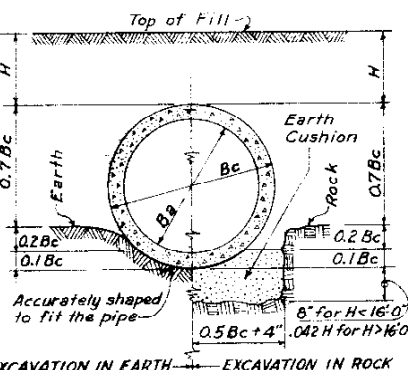
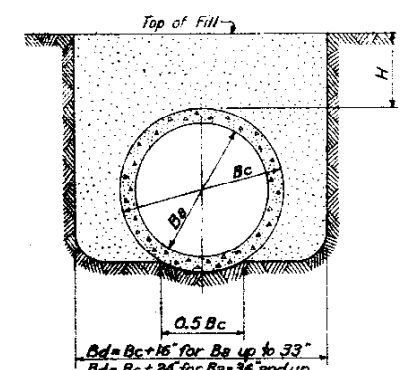
CONCRETE CRADLE BEDDING IN TRENCHES

CONCRETE CRADLE BEDDING IN FILLS



FIRST CLASS BEDDING IN TRENCHES

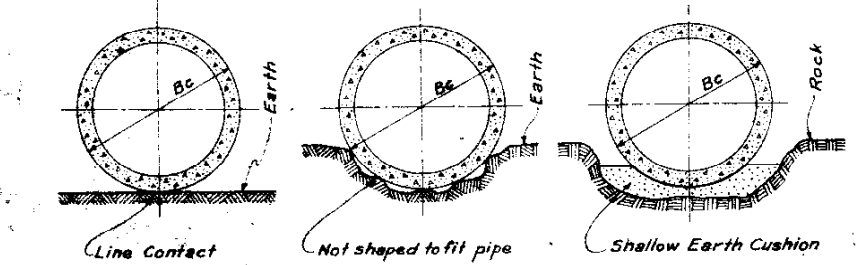
FIRST CLASS BEDDING IN FILLS



ORDINARY BEDDING IN TRENCHES

ORDINARY BEDDING IN FILLS

Backfill to conform to the requirements shown under "Structure Backfill and Mechanical Tamping Diagram."



MINIMUM DEPTH OF BEDDING IN TRENCHES OR FILLS

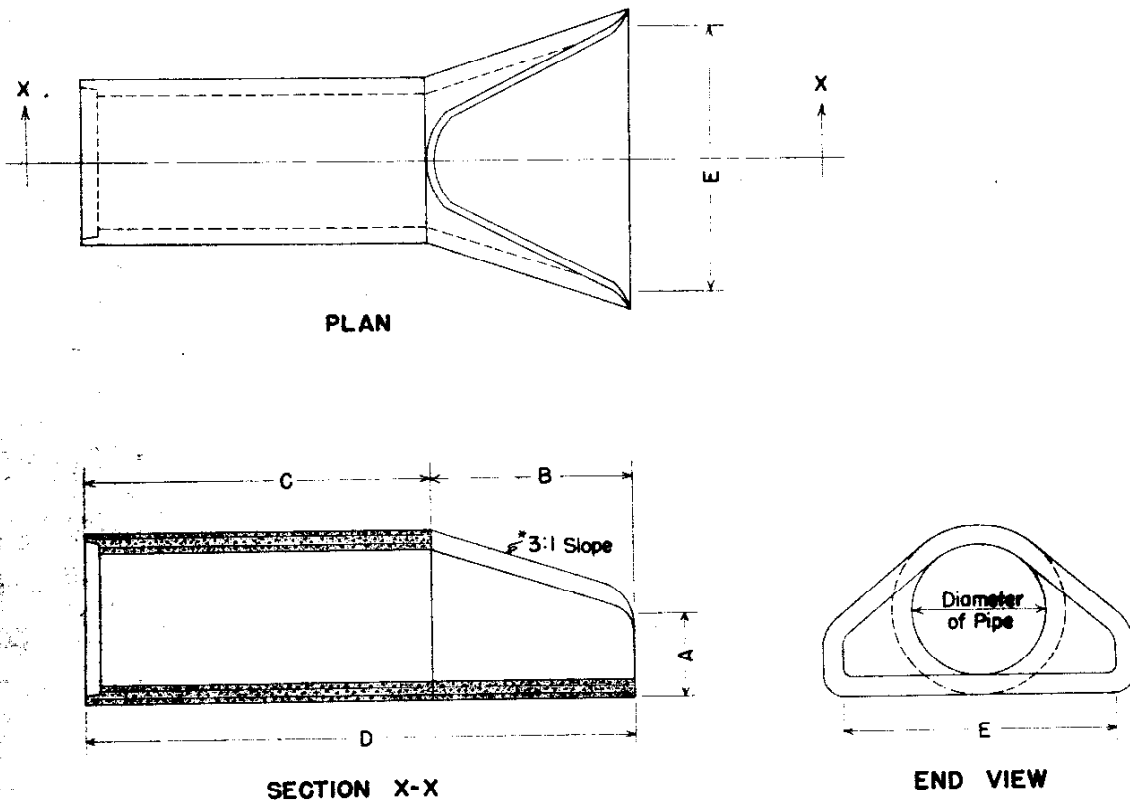
Pipe Diameter (Inches)	Ultimate Load (Pounds)	Concrete Cradle	Max. depth of fill "H" in ft. for 3 types of bedding			
			First Class	Ordinary	Extra Strength	Unreinforced
12	2250	3500	30	19	15	15
15	2625	4065	28	18	14	14
18	3000	4500	26	17	13	13
24	3000	5000	22	14	10	10
30	3375	5750	21	14	10	10
36	44	6600	21	14	10	10
42	51	7350	22	14	10	10
48	58	8000	22	14	10	10
54	65	8650	22	14	10	10
60	72	9300	22	14	10	10
66	79	9950	22	14	10	10
72	86	10600	22	14	10	10
78	93	11250	22	14	10	10
84	100	11900	22	14	10	10

COLORADO STATE HIGHWAY DEPARTMENT
REINF. CONCRETE CULVERT PIPE
 STD. STRENGTH 12, 15, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84"
EXTRA STRENGTH CONCRETE SEWER PIPE
 REINF. 12, 15, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84"
 UNREINF. 12, 15, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84"

STANDARD M-118-A

FED. ROAD DISTRICT **FOUR**
 DIV. NO. **9** COLO. **ATLANTA**
 Rev. Dimensions of End Sec. 10/1/50
 Rev. Dim. Line of End Sec. 12/18/50
 Rev. Dim. of Seal & added Note - 1/17/50 - E. E. D.

FLARED END SECTION FOR CONCRETE PIPE

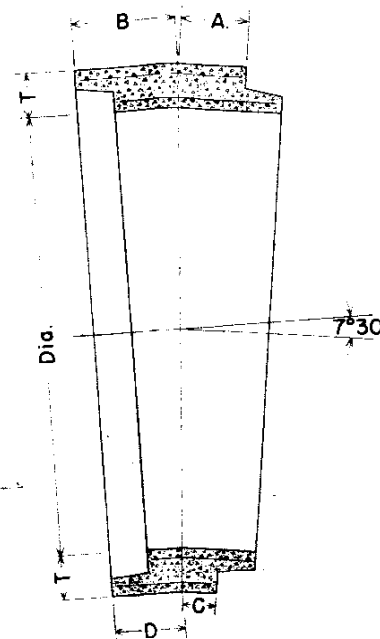


DIMENSIONS FOR FLARED END SECTIONS

DIAMETER	A	B	C	D	E
12"	4"	2'-0"	4'-0 ⁷ / ₈ "	6'-0 ⁷ / ₈ "	2'-0"
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"
24"	9 ¹ / ₂ "	3'-7 ¹ / ₂ "	4'-6"	8'-1 ¹ / ₂ "	4'-0"
30"	1'-0"	4'-6"	3'-7 ³ / ₄ "	8'-1 ³ / ₄ "	5'-0"
36"	1'-3"	5'-3"	2'-10 ³ / ₄ "	8'-1 ³ / ₄ "	6'-0"
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"
54"	2'-6"	6'-0"	2'-3"	8'-3"	7'-6"
*60"	2'-6"	5'-0"	3'-3"	8'-3"	8'-0"

*60" end section is based on a slope of 2:1

7°30' ANGLE SECTION FOR CONCRETE PIPE

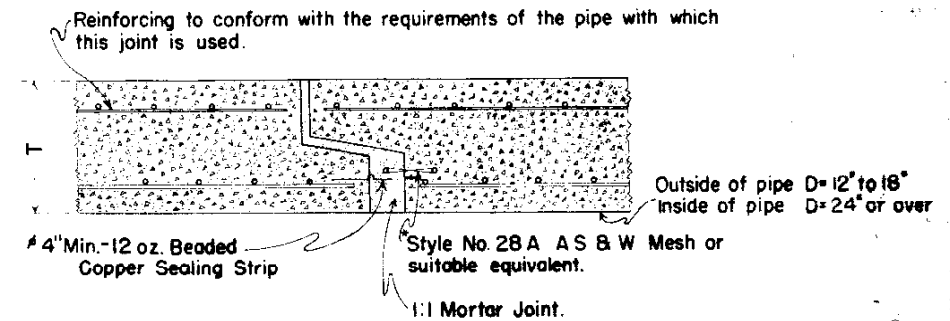


DIMENSIONS FOR 7°30' ANGLE SECTIONS

DIAMETER OF PIPE	LENGTH ON OUTSIDE OF PIPE				AVERAGE LAYING LENGTH ON C
	A	B	C	D	
12"	4 ¹ / ₂ "	4 ¹ / ₂ "	3 ¹ / ₂ "	3 ¹ / ₂ "	8"
15"	5 ¹ / ₂ "	5 ¹ / ₈ "	4 ¹ / ₄ "	3 ⁷ / ₈ "	9 ³ / ₈ "
18"	3 ¹ / ₂ "	6 ¹ / ₂ "	2"	5"	8 ¹ / ₂ "
24"	4"	6 ¹ / ₂ "	2"	4 ⁹ / ₁₆ "	8 ¹ / ₂ "
30"	4 ¹ / ₂ "	7"	2"	4 ¹ / ₂ "	9"
36"	4 ⁷ / ₈ "	8 ⁷ / ₁₆ "	2"	5 ⁹ / ₁₆ "	10 ⁷ / ₁₆ "
42"	6"	9 ¹ / ₂ "	2 ⁹ / ₈ "	6 ¹ / ₈ "	12 ¹ / ₈ "
48"	7"	11"	3 ⁷ / ₁₆ "	7 ³ / ₁₆ "	14 ³ / ₁₆ "
54"	8 ¹ / ₈ "	12 ¹ / ₈ "	4"	8"	16 ¹ / ₈ "
60"	9 ¹ / ₈ "	14"	4 ⁹ / ₈ "	9 ¹ / ₄ "	18 ³ / ₈ "

A, B, C and D apply to Tongue and Groove type of Joint only and can be varied for other types of Joints.

COPPER EXPANSION JOINT FOR CONCRETE PIPE (WHEN REQUIRED ON PLANS)



*When Welded Rectangular Mesh is used for the reinforcing steel in the pipe the inner line of Mesh may be extended into the joint space instead of using a separate strip of Triangular Mesh.

COPPER SEALING STRIP



Copper Sealing Strips shall be made from sheet copper, 4" min. width, bent as shown and weighing 12 oz. per sq. ft. Both legs of strip shall be perforated in a satisfactory manner to secure bond. Each sealing strip shall be continuous around each pipe joint with a 1/4" end lap.

GENERAL NOTES

Joints other than Tongue and Groove may be used for Flared End Sections, 7°30' Angle and for the Copper Expansion Joint but all Joints for any one pipe structure must be uniform.

Concrete, wall thickness and reinforcing steel in Flared End Sections and 7°30' Angle Sections must conform with the requirements of the pipe with which they are used.

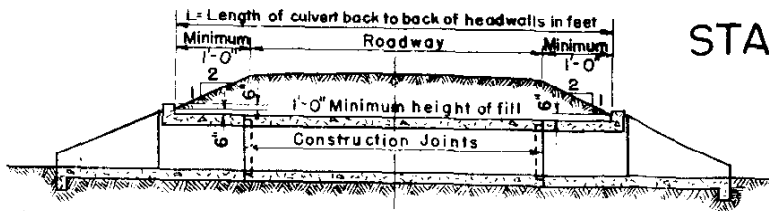
Alternate types of expansion joints may be substituted for the expansion joint shown on this sheet after approval by the Department.

Flared end sections are to be furnished with tongue or groove, and/or bell or spigot as required, in order that joints may be laid with the bell or groove end upstream.

COLORADO
 STATE HIGHWAY DEPARTMENT
 STANDARD
 FLARED END SECTION
 7°30' ANGLE SECTION
 AND
 COPPER EXPANSION JOINT
 FOR
 CONCRETE PIPE STRUCTURE

STANDARD M-103-H

FEDERAL ROAD DIVISION NO. 9 DISTRICT FLOOR 25 UNIT # 230
 REV. FOR SPECS - 9/26/52 - E.E.O.
 REV. 3-25-53, J.L.C., Rockfill.



TYPICAL SECTION SHOWING RELATION OF CULVERT TO ROADWAY

HALF-LAP CONST. JOINT

USE BARS FOR	MARK	SIZE	NUMBER	DIMENSION B	DIMENSION C	TOTAL LENGTH	BENDING DIAGRAM
ALL SIZES	501	5/8"	4.6L+7	S+7'-7"	S+2'-3"	H+1'-10"	
"	502	3/4"	2L+3	H+8"	H+1'-10"	H+1'-10"	
"	401	1/2"	4		S+6'-2"	L+1'-2"	
"	403	1/2"	4		1'-8"	3'-8"	
"	404	1/2"	4		3'-11"	5'-11"	
"	405	1/2"	4		6'-3"	8'-3"	
H=3'-0" Or more	406	1/2"	4		10'-1"	12'-11"	
H=4'-0" "	407	1/2"	4		13'-2"	15'-2"	
H=5'-0" "	408	1/2"	4		15'-6"	17'-6"	
H=6'-0" "	409	1/2"	4		17'-9"	19'-9"	
H=7'-0" "	410	1/2"	4		19'-9"	21'-9"	
ALL SIZES	503	5/8"	2	S+1'-5"	H+0'-10"	H+0'-7"	
"	504	5/8"	2	S+2'-7"	H+0'-4"	H+0'-4"	
"	506	5/8"	2	S+3'-1"	H+0'-1"	H+0'-1"	
"	507	5/8"	2	S+3'-8"	H+0'-2"	H+0'-2"	
"	508	5/8"	2	S+4'-3"	H+0'-5"	H+0'-5"	
H=3'-0" Or more	509	5/8"	2	S+5'-3"	H+0'-10"	H+0'-10"	
H=3'-0" "	510	5/8"	2	S+6'-2"	H+1'-3"	H+1'-3"	
H=3'-0" "	511	5/8"	2	S+7'-2"	H+1'-8"	H+1'-8"	
H=4'-0" "	512	5/8"	2	S+8'-1"	H+2'-1"	H+2'-1"	
H=4'-0" "	513	5/8"	2	S+9'-7"	H+2'-9"	H+2'-9"	
H=5'-0" "	514	5/8"	2	S+11'-0"	H+3'-4"	H+3'-4"	
H=6'-0" "	515	5/8"	2	S+12'-5"	H+4'-0"	H+4'-0"	
H=6'-0" "	516	5/8"	2	S+13'-11"	H+4'-7"	H+4'-7"	
H=7'-0" "	517	5/8"	2	S+15'-4"	H+5'-3"	H+5'-3"	
H=7'-0" "	518	5/8"	2	S+16'-9"	H+5'-10"	H+5'-10"	
ALL SIZES	411	1/2"	(S+1) 4 D+3'-0"			D+5'-4"	

★ See table of Dimensions and Quantities

SPAN S	HEIGHT OF FILL H	HEIGHT OF FILL ALLOWED	DIMENSION M	DIMENSION N	DIMENSION D	THICKNESS OF SLAB OF 401 PER BOX	QUANTITIES FOR ONE LINEAR FT. OF BOX		QUANTITIES FOR TWO HEADWALLS		STRUCTURAL EMBANKMENT	
							CONCRETE CU. YDS.	STEEL LBS.	CONCRETE CU. YDS.	STEEL LBS.	TWO HEADWALLS SQ. FT.	TWO CUT-OFF WALLS CU. YDS.
2'-0"	2'-0"	37'-0"	4'-0 1/2"	2'-0 1/2"	3'-6"	12	0.258	38.5	3.3	3.01	7.9	3
3'-0"	2'-0"	29'-0"	4'-2 3/4"	2'-1 3/4"	3'-8"	7	1.6	31.8	45.4	4.0	3.86	9.4
4'-0"	2'-0"	29'-0"	4'-6 1/2"	3'-3 3/4"	5'-8"	7	1.8	37.5	49.0	6.0	5.20	14.4
4'-0"	2'-0"	20'-0"	4'-2 3/4"	2'-1 3/4"	3'-8"	7	1.8	36.5	51.8	4.4	4.04	10.6
4'-0"	3'-0"	20'-0"	6'-6 1/2"	3'-3 3/4"	5'-8"	7	2.0	42.2	55.3	6.8	5.81	15.9
4'-0"	4'-0"	20'-0"	8'-10 1/2"	4'-5 1/2"	7'-8"	7	2.4	47.7	60.1	9.6	7.61	22.2
5'-0"	3'-0"	16'-0"	6'-9"	3'-4 1/2"	5'-10"	8	2.4	50.8	63.0	7.9	6.46	18.0
5'-0"	4'-0"	16'-0"	9'-0 1/2"	4'-6 1/2"	7'-10"	8	2.6	56.4	66.5	11.1	8.33	24.8
5'-0"	5'-0"	16'-0"	11'-4 1/2"	5'-8 1/2"	9'-10"	8	2.8	62.0	69.9	14.7	10.04	32.5
6'-0"	4'-0"	13'-0"	9'-1 3/4"	4'-6 7/8"	7'-11"	8 1/2	2.8	63.9	72.9	12.3	9.04	27.1
6'-0"	6'-0"	13'-0"	13'-9"	6'-10 1/2"	11'-11"	8 1/2	3.4	75.0	81.6	20.6	13.25	44.3
6'-0"	7'-0"	13'-0"	16'-0 3/4"	8'-0 3/4"	13'-11"	8 1/2	3.6	80.5	84.6	24.8	15.86	54.2

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

GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado Department of Highways applicable to the project.
 All concrete shall be class "A", AND AIR ENTRAINMENT AS SPECIFIED.
 Horizontal const. keys not required when floors and side walls are poured monolithically. All walls shall have forms on both sides.
 Minimum distance between centering of bar and edge of concrete to be 1 1/2".
 All construction joints shall be thoroughly cleaned before fresh concrete is poured. Footings in rock shall be poured out to the rock and not formed.
 For culverts required and governing dimensions see "List of Structures".
 All reinforcing bars shall be deformed.
 All reinforcing bars shall be tagged with the station number and BAR designation. Secondary bars when spliced shall be given a lap of 35 diameters.
 Main bars shall not be spliced.
 Soundings and depth of footings shown are according to the best available data, if essentially different conditions are encountered the engineer will inspect and determine if redesign is necessary.
 Pour wing footings monolithically with floor of box.
 The use of additional construction joints undesirable, should field conditions require, construction joints may be made on a vertical plane perpendicular to centerline of culvert and shall be Half-Lap Joints as shown in detail.
 This design not to be used when height of fill exceeds the allowable tabulated.
 Supporting soils for all culverts must be composed of firm and uniform material throughout.
 All backfilling in approaches to and over culverts shall be laid in layers not exceeding six inches in depth and each layer shall be compacted in accordance with the illustration for Mechanically Tamped Backfill shown on this drawing.
 All surfaces exposed to view on the box and wing walls shall receive class I surface finish, except culvert barrel.
 ALL DIMENSIONS NOT SHOWN AS CLEAR ARE TO THE C. OF THE BAR

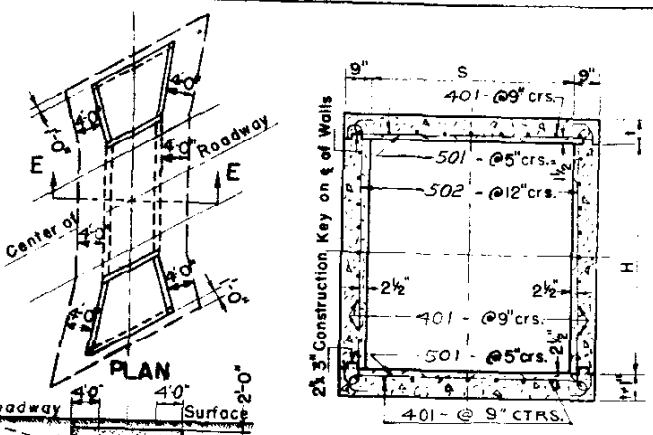
LOADING DATA
 LIVE LOAD: A.A.S.H.O. H 20-S16-44
 DEAD LOAD: EARTH 120 lb. per cu. ft.
 CONCRETE 150 lb. per cu. ft.

DESIGNING DATA
 A.A.S.H.O. 1944 UNIT STRESSES
 f'c = 1000 lb. per sq. in.
 f's = 20000 lb. per sq. in.
 n = 10

COLORADO DEPARTMENT OF HIGHWAYS
CONCRETE BOX CULVERT

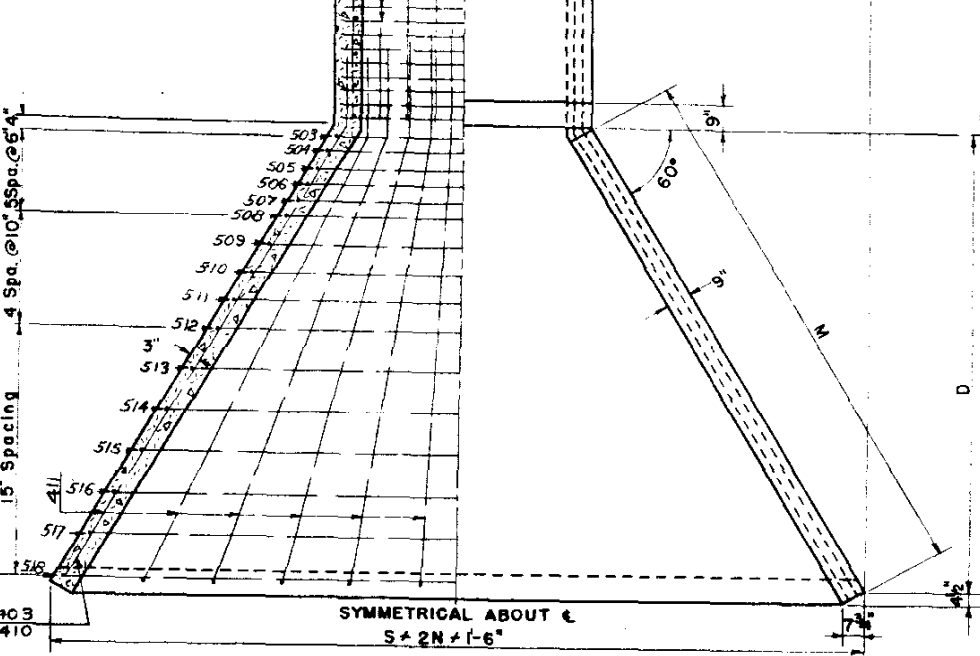
2'x2'	4'x3'	5'x5'
3'x2'	4'x4'	6'x4'
3'x3'	5'x3'	6'x6'
4'x2'	5'x4'	6'x7'

Designed by W.W.D. Approved by C.L. [Signature]
 Made by P.C. Bridge Engineer
 Checked by S.L. Date: JUL 10 1953

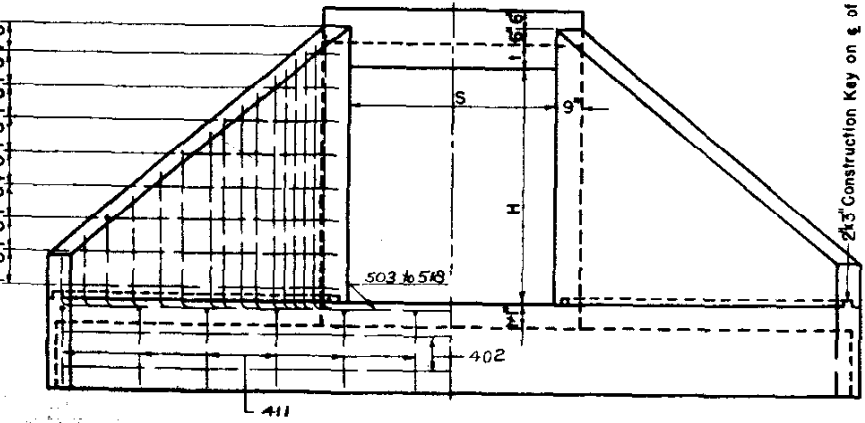


TYPICAL SECTION THRU BOX

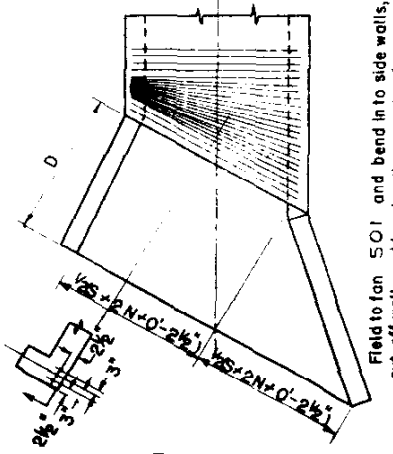
MECHANICALLY TAMPED BACKFILL



PART PLAN



END VIEW



PART PLAN FOR SKEWED HEADWALLS

Field to fan 501 and bend into side walls, cut-off walls, and head walls at ends of skewed culverts where necessary.

Use 3 straightened 501 in each curb, thus:

ORIGINAL BY [] INITIAL [] DATE []
 CHECKED BY []
 DRAWN BY []
 CHECKED BY []

STANDARD M-46-A

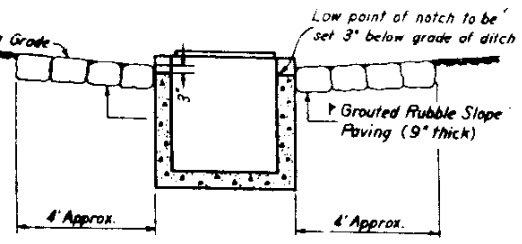
SPECIAL REVISION FOR FI 002-2 (25) UNIT 2

REVISIONS

FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FI 002-2 (25)	31	
UNIT 2				

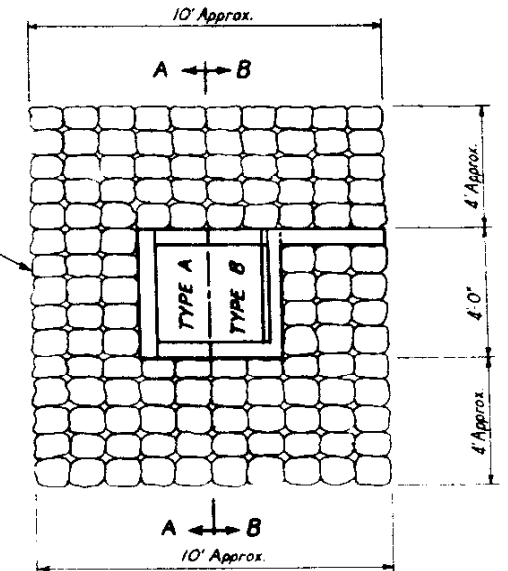
TYPE A

FOR USE AT BOTTOM OF VERTICAL CURVE

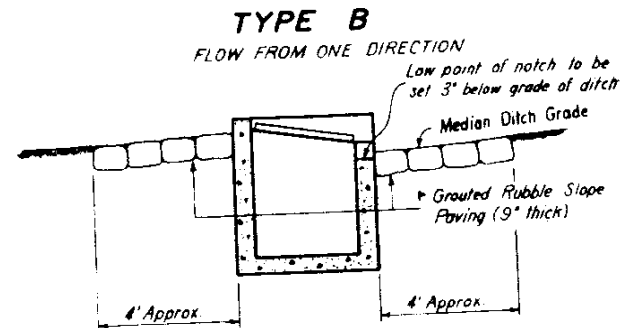


SECT. "A-A"

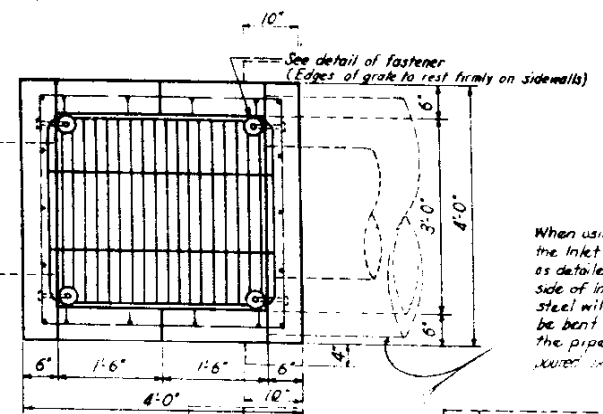
Materials used in the construction of Inlet Gratings shall meet with the requirements of Item 48, Structural Steel, in the Standard Specifications



LAYOUT OF INLET IN MEDIAN DITCH

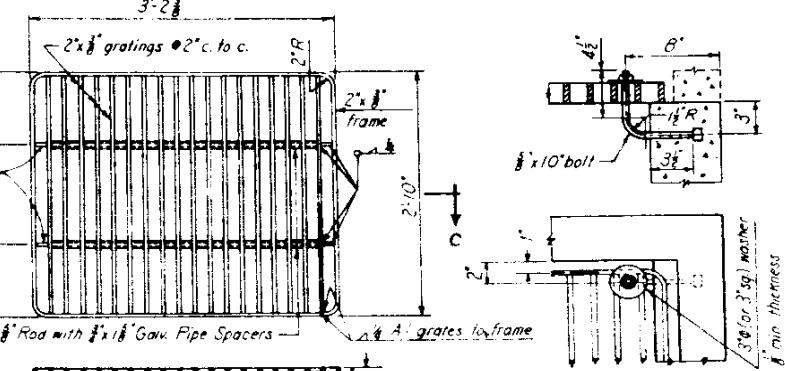


SECT. "B-B"



FLAN

When using a 36" Concrete Pipe into the inlet an extra strip of concrete as detailed shall be added to each side of inlet box. The reinforcing steel will be the same and may be bent around the outside of the pipe. These extra strips shall be secured specifically with the box.



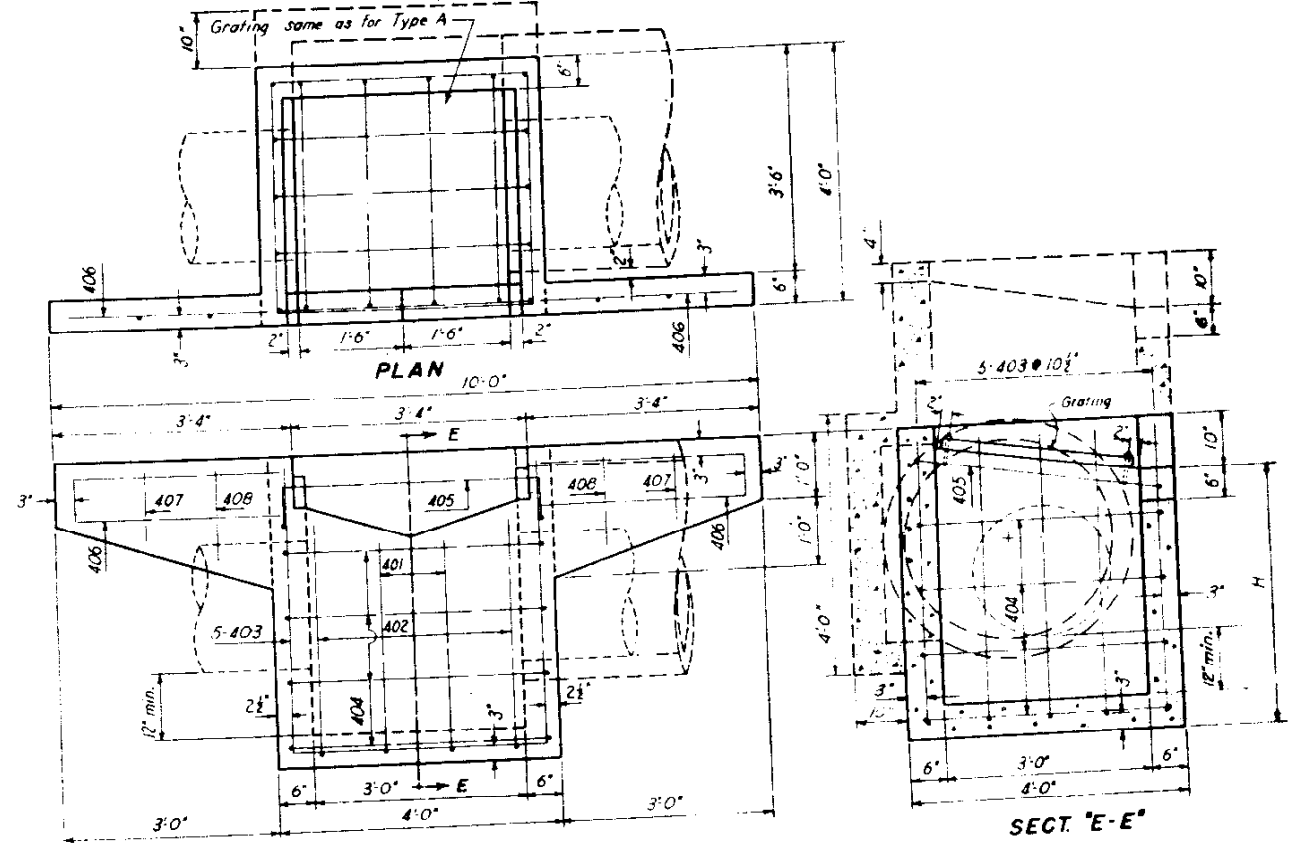
DETAIL OF FASTENER

DETAIL OF GRATING

MATERIAL LIST FOR GRATING AND FASTENERS

Strap Iron Frame	1 pc	2" x 3/8" x 11'-9 3/4"	• 2.55 lb. per ft. = 30.0 lb.
Strap Iron Gratings	18 pcs	2" x 3/8" x 2'-9 1/4"	• 2.55 lb. per ft. = 127.2 lb.
Galv. Iron Pipe Spacers	34 pcs	3/4" x 1 3/8"	• 1.13 lb. per ft. = 5.2 lb.
Tie Rods	2 pcs	5/8" x 3'-1 3/8"	• 1.04 lb. per ft. = 6.5 lb.
Bolts	4 pcs	1/2" x 10"	• 1.03 lb. ea. = 4.1 lb.
Washers	4 pcs		• 0.23 lb. ea. = 0.9 lb.

Note: Acceptable equivalent Gratings may be substituted after approval by the Engineer



FRONT ELEV.

SECT. "E-E"

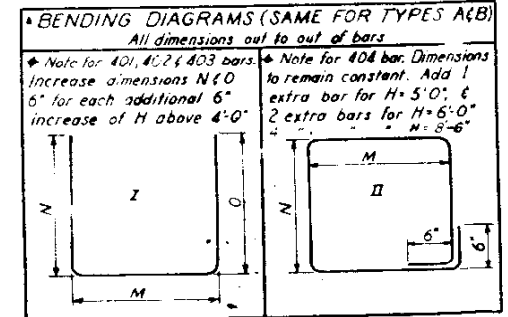
FRONT ELEV.
Longitudinal Pipe: 6" minimum between bottom of inlet and top of Longitudinal Pipe.

BAR LIST FOR H=4'-0"

NO. REQD.	KIND	TYPE A			TYPE B		
		M	N	O	M	N	O
2	I	3'-5"	3'-3"	3'-3"	3'-5"	3'-3"	4'-5"
2	I	3'-5"	3'-6"	3'-6"	3'-5"	3'-6"	4'-5"
5	I	3'-6"	3'-7"	3'-7"	3'-7"	4'-5"	12'-4"
4	II	3'-7"	3'-7"		3'-8"	3'-6"	15'-4"
1	I				3'-8"	3'-7"	10'-9"
2	I				0'-8"	2'-10"	6'-3"
2	Str.						1'-7"
2	Str.						1'-5"

QUANTITIES FOR ONE INLET

H	CLASS A CONCRETE		REINFORCING STEEL	
	CU. YDS.	CU. YDS.	LBS.	LBS.
4'-0"	1.18	1.49	104	133
4'-6"	1.31	1.62	110	139
5'-0"	1.44	1.75	126	155
5'-6"	1.56	1.88	132	161
6'-0"	1.69	2.01	149	178
6'-6"	1.82	2.13	155	184
8'-6"	2.35	2.67	200	230



Note: Cut or bend bars to fit around pipes as required

GENERAL NOTES

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

All concrete shall be Class 'A' and air entrained as specified

All walls shall have forms on both sides. Bevel all exposed corners to a 1" face.

All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with the station number and bar designation.

All reinforcing steel bars shall conform to ASTM specification A305-SOT or latest revision thereof.

All edge distances not marked clear are to the E of the bar

Inlet grating to be painted as per specifications for structural steel.

When using a 36" Concrete Pipe into the inlet an extra strip of concrete shall be added to the sides of the inlet box. The reinforcing steel may be bent around the outside of Pipe or cut and used in additional concrete.

COLORADO
DEPARTMENT OF HIGHWAYS
TYPES A & B
CONCRETE INLETS
FOR MEDIAN DITCH

18", 24", 30" and 36" CULVERTS

Designed by W.W. [Signature]
Made by RC [Signature]
Checked by T.C.R. Date: March 1, 1952

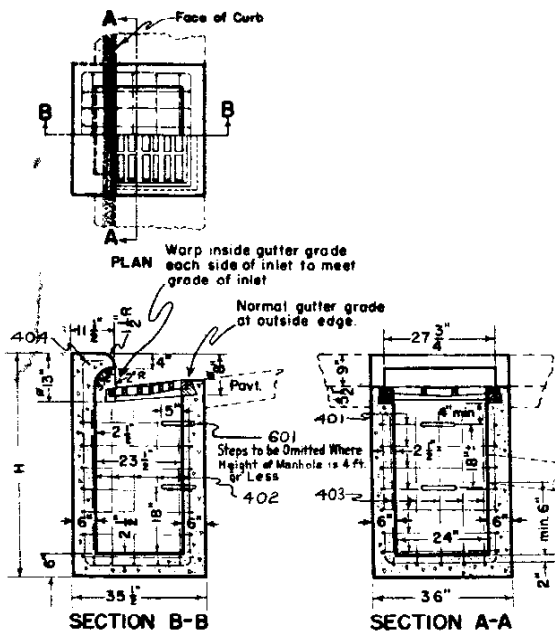
STANDARD M-12-D-13

NO. 12 CONCRETE INLET

FED. ROAD DIV. NO.	DISTRICT	FLOOR PLAN	SHEET NO.
9	COLO.	UNIT #2	30

Rev. 7-7-52 S.M. 1952 Specifications

NO. 12 CONCRETE INLET



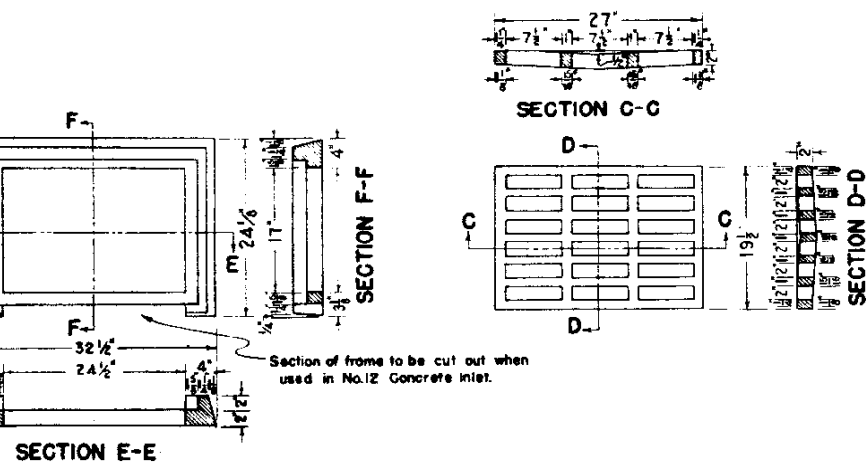
BAR LIST FOR H = 3' 0"

MARK	SIZE	NO REQ.	LENGTH	TYPE	DIMENSIONS		BENDING DIAGRAM
					1	2	
601	3/4"	Note	2' 6"	I	1'-0"	0'-10"	
401	1/2"	3	11'-10"	III	2'-6"	2'-6"	
402	1/2"	5	5'-6"	II	2'-5"	2'-7"	
403	1/2"	5	7'-1"	I	2'-7"	2'-8"	
404	1/2"	2	2'-7"	STR.	-	-	

* Omit 601 when H is 4'-0" or less.
 * These dimensions to be increased in increments of 6" for H above 3'-0".
 Add 1-401 for each 6" additional height above 3'-0".
 601 required as follows:
 H = 4'-6" to 5'-6" - 1 bar;
 H = 6'-0" to 7'-0" - 2 bars;
 H = 7'-6" to 8'-6" - 3 bars;
 Cut or bend bars around pipes as required.
 See Plans for size and locations of outlets.

NO. 12 INLET GRATING & FRAME

Approx. Weight 340 lbs.



H	CLASS "A" CONCRETE CU. YDS.	REINFORCING STEEL lbs.
3' 0"	0.54	70
3' 6"	0.63	85
4' 0"	0.72	100
4' 6"	0.81	119
5' 0"	0.90	137
5' 6"	0.99	152
6' 0"	1.08	166
6' 6"	1.17	185
7' 0"	1.27	200
7' 6"	1.36	215
8' 0"	1.45	233
8' 6"	1.54	248
9' 0"	1.63	263
9' 6"	1.73	282
10' 0"	1.82	297

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

GENERAL NOTES

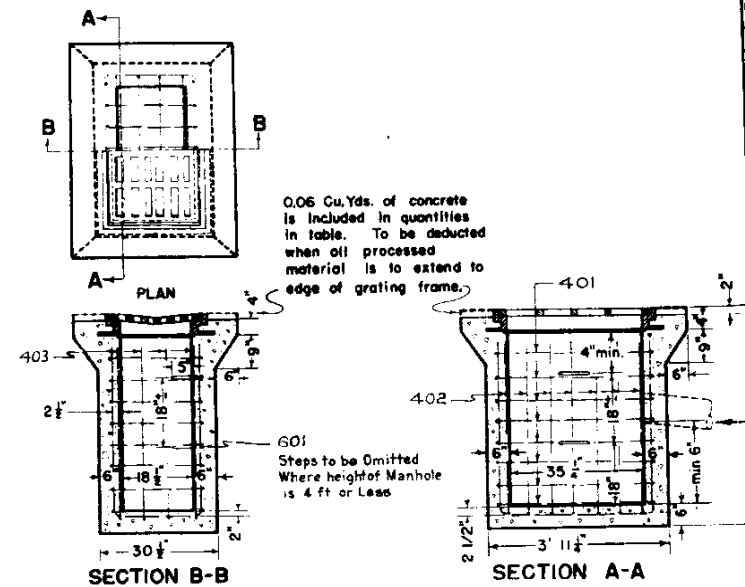
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.
 All reinforced concrete shall be class "A" and AIR ENTRAINED AS SPECIFIED.
 All concrete walls shall be formed on both sides.
 All exposed concrete corners shall be beveled to a 1" face.
 All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with BAR designation and station number.
 All castings shall be painted with two coats of asphalt or coal tar and oil.
 All surfaces exposed to view on the box shall receive class 1 surface finish.
 ALL DIMENSIONS NOT SHOWN AS CLEAR ARE TO $\frac{1}{2}$ " OF BAR.
 ALL REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. SPECIFICATION A-305-50T OR LATEST REVISION THEREOF.

NO. 13 CONCRETE INLET

BAR LIST FOR H = 3' 0"

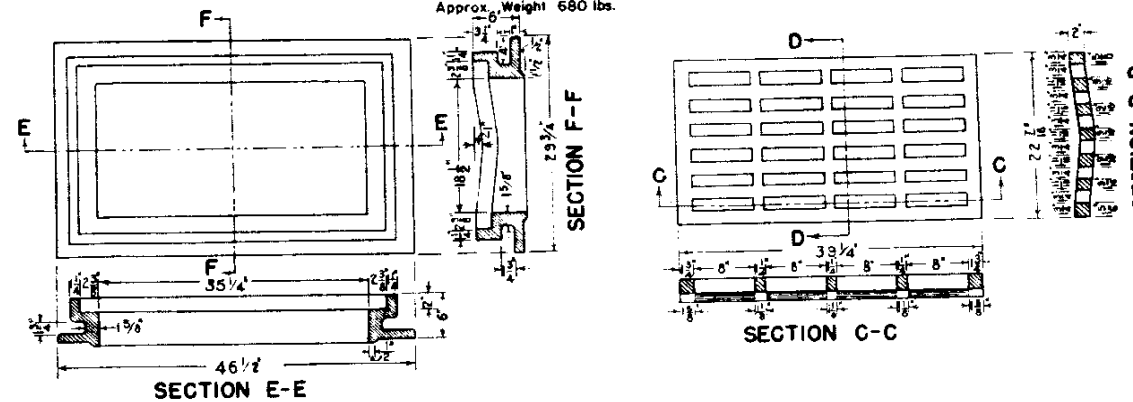
MARK	SIZE	NO REQ.	LENGTH	TYPE	DIMENSIONS		BENDING DIAGRAM
					p	q	
601	3/4"	Note	2' 6"	I	1'-0"	0'-10"	
401	1/2"	4	12'-10"	II	3'-5"	2'-1"	
402	1/2"	7	6'-1"	I	2'-0"	2'-1"	
403	1/2"	4	7'-5"	I	3'-4"	2'-1"	

* Omit 601 when H is 4'-0" or less.
 * These dimensions to be increased in increments of 6" for H above 3'-0".
 Add 1-401 for each 6" additional height above 3'-0".
 601 required as follows:
 H = 4'-6" to 5'-6" - 1 bar;
 H = 6'-0" to 7'-0" - 2 bars;
 H = 7'-6" to 8'-6" - 3 bars;
 Cut or bend bars around pipes as required.



NO. 13 INLET GRATING & FRAME

Approx. Weight 680 lbs.



* VOLUME TO BE DEDUCTED FOR EACH OPENING

	C.M.P.	R.C.P.
18"	0.03	0.05
24"	0.06	0.09
30"	0.09	0.14
36"	0.13	-

QUANTITIES

H	CLASS "A" CONCRETE CU. YDS.	REINFORCING STEEL lbs.
3' 0"	.86	84
3' 6"	.96	100
4' 0"	1.06	116
4' 6"	1.16	136
5' 0"	1.26	156
5' 6"	1.36	172
6' 0"	1.46	192
6' 6"	1.57	208
7' 0"	1.67	225
7' 6"	1.77	245
8' 0"	1.87	261
8' 6"	1.97	277
9' 0"	2.07	297
9' 6"	2.17	313
10' 0"	2.28	329

* Volume for inlet - volume occupied by pipes to be deducted for pay quantity of concrete.

* Includes 1% allowance for overrun.

COLORADO
DEPARTMENT OF HIGHWAYS
STANDARD
NO. 12 AND NO. 13
CONCRETE INLETS

Designed by A.R.G.
 Made by A.R.G.
 Check Design A.Z.
 Check Detail C.R.S. Date Jul. 14, 1952

Approved by P. J. [Signature]
 Bridge Engineer

STANDARD TIMBER GUARD POSTS

STANDARD M-19-D SPECIFICATIONS

FED. ROAD DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	33	

Rev 5-13-53, Specifications, J.G.R.
Rev 12-4-53, Date Nails Deleted, D.L.V.

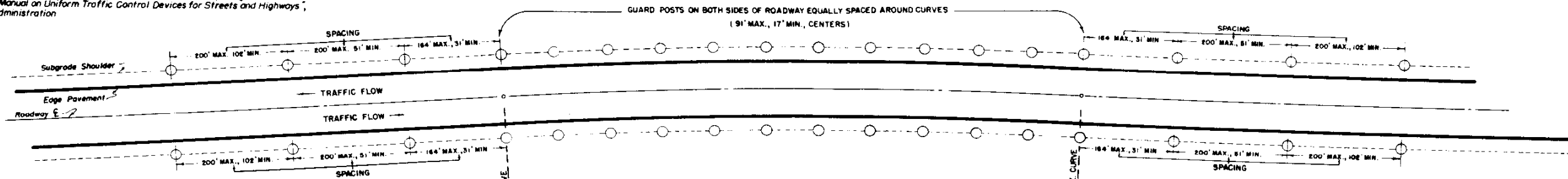
POSTS: Lodgepole Pine, Southern Yellow Pine or West Coast Douglas Fir, not less than six (6) inches in diameter. All posts shall be pressure treated with Pentachlorophenol as provided under paragraph 42.2.20 of the specifications, after being peeled and shaved in accordance with specifications.

REFLECTIVE SHEETING: The Contractor will be required to provide 2"x6" B 2"x10" smooth surfaced silver or white reflective sheeting of utmost brilliance mounted on aluminum or plastic strips. Aluminum strips to be 3s-114 alloy, min. thickness 0.025", complete with aluminum or plated nails of sufficient length. Strips shall be suitable for placement around a curved surface. Reflective sheeting strips shall be of a type approved by the Department.

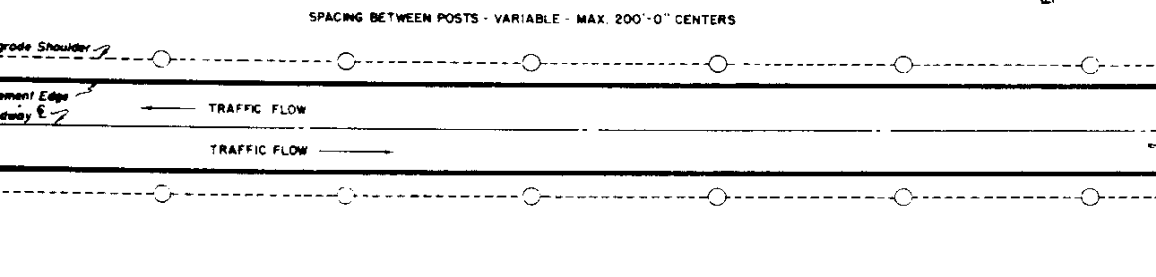
PAINTING (WORK BY CONTRACTOR): Posts shall be painted with aluminum paint and a black band placed around each post as per details on this sheet. Number of coats and type of paint applied shall be in accordance with specifications.

Typical Installation on Curves

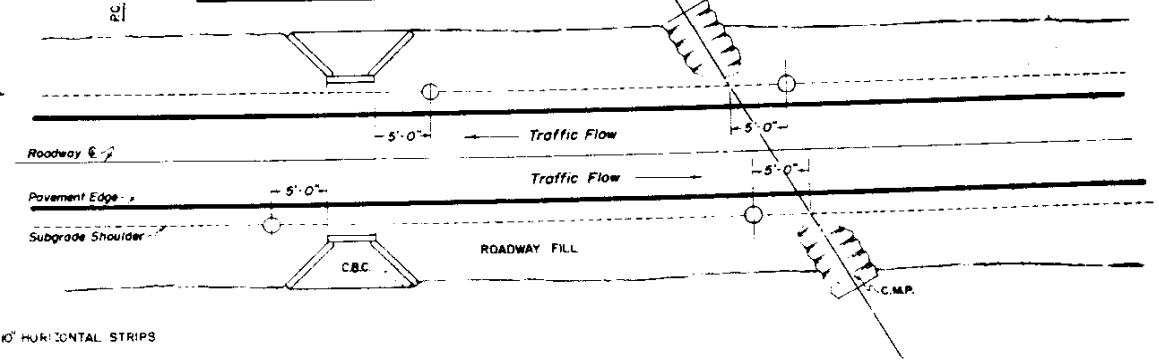
INSTALLATION of guard posts on curves shall be in accordance with details shown below. Spacing shall be in accordance with Section 157, Table 1 of "Manual on Uniform Traffic Control Devices for Streets and Highways", Aug. 1948 by the Public Roads Administration



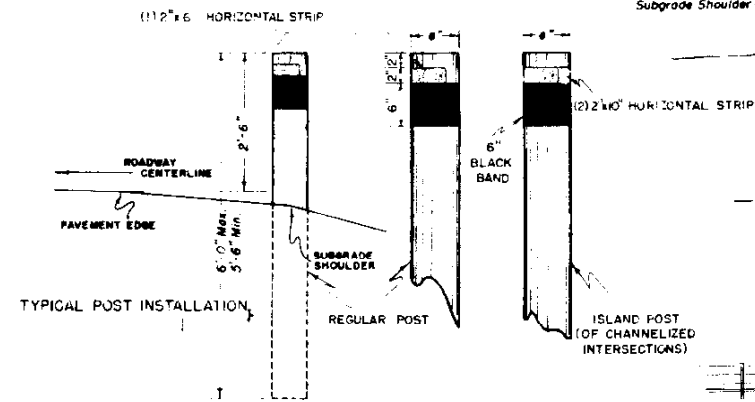
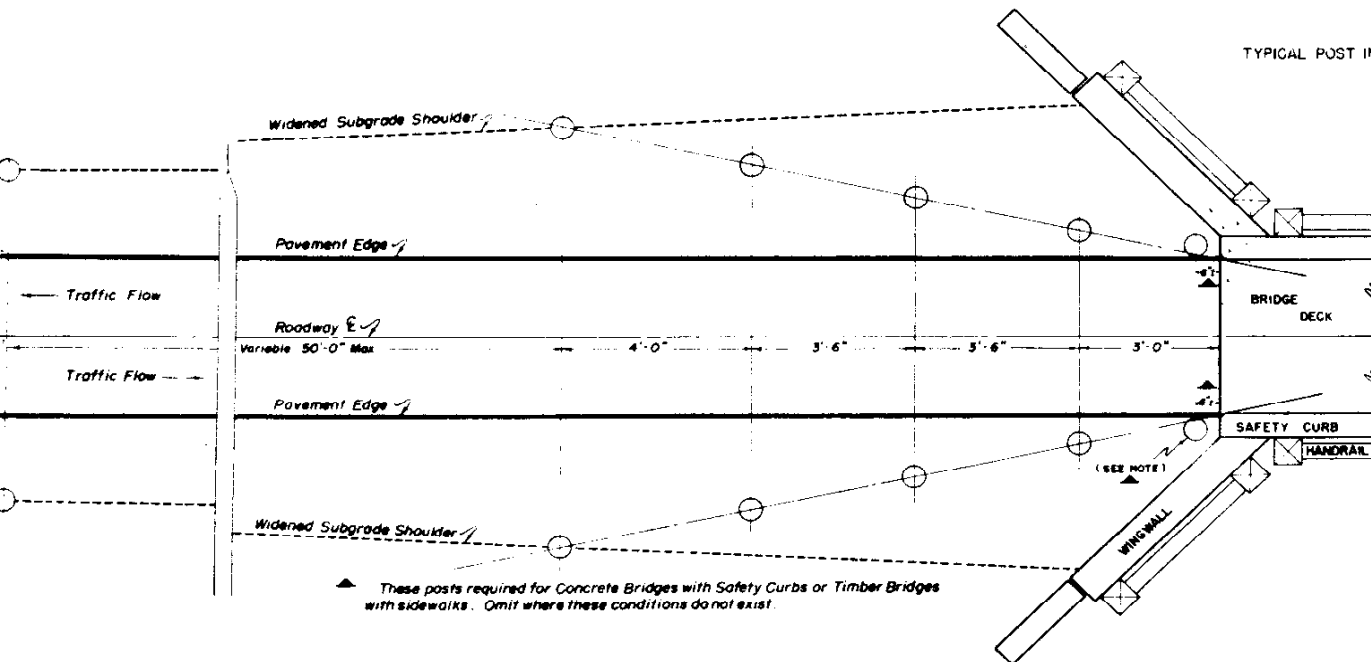
Method of Placement on Tangents



Plan View Showing Placement at Isolated Minor Structures



Typical Installation at Bridge Approaches

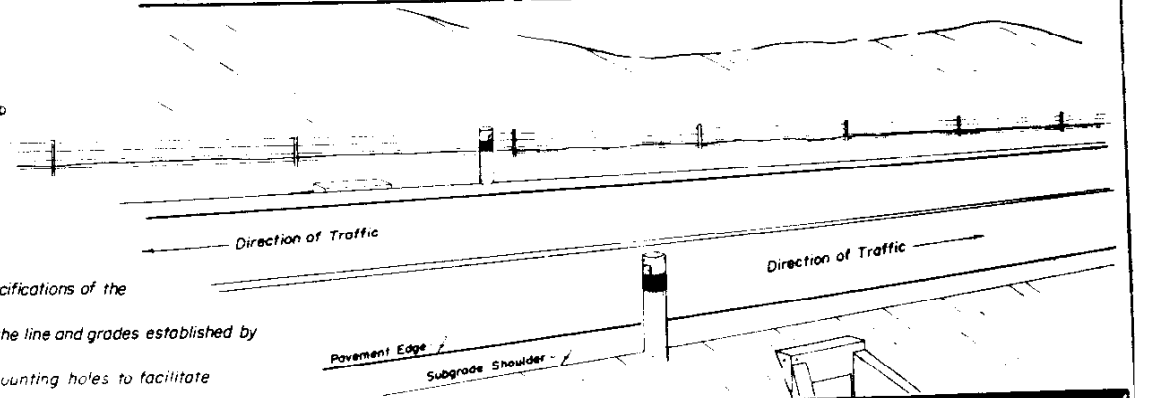


INSTALLATION DETAILS OF REFLECTORIZED STRIPS

GENERAL NOTES

- All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.
- All posts shall be set and tamped in, plumb and firm, to the line and grades established by the Engineer.
- Reflective Sheeting Strips shall be furnished with two (2) mounting holes to facilitate nailing to posts.
- INSTALLATION of Timber Guard Posts on Tangents, Curves and at Bridge Approaches shall be in conformity with details on this sheet and in accordance with the following; Wrap Around Reflective Sheeting Strips shall be installed horizontally one (1) sheet on all posts. Island Posts shall have two (2) Wrap Around Reflective Sheeting Strips placed horizontally to cover entire circumference of Post.
- On Divided Highways and Islands, Reflective Sheeting Strips shall be placed in a manner to obtain maximum visibility for the primary direction of travel. In all instances a test shall be made to assure the maximum effect from Reflective Sheeting Strips.
- All Traffic Islands shall be marked with Island Posts as shown above.
- Reflective Sheeting Strips to be installed by the Contractor after painting of Posts. The number, location and spacing of Timber Guard Posts is shown on plans.

Pictorial View Showing Location at Isolated Minor Structures



COLORADO DEPARTMENT OF HIGHWAYS

STANDARD TIMBER GUARD POSTS

Designed by	Approved by
Made by	Engineer, Survey & Plans
Checked by	Date: March 25, 1953

Standard Wire Fence With Metal Posts

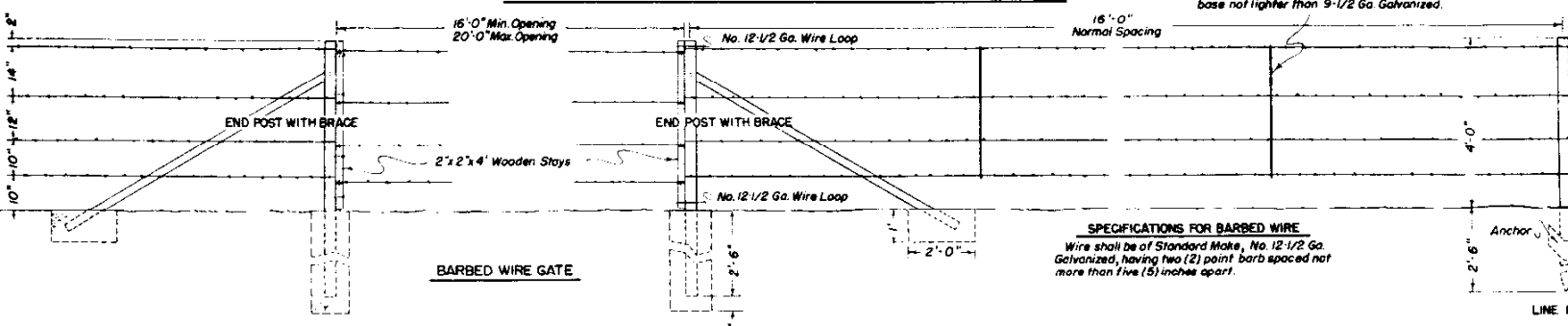
REVISIONS

Rev. 7-3-51, C.G.M., Alternate Gate Note
 Rev. 4-30-53, Deleted Rod Brace from Driveway Gate, J.C.R.
STANDARD M-27-C
 Rev. 6-30-53, Added acceptable equivalent for End, Corner & Gate Posts, J.C.R.
 Rev. 8-14-53, Added Carriage Bolt to Tubular Posts, J.C.R.

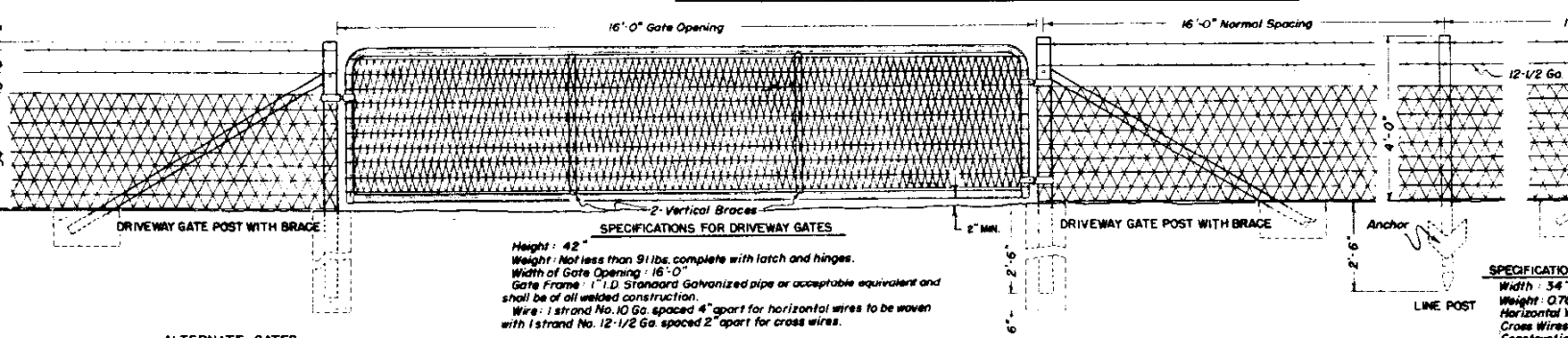
FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1002-2(25)	37	
		UNIT #		

Rev. 5-9-50, C.G.M., Specs. for Driveway Gates & Posts and Walk Gates.
 Rev. 6-7-50, C.G.M., Rev. detail & specs. for Tee & Angle Post Clips.
 Rev. 6-21-50, J.L.G., Ties, Holes for Fastening Fence Wire.

BARBED WIRE FENCE WITH METAL POSTS



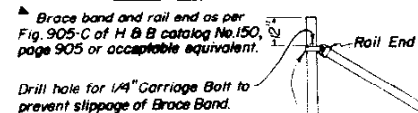
COMBINATION WIRE FENCE WITH METAL POSTS



ALTERNATE GATES

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

Acceptable Equivalent for End, Corner & Gate Posts

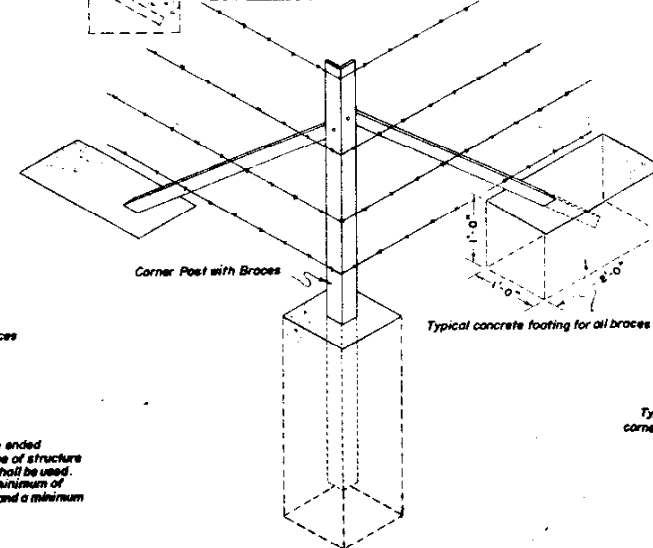


SPECIFICATIONS

END, CORNER & GATE POSTS-
 TYPE - 2-1/2" O.D. Galvanized Tubular Steel.
 WGT. - 3.65 lbs./lin. ft., Min.

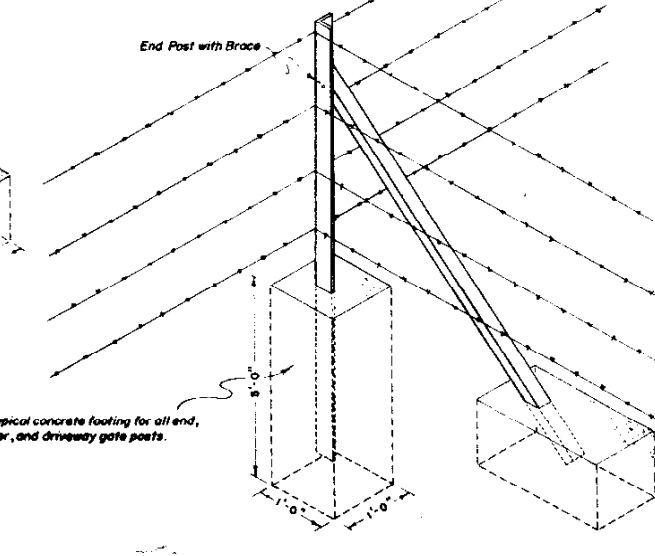
BRACES-
 TYPE - 1-3/8" O.D. Tubular Steel with 2-1/2" Brace Band, Hinge Bolt and 1-3/8" I. D. Rail End - all Galvanized.
 WGT. - 1.68 lbs./lin. ft., Min.
 LENGTH - Refer to various lengths indicated on this sheet for End, Corner and Gate Posts, and Braces. Holes for fastening wire to be drilled as indicated elsewhere on this sheet for End, Corner and Gate Posts.

Typical Corner Post Installation

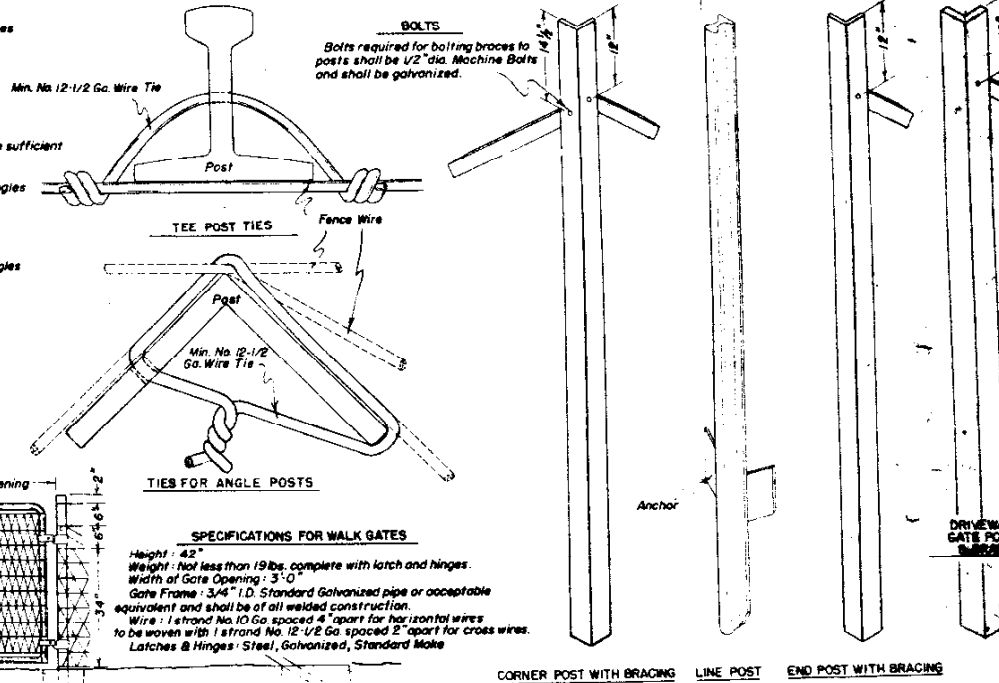


Typical Installation At Fence Intersections

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.



Typical Metal Posts & Fence Clamps



General Notes

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

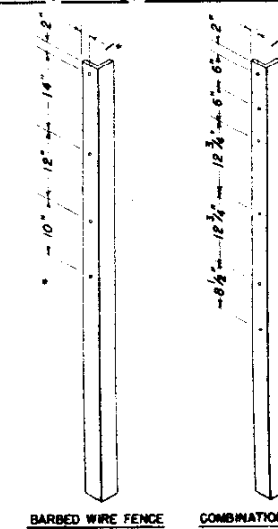
All posts and braces shall be of the types and weights as shown on this sheet or acceptable equivalents. Posts and braces to be of structural steel hot dip galvanized or painted with an approved waterproof asphalt or mineral paint. Holes to be provided in end, corner and gate posts as detailed herein.

Wire mesh used in Combination Wire Fence as shown above shall be galvanized. Wire mesh used in walk & 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. On curves the wire should be placed on side 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.

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



NOTE -
 All holes to be 1/4" Diameter. Fence wire to be securely fastened with No. 12-1/2 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
 DEPARTMENT OF HIGHWAYS

Standard Wire Fence With Metal Posts

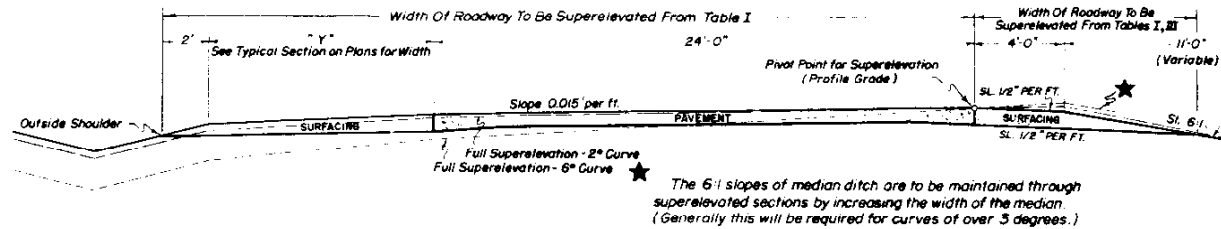
Designed by C.G.M. Approved by *[Signature]*
 Made by C.G.M. Engineer, Surveys & Plans
 Checked by _____ Date: Mar. 1, 1950

Standard Methods for Superelevating Curves on Divided Highways

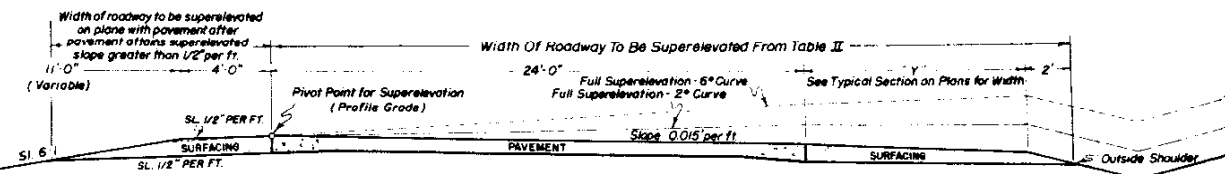
STANDARD M-1-C-1

FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.
9	COLO.	

Roadway On Inside Of Curve



Roadway On Outside Of Curve



The 6:1 slopes of median ditch are to be maintained through super-elevated sections by increasing the width of the median. (Generally this will be required for curves of over 3 degrees.)

Superelevation Tables

TABLE I - FOR ROADWAY ON INSIDE OF CURVE

(Figures in columns are Rates of Super-elevation per Foot of Roadway Width)

Percent Of Transition Distance	Distance From BT In Feet	DEGREE OF CURVE				
		2° & 3°	3° & 4°	4° & 5°	5° & 6°	6° & 8°
2	5	.0000	.0000	.0000	.0000	.0000
4	10	.0000	.0001	.0001	.0001	.0002
6	15	.0000	.0001	.0002	.0003	.0004
8	20	.0001	.0002	.0004	.0005	.0006
10	25	.0001	.0003	.0006	.0008	.0010
12	30	.0002	.0005	.0010	.0014	.0018
14	35	.0002	.0007	.0014	.0020	.0026
16	40	.0003	.0009	.0018	.0025	.0032
18	45	.0004	.0011	.0023	.0031	.0040
20	50	.0005	.0014	.0028	.0038	.0048
22	55	.0006	.0017	.0034	.0045	.0056
24	60	.0007	.0020	.0040	.0053	.0066
26	65	.0008	.0024	.0048	.0063	.0078
28	70	.0010	.0027	.0056	.0073	.0090
30	75	.0011	.0031	.0065	.0084	.0102
32	80	.0013	.0035	.0075	.0096	.0118
34	85	.0014	.0040	.0087	.0110	.0133
36	90	.0016	.0045	.0100	.0126	.0150
38	95	.0018	.0050	.0113	.0141	.0166
40	100	.0020	.0055	.0125	.0155	.0180
42	105	.0022	.0061	.0138	.0170	.0200
44	110	.0024	.0066	.0150	.0182	.0212
46	115	.0026	.0072	.0163	.0195	.0224
48	120	.0028	.0077	.0176	.0208	.0236
50	125	.0030	.0083	.0189	.0221	.0249
52	130	.0032	.0088	.0200	.0234	.0262
54	135	.0034	.0094	.0213	.0247	.0274
56	140	.0036	.0099	.0225	.0260	.0286
58	145	.0038	.0105	.0238	.0273	.0299
60	150	.0040	.0110	.0250	.0286	.0312
62	155	.0042	.0116	.0263	.0299	.0325
64	160	.0044	.0120	.0274	.0312	.0338
66	165	.0046	.0126	.0285	.0325	.0351
68	170	.0047	.0130	.0295	.0338	.0364
70	175	.0049	.0135	.0305	.0351	.0377
72	180	.0050	.0138	.0314	.0364	.0390
74	185	.0052	.0142	.0323	.0377	.0402
76	190	.0053	.0145	.0330	.0390	.0415
78	195	.0054	.0149	.0338	.0402	.0428
80	200	.0055	.0151	.0344	.0415	.0440
82	205	.0056	.0154	.0350	.0428	.0452
84	210	.0057	.0156	.0355	.0440	.0465
86	215	.0058	.0158	.0359	.0452	.0477
88	220	.0058	.0160	.0364	.0465	.0490
90	225	.0059	.0162	.0367	.0477	.0502
92	230	.0059	.0163	.0370	.0490	.0515
94	235	.0060	.0164	.0372	.0502	.0527
96	240	.0060	.0164	.0374	.0515	.0540
98	245	.0060	.0165	.0375	.0527	.0552
Full Super	250	.0060	.0165	.0375	.0540	.0566

TABLE II - FOR ROADWAY ON OUTSIDE OF CURVE

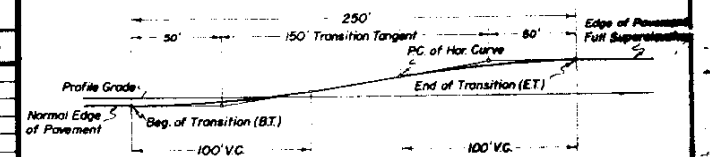
(Figures in columns are Rates of Super-elevation per Foot of Roadway Width)

Percent Of Transition Distance	Distance From BT In Feet	DEGREE OF CURVE				
		2° & 3°	3° & 4°	4° & 5°	5° & 6°	6° & 8°
2	5	.0000	.0000	.0000	.0001	.0001
4	10	.0001	.0002	.0002	.0002	.0003
6	15	.0003	.0004	.0004	.0005	.0006
8	20	.0005	.0006	.0008	.0009	.0010
10	25	.0008	.0010	.0012	.0014	.0016
12	30	.0011	.0014	.0017	.0020	.0023
14	35	.0015	.0019	.0023	.0028	.0032
16	40	.0019	.0025	.0030	.0036	.0042
18	45	.0024	.0031	.0038	.0046	.0053
20	50	.0030	.0039	.0048	.0056	.0065
22	55	.0036	.0047	.0057	.0069	.0079
24	60	.0043	.0056	.0068	.0081	.0094
26	65	.0051	.0066	.0080	.0096	.0110
28	70	.0059	.0076	.0093	.0110	.0127
30	75	.0068	.0088	.0107	.0127	.0146
32	80	.0077	.0099	.0122	.0144	.0166
34	85	.0087	.0113	.0137	.0163	.0188
36	90	.0097	.0126	.0154	.0182	.0211
38	95	.0108	.0140	.0171	.0204	.0235
40	100	.0120	.0155	.0190	.0225	.0260
42	105	.0132	.0171	.0209	.0248	.0286
44	110	.0144	.0186	.0228	.0270	.0312
46	115	.0156	.0202	.0247	.0293	.0338
48	120	.0168	.0217	.0266	.0315	.0364
50	125	.0180	.0233	.0285	.0338	.0390
52	130	.0192	.0248	.0304	.0360	.0416
54	135	.0204	.0264	.0323	.0383	.0442
56	140	.0216	.0279	.0342	.0405	.0468
58	145	.0228	.0295	.0361	.0428	.0494
60	150	.0240	.0310	.0380	.0450	.0520
62	155	.0252	.0326	.0399	.0472	.0545
64	160	.0263	.0339	.0416	.0493	.0569
66	165	.0273	.0353	.0433	.0513	.0592
68	170	.0283	.0366	.0448	.0531	.0614
70	175	.0292	.0378	.0463	.0549	.0634
72	180	.0301	.0389	.0477	.0565	.0653
74	185	.0309	.0400	.0490	.0580	.0670
76	190	.0317	.0409	.0502	.0594	.0686
78	195	.0324	.0419	.0513	.0607	.0701
80	200	.0330	.0426	.0522	.0619	.0715
82	205	.0336	.0434	.0532	.0629	.0727
84	210	.0341	.0440	.0540	.0639	.0738
86	215	.0345	.0446	.0547	.0647	.0748
88	220	.0349	.0451	.0553	.0655	.0757
90	225	.0352	.0455	.0558	.0661	.0764
92	230	.0355	.0459	.0562	.0666	.0770
94	235	.0357	.0461	.0566	.0670	.0774
96	240	.0359	.0463	.0568	.0673	.0777
98	245	.0360	.0465	.0570	.0674	.0779
Full Super	250	.0360	.0465	.0570	.0675	.0780

TABLE III - FOR INSIDE SHOULDER OF ROADWAY INSIDE OF CURVE

Percent Of Transition Distance	Distance Back Of BT	Rate Of Super-elevation Per Foot Of Shoulder Width
100	BT	.05666
80	10	.04533
60	20	.03400
40	30	.02266
20	40	.01133
0	50	.00000

PROFILE VIEW SHOWING TRANSITION TO FULL SUPERELEVATION ON ROADWAY OUTSIDE OF CURVE



Circular Curve with Unlimited Tangent Approach

The Transition shown above illustrates the effect of Super-elevation on the outside edge of the pavement by gradually raising the outside shoulder over a distance of 250 feet. The beginning of this transition takes place at a point 150 feet back of the end of the curve and acquires full Super-elevation at a point 100 feet inside of the curve.

GENERAL NOTES

- All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.
- Special transition problems not covered by this Standard Sheet shall be covered by appropriate notes included with curve data on plans.
- In cases where spiral curves are used, the transition from normal crowned section to full super-elevation shall take place over the full length of spiral curve.
- The use of this Standard Sheet is restricted to Divided Highways having a normal crown slope of 0.015' per foot on pavements and a normal crown slope of 1/2' per foot on the inside shoulders.

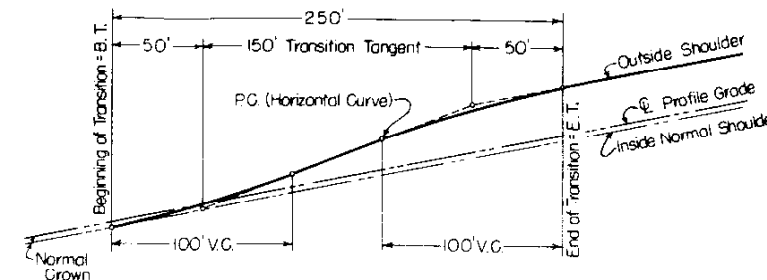
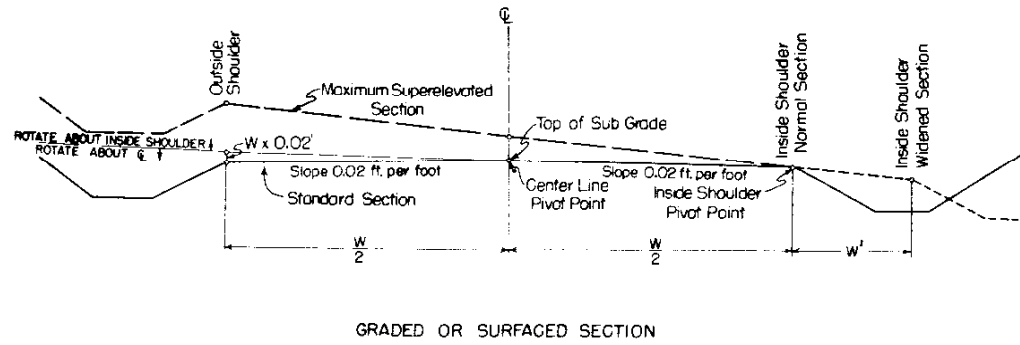
COLORADO STATE HIGHWAY DEPARTMENT

Standard Methods For Super-elevating Curves On Divided Highways

Designed by C.G.M.	Approved by [Signature]
Made by C.G.M.	Engineer, Surveys & Plans
Checked by M.R.H.	Date: Feb 8, 1950

STANDARD M-1-C

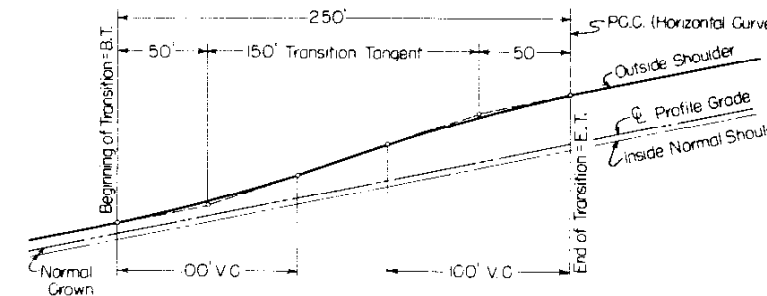
FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	TOTAL SHEETS
9	COLO.	352	



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

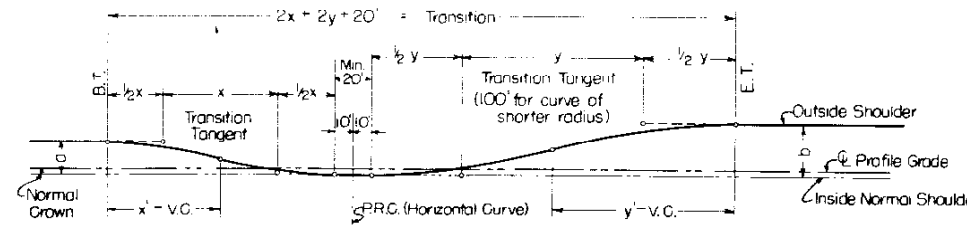
The transition in this case, from crowned section to superelevated section, shall proceed by raising the outside shoulder, over a distance of 250 ft. as shown, beginning at a point on the tangent 150 ft. from the end of the curve and acquiring full superlevation at a point 100 ft. inside the curve.



CASE II: COMPOUND CURVE

NOTE: CASE II

Superelevation transitions at the outside ends of compound curves shall be constructed in accordance with rules given under CASE I. Superelevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie within the limits of the curve of the longer radius. In cases where curves in the same direction have a tangent distance of less than 300 ft. between points of curve, the intervening tangent shall be superelevated an amount equal to that of the curve of greater radius and the transition shall be made as in the case of a true compound curve.



CASE III: REVERSE CURVES

NOTE: CASE III

Transitions between true reverse curves shall be accomplished as shown on the above diagram. Transition tangents shall be directly proportional to the amount of superlevation of the respective curves.

EXAMPLE: Let a represent the amount of superlevation on 1st curve;
 b " " " " " 2nd " "
 x " " " " " transition tangent - 1st " "
 y " " " " " " " 2nd " "

then, a:b = x:y.

The transition tangent of the curve having the shorter radius shall be set at 100 ft. A normal crowned section 20 ft. long, 10 ft. on each side of the P.C. shall be used. In cases where curves in opposite directions are in such proximity that a standard transition can not be had, the practice outlined for true reversing curves shall be used. The total distance between the P.T. of the first curve and the P.C. of the succeeding curve shall be prorated into the transition distance of the respective curves until a maximum of 150 ft. of transition tangent for each curve is achieved.

GENERAL NOTES

Curves on projects using the Section shown are to be superelevated and widened as indicated in the accompanying drawings and tables.

The normal inside edge of the Graded or Surfaced Section is to remain at the standard elevation of 0.02 ft. per foot width of roadway below the profile grade, or as shown on the Typical Section for the Project. The centerline pivot point is to be used until the superlevation equals 0.02 ft. per foot width of roadway. When this elevation is exceeded the normal inside shoulder pivot point is to be used.

When the degree of curvature exceeds 10°, the inside edge of the Asphaltic Mat or the inside shoulder of the Graded or Surfaced Section is to be widened from the normal inside edge or shoulder, respectively, as shown by the table and plan or by cross-sections. Curves of 10° or less are not to be widened.

The slope of the shoulders and widened sections shall conform to the rate per foot width of roadway required, except that the inside shoulder shall maintain the Typical Section slope until this slope is exceeded by the required superlevation slope.

The outside ditch on superelevated sections is to be modified, where necessary to provide proper drainage. Otherwise, this ditch shall conform to normal ditch section shown for Project. The rate of superlevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

The full superlevation per foot width of roadway rate for a given degree of curvature is 0.0105 ft x Degree of Curvature.

The maximum superlevation of 0.10 ft. per foot width, applying to curves of 10° and over, is not to be exceeded.

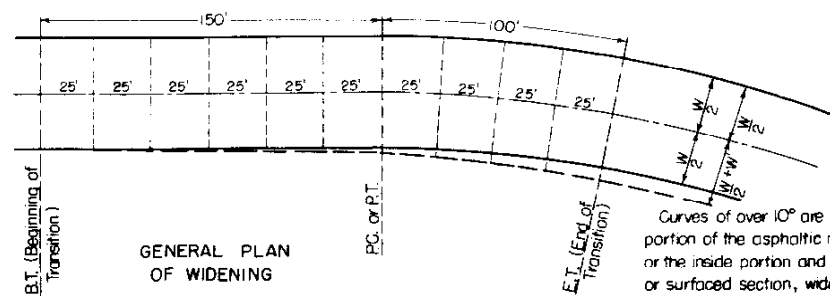
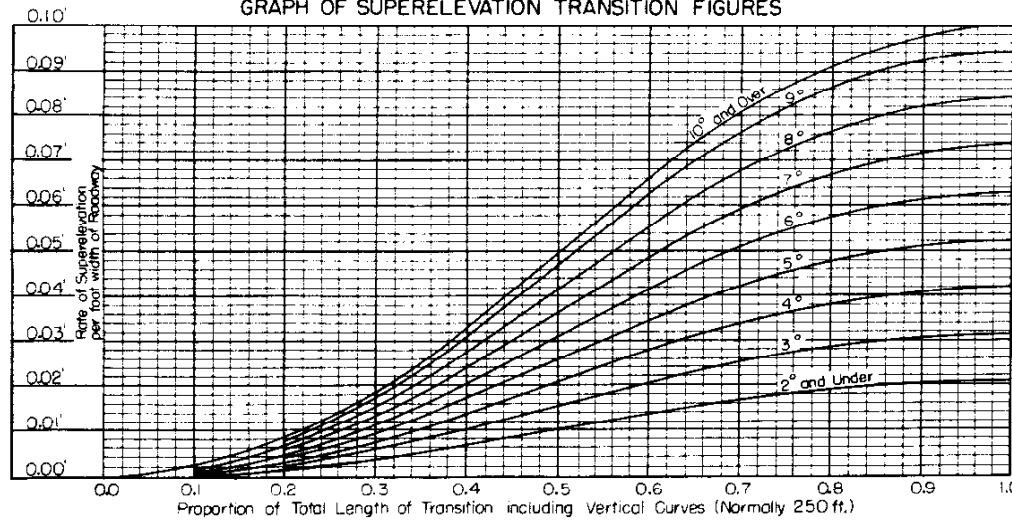
Where spiral curves are used, the transition from normal crowned section to full superlevation and widening shall take place over the full length of spiral curve.

Special transition problems not covered by this standard sheet shall be covered by appropriate notes included with curve data on plans.

SUPERELEVATION AND WIDENING TABLES

DISTANCE FROM B.T. (PROPORTION)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Max. 1.0
Degree of Curvature	RATE OF SUPERELEVATION (IN FEET) PER FOOT WIDTH OF ROADWAY									
2° and Under	0.00044	0.00175	0.00394	0.00700	0.01050	0.01400	0.01706	0.01925	0.02056	0.02100
3°	0.00066	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
4°	0.00088	0.00350	0.00788	0.01400	0.02100	0.02800	0.03413	0.03850	0.04113	0.04200
5°	0.00109	0.00438	0.00984	0.01750	0.02625	0.03500	0.04266	0.04813	0.05141	0.05250
6°	0.00131	0.00525	0.01181	0.02100	0.03150	0.04200	0.05119	0.05775	0.06169	0.06300
7°	0.00153	0.00613	0.01378	0.02450	0.03675	0.04900	0.05972	0.06738	0.07197	0.07350
8°	0.00175	0.00700	0.01575	0.02800	0.04200	0.05600	0.06825	0.07700	0.08225	0.08400
9°	0.00197	0.00788	0.01772	0.03150	0.04725	0.06300	0.07678	0.08663	0.09253	0.09450
10° and Over	0.00208	0.00833	0.01875	0.03333	0.05000	0.06667	0.08125	0.09166	0.09792	0.10000
	OFFSETS FOR WIDENING - W' (IN FEET)									
Over 10° - Under 12°	0.03	0.12	0.27	0.48	0.75	1.08	1.47	1.92	2.43	3.00
12° - 15°	0.04	0.16	0.36	0.64	1.00	1.44	1.96	2.56	3.24	4.00
15° - 20°	0.05	0.20	0.45	0.80	1.25	1.80	2.45	3.20	4.05	5.00
20° and Over	0.06	0.24	0.54	0.96	1.50	2.16	2.94	3.84	4.86	6.00

GRAPH OF SUPERELEVATION TRANSITION FIGURES



Curves of over 10° are to have the inside portion of the asphaltic mat and shoulder, or the inside portion and shoulder in a graded or surfaced section, widened in accordance with the plan, offsets for widening, and cross sections.

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

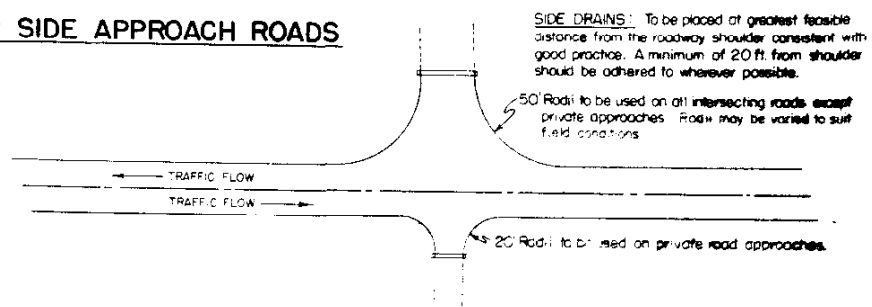
Designed by REL
 Made by S.J.M.
 Checked by C.R.S.

Approved by A. Zubian
 Date: November 1, 1953

STANDARD M-2-EM

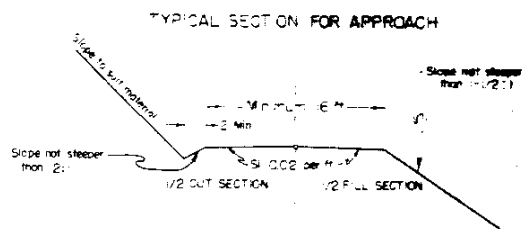
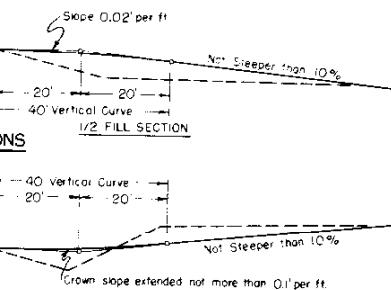
FED. ROAD DIV. NO. 9 DISTRICT COLO. UNIT # 25 SHEET NO. 30
 Rev. 12-9-53, Details of Road Approaches, J.C.R.

L PLANS FOR SIDE APPROACH ROADS



SIDE DRAINS: To be placed at greatest feasible distance from the roadway shoulder consistent with good practice. A minimum of 20 ft. from shoulder should be adhered to wherever possible.

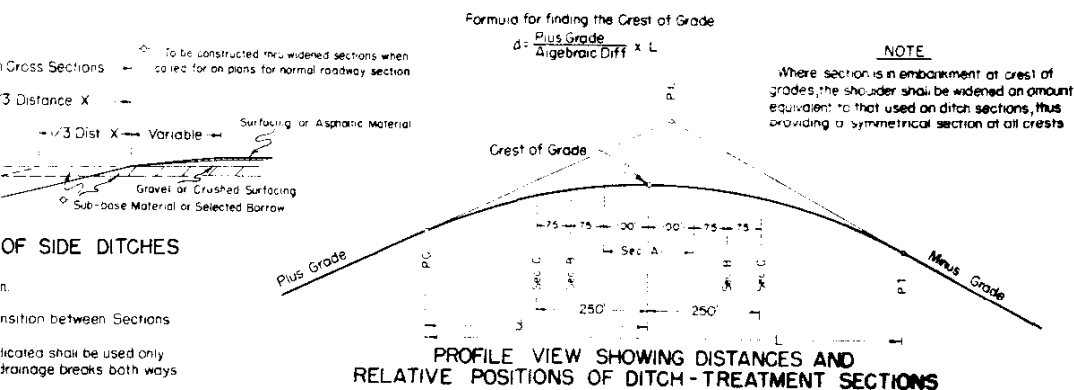
TION



NOTE:
 ROAD APPROACHES: To conform to the above details unless otherwise indicated on plans by Special Details. The width of the crowned section shall be not less than the width of the crowned section of the existing approach road and in no case shall the new construction be less than sixteen (16) feet in width.

TAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

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



OF SIDE DITCHES

osition between Sections
 icated shall be used only
 drainage breaks both ways

GENERAL NOTES

If work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.
 If side approach roads to the Project shall be Gravel Surfaced with a four (4) inch thickness gravel or Crushed Rock Surfacing extending approximately to the Right of Way Line. Estimate 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 to 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 DEPARTMENT OF HIGHWAYS
STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, AND WIDENING AT BRIDGES AND AT CREST OF GRADES
 Designed by J.C.R. Approved by A. Julian
 Made by S.J.M. & A.B. Checked by C.R.S. Date: November 1, 1953

STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-A

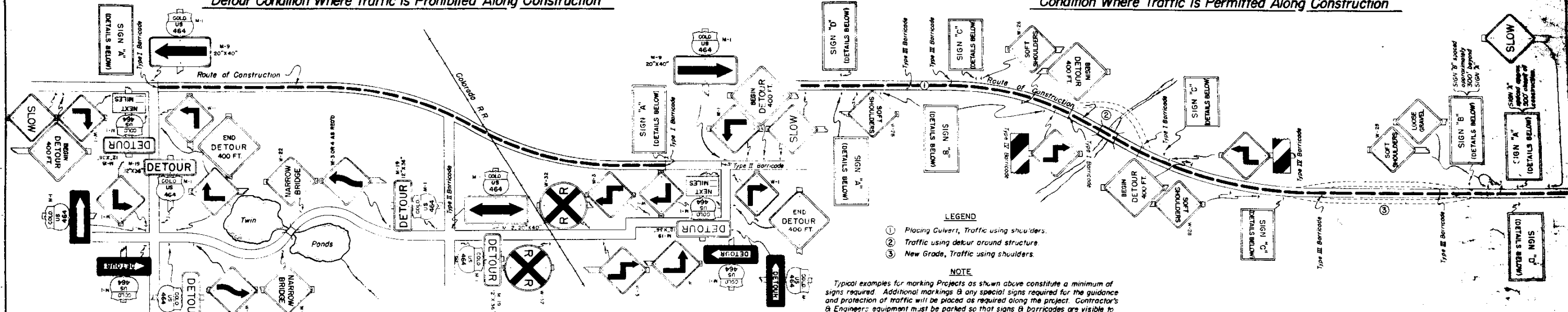
FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	UNITH-31	31	

Rev. 11-28-52, J.C.R.

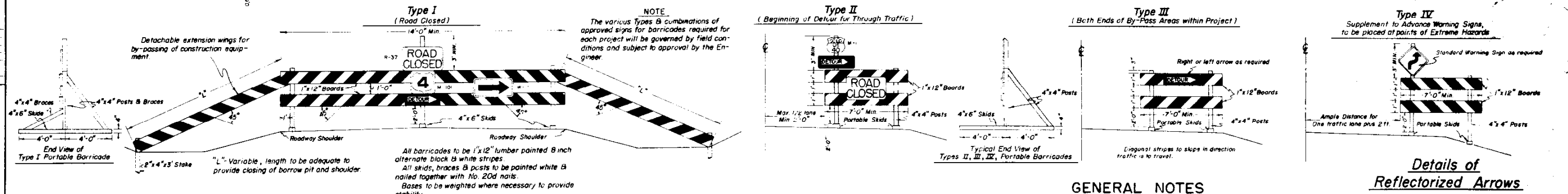
Typical Methods of Marking Highways & Detours

Detour Condition Where Traffic is Prohibited Along Construction

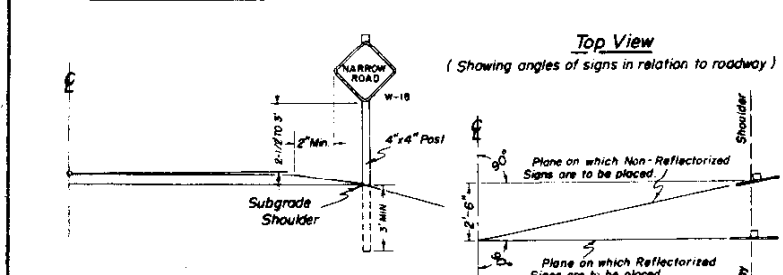
Condition Where Traffic is Permitted Along Construction



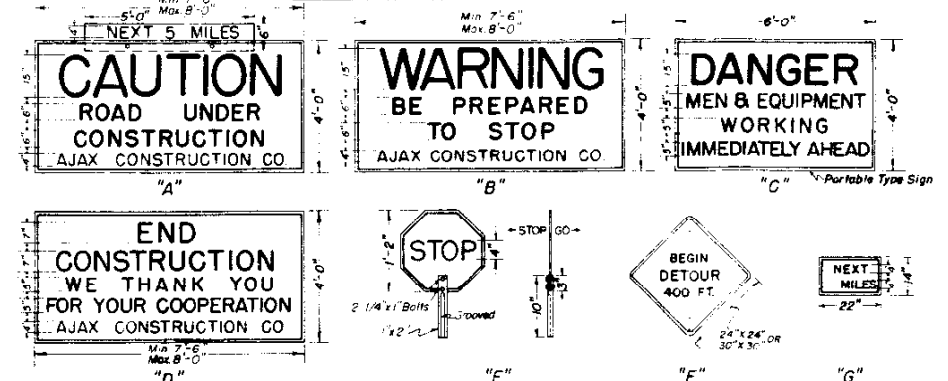
Details of Barricades



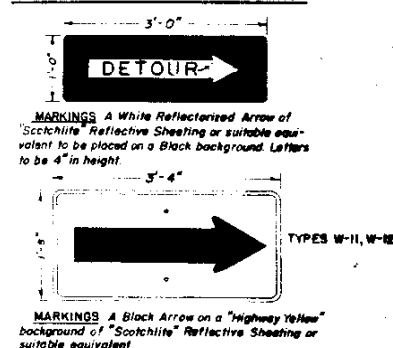
Position of Signs Relative to Roadbed & Hazards



Details of Construction Signs



Details of ReflectORIZED Arrows



COLORADO DEPARTMENT OF HIGHWAYS

Standard Roadway Construction Traffic Signs

Designed by J.C.R. Approved by *C. J. Johnson*
 Made by J.C.R. Engineer, Surveys & Plans
 Checked by Date: October 10, 1952

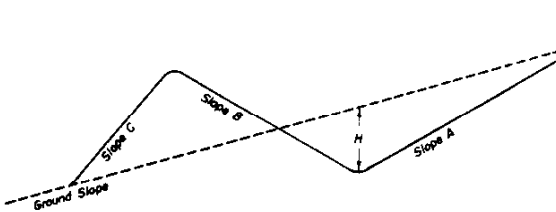
STANDARD TYPES OF DITCHES and CONSTRUCTION METHODS

REVISIONS
STANDARD M-107-C

FED. ROAD DISTRICT NO.	DISTRICT	NO.
3	COLO.	UNIT # 38

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 contrasted 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

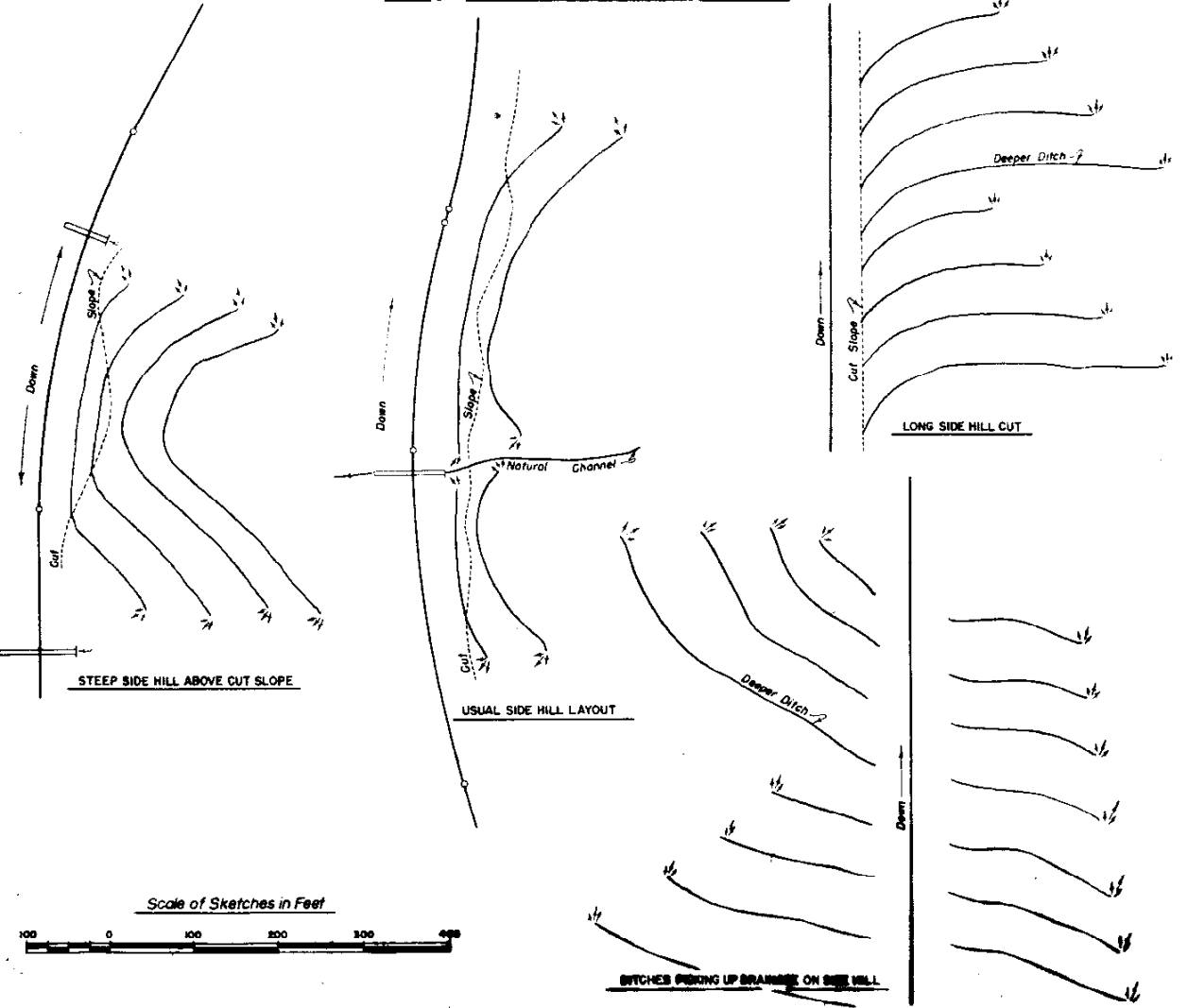
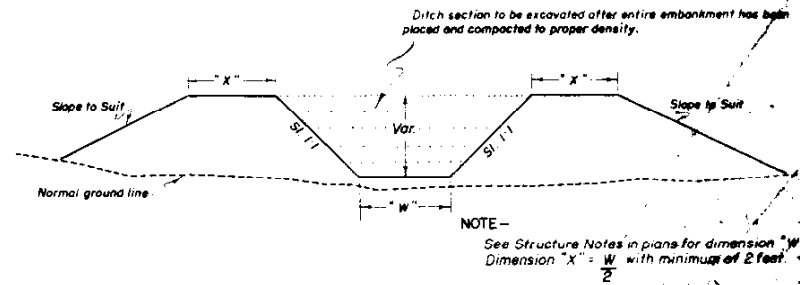


Table of Slopes and Yardages

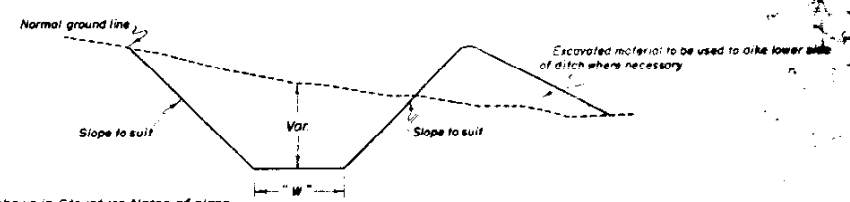
Ground Or Flatter	SLOPES			H	Cubic Yards per 100 lin. ft. of Ditch		
	A	B	C				
5:1	2:1	4:1	2:1	15"	16		
				18"	23		
		21"	32				
		3:1	2:1	15"	15		
				18"	22		
		21"	30				
	1-1/2:1	2:1	2:1	15"	14		
				18"	20		
		21"	27				
		1-1/2:1	4:1	1-1/2:1	15"	13	
					18"	19	
		21"	25				
4:1	2:1	4:1	2:1	15"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



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



For Cut Sections

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.
All ditches are to be constructed to lines and grades as staked by the Engineer using the ditch section shown on plans or as ordered by the Engineer.
CONTOUR INTERCEPTING DITCHES: Ditches are to be laid out along the ground contour on a grade of not over 1%. (Type of soil shall govern the grade).
Ends of ditches are to be lined up so that concentration of flow from a higher contour ditch into one of lower contour is, as far as possible avoided. The use of a deeper ditch is recommended where this condition is encountered.
The following horizontal spacing of ditches is recommended:
4% to 6% Approximately 70' Centers
8% to 10% Approximately 60' Centers
20% to 4:1 Slope Approximately 55' Centers
30% to 1-1/2:1 Slope Approximately 50' Centers
Where ditch checks are required the intervening ditch between one set of ditch checks shall not exceed a grade of 1.0%. Details of checks will be shown on plans when required.

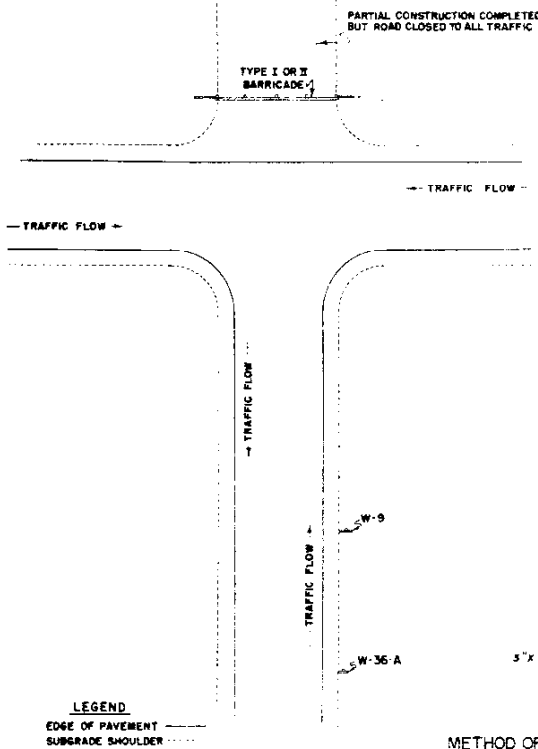
COLORADO STATE HIGHWAY DEPARTMENT
Standard Types of Ditches and Construction Methods
Designed by CGM Approved by [Signature]
Made by CGM Engineer, Survey & Plans
Checked by [Signature] Date: Aug. 19, 1939

STANDARD TIMBER BARRICADES

STANDARD M-30-A

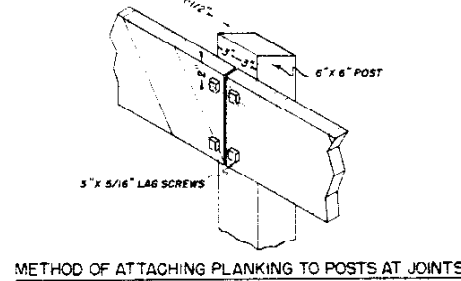
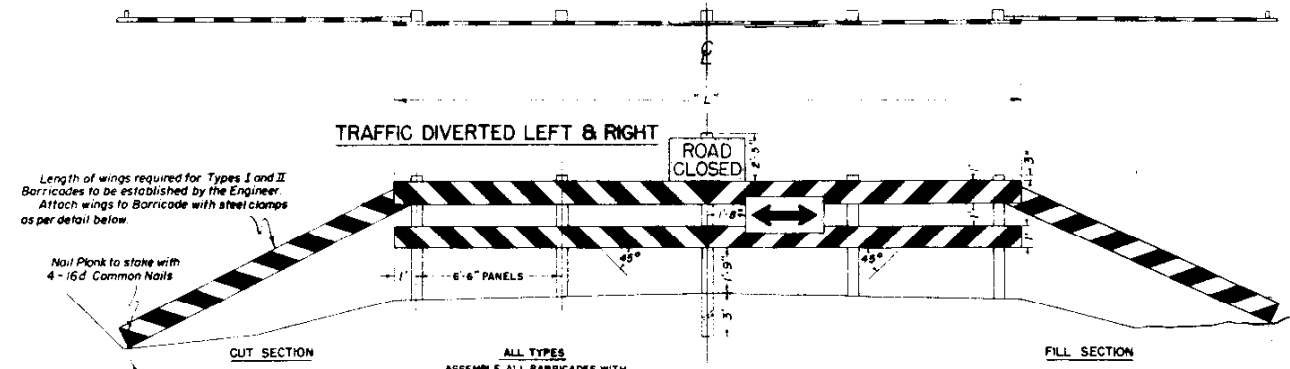
FED. ROAD DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	14782	37	

SITUATION "A"



TYPES I AND II

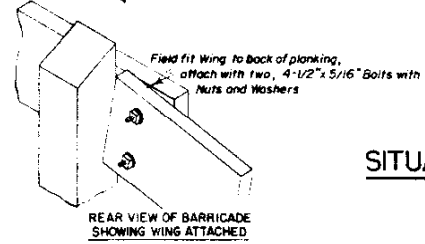
FOR USE WITH SITUATIONS "A" & "B"



TRAFFIC DIVERTED TO LEFT

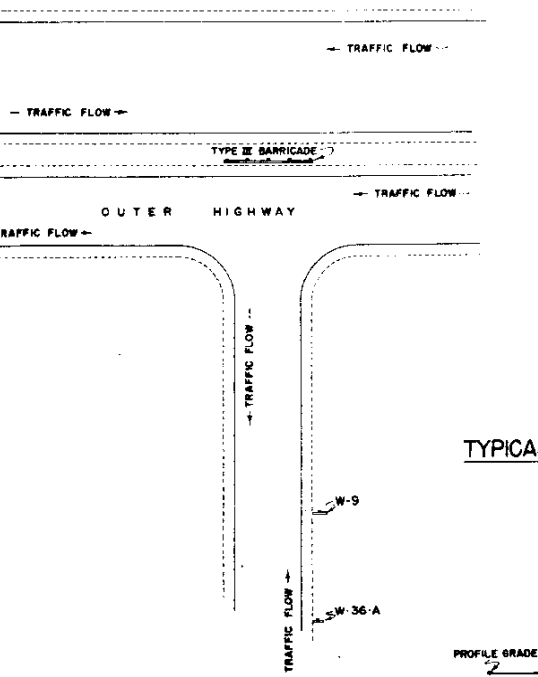


TRAFFIC DIVERTED TO RIGHT



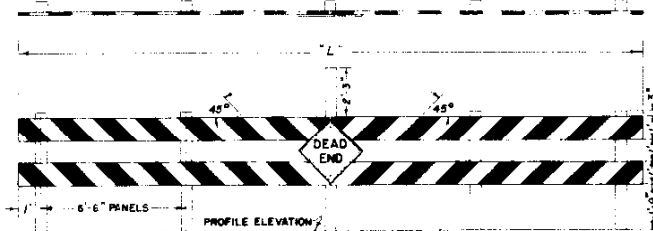
DETAIL OF WING ATTACHED

SITUATION "C"

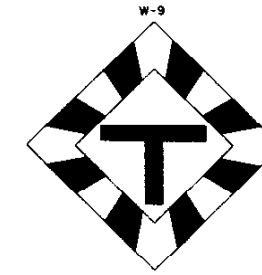
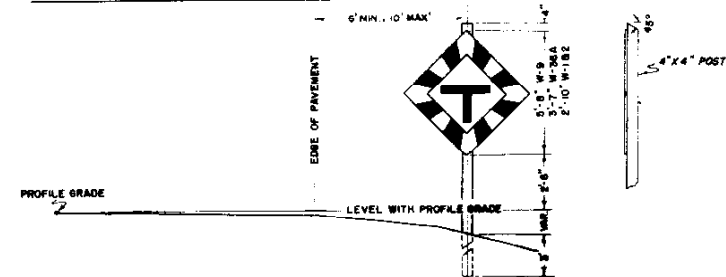


TYPE III

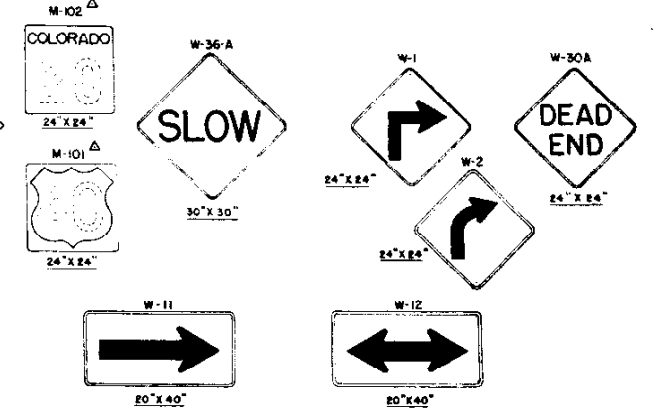
FOR USE WITH SITUATION "C"



TYPICAL SIGN INSTALLATION



SIGN DETAILS



SPECIFICATIONS

PAINT - All paint and methods of painting shall be in conformity with the Standard Specifications for painting of timber structures.

STRIPING - Alternate black and white stripes as shown on this sheet shall be accomplished by the following methods:
 1. Stripes for barricades diverting traffic in one direction shall start on the right hand side of the lower plank and progress to the left.
 2. Stripes on barricades diverting traffic in both directions shall begin at the center of the lower plank and progress in both directions. Stripes shall extend over edges of planking, backs of barricades and posts to be painted white.

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

Planking 2" x 12" S4S
 Posts (Barricades) 6" x 6" S4S
 Posts (Signs) 4" x 4" S4S

SIGNS - All signs shall be constructed and marked in conformity with the Specifications of the following publications:
 a. Field Manual on Traffic Control Devices for Colorado Streets and Highways C.S.H.D. 1951
 b. Manual on Uniform Traffic Control Devices for Streets and Highways P.R.A. Aug. 1948

The Contractor shall be required to furnish and install to line and grades as staked by the Engineer, Barricades of the Types shown on plans complete with R-37, W-30-A and W-11 or W-12 signs as required. All advance warning signs and U.S. or State Route Markers required on Barricades shall be furnished and installed by State Forces.

All Warning and Directional Signs (Series "R" and "W" shown above) shall be reflectorized with "Scotchlite" reflective sheeting or acceptable equivalent.

The black stripes on Planking and Wings on all Barricades shall be reflectorized with "Scotchlite" reflective sheeting or acceptable equivalent.

GENERAL NOTES

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

Timber barricades shown hereon are designed for uses that are semi-permanent or permanent in nature. Barricades as shown with necessary signs as noted above, will be furnished and installed by the Contractor complete with necessary wings, hardware & stakes as required. Posts shall be set and tamped in, plumb and true.

Situations arising which require signs to be furnished by State Forces other than shown above, will be determined by the Traffic Division of the Department. All State installed signs shall be included for cost in the Signing and Striping Plan for the Project.

BILL OF MATERIALS

TYPE	RANGE ROADWAY WIDTHS	"L"	NO. PANELS	DESCRIPTION OF MATERIAL	NO. REQ'D	BOARD FEET
I	26'-34'	28'	4	Miscellaneous Untreated Timber		
				6" x 6" x 8'-0"	4	96.00
				6" x 6" x 10'-0"	1	30.00
				2" x 12" x 14'-0"	4	112.00
				2" x 12" (Wings) (Includes 2 - 2" x 4" x 3'-0" Stakes)	2	
				Signs		
				W-11 or W-12	1	
				R-37	1	
II	35'-44'	41'	6	Miscellaneous Untreated Timber		
				6" x 6" x 8'-0"	6	144.00
				6" x 6" x 10'-0"	1	30.00
				2" x 12" x 7'-6"	4	60.00
				2" x 12" x 13'-0"	4	104.00
				2" x 12" (Wings) (Includes 2 - 2" x 4" x 3'-0" Stakes)	2	
				Signs		
				W-11 or W-12	1	
R-37	1					
III		28'	4	Miscellaneous Untreated Timber		
				6" x 6" x 8'-0"	4	96.00
				6" x 6" x 10'-0"	1	30.00
				2" x 12" x 14'-0"	4	112.00
				Signs		
				W-30-A	1	
				Misc.		
				3" x 5/16" Log Screws	24	
2" x 1/4" Log Screws	2					

COLORADO STATE HIGHWAY DEPARTMENT

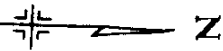
STANDARD TIMBER BARRICADES

Designed by *[Signature]* Approved by *[Signature]*
 Made by *[Signature]* Engineer, Surveys and Plans
 Checked by *[Signature]* Date: 19

S.W. 1/4, SEC. 6

N.E. 1/4, SEC. 6

BREED



FED. ROAD NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F.I.002-2 (25)	40	
UNIT 2				

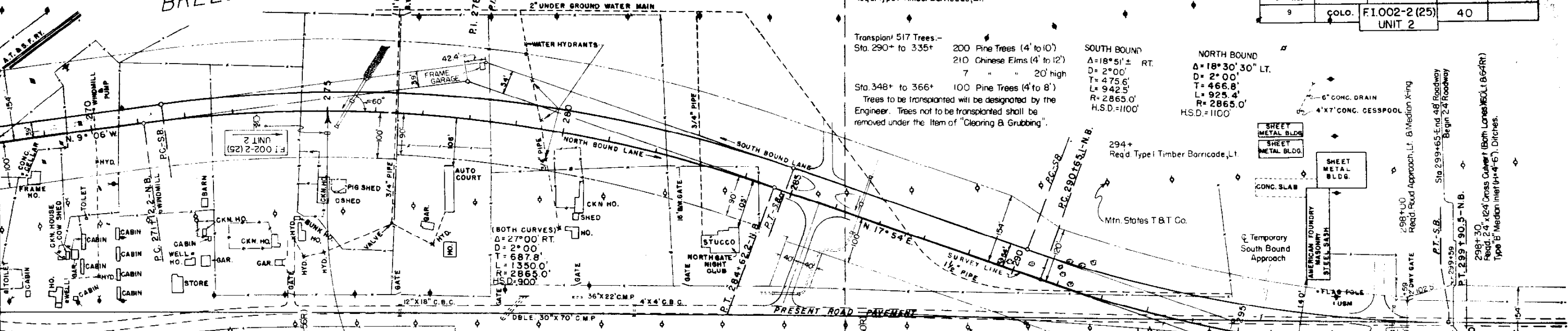
291+
Reqd. Type I Timber Barricade, Lt.

Transplant 517 Trees -
Sta. 290+ to 335+
200 Pine Trees (4' to 10')
210 Chinese Elms (4' to 12')
7 " " 20' high

Sta. 348+ to 366+
100 Pine Trees (4' to 8')
Trees to be transplanted will be designated by the Engineer. Trees not to be transplanted shall be removed under the item of "Clearing & Grubbing".

SOUTH BOUND
Δ=18°51' ± RT.
D=2°00'
T=475.6'
L=942.5'
R=2865.0'
H.S.D.=1100'

NORTH BOUND
Δ=18°30' 30" LT.
D=2°00'
T=466.8'
L=923.4'
R=2865.0'
H.S.D.=1100'



275+ to 285+
Reqd. Metal Sheet Piling in
Roadway Ditches, Lt. & Rt.
Details on Sheet 8.

STA. 275+00
BEGIN F.I. 002-2 (25) Unit 2
END I 002-2 (27) (Future Construction)
Opposite Sta 276+21 of F.A.P. 116 G

275+00
Reqd. Project Marker Rt.
275+50
Reqd. 24" x 108 Gr. Cur. (M2L-56R)
(Both Lanes) No. 13 Median
Inlet (H=5'-0") (M12-D-13)
Ditches. Paving at Inlet.

S.E. 1/4, SEC. 5
T. 13 S., R. 66 W.

276+40, 279+50
B. 283+00
Remove 3/4" x 40" Water Line.
Lay 3/4" x 150 Galv. Inlet Pipe
Encased in 18" 106 CMP. at
Each Place.

285+62
Reqd. 24" x 40" Side Dr.
200' R. B. Approach to
Present Road. Road
Approach, Lt.
Median X-ing

286+50
Reqd. 24" x 116 Gr. Cur. (M2L-56R)
(Both Lanes) B. Type "A"
Median Inlet (H=6'-0")
Inlet Lt. B. Drain Ditch, Rt.

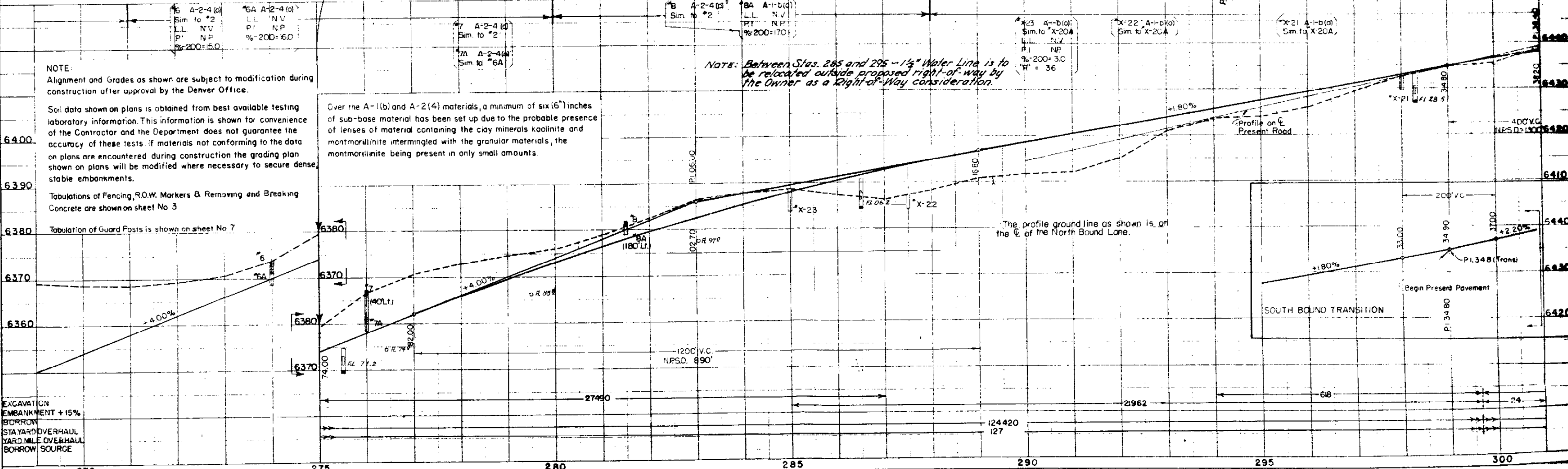
289+40
Reqd. Type III Timber
Barricade on Present
Road Rt. (M-30-A)
(Future Construction) Gate

290+ to 335+ B
348+ to 366+ B
Transplant 517 Trees.

296+
Reqd. Temporary approach. Details on Sheet 8a.

American T & B Co.
Temporary North Bound Approach
Temporary South Bound Approach
Mtn. States T & B Co.
SHEET METAL BLDG.
SHEET METAL BLDG.
CONC. SLAB
AMERICAN FOUNDRY STEEL BASH
FLG. POLE
6" CONC. DRAIN
4' x 7' CONC. CESSPOOL
298+00
Reqd. Road Approach, Lt. & Median X-ing
299+59
Reqd. 24" x 108 Gr. Cur. (M2L-56R)
Begin 24" Roadway
P.T. 299+59
Sta. 299+65-End 48' Roadway
Begin 24" Roadway
P.T. 299+65
298+30
Reqd. 24" x 124 Cross Culvert (Both Lanes) (M2L-56R)
Type B Median Inlet (H=4'-6"). Ditches.

CITY OF COLORADO SPRINGS
N.W. 1/4, SEC. 5
50' END CONC. DOOR STEE ENTRANCE TO AMERICAN FOUNDRY CO.
ELEV. 6430.70



NOTE:
Alignment and Grades as shown are subject to modification during construction after approval by the Denver Office.

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

Tabulations of Fencing, R.O.W. Markers & Removing and Breaking Concrete are shown on sheet No. 3

Tabulation of Guard Posts is shown on sheet No. 7

EXCAVATION
EMBANKMENT + 15%
BORROW
STAYARD OVERHAUL
YARD MILE OVERHAUL
BORROW SOURCE

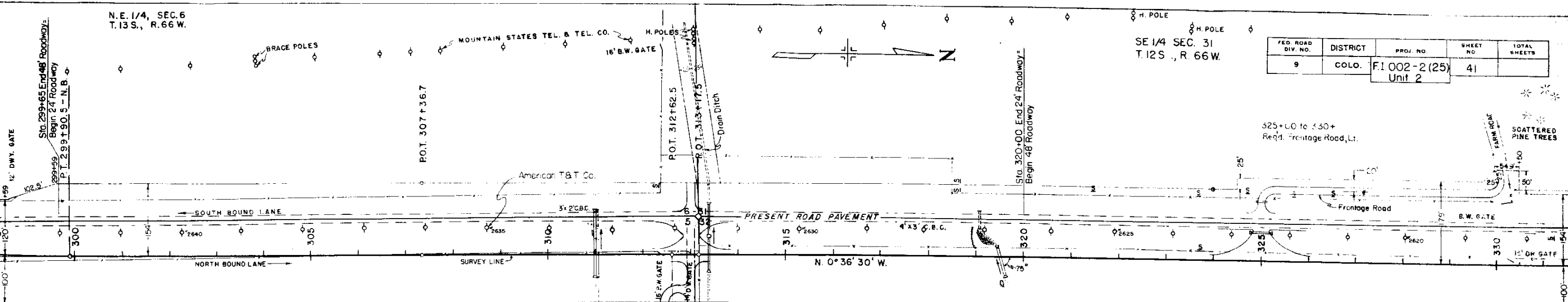
NOTE: Between Stas. 285 and 295 - 1 1/2" Water Line is to be relocated outside proposed right-of-way by the Owner as a Right-of-Way consideration.

The profile ground line as shown is on the C.L. of the North Bound Lane.

N.E. 1/4, SEC. 6
T. 13 S., R. 66 W.

SE 1/4 SEC. 31
T. 12 S., R. 66 W.

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F.1.002-2(25) Unit 2	41	



City of Colo Springs 299+ to 314+ Transplant 50 Shrubs

311+00 Remove 3' x 2' x 48" C.B.C. LT. Reqd. 24' x 136' Gross Culvert (Both Lanes) Ditches Removed Material to be disposed of as directed by the Engineer. 313+00 Reqd. Road Approaches, Lt. BRT. Median X-ing.

313+35 Reqd. 36' x 132' Gross Culvert (64' Lt. & 68' Rt.) & Type 'A' Median Inlet (H-6'-0") Inlet, Rt. Drain Ditch, Lt. (W=2')

312+40 Reqd. Road Approach to Private Road, Rt.

319+50 Reqd. 48' x 60' Gross Culvert (NB Lane) Ditches & Dikes at Inlet. R. Outlet. Paving of Outlet Dike. (W=2')

325+00 Reqd. 18' x 22' Side Drain and Road Approach, Lt. Median X-ing & 18' x 36' Side Drain in Median.

325+00 to 330+ Reqd. Frontage Road, Lt.

SCATTERED PINE TREES

N.W. 1/4, SEC. 5

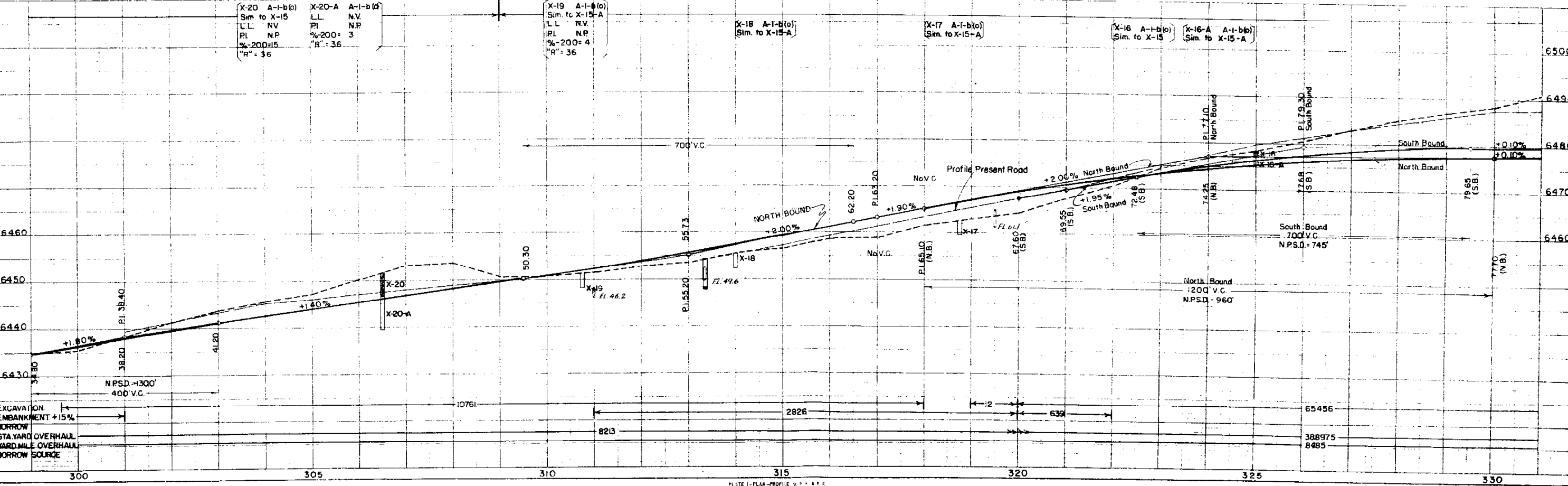
S.W. 1/4, SEC. 32

B.M. SPIKE IN TEL. POLE NO. 2640 ELEV. = 6441.16

B.M. FOR S.E. COR. EAST HEADWALL 60' LT. STA. 311+00 ELEV. = 6452.23

B.M. FOR S.E. COR. EAST HEADWALL 59' LT. STA. 319+00 ELEV. = 6448.91

CLEARING & GRUBBING
30+ to 314+ 50' Ponderosa Pine, Lt.
306+ to 308+ 50' Rustyholota, Lt.

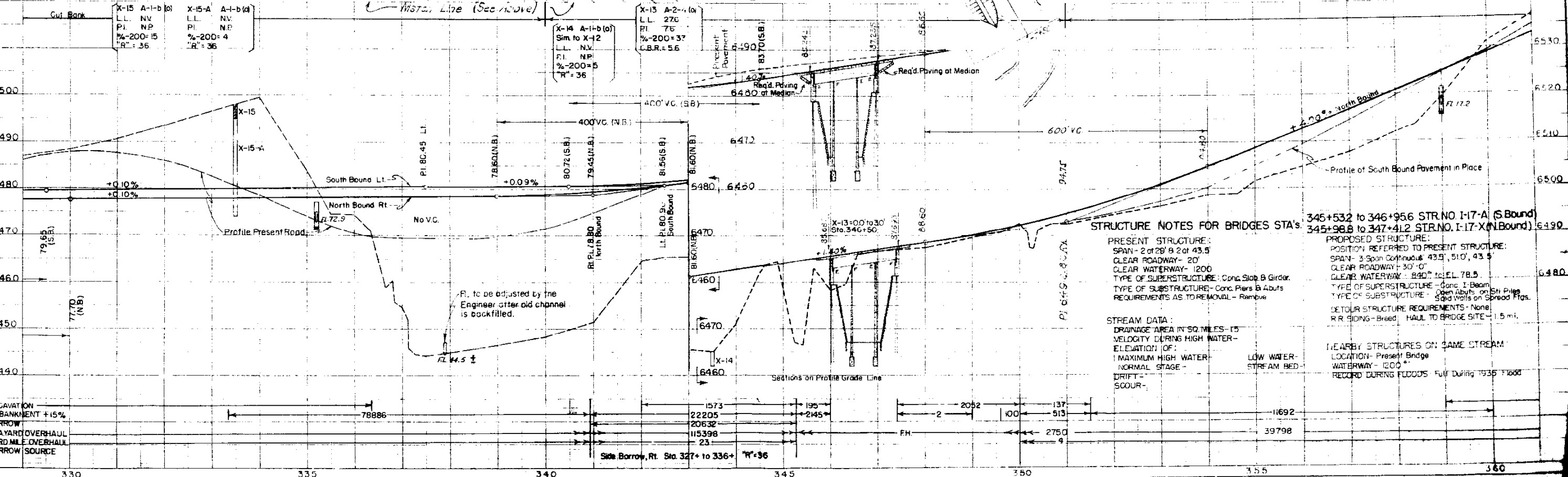
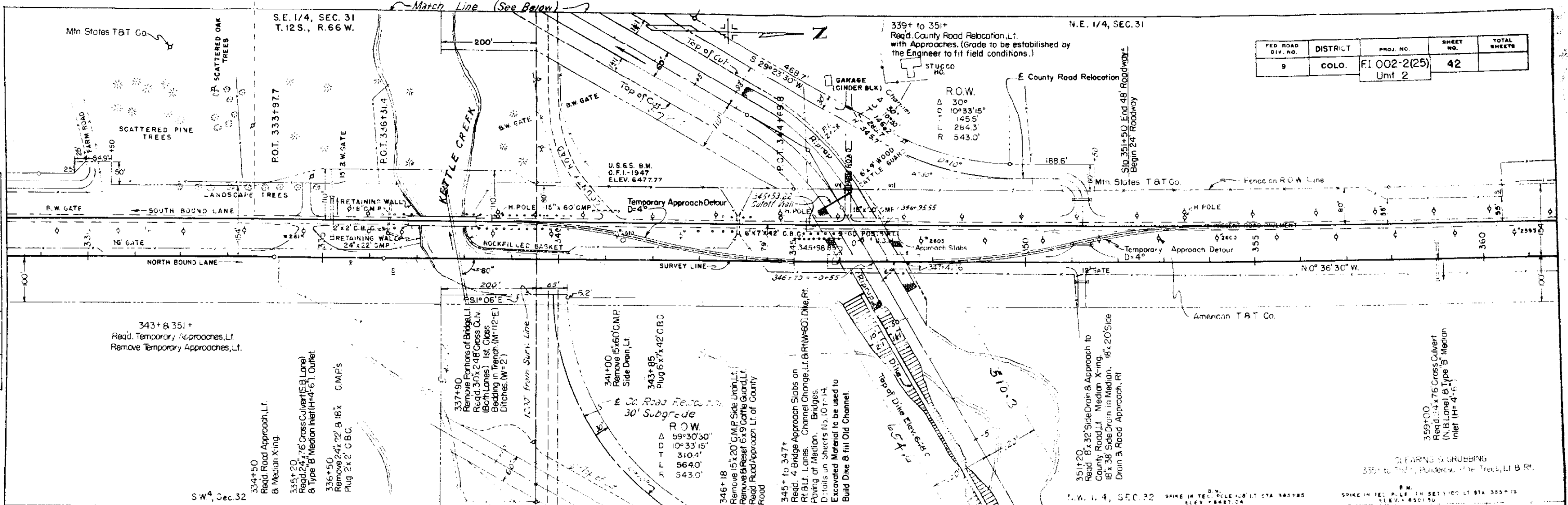


EXCAVATION
EMBANKMENT +15%
BORROW
STAYARD OVERHAUL
HARD MILE OVERHAUL
BORROW SOURCE

S.E. 1/4, SEC. 31
T. 12S., R. 66W.

N.E. 1/4, SEC. 31

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F1 002-2(25) Unit 2	42	



STRUCTURE NOTES FOR BRIDGES STA. 345+53.2 TO 346+95.6 STR. NO. I-17-A (S Bound) 345+98.8 TO 347+41.2 STR. NO. I-17-X (N Bound)

PRESENT STRUCTURE:
 SPAN - 2 of 29' 8 1/2 of 43.5'
 CLEAR ROADWAY - 20'
 CLEAR WATERWAY - 1200'
 TYPE OF SUPERSTRUCTURE - Conc. Slab & Girder.
 REQUIREMENTS AS TO REMOVAL - Ramp

PROPOSED STRUCTURE:
 POSITION REFERRED TO PRESENT STRUCTURE:
 SPAN - 3 Span Continuous 43.5', 51.0', 43.5'
 CLEAR ROADWAY - 30'-0"
 CLEAR WATERWAY - 840' to E.L. 78.5'
 TYPE OF SUPERSTRUCTURE - Conc. I-Beam
 TYPE OF SUBSTRUCTURE - Open Abutts on 5th Piles
 DETOUR STRUCTURE REQUIREMENTS - None
 RR SIDING - Broad GAUL TO BRIDGE SITE - 1.5 mi.

NEARBY STRUCTURES ON SAME STREAM:
 LOCATION - Present Bridge
 WATERWAY - 1200'
 RECORD DURING FLOODS - Full During 1936 Flood

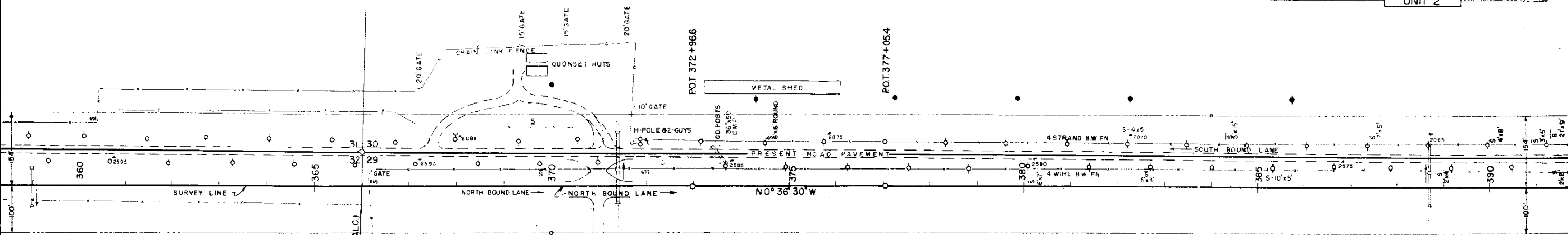
EXCAVATION
EMBANKMENT +15%
BORROW
STAYARD OVERHAUL
YARD MILE OVERHAUL
BORROW SOURCE

Side Borrow, Rt. Sta. 327+ to 336+ R=36

N.E. 1/4 SEC. 31
T. 12 S., R. 66 W.

S.E. 1/4 SEC. 30

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FI 002-2(25) UNIT 2	43	



361+ to 370+
Read Metal Sheet Piling in
Roadway Ditches, Rt.

360+ TO 366+
20 PONDEROSA PINE TREES RT. & LT. OF C

371+00
Read Road Approaches, Lt. & Rt.
Median X-ing

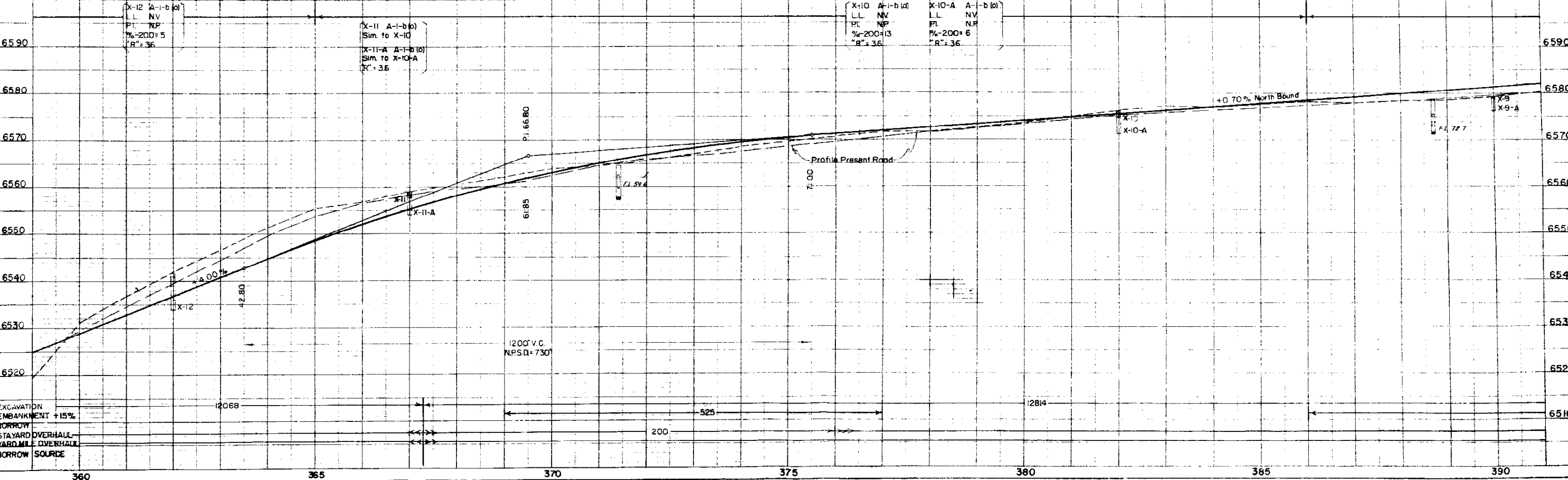
371+40
Read 36" x 136 Cross Culvert (72 Lt. & 64 Rt.)
(Both Lanes) B Type B Median Inlet (4'-6"-6")
Ditches (W=2)

373+50
Plug 36" x 50 C.M.P. Cross
Culvert, Lt.

388+70
Read 30" x 120 Cross Culvert (56 Lt. & 64 Rt.)
B Type B Median Inlet (4'-6"-6") Ditches (W=2)

N.W. 1/4 SEC. 32

S.W. 1/4 SEC. 29



EXCAVATION
EMBANKMENT +15%
BORROW
STAYARD OVERHAUL
YARD MILE OVERHAUL
BORROW SOURCE

S.E. 1/4 SEC 30

S.E. 1/4 SEC 30

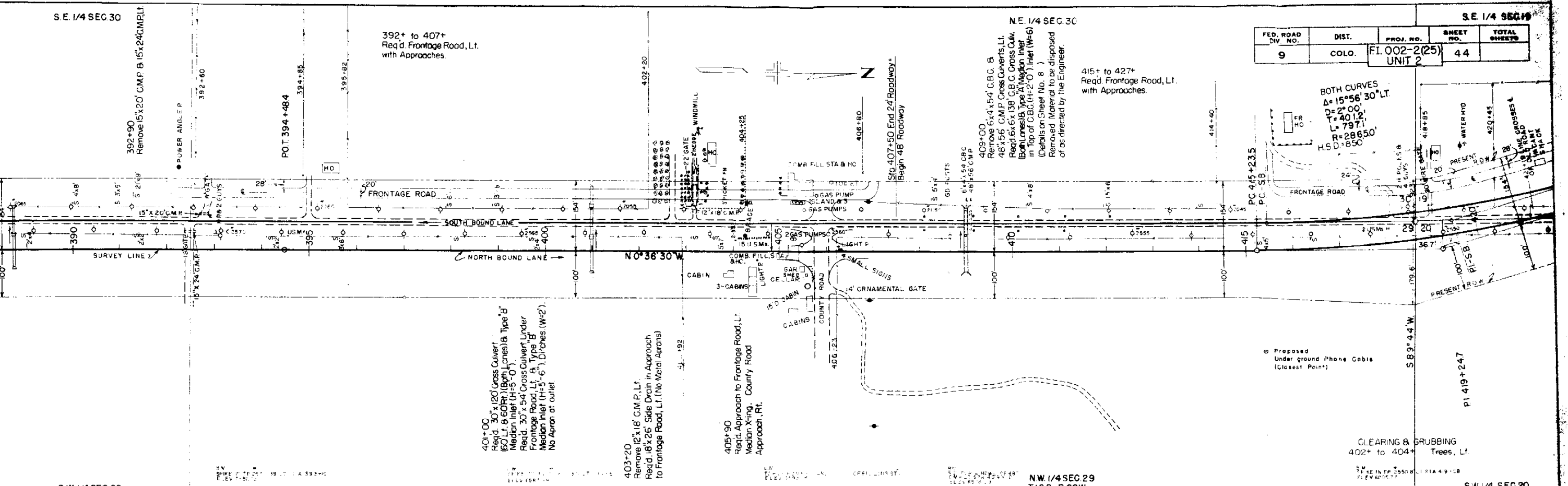
FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FI.002-2(25) UNIT 2	44	

392+ to 407+
Req'd. Frontage Road, Lt.
with Approaches

415+ to 427+
Req'd. Frontage Road, Lt.
with Approaches.

BOTH CURVES
 $\Delta = 15^\circ 56' 30''$ LT.
 $D = 2500'$
 $L = 401.2'$
 $R = 28650'$
H.S.D. = 850'

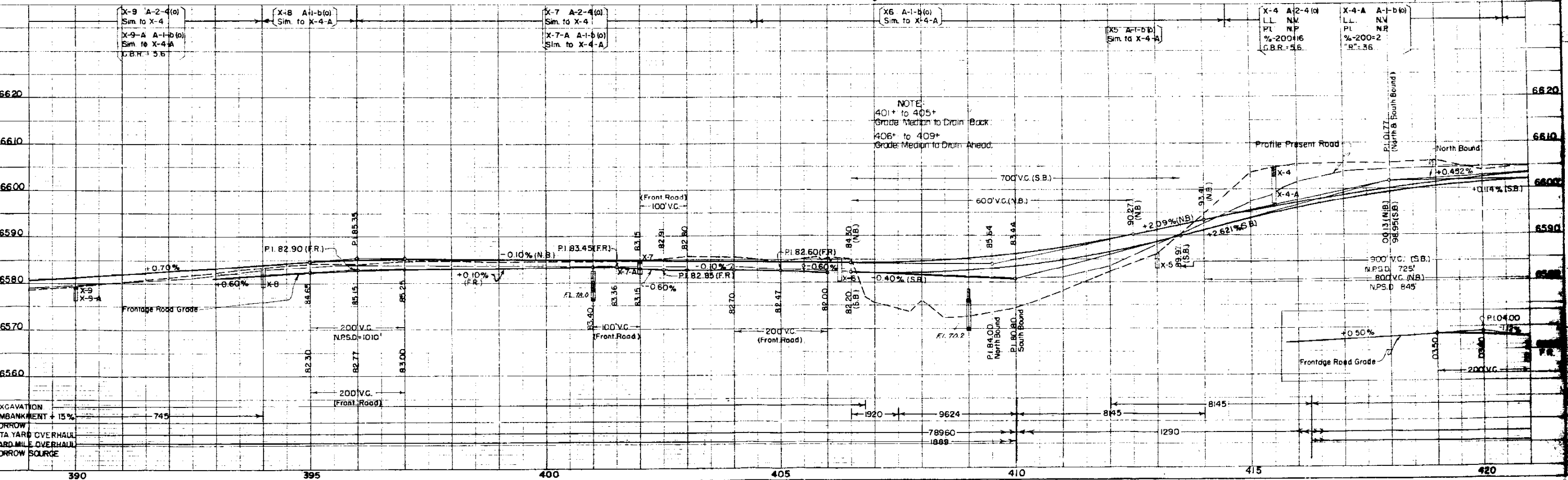
Remove 6'x4'x5' C.B.C. &
48'x56' C.M.P. Cross Culverts Lt.
Read 6'x6'x36' C.B.C. Cross Culk.
(Both Lanes) Type A Inlet in Top of C.B.C. (H=2'-0") Inlet (W=6')
(Details on Sheet No. 8)
Removed Material to be disposed
of as directed by the Engineer.



S.W. 1/4 SEC 29

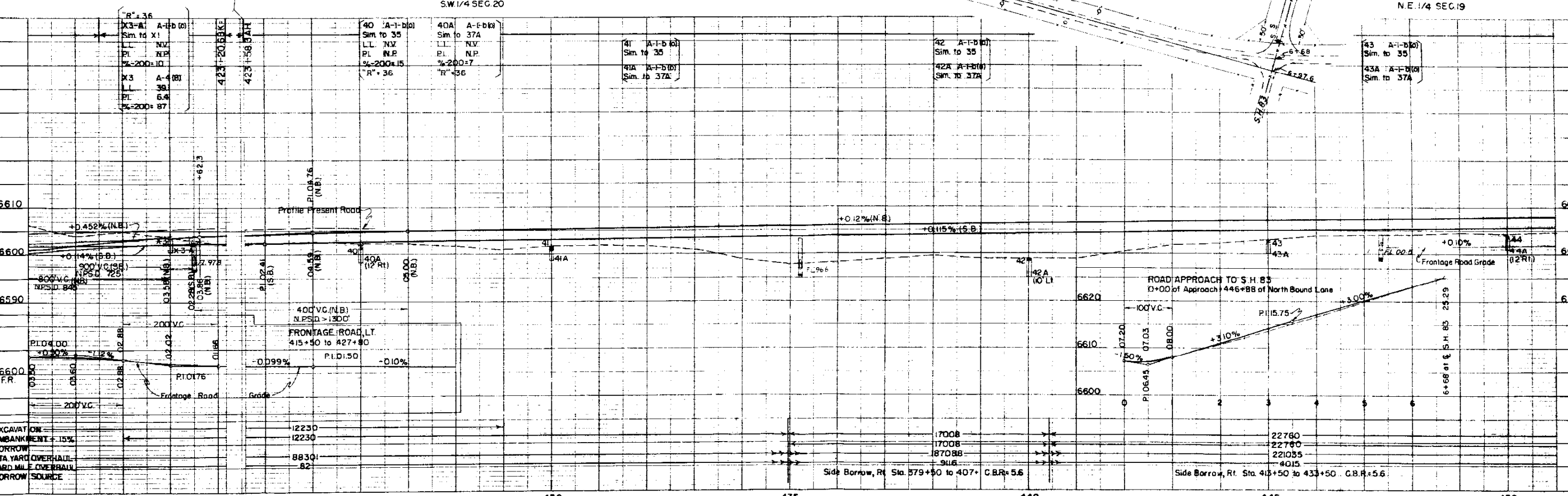
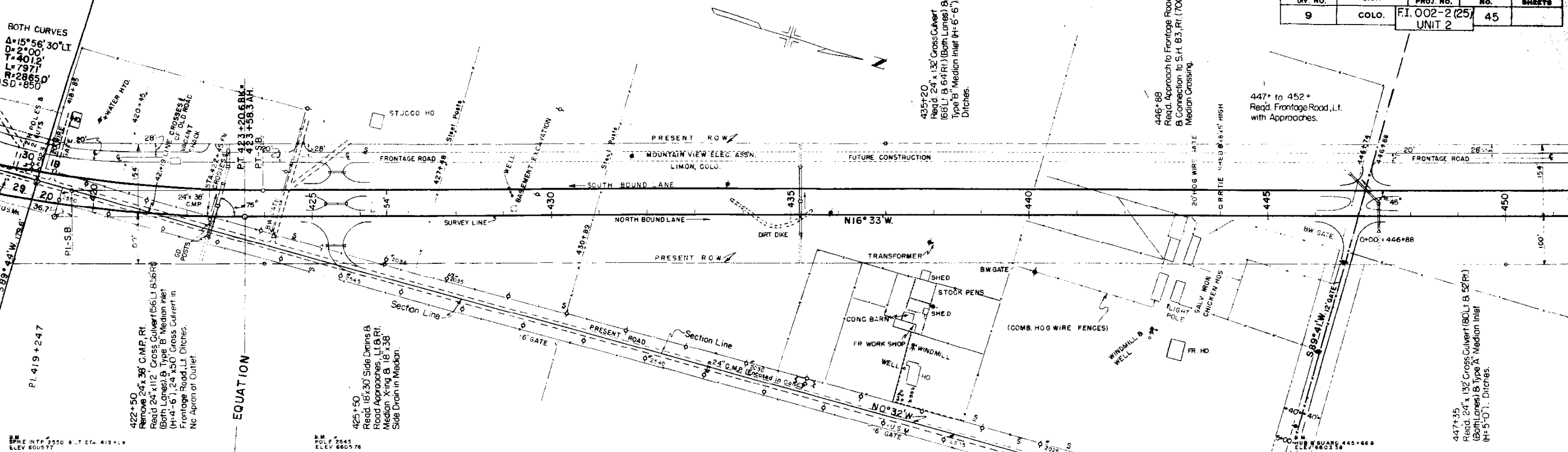
N.W. 1/4 SEC 29
T12S, R68W

S.W. 1/4 SEC 20



NOTE:
401+ to 405+
Grade Median to Drain Back.
406+ to 409+
Grade Median to Drain Ahead.

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FI. 002-2 (25) UNIT 2	45	



NE 1/4 SEC. 19
T. 12 S. R. 66 W.

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FI. 002-2 (25) Unit 2	46	

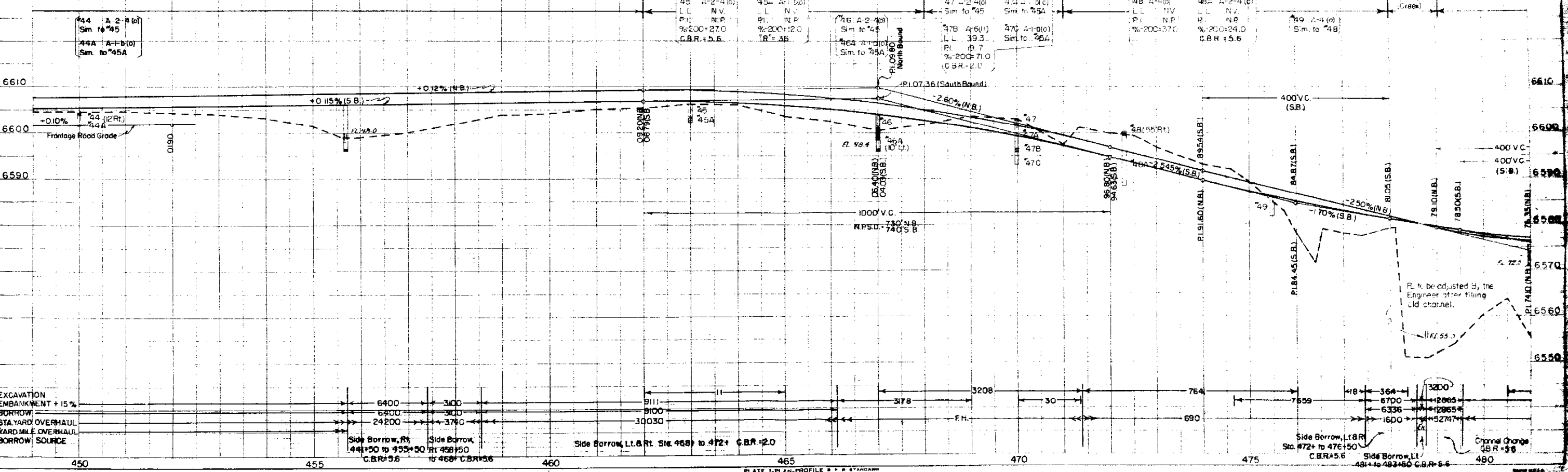
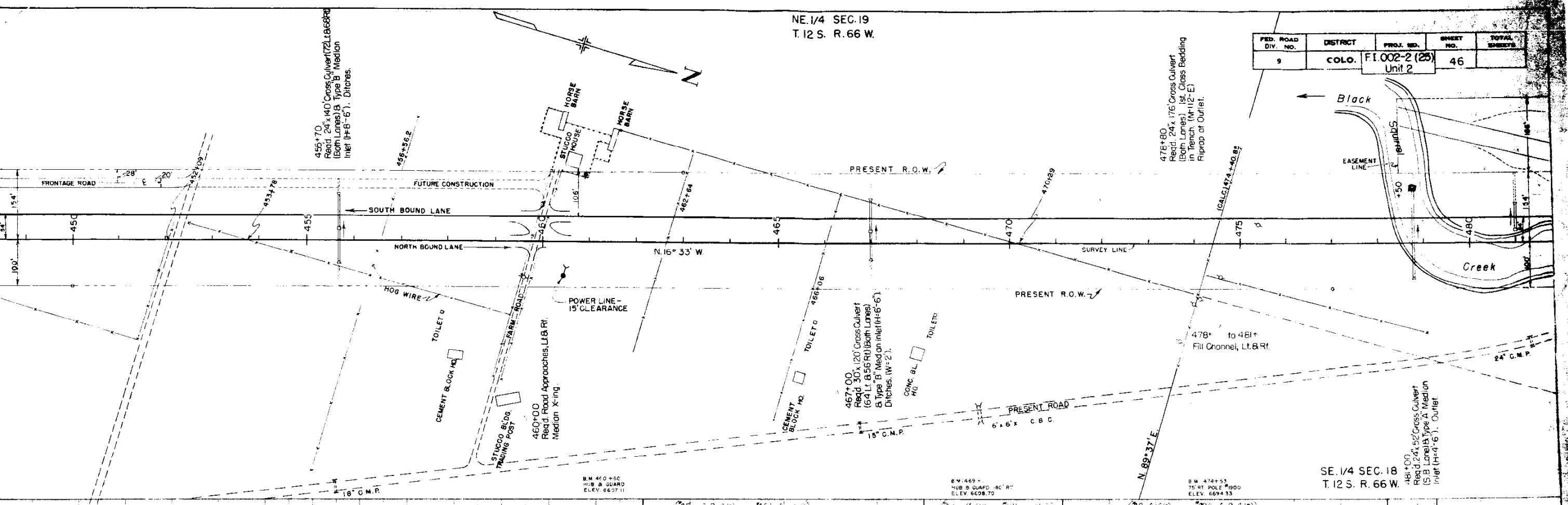
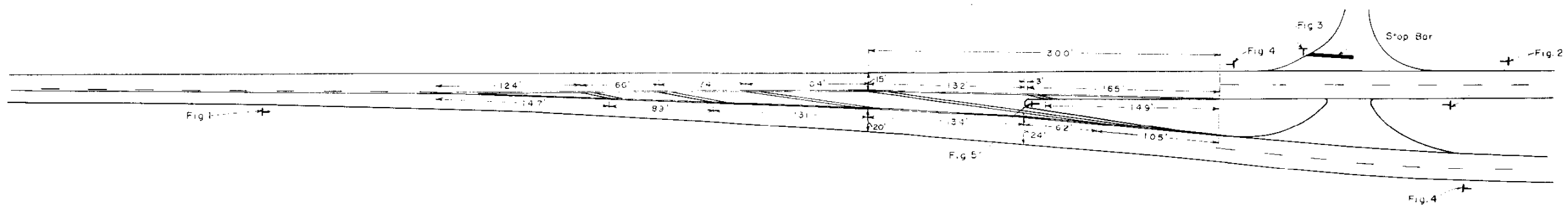


PLATE 1-PLAN-PROFILE - STANDARD
BURNS & MCDONALD CO., Chicago, New York

SIGNING AND STRIPING TEMPORARY APPROACH STA. 295±

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	FI 002-2(25) Unit 2	47a	



PAINT SUMMARY

PAINT	FEET	GALS. REQD.
WHITE	930	5
YELLOW*	3,500	50

SIGN SUMMARY

FIG. NO.	QUAN. REQD.
1	1
2	2
3	1
4	2
5	1

LEGEND

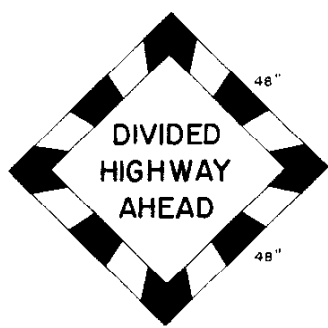
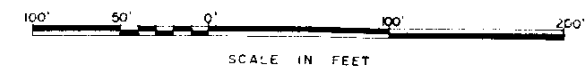
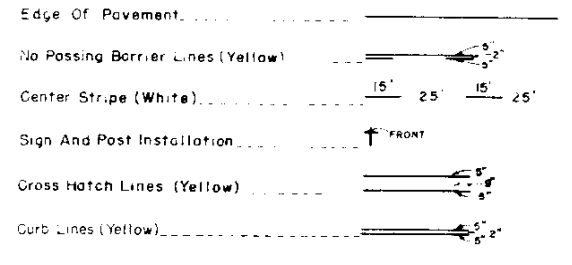


FIG. 1
(W-20, SUNBURST)

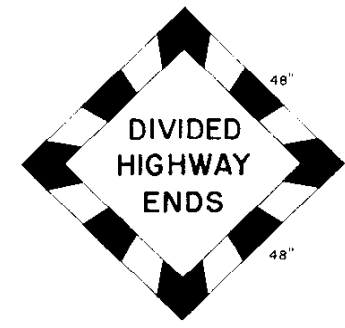


FIG. 2
(W-2), SUNBURST)

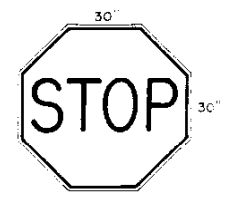


FIG. 3
(R-1)

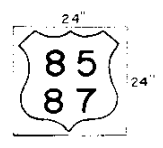


FIG. 4
(M-101)

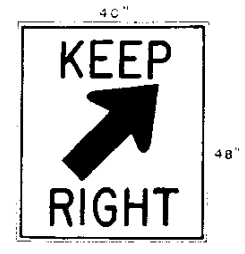
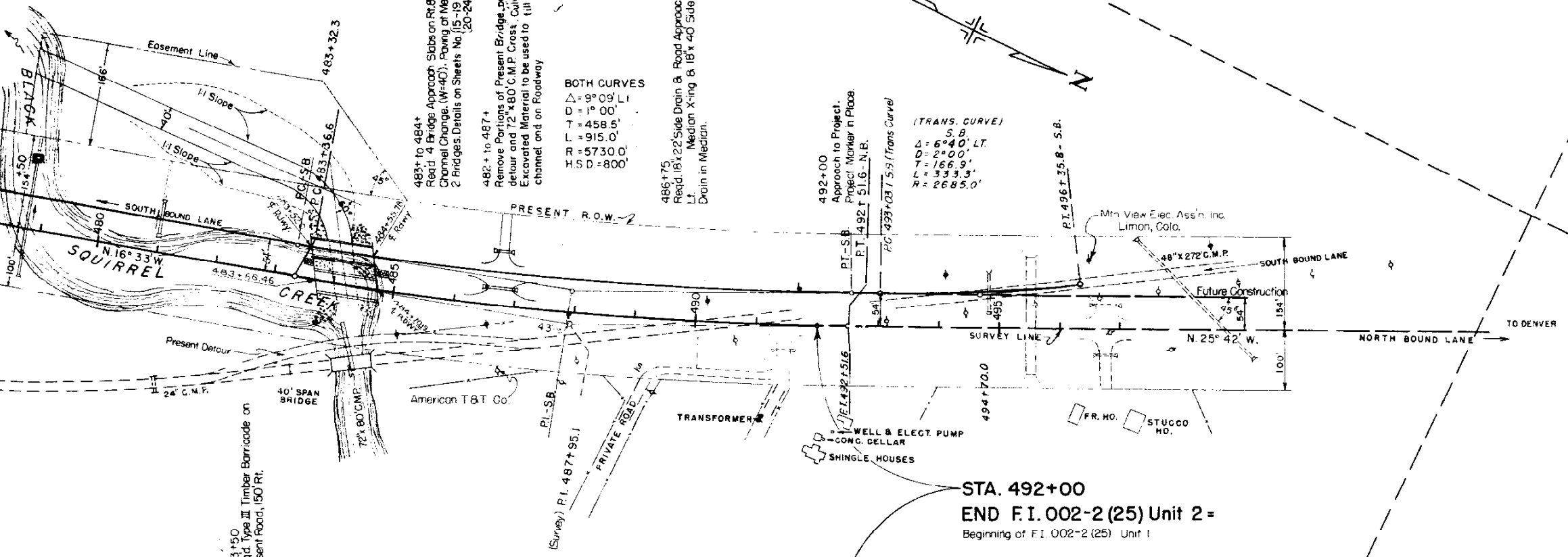


FIG. 5
(R-114, SPECIAL)

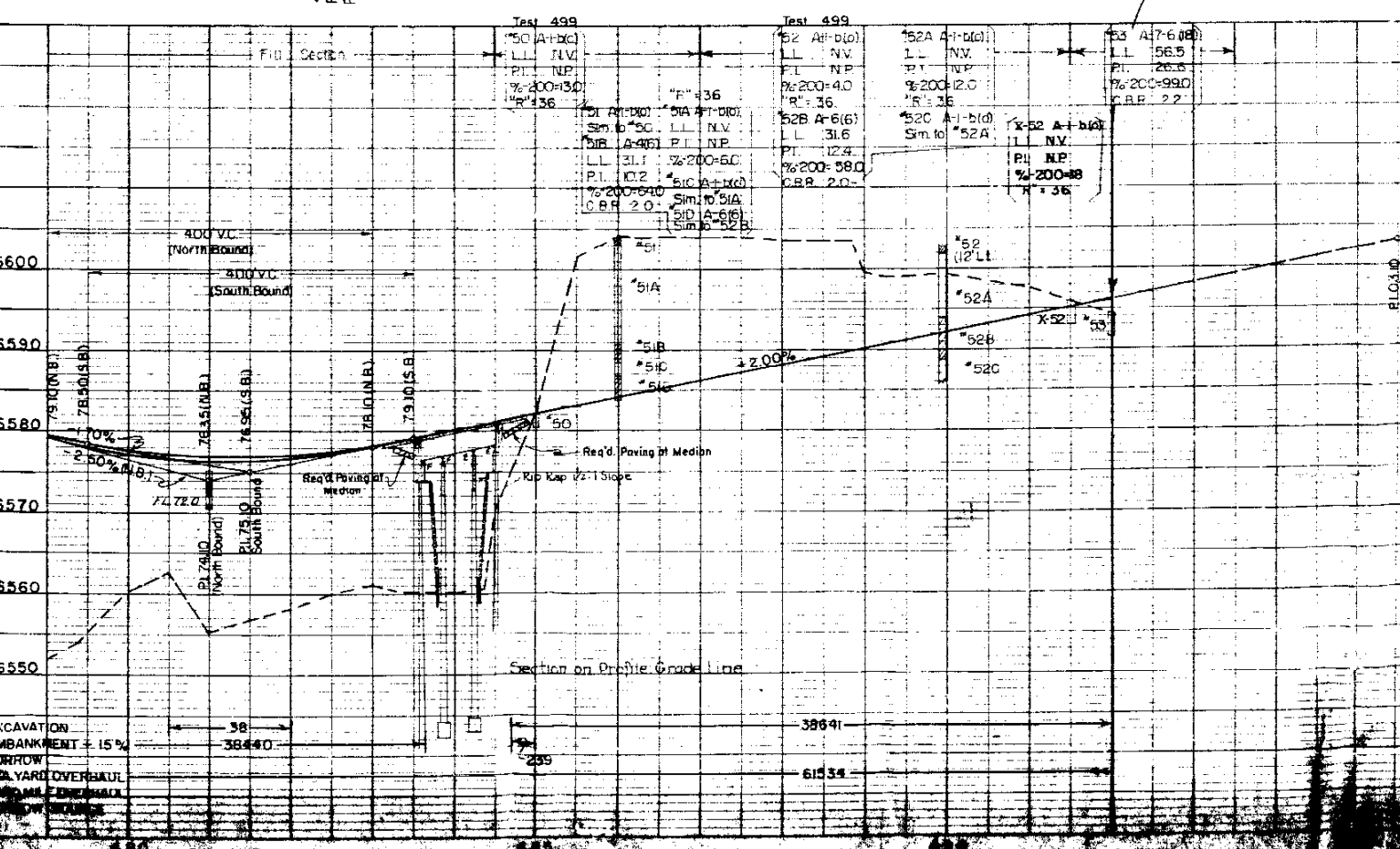
S.E. 1/4, SEC. 18
T. 12 S., R. 66 W.

FED. ROAD DEV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F.I. 002-2 (25) Unit 2	47	



STA. 492+00
END F.I. 002-2 (25) Unit 2 =
Beginning of F.I. 002-2 (25) Unit 1

CLEARING & GRUBBING
480+ to 485+, Heavy Growth of Pine Trees, Lt. & Rt.



STRUCTURE NOTES FOR BRIDGES STA. 483+52.0 to 484+55.78 STR. NO. H-17-L (S. Bound)
483+66.46 to 484+70.19 STR. NO. H-17-J (N. Bound)

PRESENT STRUCTURE: H-17-L
SPAN - 1 of 40'-0"
CLEAR ROADWAY - 20'-0"
CLEAR WATERWAY -
TYPE OF SUPERSTRUCTURE - Concrete Arch
REQUIREMENTS AS TO REMOVAL -

PROPOSED STRUCTURE:
POSITION REFERRED TO PRESENT STRUCTURE - Approx. 90' Southwest (S. Bound) 130' Southwest (N. Bound)
SPAN - 3 (31'-38" 31')
CLEAR ROADWAY - 30'-0"
CLEAR WATERWAY - 720"
TYPE OF SUPERSTRUCTURE - 3 Span Continuous Concrete Slab B.T. Beam
TYPE OF SUBSTRUCTURE - Abutts - Steel Piling, Conc. Cap Piers - Rein. Conc. with 2 legs
DETOUR STRUCTURE REQUIREMENTS - Use Present Bridge
R.R. SIDING - Husted HAUL TO BRIDGE SITE - 1.5 mi.

STREAM DATA:
DRAINAGE AREA IN SQ. MILES - 12
VELOCITY DURING HIGH WATER -
ELEVATION OF:
MAXIMUM HIGH WATER - LOW WATER
NORMAL STAGE - 6561.5 STREAM BED - 6560.2
DRIFT - Heavy
SCOUR - Heavy

NEARBY STRUCTURES ON SAME STREAM:
LOCATION -
WATERWAY -
RECORD DURING FLOODS -