

FED. ROAD DIST. NO.	STATE	P. W. A. PROJ. NO.	SHEET NO	TOTAL SHEETS
3	COLO.	245-D-R	1	

Rev. Guard Fence 6-14-37 J.P.K.

COLORADO STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED P. W. A. DOCKET COLO. 804-D PROJECT NO. 245-D-R STATE HIGHWAY NO. 650 BENT COUNTY

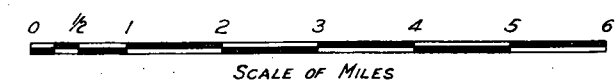
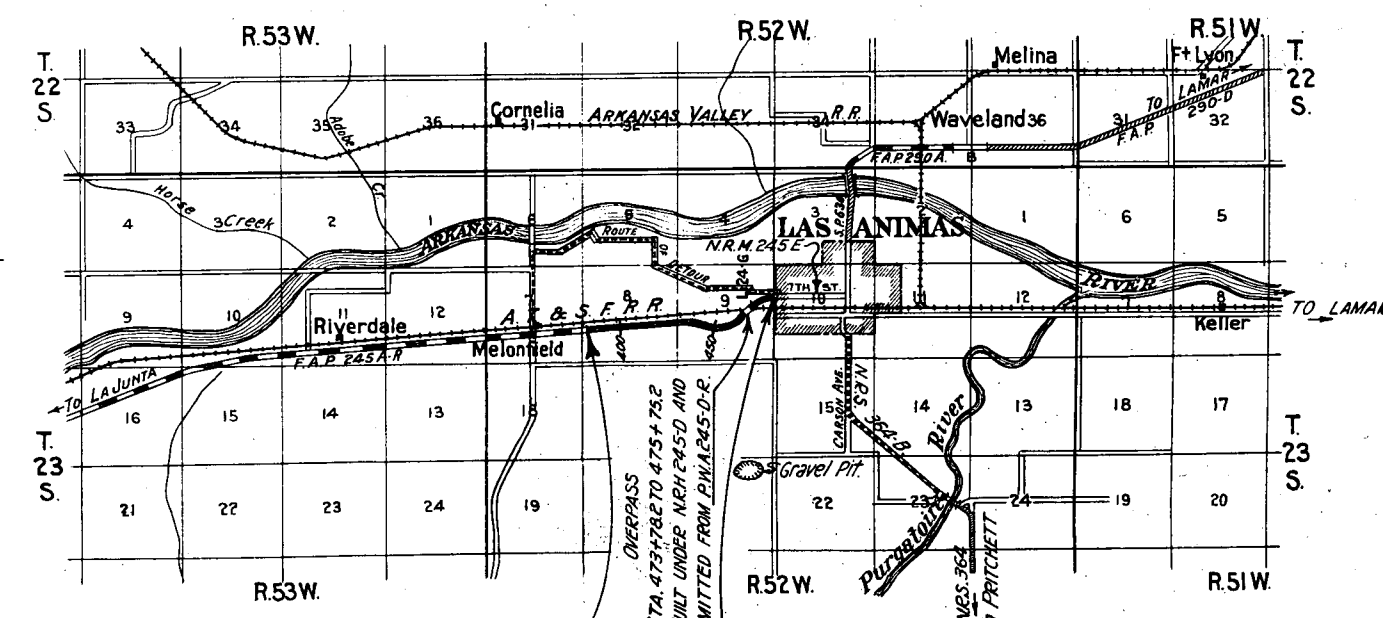
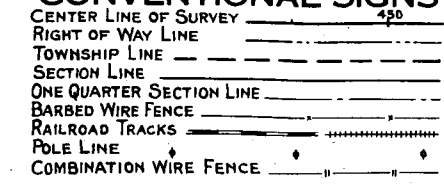
SCALES OF ORIGINAL TRACINGS

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 10,910.4 FEET = 2.066 MILES
NET LENGTH OF PROJECT 10,713.4 FEET = 2.029 MILES

INDEX OF SHEETS

- SHEET NO 1 TITLE SHEET AND SKETCH MAP
- 2 TYPICAL CROSS SECTION AND SUMMARY OF QUANTITIES
- 3 DETOUR REQUIREMENTS
- 4 STANDARD CONCRETE PAVEMENT JOINT DETAILS M & A
- 5 } NOT USED
- 6 }
- 7 STANDARD METHODS FOR SUPERELEVATION AND WIDENING OF CURVES M, 1 B
- 8 TYPICAL SIDE APPROACH ROADS/ROADWAY CONSTRUCTION TRAFFIC SIGNS (P.W.A) M 2 BX
- 9 TO 11 ALIGNMENT PLAN AND PROFILE
- 12 TO 22 CROSS SECTIONS

CONVENTIONAL SIGNS



STA. 383+75 STA. 492+48.2
BEG. OF P.W.A. NO. 245-D-R END OF P.W.A. NO. 245-D-R

NOTE

It is recommended that the bidders on this Project go over the plan details with one of the following field representatives of this department:

James D. Bell	Div. Engr.	Pueblo
J.A. Salmonson	Res. Engr.	Las Animas

RECOMMENDED FOR APPROVAL
J. Salmonson
ASSISTANT ENGINEER

APPROVED
Chas. V. Vane
STATE HIGHWAY ENGINEER

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 August 1, 1935.

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

All roadway excavation required to construct the project is to be obtained as indicated on the plans. Quantities involved beyond the limits of ditch as shown on the Typical Section, either noted on profile as "Borrow" or on Tabulation of Structures as "Excavation" and "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 as shown, are subject to change by the Engineer to fit embankment requirements actually encountered in construction.

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

Except as noted on the plans overhaul will be paid as measured along center line of project.

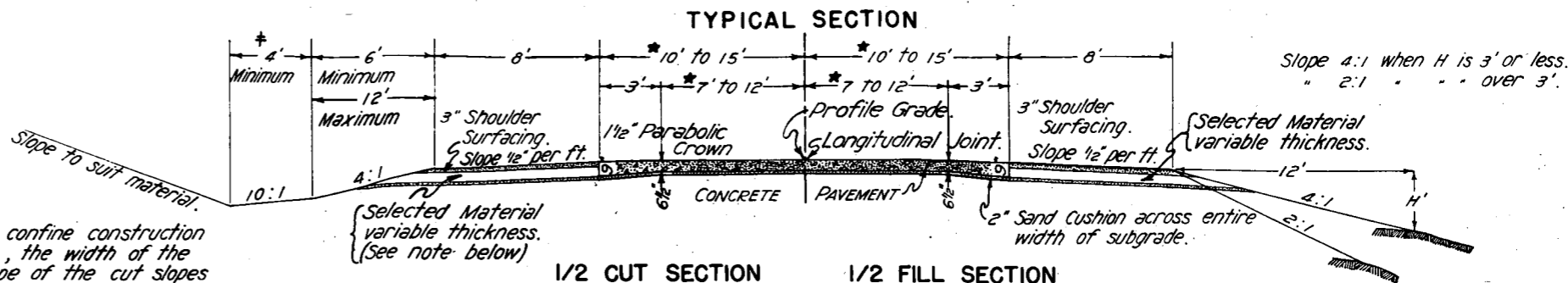
All side approach roads to the project shall be gravel surfaced with a 4" thickness of "Gravel or Crushed Rock Surfacing" extending approximately 30 feet from edge of highway. It is estimated that approximately 200 tons of surfacing material will be required for these road approaches.

The entire project is to be cleared for the full width of the Right of Way and the cost thereof included in the "Lump Sum" price for Clearing & Grubbing the entire project.

The detour shall be along the route indicated on the title sheet.

The Contractor shall at his own expense construct and maintain in safe condition all temporary approaches to and crossings of intersecting roads.

At the expense of the State, the Contractor shall make the detour improvements shown in the tabulation on sheet No. 3.



* Where necessary to confine construction within the right of way, the width of the roadway ditch and slope of the cut slopes may be modified.

NOTE:-

Whenever the distance from the present oil surfacing to the under side of proposed pavement is more than two inches, the additional depth is to be filled in by increasing the thickness of the sand cushion.

The sand cushion to be placed outside of the concrete pavement shall be uniformly two inches in thickness.

The subgrade under the sand cushion shall be so graded that there shall be at every cross section a grade of at least 0.02' per foot toward the outside of the roadway embankment. Therefore the space between the top of the sand cushion and the under side of the shoulder surfacing, which is to be filled in with selected material, will be variable in thickness.

The cost of grading and blading the subgrade shall be included in the unit price bid per cubic yard for "Unclassified Excavation".

* WIDTHS OF CONCRETE PAVEMENT.

- Sta. 383+75 to 470+50, 20' wide.
- 470+50 to 473+48.7, Taper from 20' to 30'.
- 476+04.7 to 492+48.2, 30' wide.

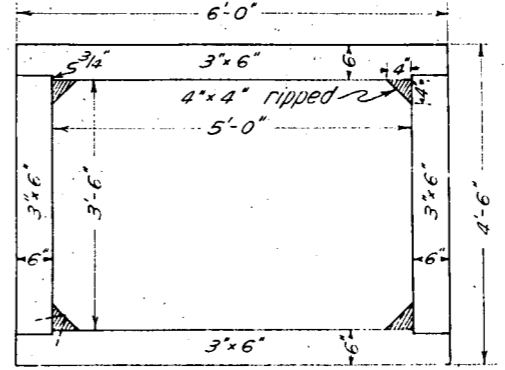
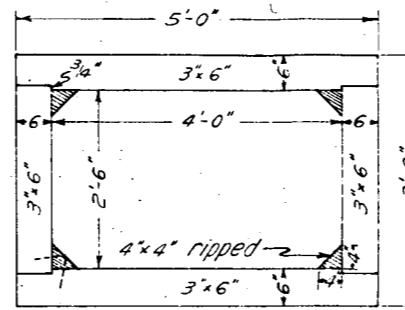
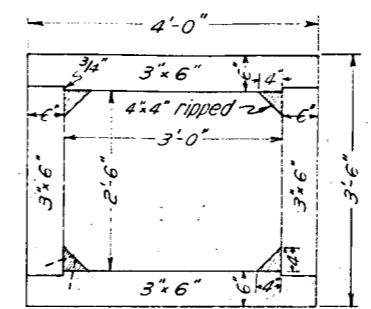
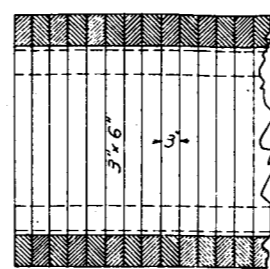
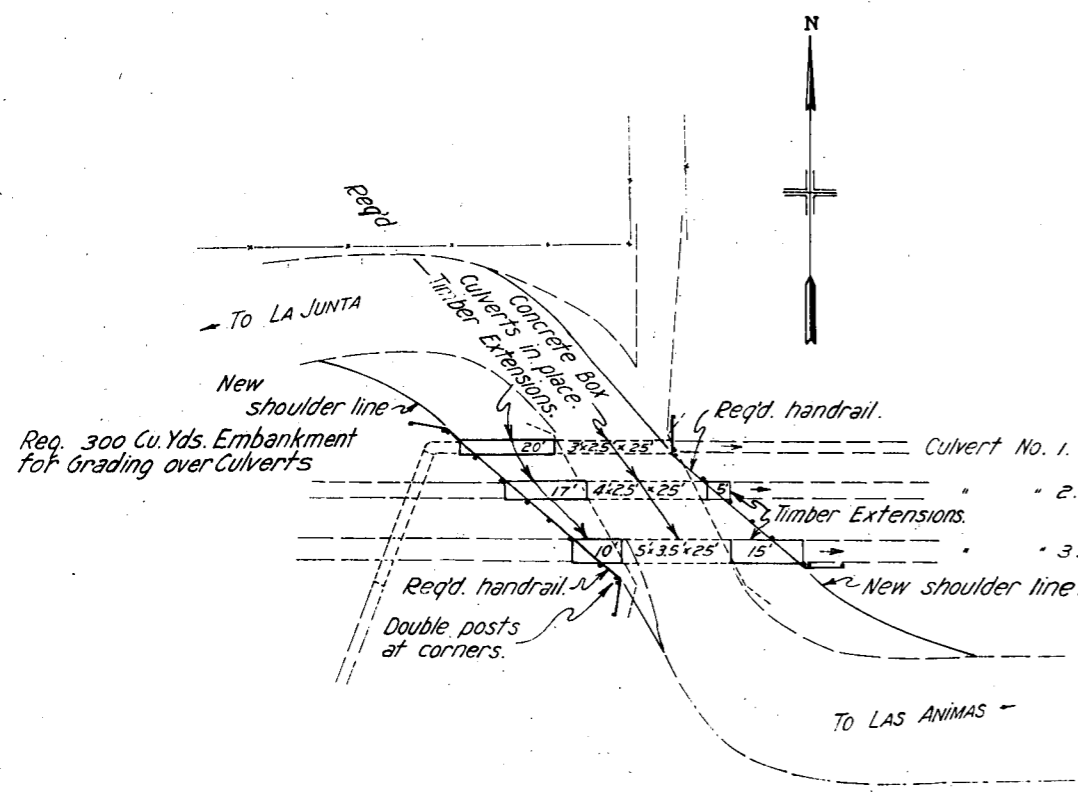
SELECTED MATERIAL (ITEM 13C)

PLACE REQUIRED STA. TO STA.	QUANTITY REQUIRED CU. YDS.	ESTIMATED OVERHAUL		SOURCE OF MATERIAL
		STA. YDS.	YD. MI'S	
383+75 to 473+48.7	4100	37,710	1899	It is estimated that all Selected Material required on this project will be obtained from a pit located approximately 300' left of Sta. 463+00 or in the immediate vicinity thereof. It is estimated that 6000 cu. yds. of acceptable material are available from this pit. The Selected Material is to be paid for as Unclassified Excavation.
476+04.7 to 492+48	900	9,900	141	
TOTALS	5000	47,610	2040	

SUMMARY OF APPROXIMATE QUANTITIES

ITEM NO.	ITEM	UNIT	20 - FT. ROADWAY	30 - FT. ROADWAY	DETOUR	PROJECT TOTALS
10a	Clearing and Grubbing Entire Project	Lump Sum	●	●	●	●
11c	Removing and Rebuilding Handrail	Lin. Ft.			95	95
12c	Removing & Replacing Guard Fence.	Lin. Ft.	1,280	1,310		2,590
13c	Unclassified Excavation.	Cu. Yd.	11,000	2,700	300	14,000
18a	Station Yard Overhaul.	Sta. Yd.	91,000	24,000		115,000
18b	Yard Mile Overhaul.	Yd. Mi.	5,000	300		5,300
26a	Gravel or Crushed Rock Surfacing.	Ton	200		2000	2,200
37a	Concrete Pavement.	Sq. Yd.	20,192	5,478		25,670
37c	Sand Cushion.	Cu. Yd.	4100	900		5,000
37d	Gravel or Crushed Rock Shoulder Surfacing.	" "	1,450	300		1,750
44a	Miscellaneous Untreated Timber.	M ft. bm			.2	.2
44b	" Treated "	" "			7.0	7.0

DETOUR REQUIREMENTS



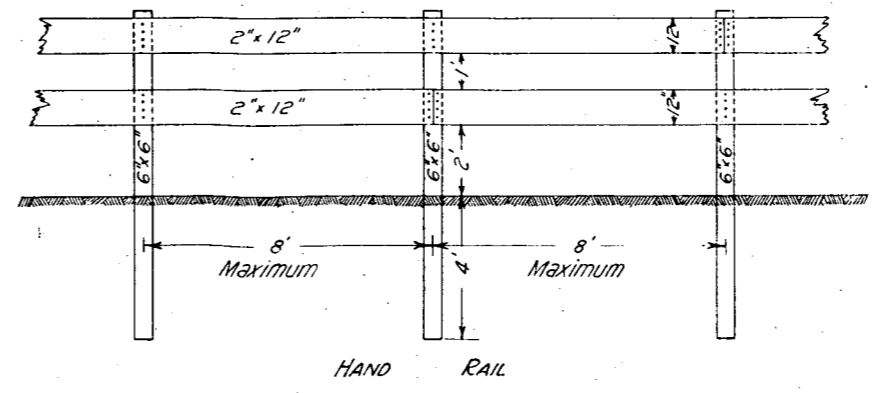
DETOUR IMPROVEMENTS REQUIRED AT A POINT 3.2 MILES FROM WEST END OF DETOUR SHOWN ON TITLE SHEET

GENERAL NOTES FOR CULVERT EXTENSIONS

- All timber to be treated.
- All side, roof, and floor timbers to be 3"x6".
- All corner fillets to be 4"x4" ripped diagonally.
- Reductions from full sawn material will be permitted up to 3/16" one dimension face only for Misc. Untreated Material.
- NAILING DIRECTIONS**
- Each successive set of timbers to be nailed to the previous set with 50 d nails @ 12" centers - staggered; and 2-50 d nails at each end of each timber.
- Corner fillets to be nailed with 30 d nails @ 6" centers - staggered.

TABULATION OF DETOUR QUANTITIES

LOCATION	REQUIREMENT	MISCELLANEOUS	
		TREATED TIMBER M FT. B M	UNTREATED TIMBER M FT. B M
On detour as shown on title sheet.	2000 tons Gravel Surfacing to be placed at the approximate rate of 500 tons per mile		
3.2 miles from west end of detour (See title sheet)	Extend Culvert No. 1, 20' west.	1.643	
	" " " 2, 17' " & 5' east.	2.072	
	" " " 3, 10' " & 15' "	2.955	
"	Remove and rebuild 95' handrail.		
"	Build 45' handrail.	.270	.180
"	300 cu. yds. embankment for widening and raising roadway.		
TOTALS		6.940	.180

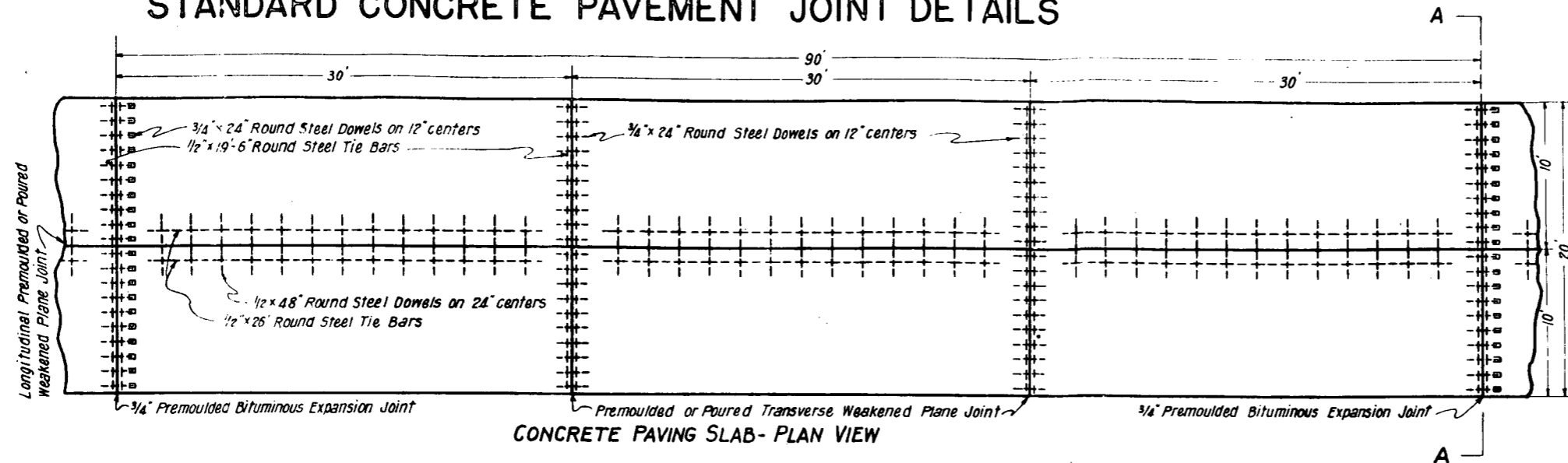


- NOTES FOR HANDRAIL**
- All posts to be treated timber.
 - All rails to be untreated timber. (SISIE)
 - " " " painted white with 3 coats of white lead and linseed oil.
 - Rails to be nailed to posts with 4-50 d nails at each post, and 4-50 d nails at each end of each rail.

STANDARD CONCRETE PAVEMENT JOINT DETAILS

STANDARD M-8-A

SEE STANDARD M-4-D (SHEET 1) FOR DETAILS OF STANDARD CONCRETE PAVING SECTIONS



GENERAL NOTES

The cost of all dowels, tie bars, metal sleeves and expansion joint material shall be included in the contract unit price per square yard for Item 31a - Concrete Pavement.

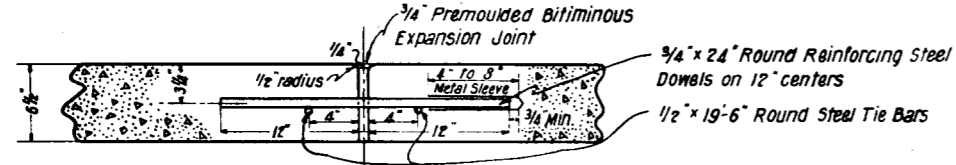
Patented tie bars of approved design may be used in lieu of the 1/2" steel tie bars provided for on details.

All bars must be accurately and firmly supported in proper position by means of metal chairs or other devices until concrete has been cured.

Dowel bars must be tied or clipped to tie bars in such manner that the dowels and tie bars remain in parallel positions shown on details.

Dowel bars and tie bars must be assembled in mats at least 10 feet long. The length of tie bars shown on details is the length required for mats assembled in one piece.

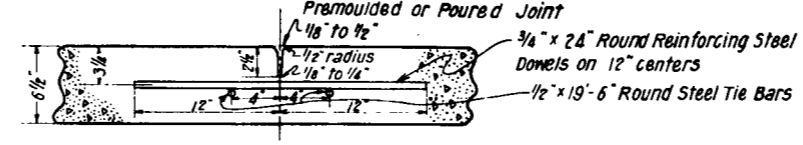
TRANSVERSE EXPANSION JOINT



1/4" Premoulded Bituminous Expansion Joints, with steel dowels at 12" centers and 2-1/2" x 19-6" round steel tie bars placed parallel to joint and 4 inches from center at joint, are required to be constructed 90 ft. apart perpendicular to center line of pavement.

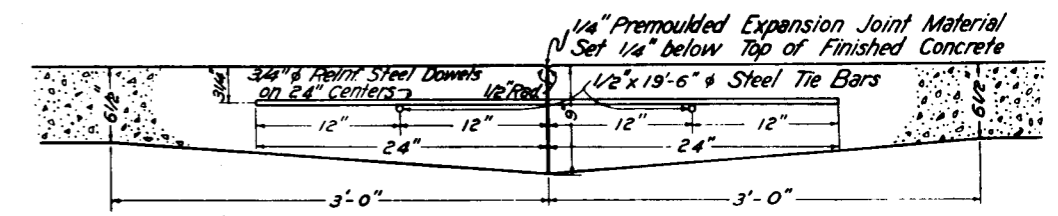
NOTE: The steel dowel is to be treated on one half its length to break bond, and the metal sleeve is to be placed on the treated part. The oil used in treatment of bars shall have an S.A.E. viscosity rating of not less than 250.

TRANSVERSE WEAKENED PLANE JOINT

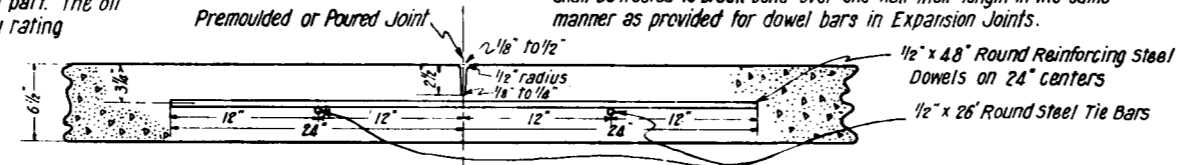


Two Transverse weakened Plane Joints with steel dowels at 12" centers and 2-1/2" x 19-6" round steel tie bars placed parallel to joint and 4 inches from joint, shall be constructed between expansion joints at 30 ft. intervals perpendicular to center line of pavement. Dowel bars in Transverse Weakened Plane Joints shall be treated to break bond over one-half their length in the same manner as provided for dowel bars in Expansion Joints.

LONGITUDINAL EXPANSION JOINT FOR PAVEMENT THICKENED IN CENTER OF SLAB



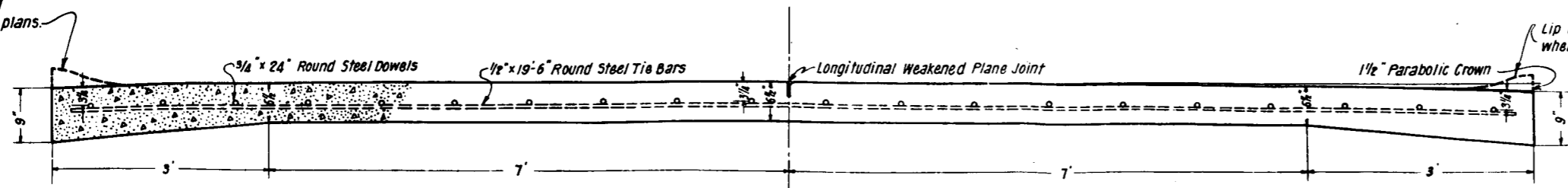
Longitudinal Expansion Joint is to be constructed with steel dowels @ 24" centers and 2-1/2" x 26" steel tie bars placed parallel to & 12" on either side of the joint. The steel dowels and tie bars shall not be treated to break bond. This type of longitudinal joint shall be used only where the paving slab is thickened in the center.



Longitudinal Weakened Plane Joint with steel dowels at 24" centers, and 2-1/2" x 26" round steel tie bars placed parallel to center line and 12" from center line of pavement. The steel dowels for longitudinal joint shall not be treated to break bond.

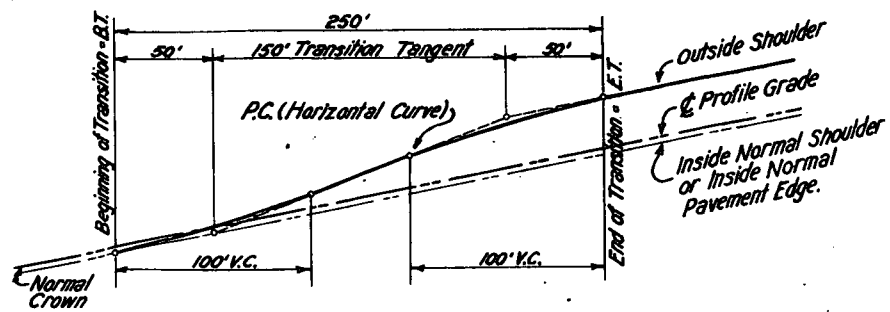
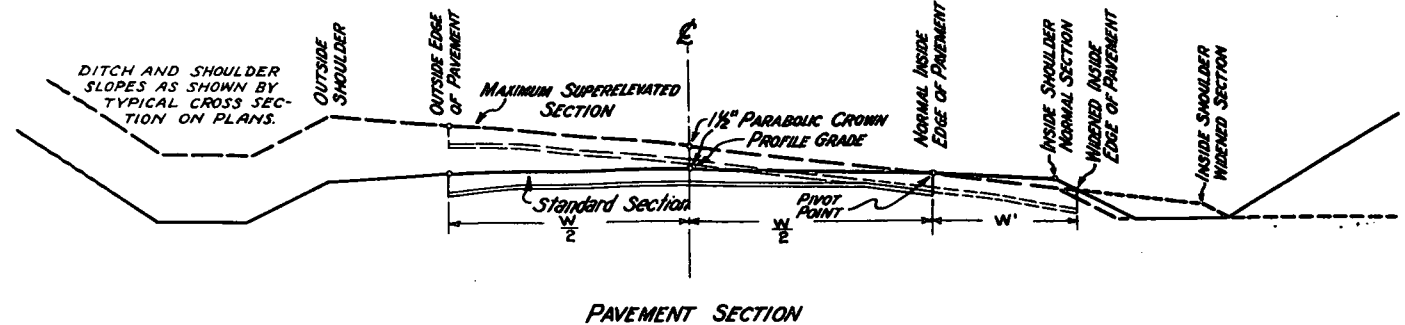
LONGITUDINAL WEAKENED PLANE JOINT

Lip Curb to be placed where called for on plans.



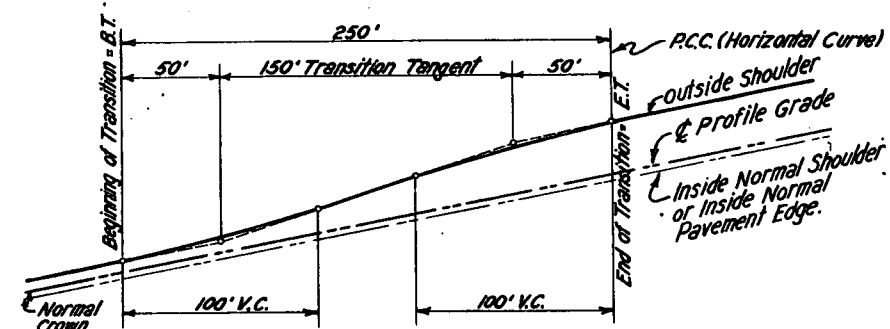
VERTICAL SECTION PERPENDICULAR TO CENTERLINE AT A-A

COLORADO STATE HIGHWAY DEPARTMENT STANDARD CONCRETE PAVEMENT JOINT DETAILS	
Designed by Made by Checked by	Approved by Bridge Engineer Date: 193



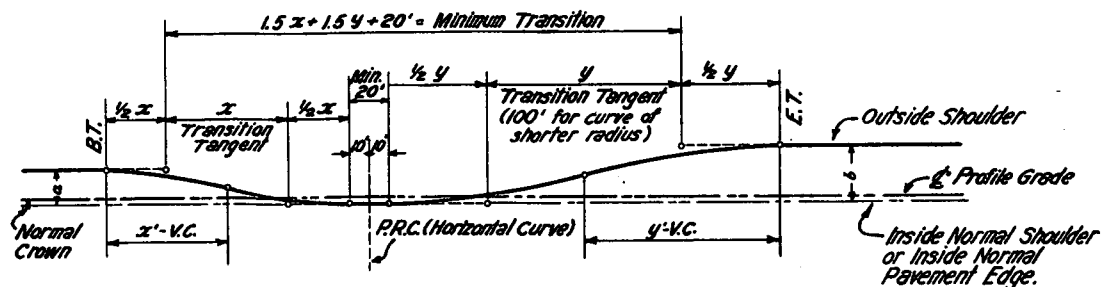
NOTE: CASE I

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.



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 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.

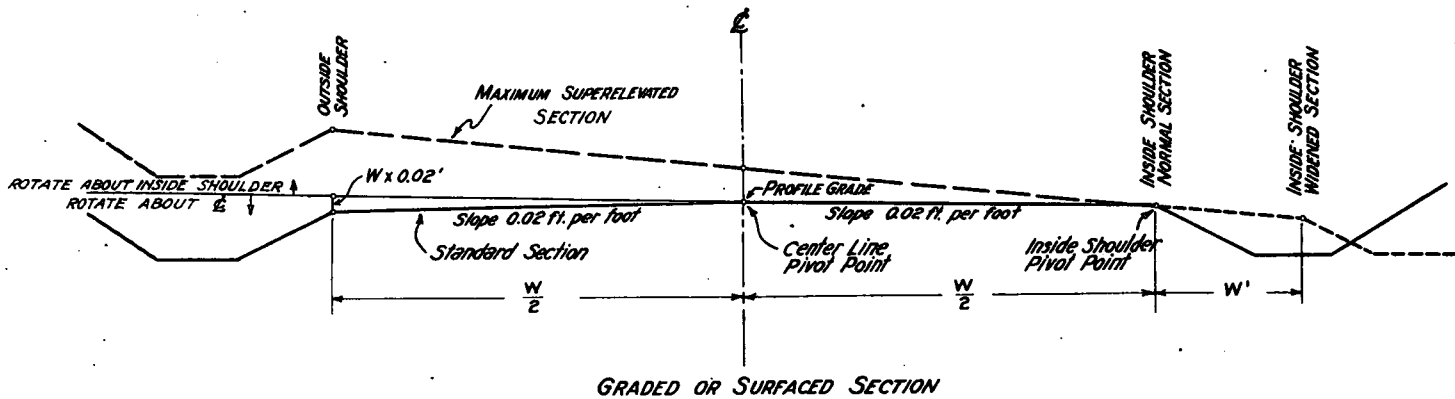


NOTE: CASE III

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 " " " 2nd " " x " " " transition tangent on 1st " " y " " " " 2nd " " then, $a:b = x:y$. The transition tangent of the curve having the shorter radius shall be set at 100 ft. A normal crowned section 20 ft. long, 10 ft. on each side of the P.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.

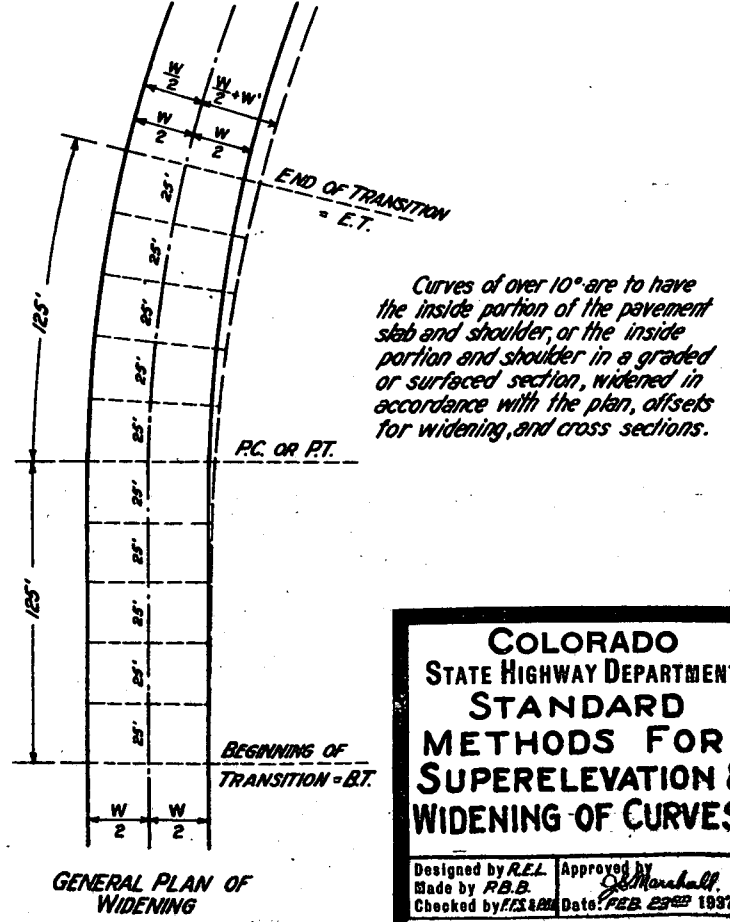
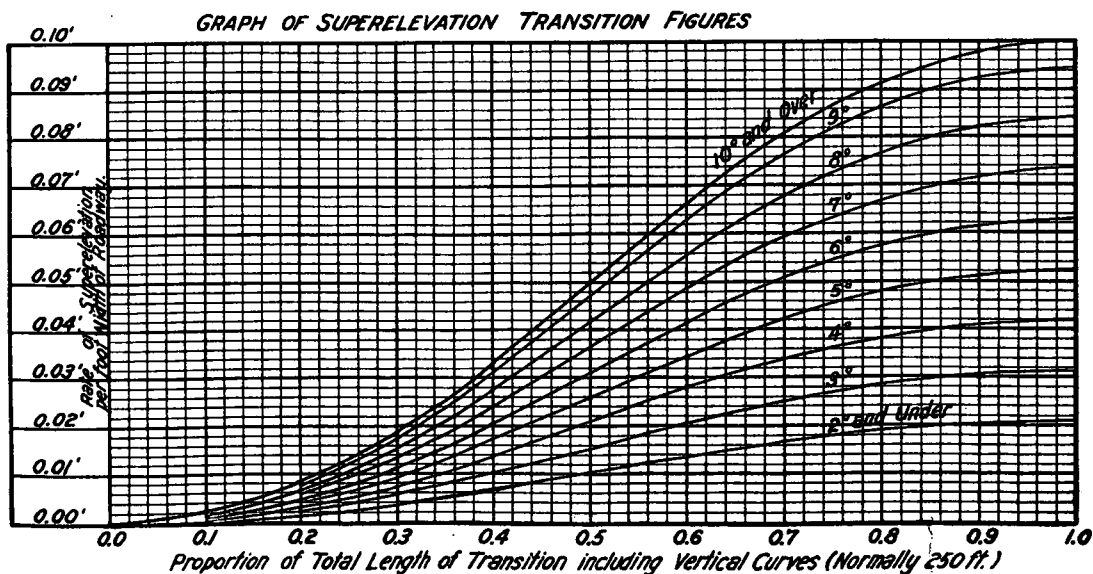
GENERAL NOTES

Curves on projects using the Sections shown are to be super-elevated 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 super-elevated 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 1/2" 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 center-line 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 ft. x 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.



SUPERELEVATION AND WIDENING TABLES

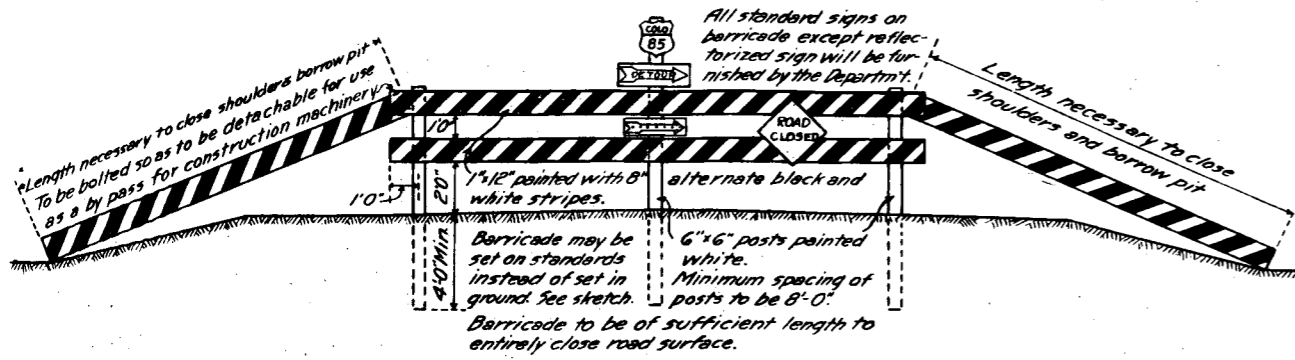
DISTANCE FROM B.T. (PROPORTION)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	MAX. 1.0
RATE OF SUPERELEVATION (IN FEET) PER FOOT WIDTH OF ROADWAY										
Degree of Curvature										
2° and Under	0.00044	0.00175	0.00394	0.00700	0.01050	0.01400	0.01706	0.01925	0.02056	0.02100
3°	0.00066	0.00263	0.00591	0.01050	0.01575	0.02100	0.02559	0.02888	0.03084	0.03150
4°	0.00088	0.00350	0.00789	0.01400	0.02100	0.02800	0.03413	0.03880	0.04113	0.04200
5°	0.00109	0.00438	0.00984	0.01750	0.02625	0.03500	0.04266	0.04819	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	0.06736	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	0.00789	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



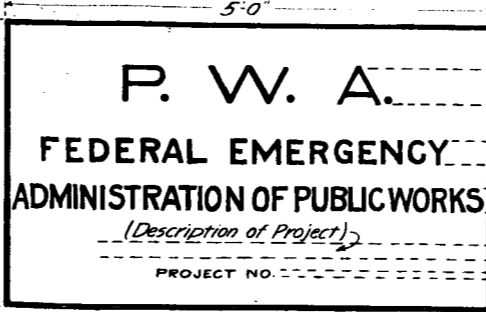
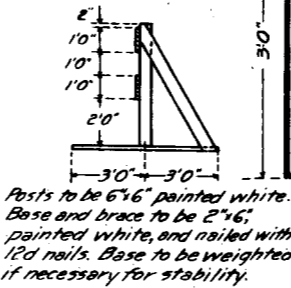
DESIGNED BY R.E.L. APPROVED BY F.B.B. MADE BY F.B.B. CHECKED BY F.B.B. DATE FEB. 23 1937

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

DETAILS OF PERMANENT BARRICADE



END VIEW OF PORTABLE BARRICADE



SIGN REQUIRED ON ALL P.W.A. PROJECTS

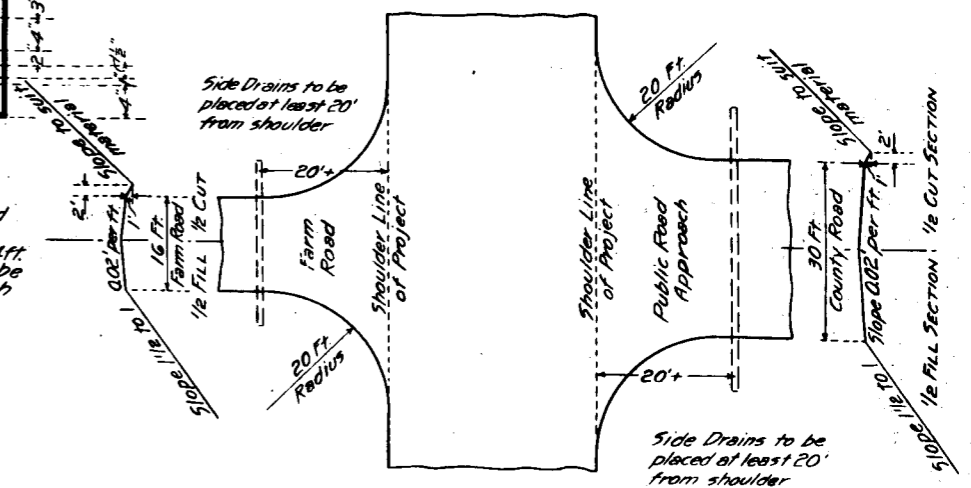
Sign to be made on 1\" material with at least three cleats on back. Background to be white, letters to be black. Sign to be placed on two 4\"x4\"x10\" posts set 4ft. in the ground. One sign is required to be located at each end of each unit of construction.

STANDARD M-2-BX

FED ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	245-DR	8	

Rev. 5-3-37 S.B.L.-W.P.A. Signs

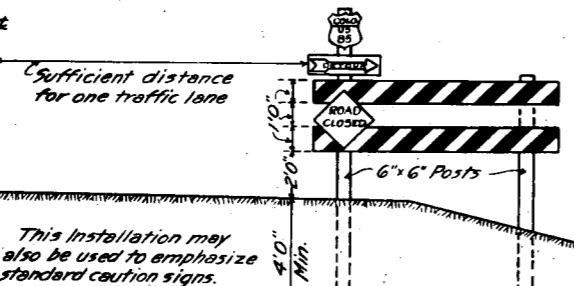
TYPICAL PLAN FOR SIDE APPROACH ROADS



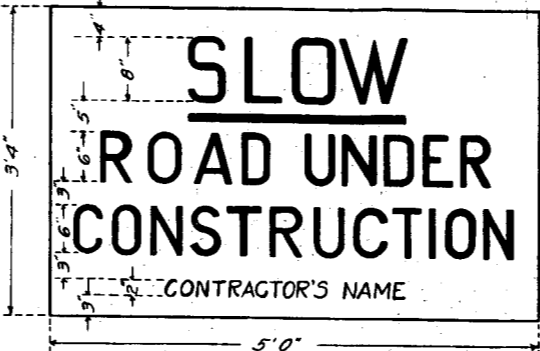
POSITION OF SIGNS RELATIVE ROAD BED

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.

DETAILS OF PARTIAL BARRICADE

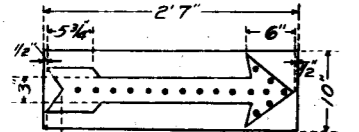


DETAILS OF ROAD UNDER CONSTRUCTION SIGN

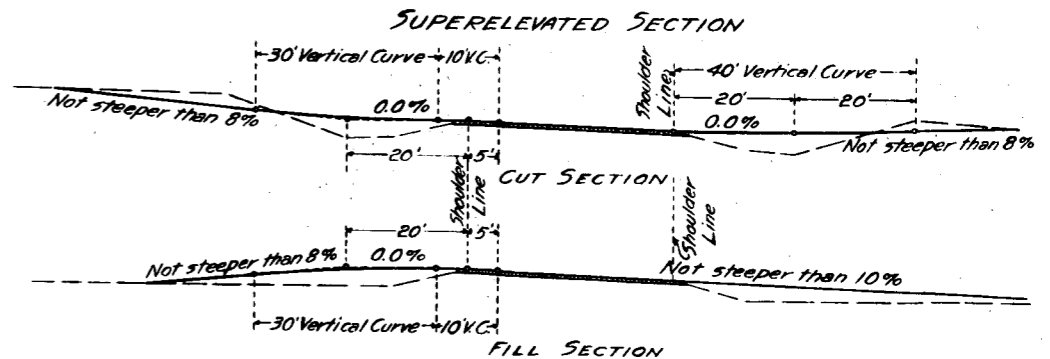
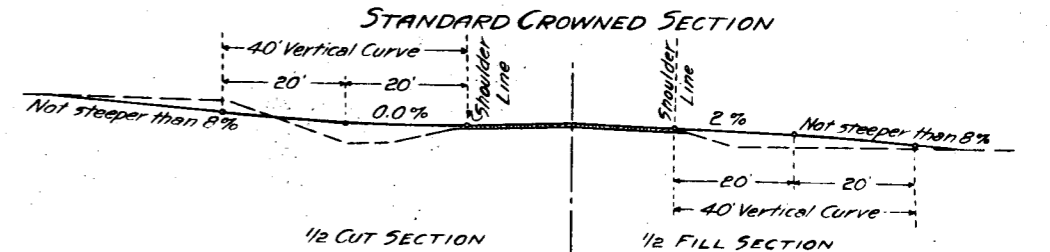
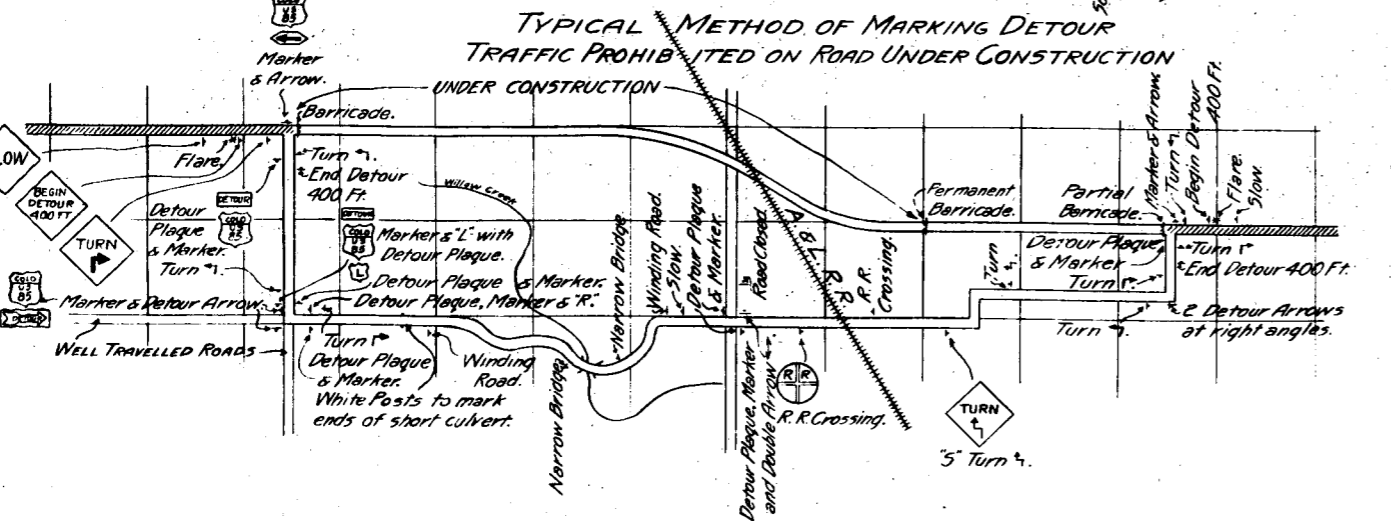
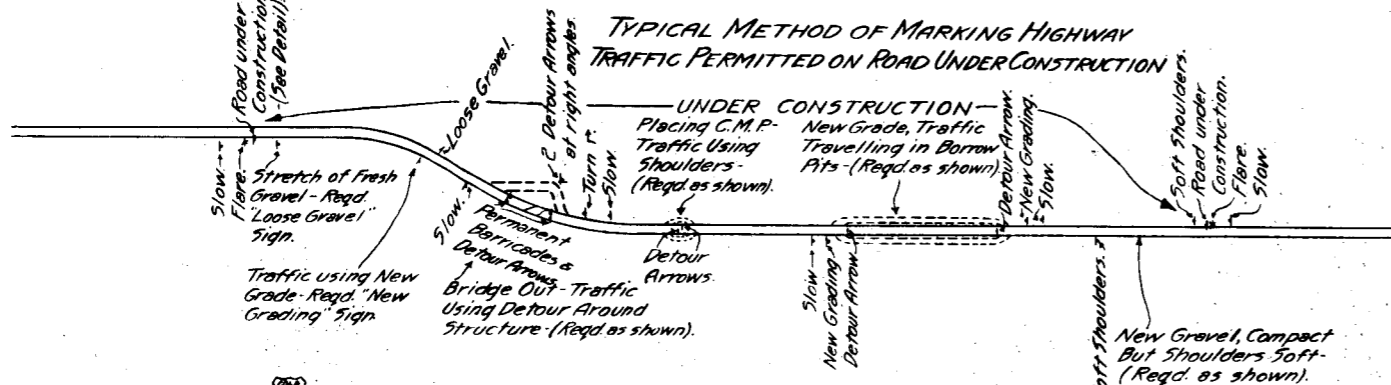


Sign to be made on 1\" material with at least three cleats on the back. Background to be white, SLOW and underline to be red, and other lettering to be black. Sign to be set on 2-6\"x6\" posts 4ft. in the ground.

SUGGESTED DETAIL OF REFLECTORIZED ARROW



Contractor shall be required to have at least two such arrows for use on barricades at the ends of each project. Reflector Buttons shall be of a type and size, and the sign shall be subject to Department approval.



GENERAL NOTES ON APPROACHES

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.

GENERAL NOTES FOR ROADWAY CONSTRUCTION TRAFFIC SIGNS

All Work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department adopted ~~1935~~ 1935. 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.

COLORADO STATE HIGHWAY DEPARTMENT
TYPICAL SIDE APPROACH ROADS ROADWAY CONSTRUCTION TRAFFIC SIGNS

Designed by J.S.M.
Made by S.B.L.
Check J.S.M.
Check K.A.K.

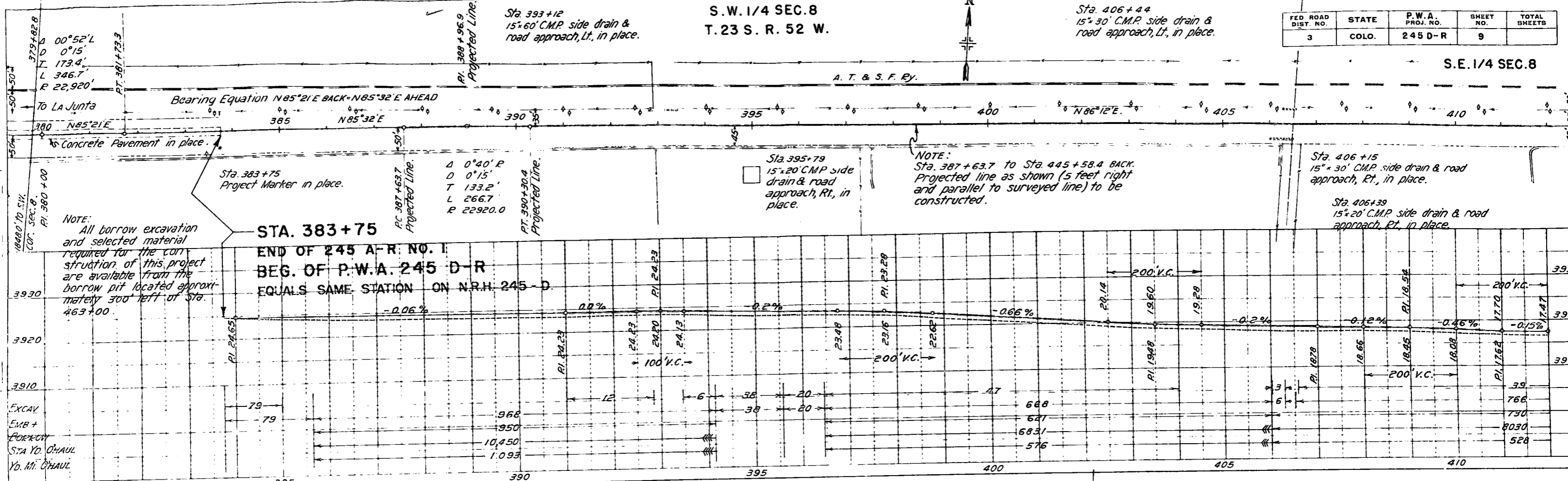
Approved by J.S.M.
Date: Aug. 20, 1935

FED. ROAD DIST. NO.	STATE	P.W.A. PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	245 D-R	9	

S.W. 1/4 SEC. 8
T. 23 S. R. 52 W.

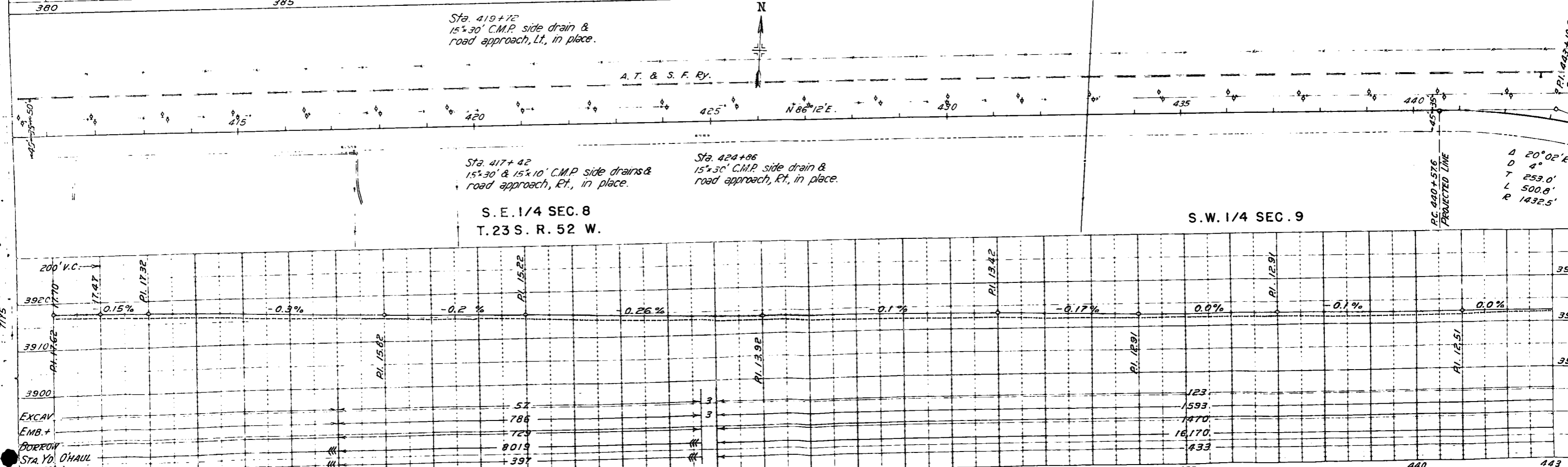
Sta. 406+44
15'x30' C.M.P. side drain & road approach, Lt., in place.

S.E. 1/4 SEC. 8



S.E. 1/4 SEC. 8
T. 23 S. R. 52 W.

S.W. 1/4 SEC. 9



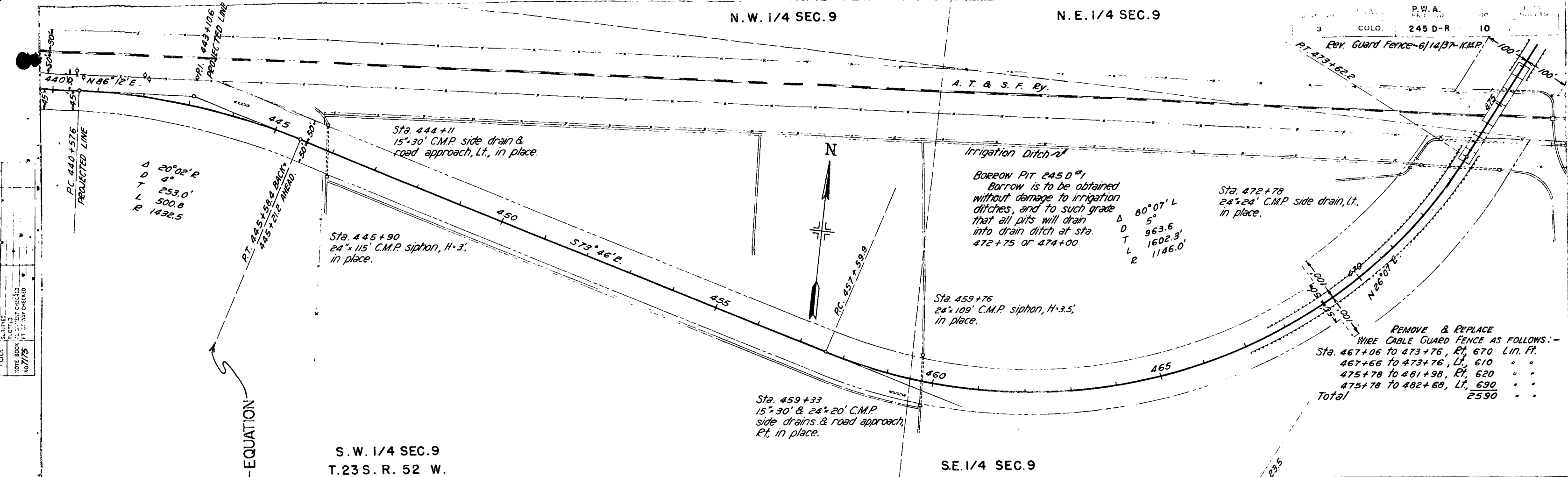
N. W. 1/4 SEC. 9

N. E. 1/4 SEC. 9

P.W.A. 245 D-R 10
3 COLO. 245 D-R 10

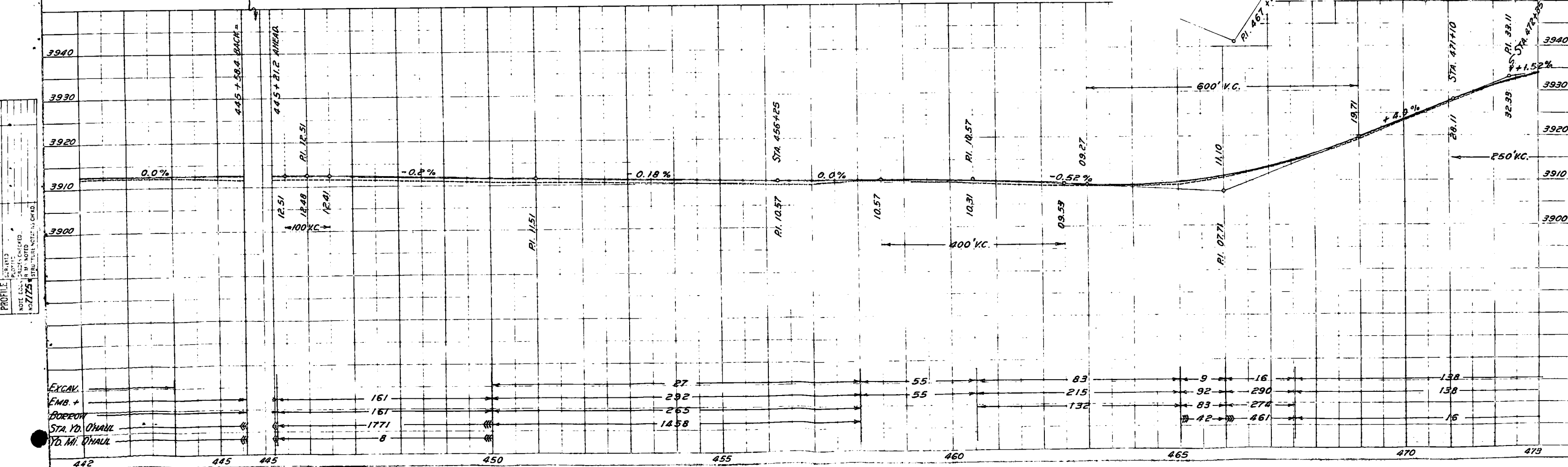
Rev. Guard Fence-6/14/37-K.M.P.
PT. 473+62.2

A. T. & S. F. Ry.



S. W. 1/4 SEC. 9
T. 23 S. R. 52 W.

SE. 1/4 SEC. 9



Sta. 474+00
24'x154' C.M.P. cross
culvert in place.

N. E. 1/4 SEC. 9
T. 23 S. R. 52 W.

Sta. 485+50
24'x88' C.M.P. siphon,
H-3, in place.

Sta. 489+51
24'x60' C.M.P. cross
culvert in place.

N. W. 1/4 SEC. 10

P.W.A.
3 COLO. 245 D-R II
Rev. Guard Fence - 6/14/37 - K.M.R.

Sta. 475+35
36'x132' C.M.P. cross culvert
in place.

Sta. 473+48.7 TO 476+04.7
Structure L-24-6. overhead
crossing in place.

Sta. 473+28
2'x2'x172' concrete box
culvert in place.

Concrete Approach
slabs in place

Δ 64°08' P
D 5°
T 717.9
L 1282.7
R 1146.0

Sta. 474+85
24'x20' C.M.P. side drain,
Rt. in place.

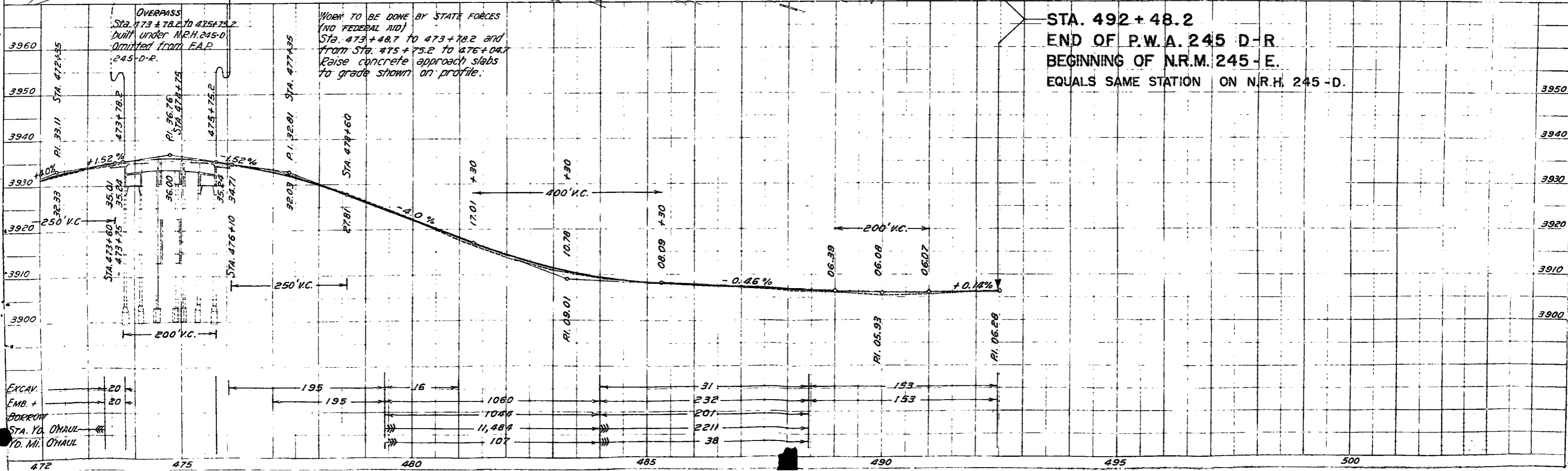
S. E. 1/4 SEC. 9

LAS ANIMAS

High School

30' Concrete Pavement in place
N.E.M. 245-E.
500 TO LAMAR

STA. 492+48.2
END OF P.W.A. 245 D-R
BEGINNING OF N.R.M. 245-E.
EQUALS SAME STATION ON N.R.H. 245-D.



PLAN
SCALE
DATE
NO. 7175

PROFILE
SCALE
DATE
NO. 7175

EXCAV. 20
EMB. + 20
BORROW
STA. Yd. OHAUL
Yd. Mi. OHAUL

PLAN
SCALE
DATE
NO. 7175