

FED. ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	5-A(1)	1	

INDEX OF SHEETS

- Sheet No. 1 - Title Sheet
- " " 2 - Typical Section, Summary & Surfacing Plan
- " " 3 - List of Structures, Fencing, Right of Way Markers, Guard Fence, Snow Fence, & Detail of Special Grouted Rubble Apron.
- " " 4 - Standard Headwall for C.M.P. Culverts ----- M-102-E
- " " 5 " Timber Guard Posts ----- M-19-A
- " " 6 " Wire Cable Guard Fence ----- M-20-B
- " " 7 " Wire Fences with Steel Posts ----- Marker Posts - M-27-A
- " " 8 " Picket Snow Fence with Steel Posts --- M-25-B
- " " 9 " Methods for Superelevation & Widening of Curves --- M-1-B
- " " 10 - Typical Side Approach Roads and Roadway Construction Traffic Signs ----- M-2-B
- " " 11-14 - Plan & Profile Sheets.
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COLORADO
STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED
FEDERAL AID SECONDARY PROJECT NO. F.A.S. 5-A(1)
STATE HIGHWAY NO. 67
TELLER COUNTY

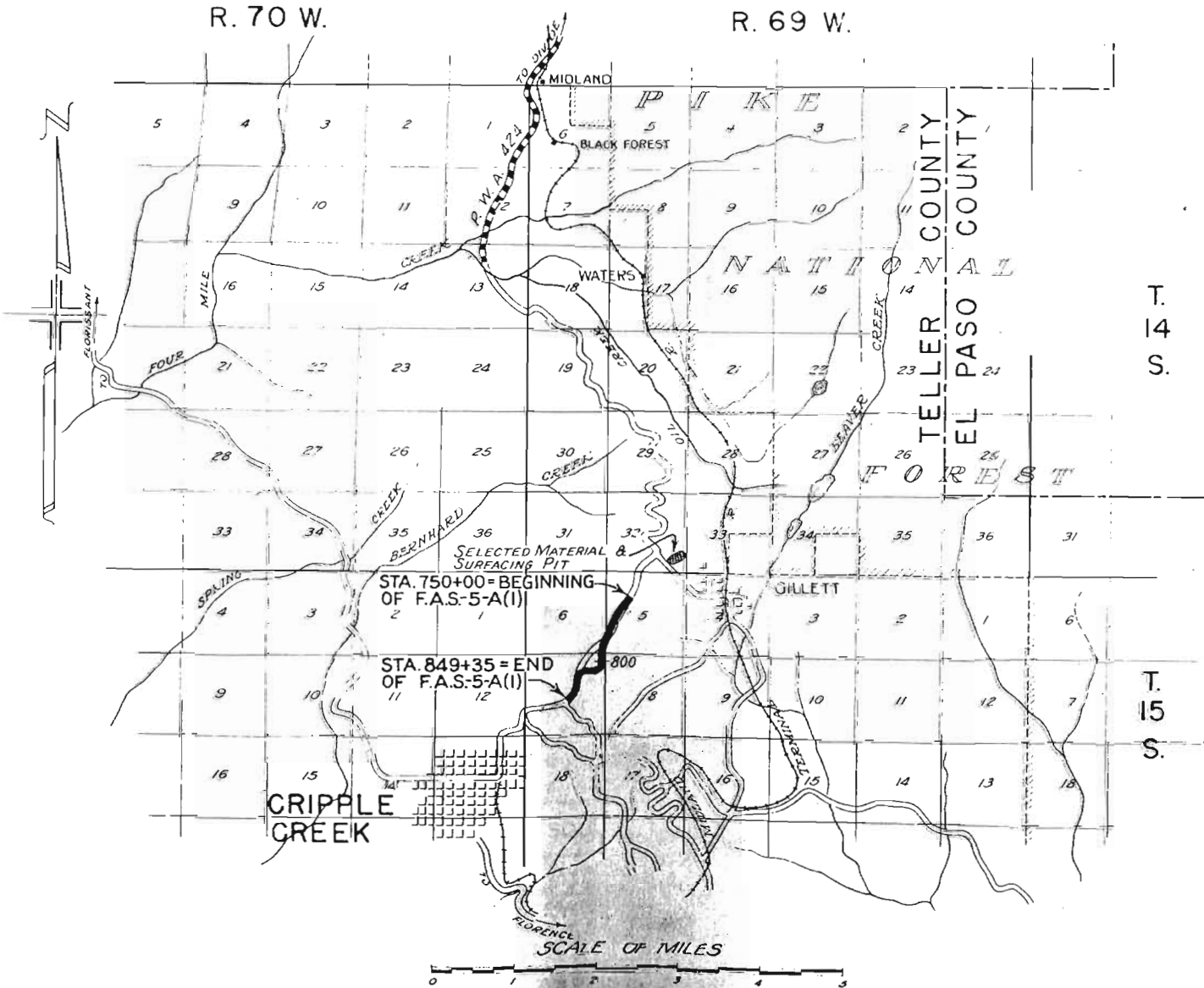
SCALES OF ORIGINAL TRACINGS

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 } 9940.7 FT. = 1.882 MI.
NET LENGTH OF PROJECT }

CONVENTIONAL SIGNS

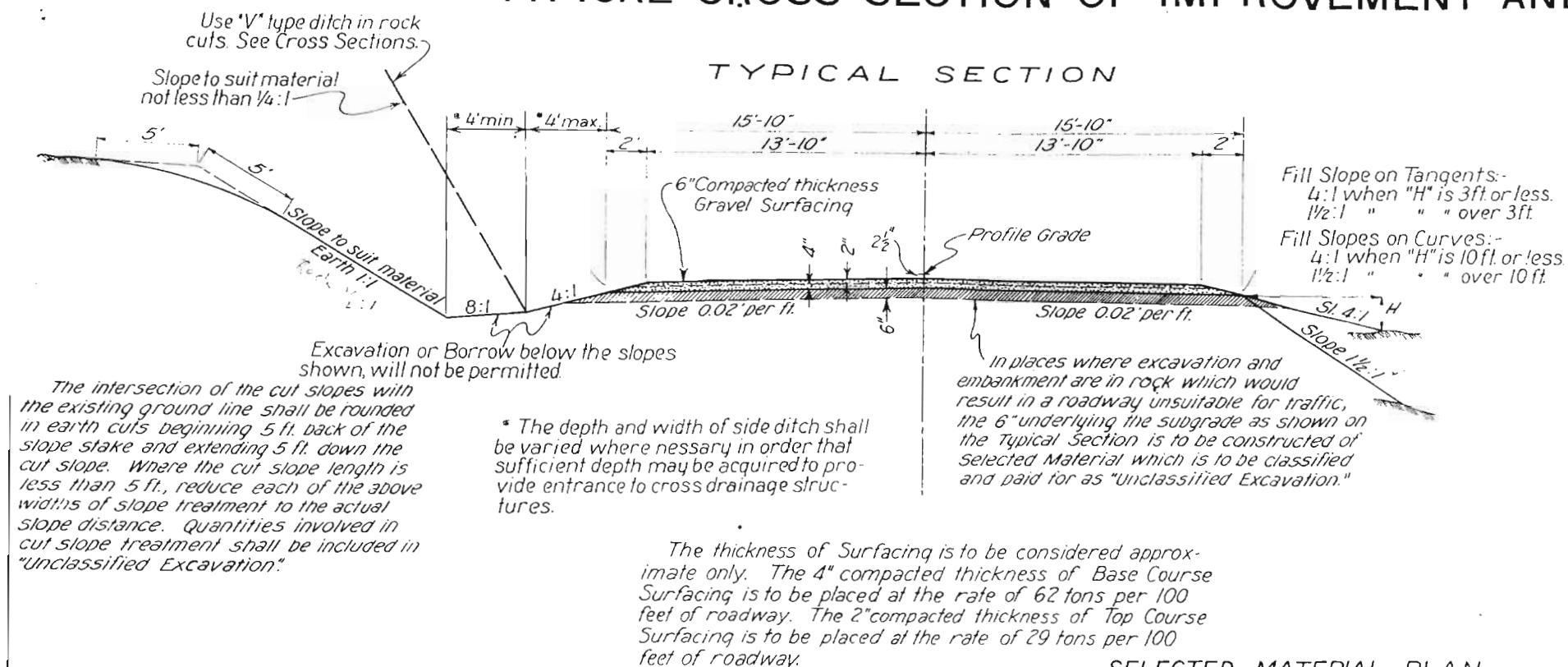
- Center Line
Right-of-Way Line
Township or Range Line
Section Line
Quarter Section Line
Property or Tract Line
City Limits
Railroad
Barbed Wire Fence
Woven Wire-Combination Fence
Picket Fence
Board Fence
Snow Fence
Teleph. & Teleg. Line
Power Line
Water Main



NOTE -
It is recommended that bidders on this Project go over the plan details with one of the following field representatives of this Department.
Ernest Montgomery, Division Engineer, Colorado Spgs.
E.E. Featherston, Resident Engineer, Divide

RECOMMENDED FOR APPROVAL
APPROVED
RECOMMENDED FOR APPROVAL
DIST. ENG. BUREAU PUBLIC ROADS
RECOMMENDED FOR APPROVAL
CHIEF ENG. BUREAU PUBLIC ROADS
APPROVED
DIRECTOR BUREAU PUBLIC ROADS

TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES



GENERAL NOTES

This Project is to be constructed in conformity with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1937.

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

All roadway excavation required to construct this Project is to be obtained as indicated on the plans. Quantities involved beyond the limits of the ditch as shown on the Typical Section, either noted on the profile as "Borrow" or in the "List of Structures" as "Embankment" are to be classified and paid for as "Unclassified Excavation". These quantities are to be staked as part of the original excavation at locations indicated on the plans. Slope stakes beyond the limits of the Typical Section are subject to change by the Engineer to meet embankment requirements actually encountered during construction.

All curves are to be superelevated and widened as provided by the Standard Superelevation Sheet.

Overhaul will be paid for as measured along centerline of Project except as otherwise noted on the plans.

All side approach roads to the project shall be gravel surfaced with a 4" thickness of "Gravel or Crushed Rock Surfacing" extending approx. 30 ft. from edge of highway. Estimated tonnage of surfacing material required in this operation is shown on the List of Structures.

At all places on the project where the new work lies along the present traveled road, the contractor shall, at his own expense, prosecute construction in such manner that traffic may readily pass over the road. Also the contractor shall maintain in safe condition and at his own expense, all temporary approaches to and crossings of intersecting roads.

All poles encroaching on construction are to be moved by owners.

All corrugated metal pipe cross culverts are to be provided with one headwall on the inlet end, unless otherwise noted on the plans.

New right of way fences for this project shall be constructed entirely within the highway right of way as shown on the plans.

Clearing and Grubbing shall be of variable widths and to be held to the minimum required for the construction of the road and channel changes and to accommodate visibility. Ordinarily the clearing shall not extend more than 8 ft. beyond the toes of fills or the tops of cut banks.

SUMMARY OF APPROXIMATE QUANTITIES

NO.	ITEM	UNIT	TOTAL
10a	Clearing and Grubbing Entire Project	Lump Sum	.
11b	Removal of 8 Structures	" "	.
11c	Remove Snow Fence	Lin. Ft.	540
12a	Removing Fence	Lin. Ft.	1700
13c	Unclassified Excavation	Cu. Yd.	63,000
14a	Dry Rock Excavation (Structural)	" "	55
14b	Dry Common Excavation	" "	55
14c	Wet Rock Excavation	" "	10
14d	Wet Common Excavation	" "	10
18a	Station Yard Overhaul	Sta. Yd.	73,000
18b	Yard Mile Overhaul	Yd. Mi.	4500
26a	Gravel or Crushed Rock Surfacing	Ton	9550
26c	Overhaul on Surfacing	Ton Mile	7400
49	Cement Rubble Masonry	Cu. Yd.	13
53b	18" Corrugated Metal Culvert Pipe	Lin. Ft.	56
53c	24" " "	" "	404
64	Grouted Rubble Slope & Ditch Paving (12" th)	Sq. Yd.	34
74	Wire Cable Guard Fence	Lin. Ft.	1000
74x	Timber Guard Posts	Each	87
76c	Barbed Wire Fence with Steel Posts	Lin. Ft.	3000
76g	Barbed Wire Gates	Each	2
77	Picket Snow Fence	Lin. Ft.	7470
81a	Project Markers	Each	1
81b	Right of Way Markers	"	27

SELECTED MATERIAL PLAN

Selected Material for topping out of subgrade, as shown on the Typical Section, is estimated to be available from the sources indicated in the tabulation below.

Estimated quantities involved in this operation are as follows:

MATERIAL TO BE PLACED	QUANTITY Cu. Yds.	SOURCE	OVERHAUL	
			Sta. Yds.	Yd. Mi.
798+00 to 802+58	330	Pit No. 1 located approx. 4300' back of Sta. 750+00 in the S.E. 1/4 Sec. 32, T14S, R. 69W.	3630	483
802+58 to 812+06	758		8338	1211
812+06 to 813+10	75		825	127
813+10 to 815+27	178		1958	308
815+27 to 819+84	375	Widened ditches between Sta. 773+ and 777+ within the right of way.	4125	201
819+84 to 849+35	2125		23,375	1745
TOTAL FROM PIT NO. 1	1341		14,751	2129
TOTAL FROM RIGHT-OF-WAY	2500		27,500	1946
PROJECT TOTALS	3841		42,251	4075

SURFACING PLAN

It is estimated that material for gravel surfacing for the Project is available in the vicinity of the pit indicated on the following tabulation. Estimated quantities involved in the operation are shown below.

No alteration of the surfacing plan as here outlined will be allowed without written permission from the Department.

MATERIAL TO BE PLACED	SOURCE	QUANTITY		OVERHAUL
		AVAILABLE TON	USED TON	
750+00 to 759+80	Pit No. 1 located approx. 4300' back of Sta. 750+00 in the S.E. 1/4 of Sec. 32, T14S, R. 69W.		892	Free
759+80 to 802+58			3898	1581
802+58 to 812+06			979	882
812+06 to 813+10			95	95
813+10 to 819+84			716	769
819+84 to 849+35			2685	3807
Road Approaches			260	221
TOTALS			9525	7355

LOCATION	DESCRIPTION	REMOVE EXCAVATION STRUCT. CU YDS.	STRUCTURAL EXCAVATION • CU YDS.	SURF. FOR APPR. TON	CEMENT RUBBLE MASONRY CU. YDS.	CONCRETE CU. YDS.	REINFORCED STEEL LBS.	CORRUGATED METAL CULVERT PIPE LIN. FT.	MISCELLANEOUS
750+00 763+00 763+20 776+00 - 782+00 777+50 - 779+00 778+38 779+00 779+00 - 783+50 781+00 781+68 786+00 790+00 795+34 804+00 811+00 811+00 - 819+00 819+25 819+25 - 827+00 827+00 - 839+00 837+50 839+00 839+00 - 841+00 840+05 841+00 - 847+70 845+30 847+70 847+70 - 849+35 847+95 849+35 753+58	Project Marker & Approach to Project Road Approach Lt. C.M.P. Cross Culvert & Ditches Remove Snow Fence Rt. Intercepting Ditch Rt. Remove 18'x30' C.M.P. Culvert Drain Ditch Rt. Intercepting Ditch Rt. Road Approach & C.M.P. Side Drain Rt. Remove 12'x34' C.M.P. Culvert Road Approach & C.M.P. Side Drain Lt. Road Approaches Lt. & Rt. Remove 18'x28' C.M.P. C.M.P. Culvert Road Approach Lt. C.M.P. & Ditches - Remove 40' C.M.P. Lt. Intercepting Ditch Lt. C.M.P. Cross Culvert & Inlet (Intercepting Headwall) Intercepting Ditch Lt. Intercepting Ditch Lt. Remove 2'x2x26' Wooden Box C.M.P. Cross Culvert & Inlet (Intercepting Headwall) Special Grouted Rubble Apron as long as Outlet Intercepting Ditch Lt. Remove 12'x30' C.M.P. Culvert Intercepting Ditch Rt. Remove 12'x30' C.M.P. Culvert C.M.P. Cross Culvert and Inlet Intercepting Ditch Lt. Remove 12'x28' C.M.P. Culvert Approach to Project C.M.P. Cross Culvert	800 20 20 60 50 20 20 50 5 100 15 185 230 15 50 5 130 5 30 500	15 15 20 60 80 20 20 50 10 25 10 25 10 20 10	100 10 10 10 20 10 2.05 2.05 2.30 2.30 2.05 2.05				50 30 26 100 56 44 66 88	1 Project Marker Rem. 540 Snow Fence 34 Sq Yds Grouted Rubble Slope & Ditch Revving (12 M)
TOTALS		8	2255	125	115	260	12.80	56	404

* Structural Excavation is estimated to be 50% common and 50% rock, each of which is estimated to be 90% dry and 10% wet.

R.O.W. MARKERS

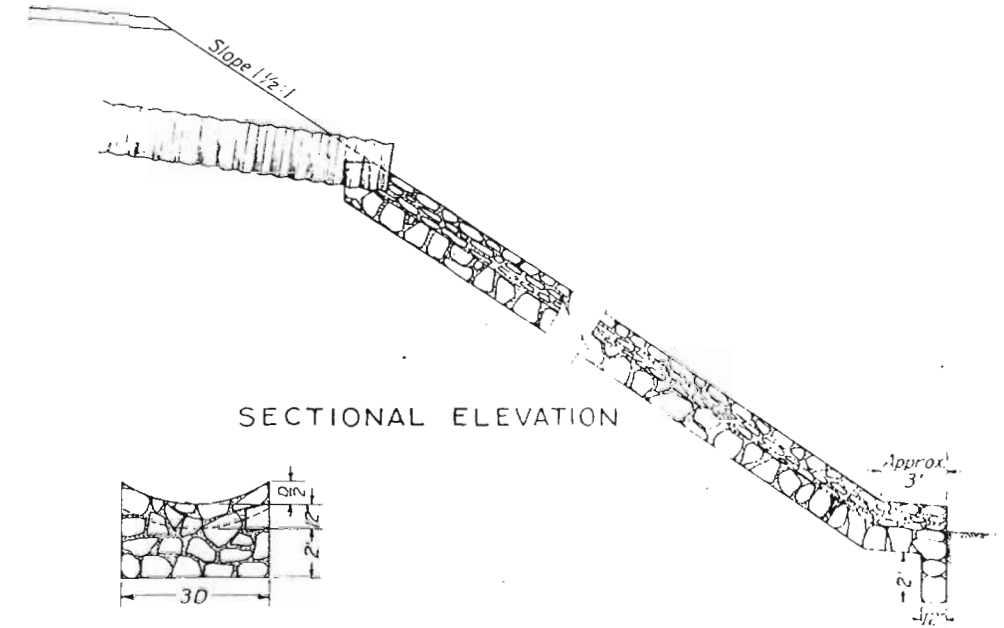
STATION	SIDE	NO.
750+00	Lt. & Rt.	2
764+35	Lt.	1
764+44	Lt.	1
765+10	Rt.	1
772+00	Rt.	1
773+00	Rt.	1
783+45	Rt.	1
783+83	Rt.	1
785+07	Lt.	1
793+31	Lt. & Rt.	2
809+00	Rt.	1
810+00	Rt.	1
819+83.5	Lt.	1
820+828	Lt.	1
829+52	Lt.	1
830+85	Rt.	1
831+20	Rt.	1
838+84.5	Lt. & Rt.	2
840+00	Lt. & Rt.	2
844+72	Rt.	1
845+16	Lt.	1
849+35	Lt. & Rt.	2
TOTAL		27

FENCING REQUIREMENTS

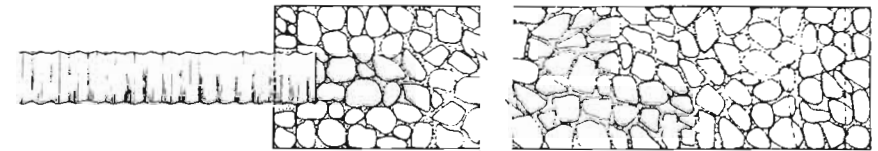
STATIONING	SIDE	REM. FENCE LIN. FT.	B.L.D.B.W. FENCE LIN. FT.	B.W. GATES EACH
774+50 to 783+00	Lt.	850		
774+50 to 803+90	Lt.		2920	
786+00	Lt.			1
790+00	Lt.			1
796+30 to 803+90	Lt.	770		
TOTALS		1620	2920	2

PICKET SNOW FENCE

STATIONING	SIDE	LENGTH LIN. FT.
749+48 to 752+20	Lt.	272
754+30 to 762+90	Lt.	862
754+30 to 765+02	Rt.	1072
763+08 to 777+10	Lt.	1402
772+50 to 780+92	Rt.	842
781+08 to 789+90	Rt.	882
786+10 to 789+92	Lt.	382
797+50 to 804+02	Lt.	652
798+12 to 805+14	Rt.	702
806+68 to 810+00	Lt.	402
TOTAL		7470



END VIEW



SPECIAL GROUDED RUBBLE APRON
STA. 839+00

WIRE CABLE GUARD FENCE & TIMBER GUARD POSTS

STATIONING	SPACING	SIDE	FENCE LIN. FT.	POSTS NO.
752+75 to 754+25	50ft. centers	Rt.		4
753+00 to 754+00	50' "	Lt.		3
792+00 to 796+00	50' "	Rt.		9
803+40 to 806+70	30' "	Lt.		12
810+00 to 811+80	30' "	Lt.		7
810+00 to 820+00	50ft. centers	Rt.	1000	40
820+50 to 840+00	50' "	Rt.		12
843+00 to 848+50	50' "	Rt.		
TOTALS			1000	87

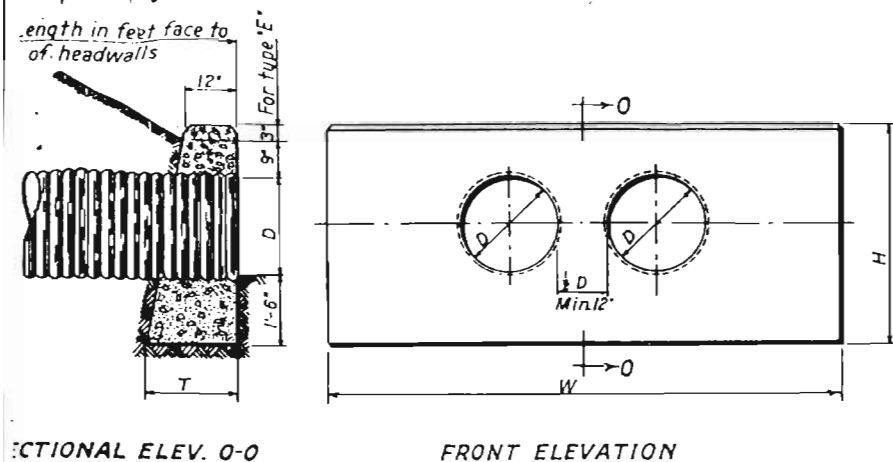
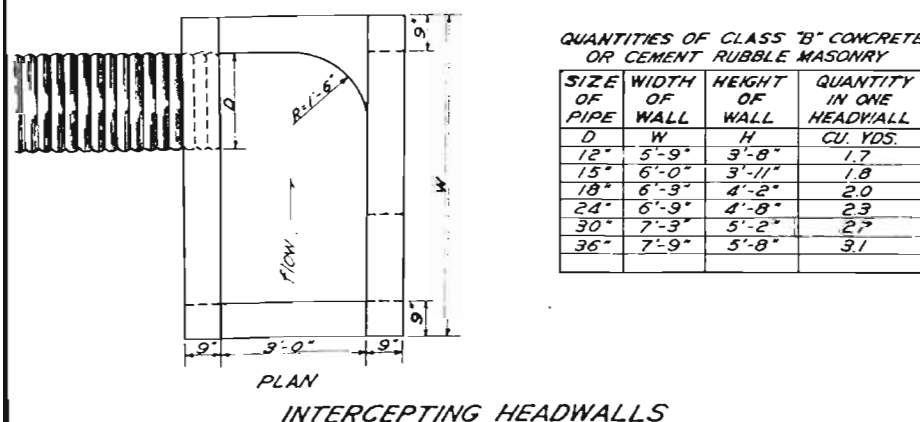
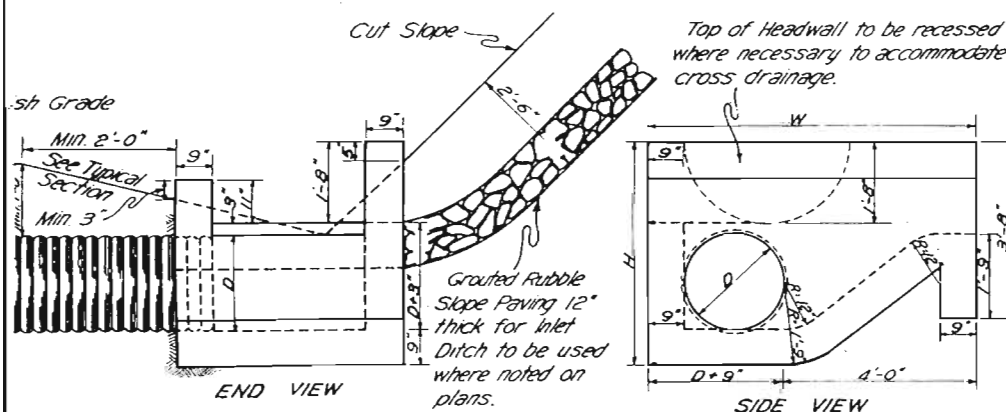


TABLE OF DIMENSIONS & QUANTITIES FOR DOUBLE CORRUGATED METAL PIPE CULVERT & HEADWALLS

D	W	H	T	CL. B' CONCRETE FOR 2 HDWALLS	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY
15"	7'-6"	3'-9"	1'-6"	2.4 CU. YDS.	16 GAGE 2xL = LIN. FT.	
18"	8'-6"	4'-0"	1'-7"	3.0 DO.	14 DO 2xL = DO	
24"	10'-0"	4'-6"	1'-10"	4.4 DO.	12 DO 2xL = DO	
30"	12'-0"	5'-0"	2'-0"	6.7 DO.	10 DO 2xL = DO	
36"	14'-0"	5'-6"	2'-6"	10.8 DO.	8 DO 2xL = DO	
42"	16'-0"	6'-0"	3'-0"	13.6 DO.	6 DO 2xL = DO	
48"	18'-0"	6'-6"	3'-6"			

STD. HEADWALLS FOR DOUBLE CORR. METAL PIPE CULV'S.



QUANTITIES OF CLASS "B" CONCRETE OR CEMENT RUBBLE MASONRY

SIZE OF PIPE	WIDTH OF WALL	HEIGHT OF WALL	QUANTITY IN ONE HEADWALL
12"	5'-9"	3'-8"	1.7
15"	6'-0"	3'-11"	1.8
18"	6'-9"	4'-2"	2.0
24"	6'-9"	4'-8"	2.3
30"	7'-3"	5'-2"	2.7
36"	7'-9"	5'-8"	3.1

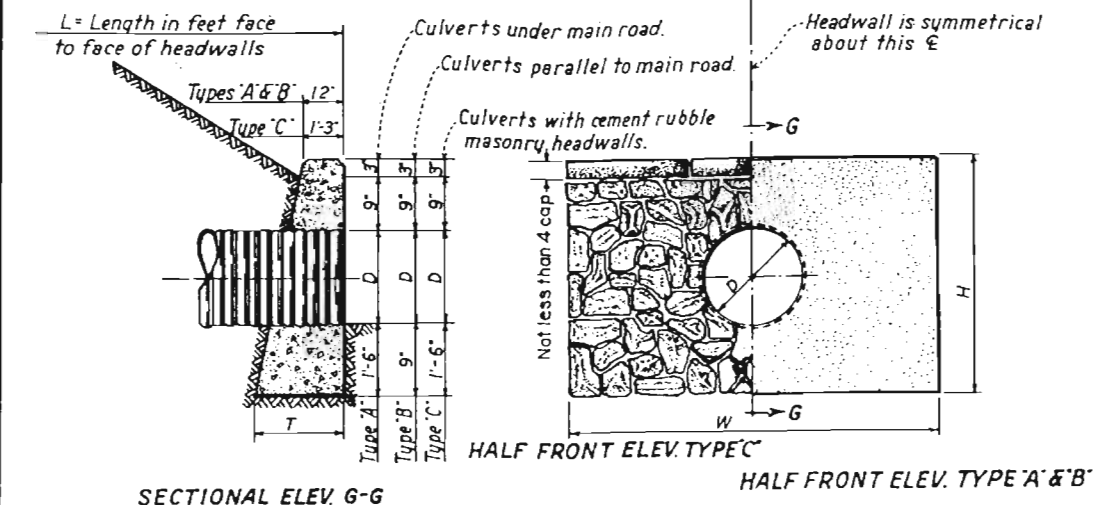
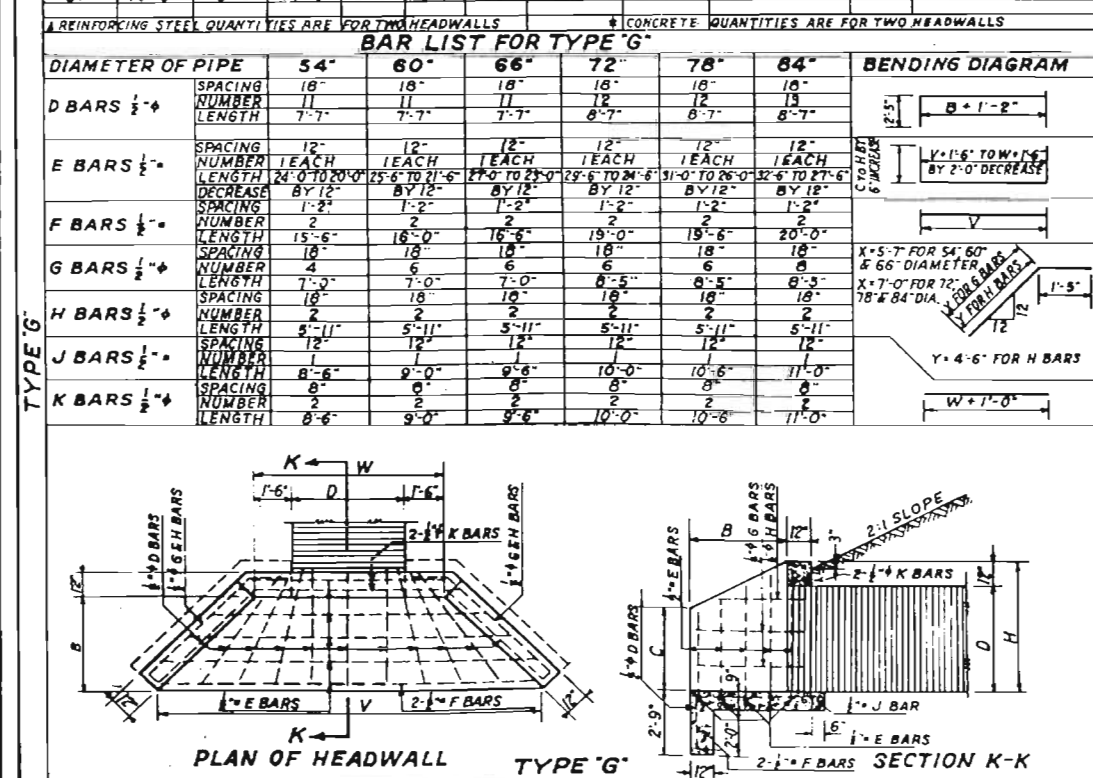


TABLE OF DIMENSIONS & QUANTITIES FOR CORRUGATED METAL PIPE CULVERTS & HEADWALLS

D	W	H	T	CL. B' CONCRETE FOR 2 HEADWALLS	CORRUGATED METAL PIPE	CEMENT RUBBLE MASONRY
12"	4'-6"	3'-6"	1'-5"	1.4 CU. YDS.	16 GAGE L = LIN. FT.	
15"	5'-3"	3'-9"	1'-6"	1.8 DO.	14 DO L = DO	
18"	6'-0"	4'-0"	1'-7"	2.2 DO.	12 DO L = DO	
24"	7'-6"	4'-6"	1'-10"	3.3 DO.	10 DO L = DO	
30"	9'-0"	5'-0"	2'-0"	4.5 DO.	8 DO L = DO	
36"	10'-6"	5'-6"	2'-6"	6.0 DO.	6 DO L = DO	
42"	12'-0"	6'-0"	3'-0"	8.0 DO.		
48"	13'-6"	6'-6"	3'-6"	10.0 DO.		



STD. HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS

STANDARD M-102-E

Revised 10-14-38 P.A.F. - New Intercepting Headwall and Quantities.

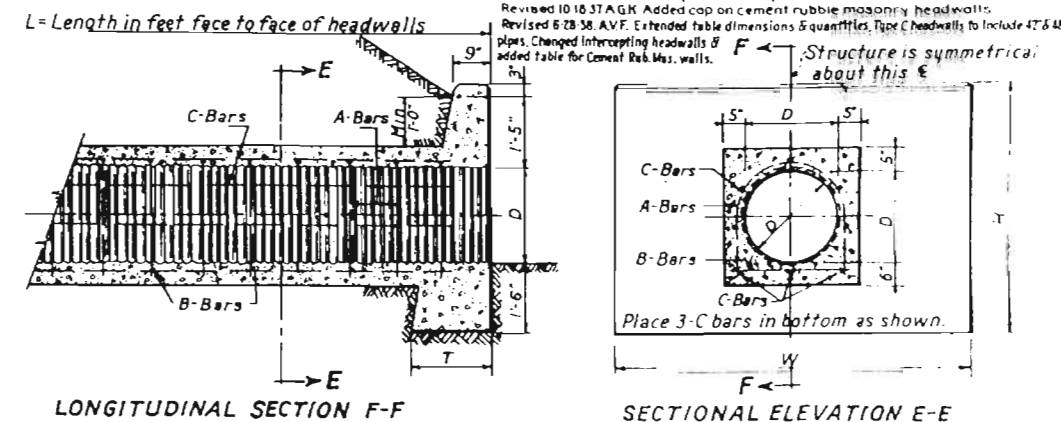


TABLE OF DIMENSIONS & QUANTITIES FOR INCASED PIPE CULVERTS

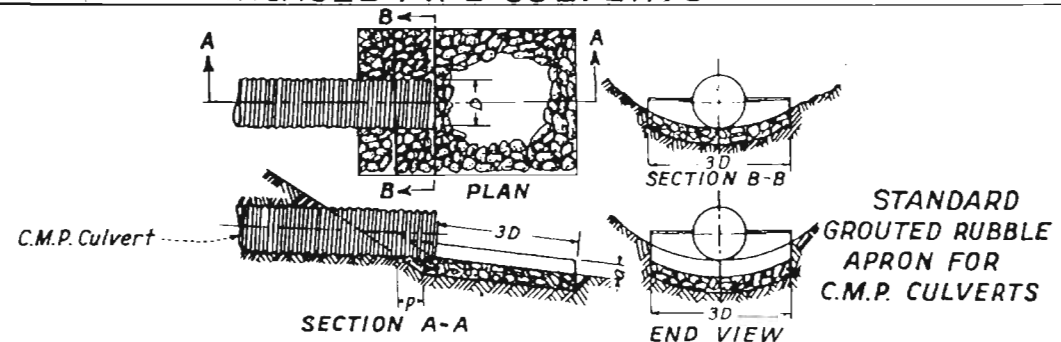
Diameter of pipe	D	12"	15"	18"	24"	30"	BENDING DIAGRAM
Width of headwall	W	4'-6"	5'-3"	6'-0"	7'-6"	9'-0"	
Height of headwall	H	4'-2"	4'-5"	4'-8"	5'-2"	5'-8"	
Width of headwall base	T	1'-7"	1'-8"	1'-9"	2'-0"	2'-3"	
A BARS	SPACING	12"	12"	12"	12"	12"	
B BARS	SPACING	12"	12"	12"	12"	12"	
C BARS	SPACING	12"	12"	12"	12"	12"	
ITEM	DESCRIPTION	UNIT					
46a	Concrete Class "A"	Cu. Yds.	14.0101L	16.0122L	22.0145L	32.0191L	45.0239L
47	Reinforcing Steel	Lbs.	8.96L-16.20L	11.19L-17.20L	11.86L-17.80L	13.19L-18.80L	14.90L-19.40L
53	Galv. Corr. Metal Pipe	Lin. Ft.	L	L	L	L	L

- * Concrete quantities shown above include two headwalls
- When L = 40 feet or more add 10.6 Lbs. for lap in C-bars
- ▼ When L = 40 feet or more add 14.17 Lbs. for lap in C-bars

SPECIAL NOTES

All reinforcing bars shall be 1/2".
Minimum distance E of bar to surface of concrete shall be 2".
Pipe shall be thoroughly cleaned before incasing with concrete.

INCASED PIPE CULVERTS



SQUARE YARDS GROUDED RUBBLE SLOPE & DITCH PAVING "1 FOOT THICK"

FILL	D	15"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
SLOPE	1:1	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1:1 1/2	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
2:1	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
3:1	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
4:1	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0

GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted June 1-1937.
All concrete shall be class "A" except types A & B, which shall be class "B".
All exposed surfaces shall be rubbed free of form marks.
All exposed corners shall be beveled to a 2" face.
All construction joints shall be thoroughly cleaned before fresh concrete is poured.
All walls shall have forms on both sides.
All reinforcing bars shall be deformed.
All reinforcing bars shall be tagged with the station number & letter designation.
Secondary bars when spliced shall be given a lap of 50 diameters.
Main bars shall not be spliced.
Minimum fill over top of culverts shall be 1'-0".
When culvert is skewed, headwalls shall be placed parallel to E of roadway.
Minimum grade of pipe shall be 1%.
For size and location of culverts see sheet No. 2.
Footings in rock shall be poured out to the rock and not formed.

COLORADO
STATE HIGHWAY DEPARTMENT

STANDARD HEADWALLS
INTERCEPTING HEADWALLS
INCASED METAL PIPE CULVERT
WITH HEADWALLS
FOR CORRUGATED
METAL PIPE CULVERTS

Designed by GND
Made by C.S.-A.V.E.
Checked GND-WMM

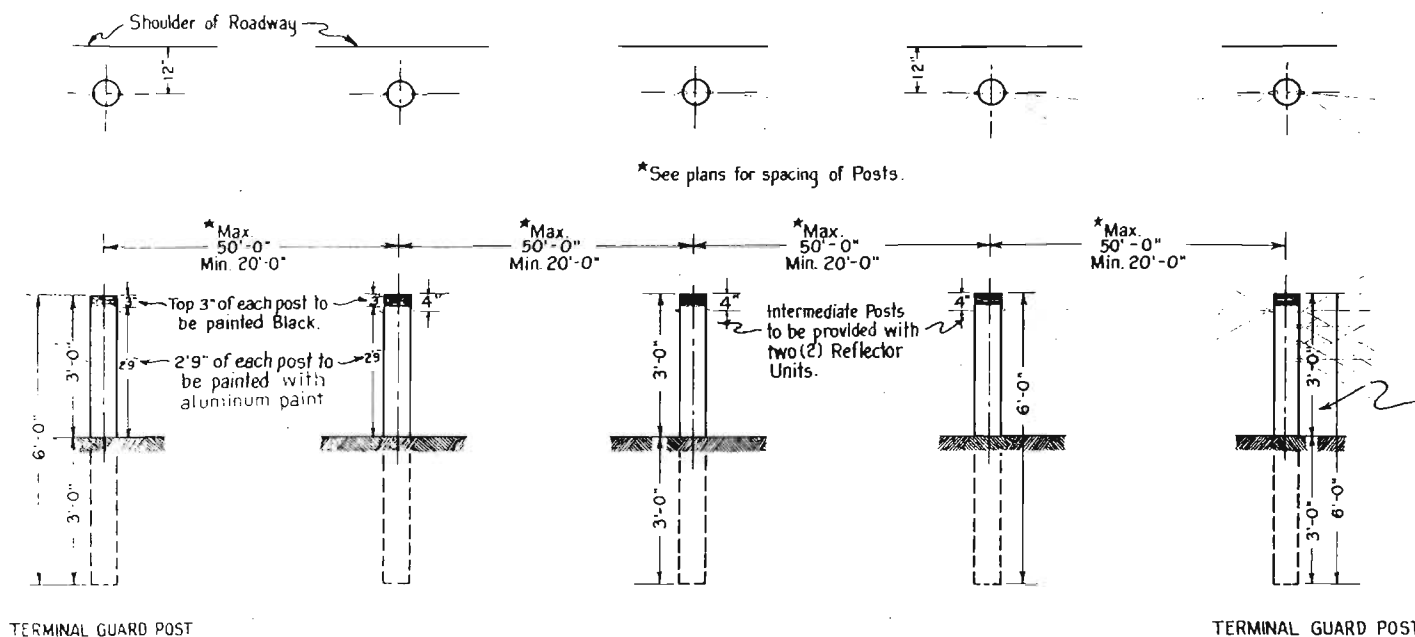
Approved by P. Bailey
Bridge Engineer
Date: April 27, 1937.

STANDARD M-19-A

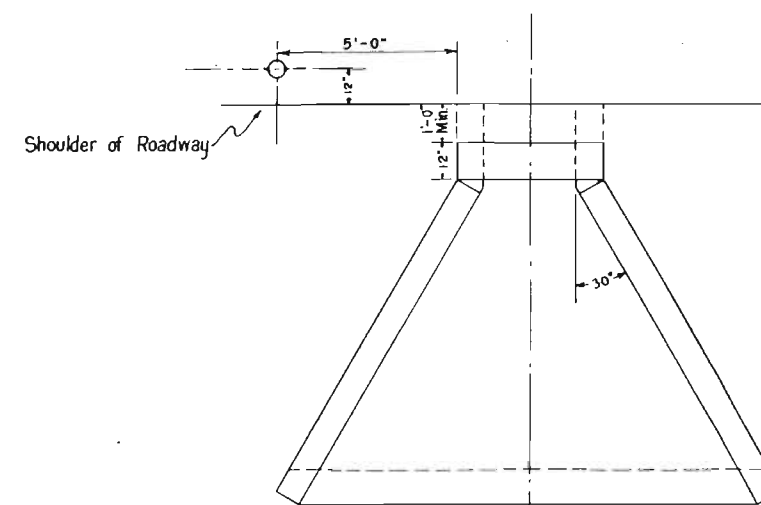
FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	5A(1)	5	

Revised 3-26-37
 Revised 6-1-37 A.G.W. Changed to 1937 Specifications.
 Revised 12-16-37 P.B.B.
 Revised 1-10-38 P.B.B.
 Revised 7-7-38 P.B.B.
 Revised 10-14-38 P.B.B.

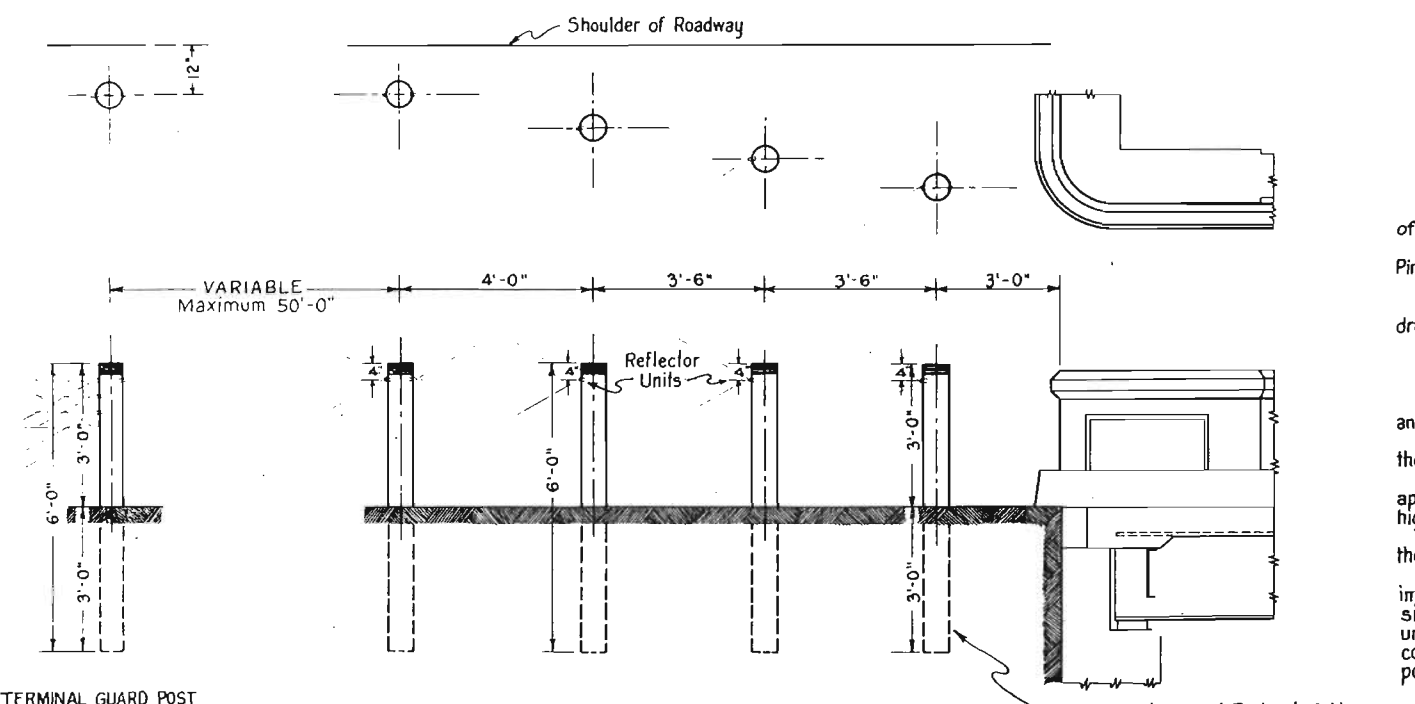
Note: Posts to be required as shown only when Headwalls are within 5 ft. of shoulder of roadway.



SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



SHOWING PLACEMENT AT MINOR STRUCTURES

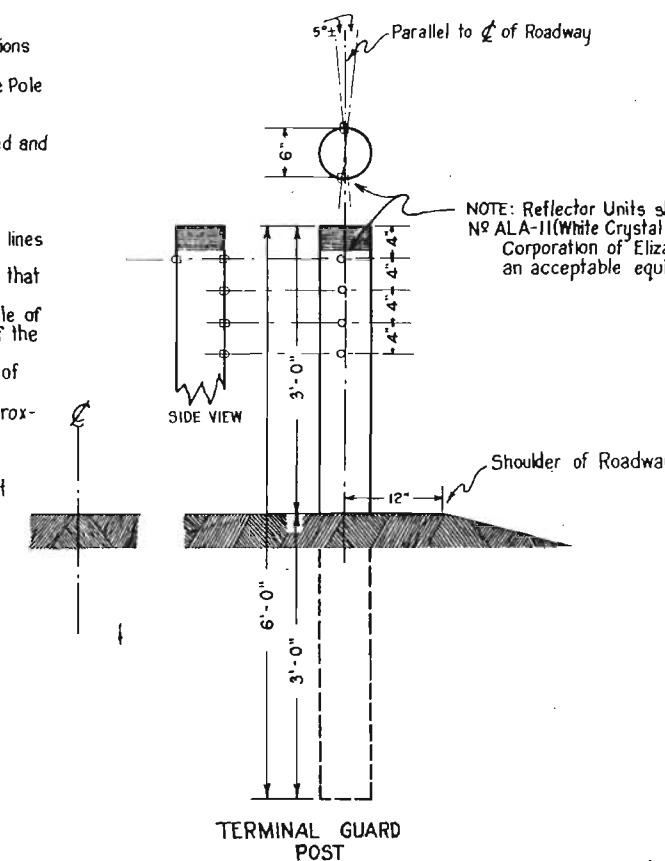


SHOWING PLACEMENT AT BRIDGE APPROACHES

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted on June 1-1937.
 All wood posts shall be made from seasoned, straight, sound, Lodge Pole Pine, Southern Yellow Pine, or West Coast Douglas Fir.
 No section of wood posts shall be less than 6" in diameter.
 All wood posts shall be entirely peeled and shaved, thoroly seasoned and dry, with square tops. Posts shall not be treated.

All wood posts shall be set and tamped in plumb and firm, to the lines and grades as directed by the Engineer.
 Reflector Units in all posts shall be placed in such position that the units will function at a distance of 500 feet.
 On tangents the Reflector Units shall be placed at an angle of approximately five degrees to a line parallel to the center line of the highway.
 In all instances a test shall be made to assure the position of the Reflector Units to be the most effective possible.
 The diameter of holes drilled in the posts shall be drilled approximately one-sixteenth (1/16) inch less than the diameter of the signal button base. In all instances the hole shall be enough undersize that the button when driven into the post shall have complete bond with the post, and be securely locked in correct position.



COLORADO
 STATE HIGHWAY DEPARTMENT
 STANDARD
 TIMBER GUARD
 POSTS

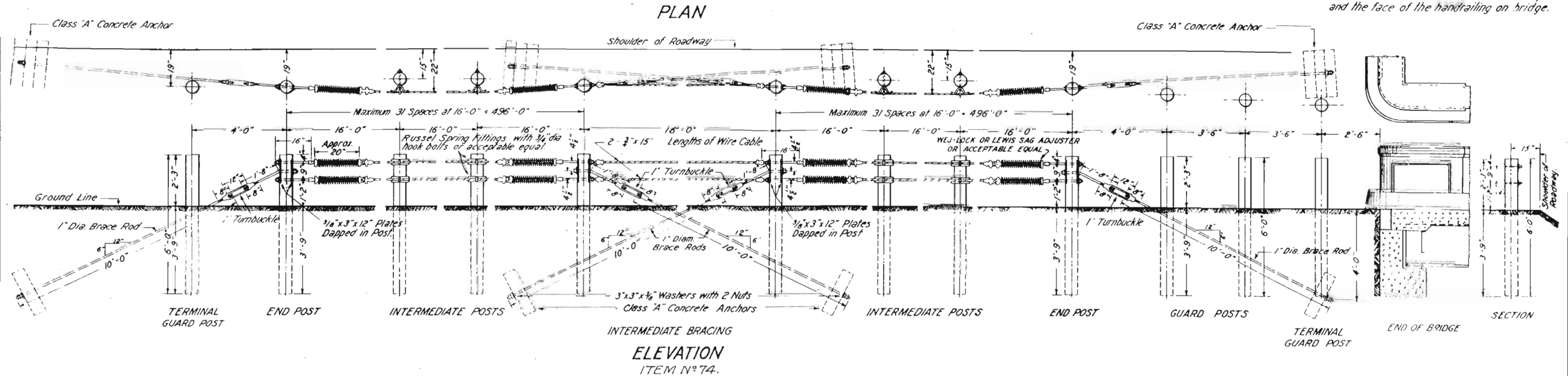
Designed & Made by P.B.B.
 Checked by J.M.
 Approved by J.H. Marshall
 Date: 12, 6 1937

STANDARD M-20-B

REV. 5-18-37 - E.L.A. NOTES RE. BRIDGE & SIDEWALK
Rev. 6-1-37, A.O.G. (1937 Specifications)
Rev. 3-25-38, A.G.H. Added paint note for W.I. posts

FED. ROAD DIST. NO.	STATE	F.A.S.	SHEET NO.	TOTAL SHEETS
3	COLO.	5A (1)	6	

NOTE: The 3 guard posts between the End Post and the end of bridge railings shall be so placed that the faces of the posts are in a direct line between the face of the end post and the face of the handrailing on bridge.



GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1-1937.

The length of guard fence to be paid for and designated on plans shall be measured from terminal guard post to terminal guard post.

When continuous wire cable fence is more than 500 ft. in length it shall have intermediate bracing complete with turnbuckles.

All wood posts shall be made from seasoned, straight, sound Lodge Pole Pine, Southern Yellow Pine, or West Coast Douglas Fir.

No section of wood posts shall be less than 6" diameter.

All wood posts shall be entirely peeled and shaved, thoroughly seasoned and dry, with square tops and all holes to be drilled 1/8" larger than diameter of bolt or rod before treatment is applied.

All wood posts shall be pressure treated with creosote for the full length of posts, as provided for in the Specifications.

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

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

Only one style of eyebolts, turnbuckles, and other fittings may be used on a project.

Turnbuckles on all brace rods shall be so placed that the entire turnbuckle clears the ground line.

All sag adjusters shall be compressed a minimum of 1" @ 100°F to allow for initial tension in the cable. The adjusted amount of compression of springs due to temperature shall be figured in the following manner. For every 10° of temperature below 100°F an additional 1/2" of compression per 100 ft. of cable shall be used. Illustration: Length between end posts-400 ft. Temp. 40°F; $(4 \times 6 \times \frac{1}{2}) + 1 = 13\frac{1}{2}"$.

Sag adjusters and appurtenances shall be either hot dip galvanized or painted with 2 coats of approved aluminum paint. Paint and painting shall conform to requirements of Item 41 of the Standard Specifications.

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

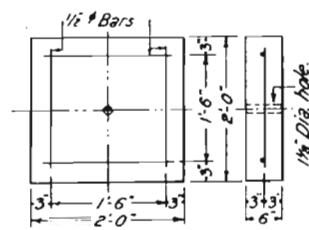
Where Guard Fences are constructed on the approaches to bridges with sidewalks, the cable at bridge shall be placed in line with the face of the curbing on the bridge.

Note!

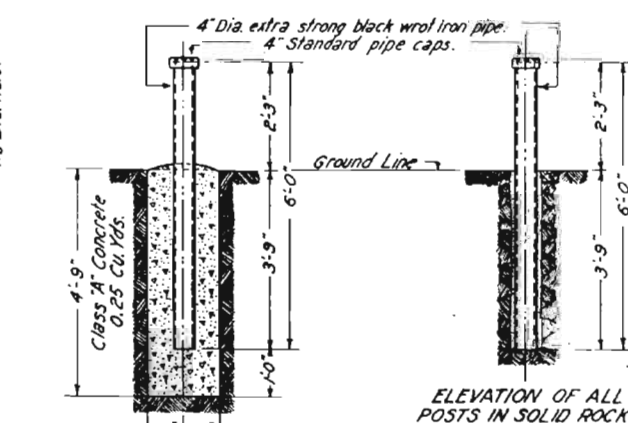
All wrought iron posts shall have one shop coat, red lead, and two coats aluminum as specified under item N° 41.

NOTE: Holes in rock shall be constructed as near as possible to diameter of pipe the remaining space between pipe and wall of hole to be filled with cement grout.

Holes necessary for type of fence used shall be drilled in pipe posts.

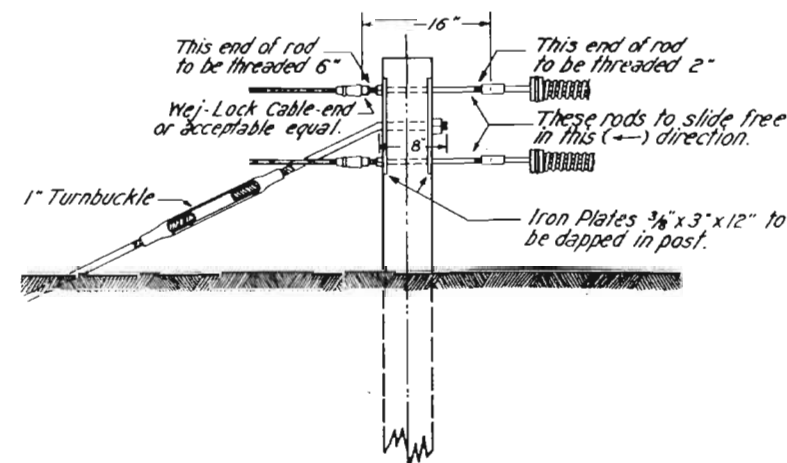


Class "A" Concrete
DETAIL OF ANCHORS



ELEVATION OF ALL POSTS IN
MATERIAL OTHER THAN SOLID ROCK

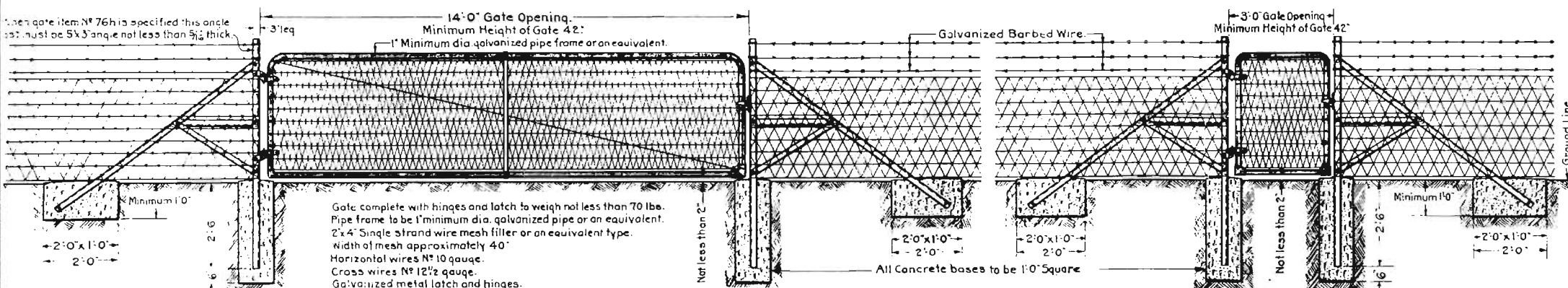
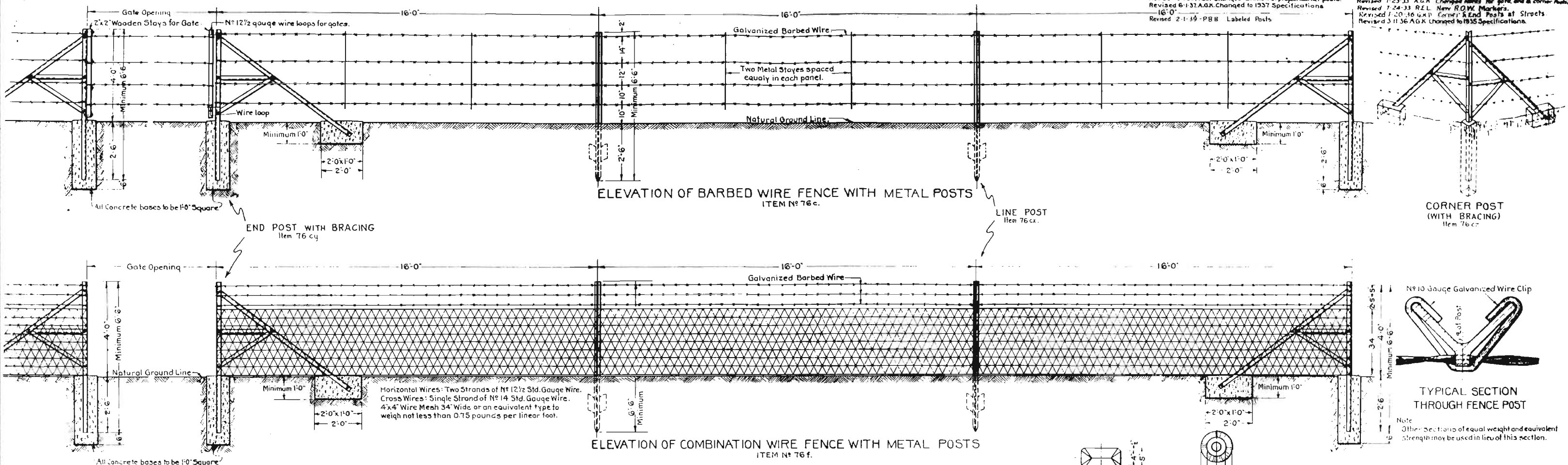
DETAILS FOR WROUGHT IRON PIPE
ITEM N° 74b.



SIDE VIEW OF POST AT
INTERMEDIATE BRACING

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
WIRE CABLE GUARD
FENCE

Designed by R.L.
Made by P.B.B.
Checked by
Approved by
Date May 5, 1937



GENERAL NOTES FOR WIRE FENCES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, Adopted June 1-1937.

Barbed wire shall be of standard make, not lighter than No. 12 1/2 gauge galvanized and with two point barbs spaced not more than 5" apart.

Wire mesh must be galvanized and not lighter than shown and noted on this plan.

Four Corner Posts and four Endposts shall be used at each structure over 4' x 4' in size and fence turned in and ended at wings.

All line posts to be structural steel to weigh not less than 200 lbs. per lineal foot.

Suitable anchor plates shall be securely riveted or welded to each line post.

All line posts to be painted with an approved waterproof asphalt or mineral paint or hot dip galv.

All corner, end and gate posts including braces to be structural steel 2' x 2' x 1/4" angles to weigh not less than 3.15 lbs. per lineal foot, and to be painted with an approved waterproof asphalt or mineral paint or hot dip galvanized, except post supporting driving gate item No. 76h.

At all places where intersecting fences are encountered an end post is to be placed with the angle arm at right angles to the line of fence.

All footings or bases shall be of class 'A' concrete with crowned tops and shall be included in the price bid per lineal foot of fence with metal posts.

If three braces are omitted from end, corner and gate posts the vertical post must be at least 2' x 2' x 1/4".

Gate complete with hinges and latch to weigh not less than 19 lbs.

Pipe frame to be 3/4" minimum dia. galvanized pipe or an equivalent.

2' x 4" Single strand wire mesh filler or an equivalent type.

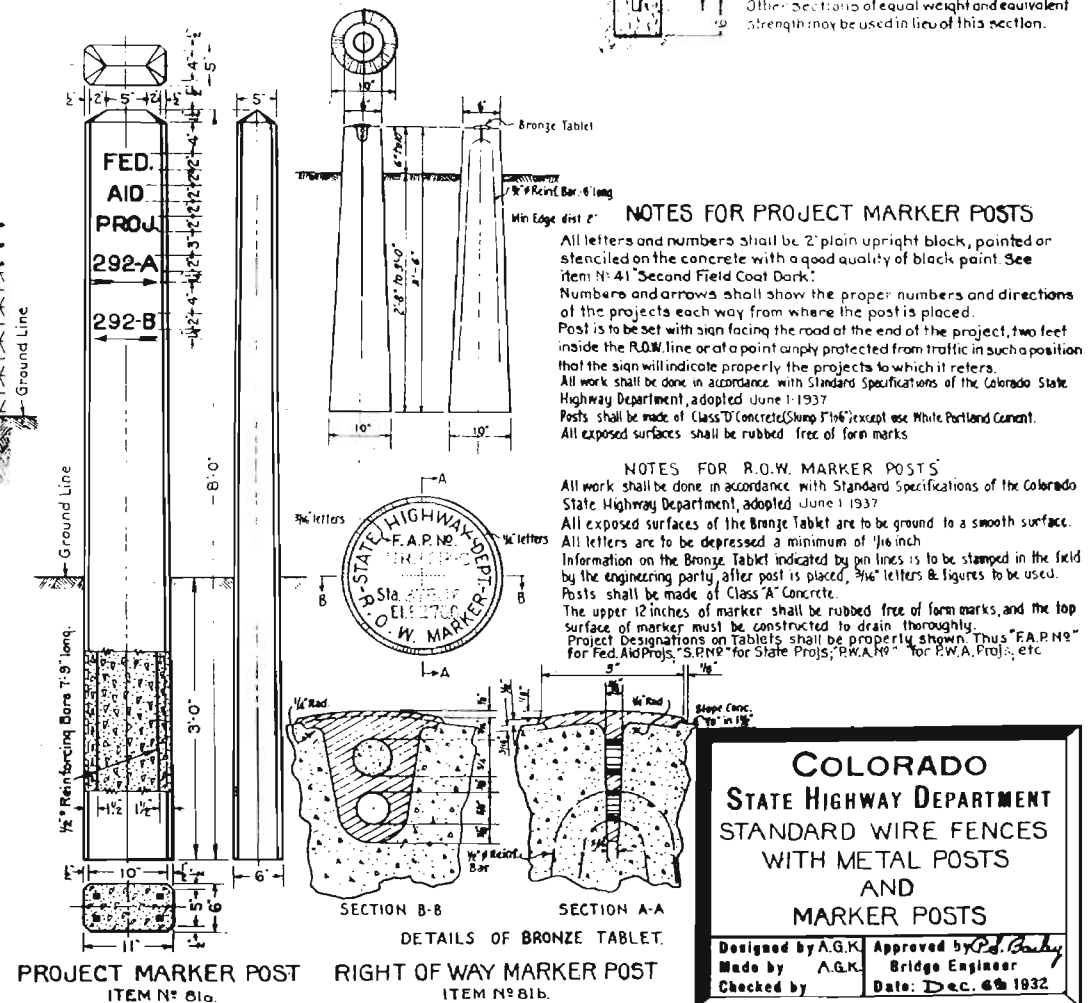
Width of mesh approximately 40".

Horizontal wires No. 10 gauge.

Cross wires No. 12 1/2 gauge.

Galvanized metal latch and hinges.

ELEVATION OF WALK GATE
ITEM No. 76i.

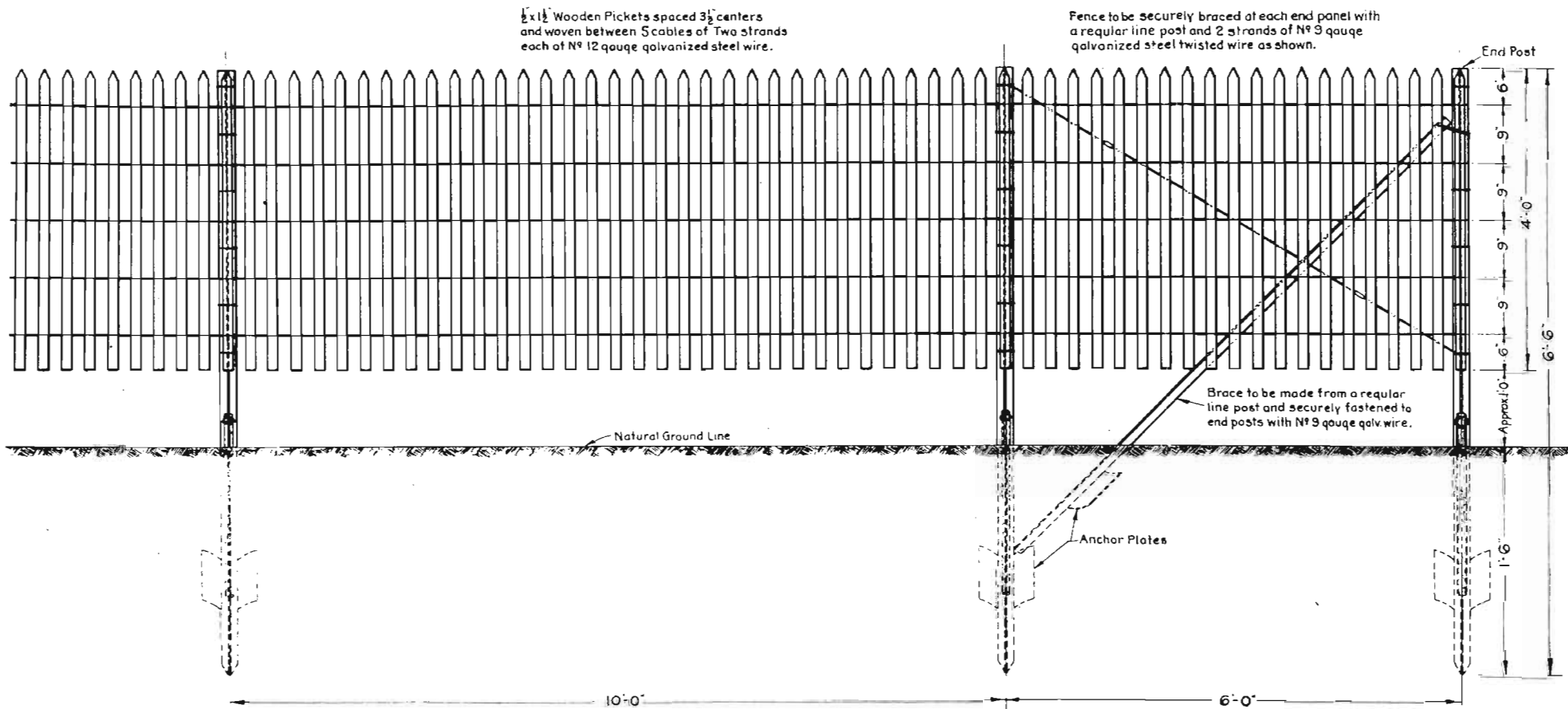


COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD WIRE FENCES
WITH METAL POSTS
AND
MARKER POSTS

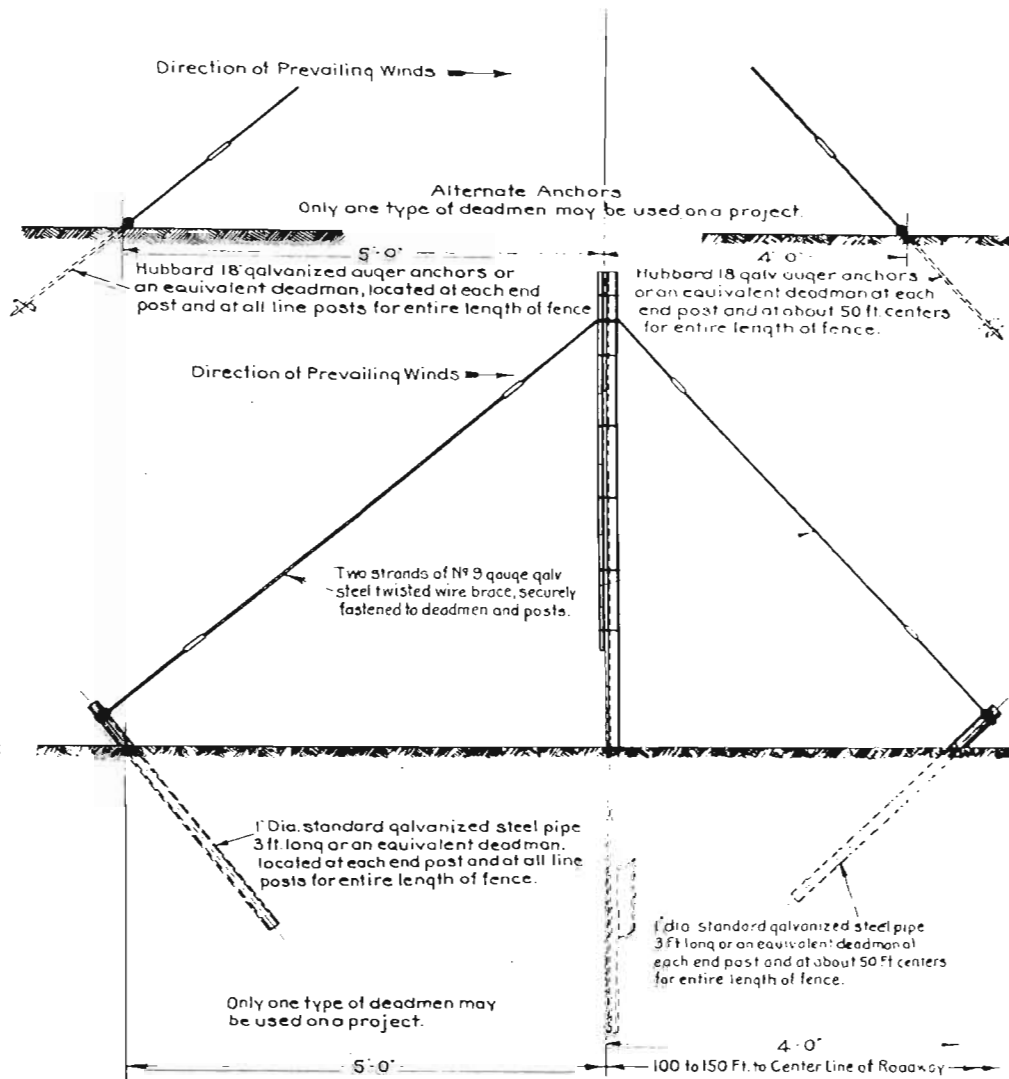
Designed by A.G.K. Approved by P. J. Bailey
Made by A.G.K. Bridge Engineer
Checked by Date: Dec. 6th 1932

FED. ROAD DIST. No.	STATE	F.A.S. PROJ. No.	SHEET No.	TOTAL SHEETS
3	COLO.	5A(1)	8	

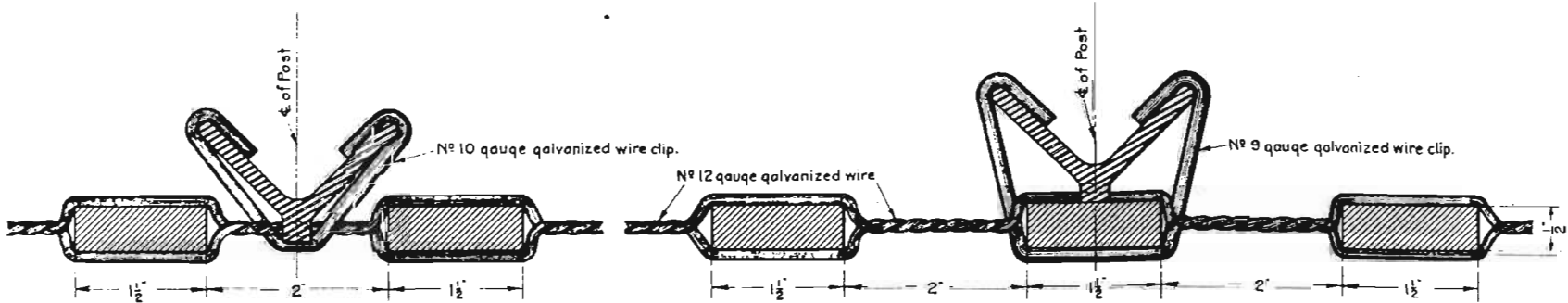
Revised 1-15-33 A.G.K. Changed Length of Posts A General Note
Revised 3-11-36 A.G.K. Changed to 1935 Specifications
Revised 6-1-37 A.G.K. Changed to 1937 Specifications
Revised 3-24-38 A.G.K. Added Hubbard auger anchors



FRONT ELEVATION OF PICKET SNOW FENCE
ITEM No 77



END ELEVATION



TYPICAL SECTIONS THROUGH SNOW FENCE POST AND PICKETS

Note:
Other sections of steel posts having equal weight and equivalent strength may be used in lieu of this Section.

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of The Colorado State Highway Department, Adopted June 1-1937.
Picket Fence is to be stretched tight and securely fastened to all posts with galvanized clips or No 9 galvanized steel wire.
All pickets shall be painted with a mineral preservative or brush treated with creosote oil as specified in item No 42 of the specifications.
All fence posts to be hot dip galvanized and to be manufacturers heavy section type with anchor plates to weigh not less than 2 Lbs. per lin. Ft. Fence posts may be painted with an approved waterproof asphalt or mineral paint in lieu of hot dip galvanized.
Suitable anchor plates shall be securely riveted or welded to each line post.

COLORADO
STATE HIGHWAY DEPARTMENT
STANDARD
PICKET SNOW FENCE
WITH STEEL POSTS

Designed by A.G.K. Approved by P.D. Bailey
Made by A.G.K. Bridge Engineer
Checked by Date: Dec 3rd 1937

Initial Date

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

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

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

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

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

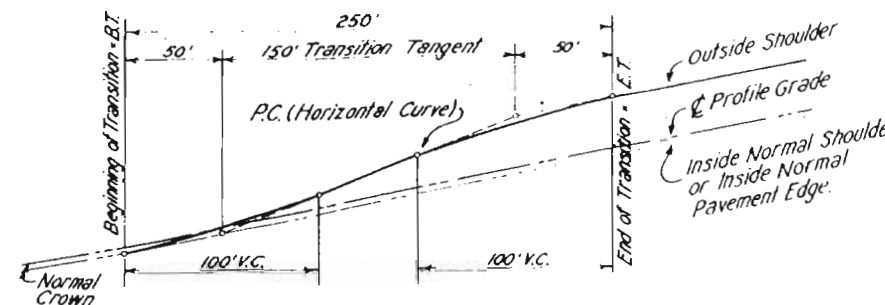
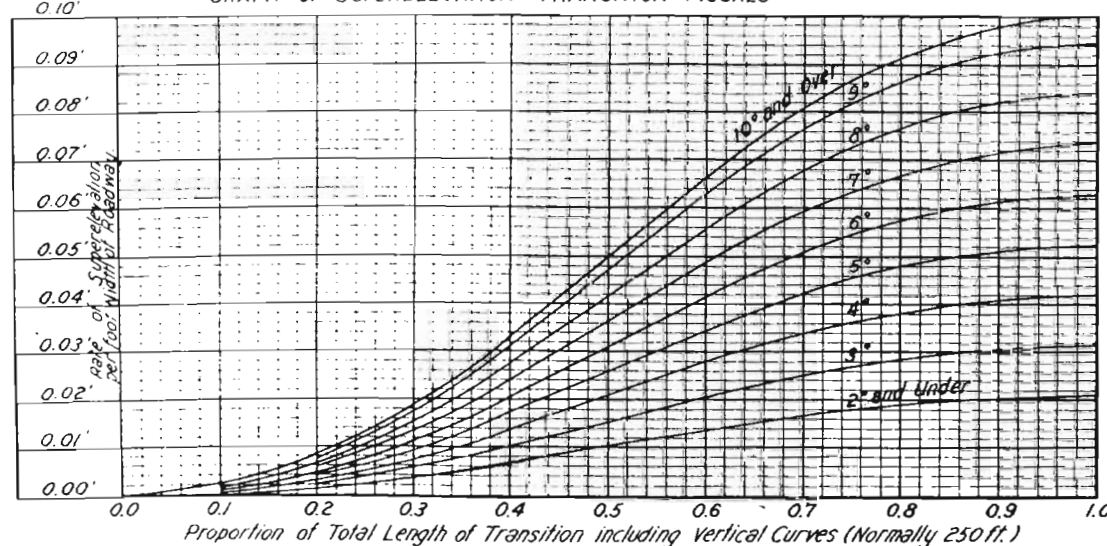
PAVEMENT SECTION

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°	0.06	0.24	0.54	0.96	1.50	2.16	2.94	3.84	4.86	6.00

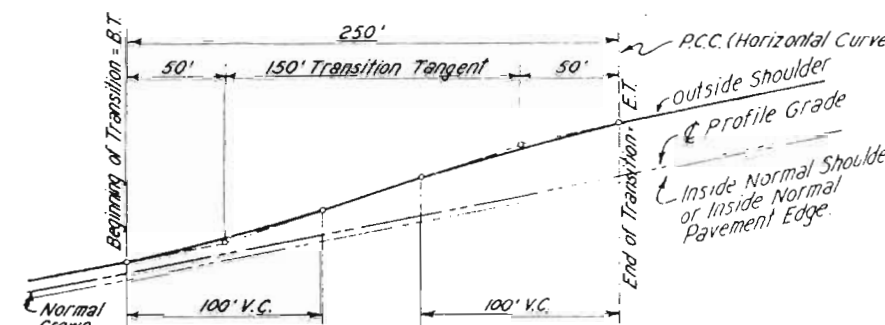
GRAPH OF SUPERELEVATION TRANSITION FIGURES



CASE I: SIMPLE CURVE WITH UNLIMITED TANGENT APPROACH

NOTE: CASE I

The transition in this case, from crowned section to superelevated 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 superlevation at a point 100 ft. inside the curve.



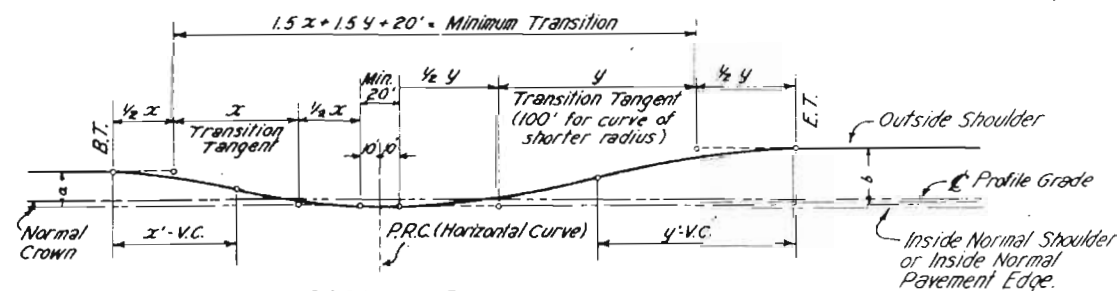
CASE II: COMPOUND CURVE

NOTE: CASE II

Superelevation transitions at the outside ends of compound curves shall be constructed in accordance with rules given under CASE I.

Superelevation transition between the arcs of different radii shall be made as in CASE I, except that the entire transition shall lie within the limits of the curve of the longer radius.

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



CASE III: REVERSE CURVES

NOTE: CASE III

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

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

EXAMPLE: Let a represent the amount of superlevation on 1st curve;

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

" x " " " " " 2nd " "

" y " " " " " 2nd " "

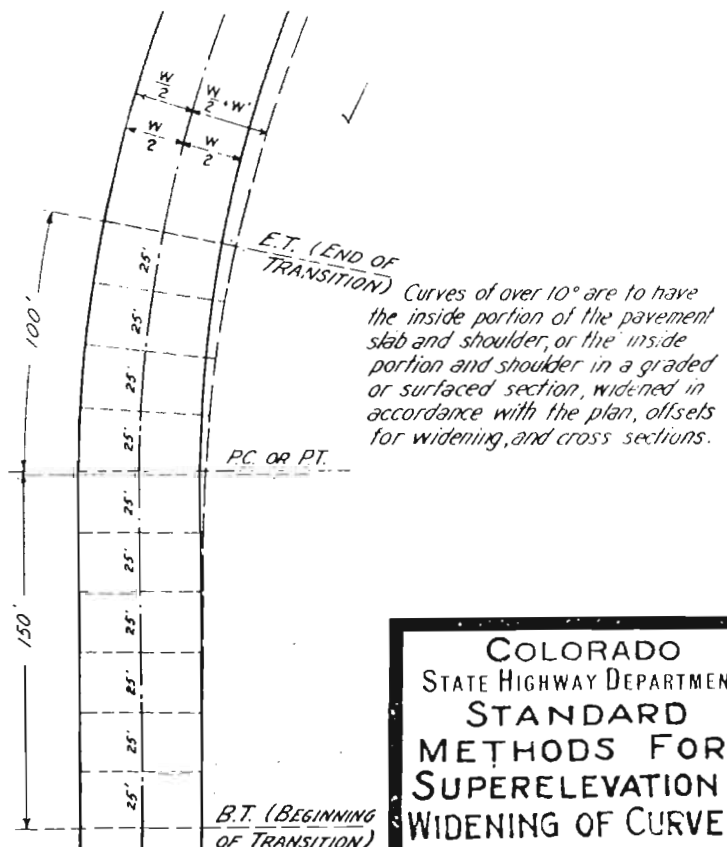
then, $a:b = x:y$.

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.C. shall be used.

In cases where curves in opposite directions are in such proximity that a standard transition can not be had, the practice outlined for true reversing curves shall be used.

The total distance between the P.T. of the first curve and the P.C. of the succeeding curve shall be prorated into the transition distance of the respective curves until a maximum of 150 ft. of transition tangent for each curve is achieved.



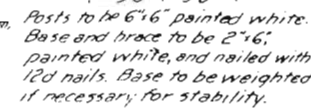
GENERAL PLAN OF WIDENING

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

Designed by R.E.L. Approved by
Checked by P.B.B. Date FEB. 23RD 1937

FED ROAD DIST. NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	5A(1)	10	

Revised 6-137 A.A.R. changed to 1937 Specifications



Hand-drawn cross-section diagram of a road project. The diagram shows a central section labeled "12 ft FILL" and "12 ft CUT". To the left, a "Farm Road" is shown with a "16 ft" width and a "1/2 CUT". To the right, a "Publicized Approach" is shown with a "10 ft" width and a "16 ft" cut. The "Shoulder Line of Project" is indicated. Dimensions include "20 ft RADIUS" for the curves and "20 ft" for the width of the approach. A note states "Side Drains to be placed at least 20' from shoulder". A scale bar at the bottom indicates "1 inch = 20 feet".

Hand-drawn diagrams illustrating the cross-sections of a road for a 1/2 cut section and a 1/2 fill section.

1/2 CUT SECTION:

- Vertical Curve: 40' (20' + 20')
- Grade: 0.0%
- Shoulder: 20'
- Not steeper than 8%

1/2 FILL SECTION:

- Vertical Curve: 40' (20' + 20')
- Grade: 2%
- Shoulder: 20'
- Not steeper than 8%

The diagram illustrates a road cross-section with a central 'CUT SECTION' and a 'FILL SECTION'. The road is shown with a 0.0% grade. The cut section on the left has a 30' vertical curve with a 10% grade, a 20' shoulder, and a 'Not steeper than 8%' slope. The fill section on the right has a 30' vertical curve with a 10% grade, a 20' shoulder, and a 'Not steeper than 10%' slope. The road is labeled 'Not steeper than 8%' and 'Not steeper than 10%'.

All Work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, dated June 1, 1937.

Whenever traffic is permitted on a road while under construction, the Contractor shall at all times adequately and appropriately mark any and all hazards on the Project with well painted, well maintained barricades, and standard caution and warning signs. The Contractor shall also mark with standard directional signs any places where the direction of the flow of traffic is not plain.

Whenever traffic is prohibited from a Project under construction, the Detour will be marked by the Department and the barricades at either end of the Project shall be erected and maintained by the Contractor.

All signs and barricades shall be immediately moved, added to, removed, or changed to appropriately mark hazards, or conditions altered, corrected, or changed by construction progress.

The Contractor shall furnish:

- (1) All barricade material. It shall always be well painted, as per sketch, and well maintained.*
- (2) A reflectorized arrow of an approved type for each barricade at the ends of the Project, and at other barricades required where traffic is permitted on road under construction.*
- (3) "SLOW-ROAD UNDER CONSTRUCTION" signs as required.*
- (4) Any special signs the Department may deem necessary for the protection of traffic over the Project.*
- (5) At least three (3) flares or torches for each barricade, and other flares to illuminate such signs as are called for on these plans, or as the Department may direct.*

Flares or torches shall be placed between 3 and 5 feet ahead of the sign or object to be illuminated, and shall be kept burning from sunset to sunrise.

Costs of all of the foregoing materials and work by the Contractor shall be included in the original contract prices for the Project.

The Highway Department will furnish all standard signs not required to be furnished by the Contractor.

Designed by J.S.M. K.A.K.	Approved by <i>J. Marshall</i>
Made by S.B.L.	Date: Aug. 20, 1935
Check J.S.M.	
Check K.A.K.	

This distance to be governed by the maximum day and night visibility which is influenced by grade, curvature, interference of local signs, shrubbery, fences, etc.

Exact location is to be staked by the Engineer, but in no case shall it be more than 8 feet from the travelled zone.

The diagram shows a road layout with a 'SLOPE' sign and a '10 ft. zone' indicated. A dashed line represents the edge of the road, and a solid line represents the travelled zone. A 'SLOPE' sign is shown on the right side of the road. A '10 ft. zone' is indicated by a dashed line and an arrow pointing to the travelled zone.

Technical drawing of a double-headed arrow. The drawing includes the following dimensions and features:

- Total length: $2' 7''$
- Arrowhead width: $6''$
- Tail width: $5 \frac{3}{4}''$
- Shaft width: $1 \frac{1}{2}''$
- Shaft height: $10''$
- The shaft contains a series of dots along its length.
- The arrowhead and tail are pointed.

→ 2 Contractor shall be required to have at least two such arrows for use on barricades at the needs of each project.

Reflector Buttons shall be of a type and size, and the sign shall be subject to Department approval.

Sufficient distance for one traffic lane

20' 110'

4'0" Min

6" 6" Posts

CAUTION

ROAD CLOSED

This installation may also be used to emphasize standard caution signs.

A diagram of a rectangular sign with dimensions and text. The sign is 5'0" wide and 3'4" high. The text on the sign is:

- SLOW** (in large, bold, sans-serif capital letters, underlined)
- ROAD UNDER** (in large, bold, sans-serif capital letters)
- CONSTRUCTION** (in large, bold, sans-serif capital letters)
- CONTRACTOR'S NAME** (in smaller, bold, sans-serif capital letters, centered below the main text)

The sign is shown with a dashed line indicating the placement of the text. The dimensions are indicated by arrows and numbers: 5'0" for the width and 3'4" for the height. The text is arranged in four lines, with the first line being the largest and the last line being the smallest.

Sign to be made on 1" material with at least three cleats on the back. Background to be white, SLOW and underline to be red, and other lettering to be black. Sign to be set on 2'-6" x 6" posts 4 ft. in the ground.

The maximum grades shown are to be the limiting grades for all except extreme cases.

When the length of the approach as determined by the intersection of these grades with the natural ground is such as to damage the Property so served, or cause unreasonable conditions, the grades may be modified.

In such cases, methods used, and maximum grades, shall be as indicated on the plans, or provided by work order

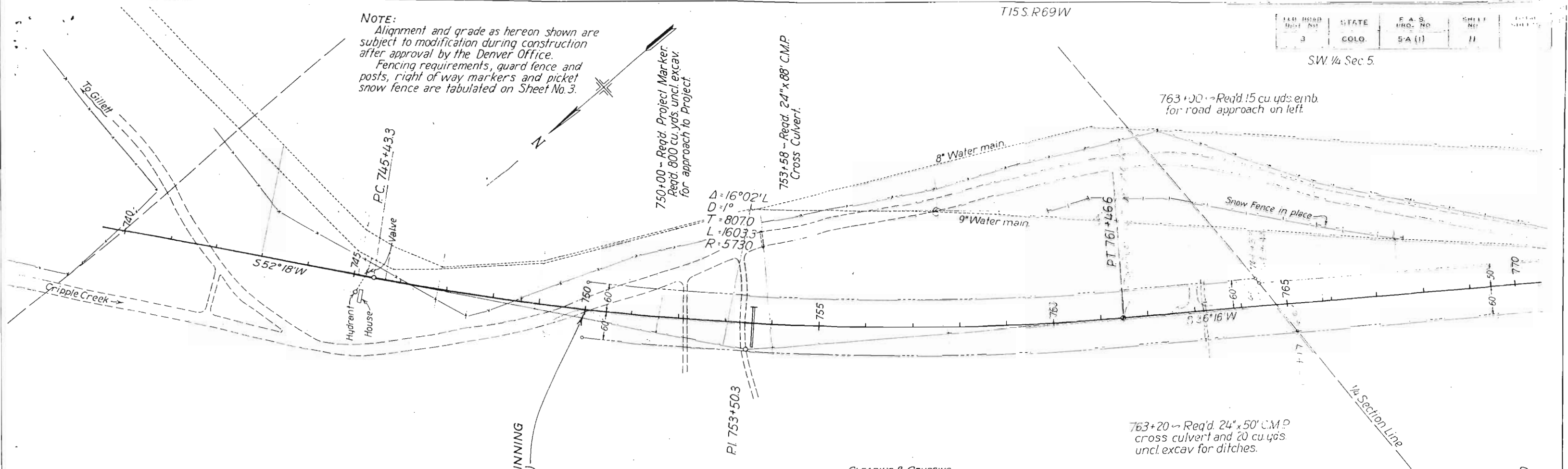
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T15S.R69W

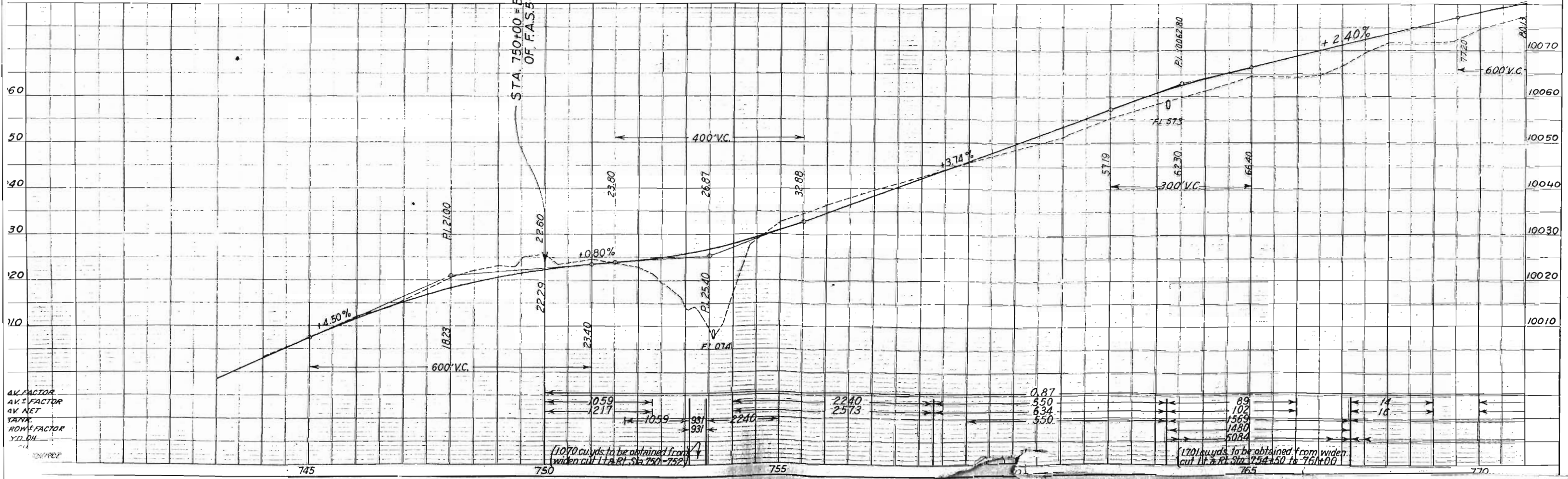
FILE NO.	STATE	F.A.S. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	5-A (1)	11	

SW 1/4 Sec 5.

NOTE:
Alignment and grade as hereon shown are subject to modification during construction after approval by the Denver Office.
Fencing requirements, guard fence and posts, right of way markers and picket snow fence are tabulated on Sheet No. 3.



N.W. 1/4 Sec. 5
CLEARING & GRUBBING
763+00 TO 770+00 - LIGHT CLEARING



AV. FACTOR
AV. 2 FACTOR
AV. NET
TANK
ROW FACTOR
Y.D. BY
C.M.

(1070 cu. yds. to be obtained from
widen cut 17.8 ft. Sta. 750-752)

(1701 cu. yds. to be obtained from widen
cut 17.8 ft. Sta. 754+50 to 760+00)

S.W. 1/4 Sec. 5.

T153 R69W

