

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 018-1(7)	1	

18,0107

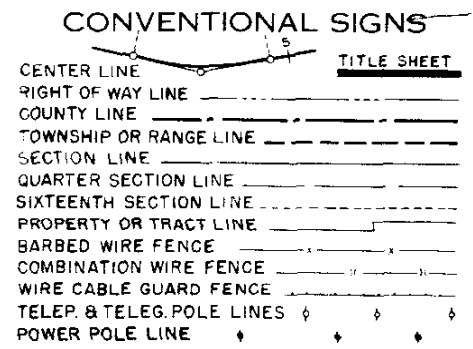
COLORADO STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. F 018-1(7) STATE HIGHWAY NO. 13 GARFIELD COUNTY

INDEX OF SHEETS

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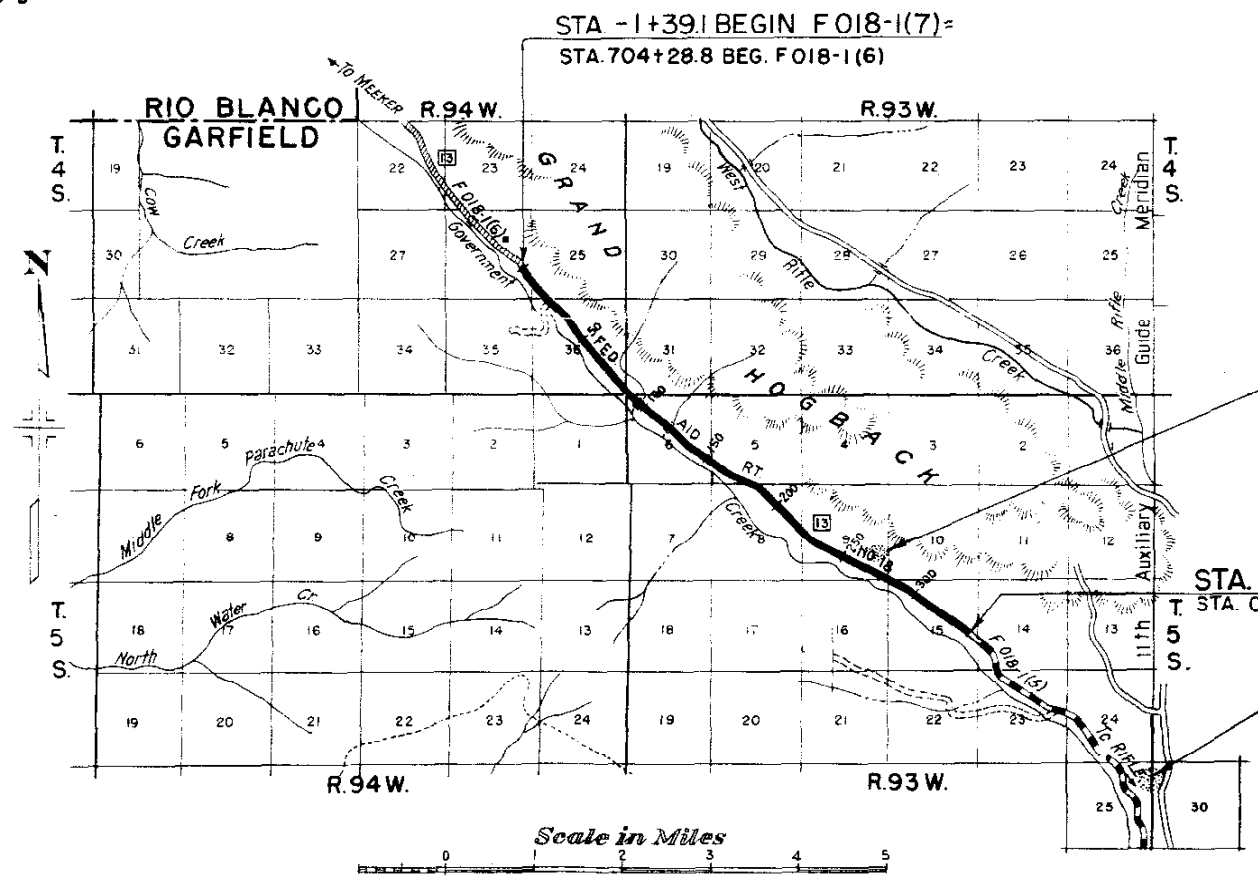
M-7-B
M-112-D
M-19-C
M-24-H
M-1-B
M-2-DM
M-2-DS
M-107-C
M-115-CX
M-10-B

SCALES ON ORIGINAL TRACINGS
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 } 34,133.3 Feet = 6.465 Miles
NET LENGTH OF PROJECT }



TABULATION OF LENGTH & DESIGN DATA

STATION	DESCRIPTION	ROADWAY	
		LIN. FT.	
704+28.8 -1+39.1	Beg. F 018-1(6) = BEG. F 018-1(7)	2,896.0	
27+56.9 Bk = 27+80.0 Ah.	Equation	1,238.2	
40+18.2 Bk = 40+18.4 Ah.	Equation	1,352.8	
53+71.2 Bk = 53+72.5 Ah.	Equation	17,620.4	
229+92.9 Bk = 229+93.1 Ah.	Equation	11,025.9	
340+19.0 0+00	End F 018-1(7) = Beg. F 018-1(5)		
TOTAL		34,133.3	
SUMMARY		LIN. FT.	MILES
F 018-1(7) Roadway		34,133.3	6.465
TOTAL F 018-1(7)		34,133.3	6.465
DESIGN DATA			
Maximum Degree of Curve			4°00'
Maximum Grade			5.98%
Minimum N.P.S.D. - Horizontal			480'
Minimum N.P.S.D. - Vertical			500'
Maximum Design Speed			50 M.P.H.



INACTIVE

PIT NO 2 (U.S. Land)
BORROW

STA. 340+19.0 END F 018-1(7) =
STA. 0+00 BEG. F 018-1(5)

PIT NO 1 (Sayre & Coulter)
BALLAST
& SURFACING

NOTE:
It is recommended that Bidders on this Project go over the plan details with one of the following field representatives of this Department
H.W. Gray, Construction Engineer,
Grand Junction, Colo.
F.C. Hammond, Resident Engineer,
Glenwood Springs, Colo.

HIGHWAY DEPARTMENT
STATE OF COLORADO

RECOMMENDED FOR APPROVAL:
John S. Bell 8-15-51
ASSISTANT ENGINEER DATE

APPROVED:
Mark A. Williams 8-15-51
STATE HIGHWAY ENGINEER DATE

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL:
DISTRICT ENGINEER DATE

APPROVED:
DIVISION ENGINEER DATE

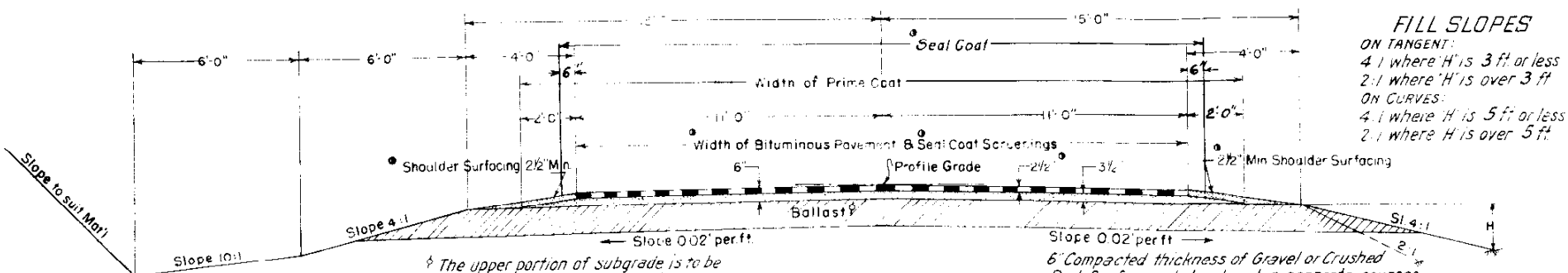
NOTE:
See Standard M-2-DM for details of
Cut Slope Treatment, Flaring & Widening
for Guard Fence and/or Guard Posts

FED. ROAD D.V. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 018-1 (7)	2	

Rev. Note B, Non-Fed. Aid 4/18/CMP - 9-12-51 - 65.

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

TYPICAL SECTION "A"
(Grade Line Shown on Plans)



The depth and width of side ditch shall be varied where necessary in order to provide proper drainage and/or entrance to drainage structures.

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

The upper portion of subgrade is to be constructed of Ballast Material at locations designated in Ballast Tabulation. Estimated quantities involved in this operation and thickness of material required, are tabulated on Sheet No. 3.

TYPICAL SECTION "B"
(No Grade Line Shown on Plans)

* At all locations where present subgrade is not wide enough to receive stabilization material as shown, the subgrade will be widened with embankment material obtained within present R.O.W.

* At all locations where Profile Grade is not shown the grade to be staked by the engineer shall be approximately the combined thickness of ballast and surfacing above profile of present roadway.

* Embankment Material required to widen subgrade

Profile Present Roadway

Present Oil Mat shall be plowed and broken

* Embankment Material required to widen subgrade.

FUTURE CONSTRUCTION

GENERAL NOTES

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

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

All poles encroaching on construction are to be moved by the owners, except Power Pole Lt Sta. 17+.

All Concrete used on this Project shall be "Air-entrained Concrete."

Culverts projecting from embankments shall be covered with approximately 6 inches of embankment material in such a manner that a minimum of pipe shall be exposed in the completed work. This shall be accomplished by warping embankment slopes around and adjacent to the Culvert.

Payment for Overhaul will be based on measurement along the centerline of the Project.

All Side Approach Roads to the Project shall be Prime Coated & Seal Coated to approximately 50 feet out from edge of Oil Mat or to the Right of Way line, whichever is less.

Approximate location and quantities involved in construction of intercepting ditches are tabulated on Summary of Earthwork Quantities sheet.

It is estimated that rolling of the Oil Mat with Flat Wheeled Roller will be necessary after compaction with Rubber Tired Rollers in order to provide a firm, smooth surface.

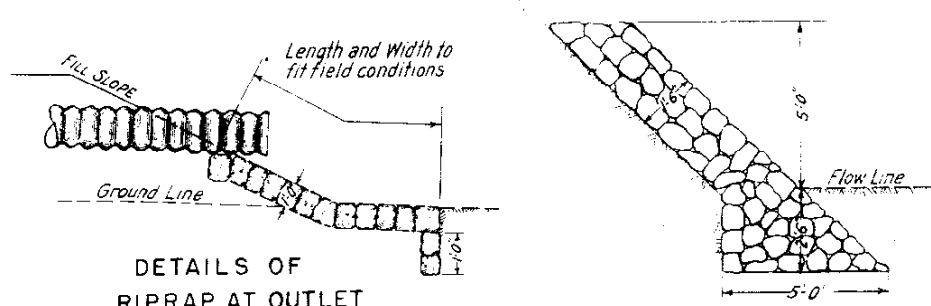
For preliminary plan quantities of Asphaltic Road Materials, the following rates of application were used:

- PRIME COAT - MC @ 0.40 Gals. per Sq. Yd.
- * PROCESS OIL - MC-3 or MC-4 with additive @ 0.76 Gals. per Sq. Yd. per inch.
- SEAL COAT - RC @ 0.19 Gals. per Sq. Yd.
- STONE SCREENINGS, Type 2 @ 22 Lbs. per Sq. Yd.

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

* MC-3 Processed Oil used for preliminary computations of quantities on these plans.

All Curves are to be Superelevated and Widened as provided by the Standard Super-elevation sheet included with the Plans, except in cases where Spiral Curves are used the transition from normal crowned section to full Superelevation and widening shall take place over the full length of Spiral Curve.



DETAILS OF
RIPRAP AT OUTLET

DETAIL OF HEAVY RIPRAP

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	ROADWAY	PROJECT TOTALS
10a	Clearing & Grubbing entire Project	Lump Sum		
11a	Removal of 38 Structures	Lump Sum		
11b	Removal of portions of present structure, Sta. 12+ to 22+	Lump Sum		
11d	Removing & Resetting Mail Boxes	Lump Sum		
11e	Plug Culverts	Each	5	5
11f	Remove & Rebuild Pole Corral & Loading Chute	Lump Sum		
12a	Removing Fence	Lin. Ft.	34,600	34,600
12b	Removing & Rebuilding Fence	Lin. Ft.	2,900	2,900
12c	Line Posts (Treated Wood)	Each	30	30
13c	Unclassified Excavation	Cu. Yd.	62,000	62,000
13d	Unclassified Ditch Excavation	Cu. Yd.	5,400	5,400
13y	Unclassified Excavation (stripping)	Cu. Yd.	13,000	13,000
14a	Dry Rock Excavation (Str.)	Cu. Yd.	200	200
14b	Dry Common Excavation (Str.)	Cu. Yd.	1,110	1,110
14c	Wet Rock Excavation (Str.)	Cu. Yd.	50	50
14d	Wet Common Excavation (Str.)	Cu. Yd.	280	280
16a	Structure Backfill (Class 1)	Cu. Yd.	1,100	1,100
16d	Mechanical Tamping	Hour	110	110
17ax	Rolling with Tamping Roller (2 Unit)	Hour	230	230
17ay	Rolling with Tamping Roller (4 Unit)	Hour	120	120
17b	Rolling with Flat Wheeled Roller	Hour	180	180
17c	Rolling with Rubber Tired Roller	Hour	60	60
17dx	Furnishing Tamping Roller (2 Unit)	Each	1	1
17dy	Furnishing Tamping Roller (4 Unit)	Each	1	1
17e	Furnishing Flat Wheeled Roller	Each	1	1
17f	Furnishing Rubber Tired Roller	Each	1	1
17g	Wetting	M. Gal.	3,790	3,790
18a	Station Yard Overhaul	Sta. Yd.	270,000	270,000
18b	Yard Mile Overhaul	Yd. Mi.	19,600	19,600
18c	Ton Mile Overhaul	Ton Mi.	399,200	399,200
23b	Ballast (Class 2)	Ton	49,200	49,200
26c	Gravel or Crushed Rock Surfacing (Grading C)	Ton	16,600	16,600
30x	Asphaltic Road Material MC	Gal.	40,600	40,600
46a	Class "A" Concrete	Cu. Yd.	12	12
47	Reinforcing Steel	Lb.	900	900
53b	18" Corrugated Metal Culvert Pipe	Lin. Ft.	322	322
53c	24" Corrugated Metal Culvert Pipe	Lin. Ft.	1,767	1,767
53d	30" Corrugated Metal Culvert Pipe	Lin. Ft.	24	24
53e	36" Corrugated Metal Culvert Pipe	Lin. Ft.	573	573
53k	84" Corrugated Metal Culvert Pipe	Lin. Ft.	66	66
58c	24" Asbes Bonded Cor. Met. Culv. Pipe (Bitum. Coated)	Lin. Ft.	184	184
67a	Riprap	Cu. Yd.	150	150
67b	Heavy Riprap	Cu. Yd.	60	60
76a	Barbed Wire Fence with treated wooden posts	Lin. Ft.	34,700	34,700
76g	Barbed Wire Gates	Each	12	12
81b	Right of Way Markers	Each	20	20
92	Timber Guard Posts	Each	60	60
FORCE ACCOUNT				
	Move Telephone Line (Work by M.S.T. & T. Co.)	Lump Sum		
	Placing 6" Material in bottom of 84" C.M.P. for Stock Pass.	Lump Sum		
RIGHT OF WAY				
	Right of Way entire Project	Lump Sum		
NON-FEDERAL-AID				
11c	Move private Power Pole	Lump Sum		
Alternate Bids to be received for Concrete Culverts. The following item is to be bid upon in lieu of the foregoing item 58c:-				
52c	24" Reinforced Concrete Culvert Pipe	Lin. Ft.	184	184

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FO18-1(7)	3	

BALLAST PLAN

It is estimated that Ballast material for the Project is available in the vicinity of the Pit indicated in the following tabulation:

Estimated quantities involved in this operation are shown below.
Alteration of the plan as here outlined will be allowed only on written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	QUANTITY & THICKNESS			OVERHAUL	
		AVAILABLE	THICKNESS "	TONS CLASS 2	TON MILE	
-1+39.1 to 15+00 15+00 to 27+56.9 Bk 27+80.0 Ah to 31+00 31+00 to 40+18.2 Bk 40+18.4 Ah to 42+00		60,000 Cu. Yds.	17" 15" 15" 0" 0"	5,311 3,545 903 *1132 *124	47,316 30,611 7,663 9,474 1,025	
42+00 to 46+00 46+00 to 52+00 53+72.5 Ah to 83+50 83+50 to 100+00	Pit No. 1 (EFFIE SAYRE & GUY COULTER)		15" 8" 0" 15"	1128 858 *232 4,653	9,260 6,963 1,797 33,990	
114+50 to 126+00 126+00 to 142+00 142+00 to 151+00 151+00 to 154+00	NW 1/4 Sec 30, T.5S., R.92W. & NE 1/4 Sec 25, T.5S., R.93W.		4" 0" 4" 12"	794 *270 621 660	5,372 1,757 3,893 4,063	
154+00 to 157+50 157+50 to 162+00 162+00 to 174+00 174+00 to 197+00	ROUTE OF HAUL 3.6 Miles to Sta 340+19		15" 12" 15" 6"	987 990 3,384 2,415	6,014 5,957 19,834 13,355	
197+00 to 216+00 216+00 to 229+92.9 Bk 229+93.1 Ah to 231+00 231+00 to 246+00 246+00 to 260+00	R=78		4" 10" 10" 0" 10"	1,311 2,522 194 *417 2,534	6,728 12,156 908 1,891 10,773	
269+00 to 286+00 286+00 to 299+50 299+50 to 303+00 303+00 to 309+00			10" 15" 17" 15"	3,077 3,807 1,134 1,692	11,653 13,317 3,786 5,496	
10% for irregularities in Subgrade				4,470	27,505	
TOTALS				49,165	302,557	

* Additional for Super-elevation.

* Based on Curve "D" of S.H.D. Design #12

TIMBER GUARD POSTS

STATIONS	SIDE	SPACING	NO.	
			POSTS	EACH
69+00	Lt. & Rt.	Culvert	2	
4+00	Lt. & Rt.	Culvert	2	
131+82	" "	"	2	
25+77	Lt. & Rt.	Culvert	2	
247+90	" "	"	2	
47+00	Lt. & Rt.	Culvert	2	
52+00	" "	"	2	
55+35	" "	"	2	
255+80	" "	"	2	
88+00	Lt. & Rt.	Culvert	2	
98+40	Lt. & Rt.	C.B.C.	2	
109+00	" "	Culvert	2	
115+00	" "	"	2	
267+94	" "	"	2	
122+80	Lt. & Rt.	C.B.C.	2	
143+00	Lt. & Rt.	Culvert	2	

STATION	SIDE	SPACING	NO.	
			POSTS	EACH
186+25	Lt. & Rt.	Culvert	2	
276+64	" "	"	2	
195+00	Lt. & Rt.	Culvert	2	
201+94	" "	"	2	
212+55	Lt. & Rt.	Culvert	2	
221+70	" "	"	2	
308+50	" "	"	2	
228+00	Lt. & Rt.	Culvert	2	
232+78	" "	"	2	
240+87	" "	"	2	
337+42	" "	"	2	
283+00	Lt. & Rt.	Culvert	2	
327+36	" "	"	2	
339+54	" "	"	2	
TOTAL			60	

SURFACING PLAN

It is estimated that material for Gravel Surfacing for the Project is available in the vicinity of the Pit indicated in the following tabulation.
Estimated quantities involved in this operation are shown below.

Alteration of the Surfacing Plan as here outlined will be allowed only on written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	AVAILABLE	TONS USED			OVERHAUL	
			* TOP COURSE	BOTTOM COURSE	* SHOULDER COURSE	BOTTOM TON MILES	* TOP & SHOULDER
-1+39.1 Beg. to 27+56.9 Bk 27+80.0 Ah to 40+18.2 Bk 40+18.4 Ah to 53+71.2 Bk 53+72.5 Ah to 229+92.9 Bk 229+93.1 Ah to 340+19.0 End	Pit No. 1 (EFFIE SAYRE & GUY COULTER)	60,000 Cu. Yds.	898 384 420 5,463 3,418	1,362 582 636 8,282 5,183	261 112 122 1,586 993	11,972 4,889 5,186 52,649 18,887	10,189 4,167 4,420 44,812 16,075
Estimated for Approaches	NW 1/4 Sec 30 T.5S., R.92W. & NE 1/4 Sec 25 T.5S., R.93W.			510		2975	
	ROUTE OF HAUL 3.6 Miles to Sta 340+19 R=78						
TOTALS			10,583	16,555	3,074	96,558	79,663

* FUTURE CONSTRUCTION

FENCING REQUIREMENTS

STATIONS	SIDE	REMOVE FENCE	REMOVE & REBUILD FENCE	BUILD B.W. Δ FENCE	B.W. GATES
		LIN. FT.	* LIN. FT.	LIN. FT.	EACH
-1+39.1 to 17+03 -1+39.1 to 0+50	Rt. Lt.		1,842 190		
15+30 to 13+60	Lt.		640		
23+75 to 260+40	Rt.	23,850		23,670	
66+00 75+00	Rt. Rt.				1 1
97+00 97+50 to 135+50	Rt. Lt.			3,850	1
99+00	Lt.	3,470			1
106+00	Rt.				1
195+00	Rt.				1
214+40 219+00	Rt. Rt.				1 1
283+50 to 321+45 289+00 to 300+80	Lt. Rt.	3,800 1,210		3,800 1,180	
292+15 293+00	Lt. Rt.				1 1
299+80	Lt.				1
305+40	Lt.				1
308+20 to 329+70	Rt.	2,200		2,150	
TOTALS		34,530	2,872	34,650	12

* Estimated 27 New Line Posts

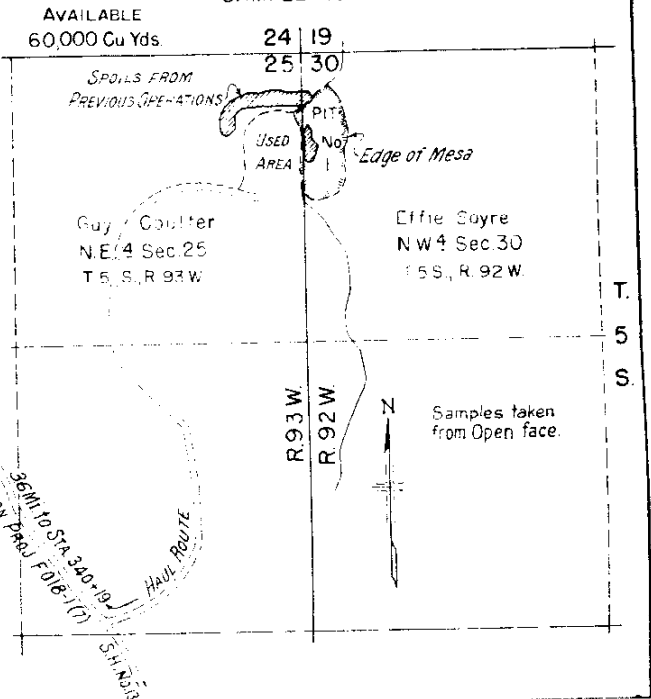
Δ Estimated 174 Gate Nails to be installed by State Forces

R.O.W. MARKERS

STATIONS	SIDE	NO.	
		POSTS	EACH
13+00	Rt.	1	
27+00	Lt.	1	
40+00	Rt.	1	
54+00	Lt.	1	
79+00	Lt.	1	
66+50	Rt.	1	
107+00	Rt.	1	
132+00	Rt.	1	
145+00	Lt.	1	
158+00	Rt.	1	
170+00	Lt.	1	
198+00	Lt.	1	
211+00	Rt.	1	
237+00	Rt.	1	
250+00	Lt.	1	
264+00	Rt.	1	
290+00	Rt.	1	
277+00	Lt.	1	
317+00	Rt.	1	
303+00	Lt.	1	
TOTAL		20	

BALLAST & SURFACING PIT NO. 1

Owners, Effie Sayre & Guy Coulter
SAMPLE NO. 338



BORROW PIT NO. 2

Owners, U.S. Land

SAMPLE NO. 319

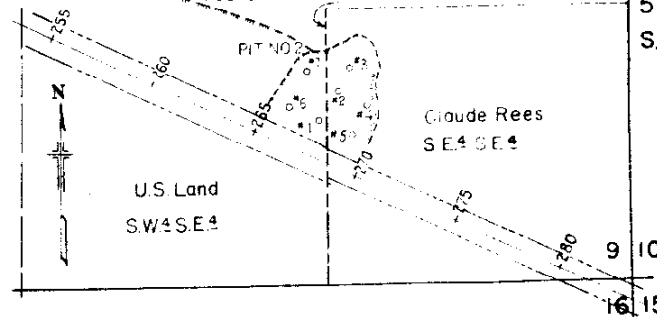
AVAILABLE
50,000 Cu. Yds.

R.93W.

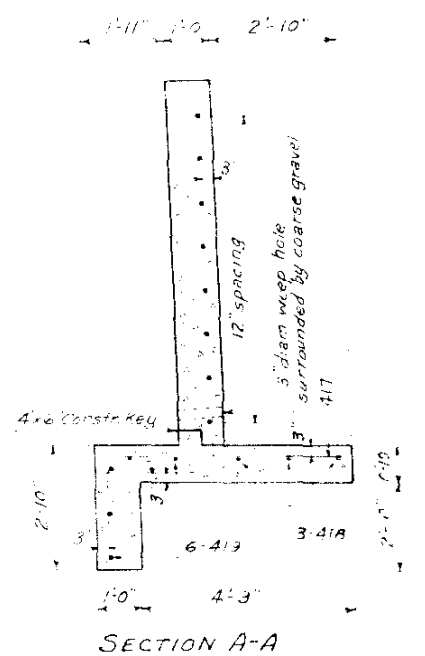
LOG OF PIT

TEST	DEPTH	DESCRIPTION
1	0.0-11.0	Rock & Binder
2	0.0-12.0	" " "
3	0.0-9.0	" " "
4	0.0-11.0	" " "
5	0.0-12.0	" " "
6	0.0-14.0	" " "
7	0.0-8.0	" " "

NOTE:
Do not obtain material
East of this line.



	Date
0	7-17-51
1	7-12-51
2	7-17-51



SUMMARY OF QUANTITIES			LN#	REF
ITEM	DESCRIPTION	UNIT	TOTAL	
11b	Removal of portions of Present Structure	LS	Lump Sum	
14	Structural Excav.	Cu.Yd	10	
16a	Structure Backfill (Class)		15	
46a	Class A Concrete	Cu.Yd	5	
47	Reinforcing Steel	Lbs.	285	
*	1/2 Expn Joint Mat'l.	Sq.Ft.	9	
67a	R.grap	Cu.Yd	10	

* To be included in bid price of Class A Concrete

All reinforcing steel bars shall conform to A.S.T.M. Specification A-305-50T or latest revision thereof.

LOADING DATA.

DATE LOADED: APRIL 1968 H-15-44

DATE OF ANALYSIS: JULY 1968 BY: DR. S. K. AGNEW

ANALYSTS: J. L. BARNETT JR., R. C. GUNDEL, E. M. IN
CUNIERE, C. A. STOUT, AND W. D. BEAUCHAMON

DESIGNING DATA

GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JAN. 1, 1948.

ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINMENT AS SPECIFIED.

SPACINGS FOR CONCRETE REINFORCING BARS IN THE FINISHED WORK SHALL BE CONSTRUCTED OF HILPILAP OR TONGUE AND GROOVE LUMBER XKS UNLESS FACED WITH PANEL BOARD.

CONCRETE GIRDERS, FLOOR SLABS AND CURBS SHALL BE FORMED MONOLITHICALLY. FOOTINGS IN ROCK SHALL BE POURED OUT TO THE ROCK AND NOT FORMED.

ALL REINFORCING BARS SHALL BE INTERMEDIATE GRADE.

ALL REINFORCING BARS SHALL BE DEFORMED AND TAGGED WITH THE STATION NUMBER AND BAR DESIGNATION. MAIN BARS SHALL NOT BE SPLICED.

SCOUR PILES AND BRIDGE PILES SHALL BE SHOWN ON PLANS TO THE BEST AVAILABLE DATA. IF ESSENTIALLY DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.

ALL RIVETS TO BE 1/2" DIA. ALL RIVETS TO BE POWER DRIVEN.

All concrete surfaces exposed to view shall receive Class "1" surface finish.

COLORADO
STATE HIGHWAY DEPARTMENT

5' x 7' x 32' C.B.C.
DETAILS OF REPAIRS
TO NW WING

Across Sta. 122 + 80
Near Rio Blanco Svc 6 T 55 R 354
Designed by WWD Approved by J. L. Bailey
Made by L.W.F. Bridge Engineer J.
Checked by Date July 18, 1956

LIST OF STRUCTURES

Add Road Appr. (7/1/51) (10)

DISTRICT

PROJECT NO.

FILE

F 018-1(7)

5

LOCATION	DESCRIPTION	REMOVE STRUCTURE	EXCAVATION		STRUCTURAL EXCAVATION	STRUCTURE BACKFILL	METH. TAMPING	CORRUGATED METAL CULVERT PIPE	CONCRETE	REINFORCING STEEL	CORRUGATED METAL CULVERT PIPE					RIPRAE	MISCELLANEOUS			
			CUBIC YARDS								CUBIC YARDS		CUBIC YARDS	LINEAR FEET						
			NO.	SIZE							NO.	SIZE		18"	24"			30"	36"	84"
0+48	Extend 24"x67' C.M.P. 16 Lt. 2 Rt. Riprap at Outlet Inlet Ditch			10	4	6								17		23				
3+75 to 4+25	Remove unsuitable material		370											3						
4+00	Gross Culvert, Ditches & Riprap at Outlet			5	9	19								58		23				
6+86	Plug Gross Culvert																Plug Culvert			
7+27	Gross Culvert, Inlet Ditch & Riprap at Outlet			5	54	27								80		23				
10+80	Road Approach Rt.		205					20												
11+40	Gross Culvert, Inlet Ditch & Riprap at Outlet. Remove 18"x30' C.M.P. with Headwalls.	1		5	13	18								54		23				
12+00	Road Approach, Lt.		35					20												
14+53	Plug Gross Culvert																Plug Culvert			
14+90	Gross Culvert, Inlet Ditch & Riprap at Outlet			10	70	41								84		43				
15+97	Remove 18"x48' C.M.P.	1																		
17+	Move Power Pole Lt.																Move Power Pole (Not Fast Aid)			
17+06	Side Drains, Road Approaches, Lt. & Rt., Ditches.		40	5	6	8		40						28						
18+40	Side Drains & Road Approaches Lt. & Rt., Ditches. Remove 24"x20' C.M.P.	1	60	10	11	15		40						28						
22+50	Road Approach, Rt.		65					20												
25+77	Extend 36"x55' C.M.P. 14 Lt. & Riprap at Outlet. Remove Headwall, Lt.	1			4	7								15		43				
41+00	Extend 36"x66' C.M.P. 8 Lt. & Riprap at Outlet. Inlet Ditch. Remove Headwall Lt.	1		5	3	4								9		43				
46+60	Remove Headwall Lt. & Plug Gross Culvert	1															Plug Culvert			
47+00	Gross Culvert, Inlet Ditch & Riprap at Outlet			5	42	21								72		23				
52+00	Gross Culvert, Inlet Ditch & Riprap at Outlet			5	24	26								62		23				
55+35	Gross Culvert, Riprap at Outlet. Remove 18"x40' C.M.P. with Headwall.	1			23	19								58		23				
55+90 to 56+70	Channel Change & Heavy Riprap Rt. (N=11)		500		15												250 yds Heavy Riprap			
60+41	Extend 24"x54' C.M.P. 12 Lt. 20 Rt. Inlet Ditch & Riprap at Outlet. Remove Headwall, Lt.	1		5	5	11								13		23				
66+00	Side Drain & Road Approach Rt.		30		2	8		20						21						
69+00	Gross Culvert, Riprap at Outlet				18	18								28		23				
75+00	Road Approach Rt.		25					20												
82+30	Gross Culvert, Inlet Ditch & Riprap at Outlet			5	56	23								70		23				
82+40	Remove 24"x62' C.M.P. with Headwall	1																		
88+00	Gross Culvert, Inlet Ditch & Riprap at Outlet. Remove 18"x36' C.M.P. with Headwall.	1		5	20	16								50		23				
93+15	Remove & Rebuild Pole Corral & Loading Chute Rt.																Remove & Rebuild Pole Corral & Loading Chute			
97+00	Road Approach, Rt.		125					20												
99+00	Road Approaches, Lt. & Rt.		60					40												
102+90 to 103+60	Channel Improvement & Heavy Riprap, Rt. (W=11)		430		15												25 Cuyds Heavy Riprap			
103+00	Gross Culvert, Riprap at Outlet. Remove 18"x50' C.M.P. with Headwall.	1			68	20								62		23				
109+00	Gross Culvert, Ditches & Riprap at Outlet			10	22	18								52		23				
115+00	Gross Culvert, Ditches & Riprap at Outlet			5	19	17								52		23				
122+80	Remove portions of present structure and rebuild wing wall (Details on Sheet No. 4)				10	15			5	285						10.0	Removal of portions of present structure.			
131+82	Extend 30"x36' Gross Culvert 16 Lt. 6 Rt., Ditches. Riprap at Outlet. Remove Headwall, Lt.	1		5	5	9								17		3.3				
143+00	Gross Culvert, Inlet Ditch & Riprap at Outlet			5	19	17								52		23				
151+00	Extend 36"x50' Gross Culvert, 16 Rt.; Outlet Ditch & Riprap at Outlet			5	14	8									17	43				

LIST OF STRUCTURES

SECTION	DISTRICT	PROJECT NO.	NO.
		F 018-1(7)	6

LOCATION	DESCRIPTION	REMOVE	EXCAVATION			STRUCTURAL	STRUCTURE	MESH	GRAVEL OR		CONCRETE	REINFORCING	CORRUGATED METAL CULVERT PIPE					RIPRAP	MINI ELANERUS
		STRUCTURE	CUBIC YARDS			CUBIC YARDS	BACKFILL				CUBIC YARDS	STEEL	LINEAR FEET					CUBIC YARDS	
		NO.	KIND	TIME	CL. I	CL. I	CL. I				CL. I	18"	24"	30"	36"	84"			
156+50	Extend 36' x 46' Cross Culvert 18 Lt, 22 Rt Ditches Riprap at Outlet. Remove Headwall, Lt.	1			5	10	19								9		43		
164+65	Cross Culvert, Inlet Ditch & Riprap at Outlet				5	87	35								72		43		
164+70	Remove 24' x 66' C.M.P. with Headwall.	1																	
168+80	Cross Culvert, Inlet Ditch & Riprap at Outlet				5	148	44								92		43		
168+86	Remove 24' x 82' C.M.P. with Headwall.	1																	
177+06	Cross Culvert, Riprap at Outlet. Remove 24' x 18' C.M.P.	1				43	24								72		23		
181+74	Cross Culvert, Inlet Ditch, Riprap at Outlet.																		
	Remove 18' x 42' C.M.P. with Headwall.	1			5	30	21								54		23		
184+50	Cross Culvert, Riprap at Outlet. Remove 24' x 50' C.M.P.																		
	with Headwall.	1				59	26								78		23		
186+25	Cross Culvert, Riprap at Outlet. Remove 24' x 44' C.M.P.																		
	with Headwall.	1				30	18								56		23		
189+50	Side Drain & Road Approach Lt.			50		4	9		20						36				
193+50	Side Drain & Road Approach Lt. Ditches.			25	5	6	8		20						30				
195+00	Side Drain & Road Approach Rt.			35		4	8		20						30				
195+20	Cross Culvert, Ditches & Riprap at Outlet				5	20	22								66		23		
201+94	Cross Culvert, Inlet Ditch & Riprap at Outlet.				5	25	18								56		23		
	Remove 24' x 38' C.M.P. with Headwall.	1																	
207+65	Cross Culvert & Riprap at Outlet. Remove 24' x 40'					32	18								54		23		
	C.M.P. with Headwall.	1																	
212+55	Cross Culvert, Inlet Ditch & Riprap at Outlet.				5	16	18								56		23		
	Remove 18' x 30' C.M.P. with Headwalls.	1																	
214+40	Road Approach Rt.			45					20										
216+00	Side Drain, Ditches & Road Approach Lt.			25	5	8	8		20						30				
219+00	Road Approach Rt.			55					20										
221+70	Cross Culvert, Ditches & Riprap at Outlet.				5	15	18								54		23		
	Remove 18' x 30' C.M.P. with Headwalls.																		
228+00	Cross Culvert, Inlet Ditch & Riprap at Outlet.				5	20	19								58		23		
232+78	Cross Culvert, Inlet Ditch & Riprap at Outlet.																		
	Remove 18' x 36' C.M.P. with Headwall.	1			5	21	18								54		23		
240+67	Ditches & Riprap at Outlet.				5												33		
247+90	Cross Culvert, Inlet Ditch & Riprap at Outlet.				5	46	30									62	43		
	Remove 18' x 48' C.M.P.	1																	
251+00	Cross Culvert, Outlet Ditch & Riprap at Outlet.				5	60	32								66		43		
251+30	Remove Headwall & Plug Culvert.	1																	
255+80	Cross Culvert, Riprap at Outlet. Remove 36' x 44'					40	28								58		43	Plug Culvert	
	C.M.P. with Headwall.	1																	
260+70	Extend 24' x 54' Cross Culvert 10 Rt. Riprap at Outlet.					1	3								91		23	Plug Culvert	
265+55	Remove Headwall & Plug Culvert.	1																	
267+94	Cross Culvert, Inlet Ditch, Riprap at Outlet.				5	16	18								54		23		
	Remove 18' x 40' C.M.P. with Headwall.	1																	
276+64	Cross Culvert, Riprap at Outlet. Remove 18' x 38'					22	20								60		23		
	C.M.P. with Headwall.	1																	
283+00	Cross Culvert, Inlet Ditch & Riprap at Outlet.				5	13	16								48		23		
	Remove 18' x 30' C.M.P. with Headwalls.	1																	
289+00	Cross Culvert, Ditches & Riprap at Outlet.				10	17	21		20						64		23		
292+15	Road Approach, Lt.			35					20										
293+00	Road Approach, Rt.			35					20										
296+11	Cross Culvert, Std Headwall at Inlet & Inlet Ditch.																		
	Remove 24' x 46' C.M.P. with Headwall. (W-11)	1	70			177	82		20	695	535				66				
299+80	Side Drain, Ditches & Road Approach Lt.			30	5	10	7								28				

LIST OF STRUCTURES

REV 18. MAY 9-12-51 155

PROJECT NO.	FOIR-1(7)	7
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STATION	DESCRIPTION	REMOVE STRUCTURE	EXCAVATION			STRUCTURE BACKFILL	MECH. TAMPING	GRAVEL OR CRUSHED ROCK SUBGRADE		CONCRETE	REINFORCING STEEL	CORRUGATED METAL CULVERT PIPE					RIPRAP	MISCELLANEOUS
			CUBIC YARDS									CUBIC YARDS	CUBIC YARDS	LBS.	LBS.	LINEAR FEET		
			18"	24"	30"	36"	48"	60"	72"	84"								
											18"					24"	30"	
305+40	Side Drain, Ditches & Road Approach Lt		25	5	9	7		20					28					
308+50	Gross Culvert, Inlet Ditch & Riprap at Outlet; Remove 18' x 40' C.M.P. with Headwall.	1		5	20	19							58			23		
317+34	Extend 24' x 46' Gross Culvert, 16 Lt., 6 Rt., Inlet Ditch & Riprap at Outlet. Remove Conc. Headwall Lt.	1		5	6	7							47					
325+39	Extend 24' x 46' Gross Culvert, 10 Lt., 10 Rt., Inlet Ditch & Riprap at Outlet. Remove Headwall Lt.	1		5	3	7							7			23		
		1											11			23		
327+26	Remove 24' x 38' C.M.P. with Headwall.	1																
327+36	Gross Culvert, Inlet Ditch, Riprap at Outlet			5	22	27								56		43		
337+42	Gross Culvert & Riprap at Outlet. Remove 24' x 40' C.M.P. with Headwall.	1			22	19							58			23		
339+54	Gross Culvert, Inlet Ditch & Riprap at Outlet Remove 18' x 36' C.M.P. with Headwall.	1		5	16	18							54			23		
340+19	Approach to Project							70										
Entire Project	Mechanical Tamping						110											
Entire Project	Removing & Resetting Nail Boxes																Removing & Resetting Nail Boxes	
TOTALS			38	1370	1005	240	1629	1100	110	510	11.95	820	322	84	24	573	66	146.7

- Structural Excavation is estimated to be 85% Common and 15% Rock each of which is estimated to be 80% Dry and 20% Wet
- ♦ Included in Roadway Quantities.
- * Includes One Foot allowance for Connecting Bands.
- * Asbestos Banded (Bituminous Coated)

REVISIONS
Rev 12-13-47 J.P.K.
Rev 7-1-49 J.E.E.
Rev 9-14-50 J.E.R.

STANDARD M-10-B.

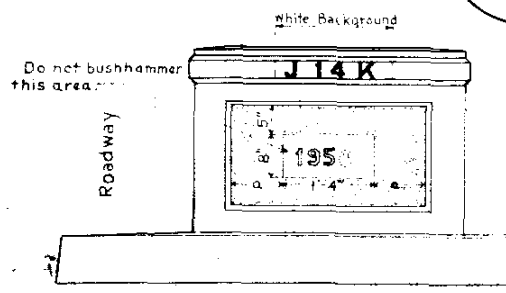
FED. ROAD DIST. NO.	STATE	SHEET NO.	TOTAL SHEETS
3	COLO.	5018-107A	



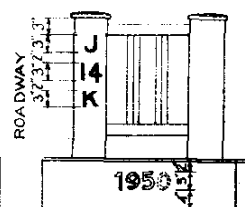
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SAMPLE BRIDGE NUMBER

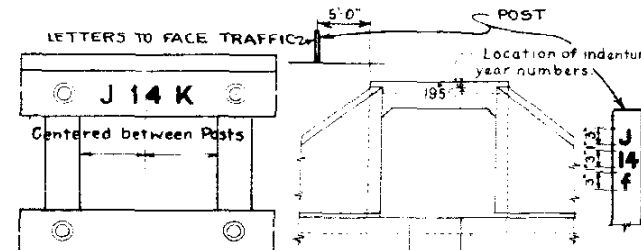
SAMPLE YEAR NUMBER



TYPICAL FOR CONCRETE ENDPOST



TYPICAL FOR STEEL HANDRAIL END POST



TYPICAL FOR TIMBER WING HANDRAIL

TYPICAL FOR LARGE BOX GULVERTS

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JANUARY 1ST 1948.

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

THE SIZE, SHAPE AND SPACING OF THE LETTERS AND FIGURES SHALL BE IN ACCORDANCE WITH THE FULL SIZE SHOWN ON THIS SHEET.

ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

THE YEAR NUMBERS ARE RECESSED IN CONCRETE 3/8" MINIMUM AS SHOWN INTO THE PANEL OF THE ENDPOST ON THE RIGHT HAND SIDE OF EACH BRIDGE END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF GULVERTS AS SHOWN ON PLAN DETAILS.

NUMBERS TO BE MADE OF WOOD, METAL OR OTHER SUITABLE MATERIAL AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED.

THE YEAR NUMBER OF EACH STRUCTURE SHALL CORRESPOND WITH THE YEAR IN WHICH THE CONCRETE IS POURED.

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

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

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

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

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

MINOR STRUCTURES WITH CLEAR SPANS 12 TO 20 FEET INCLUSIVE SHALL BE STENCILED WITH STRUCTURE NUMBER THUS: W-18-S ON 3 STEEL MARKER POSTS WHERE PROVIDED AND AS SHOWN ON STATE HIGHWAY STD M-23A

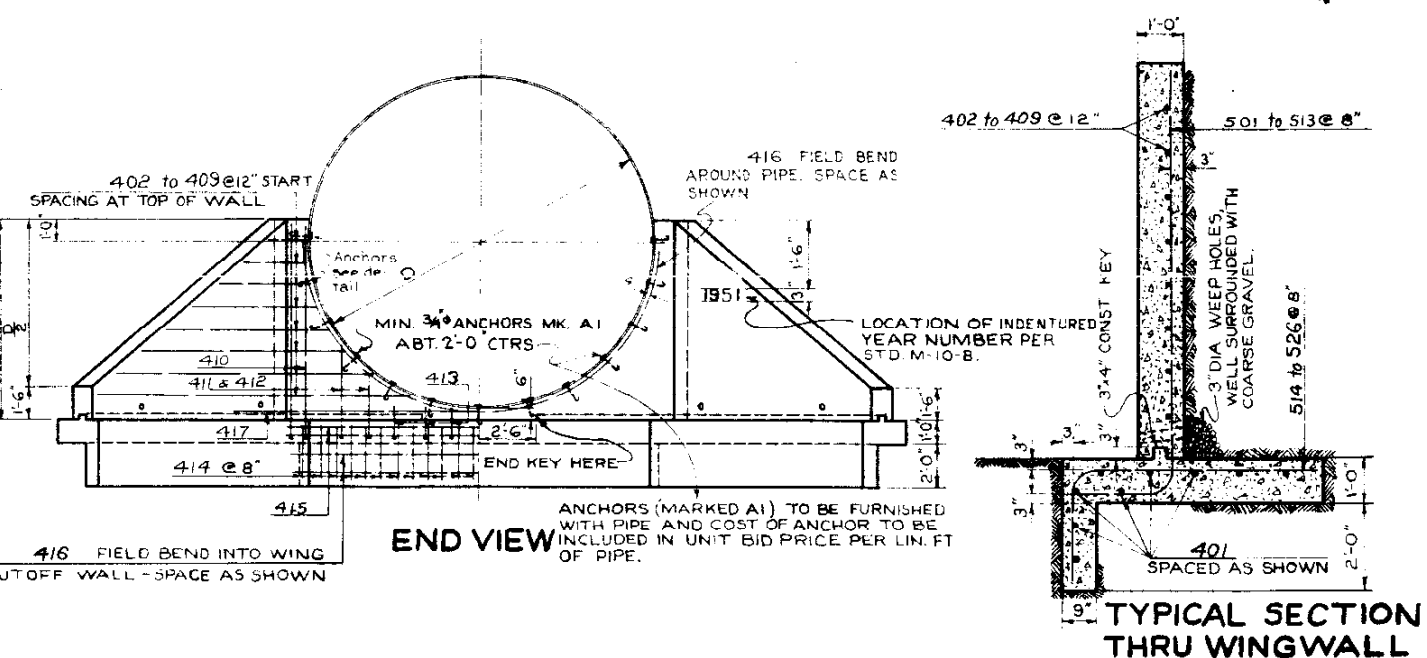
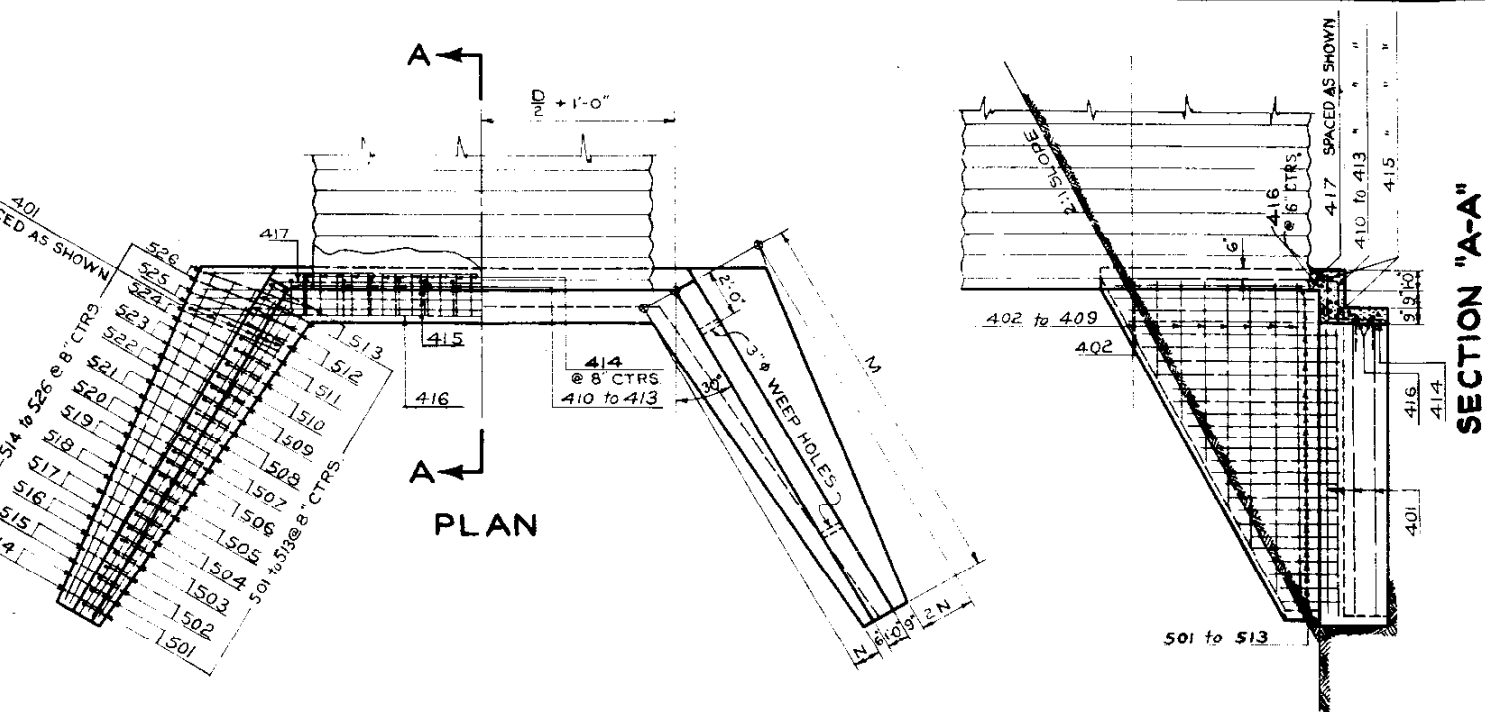
COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
LETTERS AND FIGURES
FOR
YEAR NUMBERS AND
STRUCTURE NUMBERS

Designed by G.H.D. Approved by W.P.M.
Made by W.P.M. Bridge Engineer
Checked by Date: June 1, 1948

STRUCTURE NO.

STANDARD M-10-B

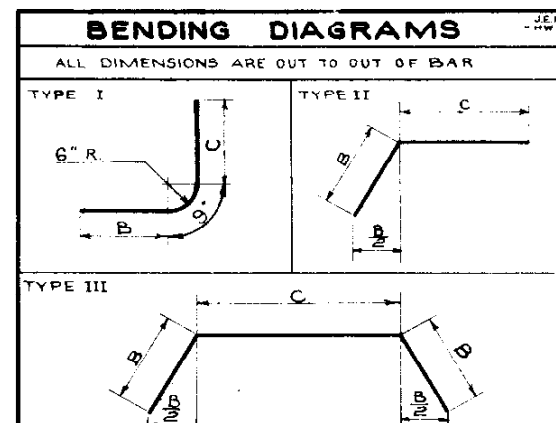
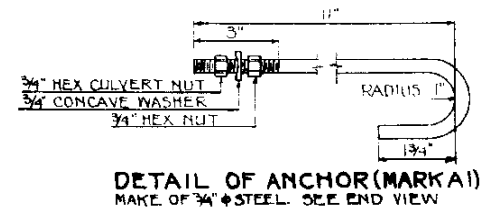
STANDARD M-115-CX

STATE
COLO.SHEET NO.
5018-1(6) 34TOTAL
SHEETS

NOTE:
WHEN CULVERT IS SKEWED, 15 DEGREES OR MORE,
HEADWALLS SHALL BE PLACED
PARALLEL TO $\frac{1}{2}$ OF ROADWAY
416 TO BE LENGTHENED
WHEN NECESSARY TO FIT SKEWED
CULVERTS.

MAKE THIS ANGLE TO SUIT FIELD
CONDITIONS ON SKEWED CULVERTS.

PART PLAN FOR SKEWED
HEADWALL



DIAMETER OF PIPE - D -	LENGTH OF WINGWALL - M -	NUMBER OF 414 FOR TWO HOWLS	DIMENSION - N -	QUANTITIES FOR TWO HEADWALLS	
				CONCRETE CU. YD.	STEEL LB.
60"	5'-9 1/2"	16	4"	9.4	730
66"	6'-4 1/2"	16	4 1/2"	7.5	540
72"	6'-11"	18	5"	11.5	875
75"	7'-2 1/2"	20	5 1/2"	12.1	945
78"	7'-6"	20	6"	12.7	960
84"	8'-1"	24	6 1/2"	13.9	1070
90"	8'-8"	24	7"	15.0	1155
96"	9'-3"	24	7 1/2"	16.3	1235
102"	9'-10"	26	8"	17.6	1325
108"	10'-5"	28	8 1/2"	18.9	1390
114"	11'-0"	30	9"	20.3	1480
120"	11'-6 1/2"	32	9 1/2"	21.6	1570
126"	12'-1"	32	10"	23.0	1660
132"	12'-8"	34	10 1/2"	24.4	1800
135"	13'-0"	36	10 1/2"	25.1	1820
138"	13'-3"	36	11"	26.0	1900
144"	13'-10"	38	11 1/2"	27.5	2000
150"	14'-5"	40	1'-0"	29.0	2030
156"	15'-0"	40	1'-0 1/2"	30.7	2180
162"	15'-7"	42	1'-1"	32.3	2290
168"	16'-2"	44	1'-1 1/2"	33.9	2390
174"	16'-9"	46	1'-2"	35.7	2500
180"	17'-4"	48	1'-2"	37.2	2680

*INCLUDES 1% ± OVERRUN

USE BARS FOR	MARK	SIZE	NO. REQ'D.	DIMENSIONS	TOTAL LENGTH	TYPE
ALL SIZES	501	8	8	0'-7"	3'-2"	I
"	502	8	8	0'-8"	3'-10"	I
"	503	8	8	0'-9 1/2"	4'-6"	I
"	504	8	8	0'-10 1/2"	5'-2"	I
D=60"	505	4	4	0'-11 1/2"	5'-10"	I
D=66" AND OVER	506	4	4	1'-0"	6'-6"	I
D=75", D=78"	507	4	4	1'-1 1/2"	7'-2"	I
D=84" AND OVER	508	4	4	1'-2 1/2"	7'-10"	I
D=90"	509	4	4	1'-3 3/4"	8'-6"	I
D=96" AND OVER	510	4	4	1'-4 1/4"	9'-2"	I
D=102", D=108"	511	4	4	1'-5 1/4"	9'-10"	I
D=114" AND OVER	512	4	4	1'-7"	10'-6"	I
D=120"	513	4	4	1'-8"	11'-2"	I
D=126" AND OVER	514	4	4	1'-9"	11'-10"	I
D=132", D=135"	515	4	4	1'-10"	12'-6"	I
D=138" AND OVER	516	4	4	1'-11"	13'-2"	I
D=144", D=150"	517	4	4	1'-12"	14'-8"	I
D=156" AND OVER	518	4	4	2'-0"	16'-4"	I
D=162"	519	4	4	2'-1"	17'-0"	I
D=168" AND OVER	520	4	4	2'-2"	18'-6"	I
D=174"	521	4	4	2'-3"	19'-2"	I
D=180"	522	4	4	2'-4"	20'-8"	I
ALL SIZES	523	8	8	0'-7"	3'-2"	I
"	524	8	8	0'-8"	3'-10"	I
"	525	8	8	0'-9 1/2"	4'-6"	I
"	526	8	8	0'-10 1/2"	5'-2"	I
D=60"	527	4	4	0'-11 1/2"	5'-10"	I
D=66" AND OVER	528	4	4	1'-0"	6'-6"	I
D=75", D=78"	529	4	4	1'-1 1/2"	7'-2"	I
D=84" AND OVER	530	4	4	1'-2 1/2"	7'-10"	I
D=90"	531	4	4	1'-3 3/4"	8'-6"	I
D=96" AND OVER	532	4	4	1'-4 1/4"	9'-2"	I
D=102", D=108"	533	4	4	1'-5 1/4"	9'-10"	I
D=114" AND OVER	534	4	4	1'-7"	10'-6"	I
D=120"	535	4	4	1'-8"	11'-2"	I
D=126" AND OVER	536	4	4	1'-9"	11'-10"	I
D=132", D=135"	537	4	4	1'-10"	12'-6"	I
D=138" AND OVER	538	4	4	1'-11"	13'-2"	I
D=144", D=150"	539	4	4	1'-12"	14'-8"	I
D=156" AND OVER	540	4	4	2'-0"	16'-4"	I
D=162"	541	4	4	2'-1"	17'-0"	I
D=168" AND OVER	542	4	4	2'-2"	18'-6"	I
D=174"	543	4	4	2'-3"	19'-2"	I
D=180"	544	4	4	2'-4"	20'-8"	I
ALL SIZES	401	36	36	STRAIGHT	M (1'-0")	STR.
"	402	4	4	2'-0"	3'-3"	II
"	403	4	4	2'-1"	3'-9"	II
"	404	4	4	2'-2"	4'-3"	II
"	405	4	4	2'-3"	4'-9"	II
D=84" AND OVER	406	4	4	2'-4"	5'-3"	II
D=108" AND OVER	407	4	4	2'-5"	5'-9"	II
D=132" AND OVER	408	4	4	2'-6"	6'-3"	II
D=156" AND OVER	409	4	4	2'-7"	6'-9"	II
D=180"	410	4	4	2'-8"	7'-3"	II
ALL SIZES	411	8	8	0.25 D	1'-3 1/2"	I
"	412	4	4	0.15 D	1'-3 1/2"	I
"	413	12	12	0'-6 1/2"	2'-7"	I
"	414	4	4	1'-6 1/2"	4'-4"	I
"	415	12	12	STRAIGHT	D+(4'-3")-4N	STR.
"	416	8	8	FIELD BEND	D+(4'-0")	STR.
"	417	2	2	D+2'-10"	D+(6'-10")	III

*SEE TABLE OF DIMENSIONS AND QUANTITIES

GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT, ADOPTED JAN. 1, 1948.
ALL CONCRETE SHALL BE CLASS "A", AND AIR ENTRAINMENT AS SPECIFIED.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.
SECONDARY BARS WHEN SPLICED SHALL BE GIVEN A LAP OF 35 DIAMETERS.

ALL WALLS SHALL HAVE FORMS ON BOTH SIDES.
ALL REINFORCING BARS SHALL BE TAGGED WITH THE STATION NUMBER AND BAR DESIGNATION.

END STRUTTING FOR PIPES SHALL BE GRADUATED FROM FULL ROUND AT THE HEADWALL TO FULL ELONGATION AT (20) TWENTY FT. DISTANCE FROM EACH END.
COST OF ANCHORS TO BE INCLUDED IN UNIT BID PRICE PER LIN. FT. OF PIPE.

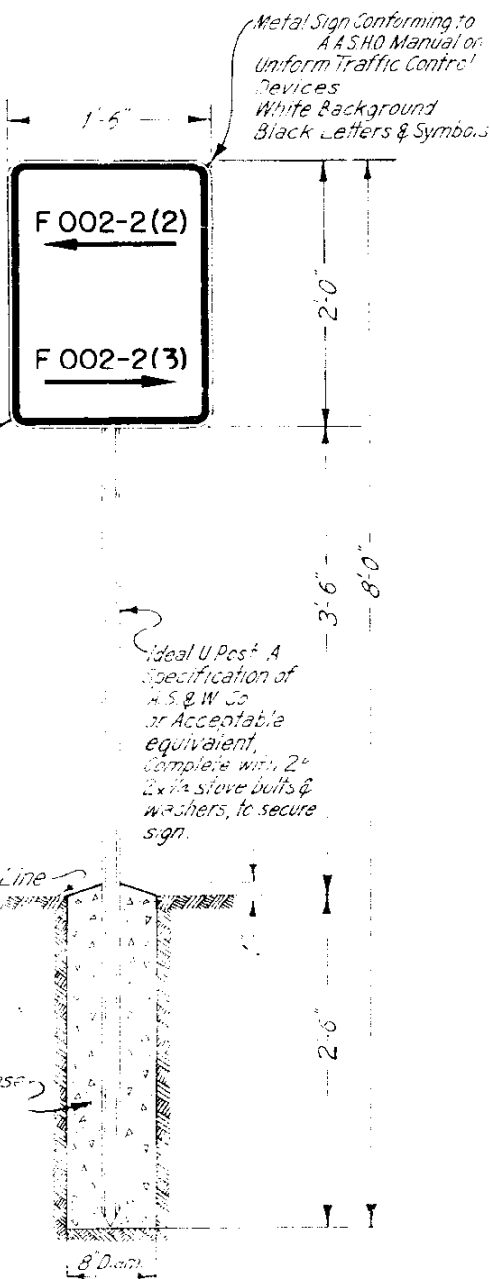
ALL DIMENSIONS NOT SHOWN AS CLEAR ARE TO THE $\frac{1}{2}$ OF THE BAR.
ALL SURFACES EXPOSED TO VIEW ON THE HEAD WALLS SHALL RECEIVE CLASS 1 SURFACE FINISH.
HORIZONTAL CONSTRUCTION JOINTS NOT REQUIRED WHEN FOOTING AND WALLS ARE POURED MONOLITHICALLY.
ALL ANCHORS, BOLTS, NUTS AND WASHERS TO BE HOT DIP GALVANIZED.

60"	90"	126"	156"
66"	96"	132"	162"
72"	102"	135"	168"
75"	108"	138"	174"
78"	114"	144"	180"
84"	120"	150"	

Designed by T.G. PC
Made by PC
Checked by H.W.P. Date: 1/1/50

Approved by *Art Bailey*
Bridge Engineer

PROJECT MARKER POST ITEM N° 818



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 1945.

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

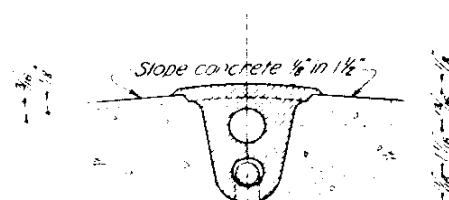
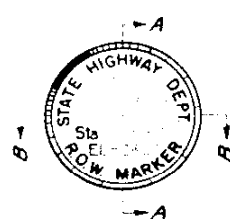
All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted January 1st 1945.

Posts shall be made of Class "A" concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.

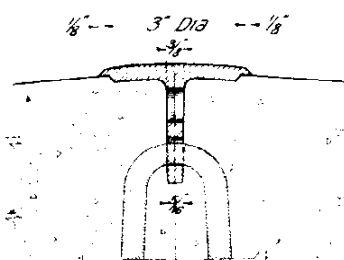
All exposed surfaces of the bronze tablet are to be ground to a smooth surface.

All letters are to be depressed a minimum of $\frac{1}{16}$ inch. Information on the bronze tablet indicated by pin lines is to be stamped in the field by the engineering party after post is placed. $\frac{3}{16}$ inch letters and figures to be used.

Project designations on tablets shall be properly shown. I.E., F.I. for Fed Aid Interstate, F. for Fed Aid Primary, S. for Fed Aid Secondary etc. & S.P. No. for State Projects. See detail below.



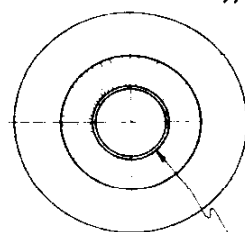
SECTION B-B



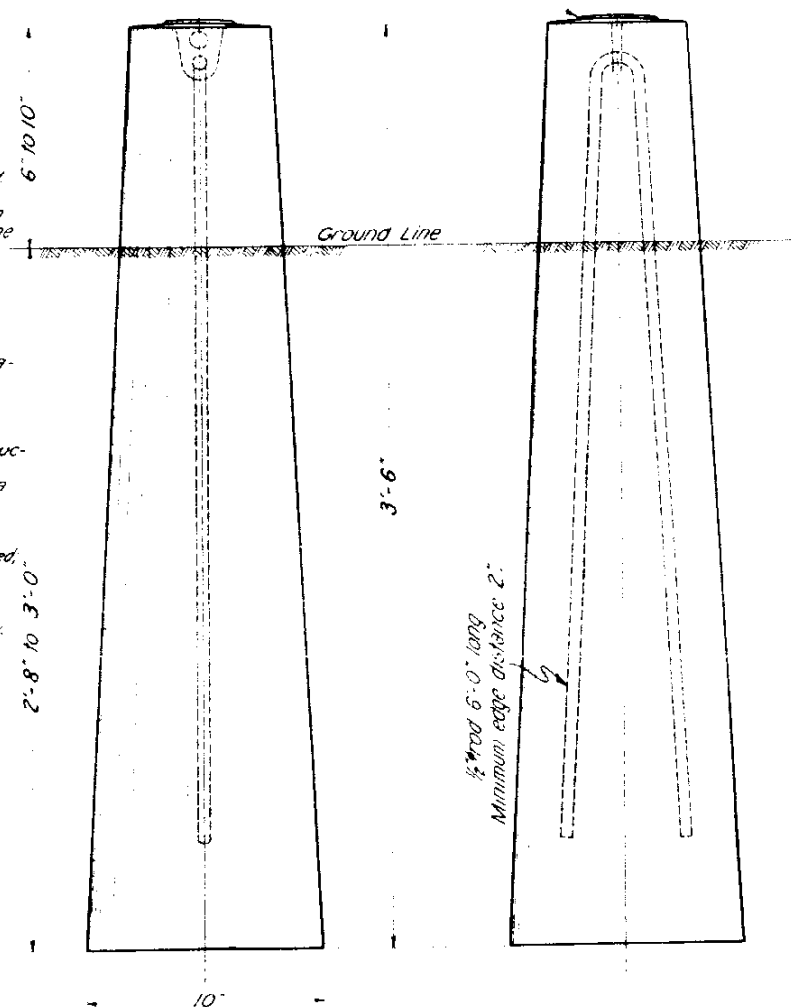
SECTION A-A

DETAIL OF BRONZE TABLET
FOR RIGHT OF WAY MARKER POST

RIGHT OF WAY MARKER POST ITEM N° 819



BRONZE TABLET



STANDARD M-7-B

Rev. 5-19-40, A.C. 377 SPEC.
Rev. 1-2-46, G.S.D. Item 819
Rev. 6-1-46, W.C.M. Bronze Tablet
Rev. Mar 21-47, H.M.M. Project Marker Post
Rev. Dec. 21-47, P.K. Metal Project Marker
Rev. Dec. 1-48, P.K. Metal Project Marker
Rev. July 5-1950, U.C.R. Rev. Note Re Metal Sign for Project Marker, & ROW Marker Markings

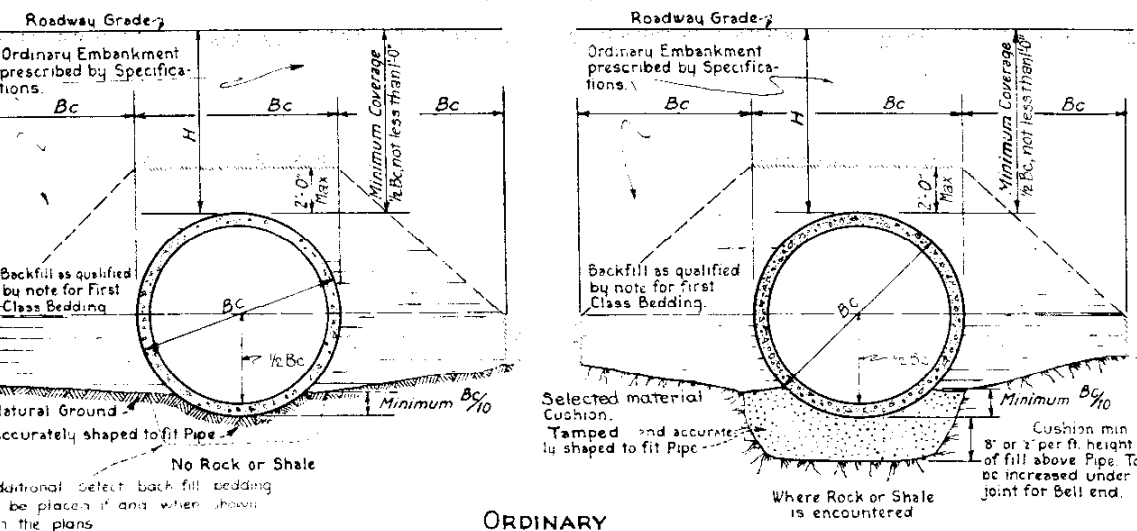
STATE **COLO**
COUNTY **Folsom**
DIST. NO. **8**

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
MARKER POSTS

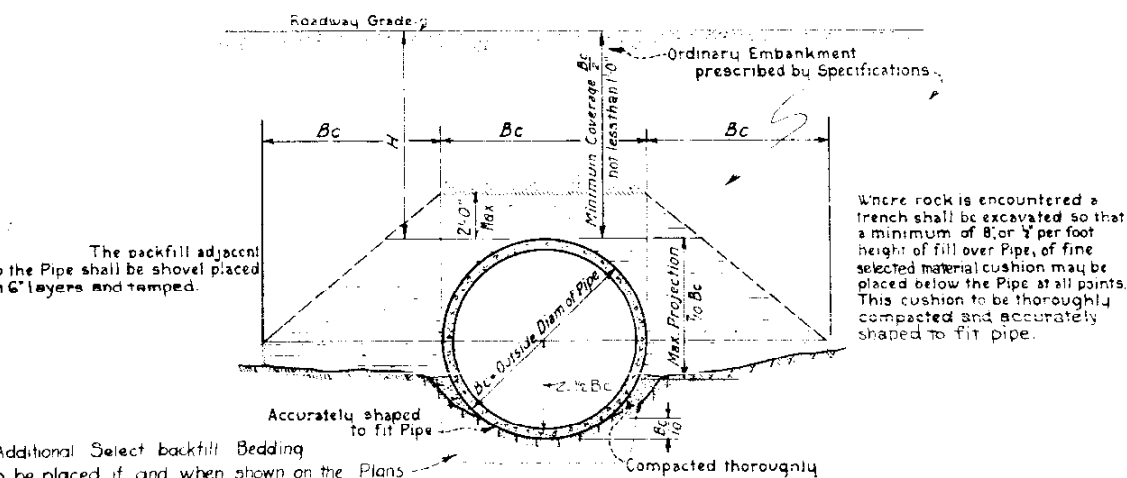
Designed by A.F.F.
Made by F.F.S.
Checked by R.E.L.
Approved by *[Signature]*
Date January 1948

TYPES OF BEDDING

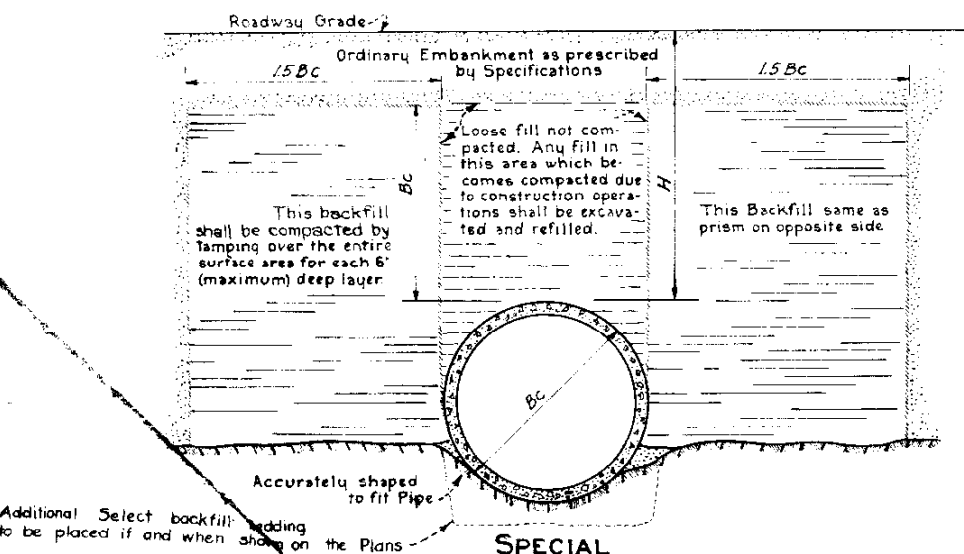
NOTE: Backfill layers for all Types of Bedding must be placed simultaneously on each side of the pipe to maintain equal lateral pressures



ORDINARY



FIRST CLASS

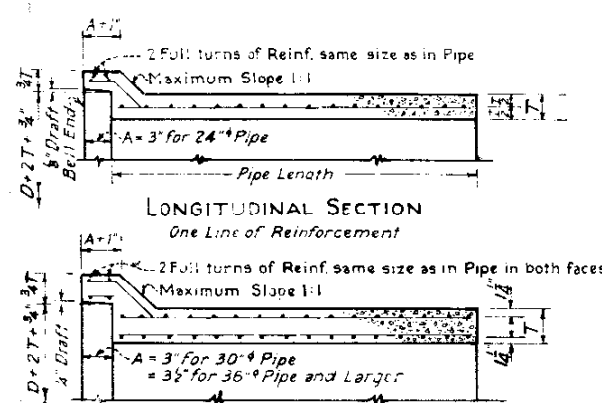
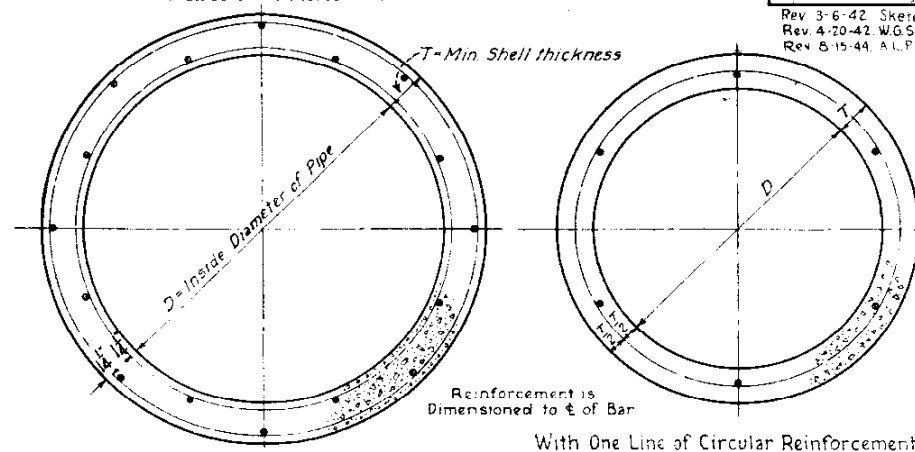


SPECIAL

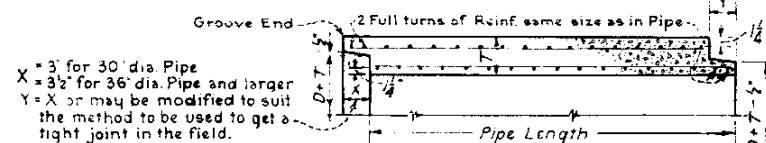
A construction which consists of Ordinary Bedding or First Class Bedding combined with Special Backfilling, as noted above, to be used when height "H" exceeds limits noted in Table for Ordinary or First Class Bedding.

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

PIPE CROSS SECTIONS



LONGITUDINAL SECTION
TWO LINES OF REINFORCEMENT
BELL AND SPIGOT TYPE OF JOINT



GENERAL NOTES

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

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

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

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

All Culverts shall have concrete headwalls if and as shown on the plans in accordance with the Department's Stand. Dwg. M-102

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

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

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

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

UNREINFORCED CONCRETE PIPE

Unreinforced Concrete Pipe will be accepted in the following sizes: 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 78", 84". Unreinforced Concrete Pipe shall meet the same specifications and may be of the same minimum thickness as shown for Reinforced Concrete Pipe. It will be noted however, that Unreinforced Concrete Pipe is required to meet the same Three-edged Bearing Tests as specified for Reinforced Concrete Pipe. Thickness of pipe may be increased as required in order to satisfy the Three-edged Bearing Tests.

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

Special bedding as specified not included in structural exc.

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

STRUCTURE NO.

STANDARD M-112-D

Rev. 2-2-42 Add'n notes H.C.C.
Rev. 3-6-42 Sketch for calc. str. exc. in cut. E.R.B.
Rev. 4-20-42 W.G.S. Unreinforced Concrete Pipe notes.
Rev. 5-15-44 A.L.C. Replaced Mechanical Tamping with Selected Mat'l.
Revision: To conform to A.S.T.M. spec. C-78-41 by A.L.C. 12-30-41.
Rev. To include 12", 15" & 18" Dia. Pipe H.C.C. 1-20-42.

STATE **COLO** SHEET NO. **4** TOTAL SHEETS

STANDARD STRENGTH REINFORCED CONCRETE CULVERT PIPE

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

Max. Fill Heights above Top of Pipe for Standard Pipe	D Inches	T Inches	Circular Reinforcement Sq. Ins. per Lin. Ft. of Pipe	Longitudinal Reinforcement Total Area Req'd.
(Fill height not limited for 12", 15" & 18" dia. pipes)	12	2	1 Line	0.07
	15	2 1/4	1 Line	0.09
	18	2 1/2	1 Line	0.12
Type of Bedding Ordinary H=16 feet First Class H=15 feet	24	3	1 Line	0.17
	30	3 1/2	1 Line each	0.22
	36	4	2 Lines	0.18
	42	4 1/2	2 " "	0.21
	48	5	2 " "	0.25
	54	5 1/2	2 " "	0.30
	60	6	2 " "	0.33
	66	6 1/2	2 " "	0.37
	72	7	2 " "	0.40
	78	7 1/2	2 " "	0.43
84	8	2 " "	0.46	

EXTRA STRENGTH REINFORCED CONCRETE CULVERT PIPE

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

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

COLORADO
STATE HIGHWAY DEPARTMENT
UNREINFORCED CONCRETE PIPE
SIZES: 12", 15", 18"
REINFORCED CONCRETE PIPE
STANDARD & EXTRA STRENGTH
SIZES: 12", 15", 18", 24", 30", 36", 42", 48", 54", 60", 66", 72", 78", 84"
Designed by **W.G.S.** Approved by **P.D. Bailey**
Checked by **A.L.C.** Date: **June 1, 1940**

STANDARD TIMBER GUARD POSTS

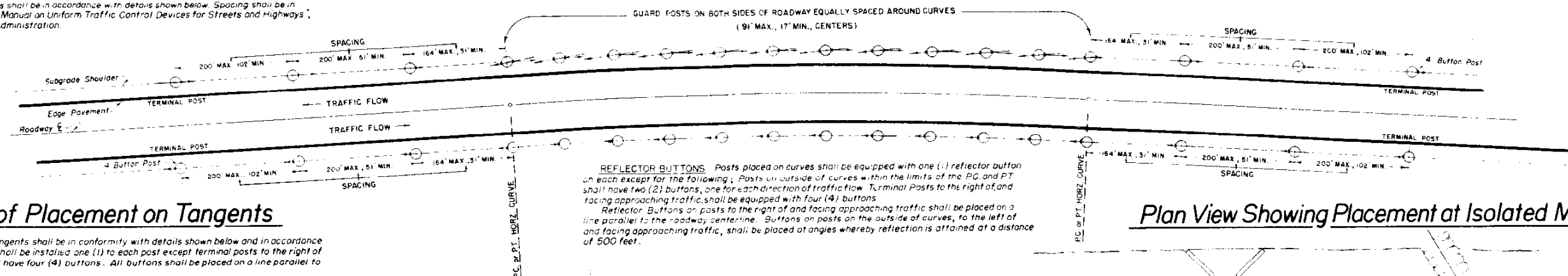
STANDARD M-19-C

SPECIFICATIONS

DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.
9	10	2618-16	10

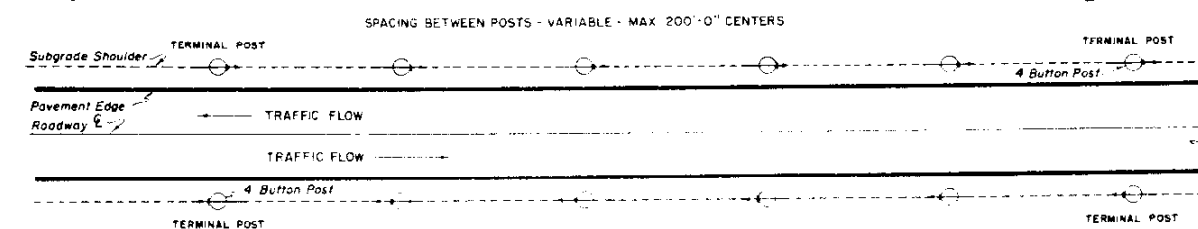
Typical Installation on Curves

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



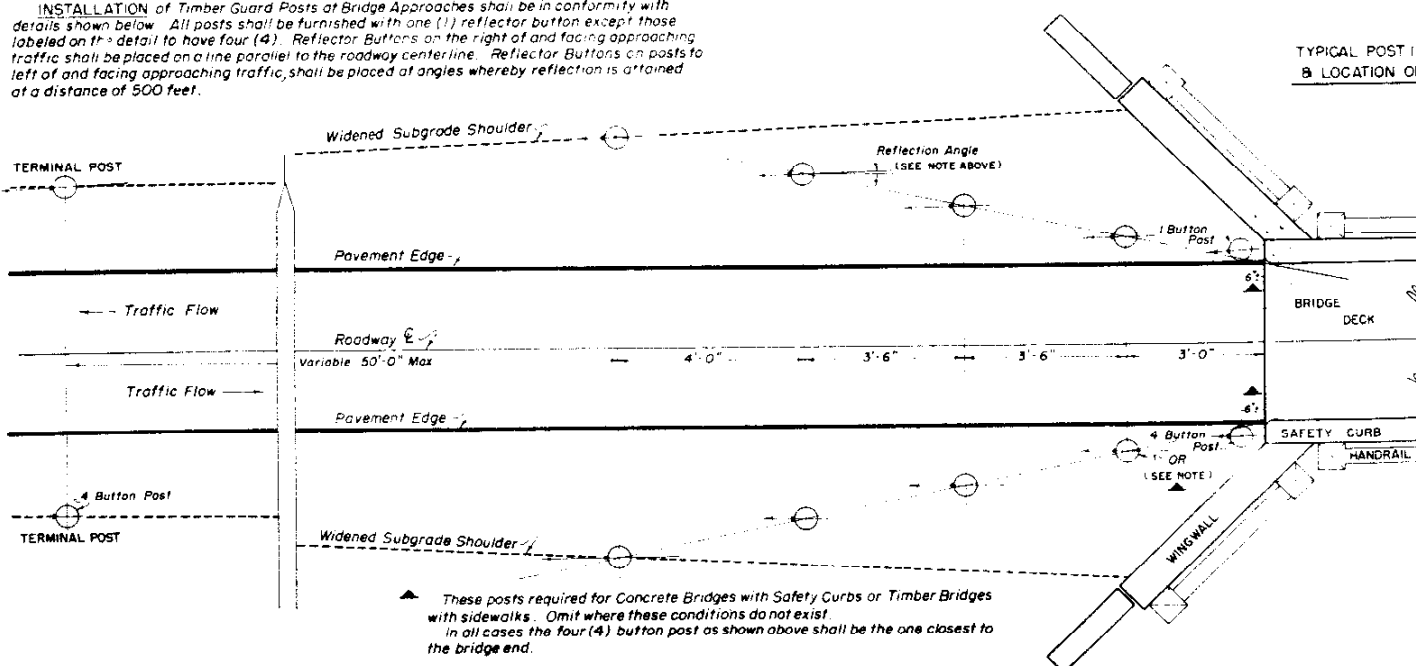
Method of Placement on Tangents

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

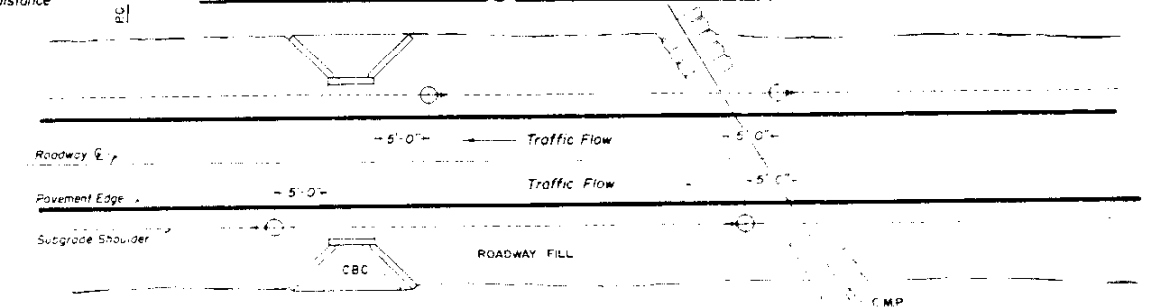


Typical Installation at Bridge Approaches

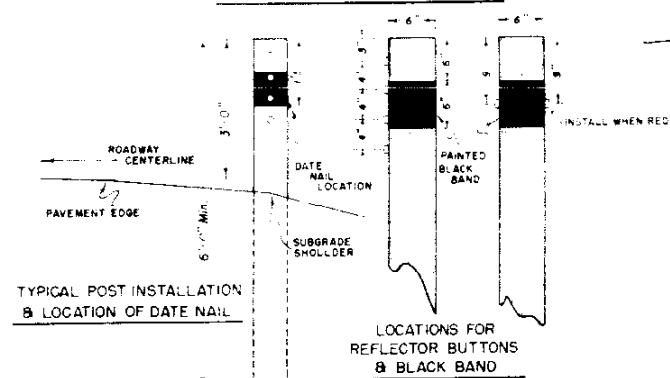
INSTALLATION of Timber Guard Posts at Bridge Approaches shall be in conformity with details shown below. All posts shall be furnished with one (1) reflector button except those labeled on the detail to have four (4). Reflector Buttons on the right of and facing approaching traffic shall be placed on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



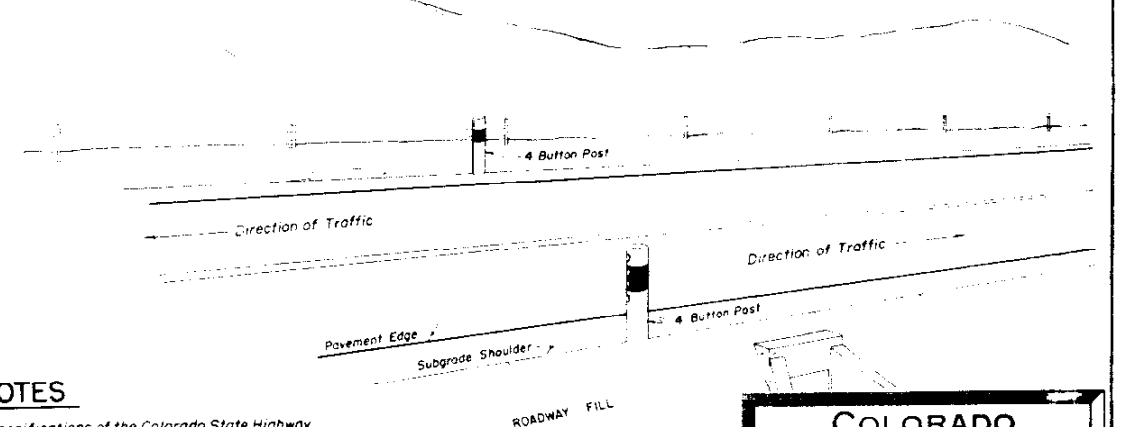
Plan View Showing Placement at Isolated Minor Structures



DETAILS OF POSTS



Pictorial View Showing Location at Isolated Minor Structures



GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.
All posts shall be set and tamped in, plumb and firm, to the line and grades established by the Engineer.
In all instances a test shall be made to assure the maximum effect from reflective units.
The number, location and spacing of guard posts will be shown on plans.

COLORADO STATE HIGHWAY DEPARTMENT	
STANDARD TIMBER GUARD POSTS	
Designed by C.G.M. Made by C.G.M. Checked by	Approved by A. Julian Engineer, Survey & Plans Date: March 2, 1951

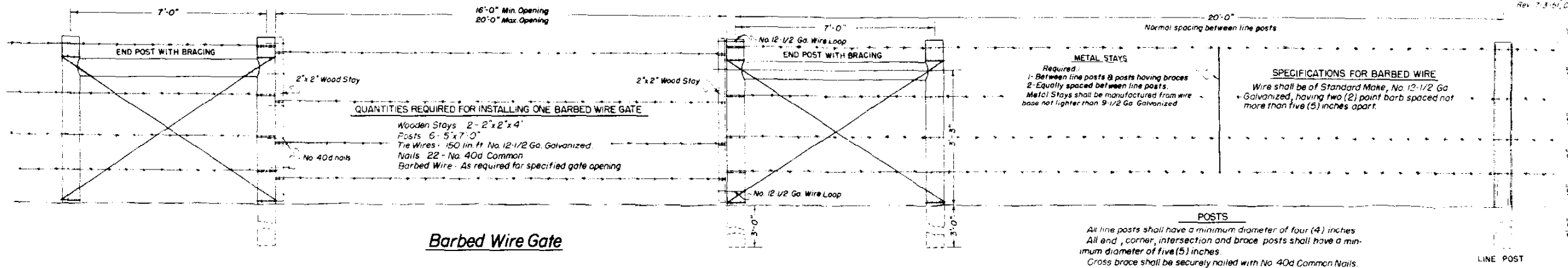
Standard Wire Fence With Wooden Posts

STANDARD M-24-H

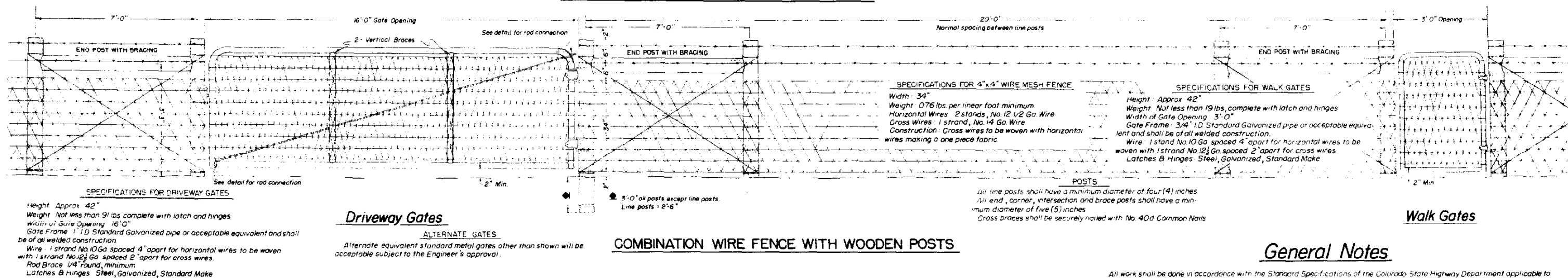
REVISIONS

DIVISION NO.	DISTRICT	PROJECT	TOTAL SHEETS
9	COLO.	5-18-17	11

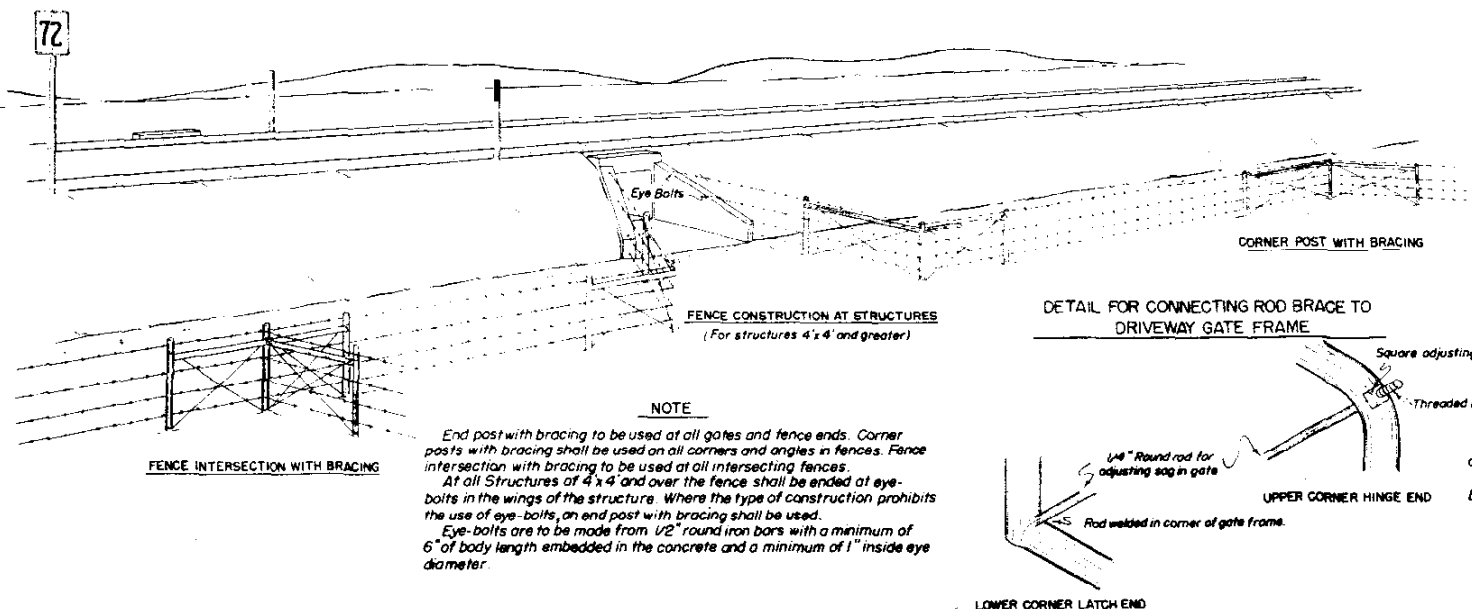
Rev. 3-1-50, C.G.M., Post spacing, Driveway gate, Added Gen. Note
Rev. 7-3-51, C.G.M., Alternate Gate Note



BARBED WIRE FENCE WITH WOODEN POSTS

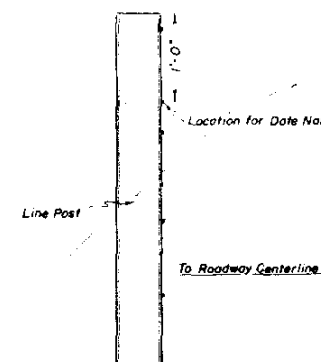


Illustrative Sketch Showing Typical Examples For Constructing Fences



DETAILS FOR PLACING DATE NAILS

(To be installed on Treated Wooden Posts only)



NOTE

Date Nails shall be placed on every tenth (10th) post and shall be driven flush.
Date Nails to be furnished and installed by State Forces as part of Engineering Costs.

COLORADO
STATE HIGHWAY DEPARTMENT

Standard Wire Fence
With
Wooden Posts

Designed by GGM
Made by GGM
Checked by GGM

Approved by *[Signature]*
Engineer, Surveys & Plans
Date: 14 Jun. 1, 1956

STANDARD M-1-B

GENERAL NOTES

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

The normal inside edge of the Pavement slab is to remain at the standard elevation of 0.125 ft below the profile grade, and the outside edge of the slab is to be superelevated at the rate per foot width of roadway given in the table. The Section is to be rotated about the normal inside edge of the Pavement, with a $1\frac{1}{2}$ " parabolic crown for curves of 10° and under, and a flat 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 super-elevation 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 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 super-elevation slope.

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

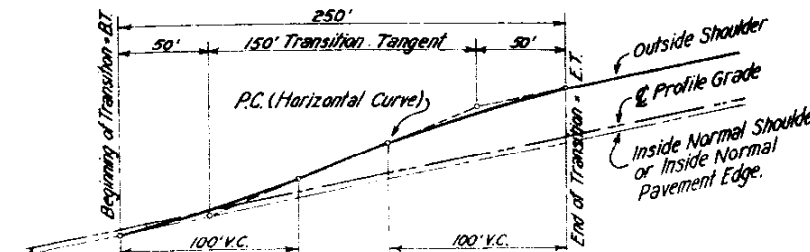
The rate of super-elevation per foot width of roadway to be applied at the outside shoulder of the roadway is computed as follows:

The full super-elevation per foot width of roadway rate for a given degree of curvature is

$$0.0105 \text{ ft} \times \text{Degree of Curvature}$$

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

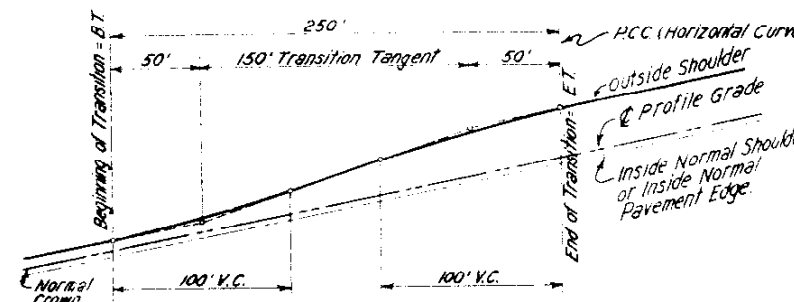
Special transition problems not covered by this standard sheet shall be covered by appropriate notes included with curve data on plans.



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

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.

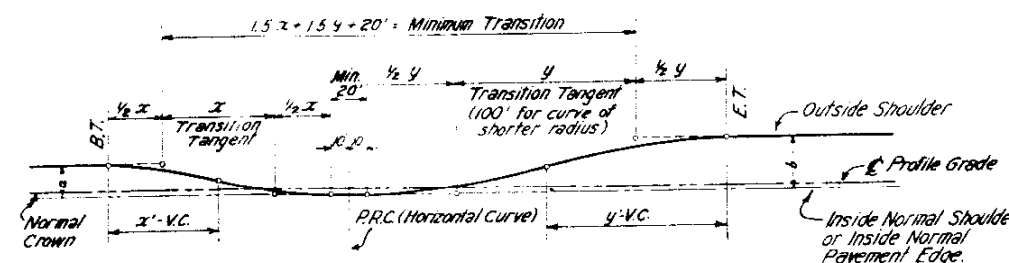


CASE II: COMPOUND CURVE

NOTE: CASE II

Super-elevation transitions at the outside ends of compound curves shall be constructed in accordance with rules given under CASE I. Super-elevation on transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie within the limits of the curve of the longer radius.

In cases where curves in the same direction have a tangent distance of less than 300 ft between points of curve, the intervening tangent shall be super-elevated an amount equal to that of the curve of greater radius and the transition shall be made as in the case of a true compound curve.



CASE III: REVERSE CURVES

NOTE: CASE III

Transitions between true reverse curves shall be accomplished as shown on the above diagram.

Transition tangents shall be directly proportional to the amount of super-elevation of the respective curves.

EXAMPLE: Let a represent the amount of super-elevation on 1st curve;

" b " " " " transition tangent on 1st "

" x " " " " " 2nd "

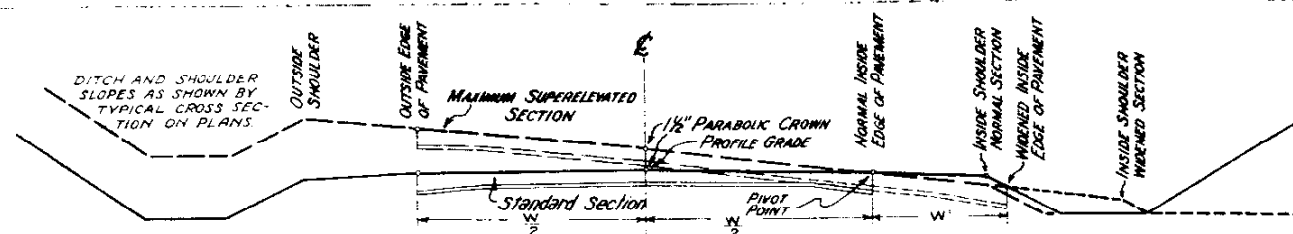
" y " " " " " 2nd "

then, $a:b = x:y$

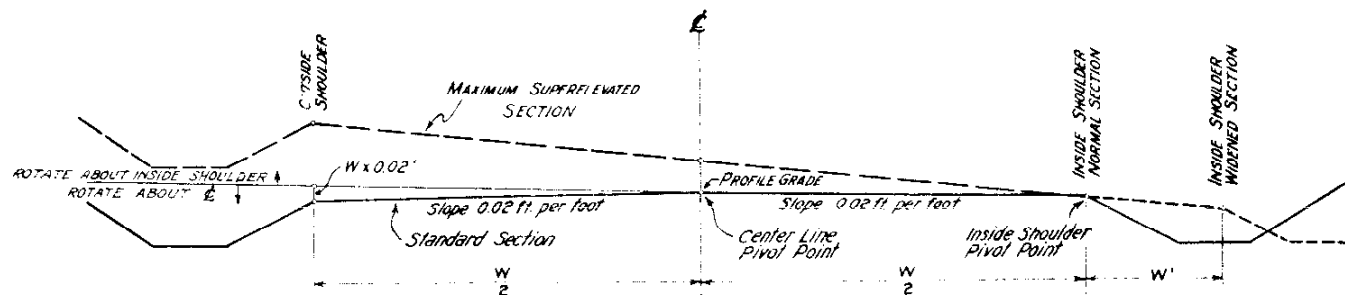
The transition tangent of the curve having the shorter radius shall be set at 100 ft. A normal crowned section 20 ft long, 10 ft on each side of the P.R.C. shall be used.

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.



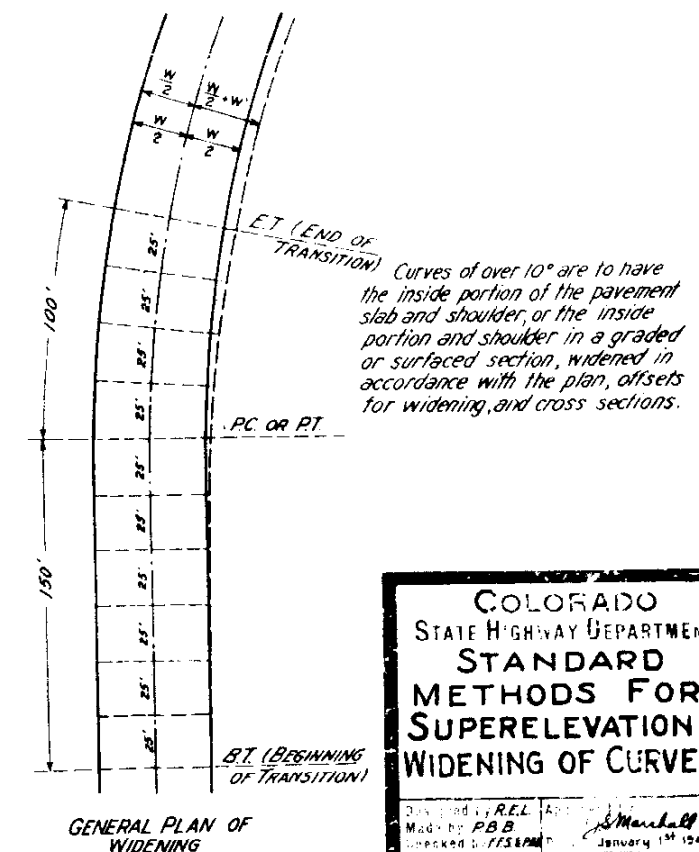
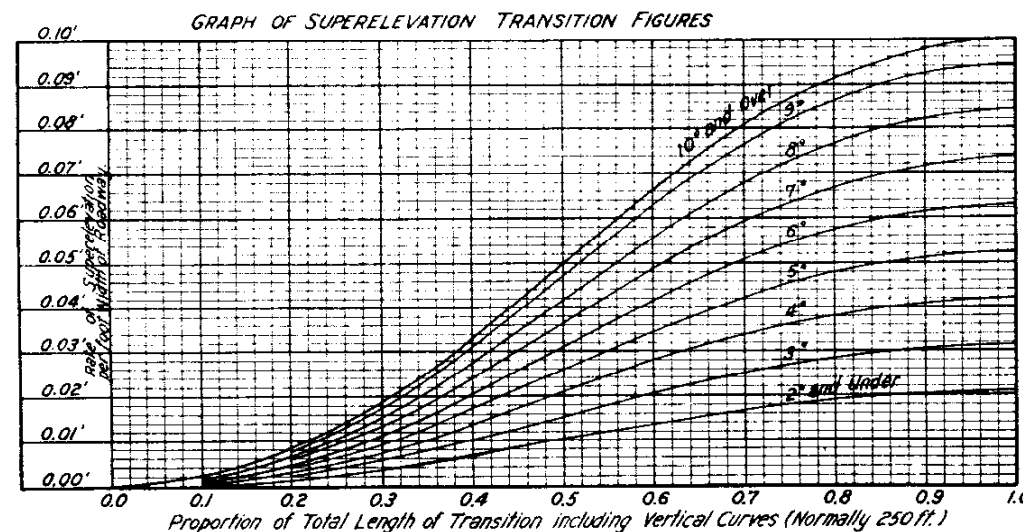
PAVEMENT SECTION



GRADED OR SURFACED SECTION

SUPERELEVATION AND WIDENING TABLES

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



GENERAL PLAN OF WIDENING

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
METHODS FOR
SUPERELEVATION &
WIDENING OF CURVES

Designed by R.E.L. and J.P.B.
Made by P.B.B.
Checked by J.F.S. and J.P.B.
January 1948

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

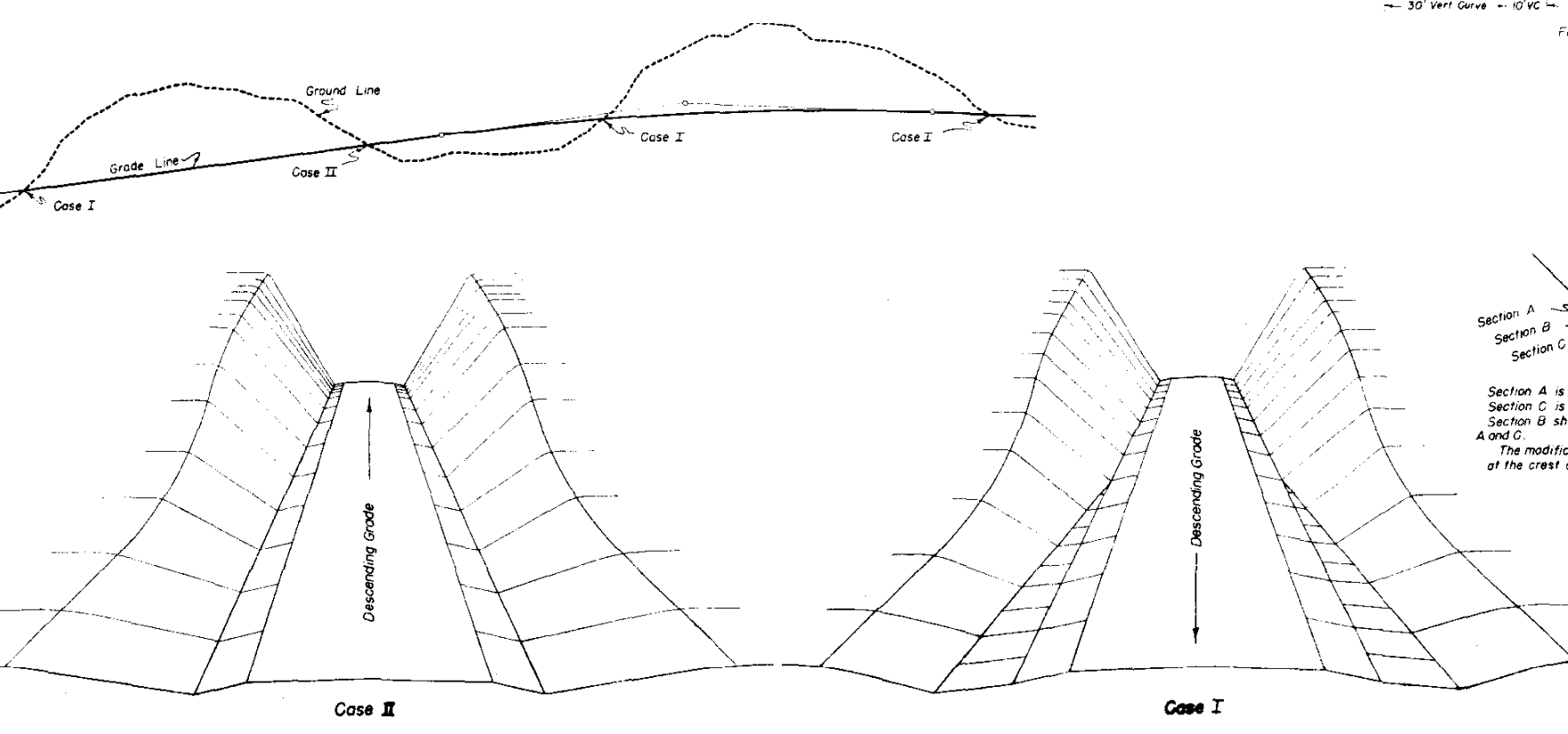
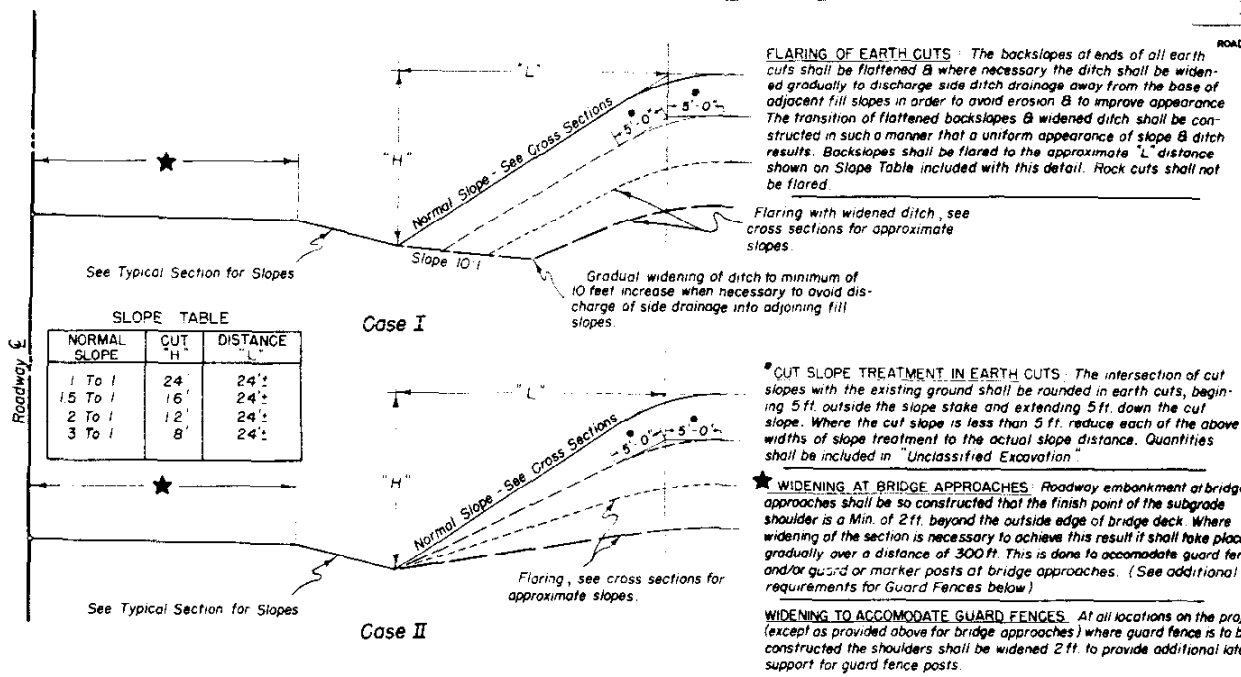
Rev. 10-25-50 C.G.M., Accel. Lanes, Ballast note re widen crest grades

STANDARD M-2-DM

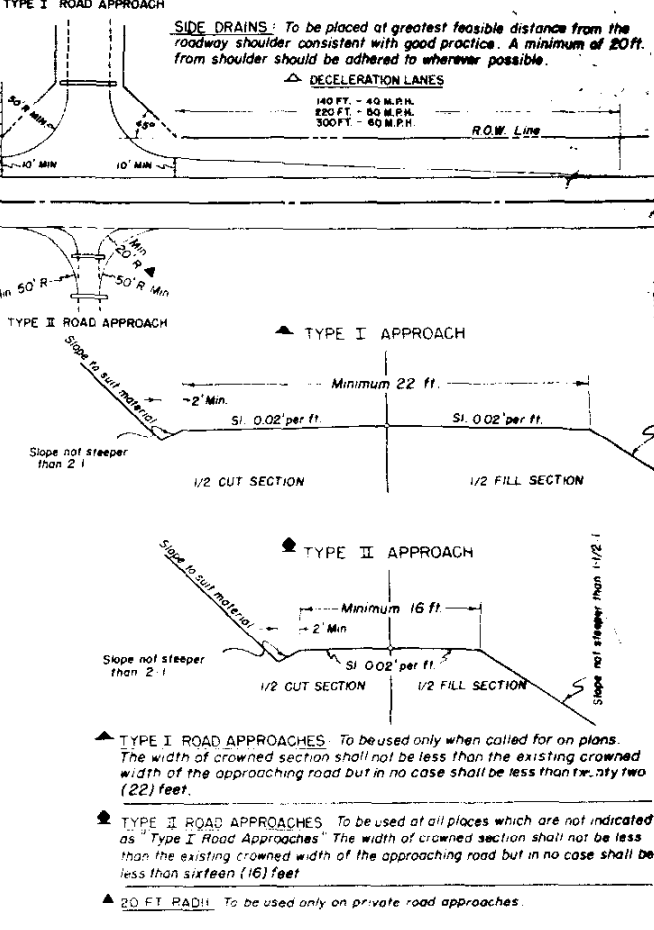
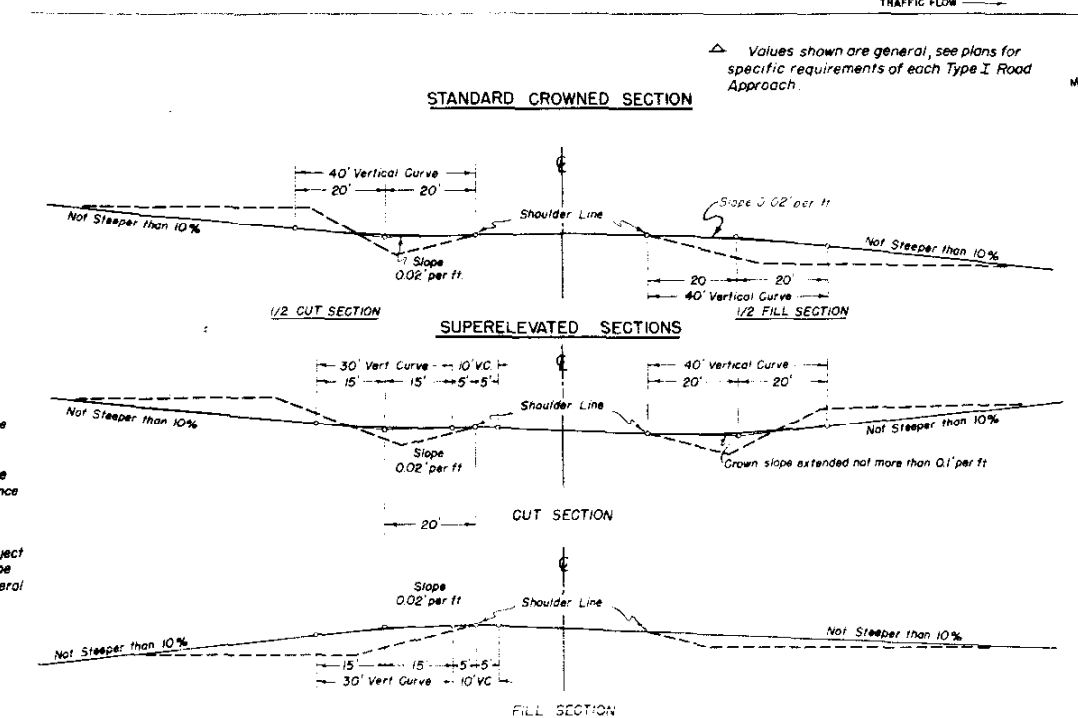
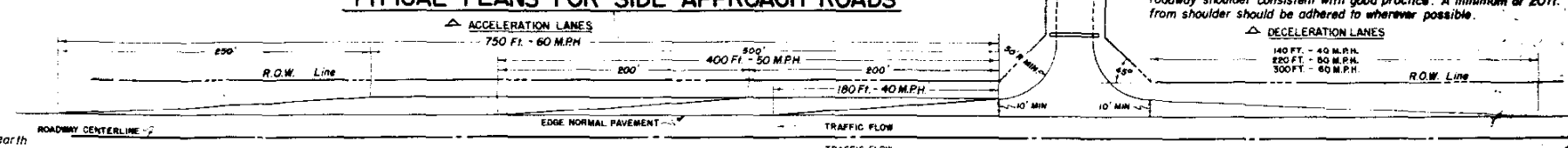
Rev. 7-12-49, C.G.M., Details for widening at Crest of Grades
Rev. 12-7-49, C.G.M., Rev. notes re Type I Rd. Apprs. & widen. at Bridge Apprs., added note re accel. & decel. lanes

DIVISION NO.	DISTRICT	SHEET NO.	TOTAL SHEETS
9	COLO.	1218-10/13	

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

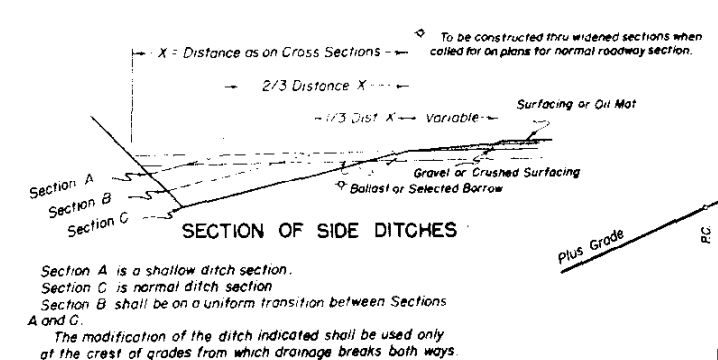


TYPICAL PLANS FOR SIDE APPROACH ROADS



DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES

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



GENERAL NOTES

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

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

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

COLORADO STATE HIGHWAY DEPARTMENT

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

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

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

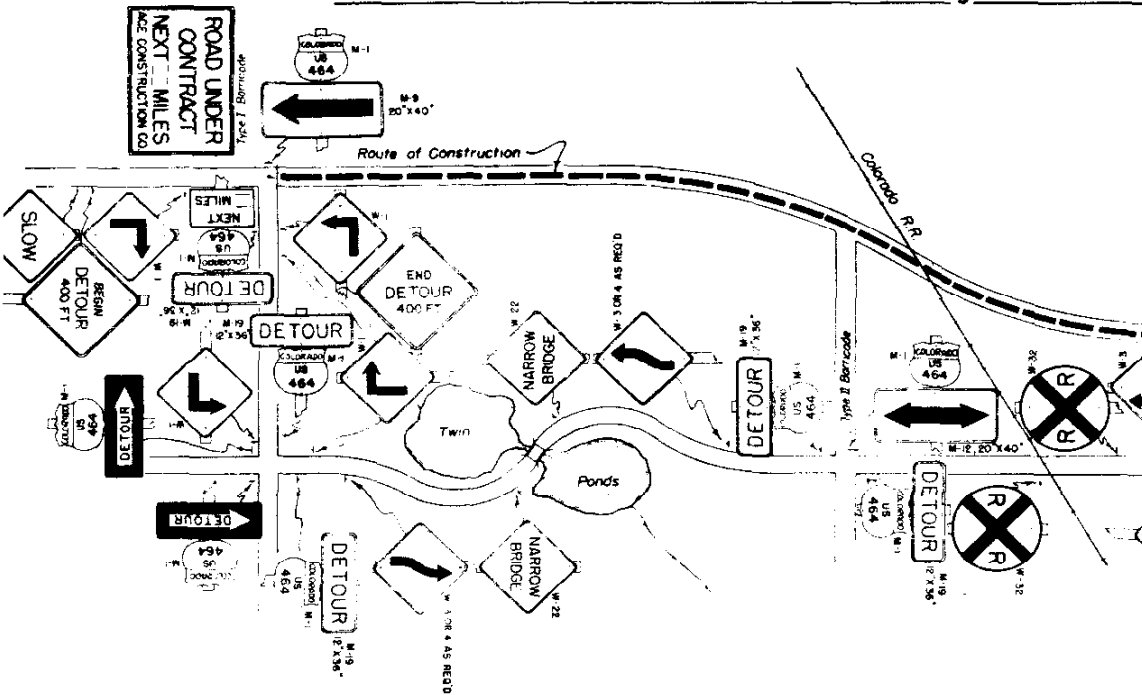
STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-2-DS

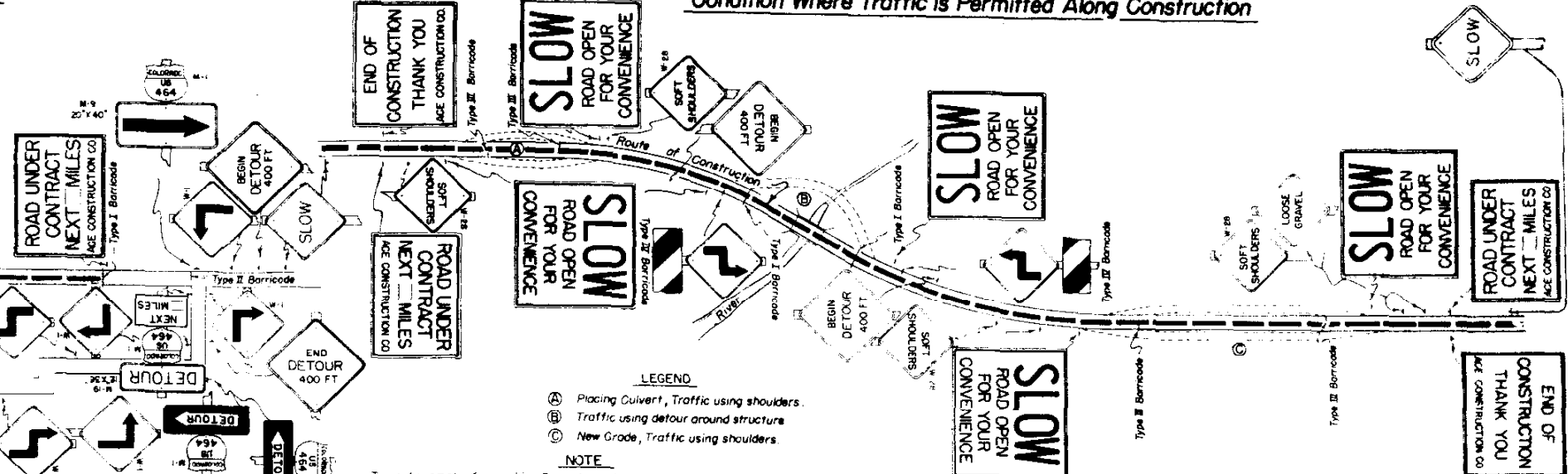
DIVISION NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	1618-10	74	
REV. - 8/16/49 - E.E.O.				
REV. - 2/3/50 - E.A.R.				

Typical Methods Of Marking Highways & Detours

Detour Condition Where Traffic Is Prohibited Along Construction



Condition Where Traffic Is Permitted Along Construction

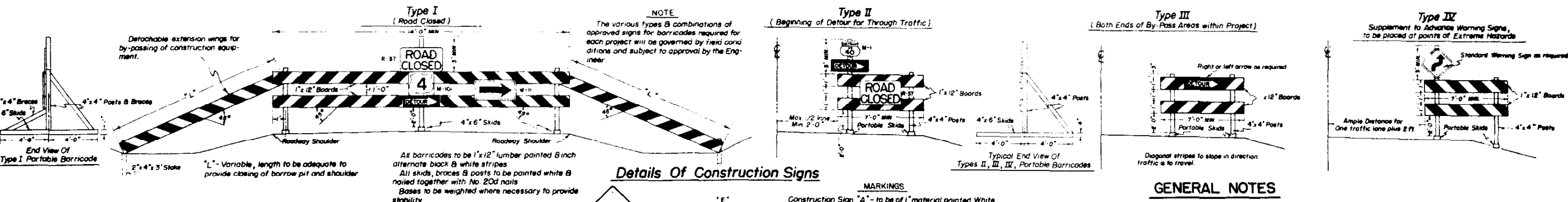


- LEGEND
- (A) Placing Culvert, Traffic using shoulders.
 - (B) Traffic using detour around structure.
 - (C) New Grade, Traffic using shoulders.

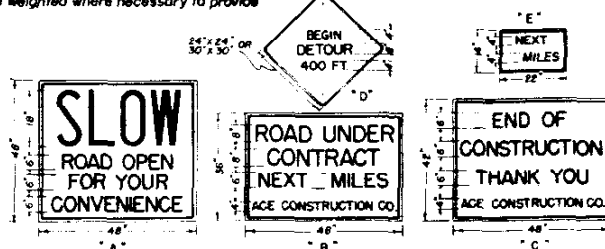
NOTE

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

Details Of Barricades



Details Of Construction Signs



MARKINGS

Construction Sign "A" - to be of 1" material painted white, the word "SLOW" lettered in Red, balance of lettering to be Black.

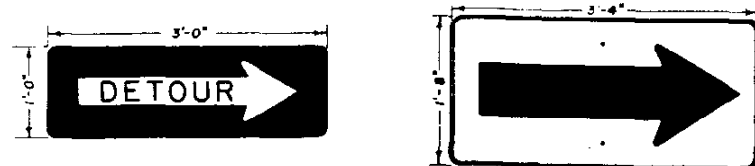
Construction Signs "B", "C", "E" - to be of 1" material painted white, all lettering to be Black.

Detour Warning Sign "D" - to be of 1/4" (min.) plywood or No. 10 (min.) gauge metal, painted yellow, all lettering to be Black.

Construction Signs - "B", "E" - 3/4" x 9" metal slides to be placed between words "Next & Miles" spaced so as to accommodate appropriate size numerals. Required numerals to be furnished by the Department and to be installed by the Contractor.

Signs to be fastened to 2" x 4" x 4" posts set 4 ft. in the ground with a minimum of 3 cleats on the back.

Details Of ReflectORIZED Arrows



MARKINGS - A White ReflectORIZED Arrow of "Scotchlite" Reflective Sheeting or suitable equivalent to be placed on a Black background. Letters to be 4" in height.

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

GENERAL NOTES

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

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

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

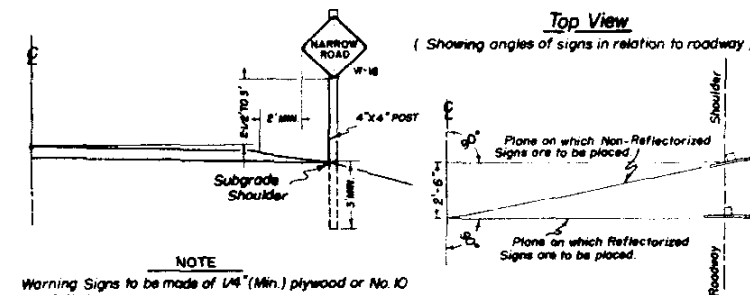
The Contractor shall furnish & install the following as required within the limits of the Project:

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

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

All markers used shall be of sound durable material. Barricades, Signs, Symbols & Lettering conforming to styles noted hereon will be well painted & maintained. Uneven or smeared lettering will not be accepted. Flares and Torches shall be of the Oil Burning Type approved by the Department and shall be placed 3 ft. or 5 ft. ahead of the object to be illuminated. Particular care shall be taken to protect all signs and barricades from smoke and smudge arising from torches and flares.

Position Of Signs Relative To Roadbed & Hazards



NOTE

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

Location to be governed by field conditions. Exact location to be stated by the Engineer. In all cases warning signs are to be placed well in advance of hazard, the distance depending on topography, and existing approach speeds.

COLORADO
STATE HIGHWAY DEPARTMENT

Standard Roadway
Construction Traffic Signs

Designed by
Made by CGM
Checked by

Approved by
Engineer
Date: 7-25-1949

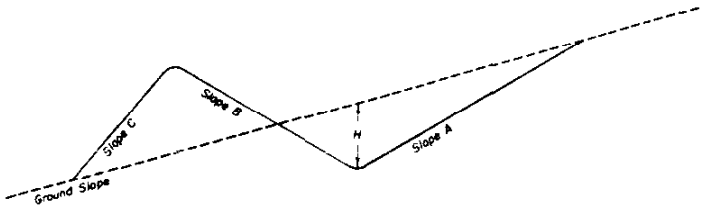
STANDARD TYPES *of* DITCHES *and* CONSTRUCTION METHODS

STANDARD M-107-C

DISTRICT	SHEET NO.	TOTAL SHEETS
9.	COLO	FOUR-16 15

DETAILS *for* CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



PURPOSE & USE OF THE TABLE

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

Typical Construction Layouts

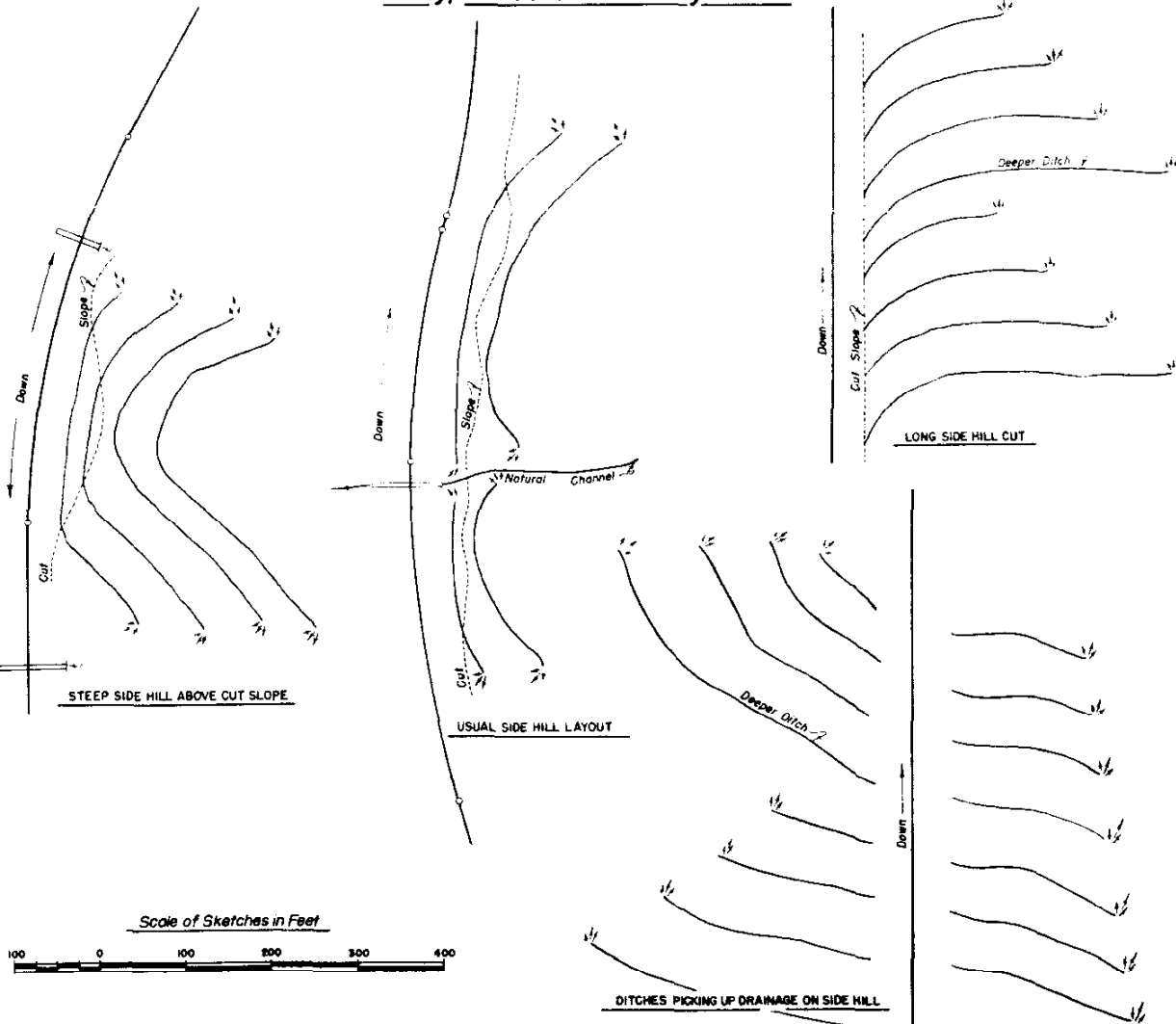
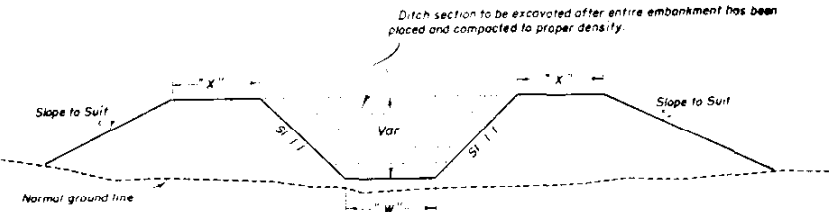


Table of Slopes and Yardages

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

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

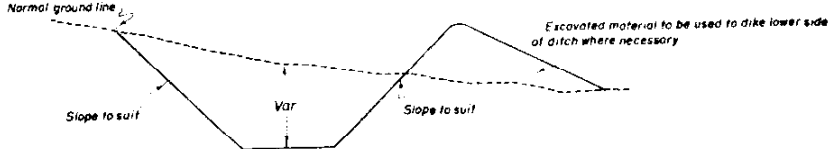
TYPICAL SECTIONS *for* DRAINAGE, IRRIGATION DITCHES *and* CHANNEL CHANGES



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

For Embankment Sections

(Generally for use in Irrigation Ditches & Channel Changes)



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

For Cut Sections

GENERAL NOTES

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

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

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

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

The following horizontal spacing of ditches is recommended:

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

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

COLORADO
STATE HIGHWAY DEPARTMENT

Standard Types of Ditches
and
Construction Methods

Designed by GGM
Made by GGM
Checked by

Approved by Marshall
Engineer, Surveys & Plans
Date: Aug. 16, 1950

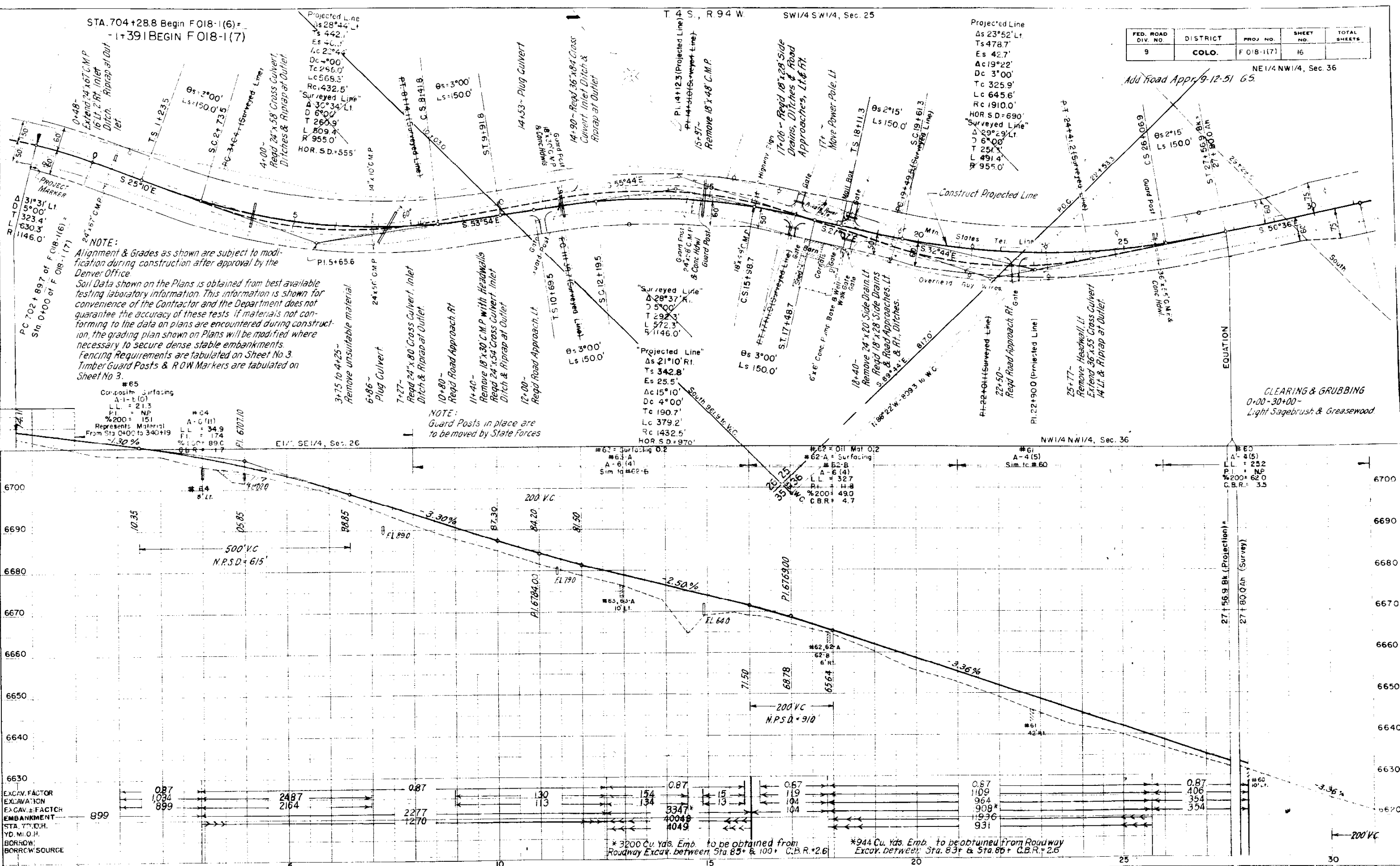
STA. 704+28.8 Begin F018-1(6)
+1391 BEGIN F018-1(7)

T 4 S, R 94 W SW 1/4 SW 1/4, Sec. 25

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 018-1(7)	16	

NE 1/4 NW 1/4, Sec. 36

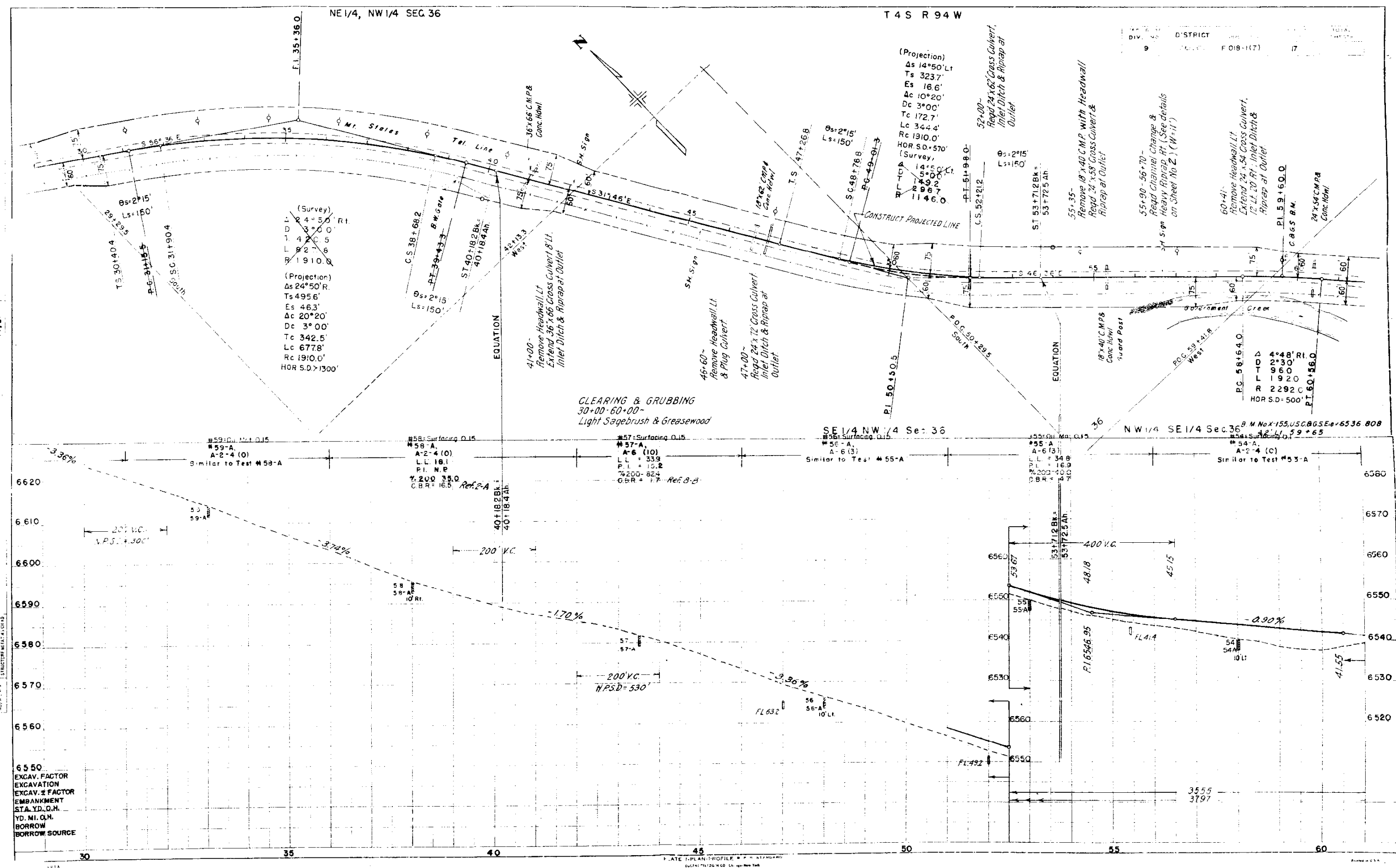
Add Road Appr. 9-12-51 G.S.



NOTE:
Alignment & Grades as shown are subject to modification during construction after approval by the Denver Office.
Soil Data shown on the Plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests if materials not conforming to the data on plans are encountered during construction, the grading plan shown on Plans will be modified where necessary to secure dense stable embankments.
Fencing Requirements are tabulated on Sheet No. 3.
Timber Guard Posts & ROW Markers are tabulated on Sheet No. 3.

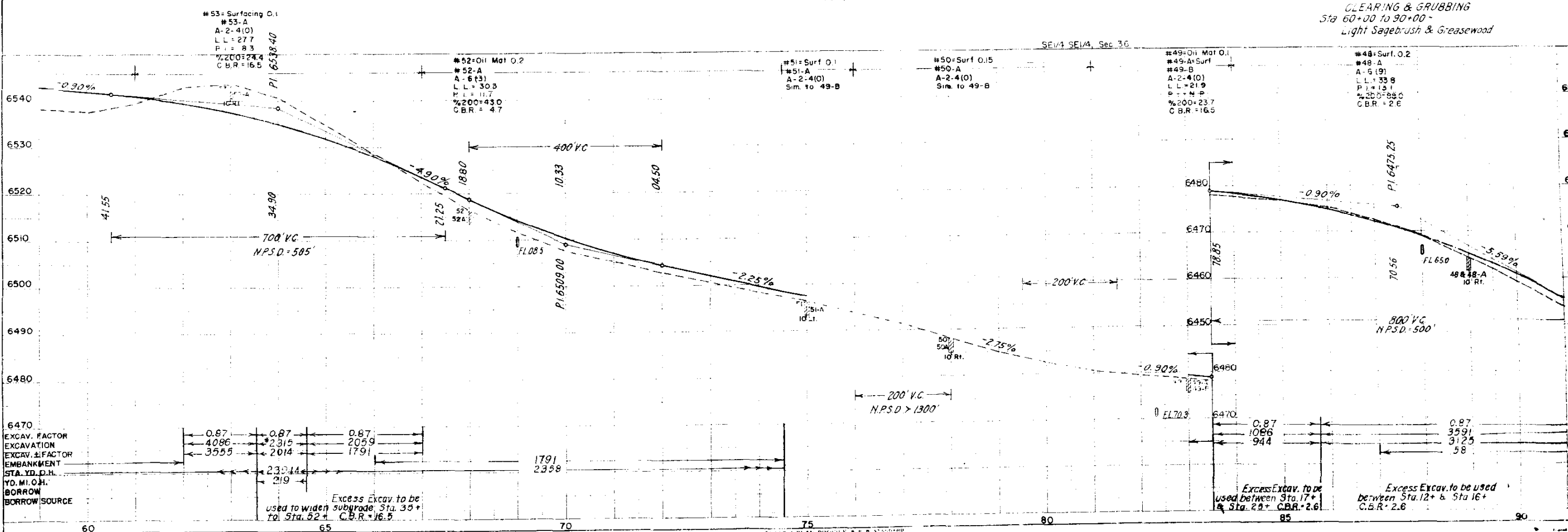
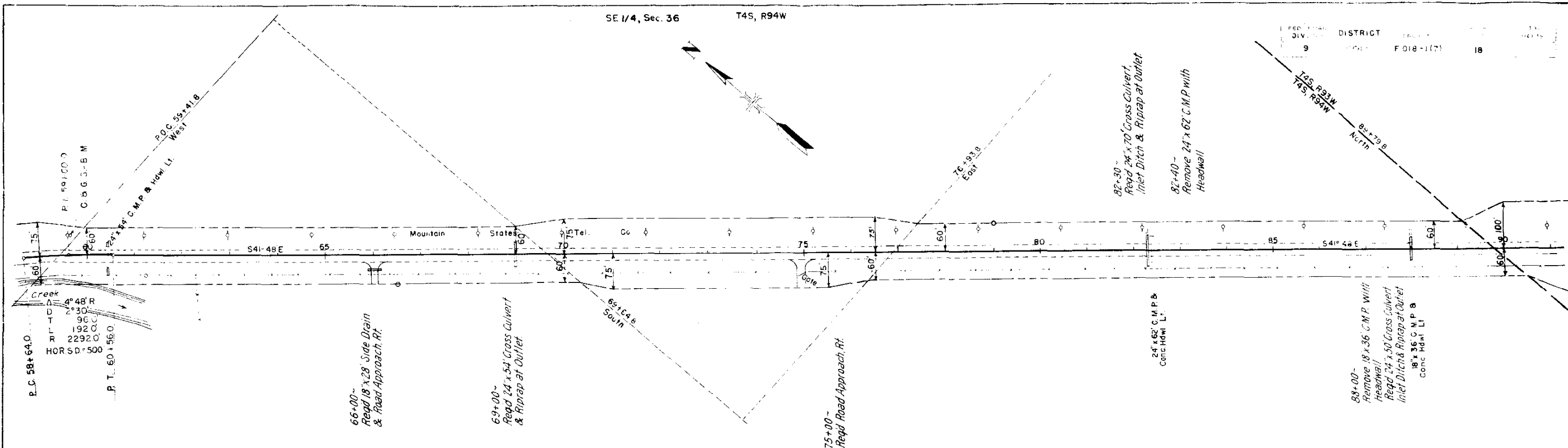
NOTE:
Guard Posts in place are to be removed by State Forces

CLEARING & GRUBBING
0+00-30+00-
Light Sagebrush & Greasewood



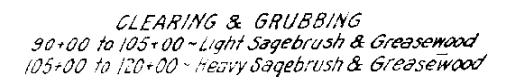
SE 1/4, Sec. 36 T4S, R94W

FED. ROAD DISTRICT
DIV. 9 F.O.B. 11(7) 18

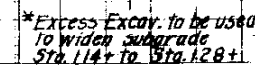


SW 1/4 Sec. 31

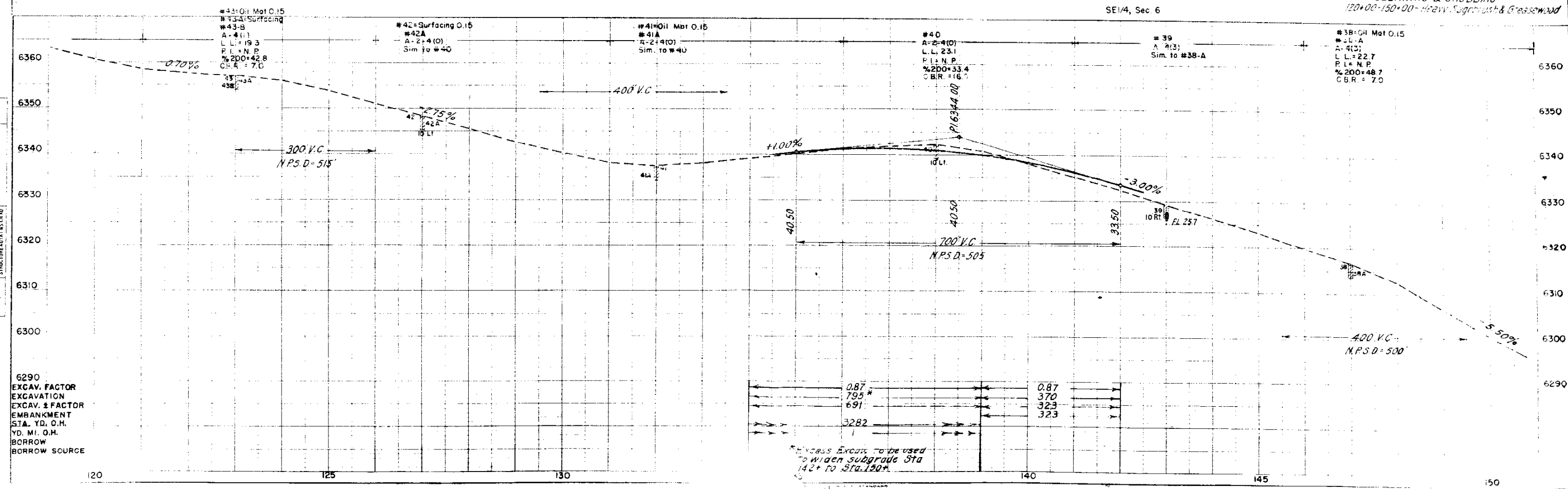
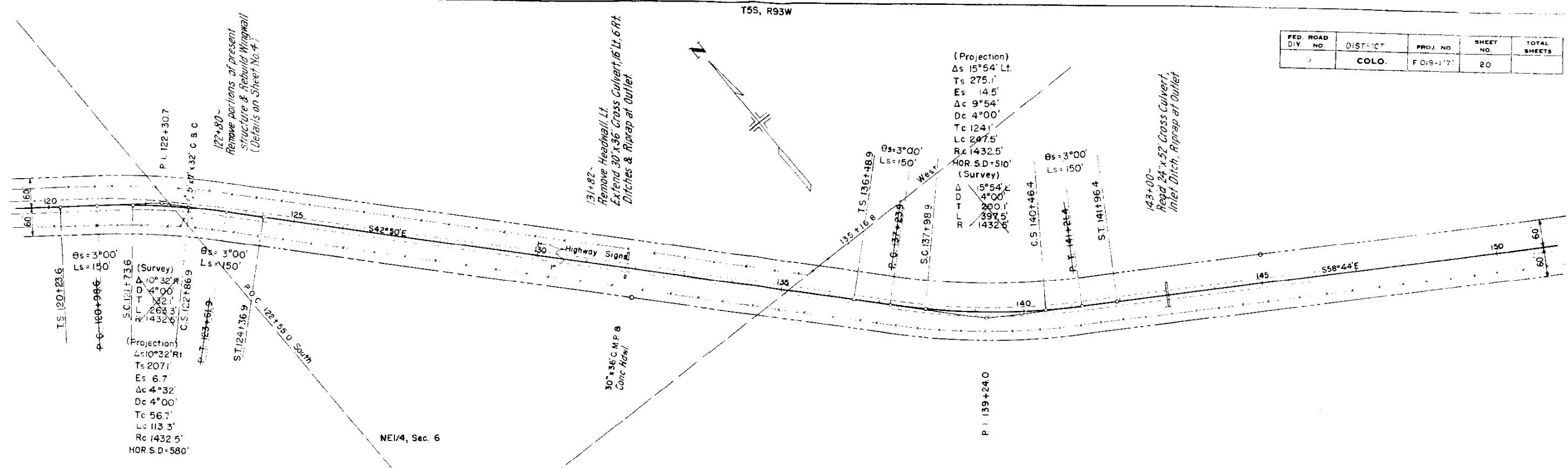
FED. ROAD DIV.	DISTRICT	PROJ. NO.	NO. OF SHEET	TOTAL SHEETS
9	0000	F 018-1 (7)	19	



N W 1/4 Sec. 6



FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	COLO.	F 019-171	20	



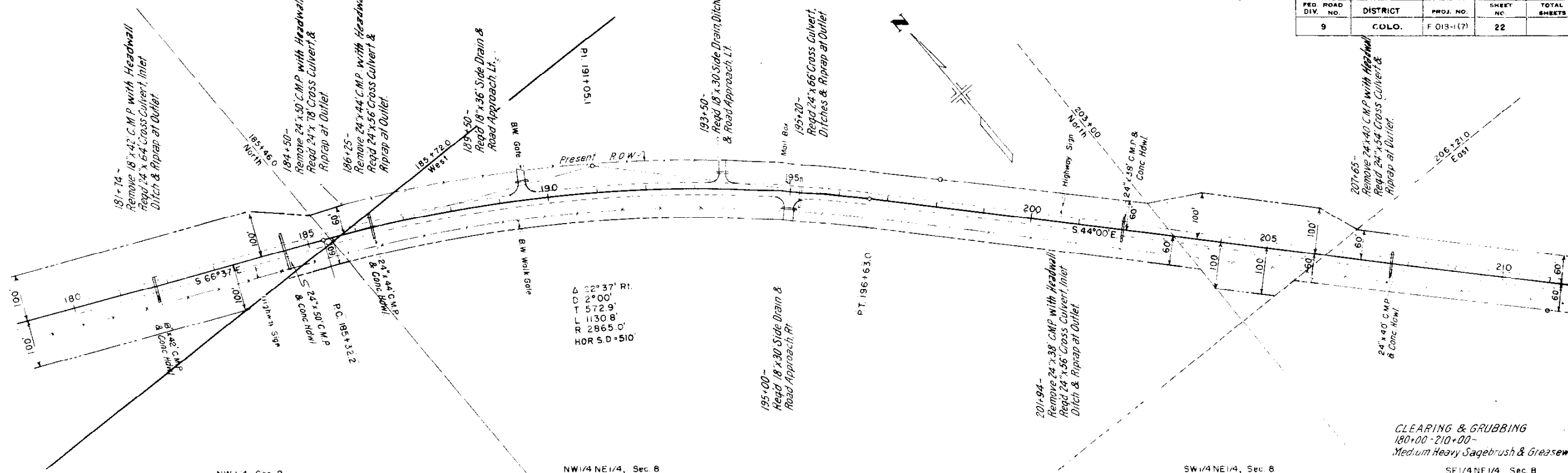
SW 1/4, Sec. 5

SE 1/4, Sec. 5

T. 5S, R. 93W.

NE 1/4 NE 1/4, Sec. 8

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 013-1(7)	22	



NW 1/4, Sec. 8

NW 1/4 NE 1/4, Sec. 8

SW 1/4 NE 1/4, Sec. 8

SE 1/4 NE 1/4, Sec. 8

#31 = Oil Mat 0.2
#31-A
A-4(1)
L.L. = 21.4
P.L. = N.P.
%200 = 45.2
C.B.R. = 70 REF 32-A

#30 = Surfacing 0.15
#30-A
A-4(1)
Sim. to #25

#29 = Oil Mat 0.15
#29-A
A-4(1)
Sim. to #25

#28
A-4(1)
L.L. = 23.4
P.L. = 3.8
%200 = 38.2
C.B.R. = 70

#27 = Oil Mat 0.15
#27-A
A-4(1)
Sim. to #25-A

#26
A-4(1)
Sim. to #25-A

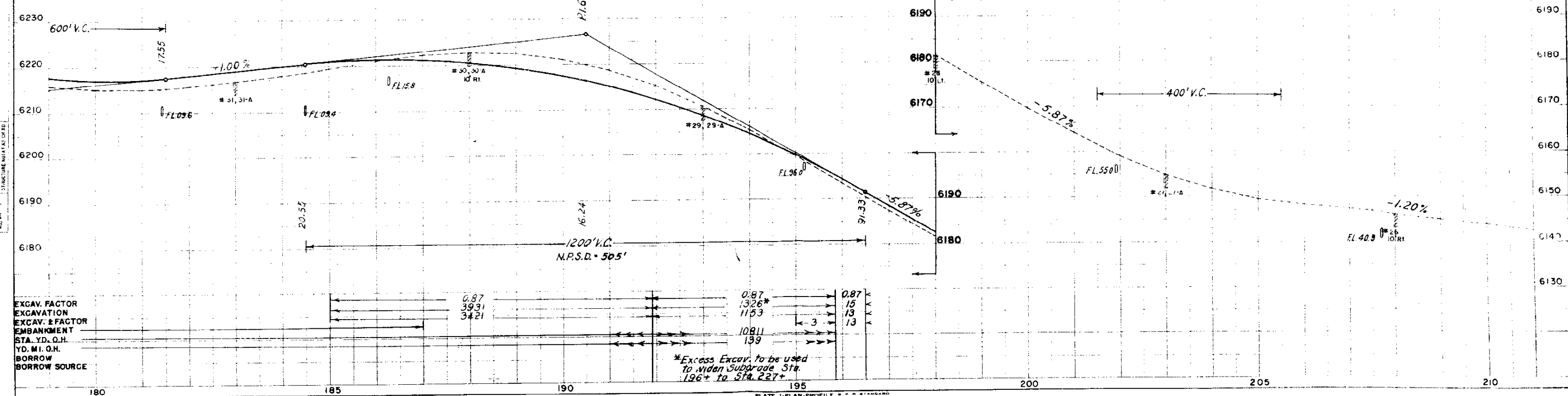
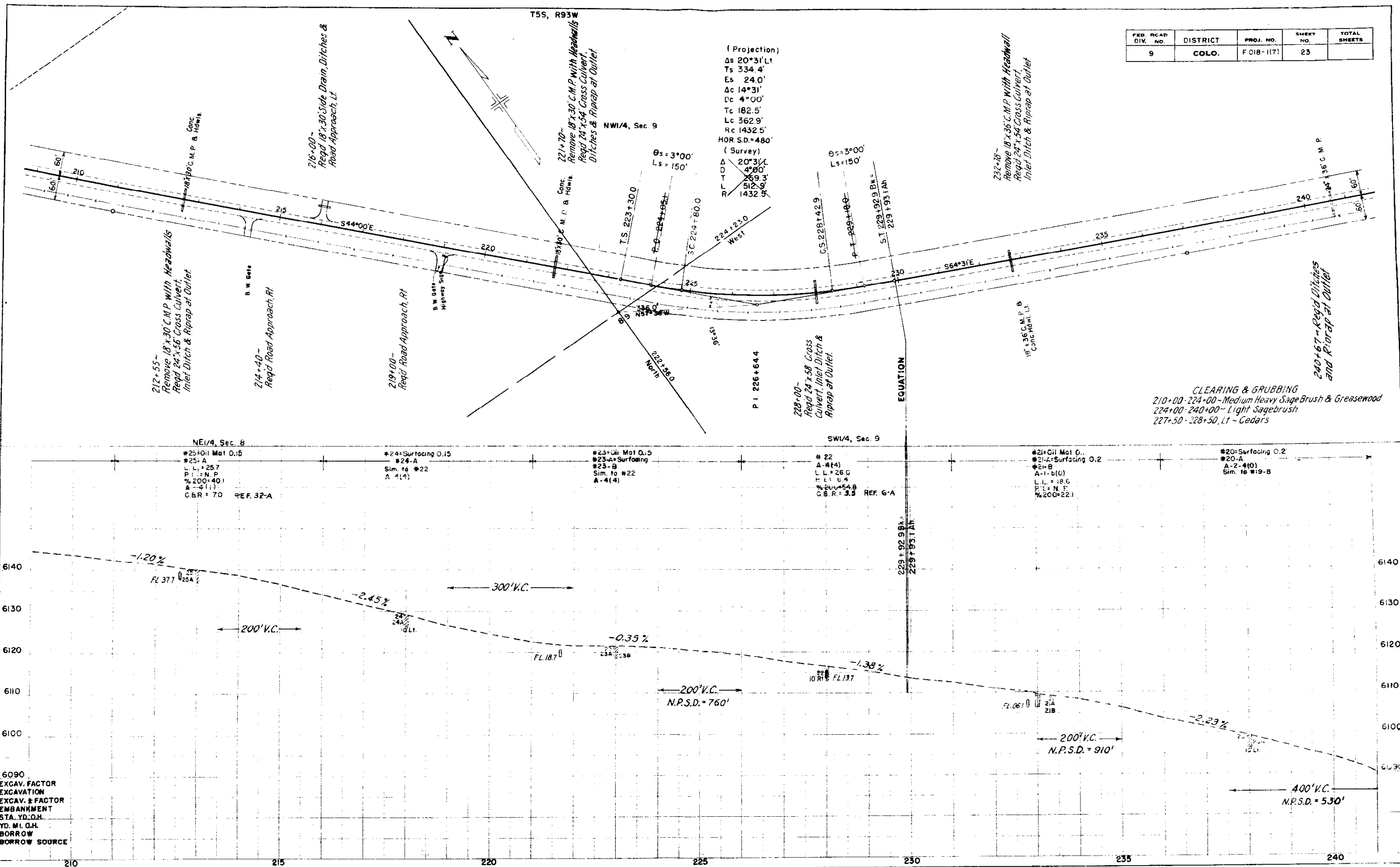
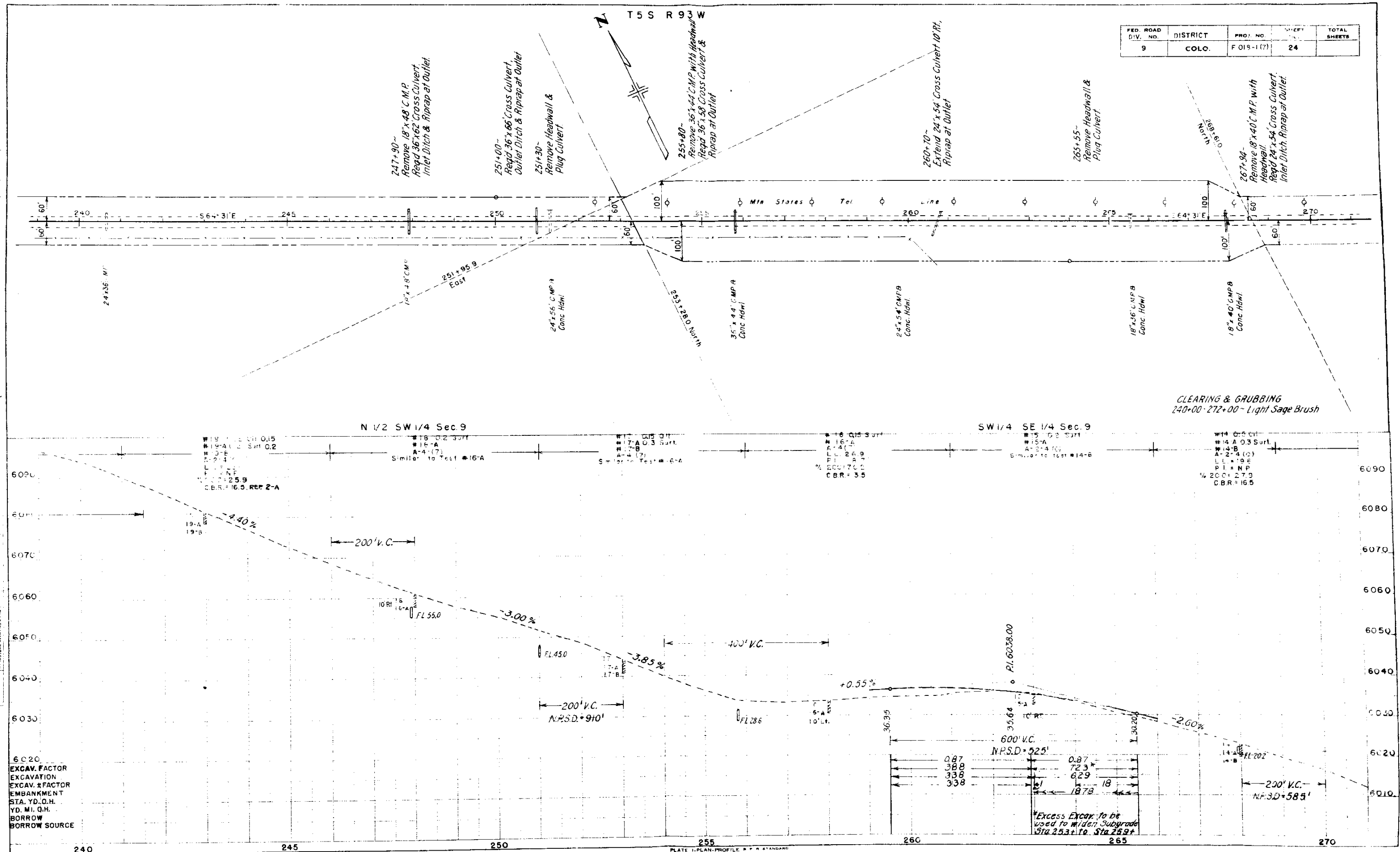


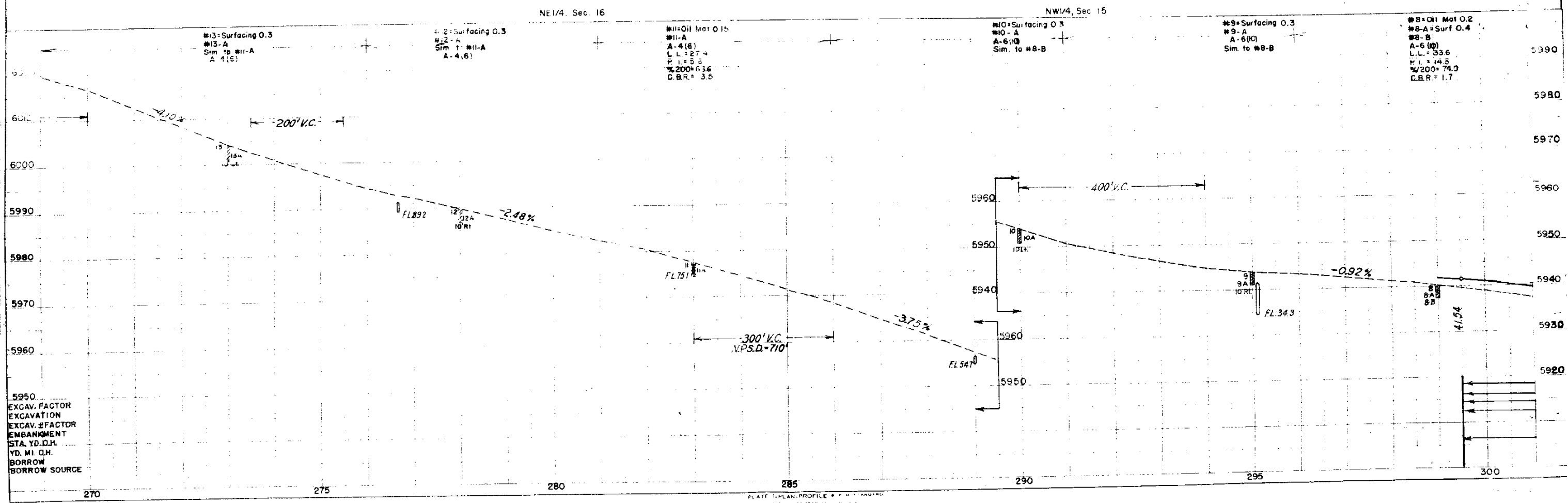
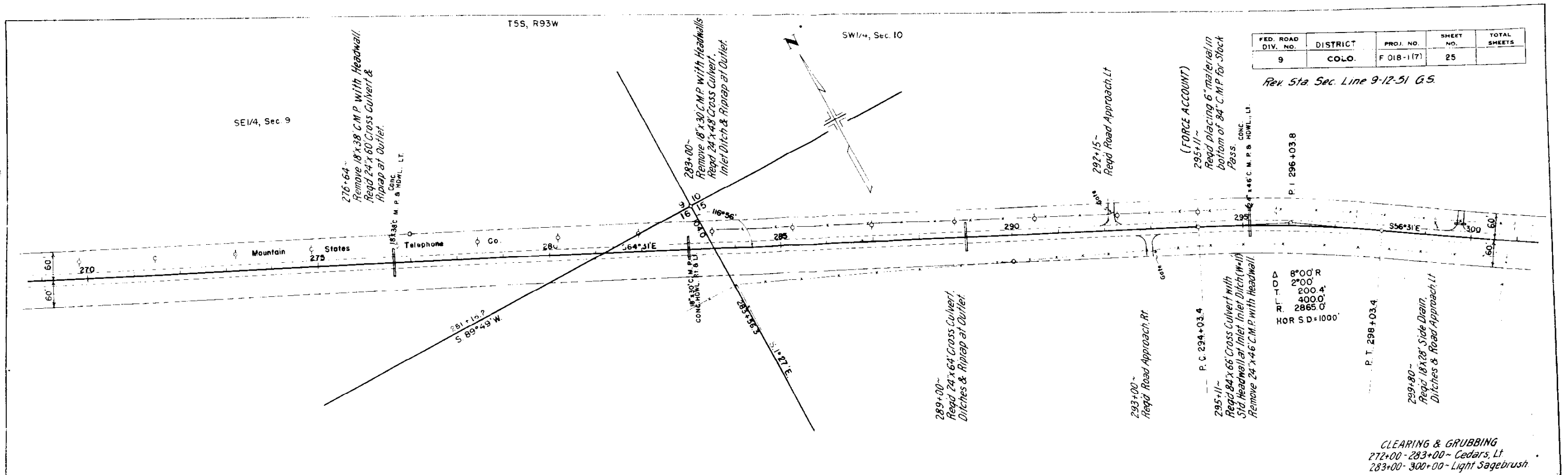
PLATE 1-PLAN-PROFILE

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 018-11(7)	23	

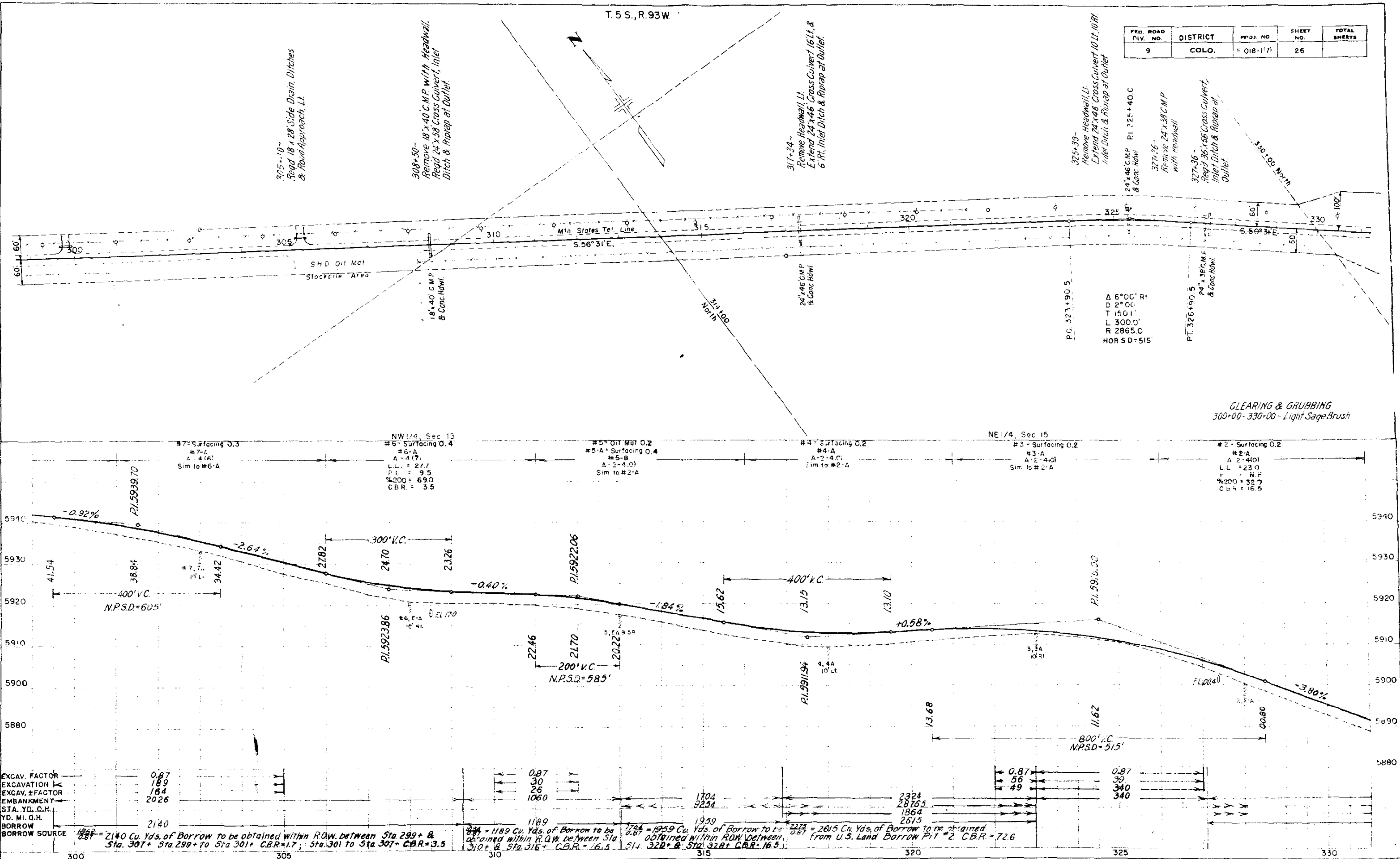


FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET	TOTAL SHEETS
9	COLO.	F 019-1(7)	24	





EXCAV. FACTOR
EXCAVATION
EXCAV. #FACTOR
EMBANKMENT
STA. YD. D.H.
YD. MI. D.H.
BORROW
BORROW SOURCE



FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	018-1171	26	

EXCAV. FACTOR	0.87
EXCAV. 2 FACTOR	189
EMBANKMENT	164
STA. YD. O.H.	2026
YD. M.O.H.	
BORROW	
BORROW SOURCE	

2140 = 2140 Cu. Yds. of Borrow to be obtained within ROW between Sta 299+ & Sta 301+ C.B.R.=1.7; Sta 301 to Sta 307+ C.B.R.=3.5

1189 = 1189 Cu. Yds. of Borrow to be obtained within ROW between Sta 310+ & Sta 316+ C.B.R.=16.5

1959 = 1959 Cu. Yds. of Borrow to be obtained within ROW between Sta 314+ & Sta 320+ C.B.R.=16.5

2615 = 2615 Cu. Yds. of Borrow to be obtained from U.S. Land Borrow Pit #2 C.B.R.=72.6

FED. ROAD DIV. NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 018-117	27	

T55, R93W

SE1/4 NE1/4, Sec. 15
U. S. LAND

NE1/2 SE1/4, Sec. 15
U. S. LAND

337+42~
Remove 24"x40" C.M.P. with Headwall.
Reqd. 24"x58" Cross Culvert &
Rinap at Outlet

339+54~
Remove 18"x36" C.M.P. with Headwall.
Reqd. 24"x54" Cross Culvert Inlet
Ditch & Rinap at Outlet

340+19~
Reqd. Approach to Project.

R.O.W. Marker

To RIFLE

PROJECT MARKER
IN PLACE

340+19.0 END FO18-1(7)
0+00 BEG. FO18-1(5)

CLEARING & GRUBBING
330+00-344+19~ Light Sage Brush

#1=Surfacing Composites under #65) G.2
#1-A
A-2-400
L-1-200
P-1-N-F
%200+240
CBR=105 REF 2-A

