

|                     |       |                  |      |              |
|---------------------|-------|------------------|------|--------------|
| FED. ROAD DIST. NO. | STATE | F.A. PROJECT NO. | DATE | TOTAL SHEETS |
| 3                   | COLO  | 25-0(1)          | 1    |              |

## CONVENTIONAL SIGNS

- CENTER LINE OF SURVEY  
RIGHT OF WAY LINES  
TOWNSHIP OR RANGE LINES  
SECTION LINES  
QUARTER SECTION LINES  
BARBED WIRE FENCE  
SNOW FENCE  
TELEPHONE LINES  
POWER LINES

11-19 }  
38-52 } DELETED  
157 }  
334-336 }

- STA. 498+00 ~ END OF P.W.A. 1220 F  
UNIT 3 CONST. DIVISION № 2  
8 F.A.P. 25-D(II)



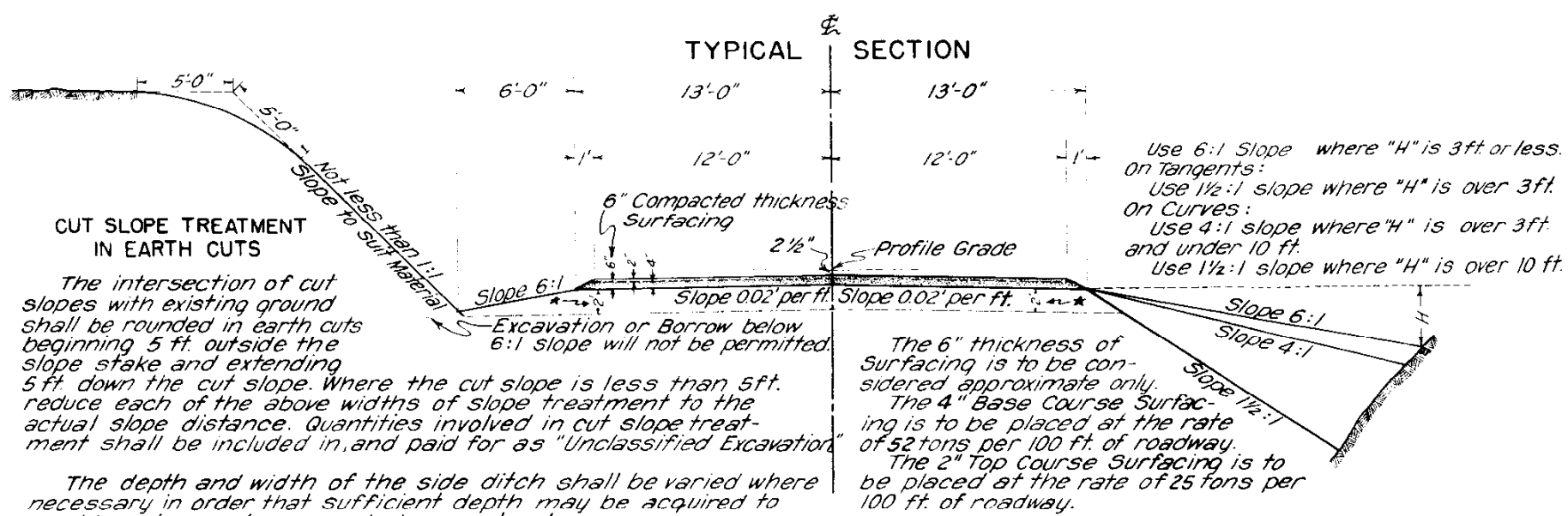
~NOTE~

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

H.L. Jenness - Division Engineer - Greenwood Spgs.  
H.E. Rowbotham - Resident Engineer - Redcliff

RECOMMENDED FOR APPROVAL  
*Edward* 6/16/34  
CHIEF ENGINEER  
APPROVED  
*Charles Hall*  
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 June 1, 1940.

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

All roadway excavation required to construct the project shall be obtained as indicated on the plans. Quantities involved beyond the limits of the ditch as shown on the Typical Section, and those quantities either noted on the plans as "Borrow" or on 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 ditch are subject to change by the Engineer to fit embankment requirements actually met during construction.

All curves are to be superelevated and widened in conformity with the Standard Superelevation and Widening Sheet unless otherwise noted on the plans.

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

Unless otherwise noted on the plans all overhaul shall be measured along the centerline of the project.

The entire project is to be cleared for variable widths which shall be held to a minimum required for the construction of the road, material pits, channel changes and for widths to accommodate visibility. Ordinarily clearing shall not extend more than 8 feet beyond the toes of the fills or the top of cut banks and the cost thereof included in the lump sum price for "Clearing and Grubbing the Entire Project."

On sheets formerly used on P.W.A. 1220-F, the notes pertaining to F.A.P. 25-D(1) are marked as such, and any notes not so marked do not apply to this 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 ft. from the edge of the highway. Estimated tonnage of surfacing material required in this operation is shown in the "List of Structures."

★ Between Stas. 424+50 and 426+50 unstable material to be excavated and wasted. Selected material for backfilling excavated area is available from roadway excavation between Stas. 427+ and 429+.

## SURFACING PLAN

IT IS ESTIMATED THAT MATERIAL FOR GRAVEL SURFACING FOR THE PROJECT IS AVAILABLE IN THE VICINITY OF THE PITS INDICATED IN THE FOLLOWING TABULATION. ESTIMATED QUANTITIES INVOLVED IN THIS OPERATION ARE SHOWN BELOW. NO ALTERATION OF THE SURFACING PLAN AS HEREIN SET FORTH WILL BE ALLOWED WITHOUT WRITTEN PERMISSION FROM THE DEPARTMENT.

| MATERIAL TO BE PLACED       | SOURCE                                                                                    | QUANTITY       |                   | OVERHAUL     |                 |
|-----------------------------|-------------------------------------------------------------------------------------------|----------------|-------------------|--------------|-----------------|
|                             |                                                                                           | TONS AVAILABLE | TONS USED ROADWAY | TON. ROADWAY | MILES MAJ. STR. |
| 28+646 to 86+826 Approaches | Pit No. 2 - 200' Right of Sta. 138+00, Sec. 4 T.6 S., R. 79 W.                            | Ample          | 795               | 15,562       |                 |
| 86+826 to 138+00 Approach   |                                                                                           |                | 40                | 413          |                 |
| 138+00 to 189+336           |                                                                                           |                | 3,912             | 3,433        |                 |
| 189+336 to 482+83.3         |                                                                                           |                | 10                | 8            |                 |
| 482+83.3 to 483+28.3        | Pit No. 2 - A - 300' Rt. of Sta. 808+00 (1220-F Unit 3, Div. #1) Sec. 25 T.6 S., R. 79 W. |                | 3,912             | 3,432        |                 |
| 483+28.3 to 498+00          |                                                                                           |                | 22,283            | 82,216       |                 |
|                             |                                                                                           |                | 42                | 7,513        | 267             |
| TOTAL                       |                                                                                           |                | 39,324            | 112,577      | 267             |

★ Includes widening.  
Overhaul quantities shown above are based on 80% of the surfacing material to be taken from Pit No. 2 and 20% Rock to be taken from Pit No. 2-A.  
Overhaul quantities will vary with the actual amount of Rock necessary to furnish material complying with mechanical analysis requirements given in the specifications.  
The material from Pit No. 2-A will be hauled to Pit No. 2 and there mixed with material developed at that point.

## SUMMARY OF APPROXIMATE QUANTITIES

| ITEM NO.            | DESCRIPTION                                                                                                     | UNIT     | ROADWAY | DOUBLE 14" x 14" C.B.C. STA. 482+ STA. 483+ | TOTAL   |
|---------------------|-----------------------------------------------------------------------------------------------------------------|----------|---------|---------------------------------------------|---------|
| 10a                 | Clearing and Grubbing Entire Proj.                                                                              | Lump Sum | •       |                                             | •       |
| 11b                 | Removal of 3 Structures                                                                                         | " "      | •       |                                             | •       |
| 13c                 | Unclassified Excavation                                                                                         | Cu. Yd.  | 50,000  |                                             | 50,000  |
| 13d                 | Unclassified Ditch Excavation                                                                                   | " "      | 1,000   |                                             | 1,000   |
| 13x                 | Blading and Grading Roadway                                                                                     | Mi.      | 96      |                                             | 96      |
| 14a                 | Dry Rock Excavation (Structural)                                                                                | Cu. Yd.  | 55      |                                             | 55      |
| 14b                 | Dry Common Excavation (Structural)                                                                              | " "      | 155     |                                             | 155     |
| 14c                 | Wet Rock Excavation (Structural)                                                                                | " "      | 155     |                                             | 155     |
| 14d                 | Wet Common Excavation (Structural)                                                                              | " "      | 455     |                                             | 455     |
| 18a                 | Station Yard Overhaul                                                                                           | Sta. Yd. | 21,000  |                                             | 21,000  |
| 18b                 | Yard Mile Overhaul                                                                                              | Yd. Mi.  | 100     |                                             | 100     |
| 26a                 | Gravel or Crushed Rock Surfacing                                                                                | Ton      | 39,355  | 45                                          | 39,400  |
| 26c                 | Overhaul of Surfacing                                                                                           | Ton Mi.  | 112,630 | 270                                         | 112,900 |
| 49                  | Cement Rubble Masonry                                                                                           | Cu. Yd.  | 22      |                                             | 22      |
| 51                  | Relaying Pipe                                                                                                   | Lin. Ft. | 58      |                                             | 58      |
| 53c                 | 24" Corrugated Metal Culvert Pipe                                                                               | " "      | 366     |                                             | 366     |
| 53d                 | 30" Corrugated Metal Culvert Pipe                                                                               | " "      | 9       |                                             | 9       |
| 53g                 | 48" Corrugated Metal Culvert Pipe                                                                               | " "      | 112     |                                             | 112     |
| 63                  | Grouted Rubble Sl. & Ditch Pav. (12" th)                                                                        | Sq. Yd.  | 67      |                                             | 67      |
| 71a                 | 6" Perforated C.M.P. Underdrain                                                                                 | Lin. Ft. | 970     |                                             | 970     |
| 74                  | Wire Cable Guard Fence                                                                                          | " "      | 6358    | 90                                          | 6448    |
| 92                  | Timber Guard Posts                                                                                              | Each     | 593     |                                             | 593     |
| FORCE ACCOUNT ITEMS |                                                                                                                 |          |         |                                             |         |
|                     | Benching and Stabilizing Embankments, Sta. 97+, Sta. 109+, Sta. 112+, & Sta. 140+, and Relaying Pipe, Sta. 109+ | Lump Sum | •       |                                             | •       |

LIST OF STRUCTURES

|                        |       |                       |              |                 |
|------------------------|-------|-----------------------|--------------|-----------------|
| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | SHEET<br>NO. | TOTAL<br>SHEETS |
| 3                      | COLO. | 25-D(1)               | 3            |                 |

| LOCATION                                                         | DESCRIPTION                                                                                                                                                                                                 | REMOVE<br>STRUCT. | UNCLASSIFIED<br>EXCAVATION |         | STRUCTURAL<br>EXCAVATION |         | CEMENT<br>RUBBLE<br>MASONRY | GROUTED<br>RUBBLE<br>SLOPE PAV.<br>12"<br>THICK | CORRUGATED METAL<br>CULVERT PIPE<br>LIN. FT. |      |     |     | 6"<br>PERFORATED<br>C.M.P.<br>UNDERDRAIN | GRAVEL<br>OR<br>CRUSH. ROCK<br>SURFACING | MISCELLANEOUS           |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------|---------|--------------------------|---------|-----------------------------|-------------------------------------------------|----------------------------------------------|------|-----|-----|------------------------------------------|------------------------------------------|-------------------------|
|                                                                  |                                                                                                                                                                                                             |                   | CU. YD.                    | CU. YD. | CU. YD.                  | SQ. YD. |                             |                                                 | 18"                                          | 24"  | 30" | 48" |                                          |                                          |                         |
|                                                                  |                                                                                                                                                                                                             |                   |                            |         |                          |         | NO.                         | DITCH<br>EXCAV.                                 |                                              |      |     |     | EMBANK.                                  | Ø                                        |                         |
| 54+50 ~ 56+50<br>58+85<br>97± ~ 98±<br>107+00 ~ 108+00<br>107+00 | Drain Ditch above Cut on Rt.<br>Inlet Ditch above Slope Paving on Rt.<br>Benching & Stabilizing Embankment.<br>Intercepting Ditch on Rt.<br>C.M.P. Cross Culvert & Inlet Grouted Rubble<br>Apron at Outlet. |                   | 800<br>100                 |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
|                                                                  | (Force Account ~ Work by State Forces)                                                                                                                                                                      |                   | 15                         |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
|                                                                  |                                                                                                                                                                                                             |                   | 10                         | 45      |                          |         | 2.05                        | 6                                               |                                              | 56   |     |     |                                          |                                          |                         |
| 109± ~ 110±                                                      | Benching & Stabilizing Embankment and<br>Relaying 24"x 76' C.M.P.                                                                                                                                           |                   |                            |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
| 112± ~ 113±                                                      | Benching & Stabilizing Embankment.                                                                                                                                                                          |                   |                            |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
|                                                                  | (Force Account ~ Work by State Forces)                                                                                                                                                                      |                   |                            |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
|                                                                  | (Force Account ~ Work by State Forces)                                                                                                                                                                      |                   |                            |         |                          |         |                             |                                                 |                                              |      |     |     |                                          |                                          |                         |
| 136+00                                                           | Remove Headwall & Extend 24" C.M.P.<br>Cross Culvert 8 Ft. (New Headwall) Inlet.                                                                                                                            | 1                 | 15                         | 10      |                          |         | 2.05                        |                                                 |                                              | 8+1  |     |     |                                          |                                          |                         |
| 139+50                                                           | C.M.P. Cross Culvert & Inlet Grouted Rubble<br>Apron (40' Long) at Outlet.                                                                                                                                  |                   | 5                          | 85      |                          |         | 2.05                        | *29                                             |                                              | 80   |     |     |                                          |                                          |                         |
| 140+81                                                           | C.M.P. Cross Culvert, Grouted Rubble<br>Apron at Outlet.                                                                                                                                                    |                   |                            | 160     |                          |         | 2.05                        | 6                                               |                                              | 158  |     |     |                                          |                                          |                         |
| 143+56                                                           | Remove & Relay 24"x 58' C.M.P.<br>and Extend 16' (New Headwall) & Inlet.                                                                                                                                    |                   | 5                          | 5       |                          |         | 2.05                        |                                                 |                                              | 16+1 |     |     |                                          |                                          | { Relay 24"x 58' C.M.P. |
| 150+65                                                           | C.M.P. Cross Culvert & Inlet Ditch                                                                                                                                                                          |                   | 5                          | 25      |                          |         | 2.05                        |                                                 |                                              | 46   |     |     |                                          |                                          |                         |
| 137± ~ 145±<br>358+75                                            | Benching & Stabilizing Embankment.<br>Grouted Rubble Slope & Ditch Paving at<br>Inlet of C.M.P. Culv. to protect Underdrain.                                                                                |                   |                            |         |                          |         |                             | 8                                               |                                              |      |     |     |                                          |                                          |                         |
| 358+00 ~ 363+00                                                  | 6" Perforated C.M.P. Underdrain on Rt.                                                                                                                                                                      |                   |                            | 170     |                          |         |                             |                                                 |                                              |      |     | 504 |                                          |                                          |                         |
| 360+61.5                                                         | 6" Perforated C.M.P. Underdrain Skew 60° Lt.<br>(Cross Outlet for Underdrain Rt.) Grouted<br>Rubble Slope Paving at Outlet.                                                                                 |                   |                            | 25      |                          |         |                             | 18                                              |                                              |      |     | 54  |                                          |                                          | 60° "Y" Branch          |
| 363+11.5                                                         | 6" Perforated C.M.P. Underdrain Skew 60° Lt.<br>(Cross Outlet for Underdrain Rt.)                                                                                                                           |                   |                            | 25      |                          |         |                             |                                                 |                                              |      |     | 50  |                                          |                                          | 60° Elbow               |
| 422+25                                                           | Remove Headwall & Extend 30"x 108' C.M.P.<br>Cross Culvert 8' on Rt., Inlet Ditch                                                                                                                           | 1                 | 5                          | 5       |                          |         | 2.80                        |                                                 |                                              | 8+1  |     |     |                                          |                                          |                         |
| 431+35                                                           | Remove 48"x 98' C.M.P. Cross Culvert; C.M.P.<br>Cross Culvert.                                                                                                                                              | 1                 |                            | 125     |                          |         | 5.75                        |                                                 |                                              | 112  |     |     |                                          |                                          |                         |
| 486+50 ~ 490+05                                                  | 6" Perforated C.M.P. Underdrain Rt. with<br>Headwall on Outlet end.                                                                                                                                         |                   |                            | 120     |                          |         | 0.50                        |                                                 |                                              |      |     | 362 |                                          |                                          |                         |
| -(19+50)<br>29+28<br>64+58<br>133+85                             | Surface Road Approach on Lt.<br>Surface Road Approach on Lt.<br>Surface Road Approach on Lt.<br>Surface Road Approach on Lt.                                                                                |                   |                            |         |                          |         |                             |                                                 |                                              |      |     |     | 20<br>10<br>10<br>10                     |                                          |                         |
| TOTAL                                                            |                                                                                                                                                                                                             | 3                 | 980                        | 805     |                          |         | 21.35                       | 67                                              | 366                                          | 9    | 112 | 970 | 50                                       |                                          |                         |

Ø Structural Excavation is estimated to be 25% Rock and 75% Common, each of which is estimated to be 75% Wet and 25% Dry.  
\* Grouted Rubble Apron to be Standard except for length.

# TABULATION OF UNCLASSIFIED EXCAVATION

| SOURCE OF EXCAVATION                                                           |             |                   | * MATERIAL TO BE PLACED           | EXCAVATION | OVERHAUL |         |
|--------------------------------------------------------------------------------|-------------|-------------------|-----------------------------------|------------|----------|---------|
| STA. TO STA.                                                                   | WIDTH DITCH | BACK SLOPE        | STA. TO STA.                      | CU. YD.    | STA. YD. | YD. MI. |
| -23+00 ~ -21+50                                                                | 6'          | 2:1               | -20+00±<br>Within 500'<br>-14+00± | 928        |          |         |
| -21+00                                                                         | 6'          | 1 1/2:1           |                                   |            |          |         |
| -20+50 ~ -19+00                                                                | 6'          | 1 1/2:1           |                                   | 932        |          |         |
| -19+00 ~ -16+00                                                                | 6'          | 2:1               |                                   | 186        |          |         |
| -15+00 ~ -13+00                                                                | 6'          | 2 1/2:1           |                                   |            |          |         |
| 34+00 ~ 37+00                                                                  | 12' min.    | 1 1/2:1           | 20+00 ~ 29+00                     | 2116       | 12,343   | 2       |
| 40+00                                                                          | 6'          | 1 1/2:1           | 36+00 ~ 39+00<br>Within 500'      | 668        |          |         |
| 40+50                                                                          | 6'          | 2:1               |                                   |            |          |         |
| 41+00 ~ 41+50                                                                  | 12'         | 1:1               |                                   | 500        |          |         |
| 42+00 ~ 52+00                                                                  | 3'          | 1:1               |                                   |            |          |         |
| 55+25 ~ 55+75                                                                  | 12'         | TO 20% OF SLOPE   |                                   | 1000       |          |         |
| 64+50 ~ 70+00                                                                  | 8'          | 1:1               | " "                               | 1450       |          |         |
| 70+00 ~ 72+25                                                                  | 6'          | 1 1/2:1           | 67+00 ~ 77+00                     | 949        | 125      |         |
| 72+50 ~ 75+50                                                                  | 6'          | 1 1/2:1           | 80+00±                            | 89         | 72       |         |
| 76+00 ~ 78+50                                                                  | 6'          | 2:1               | 89+00±                            | 1095       | 7068     |         |
| 79+00 ~ 81+00                                                                  | 6' to 12'   | 1:1               | Within 500'                       | 750        |          |         |
| 83+50 ~ 85+50                                                                  | 3'          | 1:1               | " "                               | 100        |          |         |
| 95+00                                                                          | 10'         | 1 1/2:1           | 96+00 ~ 98+00                     |            |          |         |
| 95+50 ~ 96+00                                                                  | 6'          | 1 1/2:1           |                                   | 349        |          |         |
| 96+50                                                                          | 6'          | 1:1               |                                   |            |          |         |
| 110+00 ~ 112+50                                                                | 8'          | 1:1               | 110+00 ~ 115+00                   | 431        |          |         |
| 116+00 ~ 117+50                                                                | 8'          | 1 1/2:1           | 114+00±                           | 530        |          |         |
| 126+00                                                                         | 8'          | 1 1/2:1           | 120+00 ~ 127+00                   |            | 1200     |         |
| 126+50                                                                         | 8'          | 1 1/2:1 & 1 1/4:1 |                                   |            |          |         |
| 127+00                                                                         | 8'          | 1 1/2:1           |                                   | 1802       |          |         |
| 127+50                                                                         | 10'         | 1 1/2:1           |                                   |            |          |         |
| 129+00                                                                         | 10'         | TO 20% OF SLOPE   |                                   |            |          |         |
| 131+00 ~ 153+02.88                                                             | 3'          | 1 1/2:1 & 1 1/4:1 | Line Change                       | 21,845     |          |         |
| 155+126A                                                                       |             |                   |                                   |            |          |         |
| 199+00 ~ 211+00                                                                | 6'          | 1:1 & 1 1/2:1     | 203+00 ~ 207+00                   | 500        |          |         |
| 218+00 ~ 219+00                                                                | 3'          | 1:1               | 215+50 ~ 218+00                   | 500        |          |         |
| 268+00 ~ 269+00                                                                | 6'          | 1 1/2:1           | 269+00 ~ 270+00                   | 150        |          |         |
| 271+00 ~ 277+00                                                                | 3'          | 1:1               | 275+00 ~ 278+00                   | 300        |          |         |
| 280+00 ~ 286+00                                                                | 6'          | 1 1/2:1           | 278+00 ~ 286+00                   | 892        |          |         |
| 307+00 ~ 312+00                                                                | 6'          | 1:1               | 309+00 ~ 314+00                   | 500        |          |         |
| 333+00 ~ 342+00                                                                | 6'          | 1:1               | 335+00 ~ 339+00                   | 200        |          |         |
| 358+00 ~ 363+00                                                                | 8'          | 1:1               | 363+00 ~ 368+00                   | 257        |          |         |
| 381+00 ~ 386+00                                                                | 6'          | 1 1/2:1           | Within 500'                       | 857        |          |         |
| 410+00 ~ 412+00                                                                | 10'         | 1:1               | 408+00 ~ 410+00                   |            |          |         |
| 412+50 ~ 413+50                                                                | 8'          | 1 1/2:1           | 412+00 ~ 417+00                   | 1194       |          |         |
| 413+50 ~ 418+50                                                                | 10'         | 1:1               | 413+50 ~ 418+50                   | 600        |          |         |
| 420+00 ~ 431+61.7                                                              | 10'         | 1 1/2:1           | Grade Revision                    | * 5082     | 78       |         |
| 460+50 ~ 464+50                                                                | 3'          | 1 1/2:1           | 464+50 ~ 467+00                   | 500        |          |         |
| 479+00 ~ 481+00                                                                | 3'          | 1:1               | 481+87 ~ 482+50                   | 50         |          |         |
| 486+50 ~ 495+00                                                                | 6'          | 1:1               | Within 500'                       | 400        |          |         |
| Estimated for cut slope Treatment in areas where new back slopes are required. |             |                   |                                   | 1700       |          |         |
| TOTAL                                                                          |             |                   |                                   | 49,402     | 20,886   | 2       |

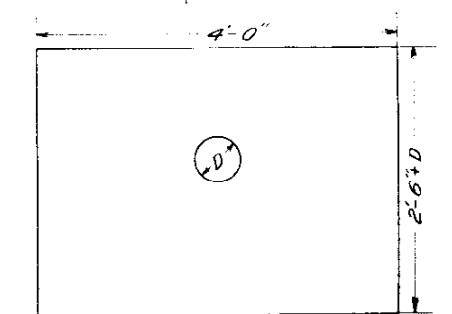
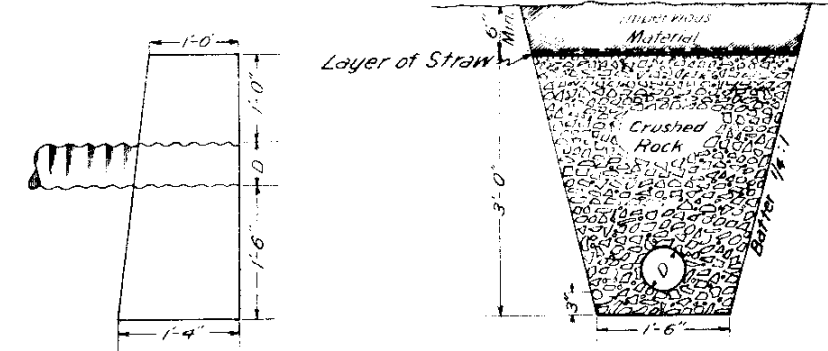
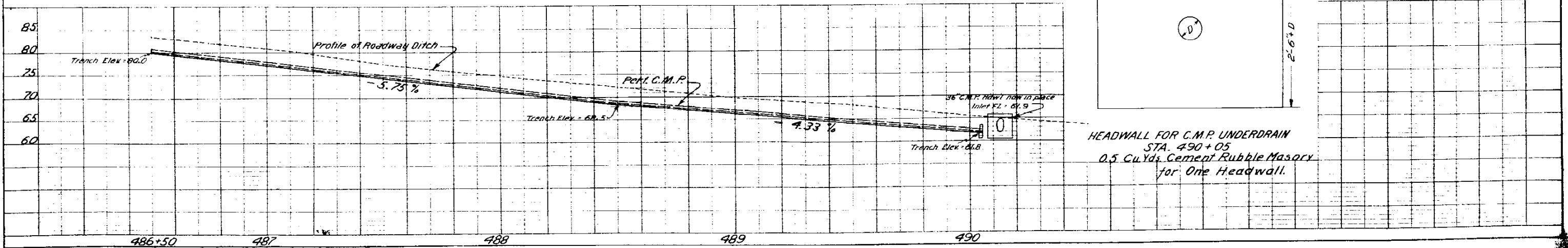
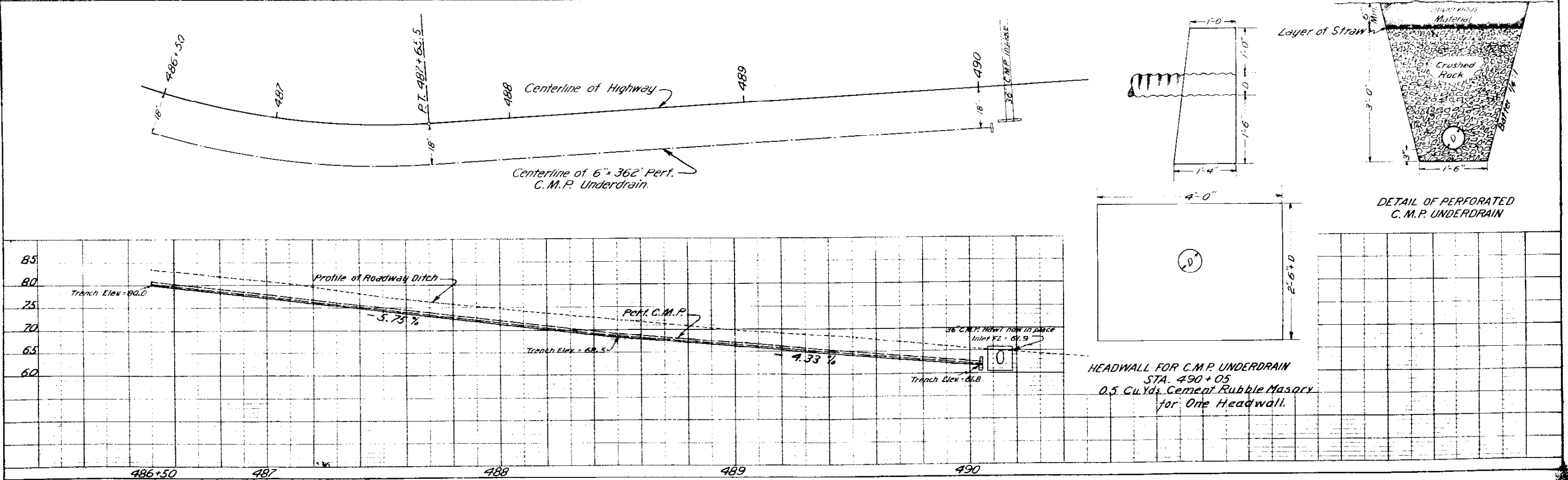
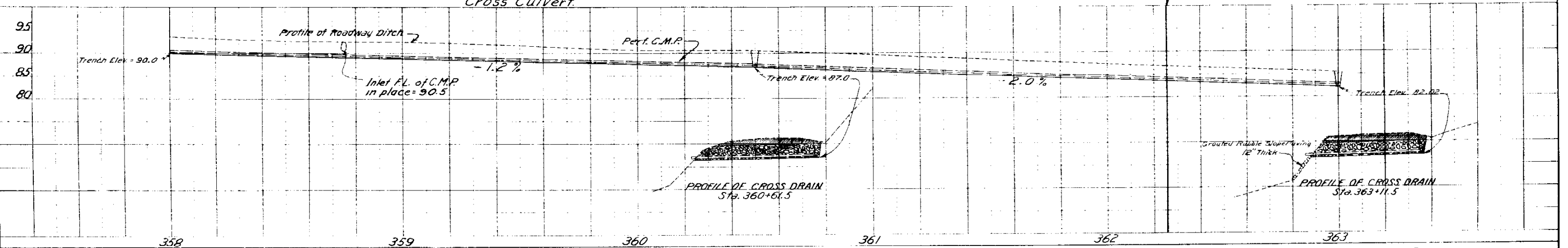
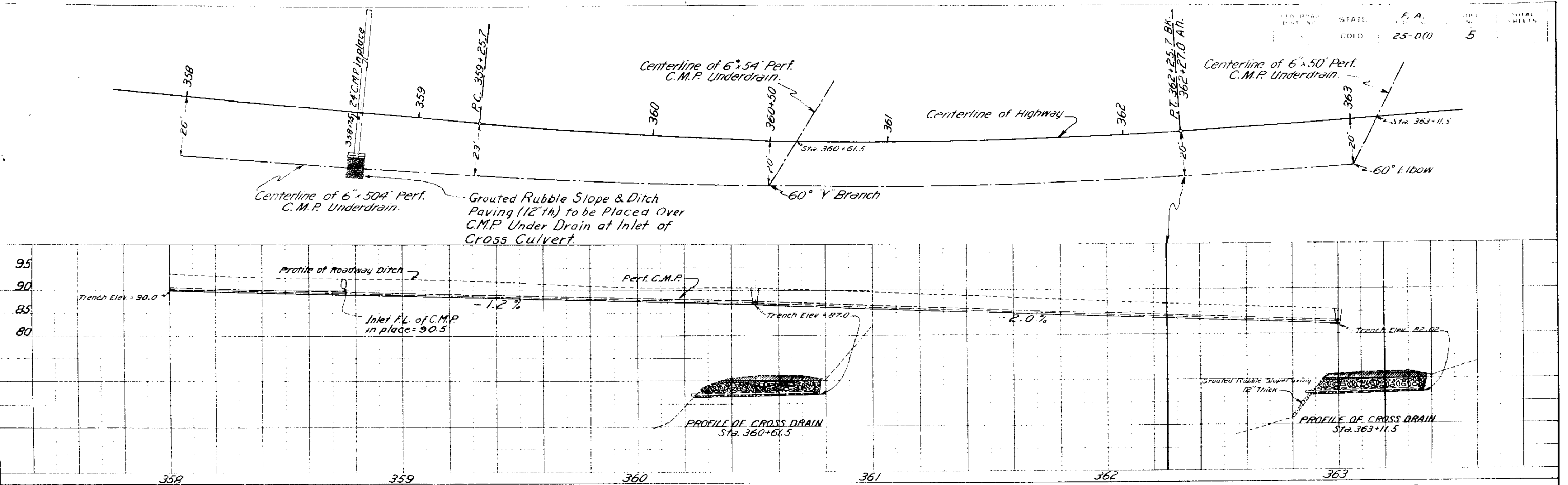
\* Includes 515 Cu. Yds. of unstable material from Sta. 424+50 to Sta. 426+50 to be wasted on left of Sta. 429+50 to Sta. 431+00.  
 \* Excavated material to be used to build Embankments to grade and to widen fills at the locations indicated in the column headed "Material to be placed."

# TIMBER GUARD POSTS

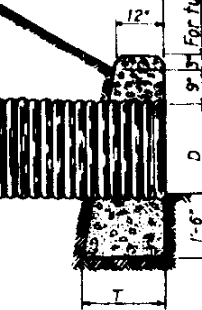
| STATION TO STATION  | SIDE | SPACING | NO. POSTS |
|---------------------|------|---------|-----------|
| -(26+00) ~ -(18+50) | L    | 50'     | 16        |
| -(10+00) ~ 6+55     | L    | 50'     | 10        |
| 9+50 ~ 14+00        | L    | 50'     | 10        |
| 20+50 ~ 28+00       | R    | 50'     | 16        |
| 21+00 ~ 28+00       | L    | 50'     | 15        |
| 45+50 ~ 57+00       | L    | 50'     | 24        |
| 78+80 ~ 83+20       | L    | 40'     | 12        |
| 93+00 ~ 98+50       | L    | 50'     | 12        |
| 100+00 ~ 104+40     | L    | 40'     | 12        |
| 107+50 ~ 115+50     | L    | 40'     | 21        |
| 127+50 ~ 130+00     | L    | 50'     | 6         |
| 139+00 ~ 142+00     | L    | 50'     | 7         |
| 143+00 ~ 149+50     | L    | 50'     | 14        |
| 152+50 ~ 153+50     | R    | 50'     | 3         |
| 152+50 ~ 153+50     | L    | 50'     | 3         |
| 161+00 ~ 175+04     | L    | 50'     | 29        |
| 175+34 ~ 181+64     | L    | 30'     | 22        |
| 184+00 ~ 192+90     | L    | 50'     | 18        |
| 203+00 ~ 208+50     | L    | 50'     | 12        |
| 210+75 ~ 212+75     | L    | 40'     | 6         |
| 215+00 ~ 218+00     | L    | 50'     | 7         |
| 232+60 ~ 241+00     | L    | 30'     | 29        |
| 257+34 ~ 258+54     | L    | 40'     | 4         |
| 262+00 ~ 265+00     | L    | 50'     | 7         |
| 286+00 ~ 303+60     | L    | 40'     | 45        |
| 317+50 ~ 321+50     | L    | 50'     | 9         |
| 324+00 ~ 330+00     | L    | 50'     | 13        |
| 334+50 ~ 339+00     | L    | 50'     | 10        |
| 344+75 ~ 358+18     | L    | 40'     | 31        |
| 359+75 ~ 361+25     | L    | 50'     | 4         |
| 363+00 ~ 366+60     | L    | 40'     | 10        |
| 363+50 ~ 365+00     | R    | 50'     | 4         |
| 368+00 ~ 369+50     | L    | 50'     | 4         |
| 393+75 ~ 395+75     | L    | 40'     | 6         |
| 394+15 ~ 395+35     | R    | 40'     | 4         |
| 398+70 ~ 416+45     | L    | 40'     | 44        |
| 400+15 ~ 401+35     | R    | 40'     | 4         |
| 402+50              | R    |         | 1         |
| 418+00 ~ 423+00     | L    | 50'     | 11        |
| 419+00 ~ 423+00     | R    | 50'     | 9         |
| 429+50 ~ 433+32     | L    | 30'     | 15        |
| 430+00 ~ 433+62     | R    | 40'     | 11        |
| 441+20 ~ 442+40     | L    | 40'     | 4         |
| 441+20 ~ 442+40     | R    | 40'     | 4         |
| 446+20 ~ 450+23     | L    | 40'     | 6         |
| 452+00 ~ 461+20     | L    | 40'     | 24        |
| 478+00 ~ 478+50     | L    | 50'     | 2         |
| 478+50 ~ 479+50     | R    | 50'     | 3         |
| TOTAL               |      |         | 593       |

# GUARD FENCE

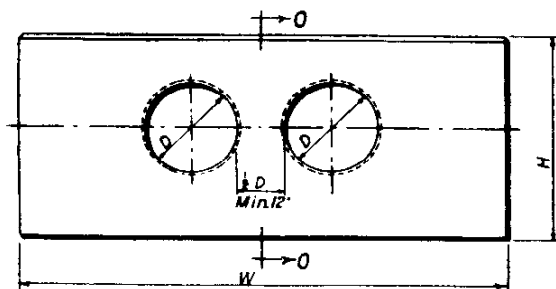
| STATION TO STATION | SIDE | LIN. FT. |
|--------------------|------|----------|
| 130+50 ~ 133+50    | L    | 296      |
| 134+05 ~ 137+17    | L    | 312      |
| 220+00 ~ 227+60    | L    | 760      |
| 249+50 ~ 256+94    | L    | 744      |
| 268+00 ~ 270+80    | L    | 280      |
| 268+90 ~ 270+58    | R    | 168      |
| 277+40 ~ 279+56    | L    | 216      |
| 277+80 ~ 279+64    | R    | 184      |
| 306+30 ~ 314+20.5  | L    | 776      |
| 307+88 ~ 310+84    | R    | 296      |
| 463+00 ~ 468+73    | L    | 569      |
| 464+30 ~ 467+10    | R    | 280      |
| 472+45 ~ 477+50    | L    | 488      |
| 473+40 ~ 475+72    | R    | 232      |
| 482+00 ~ 486+40    | R    | 440      |
| 482+50 ~ 486+58    | L    | 408      |
| TOTAL              |      | 6448     |



th in feet face to  
headwalls



SECTIONAL ELEV. 0-0

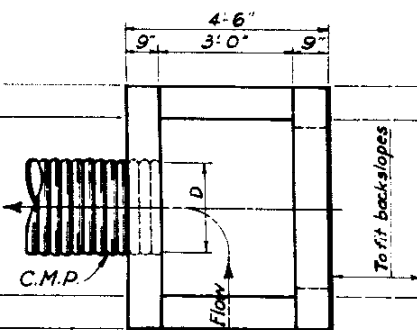


FRONT ELEVATION

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

| W      | H     | T     | CL. B CONCRETE FOR 2 HEADWALLS | CORRUGATED METAL PIPE | CEMENT RUBBLE MASONRY |
|--------|-------|-------|--------------------------------|-----------------------|-----------------------|
| 7'-6"  | 3'-9" | 1'-6" | 2.4 CU. YDS.                   | 18 GA. 2 L. LIN. FT.  | 18 DO 2 XL = DO       |
| 8'-6"  | 4'-0" | 1'-9" | 3.0 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 10'-0" | 4'-6" | 2'-0" | 4.4 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 12'-0" | 5'-0" | 2'-3" | 6.1 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 14'-0" | 5'-6" | 2'-6" | 8.2 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 16'-0" | 6'-0" | 2'-9" | 10.8 DO                        | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 18'-0" | 6'-6" | 3'-0" | 13.8 DO                        | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |

HEADWALLS FOR DOUBLE CORR. METAL PIPE CULV'S.

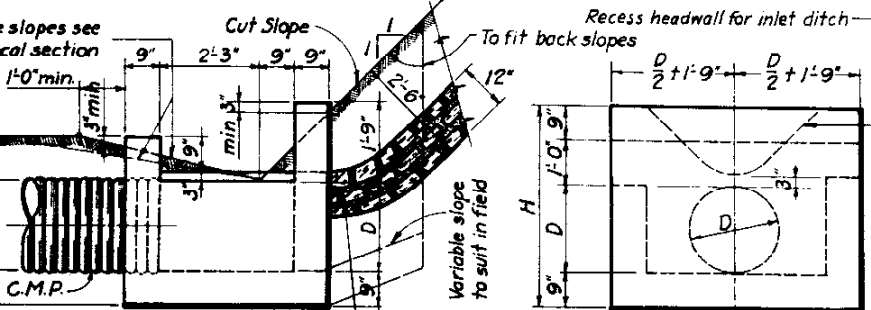


PLAN

QUANTITIES OF CLASS "B" CONCRETE  
OR CEMENT RUBBLE MASONRY

| SIZE OF PIPE | WIDTH OF WALL | HEIGHT OF WALL | QUANTITIES IN ONE HEADWALL |
|--------------|---------------|----------------|----------------------------|
| D            | W             | H              | CU. YDS.                   |
| 12"          | 4'-6"         | 3'-6"          | 1.33                       |
| 15"          | 4'-9"         | 3'-9"          | 1.48                       |
| 18"          | 5'-0"         | 4'-0"          | 1.64                       |
| 24"          | 5'-6"         | 4'-6"          | 1.90                       |
| 30"          | 6'-0"         | 5'-0"          | 2.34                       |
| 36"          | 6'-6"         | 5'-6"          | 2.72                       |

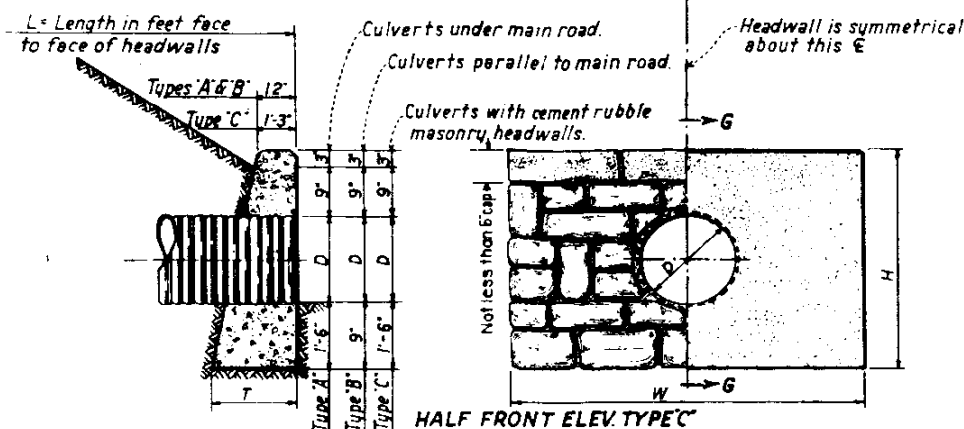
NOTE: Backwall to be eliminated and end walls connected to back slope where ordered by the Engineer. Floor slab is to be extended with side walls if in common material and is to be omitted when inlet is in rock. Actual quantities involved in such operation shall be allowed and paid for. Increases in plan quantities must be covered by work order.



ELEVATION

INTERCEPTING HEADWALLS

END VIEW



SECTIONAL ELEV. G-G

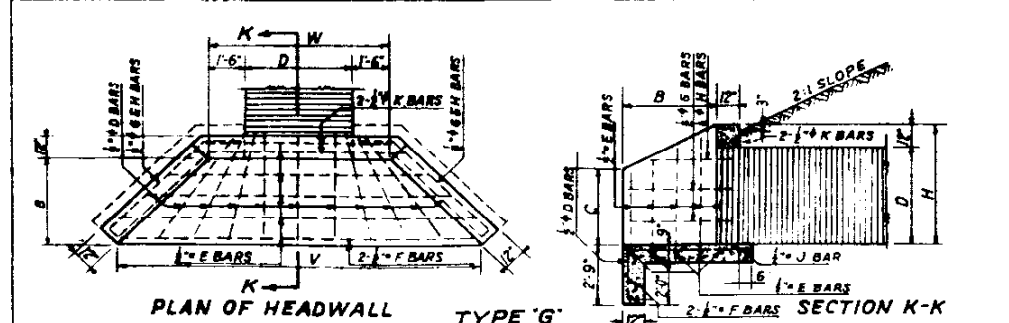
HALF FRONT ELEV. TYPE 'A' & 'B'

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.                   | 18 GA. 2 L. LIN. FT.  | 18 DO 2 XL = DO       |
| 15" | 4'-9" | 3'-9" | 1'-6"  | 1.8 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 18" | 5'-0" | 4'-0" | 1'-7"  | 2.3 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 24" | 5'-6" | 4'-6" | 1'-10" | 4.3 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 30" | 6'-0" | 5'-0" | 2'-0"  | 6.0 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 36" | 6'-6" | 5'-6" | 2'-3"  | 8.0 DO                         | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 42" | 7'-0" | 6'-0" | 2'-6"  | 10.0 DO                        | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |
| 48" | 7'-6" | 6'-6" | 2'-9"  | 12.0 DO                        | 18 DO 2 XL = DO       | 18 DO 2 XL = DO       |

REINFORCING STEEL QUANTITIES ARE FOR TWO HEADWALLS

| DIAMETER OF PIPE | 54"                                | 60"                                | 66"                                | 72"                                | 78"                                | 84"                                | BENDING DIAGRAM |
|------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------|
| D BARS 1/4"      | SPACING 10"<br>LENGTH 11"<br>7'-7" | SPACING 10"<br>LENGTH 11"<br>7'-7" | SPACING 10"<br>LENGTH 11"<br>7'-7" | SPACING 10"<br>LENGTH 11"<br>7'-7" | SPACING 10"<br>LENGTH 11"<br>7'-7" | SPACING 10"<br>LENGTH 11"<br>7'-7" |                 |
| E BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |
| F BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |
| G BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |
| H BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |
| J BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |
| K BARS 1/2"      | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" | SPACING 12"<br>LENGTH 12"<br>1'-0" |                 |



PLAN OF HEADWALL

TYPE 'G'

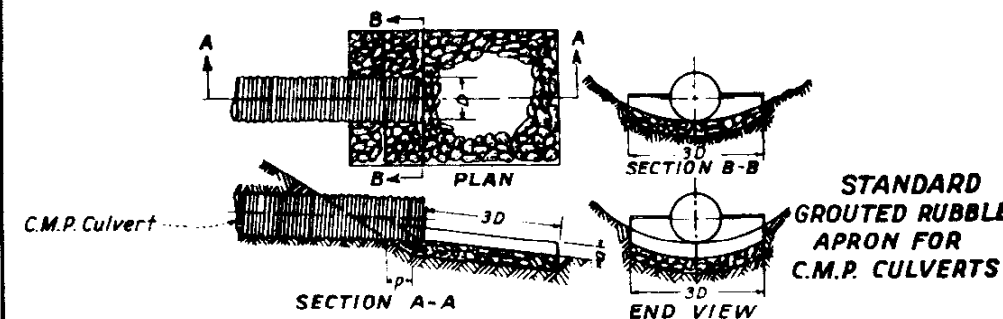
SECTION K-K

STD. HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS

REVISIONS

STANDARD M-102-F

| FED. ROAD DIST. NO. | STATE | FAP  | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|------|-----------|--------------|
| 3                   | COLO. | 2500 | 6         |              |



| SQUARE YARDS GROUTED RUBBLE SLOPE & DITCH PAVING "1 FOOT THICK" |       |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------------------------------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| FILL SLOPE                                                      | D     | 15' | 18' | 24' | 30' | 36' | 42' | 48' | 54' | 60' | 66' | 72' | 78' | 84' |
| 1 1/2:1                                                         | 2'-0" | 3   | 4   | 6   | 9   | 12  | 15  | 18  | 21  | 24  | 27  | 30  | 33  | 36  |
| 2:1                                                             | 2'-0" | 3   | 4   | 7   | 10  | 13  | 16  | 20  | 23  | 26  | 30  | 34  | 37  | 40  |
| 3:1                                                             | 3'-0" | 3   | 4   | 7   | 11  | 15  | 20  | 25  | 31  | 36  | 41  | 46  | 51  | 56  |
| 4:1                                                             | 4'-0" | 3   | 5   | 8   | 12  | 16  | 22  | 28  | 34  | 40  | 46  | 52  | 58  | 64  |

NOTE: Mechanical Tamping as provided under Item 14 of the specifications shall be applied over such areas as shown on the plans or as ordered by the Engineer.

GENERAL NOTES FOR ALL STRUCTURES

All work shall be done according to the standard specifications of the Colorado State Highway Department, adopted June 1-1940.  
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 centerline 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**  
**GROUTED RUBBLE APRONS**  
**FOR C.M.P. CULVERTS**

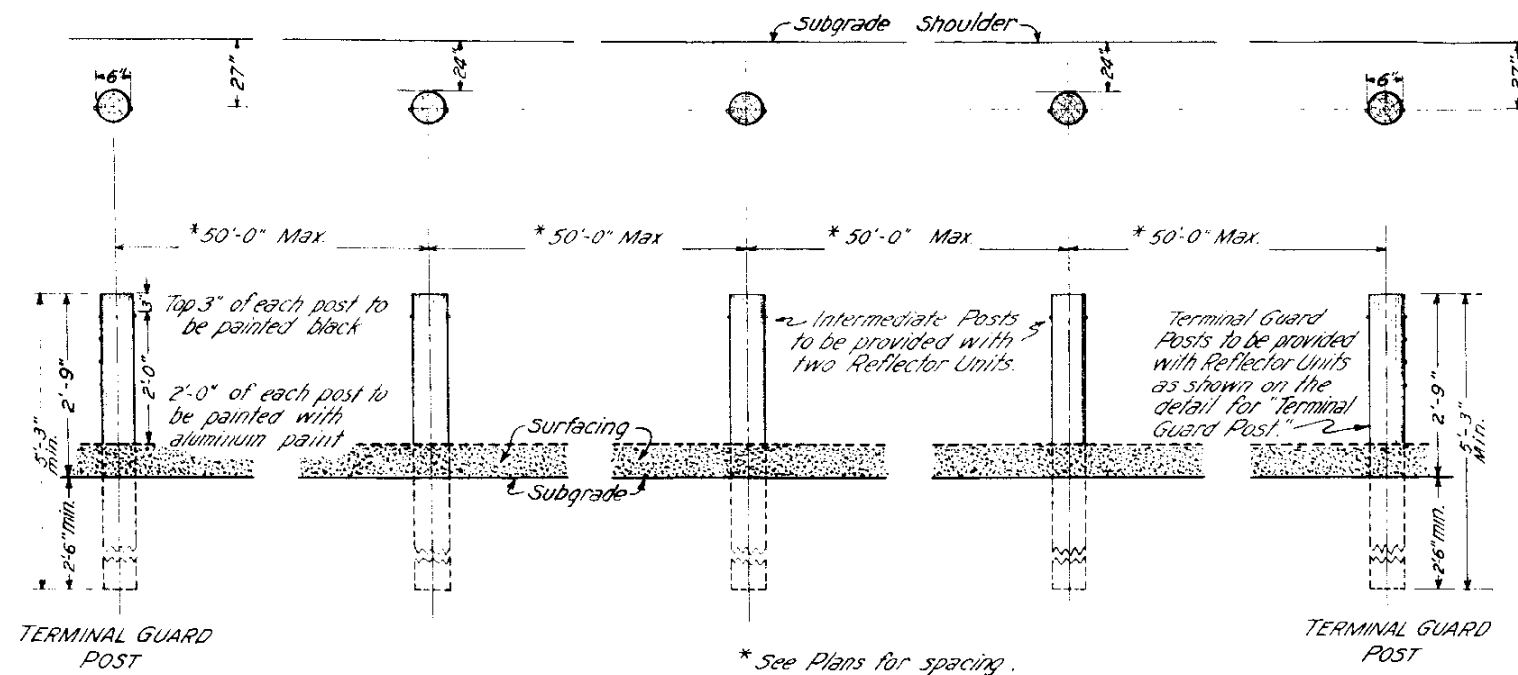
Designed by GND  
Made by LS-AUN  
Checked GND-WMA  
Date: April 27, 1937

Approved by [Signature]  
Bridge Engineer

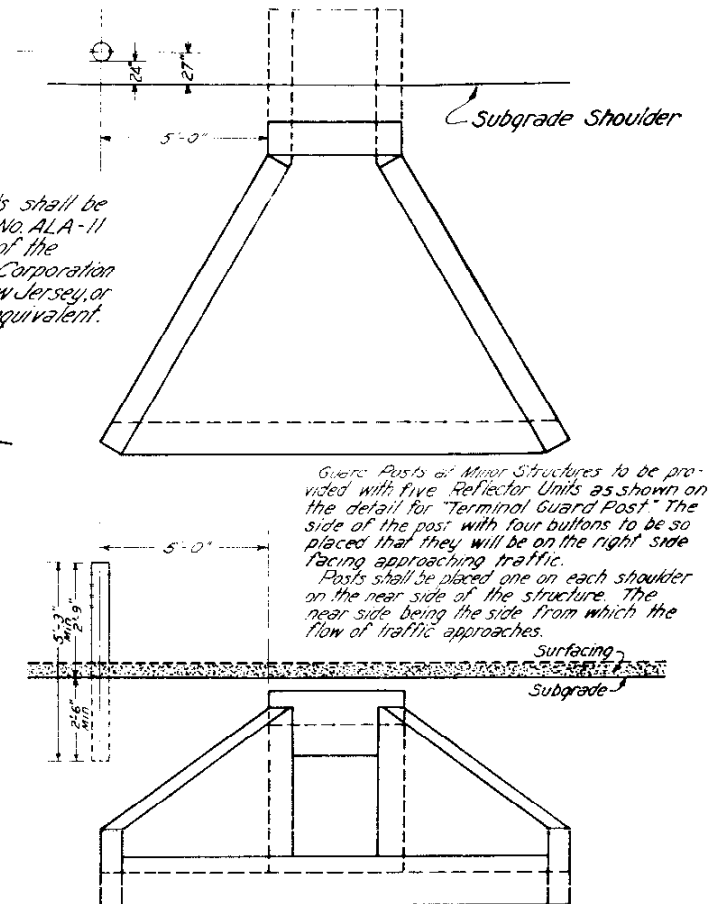
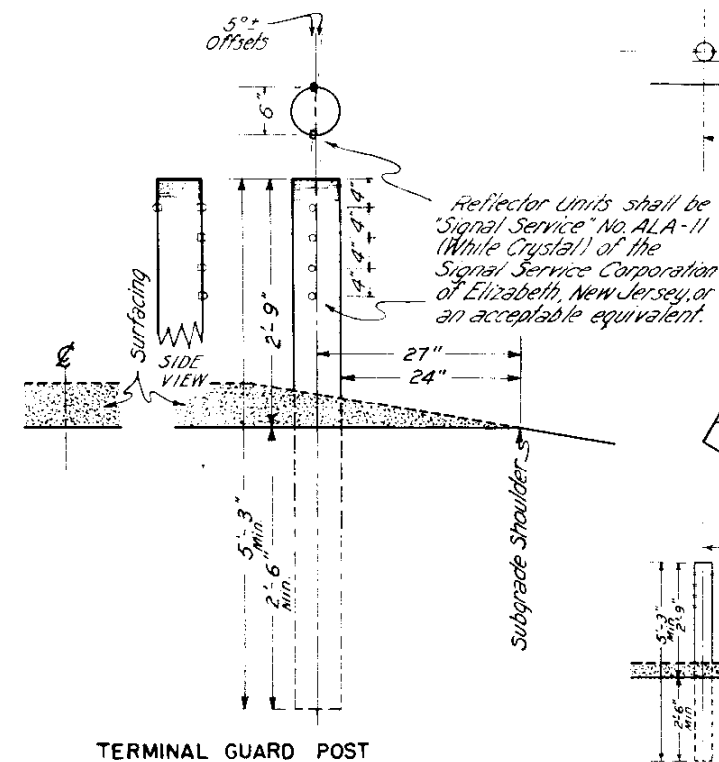
STRUCTURE NO.



|                       |       |             |             |                 |
|-----------------------|-------|-------------|-------------|-----------------|
| FED. ROAD<br>DIST NO. | STATE | FAP<br>2500 | SHEET<br>NO | TOTAL<br>SHEETS |
| 3                     | COLO. |             | 7           |                 |



### SHOWING PLACEMENT ON NORMAL ROADWAY FILLS



SHOWING PLACEMENT AT  
MINOR STRUCTURES

### GENERAL NOTES

*All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted on June 1, 1940.*

All wood posts shall be made from seasoned, straight, sound Lodgepole 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, thoroughly seasoned and dry, with square tops.

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.

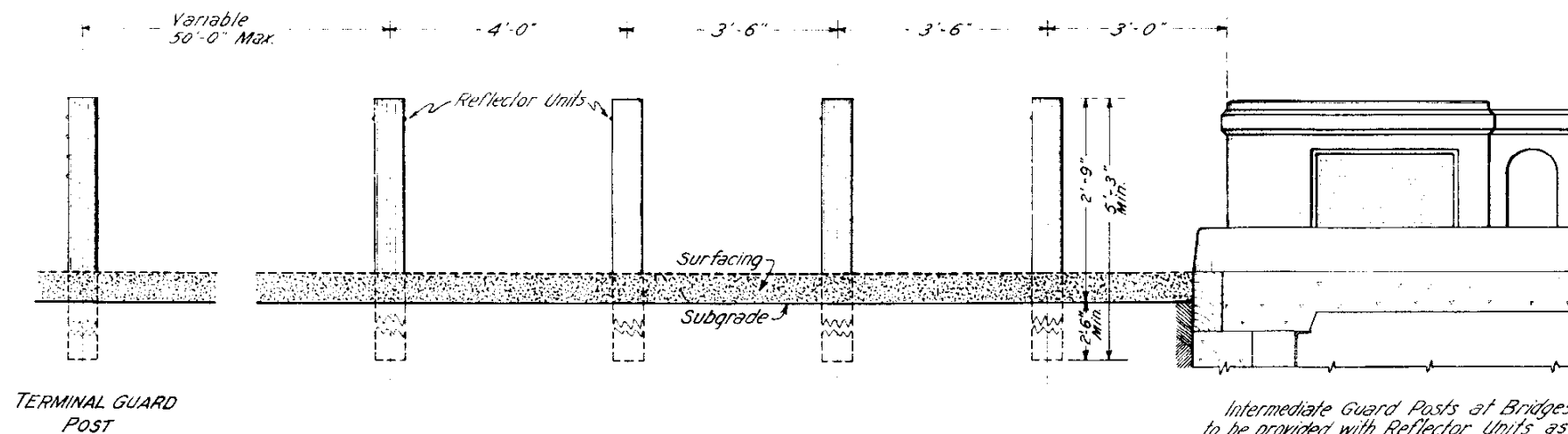
On tangents the Reflector Units shall be placed at an angle of approximately five degrees to a line parallel to the centerline of the highway.

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

approximately one-tenth (0.1) inch less than the breadth 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.

Posts shall be given a standard pressure Creosote treatment and then be thoroughly steam-cleaned in accordance with requirements of specifications.



### SHOWING PLACEMENT AT BRIDGE APPROACHES

*Intermediate Guard Posts at Bridges to be provided with Reflector Units as shown; that is, one Unit each on the three Posts nearest the bridge end and two Units on the fourth Post.*

**COLORADO**  
**STATE HIGHWAY DEPARTMENT**  
**STANDARD**  
**TIMBER GUARD**  
**POSTS**

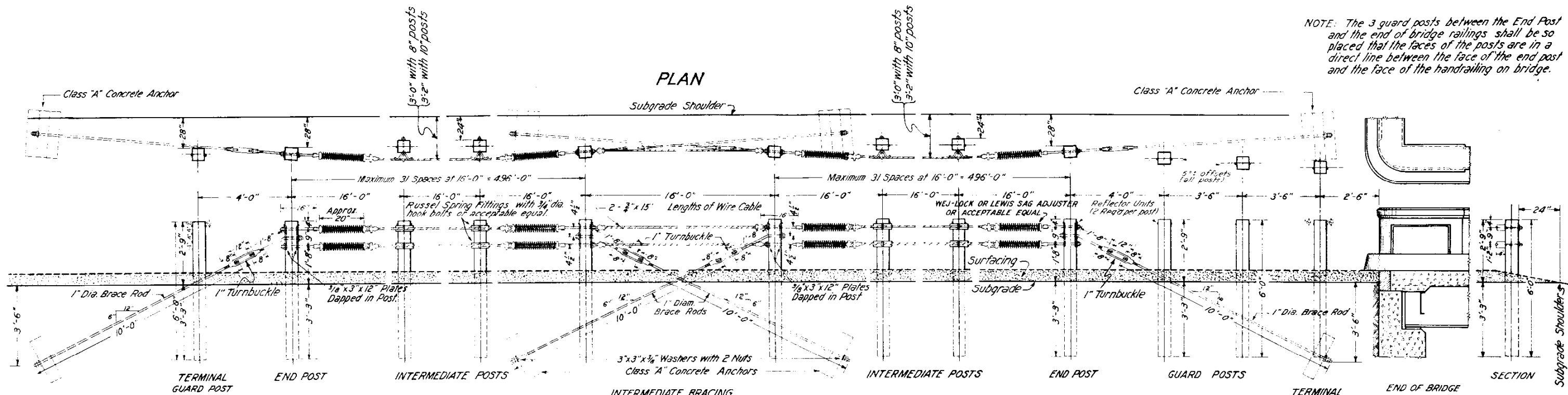
|             |     |             |                         |
|-------------|-----|-------------|-------------------------|
| Designed by | REL | Approved by | <i>W. M. Mendenhall</i> |
| Made by     | PBB | Chief       | <i>D. J. McMahon</i>    |
| Checked by  |     | Date:       | 7. 15, 1939             |



# STANDARD M-20-B

| FED. ROAD DIST. NO. | STATE | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------|--------------|
| 3                   | COLO. | 25011 8   |              |

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.



ELEVATION  
 ITEM N° 74.

## GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department, adopted June 1, 1940.

Wire cable shall be a minimum of 3/4" in diameter and shall conform to the requirements of A.A.S.H.O. Standard Specification M-30-38 for Class "A".

All wood posts shall be close-grained Douglas Fir of the Coast Region, Dense Longleaf or Shortleaf Southern Pine, or Lodgepole Pine.

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.

Timber posts fabricated from Douglas Fir or Southern Pine shall be 8"x8" square. Timber posts fabricated from Lodgepole Pine shall be 8"x10" and shall be installed with the 8" face parallel to the centerline of the roadway.

All wood posts shall be full sawn, square edged, thoroughly seasoned and dry, with square tops and all holes to be drilled no 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 1/32" of compression per 100 ft. of cable shall be used. Illustration: Length between end posts - 400 ft., Temp. 40°F;  $(4 \times 6 \times \frac{1}{32}) \div 1 = 1 \frac{1}{4}$ ".

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 ends shall be placed in line with the face of the curbing on the bridge.

## GEN. NOTES (CONT.)

Reflector Units shall be "Signal Service" No. ALA-11 (White Crystal) of the Signal Service Corporation, Elizabeth, N.J., or an acceptable equivalent.

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 centerline 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 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.

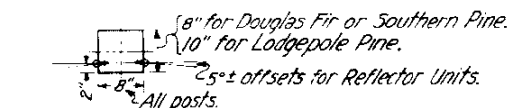
All Terminal Guard Posts except those at Bridge ends to be provided with five Reflector Units as shown on detail. Terminal Guard Posts at Bridge ends to be provided with two Reflector Units in the manner shown for intermediate posts.

NOTE:

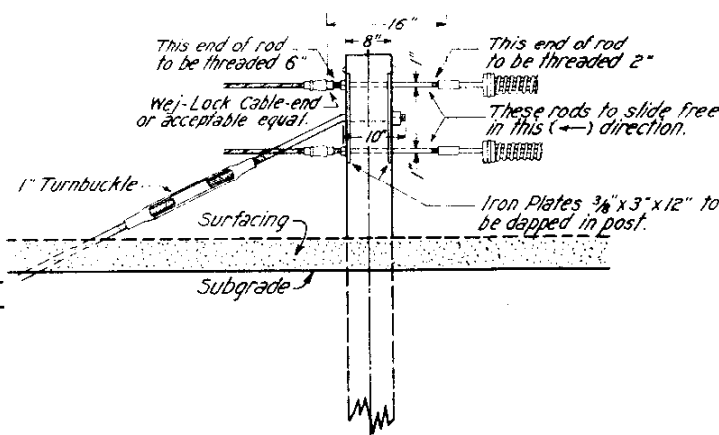
All wrought iron posts shall have one shop coat, red lead, and two coats aluminum as specified under item N° 41.

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.

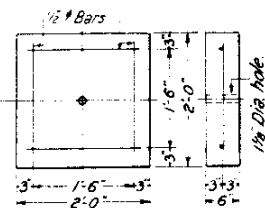
Holes necessary for type of fence used shall be drilled in pipe posts.



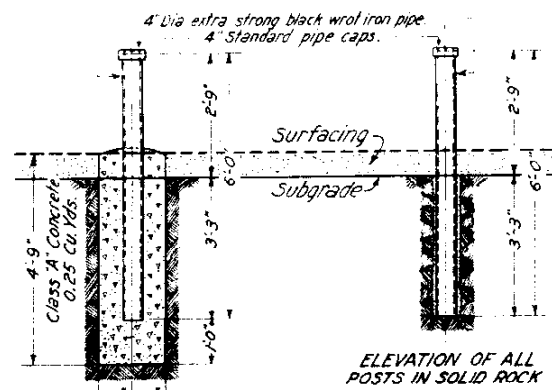
TOP VIEW OF POST



SIDE VIEW OF POST AT INTERMEDIATE BRACING



DETAIL OF ANCHORS



ELEVATION OF ALL POSTS IN SOLID ROCK

ELEVATION OF ALL POSTS IN MATERIAL OTHER THAN SOLID ROCK

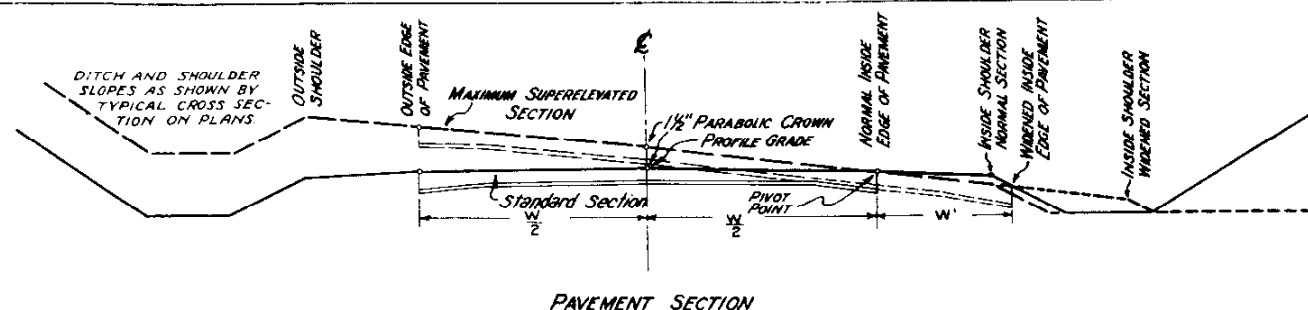
DETAILS FOR WROT IRON PIPE  
 ITEM N° 74 b.

COLORADO  
 STATE HIGHWAY DEPARTMENT  
**STANDARD  
 WIRE CABLE GUARD  
 FENCE**

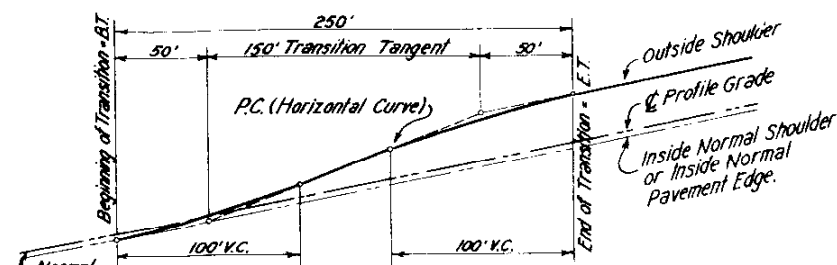
Designed by *R.L.*  
 Made by *P.B.R.*  
 Checked by

Approved by   
 Date *May 5, 1937*





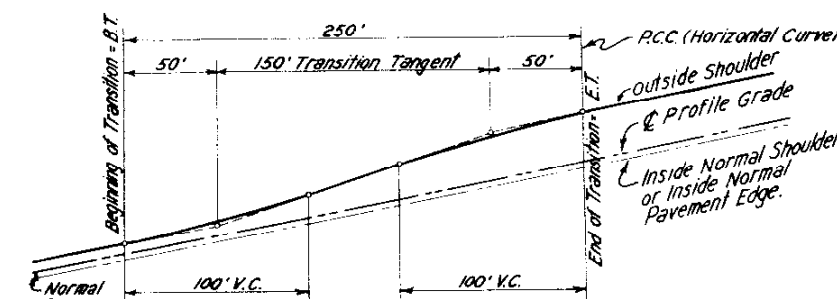
PAVEMENT SECTION



### 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.*



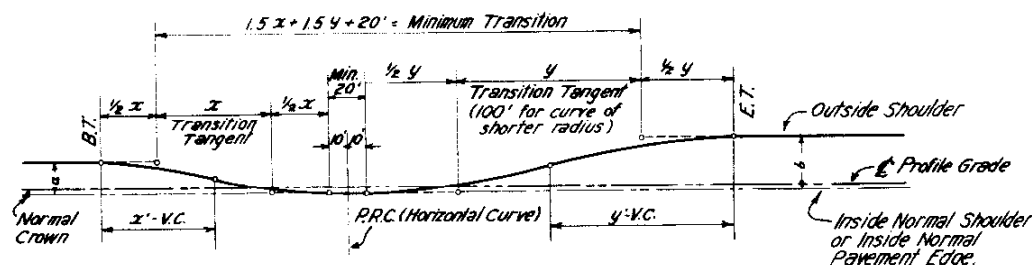
### CASE II: COMPOUND CURVE

**NOTE: CASE 11**

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 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 superelevation of the respective curves.

EXAMPLE: Let  $\alpha$  represent the amount of superelevation on 1<sup>st</sup> curve;

[illegible]

"  $\tau$  " " " " transition tangent on 1st " :

|   |    |   |   |   |   |                       |     |
|---|----|---|---|---|---|-----------------------|-----|
| " | I  | " | " | " | " | HABITAT TANGKAP DI PZ | "   |
| " | // | " | " | " | " | " " 2 <sup>nd</sup>   | " : |

then  $a \cdot b = x \cdot y$

then,  $a:b = x:y$ .  
The transition tangent of the curve having the shorter radius shall be set

The transition tangent of the curve having the shorter radius shall be set  
A normal curved section 20 ft long, 10 ft on each side of the PRC shall

A normal crowned section 20 ft. long, 10 ft. on each side of the P.R.C. is to be used where curves in opposite directions are in such proximity that

*In cases where curves in opposite directions are in such proximity that*

transition can not be had, the practice outlined for true reversing curves should be followed.

The total distance between the P.T. of the first curve and the P.C. of the second curve is

ing curve shall be prorated into the transition distance of the respective c

a maximum of 150 ft. of transition tangent for each curve is achieved.

• **Maximum of 100% of the maximum salary**

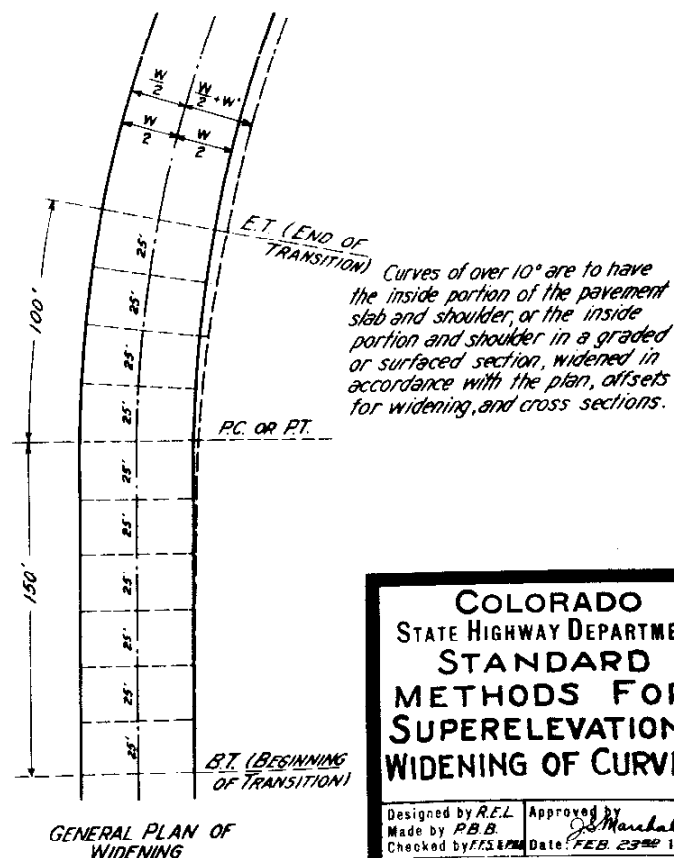
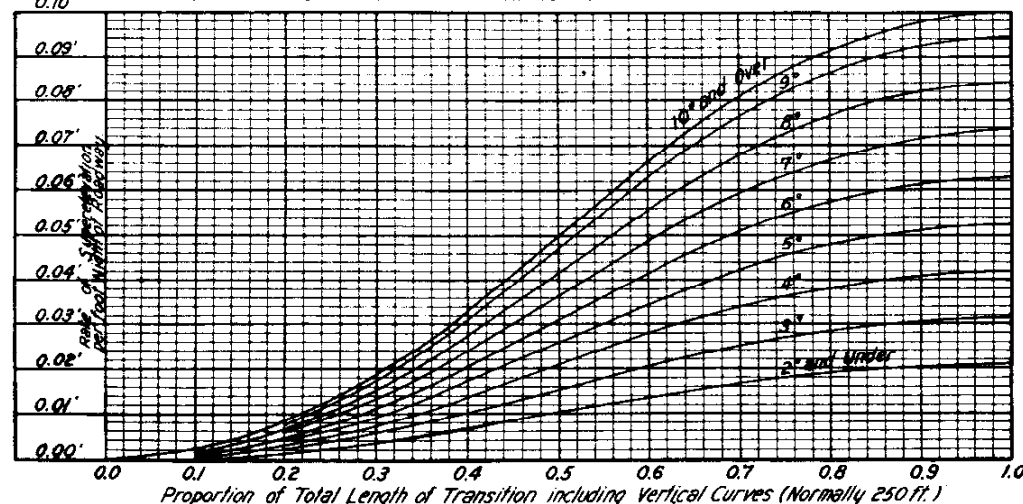
Figure 1 illustrates the experimental setup. A participant is seated at a table, looking at a screen. The screen displays a horizontal line with a central point and two endpoints. The participant is positioned to the left of the screen, and the screen is positioned to the right of the participant. The screen is labeled 'Screen' and the participant is labeled 'Participant'.

---

*SUPERELEVATION AND WIDENING TABLES*

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

GRAPH OF SUPERELEVATION TRANSITION FIGURES

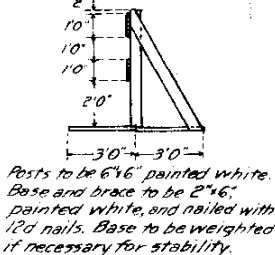


**COLORADO  
STATE HIGHWAY DEPARTMENT  
STANDARD  
METHODS FOR  
SUPERELEVATION &  
WIDENING OF CURVES**

|                           |                                  |
|---------------------------|----------------------------------|
| Designed by <i>R.E.L.</i> | Approved by <i>J.S. Marshall</i> |
| Made by <i>P.B.B.</i>     |                                  |
| Checked by <i>FFS</i>     | Date <i>FEB 23 1937</i>          |

|                        |       |                               |              |                 |
|------------------------|-------|-------------------------------|--------------|-----------------|
| FED. ROAD<br>DIST. NO. | STATE | <del>STATE</del><br>PROJ. NO. | SHEET<br>NO. | TOTAL<br>SHEETS |
| 3                      | COLO. | 23-000                        | 10           |                 |

Revised 6-13-43 A-Z. Changed to 137 Specifications.  
 Revised 8-18-39 A-Z. Changed side drain note.  
 Revised 12-1-41 A-Z. Changed typical cross section for side approach roads.  
 Revised 5-15-42 A-Z. Changed storm drains for side approach roads.  
**APPROACH ROADS**  
 Proj. 6-28-40 A-Z-1940 Specs.



*Side drains shall be placed at the greatest feasible distance from the roadway shoulder consistent with good practice. A minimum of 20 feet from shoulder should be adhered to wherever possible.*

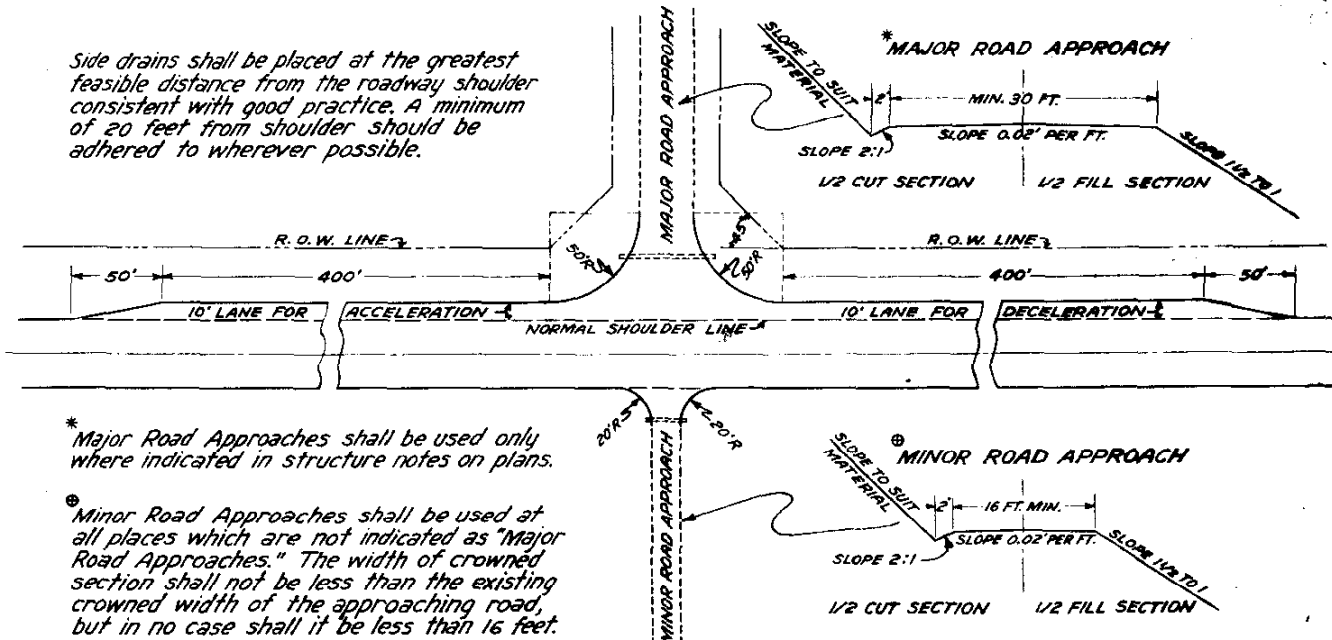


Diagram illustrating the cross-sections of a road, showing the 1/2 CUT SECTION, SUPERELEVATED SECTION, and 1/2 FILL SECTION.

**1/2 CUT SECTION:** Shows a 40' VERT. CURVE with a SLOPE -0.02 PER FT. and a SHOULDER LINE. The road is NOT STEEPER THAN 8%.

**SUPERELEVATED SECTION:** Shows a 40' VERT. CURVE with a SLOPE -0.05 PER FT. and a SHOULDER LINE. The road is NOT STEEPER THAN 8%.

**1/2 FILL SECTION:** Shows a 40' VERT. CURVE with a SLOPE -0.02 PER FT. and a SHOULDER LINE. The road is NOT STEEPER THAN 10%.

Labels include: 40' VERT. CURVE, SHOULDER LINE, SLOPE -0.02 PER FT., SLOPE -0.05 PER FT., 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 adopted June 1-1940. 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 <i>SW</i>    | Approved by <i>[Signature]</i> |
| Made by <i>SLC</i>       |                                |
| Check <i>[Signature]</i> | Date: <i>May 1941</i>          |
| Check <i>RAK</i>         |                                |

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

Designed by JSM  
Made by EAL  
Checked by JSM  
Checked by EAL

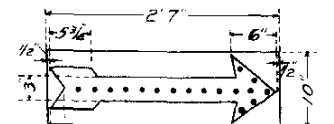
Approved by [Signature]  
Date: May 28, 1968

This District, 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 stated by the Engineer, but in no case shall it be more than 8 feet from the travelled zone.



8 ft.



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

Reflector Buttons and Sign shall be subject to Department approval. Reflector Buttons shall be Signal Service ALA (white crystal) or suitable equivalent.

*Sufficient distance for one traffic lane*

ROAD 65

CAUTION

ROAD AHEAD

6" x 6" Posts

40" Min.

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

Diagram of a rectangular sign with dimensions and text layout:

- Dimensions:**
  - Overall width: 5' 0"
  - Overall height: 3' 4"
  - Text area width: 4' 0"
  - Text area height: 2' 8"
  - Top margin: 6"
  - Left margin: 3"
  - Right margin: 3"
  - Bottom margin: 3"
- Text:**
  - SLOW** (Large, bold, sans-serif font, underlined)
  - ROAD UNDER CONSTRUCTION** (Large, bold, sans-serif font, split across two lines)
  - CONTRACTOR'S NAME** (Smaller, bold, sans-serif font, located at the bottom of the 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" posts 4 ft. in the ground.

[illegible][illegible]

Alignment and Grades as hereon shown are subject to modification during construction after approval by the Denver Office. Guard Fences and Guard Posts Req'd are tabulated on Sheet No. 4. Earthwork quantities involved in this project are tabulated on Sheet No. 4. Earthwork quantities shown on profile do not apply to this project.

- (28+30) ~ 24"x42' C.M.P.  
Cross Cult. (Interc. pot. Howell)

- (18+00) to - (15+00) ~ 47 cu. yds.  
excav for Intercept. Ditch Rt.

$$\begin{aligned}\Delta &= 10^{\circ}02' \\ D &= 1^{\circ} \\ T &= 503.0 \\ L &= 1003.3 \\ R &= 5730.0\end{aligned}$$

**NOTE:**  
Alignment and Grades as shown are subject to modification during construction after approval by the Denver office.  
All poles encroaching on the construction are to be moved by the owners.  
R.O. V. Markers are tabulated on Sheet No. 3.  
Wire Cable Guard Fence and Timber Guard Posts are tabulated on Sheet No. 4.

STA 710+83 BEGINNING  
OF P.W.A. 1220-F UNIT 3 MOI-  
STA 128+64 BEGINNING  
OF P.W.A. 1220-F UNIT 3 MOI-  
AND F.A.P. 25-D-10

### EQUATION

-19+50 ~ 2546 Cu. Yds. Embankment  
for Road Approach on Lt.

24" X 42" C.M.P. CROSS CULV.  
-(16+00)~

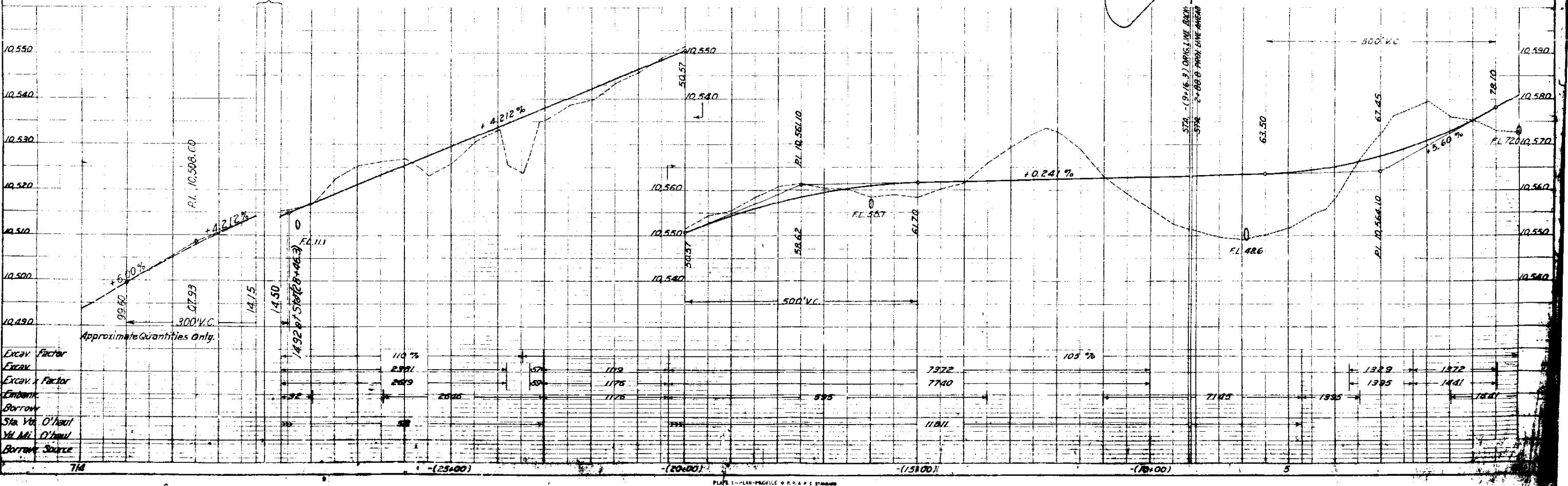
-11+00 to -10+00.  
14.2 Cu Yds uncl for intercepting ditch, Rt.

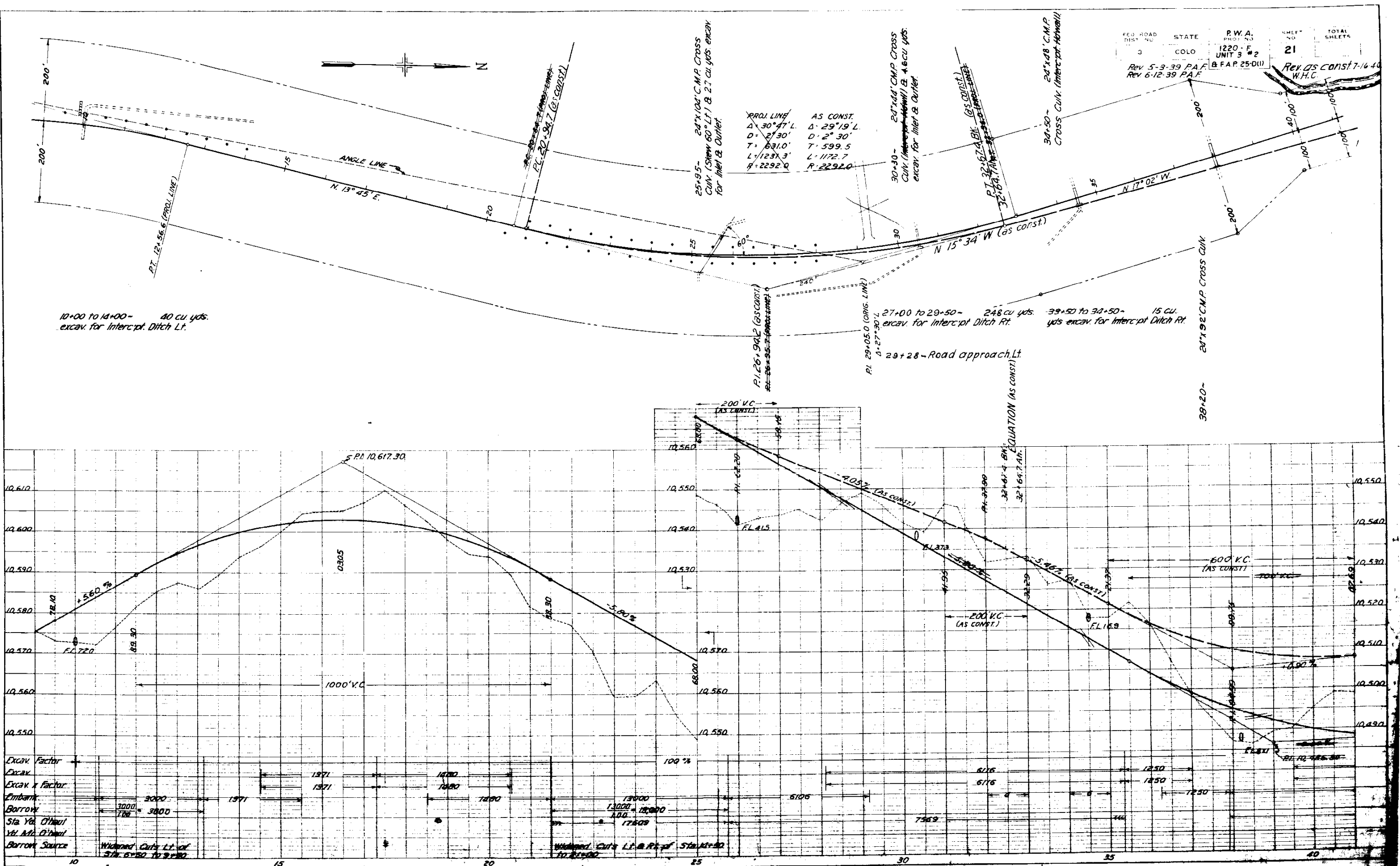
- (11+00) to 3+00 ~ 8"x20" Perf. C.M.P.  
Underdrain (See details on Sheet No. 11)  
2.00' total

EQUATION

4-05- 36"x88" C.M.P. CROSS CURV.  
 & 30 cu. yds excav. for Inlet & Outlet.

10+00~ 24"x62' C.M.P. Cross  
Culv. & 1.6 cu. yds. excav. for Inlet.





REV 5-3-39 P.A.F.

FED. ROAD DIST. NO. 3

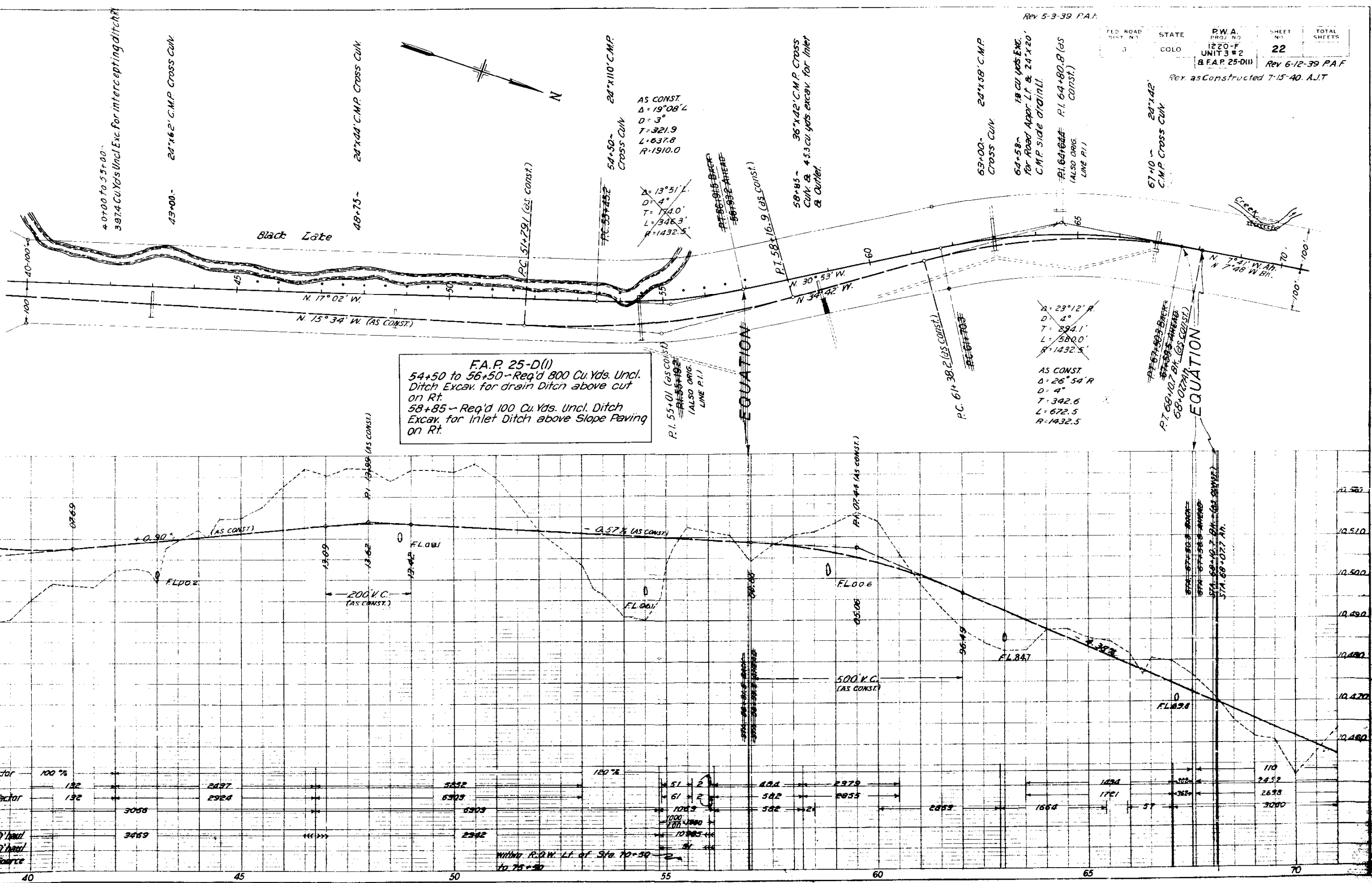
STATE COLO.

P.W.A. PROJ. NO. 1220-F  
UNIT 3 #2  
8 F.A.P. 25-D(II)

SHEET NO. 22

TOTAL SHEETS

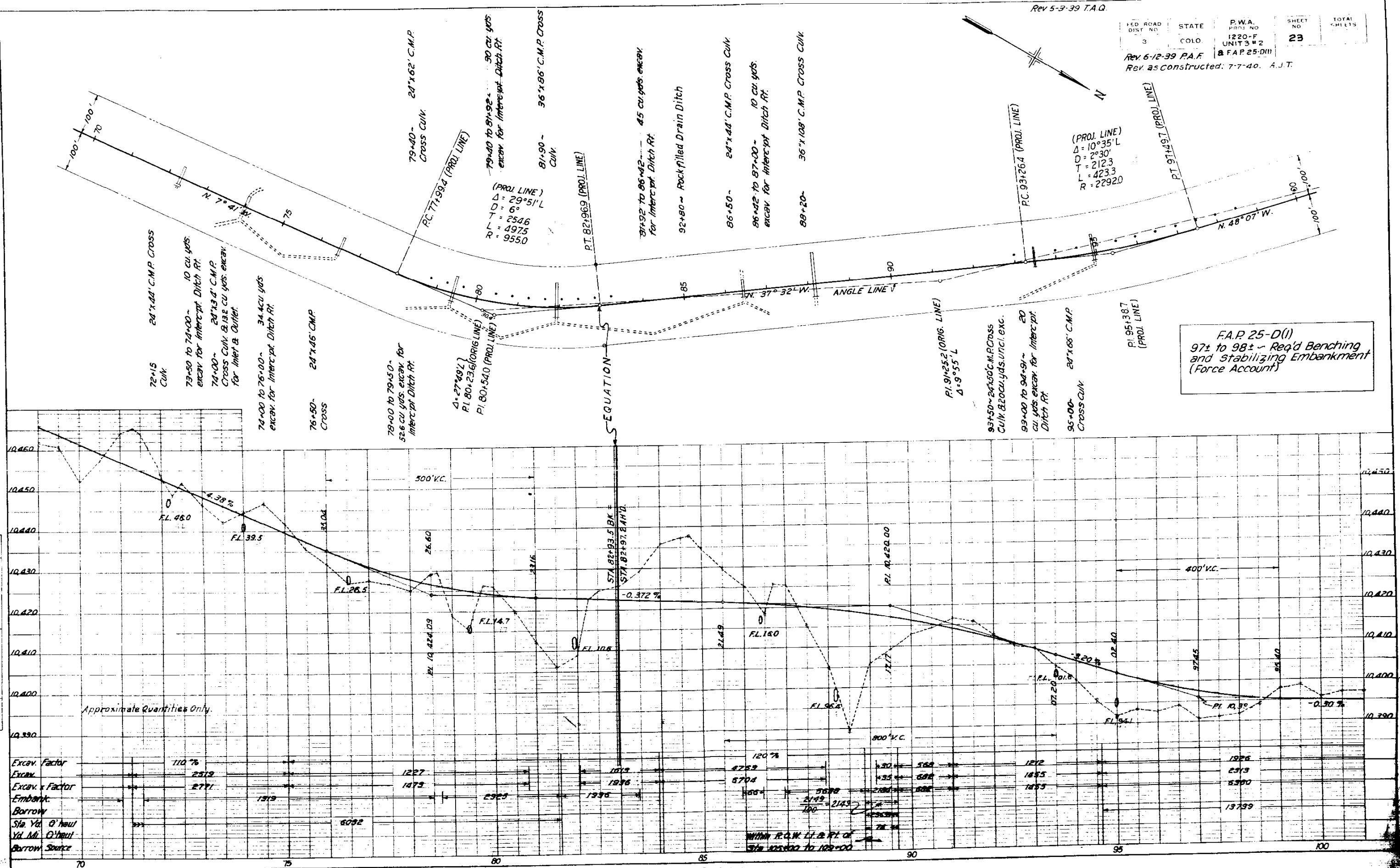
Rev. as Constructed 7-15-40. A.J.T.





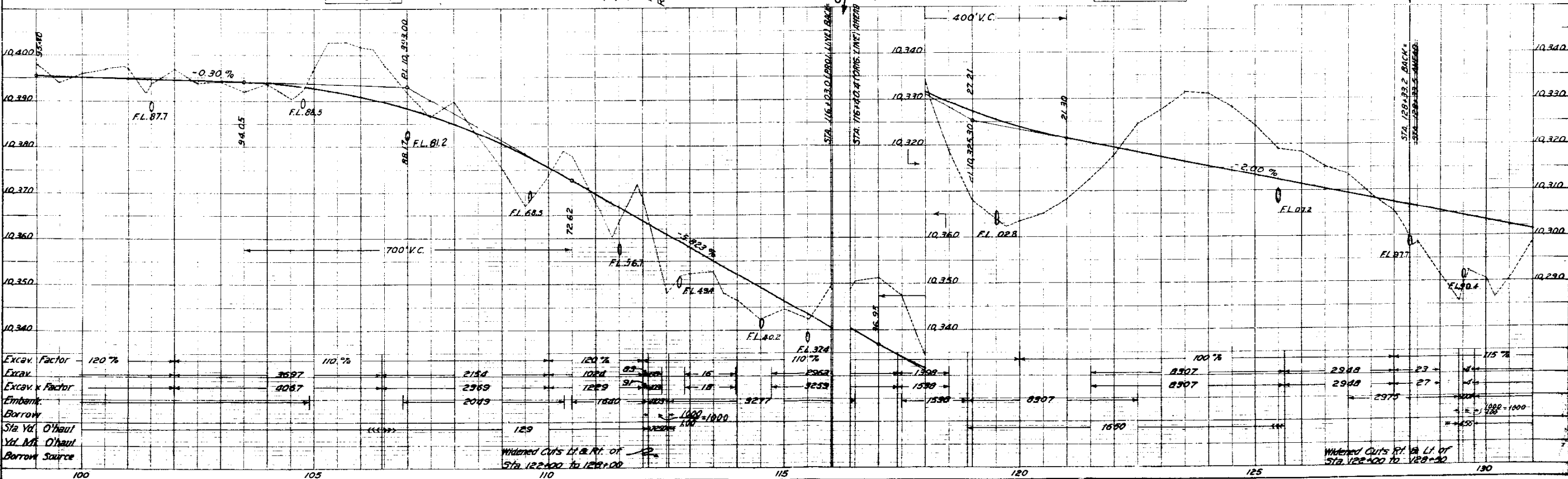
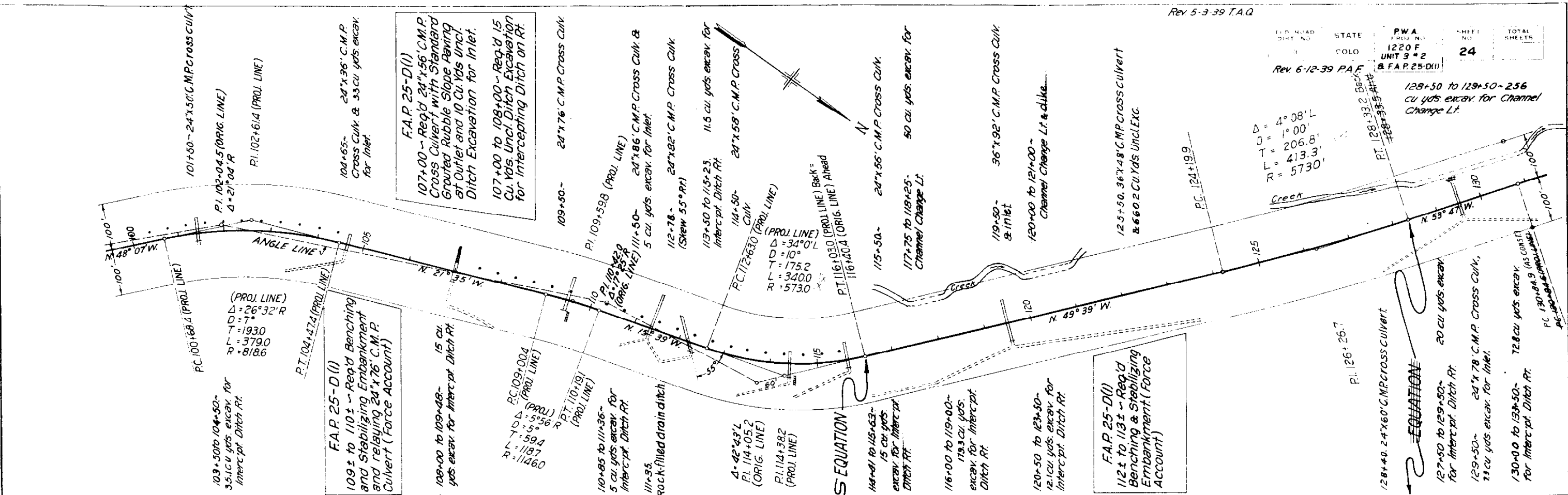
Rev 5-3-39 T.A.Q.

|                                                            |       |                                |           |              |
|------------------------------------------------------------|-------|--------------------------------|-----------|--------------|
| FED. ROAD DIST. NO.                                        | STATE | P.W.A. PROJECT NO.             | SHEET NO. | TOTAL SHEETS |
| 3                                                          | COLO. | 1220-F UNIT 3#2 & FAP 25-D(II) | 23        |              |
| Rev. 6-12-39 P.A.F.<br>Rev. as Constructed: 7-7-40. A.J.T. |       |                                |           |              |



F.A.P. 25-D(II)  
97± to 98± ~ Req'd Benching  
and Stabilizing Embankment  
(Force Account)





10 cu. yds. excav. for

153+08~ 24"x100' C.M.P. CROSS CULV. & away for Inlet & Outlet Ditches

BK. (AS CONST.)

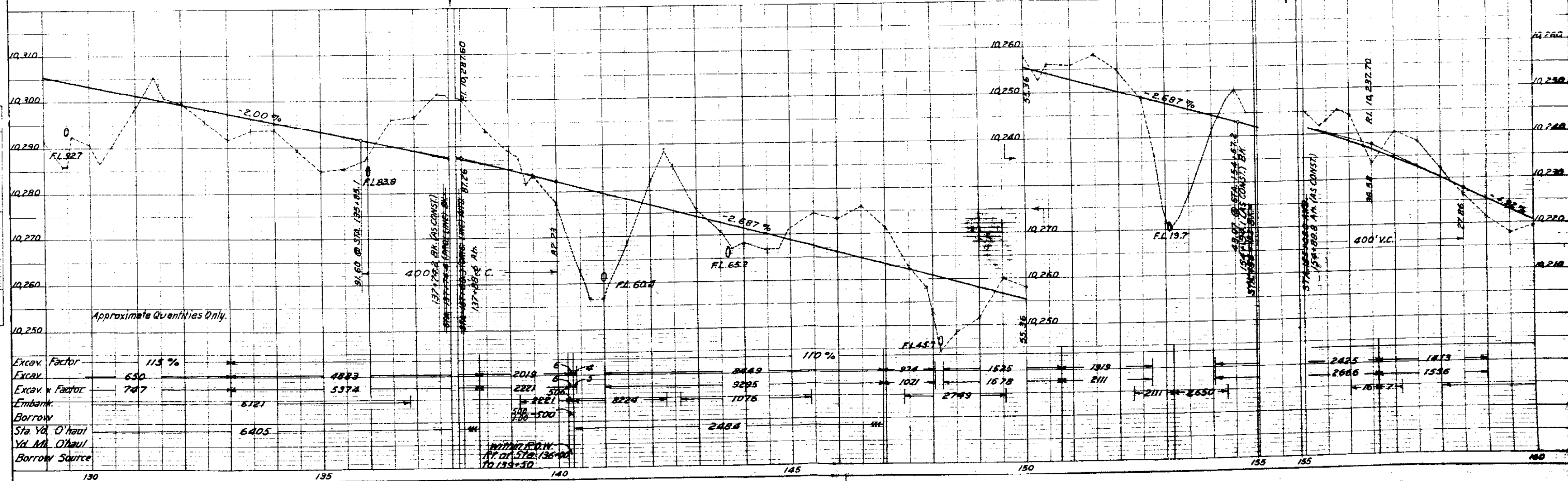
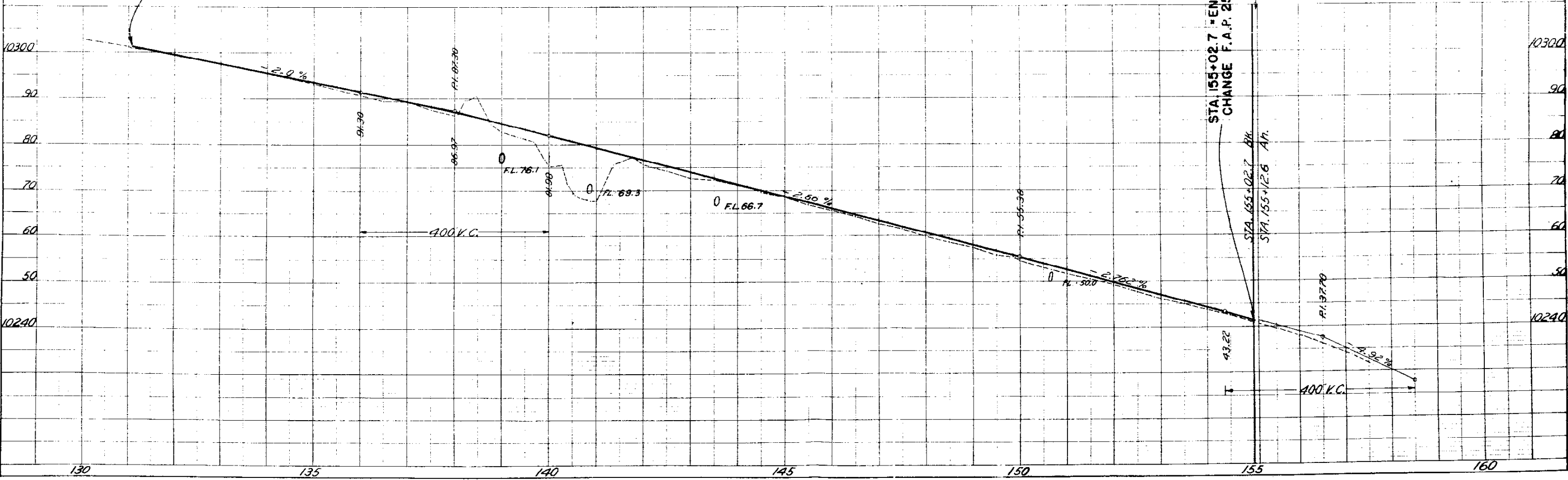
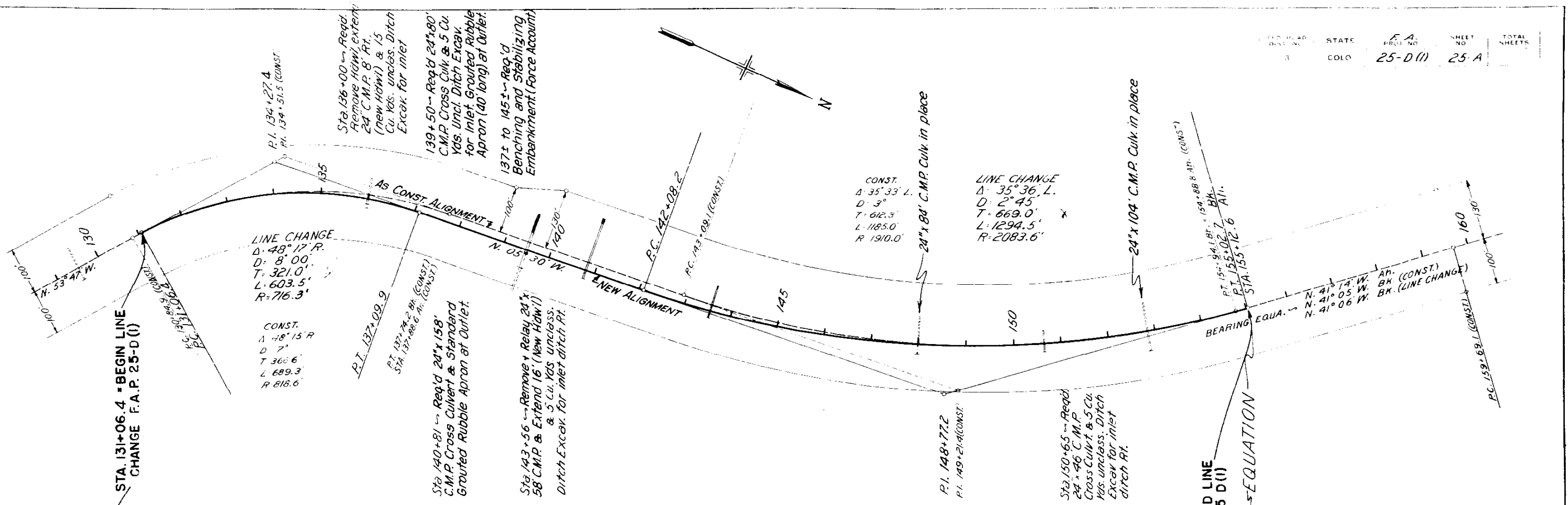
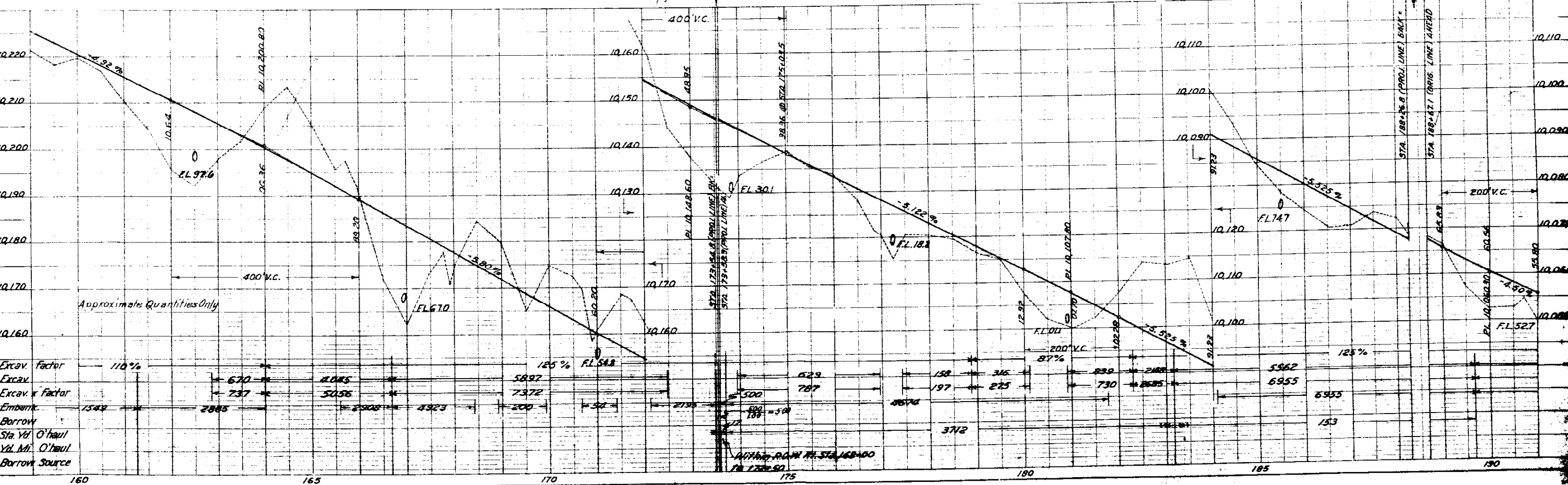
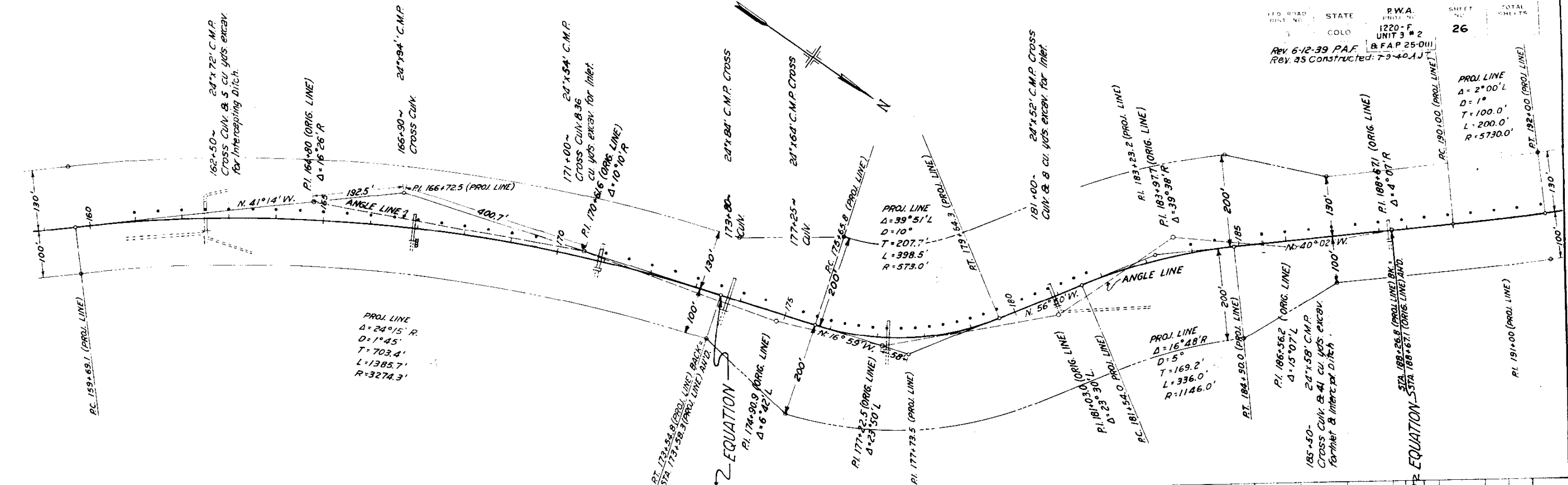
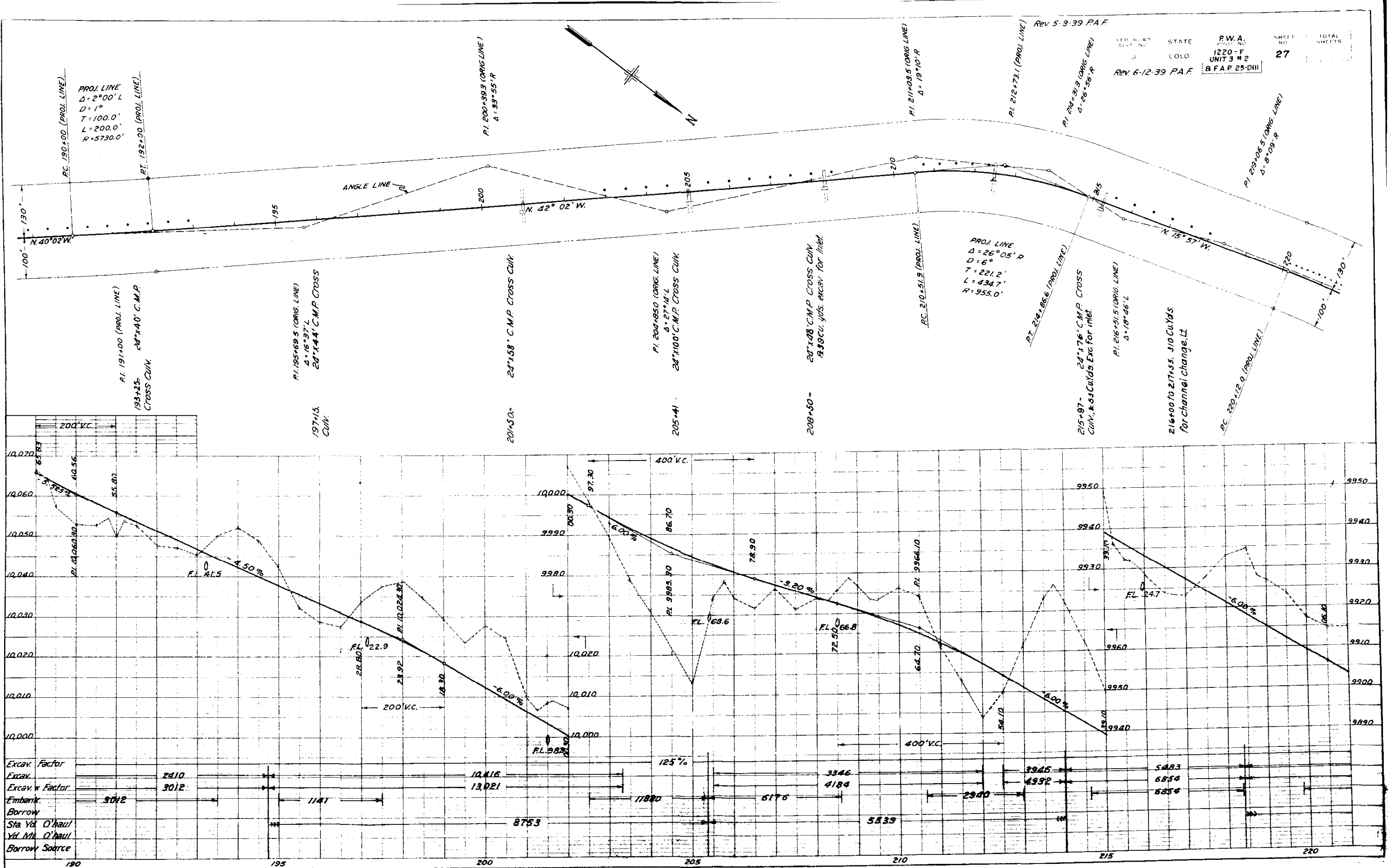


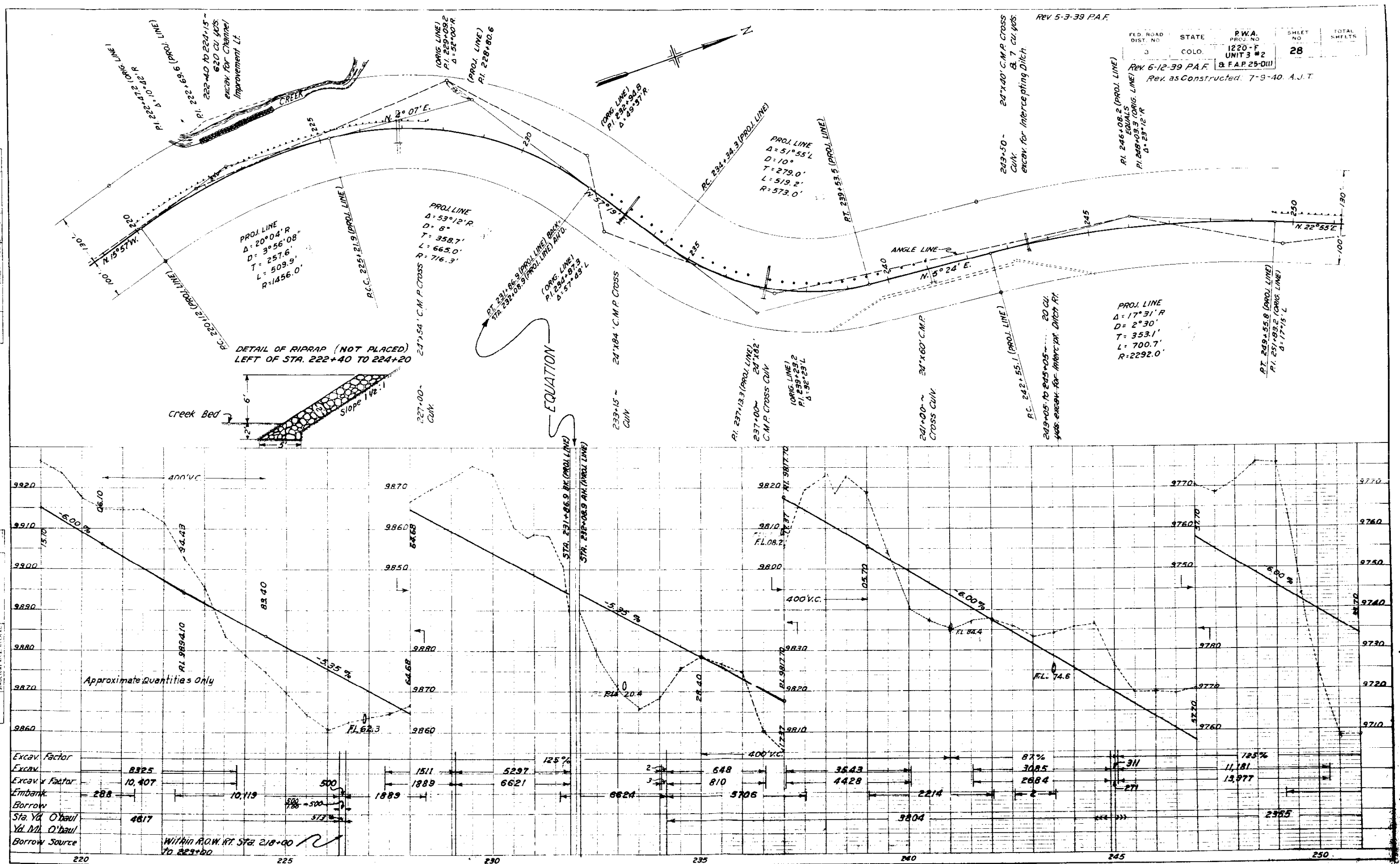
PLATE 1-PLAN-PROFILE OF RAIL STATION



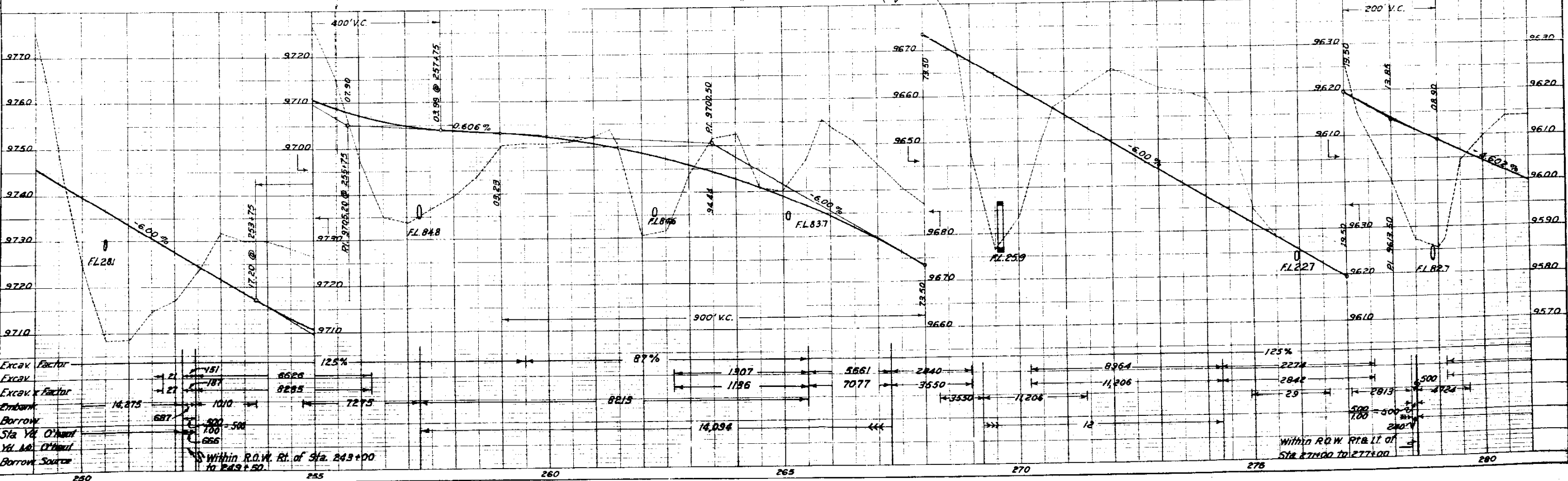
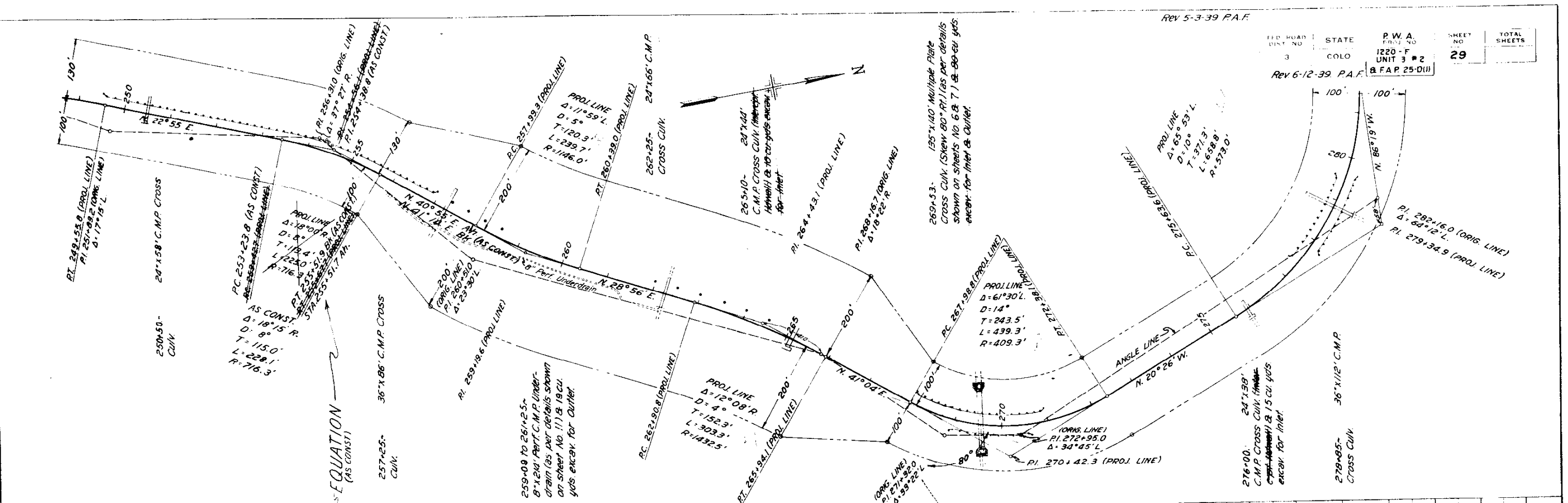
PROJ. LINE  
 $\Delta = 2^{\circ}00' L$   
 $D = 1^{\circ}$   
 $T = 100.0'$   
 $L = 200.0'$   
 $R = 5730.0'$

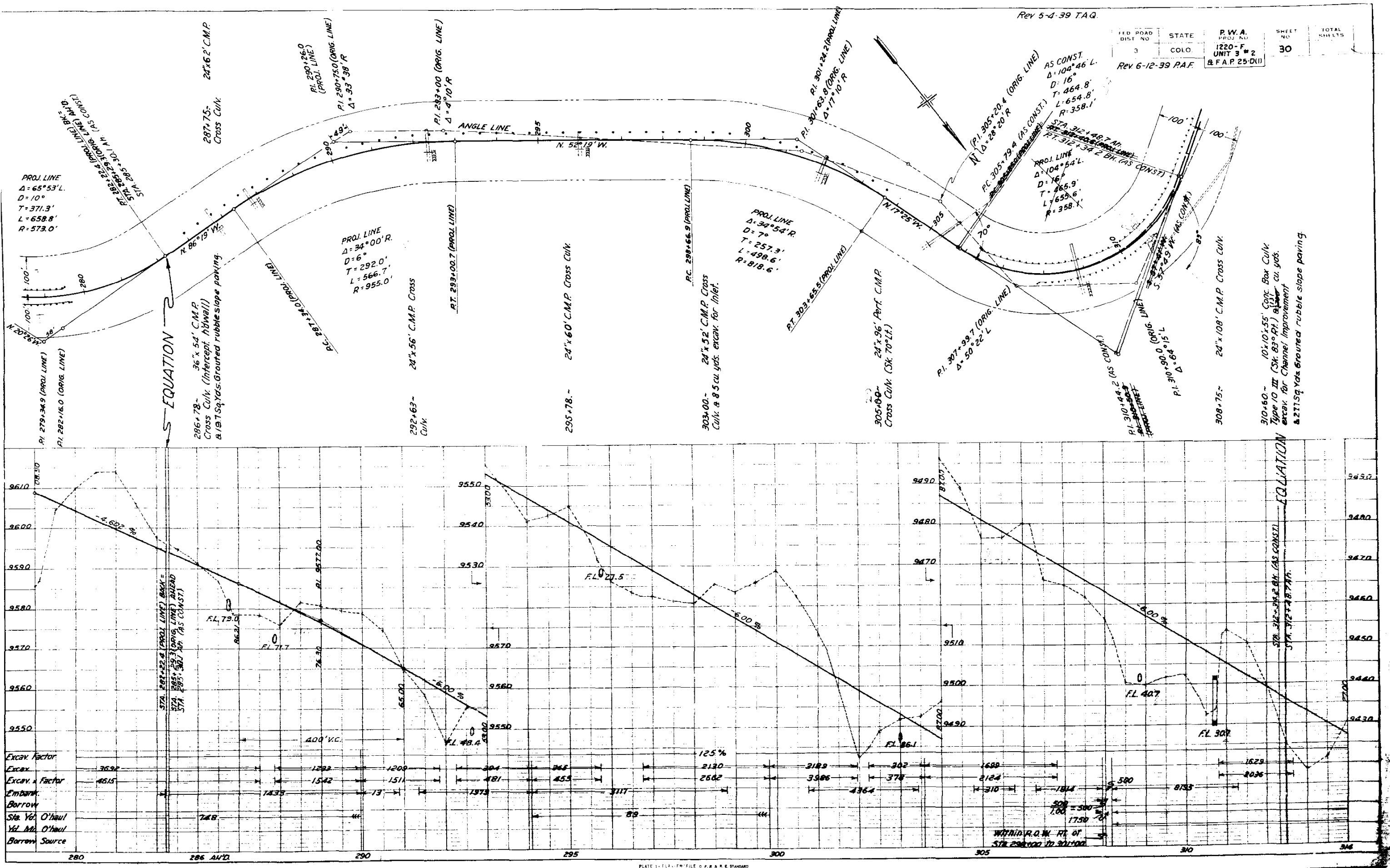


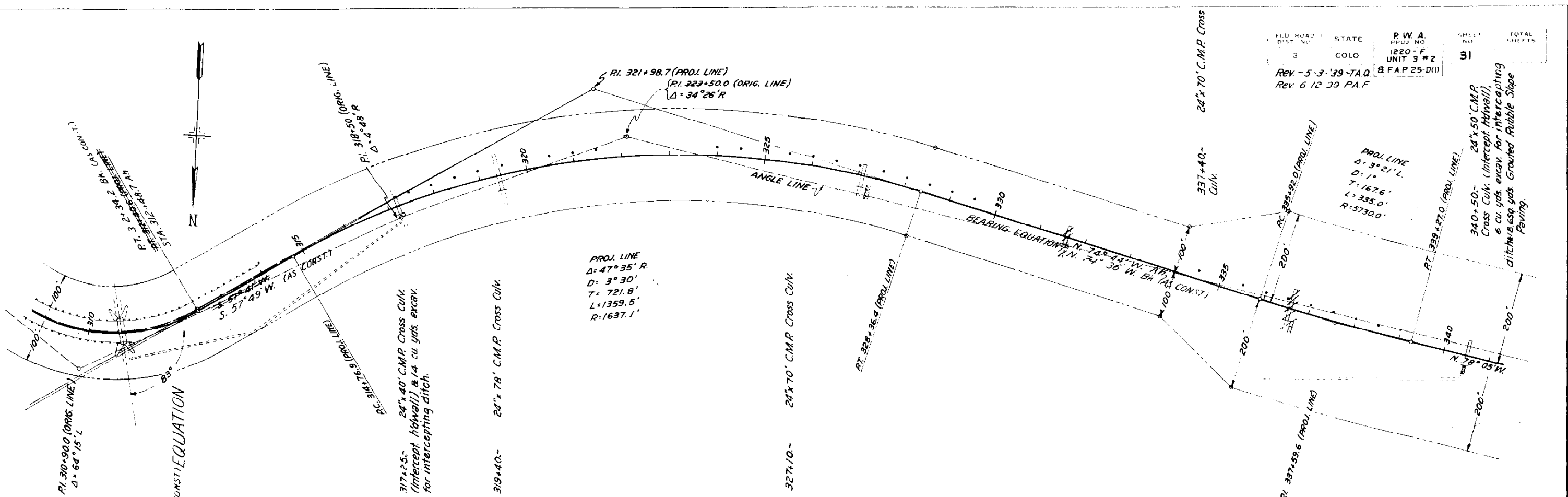




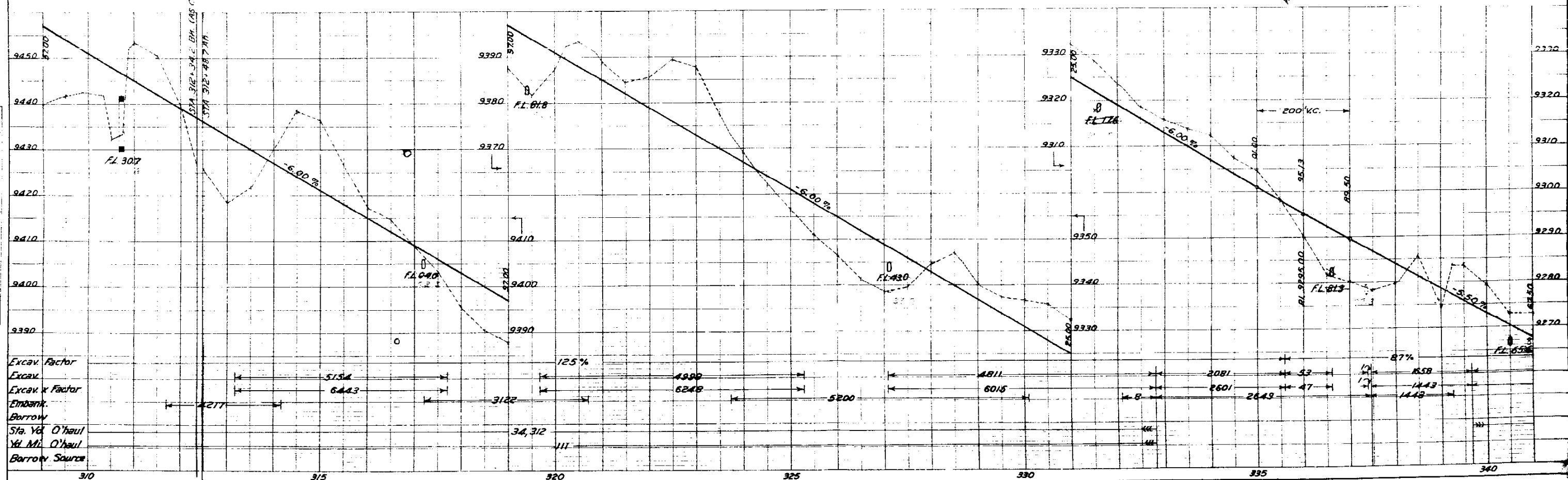






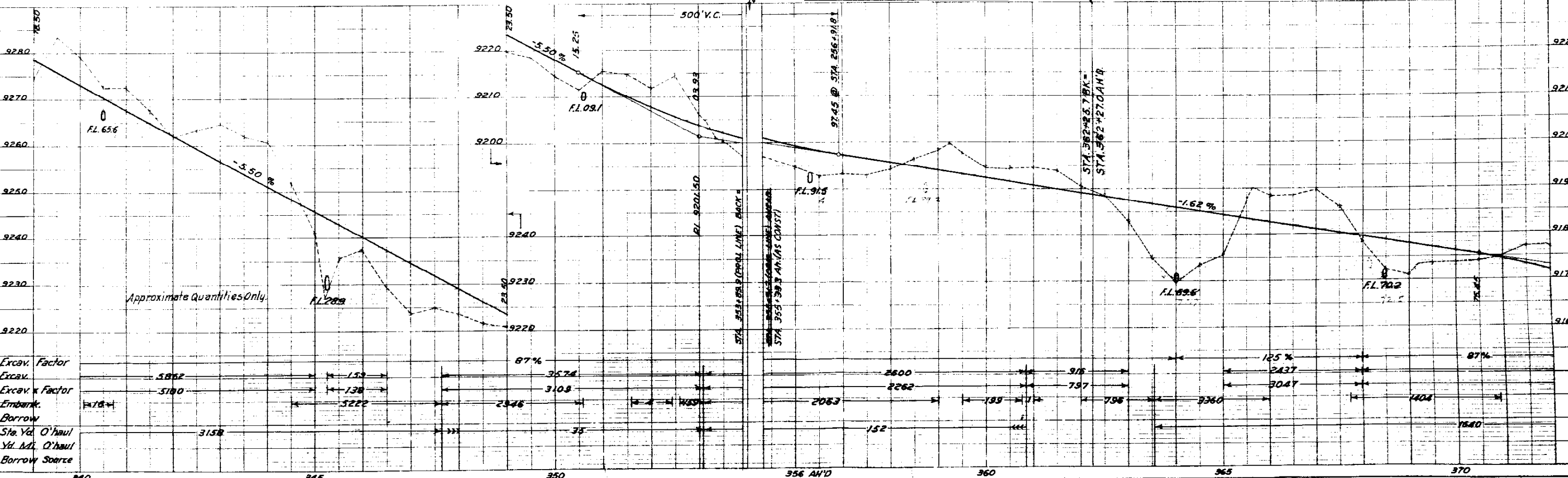
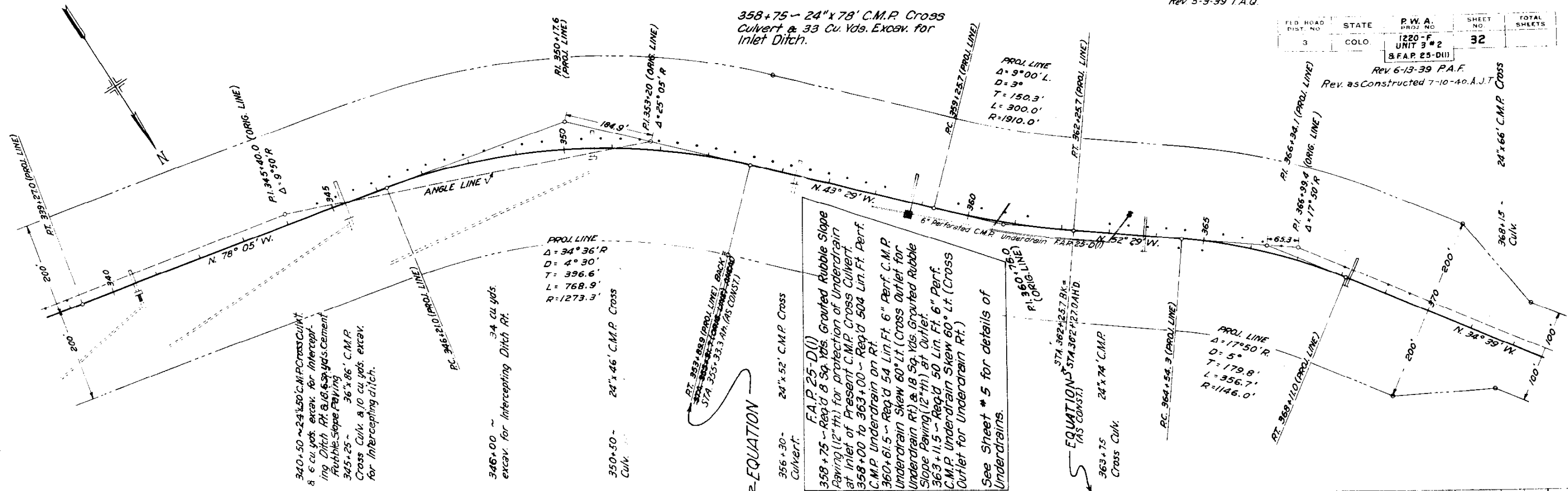


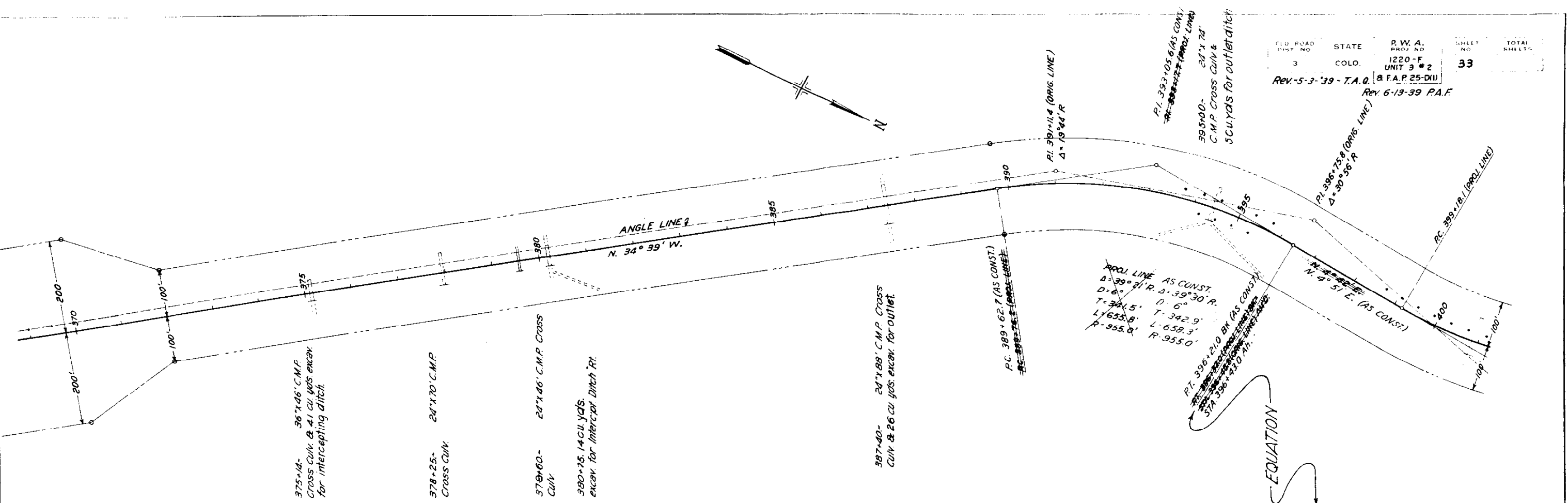
FIELD ROAD DIST. NO. 3  
 STATE COLO.  
 P.W.A. DIST. NO. 1220-F  
 UNIT 3 #2  
 REV. 5-3-39-TAQ  
 REV. 6-12-39 P.A.F.  
 SHEET NO. 31  
 TOTAL SHEETS



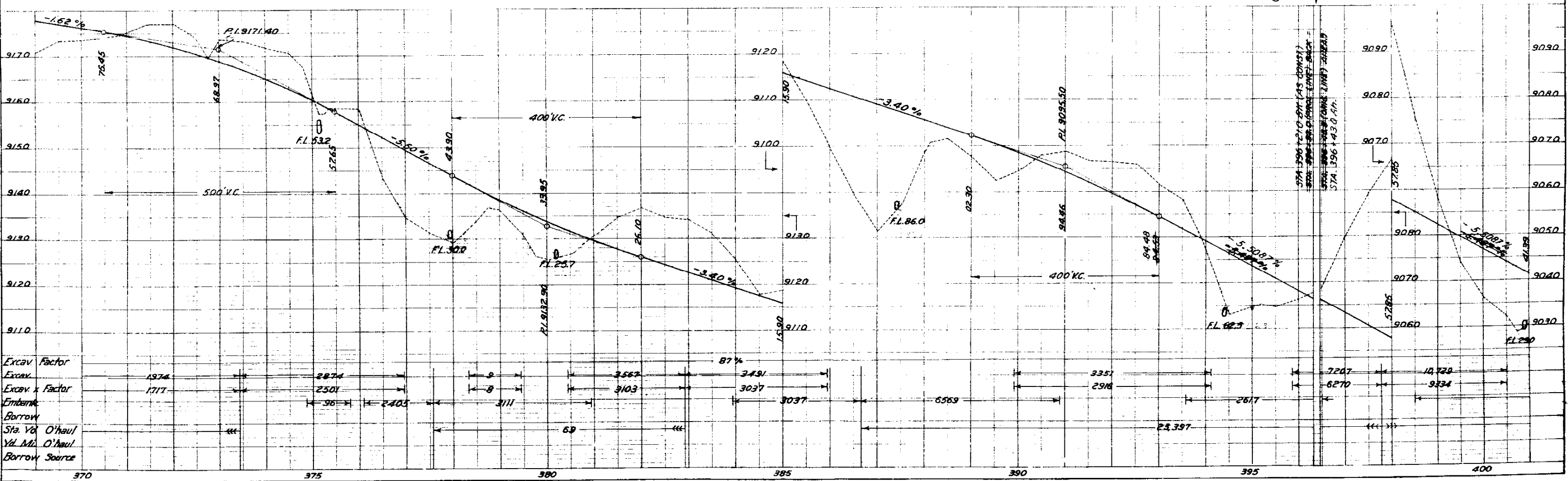
| FED. ROAD DIST. NO. | STATE | P.W. A. PROJ. NO.                       | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------------------------|-----------|--------------|
| 3                   | COLO. | 1220-F<br>UNIT 3-2<br>8.F.A.P. 25-D(II) | 32        |              |

Rev 6-13-39 P.A.F.  
Rev. as Constructed 7-10-40 A.J.T.



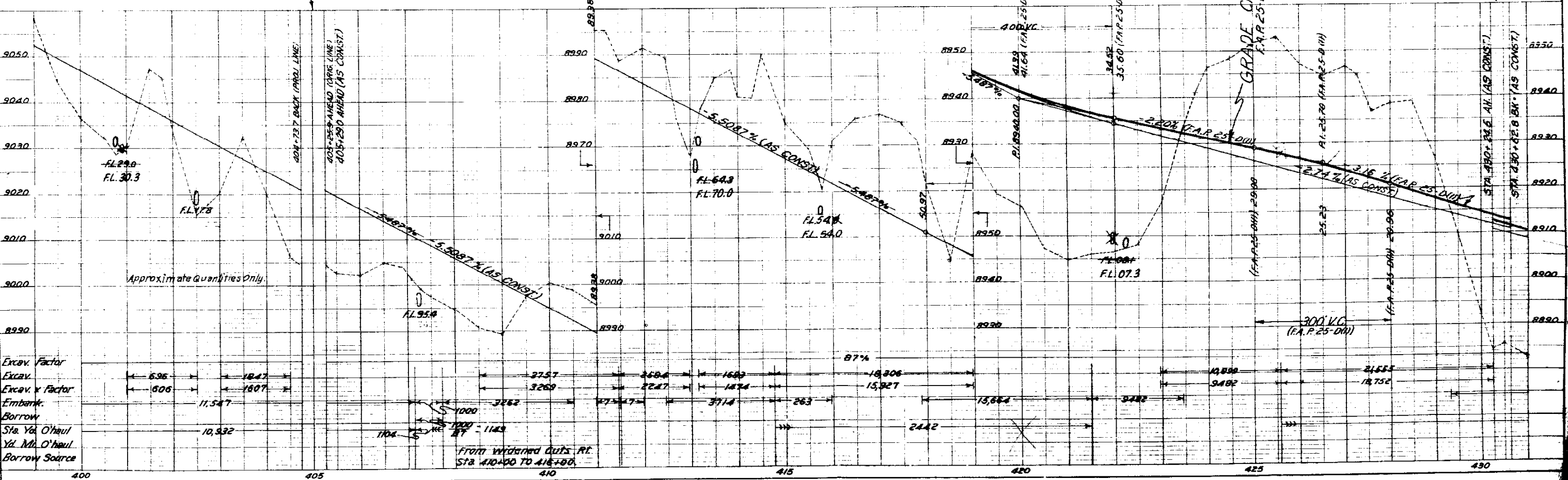
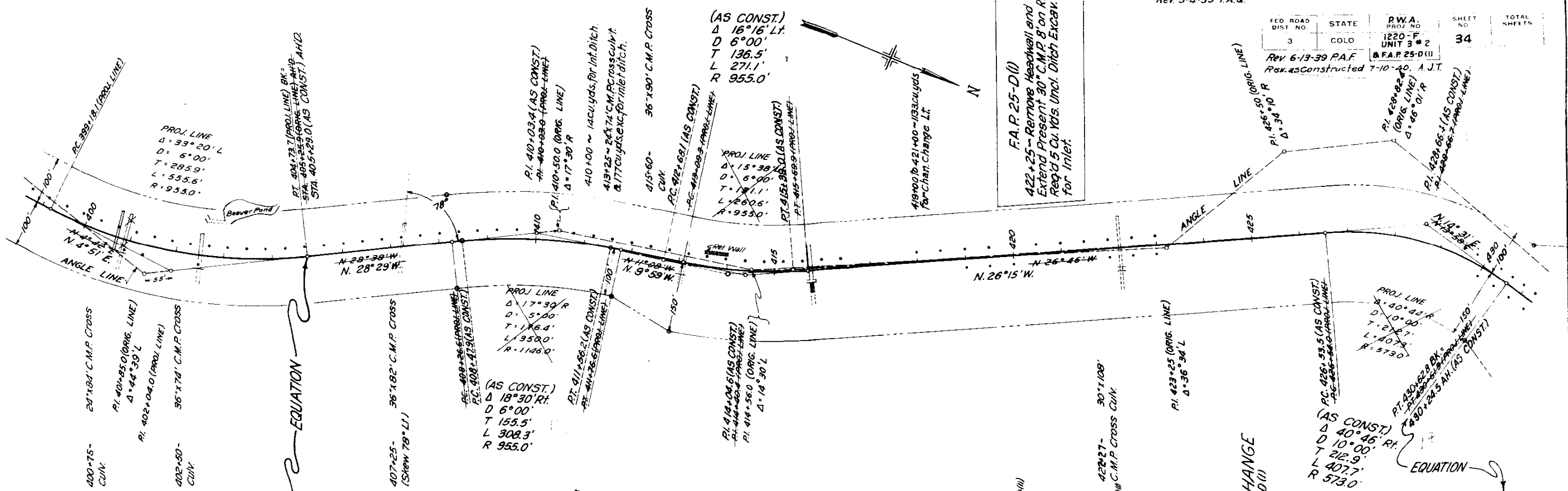


P.W. A. 1220-F  
 STATE COLO. UNIT 3 #2  
 REV. 5-3-39 - T.A.Q. (8 F.A.P. 25-D11)  
 REV. 6-13-39 P.A.F.

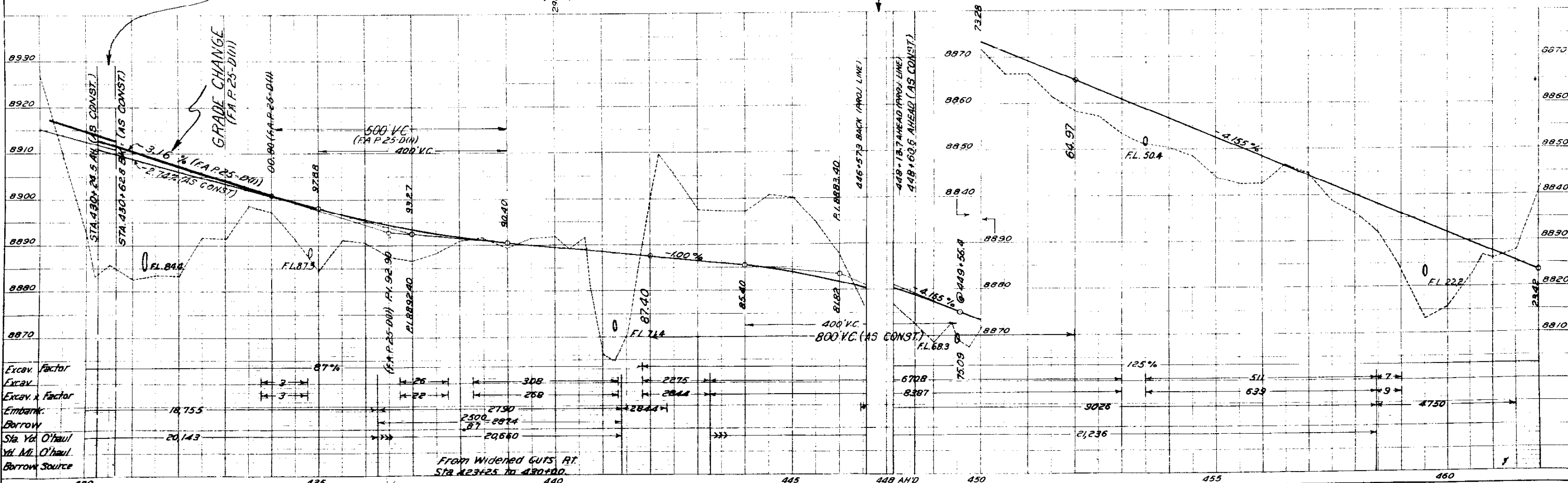
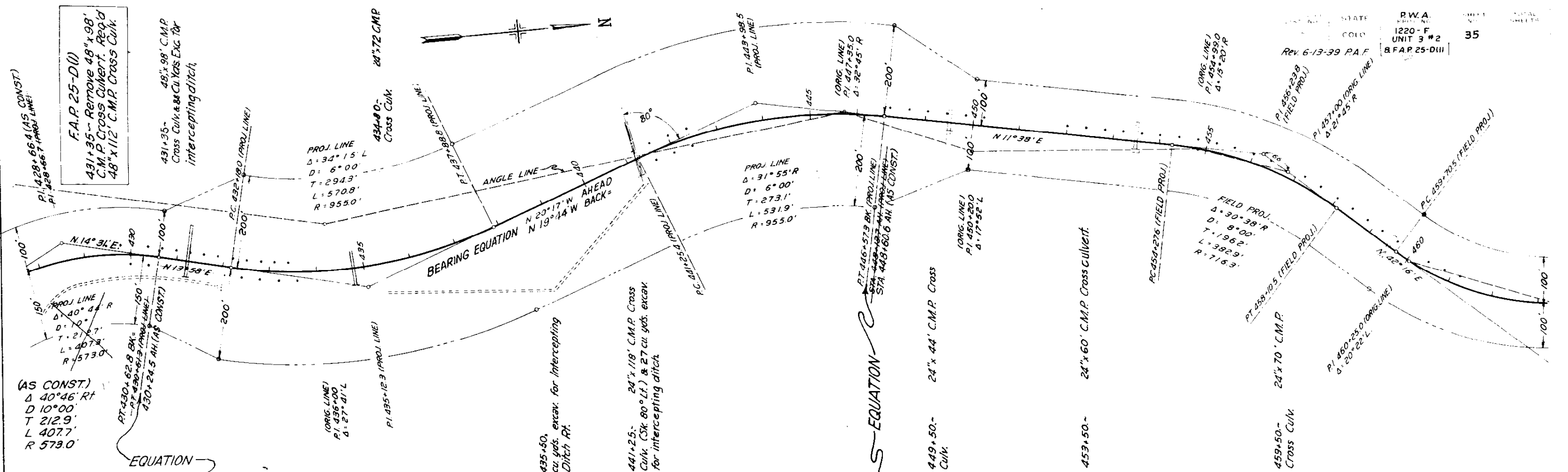


REV 5-4-39 T.A.Q.

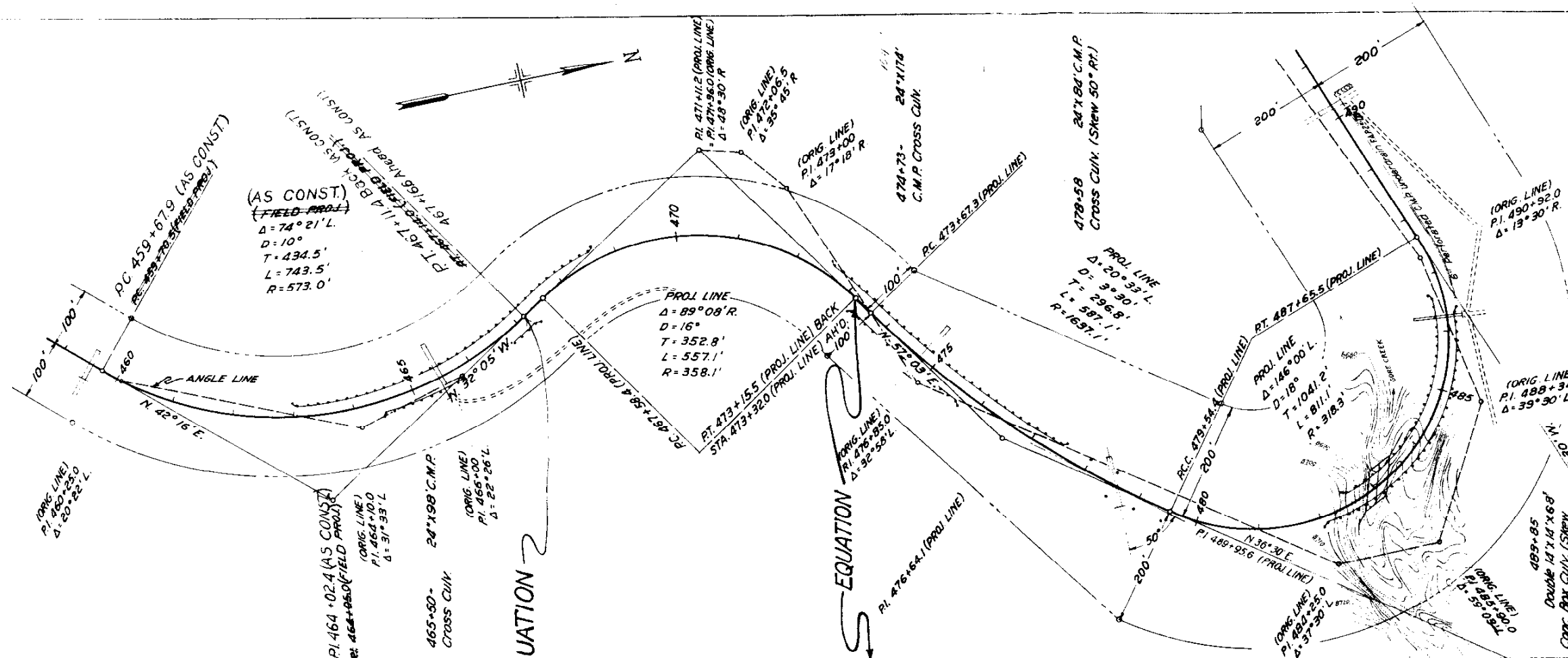
| FED. ROAD DIST. NO.                                       | STATE | P.W.A. PROJ. NO.                         | SHEET NO. | TOTAL SHEETS |
|-----------------------------------------------------------|-------|------------------------------------------|-----------|--------------|
| 3                                                         | COLO. | 1220-F<br>UNIT 3 #2<br>& F.A.P. 25-D(II) | 34        |              |
| REV 6-13-39 P.A.F.<br>REV. AS CONSTRUCTED 7-10-40, A.J.T. |       |                                          |           |              |







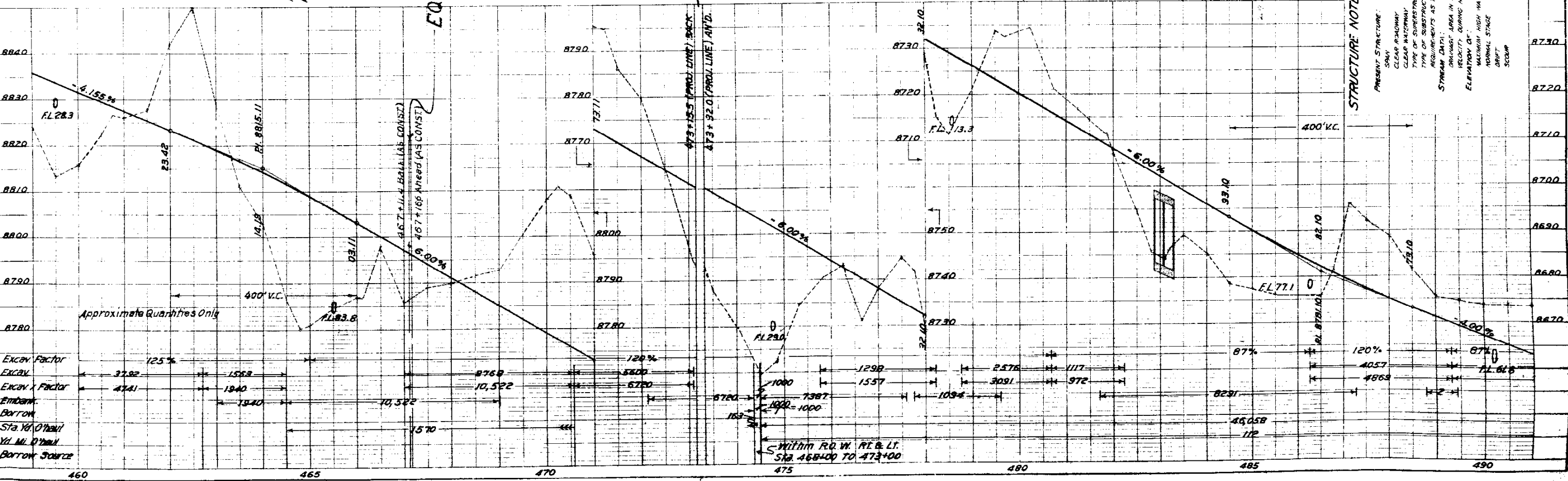
Rev. 5-4-39 P.A.F.  
Rev. 6-13-39 P.A.F.  
Rev. as Constructed: 7-10-40, A.J.T.



**F.A.P. 25-D(1)**  
486+50 to 490+05 - Req'd 362 Lin. Ft. Perforated C.M.P. Underdrain on Rt. (Headwall at Outlet)  
See Sheet #5 for Details.

**STRUCTURE NOTES FOR CONCRETE BOX CULVERT STA. 482+83.3 TO 483+28.3 STRUCT. NO. F-11-U (SKEW 45° LT.)**

- PROPOSED STRUCTURE
- POSITION REFERRED TO PRESENT STRUCTURE
- SPAN - DOUBLE 14' BOX CULVERT
- CLEAR ROADWAY - 20' ROADWAY SHOULDERS
- CLEAR WATERWAY - 30' SO FT
- TYPE OF SUBSTRUCTURE - DOUBLE 14' x 14' CONCRETE BOX CULVERT
- TYPE OF SUBSTRUCTURE - DOUBLE 14' x 14' CONCRETE BOX CULVERT
- DETAILS OF SUBSTRUCTURE - SEE SHEET #5
- NEARBY STRUCTURES ON SAME STREAM
- LOCATION
- WATERWAY
- RECORD DURING FLOODS
- LOW WATER
- STREAM BED - 486+50



490+13 ~ 36'x42' C.M.P.  
Cross Culv. 8.1/3 cu yds. excav.  
for Inlet.

N.W. 1/4, N.W. 1/4, SEC. 18  
T. 5 S., R. 79 W.

Rev. 5-4-39 T.A.G.

| FED. ROAD DIST. NO. | STATE | P.W.A. PROJ. NO.   | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-----------|--------------|
| 2                   | COLO. | 1220-F<br>UNIT 3-2 | 37        |              |

Rev. 6-13-39 P.A.F. (8 F.A.P. 25-0!!!)  
Revised as Constructed 7-15-40 A.J.T.

