

COLORADO
STATE HIGHWAY DEPARTMENT

STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
COLO.	T-170-1 (1)	1	391

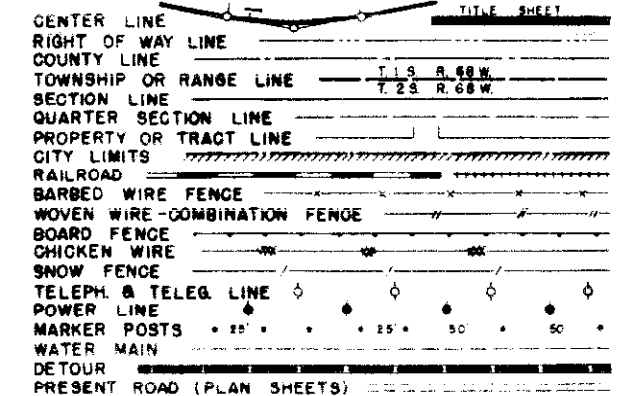
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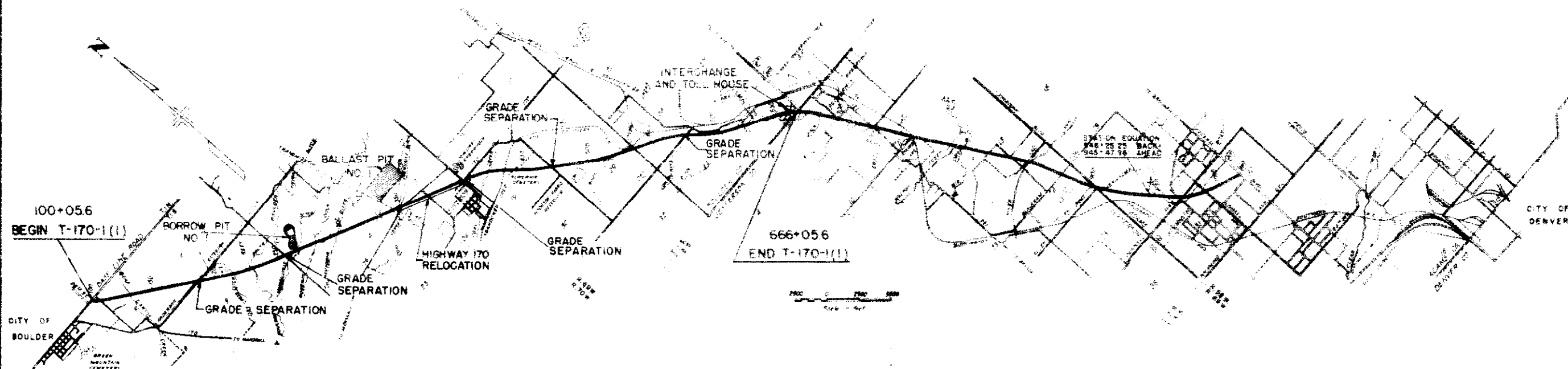
PLAN AND PROFILE OF PROPOSED
DENVER - BOULDER TURNPIKE
PROJECT NO. T-170-1 (1)

BOULDER COUNTY
SCALES ON ORIGINAL DRAWINGS
ON PLAN, 1 IN. = 100 FT.
ON PROFILE 1 IN. = 100 FT. HORIZONTAL
1 IN. = 10 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT 566000 FEET • 10.719 MILES
NET LENGTH OF PROJECT

CONVENTIONAL SIGNS



GRADING AND DRAINAGE
NORTH SECTION OF TURNPIKE



WE SUBMIT HEREBY FOR APPROVAL

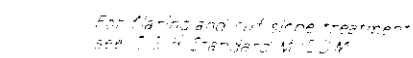
AS D. BELL	DATE
ASSISTANT ENGINEER	

APPROVED

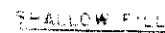
MARK WATROUS	DATE
STATE HIGHWAY ENGINEER	

PREPARED AND RECOMMENDED BY
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

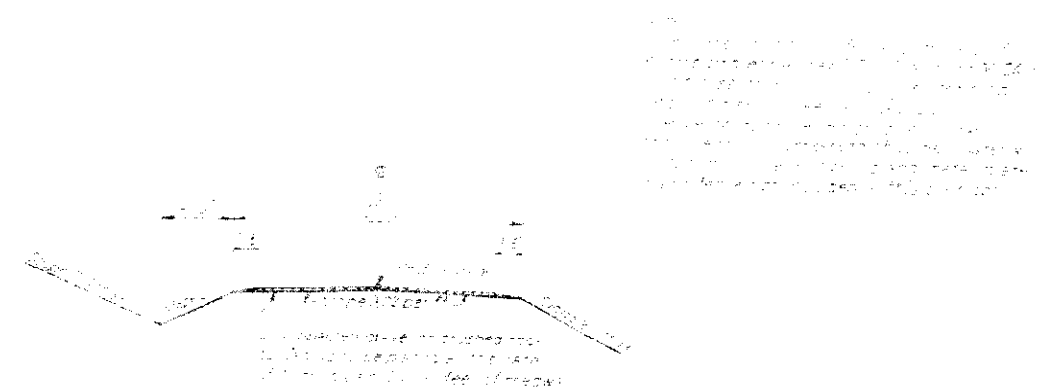
R. H. Bergendoff



Note:
interesting to see where certain regions
for typical interlocking with seedling
formation, growing between the TSP - 0.010 and
Standard Interlocking.



DEEP FILE



TYPICAL CROSS SECTION OF STATE ROUTE 170 RELOCATION

TYPICAL CROSS-SECTION OF COUNTY ROAD RELOCATIONS

TYPICAL CROSS SECTIONS OF INTERCHANGE

GENERAL NOTES

This project is to be constructed in accordance with the Standard Specifications of the Colorado State Highway Department adopted January 1, 1948 supplemented by Special Provisions. All quantities on preliminary plans are to be taken as approximate only.

All roadway excavation required to construct this project is to be obtained and used as indicated on the plans. Excavation beyond the limits of the ditches shown on the Typical Cross Section, either marked as "Borrow on the Plans" or as "Embankment" in the list of structures, is to be obtained and paid for as indicated on the plans. These quantities are to be taken as part of the original excavation quantities indicated on the plans. Any slope stakes beyond the limits of the Typical Cross Section shown are to be obtained by the Engineer to the satisfaction of the Department.

Corroded Metal pipe to have Galvanized Metal lining in accordance with Standard M-22-B unless otherwise noted on plans.

Reinforced concrete pipe to have Standard M-22-B in accordance with Standard M-22-B unless otherwise noted on plans.

All concrete used on this project shall be "Air Entrained Concrete" (Cement shall be Type II or III A unless otherwise noted).

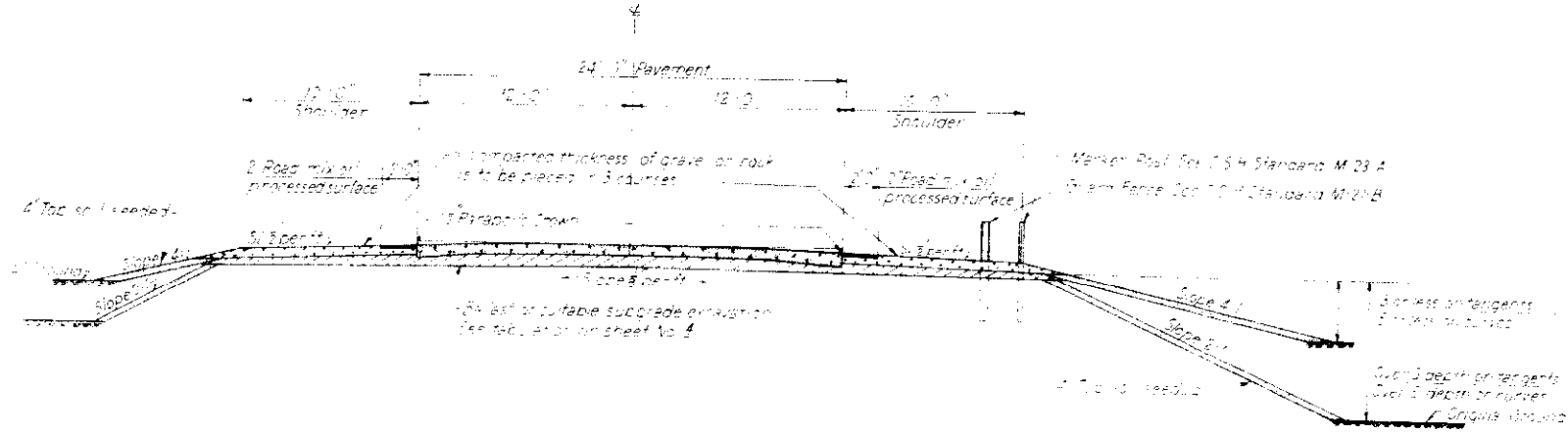
Excavation of embankment material shall be covered with approximately 6" of embankment material in such a manner that a minimum of one inch shall be exposed in the completed work. This shall be accomplished by watering embankment slopes around and adjacent to the project.

Except as otherwise noted on plans, all measurements shall be based on measurements along the center line of the project.

Right of Way lines shown on the plans shall be used as shown and shall not be varied without the approval of the Engineer. Right of Way lines shall be shown on the plans.

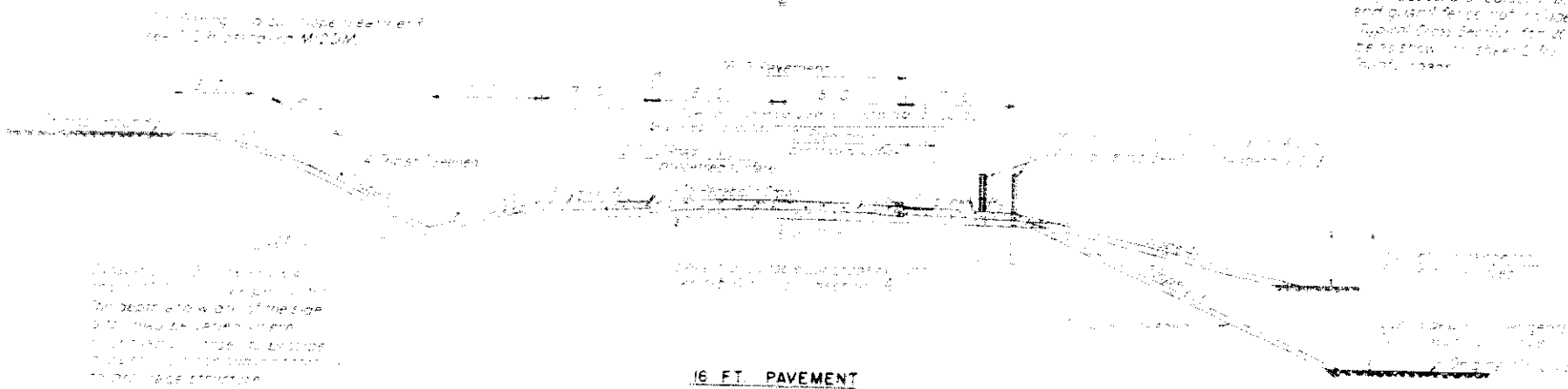
All quantities shown on the plans are to be taken as approximate only. Quantities shown on the plans are to be taken as approximate only.

All quantities shown on the plans are to be taken as approximate only. Quantities shown on the plans are to be taken as approximate only.



24 FT. PAVEMENT

Notes:
Profile grades are along edge of pavement except where noted. See interchange profiles sheets 65 and 66.
Pavement, gravel, crushed rock, shoulders, 2' of processed surface material, marker posts and guard fence not included in the interchange Typical Cross Section. For 24 ft. pavement see the notes on sheet 2 for location of guard fence.



16 FT. PAVEMENT

TABULATION OF LENGTH

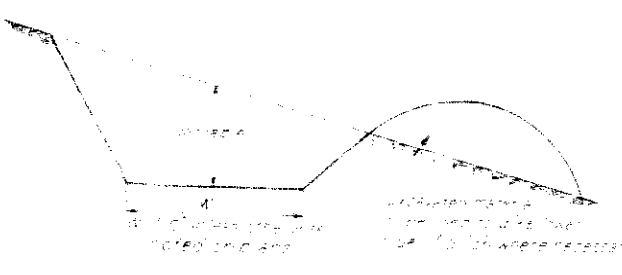
STATION	ROADWAY	BRIDGES
100+00 to 100+05	100+00 to 100+05	100+00 to 100+05
100+05 to 100+10	100+05 to 100+10	100+05 to 100+10
100+10 to 100+15	100+10 to 100+15	100+10 to 100+15
100+15 to 100+20	100+15 to 100+20	100+15 to 100+20
100+20 to 100+25	100+20 to 100+25	100+20 to 100+25
100+25 to 100+30	100+25 to 100+30	100+25 to 100+30
100+30 to 100+35	100+30 to 100+35	100+30 to 100+35
100+35 to 100+40	100+35 to 100+40	100+35 to 100+40
100+40 to 100+45	100+40 to 100+45	100+40 to 100+45
100+45 to 100+50	100+45 to 100+50	100+45 to 100+50
100+50 to 100+55	100+50 to 100+55	100+50 to 100+55
100+55 to 100+60	100+55 to 100+60	100+55 to 100+60
100+60 to 100+65	100+60 to 100+65	100+60 to 100+65
100+65 to 100+70	100+65 to 100+70	100+65 to 100+70
100+70 to 100+75	100+70 to 100+75	100+70 to 100+75
100+75 to 100+80	100+75 to 100+80	100+75 to 100+80
100+80 to 100+85	100+80 to 100+85	100+80 to 100+85
100+85 to 100+90	100+85 to 100+90	100+85 to 100+90
100+90 to 100+95	100+90 to 100+95	100+90 to 100+95
100+95 to 100+100	100+95 to 100+100	100+95 to 100+100
TOTALS	100+00 to 100+100	100+00 to 100+100
SUMMARY	100+00 to 100+100	100+00 to 100+100
TOTALS	100+00 to 100+100	100+00 to 100+100

DESIGN DATA

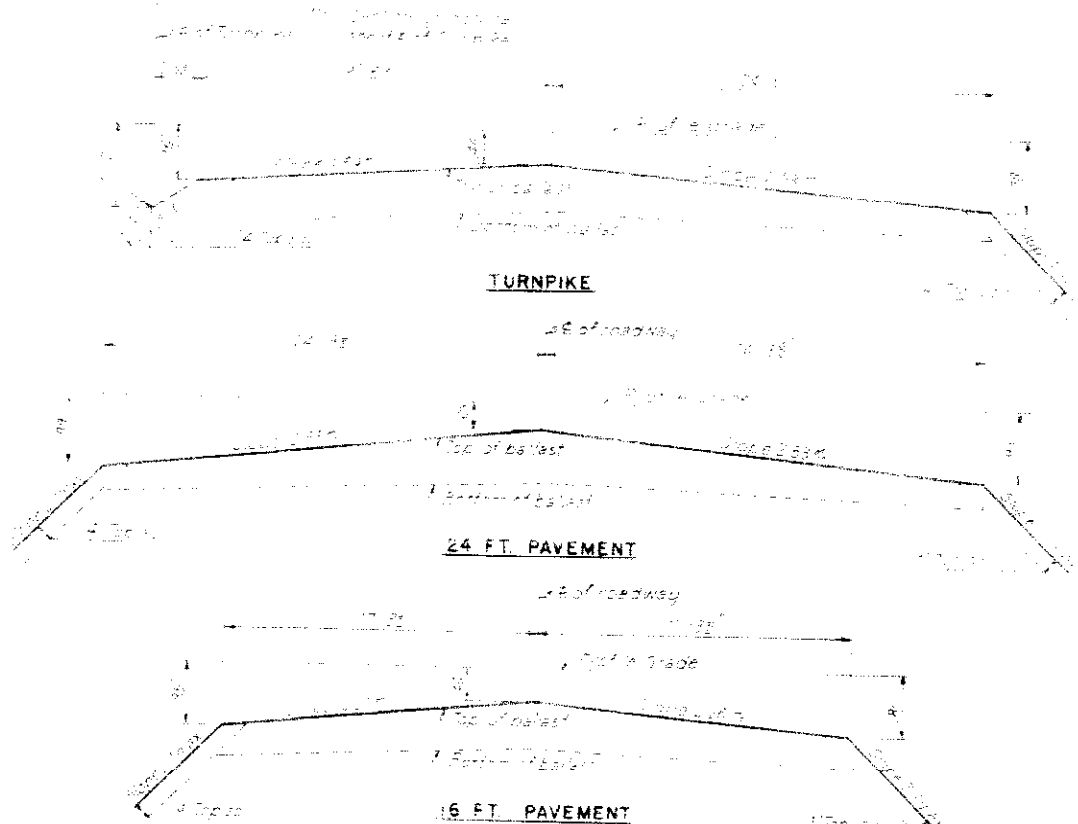
TURNPIKE	
Maximum Grade	5%
Minimum Grade	0%
Maximum Speed	50 MPH
Minimum Speed	30 MPH
BROOMFIELD INTERCHANGE	
Maximum Grade	5%
Minimum Grade	0%
Maximum Speed	50 MPH
Minimum Speed	30 MPH
INTERSECTING ROADS	
Maximum Grade	5%
Minimum Grade	0%
Maximum Speed	50 MPH
Minimum Speed	30 MPH

* Boulder Terminal is at 100+00

TYPICAL SECTION OF DITCHES & CHANNEL CHANGES



TURNPIKE



24 FT. PAVEMENT

16 FT. PAVEMENT

GRADING TEMPLATES

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION				STRUCTURAL EXCAVATION				STRUCTURE BACKFILL				MECH TAMPING HR.	GRAVEL OR CR. ROCK SURF. TON	CONCRETE		REINF. STEEL LBS	CORRUGATED METAL SIPHON PIPE				CORRUGATED METAL CULVERT PIPE				METAL APRON FOR CORRUGATED METAL PIPES				REINFORCED CONC. CULVERT PIPE				CONC. FLARED END SECTION				GRATING AND FRAME FOR NO. 13 INLETS	MISCELLANEOUS		
			CUBIC YARDS				CUBIC YARDS				CUBIC YARDS						CUBIC YARDS			LIN. FT.				LIN. FT.				EACH				LIN. FT.				EACH							
			UNCL.	EMBANK.	UNCL. DITCH																																						
			NO.	UNCL.	EMBANK.	UNCL. DITCH	●																																				
90+70	Cross Culvert - Ditches #13A Concrete Inlet (H=5)				10	13				49				5		113		310									36				2					1							
90+10= 97+00	Relay 12 x 14 Steel Pipe Cross Culvert - Ditches #13A Conc. Inlet (H=4)	1			20	13				40				4		999		164									36				2					1							
203+30 207+90	Cross Culvert - Ditches #13A Conc. Inlet (H=4) 6 x 4 C.B.C. x 204.8 Ditches For details see Sheet 14				50	3				42				4		999		164									36				2					1							
					50	132				102				5		133		16,635																									
210+00 210+70	Cross Culvert - Ditches (W=2) #13A Conc. Inlet (H=5.5) Cross Culvert - Ditches				20	47				38				4		119		352									36				2					1							
					45	-				46				4													36				2												
216+00 219+00	Cross Culvert - Ditches #13A Conc. Inlet (H=5.5) Cross Culvert				10	30				48				5		26		434									36				2					1							
						1				49				5																													
223+00	Median Drain #13 Conc. Inlet (H=3.0)					3				17				1		583		84				46														1							
228+00 230+00	Relay 12" x 14" Steel Pipe 24' Median Drain #13 Conc. Inlet (H=3.0)	1				41				2				1		213		1				5														1							
236+75 237+30 237+40	Cross Culvert - Ditches #13A Conc. Inlet (H=4.0) 6 x 4 C.B.C. x 98 (For details see Sheet 16) Concrete 24" box For details see Sheet 16				1	10				21				2		559		71									36				2					1							
					5	11				11				27		510		532																									
238+ to 239+	Relocated Boulder Canyon Ditch (W=2)		2100																																								
241+40 244+00	Cross Culvert - Ditches Median Drain #13 Conc. Inlet (H=3.0)				15	13				23				3						50							36				2					1							
						1				24						1,65		80																									
250+00 251+00	Siphon (H=11.4) & 24" R.D. Ditches (W=6) Median Drain - Ditch #13 Conc. Inlet (H=3.0)				10	33				27				13		64				100						2										1	2 1/2" x 3" Swells 3" x 10" Man. Box - 1" Pipe R.D. Box & Valve Box for 24" Siphon Similar to Sta. 36" Siphon						
258+00	Median Drain #13 (H=3.0)					16				10				4		112		40				108														1							
264+30 265+00	Siphon (H=23.1) & 19" R.D. Ditches (W=4.0) Median Drain - Ditches #13 Conc. Inlet (H=3.0)				20	112				90				9		64			124						2											1	2 1/2" x 3" Swells 3" x 10" Man. Box - 1" Pipe R.D. Box & Valve Box for 19" Siphon						
266+50 272+00	6 x 4 C.B.C. x 94 (For details see Sheet 34) Ditches Median Drain #13 Conc. Inlet (H=3.0)				45	10				173				17		11		117				48														1							
273+00	6" x 12" 2M x 5' levee for future water line																																										
275+0 to 28+40 278+40 278+85	Ditch (H=6) Left Cross Culvert - Ditch (W=2) #13A Conc. Inlet (H=5.5) 6 x 4 C.B.C. 96 (For details see Sheet 14) (W=15.0)				14	25				28				2		110		311									36				2					1							
						1				11				13		110		1,310																									

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION			STRUCTURAL EXCAVATION			STRUCTURE BACKFILL			MECH. TAMPING HR.	GRAVEL OR ROCK SURF. TON	CONCRETE		REINF. STEEL LBS.	CORRUGATED METAL SIPHON PIPE			CORRUGATED METAL CULVERT PIPE			METAL APRON FOR CORRUGATED METAL PIPES		REINFORCED CONC. CULVERT PIPE				CONC. FLARED END SECTION				GRATING AND FRAME FOR NO. 15 INLETS	MISCELLANEOUS		
			CUBIC YARDS			CUBIC YARDS			CUBIC YARDS					CUBIC YARDS			LIN. FT.			LIN. FT.			EACH		LIN. FT.				EACH							
			UNCL.	EMBANK	UNCL. DITCH	●				1					HR.		A		24"	30"	42"	18"	24"	42"	18"	24"	24"	30"	36"	42"	24"	30"			36"	42"
			CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS			CLASS	CLASS		CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS			CLASS	CLASS
283+25	Cross Culvert - Ditches (W=2) *13 A Conc. Inlet (H=4.0)				25	18			20			2																								
290+00	Median Drain *13 Conc. Inlet (H=3.0)					7			30			3		0.99	164																					
296+40	Cross Culvert - Ditches (W=2) *13 A Conc. Inlet (H=4.5)				5	6			27			3		1.06	189																					
297+00	20'x5'x11' C.B.C. (For details see Sheet 17)					260			444			44		375.2	44,880																					
303+00	Median Drain *13 Conc. Inlet (H=3.0)					21			17			2		0.83	84																					
309+00	Median Drain - Ditch *13 Conc. Inlet (H=3.0)				5	22			17			2		0.83	84																					
315+50	Median Drain *13 Conc. Inlet (H=3.5)					8			20			2		1.94	277																					
319+25	Cross Culvert, Dry Rubble Apron Lt. Std. Hdw. Pt.					128			258			26		40																				6 Bags 100# Portland Cement 53.33 1st 25 H.P. Specs 21 3/4 100# Portland Cement Rubble Masonry		
322+50	Median Drain *13 Conc. Inlet (H=3.0)					7			16			2		0.83	84																					
328+25	Median Drain - Ditch *13 Conc. Inlet (H=3.0)				5	30			22			2		0.83	84																					
341+00	Median Drain *13 Conc. Inlet (H=3.0)								25			3		0.83	84																					
343+25 to 344+25	Remove and replace telephone poles and line (No. 100-44 Mr. James T. and Mr. J. C. J.)																																			
344+00	Remove and replace 20' x 5' x 11' C.B.C. (For details see Sheet 17)																																			
348+00	Median Drain & Ditch Basin 2-#13A Conc. Inlets (H=4.0) - 5.5 ft.				5	80			54			6		1.27	906																					
349+00 to 356+00	Remove Conc. Div. Box Lt. Conc. Div. Box Lt.														576																			2		
350+00	Remove 18" x 18" Manhole, see Sheet 7, Ditches				15				170			20		1.01	1,120																					
355+50 to 365+00	Remove 6" gutter, 2' to 3' deep																																			
356+00	Median Drain - Ditch *13 Conc. Inlet (H=3.0)				5	5			22			1			34																					
362+00	Median Drain - Ditch *13 Conc. Inlet (H=3.0)				5	30			10			5		1.13	14																					
367+40	Remove and replace power pole and line (Work done by Public Service Co. of N.C.)																																			
369+50	Median Drain *13 Conc. Inlet (H=3.0)								13			1		0.83	84																					
377+25	Cross Culvert *13A Conc. Inlet (H=5.5)				13.9	3			34			1		1.12	272																					
386+50	Cross Culvert - Ditches *13A Conc. Inlet (H=4.0)				50									0.99	160																					
389+50	Median Drain - Ditch *13 Conc. Inlet (H=3.0)				5	31			25			3		0.83	84																					
390+15	Siphon, 18" x 16" Lt. & 11.7 Ft. - Ditches (W=7)				12	119			23			5		0.40		163																		2 Trash Cans 4 1/2 lbs. Metal 20' Rpe. 1-4" Valve & Valve Box for 12 Siphon		

STATION	DESCRIPTION	REMOVE STRUCTURE	EXCAVATION			STRUCTURAL EXCAVATION			STRUCTURE BACKFILL			MECH TAMPING	GRAVEL OR CR. ROCK SURE	CONCRETE		REINF. STEEL	CORRUGATED METAL SIPHON PIPE			CORRUGATED METAL CULVERT PIPE			METAL APRON FOR CORRUGATED METAL PIPES			REINFORCED CONC. CULVERT PIPE				CONC FLARED END SECTION				GRATING AND FRAME FOR NO. 13 INLETS	MISCELLANEOUS			
			CUBIC YARDS			CUBIC YARDS			CUBIC YARDS					CUBIC YARDS			LIN. FT.			LIN. FT.			EACH			LIN. FT.				EACH								
			UNCL.	EMBANK.	UNCL. DITCH	●	□	□	I	□	□			HR.	TON		CLASS		LBS.	24" 30" 42"			18" 24"			18" 24" 30"			24" 30" 36" 42"				24" 30" 36" 42"					
																	A	B		24"	30"	42"	18"	24"	18"	24"	30"	24"	30"	36"	42"							
397+00	Median Drain Lt. Ditch #13 Conc. Inlet (H=3.0)				68	6			20		2		0.83	84					50			1												1				
401+30	Remove 12' x 16" C.M. Pipe Rt.	1																																				
401+70	Remove 12' x 14" Pipe Rt.	1																																				
404+00	Median Drain #13 Concrete Inlet (H=3.0)					6			17		2		0.83	84					50			1												1				
406+85	Highway #170 Relocation - See Sheet 70																																					
411+00	Median Drain #13 Conc. Inlet (H=3.0)					7			19		2		0.83	84					50			1												1				
416+25	Cross Culvert - Ditches (W=2) #14 Conc. Inlet (H=7.0)				41	15			38		3		1.49	199																				1				
421+30	Median Drain - Ditch #13 Conc. Inlet (H=3.0)				5	1			5		2		0.83	84					50															1				
432+00	Cross Culvert - Ditches (W=2) #13 Conc. Inlet (H=4.0)				30	11			21		4		1.08	144																								
433+50	Cross Culvert - Ditches (W=2) #13 Conc. Inlet (H=4.0)					20			48		5																											
434+80	Cross Culvert - Ditches (W=2) #13 Conc. Inlet (H=4.0) Ditch Inlet Std. H.W. Lt.				50	109			28		10		0.83 1.35 0.70	84 135 160																				1	Reinforced Metal Drain Pipe 30" dia. 10' long. 1" x 1/2" x 1/			

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO	EXCAVATION			STRUCTURAL EXCAVATION			STRUCTURE BACKFILL			MECH. TAMPING HR	GRAVEL OR CR. ROCK SURF. TON	CONCRETE		REINF. STEEL LBS.	CORRUGATED METAL SIPHON PIPE			CORRUGATED METAL CULVERT PIPE			METAL APRON FOR CORRUGATED METAL PIPES			REINFORCED CONC. CULVERT PIPE				CONC. FLARED END SECTION				GRATING AND FRAME FOR NO 15 INLETS	MISCELLANEOUS						
			CUBIC YARDS			CUBIC YARDS			CUBIC YARDS					CLASS	CUBIC YARDS		CLASS	LIN. FT.			LIN. FT.			EACH			LIN. FT.				EACH										
			UNCL	EMBANK	UNCL DITCH	●																																			
472+00 472+40 477+00	Remove 12"x24 Iron Pipe Rt. Road Relocation- See Sheet #71 Cross Culvert with Std Hdwl Rt-Ditch #13 B Conc. Inlet	1			25	107			62			6		4.00		252											92				1										
484+00	Median Drain - Ditch #13 Conc. Inlet (H=3.0)				60	31			28			3		0.83		84				50												1									
490+30	Cross Culvert					50			102			10														128				2											
491+00 498+00	Median Drain #13 Conc. Inlet (H=3.0) Median Drain - Ditch #13 Conc. Inlet (H=3.0)					12			6			1		0.83		84				56			1									1									
					5	23			18			2		0.83		84				52			1									1									
504+00 to 506+00	Ditch (W=3)				244																																				
505+00	Median Drain #13 Conc. Inlet (H=3.0)					25			19			1		0.83		84				50			1										1								
512+00	Median Drain #13 Conc. Inlet (H=3.0)					7			15			1		0.83		84				54			1										1								
519+00	Median Drain - Ditch #13 Conc. Inlet (H=3.0)				5	7			15			2		0.83		84				48			1										1								
526+05 526+50 to 527+00	Median Drain #13 Conc. Inlet (H=3.0) Relocate Transmission Lines & Poles (Working Right-of-Way 20')					4			16			3		0.83		84				56			1										1								
531+75 536+25 531+50	Double 14"x10" HDPE Culvert - See Sheet #8 Remove 12"x24" B.C. Culvert Median Drain #13 Conc. Inlet (H=3.5)					61			473			47		5490		55,430																		Remove 12"x24" B.C. Culvert							
537+00	Median Drain #13 Conc. Inlet (H=3.0)				15	24			30			3		0.83		84				68			1										1								
544+00	Median Drain - Ditch #13 Conc. Inlet (H=3.0)				15	19			22			2		0.83		84				60			1										1								
552+00 551+00	Double 14"x10" HDPE Culvert - See Sheet #8 Relocate 12"x24" B.C. Culvert Median Drain #13 Conc. Inlet (H=3.0)				15	146			78			9		540		84				56			1				1196*						1	Relocate 12"x24" B.C. Culvert							
						12			55			6		0.83		84				36			1				1196*						1								
558+00	Median Drain - Ditch #13 Conc. Inlet (H=3.0)				10	29			23			2		0.83		84				68			1										1								
564+00	Median Drain #13 Conc. Inlet (H=3.5)					10			23			2		0.93		100				60			1										1								
565+50 574+00	Cross Culvert Median Drain - Ditch #13 Conc. Inlet (H=3.0)				5	17			98			10														132				2			1								
576+40	Underpass - See Sheet #72					43			38			4		0.83		84				78			1										1								
580+50 581+70	Median Drain #13 Conc. Inlet (H=3.0) Cross Culvert					8			15			2		0.83		84				52			1										1								
						33			126			13															172*				2										
588+00 592+00	Cross Culvert - Ditch #13A Conc. Inlet (H=4.5) Cross Culvert				5	24			43			4		1.15		189									92				2				1								
						53			70			7														135				2											

* Extra strength

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION				STRUCTURAL EXCAVATION				STRUCTURE BACKFILL				MECH. TAMPING HR.	GRAVEL OR CR. ROCK SURF. TON	CONCRETE		REINF. STEEL LBS.	CORRUGATED METAL SIPHON PIPE LIN. FT.			CORRUGATED METAL CULVERT PIPE LIN. FT.			METAL APRON FOR CORRUGATED METAL PIPES EACH				REINFORCED CONC. CULVERT PIPE LIN. FT.				CONC. FLARED END SECTION EACH				GRATING AND FRAME FOR NO. 13 INLETS	MISCELLANEOUS
			CUBIC YARDS				CUBIC YARDS				CLASS						CUBIC YARDS																						
			UNCL.	EMBANK.	UNCL. DITCH						I						A	B		24"	30"	42"	18"	24"	18"	24"	24"	30"	36"	42"	24"	30"	36"	42"					
592+95	Median Drain-Ditch				5	15						10			1		83	84				56										1							
597+85	#13 Conc. Inlet (H=3.0) Cross Culv.-Ditch				5	33						63			6		108	64						156							2		1						
603+00	Median Drain					7						15			5			84				50										1							
608+20	#13 Conc. Inlet (H=3.0) Median Drain					6						14			2		83	84														1							
608+20	#13 Conc. Inlet (H=3.0)																															1							
597+00 to 607+00	Relocate Trans. Lines and poles At By Public Ser. Co. Force Account					15						36			4									92							2		1						
613+50	Cross Culv.																15	169														1							
619+80	#13A Conc. Inlet (H=4.5) 12'x4'x109 C.B. Culvert-Ditch (W=6) See Sheet 18			50								253			25		190.0	13,345														1							
620+50	Median Drain-Ditch-#13 Conc. Inlet (H=3.0)					15						10			1		83	84				56										1							
628+00	Relocate and re-align power lines and poles At R.T. Force Account					5						126			13		72	664																					
634+00	By Mutual Service Co. 12'x4'x106 C.B. Culvert-Ditch (W=6) See Sheet 18					160						44			4									12							2								
636+20	Cross Culvert Ditches W=2'					74						41			4									104							2								
641+30	Cross Culvert																																						
643+35	Median Drain											10			2		83	84				56																	
643+35	#13 Conc. Inlet (H=3.0)																																						
643+35	Cross Culv. #13 Conc. Inlet (H=3.0)																																						
643+35	Cross Culv. #13 Conc. Inlet (H=3.0)																																						
643+35	Cross Culv. #13 Conc. Inlet (H=3.0)																																						
643+35	Cross Culv. #13 Conc. Inlet (H=3.0)																																						
643+35	Cross Culv. #13 Conc. Inlet																																						

LIST OF STRUCTURES

STATION	DESCRIPTION	REMOVE STRUCTURE NO.	EXCAVATION			STRUCTURAL EXCAVATION			STRUCTURE BACKFILL			MECH. TAMPING HR.	GRAVEL OR CR. ROCK SURF. TON	CONCRETE		REINF. STEEL LBS.	CORRUGATED METAL SIPHON PIPE			CORRUGATED METAL CULVERT PIPE			METAL APRON FOR CORRUGATED METAL PIPES			REINFORCED CONC. CULVERT PIPE				CONC. FLARED END SECTION				GRATING AND FRAME FOR NO.13 INLETS	MISCELLANEOUS
			CUBIC YARDS			CUBIC YARDS			CUBIC YARDS					CUBIC YARDS			LIN. FT.			LIN. FT.			EACH			LIN. FT.				EACH					
			UNCL.	EMBANK	UNCL. DITCH	●			1					A	B		24"	30"	42"	18"	24"	30"	18"	24"	30"	24"	30"	36"	42"	24"	30"	36"	42"		
7+30 7+28 350+00 to 390+00 Rt.	Relay 12"x12" C.M.P. headgate - ditch Rt. 4"x2"x87" C.B. Culvert - See C.S.H.D. Std. M-103-G Highway #170 Relocation	1			5	2			1			1				362		450.6																	
353+90 375+55 381+00	Cross Culvert - Ditches Cross Culvert - Ditches Cross Culvert - Ditches				7 10 10	16 15 9			14 12 12			1 1 1									34 32 32		2 2 2												
390+15 406+87 5+56 "A"	Cross Culvert - Ditches Grade Separation Cross Culvert				10	18			13			1									32		2												
2+95 "B" 8+90 "B" 3+00 "D"	Cross Culvert - Ditches Cross Culvert Cross Culvert - Ditch				13 25 22	15 24 10			34 20 21			3 2 2								46	96 58		2 2												
3+00 "E" 472+40 1+30	Cross Culvert - Ditch Grade Separation Remove 18"x30" C.M.P. Culvert	1			30	11			15			2									42		2												
1+30 5+28 5+56	Cross Culvert Cross Culvert - Ditch (W-2) Cross Culvert - Ditch (W-2)					74 63 63			27 55 56			3 6 6									32 58 62		2 2 2												
7+86 11+85	Cross Culvert Cross Culvert - Entry					67 35			54 43			5 4									72 46		2 2												
11+58 576+40 6+36.7	Remove 12"x25"x28" W.B.C. Grade Separation Cross Culvert						32		12			1									44		2												
9+56.4 647+00 to 654+00	Cross Culvert Reinforcing Dry Creek Valley (W-10)						32		12			1									44		2												
655+40 14+00 "A" 46+50 "A"	Interchange Cross Culvert Cross Culvert					5 5			47 51			5 5														92* 100*			2 2						
22+00 "A" 3+50 "B" 6+00 "B"	Cross Culvert - Ditch Cross Culvert - Ditch 6"x4"x89" C.B. Culvert - For details see C.S.H.D. Std. M-103-G				10 530	27 60 398			16 54 146			15													48 64			2 2							
9+15 "C" 6+10 "D" 2+40 "D" 4+70 "E" 5+60 "F"	6"x4"x83.5" C.B. Culvert - See C.S.H.D. Std. M-103-G 6"x6"x142.75" C.B. Culvert - See C.S.H.D. Std. M-103-G Cross Culvert Cross Culvert - Ditch Cross Culvert					130			168			17 19 4 1 4		500 65.6 109.6		3204 7036 11386									116* 32 96*			2 2 2							
434+6 "F" 3+30 4+40 9+85	Cemetery Access Road Cross Culv. Cross Culv. Cross Culv.					2 2 1			12 10 10			1 1 1									45 38 36		2 2 2												
12+00 19+40 19+32 to 20+00 19+60	Cross Culv. Cross Culv. - Ditches Ditch (W-5.5) 16 Wide Cattle Guard, Slotted Type				15 30	1 5			6 10			1 1									22		2			2									
19+85 21+00 22+00 23+00 28+08	Cross Culv. Cross Culv. Cross Culv. Cross Culv. - Ditch Cross Culv. - Ditches					1 1 1 12 1			5 11 11 14 1			1 2 2 2 1									26 12 27 26 22		2 2 2 2 2												
																																Dry Rubble 7 thick, 49 sq. yds.			

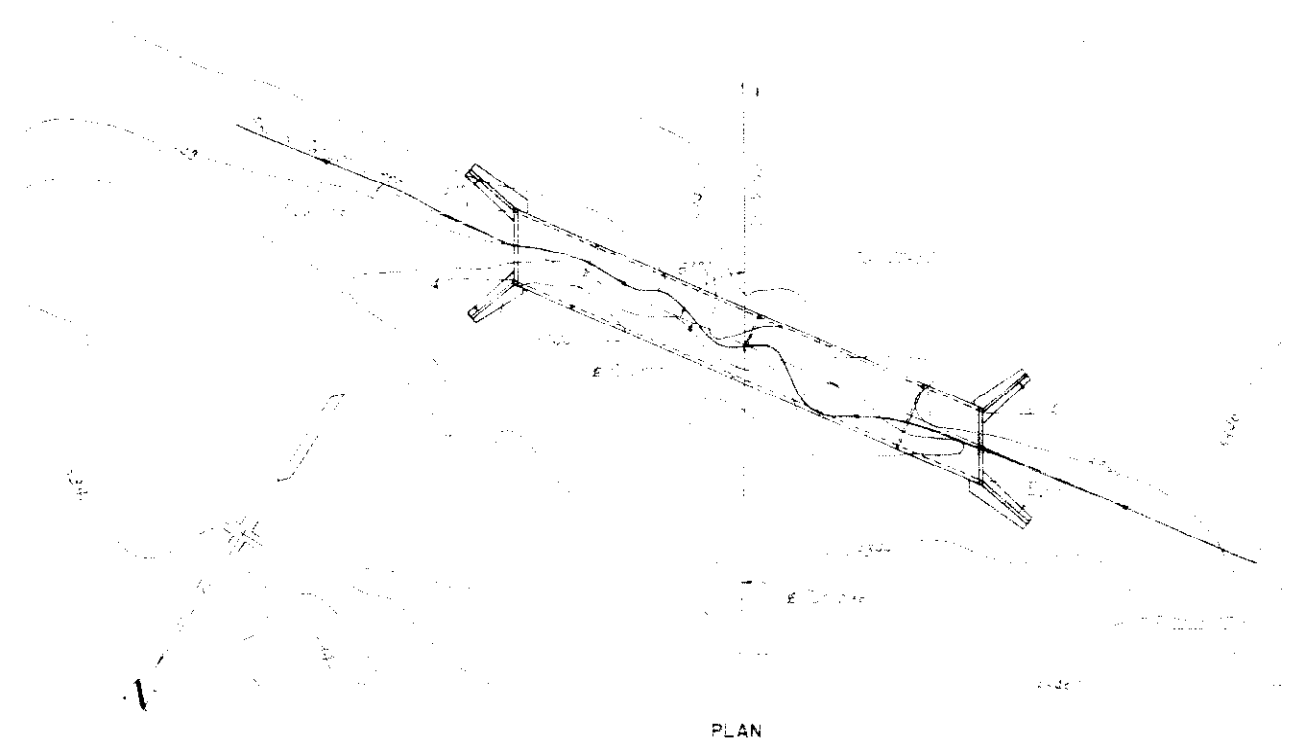
● Structural excavation is estimated to be 90% Common and 10% Rock, each of which is paid for at 75% City and 25% Hwy.

TOTALS 14 97.7 4875 7692 1154 1132 515 358 244 1024 255 122 3934 916 81 42 1781 754 212 596 29 4 6 4 88

* 30" C.M.P. = 25
* 42" C.M.P. = 348
* 30" Aprons = 6
* 42" Aprons = 2

* Extra Strength

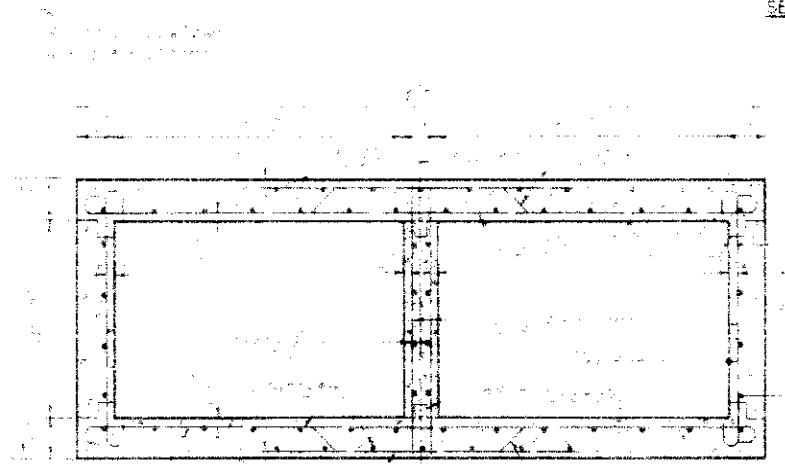
Dry Rubble 7" thick 49 sq. yds.
Flash Boards - 14
4 Valves and Valve Boxes, 7
6 Valves and Valve Boxes, 3
4" Drain Pipe - 1730'
6" Drain Pipe - 880'



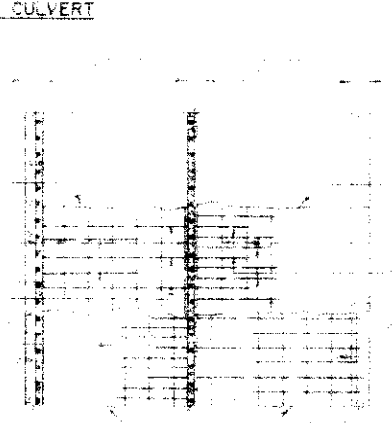
PLAN



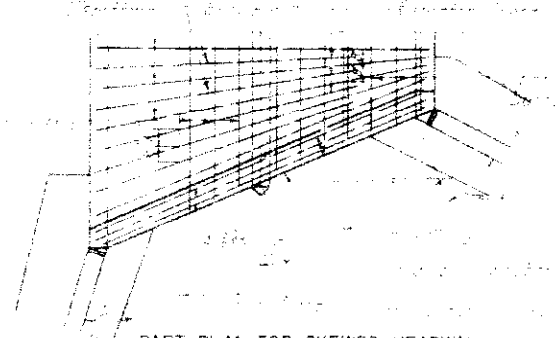
SECTION ALONG & CULVERT



TYPICAL SECTION THRU BOX



TYPICAL PLAN

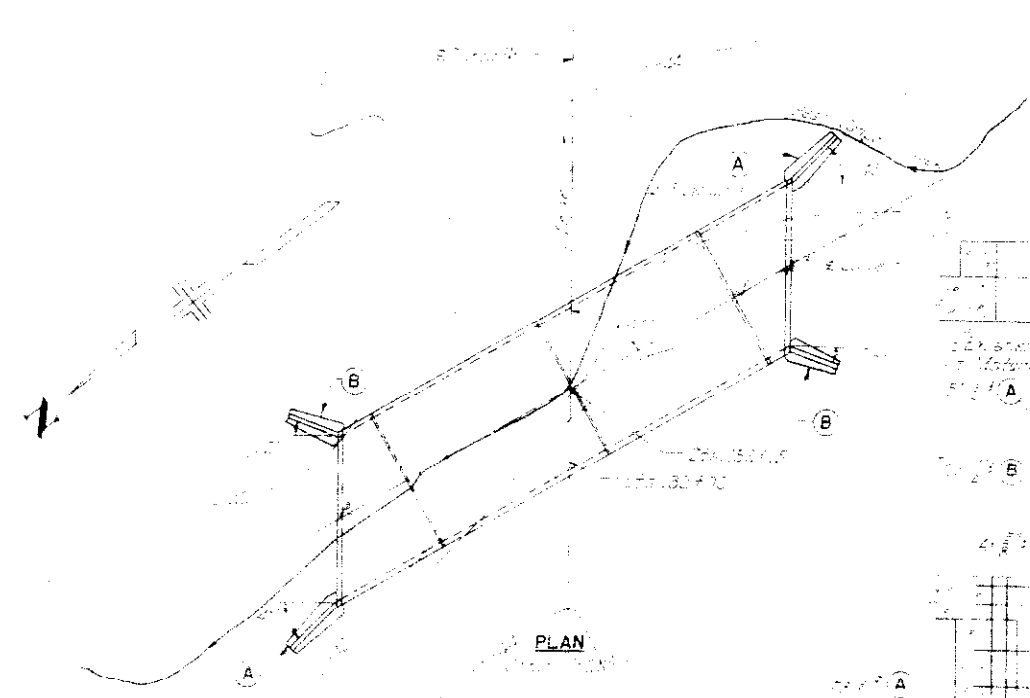


PART PLAN FOR SKEWED HEADWALL

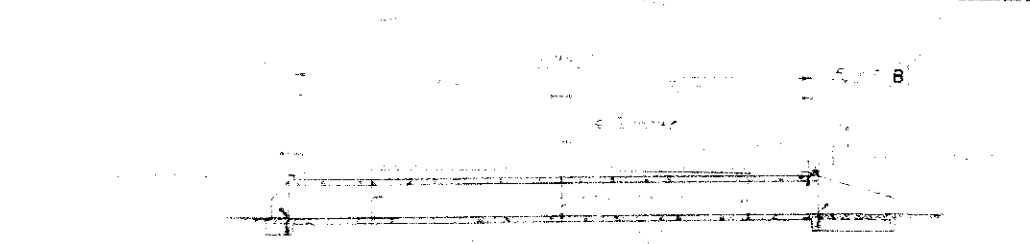
REINFORCEMENT BAR LIST			
1	4	10	10
2	4	10	10
3	4	10	10
4	4	10	10
5	4	10	10
6	4	10	10
7	4	10	10
8	4	10	10
9	4	10	10
10	4	10	10

QUANTITIES	
CONCRETE	10.0
REINFORCEMENT	10.0
PAVEMENT	10.0
GRASS	10.0
WATER	10.0

DOUBLE 6x4 BOX CULVERT AT STA 100+90



PLAN

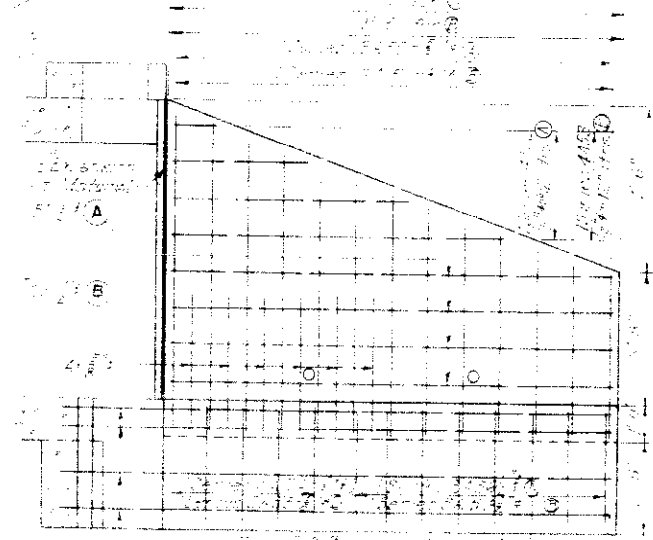


SECTION ALONG & CULVERT

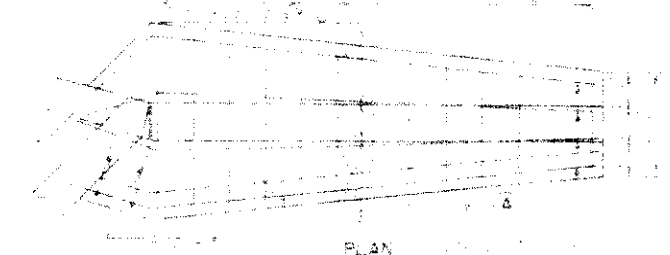
REINFORCEMENT BAR LIST			
1	4	10	10
2	4	10	10
3	4	10	10
4	4	10	10
5	4	10	10
6	4	10	10
7	4	10	10
8	4	10	10
9	4	10	10
10	4	10	10

QUANTITIES	
CONCRETE	10.0
REINFORCEMENT	10.0
PAVEMENT	10.0
GRASS	10.0
WATER	10.0

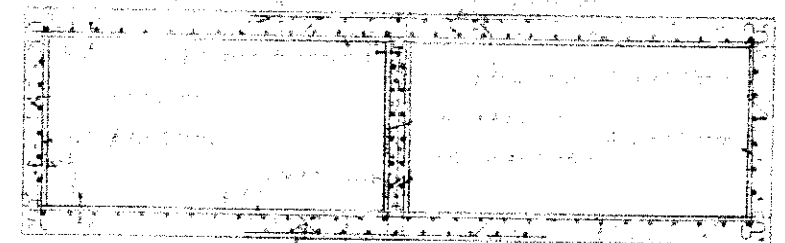
DOUBLE 14x7 BOX CULVERT AT STA 132+15



TRUE ELEVATION OF WINGWALL



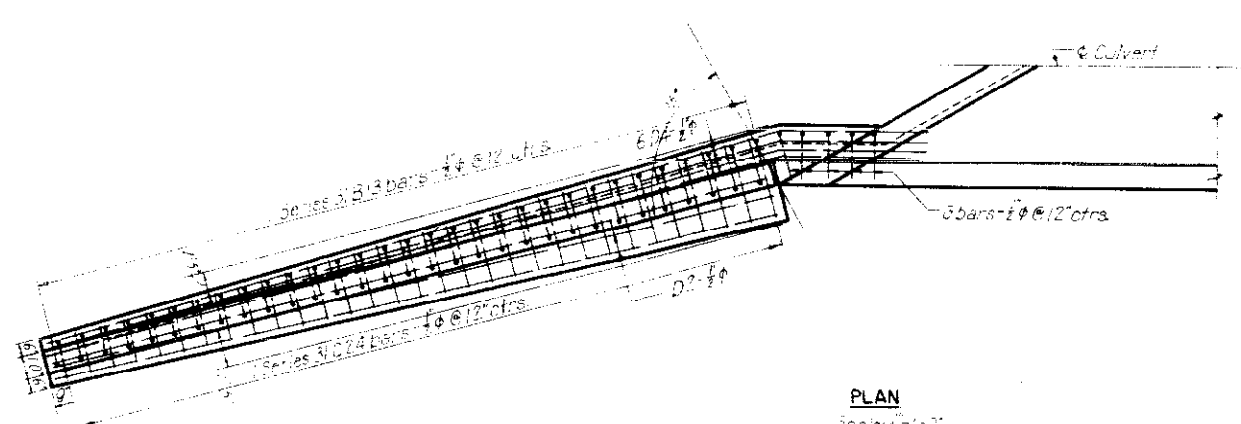
PLAN



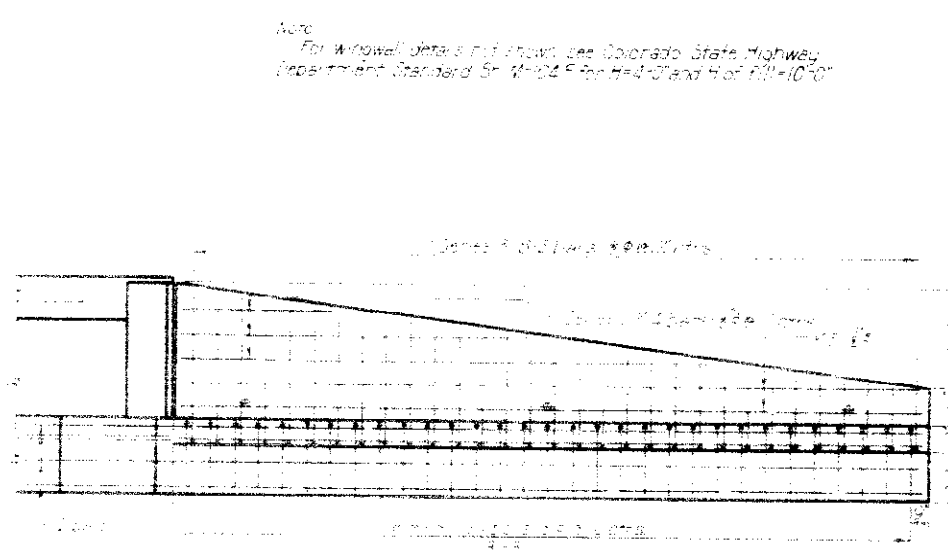
TYPICAL SECTION THRU BOX



PLAN
Scale: 1"=20'



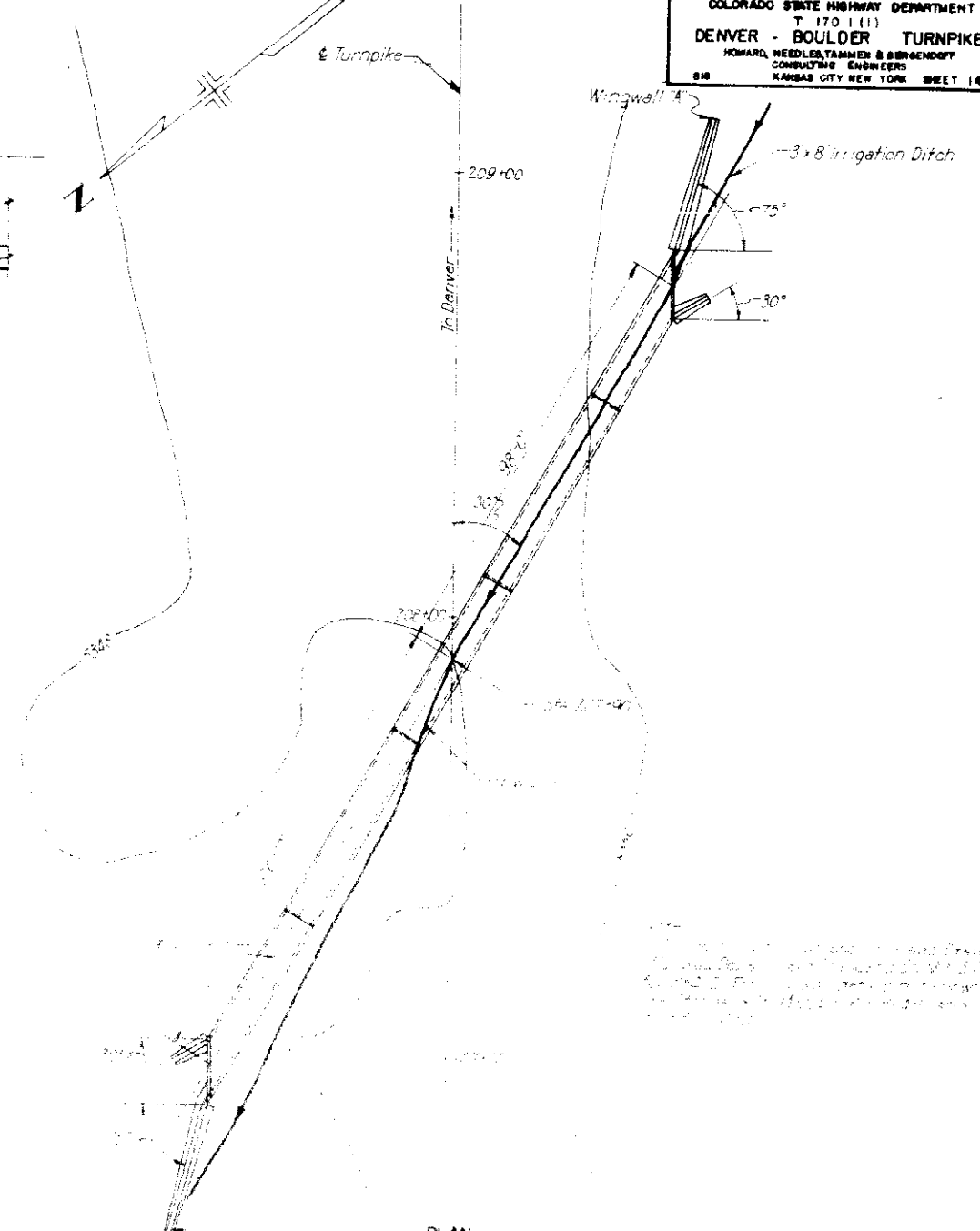
PLAN
Scale: 1"=20'



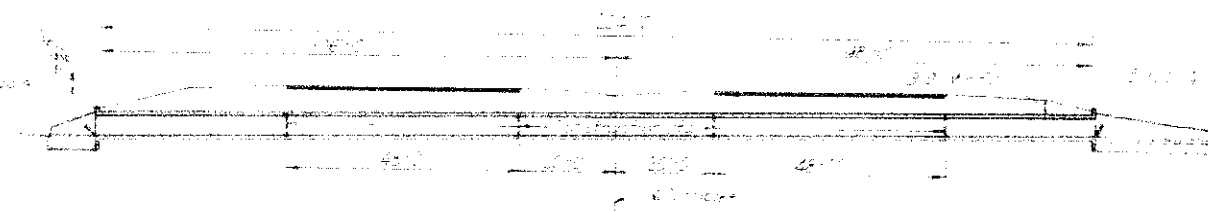
TRUE ELEVATION OF WINGWALL
Scale: 1"=10'

REINFORCEMENT BAR LIST WINGWALL "A"									
NO.	SIZE	LENGTH	QUANTITY	TYPE	NO.	SIZE	LENGTH	QUANTITY	TYPE
1	#4	14'-0"	1	Top	11	#4	14'-0"	1	Top
2	#4	14'-0"	1	Top	12	#4	14'-0"	1	Top
3	#4	14'-0"	1	Top	13	#4	14'-0"	1	Top
4	#4	14'-0"	1	Top	14	#4	14'-0"	1	Top
5	#4	14'-0"	1	Top	15	#4	14'-0"	1	Top
6	#4	14'-0"	1	Top	16	#4	14'-0"	1	Top
7	#4	14'-0"	1	Top	17	#4	14'-0"	1	Top
8	#4	14'-0"	1	Top	18	#4	14'-0"	1	Top
9	#4	14'-0"	1	Top	19	#4	14'-0"	1	Top
10	#4	14'-0"	1	Top	20	#4	14'-0"	1	Top

* For 6' x 4' box culvert only
* for 8' x 4' box culvert only
Note:
See the used M. 101-A, 101-B, and Standard M. 101-C
for bending diagrams and reinforcement details.
Also see 101-A for steel reinforcement details and 101-B
for details of 8' x 4' and 10' x 4'.



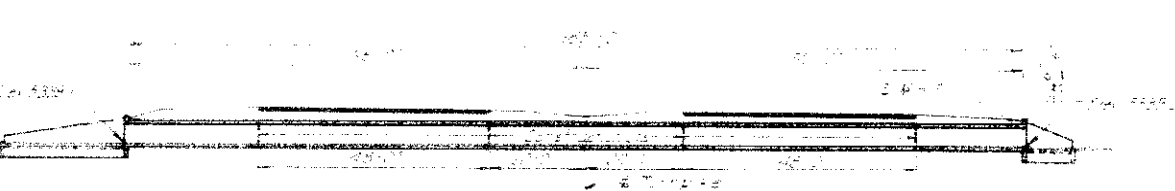
PLAN
Scale: 1"=20'



SECTION ON & CULVERT
Scale: 1"=10'

QUANTITIES			
Item	Concrete	Steel	Structure
Box	100	1.00	Excavation
Wingwall	20	0.00	Excavation
Total	120	1.00	132

Steel quantities include 1% for corrosion.



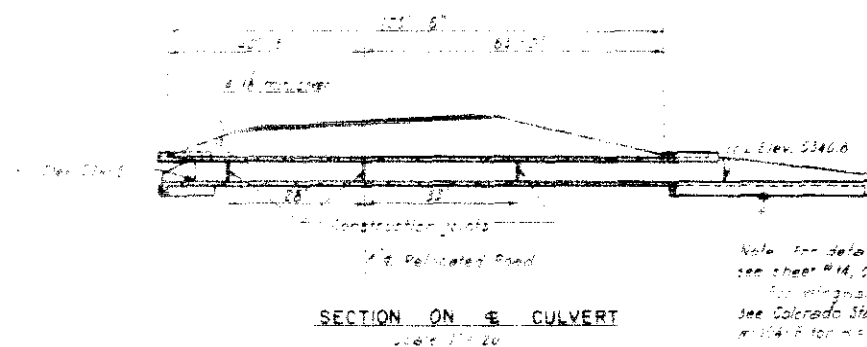
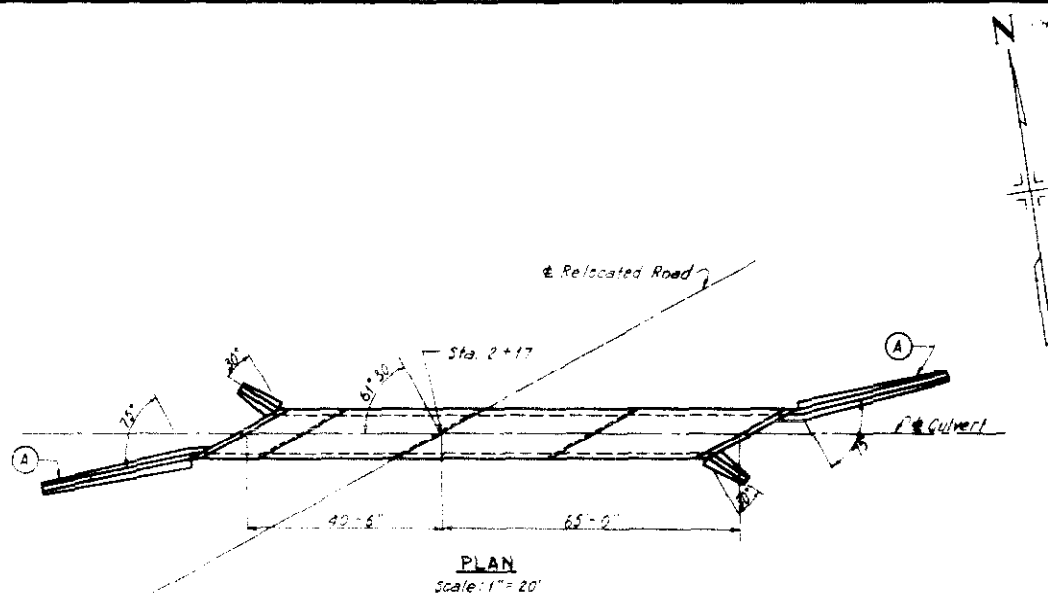
SECTION ON & CULVERT
Scale: 1"=10'

QUANTITIES			
Item	Concrete	Steel	Structure
Box	100	1.00	Excavation
Wingwall	20	0.00	Excavation
Total	120	1.00	132

Steel quantities include 1% for corrosion.

8' x 4' BOX CULVERT AT STA 185+75
(Anderson Extension Ditch)

6' x 4' BOX CULVERT AT STA 207+90



Note: For details of wingwall "B" see sheet R14, Culvert at Sta. 185+75. For wingwall detail not shown see Colorado State Highway Standard M-104-F for H=4'-0" and H of 10'-0".

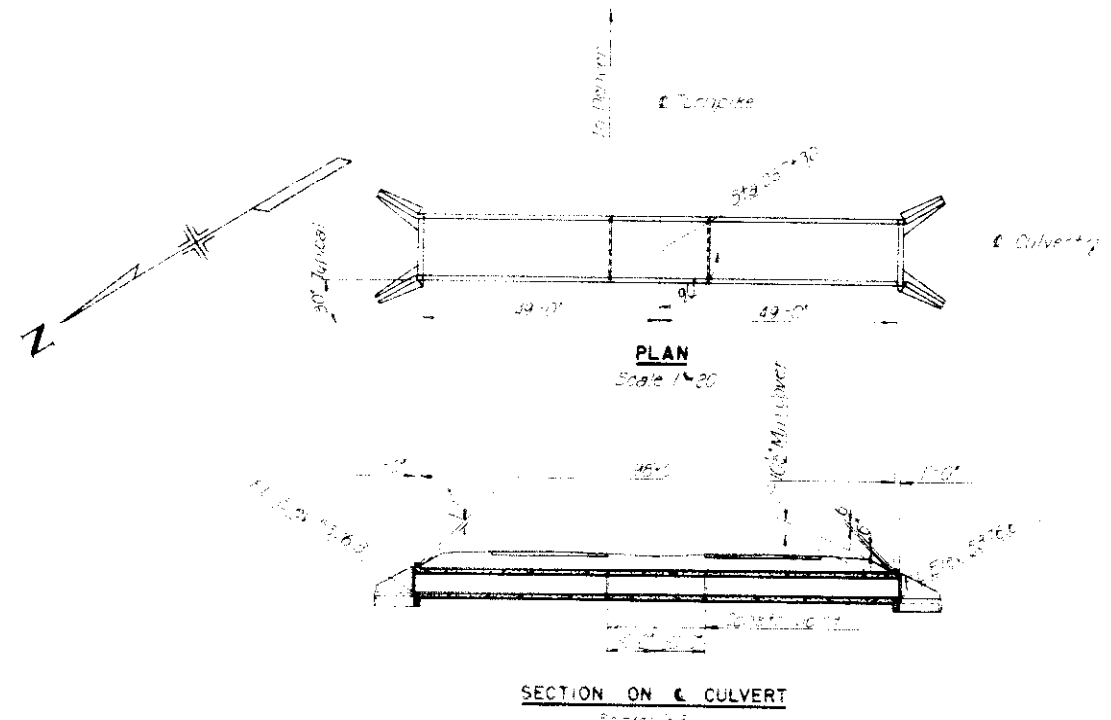
QUANTITIES			
ITEM	CONCRETE CU YDS.	STEEL LBS.	STRUCTURAL EXCAVATION CU YDS.
Box	36.4	5260	36
Wingwalls	21.2	1700	5
Total	57.6	6960	41

Steel quantities given above include an allowance of 10% for overlap.

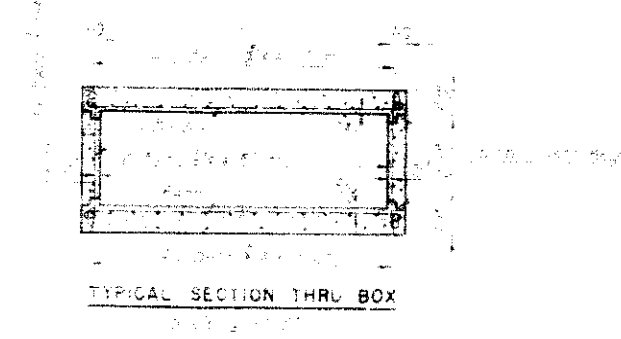
REINFORCEMENT BAR LIST FOR WINGWALL "A"						
MARK	SIZE	NO. REQS.	P	G	TOTAL LENGTH	TYPE
B13	1"	32	10'-0"	1'-4"	3'-0" to 7'-8"	III
B24	1"	16	10'-0"	1'-4"	3'-0" to 7'-8"	III
B2	1"	8	10'-0"	1'-4"	3'-0" to 7'-8"	I
B5	1"	8	10'-0"	1'-4"	3'-0" to 7'-8"	I
B1	1"	32	10'-0"	1'-4"	3'-0" to 7'-8"	III
B4	1"	24	10'-0"	1'-4"	3'-0" to 7'-8"	I
K14	1"	4	10'-0"	1'-4"	3'-0" to 7'-8"	I
K13	1"	8	10'-0"	1'-4"	3'-0" to 7'-8"	I

See Standard M-104-F for H=4'-0" and Standard M-103-B for bending diagrams and bar list not shown.

8 x 4 BOX CULVERT STA. 180+10 ± RIGHT
(See Anderson Extension Ditch under County Road Relocation)

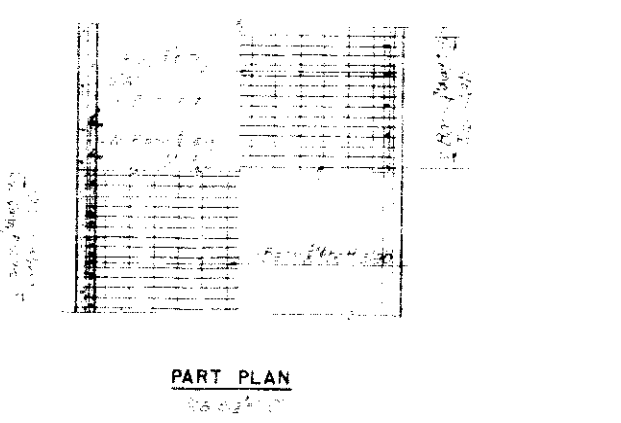


Notes:
 1. Reinforcement is shown in plan and section. Details of reinforcement are shown in the reinforcement bar list.
 2. The culvert is to be constructed of concrete and is to be reinforced with steel reinforcement bars.

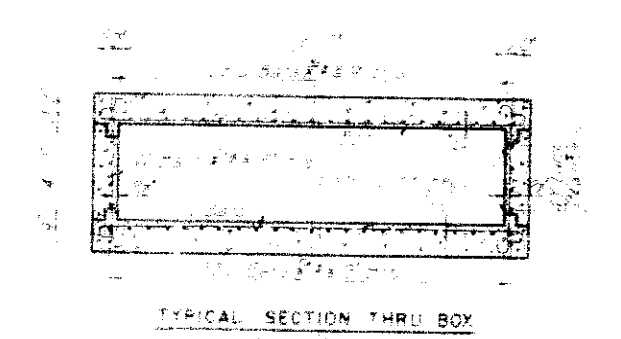
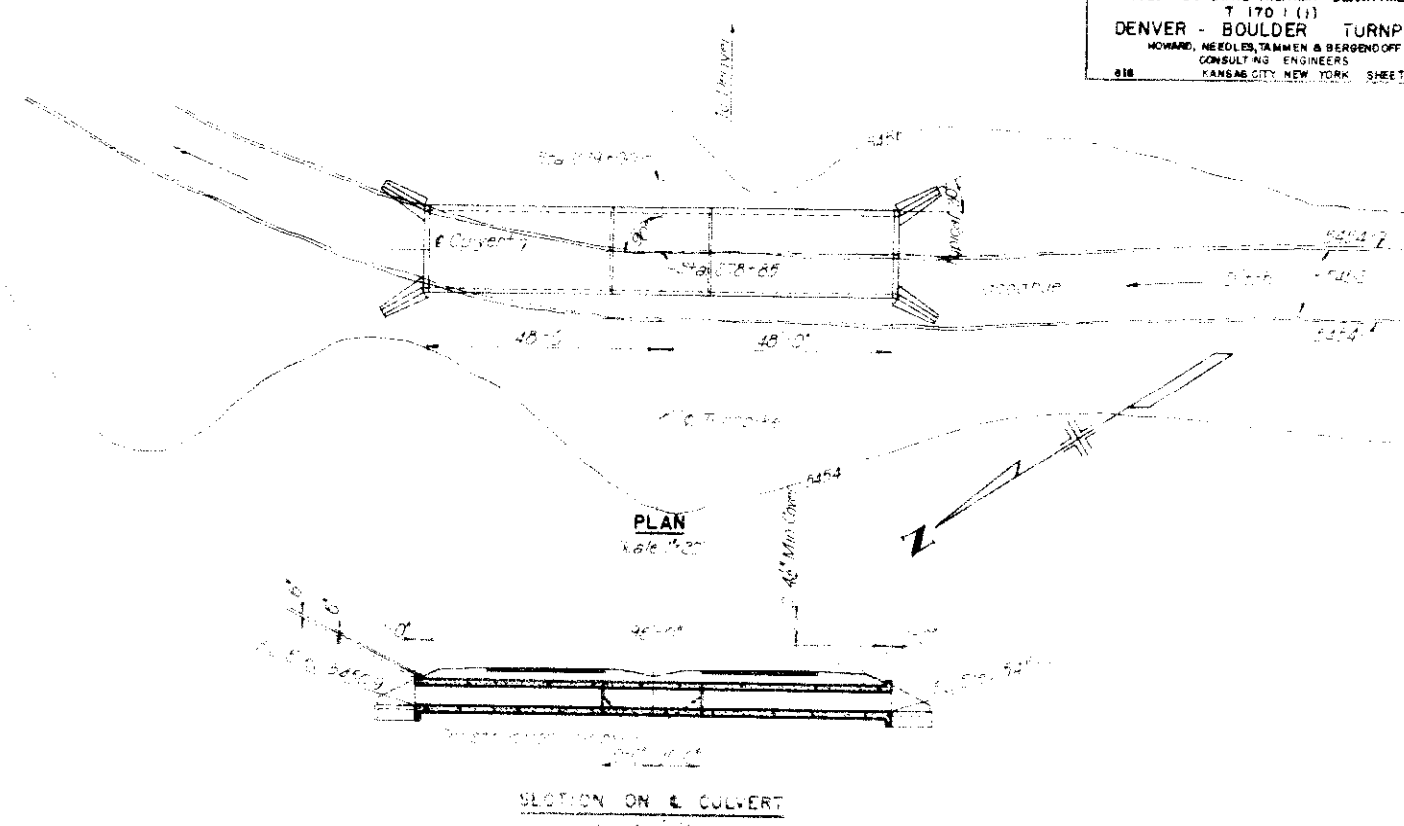


REINFORCEMENT BAR LIST
1. Top Bars: 4 #4
2. Bottom Bars: 4 #4
3. Side Bars: 4 #4
4. End Bars: 4 #4
5. Diagonal Bars: 4 #4
6. Cross Bars: 4 #4
7. Stirrups: 4 #4
8. Lap Bars: 4 #4
9. Lap Bars: 4 #4
10. Lap Bars: 4 #4
11. Lap Bars: 4 #4
12. Lap Bars: 4 #4
13. Lap Bars: 4 #4
14. Lap Bars: 4 #4
15. Lap Bars: 4 #4
16. Lap Bars: 4 #4
17. Lap Bars: 4 #4
18. Lap Bars: 4 #4
19. Lap Bars: 4 #4
20. Lap Bars: 4 #4

QUANTITIES
Concrete: 100 cu yd
Reinforcement: 100 lbs
Gravel: 100 cu yd
Sand: 100 cu yd
Water: 100 gal
Oil: 100 gal
Paint: 100 gal
Formwork: 100 sq ft
Tools: 100 set
Labor: 100 hr
Transportation: 100 mi
Other: 100

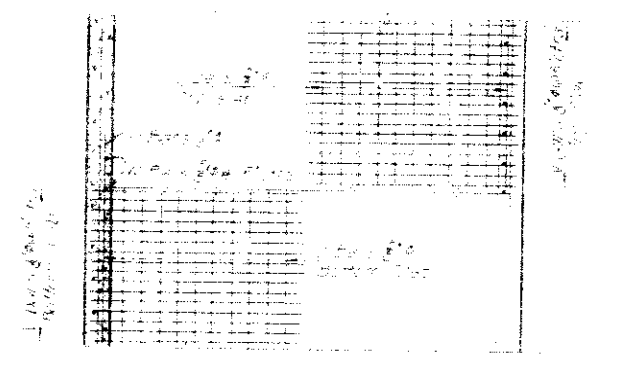


12'x4' BOX CULVERT AT STA. 237+30

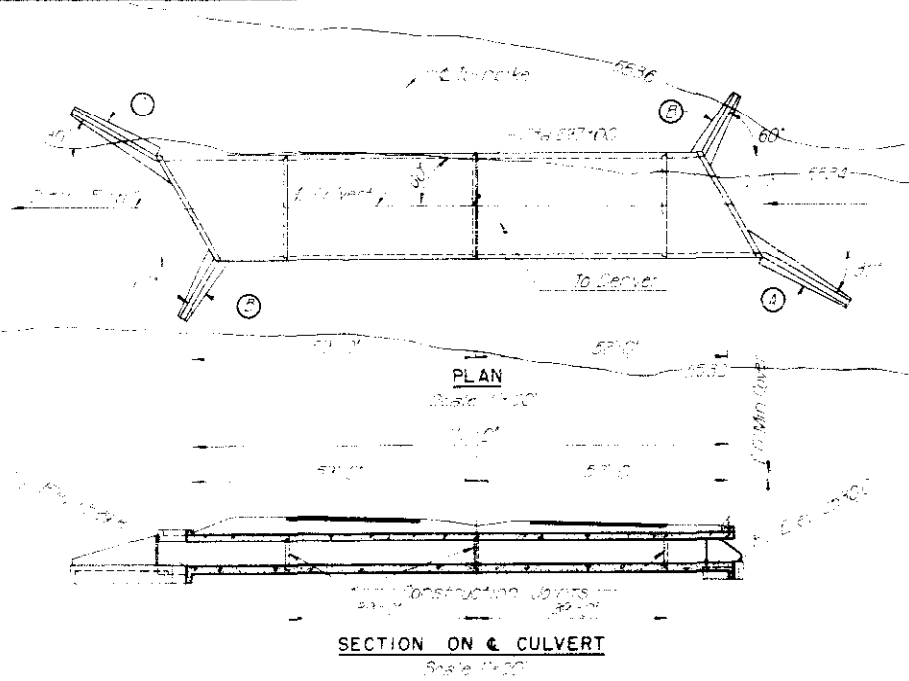


REINFORCEMENT BAR LIST
1. Top Bars: 4 #4
2. Bottom Bars: 4 #4
3. Side Bars: 4 #4
4. End Bars: 4 #4
5. Diagonal Bars: 4 #4
6. Cross Bars: 4 #4
7. Stirrups: 4 #4
8. Lap Bars: 4 #4
9. Lap Bars: 4 #4
10. Lap Bars: 4 #4
11. Lap Bars: 4 #4
12. Lap Bars: 4 #4
13. Lap Bars: 4 #4
14. Lap Bars: 4 #4
15. Lap Bars: 4 #4
16. Lap Bars: 4 #4
17. Lap Bars: 4 #4
18. Lap Bars: 4 #4
19. Lap Bars: 4 #4
20. Lap Bars: 4 #4

QUANTITIES
Concrete: 100 cu yd
Reinforcement: 100 lbs
Gravel: 100 cu yd
Sand: 100 cu yd
Water: 100 gal
Oil: 100 gal
Paint: 100 gal
Formwork: 100 sq ft
Tools: 100 set
Labor: 100 hr
Transportation: 100 mi
Other: 100

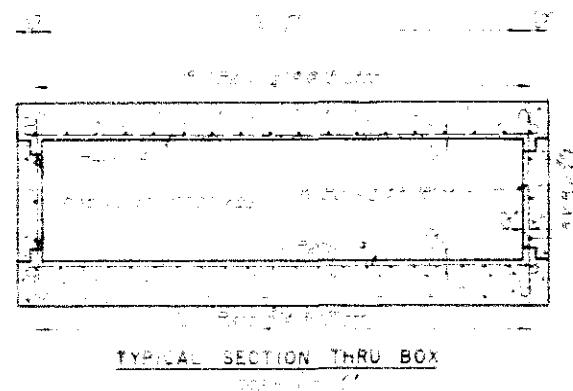


6'x4' BOX CULVERT AT STA. 278+85

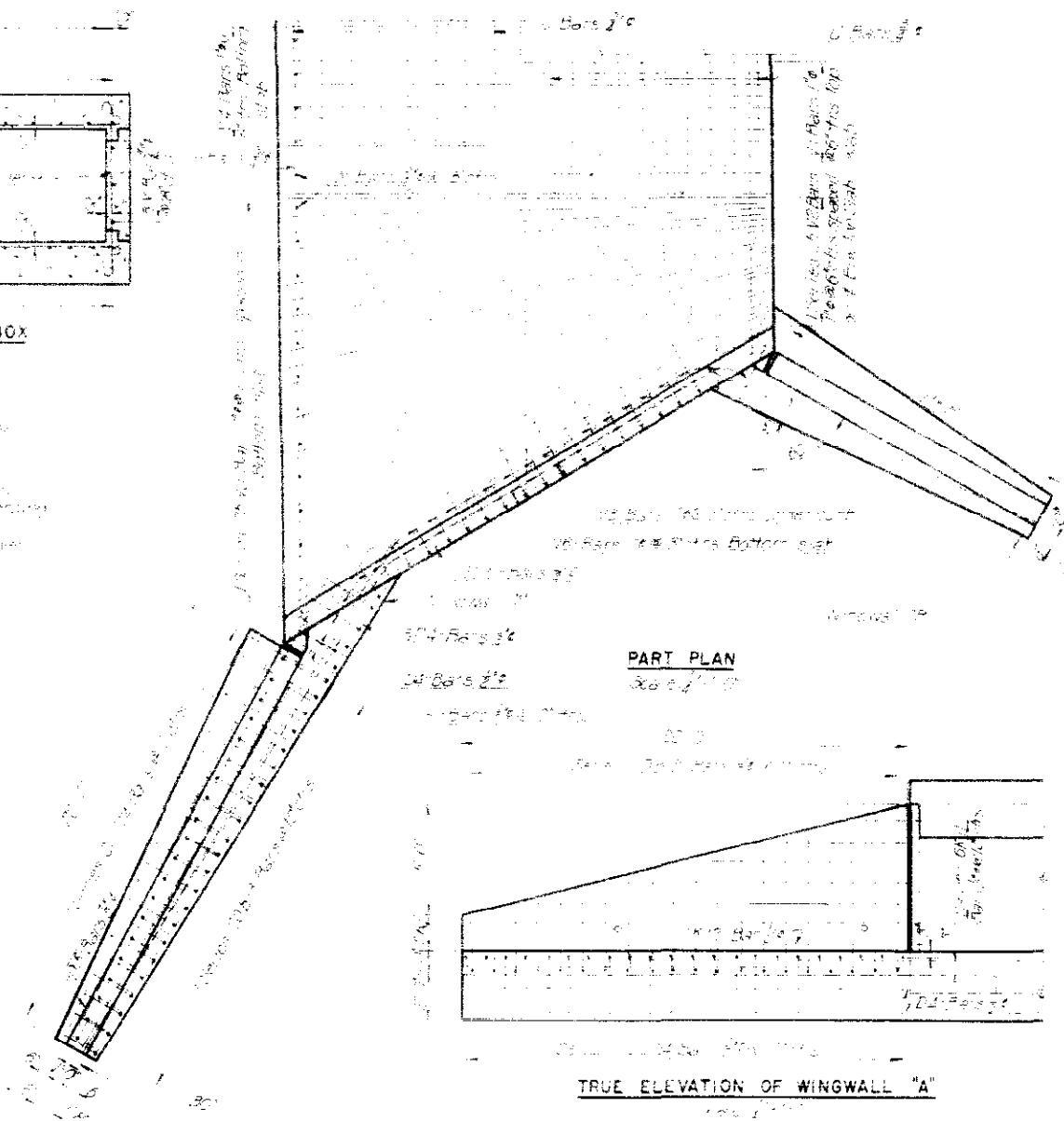


REINFORCEMENT BAR LIST					
Item	No.	Dimensions	Total Length	Notes	Qty
1	2	30'-0"	60'-0"		2
2	2	30'-0"	60'-0"		2
3	2	30'-0"	60'-0"		2
4	2	30'-0"	60'-0"		2
5	2	30'-0"	60'-0"		2
6	2	30'-0"	60'-0"		2
7	2	30'-0"	60'-0"		2
8	2	30'-0"	60'-0"		2
9	2	30'-0"	60'-0"		2
10	2	30'-0"	60'-0"		2
11	2	30'-0"	60'-0"		2
12	2	30'-0"	60'-0"		2
13	2	30'-0"	60'-0"		2
14	2	30'-0"	60'-0"		2
15	2	30'-0"	60'-0"		2
16	2	30'-0"	60'-0"		2
17	2	30'-0"	60'-0"		2
18	2	30'-0"	60'-0"		2
19	2	30'-0"	60'-0"		2
20	2	30'-0"	60'-0"		2
21	2	30'-0"	60'-0"		2
22	2	30'-0"	60'-0"		2
23	2	30'-0"	60'-0"		2
24	2	30'-0"	60'-0"		2
25	2	30'-0"	60'-0"		2
26	2	30'-0"	60'-0"		2
27	2	30'-0"	60'-0"		2
28	2	30'-0"	60'-0"		2
29	2	30'-0"	60'-0"		2
30	2	30'-0"	60'-0"		2

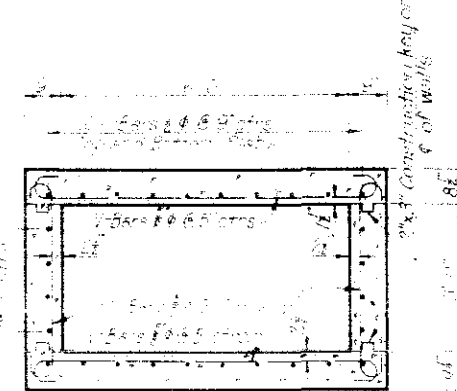
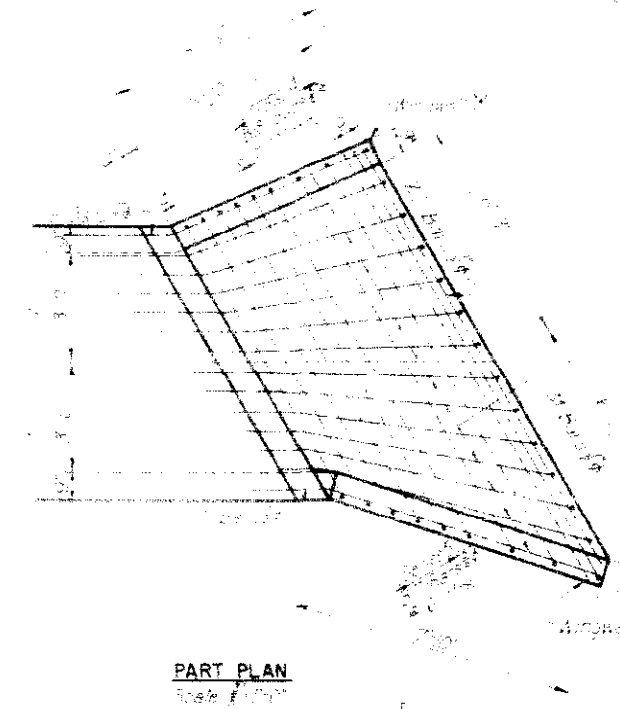
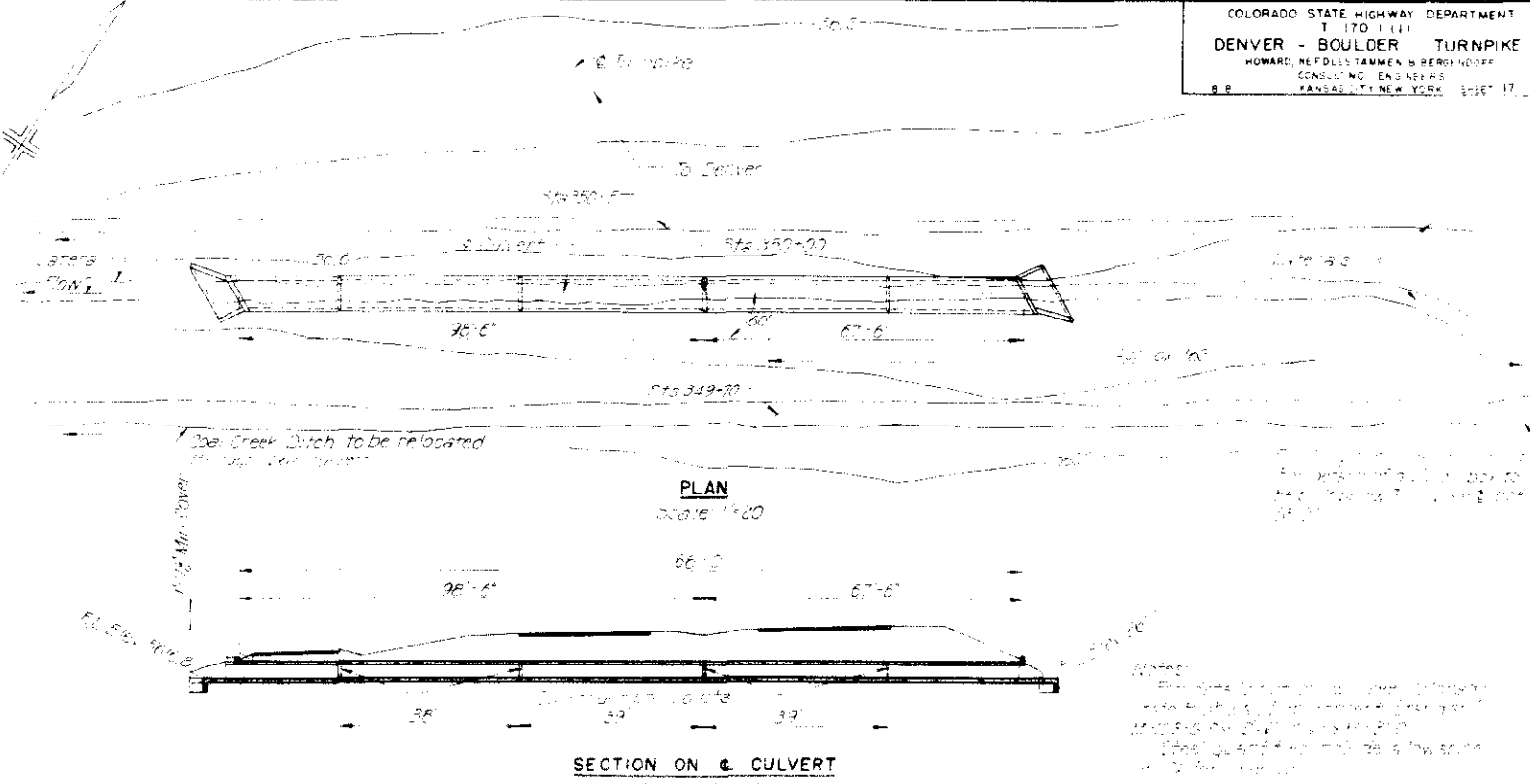
QUANTITIES			
Item	Concrete	Steel	Struct. Exch.
Box	342.6	42,650	183
Wingwall	35.6	2,230	77
Total	378.2	44,880	260



Notes:
1. All dimensions are in feet and inches.
2. All reinforcement is to be placed in accordance with the Reinforcement Bar List.
3. All concrete is to be placed in accordance with the specifications for concrete.
4. All steel is to be placed in accordance with the specifications for steel.
5. All structural steel is to be placed in accordance with the specifications for structural steel.



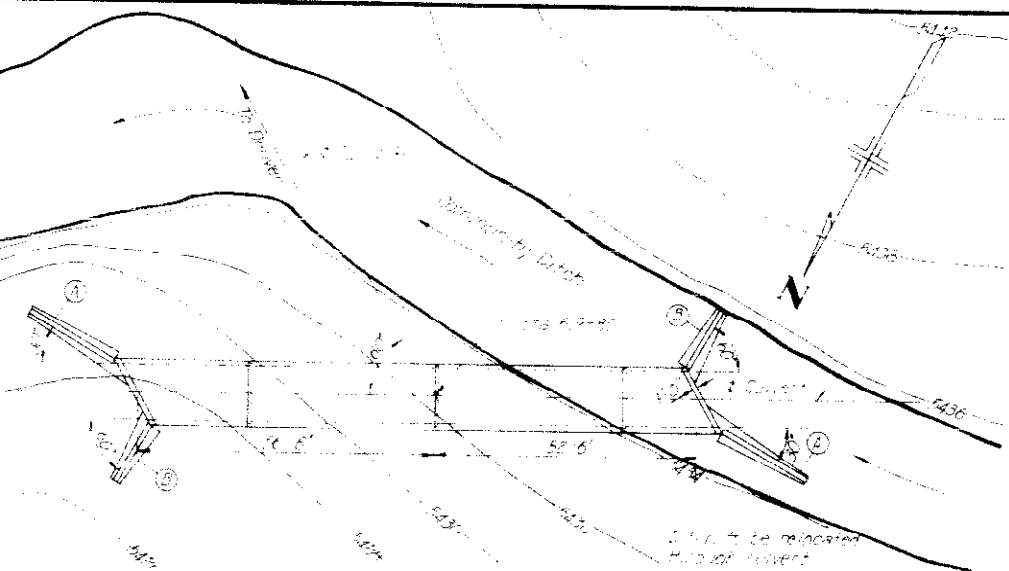
20' X 5' BOX CULVERT AT STA 297+00



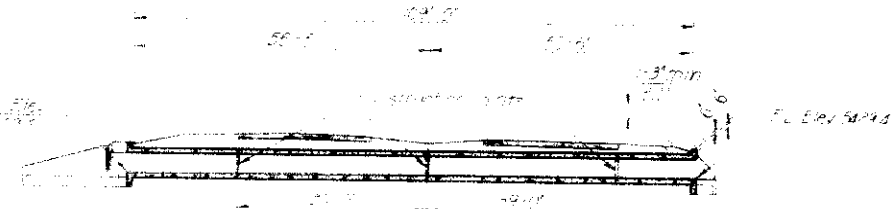
6' X 3' BOX CULVERT AT STA 350+00

REINFORCEMENT BAR LIST					
Item	No.	Dimensions	Total Length	Notes	Qty
1	2	30'-0"	60'-0"		2
2	2	30'-0"	60'-0"		2
3	2	30'-0"	60'-0"		2
4	2	30'-0"	60'-0"		2
5	2	30'-0"	60'-0"		2
6	2	30'-0"	60'-0"		2
7	2	30'-0"	60'-0"		2
8	2	30'-0"	60'-0"		2
9	2	30'-0"	60'-0"		2
10	2	30'-0"	60'-0"		2
11	2	30'-0"	60'-0"		2
12	2	30'-0"	60'-0"		2
13	2	30'-0"	60'-0"		2
14	2	30'-0"	60'-0"		2
15	2	30'-0"	60'-0"		2
16	2	30'-0"	60'-0"		2
17	2	30'-0"	60'-0"		2
18	2	30'-0"	60'-0"		2
19	2	30'-0"	60'-0"		2
20	2	30'-0"	60'-0"		2
21	2	30'-0"	60'-0"		2
22	2	30'-0"	60'-0"		2
23	2	30'-0"	60'-0"		2
24	2	30'-0"	60'-0"		2
25	2	30'-0"	60'-0"		2
26	2	30'-0"	60'-0"		2
27	2	30'-0"	60'-0"		2
28	2	30'-0"	60'-0"		2
29	2	30'-0"	60'-0"		2
30	2	30'-0"	60'-0"		2

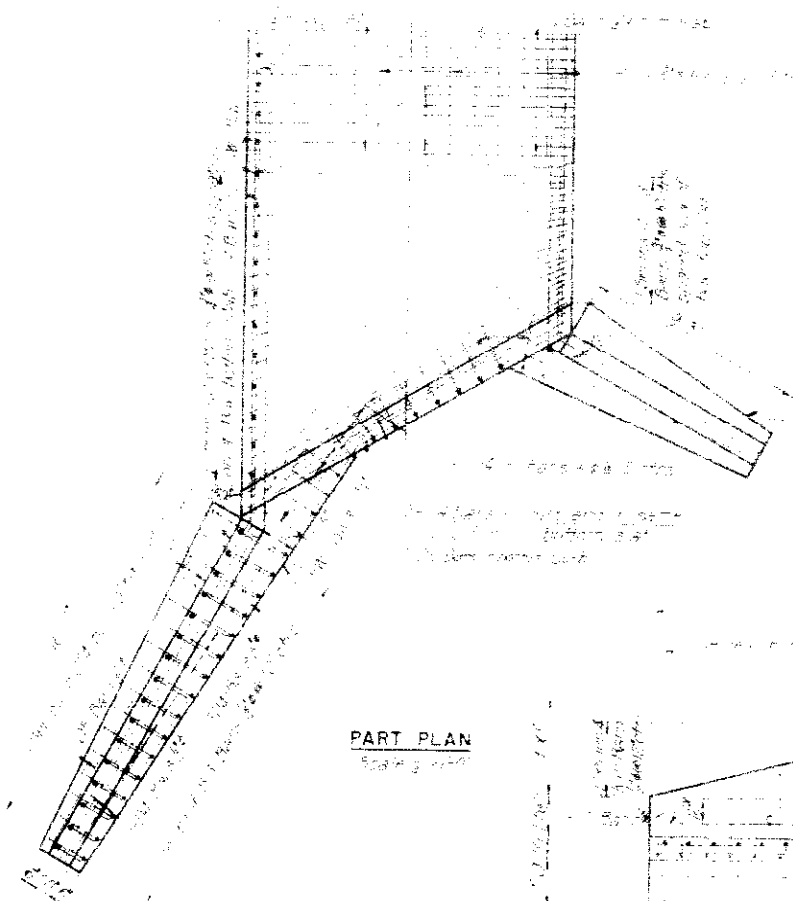
QUANTITIES			
Item	Concrete	Steel	Struct. Exch.
Box	46.4	12,000	49
Wingwall	8.4	600	10
Total	54.8	12,600	59



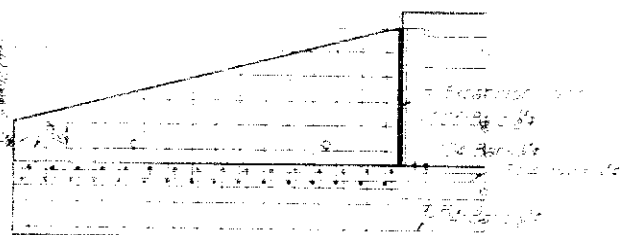
PLAN
Scale 1"=20'



SECTION ON & CULVERT



PART PLAN
Scale 1"=20'



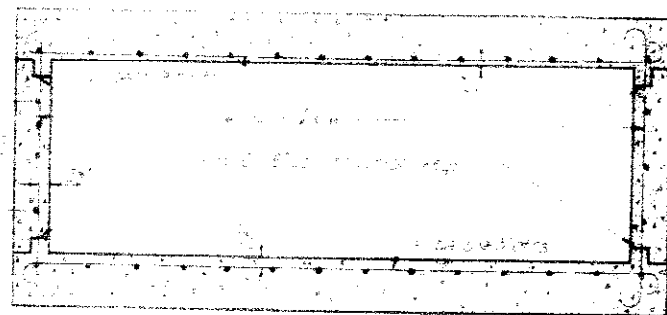
TRUE ELEVATION OF WINGWALL "A"

12'X4' BOX CULVERT AT STA. 619+80

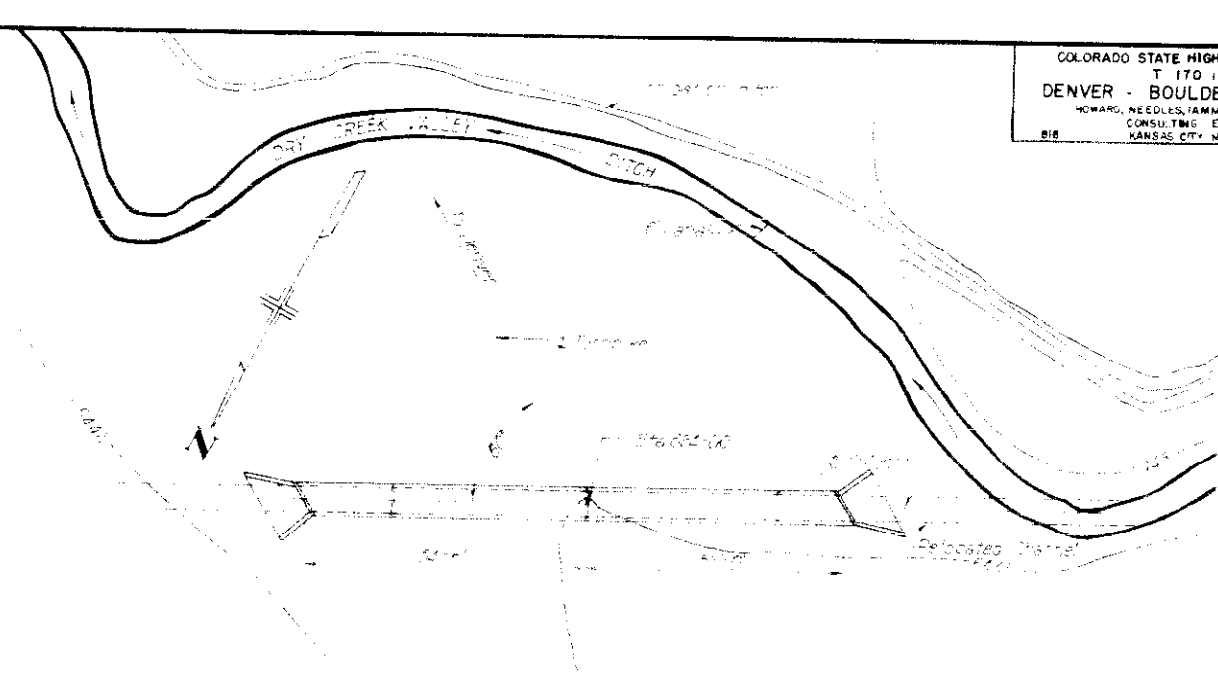
Reinforcement	Bar Size	Dimensions	Total Length	Notes
1	3/8"	38'	140'	
2	3/8"	130'	140'	
3	3/8"	130'	140'	
4	3/8"	130'	140'	
5	3/8"	130'	140'	
6	3/8"	130'	140'	
7	3/8"	130'	140'	
8	3/8"	130'	140'	
9	3/8"	130'	140'	
10	3/8"	130'	140'	
11	3/8"	130'	140'	
12	3/8"	130'	140'	
13	3/8"	130'	140'	
14	3/8"	130'	140'	
15	3/8"	130'	140'	
16	3/8"	130'	140'	
17	3/8"	130'	140'	
18	3/8"	130'	140'	
19	3/8"	130'	140'	
20	3/8"	130'	140'	
21	3/8"	130'	140'	
22	3/8"	130'	140'	
23	3/8"	130'	140'	
24	3/8"	130'	140'	
25	3/8"	130'	140'	
26	3/8"	130'	140'	
27	3/8"	130'	140'	
28	3/8"	130'	140'	
29	3/8"	130'	140'	
30	3/8"	130'	140'	
31	3/8"	130'	140'	
32	3/8"	130'	140'	
33	3/8"	130'	140'	
34	3/8"	130'	140'	
35	3/8"	130'	140'	
36	3/8"	130'	140'	
37	3/8"	130'	140'	
38	3/8"	130'	140'	
39	3/8"	130'	140'	
40	3/8"	130'	140'	
41	3/8"	130'	140'	
42	3/8"	130'	140'	
43	3/8"	130'	140'	
44	3/8"	130'	140'	
45	3/8"	130'	140'	
46	3/8"	130'	140'	
47	3/8"	130'	140'	
48	3/8"	130'	140'	
49	3/8"	130'	140'	
50	3/8"	130'	140'	
51	3/8"	130'	140'	
52	3/8"	130'	140'	
53	3/8"	130'	140'	
54	3/8"	130'	140'	
55	3/8"	130'	140'	
56	3/8"	130'	140'	
57	3/8"	130'	140'	
58	3/8"	130'	140'	
59	3/8"	130'	140'	
60	3/8"	130'	140'	
61	3/8"	130'	140'	
62	3/8"	130'	140'	
63	3/8"	130'	140'	
64	3/8"	130'	140'	
65	3/8"	130'	140'	
66	3/8"	130'	140'	
67	3/8"	130'	140'	
68	3/8"	130'	140'	
69	3/8"	130'	140'	
70	3/8"	130'	140'	
71	3/8"	130'	140'	
72	3/8"	130'	140'	
73	3/8"	130'	140'	
74	3/8"	130'	140'	
75	3/8"	130'	140'	
76	3/8"	130'	140'	
77	3/8"	130'	140'	
78	3/8"	130'	140'	
79	3/8"	130'	140'	
80	3/8"	130'	140'	
81	3/8"	130'	140'	
82	3/8"	130'	140'	
83	3/8"	130'	140'	
84	3/8"	130'	140'	
85	3/8"	130'	140'	
86	3/8"	130'	140'	
87	3/8"	130'	140'	
88	3/8"	130'	140'	
89	3/8"	130'	140'	
90	3/8"	130'	140'	
91	3/8"	130'	140'	
92	3/8"	130'	140'	
93	3/8"	130'	140'	
94	3/8"	130'	140'	
95	3/8"	130'	140'	
96	3/8"	130'	140'	
97	3/8"	130'	140'	
98	3/8"	130'	140'	
99	3/8"	130'	140'	
100	3/8"	130'	140'	

Note: Bar list shown for wingwall (A) and box only.
See Colorado Standard M-102-F for bending diagrams
and bar list for wingwall (B).

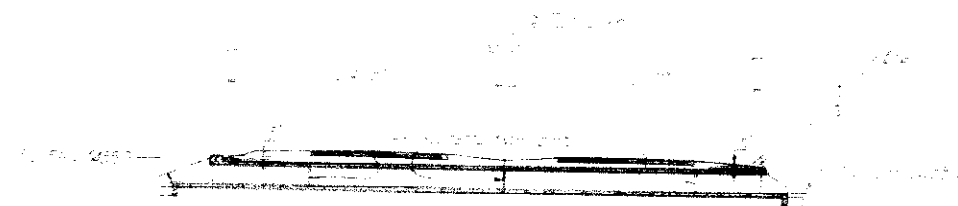
QUANTITIES	
Concrete	140'
Reinforcement	140'
Gravel	140'
Earth	140'
Water	140'
Electricity	140'
Gas	140'
Oil	140'
Other	140'



TYPICAL SECTION THRU BOX



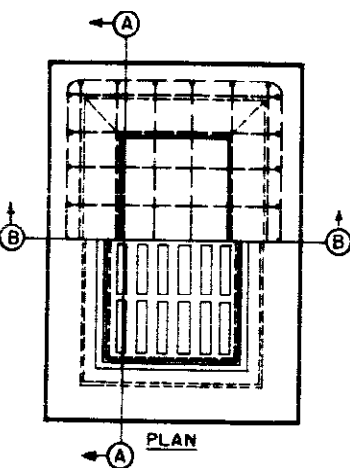
PLAN



SECTION ON & CULVERT

QUANTITIES	
Concrete	140'
Reinforcement	140'
Gravel	140'
Earth	140'
Water	140'
Electricity	140'
Gas	140'
Oil	140'
Other	140'

5'X4' BOX CULVERT AT STA 624+00

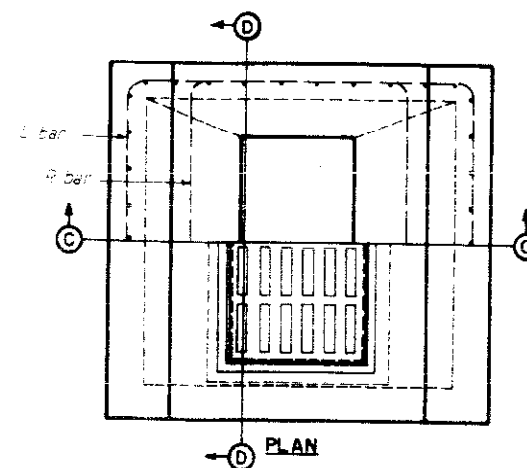
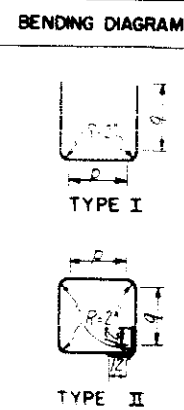


BAR LIST FOR H=3'-6"

MARK	SIZE	NO. REQ'D	LENGTH	TYPE	DIMENSIONS	
					E	Q
K	3/4"	Note	2'-6"	I	0'-8"	0'-8"
L	3/4"	5	17'-0"	II	4'-1"	2'-9"
M	3/4"	9	8'-0"	I	2'-8"	2'-5"
N	3/4"	6	9'-4"	I	4'-0"	2'-5"

- Omit K-bars when H=4'-0" or less.
- These dimensions to be increased in increments of 6" for H above 3'-6".
- Add 1 L-bar for each 6" additional height above 3'-6".

K-bars required as follows:
H=4'-0" to 5'-0" 1 bar
H=5'-0" to 6'-0" 2 bars
H=6'-0" to 7'-0" 3 bars
H=7'-0" to 8'-0" 4 bars
Cut on bend bars around pipes as required.



BAR LIST FOR H=4'-6"

MARK	SIZE	NO. REQ'D	LENGTH	TYPE	DIMENSIONS	
					E	Q
L	3/4"	3	20'-6"	II	4'-1"	4'-6"
M	3/4"	9	12'-3"	II	4'-6"	1'-6"
N	3/4"	6	11'-4"	I	4'-0"	3'-5"
O	3/4"	7	10'-0"	I	2'-0"	2'-9"
P	3/4"	2	8'-10"	I	4'-0"	2'-3"
R	3/4"	1	17'-0"	L	4'-1"	2'-9"
S	3/4"	1	18'-5"	II	4'-1"	3'-5"
T	3/4"	1	9'-9"	II	4'-1"	4'-3"
K	3/4"	Note	2'-6"	I	0'-8"	0'-8"

- Omit K-bars when H=4'-0" or less.
- These dimensions to be increased in increments of 6" for H above 4'-6".
- Add 1 L-bar for each 6" additional height above 4'-6".

See No. 13-A Concrete Inlet for number of K-bars required.
Cut on bend bars around pipes as required.

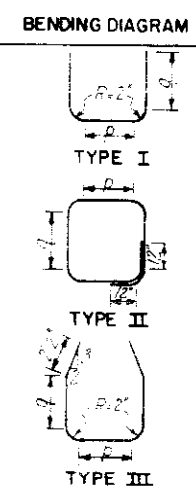
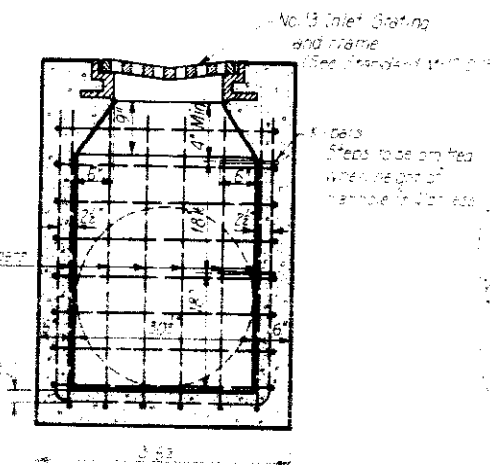
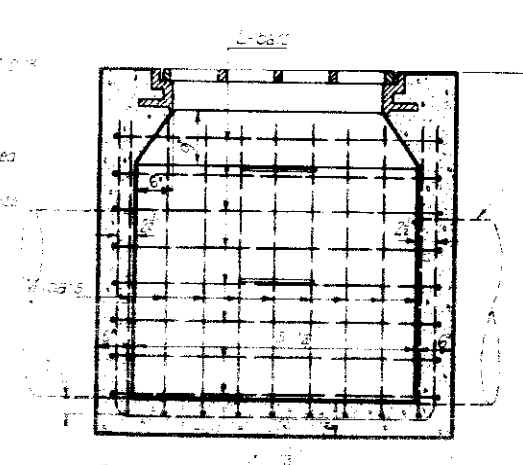


TABLE OF QUANTITIES

H	13-A		13-B	
	Concrete	Steel	Concrete	Steel
3'-6"	110	68	145	69
4'-0"	110	68	145	69
4'-6"	110	68	145	69
5'-0"	110	68	145	69
5'-6"	110	68	145	69
6'-0"	110	68	145	69
6'-6"	110	68	145	69
7'-0"	110	68	145	69
7'-6"	110	68	145	69
8'-0"	110	68	145	69
8'-6"	110	68	145	69
9'-0"	110	68	145	69
9'-6"	110	68	145	69
10'-0"	110	68	145	69

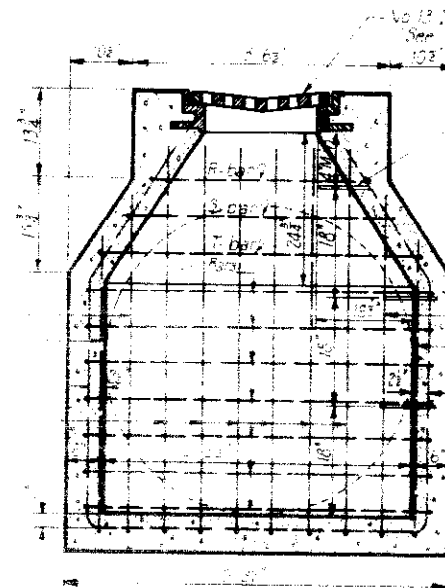


SECTION B-B

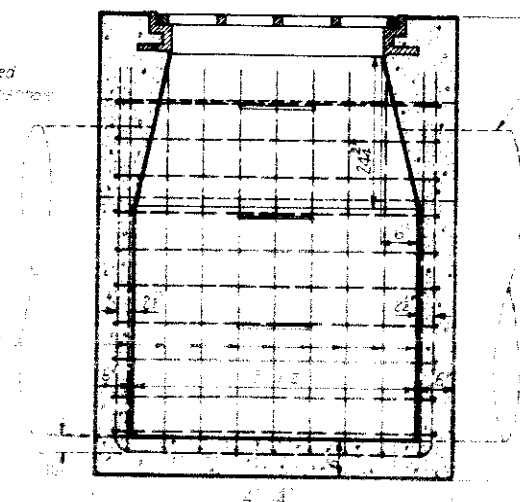


SECTION A-A

NO. 13-A CONCRETE INLET FOR MEDIAN DITCH
12' x 12' x 3'-6"

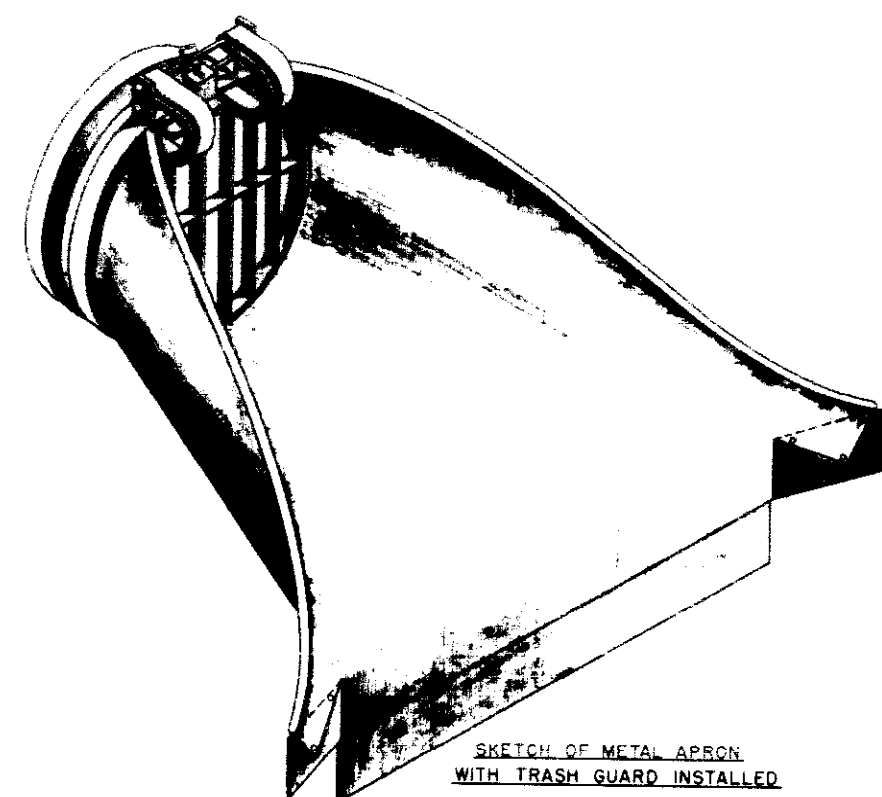


SECTION C-C

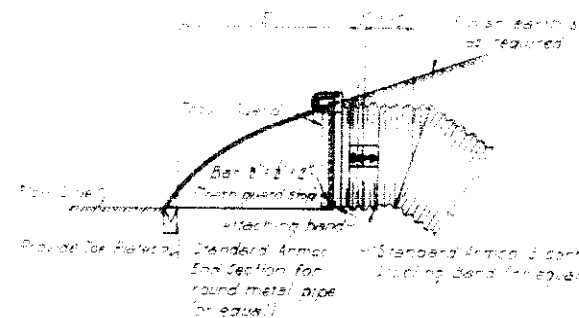


SECTION D-D

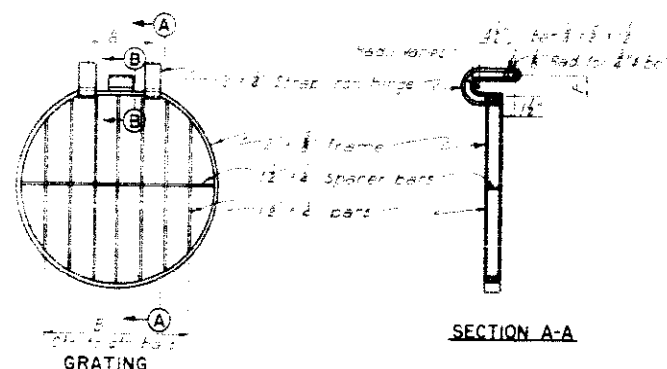
NO. 13-B CONCRETE INLET FOR MEDIAN DITCH
10' x 10' x 4'-0"



SKETCH OF METAL APRON
WITH TRASH GUARD INSTALLED

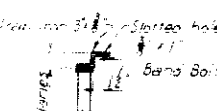


METAL APRON END SECTION
Scale: 1/4" = 1'-0"



SECTION A-A

GRATING



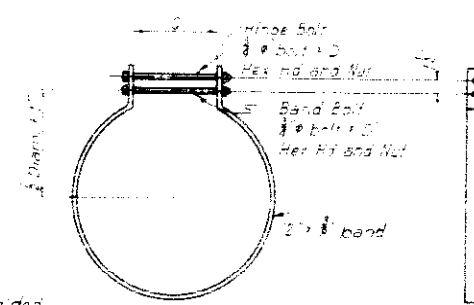
SECTION B-B

Note: Trash guard to be of welded construction. Provide 1/2" lever tumbler mechanism on each side of trash guard.

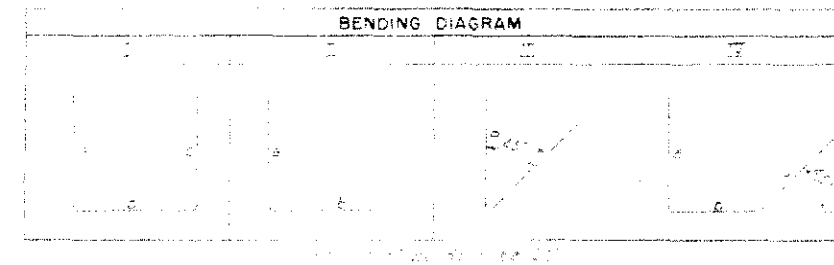
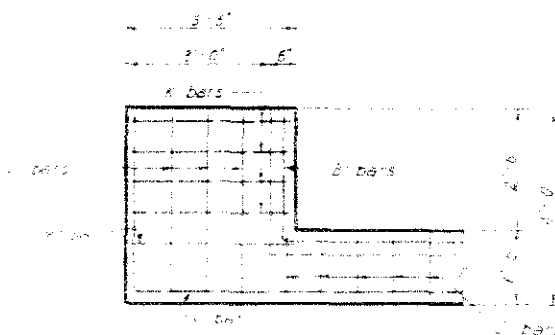
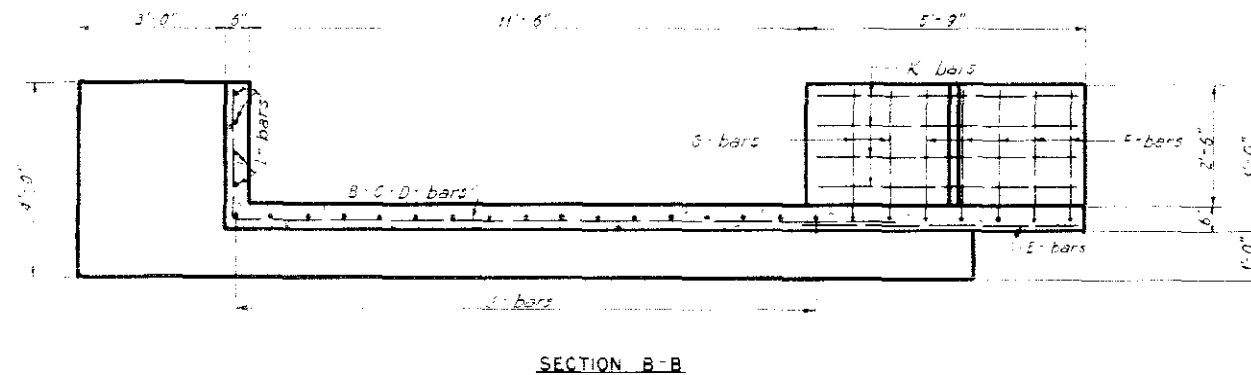
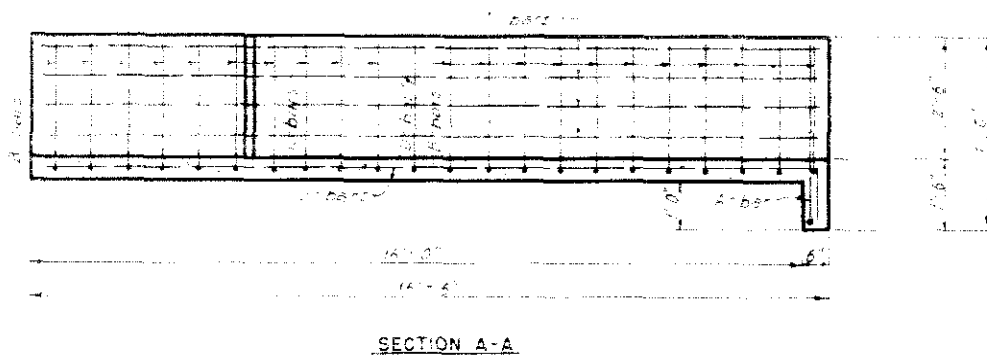
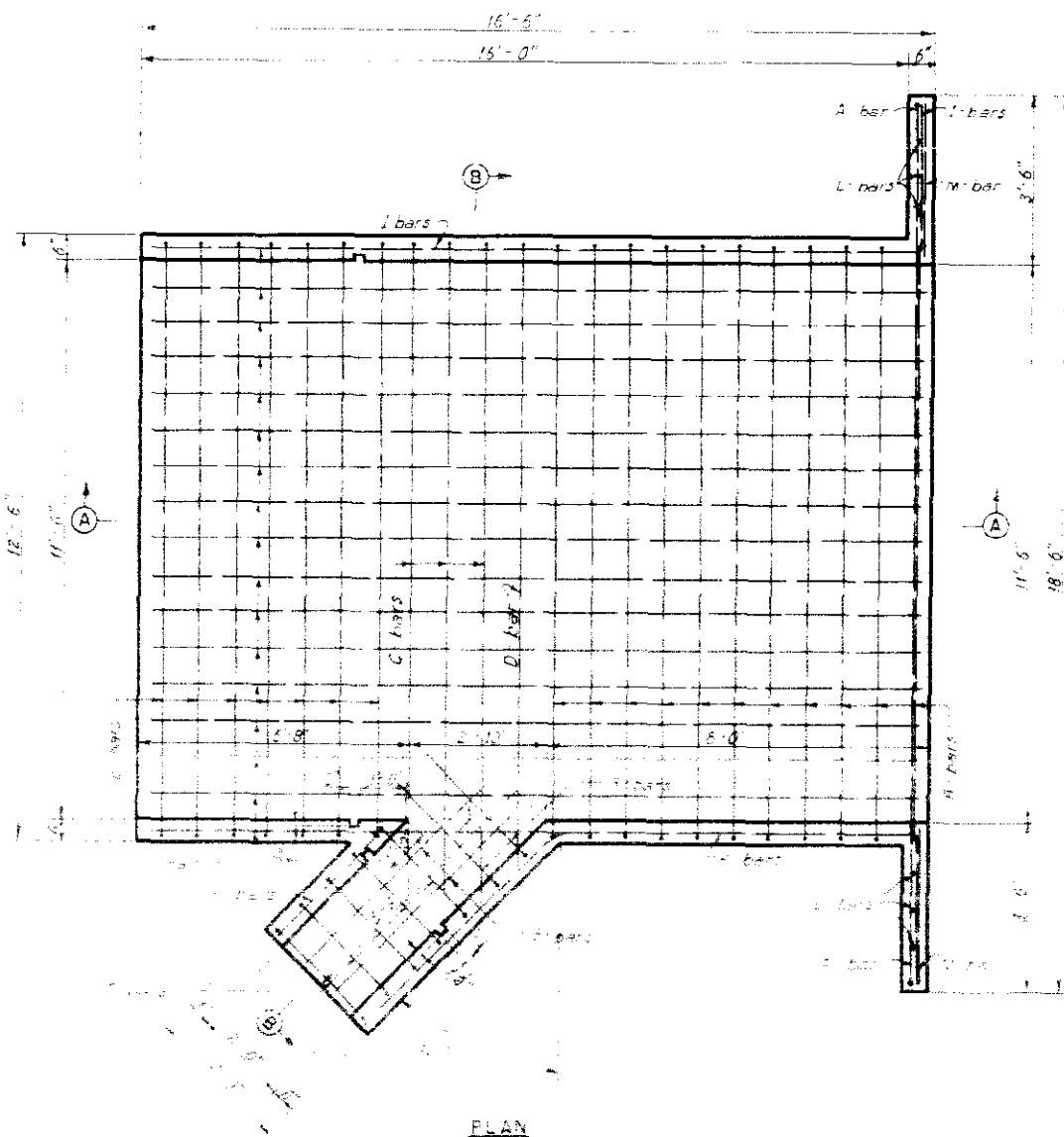
DETAIL OF TRASH GUARD
Scale: 1/4" = 1'-0"

TABLE OF DIMENSIONS

Length	A	B	C	D	E	F
24'	5'	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"
30'	5'	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"
36'	5'	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"
42'	5'	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"

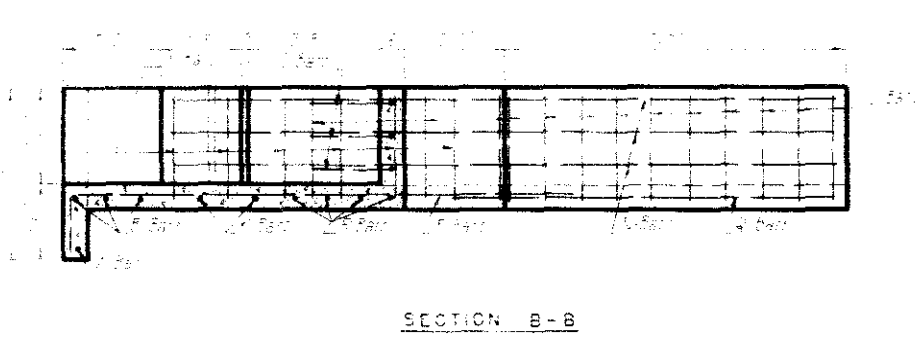
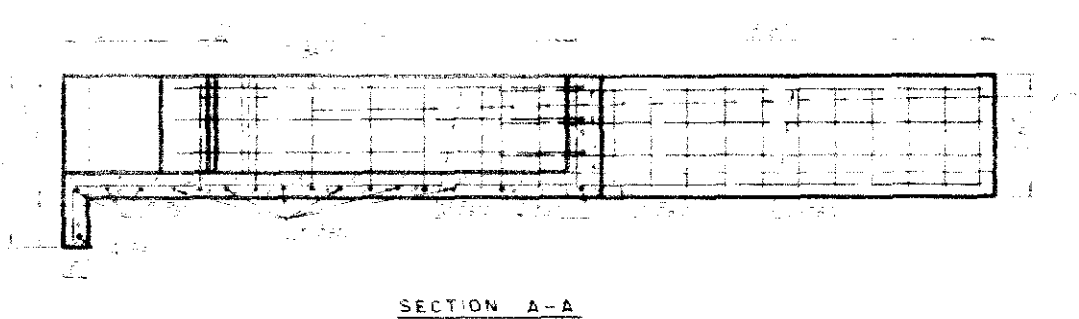
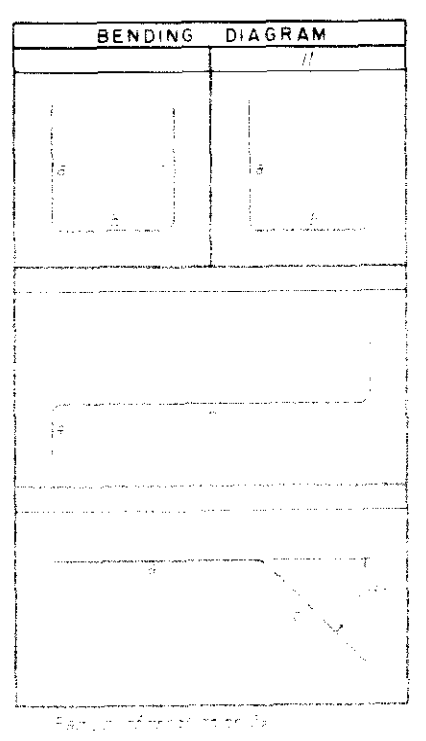
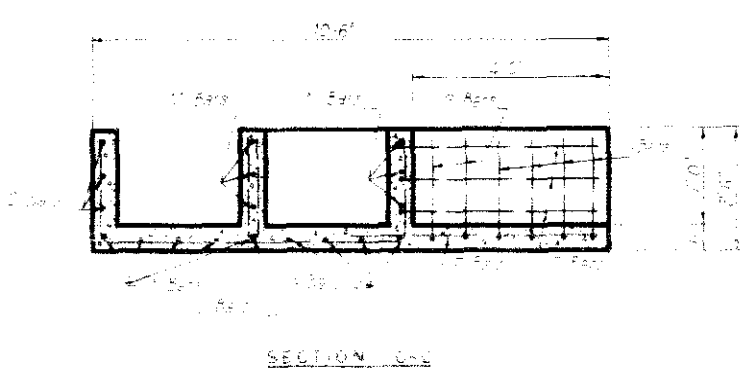
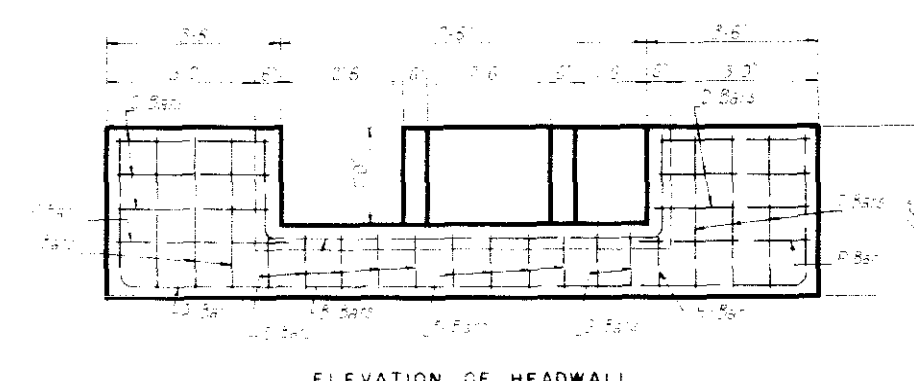
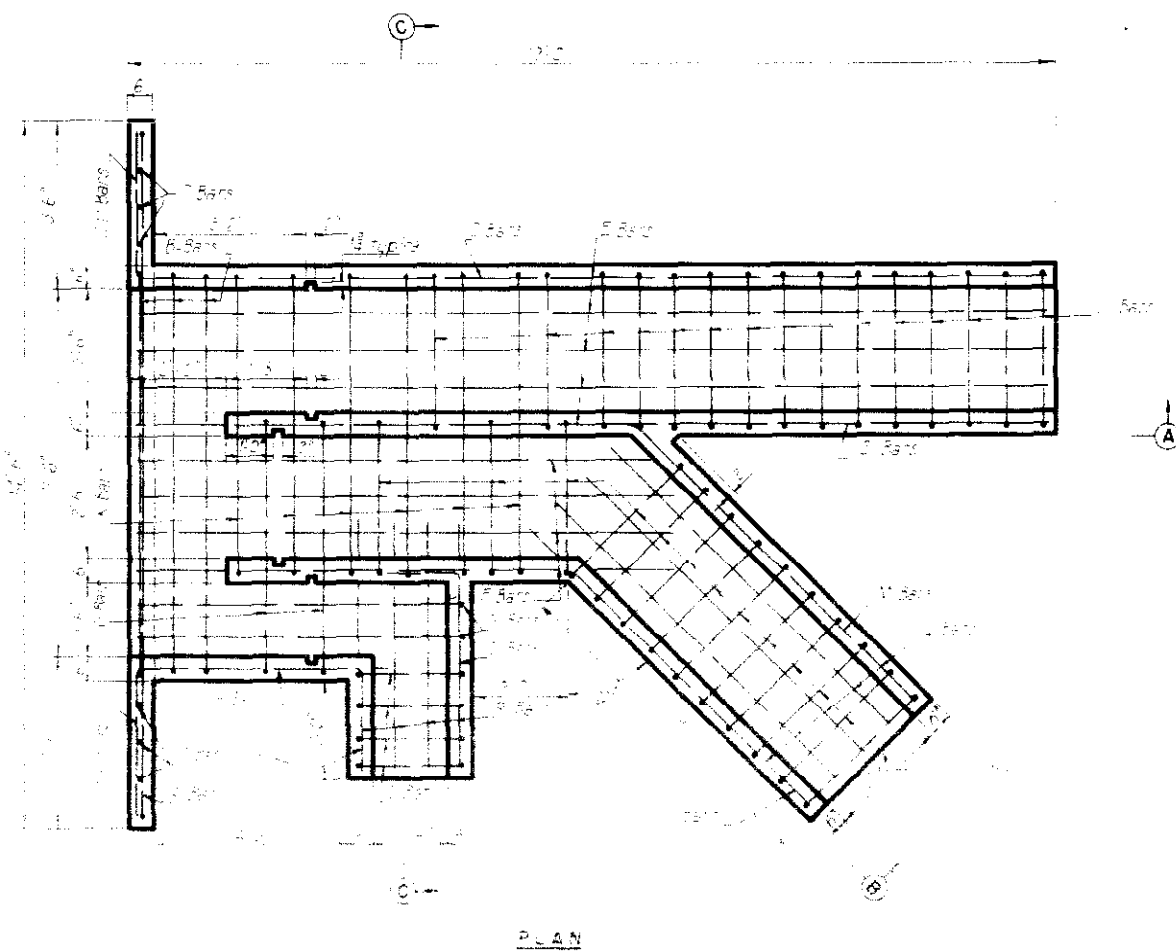


ATTACHING BAND

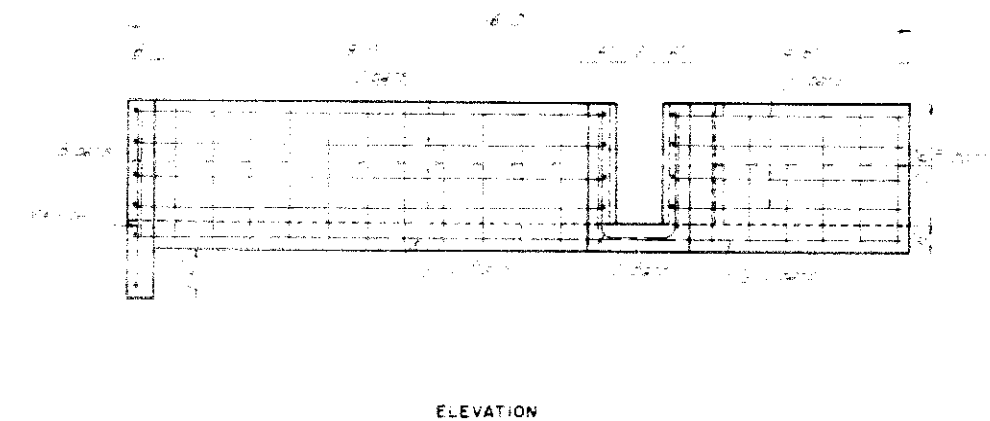
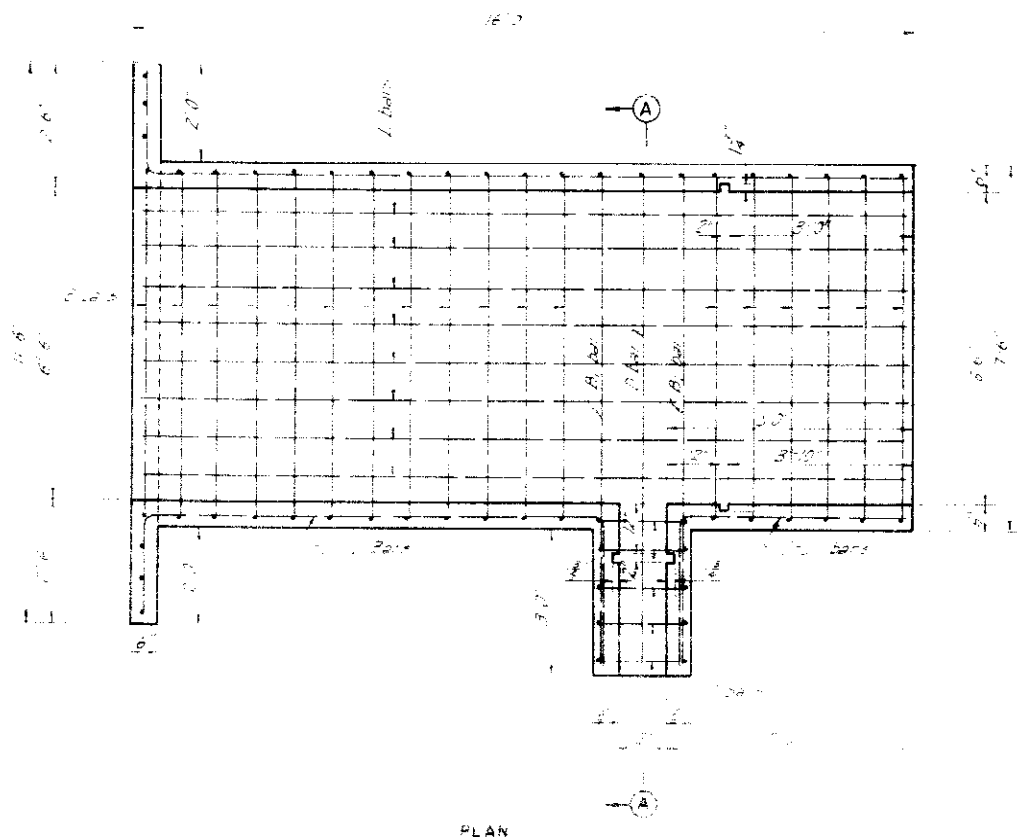


BAR LIST						
NO.	TYPE	DIMENSIONS	LENGTH OF BAR	NO. OF BARS	TOTAL LENGTH	WEIGHT
1	I	3'-0" x 11'-6"	21'-0"	1	21'-0"	See Detail
2	I	2'-0" x 2'-0"	17'-0"	16	292'-0"	9
3	I	1'-0" x 13'-6"	14'-6"	2	29'-0"	2"
4	II	2'-0" x 13'-6"	13'-6"	1	13'-6"	See Detail
5	Straight		1'-0"	2	2'-0"	10"
6	I	1'-0" x 1'-0"	7'-8"	2	15'-6"	9
7	II	2'-0" x 3'-0"	3'-0"	2	6'-0"	3"
8	III	4'-0" x 2'-0"	1'-6"	4	6'-0"	0
9	I	15'-0" x 2'-0"	15'-0"	4	60'-0"	8
10	II	16'-0" x 11'-0"	17'-0"	12	204'-0"	3"
11	III	2'-0" x 1'-0"	1'-0"	4	4'-0"	8"
12	Straight		1'-0"	6	6'-0"	3"
13	Straight		3'-0"	2	6'-0"	See Detail
Total = 2,558 lbs. per lin. ft. = 632"						
Plus 1% for overlap = 5"						
Total = 637"						
2 x 2x8x11' 6" Max. Unit Timber for Flash Boards = 28.00 Bd. ft.						
3 x 2x8x11' 6" Max. Unit Timber for Flash Boards = 11.00 Bd. ft.						
5.5 Cu. Yds. Class A Conc. Total = 70.00 Bd. ft.						

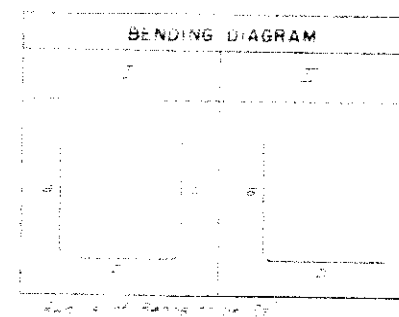
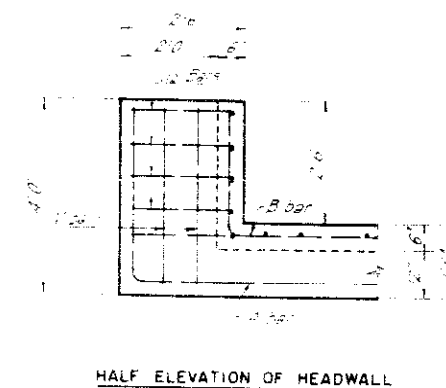
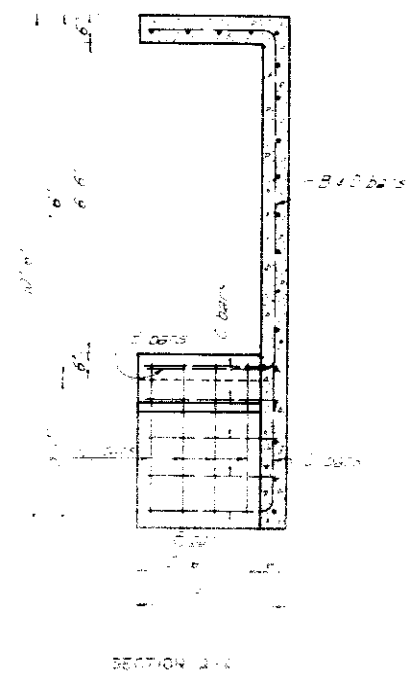
A parts are to be placed in center of walls and slabs.
All dimensions are to # of Bars.
See 11' 6" and 13' 6" for details of reinforcement in the diagram for steel and concrete.



BAR LIST									
NO.	DESCRIPTION	SIZE	LENGTH	QUANTITY	WEIGHT	NO.	DESCRIPTION	SIZE	LENGTH
1	Top longitudinal bars	#4	12.6'	1	1.1	11	Bottom longitudinal bars	#4	12.6'
2	Bottom longitudinal bars	#4	12.6'	1	1.1	12	Vertical bars	#4	4.2'
3	Vertical bars	#4	4.2'	1	0.4	13	Top longitudinal bars	#4	12.6'
4	Top longitudinal bars	#4	12.6'	1	1.1	14	Bottom longitudinal bars	#4	12.6'
5	Bottom longitudinal bars	#4	12.6'	1	1.1	15	Vertical bars	#4	4.2'
6	Vertical bars	#4	4.2'	1	0.4	16	Top longitudinal bars	#4	12.6'
7	Top longitudinal bars	#4	12.6'	1	1.1	17	Bottom longitudinal bars	#4	12.6'
8	Bottom longitudinal bars	#4	12.6'	1	1.1	18	Vertical bars	#4	4.2'
9	Vertical bars	#4	4.2'	1	0.4	19	Top longitudinal bars	#4	12.6'
10	Top longitudinal bars	#4	12.6'	1	1.1	20	Bottom longitudinal bars	#4	12.6'
Total Weight					10.0				



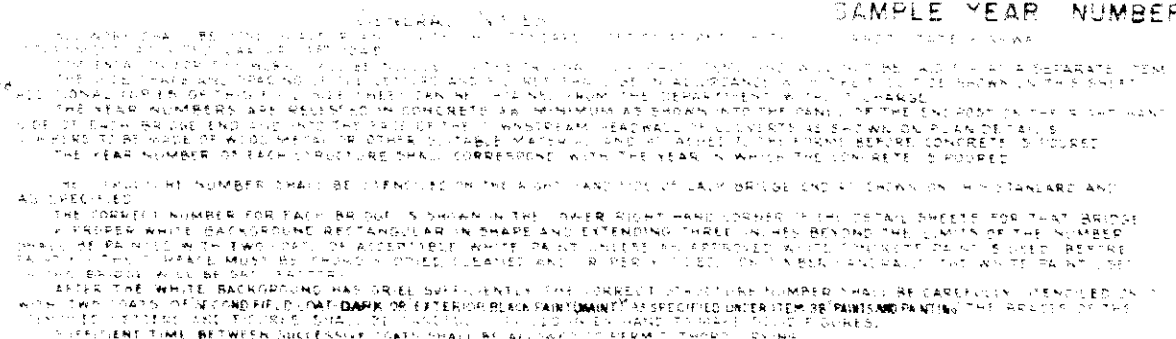
CONCRETE DIVISION BOX
DRY CREEK VALLEY DITCH
Approx. 510' Prof. Elev. 6467.70



REINFORCEMENT BAR LIST							
Bar	Size	Length	Qty	Total Length	Weight	Notes	Remarks
1	1/2"	10'0"	1	10'0"	1.10	See Detail	
2	1/2"	14'0"	1	14'0"	1.54	See Detail	
3	1/2"	10'0"	1	10'0"	1.10	See Detail	
4	1/2"	14'0"	1	14'0"	1.54	See Detail	
5	1/2"	10'0"	1	10'0"	1.10	See Detail	
6	1/2"	14'0"	1	14'0"	1.54	See Detail	
7	1/2"	10'0"	1	10'0"	1.10	See Detail	
8	1/2"	14'0"	1	14'0"	1.54	See Detail	
9	1/2"	10'0"	1	10'0"	1.10	See Detail	
10	1/2"	14'0"	1	14'0"	1.54	See Detail	
11	1/2"	10'0"	1	10'0"	1.10	See Detail	
12	1/2"	14'0"	1	14'0"	1.54	See Detail	
13	1/2"	10'0"	1	10'0"	1.10	See Detail	
14	1/2"	14'0"	1	14'0"	1.54	See Detail	
15	1/2"	10'0"	1	10'0"	1.10	See Detail	
16	1/2"	14'0"	1	14'0"	1.54	See Detail	
17	1/2"	10'0"	1	10'0"	1.10	See Detail	
18	1/2"	14'0"	1	14'0"	1.54	See Detail	
19	1/2"	10'0"	1	10'0"	1.10	See Detail	
20	1/2"	14'0"	1	14'0"	1.54	See Detail	
21	1/2"	10'0"	1	10'0"	1.10	See Detail	
22	1/2"	14'0"	1	14'0"	1.54	See Detail	
23	1/2"	10'0"	1	10'0"	1.10	See Detail	
24	1/2"	14'0"	1	14'0"	1.54	See Detail	
25	1/2"	10'0"	1	10'0"	1.10	See Detail	
26	1/2"	14'0"	1	14'0"	1.54	See Detail	
27	1/2"	10'0"	1	10'0"	1.10	See Detail	
28	1/2"	14'0"	1	14'0"	1.54	See Detail	
29	1/2"	10'0"	1	10'0"	1.10	See Detail	
30	1/2"	14'0"	1	14'0"	1.54	See Detail	
31	1/2"	10'0"	1	10'0"	1.10	See Detail	
32	1/2"	14'0"	1	14'0"	1.54	See Detail	
33	1/2"	10'0"	1	10'0"	1.10	See Detail	
34	1/2"	14'0"	1	14'0"	1.54	See Detail	
35	1/2"	10'0"	1	10'0"	1.10	See Detail	
36	1/2"	14'0"	1	14'0"	1.54	See Detail	
37	1/2"	10'0"	1	10'0"	1.10	See Detail	
38	1/2"	14'0"	1	14'0"	1.54	See Detail	
39	1/2"	10'0"	1	10'0"	1.10	See Detail	
40	1/2"	14'0"	1	14'0"	1.54	See Detail	
41	1/2"	10'0"	1	10'0"	1.10	See Detail	
42	1/2"	14'0"	1	14'0"	1.54	See Detail	
43	1/2"	10'0"	1	10'0"	1.10	See Detail	
44	1/2"	14'0"	1	14'0"	1.54	See Detail	
45	1/2"	10'0"	1	10'0"	1.10	See Detail	
46	1/2"	14'0"	1	14'0"	1.54	See Detail	
47	1/2"	10'0"	1	10'0"	1.10	See Detail	
48	1/2"	14'0"	1	14'0"	1.54	See Detail	
49	1/2"	10'0"	1	10'0"	1.10	See Detail	
50	1/2"	14'0"	1	14'0"	1.54	See Detail	
51	1/2"	10'0"	1	10'0"	1.10	See Detail	
52	1/2"	14'0"	1	14'0"	1.54	See Detail	
53	1/2"	10'0"	1	10'0"	1.10	See Detail	
54	1/2"	14'0"	1	14'0"	1.54	See Detail	
55	1/2"	10'0"	1	10'0"	1.10	See Detail	
56	1/2"	14'0"	1	14'0"	1.54	See Detail	
57	1/2"	10'0"	1	10'0"	1.10	See Detail	
58	1/2"	14'0"	1	14'0"	1.54	See Detail	
59	1/2"	10'0"	1	10'0"	1.10	See Detail	
60	1/2"	14'0"	1	14'0"	1.54	See Detail	
61	1/2"	10'0"	1	10'0"	1.10	See Detail	
62	1/2"	14'0"	1	14'0"	1.54	See Detail	
63	1/2"	10'0"	1	10'0"	1.10	See Detail	
64	1/2"	14'0"	1	14'0"	1.54	See Detail	
65	1/2"	10'0"	1	10'0"	1.10	See Detail	
66	1/2"	14'0"	1	14'0"	1.54	See Detail	
67	1/2"	10'0"	1	10'0"	1.10	See Detail	
68	1/2"	14'0"	1	14'0"	1.54	See Detail	
69	1/2"	10'0"	1	10'0"	1.10	See Detail	
70	1/2"	14'0"	1	14'0"	1.54	See Detail	
71	1/2"	10'0"	1	10'0"	1.10	See Detail	
72	1/2"	14'0"	1	14'0"	1.54	See Detail	
73	1/2"	10'0"	1	10'0"	1.10	See Detail	
74	1/2"	14'0"	1	14'0"	1.54	See Detail	
75	1/2"	10'0"	1	10'0"	1.10	See Detail	
76	1/2"	14'0"	1	14'0"	1.54	See Detail	
77	1/2"	10'0"	1	10'0"	1.10	See Detail	
78	1/2"	14'0"	1	14'0"	1.54	See Detail	
79	1/2"	10'0"	1	10'0"	1.10	See Detail	
80	1/2"	14'0"	1	14'0"	1.54	See Detail	
81	1/2"	10'0"	1	10'0"	1.10	See Detail	
82	1/2"	14'0"	1	14'0"	1.54	See Detail	
83	1/2"	10'0"	1	10'0"	1.10	See Detail	
84	1/2"	14'0"	1	14'0"	1.54	See Detail	
85	1/2"	10'0"	1	10'0"	1.10	See Detail	
86	1/2"	14'0"	1	14'0"	1.54	See Detail	
87	1/2"	10'0"	1	10'0"	1.10	See Detail	
88	1/2"	14'0"	1	14'0"	1.54	See Detail	
89	1/2"	10'0"	1	10'0"	1.10	See Detail	
90	1/2"	14'0"	1	14'0"	1.54	See Detail	
91	1/2"	10'0"	1	10'0"	1.10	See Detail	
92	1/2"	14'0"	1	14'0"	1.54	See Detail	
93	1/2"	10'0"	1	10'0"	1.10	See Detail	
94	1/2"	14'0"	1	14'0"	1.54	See Detail	
95	1/2"	10'0"	1	10'0"	1.10	See Detail	
96	1/2"	14'0"	1	14'0"	1.54	See Detail	
97	1/2"	10'0"	1	10'0"	1.10	See Detail	
98	1/2"	14'0"	1	14'0"	1.54	See Detail	
99	1/2"	10'0"	1	10'0"	1.10	See Detail	
100	1/2"	14'0"	1	14'0"	1.54	See Detail	

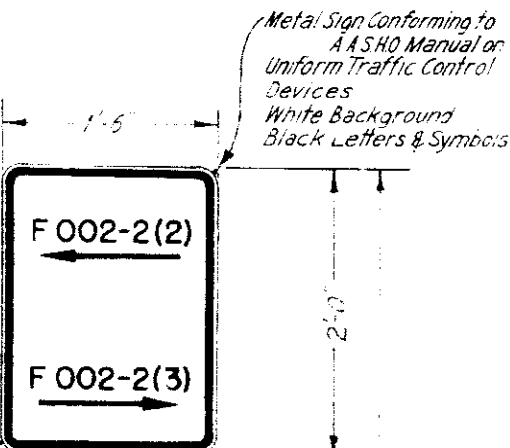
All bars are to be placed in center of slab unless noted otherwise.
Reinforcement for walls and headwalls is to be placed in the center of the wall and concrete.

Figure 1. Schematic representation of the experimental design. The subjects were divided into two groups: the control group (CG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG). The subjects were divided into two groups: the control group (CG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG).

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COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
LETTERS AND FIGURES
FOR
YEAR NUMBERS AND
STRUCTURE NUMBERS

PROJECT MARKER POST ITEM N° 81a



NOTES FOR PROJECT MARKER POSTS

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

Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed. Post 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 State Highway Department, adopted January 1st 1948.

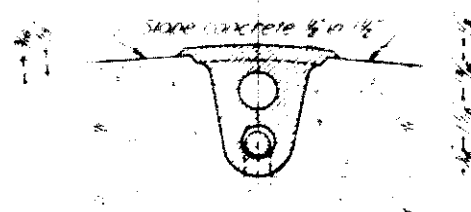
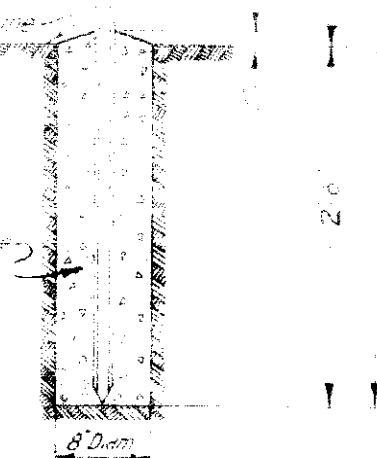
Posts shall be made of Class 4 concrete. The upper 2 inches of marker posts shall be rubbed free of form marks and the top surface of the post must be constructed to drain thoroughly.

All exposed surfaces of the bronze tablet are to be ground to a smooth surface.

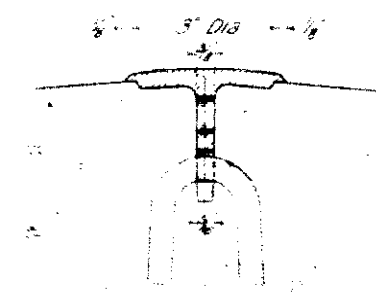
All tablets are to be debossed a minimum of 1/16 inch. Information on the bronze tablet, indicated by pin lines, is to be stamped in the metal by the engineering party after post is placed. No initials and figures to be used.

Project designations on tablets shall be properly shown: I.E. for Fed Aid Interstate, P for Fed Aid Primary, S for Fed Aid Secondary, etc. 3, 3-1/2 for State Projects. See detail below.

Class 4 concrete Post. Complete with 2" extra stove bolts & washers, to secure sign.



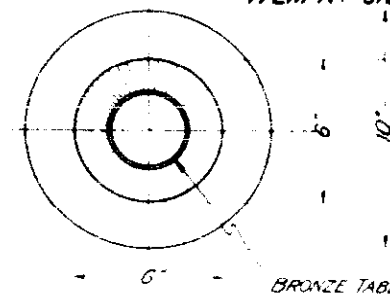
SECTION B-B



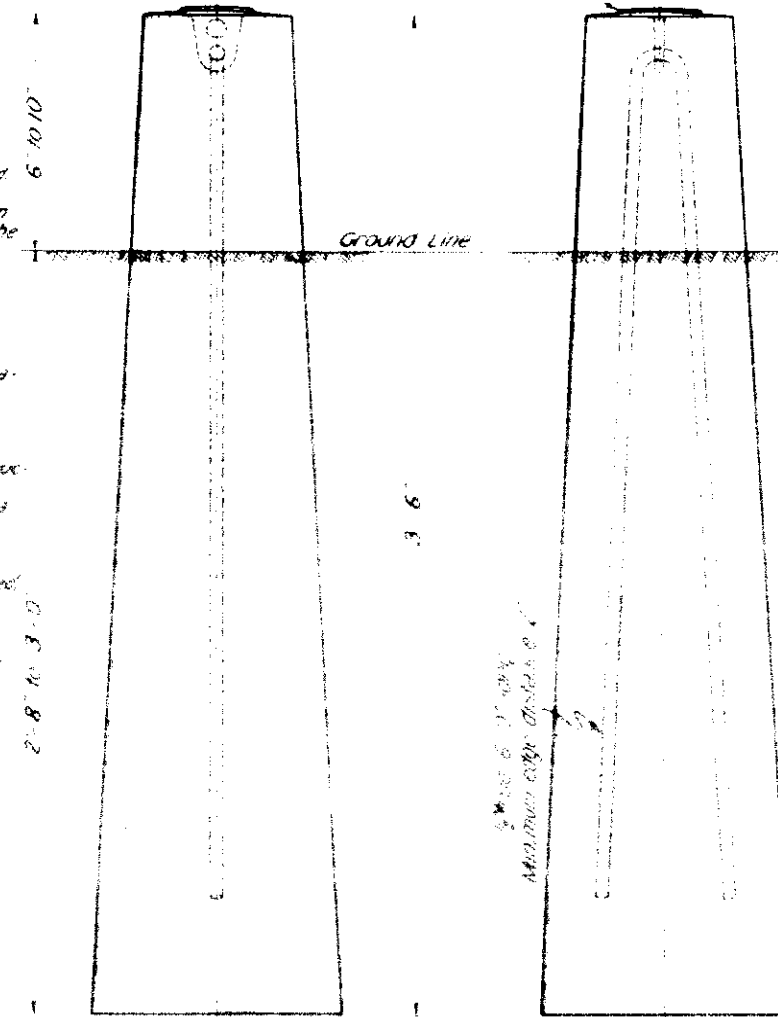
SECTION A-A

DETAIL OF BRONZE TABLET
FOR RIGHT OF WAY MARKER POST

RIGHT OF WAY MARKER POST ITEM N° 81b



BRONZE TABLET



Minimum edge distance 1"

REVISIONS

Rev 5-28-40, A.Z. 1940 Specs
Rev 1-2-46, C.S.D. Item 81a

STANDARD M-7-B

Rev 5 Jan 46, P.S.B. 1/2" to 1/2" P
Rev June 10 46, W.E.M. Bronze Tablet

Rev Mar 2 - 947, W.M. - Project Marker Post

Rev Nov 27-1947, J.P.K. - Metal Project Marker

Rev Dec 1947, J.P.K. - Metal Project Marker

Rev July 9 1950, J.C.R. - Re. Name Re Metal Sign for Project Marker, & R.O.W. Marker Markings

FED ROAD
DIST NO
3

STATE
COLO

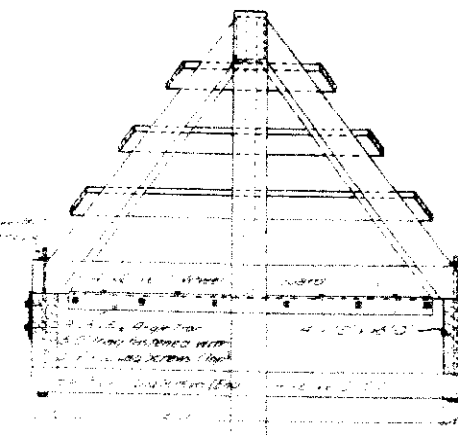
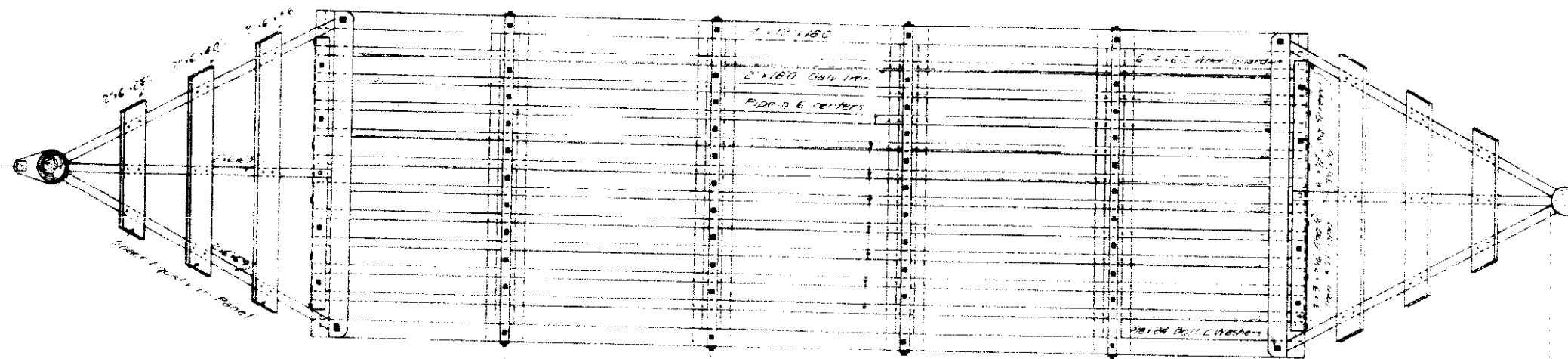
SHEET
NO
25

TOTAL
SHEETS

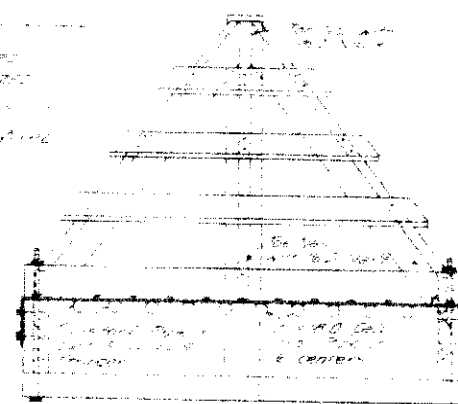
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
MARKER POSTS

Designed by R.E.L.
Made by F.F.S.
Checked by R.E.L.
APPROVED BY
Date January 1st 1948

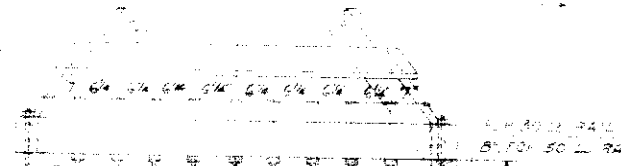
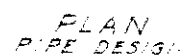
Rev. 12-13-46 A-21 (1945 Specifications)
Rev. 2-28-47 A-21 (A.C. Chemicals 1937 Specifications)
Revised 6-29-48 A-21 (1940 Specs.)
Revised 4-13-46 For R.R. Rail by S.S.
Rev. 3-9-46 A-21 (High Size)
Rev. 12-13-47 n.d.p.k.m



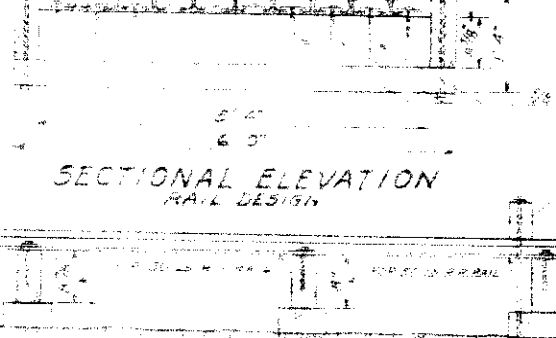
PIPE DESIGN



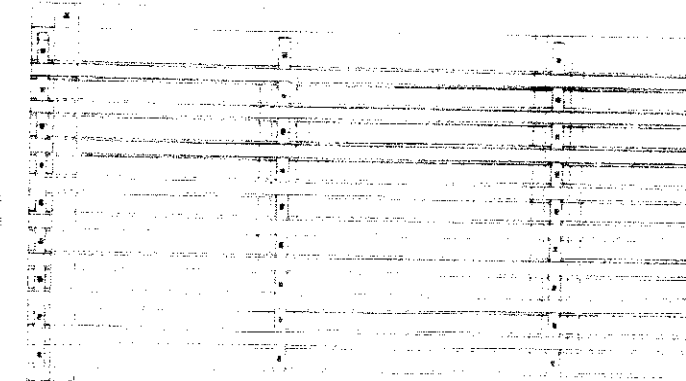
SECTIONAL ELEVATION PIPE DESIGN



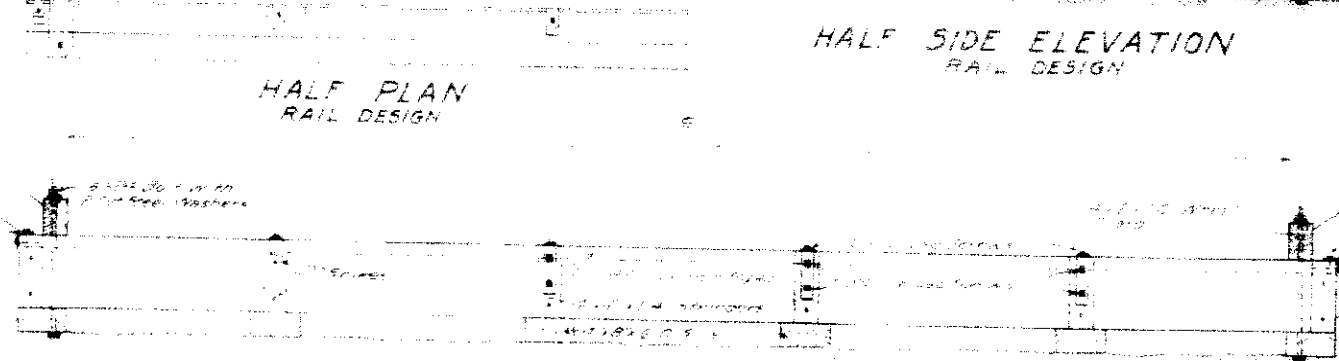
SECTIONAL ELEVATION
RAIL DESIGN



HALF SIDE ELEVATION
RAIL DESIGN



HALF PLAN
RAIL DESIGN



SIDE ELEVATION
PIPE DESIGN

GENERAL NOTES

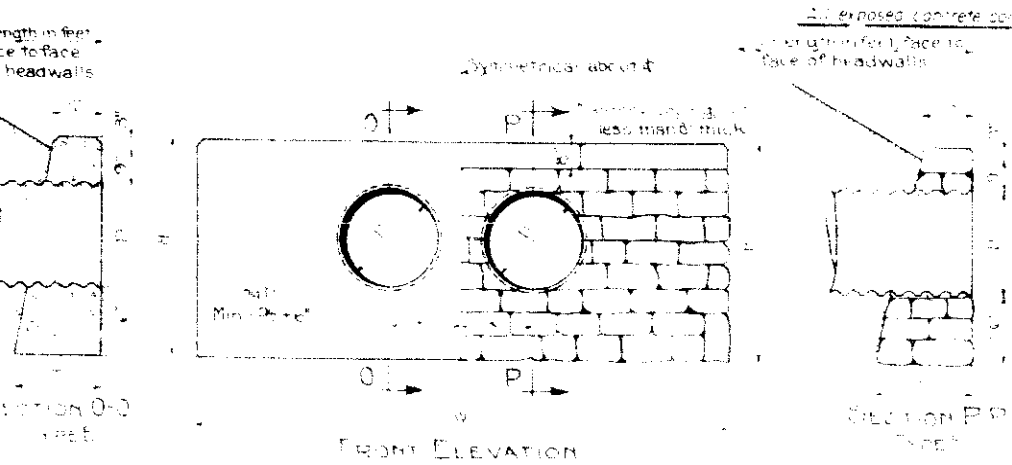
[illegible]

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
CATTLE GUARD
16 FT. ROADWAY

Designed by <i>SM</i>	Approved by <i>Ed Bailey</i>
Made by <i>SM</i>	Bridge Engineer
Checked by	Date <i>January 15 1931</i>

BILL OF MATERIALS FOR
ONE COMPLETE CATTLE GUARD

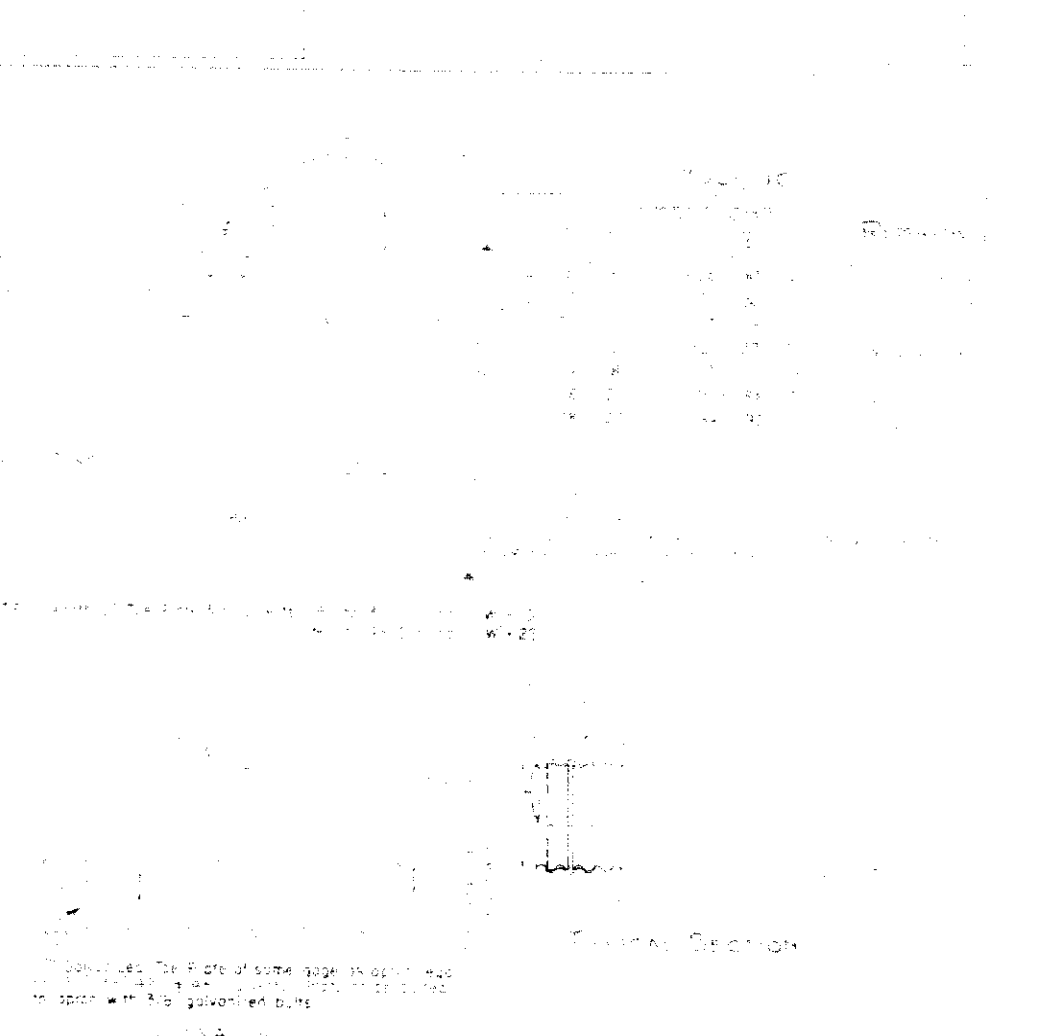
- [illegible]



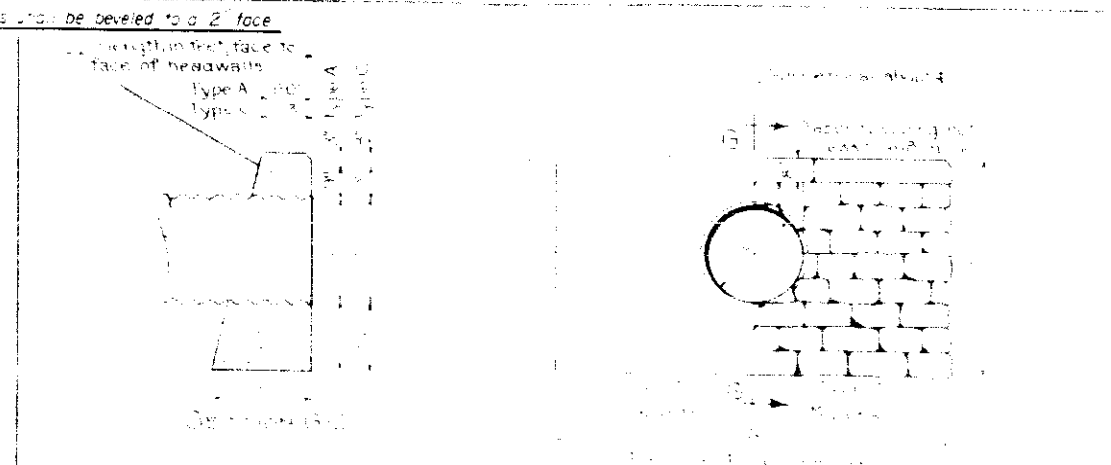
STANDARD HEADWALLS FOR DOUBLE CORRUG METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

TYPE E				BOTH TYPES				TYPE F			
CONCRETE				CONCRETE				CONCRETE			
TYPE E				TYPE F				TYPE F			
14'	14'	30	10	8.4	4.2	10	20	24	24	24	24
14'	14'	44	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	6	16	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14'	14'	5	27	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	0.5	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	24	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



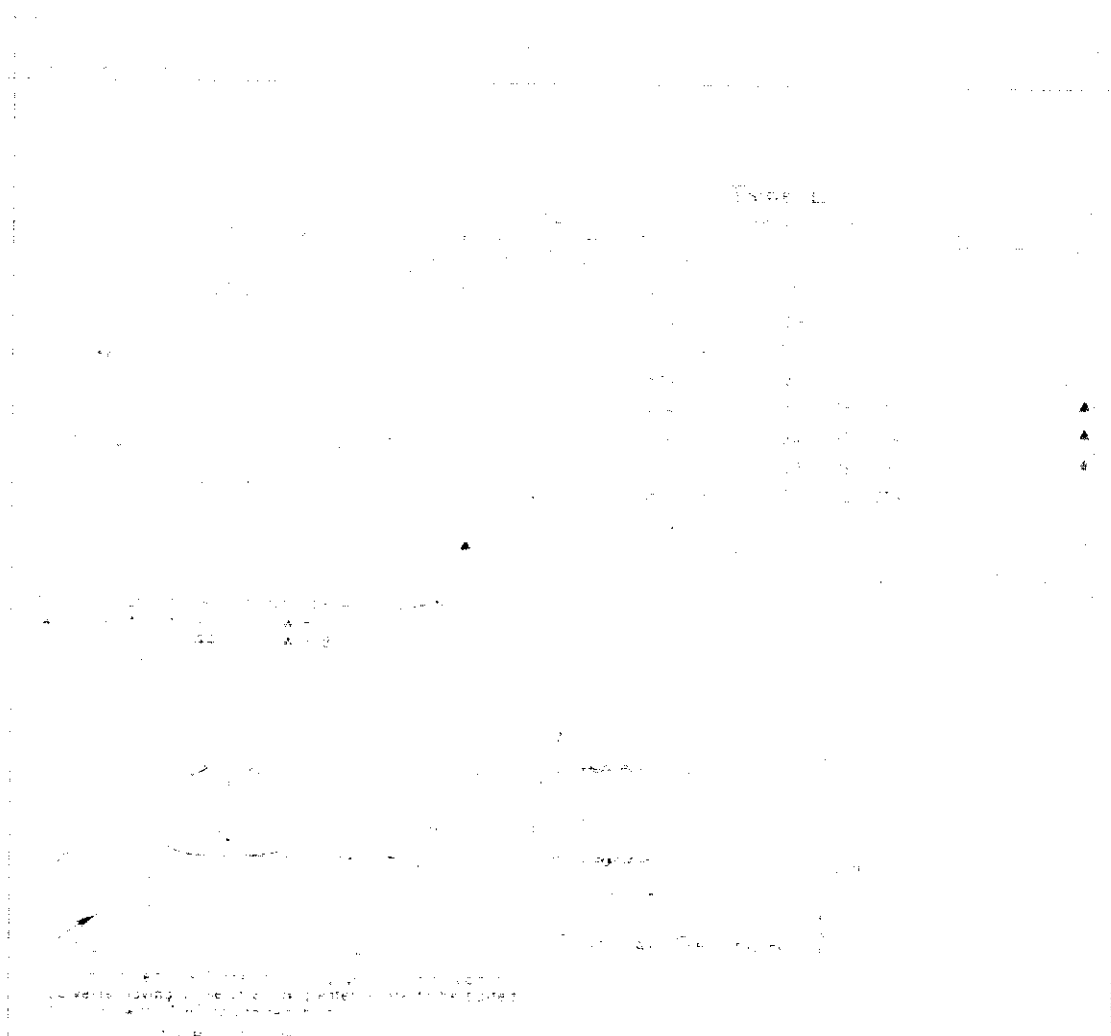
STANDARD METAL APRONS FOR CORRUGATED METAL PIPE CULVERTS TYPE K



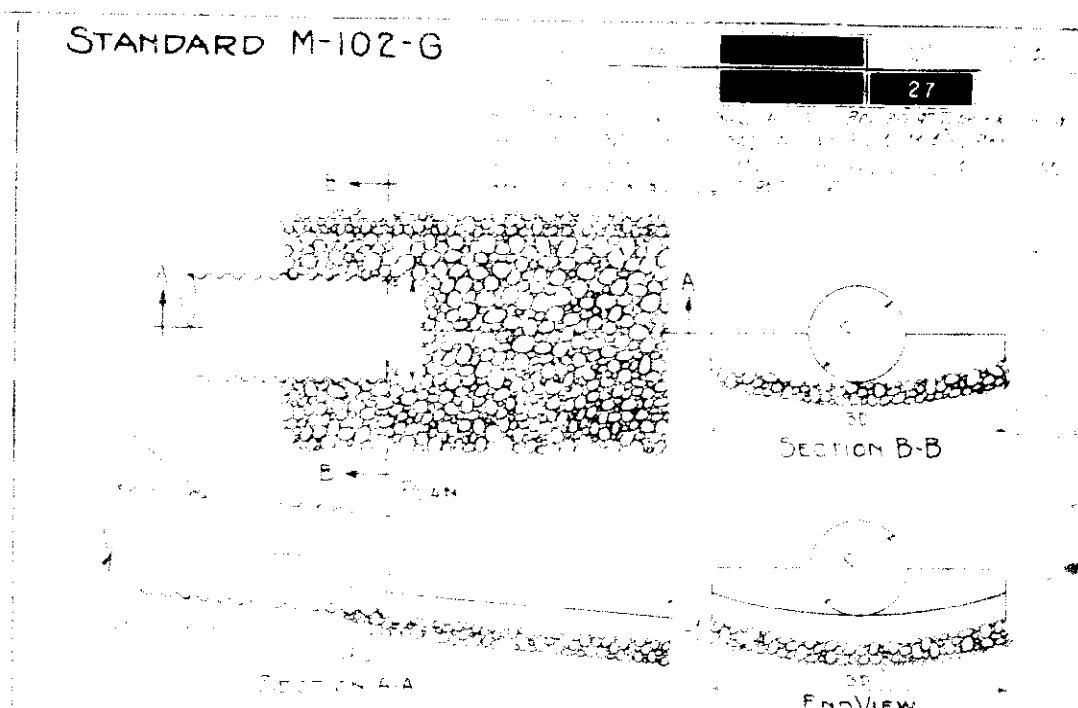
STANDARD HEADWALLS FOR SINGLE CORRUG METAL PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

TYPE A				BOTH TYPES				TYPE L			
CONCRETE				CONCRETE				CONCRETE			
TYPE A				TYPE L				TYPE L			
14'	14'	30	10	8.4	4.2	10	20	24	24	24	24
14'	14'	44	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	6	16	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14'	14'	5	27	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	0.5	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	24	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



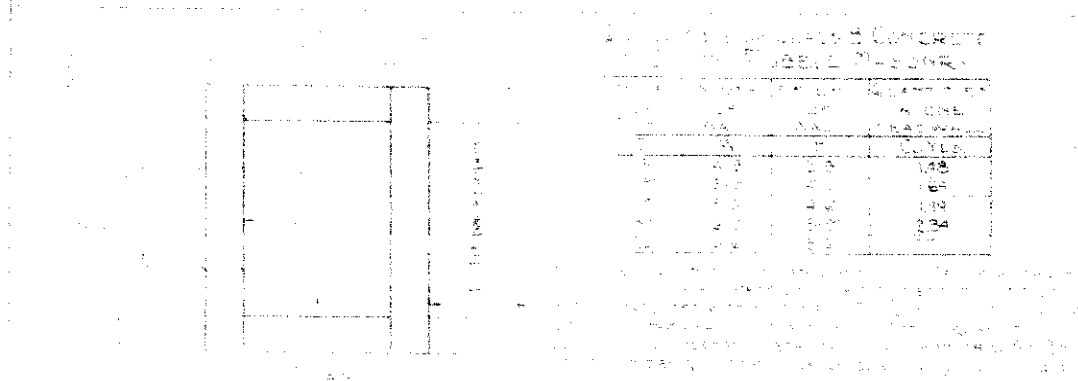
STANDARD METAL APRONS FOR CORRUGATED METAL PIPE ARCH CULVERTS TYPE L



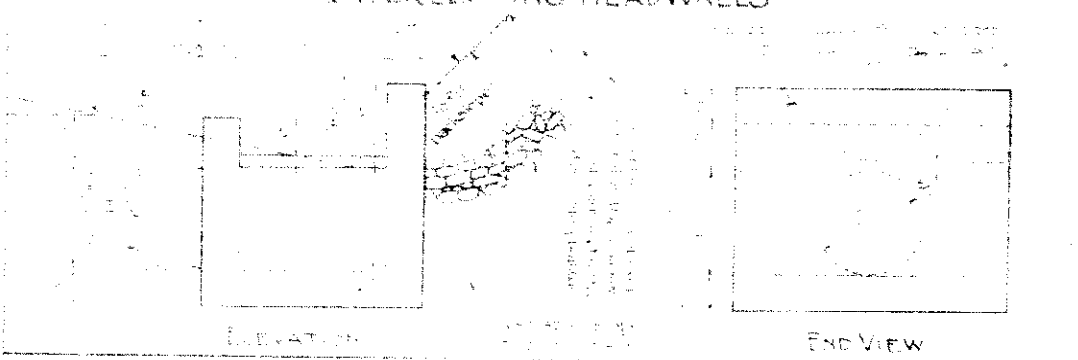
STANDARD GROUTED RUBBLE APRON FOR PIPE CULVERTS

TABLE OF DIMENSIONS AND QUANTITIES

TYPE A				BOTH TYPES				TYPE L			
CONCRETE				CONCRETE				CONCRETE			
TYPE A				TYPE L				TYPE L			
14'	14'	30	10	8.4	4.2	10	20	24	24	24	24
14'	14'	44	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	6	16	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14'	14'	5	27	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	0.5	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14'	14'	24	14	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



INTERCEPTING HEADWALLS

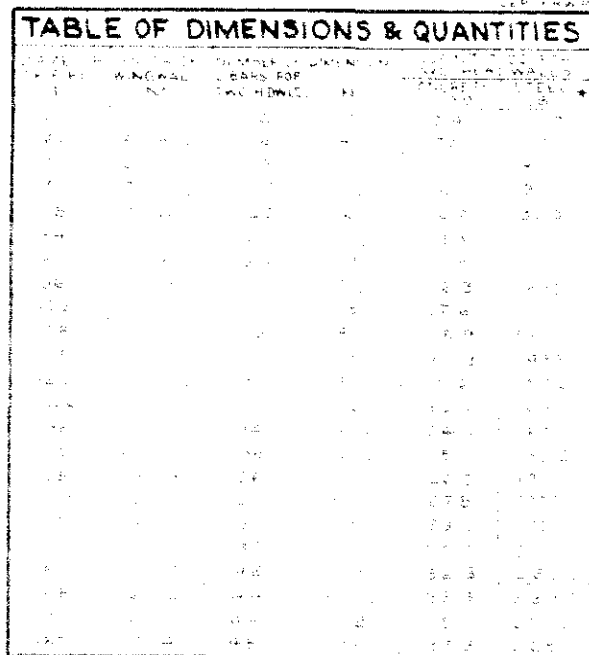


STANDARD METAL APRONS FOR CORRUGATED METAL PIPE ARCH CULVERTS TYPE L

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD HEADWALLS
INTERCEPTING HEADWALLS
GROUTED RUBBLE APRONS
FOR CORRUG METAL PIPE CULVERTS

DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: [Date]



REINFORCEMENT BAR LIST (TWO HDWLS)									
NO.	DESCRIPTION	QTY	UNIT	NO. REB.	LENGTH	WEIGHT	NO. REB.	LENGTH	WEIGHT
1	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
2	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
3	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
4	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
5	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
6	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
7	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
8	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
9	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
10	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
11	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
12	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
13	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
14	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
15	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
16	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
17	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
18	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
19	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
20	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
21	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
22	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
23	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
24	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
25	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
26	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
27	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
28	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
29	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
30	ALL SIZES	1	EA	1	7	1.10	1	7	1.10
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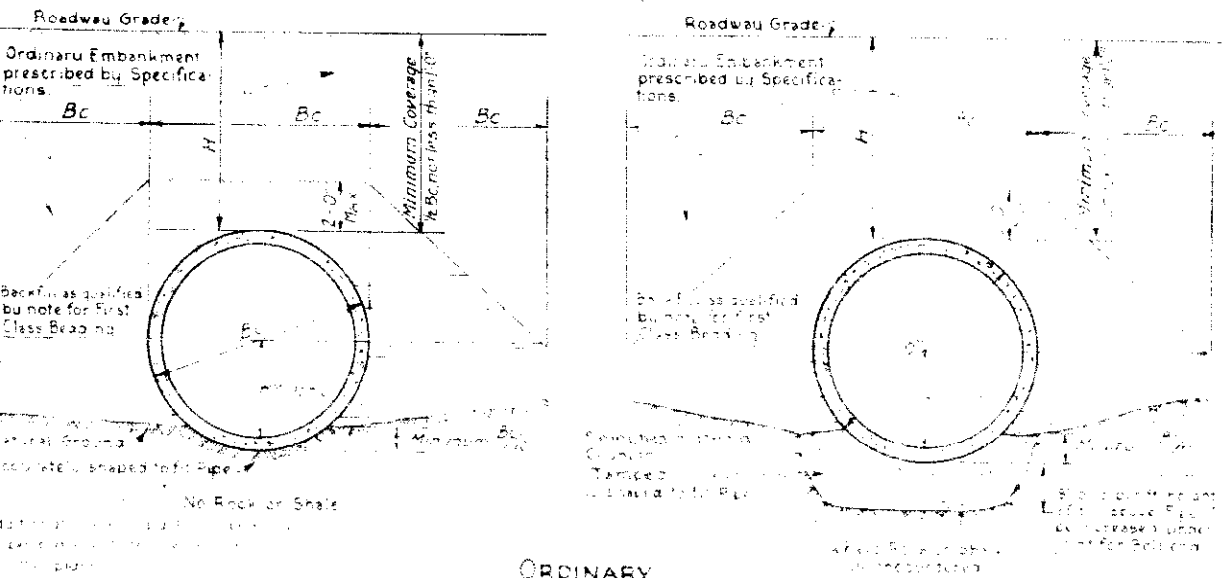
[illegible]

COLORADO			
STATE HIGHWAY DEPARTMENT			
STANDARD CORR METAL			
PIPE CULVERT HEADWALL			
50"	90	126"	156"
66"	96	132"	162"
72"	102"	135	168"
75"	108"	138"	174"
78"	114"	144"	180"
84"	120"	150"	

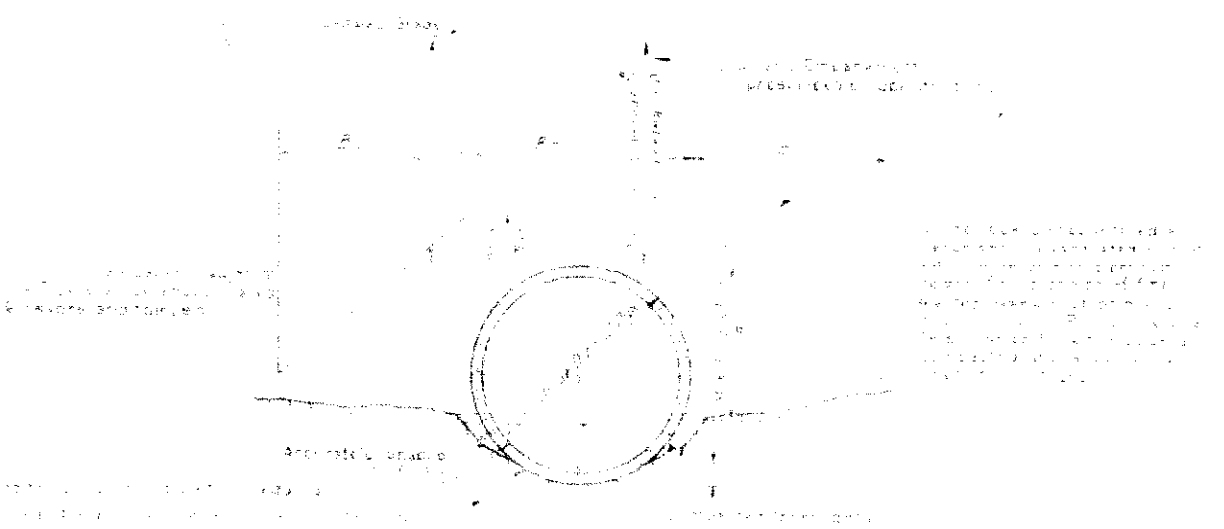
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TYPES OF BEDDING

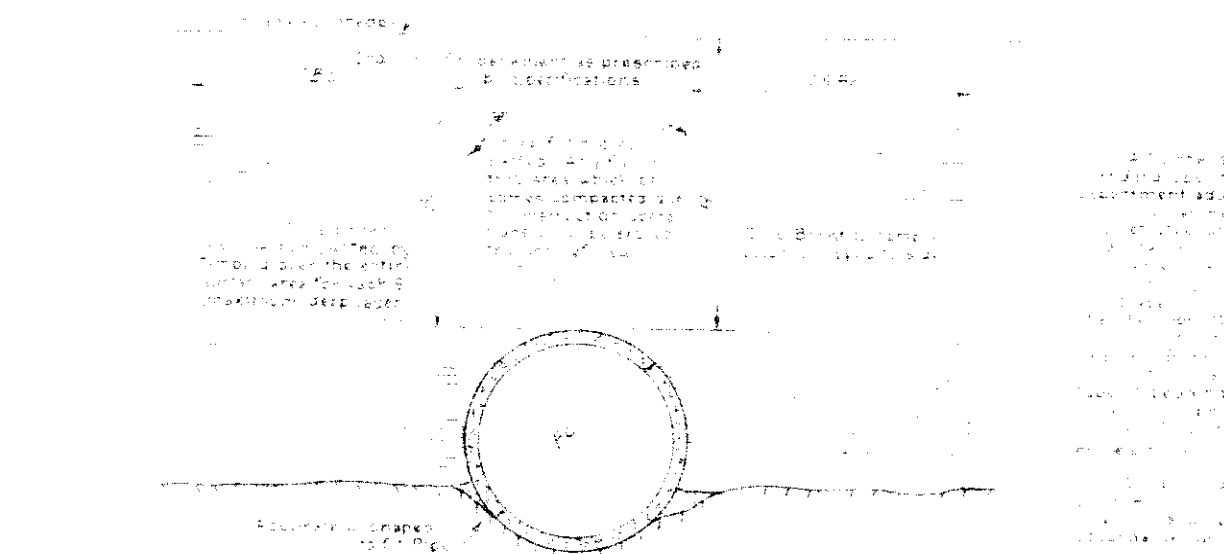
NOTE: Backfill layers for all Types of Bedding must be placed simultaneously on each side of the pipe to maintain equal lateral pressures.



ORDINARY



FIRST CLASS

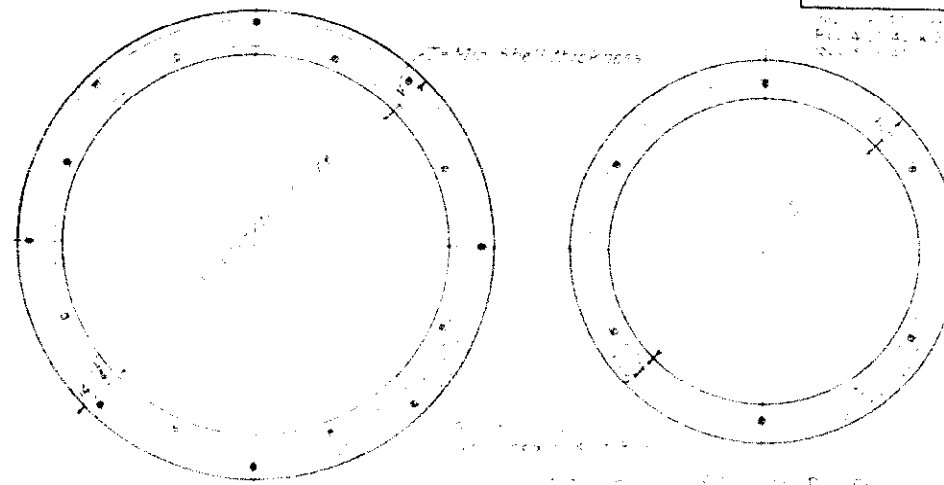


SPECIAL

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

PIPE CROSS SECTIONS

With Two Lines of Circular Reinforcement



STANDARD M-II2-D

Revised 1940

Revised 1940

STANDARD STRENGTH REINFORCED CONCRETE CULVERT PIPE

Max. Fill Height Above Pipe (Feet)	D (Inches)	Reinforcement (Sq. In. per Lin. Foot of Pipe)	Longitudinal Reinforcement (Min. Total Area Req'd)
2	2	1.00	0.35
4	4	1.00	0.60
6	6	1.00	0.85
8	8	1.00	1.10
10	10	1.00	1.35
12	12	1.00	1.60
14	14	1.00	1.85
16	16	1.00	2.10
18	18	1.00	2.35
20	20	1.00	2.60
22	22	1.00	2.85
24	24	1.00	3.10
26	26	1.00	3.35
28	28	1.00	3.60
30	30	1.00	3.85
32	32	1.00	4.10
34	34	1.00	4.35
36	36	1.00	4.60
38	38	1.00	4.85
40	40	1.00	5.10
42	42	1.00	5.35
44	44	1.00	5.60
46	46	1.00	5.85
48	48	1.00	6.10
50	50	1.00	6.35
52	52	1.00	6.60
54	54	1.00	6.85
56	56	1.00	7.10
58	58	1.00	7.35
60	60	1.00	7.60
62	62	1.00	7.85
64	64	1.00	8.10
66	66	1.00	8.35
68	68	1.00	8.60
70	70	1.00	8.85
72	72	1.00	9.10
74	74	1.00	9.35
76	76	1.00	9.60
78	78	1.00	9.85
80	80	1.00	10.10
82	82	1.00	10.35
84	84	1.00	10.60

STANDARD STRENGTH REINFORCED CONCRETE CULVERT PIPE

Max. Fill Height Above Pipe (Feet)	D (Inches)	Reinforcement (Sq. In. per Lin. Foot of Pipe)	Longitudinal Reinforcement (Min. Total Area Req'd)
2	2	1.00	0.35
4	4	1.00	0.60
6	6	1.00	0.85
8	8	1.00	1.10
10	10	1.00	1.35
12	12	1.00	1.60
14	14	1.00	1.85
16	16	1.00	2.10
18	18	1.00	2.35
20	20	1.00	2.60
22	22	1.00	2.85
24	24	1.00	3.10
26	26	1.00	3.35
28	28	1.00	3.60
30	30	1.00	3.85
32	32	1.00	4.10
34	34	1.00	4.35
36	36	1.00	4.60
38	38	1.00	4.85
40	40	1.00	5.10
42	42	1.00	5.35
44	44	1.00	5.60
46	46	1.00	5.85
48	48	1.00	6.10
50	50	1.00	6.35
52	52	1.00	6.60
54	54	1.00	6.85
56	56	1.00	7.10
58	58	1.00	7.35
60	60	1.00	7.60
62	62	1.00	7.85
64	64	1.00	8.10
66	66	1.00	8.35
68	68	1.00	8.60
70	70	1.00	8.85
72	72	1.00	9.10
74	74	1.00	9.35
76	76	1.00	9.60
78	78	1.00	9.85
80	80	1.00	10.10
82	82	1.00	10.35
84	84	1.00	10.60

GENERAL NOTES

1. All concrete shall be of the quality and strength specified in the Standard Specifications for Highway Construction, adopted by the State Highway Department.

2. The bedding shall be placed in layers, each layer compacted to the required density.

3. The bedding shall be placed in layers, each layer compacted to the required density.

4. The bedding shall be placed in layers, each layer compacted to the required density.

5. The bedding shall be placed in layers, each layer compacted to the required density.

6. The bedding shall be placed in layers, each layer compacted to the required density.

7. The bedding shall be placed in layers, each layer compacted to the required density.

8. The bedding shall be placed in layers, each layer compacted to the required density.

9. The bedding shall be placed in layers, each layer compacted to the required density.

10. The bedding shall be placed in layers, each layer compacted to the required density.

STANDARD M-II2-D

STRUCTURE NO.

COLORADO

STATE HIGHWAY DEPARTMENT

DESIGNED BY

MADE BY

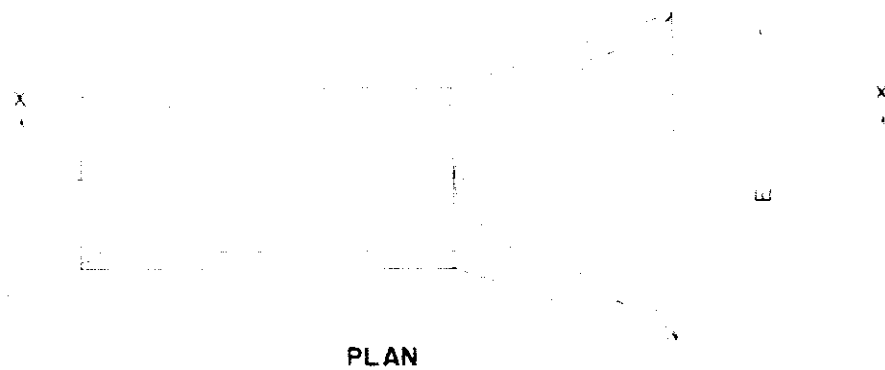
APPROVED BY

DATE

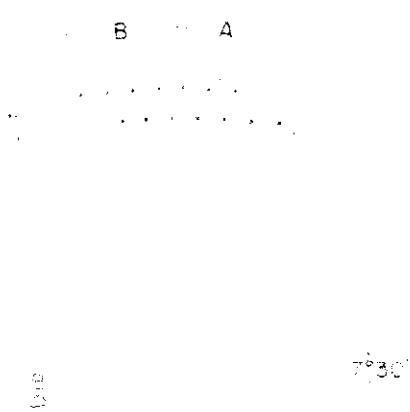
FLARED END SECTION FOR CONCRETE PIPE

7°30' ANGLE SECTION FOR CONCRETE PIPE

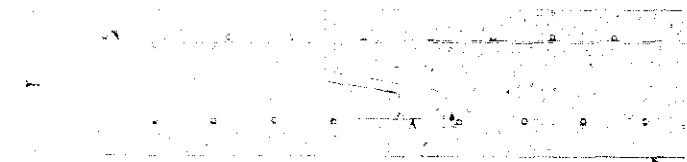
COPPER EXPANSION JOINT FOR CONCRETE PIPE
(WHEN REQUIRED ON PLANS)



PLAN



Reinforcing to conform with the requirements of the pipe with which this joint is used



Outside of pipe D=12" to 18"
Inside of pipe D=24" or over

*4" Min. 12 oz. Beaded
Copper Sealing Strip

Style No 28 A A S & W Mesh or
suitable equivalent.

1 Mortar Joint

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

3:1 Slope

1 Diameter
of Pipe

SECTION X-X

END VIEW

COPPER SEALING STRIP



Copper Sealing Strips shall be made from sheet copper, 4" min. width, bent as shown and weighing 2 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.

DIMENSIONS FOR FLARED END SECTIONS

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

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

DIMENSIONS FOR 7°30' ANGLE SECTIONS

DIAMETER OF PIPE	LENGTH IN FEET OF PIPE				AVERAGE LAYING LENGTH IN FEET
	A	B	C	D	
12"	1'-2"	5'-1"	5'-2"	3'-2"	8'
16"	5'-2"	5'-8"	4'-4"	3'-8"	9'-3 1/2"
20"	5'-2"	4'-2"	5'	5'	8'-7 1/2"
24"	4'	5'-2"	2'	4'-6"	8'-7 1/2"
30"	4'-2"	7'	2'	4'-2"	9'
36"	4'-7 1/2"	8'-6"	2'	5'-6"	10'-4"
42"	6'	9'-2 1/2"	2'-8"	6'-6"	12'-5 1/2"
48"	7'	11'	3'-6"	8'-6"	13'-6"
54"	8'-6"	10'-6"	4'	8"	16'-5 1/2"
60"	9'-8"	14'	4'-8"	9'-4"	18'-3 1/2"

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

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.

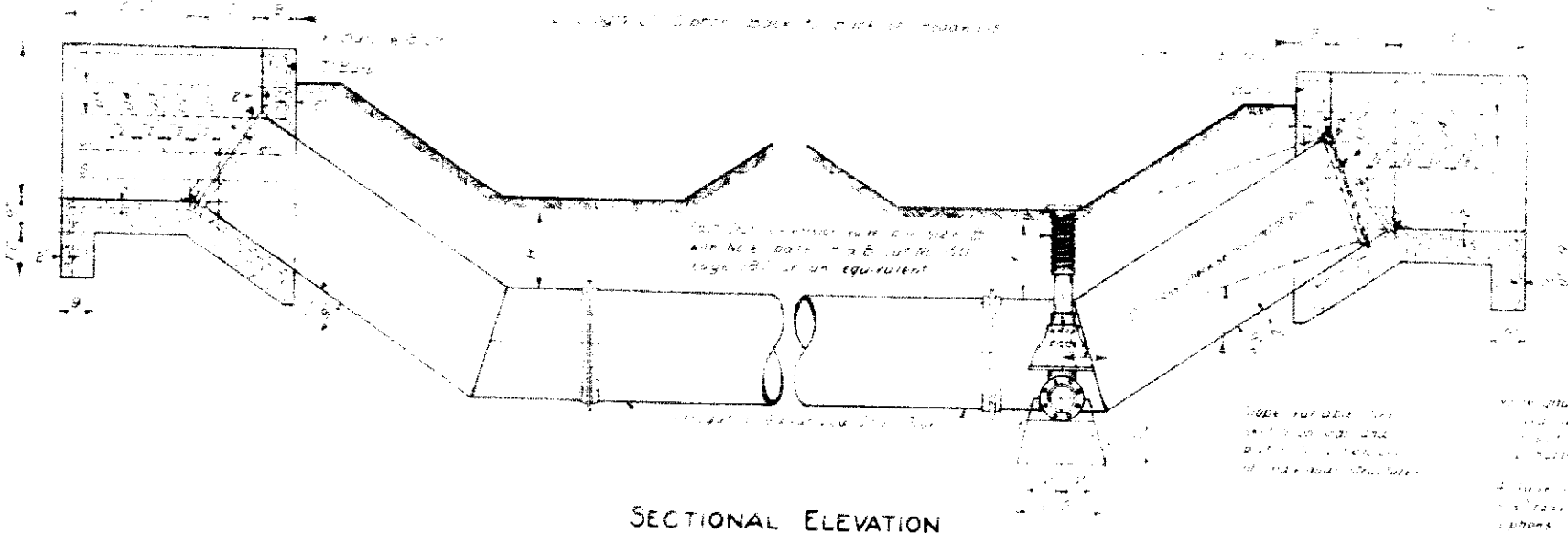
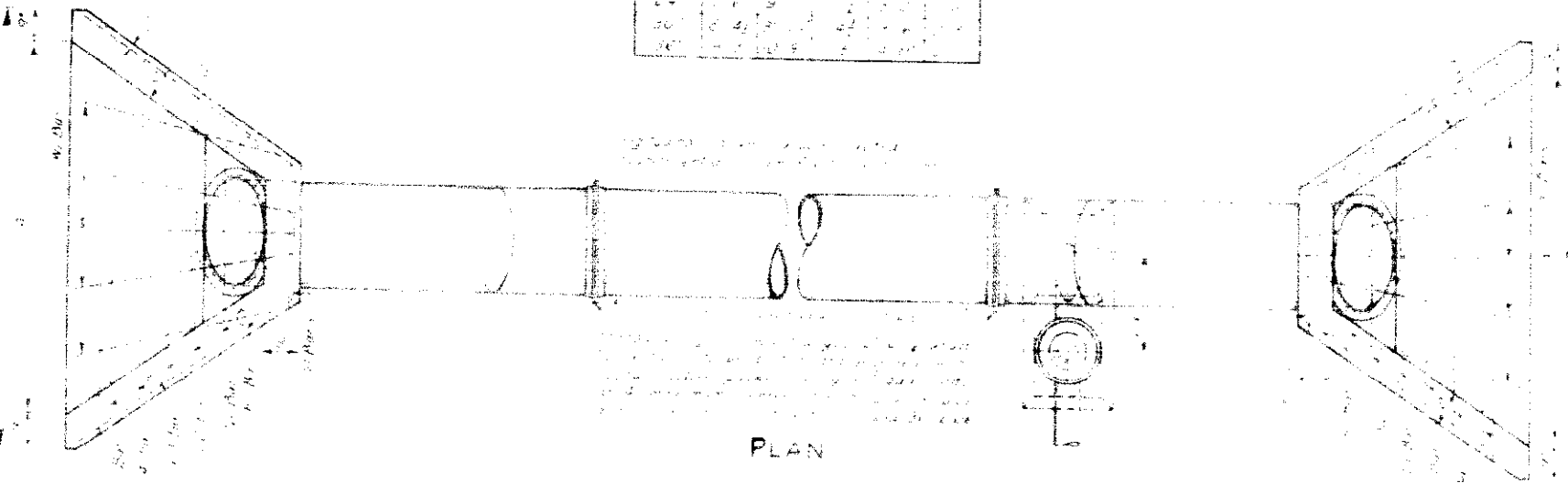
Concrete, wall thickness and reinforcing steel in Flared End Sections and 7°30' Angle Sections must conform with the requirements of the pipe with which they are used.

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.

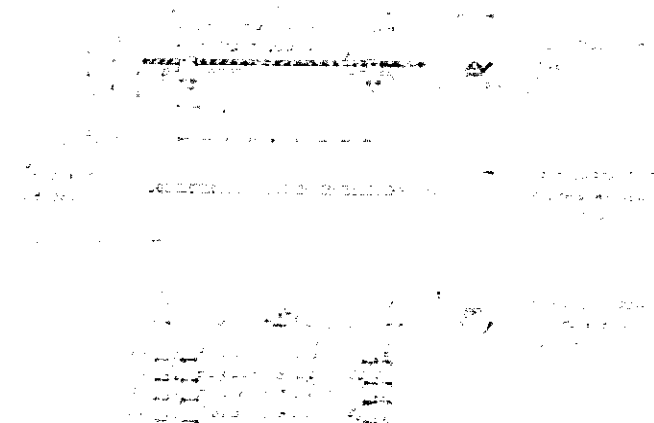
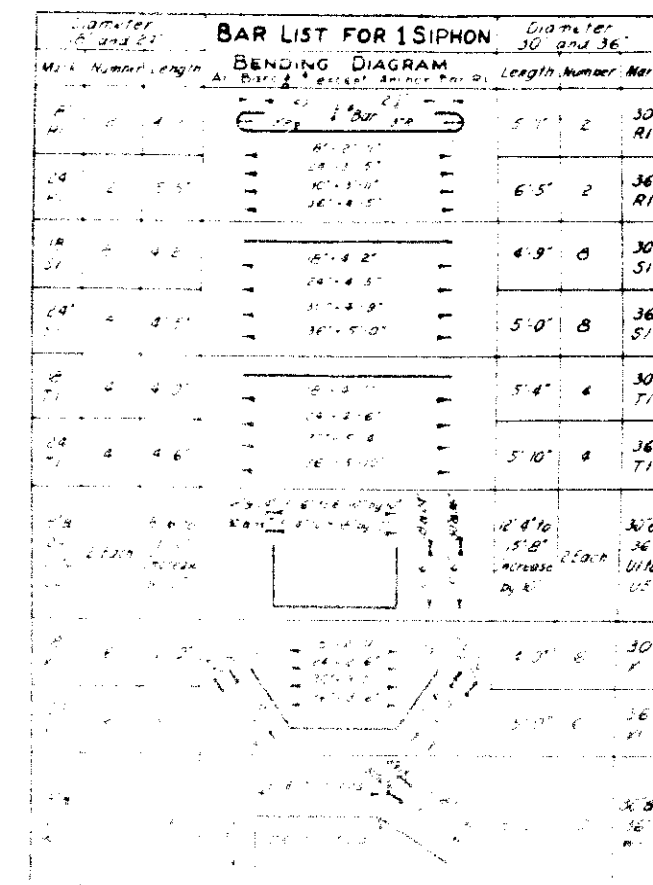


TABLE OF DIMENSIONS									
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11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

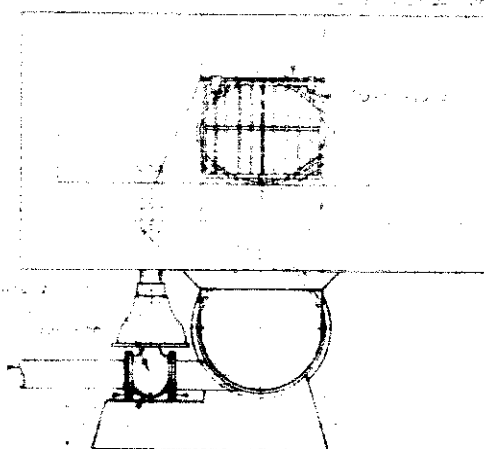


SECTIONAL ELEVATION

QUANTITIES FOR ONE SIPHON				
ITEM NO.	ITEM NAME	QTY.	UNIT	AMOUNT
1	1/2" GALV. PIPE	10	FEET	1.00
2	1/2" GALV. ELBOW	2	EA	.20
3	1/2" GALV. COUPLER	2	EA	.20
4	1/2" GALV. END CAP	2	EA	.20
5	1/2" GALV. FLANGE	2	EA	.20
6	1/2" GALV. BOLT	2	EA	.20
7	1/2" GALV. NUT	2	EA	.20
8	1/2" GALV. WASHER	2	EA	.20
9	1/2" GALV. RIVET	2	EA	.20
10	1/2" GALV. SPLICER	2	EA	.20
11	1/2" GALV. HANGER	2	EA	.20
12	1/2" GALV. CLAMP	2	EA	.20
13	1/2" GALV. BRACKET	2	EA	.20
14	1/2" GALV. SUPPORT	2	EA	.20
15	1/2" GALV. ANCHOR	2	EA	.20
16	1/2" GALV. TIE	2	EA	.20
17	1/2" GALV. RING	2	EA	.20
18	1/2" GALV. BAND	2	EA	.20
19	1/2" GALV. CLIP	2	EA	.20
20	1/2" GALV. SCREW	2	EA	.20
21	1/2" GALV. PIN	2	EA	.20
22	1/2" GALV. NAIL	2	EA	.20
23	1/2" GALV. STAPLE	2	EA	.20
24	1/2" GALV. TACK	2	EA	.20
25	1/2" GALV. BRAD	2	EA	.20
26	1/2" GALV. SHOT	2	EA	.20
27	1/2" GALV. BULLET	2	EA	.20
28	1/2" GALV. CARTRIDGE	2	EA	.20
29	1/2" GALV. RIFLE	2	EA	.20
30	1/2" GALV. PISTOL	2	EA	.20
31	1/2" GALV. REVOLVER	2	EA	.20
32	1/2" GALV. SHOTGUN	2	EA	.20
33	1/2" GALV. RIFLE	2	EA	.20
34	1/2" GALV. PISTOL	2	EA	.20
35	1/2" GALV. REVOLVER	2	EA	.20
36	1/2" GALV. SHOTGUN	2	EA	.20
37	1/2" GALV. RIFLE	2	EA	.20
38	1/2" GALV. PISTOL	2	EA	.20
39	1/2" GALV. REVOLVER	2	EA	.20
40	1/2" GALV. SHOTGUN	2	EA	.20



DETAIL OF TRAP GUARD



FRONT ELEVATION

GENERAL NOTES

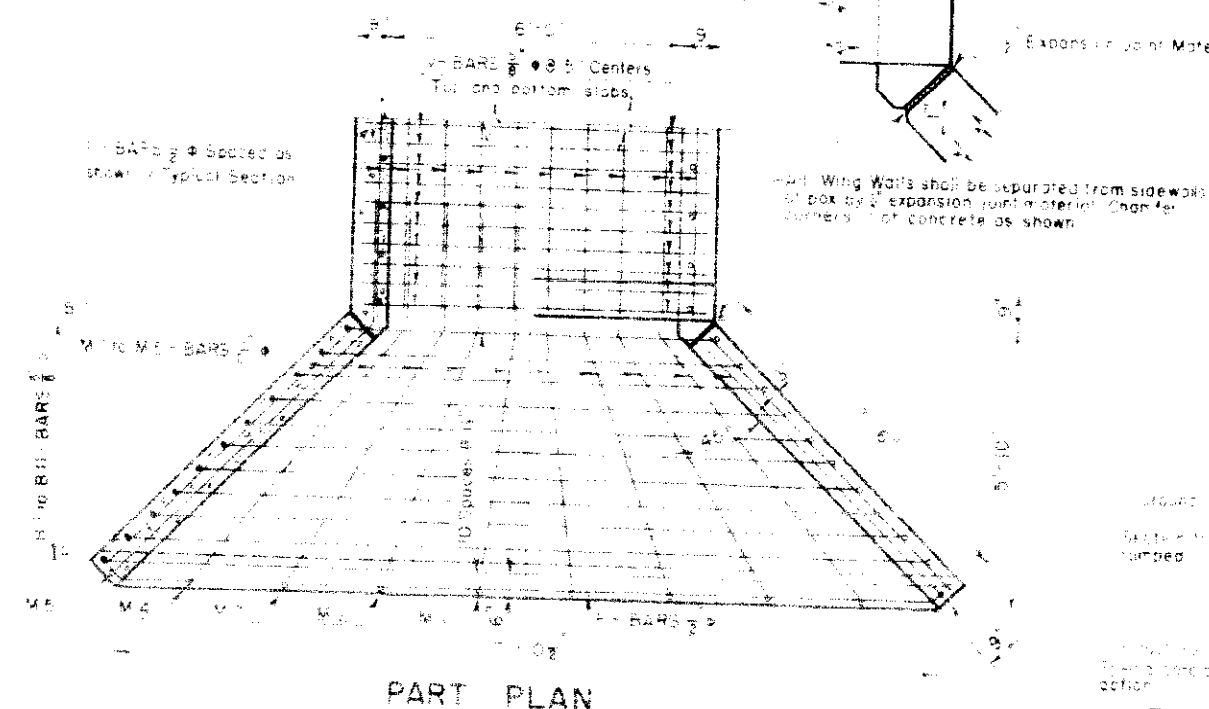
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COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD SIPHON
CORRUGATED GALVANIZED
IRON PIPE WITH CONCRETE
INLET & OUTLET BOXES
SIZES 18"-24"-30"-36"

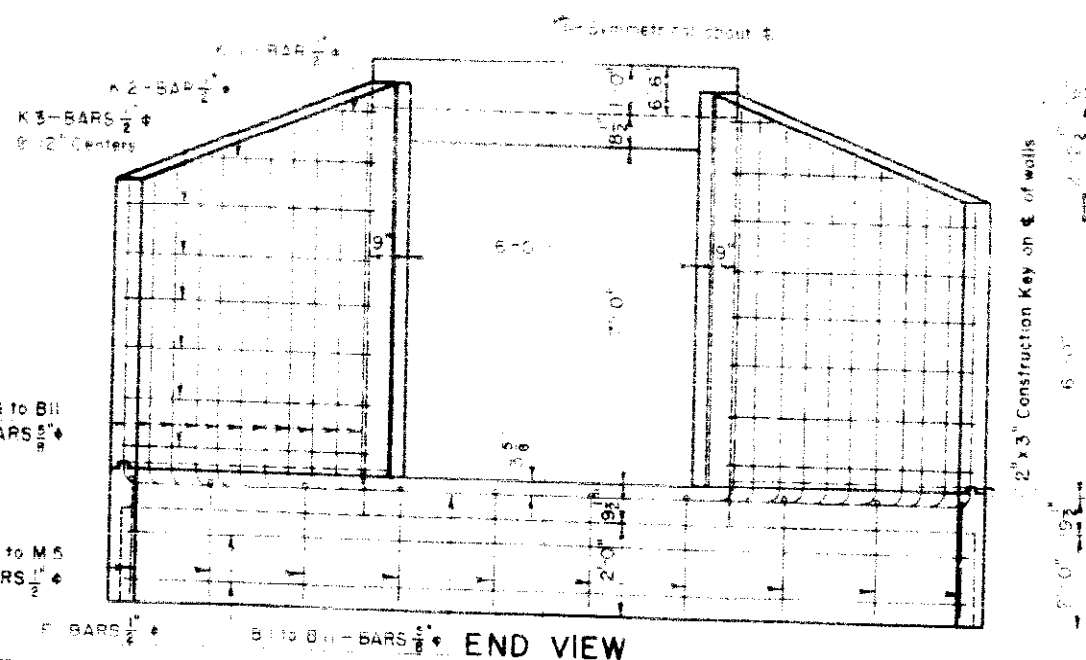
Designed by A.G.K.	Approved by <i>P. Gaudy</i>
Made by A.G.K.	Bridge Engineer
Checked by N. M. M.	Date: <i>July 1, 1948.</i>



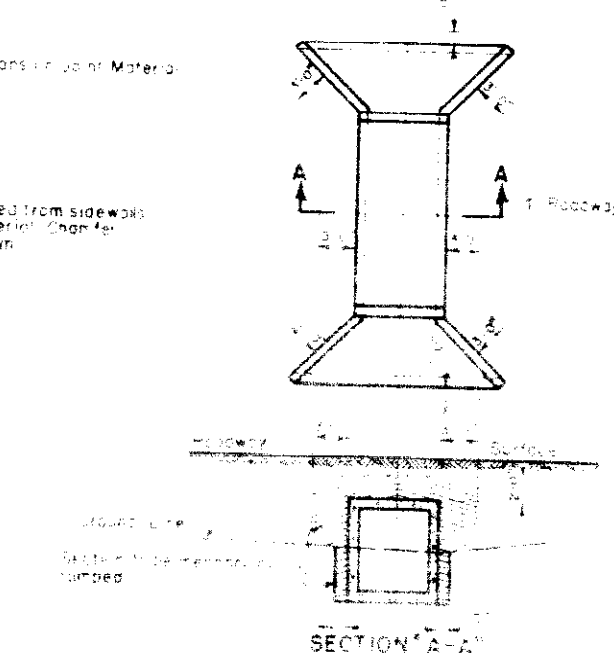
TYPICAL SECTION THRU BOX



PART PLAN

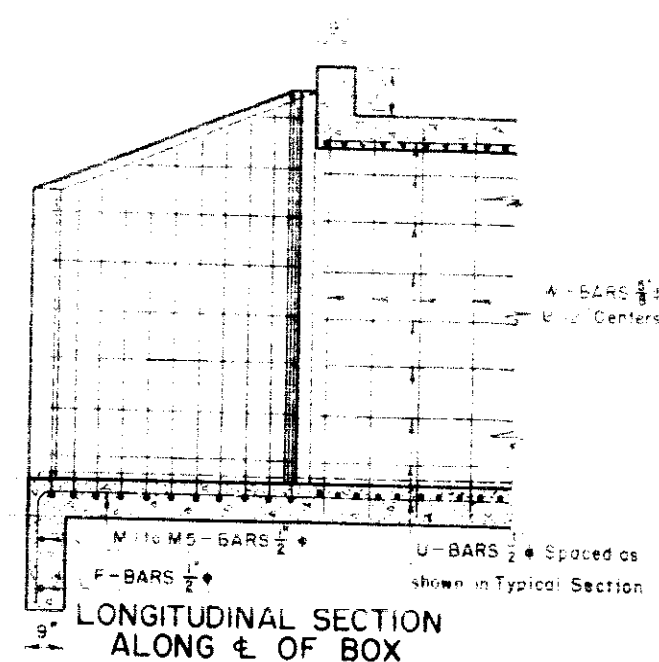


END VIEW



SECTION 4-2

MECHANICALLY TAMPED BACKFILL

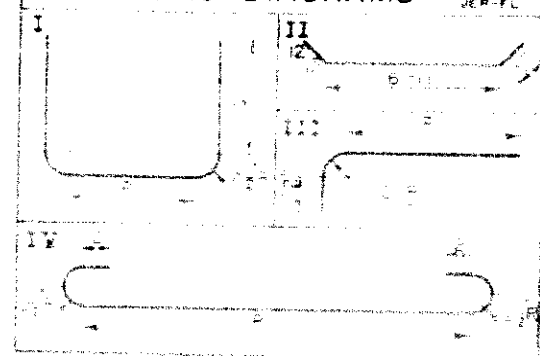


LONGITUDINAL SECTION
ALONG ϕ OF BOX

GENERAL NOTES

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BENDING DIAGRAMS



SUMMARY OF QUANTITIES

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NOTE TO BE USED AS STOCK PASS ONLY

DATE RECEIVED: 11/11/2011 11:11 AM

LOADING DATA

DATE OF BIRTH: 06 SEP 1941

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Earth = 20 lbs per cu ft

DESIGN DATA

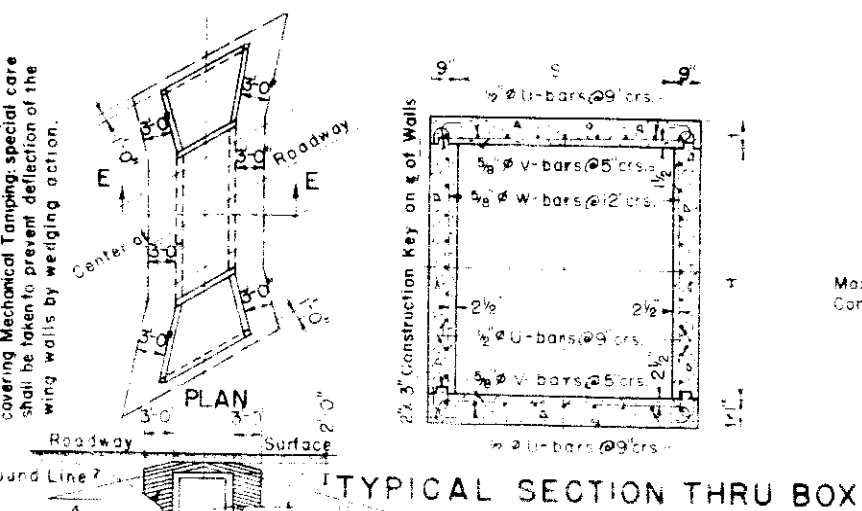
$f_1 = 10,000 \text{ lbs per sq ft.}$
 $f_2 = 20,000 \text{ lbs per sq ft.}$
 $P = 0$

COLORADO
STATE HIGHWAY DEPARTMENT

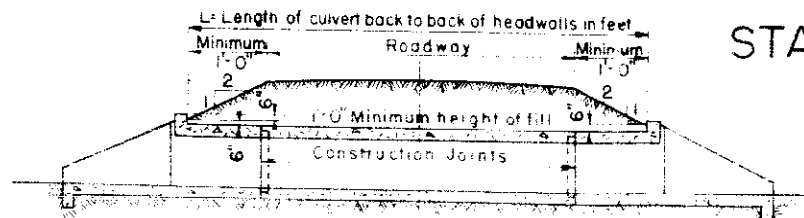
SPECIAL 6 FT. x 7 FT.
CONCRETE BOX CULVERT
FOR STOCK PASS

Approved by <i>W.D. Bailey</i> Bridge Engineer	Date: <i>Aug 25, 1948</i>
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STANDARD M-103-G



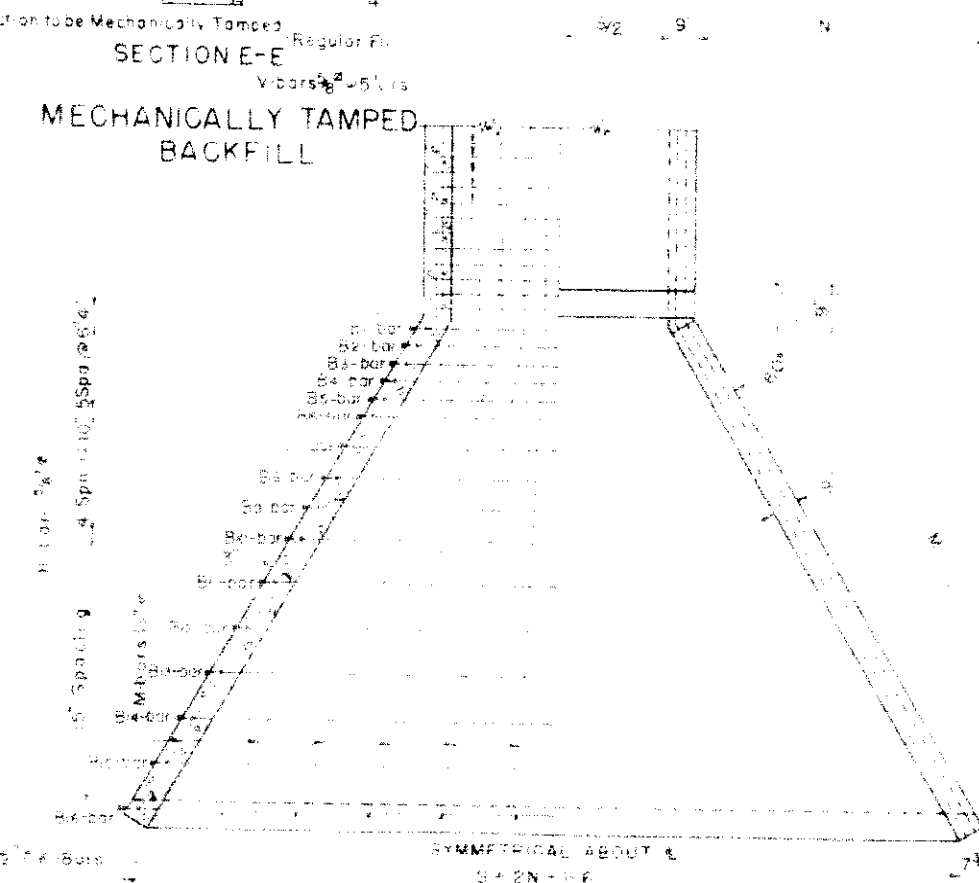
Maximum distance between
Const. joints shall be 35'-0"



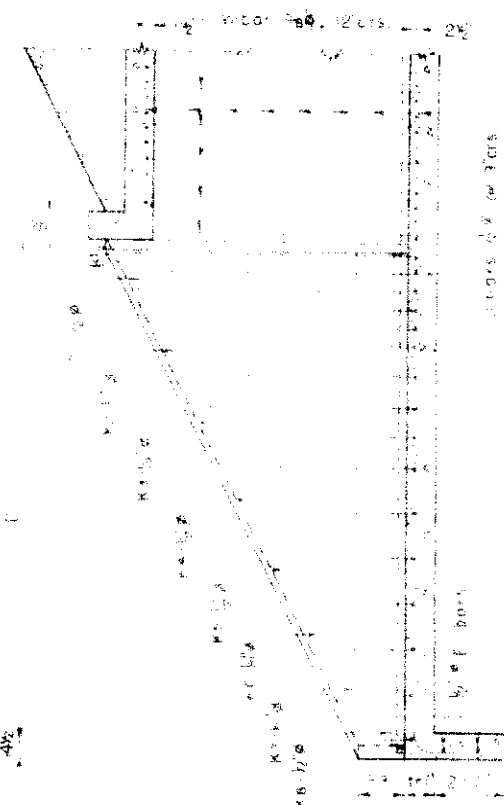
TYPICAL SECTION SHOWING RELATION
OF CULVERT TO ROADWAY



HALF-LAP CONST. JOINT



PART PLAN



LONGITUDINAL SECTION ON CENTER LINE OF BOX

REINFORCEMENT BAR LIST

USE PART FOR	MARK SIZE NUMBER	DIMENSION	DIMENSION	TOTAL	BENDING DIAGRAM
ALL SIZES	1	5'-4 1/2"	5'-8"	5'-2 1/4"	LENGTH ALL DIMENSIONS ARE TO C OF BARS
	2	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	3	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	4	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	5	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	6	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	7	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	8	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	9	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	10	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	11	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	12	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	13	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	14	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	15	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	16	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	17	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	18	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	19	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	20	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	21	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	22	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	23	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	24	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	25	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	26	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	27	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	28	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	29	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	30	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	31	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	32	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	33	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	34	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	35	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	36	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	37	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	38	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	39	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	40	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	41	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	42	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	43	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	44	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	45	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	46	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	47	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	48	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	49	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius
	50	2'-2 1/2"	1'-3"	2'-0"	2'-0" 2 1/2" Radius

2'-0" 2 1/2" Radius

[illegible]

GENERAL NOTES

Work shall be done according to the Standard Specifications for the Ohio State Highway Department, Adopted January 1, 1948.

- All concrete shall be class "A".
- Horizontal construction joints not required when floors and side walls are poured monolithically. All walls shall have forms on both sides.
- Minimum distance between centerline of box and edge of concrete to be 18".
- 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 letter designation.
- Secondary bars when spliced shall be given a lap of 50 diameters.
- Main bars shall not be spliced.
- Locations 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.
- Power 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 or mechanically tamped Backfill shown on this drawing.
- All surfaces exposed to view on the box and wing walls shall receive class "A" surface finish, except culvert barrel.

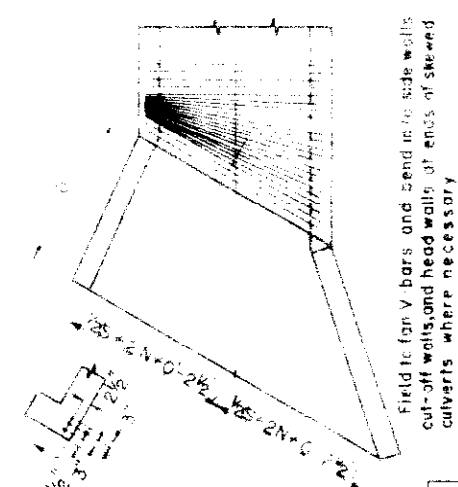
LOADING DATA
 TYPE OF LOAD: GRAVITY
 DEAD LOAD: EARTH: 120 lb per cu ft
 CONCRETE: 150 lb per cu ft

DESIGNING DATA
4.3.5.1. 844 UNIT STRESSES

COLORADO
STATE HIGHWAY DEPARTMENT

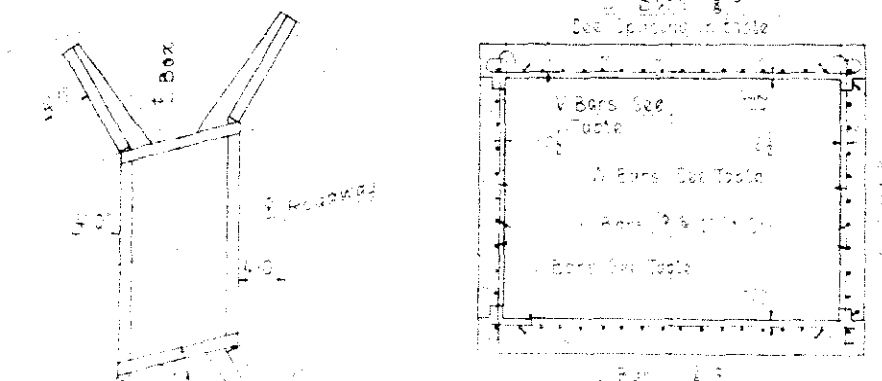
CONCRETE BOX CULVERT		
2x2'	4x3'	5x5'
3x2'	4x4'	6x4'
3x3'	5x3'	6x6'
4x2'	5x4'	6x7'

Designed by WWD	Approved by F. J. Emery
Made by S. L.	Bridge Engineer
Checked by S. L.	Date May 25, 1945

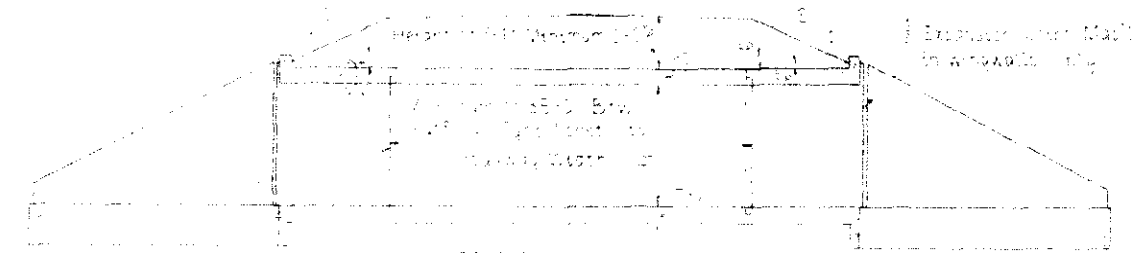


PART PLAN FOR SKEWED HEADWALLS

ORIGINAL BY	INITIAL	DATE
CHECKED BY		
VANDYKE BY		
CHECKED BY		



TYPICAL SECTION THRU BOX



TYPICAL SECTION SHOWING RELATION OF CULVERT TO ROADWAY

HALF-LAP TYPE CONSTRUCTION JOINT & ALTERNATE JOINT

PART PLAN FOR SKEWED HEADWALLS

MECHANICALLY TAMPED BACKFILL

MECHANICALLY TAMPED BACKFILL

PART PLAN

TRUE ELEVATION OF WINGWALL

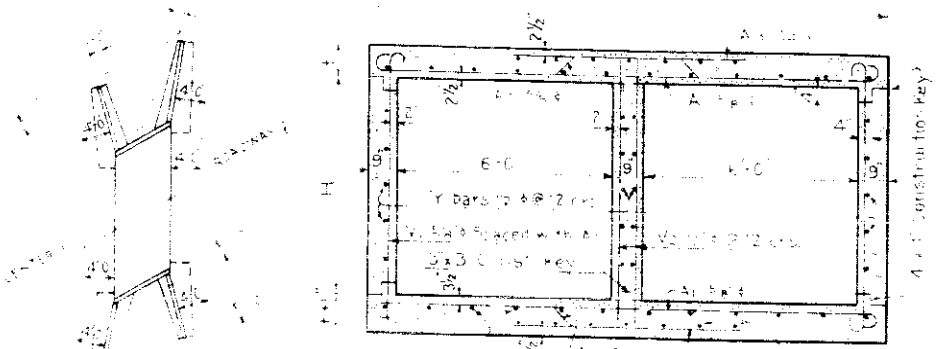
TABLE OF DIMENSIONS AND QUANTITIES

STEEL QUANTITIES GIVEN BELOW INCLUDE ALLOWANCE OF 1% FOR OVERRUN

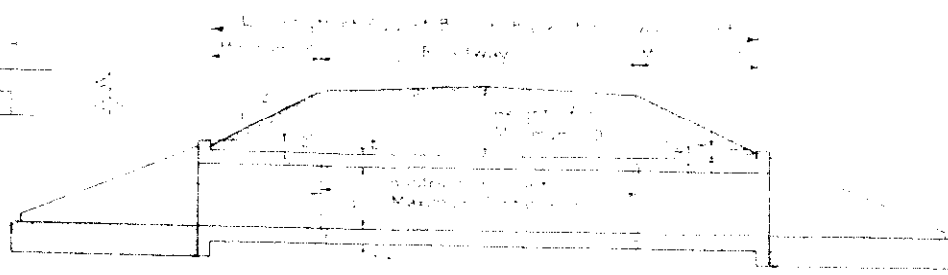
GENERAL NOTES

Box Size	Length	Area	Volume	Weight	Area	Volume	Weight
8x4	10	32	320	1280	12	384	1536
8x6	10	48	480	1920	18	576	2304
8x8	10	64	640	2560	24	768	3072
10x4	10	40	400	1600	16	480	1920
10x6	10	60	600	2400	24	720	2880
10x8	10	80	800	3200	32	960	3840
12x4	10	48	480	1920	18	576	2304
12x6	10	72	720	2880	28	864	3456
12x8	10	96	960	3840	36	1152	4608
14x4	10	56	560	2240	22	672	2688
14x6	10	84	840	3360	34	1008	3996
14x8	10	112	1120	4480	44	1344	5376

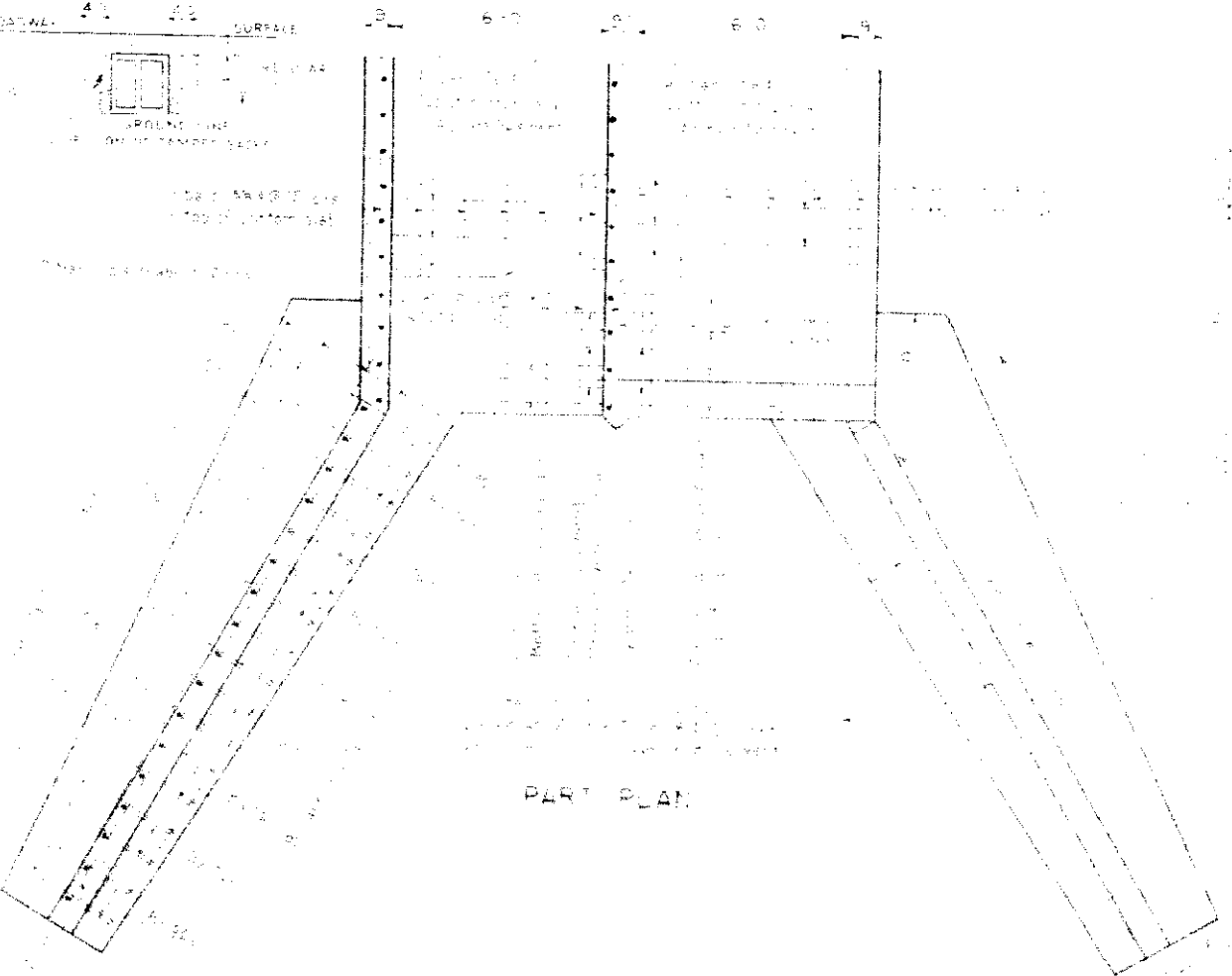
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
CONCRETE BOX CULVERT
8x4 10x6 12x6 14x8
8x6 10x8 12x8 14x10
8x8 10x10 12x10 14x12
1948



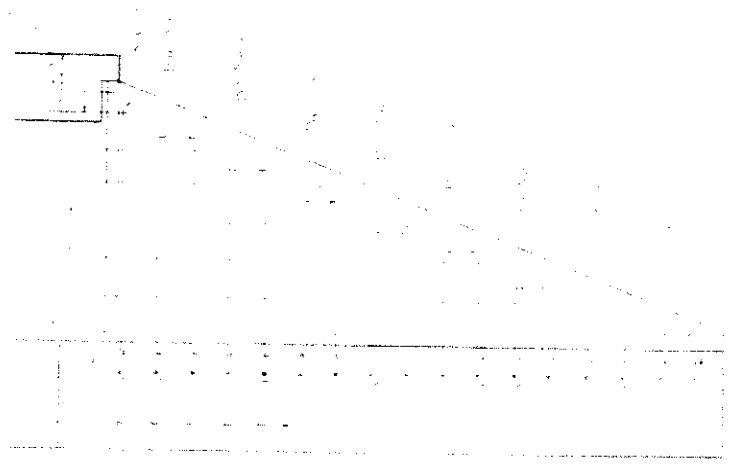
TYPICAL SECTION THRU BOX



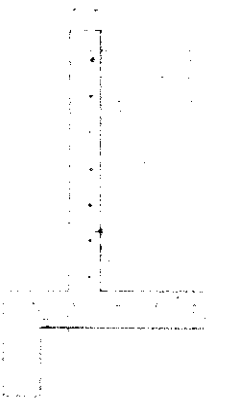
TYPICAL SECTION SHOWING RELATION OF CULVERT TO ROADWAY



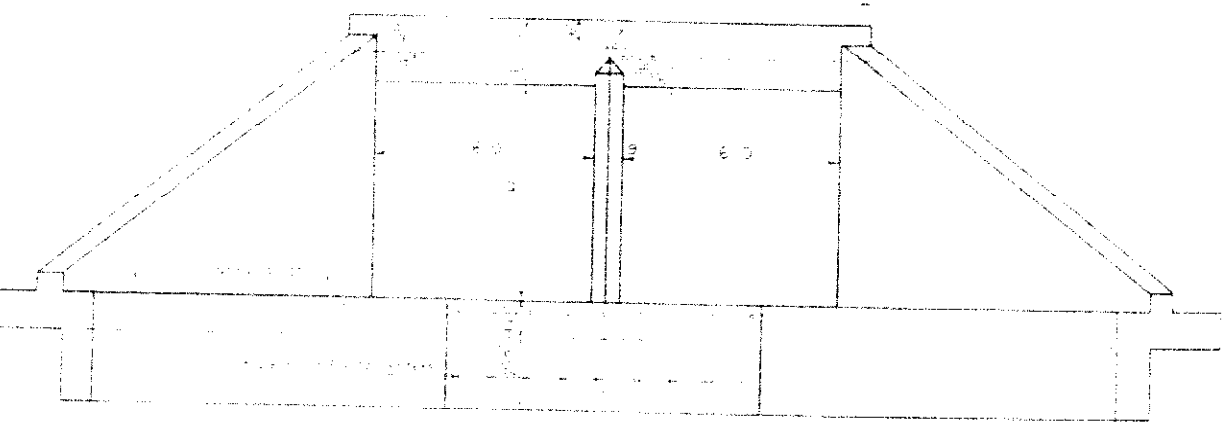
PART PLAN



TYPICAL SECTION THRU ABUTMENT



TYPICAL SECTION THRU WING WALL



END ELEVATION

PART PLAN FOR SKEWED HEADWALLS

REINFORCEMENT BAR LIST			
NO.	DESCRIPTION	QUANTITY	REMARKS
1	Top Bars	10	
2	Bottom Bars	10	
3	Side Bars	10	
4	Headwall Bars	10	
5	Wing Wall Bars	10	
6	Abutment Bars	10	
7	Foundation Bars	10	
8	Drainage Bars	10	
9	Expansion Joint Bars	10	
10	End Bars	10	
11	Top Bars	10	
12	Bottom Bars	10	
13	Side Bars	10	
14	Headwall Bars	10	
15	Wing Wall Bars	10	
16	Abutment Bars	10	
17	Foundation Bars	10	
18	Drainage Bars	10	
19	Expansion Joint Bars	10	
20	End Bars	10	

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD DOUBLE
CONCRETE BOX CULVERT
6x3 6x4 6x5
6x6

Designed by _____
Made by _____
Checked by _____

Approved by _____
Bridge Engineer
Date _____

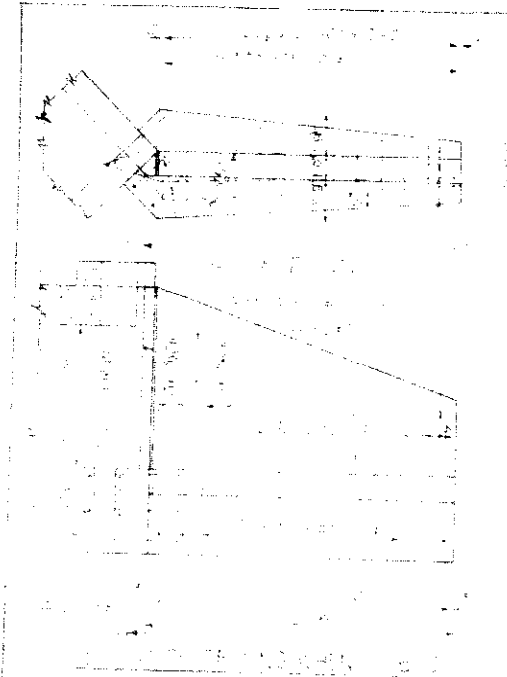
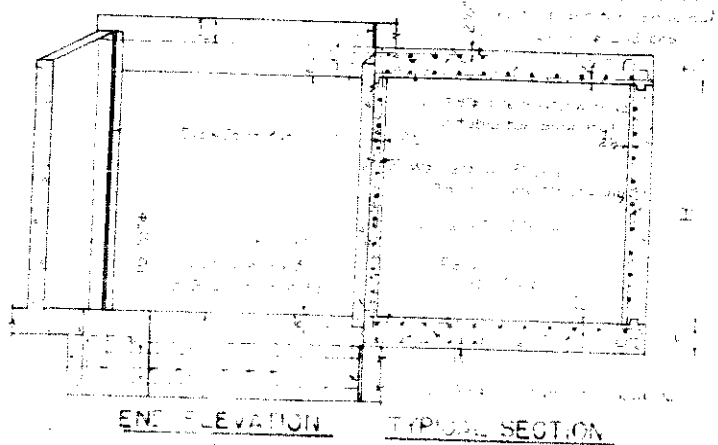
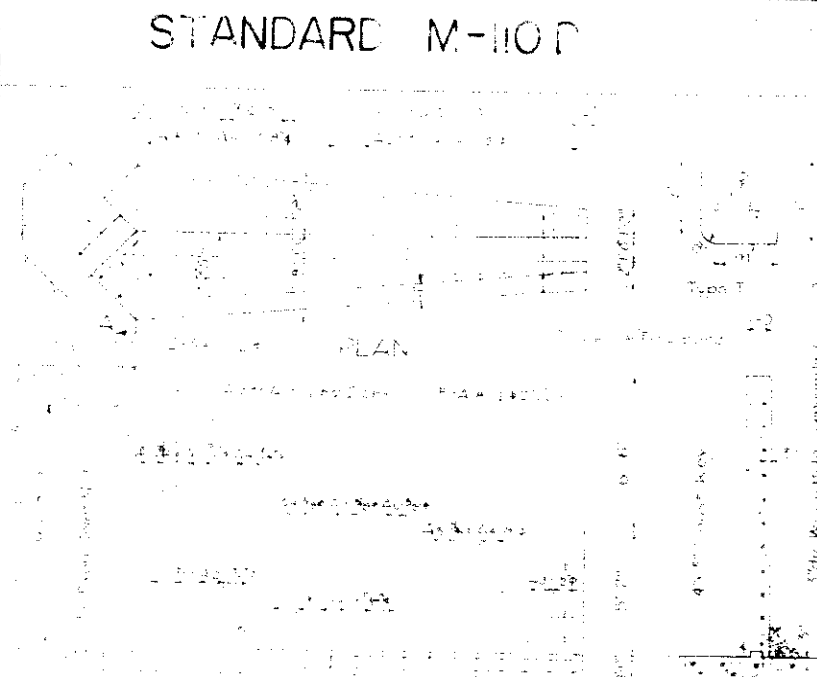


TABLE OF DIMENSIONS & QUANTITIES

ITEM	DESCRIPTION	QUANTITY	UNIT
1	CONCRETE	1.00	CU YD
2	STEEL	1.00	LB
3	GRAVEL	1.00	CU YD
4	ROADWAY	1.00	CU YD
5	EMBANKMENT	1.00	CU YD
6	HEADWALL	1.00	CU YD
7	CULVERT	1.00	CU YD
8	BACKFILL	1.00	CU YD
9	FINISH	1.00	CU YD
10	PAINT	1.00	CU YD

BAR LIST FOR CULVERT & TWO HEADWALLS

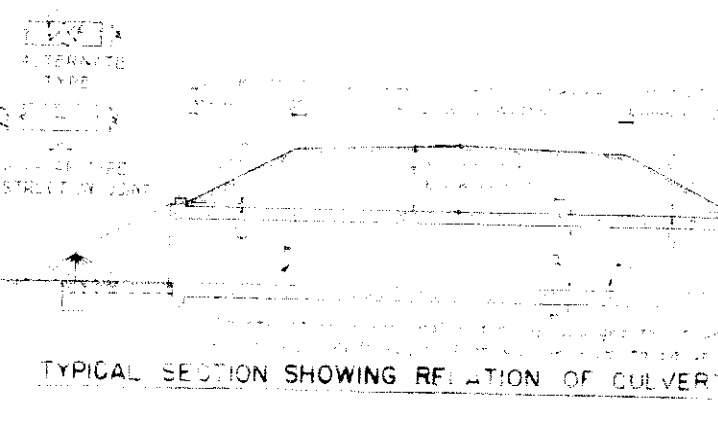
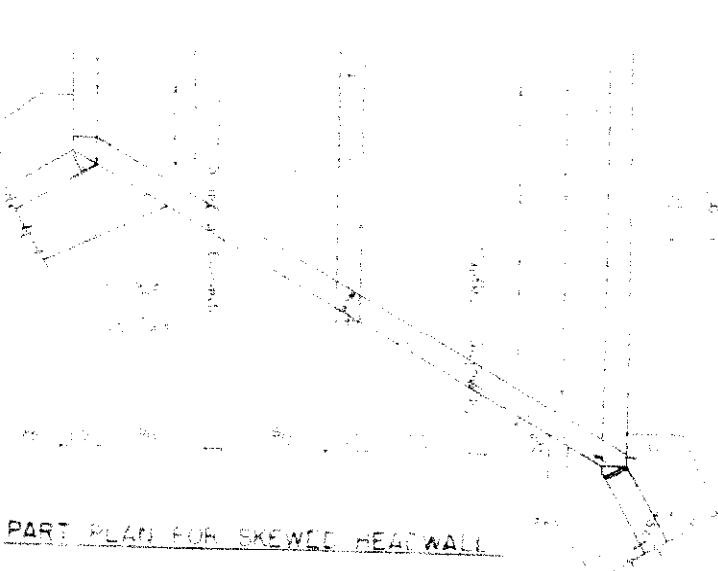
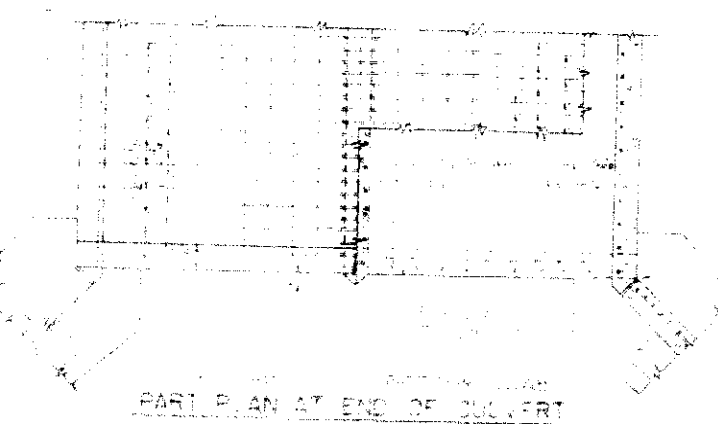
ITEM	DESCRIPTION	QUANTITY	UNIT
1	CONCRETE	1.00	CU YD
2	STEEL	1.00	LB
3	GRAVEL	1.00	CU YD
4	ROADWAY	1.00	CU YD
5	EMBANKMENT	1.00	CU YD
6	HEADWALL	1.00	CU YD
7	CULVERT	1.00	CU YD
8	BACKFILL	1.00	CU YD
9	FINISH	1.00	CU YD
10	PAINT	1.00	CU YD



GENERAL NOTES

1. The culvert shall be constructed of concrete and steel reinforcement. The culvert shall be designed to carry the full load of the roadway above it. The culvert shall be installed in a trench that is at least 18 inches deep. The culvert shall be surrounded by a layer of gravel. The culvert shall be finished with a smooth surface. The culvert shall be painted with a protective paint. The culvert shall be installed in a trench that is at least 18 inches deep. The culvert shall be surrounded by a layer of gravel. The culvert shall be finished with a smooth surface. The culvert shall be painted with a protective paint.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD DOUBLE
CONCRETE BOX CULVERT
10'x10' 12'x10' 14'x10'
10'x8' 12'x8' 14'x8'
10'x6' 12'x6' 14'x6'
10'x4' 12'x4' 14'x4'
10'x2' 12'x2' 14'x2'
10'x1' 12'x1' 14'x1'
10'x0' 12'x0' 14'x0'
10'x-1' 12'x-1' 14'x-1'
10'x-2' 12'x-2' 14'x-2'
10'x-3' 12'x-3' 14'x-3'
10'x-4' 12'x-4' 14'x-4'
10'x-5' 12'x-5' 14'x-5'
10'x-6' 12'x-6' 14'x-6'
10'x-7' 12'x-7' 14'x-7'
10'x-8' 12'x-8' 14'x-8'
10'x-9' 12'x-9' 14'x-9'
10'x-10' 12'x-10' 14'x-10'
10'x-11' 12'x-11' 14'x-11'
10'x-12' 12'x-12' 14'x-12'
10'x-13' 12'x-13' 14'x-13'
10'x-14' 12'x-14' 14'x-14'
10'x-15' 12'x-15' 14'x-15'
10'x-16' 12'x-16' 14'x-16'
10'x-17' 12'x-17' 14'x-17'
10'x-18' 12'x-18' 14'x-18'
10'x-19' 12'x-19' 14'x-19'
10'x-20' 12'x-20' 14'x-20'
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10'x-99' 12'x-99' 14'x-99'
10'x-100' 12'x-100' 14'x-100'



TYPICAL HEADWALL

MECHANICALLY TAMPED BACKFILL

NO. 12 CONCRETE INLET

STANDARD M-12-C 13

NO. 13 CONCRETE INLET

DIST. NO. 3 STATE COLORADO NO. 37 SHEETS

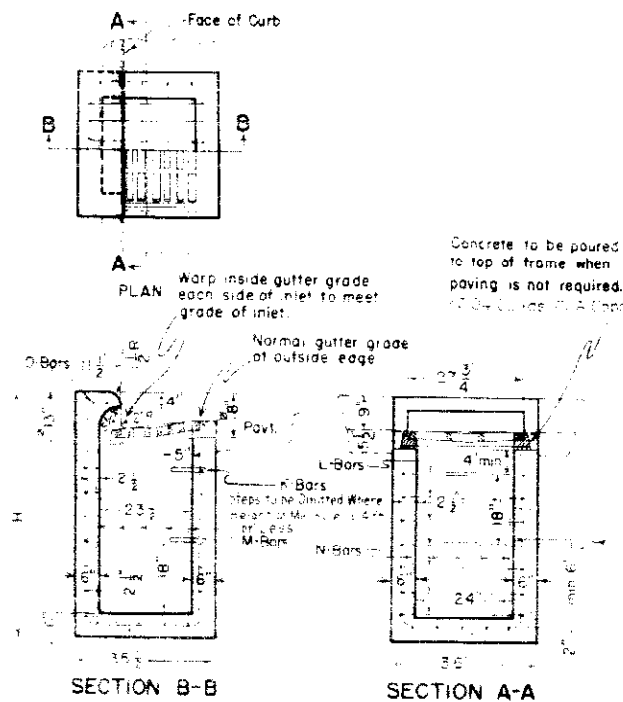
Revised 10-26-88 Changed Standard No.
Revised 12-12-87 M-12-C 13
Revised 10-26-88 Changed Standard No. 37
Revised 10-26-88 Changed Standard No. 37

BAR LIST FOR H = 3' 0"

MARK	SIZE	NO. REQD.	LENGTH	TYPE	DIMENSIONS	BENDING DIAGRAM
K	3/4"	2	6'	I	0' 8" x 0' 8"	
L	1/2"	3	12' 0"	II	2' 2" x 2' 2"	
M	1/2"	5	5' 5"	II	2' 2" x 2' 2"	
N	1/2"	5	6' 1"	I	2' 3" x 2' 6"	
O	1/2"	2	2' 7"	STR		

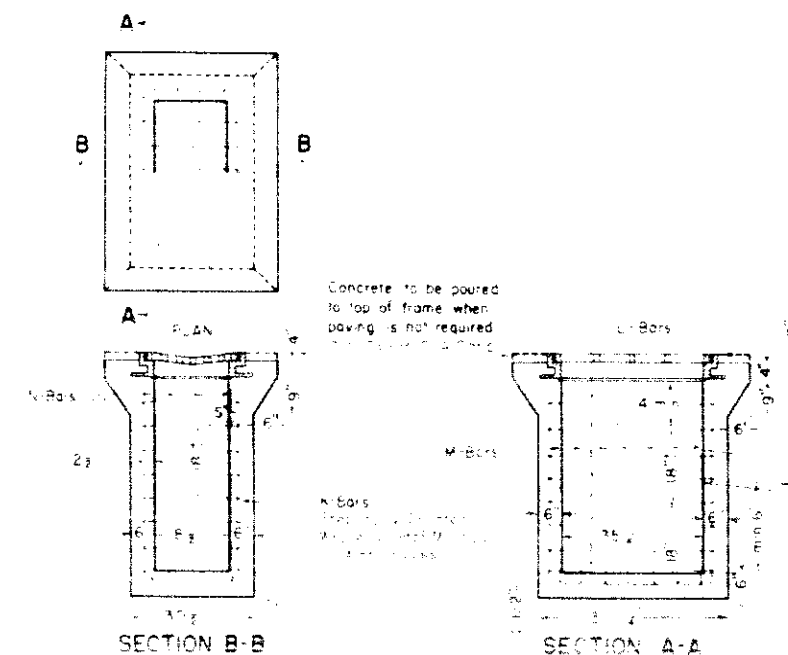
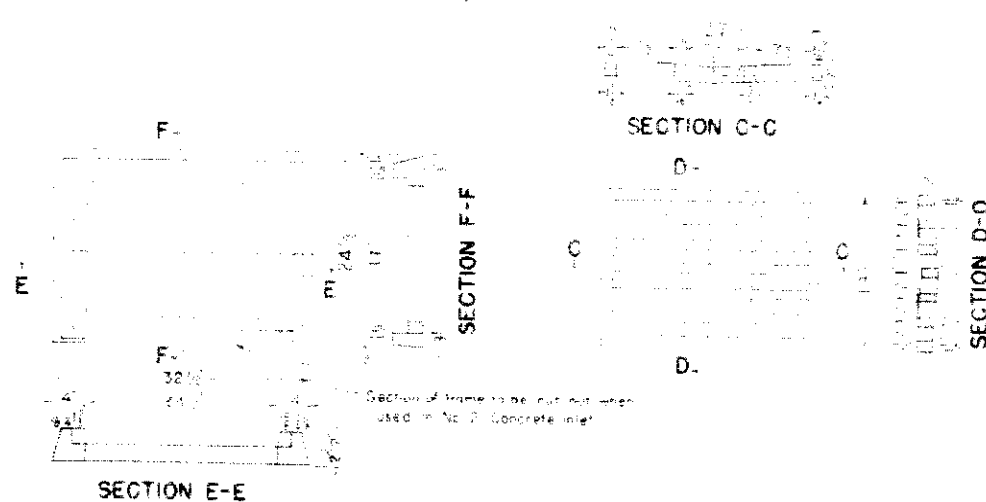
BAR LIST FOR H = 3' 0"

MARK	SIZE	NO. REQD.	LENGTH	TYPE	DIMENSIONS	BENDING DIAGRAM
K	3/4"	2	6'	I	0' 8" x 0' 8"	
L	1/2"	4	13' 0"	II	3' 1" x 3' 9"	
M	1/2"	7	6' 0"	I	1' 8" x 1' 11"	
N	1/2"	4	7' 4"	I	3' 0" x 3' 11"	



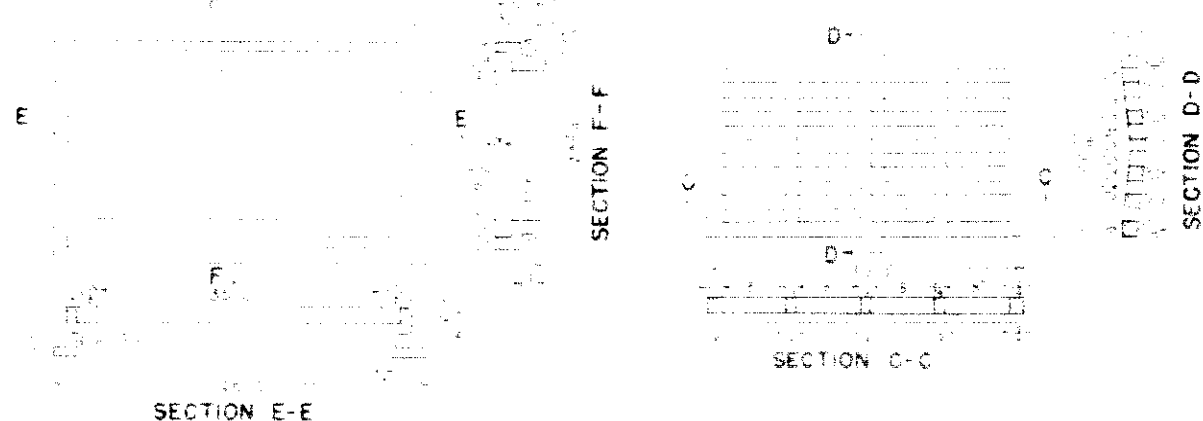
NO. 12 INLET GRATING & FRAME

Form height 24" to 30"



NO. 13 INLET GRATING & FRAME

Form height 24" to 30"



MARK	SIZE	NO. REQD.	LENGTH	TYPE	DIMENSIONS	BENDING DIAGRAM
K	3/4"	2	6'	I	0' 8" x 0' 8"	
L	1/2"	3	12' 0"	II	2' 2" x 2' 2"	
M	1/2"	5	5' 5"	II	2' 2" x 2' 2"	
N	1/2"	5	6' 1"	I	2' 3" x 2' 6"	
O	1/2"	2	2' 7"	STR		

CLASS	CONCRETE	STEEL
1	86	94
2	86	94
3	86	94
4	86	94
5	86	94
6	86	94
7	86	94
8	86	94
9	86	94
10	86	94

* 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 State Highway Department, adopted January 15, 1946.
- All reinforced concrete shall be class "A".
- 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 mark designation and station number.
- All castings shall be painted with two coats of asphalt or coal tar and oil.
- All castings exposed to view in the work shall receive a glass surface finish.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
NO. 12 AND NO. 13
CONCRETE INLETS

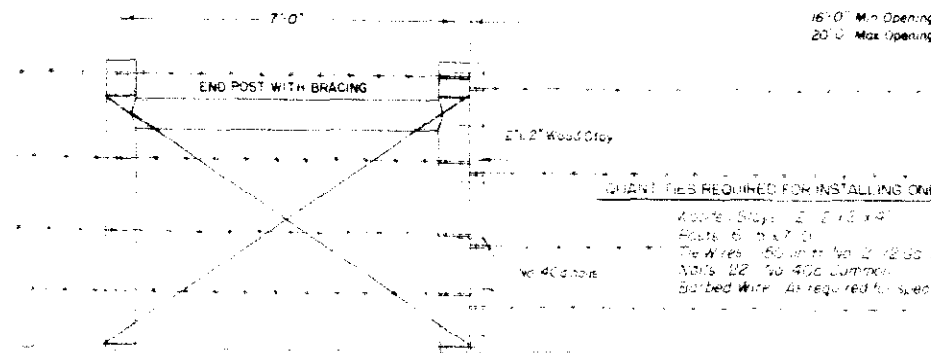
Designed by APG Approved by J. L. (12/2)
Made by APG Bridge Engineer
Check Design A Z
Check Detail C R S Date January 11, 1946

Standard Wire Fence With Wooden Posts

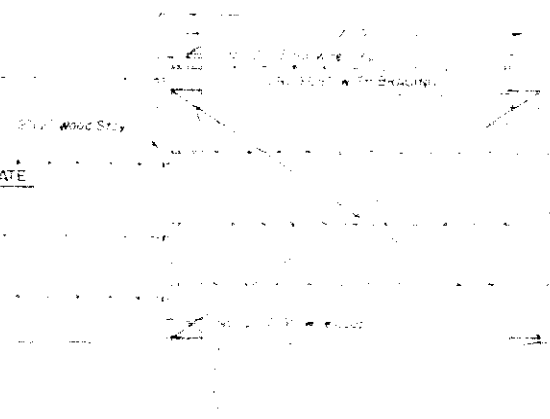
STANDARD M-24-H

38

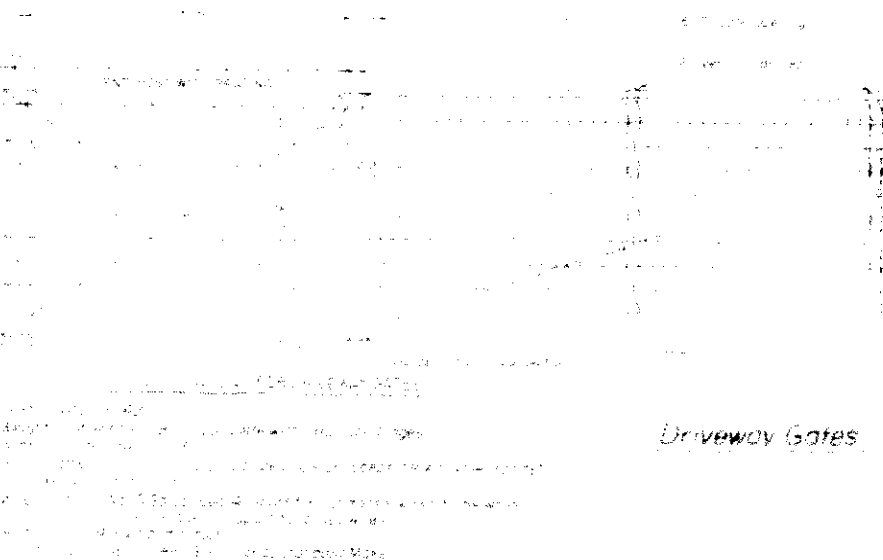
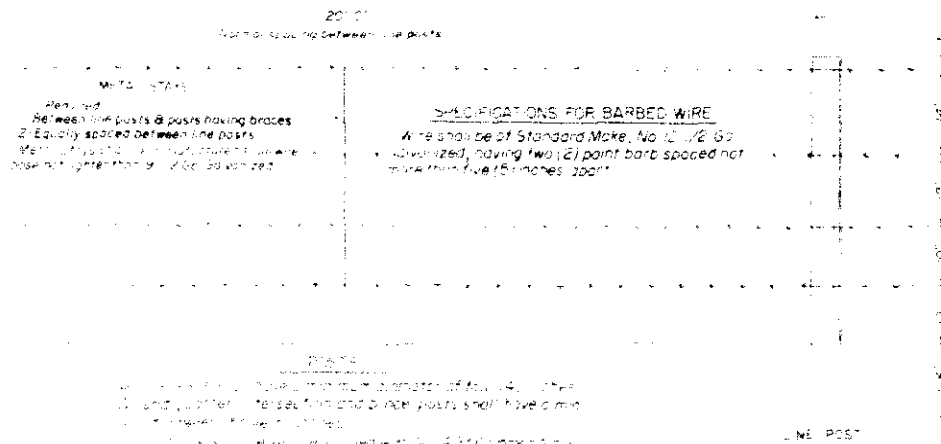
See Table M-24-H for spacing, or use gate, Added Gen. Note



Barbed Wire Gate



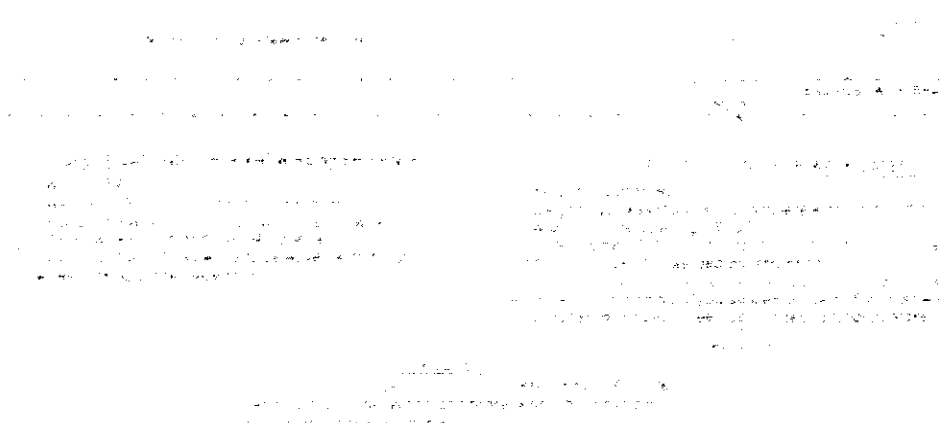
BARBED WIRE FENCE WITH WOODEN POSTS



Driveway Gates



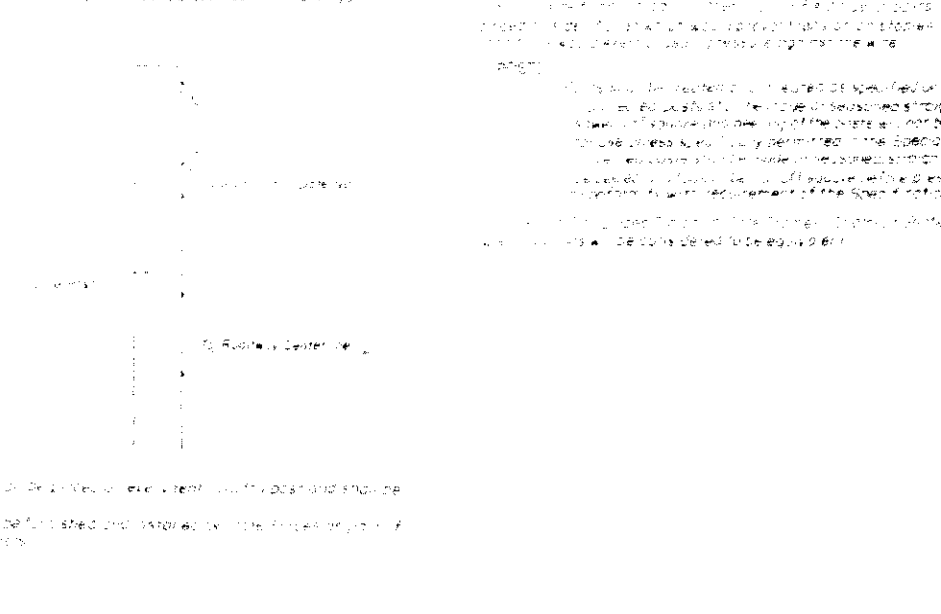
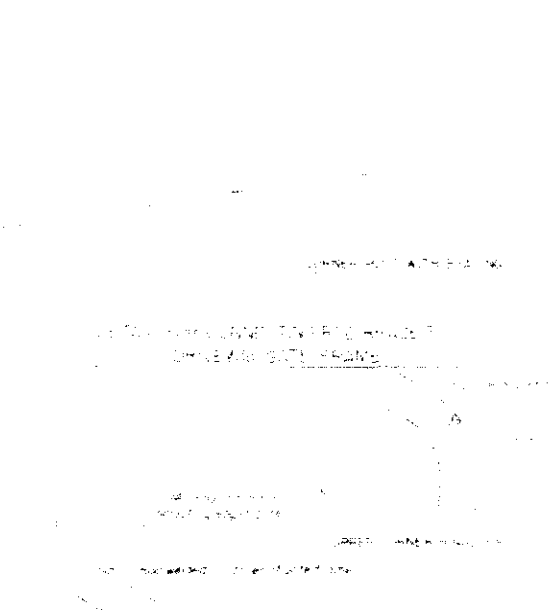
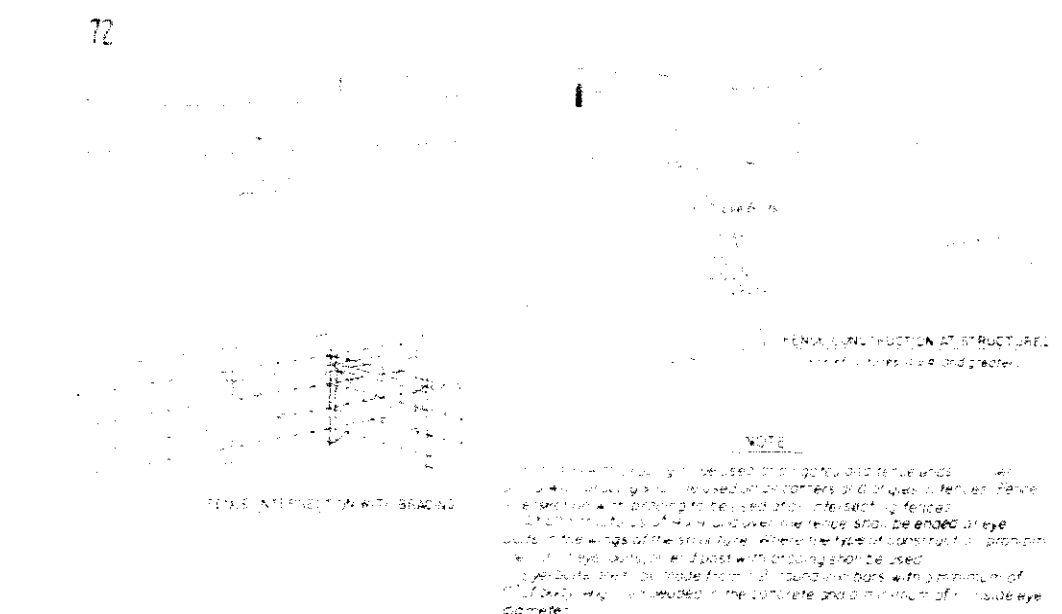
COMBINATION WIRE FENCE WITH WOODEN POSTS



Walk Gates

General Notes

Illustrative Sketch Showing Typical Examples For Constructing Fences

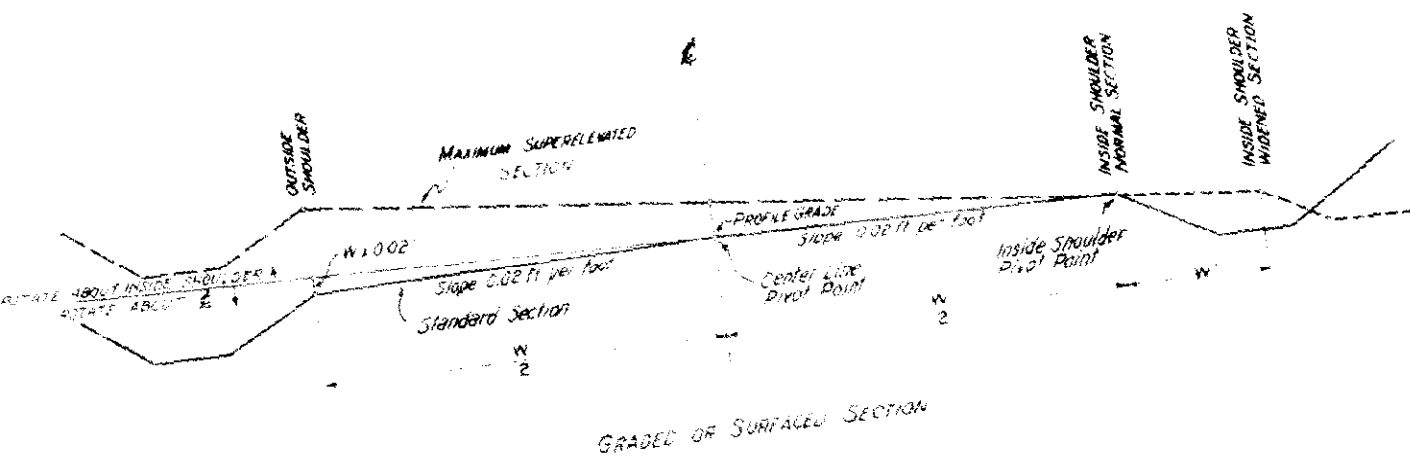


COLORADO
STATE HIGHWAY DEPARTMENT

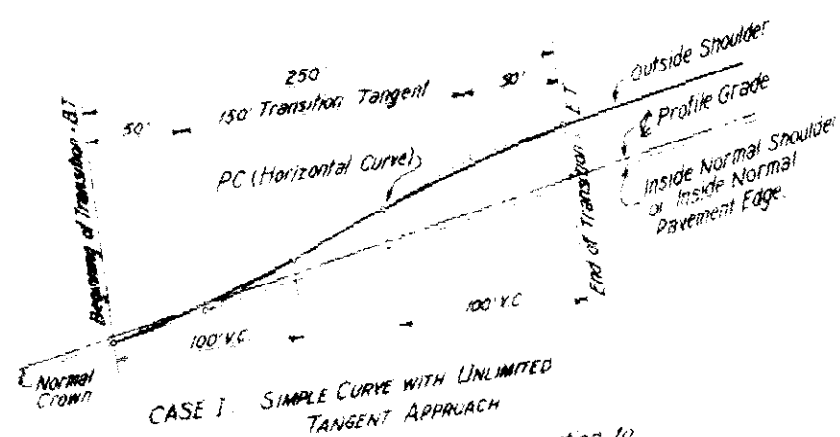
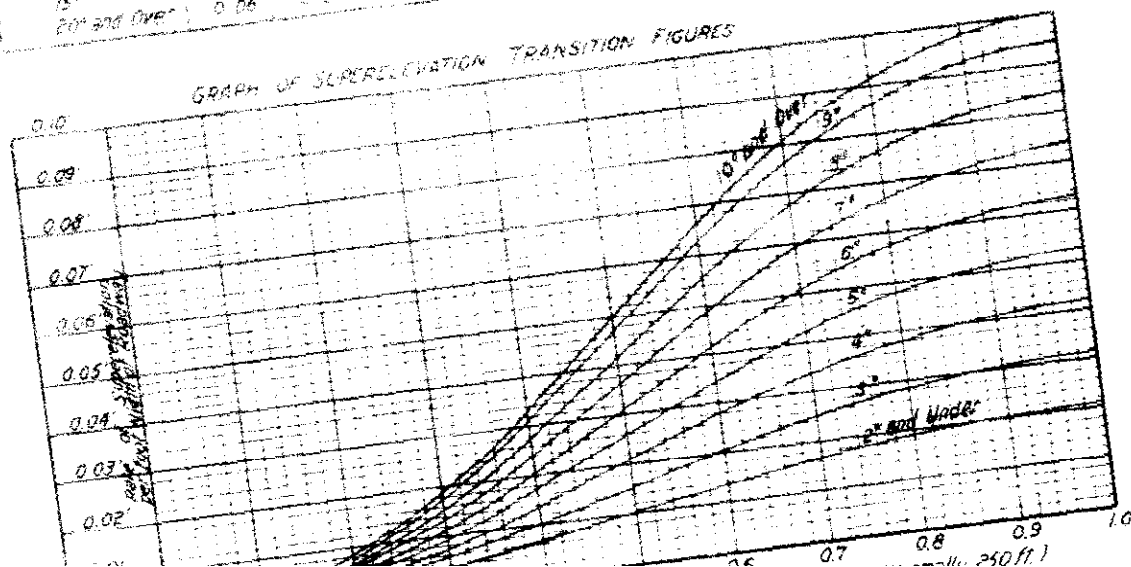
Standard Wire Fence
With
Wooden Posts

Designed by GCM
Made by GCM
Checked by GCM

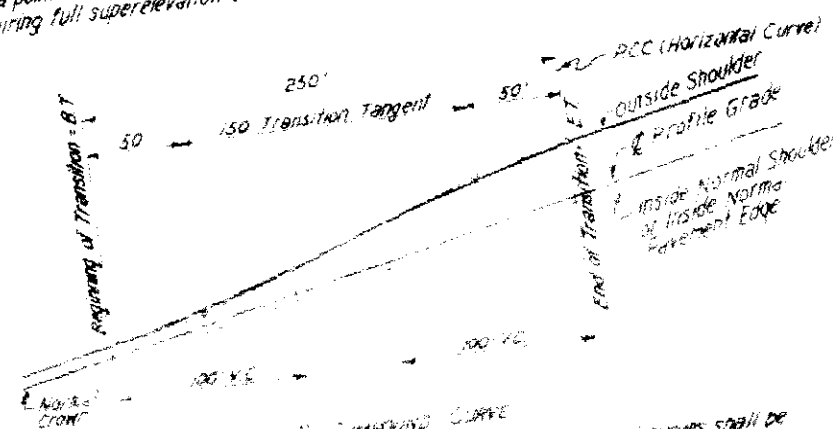
Approved by [Signature]
Engineer, Surveys & Plans
Date: [Date]



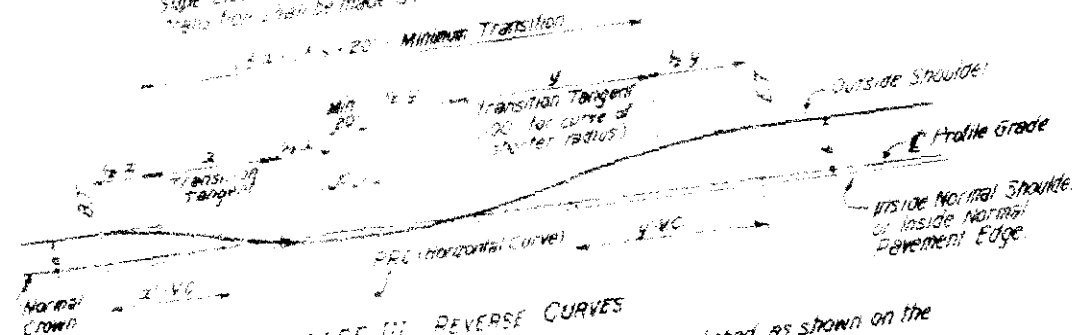
SUPERELEVATION AND WIDENING TABLES										
DISTANCE FROM BT PROPORTION		PER CENT OF SUPERELEVATION IN FEET PER FOOT WIDTH OF ROADWAY								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Degree of Curvature										
and Grade										
3°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9°		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10° and Over		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OFFSETS FOR WIDENING IN FEET										
Over 10° Under 15°		0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27
12° - 15°		0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36
15° - 20°		0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45
20° and Over		0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54



NOTE CASE 1
The transition in this case, from crowned section to super-elevated section, shall proceed uniformly 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 super-elevation at a point 100 ft inside the curve.



NOTE: CASE 11
SUPERELEVATION TRANSITION AT THE OUTSIDE ENDS OF COMPOUND CURVES SHALL BE CONSTRUCTED IN ACCORDANCE WITH RULES GIVEN UNDER CASE 1.
SUPERELEVATION TRANSITION BETWEEN THE ARCS OF DIFFERENT RADII SHALL BE MADE AS IN CASE 1, EXCEPT THAT THE ENTIRE TRANSITION SHALL BE WITHIN THE LIMITS OF THE CURVE OF THE LARGER RADIUS.
IN CASE 11, WHERE CURVES IN THE SAME DIRECTION HAVE A TANGENT DISTANCE OF LESS THAN 200 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

CASE III REVERSE CURVES

NOTE CASE III
Transitions between the reverse curves shall be accomplished as shown on the above diagram.

Transition tangents shall be directly proportional to the amount of superelevation of the respective curves.

EXAMPLE: Let a represent the amount of superelevation on 1st curve:
transition tangent on 1st curve = $\frac{a}{2}$
transition tangent on 2nd curve = $\frac{b}{2}$

then, $a + b = 2 \cdot y$.
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.R.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.

slab is to be super-elevated. The Section is to be rotated about the inside pivot point, with a 1/4" parabolic crown for curves of 10° and less, and a 1/2" parabolic crown for widened sections. 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. Also, the centerline pivot point is to be used until the superelevation equals 0.02 ft. per foot width of roadway, but 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 Pavement slab 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 minimum slope of the roadway required, except that the inside shoulder of Section slope until this slope is

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

The outside ditch on superelevated Sections is to be modified, where necessary to provide drainage. Otherwise this ditch shall conform to normal ditch section shown for Project.

The rate of superelevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

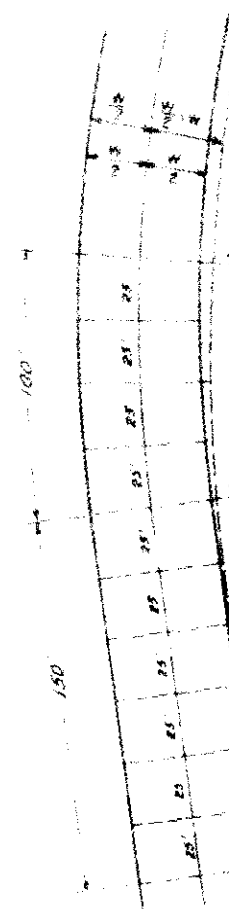
The full superelevation per foot width of roadway rate for a given degree of curvature is

$$0.005 \times \text{Degree of Curvature}$$

or 0.005 ft + Degree of Curvature

or 0.10 ft per foot width, applying to

The maximum subelevation of 0.10 ft per foot within a
curve of 100 and over is not to be exceeded by this standard sheet. Sheet
special transition problems not covered by this standard sheet or PLATE
be covered by appropriate notes including with curve data on PLATE.



Curves of over 10° are to have the inside portion of the pavement slab 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.

57 (BEGINNING
OF TRANSITION)

GENERAL PLAN OF
WIDENING

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
METHODS FOR
SUPERELEVATION
WIDENING OF CURVE

REL
RBB
JAN 20 1964

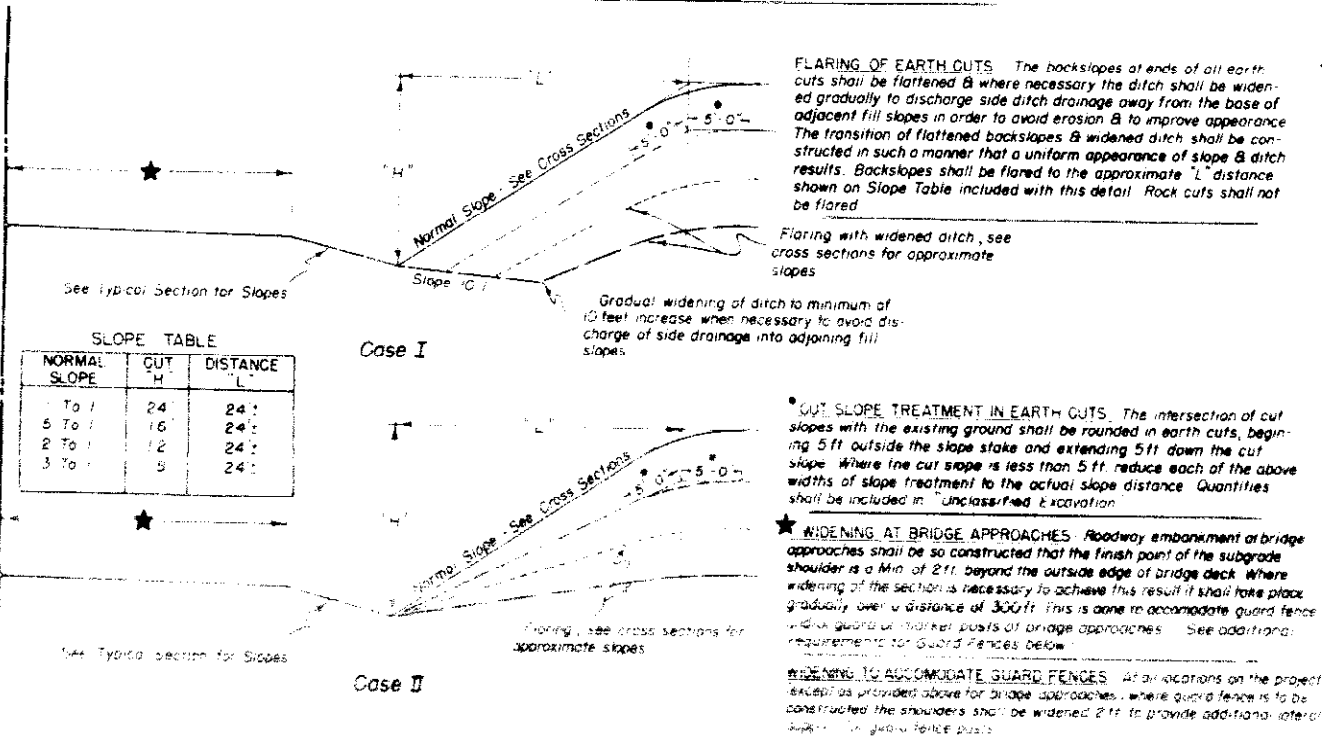
STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT & WIDENING AT BRIDGES AND AT CREST OF GRADES

STANDARD M-2-DM

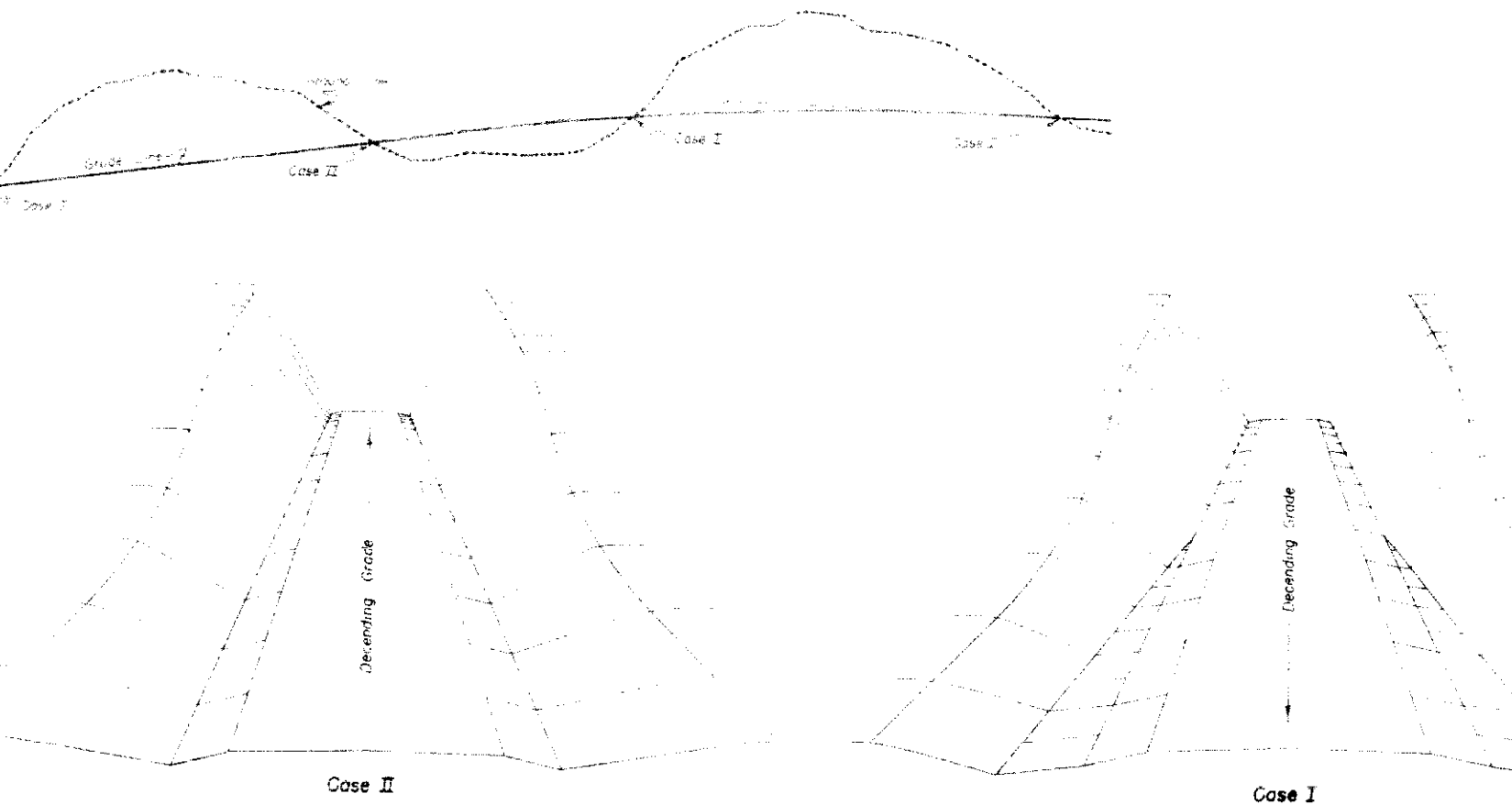
Rev 7-12-49, C.G.M., Details for widening of Crest of Grades
Rev 12-7-49, C.G.M., Rev notes re Type I Rd Apprs &
widening of Bridge Apprs, added notes re accel & decel lanes

DIVISION NO	DISTRICT	SHEET NO	TOTAL SHEETS
9	COLO	1	1

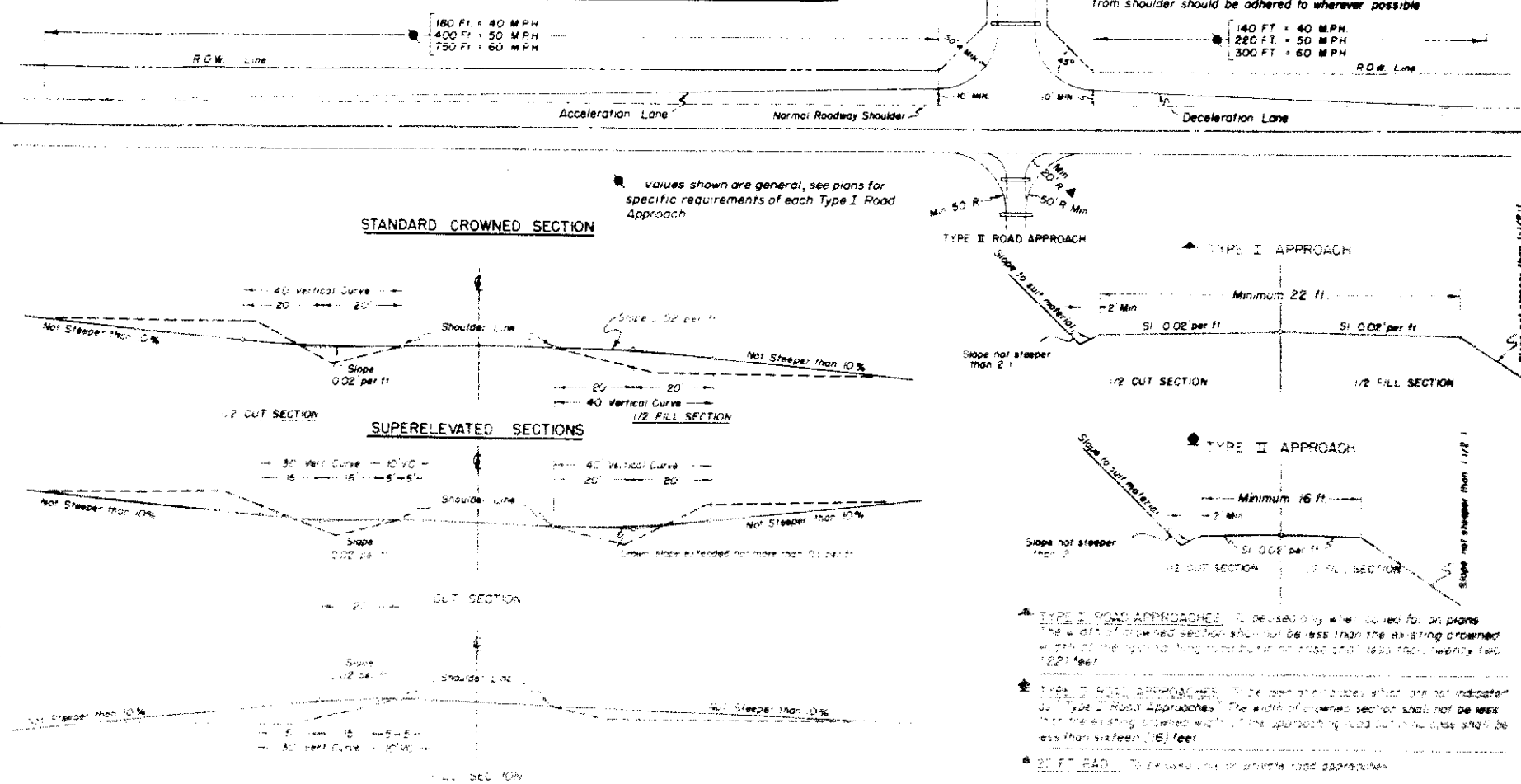
GENERAL DETAILS FOR FLARING OF EARTH CUTS, CUT SLOPE TREATMENT & WIDENING AT BRIDGES



PLAN OF FLARING IN EARTH CUTS

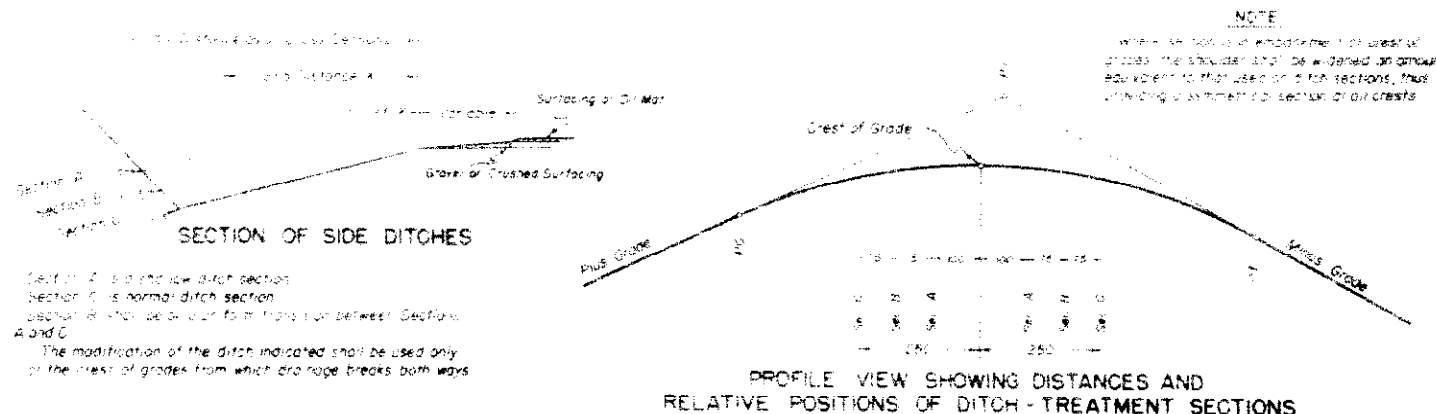


TYPICAL PLANS FOR SIDE APPROACH ROADS



DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

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



GENERAL NOTES

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

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

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

COLORADO STATE HIGHWAY DEPARTMENT

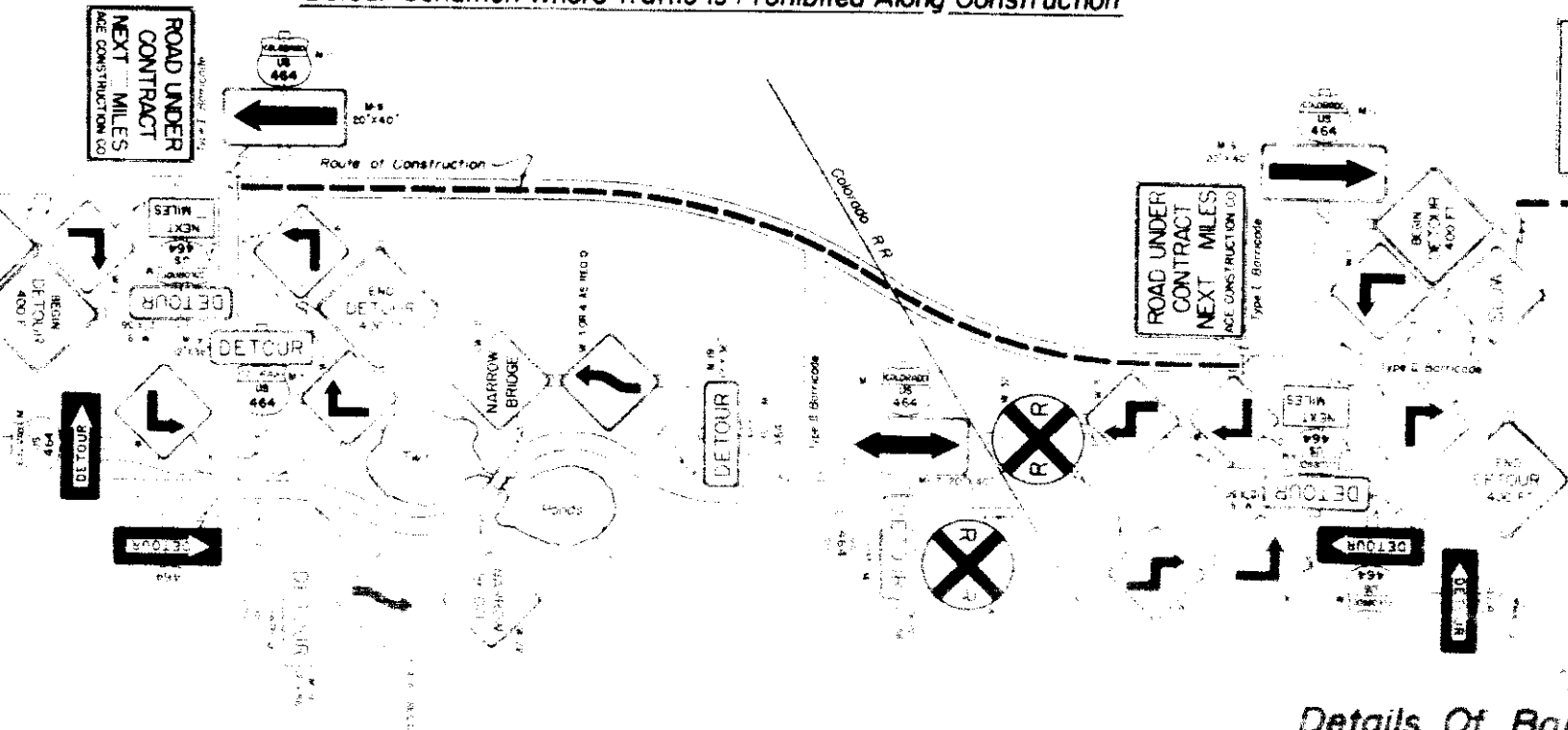
STANDARD SIDE APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, & WIDENING AT BRIDGES AND AT CREST OF GRADES

Designed by A. J. Marshall
Made by C.G.M.
Checked by J.S.

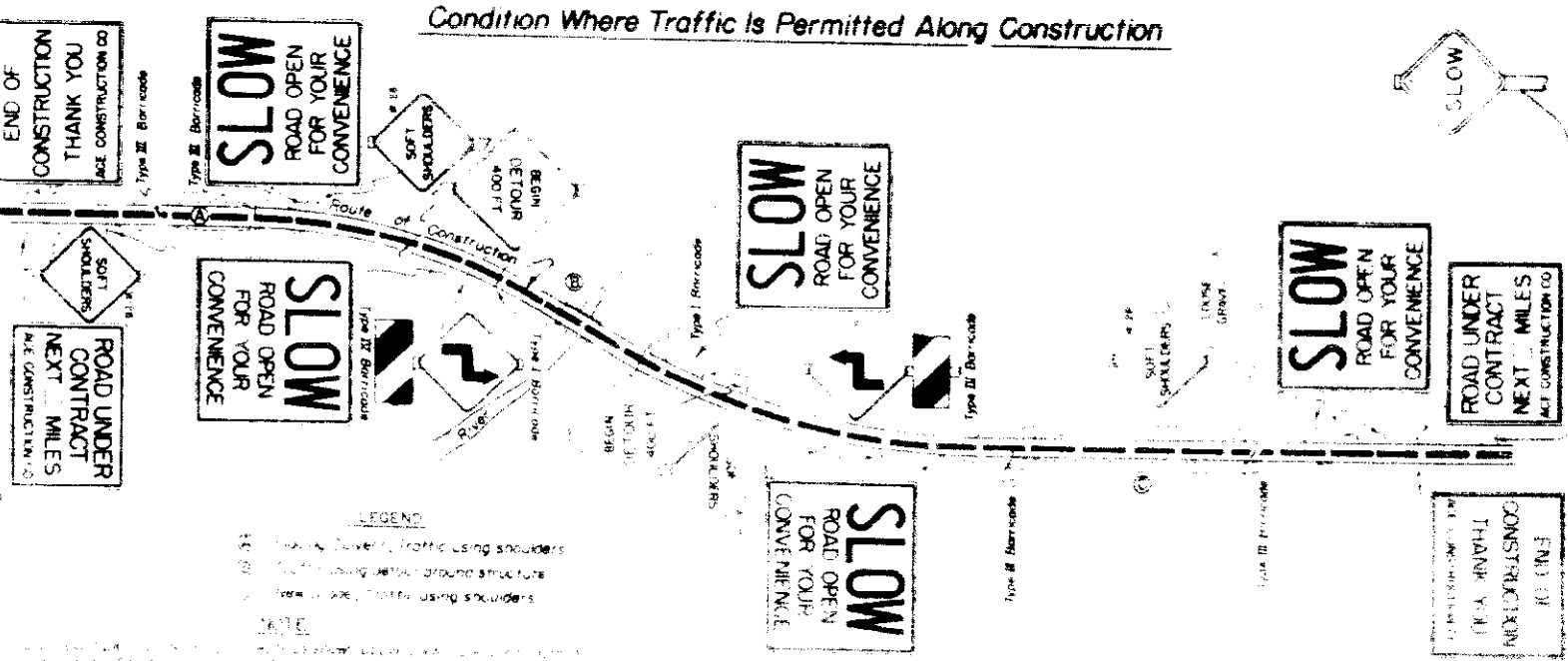
Approved by J. S. Marshall
Engineer, Surveys & Plans
Date: April 20th 1949

Typical Methods Of Marking Highways & Detours

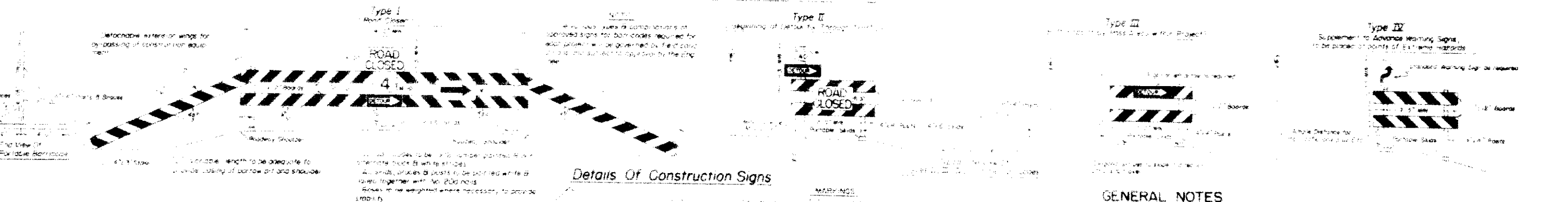
Detour Condition Where Traffic Is Prohibited Along Construction



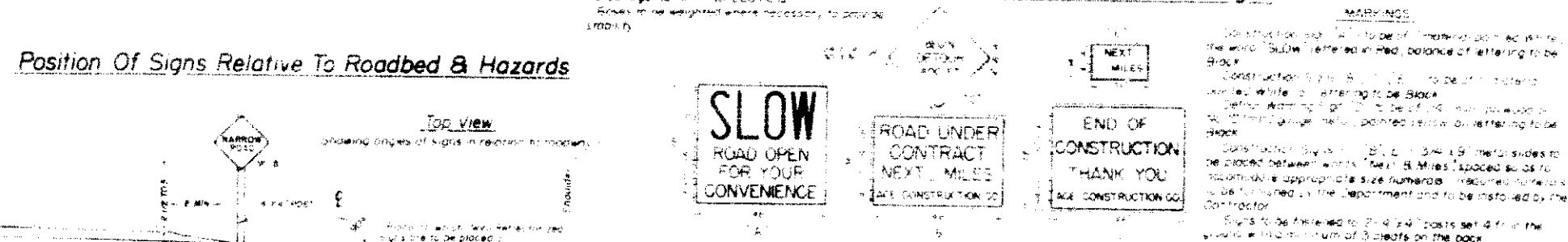
Condition Where Traffic Is Permitted Along Construction



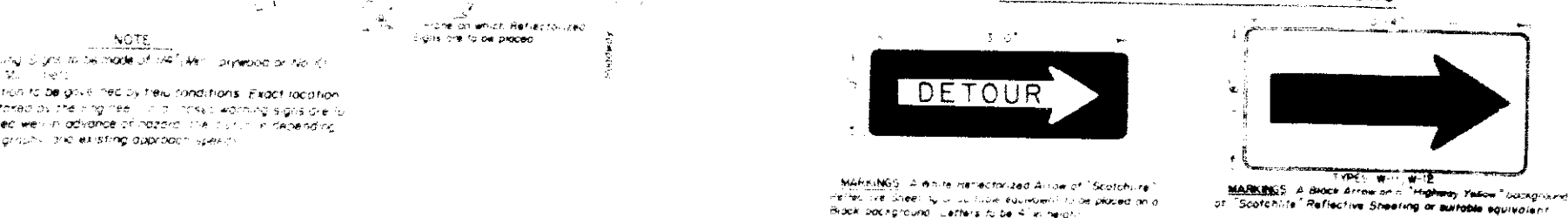
Details Of Barricades



Details Of Construction Signs



Details Of Reflectorized Arrows



GENERAL NOTES

1. All work shall be done in accordance with the Standard Specifications for the Colorado State Highway Department applicable to the project.
2. Advance warning signs shall be placed at the project limits. The contractor shall be required to mark all detours with the help of the project engineer. Advance warning signs shall be placed at the project limits and at the detour points. Advance warning signs shall be placed at the project limits and at the detour points. Advance warning signs shall be placed at the project limits and at the detour points.
3. Advance warning signs shall be placed at the project limits. The contractor shall be required to mark all detours with the help of the project engineer. Advance warning signs shall be placed at the project limits and at the detour points. Advance warning signs shall be placed at the project limits and at the detour points.
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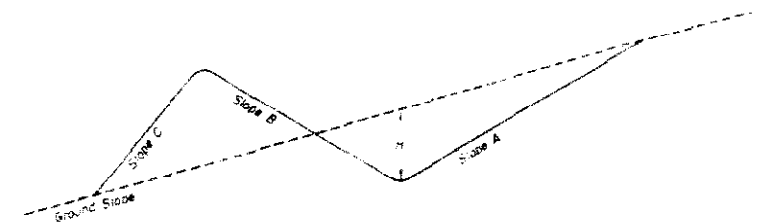
STANDARD TYPES *of* DITCHES *and* CONSTRUCTION METHODS

STANDARD M-107-C

DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLD	42	

DETAILS *for* CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



PURPOSE & USE OF THE TABLE

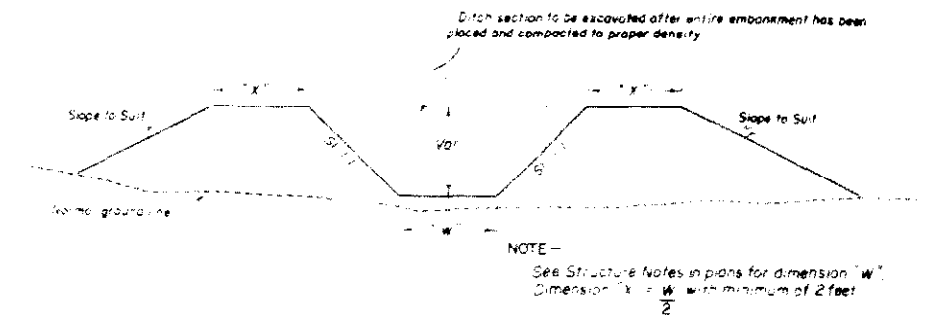
The primary purpose of the information for Contour and Intercepting Ditches shown on this sheet is to serve as a guide in construction and to readily arrive at yardages of excavation involved.
Foremost consideration in constructing these ditches is given first to the natural ground line slope confronted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

Table of Slopes and Yardages

▲ SLOPES				H	Cubic Yards per 100 lin. ft. of Ditch
Ground	A	B	C		
5:1 Or Flatter	2:1	4:1	2:1	15"	16
				18"	23
				21"	32
				15"	15
		3:1	2:1	18"	22
				21"	30
				15"	14
				18"	20
	1 1/2:1	1 1/2:1	1 1/2:1	21"	27
				15"	13
				18"	19
				21"	25
		4:1	12:1	15"	12
				18"	18
				21"	25
				15"	12
4:1	2:1	4:1	2:1	18"	17
				21"	23
				15"	10
				18"	15
		3:1	2:1	21"	20
				15"	10
				18"	14
				21"	19
	1 1/2:1	4:1	2:1	15"	12
				18"	18
				21"	25
				15"	12
		3:1	2:1	18"	17
				21"	23
				15"	10
				18"	15
3:1	2:1	4:1	2:1	21"	20
				15"	10
				18"	14
				21"	19
		3:1	2:1	15"	12
				18"	18
				21"	25
				15"	12
	1 1/2:1	4:1	2:1	18"	17
				21"	23
				15"	10
				18"	15
		3:1	2:1	21"	20
				15"	10
				18"	14
				21"	19
2:1	1 1/2:1	4:1	2:1	15"	12
				18"	18
				21"	25
				15"	12
		3:1	2:1	18"	17
				21"	23
				15"	10
				18"	15
	1:1	4:1	2:1	21"	20
				15"	10
				18"	14
				21"	19
		3:1	2:1	15"	12
				18"	18
				21"	25
				15"	12
1 1/2:1	1:1	4:1	2:1	18"	17
				21"	23
				15"	10
				18"	15
		3:1	2:1	21"	20
				15"	10
				18"	14
				21"	19
	1/2:1	4:1	2:1	15"	12
				18"	18
				21"	25
				15"	12
		3:1	2:1	18"	17
				21"	23
				15"	10
				18"	15

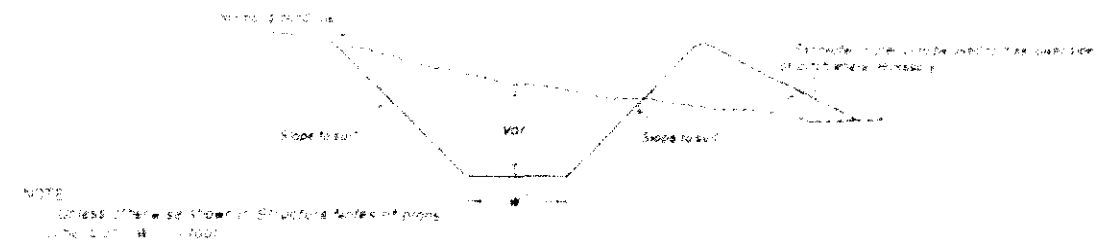
▲ Slopes are approximate and may be varied to suit variations encountered during construction.

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



For Embankment Sections

Generally for use in Irrigation Ditches & Channel Changes:



For Cut Sections

GENERAL NOTES

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

2. 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.

3. CONTOUR INTERCEPTING DITCHES: Ditches are to be laid out along the ground contour on a grade of 1 in 100 ft. Type of soil shall govern the grade.

4. 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.

5. The following horizontal spacing of ditches is recommended:

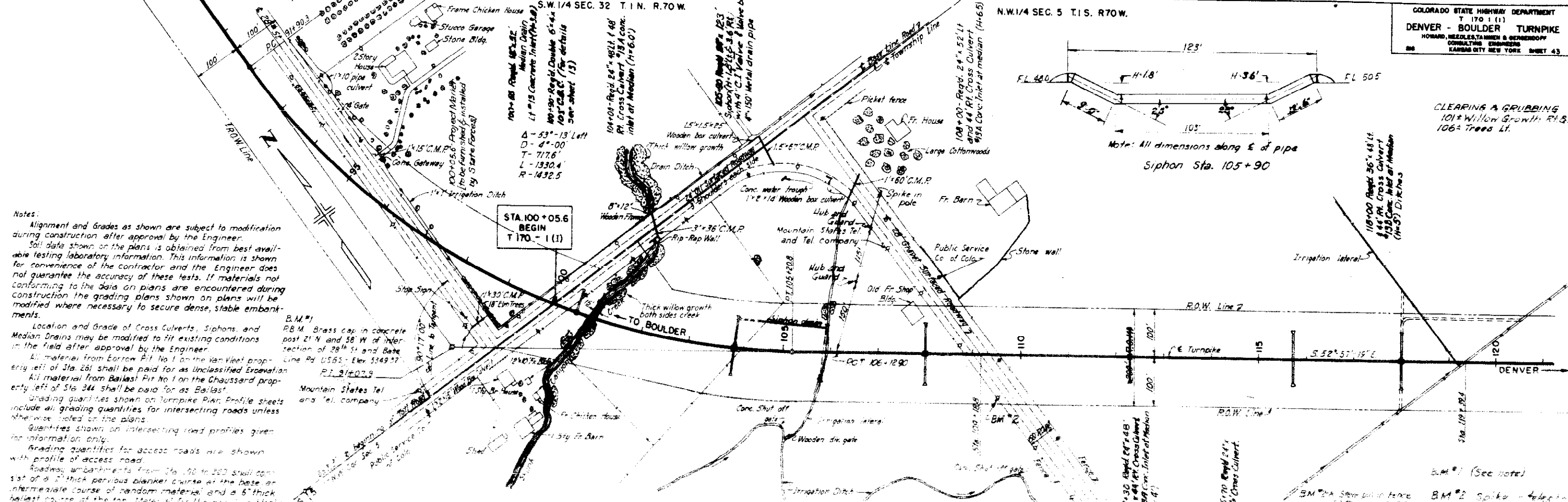
4% to 6%	Approximately 70' Centers
8% to 10%	Approximately 60' Centers
20% to 4% Slope	Approximately 55' Centers
30% to 1 1/2:1 Slope	Approximately 50' Centers

6. Where ditch checks are required the intervening ditch between one set of ditch checks shall not extend a grade of 100%. Details of checks will be shown on plans when required.

COLORADO
STATE HIGHWAY DEPARTMENT

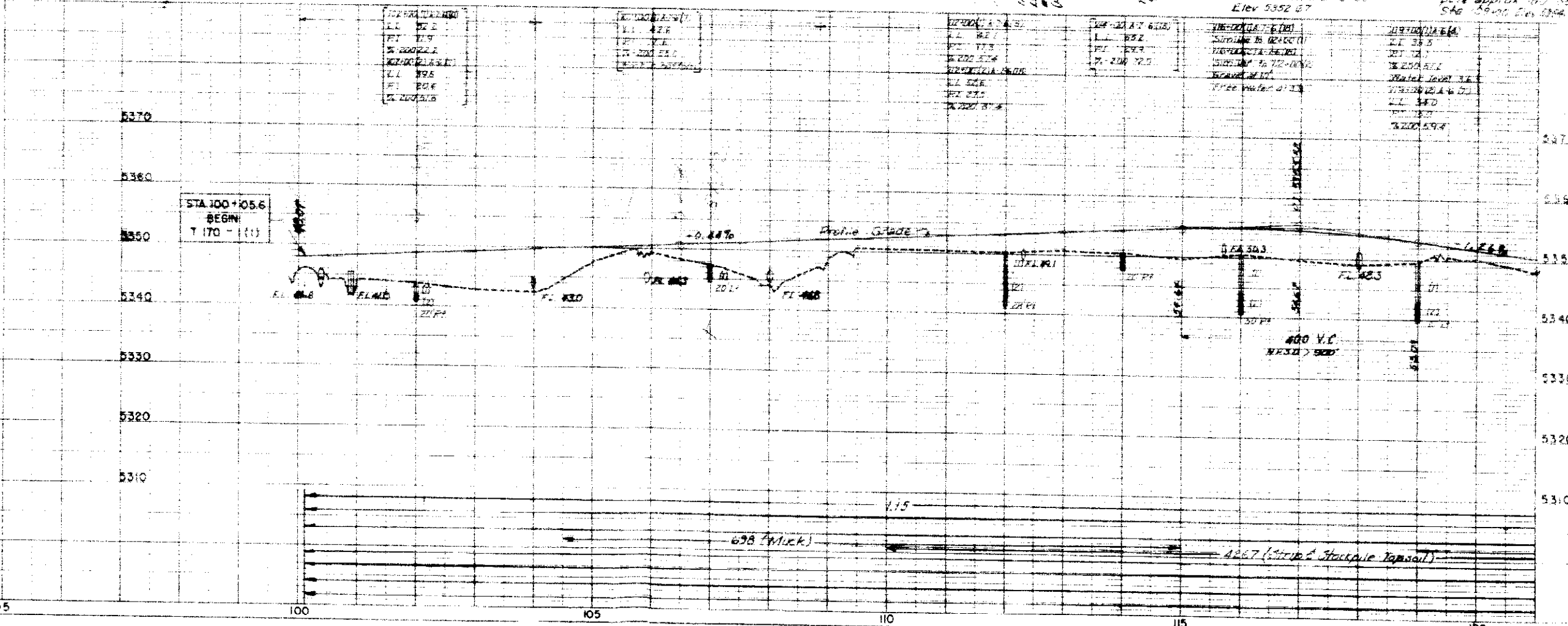
Standard Types of Ditches
and
Construction Methods

Designed by GGM
Made by GGM
Checked by
Approved by *[Signature]*
Engineer, Survey & Plans
Date: Aug 18 1950

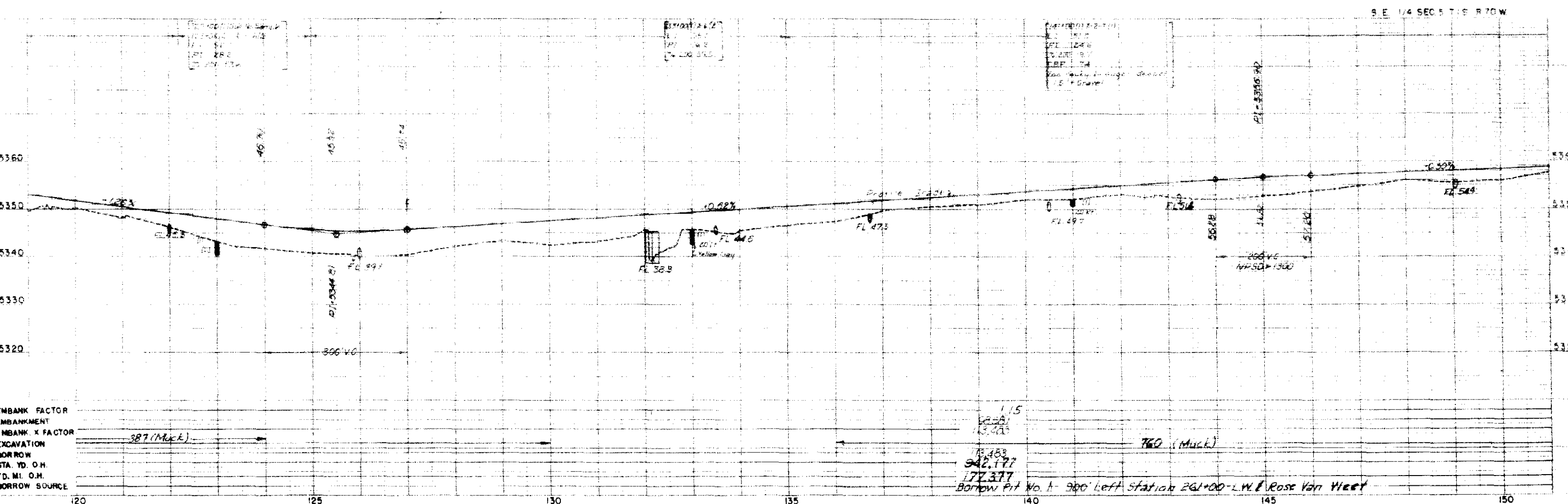
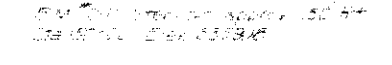


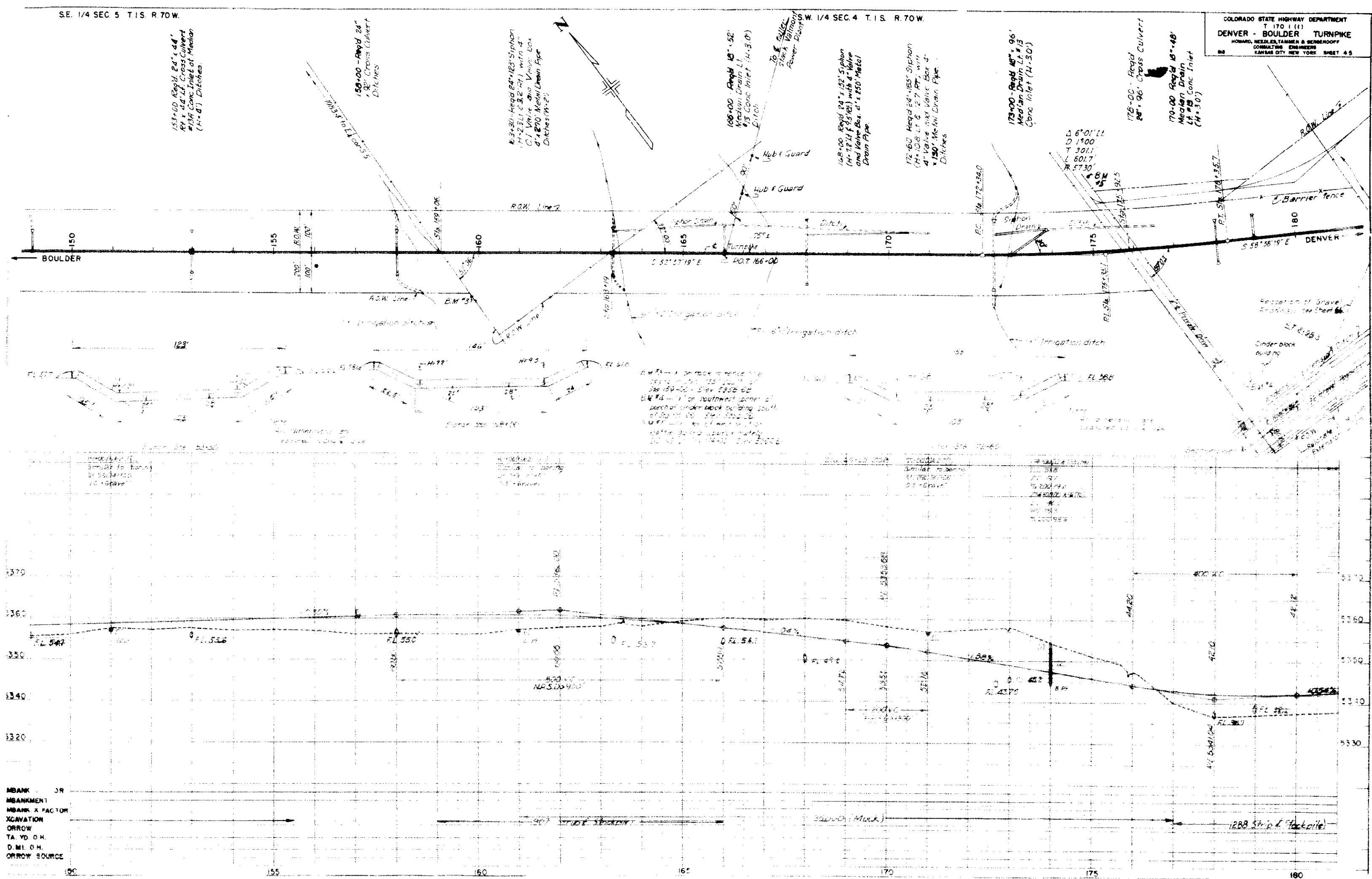
Notes:
Alignment and Grades as shown are subject to modification after approval by the Engineer.
Soil data shown on the plans is obtained from best available testing laboratory information. This information is shown for convenience of the contractor and the Engineer does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plans shown on plans will be modified where necessary to secure dense, stable embankments.
Location and Grade of Cross Culverts, Siphons, and Median Drains may be modified to fit existing conditions in the field after approval by the Engineer.
All material from Borrow Pit No. 1 on the Van Fleet property left of Sta. 261 shall be paid for as Unclassified Excavation.
All material from Borrow Pit No. 1 on the Chausserd property left of Sta. 344 shall be paid for as Ballast.
Grading quantities shown on Turnpike Plan, Profile sheets include all grading quantities for intersecting roads unless otherwise noted on the plans.
Quantities shown on intersecting road profiles given for information only.
Grading quantities for access roads are shown with profile of access road.
Roadway embankments from Sta. 100 to 300 shall consist of a 5" thick pervious blanket course at the base, an intermediate course of random material, and a 5" thick ballast course of the top. Material for the pervious blanket and for the ballast course shall come from Borrow Pit No. 1 on the Van Fleet property left of Sta. 261. Excavation from this pit shall be selective to assure approved pervious material for the blanket course and material complying with the standard specifications for Class I Ballast for the top course. No ballast tabulation is shown from Sta. 100 to 300 since all material from Borrow Pit No. 1 is to be paid for as Unclassified Excavation.
Earthwork quantities shown are based on using 150,000 cu yds. of roadway excavation material from the Davidson Mesa cut towards constructing the intermediate course of the embankments between Sts. 100 and 300, with the balance of the embankment to be constructed of material from Borrow Pit No. 1. This would entail excavating and hauling of that portion of the roadway cut labeled "Muck" between Sta. 100 and 300.
If upon excavation the material labeled "Muck" proves suitable in the opinion of the Engineer for the intermediate course of embankments, the Engineer may, at his discretion, direct to use either in the Turnpike embankments or in embankments for underpass approaches or access roads.
If for any reason, the foundation material in roadway cuts should prove unsatisfactory, the Engineer may require the Contractor to excavate additional material and backfill with a suitable base material to provide a stable base course for the roadway pavement.

EMBANK. FACTOR
EMBANK. X FACTOR
EXCAVATION
BORROW
STA. YD. Q.H.
YD. MI. Q.H.
BORROW SOURCE



STATION	EXIST. ELEV.	PROPOSED ELEV.	REMARKS
100+00	5349.52	5349.52	PT. 100+00
100+20	5349.52	5349.52	
100+40	5349.52	5349.52	
100+60	5349.52	5349.52	
100+80	5349.52	5349.52	
101+00	5349.52	5349.52	
101+20	5349.52	5349.52	
101+40	5349.52	5349.52	
101+60	5349.52	5349.52	
101+80	5349.52	5349.52	
102+00	5349.52	5349.52	
102+20	5349.52	5349.52	
102+40	5349.52	5349.52	
102+60	5349.52	5349.52	
102+80	5349.52	5349.52	
103+00	5349.52	5349.52	
103+20	5349.52	5349.52	
103+40	5349.52	5349.52	
103+60	5349.52	5349.52	
103+80	5349.52	5349.52	
104+00	5349.52	5349.52	
104+20	5349.52	5349.52	
104+40	5349.52	5349.52	
104+60	5349.52	5349.52	
104+80	5349.52	5349.52	
105+00	5349.52	5349.52	
105+20	5349.52	5349.52	
105+40	5349.52	5349.52	
105+60	5349.52	5349.52	
105+80	5349.52	5349.52	
106+00	5349.52	5349.52	
106+20	5349.52	5349.52	
106+40	5349.52	5349.52	
106+60	5349.52	5349.52	
106+80	5349.52	5349.52	
107+00	5349.52	5349.52	
107+20	5349.52	5349.52	
107+40	5349.52	5349.52	
107+60	5349.52	5349.52	
107+80	5349.52	5349.52	
108+00	5349.52	5349.52	
108+20	5349.52	5349.52	
108+40	5349.52	5349.52	
108+60	5349.52	5349.52	
108+80	5349.52	5349.52	
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110+20	5349.52	5349.52	
110+40	5349.52	5349.52	
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110+80	5349.52	5349.52	
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113+00	5349.52	5349.52	
113+20	5349.52	5349.52	
113+40	5349.52	5349.52	
113+60	5349.52	5349.52	
113+80	5349.52	5349.52	
114+00	5349.52	5349.52	
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119+20	5349.52	5349.52	
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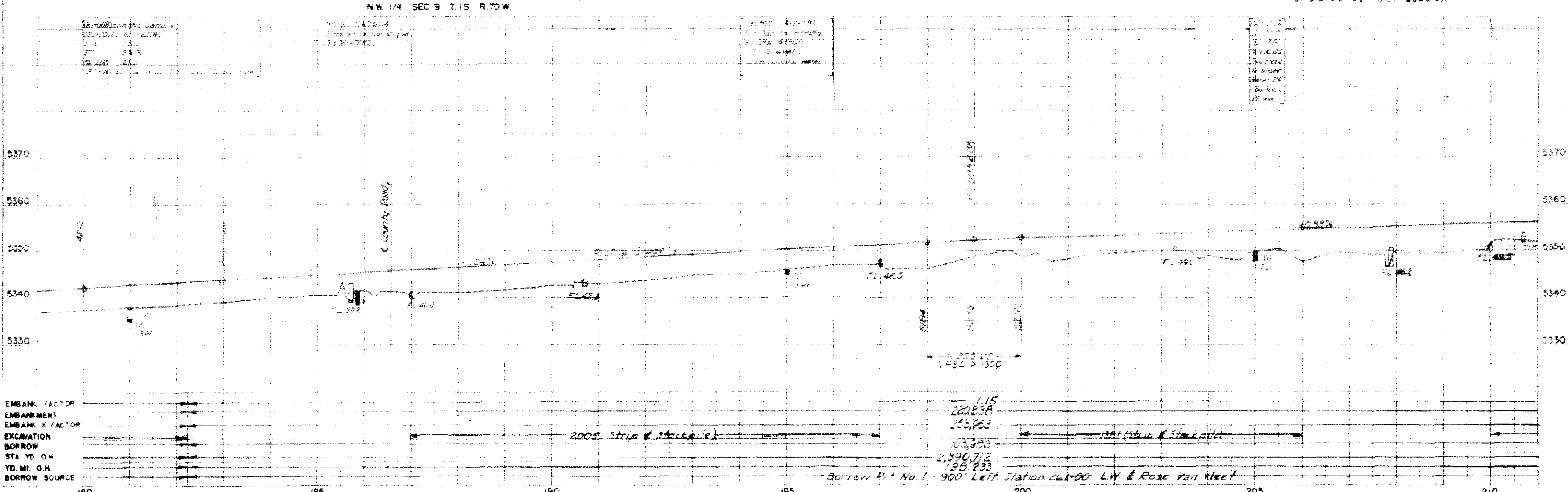
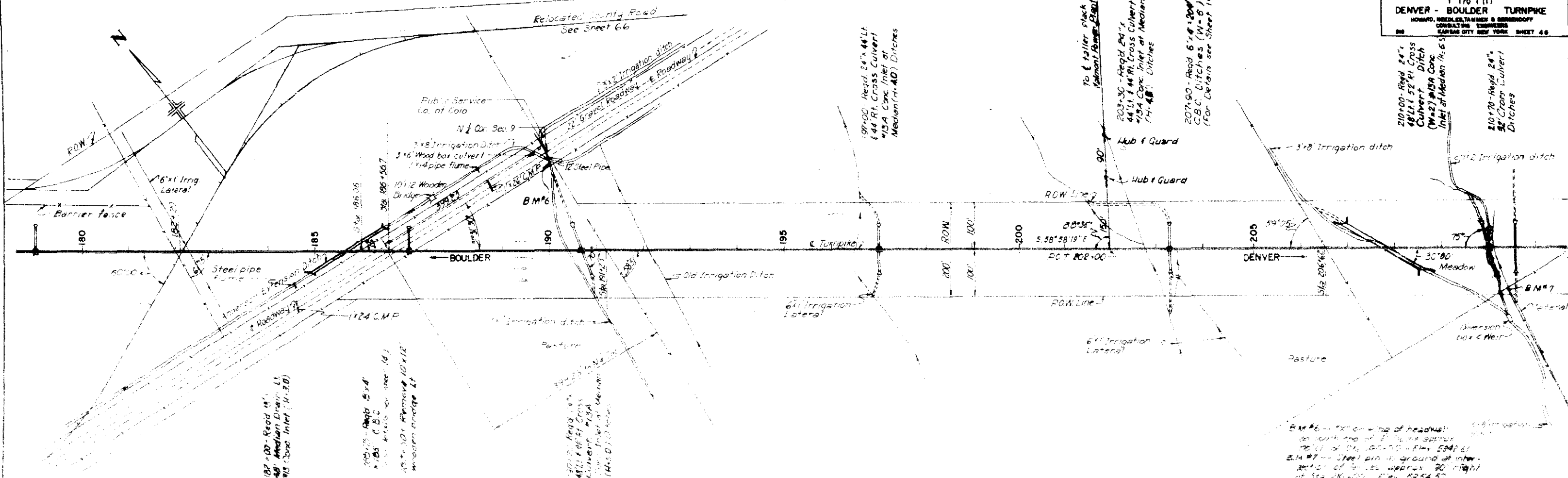


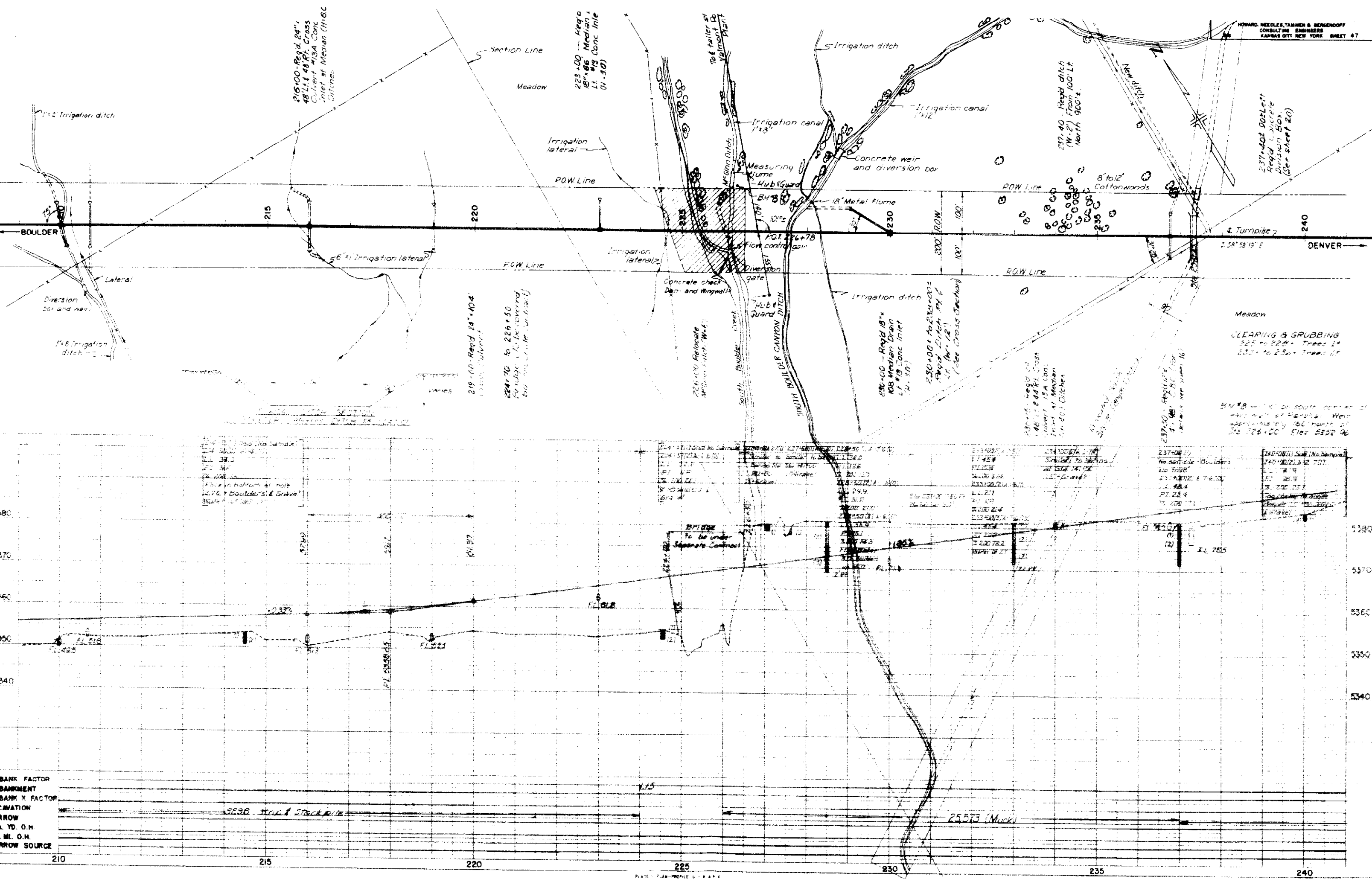
SW 1/4 SEC. 4 T.15. R.70 W.

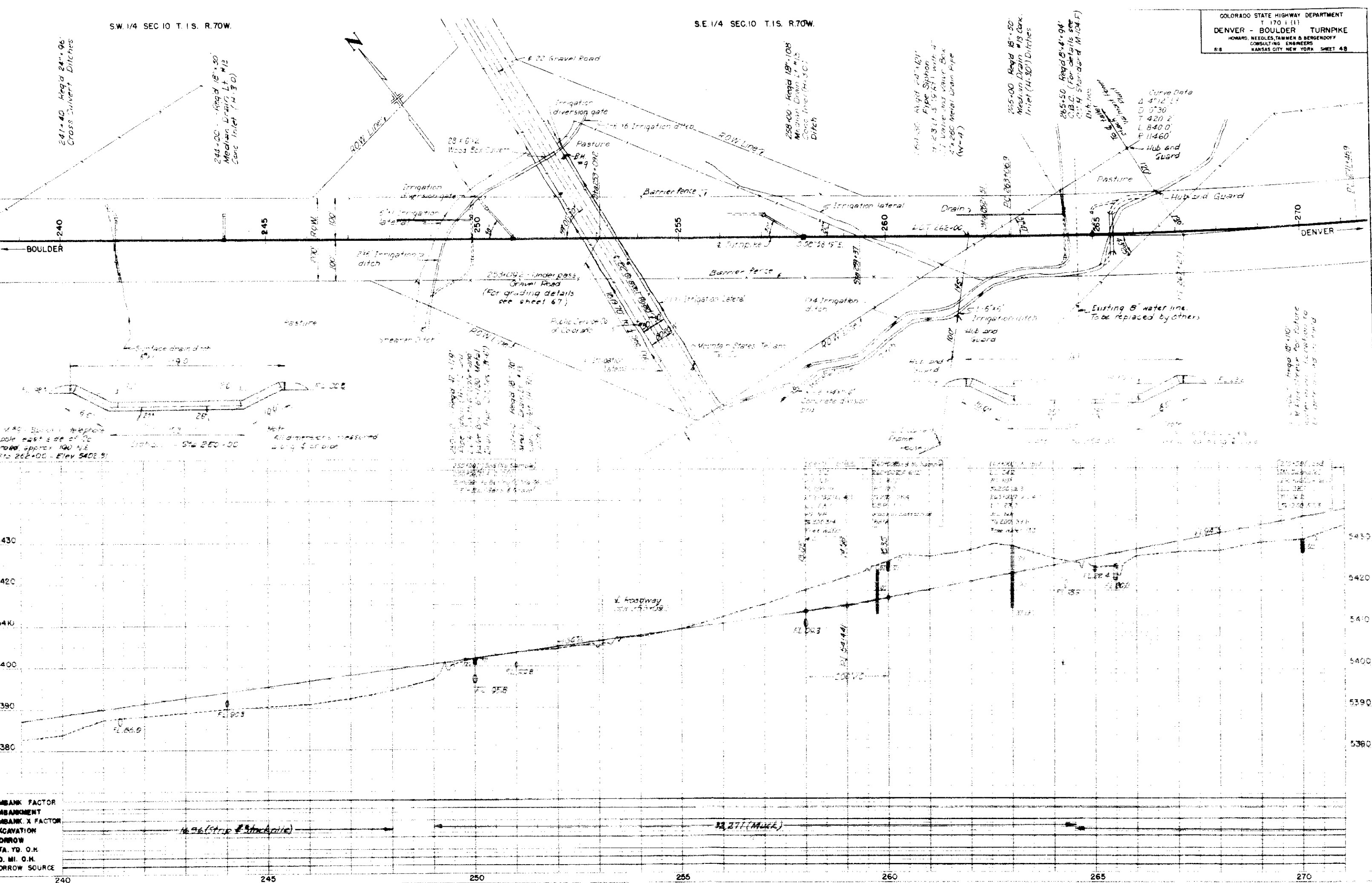
S.E. 1/4 SEC. 4 T.15. R.70 W.

N.E. 1/4 SEC. 9 T.15. R.70 W.

COLORADO STATE HIGHWAY DEPARTMENT
T 170 (11)
DENVER - BOULDER TURNPIKE
HOWARD, NEEDLEMAN & BERENSON
CONSULTING ENGINEERS
DENVER CITY NEW YORK SHEET 46





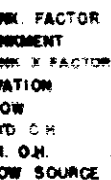
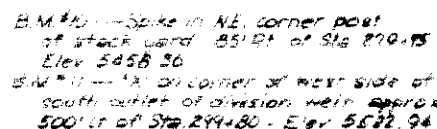


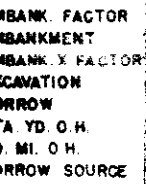
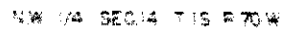
290+00 - Reg'd 18" x 56"
Median Drain Lt + 19 Conc.

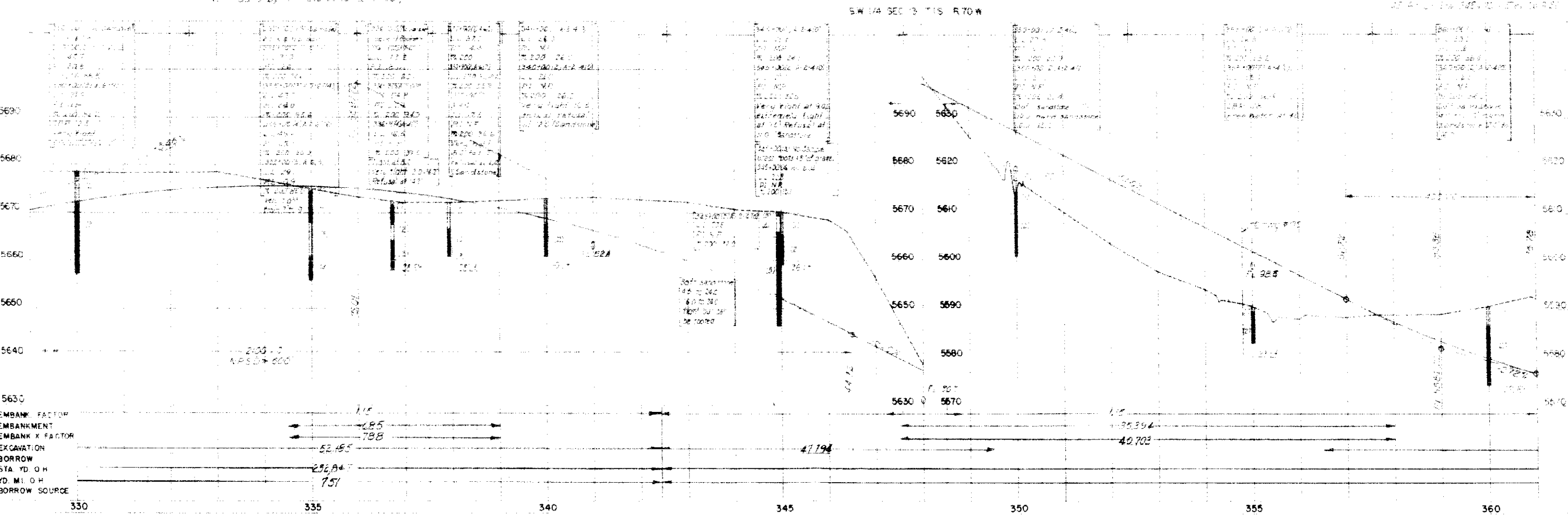
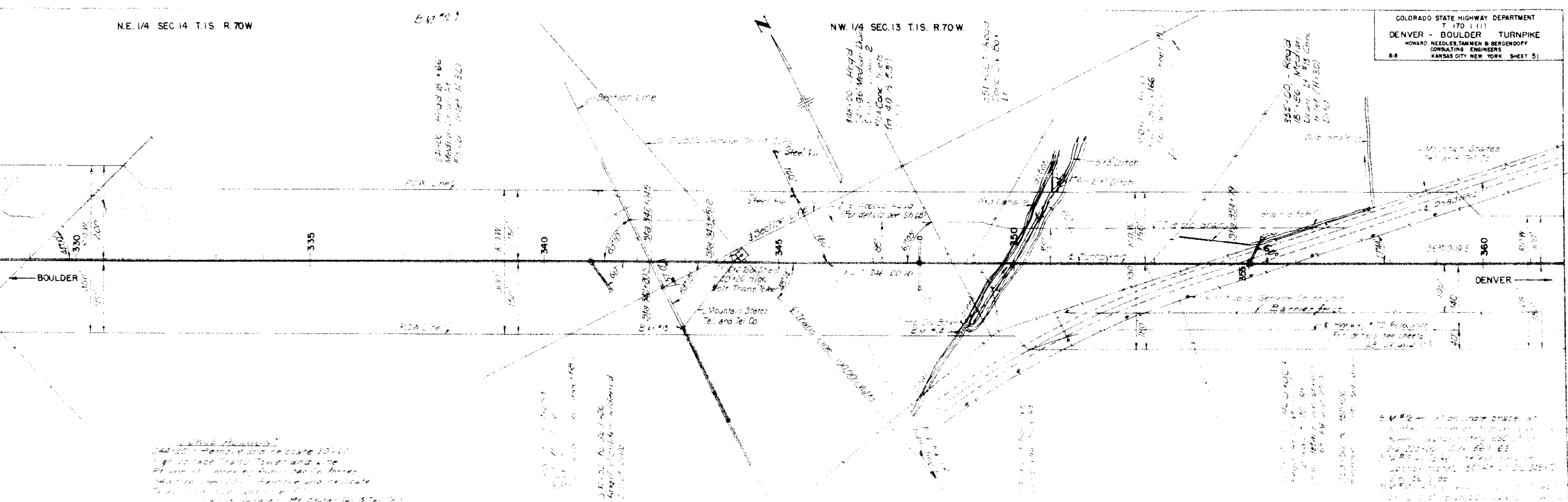
272-00 -- Reg'd 18" x 48"
Median Drain Lt #19 Conc.
1710+ (H-20)

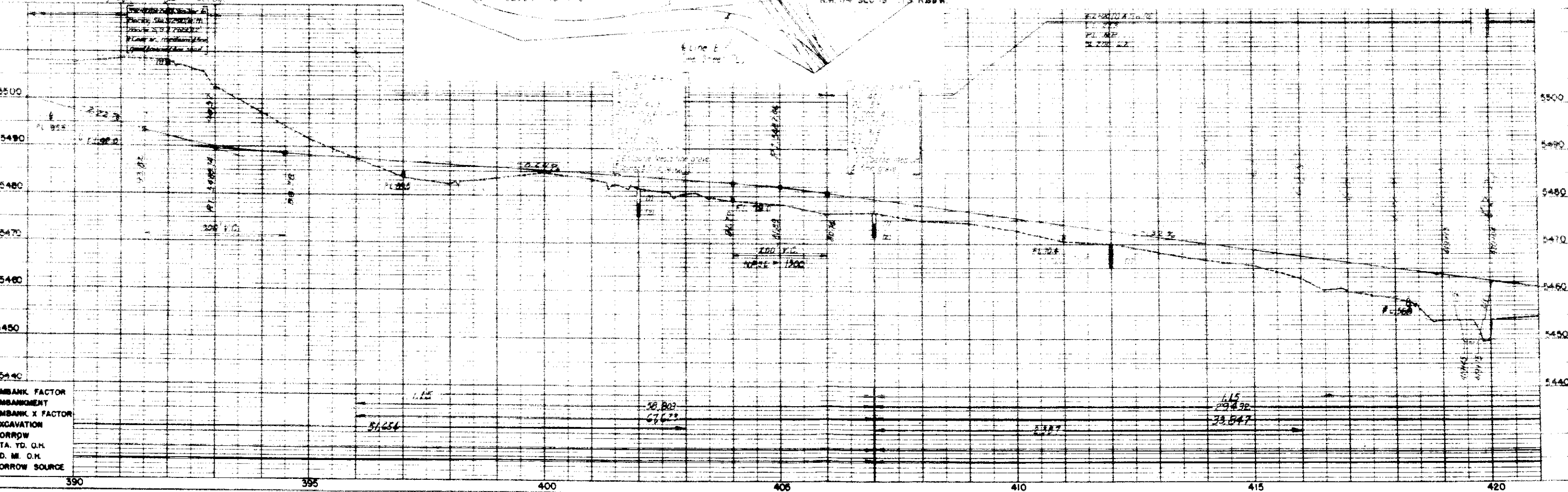
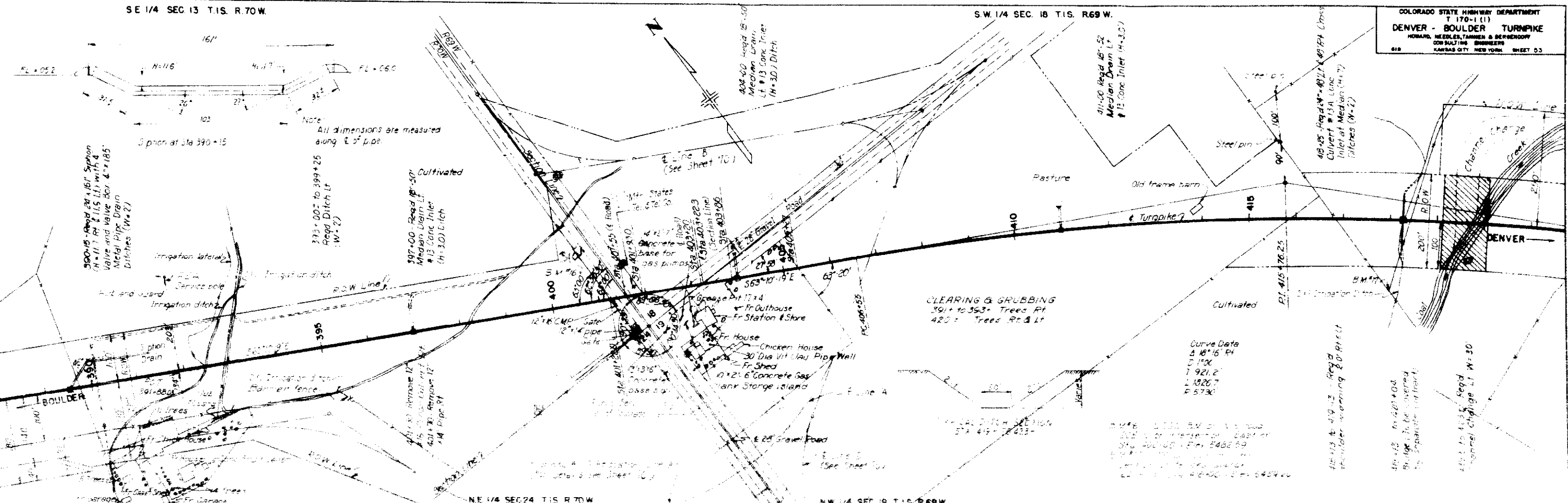
27B+40 Reg'd. 24" x 48' LT
48' RT. Cross Culvert
#13A Conc. Inlet at Median
(W=55) Ditches (W=2)

283+25 - Req'd 24"x44" Lt.
#44" Rt. Cross Culvert
#13A Conc Inlet at Median
(H=4.0') Ditches (W=2')

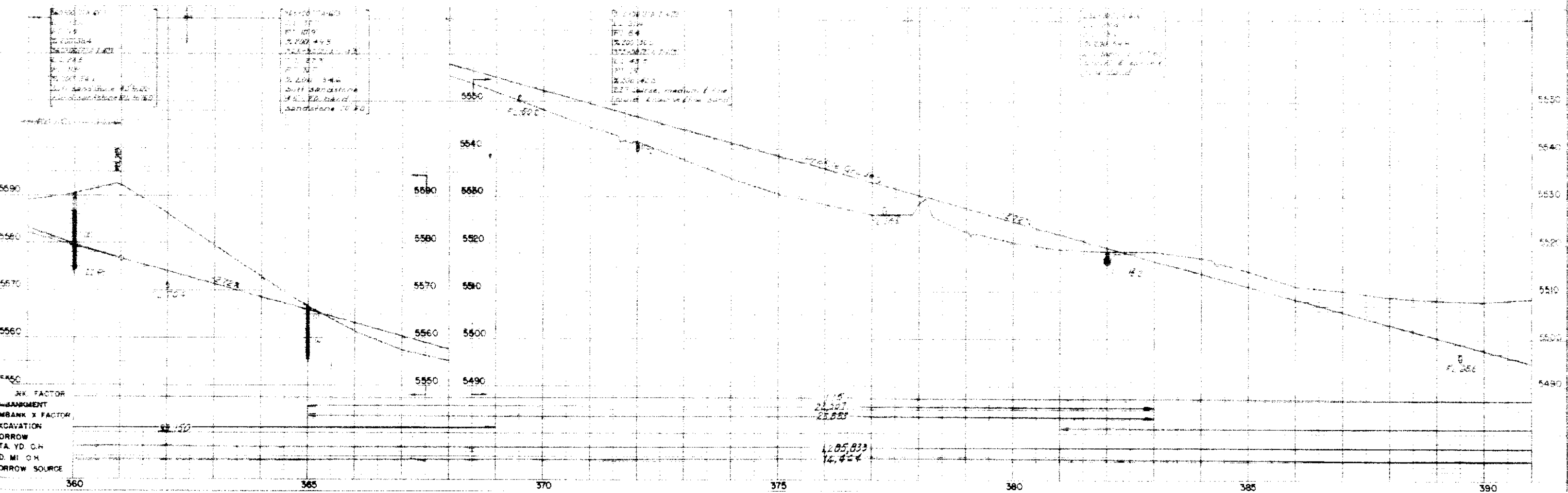
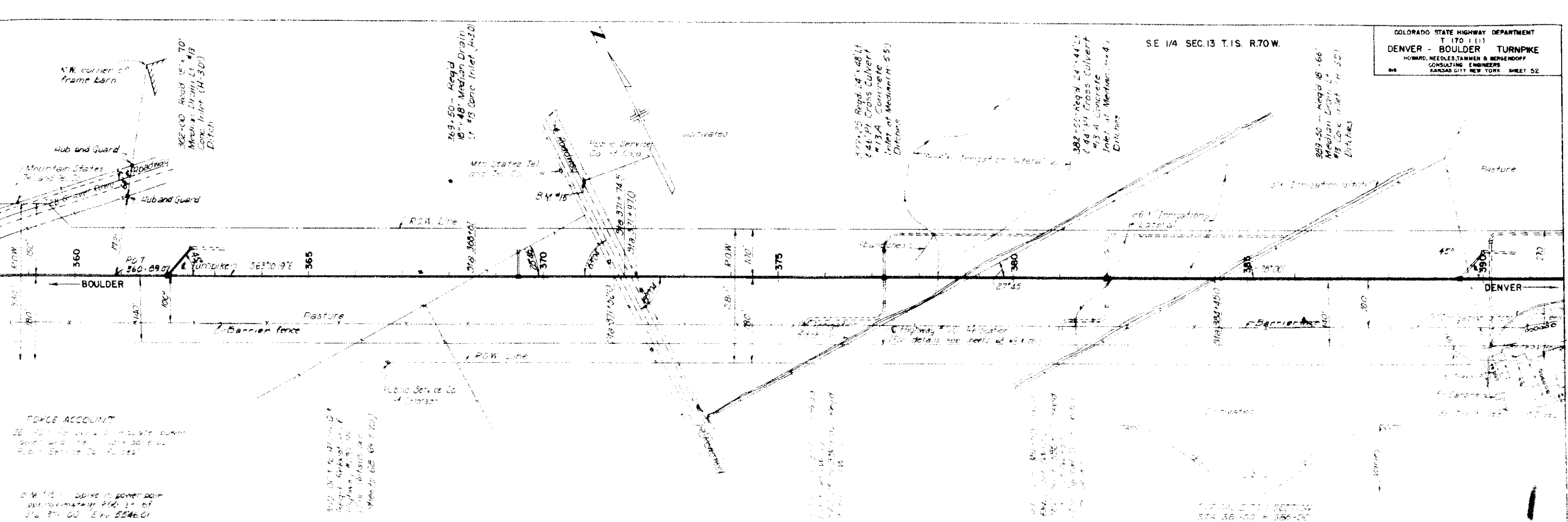


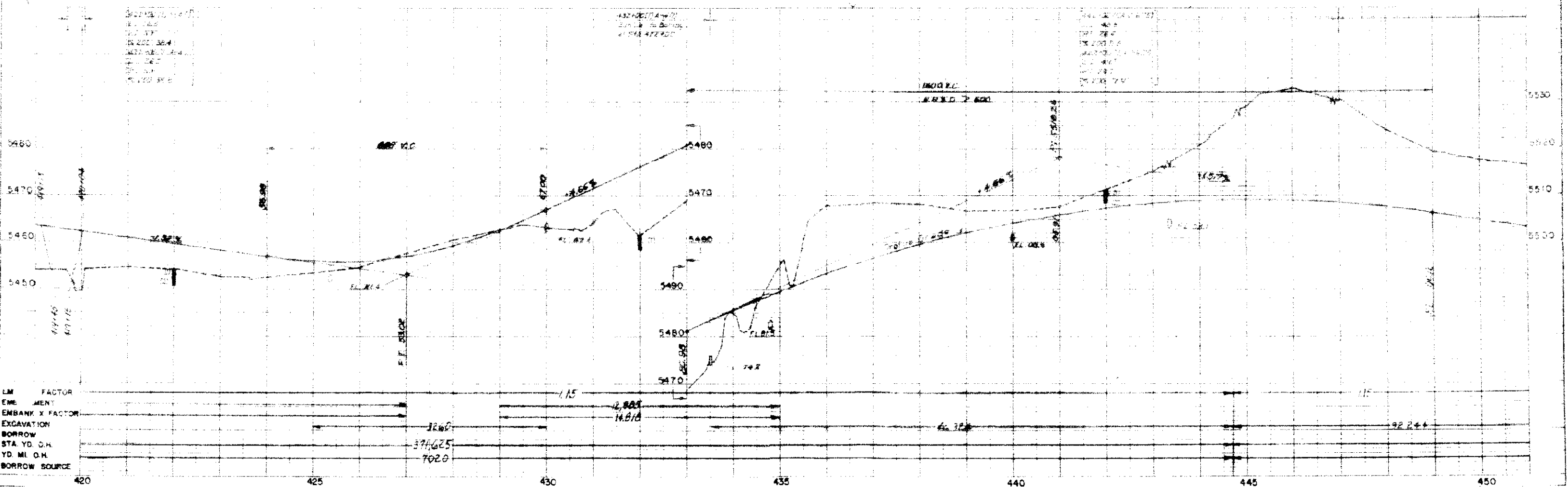
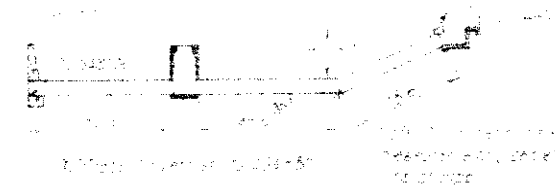


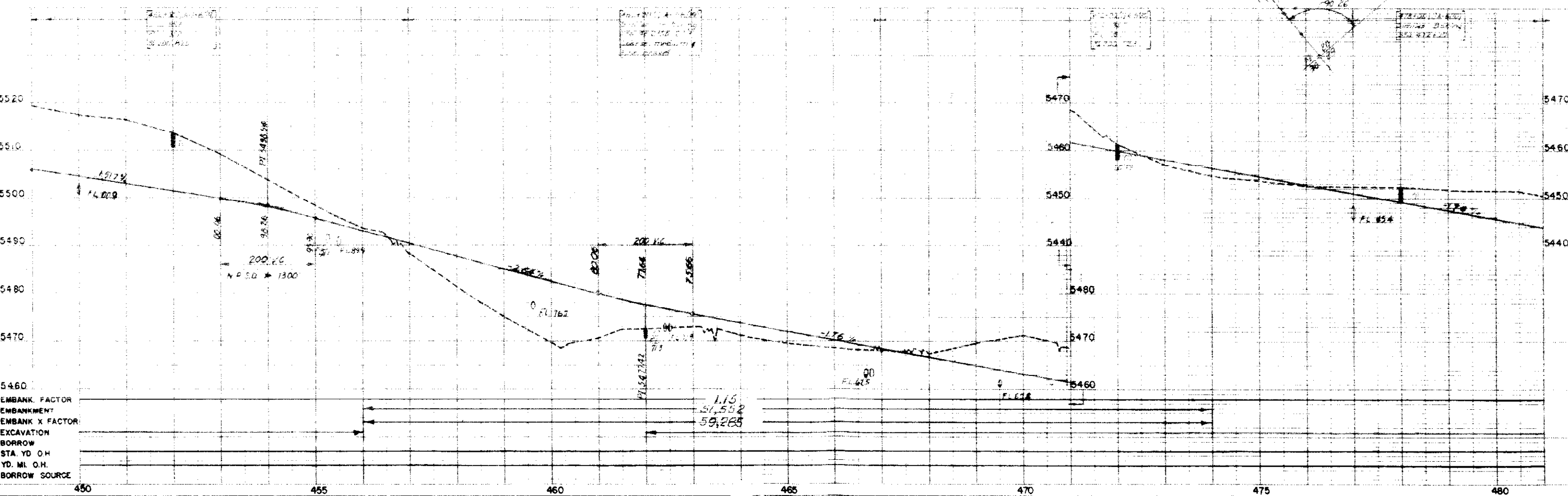
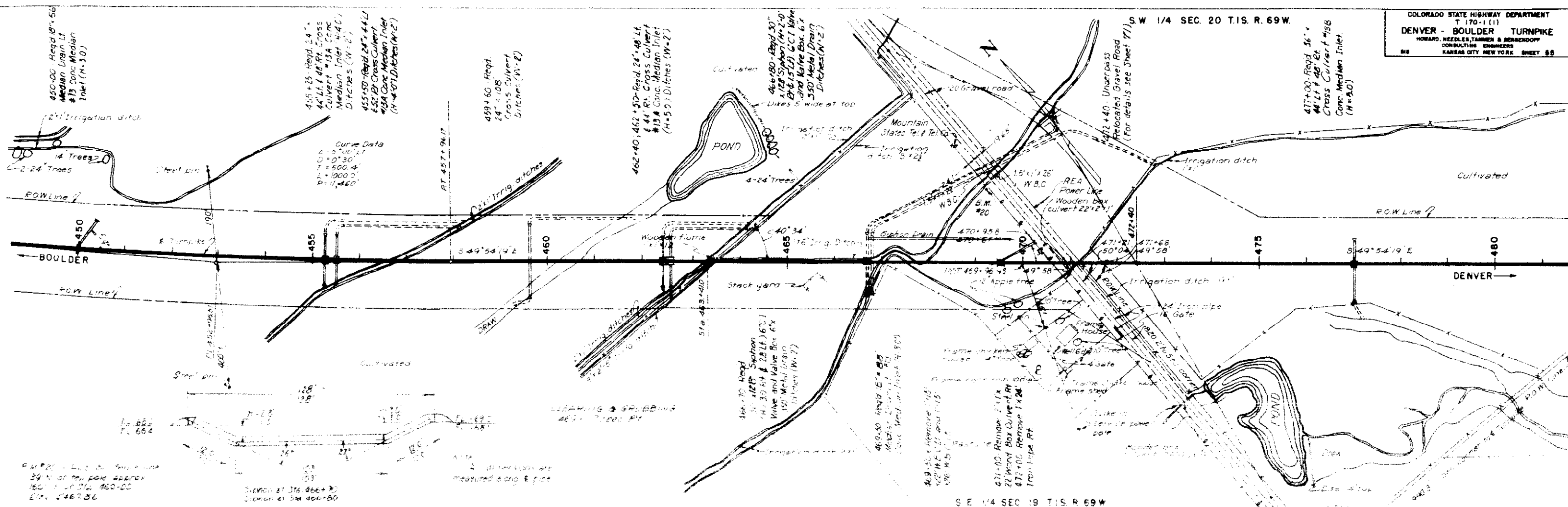


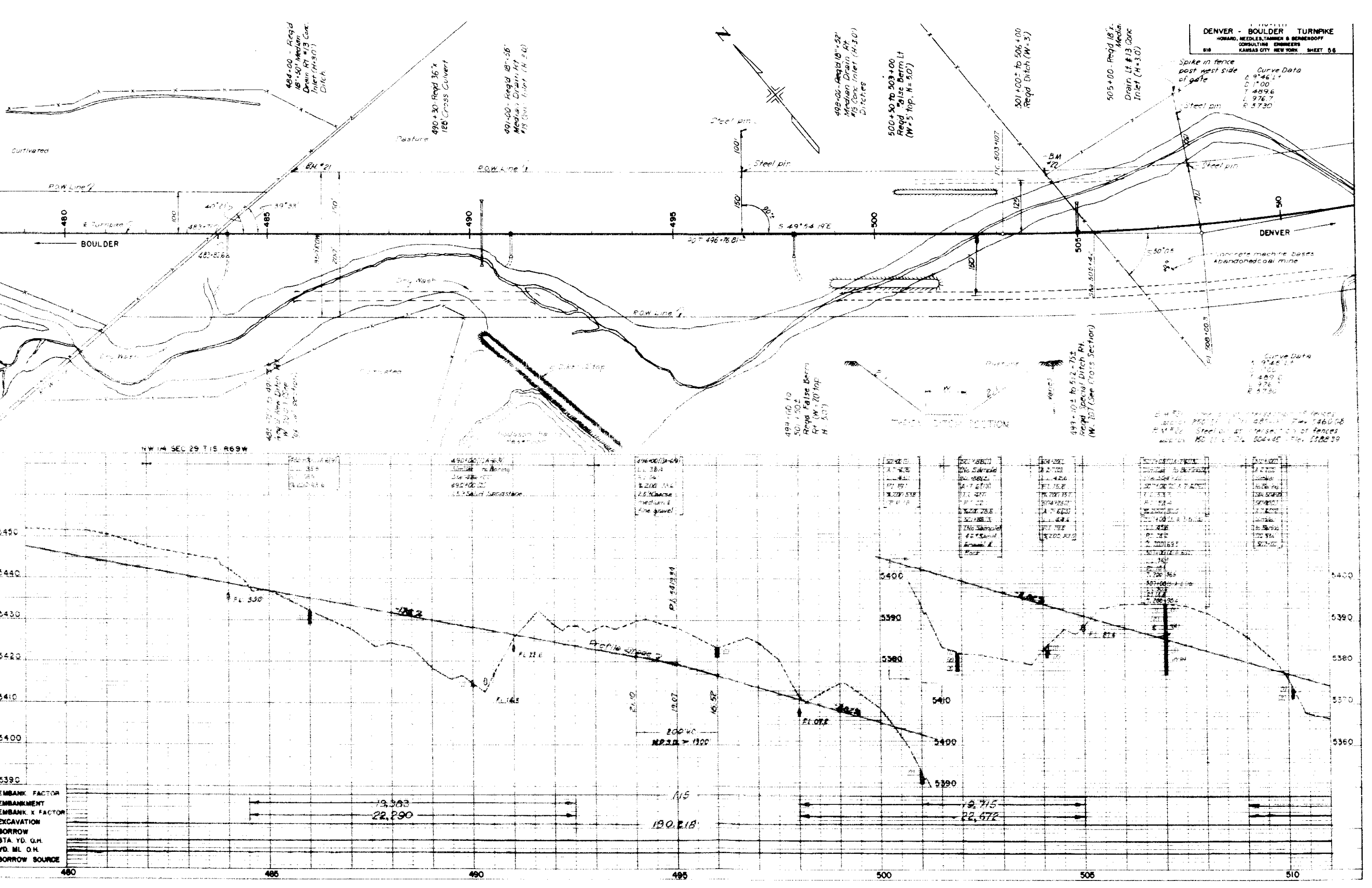


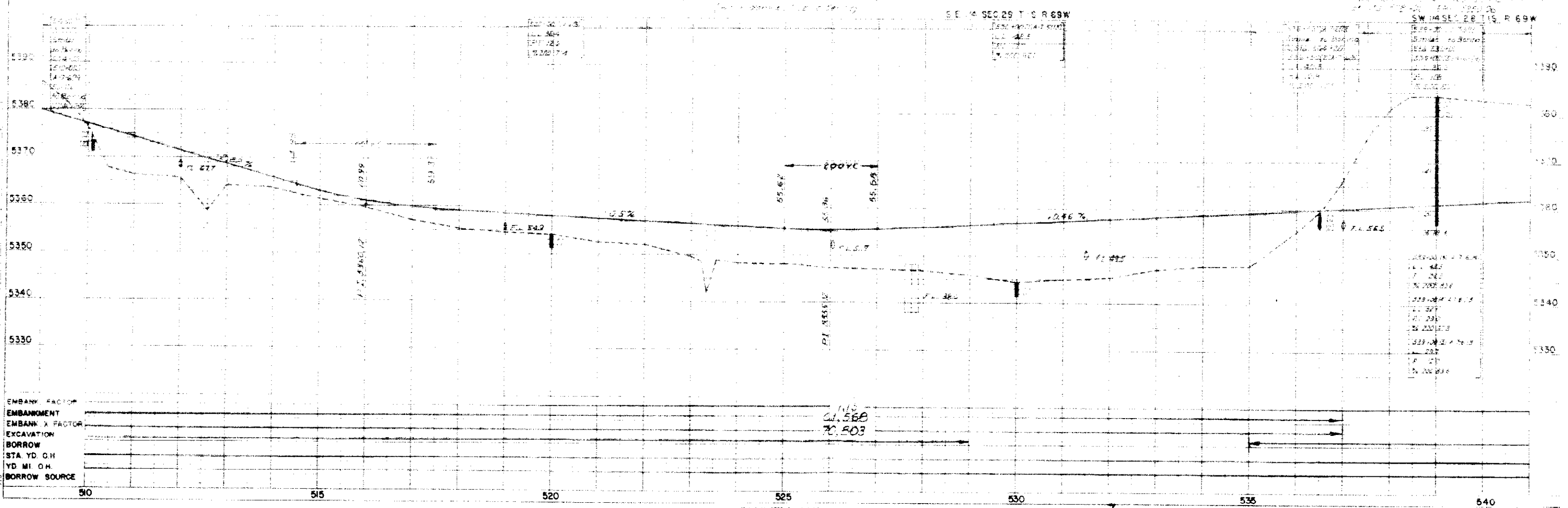
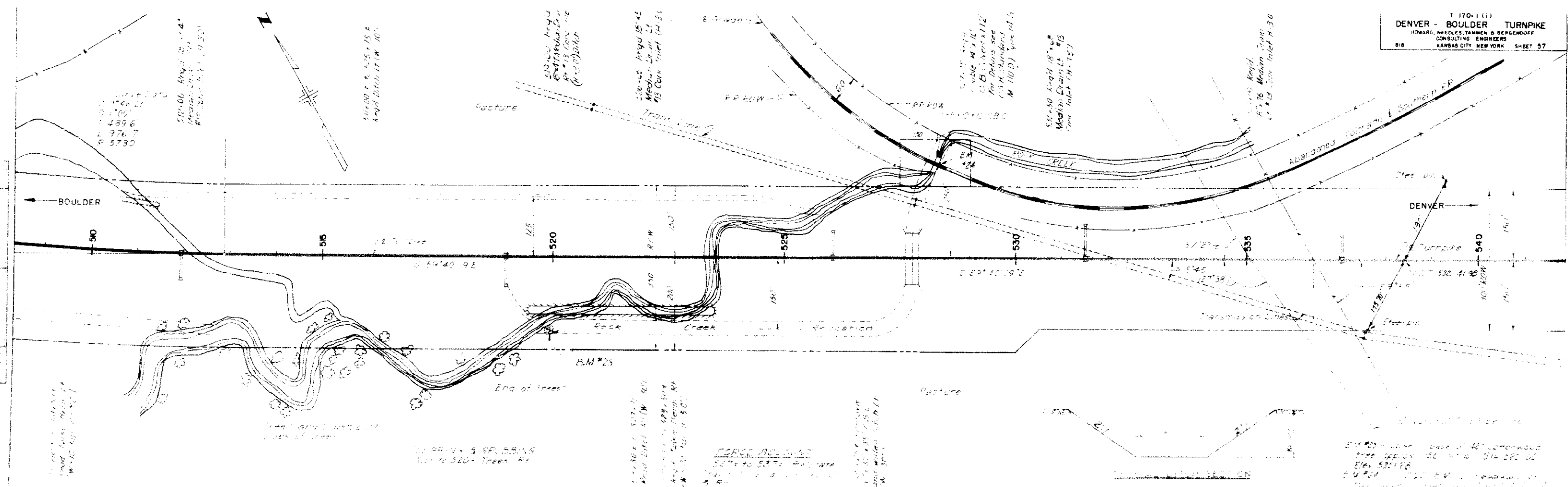
S.E 1/4 SEC.13 T.1S. R.70W.

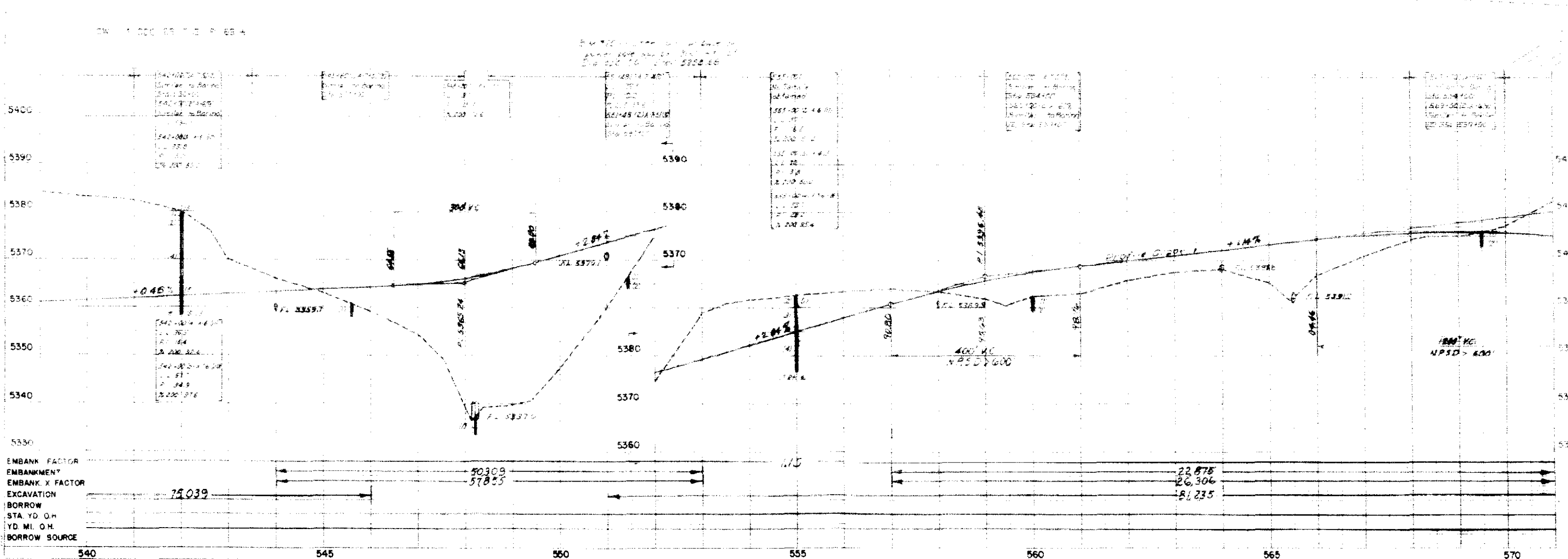
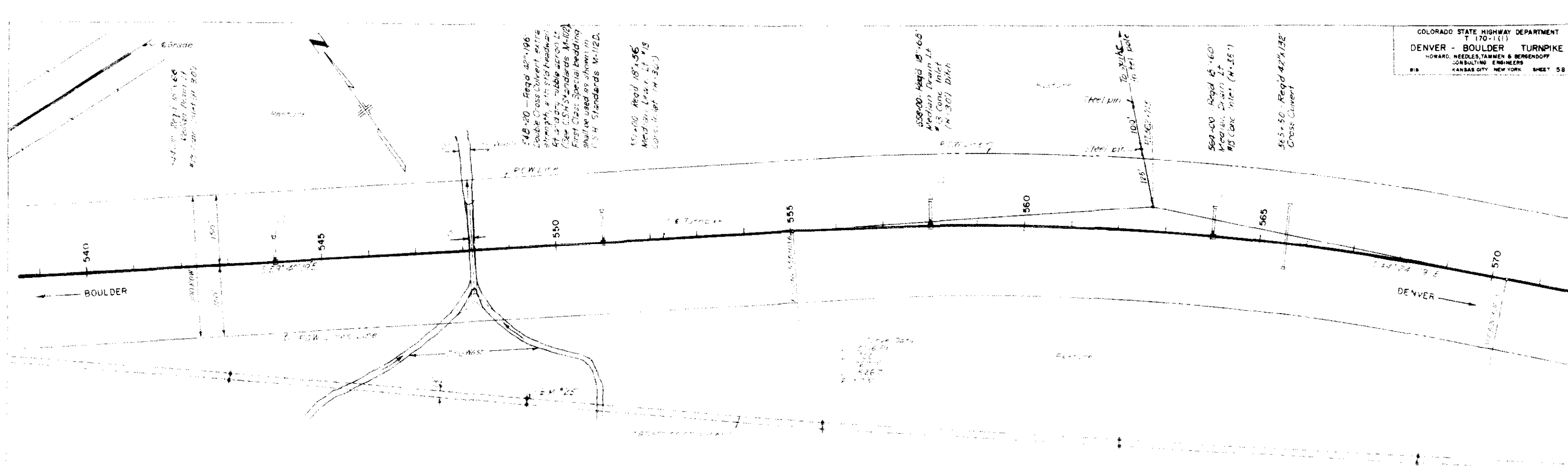




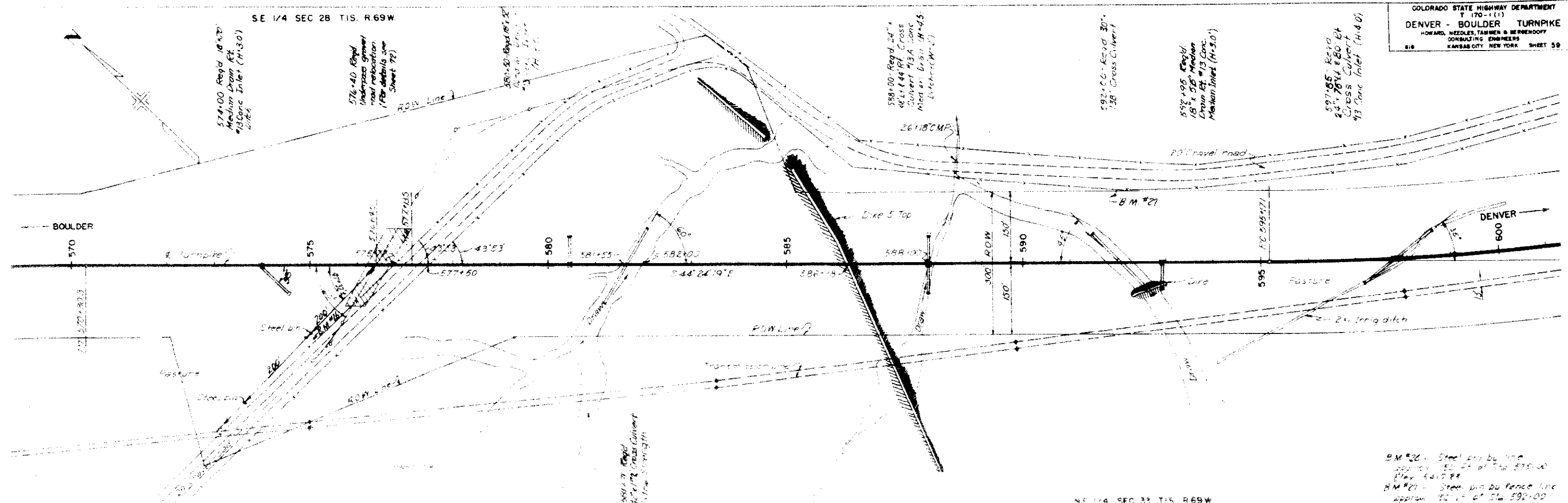






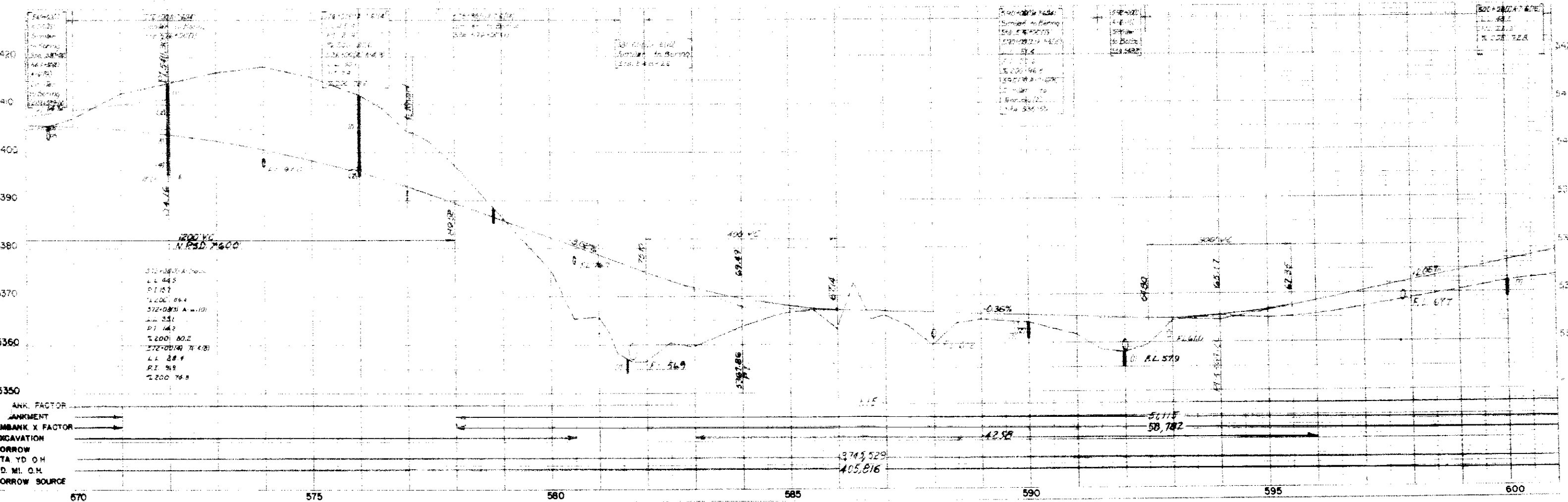


SE 1/4 SEC 28 T1S. R69W

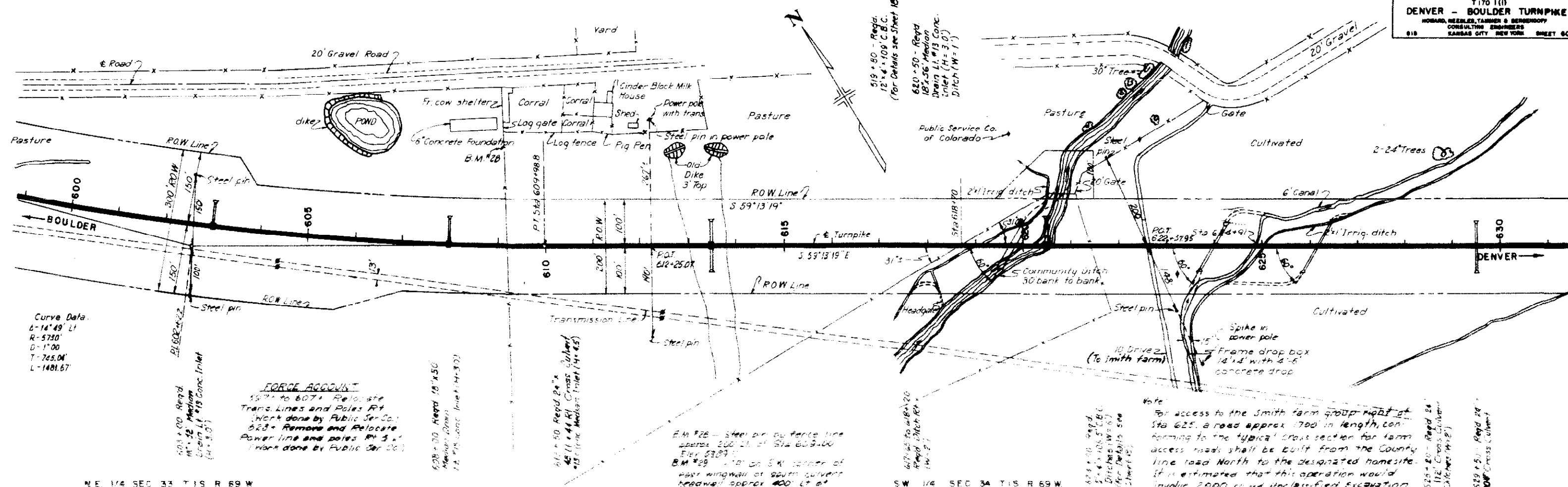


B.M. #20 - Steel pin by line
 approx. 150' E of Sta 575+00
 Elev. 5412.88
 B.M. #21 - Steel pin by fence line
 approx. 150' E of Sta 590+00
 Elev. 5361.92

NE 1/4 SEC 33 T1S. R69W



ANK. FACTOR
 EMBANK X FACTOR
 EXCAVATION
 BORROW
 STA. YD. O.H.
 YD. MI. O.H.
 BORROW SOURCE



Curve Data:
6-14'49" LI
R-5730'
D-1'00"
T-745.04'
L-1481.67'

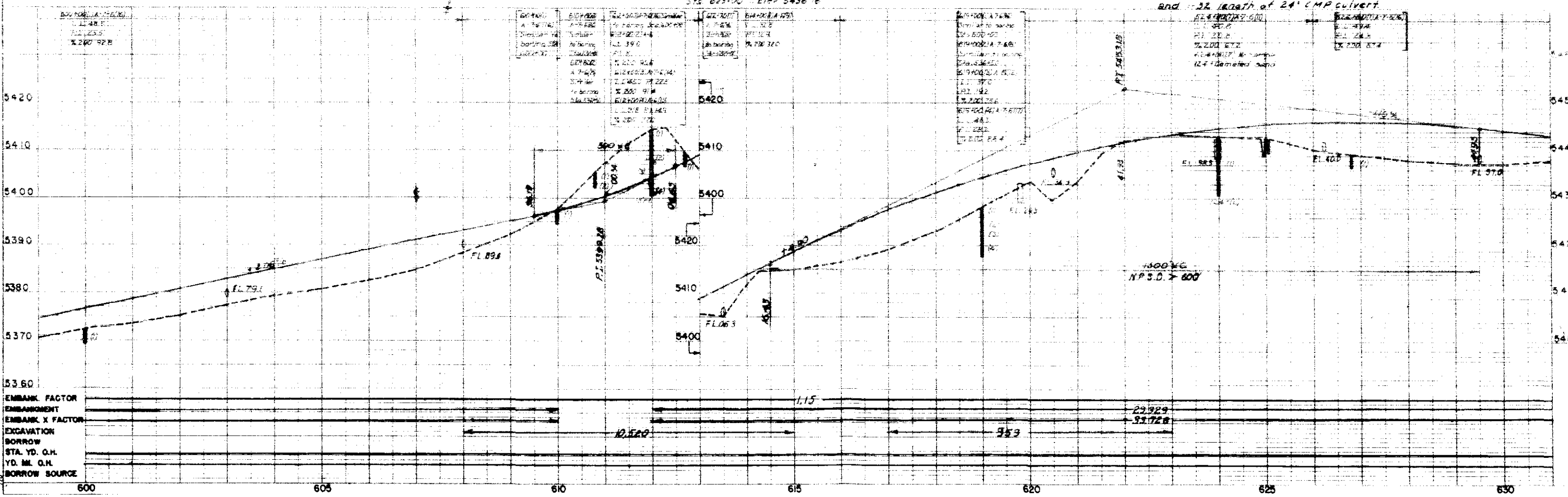
FORCE ACCOUNT
527+ to 607+ Relocate
Trans. Lines and Poles Rt.
(Work done by Public Ser. Co.)
628+ Remove and Relocate
Power line and poles Rt. 3.
(Work done by Public Ser. Co.)

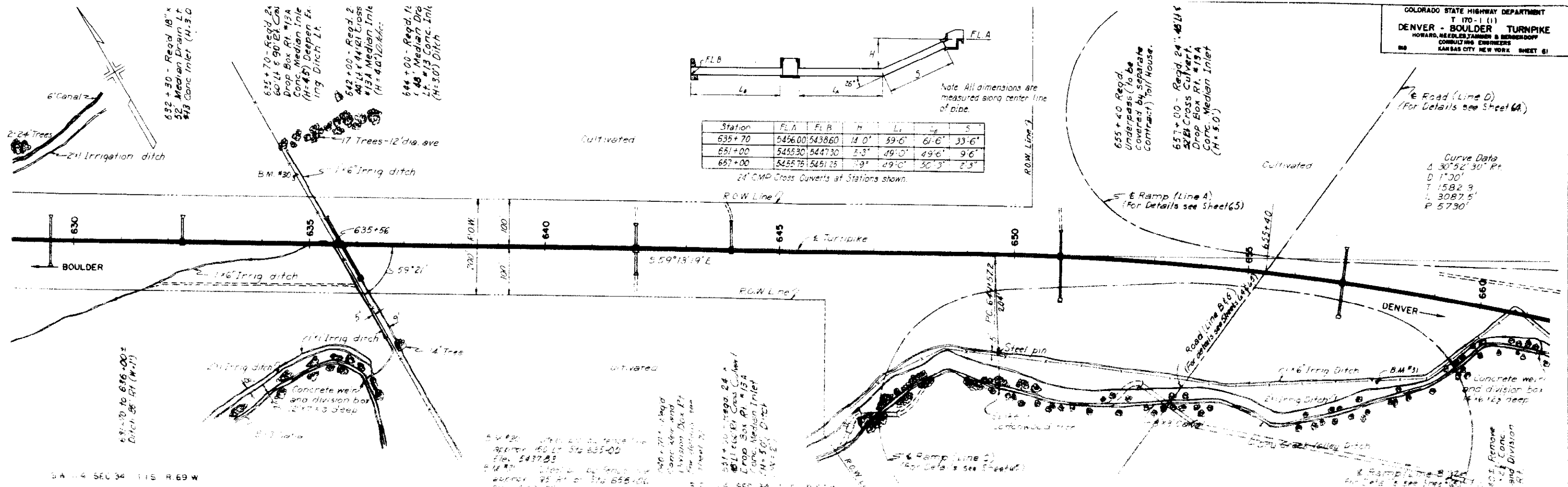
B.M. #28 - Steel pin on fence line
approx. 200' N. of Sta. 609+00
Elev. 5387'
B.M. #29 - 1" dia. on S.W. corner of
past wingwall at south culvert
headwall approx. 400' N. of
Sta. 623+00. Elev. 5436'

Note:
For access to the Smith farm group right of
Sta. 625, a road approx. 1700' in length, con-
forming to the typical cross section for farm
access roads shall be built from the County
line road North to the designated homesite.
It is estimated that this operation would
involve 2000 cu yd unclassified excavation
and 122,182 cu yd of 24" CMP culvert.

N.E. 1/4 SEC. 33 T.1S. R. 69 W

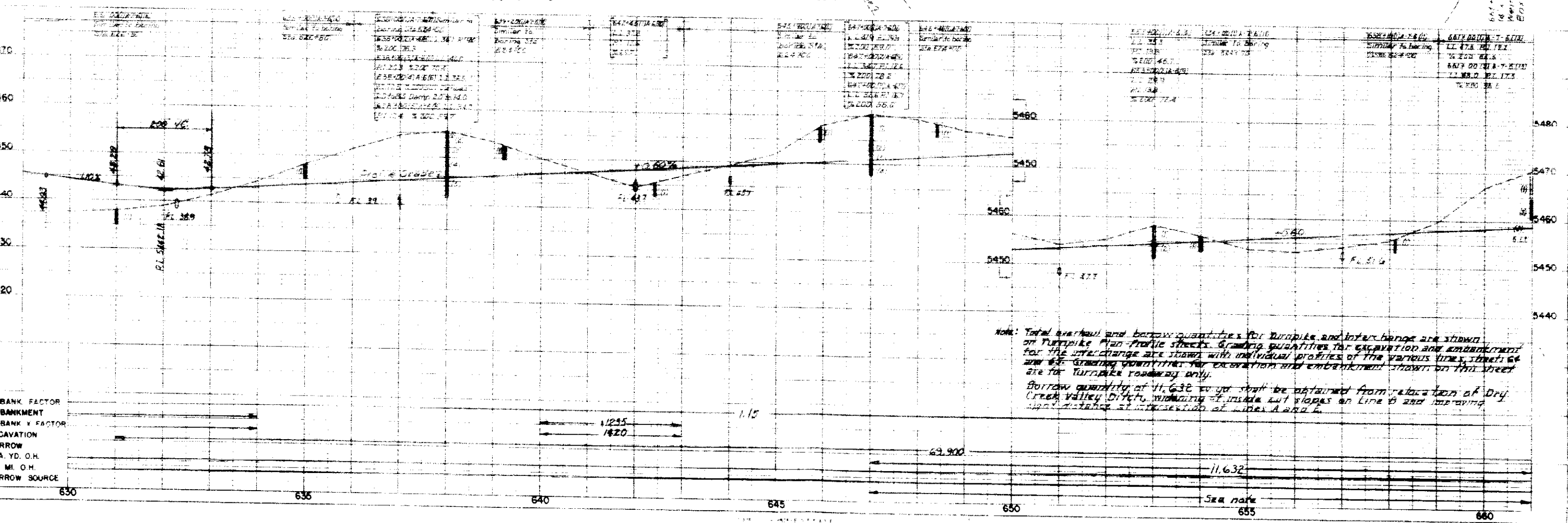
SW 1/4 SEC. 34 T.1S. R. 69 W





Station	FLA	FLB	H	L ₁	L ₂	S
635+70	5456.00	5438.60	14.0'	59'-6"	61'-6"	33'-6"
651+00	5455.30	5447.30	8.3'	49'-0"	49'-6"	9'-6"
657+00	5455.75	5451.25	4.5'	49'-0"	50'-3"	2'-3"

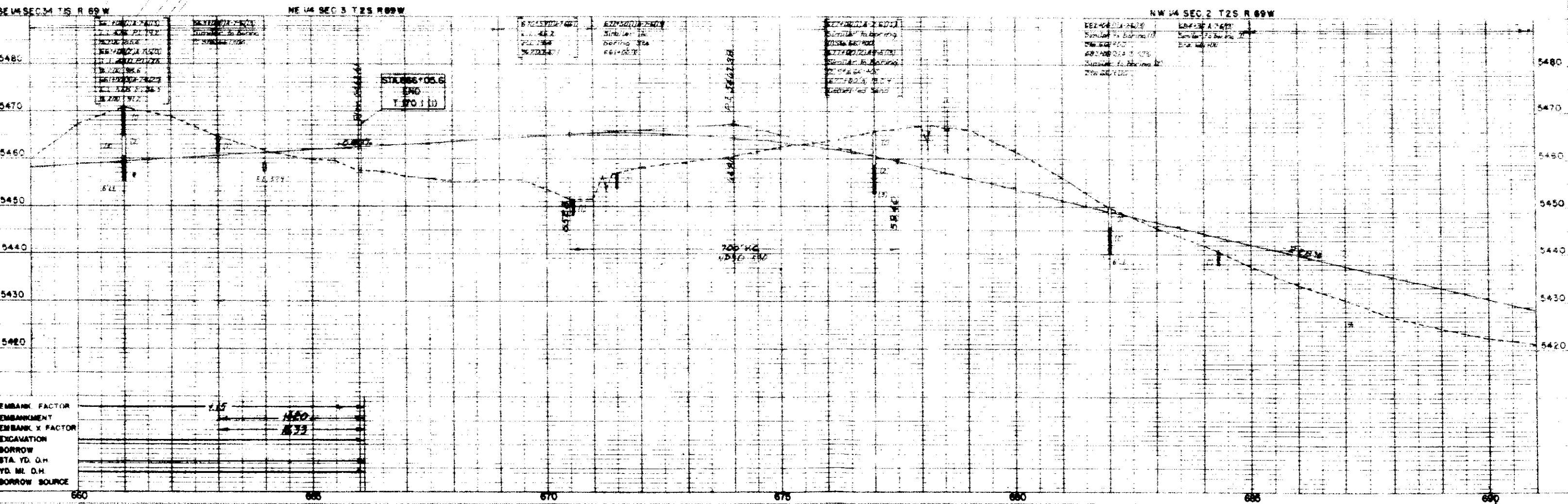
24" CMP Cross Culverts at Stations shown.

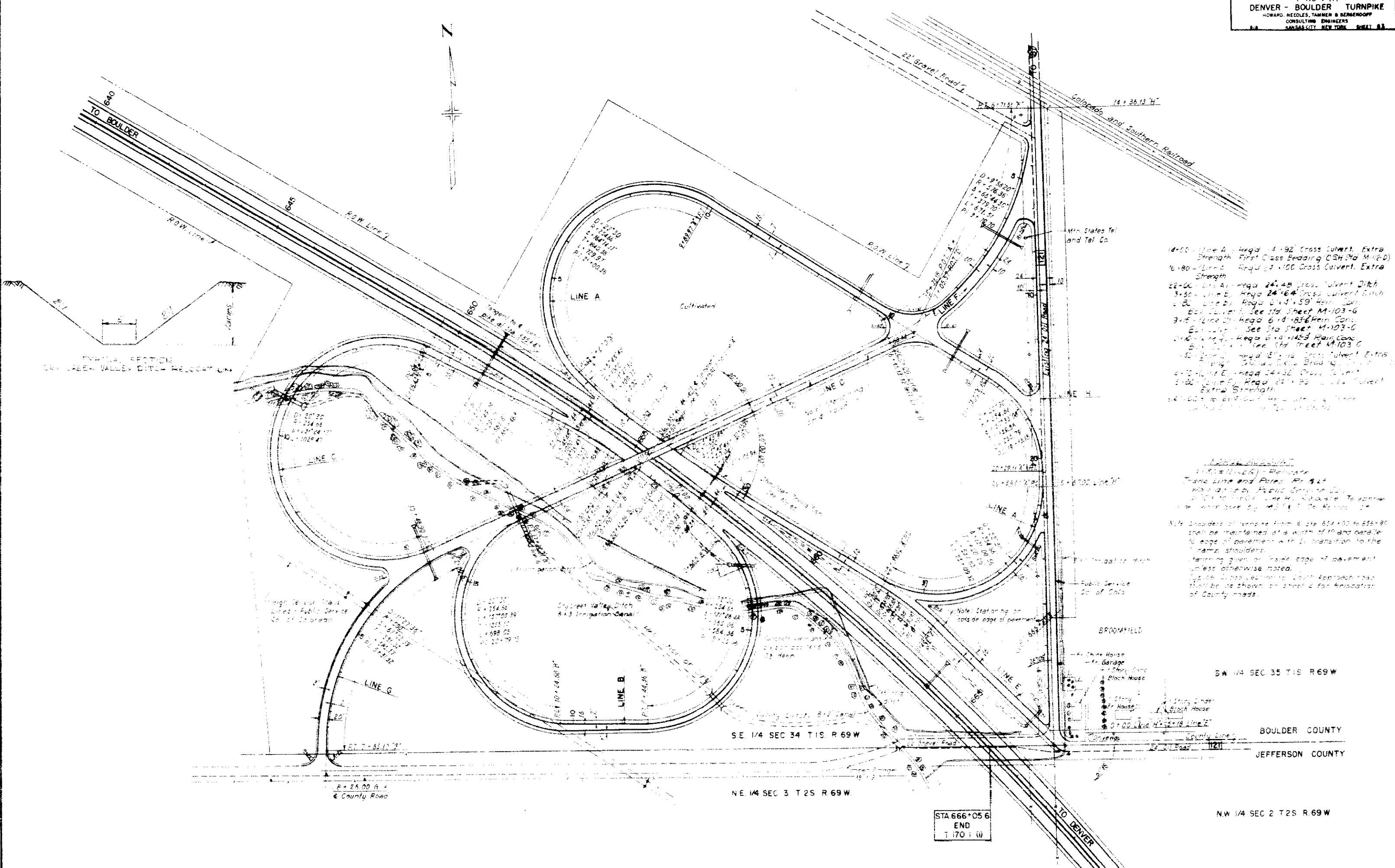


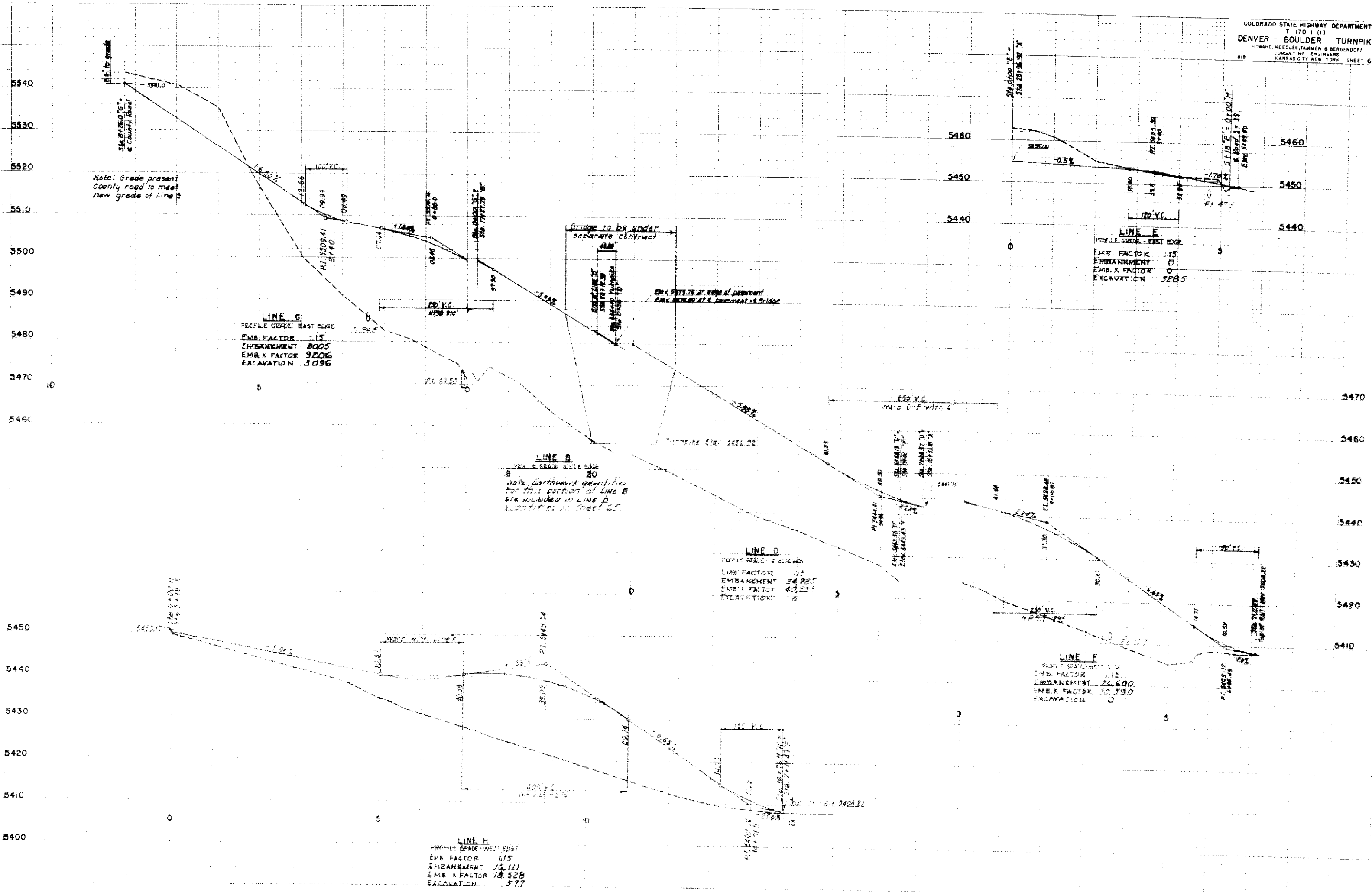
Note: Total overhaul and borrow quantities for Turnpike and Interchange are shown on Turnpike Plan-Profile sheets. Grading quantities for excavation and embankment for the interchange are shown with individual profiles of the various lines, sheet 64 and 65. Grading quantities for excavation and embankment shown on this sheet are for Turnpike roadway only.

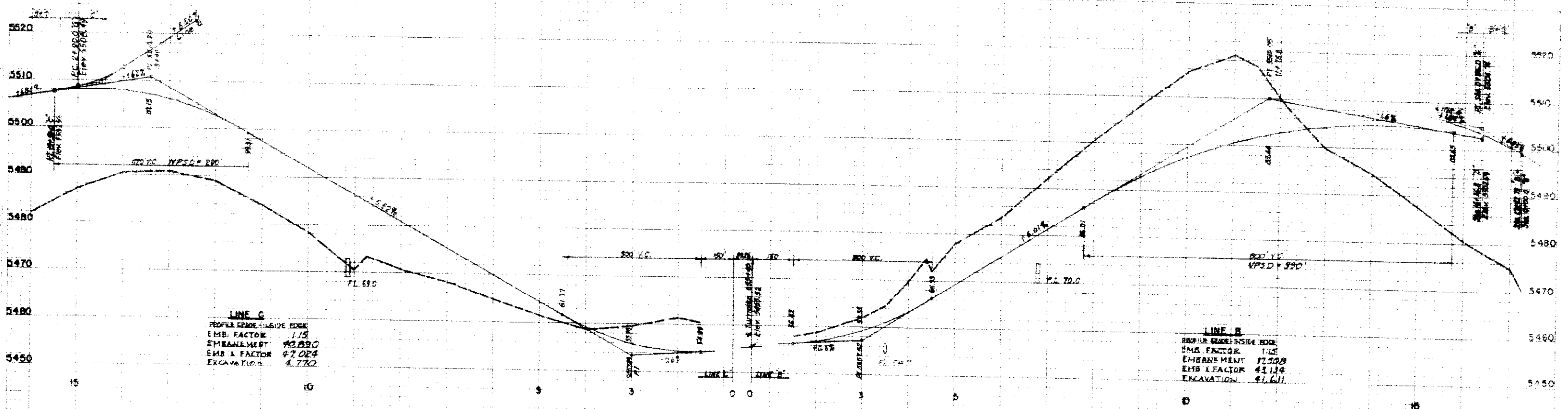
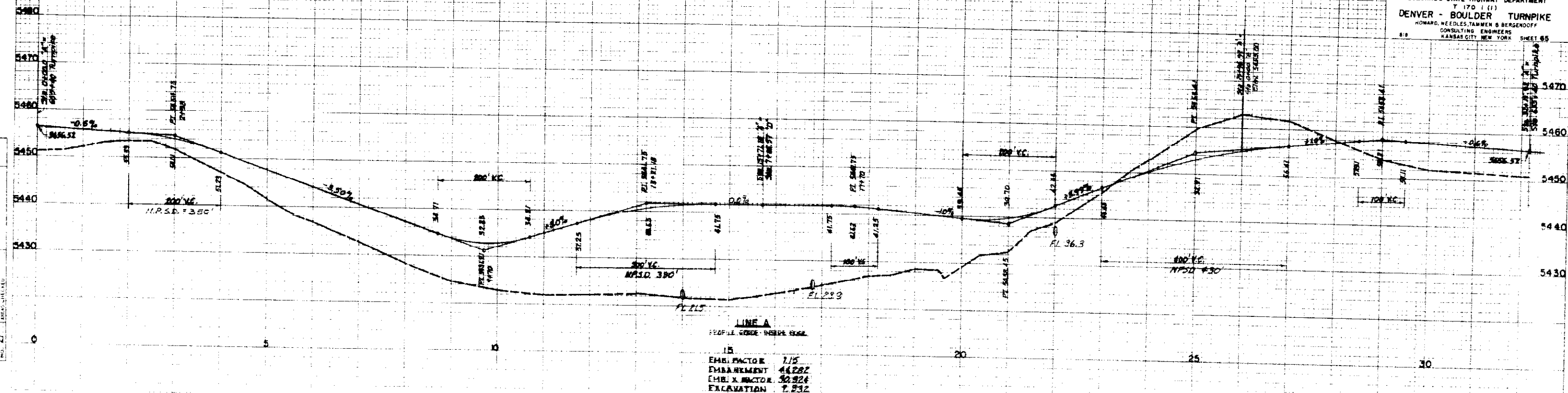
Borrow quantity of 11,632 cu yd shall be obtained from retention of Dry Creek valley ditch, widening of inside cut slopes on Line B and improving spot drainage at intersection of Lines A and B.

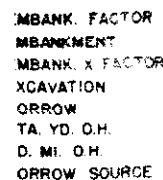
EMBANK FACTOR	1.15
EMBANKMENT	1.15
EMBANK Y FACTOR	1.15
EXCAVATION	1.15
BORROW	1.15
STA. YD. O.H.	1.15
YD. MI. O.H.	1.15
BORROW SOURCE	1.15

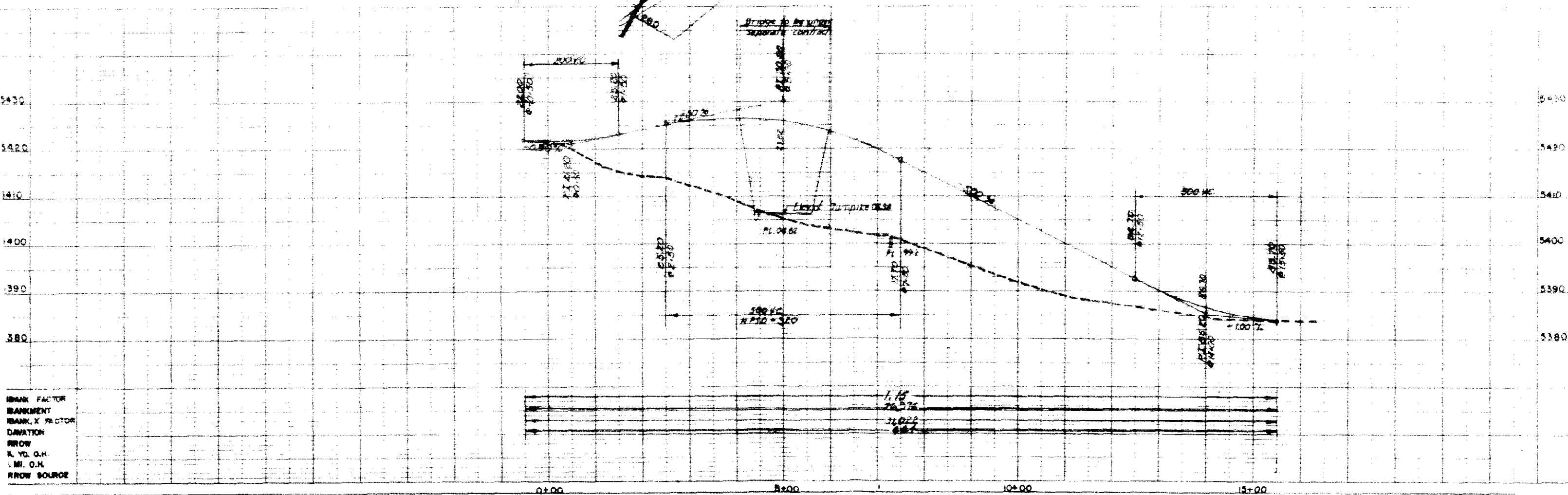
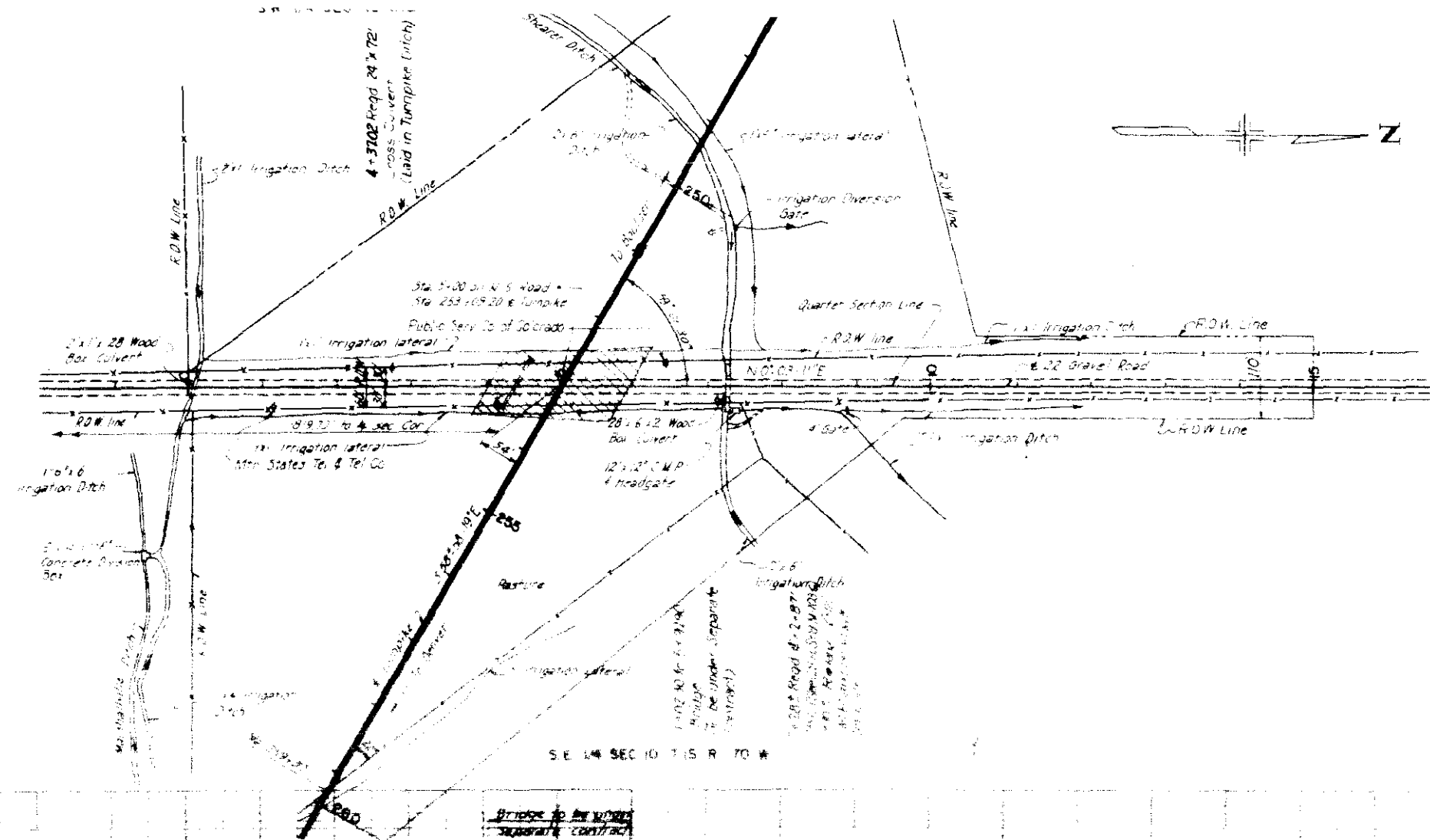




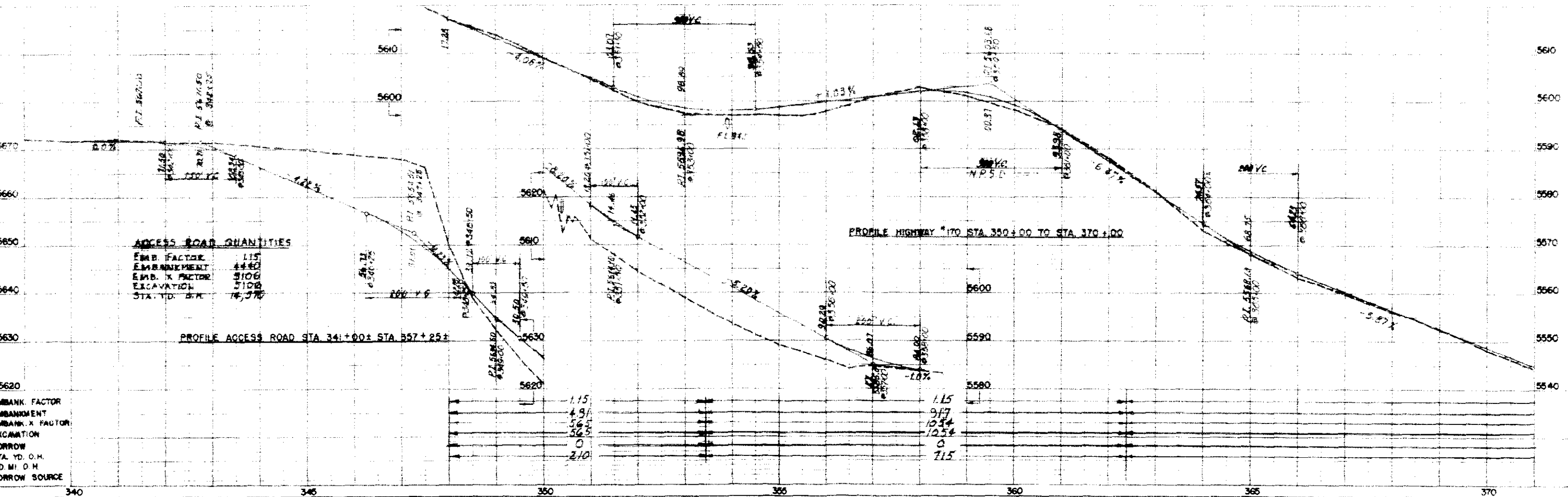
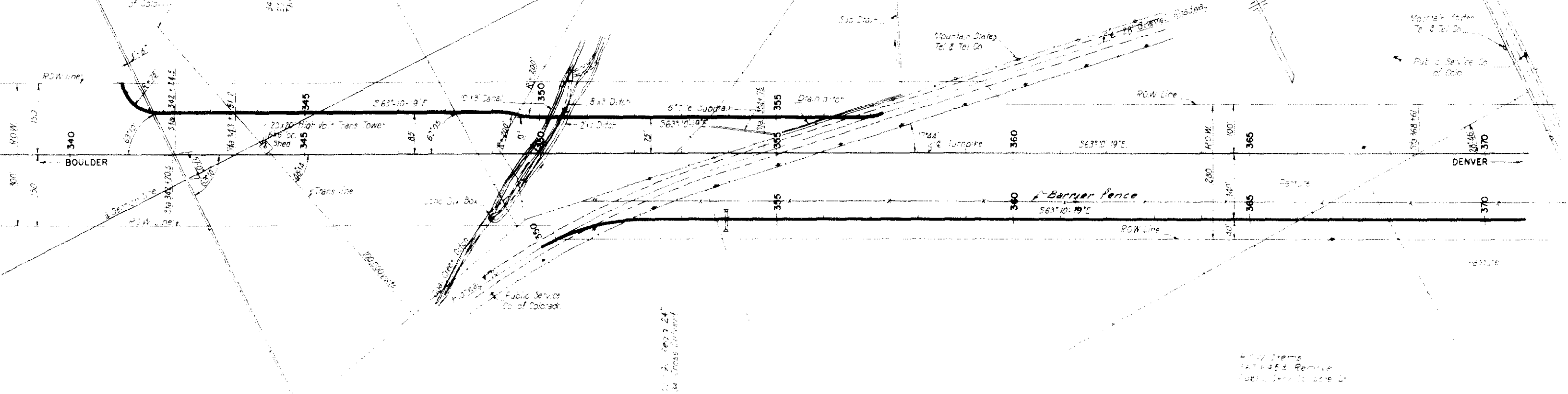


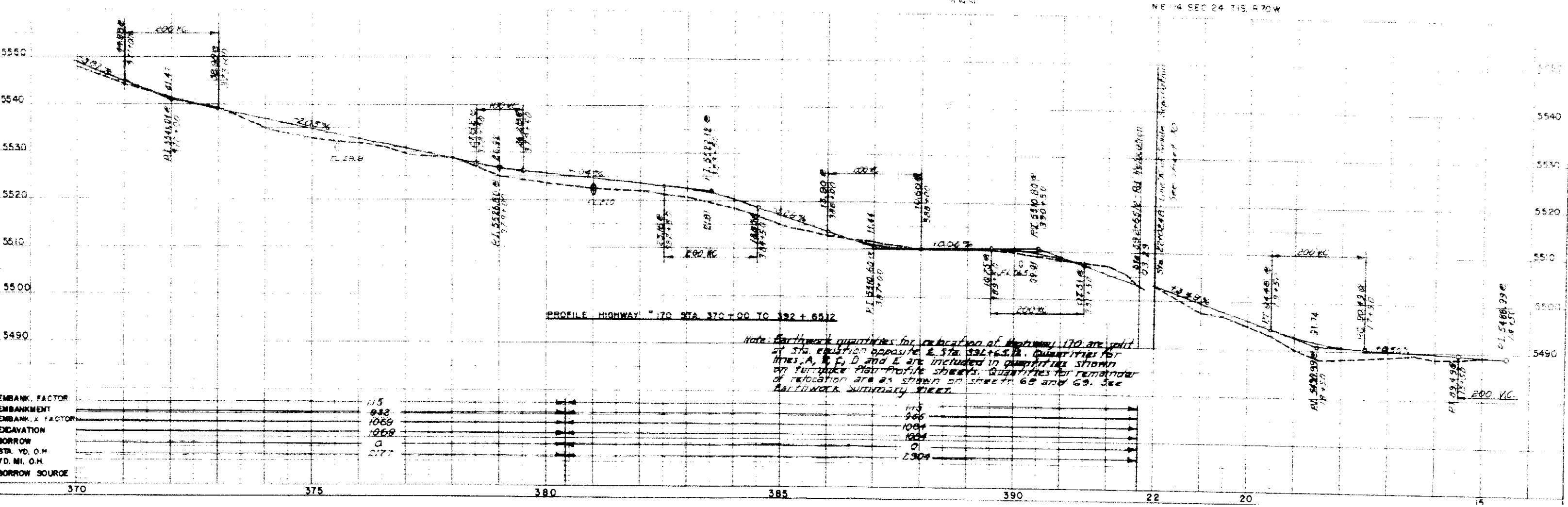
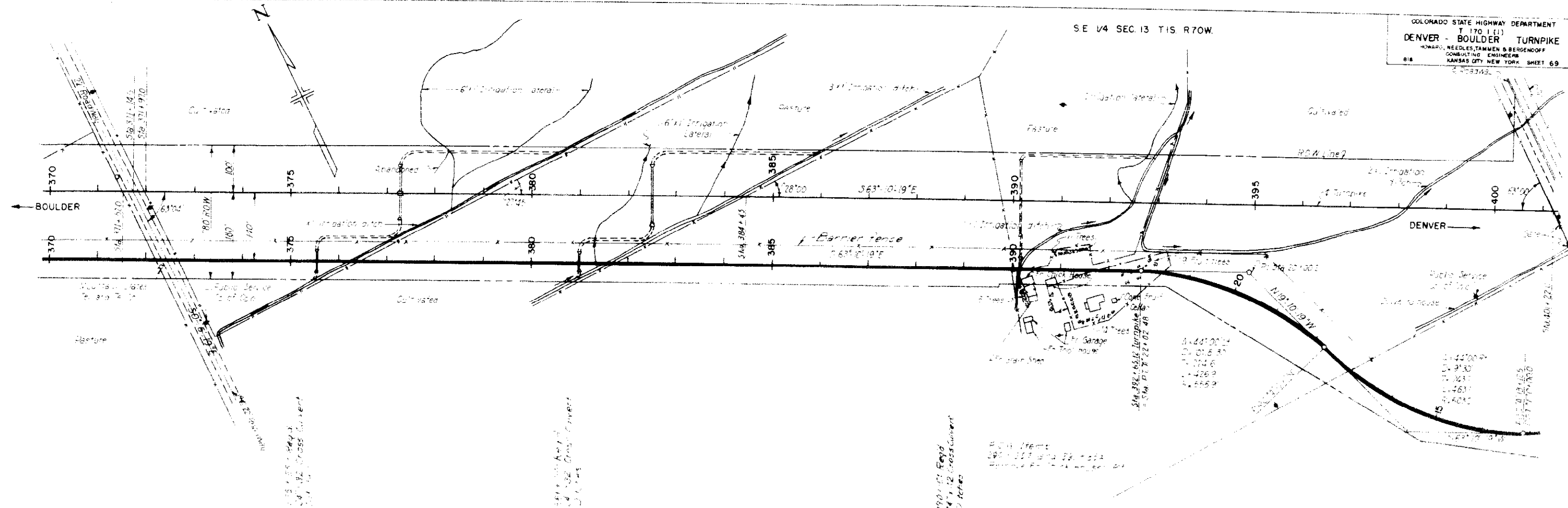






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EMBANK. FACTOR	115
EMBANKMENT	953
EMBANK. X FACTOR	1069
EXCAVATION	1069
BORROW	a
STA. YD. O.H.	2177
YD. MI. O.H.	
BORROW SOURCE	

