

DEPARTMENT OF HIGHWAYS STATE OF COLORADO

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. I 70-3 (81) 220 STATE HIGHWAY NO. 70

SUMMIT AND CLEAR CREEK COUNTIES

SCALES OF ORIGINAL DRAWINGS

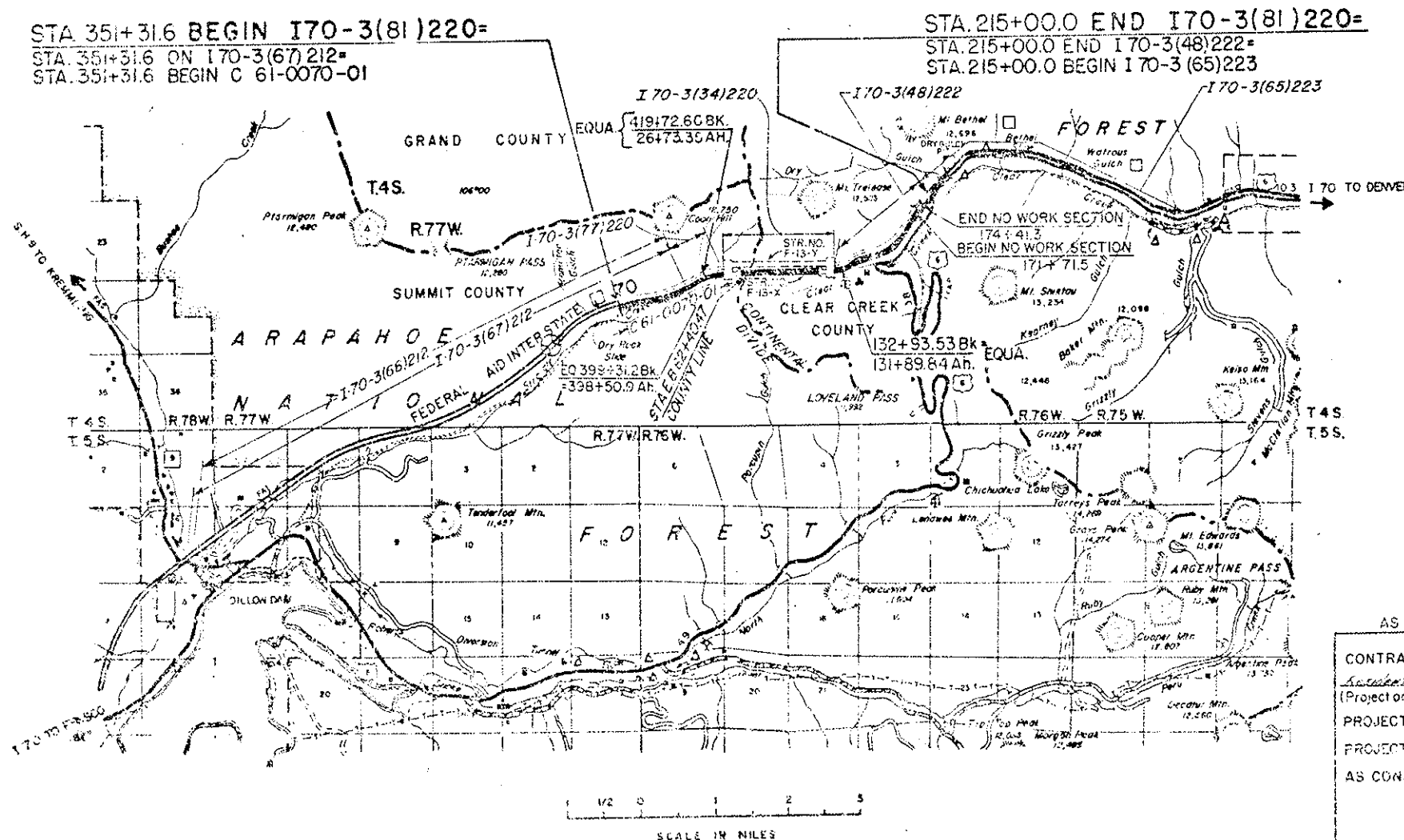
ON PLANS AS SHOWN
ON PROFILES AS SHOWN
GRADE LINE ON PROFILES IS SHOWN AS GRADE OF FINISHED ROADWAYS
GROSS LENGTH OF PROJECT 25,851.70 FEET = 4.896 MILES
NET LENGTH OF PROJECT 25,581.90 FEET = 4.845 MILES

SEE STANDARD M-100-A FOR STANDARD SYMBOLS.

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL AID PROJECT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| 70-3(81)220 | COLORADO | I 70-3(81)220 | 1 | 173 |

R.O.W. Acquired Under (I 70-3(14)220
(I 70-3(16)
(I 70-3(26)
P.E. under I 70-3(78)

| | |
|----------------|-----------------|
| AS CONSTRUCTED | |
| NO REVISIONS | REVISED 6-28-72 |



ALL SCALES SHOWN FOR ORIGINAL DRAWINGS.

INDEX OF SHEETS
(SEE SHEET 2)

AS CONSTRUCTED INFORMATION

CONTRACTOR W. J. HENNINGSON & SONS, INC.
ENGINEER Jack E. Gay
(Project or Resident)
PROJECT STARTED August 15, 1972
PROJECT COMPLETED June 29, 1973
AS CONSTRUCTED PLANS APPROVED _____
TITLE _____ DATE _____

DIVISION OF HIGHWAYS

APPROVED: [Signature] 4/5/75
CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE _____
DIVISION ENGINEER

TAL

| | | | | |
|---------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I 70-3(81)220 | 2 | 275 |

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AS CONSTRUCTED

NO REVISIONS REVISED VOID

| TABULATION OF LENGTH AND DESIGN DATA | | | | | |
|--|-----------------------|----------------------|--|----------------------------|-----------------|
| STATION | ROADWAY WEST APPROACH | TUNNEL SUMMIT COUNTY | PLAN. STR. NO. F-13-P CLEAR CREEK COUNTY | ROADWAY EAST APPROACH | NO WORK SECTION |
| 351+31.60 EB BEGIN I 70-3(81)220 = 351+31.60 OM I 70-3(67)212 | 4799.60 | | | | |
| 399+31.20 BK. = EQUATION 398+50.90 AH. | | | | | |
| 419+72.66 BK. = EQUATION 26+73.35 AH. | 2121.76 | | | | |
| 35+97.82 | | | | | |
| 62+40.47 (COUNTY LINE) | | 2642.65 | | | |
| 125+57.28 | | | | | |
| 132+93.53 BK. = EQUATION 131+89.64 AH. | | | 6316.81 | | |
| 171+71.5 Str. F-13-P (FUTURE) 174+41.3 | | | | | |
| 215+00 END I 70-3(81)220 = 215+00 END I 70-3(48)222 215+00 BEGIN I 70-3(65)223 | | | | 736.25 | |
| | | | | | |
| | | | | 8981.66 | 269.80 |
| | | | | | |
| | | | | 4058.70 | |
| | | | | | |
| TOTALS | 7845.83 | 2642.65 | 6316.81 | 8776.61 | 269.80 |
| SUMMARY | | | | | |
| | | | | LIW. FT. | MILES |
| WEST APPROACH | | | | 7845.83 | 1.486 |
| TUNNEL - SUMMIT COUNTY | | | | 2642.65 | .501 |
| TUNNEL - CLEAR CREEK COUNTY | | | | 6316.81 | 1.196 |
| EAST APPROACH | | | | 8776.61 | 1.662 |
| TOTAL NET LENGTH | | | | 25,581.90 | 4.845 |
| NO WORK SECTION | | | | 269.80 | 0.051 |
| TOTAL GROSS LENGTH | | | | 25,851.70 | 4.896 |
| DESIGN DATA | | | | | |
| MAXIMUM DEGREE OF CURVE | | | | 4°00' | |
| MAXIMUM GRADE | | | | 7.00% | |
| MINIMUM S S D ~ HORIZONTAL | | | | 315' | |
| MINIMUM S S D ~ VERTICAL | | | | 490' | |
| MAXIMUM DESIGN SPEED | | | | 45 MPH | |
| 1994 DESIGN TRAFFIC | | | | (15,500 ADT 2,060 DDHY) | |

| "M" STANDARDS | | |
|---------------|---|----------|
| M-100-A | STANDARD SYMBOLS | 5-11-70 |
| M-107-A | TEMPORARY EROSION CONTROL | 4-21-75 |
| M-203-B | APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, BRIDGE AND CREST WIDENING | 12-11-72 |
| M-203-C | DITCH TYPES | 7-23-69 |
| M-203-SC | SUPERELEVATION OF CURVES - CROWNED HIGHWAYS | 3-24-75 |
| M-203-SO | SUPERELEVATION OF CURVES - DIVIDED HIGHWAYS | 3-24-75 |
| M-206-AA | EXCAVATION AND BACKFILL FOR STRUCTURES (2 SHEETS) | 4-9-74 |
| M-500-A | LETTERS AND FIGURES FOR STRUCTURE NUMBERS | 3-28-75 |
| M-603-CA | CONCRETE AND METAL END SECTIONS | 6-25-71 |
| M-603-MA | METAL CULVERT PIPE - M-20 LOADING | 7-11-74 |
| M-604-EA | INLET, TYPE C | 11-19-74 |
| M-604-ED | STEPS FOR MANHOLES AND INLETS | 7-23-65 |
| M-612-K | MARKER POSTS AND BENCH MARKS | 6-30-71 |
| M-614-TS | TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION (3 SHEETS) | 11-22-71 |
| "S" STANDARDS | | |
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 OF LENGTH & DESIGN DATA

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| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|-------------|-----------|--------------|
| VIII | COLORADO | 170-3(5)220 | 2 AX | 172 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | | REVISED | 6-29-79 | VOID |

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| | | | | |
|----------------------------|----------|-------------|--------------|-----------------|
| PERSONAL ROAD BEACH NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| XIII | COLORADO | I70-3(8)220 | 3 | 275 |

FINRL
SUMMARY OF APPROXIMATE QUANTITIES

| INDEX BOOK PAGE SHEET | CONTRACT ITEM NO. | CONTRACT ITEM | UNIT | TUNNEL, STR. NO. F-13-X | | | | EAST APPROACH ROAD CLEAR CREEK COUNTY | FINRL EAST APPROACH ROAD | PROJECT TOTALS | FINRL PROJECT TOTALS | DIFF. | % |
|--------------------------|----------------------|---|----------|--|-----------------------------------|------------------|---------------------------|---|-----------------------------------|-------------------|----------------------------|-----------|-------|
| | | | | WEST APPROACH ROAD SUMMIT COUNTY | FINRL WEST APPROACH ROAD | SUMMIT COUNTY | FINRL SUMMIT COUNTY | | | | | | |
| Folder #1 | 201 | Clearing and Grubbing | L.S. | 0.5 | 0.5 | 0.3 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0 | |
| Folder #2 | 202 | Removal of Structures and Obstructions | L.S. | | | | | | | | | 0 | |
| Folder #3 | 202 | Removal of Structure | Each | 1 | 1 | | | | | 25 | 79 | +54 | 316 |
| Folder #4 | 202 | Removal of Asphalt Mat | Sq. Yd. | | | | | | | 40,800 | 52,936 | +12,136 | 187 |
| Folder #5 | 203 | Unclassified Excavation (Haul) | Cu. Yd. | 33,200 | 86,650 | | | | | 100 | 109 | +9 | 109 |
| Folder #6 | 203 | Dozing | Hour | 100 | 109 | | | | | 50 | 52.5 | +2.5 | 6.8 |
| Folder #7 | 203 | Dozing (Landscaping) | Hour | 50 | 15.5 | | | | | | | -34.5 | |
| Folder #8 | 206 | Structure Excavation | Cu. Yd. | 740 | 3,204 | 1,548 | 4,857 | 2,720 | 10,188 | 120 | 629 | +509 | 368 |
| Folder #9 | 206 | Structure Backfill (Class I) | Cu. Yd. | 95 | 1,463 | | | | | 0 | 677 | +582 | 2,253 |
| Folder #10 | 206 | Structure Backfill (Class 2) | Cu. Yd. | 1,010 | 331 | 3,200 | 2,468 | 7,773 | 5,986 | 140 | 0 | -7,636 | 72 |
| Folder #11 | 206 | Filter Material (Class C) | Cu. Yd. | | | 53 | 63 | 915 | 1,033 | | | +118 | 119 |
| Folder #12 | 207 | Topsoil (Haul) | Cu. Yd. | 1,300 | 0 | | | | | 3,100 | 5,500 | +2,400 | 125 |
| Folder #13 | 210 | Adjust Structure | Each | 8 | 8 | | | | | 3 | 1 | -7 | 82 |
| Folder #14 | 211 | Tunnel Excavation, (Class A) | Cu. Yd. | | | 126,299 | 125,799 | 131,255 | 131,255 | | | +4,956 | 100 |
| Folder #15 | 211 | Tunnel Excavation, (Class B) | Cu. Yd. | | | | | 27,240 | 27,241 | | | +1 | 100 |
| Folder #16 | 211 | Tunnel Excavation, (Class C) | Cu. Yd. | | | | | 196,609 | 199,138 | | | +2,529 | 101 |
| Folder #17 | 211 | Tunnel Excavation, (Class D) | Cu. Yd. | | | 124 | 147 | 276 | 281 | | | +5 | 107 |
| Folder #18 | 211 | Remine Pilot Bore (Class A) | Lin. Ft. | | | 2,108 | 2,108 | 2,047 | 2,047 | | | 0 | 100 |
| Folder #19 | 211 | Remine Pilot Bore (Class B) | Lin. Ft. | | | | | 3,266 | 3,266 | | | 0 | 100 |
| Folder #20 | 211 | Multiple Drift Structure | Lin. Ft. | | | | | 503 | 503 | | | 0 | 100 |
| Folder #21 | 211 | Foundation Drift (Class A) | Lin. Ft. | | | | | 2,186 | 2,186 | | | 0 | 100 |
| Folder #22 | 211 | Foundation Drift (Class B) | Lin. Ft. | | | | | 1,080 | 1,080 | | | 0 | 100 |
| Folder #23 | 211 | Crown Drift | Lin. Ft. | | | | | 2,186 | 2,186 | | | 0 | 100 |
| Folder #24 | 211 | 1/4 Inch Drilled Hole | Lin. Ft. | | | 27,847 | 29,118 | 74,274 | 73,661 | | | -613 | 10.5 |
| Folder #25 | 211 | 2 Inch Drilled Hole | Lin. Ft. | | | 7,905 | 7,350 | 58,095 | 54,018 | | | -4,077 | 93 |
| Folder #26 | 211 | 3 Inch Drilled Hole | Lin. Ft. | | | 0 | 160 | 4,960 | 5,288 | | | +328 | 110 |
| Folder #27 | 211 | 2 Inch Core Drilled Hole | Lin. Ft. | | | 425 | 46 | 1,200 | 263 | | | -937 | 19 |
| Folder #28 | 211 | Buttress Berm Grouting | Ton | | | 396 | 14 | 2,491 | 314 | | | -2,177 | 13 |
| Folder #29 | 211 | Pre-Grouting | Ton | | | 78 | 7.67 | 3,411 | 117 | | | -3,294 | 3 |
| Folder #30 | 211 | Re-Grouting | Ton | | | | | 228 | 0 | | | -228 | 2 |
| Folder #31 | 211 | Grouting Connection | Each | | | 527 | 758 | 9,173 | 13,188 | | | +4,015 | 144 |
| Folder #32 | 211 | Contact Grouting | Ton | | | 1,189 | 1,240.09 | 3,323 | 3,466.15 | | | +143.86 | 104 |
| Folder #33 | 211 | Steel Pipe For Grouting | Pound | | | 29,207 | 33,258 | 71,403 | 91,085 | | | +19,682 | 128 |
| Folder #34 | 211 | Chemical Grout | Gallon | | | 399 | 0 | 1,101 | 36 | | | -1,065 | 6 |
| Folder #35 | 211 | Rock Reinforcement, Portland Cement Grouted (12 Foot) | Each | | | 1,584 | 1,606 | 3,719 | 3,777 | | | +58 | 102 |
| Folder #36 | 211 | Rock Reinforcement, Portland Cement Grouted (18 Foot) | Each | | | | | 5,697 | 5,535 | | | -162 | 97 |
| Folder #37 | 211 | Rock Reinforcement, Portland Cement Grouted (20 Foot) | Each | | | 1,068 | 1,052 | 1,048 | 1,032 | | | -16 | 98 |
| Folder #38 | 211 | Rock Reinforcement Threaded Tieback - Portland Cement Grouted (20 Foot) | Each | | | | | 72 | 76 | | | +4 | 106 |
| Folder #39 | 211 | Rock Reinforcement Resin Grouted (12 Foot) | Each | | | 250 | 198 | 6,886 | 5,463 | | | -1,423 | 79 |
| Folder #40 | 211 | Rock Reinforcement, Resin Grouted (16 Foot) | Each | | | | | 16,125 | 14,327 | | | -1,798 | 89 |
| Folder #41 | 211 | Rock Reinforcement Threaded Tieback Resin Grouted (16 Foot) | Each | | | 2,235 | 2,217 | 1,162 | 1,152 | | | -10 | 99 |
| Folder #42 | 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted (20 Foot) | Each | | | 2,136 | 2,125 | 5,376 | 5,351 | | | -25 | 100 |
| Folder #43 | 211 | Sheet Metal For Panning | Pound | | | 4,680 | 312.5 | 43,320 | 2,667.5 | | | -40,652.5 | 6 |

FINRL
**SUMMARY OF APPROXIMATE
QUANTITIES**

FINAL
SUMMARY OF APPROXIMATE QUANTITIES

ADDITIONS DELETED 6-29-79 VOID

| INDEX | CONTRACT ITEM NO. | CONTRACT ITEM | UNIT | TUNNEL, STR. NO. F-13-X | | | | EAST APPROACH ROAD CLEAR CREEK COUNTY | FINAL EAST APPROACH ROAD | PROJECT TOTALS | FINAL | DIFF. | % | | |
|--|--------------------------|---|-----------------------------|----------------------------------|--------------------------|------------------|------------------------|---------------------------------------|---|----------------|------------------------|---------------------------------|--|---------------------------------|--------------------------|
| | | | | WEST APPROACH ROAD SUMMIT COUNTY | FINAL WEST APPROACH ROAD | SUMMIT COUNTY | FINAL SUMMIT COUNTY | | | | | | | CLEAR CREEK COUNTY | FINAL CLEAR CREEK COUNTY |
| Folder # 44 Folder # 45 | 212 212 | Seeding Fertilizing | Pound Acre | 51 2.5 | 126 3.1 | | | | 111 5.5 | 274 6.9 | 162 8 | 400 10 + | +238 2 | 247 125 | |
| Folder # 46 Folder # 47 Folder # 48 | 213 213 304 | Mulching Soil Retention Blanket (Jute) Aggregate Base Course (Class 2) (Haul) | Ton Sq.Yd. Ton | 5 11,670 10 | 6.2 14,633 27.1 | 17,683 | 27,005.52 | 48,135 | 73,498.82 | 27,170 10 | 13.8 34,069 30.5 | 38,840 65,838 | 48,702 100,561.94 + | -9862 34,723.94 | 125 153 |
| Folder # 49 | 506 | Riprap | Cu.Yd. | 5 | 274 | | | | | | | 5 | 274 + | 269 | 54.80 |
| Folder # 50 Folder # 51 | 507 507 | Concrete Slope and Ditch Facing (Reinforced) Grouted Rubble Slope and Ditch Paving | Cu.Yd. Cu.Yd. | 17.8 18 | 9.9 268.48 | | | | | 7.0 54 | 11.0 54 | 24.8 72 | 20.9 - 322.48 + | 39 250.48 | 84 448 |
| Folder # 52 Folder # 53 Folder # 54 Folder # 55 | 509 509 509 509 | Structural Steel (Miscellaneous) Place Structural Steel Structural Steel (W 12 X 66) Structural Steel (W 12 X 106) | Ton Ton Ton Ton | | | 338 59 37 | 338 62.53 38.02 | 1,067 39 | 1,067.89 41.34 | | | 1,405 98 37 89 | 1,405.89 + 103.87 + 38.02 + 94.80 + | 0.89 5.87 1.02 5.8 | 100 106 103 107 |
| Folder # 56 Folder # 57 Folder # 58 | 509 509 509 | Structural Steel (W 12 X 61) Structural Steel (W 12 X 95) Structural Steel (W 12 X 136) | Ton Ton Ton | | | 1,681 11 | 1,670.20 11 | 798 2,664 2,131 | 792.88 2,659.02 2,134.60 | | | 2,479 2,675 2,131 | 2,463.06 - 2,670.02 - 2,134.60 + | 15.92 4.98 3.60 | 99 100 100 |
| Folder # 59 Folder # 60 Folder # 61 Folder # 62 | 509 509 509 515 | Structural Steel (W 12 X 150) Structural Steel (W 12 X 167) Structural Steel (W 12 X 211) Waterproof Coating | Ton Ton Ton Sq.Yd. | | | 20,675 | 22,103 | 1,421 716 2,940 59,295 | 1,406.05 716.82 2,929.97 63,390. | | | 1,421 716 2,940 79,970 | 1,406.05 - 716.82 + 2,929.97 - 85,493 + | 14.95 0.82 10.03 5,523 | 93 100 100 107 |
| Folder # 63 Folder # 64 | 518 521 | Waterstop (6 Inch) Pedestrian Overpass | Lin.Ft. Each | 1 1 | 1 1 | 1,963 | 1,977 | 5,147 | 5,182 | 1 1 | 1 1 | 7,110 2 | 7,159 + 2 | 49 0 | 101 100 |
| Folder # 65 | 601 | Concrete Class A (Miscellaneous) | Cu.Yd. | 12 | 28.89 | | | | | 12 | 32.46 | 24 | 61.35 | 37.35 | 256 |
| Folder # 66 Folder # 67 | 601 601 | Concrete Class T-1 (First Stage Lining) Concrete Class T-2 (Final Lining) | Cu.Yd. Cu.Yd. | | | 18,483 12,153 | 18,432.17 12,413.49 | 21,961 16,060 | 21,900.61 16,404.24 | | | 40,444 28,213 | 40,332.78 - 28,817.73 + | 111.22 604.73 | 100 102 |
| Folder # 68 | 601 | Concrete Class T-2 (Invert) | Cu.Yd. | | | | | 15,476 | 15,433.36 | | | 15,476 | 15,433.36 - | 42.44 | 100 |
| Folder # 69 Folder # 70 | 601 601 | Concrete Class T-2 (Miscellaneous) Concrete Class T-3 (First Stage Lining) | Cu.Yd. Cu.Yd. | | | 4,470 329 | 4,661.93 328.83 | 7,206 15,522 | 7,515.40 15,513.84 | | | 11,676 15,851 | 12,177.33 + 15,842.67 - | 501.33 8.33 | 104 100 |
| Folder # 71 Folder # 72 | 601 601 | Concrete Class T-4 (Final Lining) Concrete Class T-4 (Invert) | Cu.Yd. Cu.Yd. | | | 249 204 | 249 201.64 | 22,065 7,745 | 22,065.57 7,655.45 | | | 22,314 7,949 | 22,314.57 + 7,857.09 - | 0.57 91.91 | 100 99 |
| Folder # 73 | 602 | Reinforcing Steel | Ton | | | 357 | 387.20 | 1,432 | 1,631.97 | | | 1,789 | 2,019.17 - | 230.17 | 113 |
| Folder # 74 Folder # 75 | 603 603 | 18 Inch Corrugated Steel pipe 24 Inch Corrugated Steel pipe | Lin.Ft. Lin.Ft. | 88 898 | 136 1,032.5 | | | | | 48 552 | 102 770 | 136 1,450 | 238 + 1,852.5 + | 102 412.5 | 175 128 |

FINAL
SUMMARY OF APPROXIMATE
QUANTITIES

FINAL
SUMMARY OF APPROXIMATE QUANTITIES

| | | | | |
|---------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I 70-3(81)220 | 5 | 272 |

| INDEX BOOK PAGE SHEET | CONTRACT ITEM NO. | CONTRACT ITEM | UNIT | TUNNEL, STR. NO. F-15-X | | | | EAST APPROACH ROAD CLEAR CREEK COUNTY | FINAL EAST APPROACH ROAD | PROJECT TOTALS | FINAL | DIFF. | % | | |
|--------------------------|-------------------|---|----------|-------------------------------------|--------------------------|---------------|---------------------|--|--------------------------|----------------|----------|--------|----------|--------------------|--------------------------|
| | | | | WEST APPROACH ROAD SUMMIT COUNTY | FINAL WEST APPROACH ROAD | SUMMIT COUNTY | FINAL SUMMIT COUNTY | | | | | | | CLEAR CREEK COUNTY | FINAL CLEAR CREEK COUNTY |
| Folder # 76 | 603 | 60 Inch Corrugated Steel Pipe | Lin. Ft. | | | 320 | 320 | | | 0 | 230 | 320 | 550 | + 230 | 172 |
| Folder # 77 | 603 | 66 Inch Corrugated Steel Pipe | Lin. Ft. | | | 714 | 743 | | | | | 714 | 743 | + 29 | 104 |
| Folder # 78 | 603 | 24 Inch Steel End Section | Each | | | | | | | 2 | 2 | 2 | 2 | 0 | 100 |
| Folder # 79 | 603 | 60 Inch Steel End Section | Each | | | 1 | 1 | | | | | 1 | 1 | 0 | 100 |
| Folder # 80 | 603 | 66 Inch Steel End Section | Each | | | 1 | 1 | | | | | 1 | 1 | 0 | 100 |
| Folder # 81 | 604 | Inlet Type C (5 Foot) | Each | | | 8 | 7 | | | 5 | 11 | 13 | 18 | + 5 | 139 |
| Folder # 82 | 604 | Inlet Special | Each | | | | | 34 | 34 | | | 113 | 113 | 0 | 100 |
| Folder # 83 | 604 | Manhole Special | Each | | | | | 13 | 13 | | | 46 | 46 | 0 | 100 |
| Folder # 84 | 604 | Inlet Grating and Frame Type C | Each | | | 8 | 2 | | | | | 10 | 3 | - 7 | 30 |
| Folder # 85 | 604 | 4 1/2 Inch Ductile Iron Pipe Sewer | Lin. Ft. | | | 407 | 473 | 947 | 1,102 | 2 | 1 | 1,354 | 1,575 | + 221 | 116 |
| Folder # 86 | 604 | 12 Inch Ductile Iron Pipe Sewer | Lin. Ft. | | | 2,594 | 2,565 | 6,391 | 6,320 | | | 8,985 | 8,885 | - 100 | 92 |
| Folder # 87 | 604 | 2 Inch Plastic Pipe Sewer (Polyethylene) | Lin. Ft. | | | 25,407 | 25,656 | 68,954 | 69,629 | | | 94,361 | 95,285 | + 924 | 101 |
| Folder # 88 | 604 | 2 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | | | | | 4,184 | 3,628 | | | 4,184 | 3,628 | - 556 | 87 |
| Folder # 89 | 604 | 4 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | | | 2,148 | 2,221 | 18,137 | 18,754 | | | 20,285 | 20,975 | + 690 | 103 |
| Folder # 90 | 604 | 12 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | | | 4,830 | 4,824 | 12,473 | 12,459 | | | 17,303 | 17,283 | - 20 | 100 |
| Folder # 91 | 605 | 6 Inch Non-Perforated Corrugated Steel Pipe | Lin. Ft. | | | 16 | 0 | | | | | 16 | 0 | - 16 | 0 |
| Folder # 92 | 605 | 4 Inch Perforated Plastic Pipe (Polyvinyl Chloride) | Lin. Ft. | | | 4,823 | 4,796 | 28,809 | 28,645 | | | 33,632 | 33,441 | - 191 | 99 |
| Folder # 93 | 607 | End Post (Chain Link) | Each | | | 8 | 15 | | | 10 | 15 | 18 | 30 | + 12 | 167 |
| Folder # 94 | 607 | Corner and Line Brace Post (Chain Link) | Each | | | 8 | 14 | | | 4 | 17 | 12 | 31 | + 19 | 258 |
| Folder # 95 | 607 | Fence Chain Link (Industrial) | Lin. Ft. | | | 1,980 | 2,355 | | | 2,050 | 1,901 | 4,030 | 4,255 | + 226 | 106 |
| Folder # 96 | 607 | 20 Foot Gate Double Driveway | Each | | | 2 | 5 | | | 3 | 4 | 5 | 9 | + 4 | 180 |
| Folder # 97 | 614 | Flagging | Hour | | | 8,000 | 5,996.75 | | | 8,000 | 5,996.75 | 16,000 | 11,993.5 | - 4,006.5 | 75 |
| Folder # 98 | 614 | Traffic Control Supervision | Day Hour | | | | | 445 | 489 | | | 890 | 978 | + 88 | 110 |
| Folder # 99 | 614 | Security Guard | Day Hour | | | 30,720 | 33,082 | 30,720 | 33,082 | | | 61,440 | 66,164 | + 4,724 | 108 |
| Folder # 100 | 620 | Janitorial Service | Month | | | 38 | 28 | | | | | 38 | 28 | - 10 | 74 |
| Folder # 101 | 622 | Tunnel Waste Water Treatment | L.S. | | | | | 0.5 | 0.5 | | | 1 | 1 | 0 | 100 |
| Folder # 102 | 625 | First Aid Attendant | Hour | | | | | 10,680 | 10,005.5 | | | 21,360 | 20,011 | - 1,349 | 94 |
| Folder # 103 | 625 | Ambulance Driver | Hour | | | | | 21,360 | 21,359 | | | 42,720 | 42,718 | - 2 | 100 |
| Folder # 104 | 625 | Ambulance Attendant | Hour | | | | | 250 | 33.5 | | | 500 | 67 | - 433 | 13 |
| Folder # 105 | 625 | Furnish Ambulance | Each | | | | | 1 | 1 | | | 2 | 2 | 0 | 100 |
| Folder # 106 | 626 | Mobilization | L.S. | | | | | 0.2 | 0.2 | | | 1 | 1 | 0 | 100 |
| Folder # 107 | 699 | Fixed Fee | L.S. | | | | | 0.2 | 0.2 | | | 1 | 1 | 0 | 100 |

FINAL
SUMMARY OF APPROXIMATE
QUANTITIES

| | | | | |
|------------------------|----------|--------------|----------|--------------|
| FEDERAL ROAD REGION NO | DIVISION | PROJ NO | SHEET NO | TOTAL SHEETS |
| 1 | COLORADO | 170-3(81)220 | 6 AX | 273 |

FINAL SUMMARY OF CHANGE ORDERS

APPROVED: _____
DATE: 16:29:39

| PCO NO | GMO NO | DESCRIPTION | PLAN AMT | FINAL AMT | DIFFERENCE | PERCENT | REFERENCE | REMARKS | |
|--------|---|---|---------------|---------------|-----------------|---|-------------------------|---|----------------------------|
| 1 | PLANNED FORCE ACCOUNT 17051 | ON THE JOB TRAINEE | \$ 24,000.00 | \$ 29,246.40 | + \$ 5,246.40 | 121.9 | CONTRACTORS BILLINGS | NEVER ACTIVATED <i>DELETED BY MCR FA07 LINE ITEM 36</i> | |
| 2 | | EROSION CONTROL | \$ 200,000.00 | \$ 85,436.20 | - \$ 114,563.80 | 42.7 | | | |
| 3 | | CONSTRUCTION MONITORING | \$ 200,000.00 | \$ 152,633.78 | - \$ 47,366.22 | 76.3 | | | |
| 4 | | AVALANCHE CONTROL AND CLEANUP | \$ 50,000.00 | \$ 2,724.30 | - \$ 47,275.70 | 5.4 | | | |
| 5 | | FURNISH EMPLOYEE SHUTTLE BUS | | 0.00 | | 0 | | | |
| 6 | | TRIAL TESTING FOR ROCK REINFORCEMENT | \$ 6,000.00 | \$ 1,399.33 | - \$ 4,600.67 | 23.3 | | | |
| 7 | | MISCELLANEOUS: | | | | | | | |
| | | LINE 1 PAVE OVERHEIGHT VEHICLE PULL OFF, W. PORTAL | \$ 6,900.00 | \$ 7,604.12 | + \$ 704.12 | 110.2 | | | |
| | | LINE 2 ELECTRICAL GROUNDING MAT | \$ 1,200.00 | \$ 1,194.73 | - \$ 5.27 | 99.6 | | | |
| | | LINE 3 GUARD RAIL AT PEDESTRIAN OVERPASS | \$ 1,000.00 | \$ 2,234.78 | + \$ 1,234.78 | 223.5 | | | |
| | | LINE 4 REMOVE CONCRETE BLOCK RT. & LT. IN SEGS. 165, 166, 167 | \$ 1,000.00 | \$ 1,951.86 | + \$ 951.86 | 195.2 | | | |
| | | LINE 5 DRILL & GROUT DOWELS FOR 1st STAGE CURB IN SEGS. 165, 166, 167 & TRANSITION | \$ 10,000.00 | \$ 7,206.28 | - \$ 2,793.32 | 72.1 | | | |
| | | LINE 6 MODIFICATION OF STATE FURNISHED MATERIAL IN SEGS. 5 & 6 | \$ 6,500.00 | \$ 6,499.94 | - 0.06 | 100.0 | | | SEE LINE 12 FOR SUPPLEMENT |
| | | LINE 7 FAN LINE ERECTION IN E. VENT. BLDG. FOR VENTING OF CONTROL ROOM | \$ 3,700.00 | \$ 1,705.73 | - \$ 1,994.27 | 46.1 | | | |
| | | LINE 8 CLEANOUT OF TUNNEL DRAINAGE EXTENSION, EAST PORTAL | \$ 3,000.00 | \$ 3,300.00 | + \$ 300.00 | 110.0 | | | STATE EXPENSE |
| | | LINE 9 PAYMENT FOR CONCRETE ADMIXTURES | \$ 10,000.00 | — | — | — | | | VOIDED; MOVED TO PCO 12 |
| | | LINE 10 REDUCTION OF THE PLACEMENT OF A QUANTITY OF EXCAVATED MINUS 6" MATERIAL AS EMBANKMENT FROM STA. 171+00 - 176+00 TO ENCOMPASS BRIDGE ABUTMENTS | - \$ 4,000.50 | - \$ 4,000.50 | 0.00 | 100.0 | | | |
| | | LINE 11 MAN GATE EAST PORTAL | \$ 269.50 | \$ 269.50 | 0.00 | 100.0 | | | |
| | | LINE 12 MODIFY STATE FURNISHED MATERIAL SUPPLEMENT TO LINE 6 | \$ 4,528.00 | \$ 4,528.00 | 0.00 | 100.0 | | | |
| | | LINE 13 SLOT HOLES IN HEAVY HORSESHOE PLATES | \$ 3,140.00 | \$ 3,138.80 | - \$ 1.20 | 100.0 | | | |
| | | LINE 14 LINE 9 SUPPLEMENT | \$ 10,000.00 | — | — | — | | | VOIDED; MOVED TO PCO 12 |
| | LINE 15 INSTALLATION OF ADDITIONAL GROUNDING CABLE IN WEST, CENTER & EAST CROSS PASSAGES | \$ 500.00 | \$ 2,207.09 | + \$ 1,707.09 | 441.4 | | | | |
| | LINE 16 CONNECT 8" EXISTING LONGITUDINAL DRAIN TO NEW 4" AT JOINT S5 & S6 | \$ 150.00 | \$ 41.54 | - \$ 108.46 | 27.7 | | | | |
| | LINE 17 REMOVE CONCRETE PEDESTALS & PLACE DOWELS IN OLD LINING FOR 1st STAGE CURB W.V.B. - S4 | \$ 8,000.00 | \$ 7,106.01 | - \$ 893.99 | 88.8 | | | | |
| | LINE 18 EXTEND EXISTING 4" CLAY PIPE THRU 1st STAGE CURB W.V.B. THRU S4 & 4" CEILING DRAIN IN SI. | \$ 300.00 | \$ 278.46 | - \$ 21.54 | 92.8 | | | | |
| | LINE 19 REMOVAL OF SONOTUBE FROM CURBS OF EAST & WEST VENT BLDGS. | \$ 1,000.00 | \$ 1,320.55 | + \$ 320.55 | 132.1 | | | | |
| | LINE 20 PLACEMENT OF W. BOUND 2 WAY TRAFFIC SIGNS ON WEST APPROACH | \$ 200.00 | \$ 158.85 | - \$ 41.15 | 79.4 | | | | |
| | LINE 21 RENTAL OF VERTICAL PANEL CHANNELIZING DEVICES, WEST APPROACH | \$ 500.00 | \$ 998.25 | + \$ 498.25 | 199.7 | PER UNIFORM MANUAL OF TRAFFIC CONTROL DEVICES | | | |

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| 9 | COLORADO | 170-3(81)220 | 6 BX | 273 |

FINAL SUMMARY OF CHANGE ORDERS

DATE: 6-29-79

| PCO NO | CMO NO | DESCRIPTION | PLAN AMT | FINAL AMT | DIFFERENCE | PERCENT | REFERENCE | REMARKS |
|------------|--------|--|-------------|------------|-------------|---------|-----------|--------------------------------|
| 7 CONT. | | LINE 22 REPAIR OF PEDESTRIAN OVERPASS DAMAGED BY TRAFFIC ACCIDENT ON 8-15-77 | \$4,800.00 | \$4,524.68 | -\$275.32 | 94.3 | | INSURANCE COMPANY TO REIMBURSE |
| | | LINE 23 CLEAN SLOPE & DITCH BETWEEN U.S. 6 & 170, STA. 178+ TO STA. 200+ ; TYPE C INLETS IN DITCH, STA. 184+ & 186+. | \$1,000.00 | \$1,920.21 | +\$920.21 | 192.0 | | |
| | | LINE 24 CLEANING & RESETTING 66" C.S.P. END SECT. | \$3,000.00 | \$3,950.13 | +\$950.13 | 131.7 | | |
| | | LINE 25 REPAIRING SOFT SPOTS IN SUBGRADE | \$3,000.00 | \$4,161.91 | +\$1,161.91 | 138.7 | | |
| | | LINE 26 LOCATING CONDUIT IN W. PORTAL | \$400.00 | \$1,498.39 | +\$1,098.39 | 374.6 | | |
| | | LINE 27 WELDING 2 1/2" X 2 1/2" X 4" UPPER ARCH DRIFTS | \$1,600.00 | \$1,689.99 | +\$89.99 | 105.6 | | |
| | | LINE 28 LOCATING CONDUIT IN E. PORTAL | \$800.00 | \$893.58 | +\$93.58 | 111.7 | | |
| | | LINE 29 A-36 STRUCTURAL STEEL PLATE | \$10,000.00 | \$9,841.53 | -\$158.47 | 98.4 | | |
| | | LINE 30 PLACING LEVELING COURSE ON U.S. 6 | \$1,000.00 | \$3,036.20 | +\$2,036.20 | 303.6 | | |
| | | LINE 31 REPLACING PLASTIC NIPPLES WITH STEEL NIPPLES | \$2,200.00 | \$2,488.26 | +\$288.26 | 113.1 | | |
| | | LINE 32 RESHAPE SLOPES ALONG U.S. 6 | \$3,000.00 | \$1,796.45 | -\$1,203.55 | 59.9 | | |
| | | LINE 33 ADJUST TELEPHONE MANHOLE, E. PORTAL | \$500.00 | \$97.33 | -\$402.67 | 19.5 | | |
| | | LINE 34 CLEARING TREES FOR EXTENSION OF EMBANKMENT, WEST PARKING AREA | \$1,200.00 | \$1,338.91 | +\$138.91 | 111.6 | | |
| | | LINE 35 REPAIR BLAST SHIELDS IN EAST & WEST VENTILATION BUILDINGS | \$1,200.00 | \$1,128.32 | -\$71.68 | 94.0 | | |
| | | LINE 36 BUS TRANSPORTATION (ON SITE) SUPPLIED BY CONTRACTOR | \$3,600.00 | 0.00 | -\$3,600.00 | 0.0 | | |
| | | LINE 37 ADJUST CONCRETE SLAB, N. SIDE OF EAST VENTILATION BUILDING | \$500.00 | \$426.88 | -\$73.12 | 85.4 | | |
| | | LINE 38 EXTEND EXISTING 36" C.M.P. RT. OF STA. 144+40 BY 20 FT. | \$1,500.00 | \$1,737.17 | +\$237.17 | 115.8 | | |
| | | LINE 39 INSTALL ELECTRICAL CONDUIT IN FINAL LINING AT X-PASSAGEWAYS, 5 WEST & EAST 10 CENTER | \$600.00 | \$884.45 | +\$284.45 | 147.4 | | |
| | | LINE 40 PLUG DROP HOLE IN TOP OF SOUTH TUNNEL TRANSITION - WEST PORTAL | \$200.00 | \$260.67 | +\$60.67 | 130.3 | | |
| | | LINE 41 DISMANTLE & DISPOSE OF METAL BUILDING N.E. OF STATE FIELD OFFICE | \$4,000.00 | -1.00 | -\$4,001.00 | 0.0 | | |
| | | LINE 42 SHAPED ROAD TO WATER STORAGE TANK WEST PORTAL | \$300.00 | \$2,849.97 | +\$2,549.97 | 950.0 | | |
| | | LINE 43 INSTALL 350 LIN. FT. OF 8" PERFORATED UNDERDRAIN RT. OF STA. 11+ TO 14+, WEST LOOP RAMP. | \$5,500.00 | \$5,811.80 | +\$311.80 | 105.7 | | |
| | | LINE 44 INSTALL LUMINAIRES RT. OF STA. 204+60, 207+80, & 210+80. | \$9,700.00 | \$9,649.83 | -\$50.17 | 99.5 | | |
| | | LINE 45 REMOVE ROADWAY CROWN, STA. 185+ TO 214+, EASTBOUND ROADWAY | \$500.00 | \$422.52 | -\$77.48 | 84.5 | | |
| | | LINE 46 REPAIR ASPHALT ROADWAY AROUND MEDIAN INLET, STA. 147+93 | \$300.00 | \$219.40 | -\$80.60 | 73.1 | | |
| | | LINE 47 INSTALL 4" PERFORATED UNDERDRAIN, STA. 353+ E. B. LANE | \$1,200.00 | \$1,542.63 | +\$342.63 | 128.6 | | |
| | | LINE 48 RELATED PREPARATIONS TO INSTALL 60" C.S.P., STA. 130+ | \$8,500.00 | \$8,324.57 | -\$175.43 | 97.9 | | |

| | | | | |
|------------------------|----------|-------------|----------|--------------|
| FEDERAL ROAD REGION NO | DIVISION | PROJ NO | SHEET NO | TOTAL SHEETS |
| 9 | COLORADO | 70-3(81)220 | 6 CX | 273 |

FINAL SUMMARY OF CHANGE ORDERS

| | | |
|---------------|---------|------|
| NO. OF SHEETS | REVISED | DATE |
| | 6-29-79 | |

| PCO NO | CMO NO | DESCRIPTION | PLAN AMT | FINAL AMT | DIFFERENCE | PERCENT | REFERENCE | REMARKS |
|--------|--------|---|--------------|--------------|-------------|---------|-----------|---------------------------------------|
| 7 | | LINE 49 PREPARE SLOPES FOR TOPSOIL | \$10,000.00 | \$10,000.00 | 0.00 | 100.0 | | SEE LINE ITEM #66 |
| CONT. | | LINE 50 ACCESS ROAD FOR WESTERN SLOPE GAS CO., RT. OF STA. 414+. | \$1,000.00 | \$1,014.77 | +\$14.77 | 101.5 | | |
| | | LINE 51 ADDITIONAL CLEARING, RT. OF STA. 134± | \$900.00 | \$894.04 | -\$5.96 | 99.3 | | |
| | | LINE 52 DRY GULCH LANDSCAPING | \$8,000.00 | \$7,998.65 | -\$1.35 | 100.0 | | |
| | | LINE 53 REMOVE SOFT SPOT, EAST RAMP, STA 464+ | \$9,300.00 | \$9,258.69 | -\$41.31 | 99.6 | | |
| | | LINE 54 WESTERN SLOPE GAS LINE REPAIR | \$600.00 | \$599.80 | -\$0.20 | 100.0 | | |
| | | LINE 55 BUILD STARTER WALL FOR FINAL LINING FORMS, STA. 82+ TO 90+, LT. & RT. | \$10,000.00 | \$9,869.18 | -\$130.82 | 98.6 | | |
| | | LINE 56 EXCAVATE INVERTS, SEG. 1 THRU 6, W. PORTAL | \$7,200.00 | \$11,101.62 | +\$3,901.62 | 154.2 | | |
| | | LINE 57 REPLACE PLASTIC TEE'S WITH STEEL TEE'S | \$8,700.00 | \$18,389.76 | +\$9,689.76 | 211.4 | | SEE LINE ITEM #67 |
| | | LINE 58 REPAIR BLAST SHIELD, E. & W. VENT. BLDG. | \$625.00 | \$620.90 | -\$4.10 | 99.3 | | |
| | | LINE 59 CHIP ROCK AND/OR CONCRETE IN INVERT OF WEST VENTILATION BUILDING | \$10,000.00 | \$14,085.31 | +\$4,085.31 | 140.9 | | |
| | | LINE 60 REMOVE MATERIALS IN ARCH AREAS OF EAST & WEST STUB TUNNELS | \$2,000.00 | \$5,350.48 | +\$3,350.48 | 267.5 | | |
| | | LINE 61 CLEAN & FLUSH 18" C.I.P. IN EAST VENTILATION BUILDING, STA. 124+39 | \$1,500.00 | \$193.78 | -\$1,306.22 | 12.9 | | |
| | | LINE 62 REMOVE BLAST SHIELDS IN EAST & WEST VENTILATION BUILDINGS | \$3,000.00 | \$2,006.79 | -\$993.21 | 66.9 | | |
| | | LINE 63 PURCHASE & INSTALL PLASTIC PIPE PLUGS FOR 4" PLASTIC SEEP RISERS | \$600.00 | 0.00 | -\$600.00 | 0.0 | | |
| | | LINE 64 REMOVE CHAIN LINK FENCE, SOUTH SIDE OF WEST PORTAL | \$2,000.00 | \$1,440.50 | -\$559.50 | 72.0 | | |
| | | LINE 65 CLEAN OUT & REPAIR OF SEWER LINE AT STATE FIELD OFFICE | \$1,839.00 | \$1,839.41 | +\$0.41 | 100.0 | | |
| | | LINE 66 SUPPLEMENT TO LINE #49 | \$4,700.00 | \$4,613.05 | -\$86.95 | 98.2 | | |
| | | LINE 67 SUPPLEMENT TO LINE #57 | \$9,700.00 | | | | | |
| | | LINE 68 SUPPLEMENT TO LINE #5 | \$4,100.00 | | | | | |
| | | LINE 69 TOWING T.V. VANS | \$2,000.00 | \$975.41 | -\$1,024.59 | 48.8 | | |
| | | LINE 70 INSTALL 2" PERF. P.V.C. | \$2,500.00 | \$10,449.72 | +\$7,949.72 | 418.0 | | |
| | | LINE 71 REMOVE & RESET ROADWAY SIGNS, W. PORTAL | \$1,000.00 | \$638.25 | -\$361.75 | 63.8 | | |
| | | LINE 72 EXTEND 4" P.V.C. IN SO. CURB @ STA. 38+31 | \$500.00 | \$424.17 | -\$75.83 | 84.8 | | |
| | | LINE 73 INSTALL 60 FT. OF 8" PERF. C.S.P., WEST LOOP ROAD | \$800.00 | \$2,480.80 | +\$1,680.80 | 310.1 | | |
| | | LINE 74 REPAIR OF 8" GAS LINE, EAST PORTAL CREDIT TO PROJECT | (\$5,838.72) | (\$5,838.72) | 0 | 100.0 | | CREDIT TO PROJECT (NON-PARTICIPATING) |
| | | LINE 75 INSTALL GROUNDING MAT - WEST PORTAL | \$2,000.00 | \$1,991.26 | -\$8.74 | 99.6 | | |
| | | LINE 76 THREE (3) TRANSFORMERS-EAST PORTAL CREDIT TO PROJECT | (\$3,234.00) | (\$3,234.00) | 0 | 100.0 | | CREDIT TO PROJECT |
| | | LINE 77 ADJUST FIXED FEE - CREDIT TO PROJECT | (\$43.12) | (\$43.12) | 0 | 100.0 | | CREDIT TO PROJECT |

| | | | | |
|------------------------|----------|--------------|----------|--------------|
| FEDERAL ROAD REGION NO | DIVISION | PROJ NO | SHEET NO | TOTAL SHEETS |
| 9 | COLGRADO | 170-3(81)220 | 6 DX | 273 |

FINAL SUMMARY OF CHANGE ORDERS

| | | | |
|----------------|---------|---------|------|
| NO. OF CHANGES | REVISED | 6-29-79 | VOID |
|----------------|---------|---------|------|

| PCO NO | CMO NO | DESCRIPTION | PLAN AMT | FINAL AMT | DIFFERENCE | PERCENT | REFERENCE | REMARKS | |
|--------|--------|--|---------------|---------------|--------------|---------|-----------|--|-------------------------|
| 8 | 17052 | FURNISH AND INSTALL A441 (GRADE 45) STEEL LEGS AND INVERT STRUTS, SEG. 163 | -\$4,314.35 | — | — | — | | PAID BY REDUCING PRICE ON BID ITEM 55 | |
| 9 | 0256 | BUTTRESS BERM GROUTING PRICE ADJUSTMENT | \$171,233.00 | \$171,233.00 | 0.00 | 100.0 | | PRICE REDUCTION WASHERS NOT USED WERE NOT PAID FOR UNDER THE VARIOUS STRUCTURAL STEEL ITEMS | |
| 10 | 0307 | OUT OF SPECIFICATION MATERIAL | -\$23,614.19 | -\$23,614.19 | 0.00 | 100.0 | | | |
| 11 | 0317 | REVISE TORQUE INDICATOR WASHER REQUIREMENTS | -\$887.62 | — | — | — | | | |
| 12 | 0323 | WATER REDUCING ADMIXTURES | \$235,000.00 | \$210,569.52 | -\$24,430.48 | 89.6 | | | |
| 13 | 0320 | ACCESS CROWN DRIFT | — | — | — | — | | PERMISSION TO CONSTRUCT ACCESS CROWN DRIFT AT NO COST TO STATE | |
| 14 | 0321 | REMEDIAL WORK, STA. 72+ | \$30,000.00 | \$17,140.07 | -\$12,859.93 | 57.1 | | PAID BY REDUCED PRICES FOR SOME DRAINAGE BID ITEMS | |
| 15 | 0269 | DRAINAGE MODIFICATIONS | -\$3,826.89 | — | — | — | | | |
| 16 | 0261 | REMEDIAL WORK, STA. 71+ 76 TO 72+20 | \$14,000.00 | \$9,519.38 | -\$4,480.62 | 68.0 | | | |
| 17 | 0355 | REMEDIAL WORK, STA. 81+ TO 82+ | \$46,200.00 | \$43,375.98 | -\$2,824.02 | 93.9 | | | |
| 18 | 0329 | WEST APPROACH GRADE CHANGE | \$521,200.00 | \$525,953.15 | +\$4,753.15 | 100.9 | | | |
| 19 | 0333 | WATERPROOFING CHANGES | \$119,955.00 | \$128,239.50 | +\$8,284.50 | 106.9 | | | |
| 20 | 0337 | PREGROUT PRICE ADJUSTMENT | -\$307,176.00 | -\$307,176.00 | 0 | 100.0 | | | |
| 21 | 0341 | PLANT MIX BITUMINOUS BASE (CL.6) U.S. 6 RAMP | \$12,200.00 | \$11,942.93 | -\$257.07 | 97.9 | | | |
| 22 | 0347 | TOPSOIL | — | — | — | — | | | VOIDED BY I70-3(104)220 |
| 23 | 0540 | ADDITIONAL TOPSOIL & SEEDING | \$39,924.10 | \$38,737.89 | -\$1,186.21 | 97.0 | | | |
| 24 | | NOT USED | | | | | | | |
| 25 | 4375 | ADDITIONAL COST OF FLYASH & CEMENT | \$63,634.83 | \$63,634.83 | 0.00 | 100.0 | | | |
| 26 | 0549 | A.B.C. (CL.2) SPECIFICATION MODIFICATION | 0.00 | 0.00 | 0 | 0 | | | |
| 27 | 4728 | UNDERRUN OF BID ITEM 211 - SHEET METAL FOR PANNING | \$21,854.00 | \$21,854.00 | 0.00 | 100.0 | | | |
| 28 | | VOIDED BY P.C.O. #29 | | | | | | | |
| 29 | 4983 | OVERRUN OF BID ITEM 203 - UNCLASSIFIED EXCAVATION (HAUL) | \$177,570.90 | \$177,570.90 | 0.00 | 100.0 | | | |
| 30 | 4953 | REPAIR OF BRICK FACADE WALLS & BLAST DAMAGE TO VENTILATION BUILDING. | \$9,175.70 | \$9,175.70 | 0.00 | 100.0 | | | |
| 31 | 8153 | DELAY CLP111-EAST PORTAL TOP HEADING | \$245,000.00 | \$245,000.00 | 0.00 | 100.0 | | | |

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | 7 | 273 |

COMPOSITE SUMMARY OF MINIMUM TEMPERATURE 10 WINTER SEASONS (1958-1967)

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | | APRIL | |
|----------------------------------|---------|------|----------|------|----------|------|---------|------|----------|------|-------|------|-------|------|
| | LEAST | MOST | LEAST | MOST | LEAST | MOST | LEAST | MOST | LEAST | MOST | LEAST | MOST | LEAST | MOST |
| No. of Days at Freezing or Below | 7 | 31 | 26 | 30 | 30 | 31 | 29 | 31 | 26 | 28 | 30 | 31 | 26 | 30 |
| No. of Days at 0° F. or Below | 0 | 0 | 0 | 5 | 2 | 15 | 8 | 13 | 6 | 20 | 1 | 13 | 0 | 2 |
| No. of Days at -10° F. or Below | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 9 | 0 | 6 | 0 | 4 | 0 | 0 |
| No. of Days at -20° F. or Below | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 |

MONTHLY SUMMARY OF MAXIMUM SUMMER TEMPERATURE (1964-1967)

| Number of Days warmer than | MAY | | | | JUNE | | | | JULY | | | | AUGUST | | | | SEPTEMBER | | | | | | | |
|----------------------------|------|----|----|----|------|----|----|----|------|----|----|----|--------|----|----|----|-----------|----|----|----|--|--|--|--|
| | 1964 | 65 | 66 | 67 | 64 | 65 | 66 | 67 | 64 | 65 | 66 | 67 | 64 | 65 | 66 | 67 | 64 | 65 | 66 | 67 | | | | |
| 80° | | | | | | 0 | 0 | | 0 | 0 | 13 | | | 0 | 0 | | | | | | | | | |
| 70° | | | 0 | | | 1 | 11 | | 3 | 12 | 28 | | 1 | 0 | 15 | | | 0 | | | | | | |
| 60° | | 0 | 8 | | | 14 | 24 | | 8 | 29 | 31 | | 19 | 13 | 28 | | 7 | 0 | 18 | | | | | |
| 50° | | 16 | 21 | 2 | | 25 | 30 | | 10 | 30 | | | 27 | 27 | 30 | | 11 | 11 | 30 | | | | | |
| 40° | | 25 | 28 | 12 | | 30 | | | | 30 | | | 31 | 30 | 31 | | 16 | 23 | | | | | | |
| 30° | | 31 | | 20 | | | | | | 31 | | | | | | | | | 26 | | | | | |
| 20° | | | | 21 | | | | | | | | | | | | | | | 30 | | | | | |
| 10° | | | | | | | | | | | | | | | | | | | | | | | | |
| 0° | | | | | | | | | | | | | | | | | | | | | | | | |

⊕ Based on 10 days of records. ⊕ Based on 16 days of records. ⊕ Based on 21 days of records.

TEMPERATURE READINGS IN THE PILOT TUNNEL

| Number of Days warmer than | JANUARY | | | FEBRUARY | | | MARCH | | | APRIL | | | MAY | | | JUNE | | | JULY | | | AUGUST | | | SEPTEMBER | | | OCTOBER | | | NOVEMBER | | | DECEMBER | | | | | | | | | | | | | | |
|----------------------------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|-----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | Sta. 39+ | Sta. 74+ | Sta. 118+ | | | | | | | | | | | | | | | |
| | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | 1966 | 67 | 66 | 67 | | | | | | | | | | | | |
| 25° | 29 | 29 | 31 | 12 | 23 | 23 | 11 | 28 | 27 | 31 | 6 | 31 | 27 | 31 | 27 | 30 | 27 | 30 | 27 | 31 | 22 | 31 | 23 | 31 | 23 | 30 | 3 | 30 | 4 | 30 | 3 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 30 | 23 | 20 | 17 | 24 | |
| 30° | 29 | 29 | 31 | 12 | 23 | 23 | 11 | 28 | 27 | 31 | 6 | 31 | 27 | 31 | 27 | 30 | 27 | 30 | 27 | 31 | 23 | 31 | 23 | 31 | 23 | 30 | 3 | 30 | 4 | 30 | 3 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 30 | 23 | 20 | 17 | 23 | | |
| 35° | 29 | 29 | 31 | 12 | 23 | 23 | 11 | 28 | 27 | 31 | 6 | 31 | 25 | 31 | 27 | 30 | 27 | 30 | 24 | 26 | 31 | 23 | 31 | 23 | 31 | 23 | 30 | 3 | 30 | 4 | 30 | 3 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 30 | 23 | 20 | 17 | 21 | | |
| 40° | 14 | 28 | 13 | 0 | 21 | 25 | 0 | 19 | 11 | 29 | 6 | 31 | 13 | 28 | 26 | 30 | 27 | 30 | 15 | 21 | 11 | 22 | 31 | 23 | 30 | 19 | 26 | 3 | 30 | 4 | 30 | 3 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 30 | 23 | 20 | 17 | 12 | | | | |
| 45° | 0 | 28 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 1 | 6 | 31 | 0 | 1 | 3 | 18 | 27 | 30 | 1 | 0 | 1 | 22 | 31 | 23 | 12 | 10 | 9 | 3 | 30 | 4 | 1 | 1 | 31 | 31 | 0 | 31 | 31 | 0 | 30 | 30 | 0 | 3 | 11 | 0 | | | | |
| 50° | 0 | 9 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 6 | 5 | 0 | 0 | 0 | 0 | 27 | 5 | 0 | 0 | 0 | 1 | 31 | 3 | 1 | 0 | 0 | 3 | 30 | 0 | 0 | 0 | 30 | 31 | 0 | 31 | 31 | 0 | 30 | 30 | 0 | 1 | 4 | 0 | | | | |
| 55° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 60° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Total No. Readings taken | 0 | 29 | 0 | 29 | 0 | 31 | 12 | 23 | 0 | 23 | 11 | 28 | 27 | 31 | 6 | 31 | 27 | 31 | 27 | 30 | 27 | 30 | 27 | 31 | 22 | 31 | 23 | 31 | 23 | 30 | 3 | 30 | 4 | 30 | 3 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 28 | 30 | 23 | 20 | 17 | 24 |

MONTHLY SUMMARY OF 1973-1974 TEMPERATURES ⊕ Based on 25 days of records

| Maximum Temperature | Number of Days | | | | | | | | | | | | |
|---------------------|----------------|------|------|------|-------|------|------|------|------|------|-------|-------|-----|
| | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. | JAN. | FEB. | MARCH | APRIL | MAY |
| 80° or more | | | 0 | 0 | | | | | | | | | |
| 70° | | 0 | 1 | 2 | 0 | | | | | | | | |
| 60° | 0 | 14 | 12 | 24 | 15 | 0 | | | | | | | 0 |
| 50° | 1 | 20 | 30 | 30 | 18 | 10 | 0 | 0 | 0 | | 0 | 0 | 2 |
| 40° | 11 | 25 | 31 | 31 | 24 | 21 | 7 | 2 | 2 | 0 | 1 | 7 | 17 |
| 30° | 13 | 30 | | | 28 | 25 | 16 | 9 | 2 | 5 | 14 | 17 | 19 |
| 20° | 15 | | | | 30 | 31 | 29 | 18 | 9 | 17 | 24 | 25 | |
| 10° | | | | | | | 29 | 27 | 20 | 24 | 31 | 30 | |
| 0° | | | | | | | 30 | 31 | 25 | 28 | | | |
| -10° | | | | | | | | | | | | | |
| -20° | | | | | | | | | | | | | |
| Minimum Temperature | | | | | | | | | | | | | |
| 60° or less | | | | | | | | | | | | | |
| 50° | 13 | 30 | 31 | 31 | | | | | | | | | |
| 40° | 13 | 28 | 30 | 17 | 30 | 31 | | | | | | | 19 |
| 30° | 8 | 15 | 2 | 0 | 19 | 28 | 30 | | | | 31 | 30 | 14 |
| 20° | 2 | 2 | 0 | | 1 | 9 | 21 | 31 | 25 | 28 | 27 | 4 | |
| 10° | 0 | 0 | | | 0 | 2 | 13 | 22 | 20 | 24 | 18 | 13 | 0 |
| 0° | | | | | | | 0 | 4 | 10 | 6 | 4 | 3 | |
| -10° | | | | | | | | 0 | 2 | 1 | 4 | 0 | 0 |
| -20° | | | | | | | | | 1 | 0 | | | |
| -30° | | | | | | | | | | 0 | | | |
| -35° | | | | | | | | | | | | | |

PARSHALL FLUME AND WIND DIRECTION IN THE PILOT TUNNEL

| DATE | FLUME (gpm) | WIND | DATE | FLUME (gpm) | WIND | DATE | FLUME (gpm) | WIND | DATE | FLUME (gpm) | WIND |
|---------|-------------|------|---------|-------------|------|----------|-------------|------|---------|-------------|--------------------------|
| 7-11-65 | 99 | West | 7-6-65 | 332 | East | 7-18-65 | 139 | East | 4-27-67 | 49 | No information available |
| 1-21-65 | 90 | West | 8-6-65 | 291 | East | 10-3-65 | 72 | | 5-8-67 | 49 | |
| 2-3-65 | 85 | West | 9-15-65 | 130 | East | 10-30-65 | 63 | | 5-22-67 | 49 | |
| 2-10-65 | 72 | West | 12-9-65 | 67 | West | 11-7-65 | 63 | | 5-29-67 | 133 | |
| 2-17-65 | 72 | West | 1-4-66 | 64 | - | 11-21-65 | 63 | | 6-5-67 | 251 | |
| 3-4-65 | 72 | West | 1-28-66 | 63 | East | 12-4-65 | 54 | | | | |
| 3-17-65 | 67 | West | 2-24-66 | 63 | West | 1-9-67 | 45 | | | | |
| 4-1-65 | 67 | West | 3-14-66 | 45 | East | 1-23-67 | 49 | | | | |
| 4-12-65 | 59 | West | 4-15-66 | 45 | West | 2-20-67 | 45 | | | | |
| 4-29-65 | 67 | West | 5-2-66 | 45 | West | 2-27-67 | 45 | | | | |
| 5-11-65 | 67 | West | 5-23-65 | 175 | West | 3-13-67 | 45 | | | | |
| 6-1-65 | 99 | West | 6-13-66 | 301 | East | 3-27-67 | 45 | | | | |
| 6-16-65 | 242 | West | 7-4-66 | 183 | East | 4-10-67 | 40 | | | | |

NOTE: TEMPERATURE SUMMARIES BASED ON EAST PORTAL DATA

AS CONSTRUCTED
 NO REVISIONS 6-29-73 REVISION VOID

GENERAL PHYSICAL DATA
 SHEET G-7

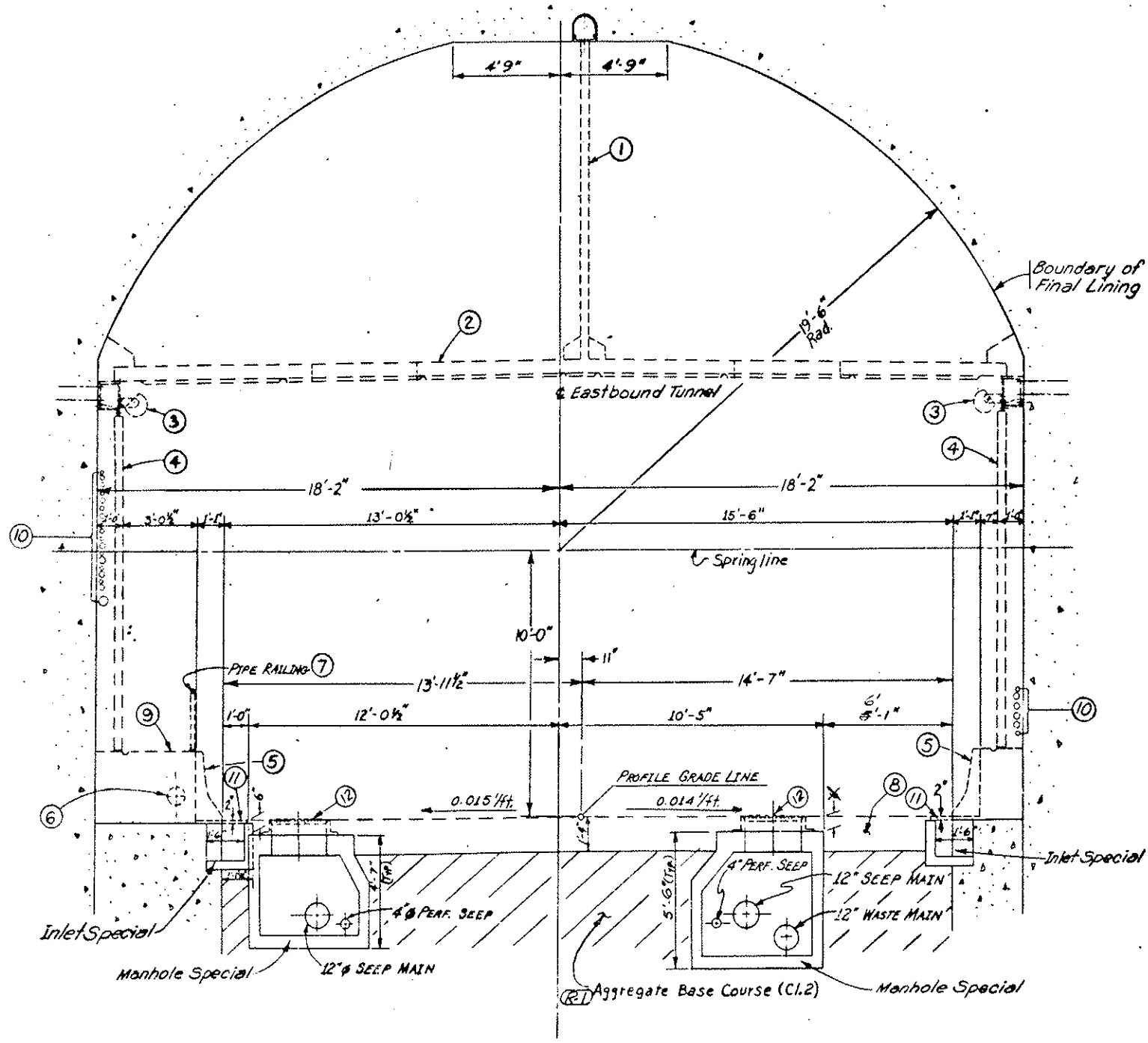
(R-1) Correct Mat'l. Class 7-3-75 T.A.L.

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|----------------|-----------|--------------|
| XX | COLORADO | I 70-3(81) 220 | 8 | 373 |

| AS CONSTRUCTED | | | |
|----------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-21-73 | VOID |

Items not included in contracts:

- ① Duct Divider Wall
- ② Ceiling
- ③ Tunnel Lights
- ④ Wall Finish
- ⑤ Safety Curbs
- ⑥ Water Main
- ⑦ Pipe Railing
- ⑧ Pavement (See Sheet AR-3)
- ⑨ Walkway
- ⑩ Electrical Conduit
- ⑪ Inlet Grating & Frame
- ⑫ Manhole Ring and Cover



SCALE: 3/8"=1'-0"

TYPICAL INTERIOR DIMENSIONS

SHEET G-8

| | | | | |
|-------------------------|----------|----------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I 70-3(81) 220 | 9 | 273 |

| | | | |
|----------------|---------|---------|------|
| AS CONSTRUCTED | | | |
| NO. REVISIONS | 6-23-73 | REV. BY | VOID |

SUB SURFACE INFORMATION

MAP SYMBOLS

| | |
|----------------------|--|
| Surficial Deposits | |
| Granite | |
| Metasedimentary Rock | |
| Diorite | |
| Decomposed Rock | |
| Shear Zone | |

Contact (Strike and Dip)

Foliation

Joint (Most Predominant)

Fault

< 1 Ft. *1-5 Ft.* *> 5 Ft.*

PIS Primary Instrumentation Station Pilot Bore
 SIS Secondary Instrumentation Station Pilot Bore
 PLC Prop Load Cell Pilot Bore

P-No. — Instrumentation Station North Tunnel
 T-No. — Instrumentation Station North Tunnel

SUPPORT DATA

STEEL SET SPACING

Spacing Information for the North Tunnel is for Crown Steel only.

NOTES

- A. Geology is at spring line in the North tunnel and eye level in the Pilot bore.
- B. For the relative positions of the Pilot bore and South tunnel, See Sheets A-2 thru A-7
- C. The sub surface information and support data shown on these sheets is presented as general information. Circled numbers on Subsurface Information sheets refer to the following reports:
 - ① Geological Report on the Straight Creek Tunnel by J. Post. April, 1973
 - ② Rock Classification Report Pilot Bore Tunnel by J. Post. January, 1974
 - ③ Final Geologic Report Straight Creek Tunnel Pilot Bore. by C.D.H. 1965
 - ④ Preliminary Geologic Maps West Bound Lane and Pilot Bore Straight Creek Tunnel by C.S. Robinson and J. Post. 1971
 - ⑤ Water Inflows and Drainage at the Eisenhower Memorial Tunnel by Leeds, Hill and Jewett, Inc. February, 1974

ROCK CHARACTERISTICS

DECOMPOSITION & ALTERATION —

WATER ZONES —

JOINT SPACING —

BLOCKY AND/OR SEAMY —

ROCK CLASSIFICATION ①

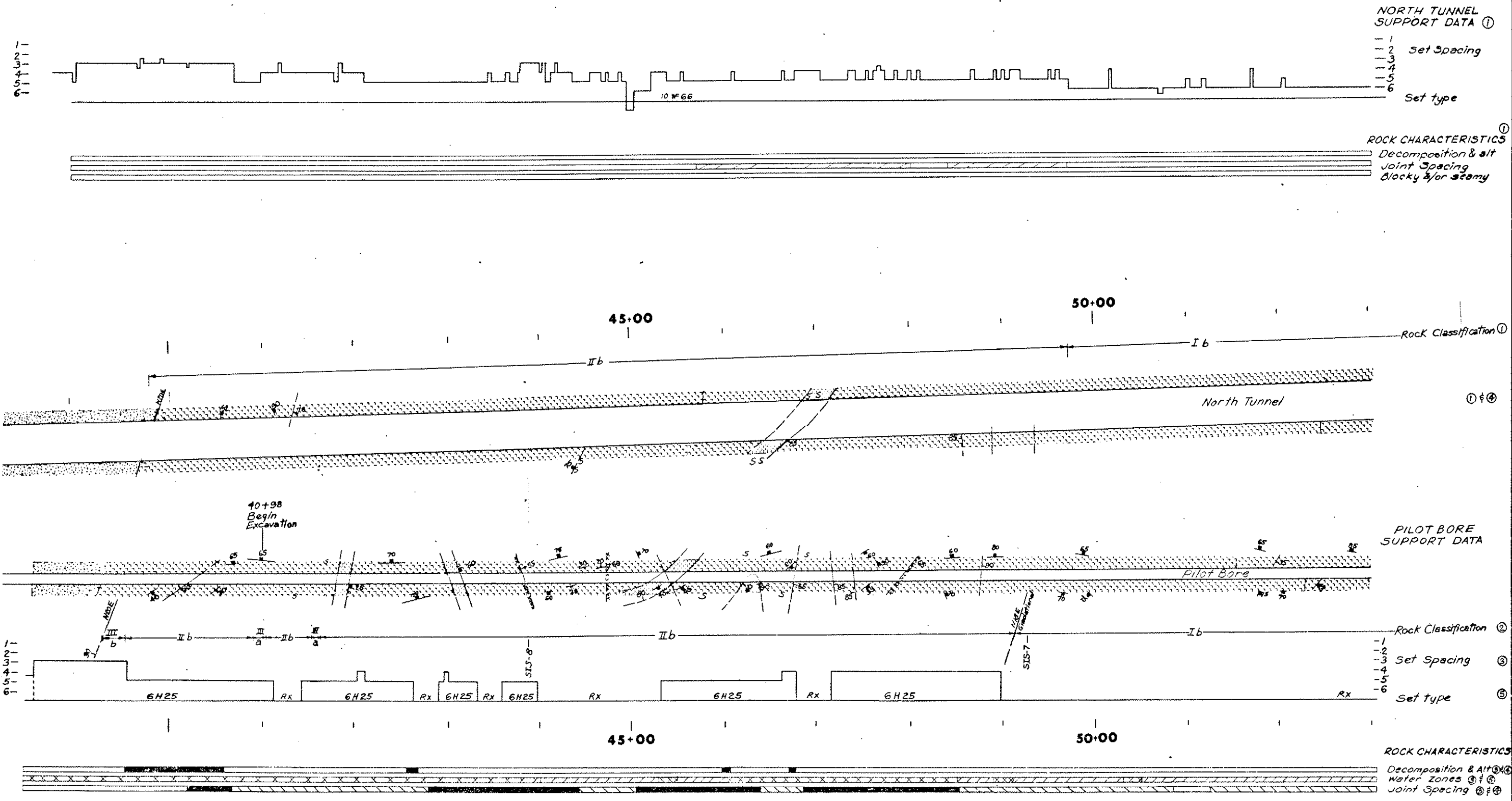
| Rock Class | Description |
|-------------|---|
| Ia - Ib | Massive to slightly blocky, no alteration, joint spacing 1.0 feet or greater. |
| IIa - IIb | Moderately blocky, little or no alteration, joint spacing 0.5 feet or greater. |
| IIIa - IIIb | Very blocky, moderately to highly altered, joint spacing less than 1.0 feet. |
| IVa | Highly crushed and altered, non-plastic, abundant clay, joint spacing less than 0.5 feet. |
| IVb | Plastic, highly altered, squeezing or swelling ground, mainly clay fault gouge. |

| |
|---|
| AS CONSTRUCTED |
| NO REVISIONS 6-23-79 REVISED _____ VOID _____ |

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|----------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81) 220 | 10 | 273 |

SUB-SURFACE INFORMATION

Scale: 1" = 50'



GEOLOGIC PLAN + PROFILE
 STA 39+00 TO STA 53+00
 SHEET G-10

| | | | | |
|---------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 170-3(81)220 | 11 | 273 |

SUB-SURFACE INFORMATION

AT CONTRACTED
 REVISIONS 6-29-79
 REVISED _____ VOID _____

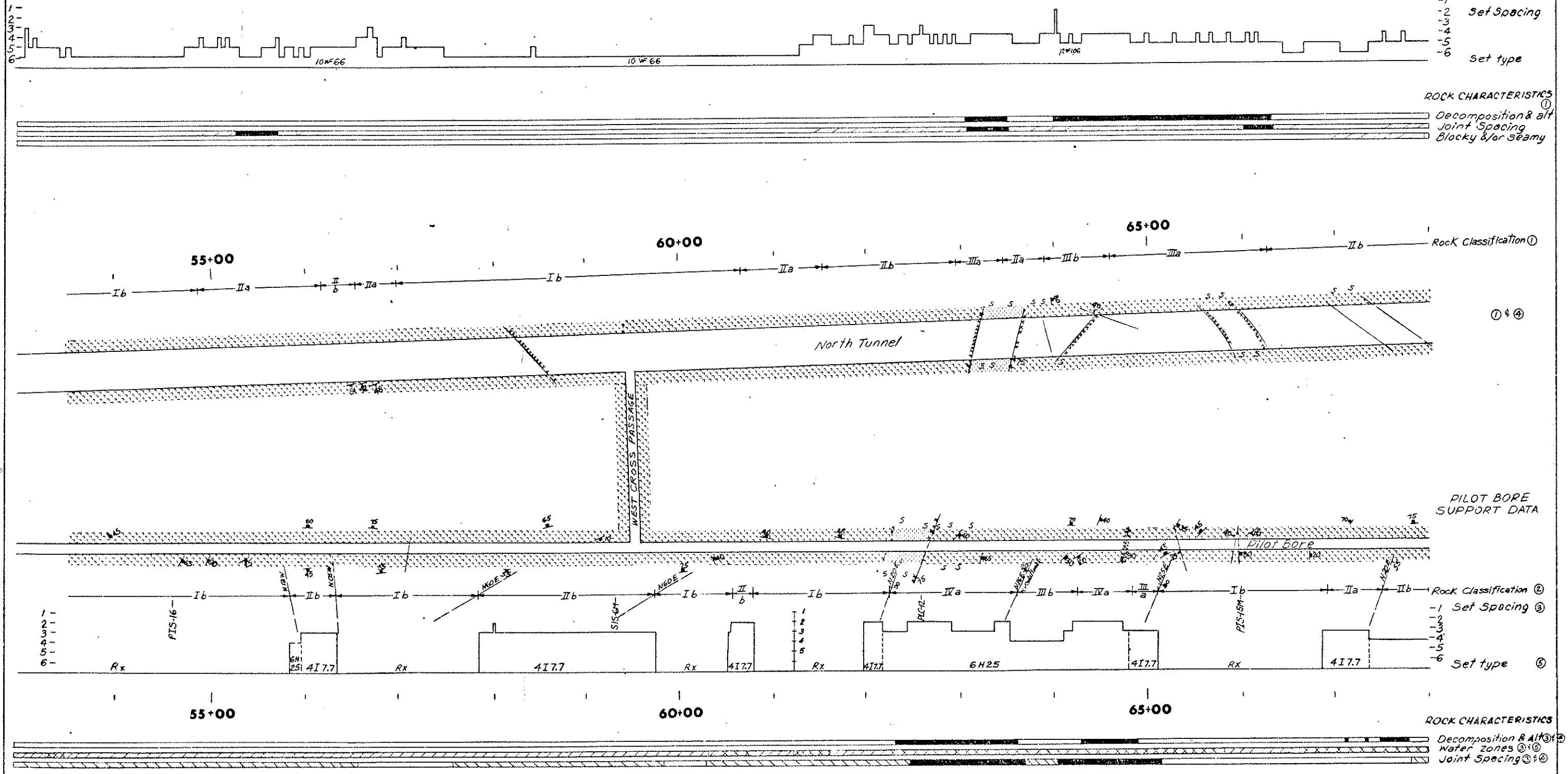
Scale: 1"=50'

NORTH TUNNEL SUPPORT DATA ①

- 1 Set Spacing
- 2
- 3
- 4
- 5
- 6 Set type

ROCK CHARACTERISTICS ①

- Decomposition & alt
- Joint Spacing
- Blocky &/or seamy



PILOT BORE SUPPORT DATA

- ① ④
- Rock Classification ②
- 1 Set Spacing ②
- 2
- 3
- 4
- 5
- 6 Set type ③

ROCK CHARACTERISTICS ②

- Decomposition & alt ③ ④
- Water zones ③ ④
- Joint Spacing ③ ④

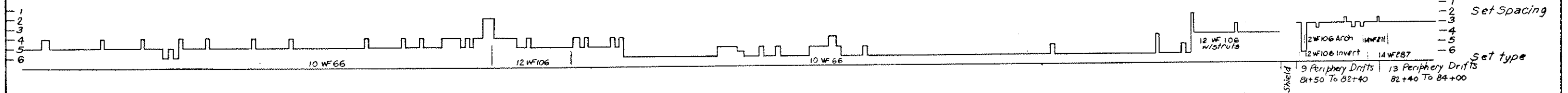
GEOLOGIC PLAN + PROFILE
 STA 53+00 TO STA 68+00
 SHEET G-11

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | I70-3(81)220 | 12 | 273 |

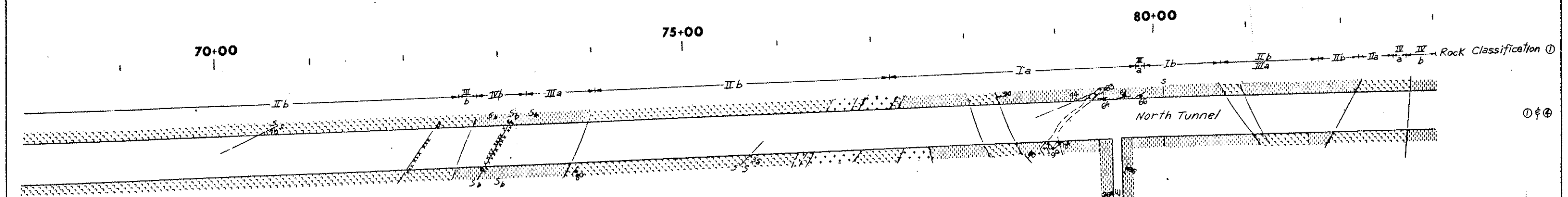
SUB-SURFACE INFORMATION

AS CLASSIFIED BY
 DATE 6-29-79, BY 1010

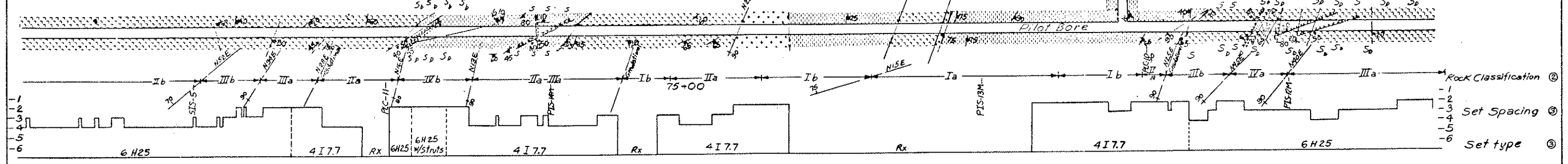
NORTH TUNNEL SUPPORT DATA



ROCK CHARACTERISTICS ①
 Decomposition & Alt
 Joint Spacing
 Blocky or Seamy



PILOT BORE SUPPORT DATA



ROCK CHARACTERISTICS ②
 Decomposition & Alt
 Water Zones
 Joint Spacing

GEOLOGIC PLAN + PROFILE
 STA 68+00 TO STA 83+00
 SHEET G-12

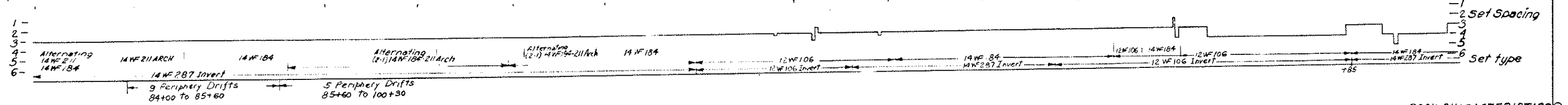
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 13 | 273 |

SUB-SURFACE INFORMATION

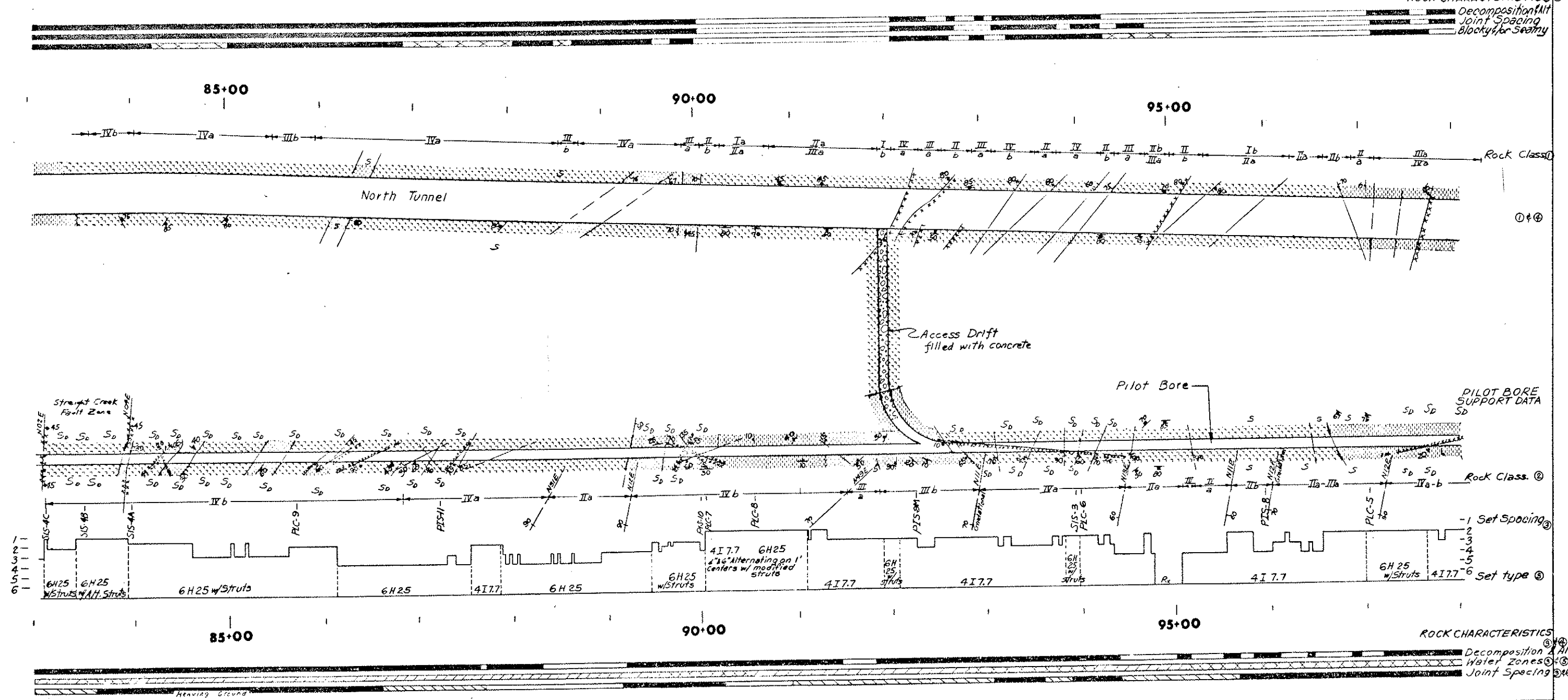
NO REVISIONS 6-29-79

Scale: 1"=50'

NORTH TUNNEL SUPPORT DATA



ROCK CHARACTERISTICS
 Decomposition & Alt
 Joint Spacing
 Blocky or Seamy



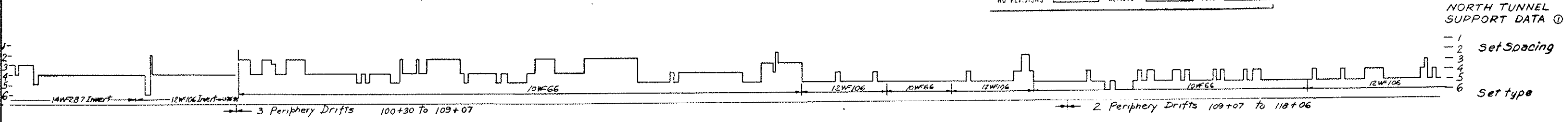
GEOLOGIC PLAN + PROFILE
 STA 83+00 TO STA 98+00
 SHEET G-13

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|----------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81) 220 | 14 | 273 |

SUB-SURFACE INFORMATION

AS CONSTRUCTED
 NO REVISIONS 6-25-73 REVISED _____ VOID _____

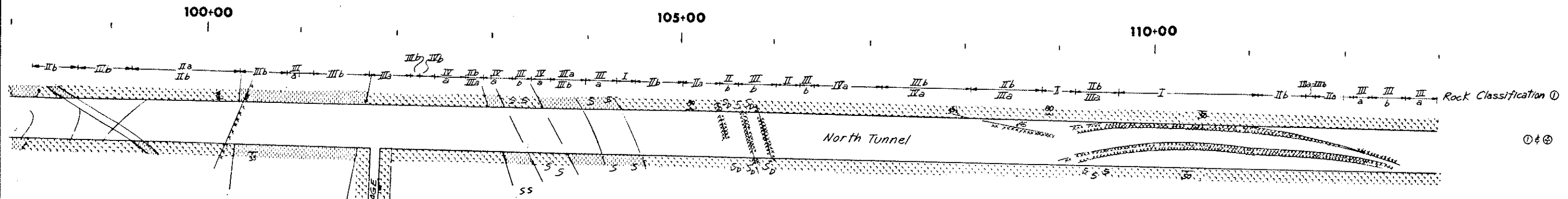
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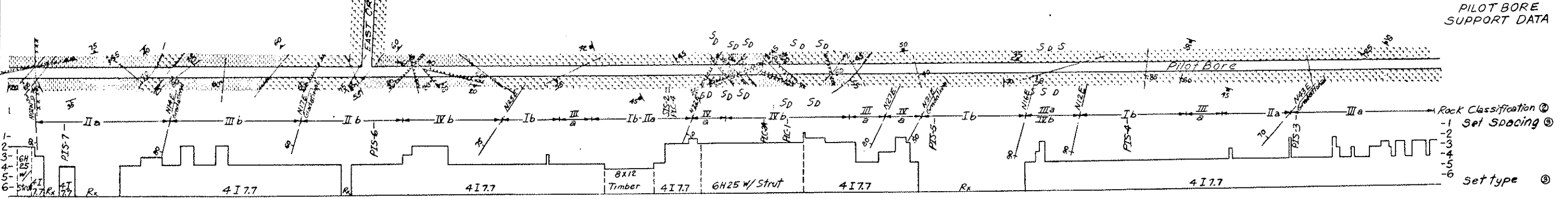
NORTH TUNNEL SUPPORT DATA ①



ROCK CHARACTERISTICS ①
 Decomposition & alt
 Joint Spacing
 Blocky &/or Seamy

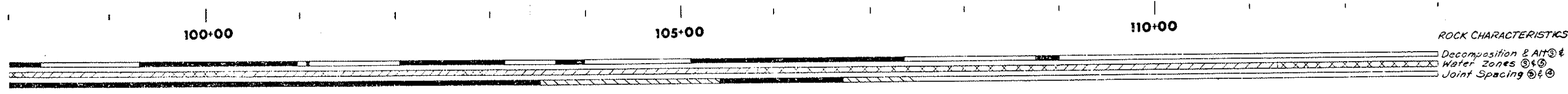


Rock Classification ①



PILOT BORE SUPPORT DATA

Rock Classification ②



ROCK CHARACTERISTICS ②
 Decomposition & alt
 Water Zones
 Joint Spacing

GEOLOGIC PLAN + PROFILE
 STA 98+00 TO STA 113+00
 SHEET G-14

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 15 | 273 |

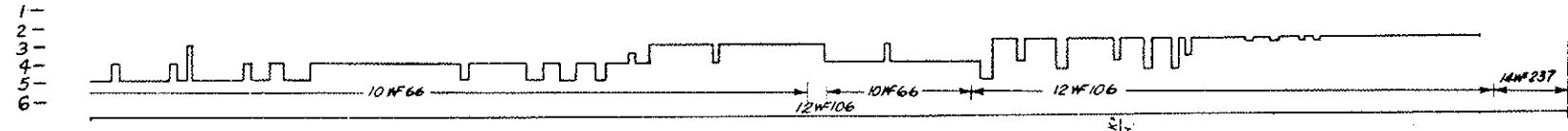
SUB-SURFACE INFORMATION

Scale: 1" = 50'

NORTH TUNNEL SUPPORT DATA ①

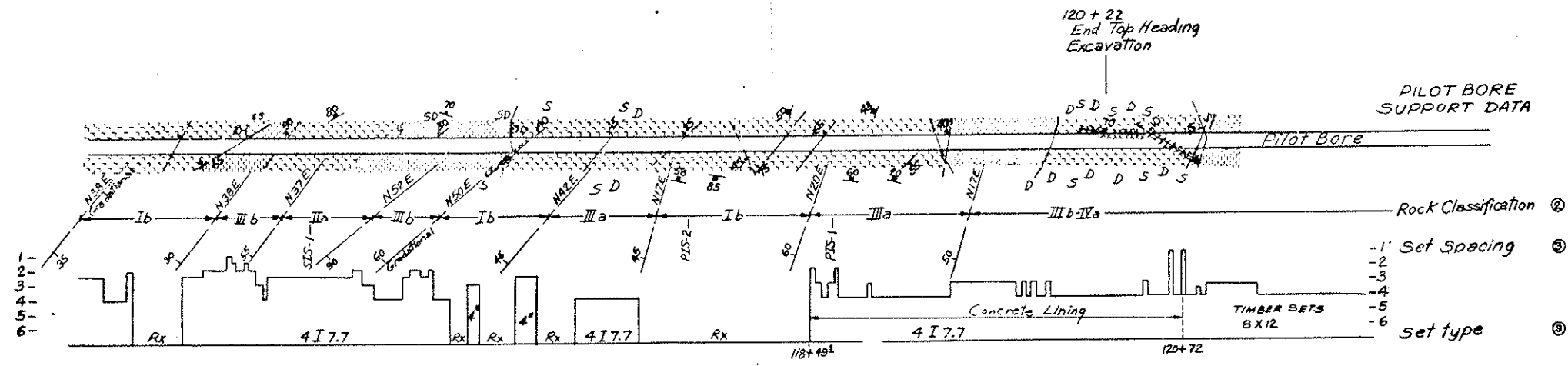
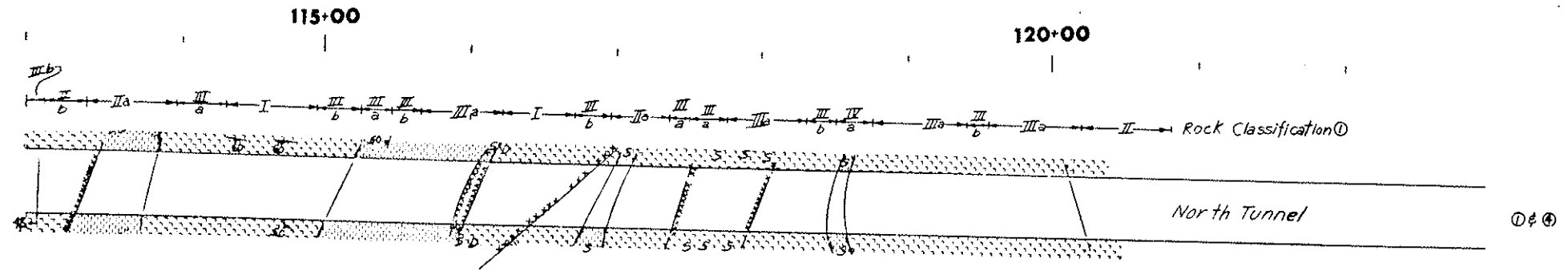
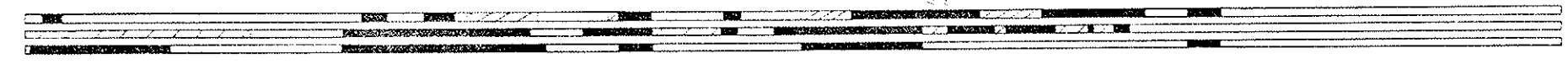
- 1 Set Spacing
- 2
- 3
- 4
- 5
- 6 Set type

| AS CONSTRUCTED | |
|----------------|------|
| NO. PER FEET | VOID |
| 6-29-79 | |



ROCK CHARACTERISTICS ①

- Decomposition & alt
- Joint Spacing
- Blocky &/or Seamy



PILOT BORE SUPPORT DATA

- Rock Classification ②
- 1' Set Spacing ③
- 2
- 3
- 4
- 5
- 6 Set type ④

ROCK CHARACTERISTICS

- Decomposition & Alt ⑤+⑥
- Water Zones ⑦⑧
- Joint Spacing ⑨⑩

GEOLOGIC PLAN + PROFILE
 STA 113+00 TO STA 120+00
 SHEET G-15

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 170-3 (8) 220 | 254 | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | 6-27-77 | REVISED | | VOID |

EXPLANATION

MAP SYMBOLS

ROCK TYPE

GRANITIC ROCK

- G₁ GRAY, MED. XLN., QTZ. PLAGIOCLASE
- G₂ PINK, MED. XLN., ABUNDANT MICROCLINE
- G₃ GRAY, FINELY XLN., EQUIGRAULAR
- G^a SLIGHTLY ALTERED
- G^b MODERATELY DECOMPOSED
- G^c HIGHLY DECOMPOSED
- PEG PEGMATITE

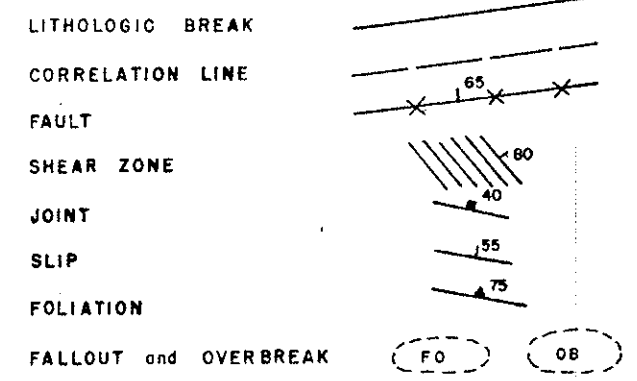
GNEISS or SCHIST

- a SLIGHTLY ALTERED
- b MODERATELY DECOMPOSED
- c HIGHLY DECOMPOSED

DIORITE

GEOLOGIC STRUCTURE SYMBOLS

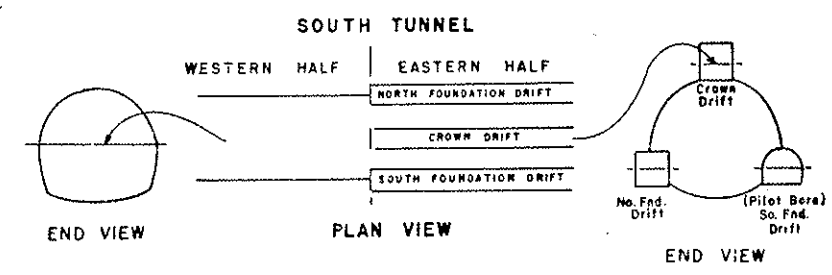
(INCLUDING DIP and STRIKE)



NOTE SECTION

- The tunnelling method that was used for excavation started with a 11x11-foot Crown Drift and a 12x12-foot North Foundation drift being driven from the east portal to a point about half way through the tunnel. A Pilot Bore previously driven in 1964 was enlarged and used as a South Foundation drift. Following the completion of the drifts and the insertion of receiver and crown beams, the main tunnel was excavated by a top heading and bench method from east and west headings.
 - Geologic studies were initially carried out in the Pilot Bore in 1964. Geologic mapping in the South Tunnel was performed during the driving of the drifts, and during the excavation of the top heading. The geologic mapping was performed by John D. Post, Senior Geologist, with the Colorado Division of Highways.
 - Two series of geologic maps were prepared. The first is a series of field maps showing the major and more important lithologic and structural geologic features in the eastern half of the tunnel at a scale of 1" = 10'. These maps show the geology of the north and south foundation drifts in plan view, and a side view of the tunnel geology along the centerline. The side view uses the geology of the foundation drifts projected to the centerline for the lower half of the tunnel and the crown drift geology for the upper part of the tunnel. This view of the geology was of great value during the critical top heading excavation. The second is a series of detailed geologic maps at a scale of 1" = 20' that shows the geology as mapped at eye level in the drifts in the eastern half of the tunnel and as mapped in the top heading at springline in the western half of the tunnel. It should be noted that the crown drift geology is about 30 feet higher in elevation than that shown in the foundation drifts. Geologic contacts and structures that have dips other than vertical will be offset in plan view between the crown drift and foundation drifts.
 - The geologic maps were updated as additional geologic mapping was performed.
 - The north tunnel was originally called the Straight Creek Tunnel and was later renamed the Eisenhower Tunnel. The excavation of the North Tunnel was started in early 1964 and completed in 1972.
- Some significant dates in the excavation of the south tunnel are as follows:
- Crown drift started on 9/18/75.
 - North foundation drift started on 1/29/76.
 - East top heading started on 8/1/77.
 - West top heading started on 5/4/77.
 - Top heading holed through on 8/17/78 at Station 89+08.
 - East Bench started on 8/31/78.
 - West Bench started on 5/16/77.
 - The bench was completed on 11/28/78 at Station 95+82.

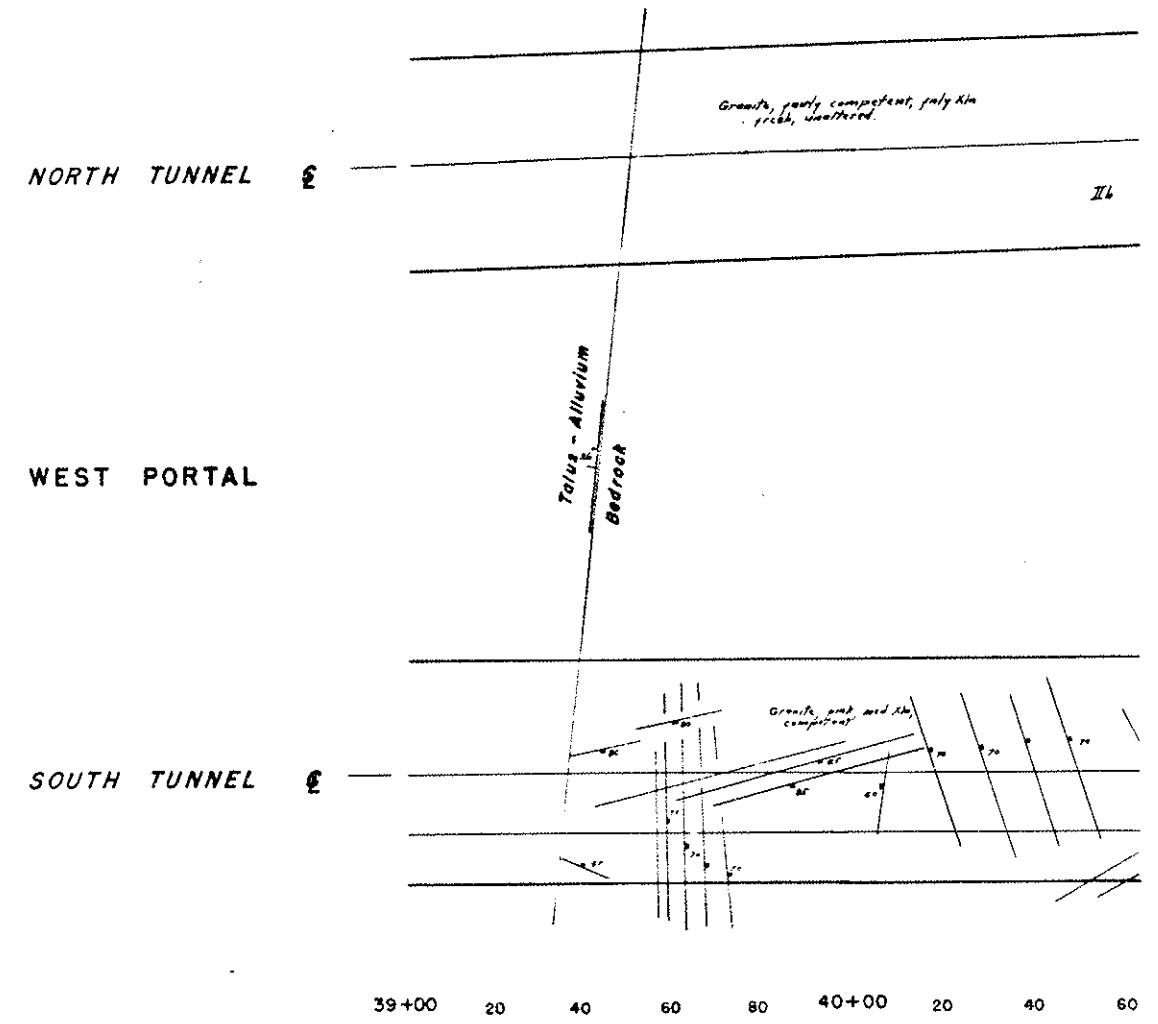
SKETCH SHOWING THE LOCATION OF THE MAPPED AREAS IN THE TUNNEL



GEOLOGIC MAP
BY JOHN POST

| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| | COLORADO | 170-3(81)220 | 158X | 273 |

STA. 39+00 to 40+62

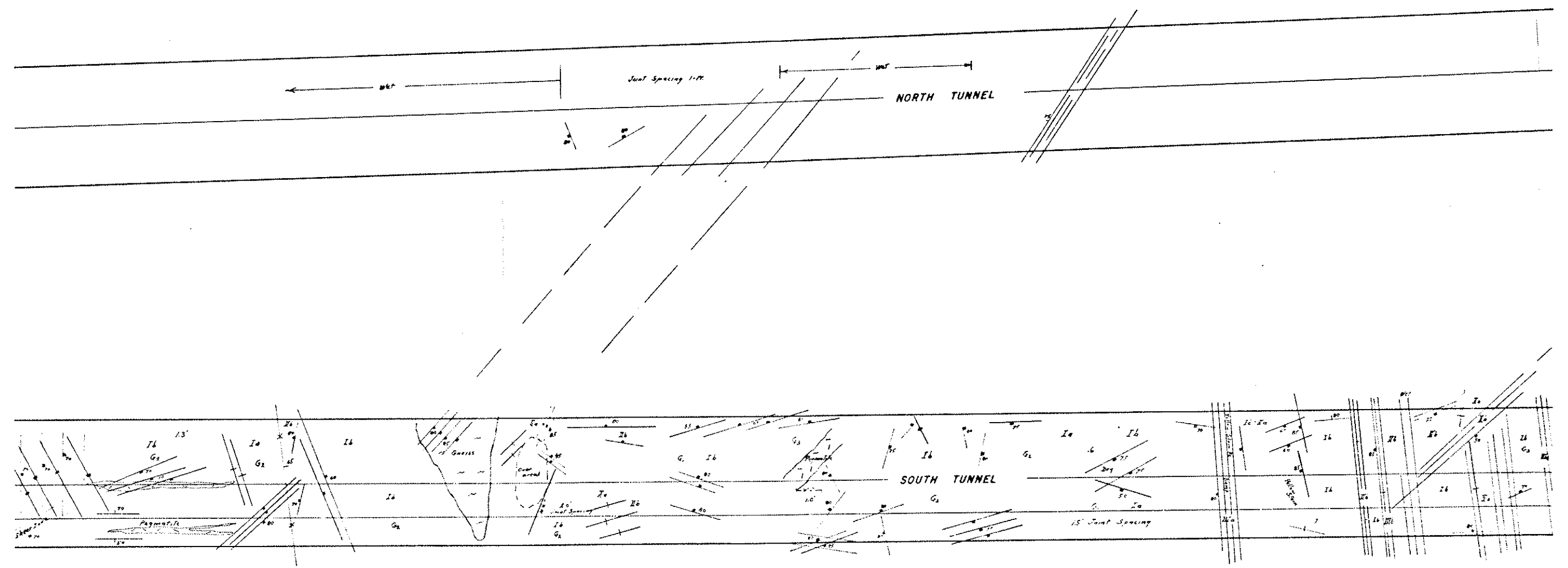


GEOLOGIC MAP

BY JOHN POST

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| | COLORADO | 170-3(81)220 | 15 CX | 273 |

STA. 40+62 to 46+62



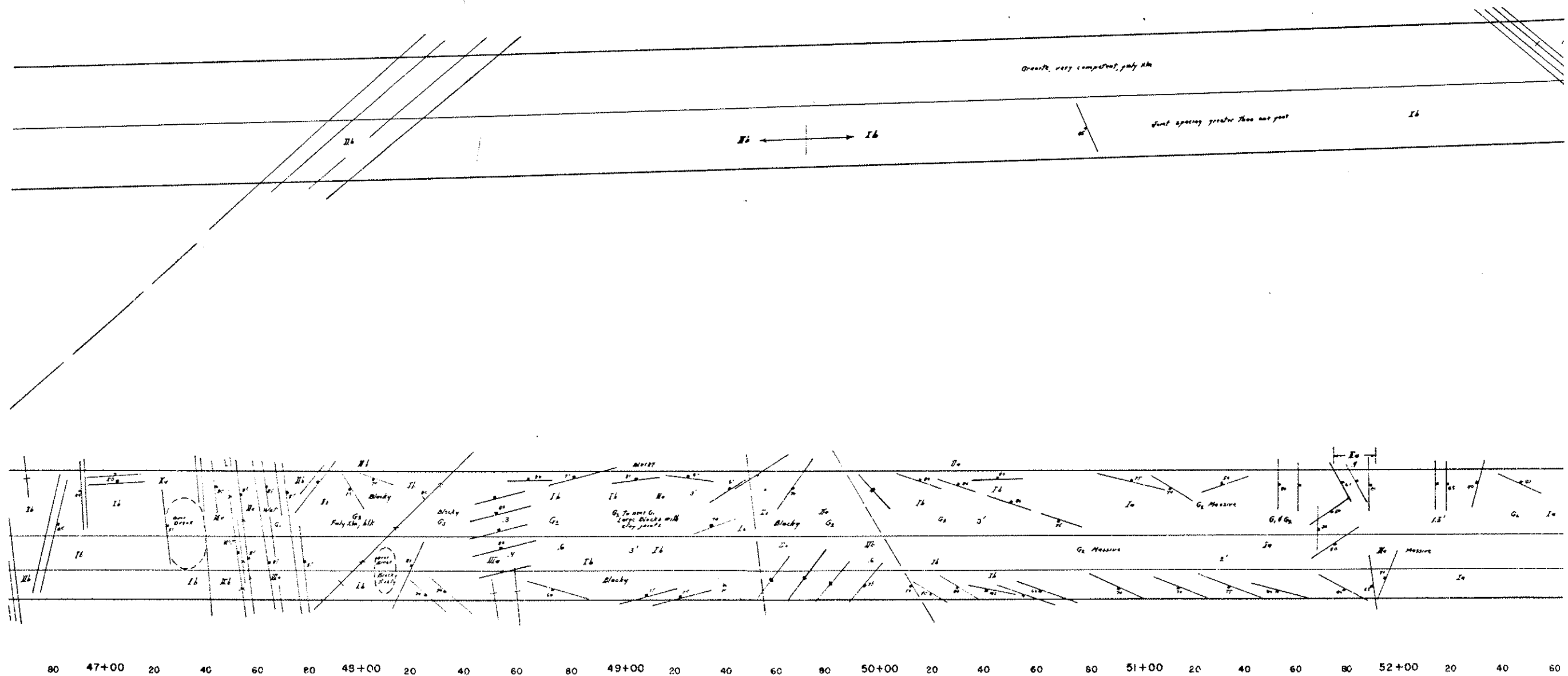
80 41+00 20 40 60 80 42+00 20 40 60 80 43+00 20 40 60 80 44+00 20 40 60 80 45+00 20 40 60 80 46+00 20 40 60

GEOLOGIC MAP

BY JOHN POST

| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|----------------------------|----------|--------------|--------------|-----------------|
| | COLORADO | 170-3(81)220 | 15DX | 273 |

STA. 46+62 to 52+62

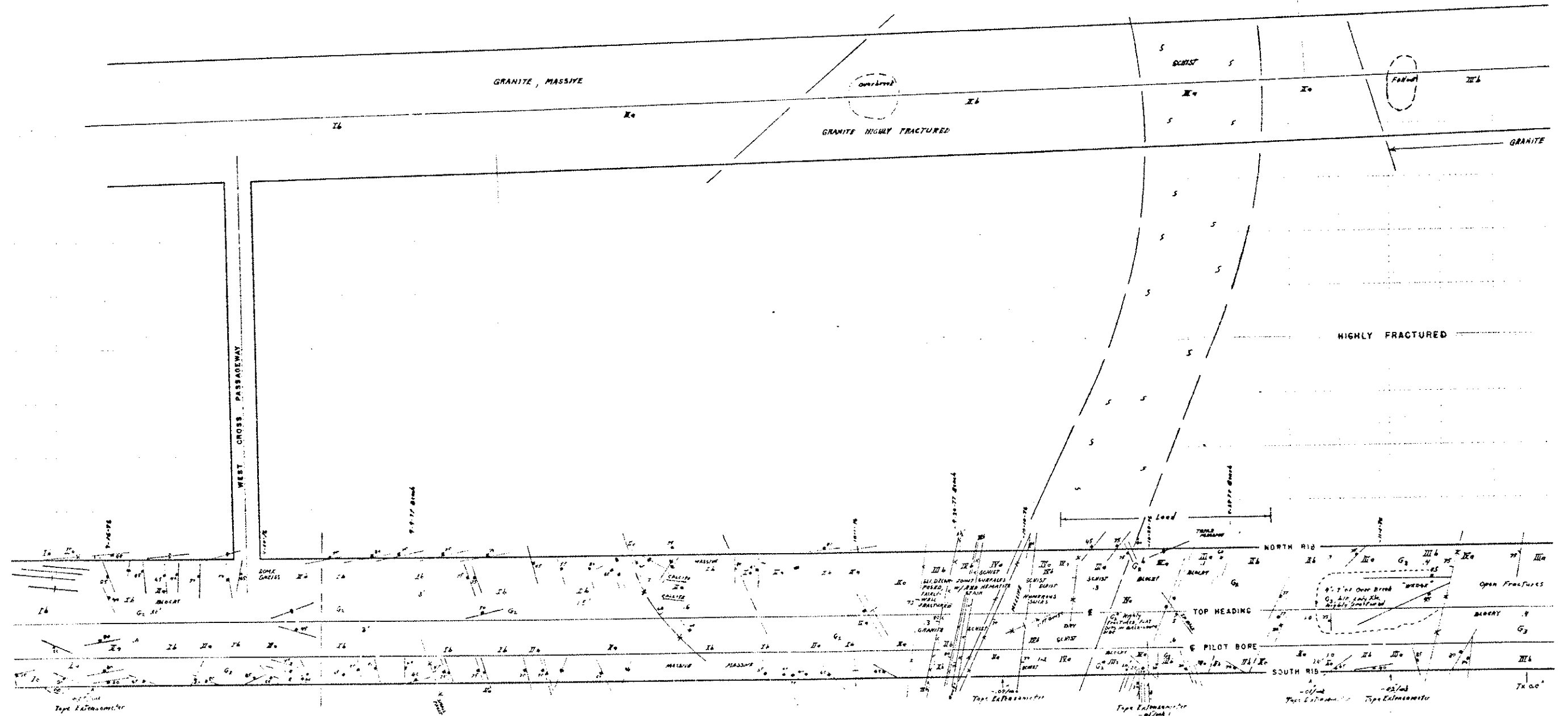


GEOLOGIC MAP

BY JOHN POST

| | | | | |
|--------------|----------|--------------|-----------|--------------|
| PROJECT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| 170-3(8)1220 | COLORADO | 170-3(8)1220 | 15Fx | 273 |

STA. 58+62 to 64+62



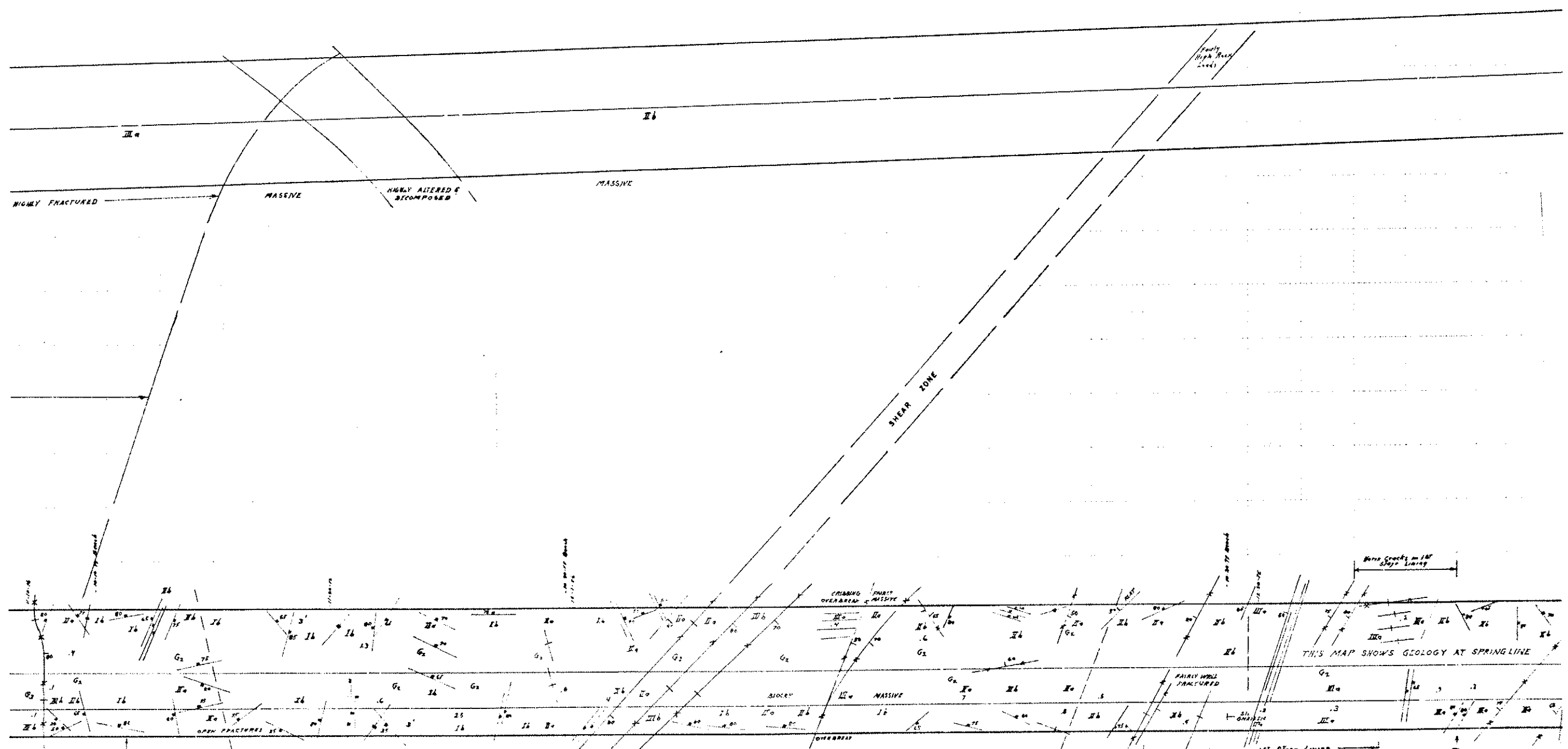
59+00 20 40 60 80 60+00 20 40 60 80 61+00 20 40 60 80 62+00 20 40 60 80 63+00 20 40 60 80 64+00 20 40 60

GEOLOGIC MAP

BY JOHN POST

| | | | |
|----------|--------------|-----------|--------------|
| DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| COLORADO | 170-3(8)1220 | 15 Gx | 273 |

STA. 64+62 to 70+62



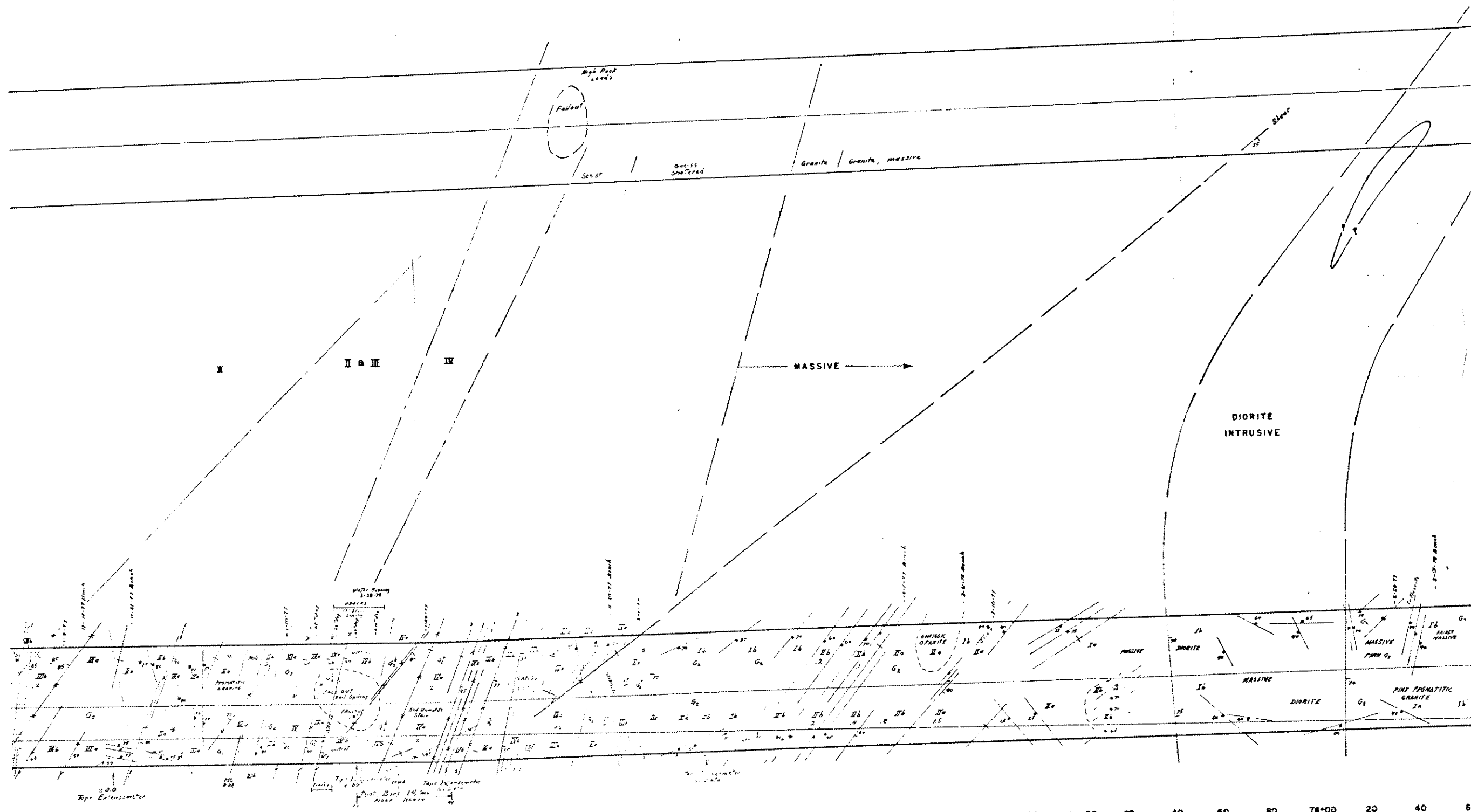
80 65+00 20 40 60 60 55+00 20 40 60 80 67+00 20 40 50 90 66+00 20 40 60 80 69+00 20 40 60 80 70+00 20 40 60

GEOLOGIC MAP

BY JOHN POST

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(81)220 | 15HX | 273 |

STA. 70+62 to 76+62

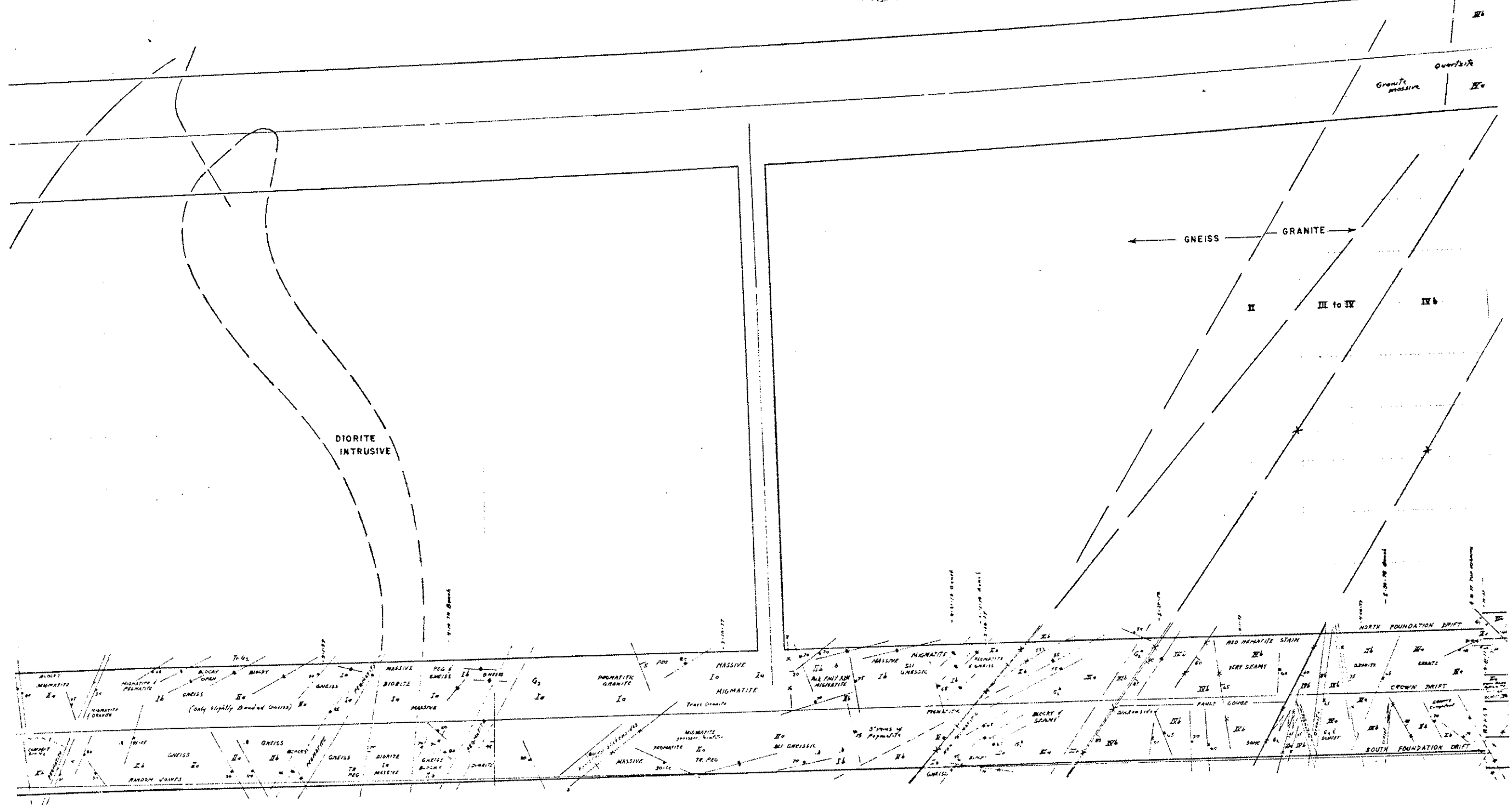


GEOLOGIC MAP

BY JOHN POST

| | | | | |
|---------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(81)220 | 15 I x | 273 |

STA. 76+62 to 82+62



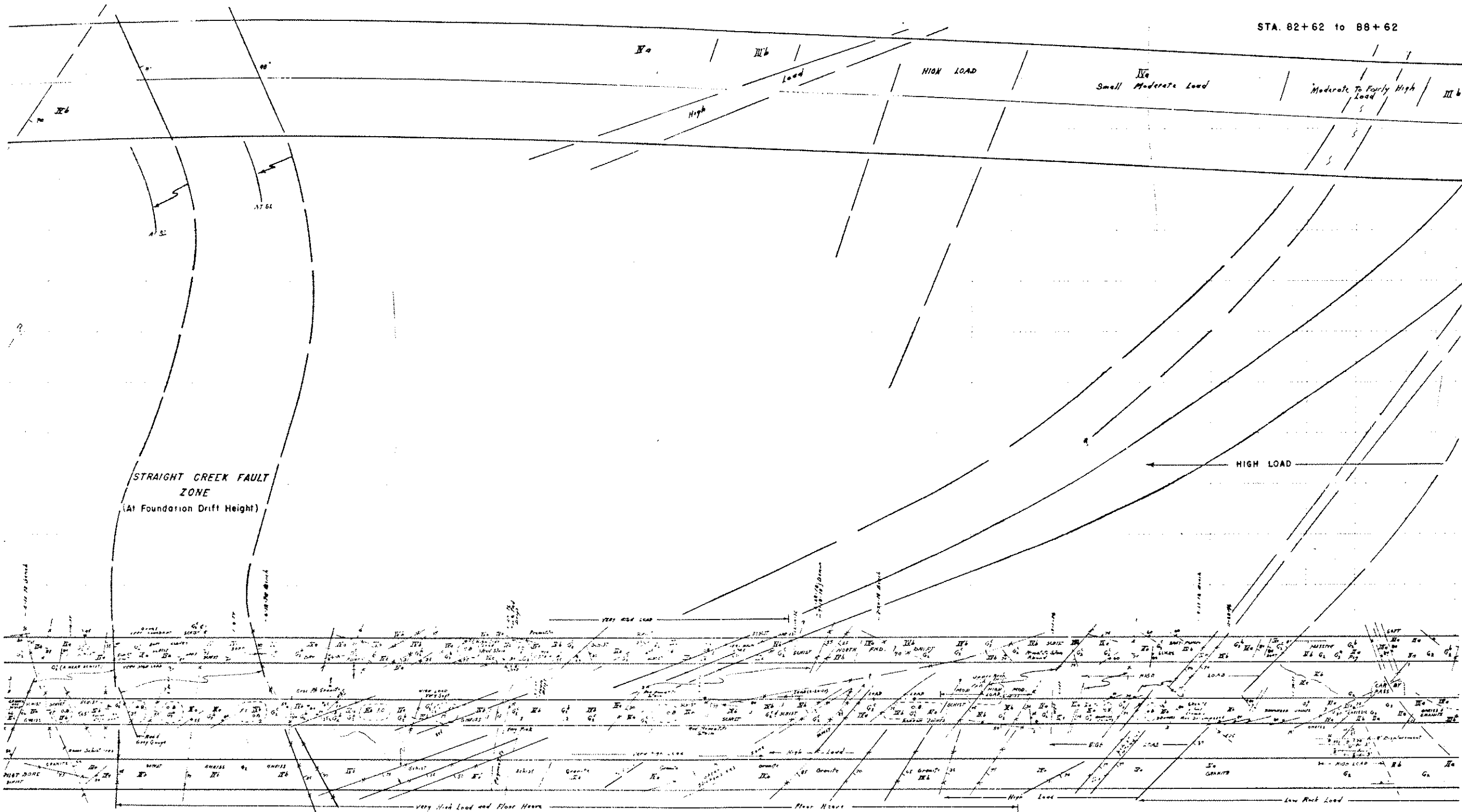
80 77+00 20 40 60 80 78+00 20 40 60 80 79+00 20 40 60 80 80+00 20 40 60 80 81+00 20 40 60 80 82+00 20 40 60

GEOLOGIC MAP

BY JOHN POST

| | | | | |
|-----------------------|----------|-------------|-----------|--------------|
| FEDERAL ROAD DISTRICT | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(8)220 | 15Jx | 273 |

STA. 82+62 to 88+62



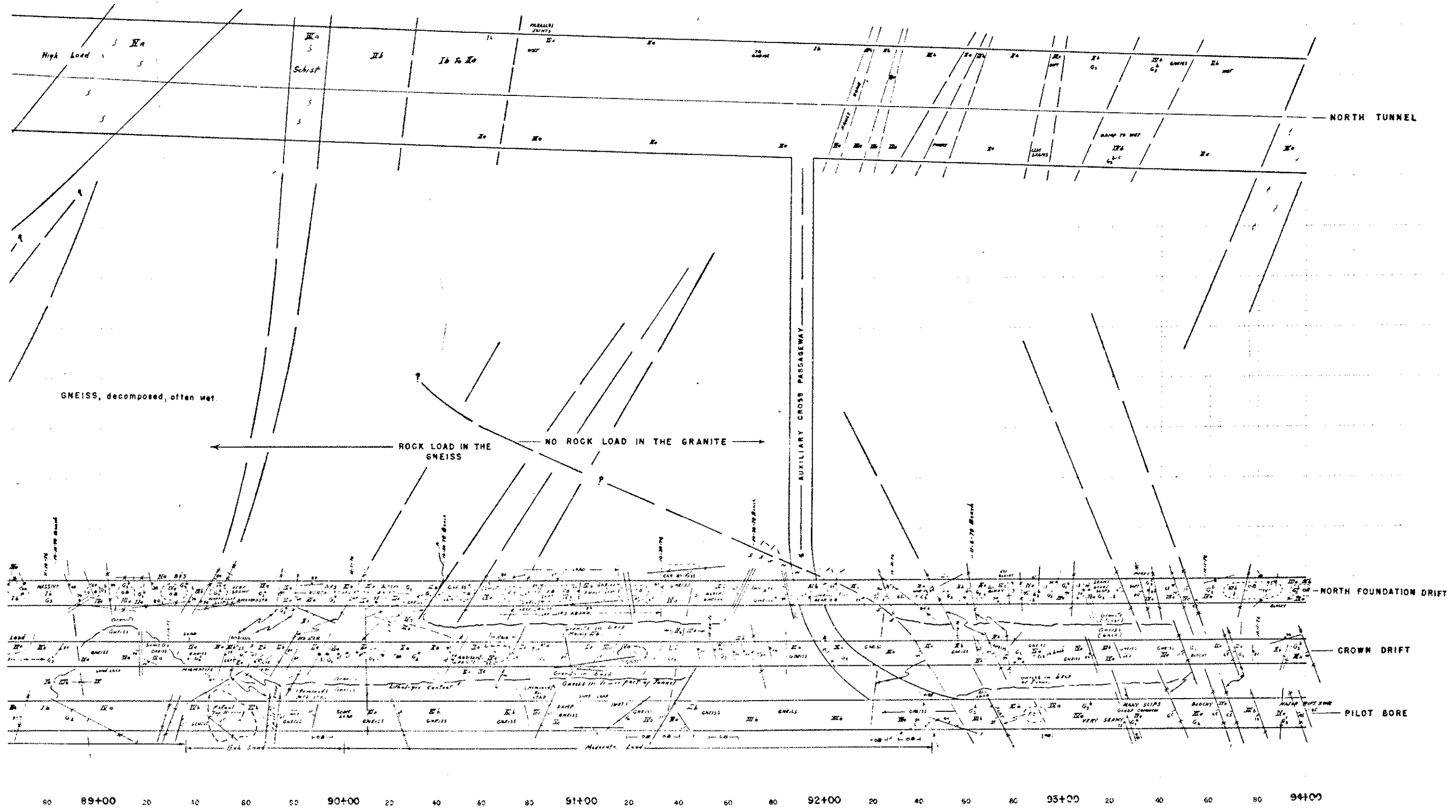
80 83+00 20 40 60 80 84+00 20 40 60 80 85+00 20 40 60 80 86+00 20 40 60 80 87+00 20 40 60 80 88+00 20 40 60

GEOLOGIC MAP

BY JOHN POST

| | | | | |
|-------------------------|----------|-------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(8)220 | 15K x | 273 |

STA. 88+62 to 94+00

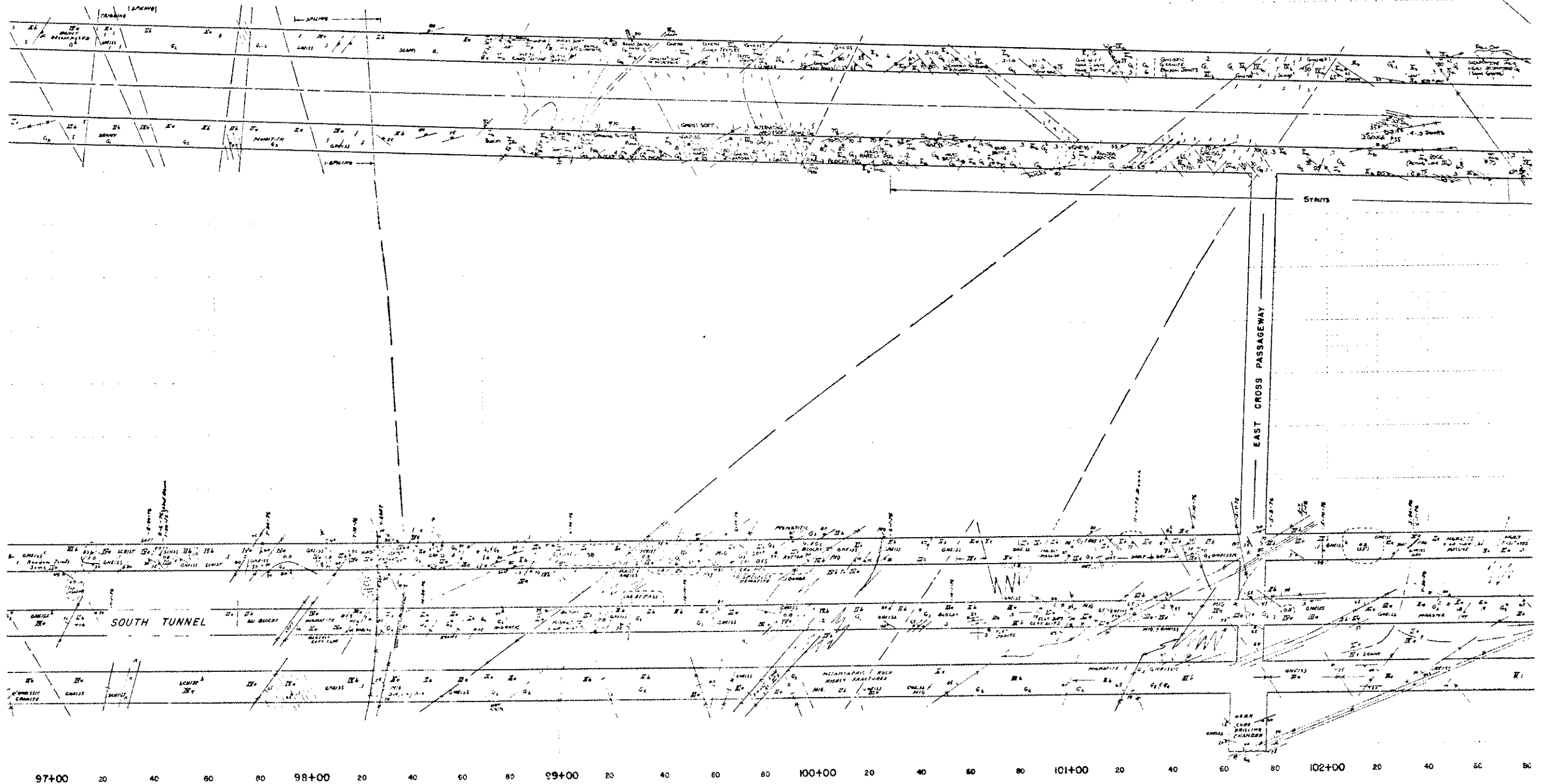


GEOLOGIC MAP

BY JOHN POST

| | | | |
|----------|-------------|-----------|--------------|
| DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| COLORADO | 170-3(8)220 | 15M X | 273 |

STA. 96+82 to 102+82

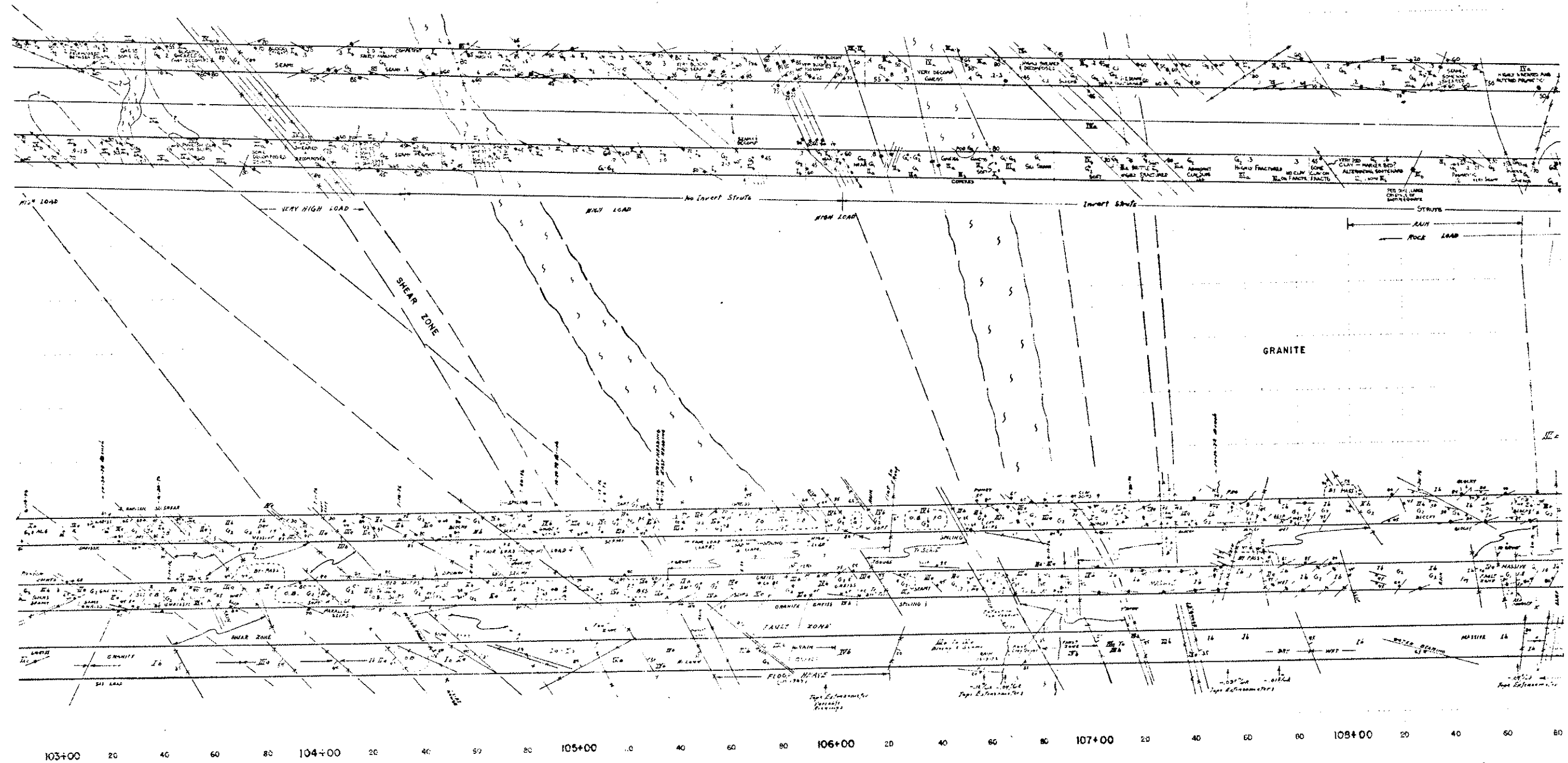


GEOLOGIC MAP

BY JOHN POST

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(81)220 | 15 N x | 273 |

STA. 102+82 to 108+82

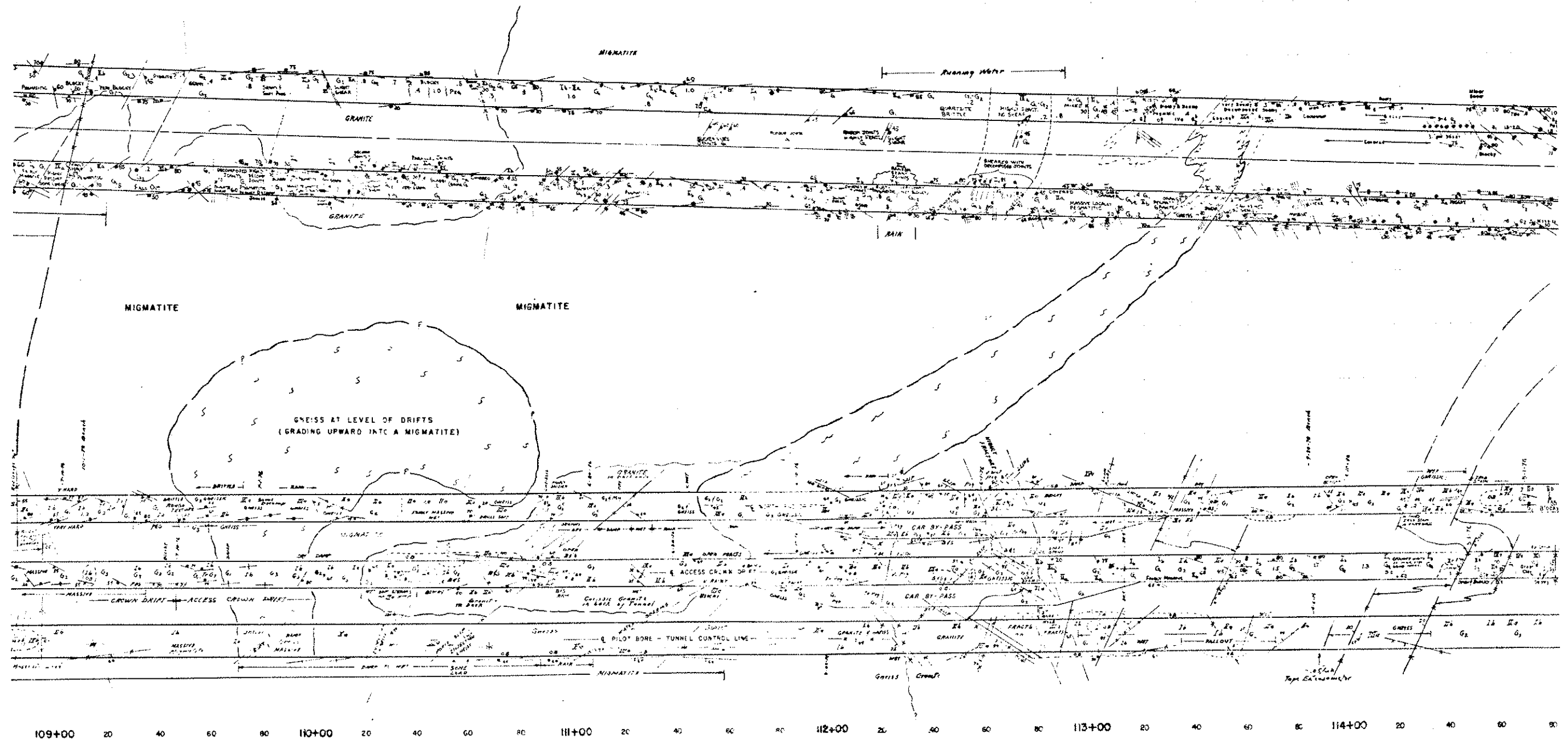


GEOLOGIC MAP

BY JOHN POST

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| | COLORADO | 170-3(81)220 | 150X | 273 |

STA. 108+82 to 114+82

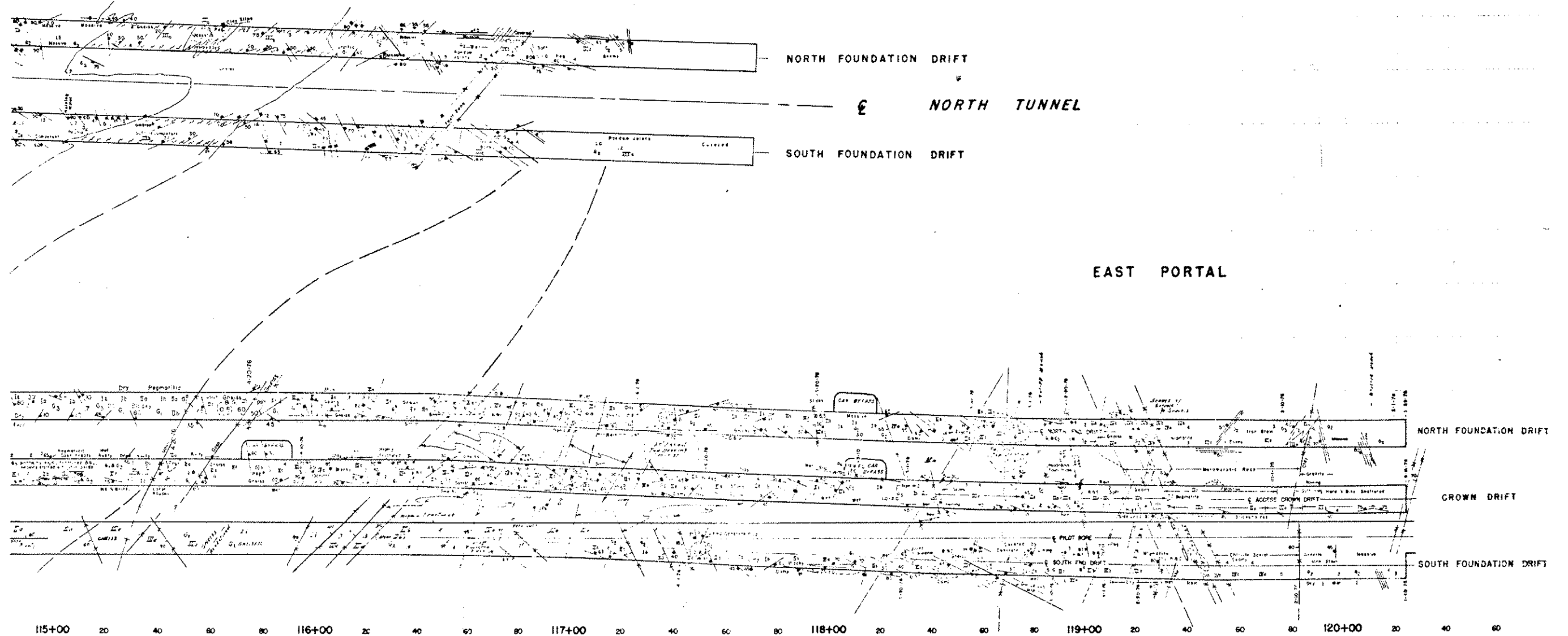


GEOLOGIC MAP

BY JOHN POST

| FEDERAL ROAD REGION NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|----------------------------|----------|-------------|--------------|-----------------|
| | COLORADO | 170-3(8)220 | 15 Px | 273 |

STA. 114+82 to 120+28

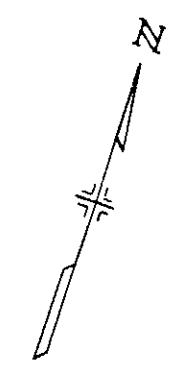


(R-1) Add Work Area 7-3-75 T.A.L.

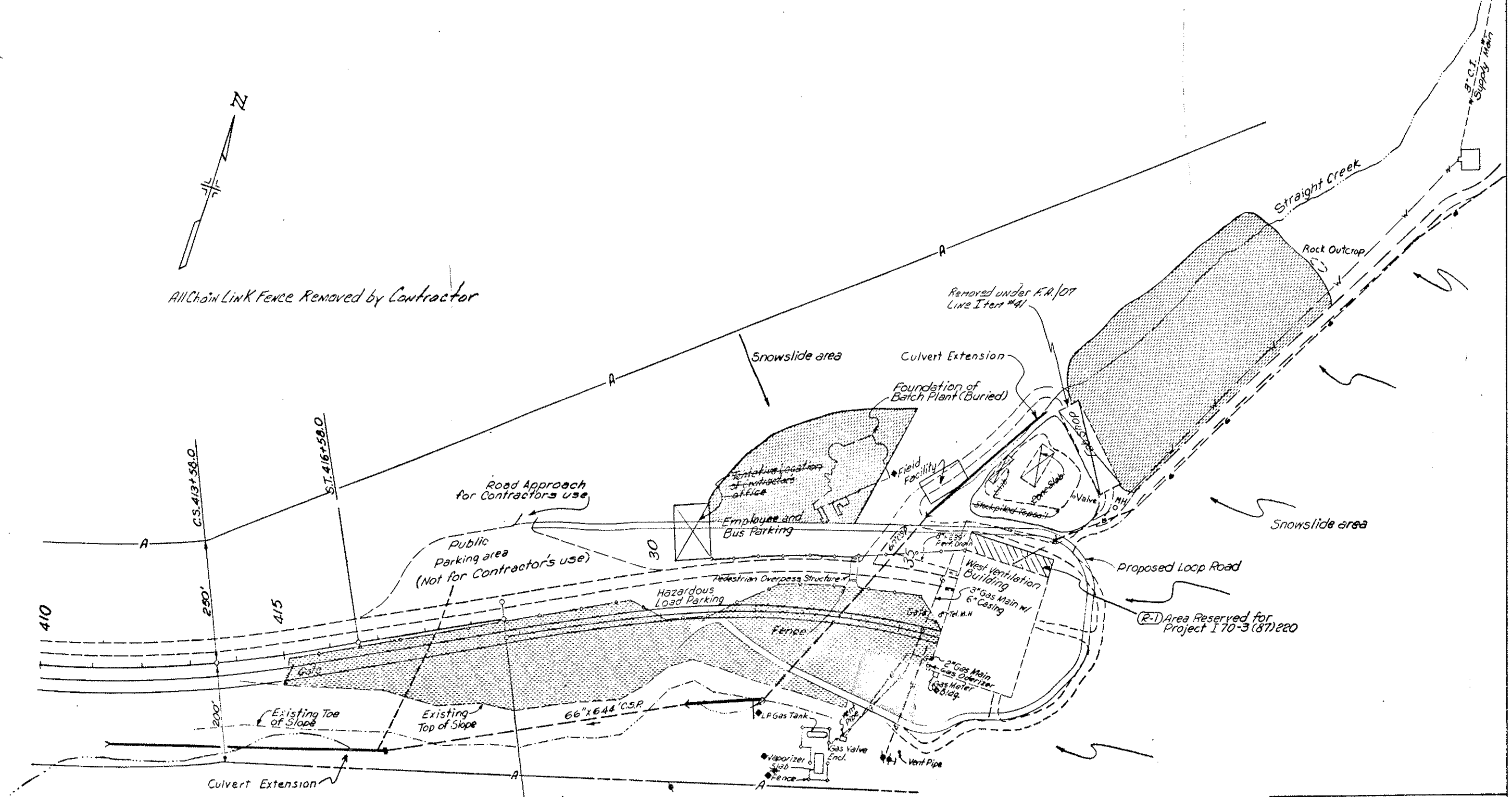
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| XX | COLORADO | I70-3(81)220 | 16 | 273 |

WORK AND STORAGE AREA WEST PORTAL

| AS CONSTRUCTED | | |
|----------------|---------|------|
| NO REVISIONS | REVISED | VOID |
| | 8-29-73 | |



All Chain Link Fence Removed by Contractor



EQUA. P.O.T. 419+72.66 OK =
 P.O.T. 26+23.70 Ah. W.B. (37' Lt.) =
 P.O.T. 26+73.35 Ah. E.B. (37' Rt.) =

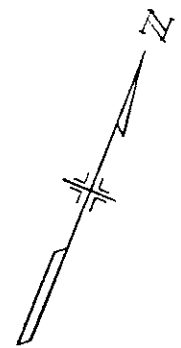
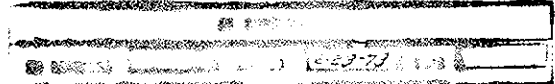
- Work and Storage Area [hatched pattern]
- Not in this Contract [dotted pattern]
- Area Reserved for I 70-3(82) [stippled pattern]

WORK AND STORAGE AREA
WEST PORTAL
SHEET G-16

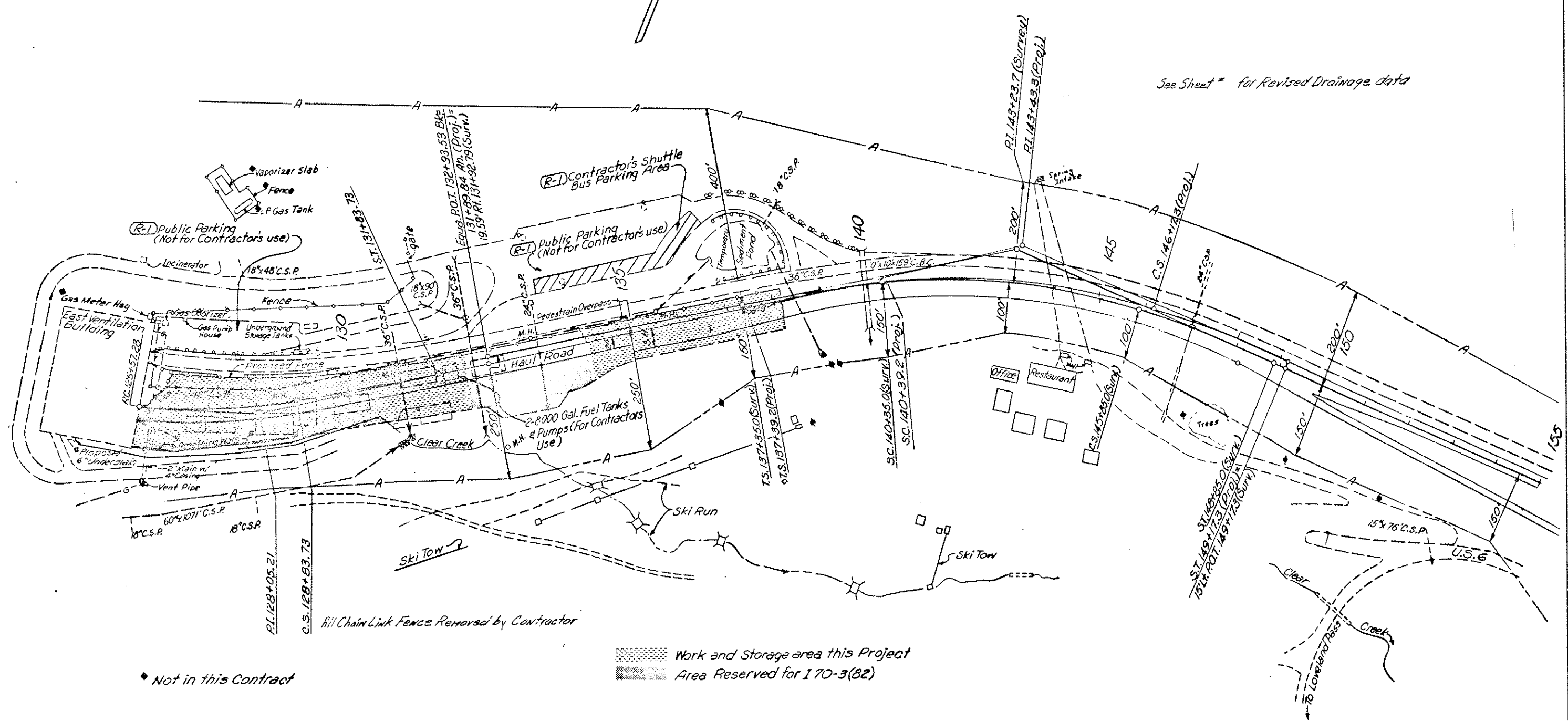
WORK AND STORAGE AREAS EAST PORTAL

(R-1) Define Areas 7-3-75 T.A.L.

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| 10 | COLORADO | I 70-3(81)220 | 17 | 275 |



See Sheet # for Revised Drainage data



◆ Not in this Contract

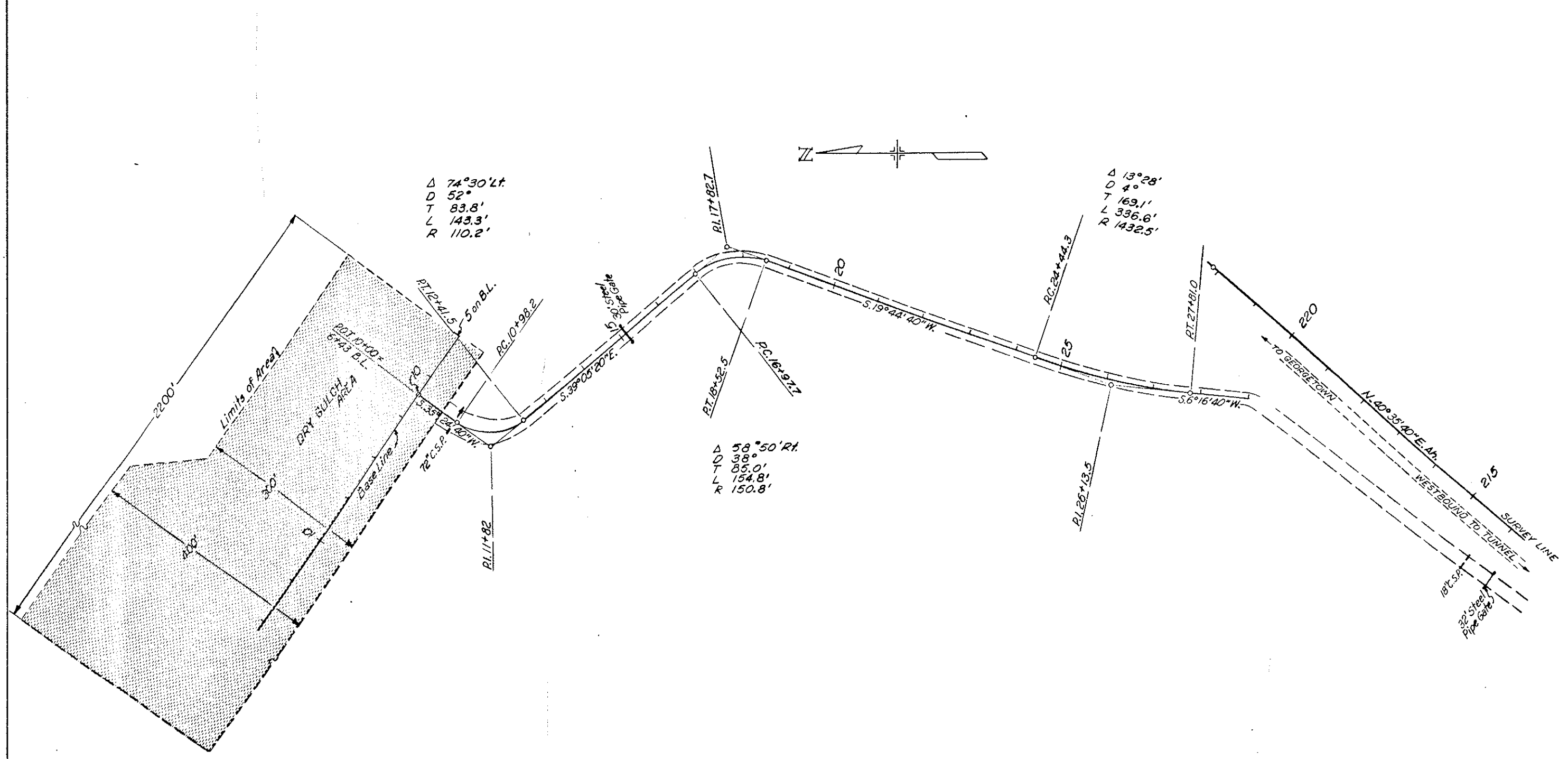
Work and Storage area this Project
Area Reserved for I 70-3(82)

WORK AND STORAGE AREA
EAST PORTAL
SHEET G-17

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|-------------|-----------|--------------|
| VII | COLORADO | 170-3(B)220 | 18 | 273 |

| AS CONTAINED | |
|---------------|--------------|
| NO. OF SHEETS | DATE 6-29-79 |

WORK AND STORAGE AREA DRY GULCH



Δ 74°30' Lt.
 D 52'
 T 83.8'
 L 143.3'
 R 110.2'

Δ 13°28'
 D 4'
 T 169.1'
 L 336.6'
 R 1432.5'

Δ 58°50' Rt.
 D 38'
 T 85.0'
 L 154.8'
 R 150.8'

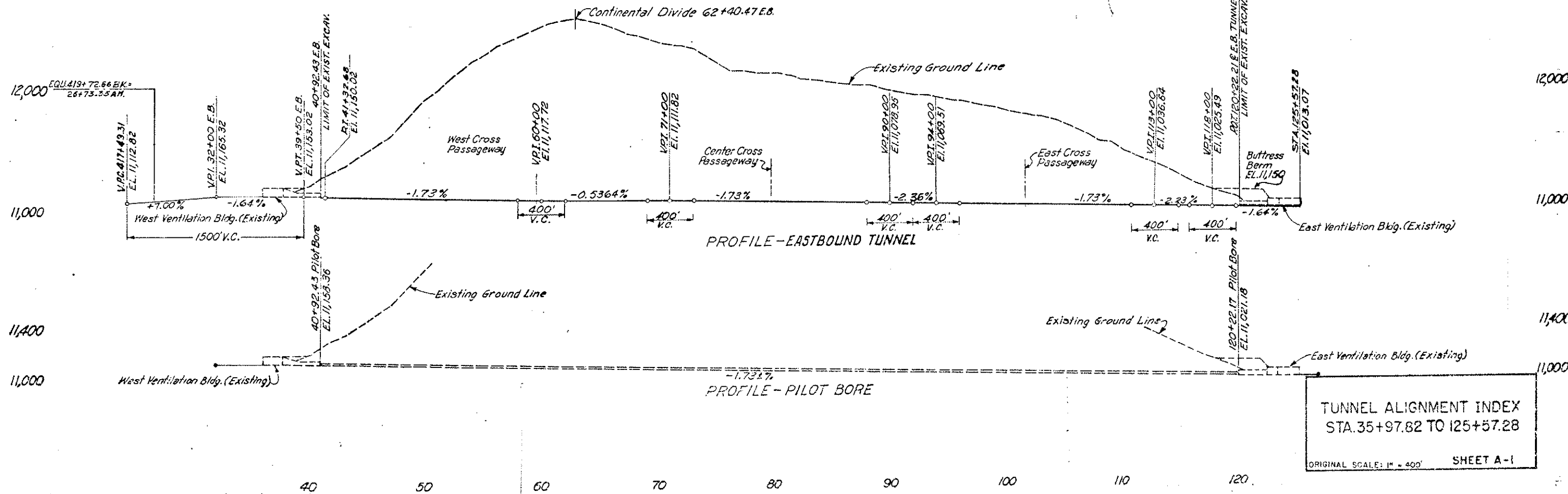
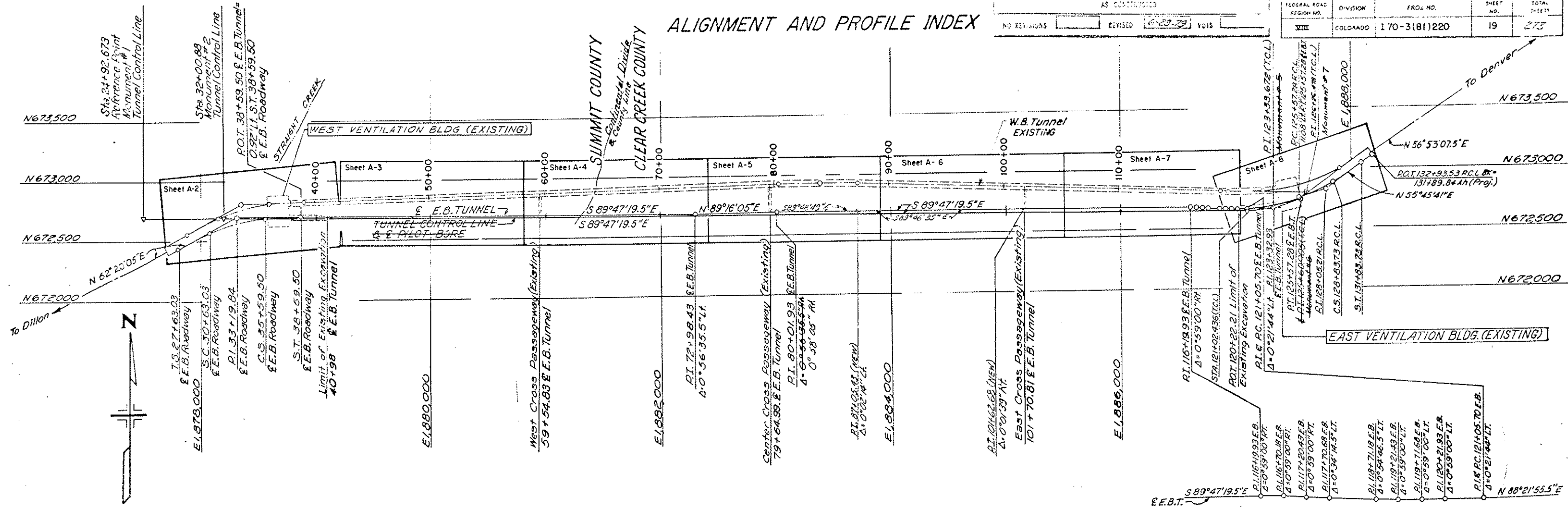
Work and Storage Area

Note: Storage area was Contoured, Fertilized and Seeded.

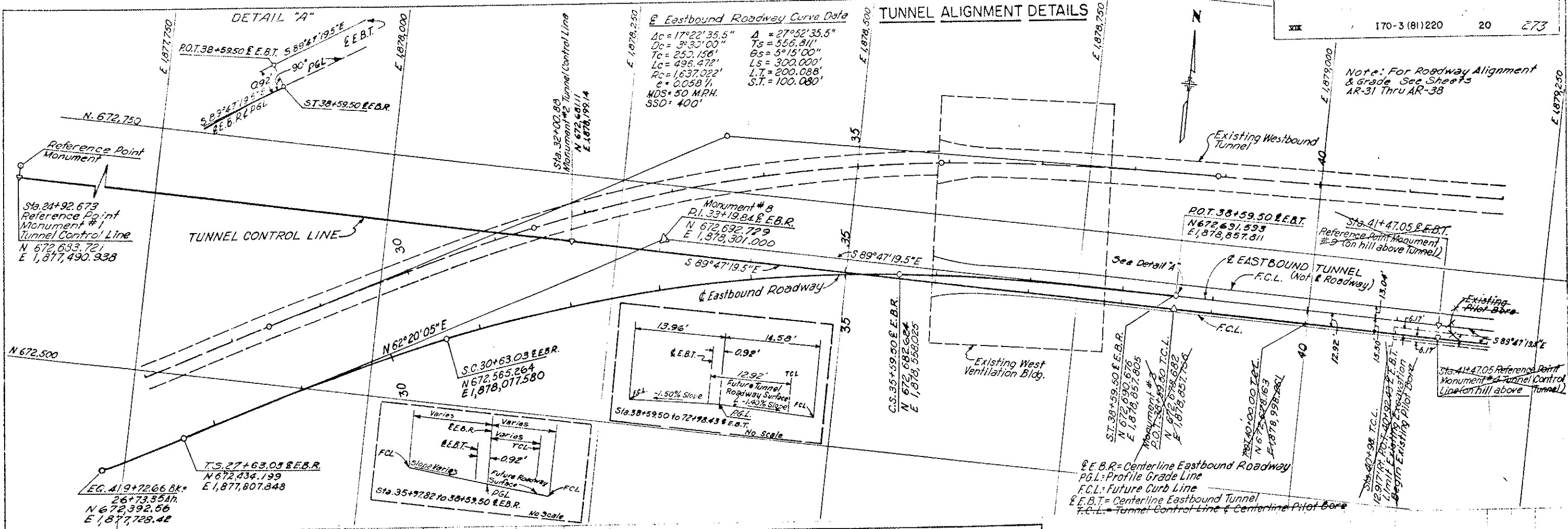
WORK AND STORAGE AREA
 DRY GULCH
 SHEET G-18

ALIGNMENT AND PROFILE INDEX

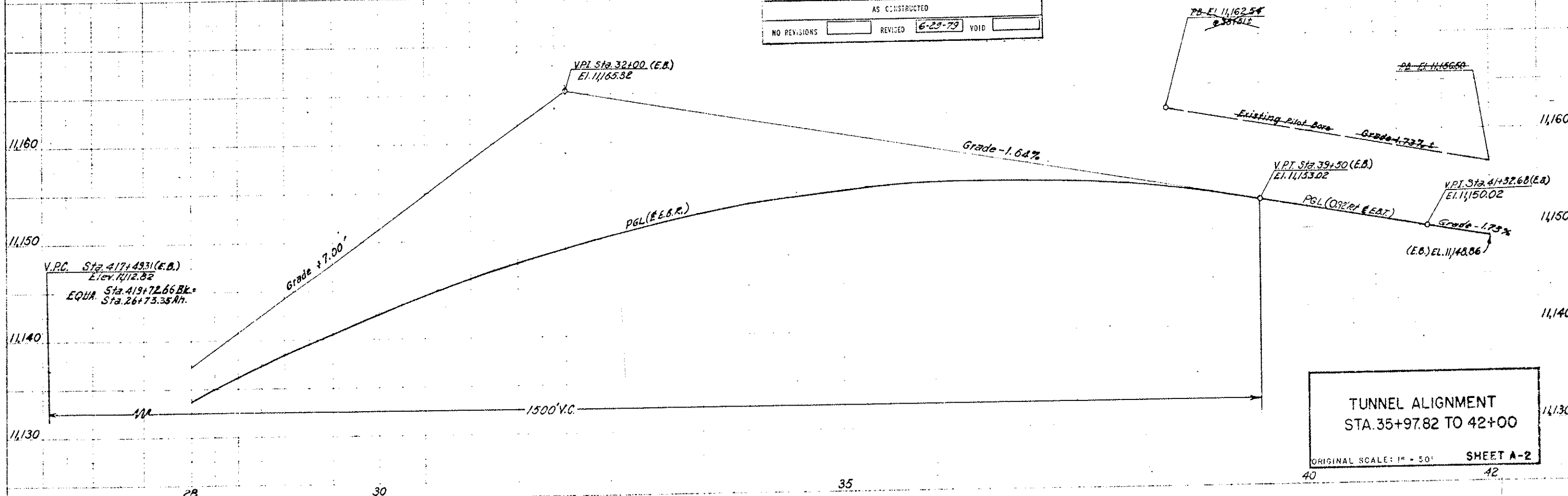
| | | | | | | |
|---------------|-----------------|-------------------------|----------|--------------|-----------|--------------|
| AS CONSIDERED | | FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| NO REVISIONS | REVISED 6-29-29 | VIII | COLORADO | 170-3(81)220 | 19 | 275 |

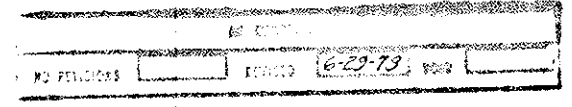
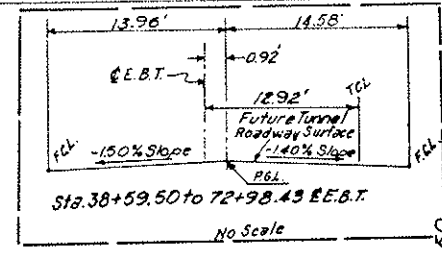


TUNNEL ALIGNMENT INDEX
 STA. 35+97.82 TO 125+57.28
 ORIGINAL SCALE: 1" = 400' SHEET A-1



AS CONSTRUCTED
 NO REVISIONS REVISED 6-29-79 VOID





Existing Westbound Tunnel

E. EASTBOUND TUNNEL (NOT E. ROADWAY)

S 89°47'19.5" E (E.E.B.T.)

FUNNEL CONTROL LINE + E PILOT BORE

Sta. 55+00.00 I.C.L.
N 672,682.633
E 1,880,498.251

Sta. 55+00.00 E.E.B.T.
N 672,685.544
E 1,880,498.300

P.G.L. - Profile Grade Line
F.C.L. - Future Curb Line
E.E.B.T. - Centerline Eastbound Tunnel
T.C.L. - Tunnel Control Line + E Pilot Bore

Sta. 45+00.00 E.E.B.T.
N 672,689.231
E 1,879,498.306

Sta. 45+00.00 I.C.L.
N 672,676.320
E 1,879,498.257

P.B. EL. 11,156.50

EL. 11,148.86 (E.B.)

P.G.L. (E.B. Tunnel) Grade -1.73%

Existing Pilot Bore

Grade -1.73%

P.B. EL. 11,120.00

VPC EL. 11,121.18 (E.B.)

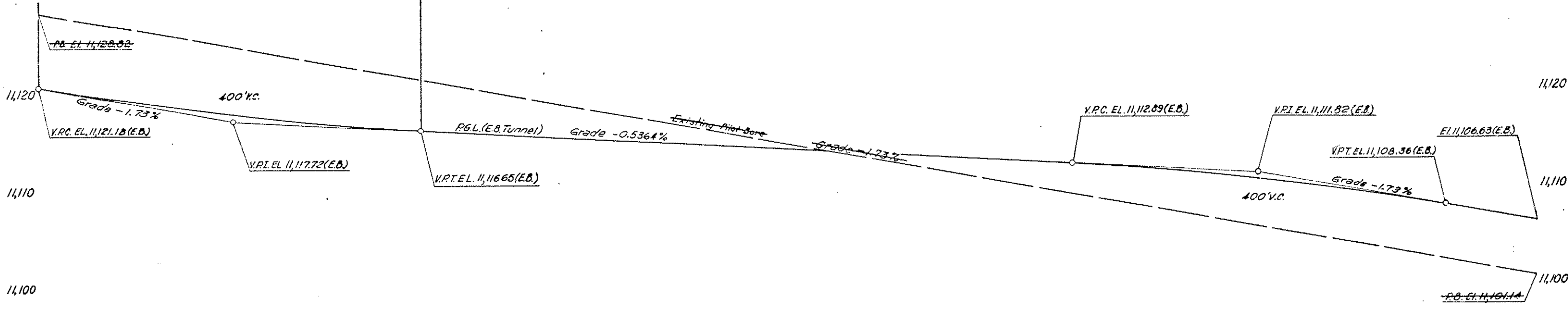
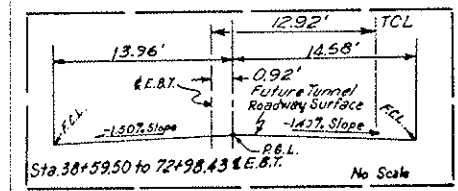
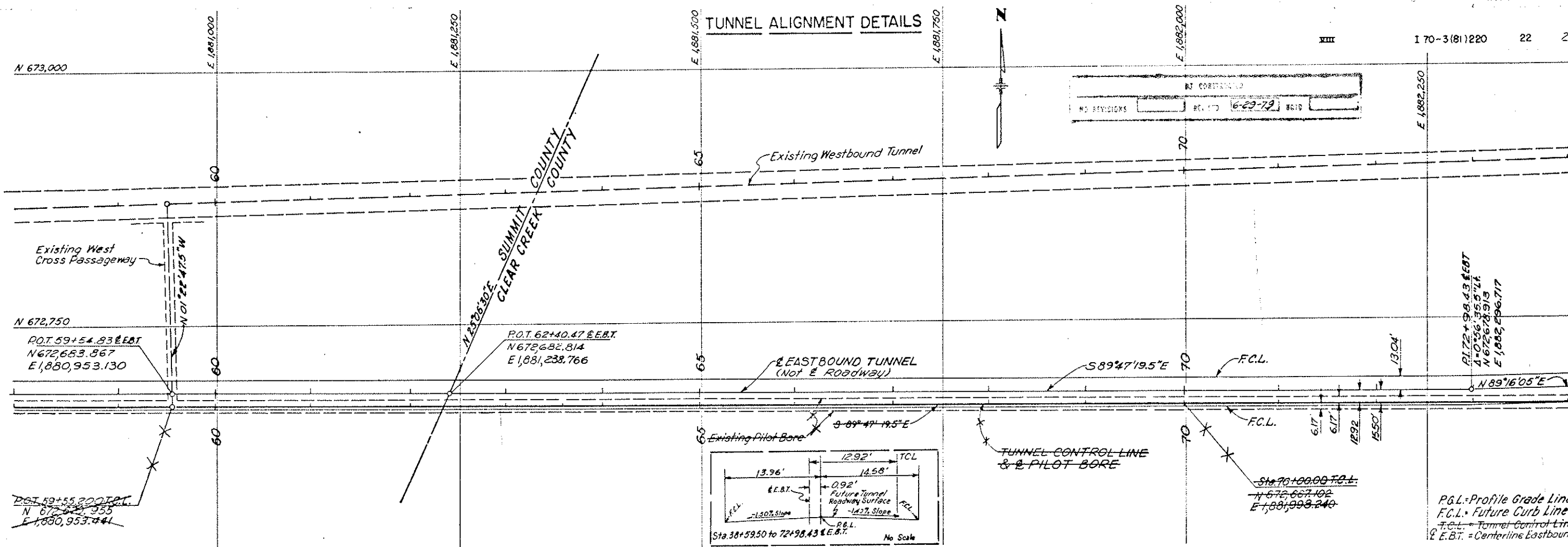
TUNNEL ALIGNMENT
STA. 42+00 TO 58+00
ORIGINAL SCALE 1" = 50'
SHEET A-3

PLAN

PROFILE

TUNNEL ALIGNMENT DETAILS

170-3(81)220 22 273

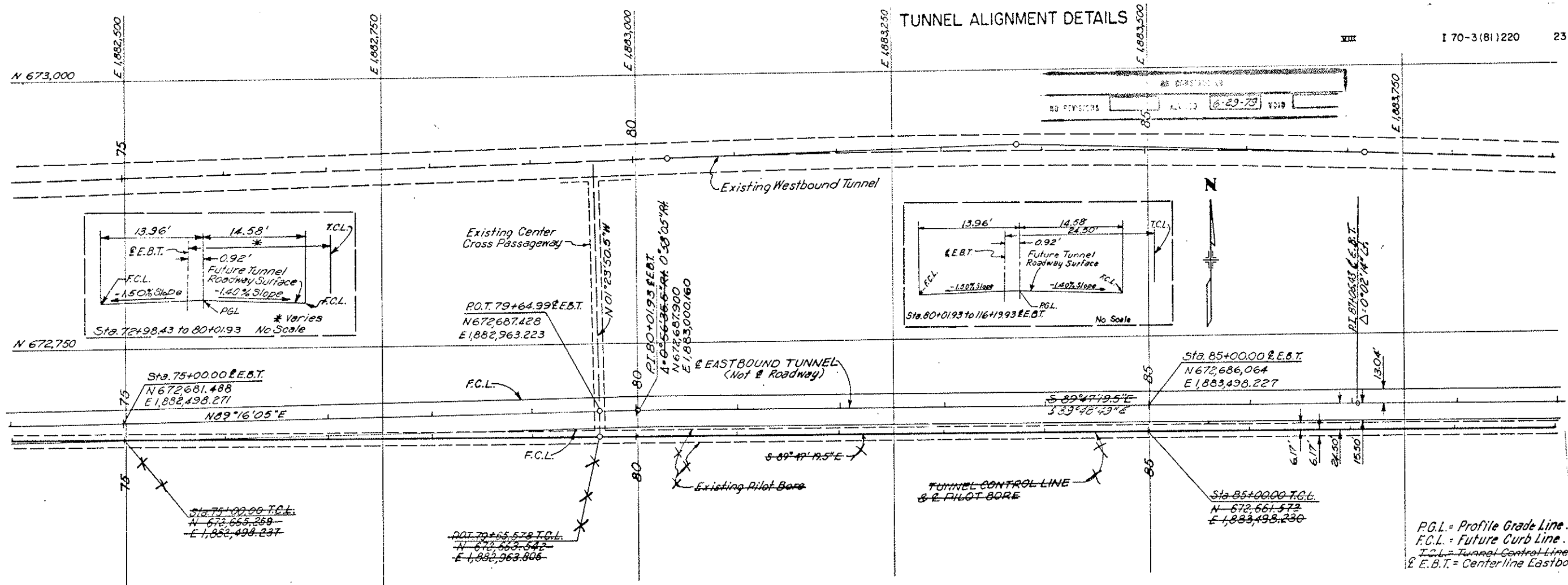


TUNNEL ALIGNMENT
STA. 58+00 TO 74+00

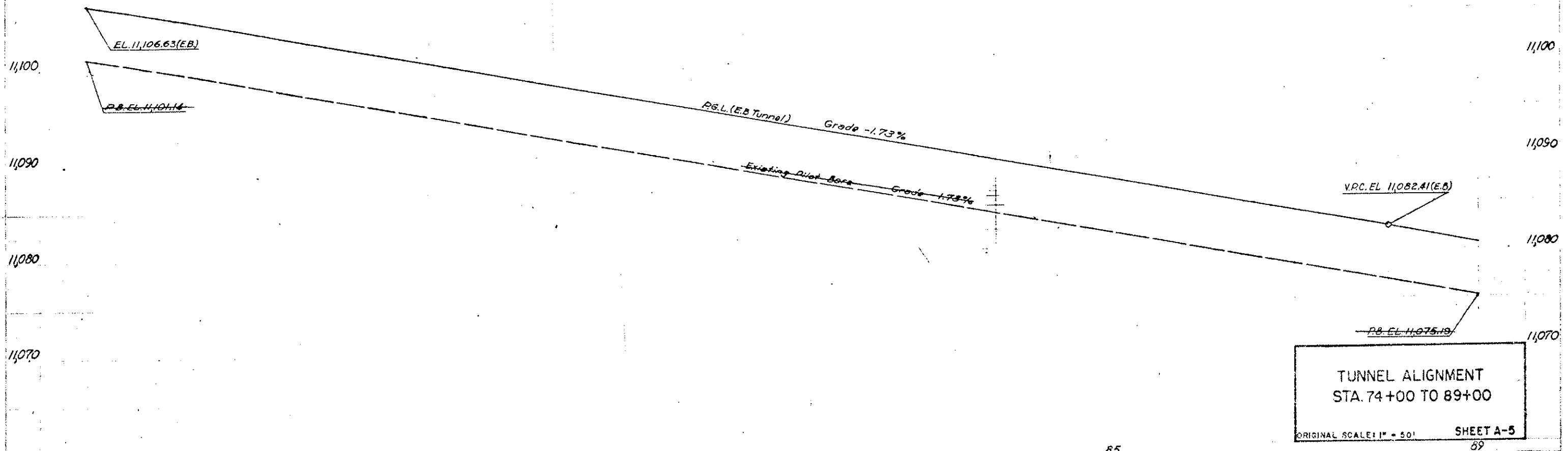
ORIGINAL SCALE: 1" = 50'

SHEET A-4

TUNNEL ALIGNMENT DETAILS

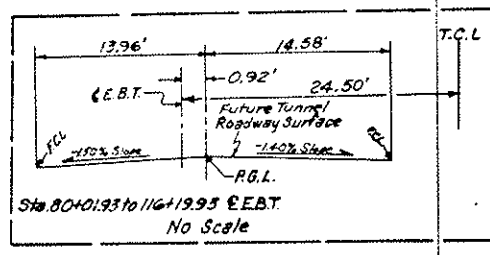


P.G.L. = Profile Grade Line.
 F.C.L. = Future Curb Line.
 T.C.L. = Tunnel Control Line & Pilot Bore
 E.B.T. = Centerline Eastbound Tunnel.



TUNNEL ALIGNMENT
 STA. 74+00 TO 89+00
 ORIGINAL SCALE: 1" = 50'
 SHEET A-5

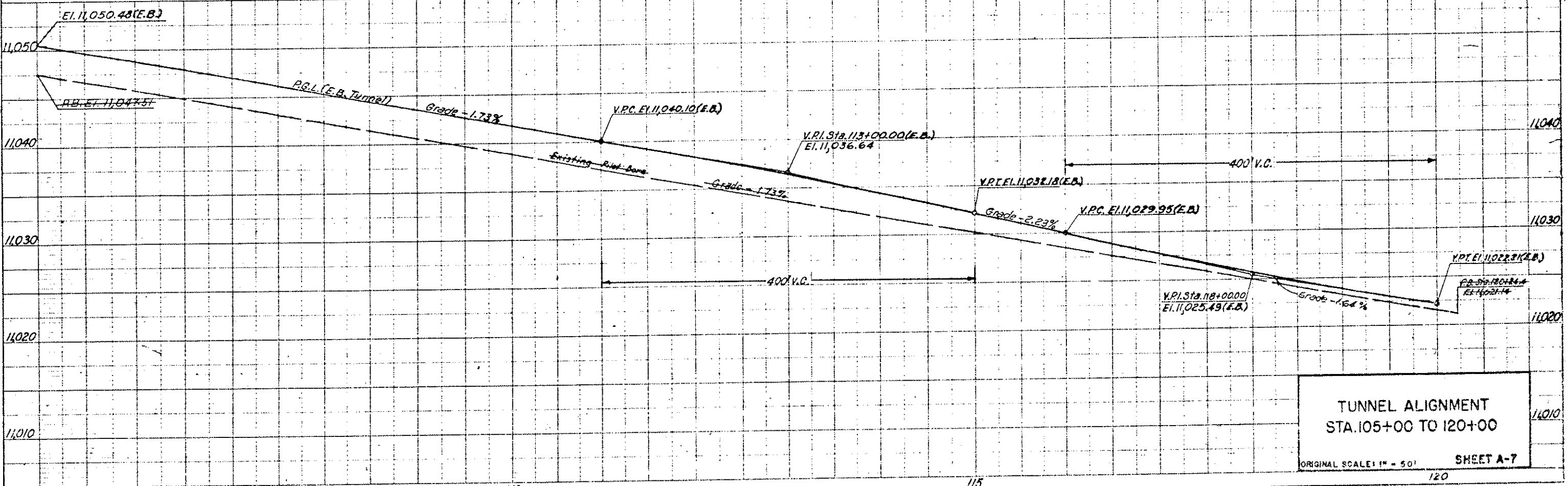
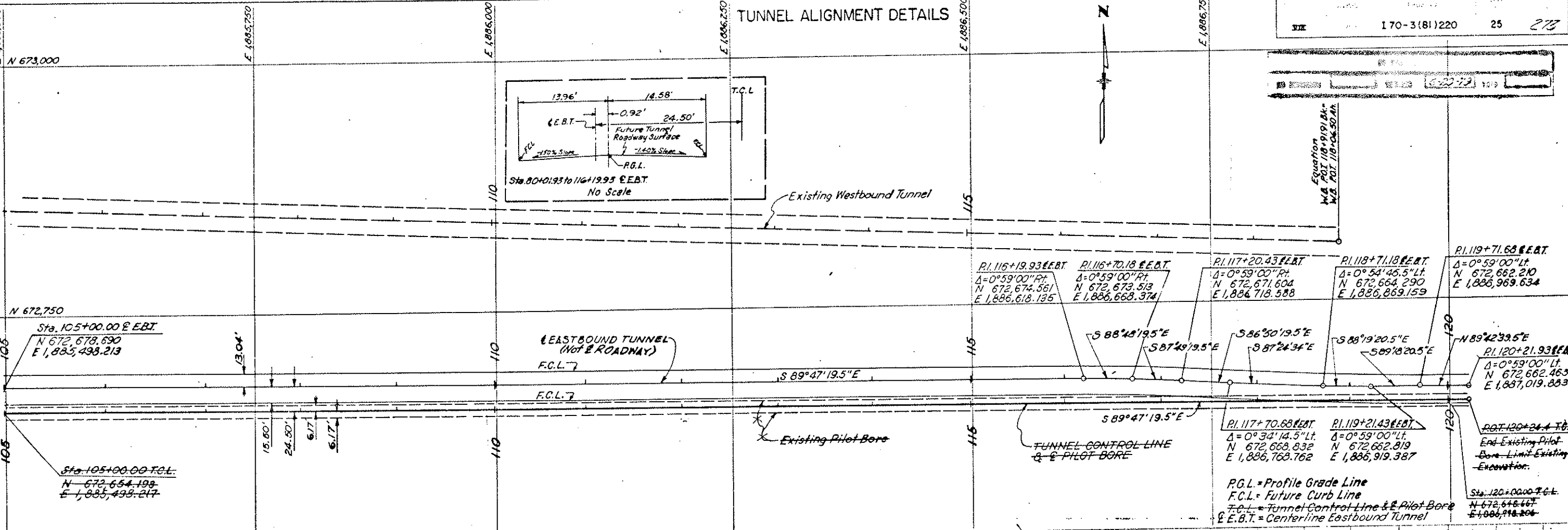
TUNNEL ALIGNMENT DETAILS



Existing Westbound Tunnel



Equation
 $MA: P.O.I. 118+91.91 \text{ BK}$
 $MB: P.O.I. 118+06.50 \text{ AK}$



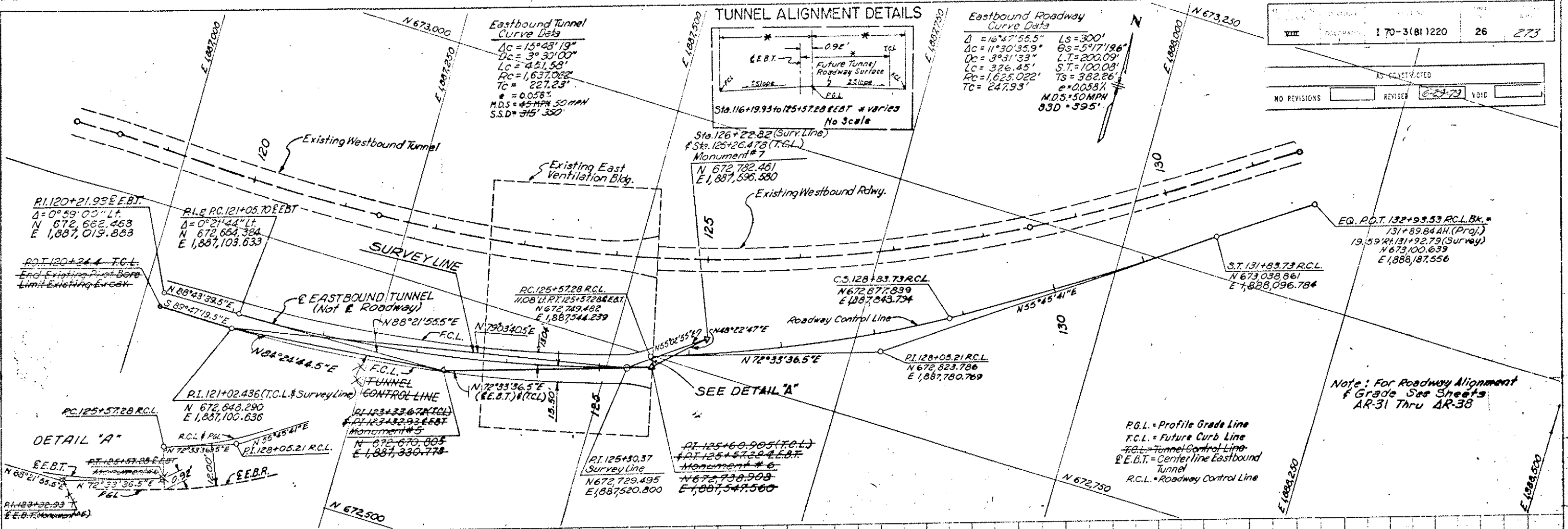
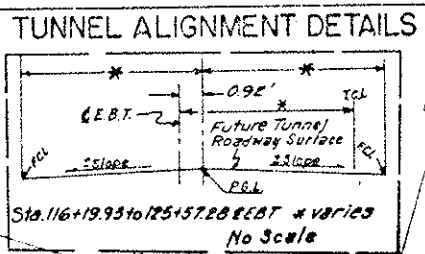
PLAT

PROFILE

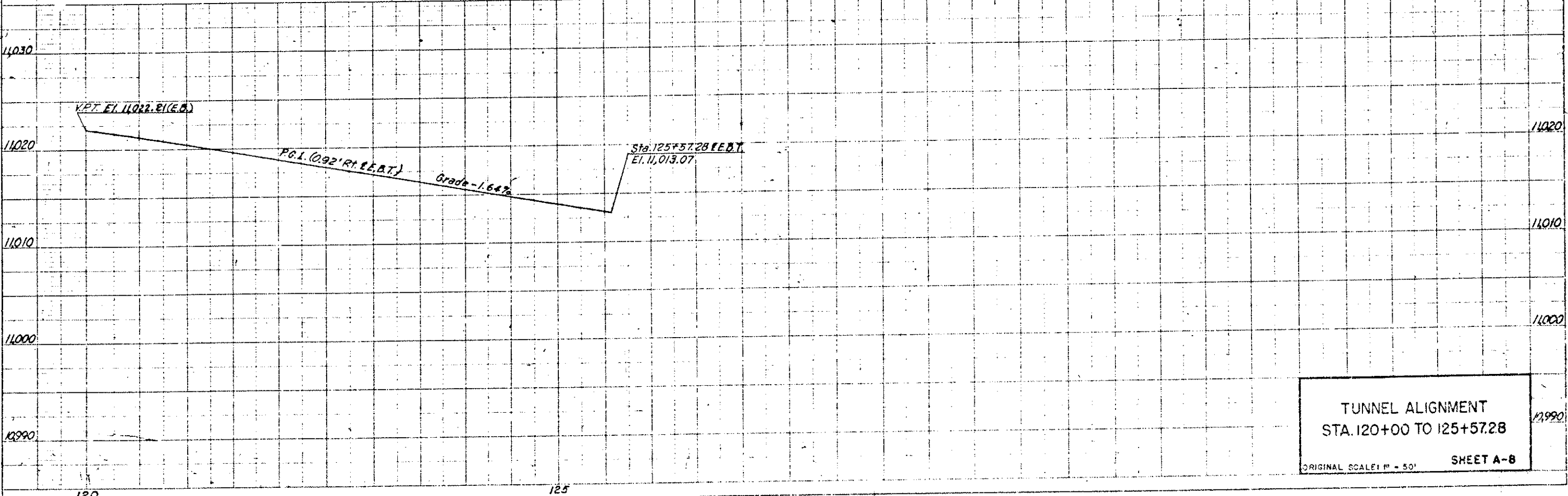
| | | |
|--------------|---------|------|
| NO REVISIONS | REVISED | VOID |
| | 6-27-73 | |

Eastbound Tunnel Curve Data
 $\Delta c = 15^{\circ}23'19''$
 $\Delta c = 3^{\circ}30'00''$
 $Lc = 451.53'$
 $Rc = 1,637.082'$
 $Tc = 227.23'$
 $e = 0.058\%$
 $M.D.S. = 45 MPH$
 $S.S.D. = 315'$

Eastbound Roadway Curve Data
 $\Delta = 16^{\circ}47'55.5''$
 $\Delta c = 11^{\circ}30'35.9''$
 $\Delta c = 3^{\circ}31'33''$
 $Lc = 326.45'$
 $Rc = 1,625.022'$
 $Tc = 247.93'$
 $Ls = 300'$
 $Gs = 5^{\circ}17'19.6''$
 $L.T. = 200.09'$
 $S.T. = 100.08'$
 $Ts = 382.26'$
 $e = 0.058\%$
 $M.D.S. = 50 MPH$
 $S.S.D. = 395'$



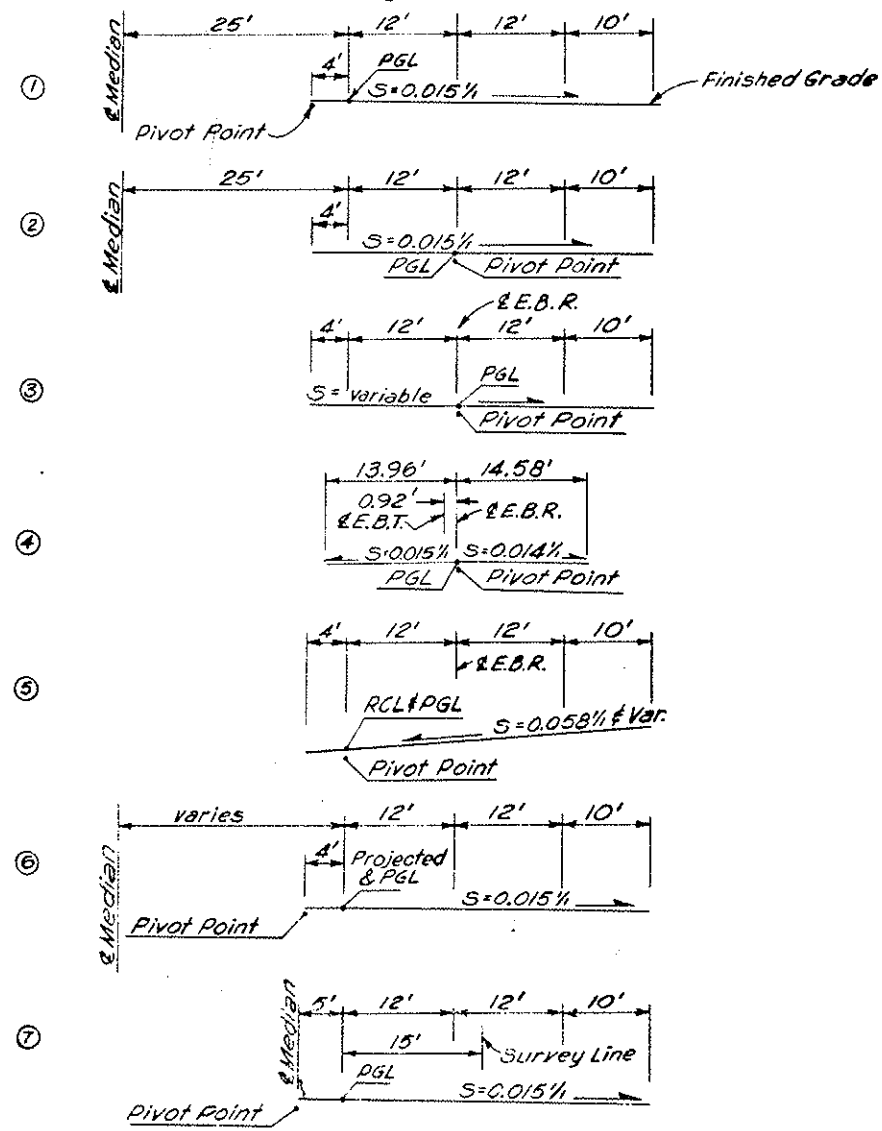
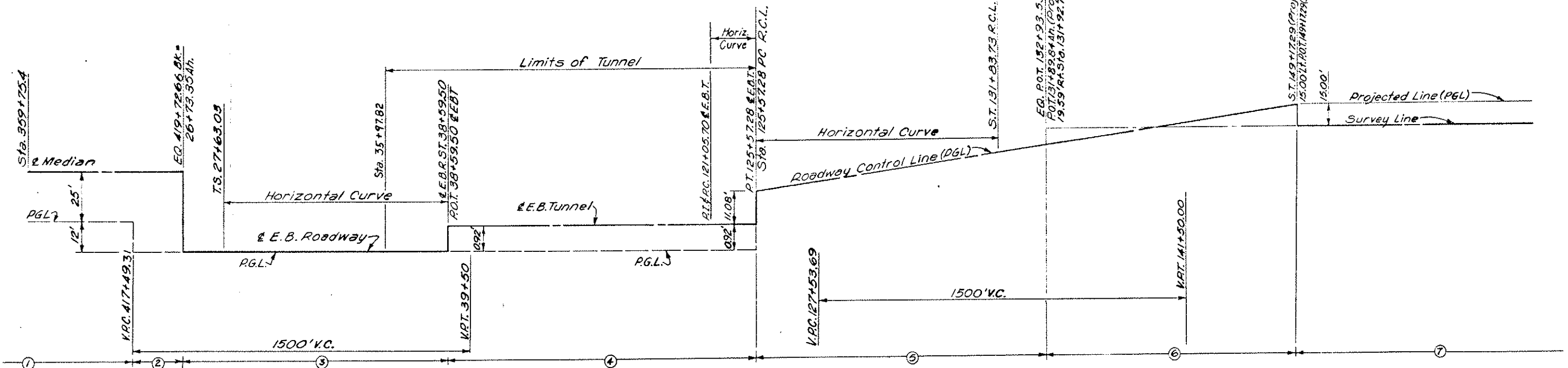
Note: For Roadway Alignment & Grade See Sheets AR-31 Thru AR-38



TUNNEL ALIGNMENT
STA. 120+00 TO 125+57.28
 ORIGINAL SCALE 1" = 50'
SHEET A-8

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(31)220 | 27 | 273 |

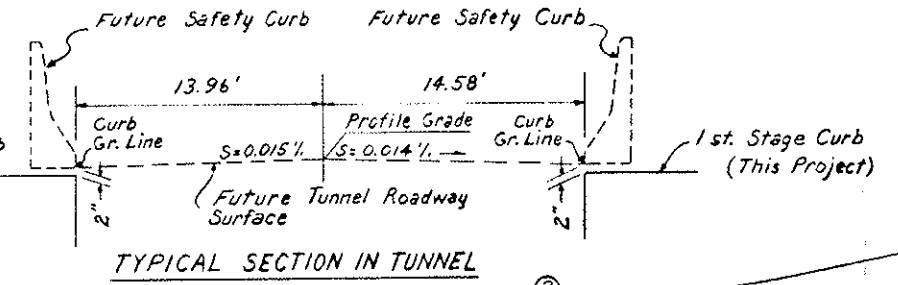
AS CONSTRUCTED
 NO REVISIONS 2-23-79 REVISED VOID



&E.B.R. = Centerline Eastbound Roadway
 &E.B.T. = Centerline Eastbound Tunnel
 PGL = Profile Grade Line
 RCL = Roadway Control Line

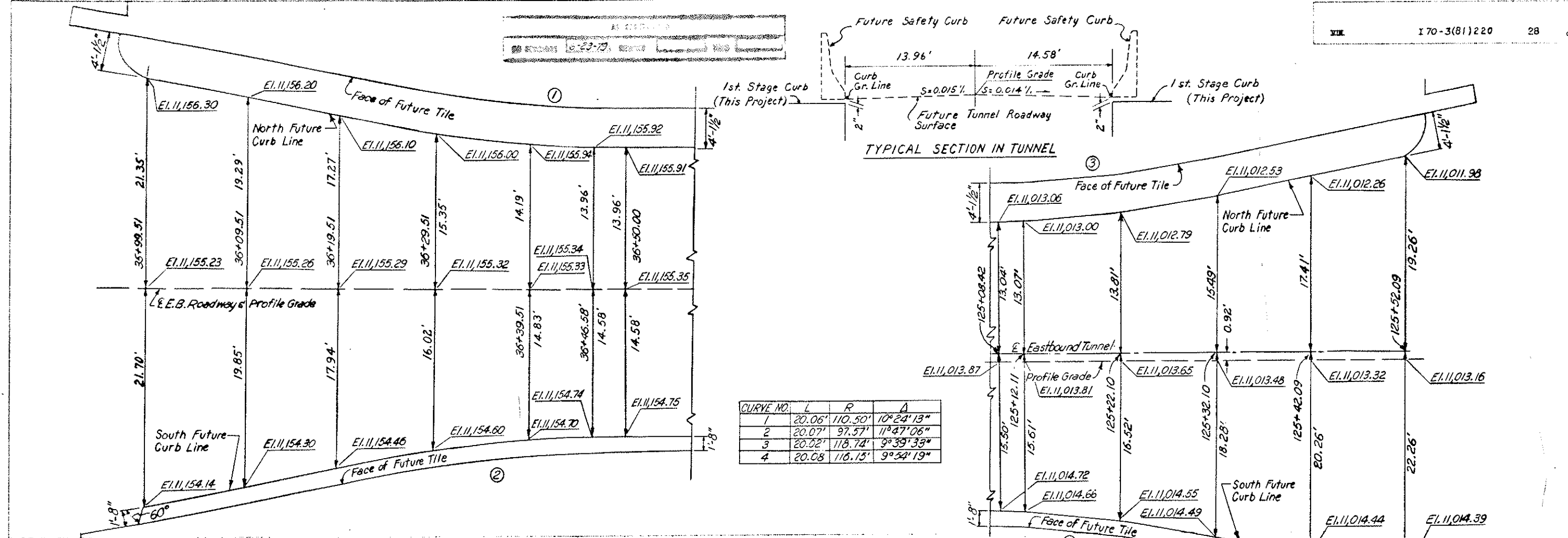
ALIGNMENT CONTROL LINE
 STA. 359+75.4 TO 215+00
 NO SCALE SHEET A-9

AS SHOWN
 16-23-79

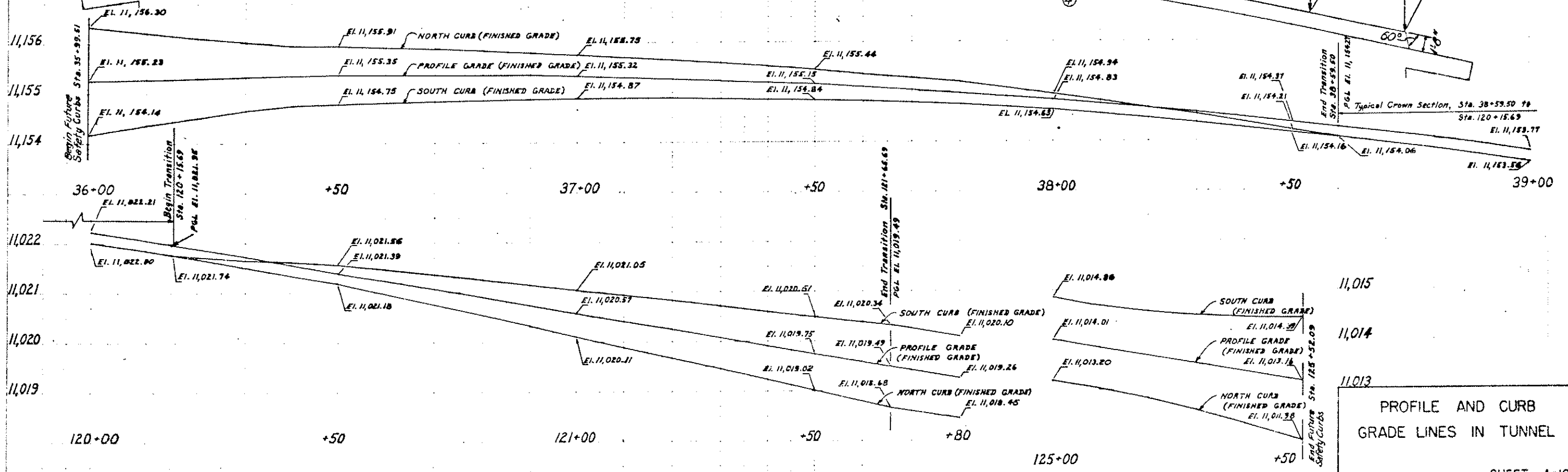


| CURVE NO. | L | R | A |
|-----------|--------|---------|-----------|
| 1 | 20.06' | 110.50' | 10°24'13" |
| 2 | 20.07' | 97.57' | 11°27'06" |
| 3 | 20.02' | 118.74' | 9°39'39" |
| 4 | 20.08' | 116.15' | 9°54'19" |

PLAN



PROFILE



PROFILE AND CURB
 GRADE LINES IN TUNNEL

| FEDERAL ROAD DISTRICT NO. | DISTRICT | PROJ. NO. | HEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------|----------|--------------|
| VIII | COLORADO | I70-5(B)130 | 29 | 273 |

| REVISIONS | | | |
|-----------|---------|--------------------|-----|
| R-1 | 6-17-75 | Add Note *22 | BRL |
| R-2 | 7-5-75 | Add Note *23 & *24 | BRL |

| AS CORRECTED | | | |
|---------------|-------|---------|----|
| NO. REVISIONS | ADDED | 6-23-75 | BY |

GENERAL NOTES:

- All work shall be done according to the project specifications.
- Full face excavation of the main tunnel is prohibited.
- All segment construction joints and steel support sets shall be placed perpendicular to the profile grade.
- All structural steel not otherwise noted shall meet A.A.S.H.T.O. M-185 (ASTM A-36)
- All bolts not otherwise noted shall be 3/4" diameter, high strength, A.A.S.H.T.O. M-164.
- All reinforcing steel, No. 5 bars and larger shall be Grade 60, A.A.S.H.T.O. M-51. All No. 4 bars may be Grade 40 or 60. All clearances to reinforcing bars shall be 2" unless otherwise noted.
- All rock reinforcement bars shall be No. 11, Grade 60.
- All concrete not otherwise noted shall be Class T-2.
- The following table shows the minimum lap for common bar sizes:

| Bar Size | *4 | *5 | *6 | *7 | *8 | *9 | *10 | *11 |
|----------|------|------|------|------|------|------|-------|------|
| Lap | 1'0" | 1'2" | 1'8" | 2'3" | 3'0" | 3'0" | 4'10" | 6'0" |

- Welding will not be permitted on the flanges of steel ribs unless specifically called for in the plans, or approved.
- The maximum unsupported advance for the excavation of the top heading shall be:

| Rock Class | Unsupported Advance |
|------------|---------------------|
| 1a 1b | 12 Ft. |
| 2a 2b | 8 Ft. |
| 3a 3b | 6 Ft. |
| 4a 4b | 4 Ft. |

Ⓜ See Note * 22.

- The bench shall be blasted and/or excavated at a maximum advance of 12 Ft. The bench may not be blasted more than 12 Ft. ahead of the bench face. Steel and concrete invert support, where called for on the plans shall be placed before continuing advance of the bench face. Invert concrete shall be protected by an approved method.
- The first stage lining shall be placed within 200 Ft. of the top heading face, and the time period between excavation at a given station and the placing of first stage lining at that station shall not exceed 20 calendar days. The contractor shall temporarily move first stage lining operations to the immediate area of the top heading face if ground conditions require or as directed.
- The final lining shall not be placed until the first stage structure has stabilized as determined by the engineer.
- Concrete finishes shall be Class 1 unless otherwise specified.
- Rock reinforcement installed in advance of the face shall be in place at least one hour prior to advancing the face.
- Radial rock reinforcement must be installed so that it does not lag more than 40 Ft. behind the heading face.
- Rock reinforcement, threaded tieback, resin grouted, at spring line shall be installed so that it does not lag more than 40 Ft. behind the face.
- Install rock reinforcement, Portland cement grouted, at spring line, 10 days minimum prior to bench excavation.
- All stationing is on Centerline Eastbound Tunnel.
- It is estimated the following ^{min.} ~~max.~~ required:
 Traffic Control Supervision 278 898 Day
 Security Guard 66,164 61,448 Hr.
 Tunnel Waste Water Treatment 1 - 5
 First Aid Attendant 23,011 2,569 Hr.
 Ambulance Driver 42,718 4,728 Hr.
 Ambulance Attendant 67 509 Hr.
 Furnish Ambulance 2 Ea.

INDEX OF DRAWINGS

- Dwg. No. B 1 - General Notes, Index of Drawings
- Dwg. No. B 2 - Summary of Quantities
- Dwg. No. B 3 - Plan, Profile, Geology Summary, Tunnel Support Types and Rock Classification.
- Dwg. No. B 4 - Light Tunnel Support, Horseshoe Type
- Dwg. No. B 5 - Medium Tunnel Support, Horseshoe Type
- Dwg. No. B 6 - Heavy Tunnel Support, Horseshoe Type
- Dwg. No. B 7 - Horseshoe Type Tunnel Support Details
- Dwg. No. B 8 - Details Tunnel Support Horseshoe Type and Reinforcing Bar Bending Diagrams
- Dwg. No. B 9 - Multiple Drift Tunnel Support, Required Section, Basis For Bid, Sta 82+53 to 87+56
- Dwg. No. B 10 - Multiple Drift Tunnel Support, Division's Proposed Method of Construction, Sta. 82+53 to 87+56
- Dwg. No. B 11 - Light Tunnel Support, 3 Drift Type, Required Section, Basis For Bid.
- Dwg. No. B 12 - Heavy Tunnel Support, 3 Drift Type, Required Section, Basis For Bid.
- Dwg. No. B 13 - Light Tunnel Support, 2 Drift Type, Required Section, Basis For Bid.
- Dwg. No. B 14 - Heavy Tunnel Support, 2 Drift Type, Required Section, Basis For Bid.
- Dwg. No. B 15 - Details, Tunnel Support, Multiple Drift, 3 Drift and 2 Drift Types and Reinforcing Bar Bending Diagrams.
- Dwg. No. B 16 - Multiple Drift Tunnel Support Details, Division's Proposed Method of Construction.
- Dwg. No. B 17 - Multiple Drift Tunnel Support Details, Division's Proposed Method of Construction.
- Dwg. No. B 18 - Drift Details For Tunnel Support, 3 Drift and 2 Drift, Division's Proposed Method of Construction.
- Dwg. No. B 19 - Detail Crown Drift - 3 Drift Type and North Foundation Drift - 3 Drift and 2 Drift Types, Division's Proposed Method of Construction
- Dwg. No. B 20 - Rock Reinforcement, Top Heading.
- Dwg. No. B 21 - Main Bore, East Bound Tunnel Location Relative To Location of Pilot Bore
- Dwg. No. B 22 - Main Bore, East Bound Tunnel Location Relative To Location of Pilot Bore
- Dwg. No. B 23 - Main Bore, East Bound Tunnel Location Relative To Location of Pilot Bore
- Dwg. No. B 24 - Locations of East Bound Tunnel Relative To Pilot Bore Division's Proposed Support of South Foundation Drift and Pilot Bore, Sta 116+00 to 120+22.
- Dwg. No. B 25 - Pre-Grout and Contact Grout Requirements.
- Dwg. No. B 26 - Buttress Berm Grout Requirements, Sta 118+50 to 120+22.
- Dwg. No. B 27 - West Transition, Elevation.
- Dwg. No. B 28 - West Transition, Sections.
- Dwg. No. B 29 - East Transition, Elevation.
- Dwg. No. B 30 - East Transition, Sections
- Dwg. No. B 31 - Reinforcement Final Lining, Horseshoe Tunnel Support, Typical Misc Details.
- Dwg. No. B 32 - Reinforcement Final Lining, Multiple Drift Tunnel Support.
- Dwg. No. B 33 - Reinforcement Final Lining, 3 Drift and 2 Drift Tunnel Support
- Dwg. No. B 34 - Reinforcement Final Lining, At West Cross Passage, S 42
- Dwg. No. B 35 - Reinforcement Final Lining, At Center Cross Passage, S 82
- Dwg. No. B 36 - Reinforcement Final Lining, At East Cross Passage, S 126
- Dwg. No. B 37 - Reinforcement Final Lining, At Center Air Bulkhead, S 84
- Dwg. No. B 38 - Reinforcement Final Lining, Segments S5 and S6, Elevation
- Dwg. No. B 39 - Reinforcement Final Lining, Segments S5 and S6, Sections
- Dwg. No. B 40 - Reinforcement Final Lining, Segments S163 and S164, Elevation
- Dwg. No. B 41 - Reinforcement Final Lining, Segments S163 and S164, Sections
- Dwg. No. B 42 - Cross Passage Plans
- Dwg. No. B 43 - Cross Passage Elevations.
- Dwg. No. B 44 - West Cross Passage Sections and Details
- Dwg. No. B 45 - Center Cross Passage Sections and Details
- Dwg. No. B 46 - East Cross Passage Sections and Details.
- Dwg. No. B 47 - Steel Supports West Cross Passage.
- Dwg. No. B 48 - Steel Supports Center Cross Passage.
- Dwg. No. B 49 - Steel Supports East Cross Passage.
- Dwg. No. B 50 - Reinforcement Details, West Cross Passage
- Dwg. No. B 51 - Reinforcement Details, Center Cross Passage.
- Dwg. No. B 52 - Reinforcement Details, East Cross Passage.
- Dwg. No. B 53 - West and Center Cross Passage Entrance To Main Bore.
- Dwg. No. B 54 - East Cross Passage Entrance To Main Bore.
- Dwg. No. B 55 - Instrumentation Horseshoe Type
- Dwg. No. B 56 - Instrumentation, Multiple Drift Support.
- Dwg. No. B 57 - Instrumentation, 3 and 2 Drift Support.
- Dwg. No. B 58 - Instrumentation, Junction Boxes.
- Dwg. No. B 59 - Blast Protection Shield For Ventilation Buildings
- Dwg. No. B 60 - Removal of Structures and Obstructions.

Ⓜ 22. As the top-heading excavation work proceeds, the Engineer will monitor the behavior of the support structures and the bench by instrumentation, surveys, and other appropriate means. If the Engineer determines that either deformations or rates of deformation which are occurring in any area could be detrimental to the work, then the Contractor may be directed to excavate the bench and install the invert structure in the relevant area or areas.

Ⓜ 23. All structural steel designated A.S.T.M. A-572 shall be Grade 55.

Ⓜ 24. Construction joints in the final lining shall be provided as shown on sheet # 59. Spacing shall be 50'-3" or 100'-6" and at right angles to grade.



DIVISION OF HIGHWAYS

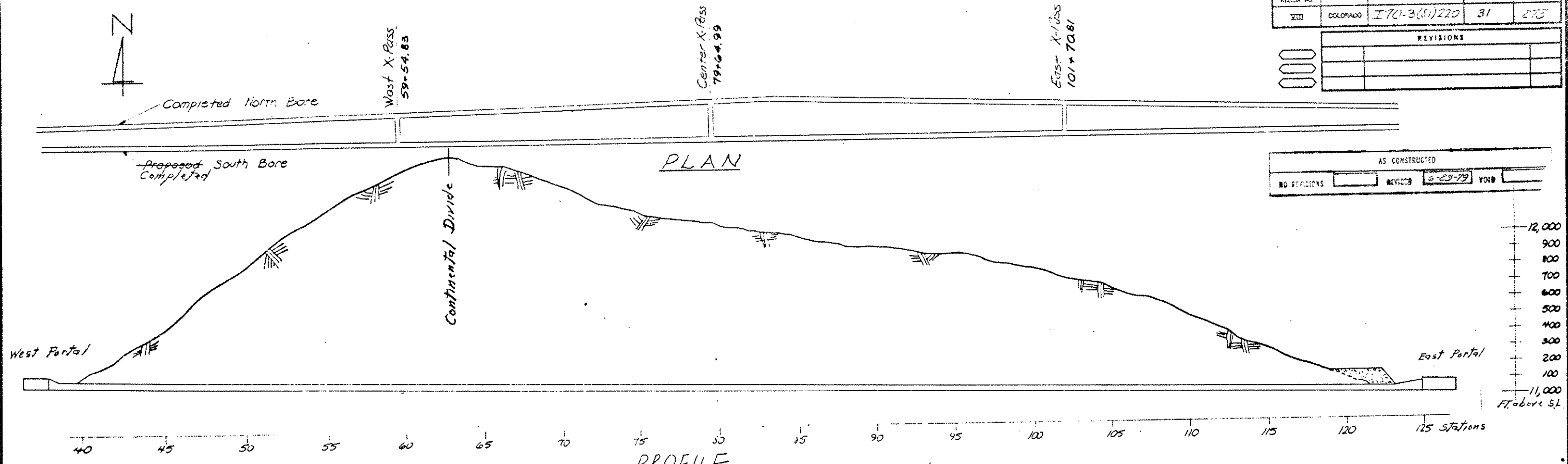
GENERAL NOTES

INDEX OF DRAWINGS

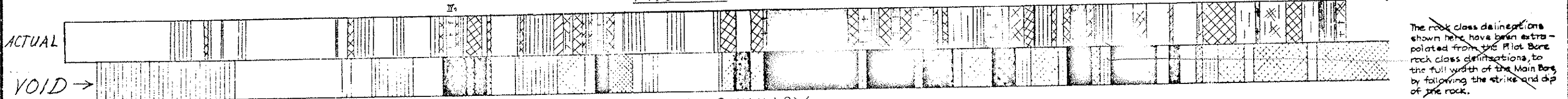
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| Checked By: [Signature] | Revisions: [Blank] |
| Drawn By: [Signature] | Scale: 1" = 60' Drawings |

| | | |
|---------------|---------|------|
| DESIGNED BY | 3/20/75 | 4-15 |
| CHECKED BY | 3/20/75 | 4-15 |
| QUANTITIES BY | 3/20/75 | 4-15 |
| CHECKED BY | 3/20/75 | 4-15 |

| FEDERAL ROAD DISTRICT NO. | DISTRICT | PROJ. NO. | BUDGET NO. | TOTAL SHEETS |
|---------------------------|----------|---------------|------------|--------------|
| XIII | COLORADO | I 70-3(81)220 | 31 | 275 |
| REVISIONS | | | | |
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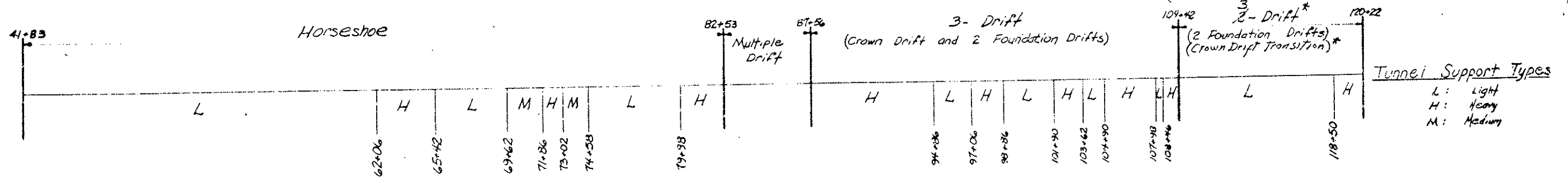


| REVISION | DATE | BY | QUANTITY | CHECKED BY |
|----------|------|------|----------|------------|
| 1 | 4-15 | W.M. | 4-15 | W.M. |
| 2 | 4-15 | W.M. | 4-15 | W.M. |



GEOLOGY SUMMARY
GEOLOGIC ROCK CLASSIFICATION

The rock class delineations shown here have been extrapolated from the Pilot Bore rock class delineations, to the full width of the Main Bore, by following the strike and dip of the rock.



| Rock Class | Legend | Description |
|------------|----------|---|
| I a | [Symbol] | Massive to slightly blocky, no alteration. |
| I b | [Symbol] | Joint spacing 1.0 feet or greater. |
| II a | [Symbol] | Moderately blocky, little or no alteration. |
| II b | [Symbol] | Joint spacing 0.5 feet or greater. |
| III a | [Symbol] | Very blocky, moderately to highly altered. |
| III b | [Symbol] | Joint spacing less than 1.0 feet. |
| IV a | [Symbol] | Highly crushed and altered, non-plastic, abundant clay. |
| IV b | [Symbol] | Joint spacing less than 0.5 feet. |
| | | Plastic, highly altered, squeezing or swelling ground, mainly clay gouge. |

Reference: "Data collected on reports from Tunnel" by John Ross - January 1974.

Scale: 1" = 500'

DIVISION OF HIGHWAYS

PLAN
 PROFILE
 GEOLOGY SUMMARY
 TUNNEL SUPPORT TYPES
 ROCK CLASSIFICATION

| | |
|---------------------|-------------------|
| Designer: C.D.J.H. | Structure: F-18-X |
| Date of: 6-29-79 | Number: 3 of 50 |
| Drawing Number: B-3 | Drawings: [Blank] |

Reviewed: [Blank] (Inventory Sheet Only)

| | | |
|--------------|---------|------|
| NO REVISIONS | REVISED | DATE |
|--------------|---------|------|

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS | |
|-----------------------|-----------|-------------|--------------|-----|
| VIII | COLORADO | ITO-5/5/220 | 32 | 273 |

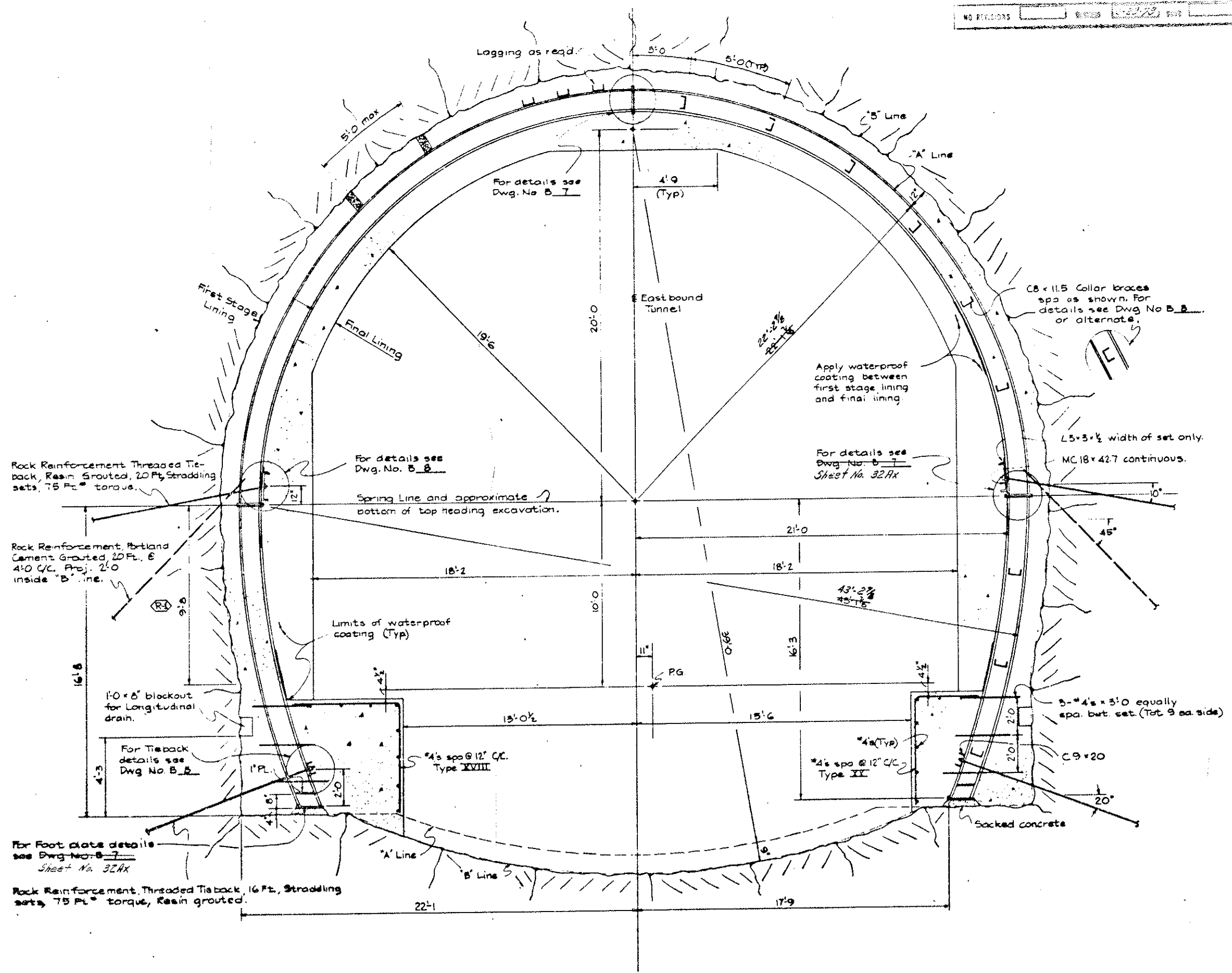
| REVISIONS | | | |
|-----------|--------|--------------------|-----|
| 5-1 | 7-3-75 | Rev. Dimens, Quans | BRL |

See Sheet No. 32AX for Hs Placed Steel Dimensions and Weights

NOTES:

- This support shall be used: Sta. 41+83 to Sta. 62+06; Sta. 65+42 to Sta. 69+68; Sta. 74+58 to Sta. 79+98.
- Steel support - Arch W14x61, A36 @ 4'-0" C/C; Leg W14x61, A36 @ 4'-0" C/C.
- Concrete: First stage lining Class T-1; Final lining (Seg. 57 thru Seg. 54 and Seg. 54 thru Seg. 56 and Seg. 57 thru Seg. 58) Class T-2; All other concrete Class T-2 (Misc).
- The first stage lining in the sidewall shall be placed within 200 Ft. of the bench face and the time period between excavation at a given station and the placing of first stage lining at that station shall not exceed 20 calendar days. The contractor shall temporarily move first stage lining operations to the immediate area of the bench face if ground conditions require, or as directed.
- For reinforcing steel bending diagrams, see Dwg. No. B-8.

| | |
|---------------|-----|
| DESIGNED BY | CDM |
| CHECKED BY | BRL |
| QUANTITIES BY | BRL |
| CHECKED BY | BRL |



Final

| Item | Description | Unit | Total |
|------|---|------|-----------|
| 211 | Tunnel Excavation (Class A) | CuYd | 150,945 |
| 211 | Rock Reinforcement, Portland Cement Grouted (12 Foot) | Ea | 3,237 |
| 211 | Rock Reinforcement, Portland Cement Grouted (20 Foot) | Ea | 1,478 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted (16 Foot) | Ea | 3,166 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted (20 Foot) | Ea | 3,364 |
| 509 | Structural Steel (Misc) | Ton | 572.83 |
| 509 | Structural Steel (W 14x61) | Ton | 2,663.08 |
| 515 | Waterproof Coating | SqYd | 20,224.4 |
| 601 | Concrete, Class T-1 (First Stage Lining) | CuYd | 26,129.78 |
| 601 | Concrete, Class T-2 (Final Lining) | CuYd | 17,129.36 |
| 601 | Concrete, Class T-2 (Misc) | CuYd | 6,234.13 |
| 602 | Reinforcing Steel | Ton | 46.53 |

Orig Scale: 1/4" = 1'-0"

| | | | |
|-----------------------------|-----|-----------|----------|
| DIVISION OF HIGHWAYS | | | |
| LIGHT TUNNEL SUPPORT | | | |
| HORSESHOE TYPE | | | |
| Designer | CDM | Structure | P-13-X |
| Checked | BRL | Revisions | |
| Drawing Number | 4 | of 60 | Drawings |

| | | |
|---------------|------|----|
| NO. REVISIONS | DATE | BY |
| | | |

| DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|----------|--------------|-----------|--------------|
| COLORADO | I70-56(1)220 | 33 | 273 |

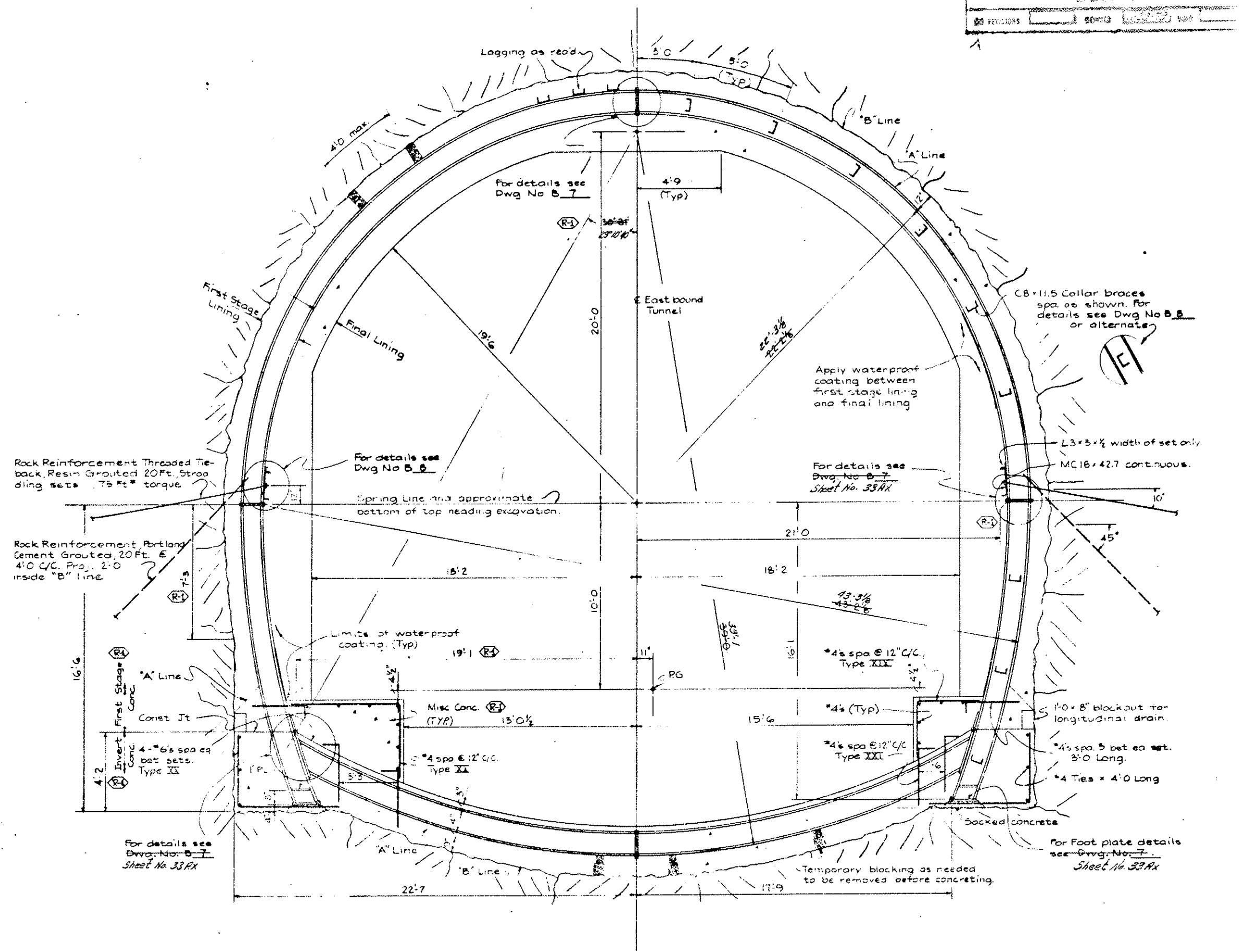
| REVISIONS | | |
|-----------|-----------------------------------|--------|
| (R-1) | 7-3-76 Rev. Dimen., Quan. & Notes | B.R.L. |
| | | |

See Sheet No. 33AX for As Placed Steel Dimensions and Weights

NOTES:

- This support shall be used:
 Sta. 69+62 to Sta. 71+86
 Sta. 75+02 to Sta. 74+582
- Steel support - Arch W14x95, A572 @ 4'0" C/C
 Invert and
 Leg W14x95, A36 @ 4'0" C/C
- Concrete:
 First stage lining Class T-1
 Invert Class T-2
 Final lining (Seg 562 thru Seg 565 and Seg 570 thru Seg 572) Class T-2
 All other concrete Class T-2 (Misc)
- The first stage lining in the sidewall shall be placed within 200 Ft of the bench face and the time period between excavation at a given station and the placing of first stage lining at that station shall not exceed 20 calendar days. The contractor shall temporarily move first stage lining operations to the immediate area of the bench face if ground conditions require, or as directed.
- For reinforcing steel bending diagrams see Dwg. No. B. B.

| | | |
|-------------|---------------|------|
| DESIGNED BY | QUANTITIES BY | DATE |
| | | |
| CHECKED BY | | |
| | | |



| Item | Description | Unit | Total |
|------|---|------|----------|
| 211 | Tunnel Excavation (Class A) | CuYd | 23,570 |
| 211 | Rock Reinforcement, Portland Cement Grouted (12 Foot) | Ea. | 265 |
| 211 | Rock Reinforcement, Portland Cement Grouted (20 Foot) | Ea. | 189 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted (20 Foot) | Ea. | 279 |
| 509 | Structural Steel (Misc) | Ton | 64.87 |
| 509 | Structural Steel (W 14x95) | Ton | 62.86 |
| 515 | Waterproof Coating | SqYd | 3,671 |
| 601 | Concrete, Class T-1 (First Stage Lining) | CuYd | 29,423 |
| 601 | Concrete, Class T-2 (Final Lining) | CuYd | 2,166.25 |
| 601 | Concrete, Class T-2 (Invert) | CuYd | 1,827.54 |
| 601 | Concrete, Class T-2 (Misc) | CuYd | 169.68 |
| 602 | Reinforcing Steel | Ton | 1,371 |

Includes 3.5 Tons of A572 Steel

DIVISION OF HIGHWAYS

MEDIUM TUNNEL SUPPORT

HORSESHOE TYPE

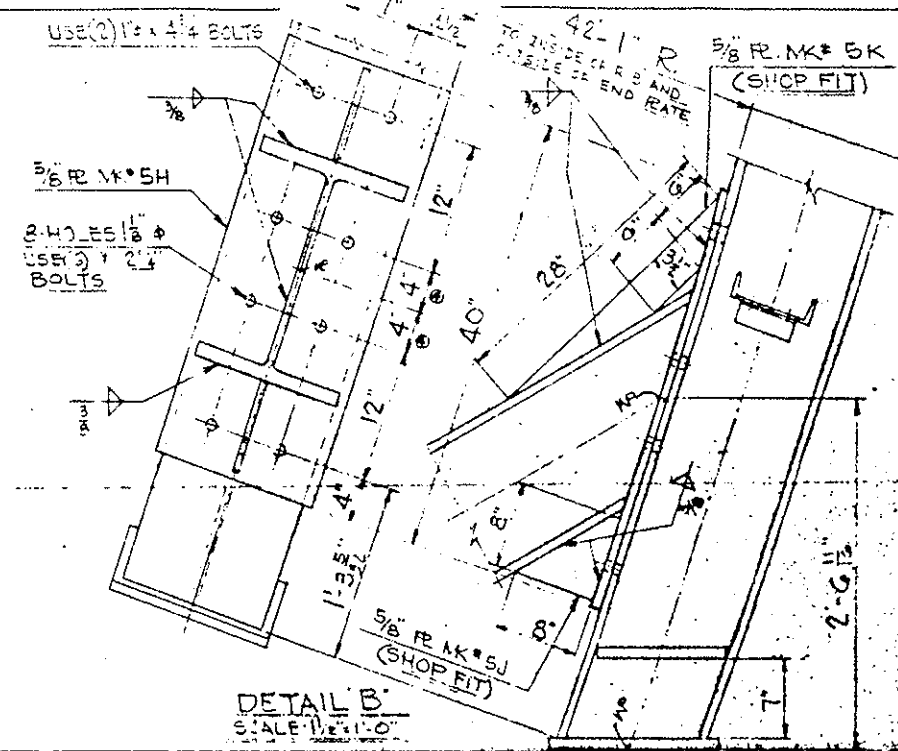
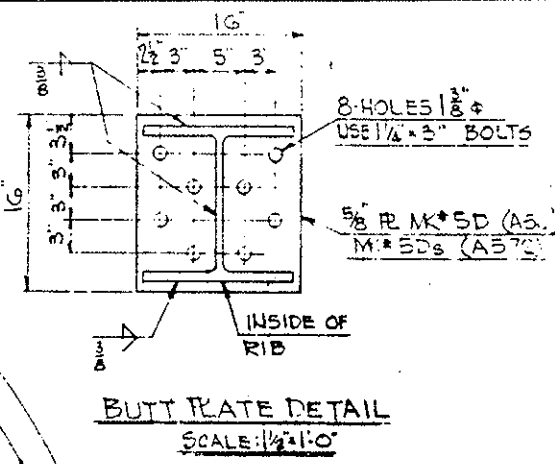
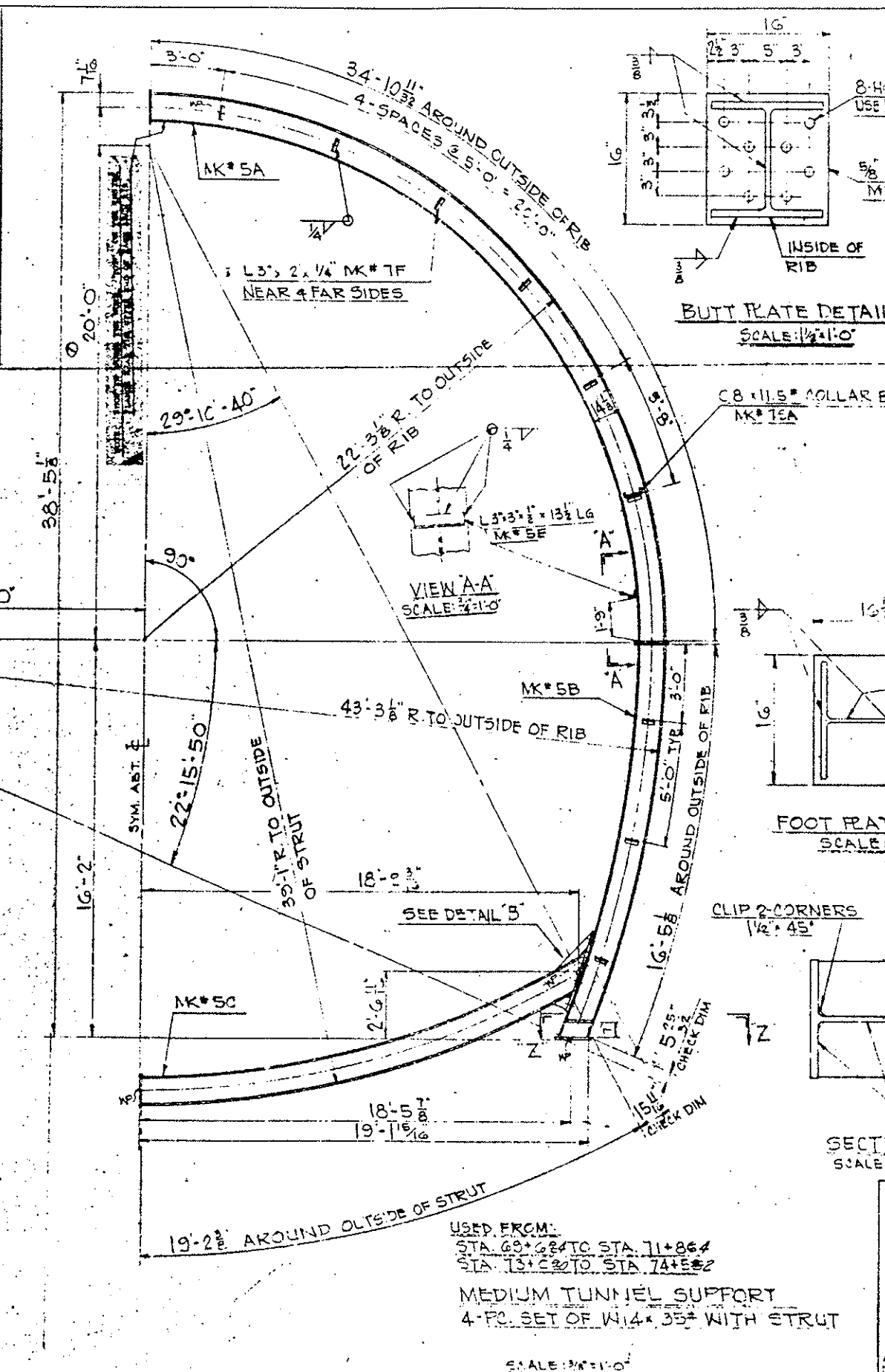
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|----------------|----------|-----------|-------------|
| Designer | C.O.M. | Structure | F-13-X |
| Detailer | B.R.Lene | Number | |
| Drawing Number | B. B. | of | 65 Drawings |

Orig Scale: 1/8" = 1'-0"

| | | |
|--------------|----------|------|
| SECTION | MARK NO. | DATE |
| W14x55 | 5C | |
| OPERATION | BY | DATE |
| INSTALLATION | | |
| REVISION | | |

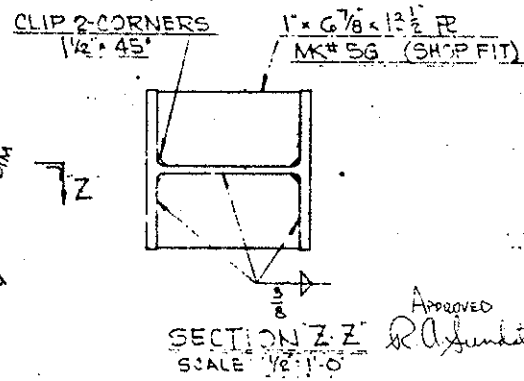
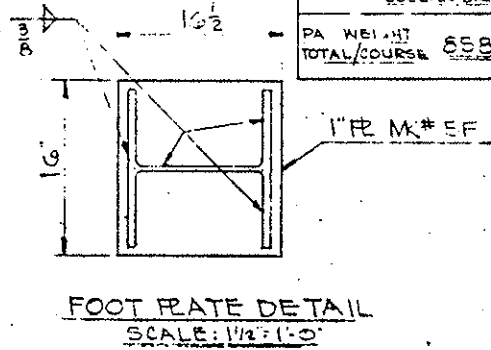
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| W14x55 | 5B | |
| OPERATION | BY | DATE |
| INSTALLATION | | |
| REVISION | | |

| | | |
|--------------|----------|------|
| SECTION | MARK NO. | DATE |
| W14x55 | 5A | |
| OPERATION | BY | DATE |
| INSTALLATION | | |
| REVISION | | |



SHOP NOTE:
 END RATES ON STRUT TO BE SENT TO FIT INSIDE RIB CONTOUR

VIEW A-A SCALE: 3/4\"/>



| | | | | |
|----------------------------------|-----------------|--------------|---------|-----------------------------------|
| 8575# TOTAL WT FOR COLLAR BRACES | 14.4 | 10 | 14.4 | 124# STD. PLAT WASHER FOR 5/8\"/> |
| PA WEIGHT TOTAL/COURSE | 10.1 | 14 | 31.5 | 72 1/2\"/> |
| 8587# | 26.6 | 31 | 806.4 | 72 3/4\"/> |
| 806.4 | 44.805 | 559-SAAB-007 | 806.4 | 75A 18 |
| 1.0 | .12 | 1.9 | 16 | LOAD INDICATOR WASHER FOR 1\"/> |
| 1.6 | .10 | 1.6 | 16 | HARDENED STEEL WASHER FOR 1\"/> |
| 0.9 | .43 | 1.6 | 16 | 1\"/> |
| 5.4 | 1.36 | 4 | 4 | 1\"/> |
| 11.0 | .92 | 12 | 12 | 1\"/> |
| 4.2 | .13 | 4.2 | 32 | LOAD INDICATOR WASHER FOR 1/4\"/> |
| 4.5 | .14 | 67.8 | 32 | HARDENED STEEL WASHER FOR 1/4\"/> |
| 25.3 | .79 | 67.8 | 32 | 1/4\"/> |
| 53.8 | 1.68 | | 32 | 1/4\"/> |
| 1.6 | DS-550-SAAB-005 | 13.5 | 5K | 1\"/> |
| 6.3 | | 6.2 | 5J | 1\"/> |
| 113.3 | | 113.3 | 5H | 1\"/> |
| 45.5 | | 45.5 | 5C | 1\"/> |
| 4065.8 | 2032.9 | 4065.6 | 5C | 2 |
| 26.3 | -005 | 26.0 | 5G | 2 |
| 1.9 | -007 | 1.9 | 7F | 6 |
| 74.8 | -005 | 74.8 | 5F | 1 |
| 45.3 | | 45.3 | 5D | 1 |
| 15621 | | 1561.4 | | 1 |
| 5497.4 | 17462 | 3489.8 | 5B | 2 |
| 10.4 | -005 | 10.0 | 5E | 1 |
| 1.3 | -007 | 1.9 | 7F | 6 |
| 153 | -005 | 45.3 | 5D | 1 |
| 302.4 | | 5211.7 | | 1 |
| 32 | 22181 | -005 | 2671.4 | 5A |
| TOTAL | WT | DRILLING NO | MARK NO | DESCRIPTION |
| 14,308.0 | # | | | MAT'L REQ'D PER COURSE OF RIBS |

USED FROM:
 STA. 69+28 TO STA. 71+86.4
 STA. 73+02 TO STA. 74+58.2
 MEDIUM TUNNEL SUPPORT
 4-PC. SET OF W14x35# WITH STRUT

APPROVED FINAL
 DATE 12-10-26
 BY Jack E. Bay

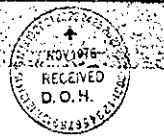
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 DATE 12-10-26
 BY Jack E. Bay

Quote Item 2 Bid Item 51

REF. ENCL. TO BE

| | | | | |
|---------------------------|----------|-------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORED | 117 156600 | 33AX | 273 |

| | | |
|--------------|----------|-----|
| NO REVISIONS | DATE | BY |
| | 12-23-22 | VJB |



AS CONSTRUCTED
 NO REVISIONS REVISED 10-29-79 VOID

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------|-----------|--------------|
| VIII COLORADO | I 70-3(B)220 | 34 | 275 |

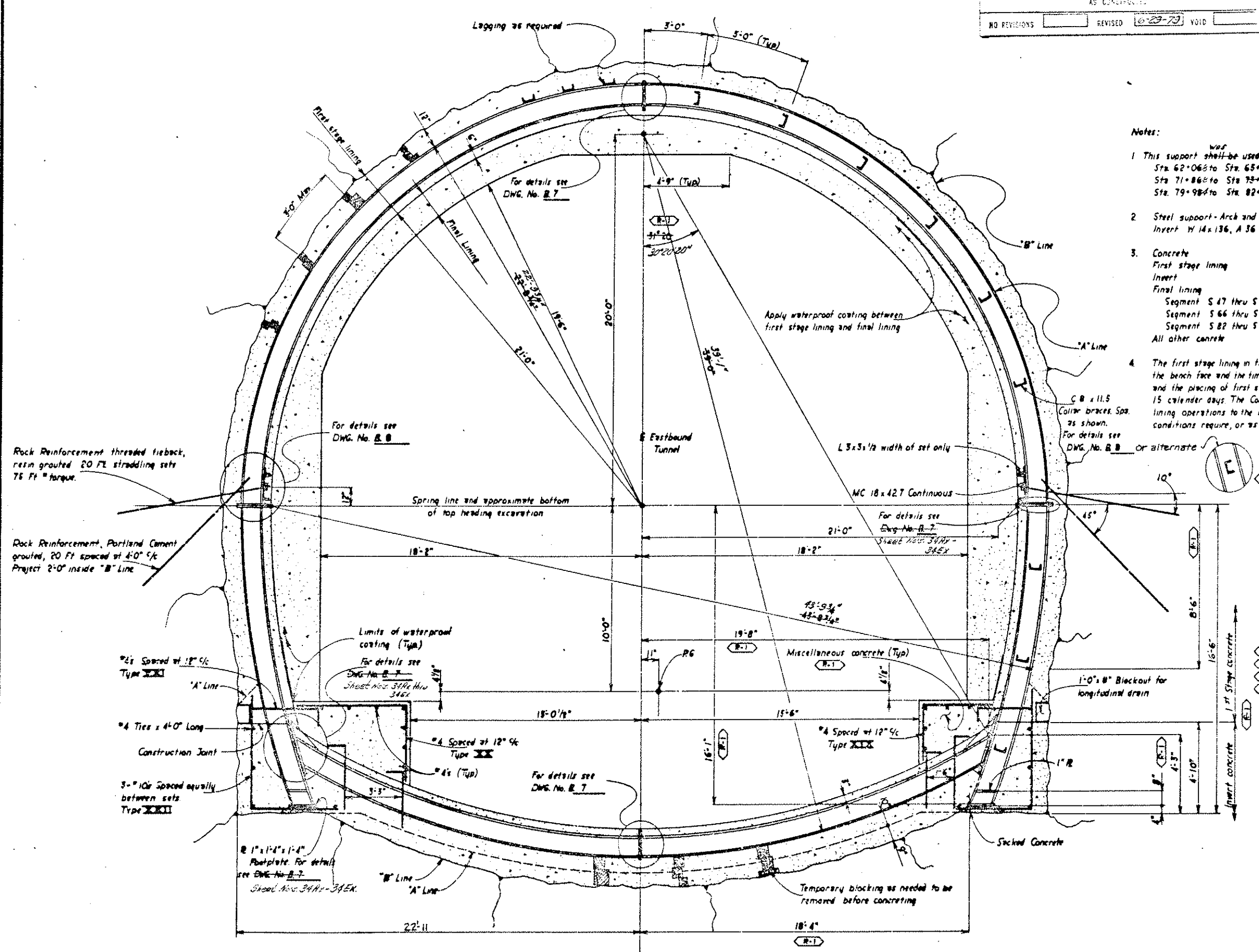
| REVISIONS | | | |
|-----------|--------|------------------------------|-----|
| 1 | 7-9-75 | Rev. Dimen. Quant. and Notes | PJS |

See Sheet Nos. 34A through 34E for As Placed Steel Weights and Dimensions

Notes:

- This support shall be used:
 Sta. 62+06.8 to Sta. 65+48.0
 Sta. 71+86.0 to Sta. 73+02.74.96
 Sta. 79+98.0 to Sta. 82+53.0
- Steel support - Arch and Sideleg W 14x136, A 572 Grade 55 Spaced at 4'-0" c/c
 Invert W 14x136, A 36 Spaced at 4'-0" c/c
- Concrete
 First stage lining Class T 3
 Invert Class T 4
 Final lining
 Segment S 47 thru S 53 Class T 4
 Segment S 66 thru S 69 Class T 4
 Segment S 82 thru S 87 Class T 4
 All other concrete Class T 2 (Miscellaneous)
- The first stage lining in the sidewall shall be placed within 200 Ft of the bench face and the time period between excavation at a given station and the placing of first stage lining at that station shall not exceed 15 calendar days. The Contractor shall temporarily move first stage lining operations to the immediate area of the bench face if ground conditions require, or as directed.

| CHECKED BY | QUANTITIES BY | DATE |
|------------|---------------|--------|
| C. J. H. | P. J. S. | 7-9-75 |
| C. J. H. | P. J. S. | 7-9-75 |
| C. J. H. | P. J. S. | 7-9-75 |



| SUMMARY OF QUANTITIES - HEAVY HORSESHOE | | | |
|---|---|-------|----------|
| Item | Description | Unit | Total |
| 211 | Tunnel Excavation (Class A) | Cu Yd | 45,760 |
| 211 | Rock Reinforcement, Portland Cement Grouted (18 Foot) | Ft | 551 |
| 211 | Rock Reinforcement, Portland Cement Grouted (20 Foot) | Ft | 340 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted (20 Foot) | Ft | 708 |
| 509 | Structural Steel (Misc) | Ton | 658 |
| 509 | Structural Steel (W 14x136) | Ton | 1,820.76 |
| 515 | Waterproof Coating | Sq Yd | 223.26 |
| 601 | Concrete, Class T 2 (Misc) | Cu Yd | 627.09 |
| 601 | Concrete, Class T 3 (First Stage Lining) | Cu Yd | 741.36 |
| 601 | Concrete, Class T 4 (Invert) | Cu Yd | 174.13 |
| 601 | Concrete, Class T 4 (Final Lining) | Cu Yd | 518.25 |
| 602 | Reinforcing Steel | Ton | 42 |

Includes 1268 Ton A 572 Steel
 Notes:
 For reinforcing steel bending diagrams see DWG. No. B. B.

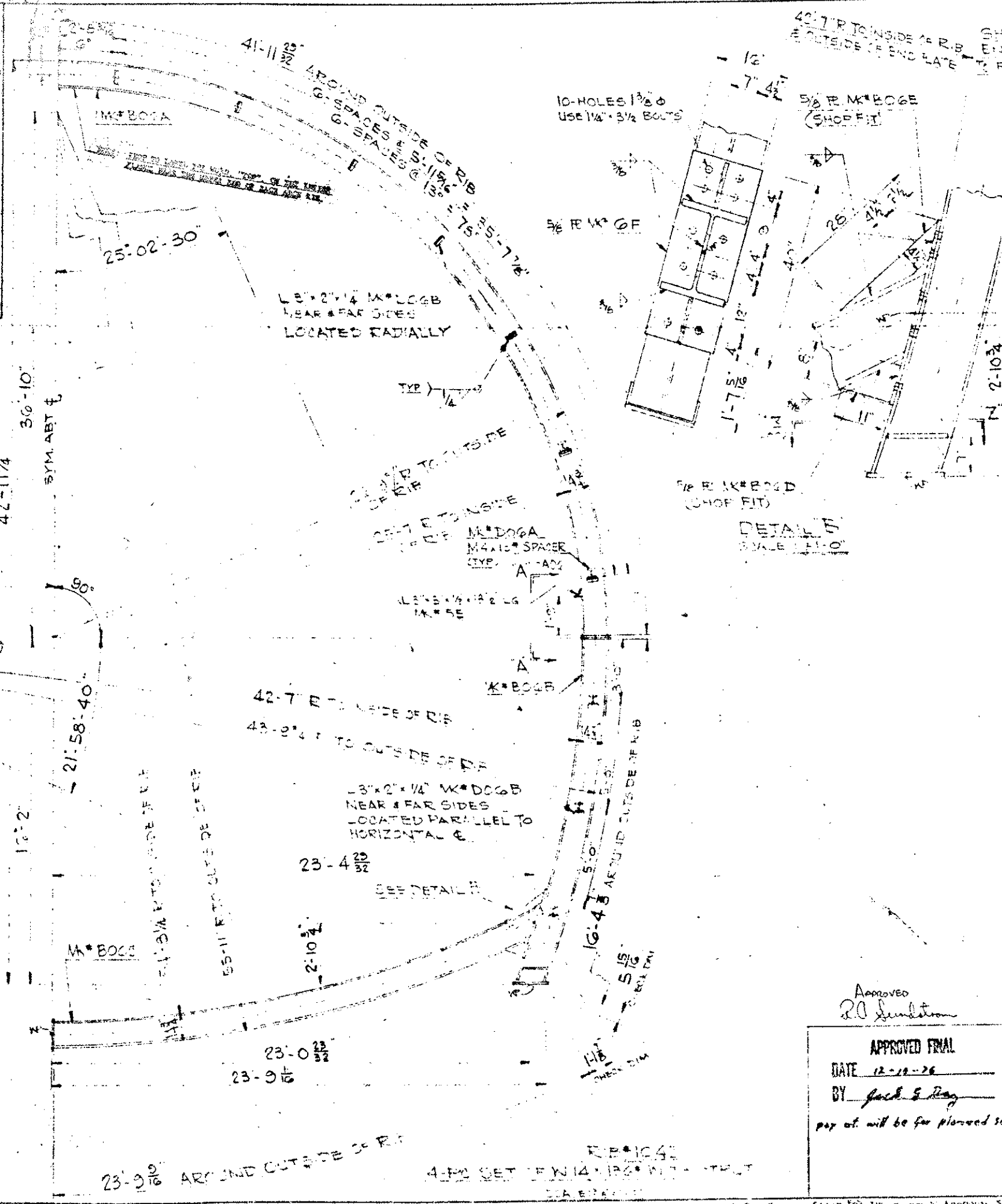
DIVISION OF HIGHWAYS

**HEAVY TUNNEL SUPPORT
HORSESHOE TYPE**

| | |
|---------------------|--------------------|
| Designer: C. J. H. | Drawn by: P. J. S. |
| Checker: R. Seymour | Number: 1-13-X |
| Drawing Number: B 6 | of 60 Drawings |

Original scale 3/8" = 1'-0"

| | | | |
|-------------|-----------------|-----------|-------------|
| SECTION | W14 x 136 | OPERATION | REPAIR |
| DATE | 12-21-26 | BY | JACK S. RAY |
| SCALE | AS SHOWN | CHECKED | JACK S. RAY |
| PROJECT NO. | 170-0-100 | REV. | 3-CX |
| DRAWING NO. | DB-559-5AAB-002 | DATE | 12-21-26 |



NOTES:
 1. ONE DIM. DB-559-5AAB-002 FOR SET OF
 2. FOR GENERAL NOTES & PREPARATION SEE END DB-559-5AAB-001

| | | |
|------|----------|-------------------------|
| REV. | DATE | DESCRIPTION |
| 1 | 12-21-26 | ISSUED FOR CONSTRUCTION |

| | | | | |
|---------------|--------|----------|----|-------------|
| NO. REVISIONS | ISSUED | 12-21-26 | BY | JACK S. RAY |
|---------------|--------|----------|----|-------------|

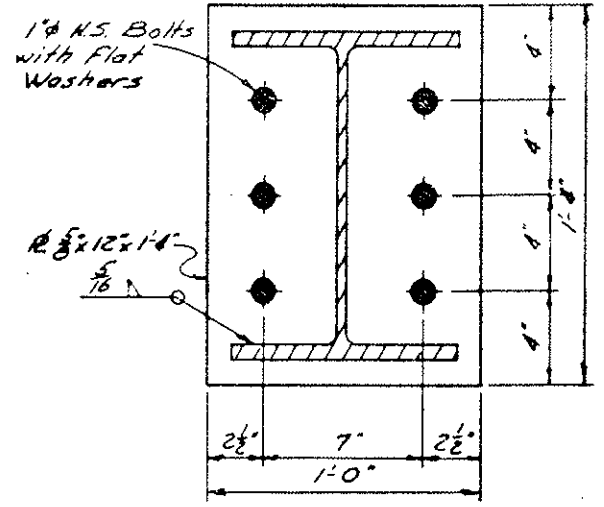
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| 16 | 10 | 40 REVELED WASHER FOR 3/4\"/> | | | |
| 17 | 14 | 20 FLAT WASHER FOR 3/4\"/> | | | |
| 18 | 37 | 3/4\"/> | | | |
| 19 | 13 | 2\"/> | | | |
| 20 | 14 | 20 HARDENED BELL WASHERS 1/4\"/> | | | |
| 21 | 19 | 1/2\"/> | | | |
| 22 | 15 | 1/2\"/> | | | |
| 23 | 14 | 20 HARDENED BELL WASHERS 1/4\"/> | | | |
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| 25 | 15 | 1/2\"/> | | | |
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| 27 | 15 | 1/2\"/> | | | |
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| 100 | 15 | 1/2\"/> | | | |

Approved
 R. J. S. RAY
 DATE 12-21-26
 BY Jack S. Ray
 pay at. will be for planned set

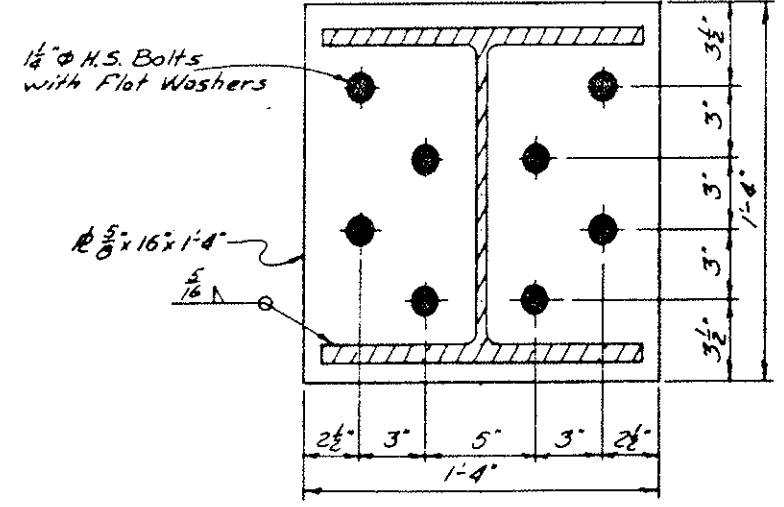
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| DATE | 12-21-26 | REVISION | |
| BY | JACK S. RAY | DATE | 12-21-26 |
| PROJECT NO. | 170-0-100 | DRAWING NO. | DB-559-5AAB-002 |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|---------------|-----------|--------------|
| XIII COLORADO | J70-3(81) 220 | 35 | 273 |

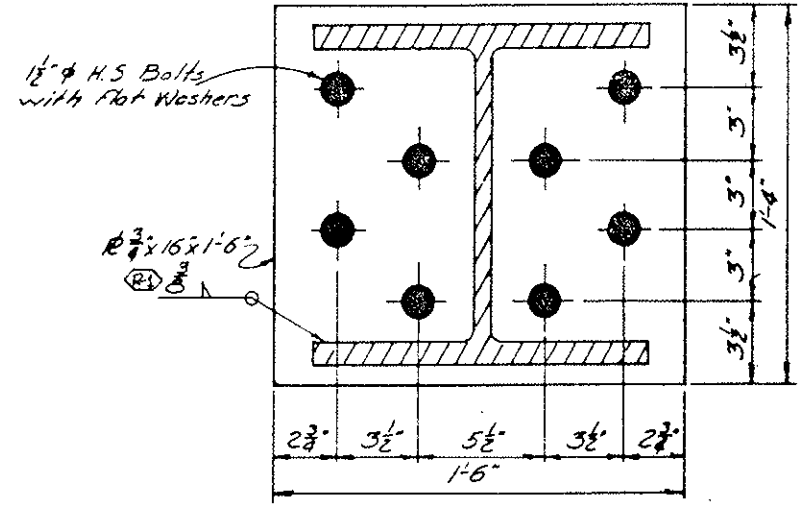
| REVISIONS | | |
|-----------|---------------|--------|
| 7-3-75 | Rev Weld Size | B.R.L. |



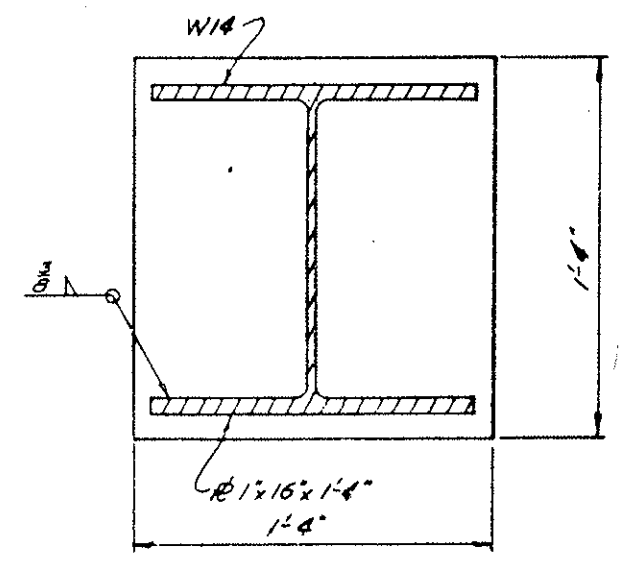
BUTTPLATE DETAIL
Arch & Leg - W14x61 Horseshoe Type



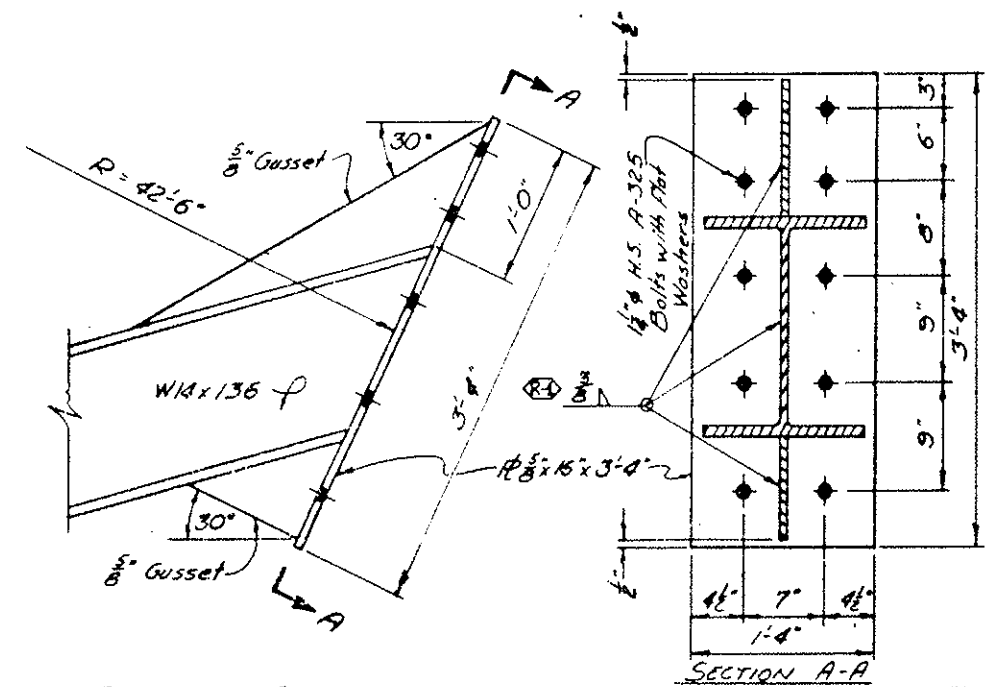
Note: Arch is A-572
BUTTPLATE DETAIL
Arch, Leg & Invert - W14x95 Horseshoe Type



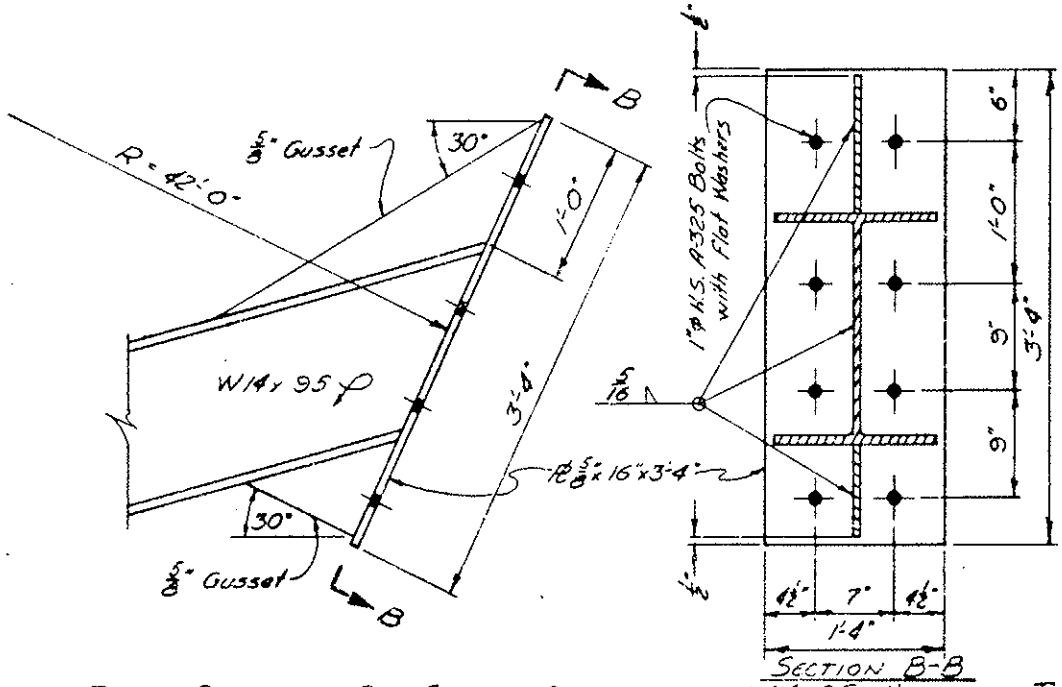
Note: Arch & Leg are A-572
BUTTPLATE DETAIL
Arch, Leg & Invert - W14x136 Horseshoe Type



TYPICAL FOOT PLATE



SECTION A-A
INVERT BUTTPLATE FOR SIDELEG CONNECTION - W14x136 HORSESHOE TYPE



SECTION B-B
INVERT BUTTPLATE FOR SIDELEG CONNECTION - W14x95 HORSESHOE TYPE

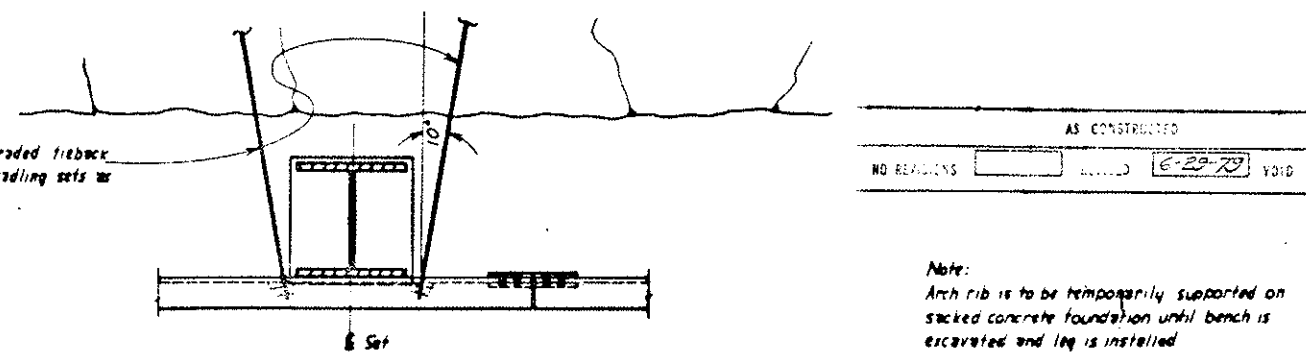
| | |
|-------------|--------|
| DESIGNED BY | CDON |
| CHECKED BY | CDON |
| DATE | 7-3-75 |
| REVISIONS | |

| | |
|---|-------------------|
| DIVISION OF HIGHWAYS | |
| HORSESHOE TYPE TUNNEL SUPPORT DETAILS | |
| Designer: CDON | Structure: F-13-X |
| Detailer: H. Fisher | |
| Drawing Number: 5 | of 60 Drawings |

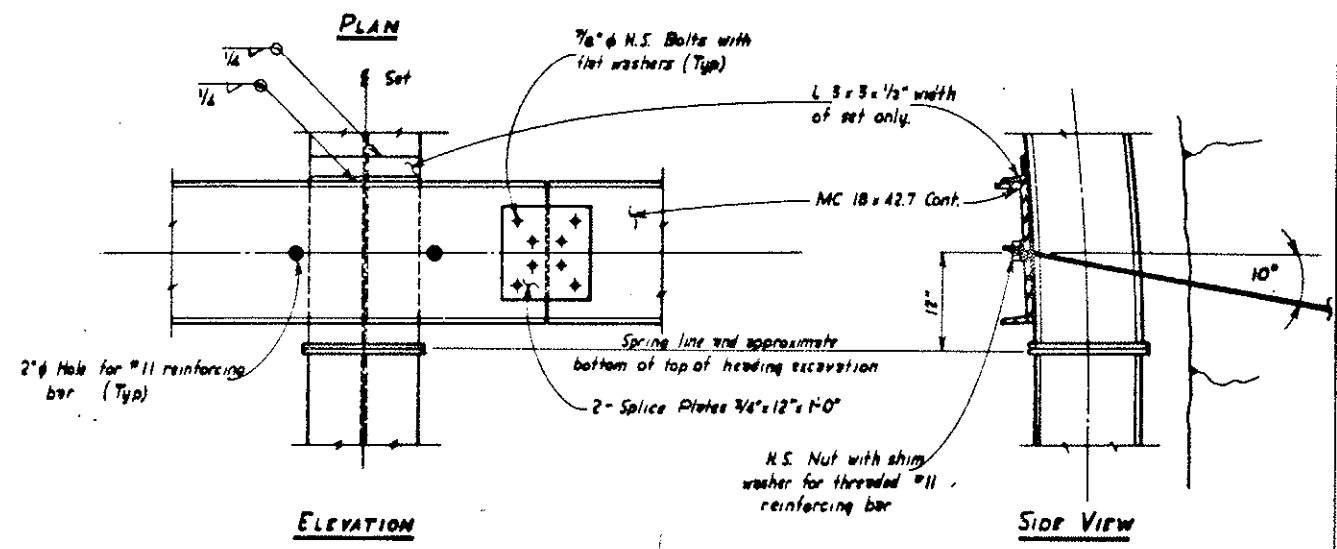
| FEDERAL ROAD DISTRICT NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------|-----------|--------------|
| XIII | COLORADO | 70-3/81/220 | 36 | 273 |

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |

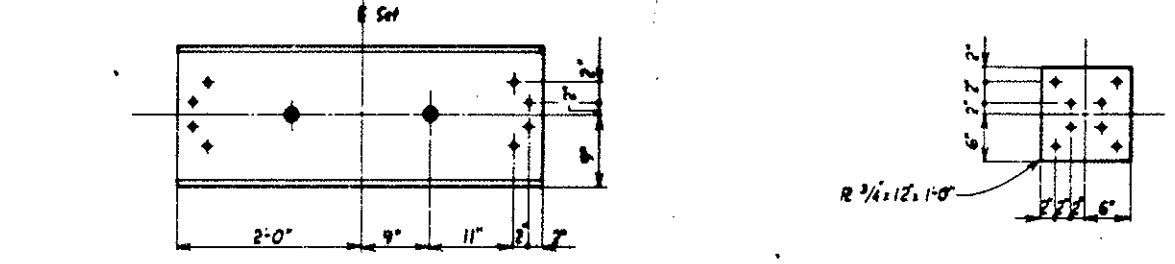
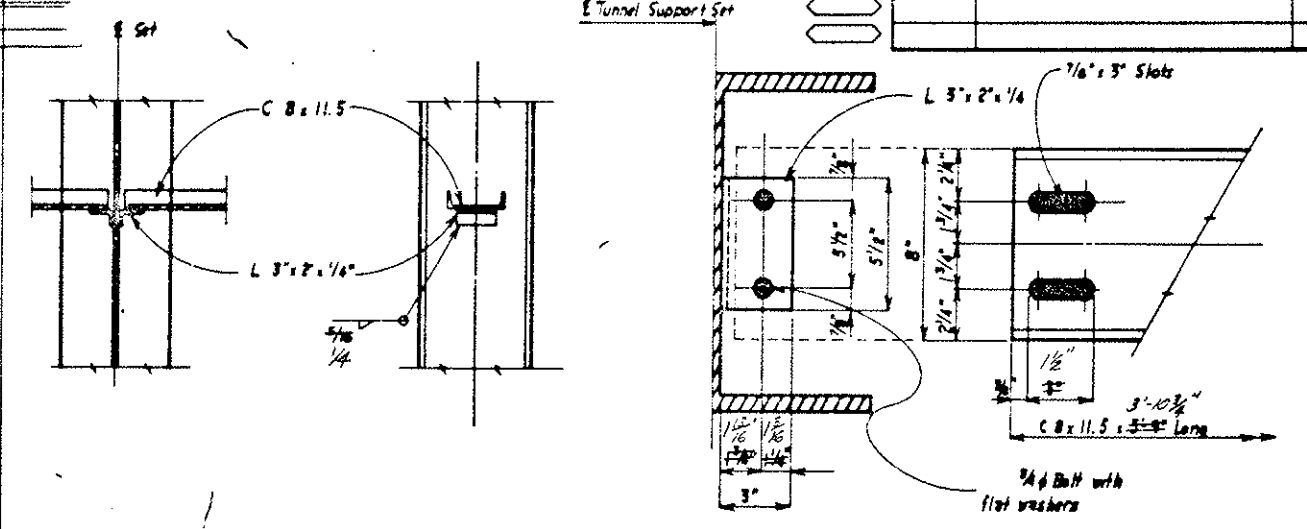
Rock reinforcement, Threaded tieback Resin Grouted, 20 Ft. Straddling sets as shown. 75 Ft² torque



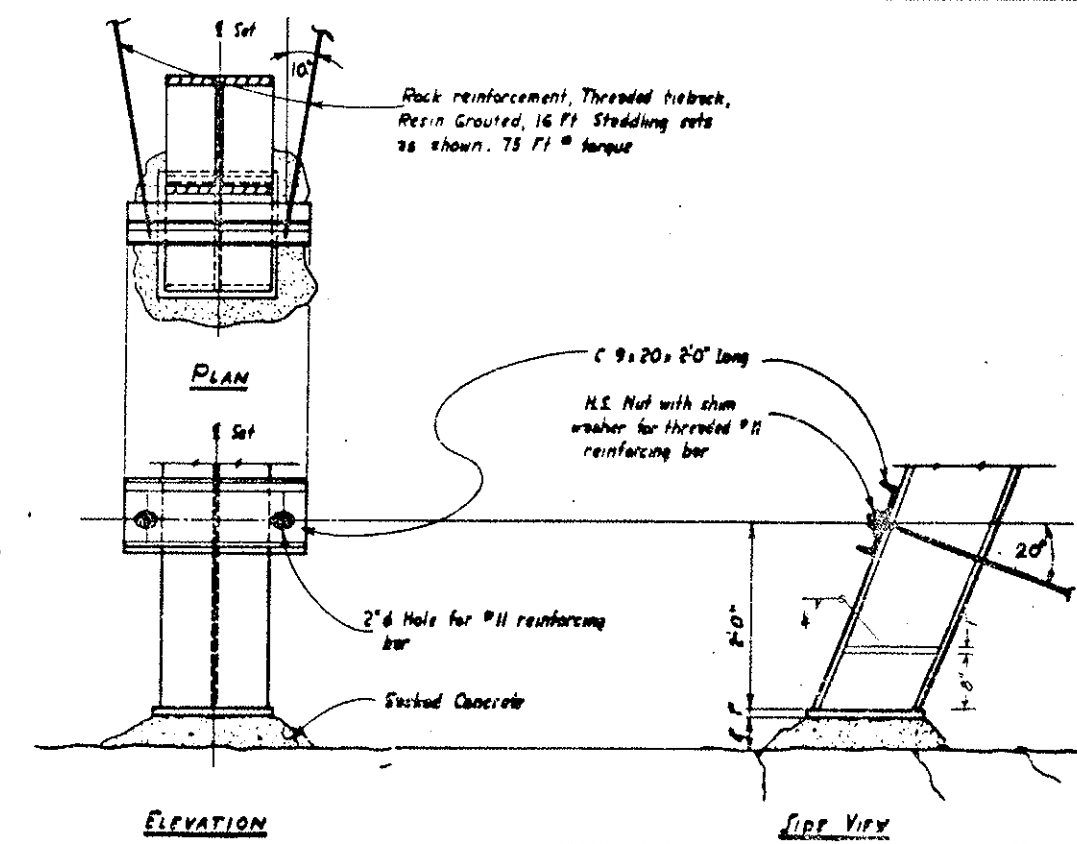
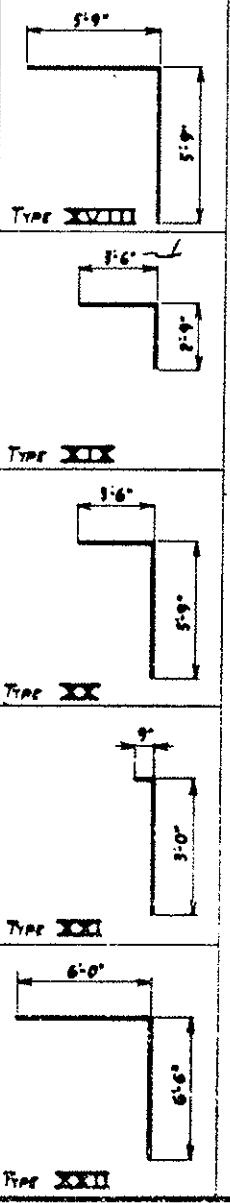
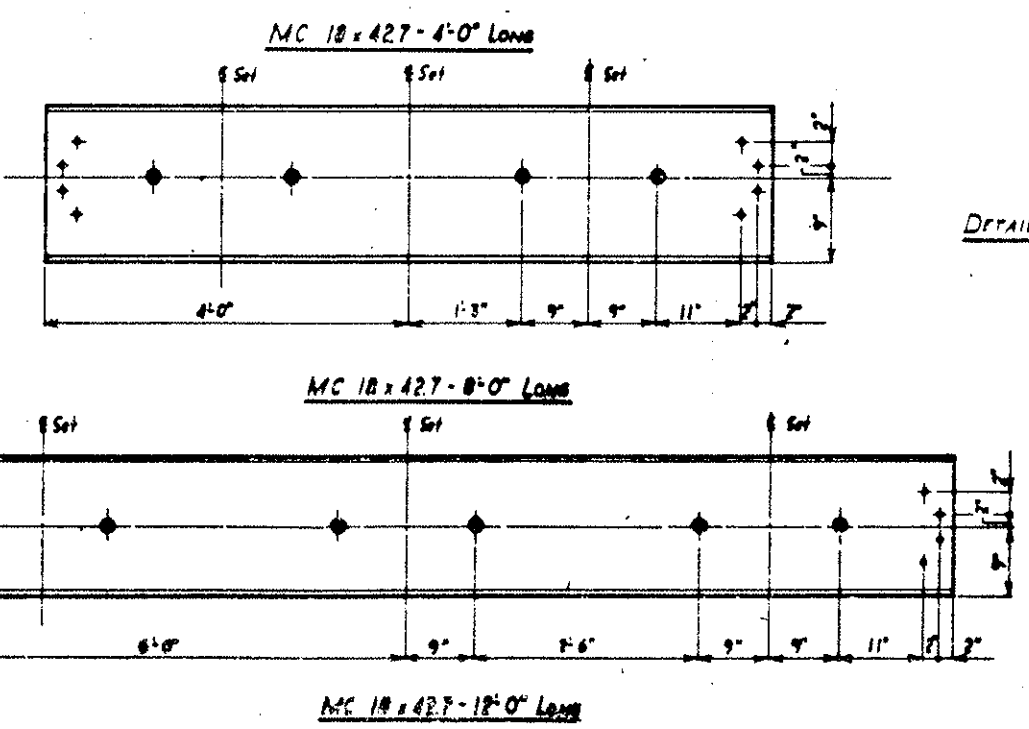
Note:
 Arch rib is to be temporarily supported on sacked concrete foundation until bench is excavated and leg is installed



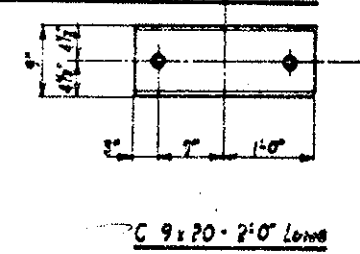
COLLAR BRACE CONNECTION DETAILS



DETAILS OF MC 18 x 42.7 TIEBACK INSTALLATION



TIEBACK AND SIDE LEG DETAILS



DIVISION OF HIGHWAYS

DETAILS TUNNEL SUPPORT HOODSIDE TYPE AND REINFORCING BAR RESTRICTION DIAGRAMS

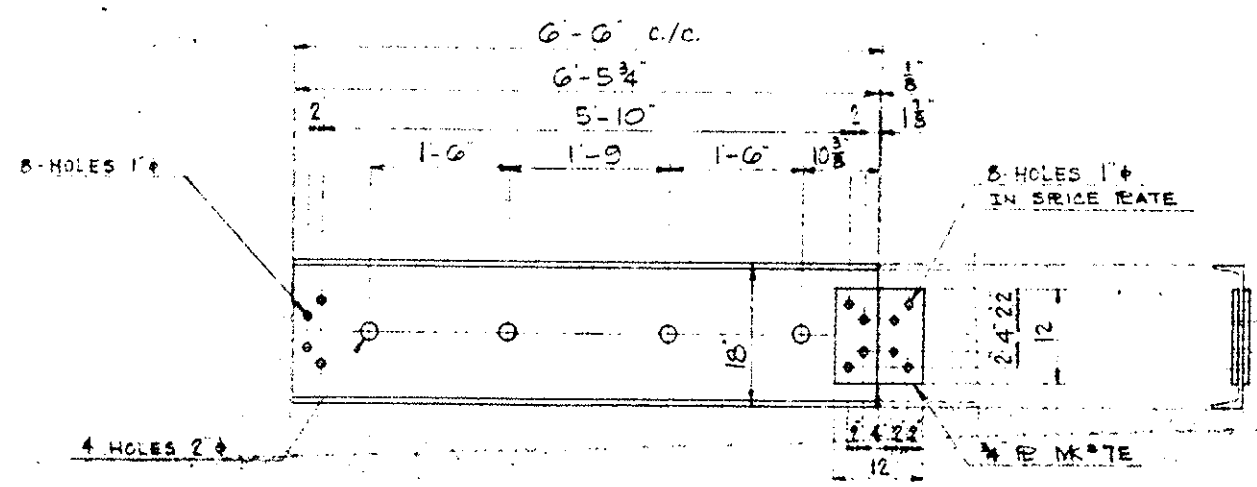
| | | | |
|----------|----------|------------|----------|
| Designer | C. O. N. | Structural | E. J. Y. |
| Checker | R. S. J. | Inspector | |
| Drawn | | | |

| | |
|-------------|--|
| DESIGNED BY | |
| CHECKED BY | |
| APPROVED BY | |
| DATE | |

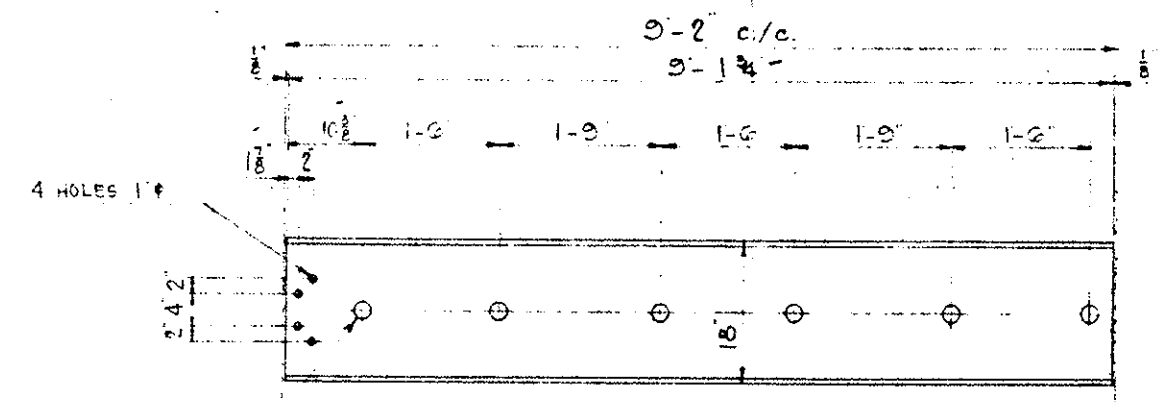
FOR GENERAL NOTES & TOLERANCES SEE DWG DS-559-5AAB-XE1

| | | | | |
|---------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 170-3 (M) 220 | 367X | 273 |

| | |
|----------------|----------------------|
| AS CONSTRUCTED | |
| NO REVISIONS | REVISED 6-23-79 VOID |



MC 18 x 42.7* MK*A07A



MC 18 x 42.7* MK*A07B

| | | | |
|-----------------------|----------|------------|-----------|
| SECTION | MARK NO. | CUT | OPERATION |
| MC 18 x 42.7* MK*A07A | 1 | CUT | OPERATION |
| MC 18 x 42.7* MK*A07B | 2 | PIECE WELD | |

| | | | | | |
|---------------------------------------|------|-----------------|-------------------------------|--|-------------------------------|
| 350E 300S DS-559-5AAB A07 | A07B | 1 | MC 18 x 42.7* x 9'-1 3/4" NNA | A36 | |
| MATERIAL REQUIRED PER TIEBACK MK*A07B | | | | | |
| 6 | 07 | | 5 | HARDENED STEEL WASHERS FOR 5/8 HS BOLTS A325 | |
| 24 | 30 | | 8 | 3/4 HI STRENGTH NUTS | |
| 62 | 77 | | 8 | 3/4 x 3/4 HI STRENGTH BOLTS | |
| 612 | 306 | DS-559-5AAB A07 | TE 2 | 3/4 x 12 x 12 SPLICE PLATES A36 | |
| 2767 | 2767 | | A07A | 1 | MC 18 x 42.7* x 6'-5 3/4" NNA |

| | | | | | | | |
|---------------------------------------|---------|------------|---------|---------|---------|-------------|-----------|
| MATERIAL REQUIRED PER TIEBACK MK*A07A | | | | | | | |
| TOTAL WT | UNIT WT | DRAWING NO | PART NO | MARK NO | NO REQD | DESCRIPTION | MATL SPEC |
| | | | | | | | |

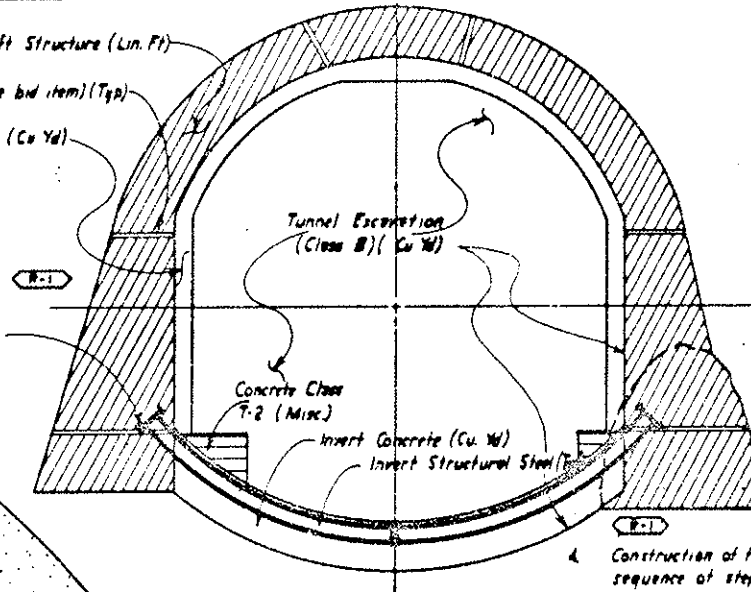
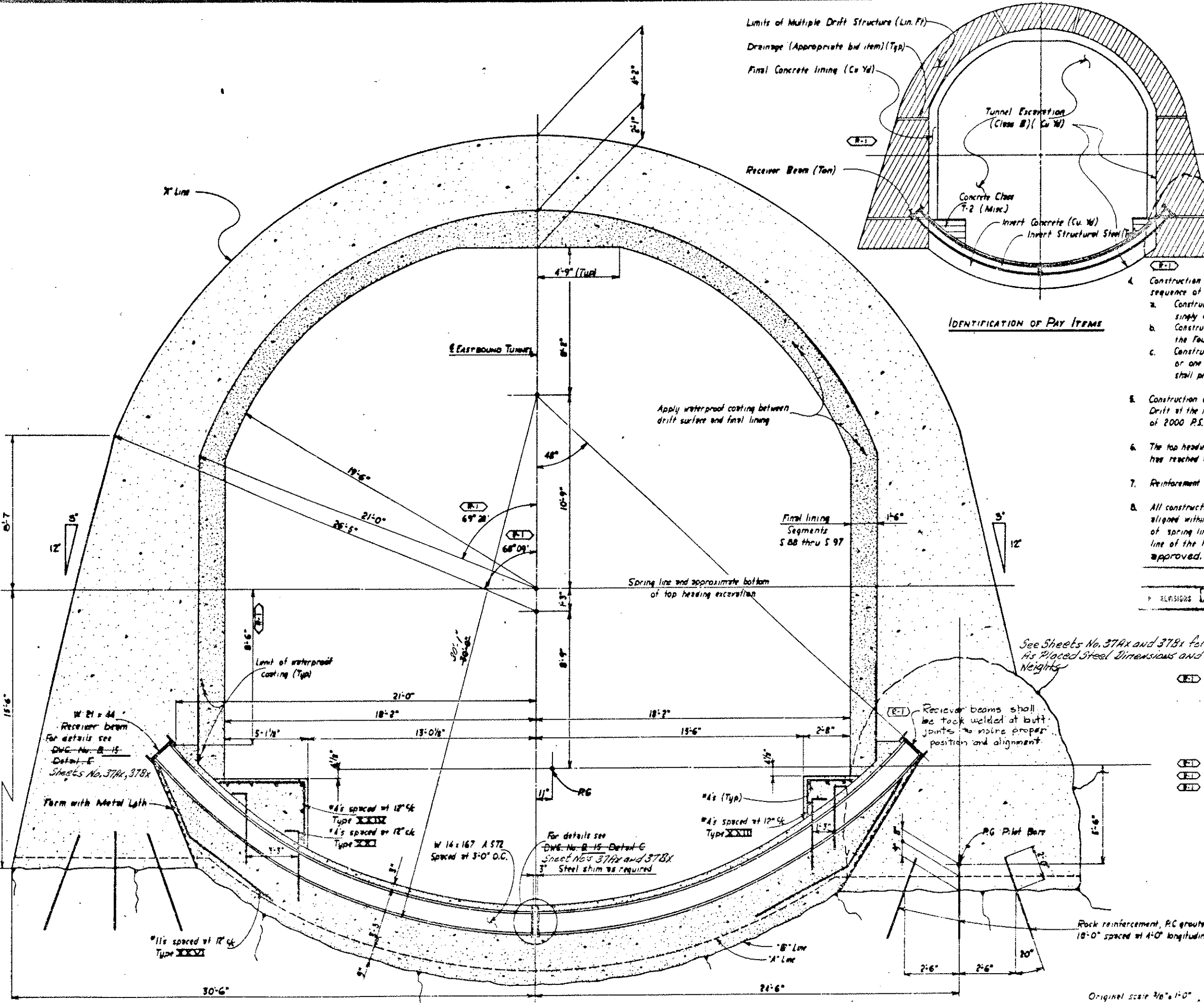
APPROVED FINAL
 DATE 7/14/76
 BY [Signature]

| | | | |
|--------|----|----------|-----------------|
| DATE | BY | SCALE | PROJECT |
| 3-0-79 | KV | 1" = 10' | DS-559-5AAB-A07 |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------|-----------|--------------|
| XIII COLORADO | I 70-3(8)220 | 37 | 273 |

| REVISIONS | | |
|-----------|--------|-------------------------------|
| R-1 | 7-9-75 | Rev. Dimes, Curren, and Niles |
| | | RTS |

- Notes:
- Construction of the multiple drift structure shall be by the multiple drift method.
 - No drift shall be greater than 12 Ft. in width or greater than 18 Ft. in height. The number and locations of drifts shall be such that the maximum dimensions of the multiple structure are accomplished without concrete intruding into the area of the final lining. The support of any individual drift shall be the responsibility of the Contractor.
 - All concrete shall be Class T-4. Except as shown in pay items identification.
 - Construction of the multiple drift structure shall be accomplished in the following sequence of steps:
 - Construction of the foundation drifts. These drifts may be constructed singly or simultaneously.
 - Construction of Crown Drift. This Drift may be constructed concurrent with the Foundation Drifts or upon completion of the Foundation Drifts.
 - Construction of Intermediate Drifts. These Drifts may be constructed singly or one on each side of the tunnel center line simultaneously. The Drift construction shall proceed from the foundation Drifts upward to the Crown Drift.
 - Construction of an Intermediate Drifts shall not begin until the concrete placed in the Drift at the next lowest level has reached a minimum compressive strength of 2000 P.S.I. as determined from cylinder tests taken during concreting.
 - The top heading excavation shall not begin until all concrete placed in the Drifts has reached a minimum compressive strength of 3000 P.S.I.
 - Reinforcement bending Diagrams are shown on drawing number R-15.
 - All construction joints above spring line of the multiple Drift structure shall be aligned within $\pm 10^\circ$ of a radial line whose origin is located at the intersection of spring line and centerline of the tunnel and all construction joints below spring line of the Multiple Drift structure shall be horizontal unless otherwise approved.



IDENTIFICATION OF PAY ITEMS

| | |
|----------------|--------------------|
| AS CONSTRUCTED | |
| REVISIONS | AS REVISED 6-29-75 |

| SUMMARY OF QUANTITIES - MULTIPLE DRIFT | | | Final |
|--|---|---------|---------|
| Item | Description | Unit | Total |
| 211 | Tunnel Excavation (Class B) | Cu. Yd. | 2724 |
| 211 | Rock Reinforcement, Portland Cement Grouted (18 Post) | Ft. | 231 |
| 211 | Multiple Drift Structure | L.F. | 508 |
| 309 | Structural Steel (Misc.) | Ton | 32.26 |
| 309 | Structural Steel (W14x16) | Ton | 716.53 |
| 513 | Waterproof Coating | Sq. Yd. | 4774.96 |
| 601 | Concrete Class T-2 (Misc.) | Cu. Yd. | 358.64 |
| 601 | Concrete Class T-4 (Invert) | Cu. Yd. | 558.27 |
| 601 | Concrete Class T-4 (Final Lining) | Cu. Yd. | 640.45 |
| 602 | Reinforcing Steel | Ton | 19 |

Includes 708 Ton A-570 Steel

DIVISION OF HIGHWAYS

MULTIPLE-DRIFT TUNNEL SUPPORT REQUIRED SECTION, BASIS FOR BID

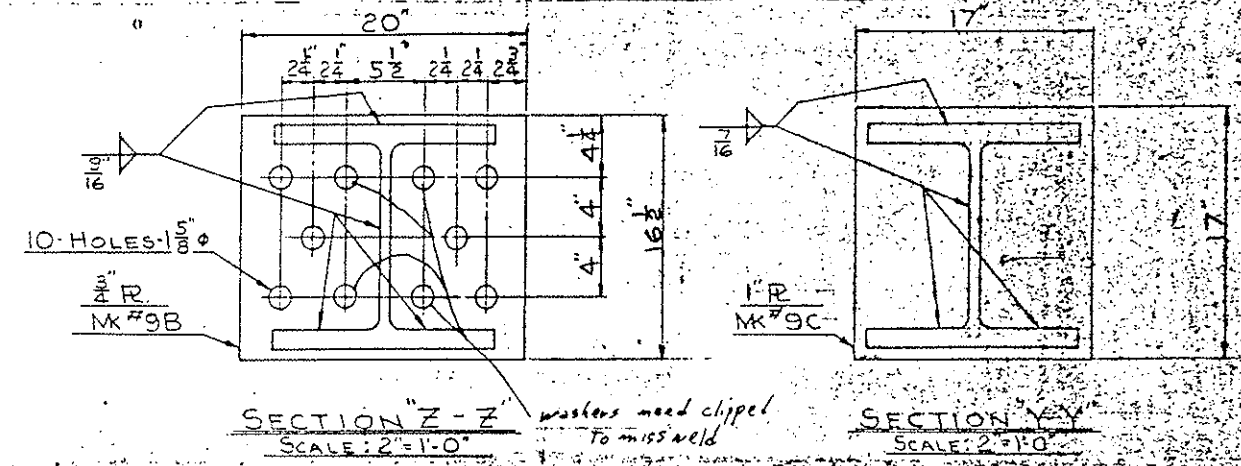
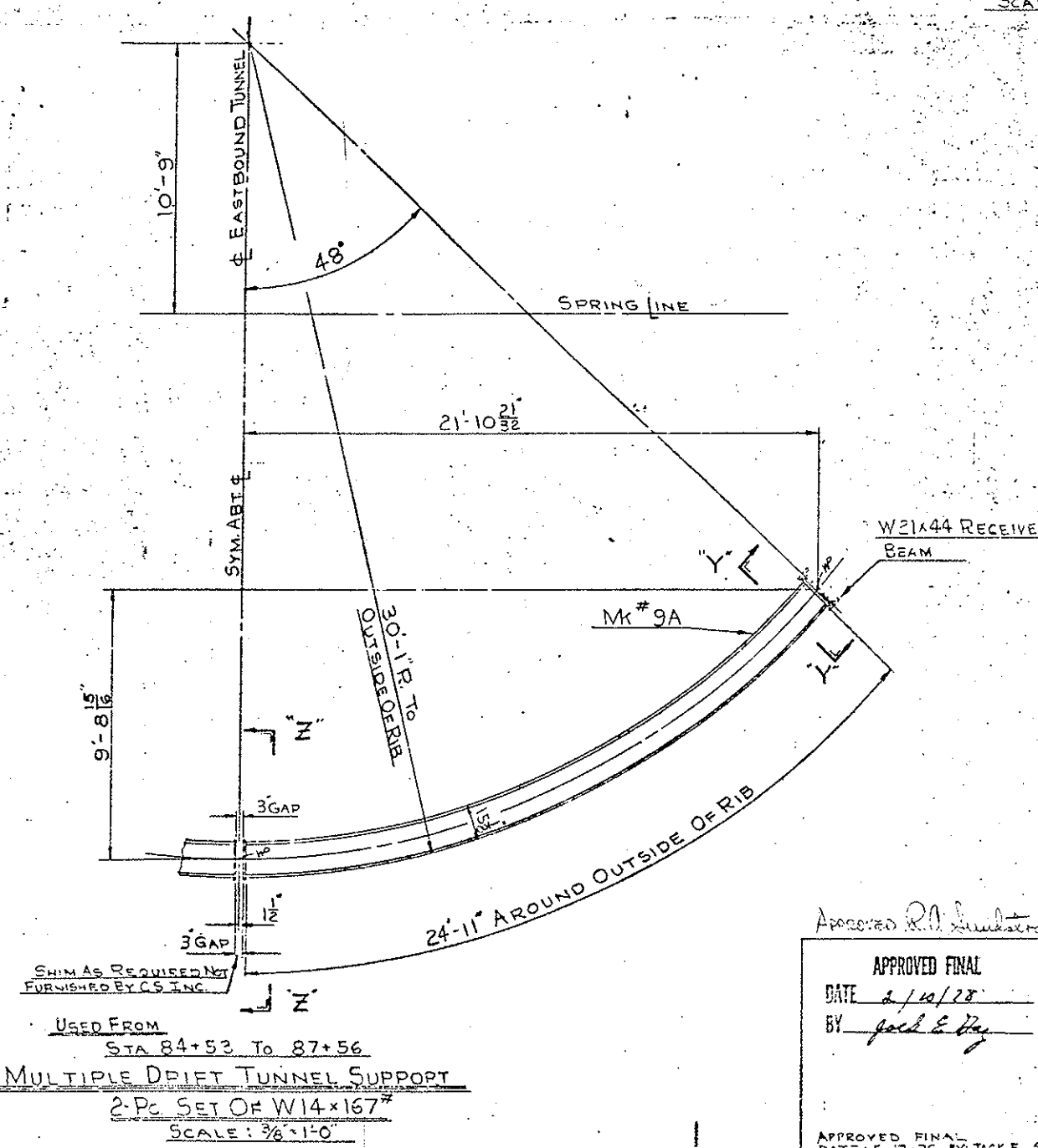
STATION 82+53 TO 87+56

| | |
|---------------------|-------------------|
| Designer: C. D. N. | Structure: F-13-X |
| Checker: R. Seyidov | Number: |
| Drawing Number: 59 | of 60 Drawings |

Original scale 3/8" = 1'-0"

| | |
|-------------|----------|
| DESIGNED BY | C. D. N. |
| CHECKED BY | R. S. |
| APPROVED BY | R. S. |
| DATE | 7-9-75 |

| SECTION | MARK NO. | OPERATION | CUT | LOTH |
|-------------|----------|-----------|-----|------|
| W14x167# 9A | | | | |
| 1 | 21.10 | WELD | | |
| 2 | 21.10 | WELD | | |
| 3 | 21.10 | WELD | | |
| 4 | 21.10 | WELD | | |



| | | | | | |
|------|-----|------|----|--------------------------------------|-------|
| 14 | 14 | 1.4 | 10 | LOAD INDICATOR WASHERS FOR 1/2" BOLT | 1.925 |
| 2.1 | 21 | | 10 | HARDENED STEEL WASHERS FOR 1/2" BOLT | |
| 13.1 | 131 | 42.3 | 10 | 1/2" HI. STRENGTH NUTS | |
| 29.7 | 297 | | 10 | 1/2" HI. STRENGTH BOLTS | |

| | | | | |
|--------------------|--------|----|--------------------------------|-------|
| 84905-559-5AAB-009 | 81.8 | 9C | 11" x 17" x 17" END PLATE | 1.925 |
| 701 | 10.1 | 9B | 1/2" x 16" x 20" BUTT PLATE | |
| 40728 | 4661.3 | | W14x167# x 24'-4 1/4" MNA | |
| 84905-559-5AAB-009 | 8426.3 | 9A | 2 STRUT ASSEMBLY CONSISTING OF | |

TOTAL WT. FOR COURSE: 8495.9

TOTAL PAY MT. PER COURSE: 8426.3

MATL REQ'D PER 2-PC SET

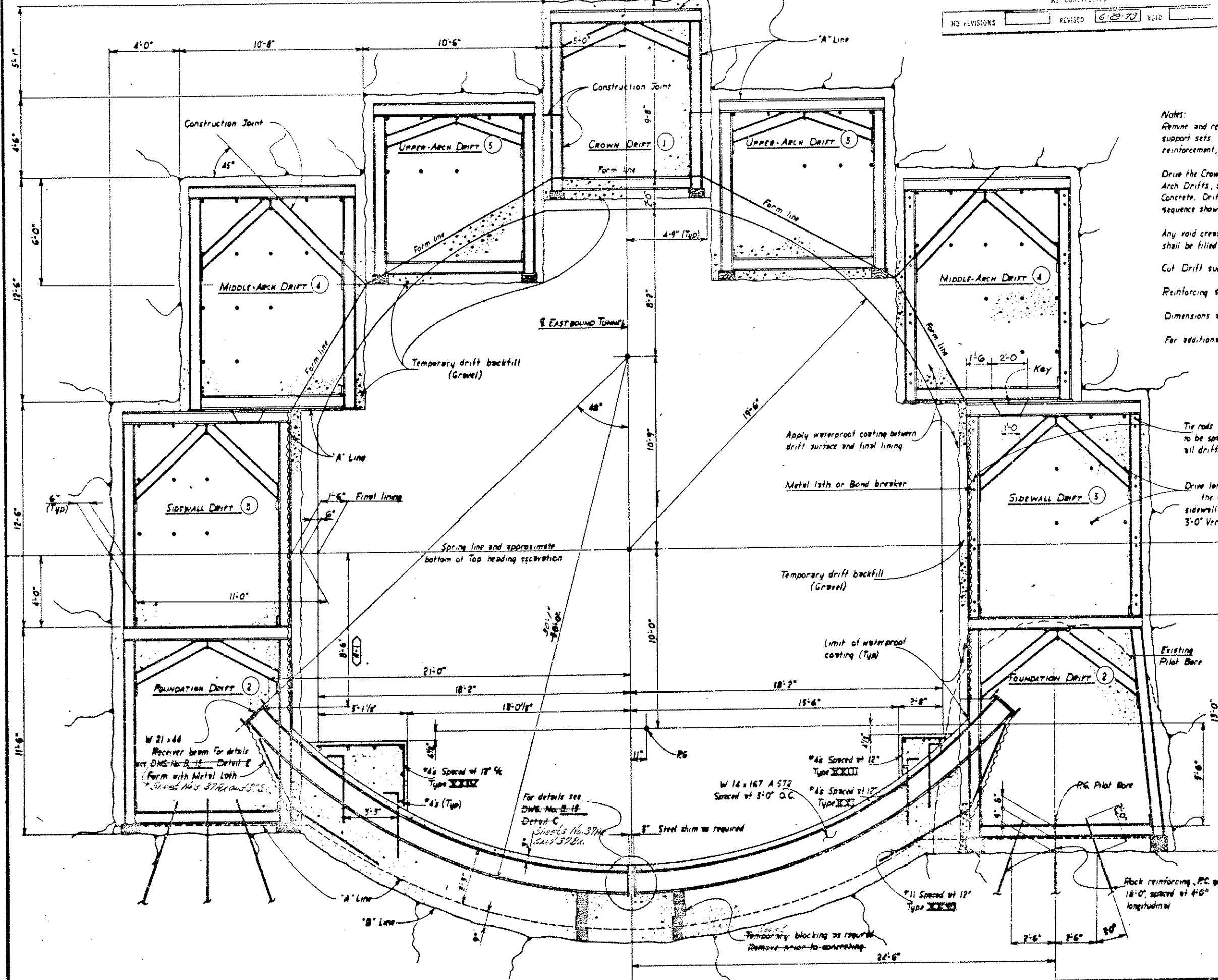
APPROVED FINAL
 DATE: 2/10/78
 BY: Jack E. Day

APPROVED FINAL
 DATE: 5-17-76 BY: JACK E. DAY

AS CONSTRUCTED
NO REVISIONS [] REVISED 6-29-75 VOID []

| | | | |
|-----------------------|--------------|-----------|--------------|
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| III COLORADO | 170-5(51)220 | 38 | 273 |

| REVISIONS | | | |
|-----------|--------|----------------|-----|
| R-1 | 7-3-75 | Rev. Dimension | RJS |
| | | | |
| | | | |



Notes:
Remine and resupport the existing Pilot Bore to accommodate the Foundation Drift support sets. Place receiver beam, form blockout for invert strut, install rock reinforcement, Portland Cement grouted, as per plans, and backfill with Concrete.

Drive the Crown Drift, the North Foundation Drift, Sidewall Drifts, Middle and Upper-Arch Drifts, support, form blockouts, install rock reinforcement and backfill with Concrete. Drifts shall be driven and backfilled with concrete in the numbered ① sequence shown on the Plans.

Any void created between the surface of the Drift concrete and the Bench material shall be filled with gravel.

Cut Drift support steel where necessary to accommodate final lining.

Reinforcing steel diagrams are shown on DWG. No. B. 15

Dimensions are typical unless otherwise shown

For additional Drift details see DWG. No. B. 16 & 17

For Additional Drift Information See Sheets No. 38A thru 38D.

| SUMMARY OF QUANTITIES FOR INFORMATION ONLY * | | |
|--|-------|--------|
| Description | Unit | Total |
| Drift Excavation | Cu Yd | 19,026 |
| Drift Support | Ton | 8,483 |
| Drift Concrete | Cu Yd | 19,158 |
| Rock Reinforcement Portland Cement Grouted (18 Feet) | Pc | 64 |

* Not for Basis of Payment
See Sheets No. 37A and 37B for As Placed Steel Weights and Dimensions

Original scale: 7/8" = 1'-0"

DIVISION OF HIGHWAYS

MULTIPLE DRIFT TUNNEL SUPPORT
DIVISION'S PROPOSED METHOD OF CONSTRUCTION

STATION 82+63 TO 87+66

| | |
|-----------------------|-----------------------|
| Designer: G. D. G. H. | Reviewer: F. L. B. B. |
| Checked: R. J. J. J. | Drawings: [] |
| Drawings: [] | Drawings: [] |

| | |
|-------------|------------|
| DESIGNED BY | CHECKED BY |
| DATE | DATE |
| BY | BY |

AS CONSTRUCTED
 NO REVISIONS REVISED 6-23-79 VOID

REVISIONS
 NO. DATE DESCRIPTION
 1 3/1/78 273

NOTES

- 1- INSTALL 6" 18' #11 CEMENT GROUTED ROCK REINFORCEMENT, LEAVING 3' PROJECTING INTO THE DRIFTS.
- 2- REMOVE ALL COLLAR BRACES AND TIE RODS EXCEPT THE LOWER INBOARD AND UPPER OUT BOARD.
- 3- CLEAN MUCK FROM MIDDLE ARCH DRIFT AND PLACE IN UPPER ARCH INVERT.
- 4- INSTALL SEEP DRAINS PER SCHEDULE. SEEP DRAINS MAY BE EITHER 2" PVC OR 2" STEEL PIPE. FILTER MATERIAL TO BE CLASS-A (3/4") CONCRETE AGGREGATE. TOP OF SEEP DRAIN PIPE TO BE COVERED WITH A 6" SQUARE GALV. #4 MECH. HARDWARE CLOTH. MINIMUM WIRE DIAMETER .003 IN.
- 5- WELD #6 REBAR TO EVERY THIRD SET TO SUPPORT LONGITUDINAL REINFORCEMENT. INSTALL #11 LONGITUDINAL REIN. IN BUNDLES OF 3. START WITH A 20 FT BAR, A 1 FT BAR AND A 6 FT. BAR FOR THE FIRST BUNDLE. THEN CONTINUE WITH 20 FT BARS THROUGHOUT THE DRIFT. DO NOT LAP THE BARS AT JOINTS - BUTT THEM.
- 6- INSTALL #11 HOOK BARS, TIE THEM TO THE LONGITUDINAL BARS AND BAR SUPPORTS.
 UPPER CROWN DRIFT HOOKS 2 / POST
 LOWER " " " " 2 / POST
 LOWER MIDDLE ARCH DRIFT HOOKS 2 / POST
 UPPER " " " " 4 / BAY
- 7- INSTALL SLICKLINE SUPPORTS EVERY THIRD SET. USE 2" X 3" X 3/8" ANGLE.
- 8- INSTALL WALKWAY SUPPORT ANGLES EVERY OTHER SET.
- 9- PLACE GRAVEL IN INVERT BLOCKOUT.
- 10- INSTALL VERTICAL REBAR BULKHEADS PER SCHEDULE.
- 11- ALL MISCELLANEOUS ANGLE BRACING IS 2" X 2" X 3/8" ANGLE.
- 12- BACKFILL DRIFTS WITH 7-4 CONCRETE.
- 13- IF CONCRETE PLACEMENT MUST BE SUSPENDED, INSTALL 6" #11 OR LARGER DOWELS 6 FT. LONG IN THE BULKHEAD. SIMILAR DOWELS WILL BE PLACED IN THE SLOPING JOINT @ 4' / 10' OR AS DIRECTED BY THE ENGINEER.
- 14- 2" GROUT PIPES TO BE INSTALLED IN NORTH DRIFT @ SETS 60-61 AND IN SOUTH DRIFT @ SET 7 WITH SUPPLY LINES LEADING TO THE WEST PORTAL OF THE DRIFTS. GROUT IN THESE PIPES WILL BE PLACED PRIOR TO THE MAIN TUNNEL TOP HEADING EXCAVATION.
- 15- HIGH OVERBREAK AREA IN NORTH DRIFT BETWEEN SETS 141 & 142 TO BE FILLED WITH CONCRETE. HIGH BULKHEAD TO BE BUILT @ SET 133. CONCRETE TO BE PUMPED INTO OVERBREAK AREA AFTER DRIFT IS POURED TO SET 133.
- 16- INSTALL 2" GROUT SUPPLY PIPE AND 2" VENT PIPE FROM WEST PORTAL OF DRIFTS TO HIGH OVERBREAK AREAS TO BE FILLED WITH GROUT. GROUT TO BE PUMPED IN THESE LOCATIONS AFTER DRIFTS ARE BACKFILLED WITH CONCRETE.

SEEP DRAIN PLACEMENT
 E - EAST SIDE OF SET
 W - WEST SIDE OF SET
 B - CENTERED BETWEEN SETS

| STATION | SET | STATION | SET |
|---------|------|---------|-----------|
| 82 + 50 | 2 W | 85 + 05 | 85 W |
| + 65 | 5 | + 14 | 88 |
| + 74 | 8 | + 23 | 91 |
| + 83 | 11 | + 29 | 93 |
| + 89 | 13 | + 30 | 96 |
| + 98 | 16 | + 47 | 99 |
| 83 + 07 | 19 | + 53 | 101 |
| + 13 | 21 | + 62 | 104 |
| + 22 | 24 | + 71 | 107 |
| + 31 | 27 | + 77 | 109 |
| + 37 | 29 | + 86 | 112 |
| + 46 | 32 | + 95 | 115 |
| + 55 | 35 | 86 + 01 | 117 |
| + 61 | 37 | + 10 | 120 |
| + 70 | 40 | + 19 | 123 |
| + 79 | 43 | + 25 | 125 |
| + 85 | 45 | + 34 | 128 |
| + 94 | 48 | + 43 | 131 |
| 84 + 03 | 51 | + 49 | 133 W |
| + 09 | 53 | + 58 | 136 E |
| + 18 | 56 | + 67 | 139 E |
| + 27 | 59 | + 75 | 141 E |
| + 33 | 61 | + 82 | 144 W |
| + 42 | 64 | + 91 | 147 E |
| + 51 | 67 | + 97 | 149 E |
| + 57 | 69 | 87 + 06 | 152 E |
| + 66 | 72 | + 15 | 155 E |
| + 75 | 75 | + 21 | 157 E |
| + 81 | 77 | + 30 | 160 W |
| + 80 | 80 | + 39 | 162-163 E |
| + 99 | 83 W | + 45 | 165 E |
| | | + 54 | 168 W |

INTERMEDIATE BULKHEADS BOTH DRIFTS

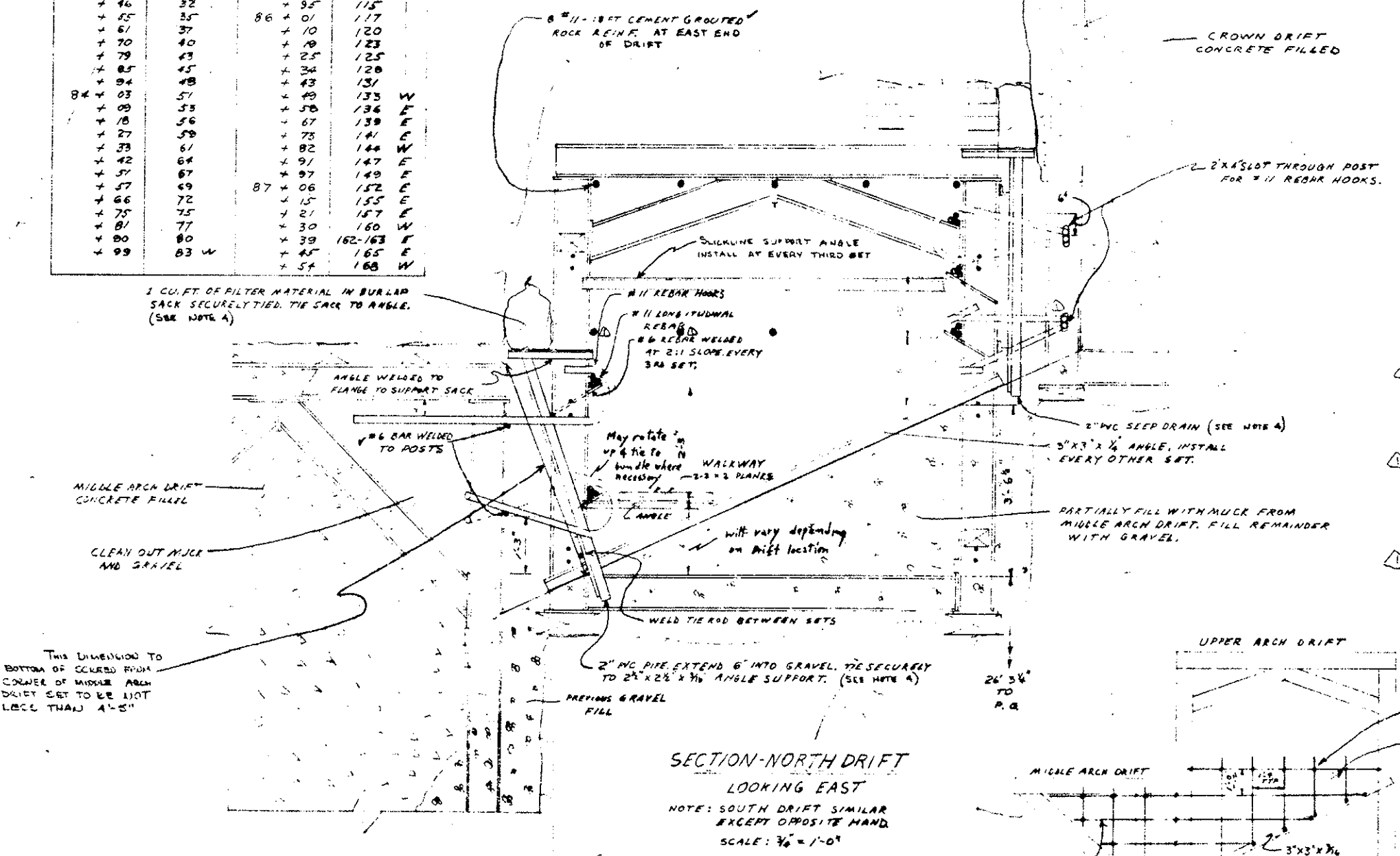
| STATION | SET |
|---------|-----|
| 87 + 12 | 154 |
| 96 + 49 | 133 |
| 95 + 98 | 116 |
| 85 + 41 | 97 |
| 84 + 84 | 78 |
| 84 + 27 | 59 |
| 83 + 70 | 40 |
| 83 + 13 | 21 |

HIGH OVERBREAK AREAS TO BE FILLED WITH GROUT

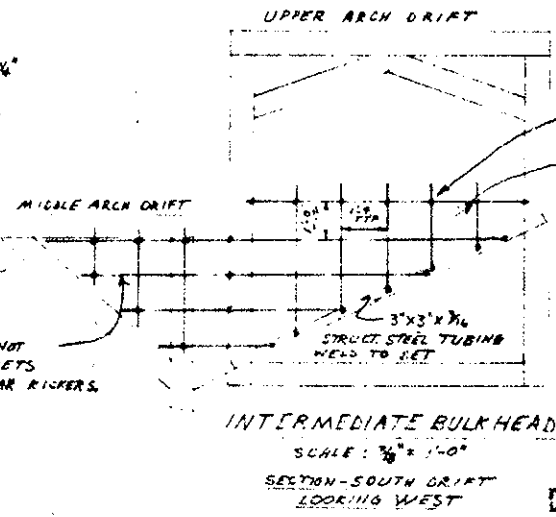
| BETWEEN SET NOS | NORTH | SOUTH |
|-----------------|-------|-------|
| 12-13 | | 9-10 |
| 28-29 | | 18-19 |
| | | 22-23 |

GROUT PIPES TO BE INSTALLED FROM HIGH POINT INTO GRAVEL

| SET NO. NORTH | SET NO. SOUTH |
|---------------|---------------|
| 24 | 48 |
| 24 | 48 |
| 45 | 67 |
| 67 | 105 |
| 90 | 128 |
| 106 | |
| 135 | |
| 139 | |



SECTION-NORTH DRIFT
 LOOKING EAST
 NOTE: SOUTH DRIFT SIMILAR EXCEPT OPPOSITE HAND
 SCALE: 3/8" = 1'-0"



INTERMEDIATE BULK HEAD
 SCALE: 3/8" = 1'-0"
 SECTION-SOUTH DRIFT
 LOOKING WEST

REVIEWED
 DATE 3/1/78
 BY [Signature]

Approved [Signature]

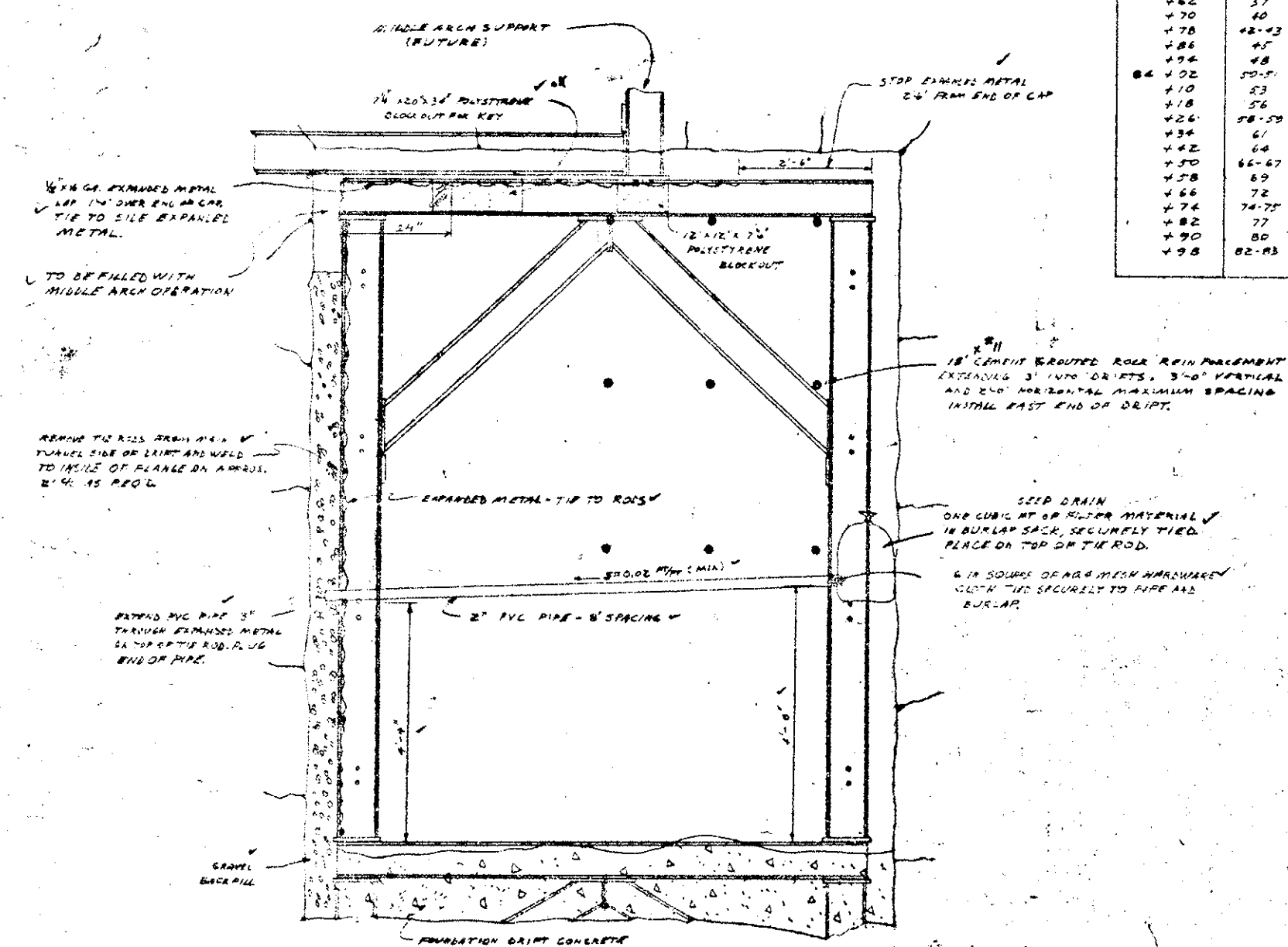
| | | |
|---|-----------------------------|------------------|
| 24-176 | VARIOUS CHANGES & ADDITIONS | DRS |
| REV. NO. | DATE | REVISION |
| PETER KIEWIT SONS' CO. and BROWN & ROOT, INC. | | |
| SCALE | DATE 2/1/78 | DRN BY GWC |
| Eisenhower Memorial Tunnel | | |
| UPPER ARCH DRIFT CONG. BACKFILL | | DRAWING NO. 2028 |

SEEP DRAIN PLACEMENT ✓

A - ANEAL SIDE OF SET
 B - BEHIND SIDE OF SET
 BET - CENTRAL BETWEEN SETS

| STATION | SET | STATION | SET |
|---------|-----------|---------|-------------|
| 82 + 58 | 2-3 BET | 85 + 06 | 85 A |
| + 66 | 5 A | + 14 | 88 B |
| + 74 | 8 B | + 22 | 90-91 BET |
| + 82 | 10-11 BET | + 30 | 93 A |
| + 90 | 13 A | + 38 | 96 A |
| + 98 | 16 B | + 46 | 98-99 BET |
| 93 + 06 | 18-19 BET | + 54 | 101 A |
| + 14 | 21 A | + 62 | 104 B |
| + 22 | 24 B | + 70 | 106-107 BET |
| + 30 | 26-27 BET | + 78 | 109 A |
| + 38 | 29 A | + 86 | 112 B |
| + 46 | 32 B | + 94 | 114-115 BET |
| + 54 | 34-35 BET | 86 + 02 | 117 A |
| + 62 | 37 A | + 10 | 120 B |
| + 70 | 40 B | + 18 | 122-123 BET |
| + 78 | 42-43 BET | + 26 | 125 A |
| + 86 | 45 A | + 34 | 128 B |
| + 94 | 48 B | + 42 | 130-131 BET |
| 84 + 02 | 50-51 BET | + 50 | 133 A |
| + 10 | 53 A | + 58 | 136 B |
| + 18 | 56 B | + 66 | 138-139 BET |
| + 26 | 58-59 BET | + 74 | 141 A |
| + 34 | 61 A | + 82 | 144 B |
| + 42 | 64 B | + 90 | 146-147 BET |
| + 50 | 66-67 BET | + 98 | 149 A |
| + 58 | 69 A | 87 + 06 | 152 B |
| + 66 | 72 B | + 14 | 154-155 BET |
| + 74 | 74-75 BET | + 22 | 157 A |
| + 82 | 77 A | + 30 | 160 B |
| + 90 | 80 B | + 38 | 162-163 BET |
| + 98 | 82-83 BET | + 46 | 165 A |
| | | + 54 | 168 B |

- ### NOTES:
- 1- INSTALL 18" CEMENT GROUTED ROCK REINFORCEMENT, LEAVING 3' PROJECTING INTO DRIFT.
 - 2- REMOVE COLLAR BRACES.
 - 3- REMOVE TIE RODS ON MAIN TUNNEL SIDE OF DRIFT, WELD TIE RODS TO INSIDE OF FLANGE AS SHOWN ON APPROX. 2' OC SPACING AS REQ'D.
 - 4- INSTALL EXPANDED METAL-MAIN TUNNEL SIDE ONLY OF CAP.
 - 5- INSTALL BLOCKOUTS FOR KEY AND BOLT HOLE PROTECTION.
 - 6- BACKFILL BEHIND EXPANDED METAL WITH GRAVEL.
 - 7- INSTALL BURLAP SACK OF FILTER MATERIAL ON TOP OF TIE ROD AS SHOWN. INSTALL 2" PVC PIPES AS SHOWN. THE OUTLET END TO TIE ROD, PLUS END OF DRIFT.
 - 8- CLEAN INVERT TO FOUNDATION DRIFT CONCRETE.
 - 9- BACKFILL DRIFT WITH T-4 CONCRETE. PLACEMENT OF CONCRETE WILL BE CONTINUOUS UNTIL COMPLETE.
 - 10- IF CONCRETE PLACEMENT MUST BE SUSPENDED, JOINT WILL BE MADE USING A 3 TO 4 FOOT HIGH EXPANDED METAL & REBAR VERTICAL BULKHEAD.
 - 11- INSTALL 6" x 11" OR LARGER DOMES 6'0" LONG IN THE VERTICAL BULKHEAD. SIMILAR DOMES WILL BE INSTALLED ON THE SLOPING JOINT @ 4-6' OC AS DIRECTED BY THE ENGINEER.



SECTION NORTH DRIFT
 LOOKING WEST ✓

NOTE: SOUTH DRIFT SIMILAR EXCEPT OPPOSITE HAND

REVIEWED
 DATE: 7-28-79
 BY: [Signature]

Approved: [Signature]

| | | |
|----------|------|----|
| REV. NO. | DATE | BY |
| | | |
| | | |

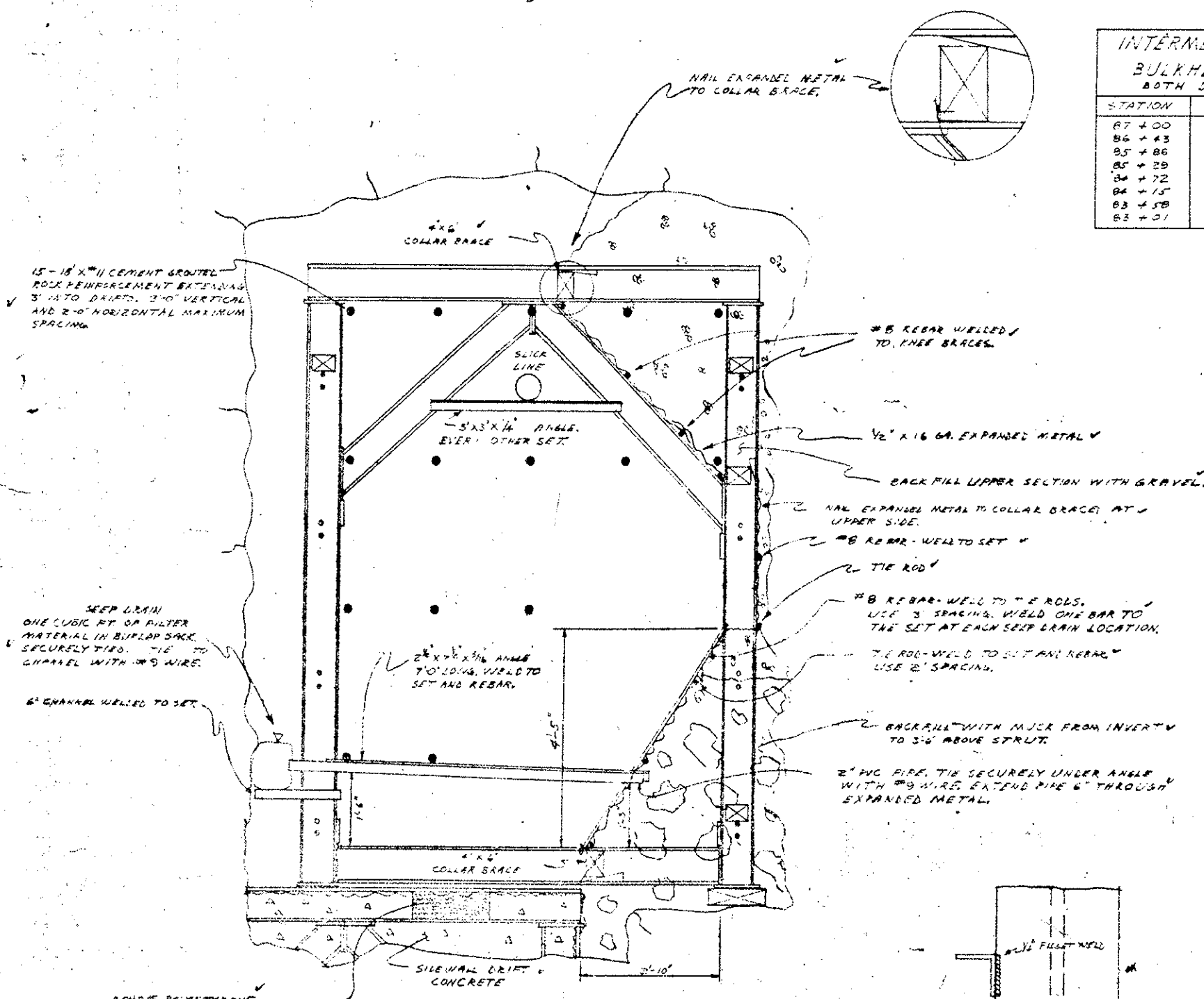
ENGINEER: [Signature]

SEEP DRAIN PLACEMENT
 E - EAST SIDE OF SET
 W - WEST SIDE OF SET
 B - CENTERED BETWEEN SETS

| STATION | SET | STATION | SET |
|---------|------|---------|-----------|
| 82 + 50 | 2 W | 85 + 05 | 85 W |
| + 65 | 5 | + 14 | 88 |
| + 74 | 8 | + 23 | 91 |
| + 83 | 11 | + 29 | 93 |
| + 89 | 13 | + 38 | 96 |
| + 98 | 16 | + 47 | 99 |
| 83 + 07 | 19 | + 53 | 101 |
| + 13 | 21 | + 62 | 104 |
| + 22 | 24 | + 71 | 107 |
| + 31 | 27 | + 77 | 109 |
| + 37 | 29 | + 86 | 112 |
| + 46 | 32 | + 95 | 115 |
| + 55 | 35 | 86 + 01 | 117 |
| + 61 | 37 | + 10 | 120 |
| + 70 | 40 | + 19 | 123 |
| + 79 | 43 | + 25 | 125 |
| + 85 | 45 | + 34 | 128 |
| + 94 | 48 | + 43 | 131 |
| 84 + 03 | 51 | + 49 | 133 W |
| + 09 | 53 | + 58 | 136 E |
| + 18 | 56 | + 67 | 139 E |
| + 27 | 59 | + 73 | 141 E |
| + 33 | 61 | + 82 | 144 W |
| + 42 | 64 | + 91 | 147 E |
| + 51 | 67 | + 97 | 149 E |
| + 57 | 69 | 87 + 06 | 152 E |
| + 66 | 72 | + 15 | 155 E |
| + 75 | 75 | + 21 | 157 E |
| + 81 | 77 | + 30 | 160 W |
| + 90 | 80 | + 38 | 162-163 B |
| + 99 | 83 W | + 45 | 165 E |
| | | + 54 | 168 W |

INTERMEDIATE BULKHEADS BOTH DRIFTS

| STATION | SET |
|---------|-----|
| 87 + 00 | 150 |
| 86 + 43 | 131 |
| 85 + 86 | 112 |
| 85 + 29 | 93 |
| 84 + 72 | 74 |
| 84 + 15 | 55 |
| 83 + 58 | 36 |
| 83 + 01 | 17 |



15-18" X 11" CEMENT GROUTED ROCK REINFORCEMENT EXTENDING 3' INTO DRIFT, 3'-0" VERTICAL AND 2'-0" HORIZONTAL MAXIMUM SPACING.

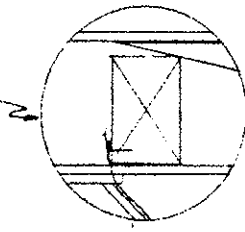
SEEP DRAIN ONE CUBIC FT. OF FILTER MATERIAL IN BUFLAP BAG, SECURELY TIED TO CHANNEL WITH #9 WIRE.

6" CHANNEL WELDED TO SET.

REMOVE POLYSTYRENE BLOCKOUT FROM SIDEWALL DRIFT.

SECTION-NORTH DRIFT

LOOKING EAST
 NOTE: SOUTH DRIFT SIMILAR EXCEPT OPPOSITE HAND



NAIL EXPANDED METAL TO COLLAR BRACE.

#8 REBAR WELDED TO KNEE BRACES.

1/2" X 16 GA. EXPANDED METAL

BACK FILL UPPER SECTION WITH GRAVEL.

2" NAIL EXPANDED METAL TO COLLAR BRACE AT UPPER SIDE.

#8 REBAR - WELD TO SET

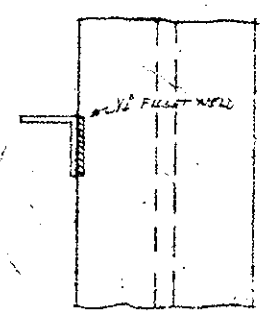
TIE ROD

#8 REBAR - WELD TO TIE RODS, USE 3" SPACING. WELD ONE BAR TO THE SET AT EACH SEEP DRAIN LOCATION.

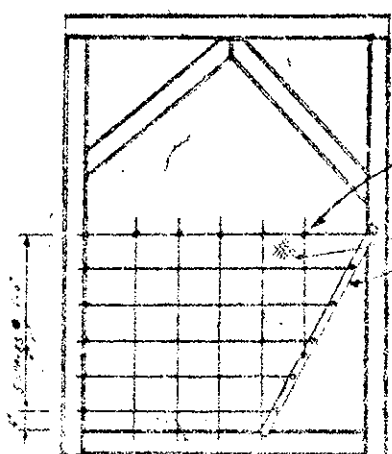
TIE ROD - WELD TO SET AND REBAR, USE 2" SPACING.

BACK FILL WITH MUCK FROM INVERT TO 3'-6" ABOVE STRUT.

2" PVC PIPE, TIE SECURELY UNDER ANGLE WITH #9 WIRE, EXTEND PIPE 6" THROUGH EXPANDED METAL.



ANGLE DETAIL
 NO SCALE



WELD HORIZONTAL BARS TO SET AND TUBING TO VERTICAL BARS ON CONCRETE SIDE OR HORIZONTAL BARS TO TOP HORIZONTAL BAR. USE #8 WIRE TO HOLD #8 WIRE. EXPANDED METAL.
 30x30x1/4 STRUCTURAL TUBING, WELD TO SET.

NOTES

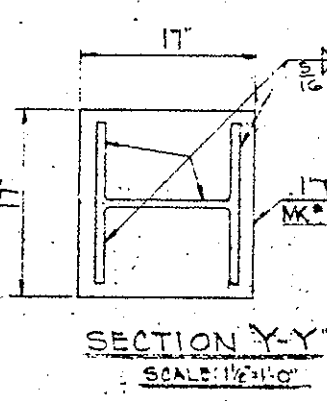
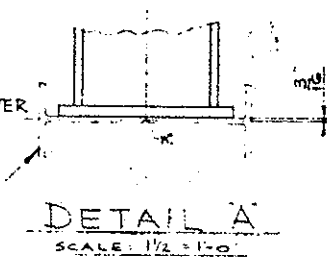
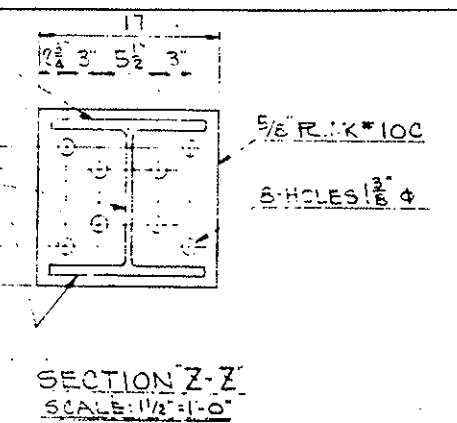
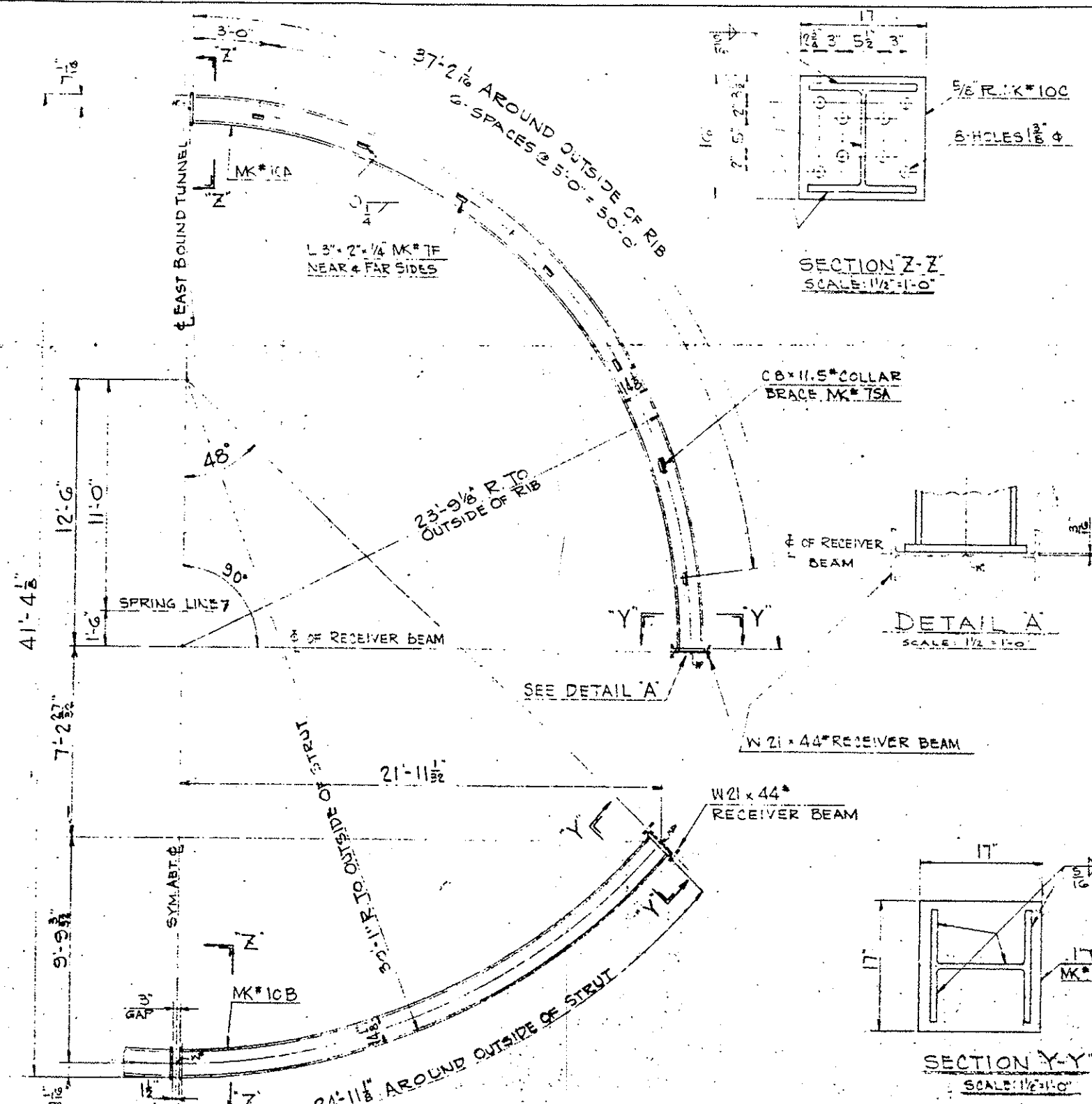
- 1- INSTALL 18" X 11" CEMENT GROUTED ROCK REINFORCEMENT, LEAVING 3' PROJECTING INTO DRIFT.
- 2- REMOVE THE 4" WELLS TO ROSS AND COLLAR BRACES AND THE LOWER DRIFT TO 150% OF SET, LEAVING THE OTHER LOWER AND UPPER ONES IN PLACE.
- 3- INSTALL REBAR AND TIE RODS FOR LOWER EXPANDED METAL SUPPORT. INSTALL EXPANDED METAL UP 4' AND BACK FILL WITH MUCK FROM THE INVERT, REMOVING FOAM BLOCKOUT FROM INVERT.
- 4- INSTALL REMAINING REBAR AND EXPANDED METAL. BACK FILL WITH GRAVEL.
- 5- WELD SLICK LINE SUPPORT ANGLE APPROX. 2' BELOW CHAIR.
- 6- INSTALL CHANNEL SUPPORT AND BURLAP BACK OR FILTER MATERIAL AND SEEP DRAIN. INSTALL ANGLE SUPPORT AND PVC PIPE AS PER SCHEDULE.
- 7- BACK FILL DRIFT WITH 7-4 CONCRETE. PLACEMENT OF CONCRETE WILL BE CONTINUOUS UNTIL COMPLETED.
- 8- INSTALL #8 REBAR AND EXPANDED METAL VERTICAL BULKHEADS PER SCHEDULE.
- 9- IF CONCRETE PLACEMENT MUST BE SUSPENDED, INSTALL 6'-0" OR LONGER BARS 6'-0" LONG IN THE BULKHEAD. SIMILAR BARS WILL BE PLACED ON THE SLOPING JOINT @ 4'-0" SIG. OR AS DIRECTED BY THE ENG. DESIG.
- 10- SEEP DRAIN LOCATIONS COINCIDE WITH THOSE IN THE SIDEWALL DRIFTS.

REVIEWED
 DATE 11-4-73
 BY [Signature]

INTERMEDIATE BULKHEAD

| | | |
|--|------|----------|
| REV. NO. | DATE | REVISION |
| 1 | | REVISION |
| PETER KROVATSKY CIVIL ENGINEER 1111 1/2 ST. N. W. WASHINGTON, D.C. 20004 (202) 331-1111 | | |

| | | | |
|----------|----------|----------------------|------|
| SECTION | MARK NO. | OPERATION | DATE |
| W14 x 95 | 10A | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10B | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10C | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10D | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10E | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10F | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10G | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10H | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10I | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10J | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10K | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10L | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10M | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10N | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10O | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10P | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10Q | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10R | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10S | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10T | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10U | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10V | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10W | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10X | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10Y | CUT TO LG TH. 24" W/ | |
| W14 x 95 | 10Z | CUT TO LG TH. 24" W/ | |



Approved: [Signature]

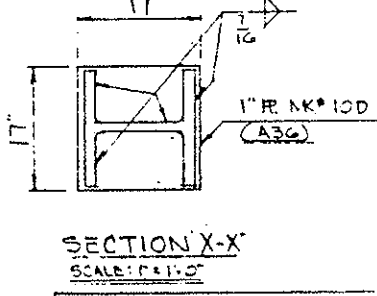
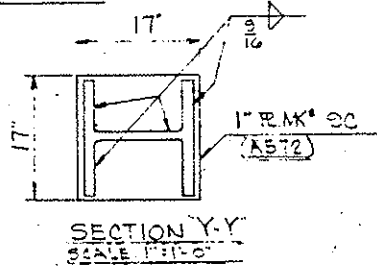
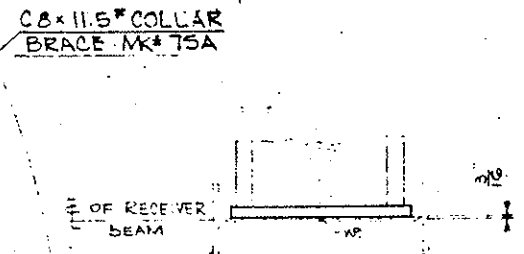
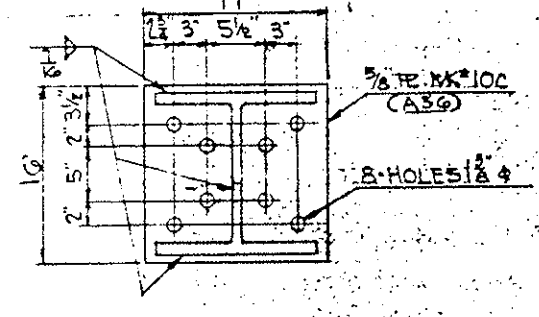
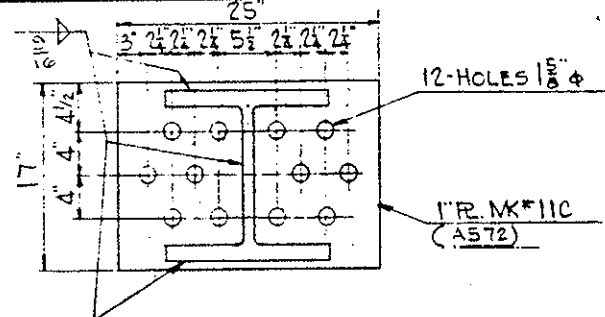
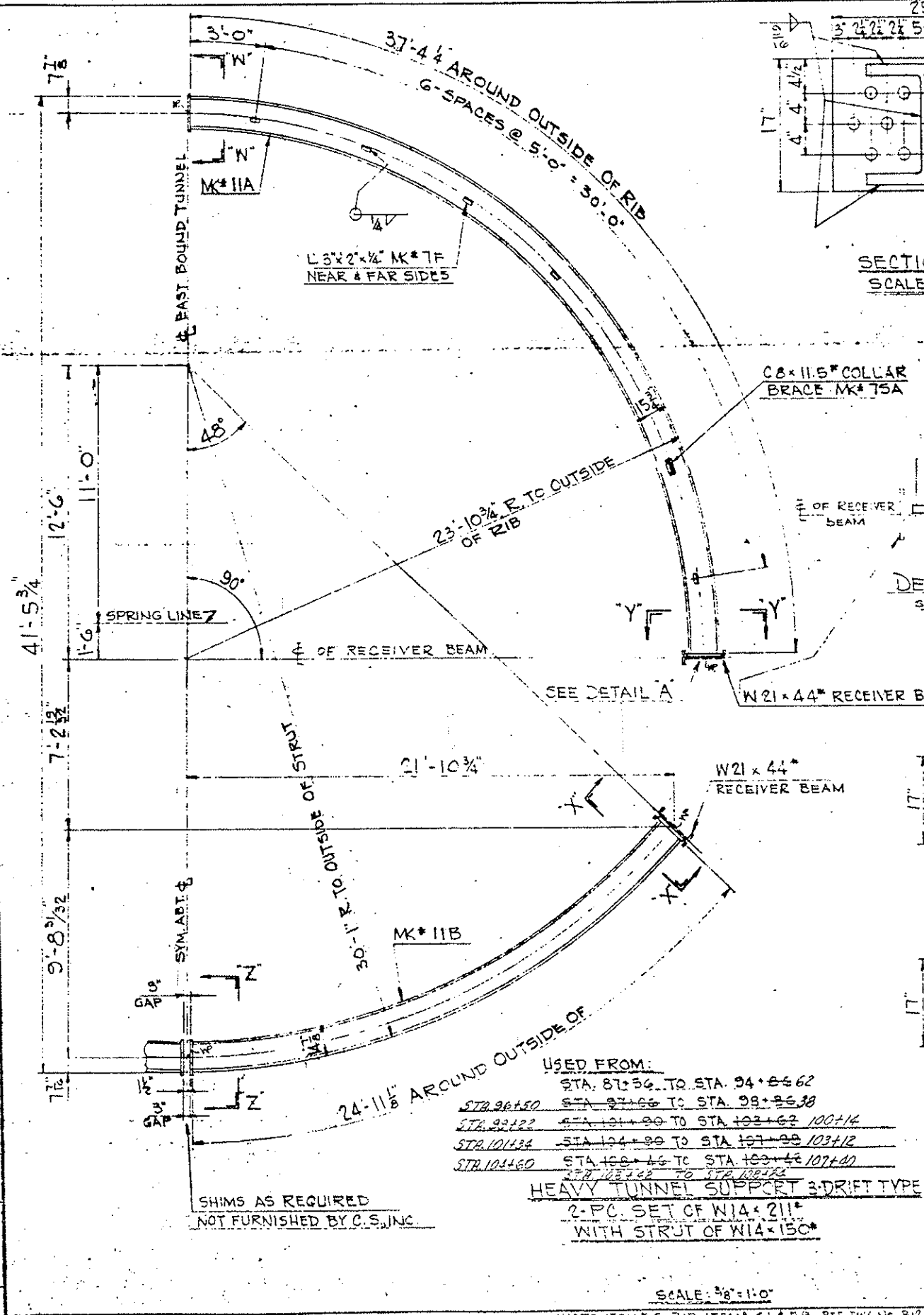
| | | | | | | |
|-----------------------------|-----------------|---------------------------------|---------------------------------|-----|----------------------------------|------|
| 11.2 | .10 | | 11.2 | 112 | STD. FLAT WASHERS FOR 3/4\" | A507 |
| 7.8 | .14 | | | | 50\" | |
| 20.7 | .31 | | 20.5 | | 56\" | |
| G27.2 | 24.8 | D5-559-5AAB-007 | 27.2 | TSA | 14\" | |
| TOTAL WT. FOR COLLAR BRACES | | | TOTAL PAY MT. PER COLLAR BRACES | | | |
| 666.9# | | | 667.5# | | | |
| 2.1 | .15 | | 2.1 | 16 | LOAD INDICATOR WASHERS FOR 1/2\" | A325 |
| 2.2 | .14 | | | 16 | HARDED STEEL WASHERS FOR 1/2\" | |
| 12.6 | .79 | | 33.9 | 16 | 1/4\" | |
| 28.2 | 1.76 | | | 16 | 1/4\" | |
| 81.8 | D5-559-5AAB-010 | 81.8 | 100 | | 1\" | A36 |
| 48.2 | | 48.2 | 100 | | 1\" | |
| 237.1 | | 237.4 | | | 1\" | |
| A302.4 | A451.2 | 488.4 | 100 | 2 | STRUT ASSYS. EA CONSISTING OF | |
| 19 | -001 | 20.6 | TF | | 1\" | |
| 81.8 | -010 | 81.9 | 100 | | 1\" | |
| 48.2 | | 48.2 | 100 | | 1\" | |
| 81.8 | | 831.2 | | | 1\" | |
| 1201.6 | 1301.9 | 1178.3 | 10A | 2 | ARCH RIB ASSYS. EA CONSISTING OF | |
| TOTAL WT. FOR COLLAR BRACES | | TOTAL PAY MT. PER COLLAR BRACES | | | | |
| 12,148.5# | | 12,148.5# | | | | |

USED FROM:
 STA. 94+66 TO STA. 96+66 STR. 107+44 TO STR. 108+44
 STA. 96+66 TO STA. 99+78 STR. 108+44 TO STR. 109+42
 STA. 99+78 TO STA. 102+80
 STA. 102+80 TO STA. 105+82
 STA. 105+82 TO STA. 108+42

LIGHT TUNNEL SUPPORT 3-DRIFT TYPE
 2-PC. SET OF W14 x 95 WITH STRUT

APPROVED FINAL
 DATE 3/26/72
 BY Jack E. Day
 APPROVED FINAL
 DATE 8-26-72 BY Jack E. Day

| | | | | |
|-----------------|----------|-----------------|---------|-------|
| SECTION | MARK NO. | OPERATION | CUT | LOTH. |
| W14 x 150 # 11B | | CUT TO LG. TH. | 24" 10" | |
| W14 x 211 # 11A | | BUTT TO LG. TH. | 36" 3" | |
| | | TRIM ENDS | | |
| | | ASSEMBLY | | |



Approved: H. Ray Palmer

| | | | | | | | |
|-----------------------------|---------|---------------------------|--------------------------|-----------------------------|----------|--------------------------------------|------------------------------------|
| 11.2 | 10 | | | 11.2 | 112 | ST'D. FLAT WASHERS FOR 3/4\" | A307 |
| 7.8 | 14 | | | | | 56 3/4\" | 59 T.L. NUTS |
| 20.7 | 57 | | | 395 | | 59 3/4\" | 2\" EQ. HD. T.L. BOLTS |
| 277.2 | 44.8 | 559-5AAB-007 | | 75A | 14 | 8 x 11.5\" | COLLAR BRACES |
| TOTAL WT. FOR COLLAR BRACES | | 563.3# | | TOTAL WT. FOR COLLAR BRACES | | 667.0# | |
| 2.5 | 11 | | | | | 12 | HARDENED STEEL WASHERS FOR 1/2\" |
| 15.7 | 151 | | | 50.8 | | 12 | 1/2\" HI STRENGTH NUTS |
| 35.5 | 321 | | | | | 12 | 1/2\" x 1/4\" HI STRENGTH BOLTS |
| 1.0 | 13 | | | 1.0 | | 8 | LOAD INDICATOR WASHERS FOR 1/2\" |
| 1.1 | 14 | | | | | 8 | HARDENED STEEL WASHERS FOR 1/2\" |
| 6.3 | 78 | | | 17.0 | | 8 | 1/2\" HI STRENGTH NUTS |
| 14.1 | 176 | | | | | 8 | 1/2\" x 3/8\" HI STRENGTH BOLTS |
| | | 819 | 10D | | | 1 | 1\" x 17\" x 17\" END PLATE |
| | | 482 | 10C | | | 1 | 5/8\" x 16\" x 17\" BUTT PLATE |
| | | 3650.3 | | | | 1 | W14 x 150\" x 24\" A307 NNA |
| | | 5780.9 | 11B | 2 | | | STRUT ASSYS. EA. CONSISTING OF: |
| 1.9 | -007 | 266 | 7F | | | 14 | L3 x 2 x 1/2\" x 5 1/2\" LG. |
| 8.9 | -011 | 819 | 9C | | | 1 | 1\" x 17\" x 17\" FOOT PLATE |
| 120.2 | | 1304 | 11C | | | 1 | 1\" x 17\" x 25\" BUTT PLATE |
| 162.1 | | 7442.2 | | | | 1 | W14 x 211\" x 36\" x 3 1/2\" NNA |
| 2759.0 | 113 | 7872.1 | 11A | 2 | | | ARCH RIB ASSYS. EA. CONSISTING OF: |
| TOTAL WT. | NET WT. | DRAWING NO. | TOTAL PAY WT. PER COURSE | MARK NO. | NO. ACC. | DESCRIPTION | |
| 23,447.2# | | COURSE 1155 COLLAR BRACES | 23,447.2# | | | MATERIAL REQUIRED PER COURSE OF RIBS | |

APPROVED FINAL
 DATE 3/26/77
 BY *H. Ray Palmer*

USED FROM:
 STA. 87+56 TO STA. 94+86 62
 STA. 97+66 TO STA. 98+86 38
 STA. 101+34 TO STA. 101+80 TO STA. 102+62 100+14
 STA. 104+60 TO STA. 107+00 103+12
 STA. 108+16 TO STA. 109+48 107+40
 STA. 109+32 TO STA. 109+32

HEAVY TUNNEL SUPPORT 3-DRIFT TYPE
 2-PC SET OF W14 x 211\"
 WITH STRUT OF W14 x 150\"

SHIMS AS REQUIRED
 NOT FURNISHED BY C.S., INC.

SCALE: 3/8\" = 1'-0\"
 QUOTE ITEM # C. BID ITEM # G. L. 59 REF. DWG. NO. 812

COMMERCIAL SHAPING, INC.
 HEAVY TUNNEL SUPPORT 3-DRIFT TYPE
 EISENHOWER MEMORIAL TUNNEL
 2ND FLOOR, PO BOX 1103, CLEVELAND, OH 44101
 PETER KEMT, SONS CO. AND BRUNN & CO. INC.

D5-559-5AAB-XXI
 D5-559-5AAB-011

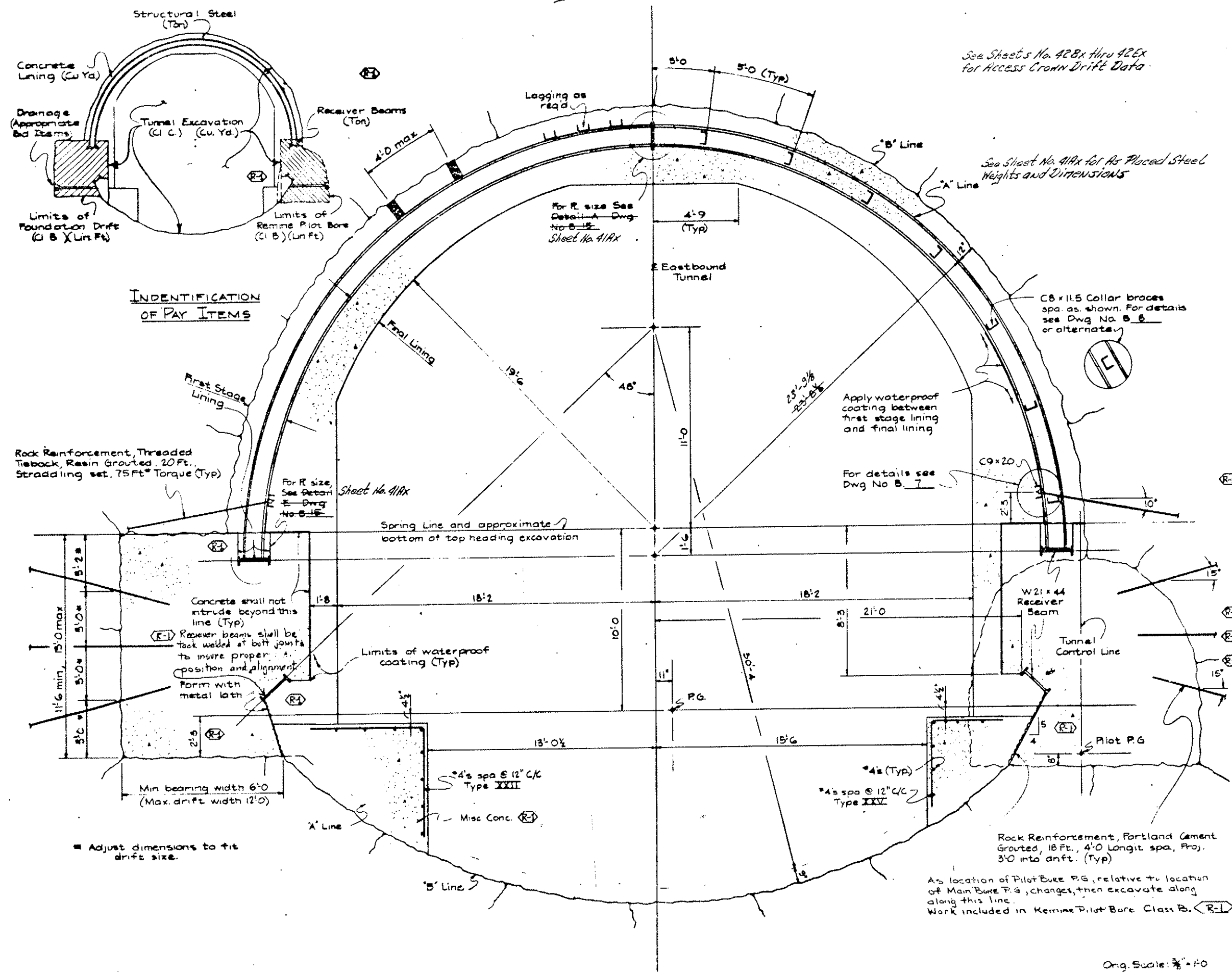
| | | | | |
|--------------|----------|-----------|-----------|--------------|
| PROJECT NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| 170-5(81)220 | 41 | 273 | | |

| REVISIONS | |
|---------------|---------|
| NO. REVISIONS | DATE |
| 1 | 5-29-72 |

- NOTES:**
- This support shall be used: Sta. 109+42 to Sta 118+50
 - Steel support - Arch W14x95, A36 @ 4'0" C/C
 - Concrete:
 - First stage lining Class T-1
 - Foundation drifts Class T-2
 - Final lining Seg S142 thru Seg S158 Class T-2
 - All other concrete Class T2(QMS)
 - Driving of the north foundation drift and raming of the Pilot Bore may be done simultaneously.
 - Any voids created between the surface of the drift concrete and the bench material shall be filled with approved material.
 - Top heading excavation shall not begin until all concrete placed in the drifts has reached a minimum compressive strength of 3000 p.s.i.
 - For reinforcing steel bending diagrams see Dwg. No. B-15

SUMMARY OF QUANTITIES - LIGHT 2 DRIFT

| Item | Description | Unit | Total |
|------|--|---------|---------|
| 211 | Tunnel Excavation (Class C) | Cu Yd | 53,458 |
| 211 | Rock Reinforcement, Portland Cement Grouted, (18 Foot) | Sq. Ft. | 103 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted, (20 Foot) | Sq. Ft. | 4311 |
| 211 | Foundation Drift (Class B) | Lin Ft. | 908 |
| 509 | Structural Steel (Misc) | Ton | 166.70 |
| 509 | Structural Steel (W14x95) | Ton | 216.52 |
| 515 | Waterproof Coating | Sq Yd | 3226.38 |
| 601 | Concrete, Class T-1, (First Stage Lining) | Cu Yd | 5276.12 |
| 601 | Concrete, Class T-2, (Final Lining) | Cu Yd | 6632.72 |
| 601 | Concrete, Class T-2, (Misc) | Cu Yd | 1868.66 |
| 602 | Reinforcing Steel | Ton | 11.02 |



| | |
|-------------|---------|
| DESIGNED BY | CDON |
| CHECKED BY | BR |
| DATE | 5-29-72 |

DIVISION OF HIGHWAYS

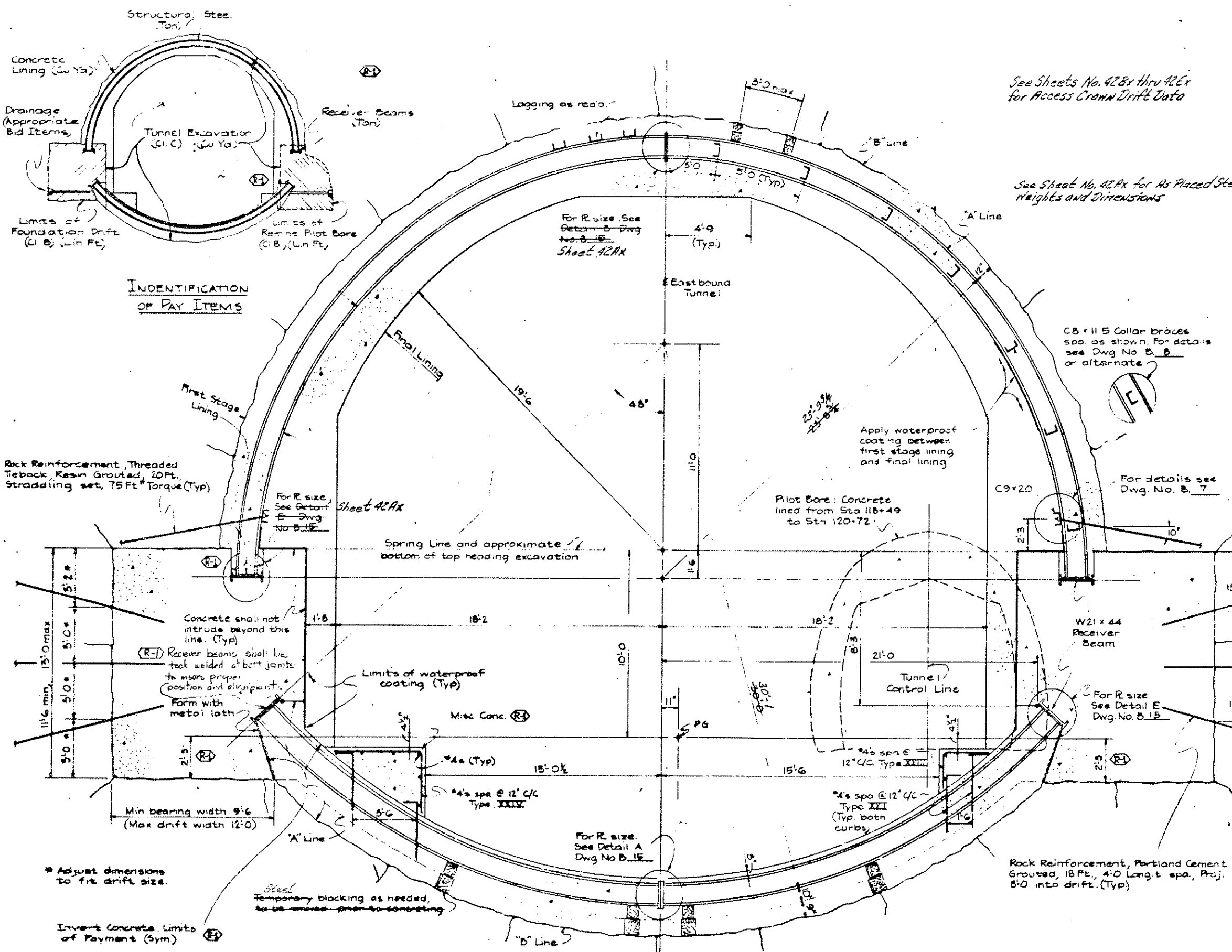
**LIGHT TUNNEL SUPPORT
 2 DRIFT TYPE
 REQUIRED SECTION,
 BASIS FOR BID**

| | | | |
|----------------|-----------|-----------|----------|
| Designer | C.D.O.-1 | Structure | F-15-Z |
| Detailer | B.R. Lane | Murphors | |
| Drawing Number | 15 | of 60 | Drawings |

Orig. Scale: 3/8" = 1'-0"

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|------------------------|-----------|--------------|
| XIII | COLORADO 170-3(81,220) | 42 | 273 |

| REVISIONS | | | |
|-----------|---------------------------|-----|--|
| 7-3-75 | Rev. Dimen. Quan. & Notes | BRL | |



See Sheets No. 42B thru 42E for Access Crown Drift Data

See Sheet No. 42A for As Placed Steel Heights and Dimensions

AS CONSTRUCTED

| | | | |
|--------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-29-77 | VOID |
|--------------|---------|---------|------|

- NOTES:**
- This support shall be used: Sta 118+50 to Sta 120+22
 - Steel support - Arch W4x136, A572, Grade 55 @ 5'0" C/C
Invert W4x95, A86 @ 4'0" C/C
 - Concrete:
First stage lining Class T-1
Foundation drifts Class T-2
Invert Class T-2
Final lining Seg S159 thru Seg S162 Class T-2
All other concrete Class T-2(Misc)
 - Driving of the north foundation drift and remaining of the Plot Bore may be done simultaneously.
 - Any voids created between the surface of the drift concrete and the bench material shall be filled with approved material.
 - Top heading excavation shall not begin until all concrete placed in the drifts has reached a minimum compressive strength of 5000 psi.
 - For reinforcing steel bending diagrams see Dwg. No. B 15.

| | | | |
|-------------|---------------|------------|------|
| DESIGNED BY | QUANTITIES BY | REVISED BY | DATE |
| C.D.H. | B.R.L. | J.V.A. | 4-75 |
| CHECKED BY | APPROVED BY | DATE | |
| B.R.L. | B.R.L. | 7-3-75 | |

SUMMARY OF QUANTITIES - HEAVY 2 DRIFT

| Item | Descriptions | Unit | Total |
|------|--|---------|----------|
| 211 | Tunnel Excavation (Class C) | CuYd | 10,287 |
| 211 | Rock Reinforcement, Portland Cement Grouted, (18 Feet) | Ea. | 267 |
| 211 | Rock Reinforcement, Threaded Tieback, Resin Grouted, (20 Feet) | Ea. | 330 |
| 211 | Foundation Drift (Class B) | Lin Ft. | 172 |
| 509 | Structural Steel (Misc) | Ton | 51.87 |
| 509 | Structural Steel (W4x95) | Ton | 107.96 |
| 509 | Structural Steel (W4x136) | Ton | 296.5 |
| 515 | Waterproof Coating | Sq Yd | 1,539.22 |
| 601 | Concrete, Class T-1, (First Stage Lining) | CuYd | 1,043.70 |
| 601 | Concrete, Class T-2, (Final Lining) | CuYd | 1,345.70 |
| 601 | Concrete, Class T-2, (Invert) | CuYd | 348.92 |
| 601 | Concrete, Class T-2, (Misc) | CuYd | 165.34 |
| 602 | Reinforcing Steel | Ton | 2 |

Includes 390 Tons of A572 Steel.

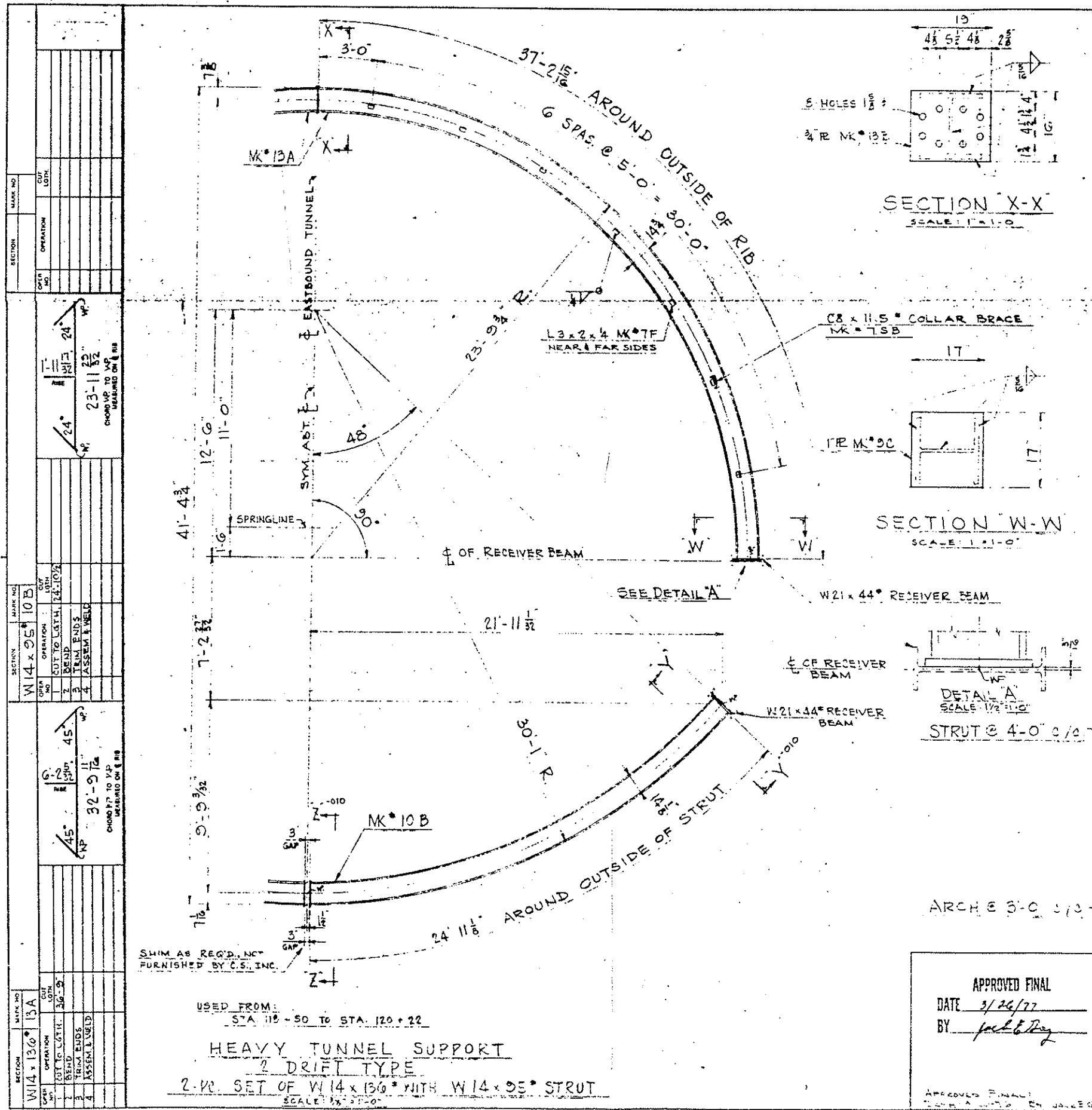
DIVISION OF HIGHWAYS

**HEAVY TUNNEL SUPPORT
2 DRIFT TYPE
REQUIRED SECTION,
BASIS FOR BID**

| | | | |
|----------------|--------|-----------|-------------|
| Designer | C.D.H. | Structure | F-15-X |
| Designer | B.R.L. | Number | |
| Drawing Number | B 14 | of | 60 Drawings |

Orig Scale: 3/8" = 1'-0"

| | | | | |
|---------------------------|------------|-------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | CALIFORNIA | 170 3 01120 | 42A X | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | REVISED | 6-29-79 | VOID | |

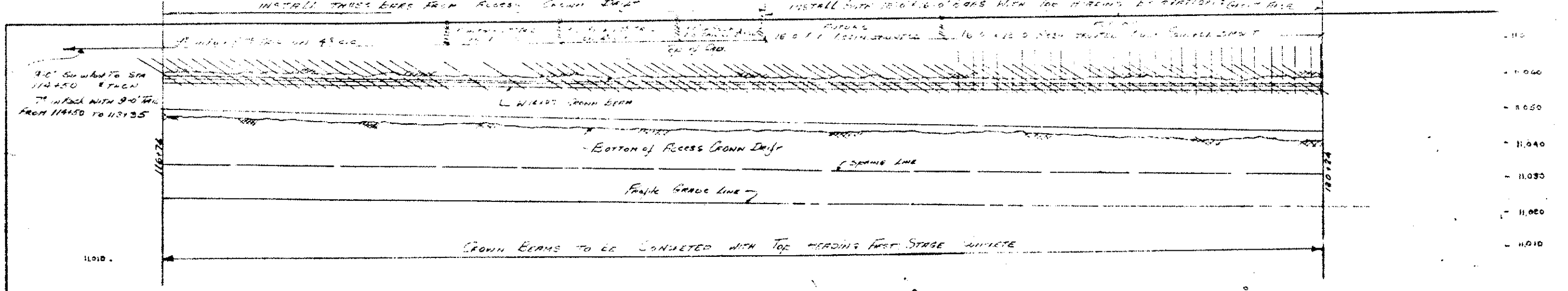


Approved: *H. Ray Patton Jr.*

| QTY | UNIT | DESCRIPTION | UNIT PRICE | TOTAL |
|----------|------|----------------------------------|------------|-------|
| 112 | | STD. FLAT WASHERS FOR 3/4\" | A307 | |
| 50 | | 3/4\" | | |
| 50 | | 3/4\" x 2\" SQ. HD. T.L. BOLTS | | |
| 400.2 | | DS-550-5AAB-007 | | |
| 33.3 | | DS-550-5AAB-007 | | |
| 14 | | C8 x 11.5\" | A36 | |
| 10 | | LOAD INDICATOR WASHERS FOR 1/4\" | A325 | |
| 11 | | HARDENED STEEL WASHERS FOR 1/4\" | | |
| 63 | | 1/2\" | | |
| 141 | | 1 1/2\" x 3/4\" | | |
| 17 | | HARDENED STEEL WASHERS FOR 1/2\" | A325 | |
| 10.5 | | 1/2\" | | |
| 23.8 | | 1/2\" x 3/4\" | | |
| 81.9 | | DS-550-5AAB-010 | | |
| 48.0 | | -010 | | |
| 332.1 | | -010 | | |
| 4.0024 | | -013 | | |
| 10 | | 1 1/2\" x 17\" x 17\" | A36 | |
| 81.9 | | 1 1/2\" x 17\" x 17\" | | |
| 64.5 | | 1 1/2\" x 16\" x 17\" | | |
| 431.3 | | 1 1/2\" x 16\" x 19\" | | |
| 10.75.4 | | 10\" | | |
| 26.6 | | 7F | | |
| 81.3 | | 9C | | |
| 64.5 | | 13B | | |
| 431.3 | | 10\" | | |
| 10.75.4 | | 13A | | |
| 15.175.7 | | BRACES | | |
| 15.175.7 | | MAT'L REQ'D. PER COURSE OF RIBS | | |
| 10 | | 1 1/2\" x 2\" x 4\" x 0-5 1/2\" | A36 | |
| 81.9 | | 1 1/2\" x 17\" x 17\" | | |
| 64.5 | | 1 1/2\" x 16\" x 19\" | | |
| 431.3 | | 10\" | | |
| 10.75.4 | | 13A | | |
| 26.6 | | 7F | | |
| 81.3 | | 9C | | |
| 64.5 | | 13B | | |
| 431.3 | | 10\" | | |
| 10.75.4 | | 13A | | |
| 15.175.7 | | BRACES | | |
| 15.175.7 | | MAT'L REQ'D. PER COURSE OF RIBS | | |

APPROVED FINAL
DATE 3/26/77
BY *J. Patton*

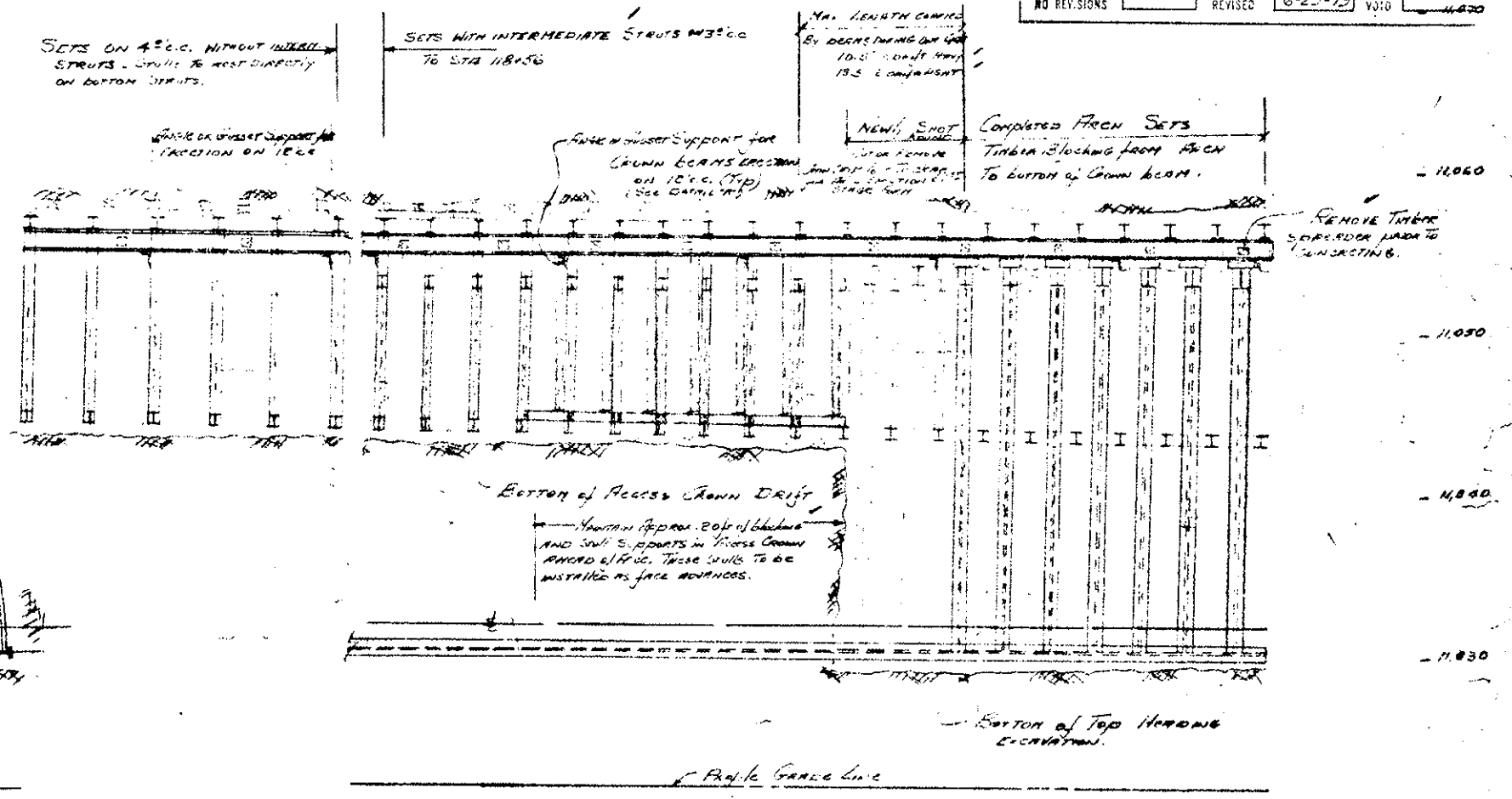
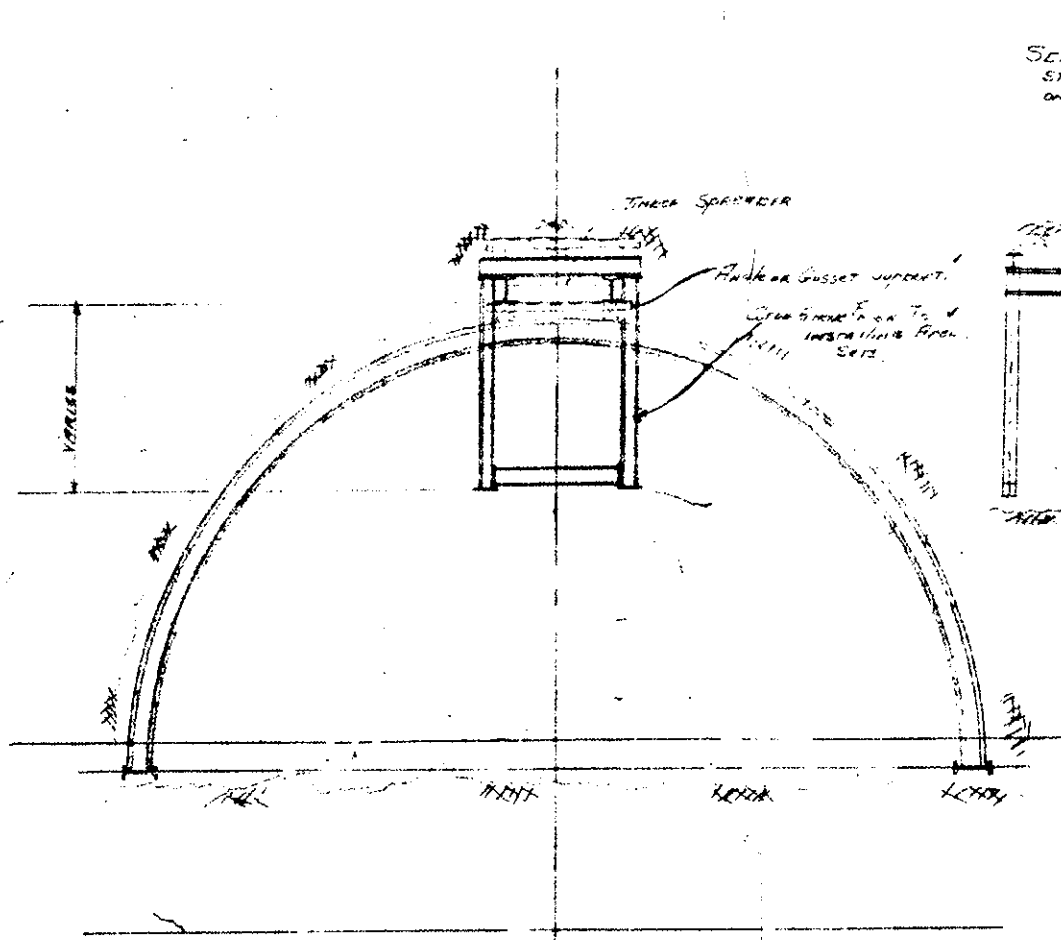
USED FROM:
STA 118 + 50 TO STA 120 + 22
HEAVY TUNNEL SUPPORT
2 DRIFT TYPE
2-PC SET OF W14 x 130 WITH W14 x 95 STRUT
SCALE: 1/4\"/>



| | | | | |
|---------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 179-3 (R) 229 | 428X | 273 |

| | | | |
|----------------|---------|---------|------|
| AS CONSTRUCTED | | | |
| NO REVISIONS | REVISED | 6-29-79 | VOID |

PROFILE of Access Crown Drift
 AREA of No Backfill
 STA 11074 - STA 12024
 SCALE 1" = 15'



SECTION
 Scale 1" = 8'0"

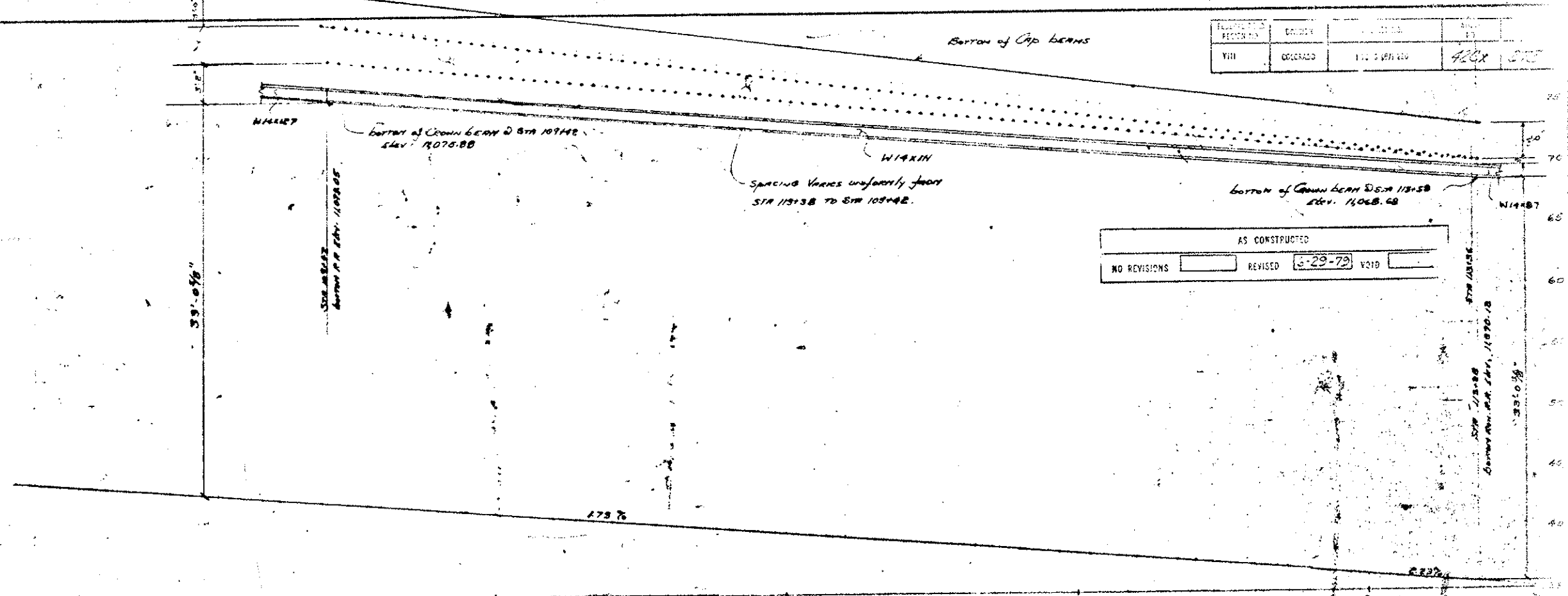
ENLARGED PROFILE
 Scale 1" = 5'0"

Approved, *H. Ray Paulsen Jr.*

REVIEWED
 DATE 4/23/77
 BY Jack E. Day

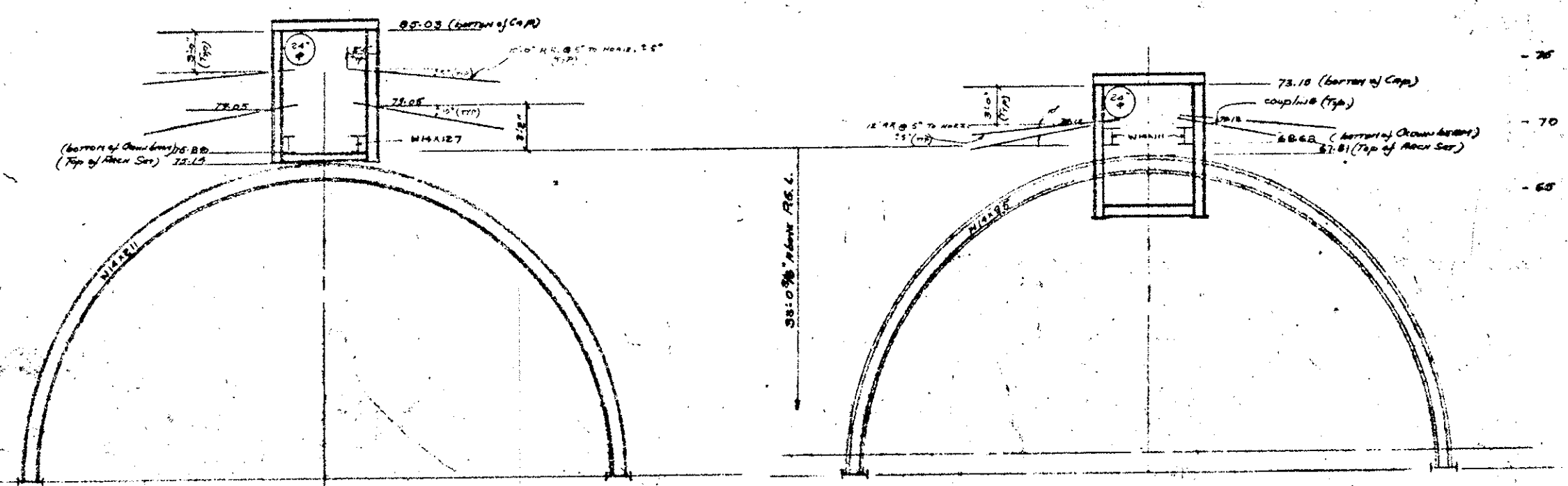
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|---|------|----------|------------------|
| REV NO. | DATE | REVISION | BY |
| PETER KIEWIT SONS' CO. and BROWN & ROOT, INC. | | | |
| Eisenhower Memorial Tunnel | | | |
| ACCESS DOWN DRIFT FROM STA 11074 - STA 12024 | | | DRAWING NO. 5033 |

| | | | |
|----------|---------|--------------|----------|
| PLANNING | DESIGN | CONSTRUCTION | AS BUILT |
| VIII | COVERED | 11/13/76 | 4/20/77 |



| | |
|----------------|-----------------|
| AS CONSTRUCTED | |
| NO REVISIONS | REVISED 3-29-79 |

Profile
 Scales: Horizontal: 1" = 20'
 Vertical: 1" = 5'



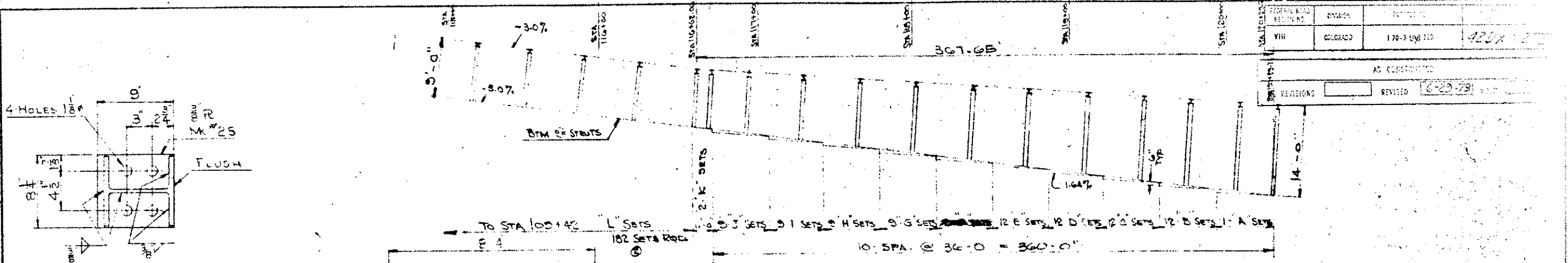
SECTION AT STA 109+42
 Typical True Crown Drift, R.P.
 Scale: 1" = 5'

SECTION AT STA 113+58
 Reinforcing of Crown Side Rock Reinforcement
 Scale: 1" = 5'

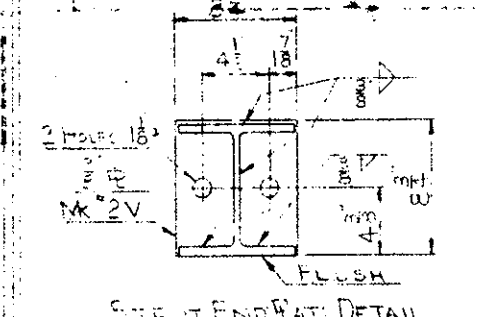
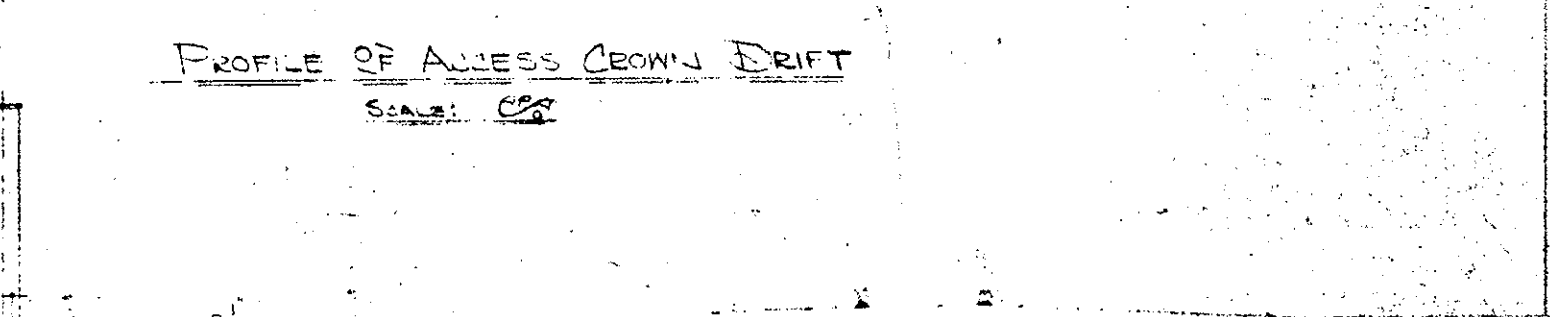
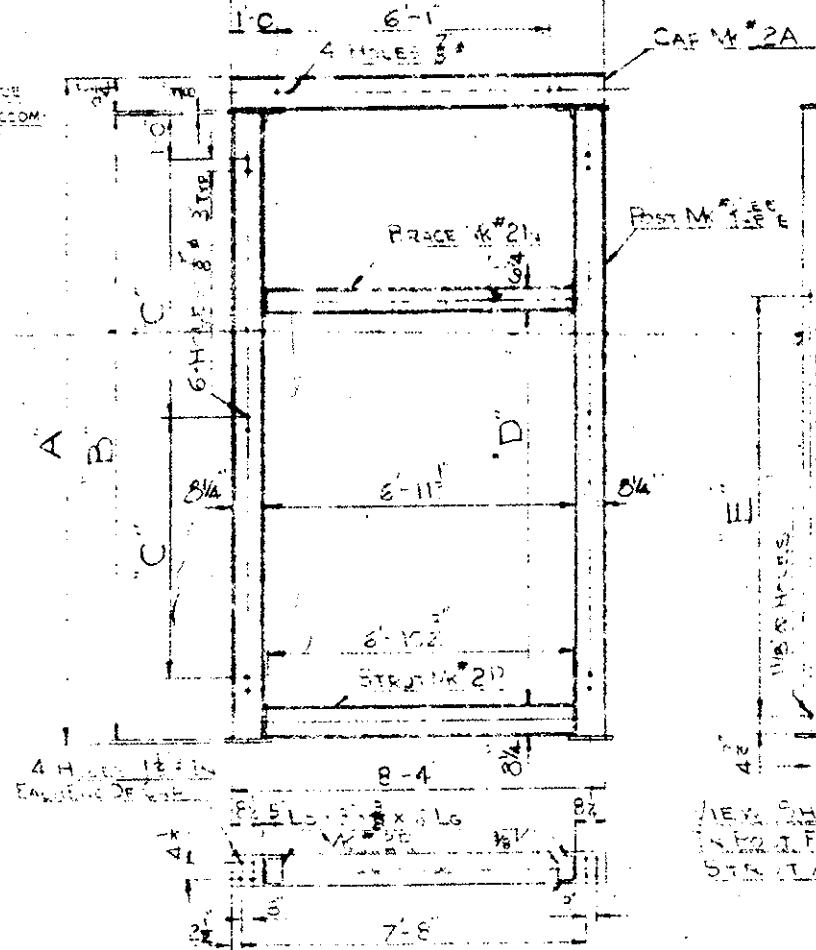
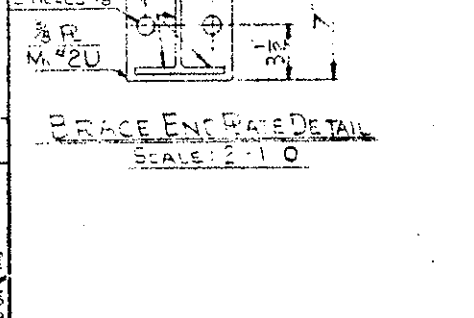
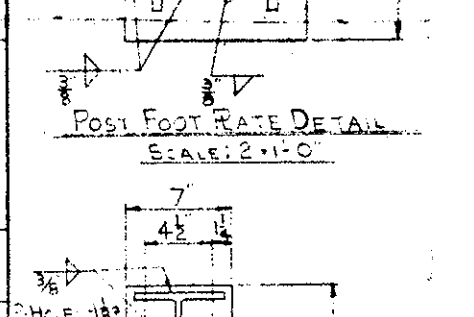
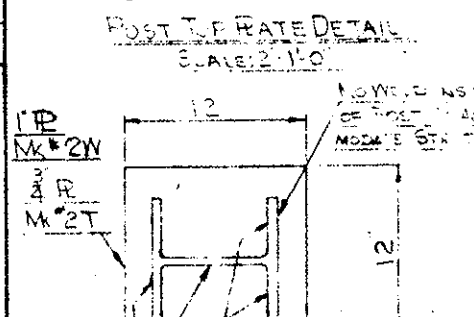
APPROVED FINAL
 DATE 8-12-76
 BY [Signature]
 Approved R.A. [Signature]

| | | |
|--|------|----------|
| REV. NO. | DATE | REVISION |
| | | |
| PETER KIEWIT SONS' CO. BROWN & ROOT, INC. | | |
| Eisenhower Memorial Tunnel | | |

| | | | | |
|---------|----------|------|-----------|----|
| SECTION | MARK NO. | DATE | OPERATION | BY |
| W8 x 20 | 2N | | CUT | |
| W8 x 20 | 2M | | ASSEMBLY | |
| W8 x 20 | 2L | | ASSEMBLY | |
| W8 x 20 | 2K | | ASSEMBLY | |
| W8 x 20 | 2J | | ASSEMBLY | |
| W8 x 20 | 2H | | ASSEMBLY | |
| W8 x 20 | 2G | | ASSEMBLY | |
| W8 x 20 | 2F | | ASSEMBLY | |
| W8 x 20 | 2E | | ASSEMBLY | |
| W8 x 20 | 2D | | ASSEMBLY | |
| W8 x 20 | 2C | | ASSEMBLY | |
| W8 x 20 | 2B | | ASSEMBLY | |
| W8 x 20 | 2A | | ASSEMBLY | |



| | |
|-----------|----------------|
| REVISIONS | AS CONSTRUCTED |
| REVISED | 6-23-79 |



| | | | | | | | |
|---------|----------|------|-----------|----|-----|-------|-----|
| SECTION | MARK NO. | DATE | OPERATION | BY | QTY | WT | VAL |
| W8 x 20 | 2N | | CUT | | 2 | 370.9 | |
| W8 x 20 | 2M | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2L | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2K | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2J | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2H | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2G | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2F | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2E | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2D | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2C | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2B | | ASSEMBLY | | 2 | 370.9 | |
| W8 x 20 | 2A | | ASSEMBLY | | 2 | 370.9 | |

| | | | | |
|-----|-----|----|--|-----|
| 14 | 488 | 16 | 3/4" S&TL NUTS (2 PER TIE ROD) | ABC |
| | | 2 | 3/4" x 10" LG TIE RODS (2 PER COURSE) | ABC |
| 15 | 131 | 12 | 1/2" x 3" HEX HD. T. L BOLTS & NUTS | ABC |
| 210 | 131 | 2 | 1/2" x 3" HEX HD. T. L BOLTS & NUTS | ABC |
| | | 2V | 2 1/2" x 8 1/4" x 3/8" END RATE | ABC |
| 76 | 559 | 2V | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| 210 | 231 | 2F | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2W | 1 1/2" x 12" x 12" FOOT RATE | ABC |
| 22 | 370 | 2W | 1 1/2" x 12" x 12" FOOT RATE | ABC |
| 148 | 370 | 2W | 1 1/2" x 12" x 12" FOOT RATE | ABC |
| | | 2E | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| 42 | 370 | 2E | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| 210 | 231 | 2E | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2A | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2B | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2C | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2D | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2E | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2F | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2G | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2H | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2I | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2J | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2K | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2L | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2M | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |
| | | 2N | 1 1/2" x 4 1/2" x 5-10 3/4" NNA EXTENS | ABC |

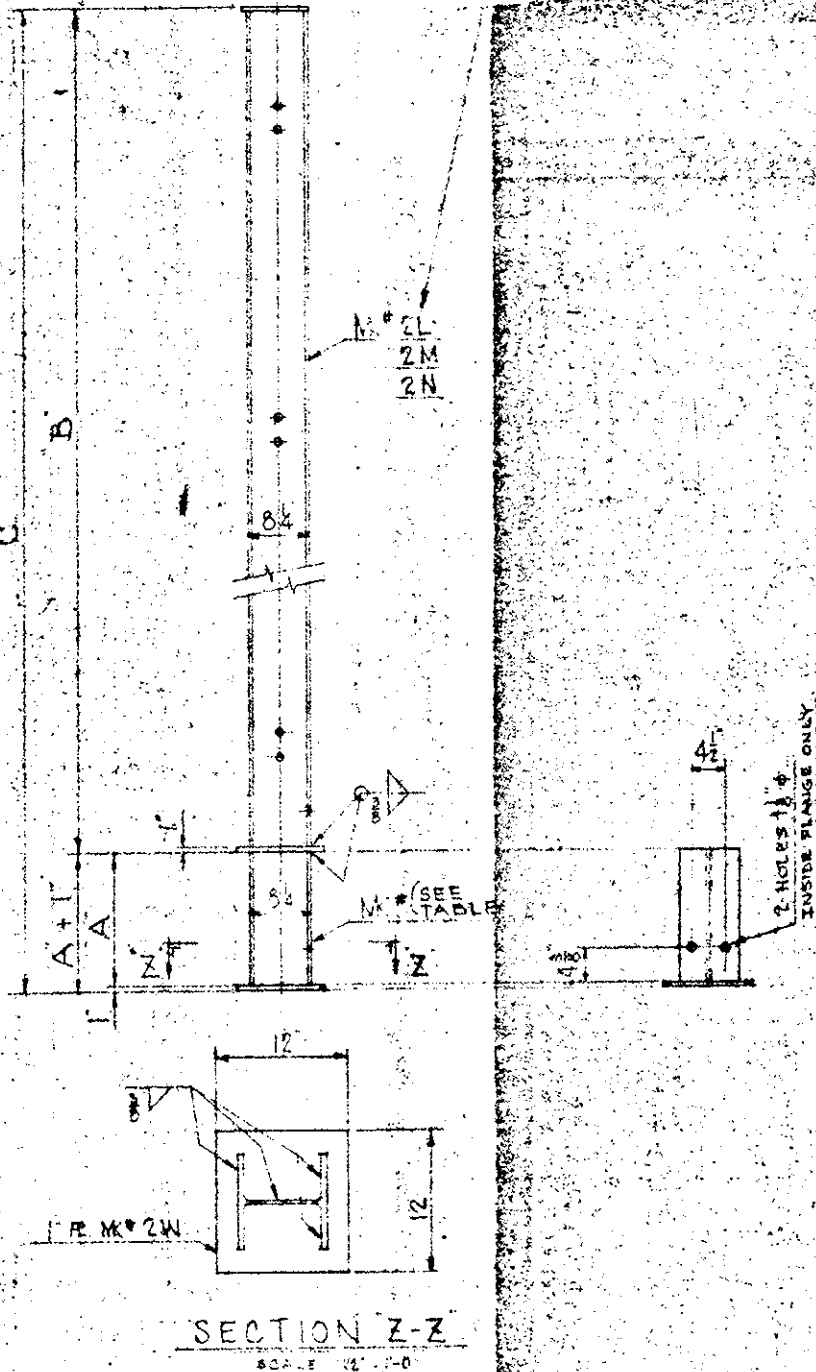
R.A. Sundstrom
 FINAL REVIEWED
 DATE 4/17/76
 BY Jack E. Hay

| | | | | | | | | | | | | |
|----------|--------|--------------------------------------|--------|---------|----|--------|----|------|-----|-------------|------|-------|
| TOTAL WT | 488 | DRAWING NO | 367-6B | PART NO | | MAN NO | | AC | | DESCRIPTION | MATL | INPEC |
| TOTAL WT | 488 | MATH. REQD. PER COURSE * (SEE TABLE) | | | | | | | | | | |
| REV | BY | DATE | PERSON | DRWD | BY | CHK | BY | DATE | NO. | | | |
| 1 | J.E.H. | 4/17/76 | | | | | | | | | | |

| | | |
|---------|------|----|
| REVISED | DATE | BY |
| 1 | | |

SHOP NOTE:

POST ASSY MK'S SHOWN TO BE RETURNED BY CUSTOMER.
 SHOP TO WELD STUB TO BOTTOM OF POST USING 3/8" FILLET WELD
 AS SHOWN. SHOP TO THEN ADD A NEW POST PLATE PER SECTION Z-Z.
 AFTER ASSY EACH POST TO BE LABELED WITH A NEW POST
 MK# AS SHOWN IN TABLE BELOW.



SECTION Z-Z
SCALE 1/2" = 1'-0"

| | | |
|---------|------|----|
| REVISED | DATE | BY |
| 1 | | |

| | | | | | | | | | |
|-------------------|----|-------|---------------------|------|------------------|------|------|-------|-------|
| 2N ^s | 2N | 8-104 | 8-4 ^{1/2} | AC2N | 4 ^{1/2} | 55.0 | 95.8 | 379.3 | 475.7 |
| 2M ^s | 2M | 9-10 | 8-6 | AC2M | 1-3 | 50.0 | 90.9 | 355.1 | 478.8 |
| 2L ^s | 2L | 8-104 | 8-10 ^{3/8} | AC2L | 0-104 | 35.0 | 79.8 | 300.3 | 475.7 |
| NEW POST ASSY MK# | | | | | | | | | |
| | | | | | | | | | |

| REV | DATE | REVISION | DR | CHK | BY | DESCRIPTION |
|-----|--------|----------|----|-----|----|---------------------------------|
| 1 | 4/4/76 | | | | | 1 WR. 40° POST ASSY BY CUSTOMER |
| | | | | | | 1 12 X 12 POST PLATE |
| | | | | | | 1 NEW 1/4" STUB A UNL |
| | | | | | | 1 POST ASSY CONSISTING OF: |

R.A. Lundstrom
 REVISED
 DATE 4/4/76
John S. 7/94

SCALE FOR DIMENSIONS: 1/2" = 1'-0"

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I 70-3(B)220 | 44 | 273 |

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |

| | | | | |
|--------------|----------------|---------|---------|------|
| NO REVISIONS | AS CONSTRUCTED | REVISOR | DATE | VOID |
| | | | 6-29-79 | |

| | |
|-------------|---------------|
| DESIGNED BY | C.D.O.H. 3-72 |
| CHECKED BY | R.V.E. 4-73 |
| DATE | 3-72 |
| BY | R.V.E. 4-73 |
| BY | R.V.E. 4-73 |

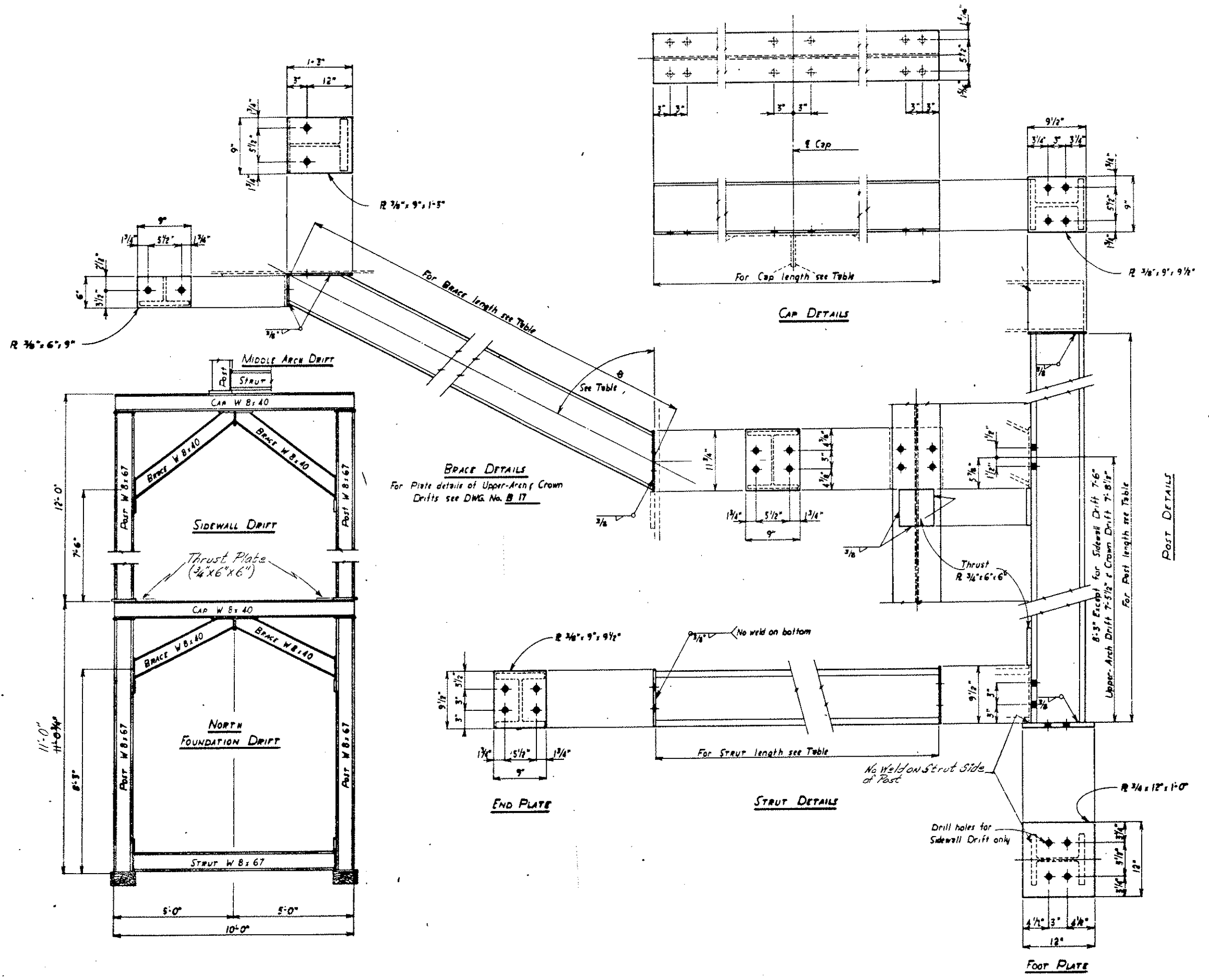


TABLE OF INFORMATION

| LOCATION | POST SIZE | POST LENGTH | STRUT SIZE | STRUT LENGTH | CAP SIZE | CAP LENGTH | BRACE SIZE | BRACE LENGTH | ANGLE |
|------------------------|-----------|-------------|------------|--------------|----------|------------|------------|--------------|-------------|
| North Foundation Drift | W 8 x 67 | 10'-2 3/4" | W 8 x 67 | 8'-5 1/4" | W 8 x 40 | 10'-0" | W 8 x 40 | 4'-7 3/4" | 61°-11'-28" |
| South Foundation Drift | W 8 x 67 | 11'-5 3/8" | W 8 x 67 | 9'-11 3/8" | W 8 x 40 | 10'-0" | W 8 x 40 | 5'-2 3/4" | 51°-20'-28" |
| Sidewall Drift | W 8 x 67 | 11'-2 3/8" | W 8 x 67 | 8'-1 1/8" | W 8 x 40 | 9'-6" | W 8 x 40 | 5'-7 1/4" | 49°-07'-50" |
| Middle Arch Drift | W 8 x 67 | 11'-0 3/4" | W 8 x 67 | 7'-11 1/4" | W 8 x 40 | 9'-6" | W 8 x 40 | 4'-1 1/4" | 71°-28'-54" |
| Upper Arch Drift | W 8 x 67 | 9'-1 1/4" | W 8 x 67 | 7'-3 1/2" | W 8 x 40 | 9'-0" | W 8 x 40 | 3'-11 3/4" | 63°-17'-20" |

▽ For skewed Post Details see DWG. No. B-17
 • For special case see DWG. No. B-17
 All Drift support steel is A 572 Grade 65, Spaced at 3'-0" centers
 All Bolts shall be 1" A-307
 All Holes are 1/8" φ

DIVISION OF HIGHWAYS

MULTIPLE DRIFT TUNNEL SUPPORT DETAILS

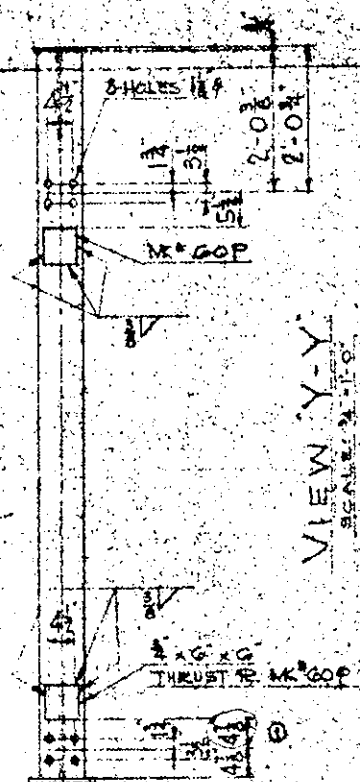
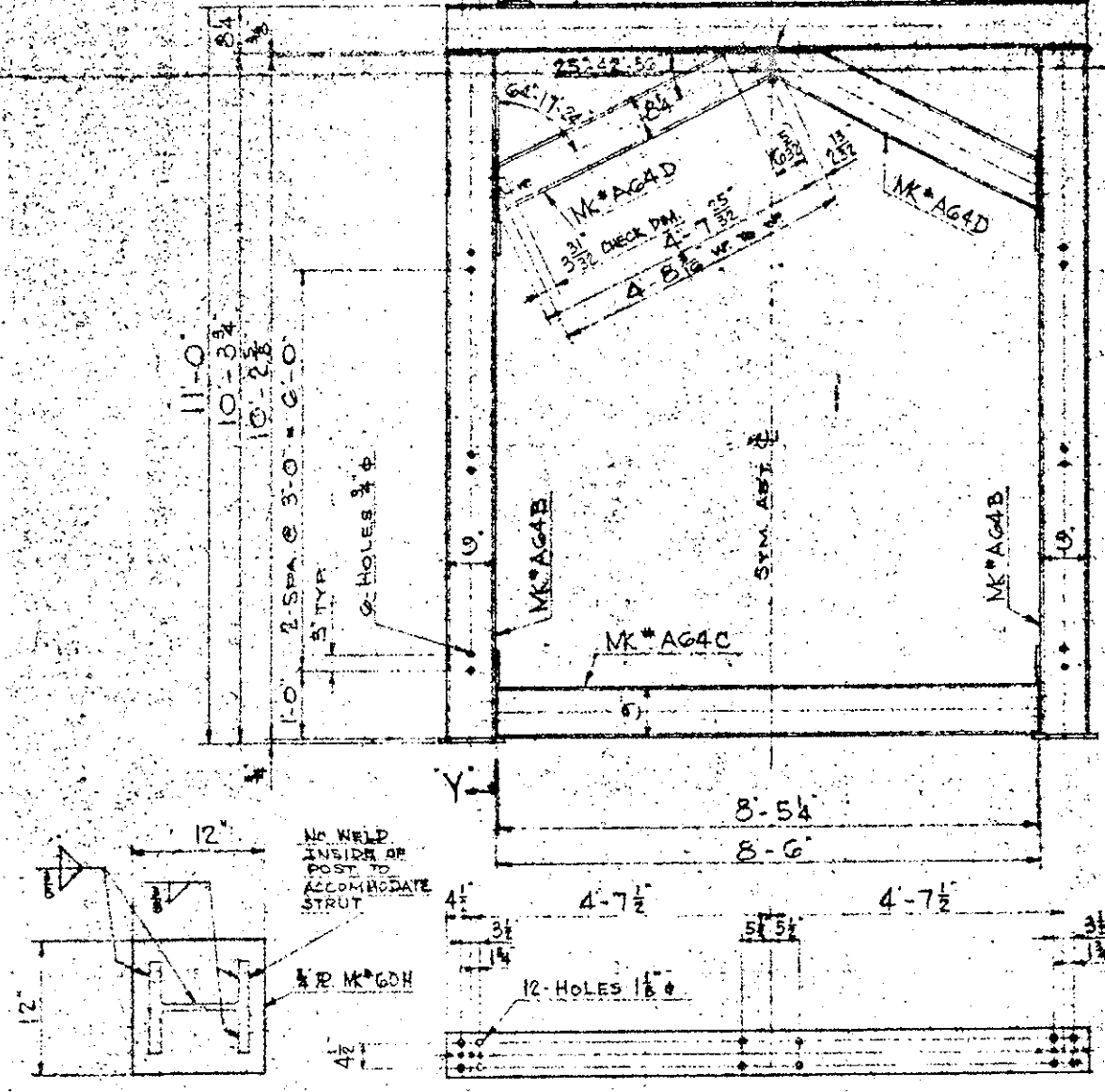
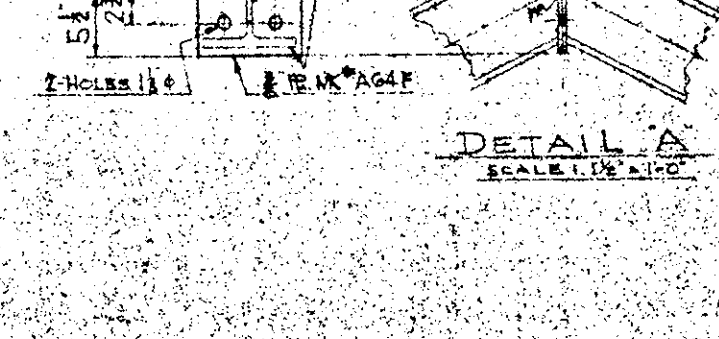
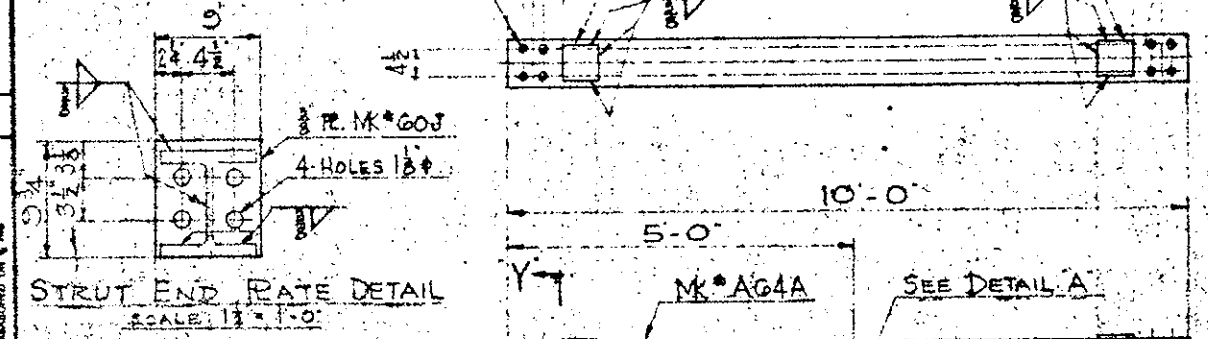
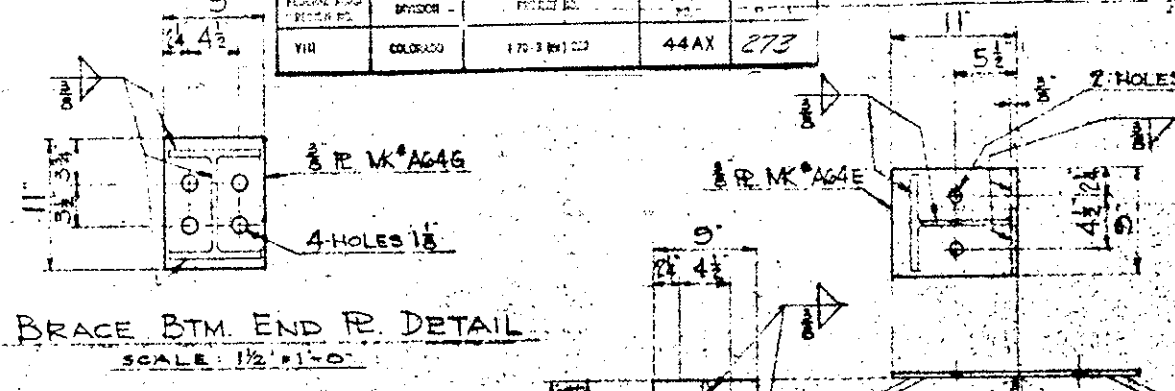
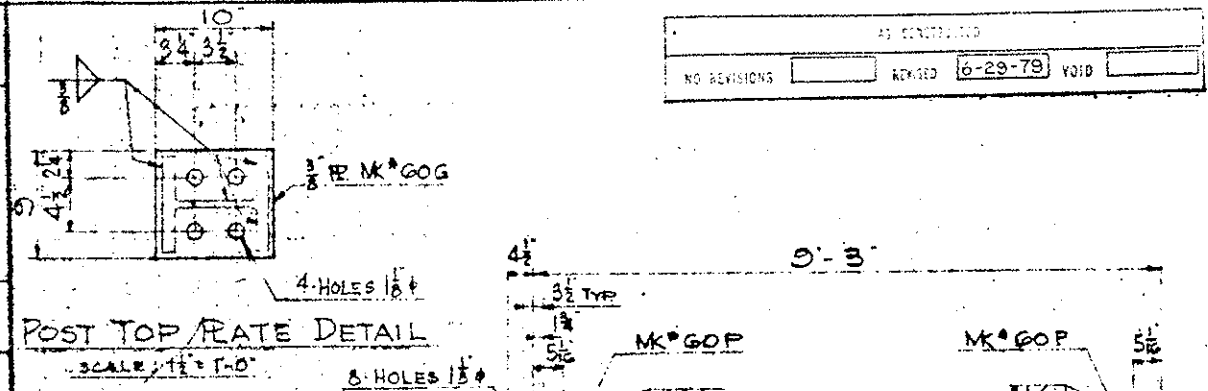
DIVISIONS PROPOSED METHOD OF CONSTRUCTION

| | | | |
|----------------|-------------|-----------|----------|
| Designer | C.D.O.H. | Structure | F-13-X |
| Detailer | R. Spahrman | Number | |
| Drawing Number | B 16 | of 60 | Drawings |

Revision Order: _____ (Preliminary Scale Only)

AS CONTRACTED
NO REVISIONS REVISIONS 6-29-79 VOID

| | | | | |
|----------------|------|------|------|----|
| PROJECT NO. | BY | DATE | REV. | BY |
| 170-3 (REV) 23 | 44AX | 273 | | |



| | | | | |
|--------|-----------------|------|-----|---------------------------------|
| 1.2 | 10 | 12 | 1/2 | 50 T.L. NUTS (2-PER ROD) |
| 20.5 | 339 | 6 | 3/8 | 1/2 x 35 TIE RODS |
| 8.4 | 28 | 30 | 1 | HEX. T.L. NUTS |
| 30.9 | 103 | 30 | 1 | x 3 HEX. HD. T.L. BOLTS |
| 10.5 | DS-559-5AAB-AG4 | AG4G | 1 | 1 1/2 x 9 x 11 BTM. END RATE |
| 5.9 | | AG4F | 1 | 1 1/2 x 5 1/2 x 9 END RATE |
| 10.5 | | AG4E | 1 | 1 1/2 x 9 x 11 END RATE |
| 184.0 | | | 1 | W8 x 40 R 4-7 1/2 R.N.A. |
| 424.6 | 2123 | AG4D | 2 | BRACE ASSYS. EA. CONSISTING OF: |
| 93 | | G0J | 2 | 2 1/2 x 9 x 9 1/2 END RATES |
| 565.9 | | | 1 | W8 x 67 x 8-5 1/2 R.N.A. |
| 583.9 | 583.9 | AG4C | 1 | STRUT ASSY. CONSISTING OF: |
| 7.6 | | G0P | 2 | 2 1/2 x 6 x 6 THRUST PLATES |
| 30.6 | | G0H | 1 | 1 1/2 x 12 x 12 FOOT PLATE |
| 5.6 | | G0G | 1 | 1 1/2 x 9 x 10 TOP PLATE |
| 584.7 | | | 1 | W8 x 67 x 10-2 1/2 R.N.A. |
| 1480.2 | 740.1 | AG4B | 2 | POST ASSYS. EA. CONSISTING OF: |
| 7.6 | | G0P | 2 | 2 1/2 x 6 x 6 THRUST PLATES |
| 403.0 | | | 1 | W8 x 40 x 10-0 R.N.A. |
| 415.2 | 415.2 | AG4A | 1 | CAP BEAM ASSY. CONSISTING OF: |

APPROVED FINAL
DATE 10-20-76
BY *[Signature]*

APPROVED
[Signature]

| TOTAL WT. PER COURSE | DRAWING NO. | TOTAL PAY PER COURSE | MARK NO. | NO. REQS. | DESCRIPTION | | | | | | | | | | | | |
|--|---|----------------------|-------------|-----------|-------------|------|-------------|------|-------------|------|-------------|---|---|------|--|--|--|
| | | | | | | | | | | | | | | | | | |
| MATERIAL REQUIRED PER COURSE OF RIBS | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <th>QTY.</th> <th>DESCRIPTION</th> <th>QTY.</th> <th>DESCRIPTION</th> <th>QTY.</th> <th>DESCRIPTION</th> </tr> <tr> <td>1</td> <td>2 1/2 x 9 x 11 DIMENSION ON 30 FT. FLG. W/ 4 1/2"</td> <td>2481</td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | QTY. | DESCRIPTION | QTY. | DESCRIPTION | QTY. | DESCRIPTION | 1 | 2 1/2 x 9 x 11 DIMENSION ON 30 FT. FLG. W/ 4 1/2" | 2481 | | | |
| QTY. | DESCRIPTION | QTY. | DESCRIPTION | QTY. | DESCRIPTION | | | | | | | | | | | | |
| 1 | 2 1/2 x 9 x 11 DIMENSION ON 30 FT. FLG. W/ 4 1/2" | 2481 | | | | | | | | | | | | | | | |

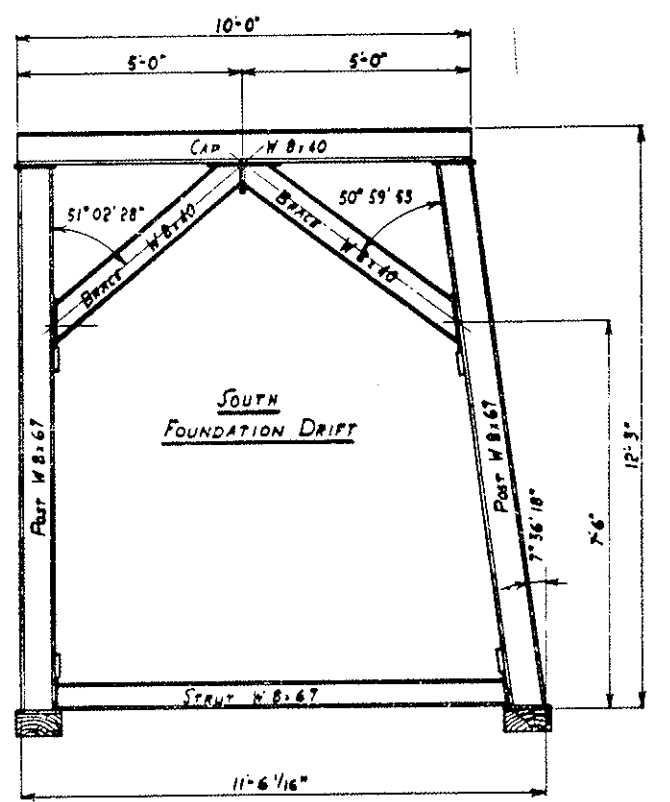
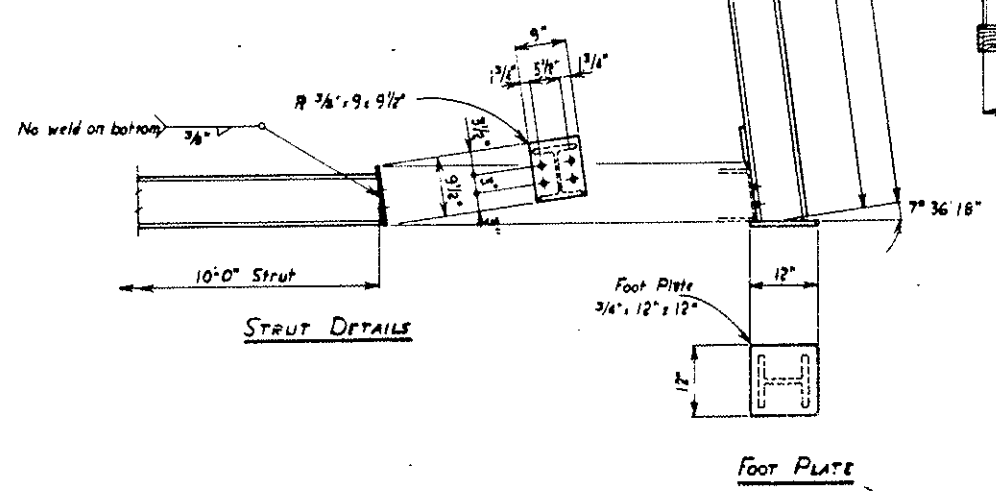
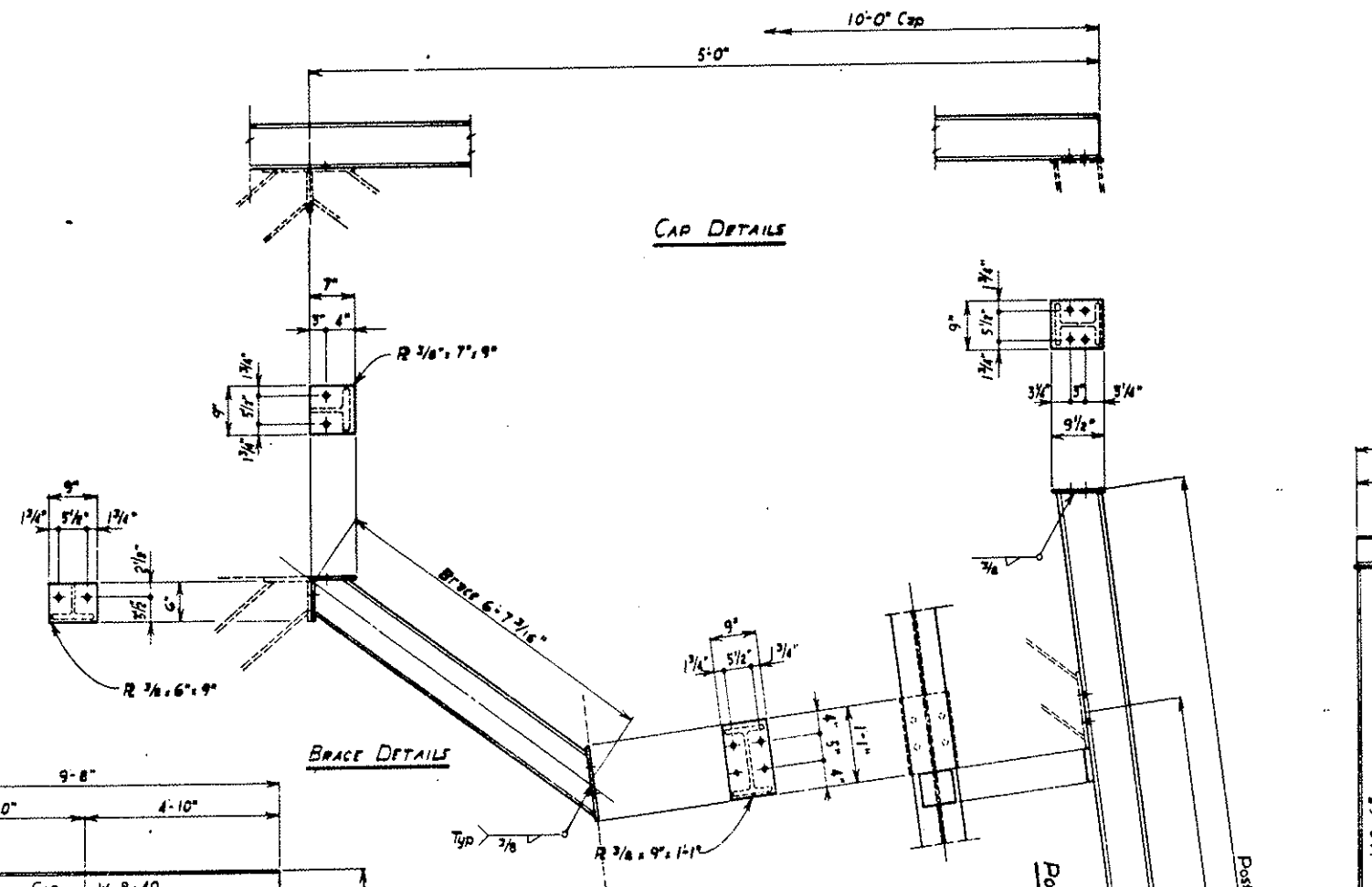
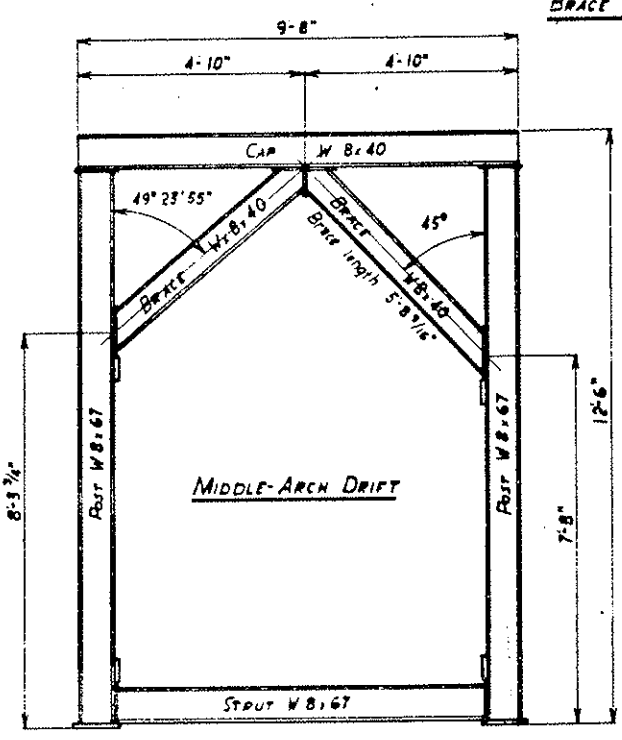
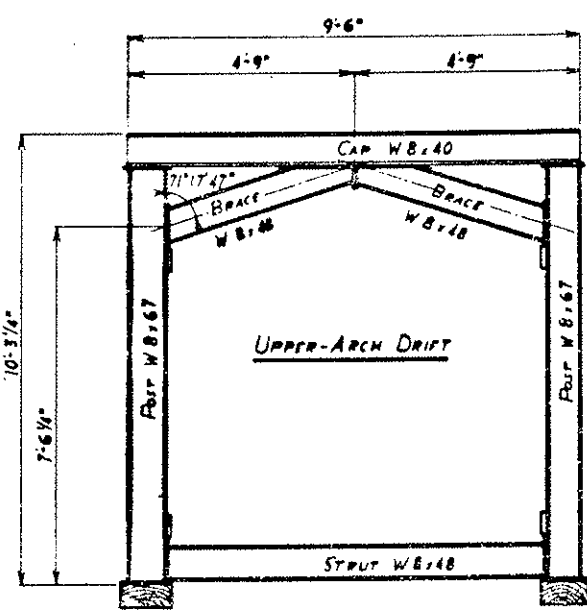
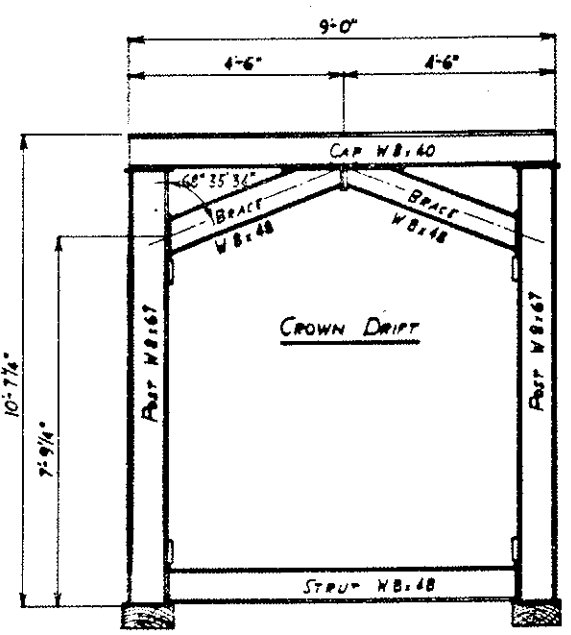
COMMERCIAL OFFICE
1234 5th Ave.
Denver, CO 80202
TEL: 303-555-1234

AS CONSTRUCTED
 NO REVISIONS
 REVISED
 6-29-73

| FEDERAL ROAD DISTRICT NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|---------------|-----------|--------------|
| XIII | COLORADO | T 70-5(81)220 | 45 | 273 |

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |

Note:
 All bolts shall be 1" A 307
 All holes are 1/8" φ
 For additional details see DWG. No. B 10

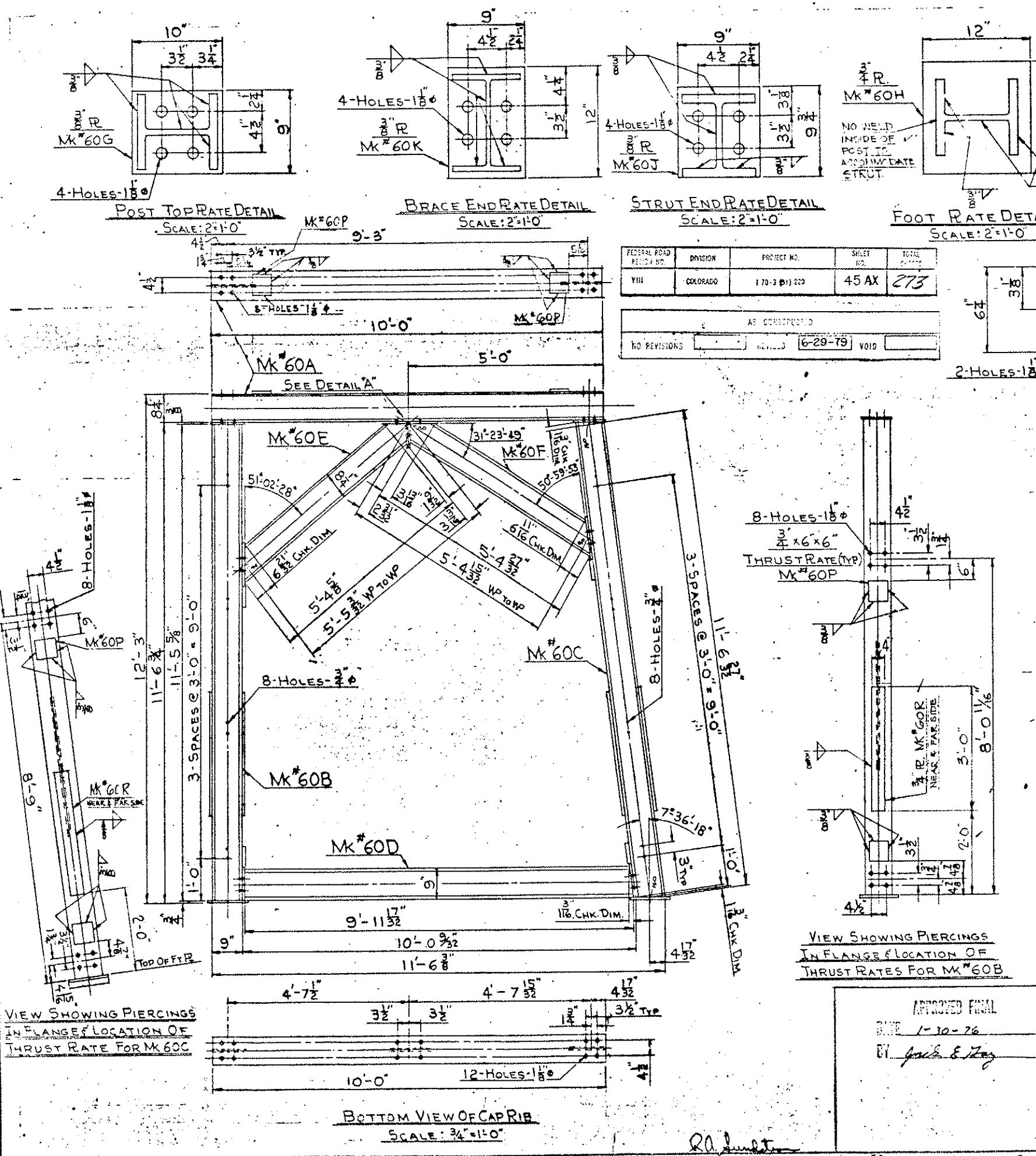


SOUTH FOUNDATION DRIFT DETAILS
 For additional details see DWG. No B 16

| | | | |
|---------------|----------|------------|--------|
| DESIGNED BY | C.D.O.H. | CHECKED BY | R.M.S. |
| QUANTITIES BY | R.M.S. | DATE | 1-77 |
| DETAILS BY | R.M.S. | DATE | 1-73 |

| | |
|---|--------------------------|
| DIVISION OF HIGHWAYS | |
| MULTIPLE DRIFT TUNNEL SUPPORT DETAILS | |
| DIVISIONS PROPOSED METHOD OF CONSTRUCTION | |
| Designer C.D.O.H. | Structure F-13-X |
| Detailer R. Southower | Numbers |
| Drawing Number B 17 | of 60 Drawings |
| Revised 2/73 | (Preliminary Stage Only) |

| | | |
|-----------------|-----------|--------|
| SECTION | MARK NO. | SOLE |
| WB X40 | 60F | |
| OPERATION | CUT | LOT |
| 1 CUT TO LENGTH | 5-3 | MK 60F |
| 2 TRIM ENDS | 5-8 | MK 60F |
| 3 ASSEMBLY | | |
| SECTION | MARK NO. | SOLE |
| WB X67 | 60B | |
| OPERATION | CUT | LOT |
| 1 CUT TO LENGTH | 11-8 1/2 | MK 60B |
| 2 TRIM ENDS | 11-12 | MK 60B |
| 3 ASSEMBLY | | |
| SECTION | MARK NO. | SOLE |
| WB X40 | 60G | |
| OPERATION | CUT | LOT |
| 1 CUT TO LENGTH | 10'-0" | MK 60G |
| 2 TRIM ENDS | 11-5 3/8" | MK 60G |
| 3 ASSEMBLY | | |



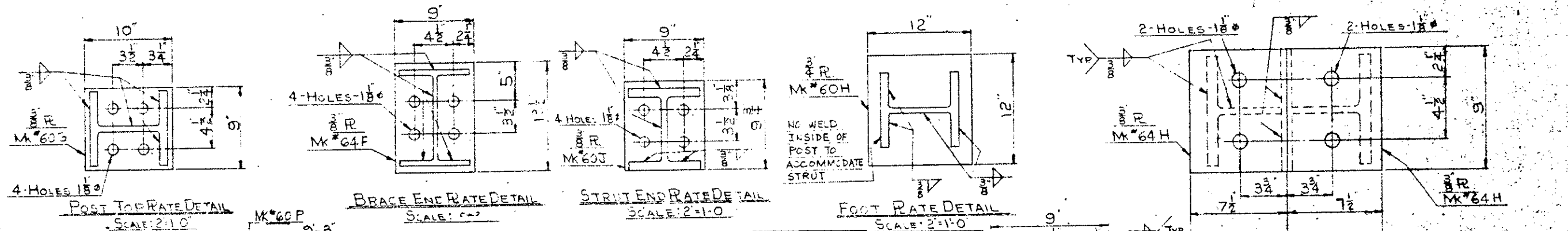
| | | | | |
|---------------------------|----------|----------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| YH1 | COLORADO | 170-3 (11) 223 | 45 AX | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | REVISED | 6-29-79 | VOID | |

| | | | |
|-------|-----------------|-----|---------------------------------|
| 16 | 10 | 16 | 5/8" 50 TL NUTS (2 PER ROD) |
| 271 | 339 | 8 | 3/8" x 39" TIE RODS (WITH 3 EA) |
| 8.4 | .28 | 30 | 1" HEX. TL NUTS |
| 30.9 | 1.03 | 30 | 1" x 3" HEX. HD. TL. BOLTS |
| 8.1 | DS-559-5AAB-060 | 60M | 1 3/8" x 8 1/2" x 9" END RATE |
| 6.0 | | 60N | 1 3/8" x 6 1/4" x 9" END RATE |
| 11.5 | | 60K | 1 3/8" x 9" x 12" END RATE |
| 2135 | | | 1 W8 x 40" x 5'-4 1/8" NNA |
| 239.1 | 239.1 | 60F | BRACE ASSY. CONSISTING OF |
| 6.9 | | 60L | 1 3/8" x 7 1/2" x 9" END RATE |
| 6.0 | | 60N | 1 3/8" x 6 1/4" x 9" END RATE |
| 11.5 | | 60K | 1 3/8" x 9" x 12" END RATE |
| 216.0 | | | 1 W8 x 40" x 5'-4 1/8" NNA |
| 240.4 | 240.4 | 60E | BRACE ASSY. CONSISTING OF |
| 9.3 | | 60J | 2 3/8" x 9" x 9 3/4" END RATE |
| 664.1 | | | 1 W8 x 67" x 9'-10 1/8" NNA |
| 682.7 | 682.7 | 60D | STRUT ASSY. CONSISTING OF |
| 30.4 | | 60R | 2 3/4" x 4" x 36" RATES |
| 30.6 | | 60H | 1 3/4" x 12" x 12" FOOT RATE |
| 7.6 | | 60P | 2 3/4" x 6" x 6" THRUST RATE |
| 9.6 | | 60G | 1 3/8" x 9" x 10" TOP RATE |
| 775.2 | | | 1 W8 x 67" x 11'-6 1/2" NNA |
| 83.8 | 87.8 | 60C | POST ASSY. CONSISTING OF |
| 30.4 | | 60R | 2 3/4" x 4" x 36" RATES |
| 30.6 | | 60H | 1 3/4" x 12" x 12" FOOT RATE |
| 7.6 | | 60P | 2 3/4" x 6" x 6" THRUST RATE |
| 9.6 | | 60G | 1 3/8" x 9" x 10" TOP RATE |
| 768.4 | | | 1 W8 x 67" x 11'-5 3/8" NNA |
| 825.0 | 825.0 | 60B | POST ASSY. CONSISTING OF |
| 415.2 | 415.2 | 60A | LAP BEAM ASSY. CONSISTING OF |

APPROVED FINAL
DATE 1-30-76
BY [Signature]

| | | | | | | | |
|--|----------|--|----------|----------|-----------|-------------|--------|
| TOTAL WT. | UNIT WT. | DRAWING NO. | PART NO. | MARK NO. | NO. RECD. | DESCRIPTION | BY/CL. |
| | | | | | | | |
| MAPLE ROAD PER COURSE OF RIBS | | | | | | | |
| COMMERCIAL BUILDING, INC. WASHINGTON, D.C. 20001 U.S.A. PHONE 202 746-8011 | | | | | | | |
| SOUTH FOUNDATION MULTIPLE DORMITORY PROJECT | | | | | | | |
| EISENHOWER MEMORIAL TUNNEL | | | | | | | |
| CAP BEAM DRAWING 10-5 (S) 720 - 60 | | | | | | | |
| DATE 12-9-75 BY WJ/CLS | | | | | | | |
| REVISIONS | | | | | | | |
| REV. | DATE | REASON | BY | CHK | APP | DATE | BY |
| 1 | 12-9-75 | REVISED TO REFLECT CHANGES TO CAP BEAM | WJ | CLS | | | |
| 2 | 1-12-76 | REVISED TO REFLECT CHANGES TO POSTS | WJ | CLS | | | |
| AS NOTED | | | | | | | |
| DS-559-5AAB-060 | | | | | | | |

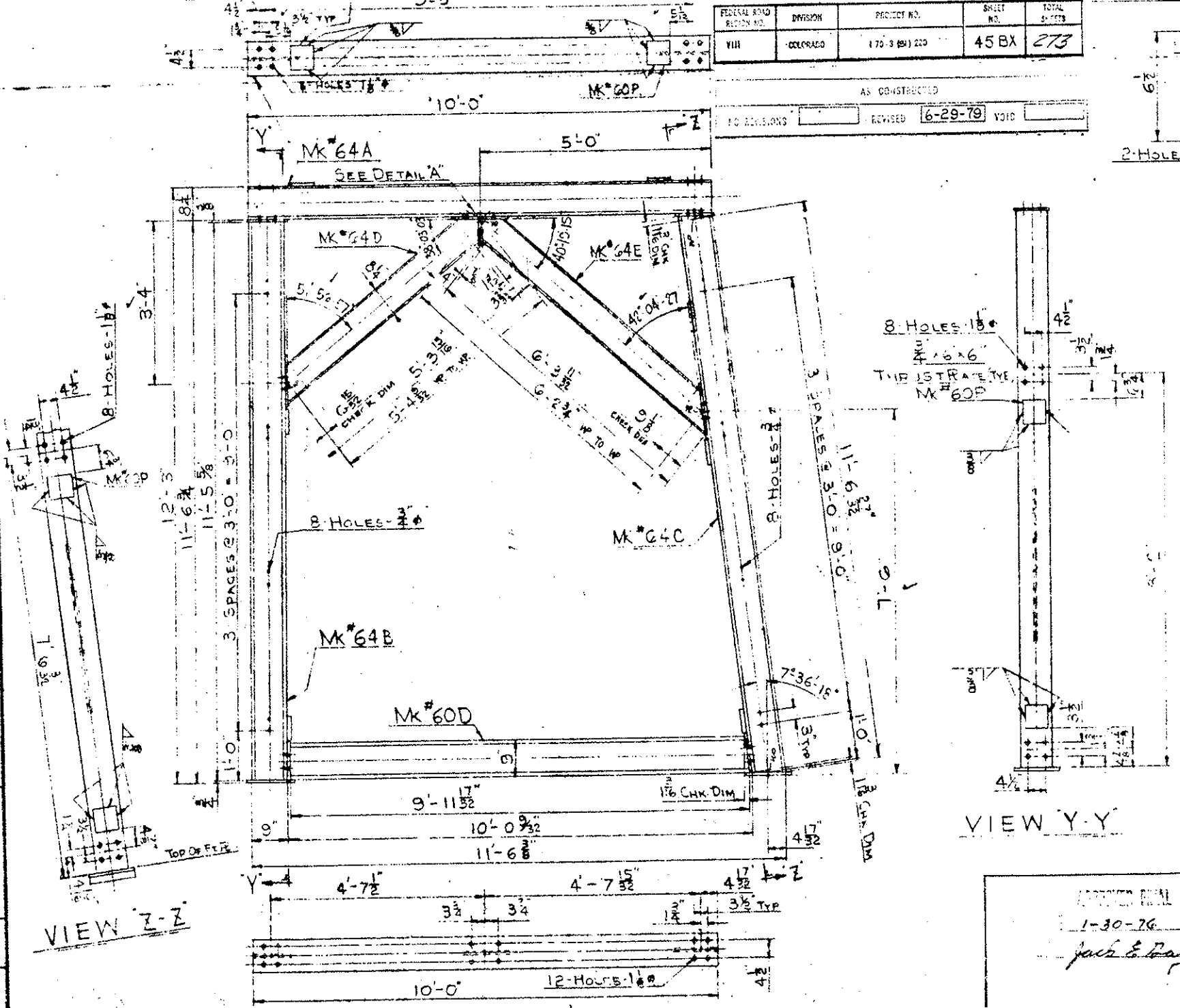
| | | | |
|---------|----------|---------|---|
| SECTION | MARK NO. | DATE | OPERATION |
| W8x40 | 64E | 5-13-76 | 1 CUT TO LENGTH 2 TRIM ENDS 3 ASSEMBLED |
| W8x67 | 64D | 5-13-76 | 1 CUT TO LENGTH 2 TRIM ENDS 3 ASSEMBLED |
| W8x67 | 64C | 5-13-76 | 1 CUT TO LENGTH 2 TRIM ENDS 3 ASSEMBLED |
| W8x67 | 64B | 5-13-76 | 1 CUT TO LENGTH 2 TRIM ENDS 3 ASSEMBLED |
| W8x67 | 64A | 5-13-76 | 1 CUT TO LENGTH 2 TRIM ENDS 3 ASSEMBLED |



| | | | | |
|---------------------------|----------|----------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 170-3 (80) 220 | 45 BX | 273 |

AS CONSTRUCTED

REVISED 6-29-79



| | | | |
|------|------|-----|---------------------------|
| 16 | 10 | 16 | 5/8\"/> |
| 271 | 330 | 8 | 5/8\"/> |
| 84 | 28 | 30 | 1\"/> |
| 308 | 103 | 30 | 1\"/> |
| 72 | 62 | 64H | 1 3/8\"/> |
| 62 | 123 | 64G | 1 3/8\"/> |
| 123 | 2475 | 64F | 1 3/8\"/> |
| 273 | 273 | 64E | 1 W8x40 x 5-3 1/2 NNA |
| | | | BRACE ASSY. CONSISTING OF |
| 72 | 62 | 64H | 1 3/8\"/> |
| 62 | 123 | 64G | 1 3/8\"/> |
| 123 | 2475 | 64F | 1 3/8\"/> |
| 273 | 273 | 64D | 1 W8x40 x 5-3 1/2 NNA |
| | | | BRACE ASSY. CONSISTING OF |
| 93 | 641 | 60J | 2 3/8\"/> |
| 641 | 6827 | 60D | 1 W8x67 x 9-10 5/8 NNA |
| 6827 | 6827 | | STRUT ASSY. CONSISTING OF |
| 306 | 76 | 60H | 1 3/4\"/> |
| 76 | 96 | 60P | 2 3/4\"/> |
| 96 | 7752 | 60G | 1 3/8\"/> |
| 7752 | 8302 | 64C | 1 W8x67 x 11-6 2/32 NNA |
| 8302 | 8302 | | POST ASSY. CONSISTING OF |
| 306 | 76 | 60H | 1 3/4\"/> |
| 76 | 96 | 60P | 2 3/4\"/> |
| 96 | 7654 | 60G | 1 3/8\"/> |
| 7654 | 8238 | 64B | 1 W8x67 x 11-5 3/8 NNA |
| 8238 | 8238 | | POST ASSY. CONSISTING OF |
| 306 | 76 | 60H | 1 3/4\"/> |
| 76 | 96 | 60P | 2 3/4\"/> |
| 96 | 7654 | 60G | 1 3/8\"/> |
| 7654 | 8238 | 64A | 1 W8x67 x 11-5 3/8 NNA |
| 8238 | 8238 | | POST ASSY. CONSISTING OF |
| 306 | 76 | 60H | 1 3/4\"/> |
| 76 | 96 | 60P | 2 3/4\"/> |
| 96 | 7654 | 60G | 1 3/8\"/> |
| 7654 | 8238 | 64A | 1 W8x67 x 11-5 3/8 NNA |
| 8238 | 8238 | | POST ASSY. CONSISTING OF |

VIEW Y-Y

VIEW Z-Z

BOTTOM VIEW OF CAP RIB
SCALE: 3/4\"/>

APPROVED
1-30-76
Jack E. Bay

| | | | | | | | |
|-----------|----------|-------------|----------|----------|-----------|--------------------------------|-------------|
| TOTAL WT. | UNIT WT. | DRAWING NO. | PART NO. | MARK NO. | NO. REQS. | DESCRIPTION | MAT'L SPEC. |
| 4152 | 452 | | | 64A | 1 | CAP BEAM ASSY. CONSISTING OF 1 | |

TOTAL WT. FOR COURSE

MAT'L REQ'D PER COURSE OF RIBS

RELOCATED THRUST PLATE CAP BEAM

DATE 1-15-76

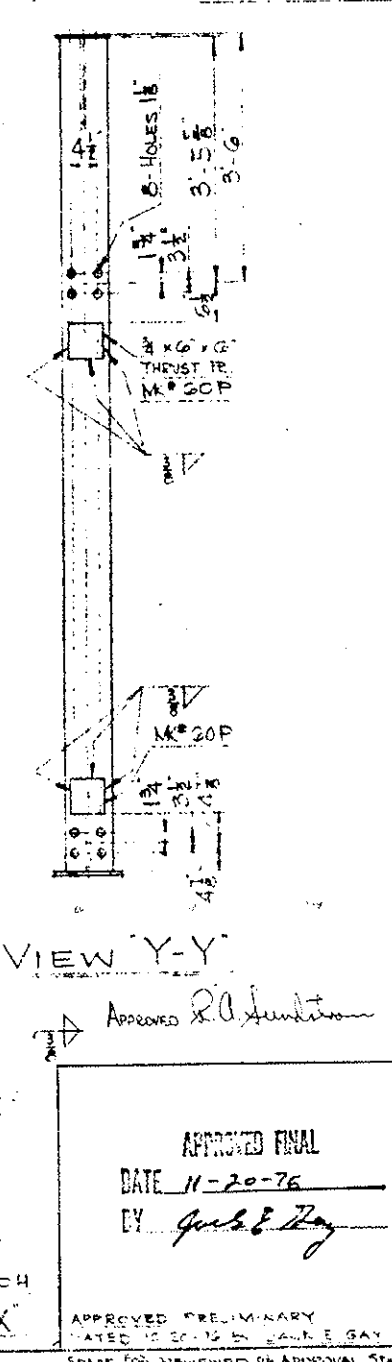
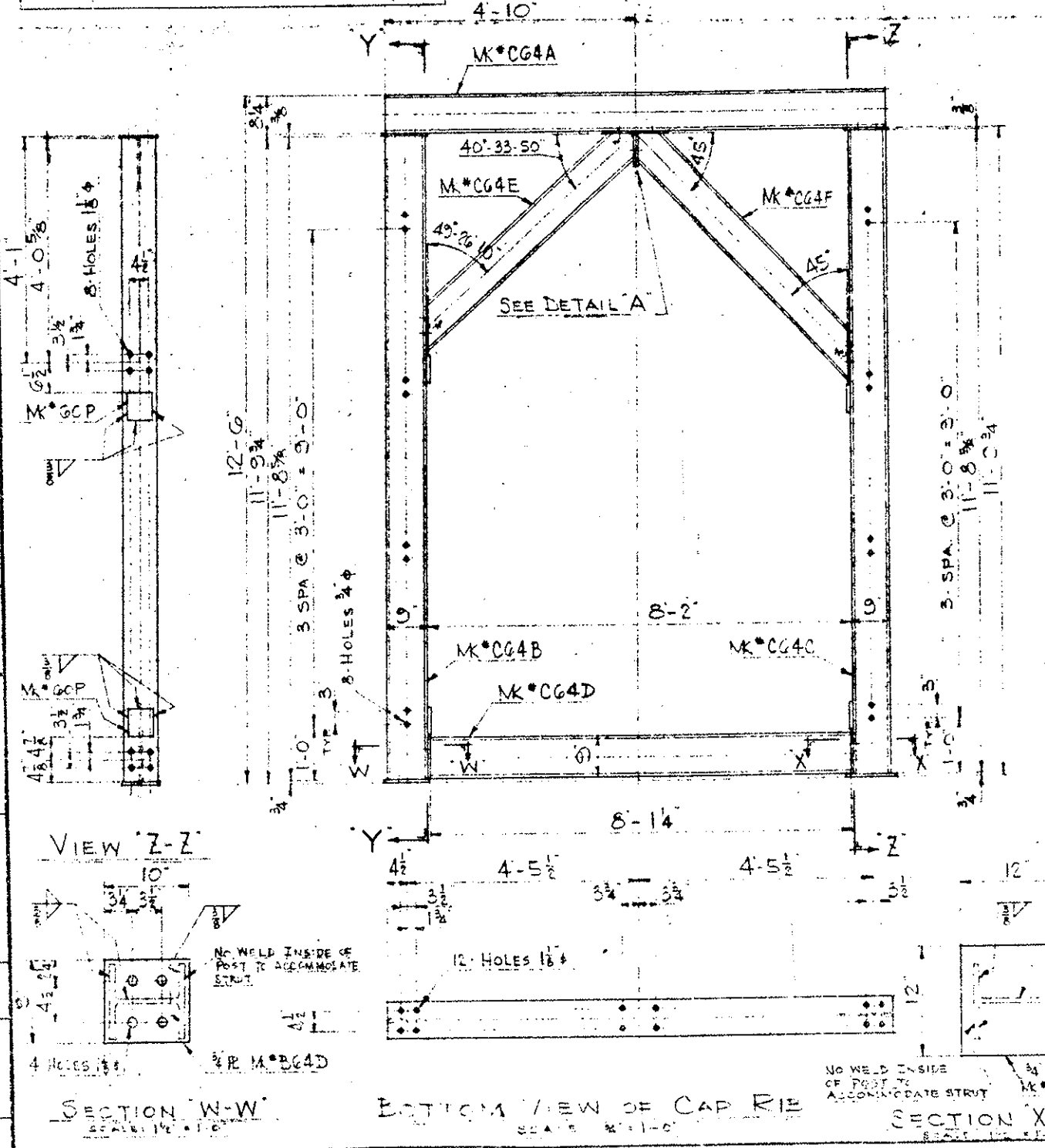
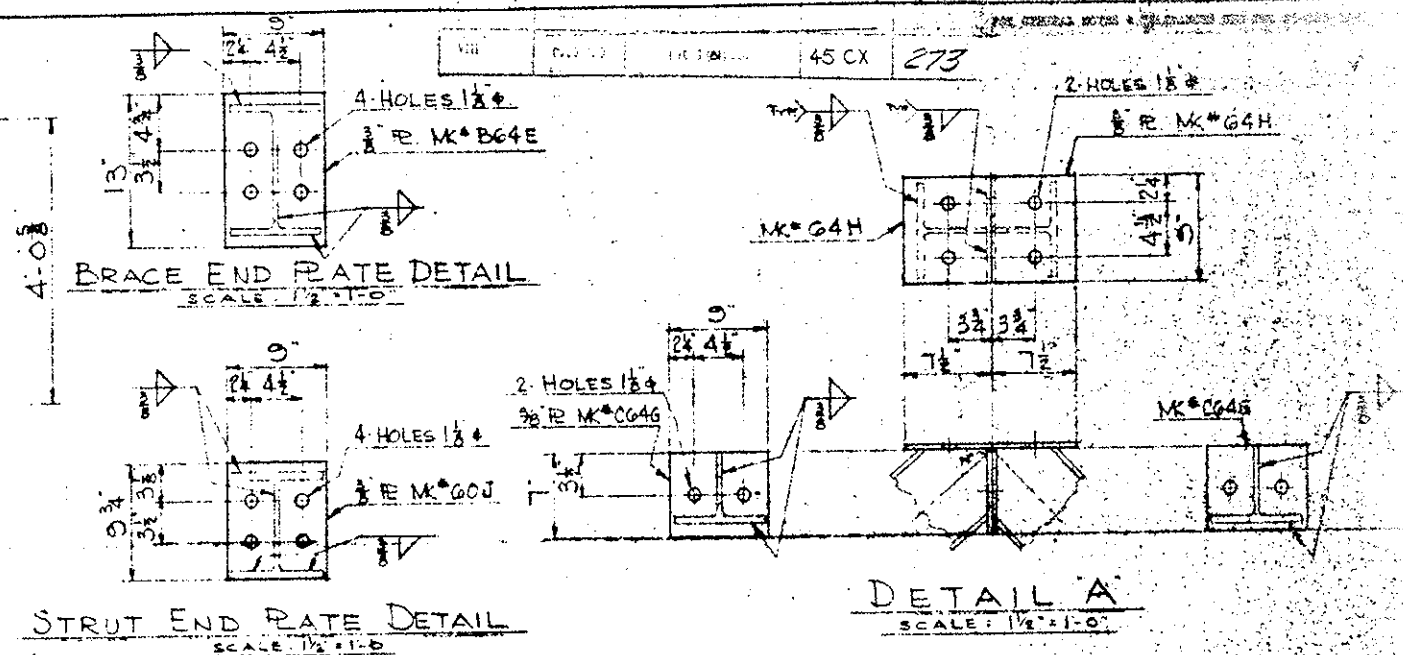
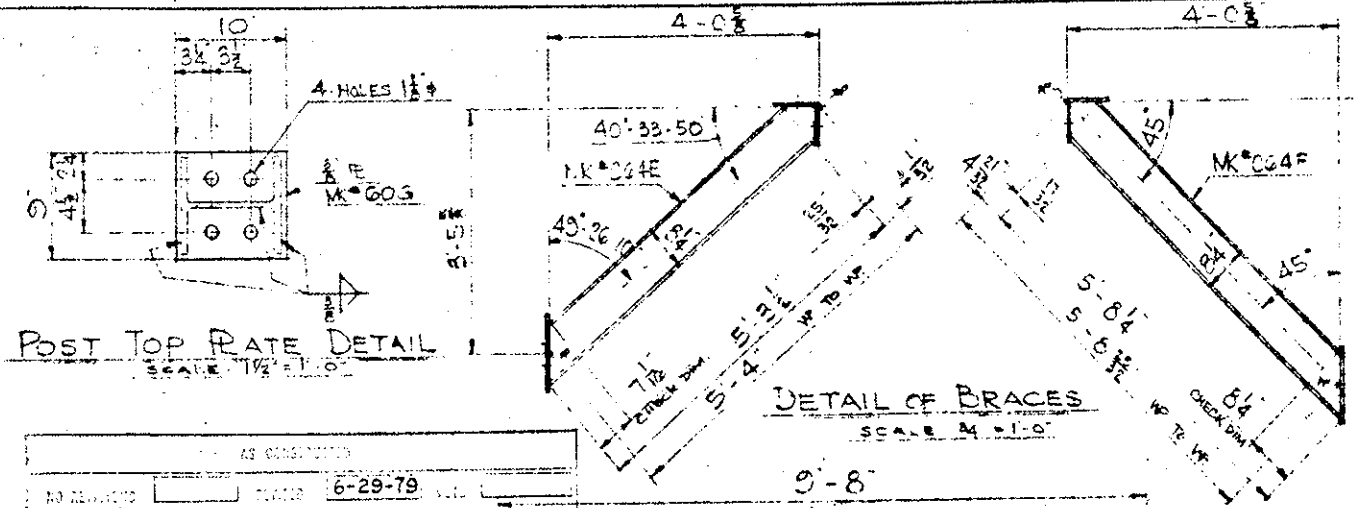
SCALE AS NOTED

DS:559-5AAB-064

| | | |
|------------------|----------|--------------|
| SECTION | MARK NO. | SCALE |
| W8 x 40 | CG4E | 1/2" = 1'-0" |
| OPERATION | DATE | BY |
| 1. CUT TO LENGTH | 6-29-79 | |
| 2. TERM ENDS | | |
| 3. ASSEMBLY WELD | | |

| | | |
|------------------|----------|--------------|
| SECTION | MARK NO. | SCALE |
| W8 x 40 | CG4D | 1/2" = 1'-0" |
| OPERATION | DATE | BY |
| 1. CUT TO LENGTH | 6-29-79 | |
| 2. TERM ENDS | | |
| 3. ASSEMBLY WELD | | |

| | | |
|------------------|----------|--------------|
| SECTION | MARK NO. | SCALE |
| W8 x 40 | CG4A | 1/2" = 1'-0" |
| OPERATION | DATE | BY |
| 1. CUT TO LENGTH | 6-29-79 | |
| 2. TERM ENDS | | |
| 3. ASSEMBLY WELD | | |



| QTY | DESCRIPTION | UNIT | WT | TOTAL WT | MARK NO. | NO. REQD. | DESCRIPTION | UNIT | WT | TOTAL WT |
|-------|-----------------|------|----|----------|----------|-----------|-------------|-------------------------------------|--------------------------|----------|
| 16 | 10 | | | | | | 16 | 3/8 SO T.L. NUTS (2 PER ROD) | | |
| 27.1 | 3.39 | | | | | | 8 | 5/8 x 20 TIE RODS (EXP. 2x 8x10) | | |
| 95 | 28 | | | | | | 84 | 1" HEX T.L. NUTS | | |
| 352 | 103 | | | | | | 34 | 1/4 x 3" HEX HD. T.L. BOLTS | | |
| 12.4 | DS-559-5AAB-C64 | B64E | 11 | 132 | | | 11 | 3/4 x 9 x 13" END RATE | | |
| 6.7 | | B64S | 11 | 73.7 | | | 11 | 3/4 x 7 x 9" END RATE | | |
| 7.2 | | G4H | 11 | 79.2 | | | 11 | 3/4 x 7 1/2 x 9" END RATE | | |
| 2275 | | | | | | | | 11 | W8 x 40" x 5-5/8" N.N.A. | |
| 259.5 | 259.5 | C64F | 1 | 259.5 | | | 1 | BRACE ASSY CONSISTING OF: | | |
| 12.4 | | B64E | 11 | 132 | | | 11 | 3/4 x 9 x 13" END RATE | | |
| 6.7 | | B64S | 11 | 73.7 | | | 11 | 3/4 x 7 x 9" END RATE | | |
| 7.2 | | G4H | 11 | 79.2 | | | 11 | 3/4 x 7 1/2 x 9" END RATE | | |
| 2275 | | | | | | | | 11 | W8 x 40" x 5-5/8" N.N.A. | |
| 259.5 | 259.5 | C64E | 1 | 259.5 | | | 1 | BRACE ASSY CONSISTING OF: | | |
| 9.3 | | G0J | 2 | 18.6 | | | 2 | 2 3/4 x 9 x 9 1/2" END RATES | | |
| 543.0 | | | | | | | | 11 | W8 x 40" x 5-5/8" N.N.A. | |
| 501.6 | 501.6 | C64D | 1 | 501.6 | | | 1 | STRUT ASSY. CONSISTING OF: | | |
| 7.6 | | G0P | 2 | 15.2 | | | 2 | 2 3/4 x 6 x 6" THRUST RATES | | |
| 31.4 | | G0H | 1 | 31.4 | | | 1 | 3/4 x 12 x 12" FOOT RATE | | |
| 9.6 | | G0G | 1 | 9.6 | | | 1 | 3/4 x 9 x 10" TOP RATE | | |
| 755.2 | | | | | | | | 1 | W8 x 40" x 5-5/8" N.N.A. | |
| 840.6 | 840.6 | C64C | 1 | 840.6 | | | 1 | POST ASSY. CONSISTING OF: | | |
| 7.6 | | G0P | 2 | 15.2 | | | 2 | 2 3/4 x 6 x 6" THRUST RATES | | |
| 31.4 | | B64D | 1 | 31.4 | | | 1 | 3/4 x 9 x 10" FOOT RATE | | |
| 9.6 | | G0G | 1 | 9.6 | | | 1 | 3/4 x 9 x 10" TOP RATE | | |
| 755.2 | | | | | | | | 1 | W8 x 40" x 5-5/8" N.N.A. | |
| 828.1 | 828.1 | C64B | 1 | 828.1 | | | 1 | POST ASSY. CONSISTING OF: | | |
| 382.7 | 382.7 | C64A | 1 | 382.7 | | | 1 | CAP RIB OF W8 x 40" x 5-5/8" N.N.A. | | |

APPROVED FINAL
 DATE 11-20-76
 BY *John E. Ray*

APPROVED PRELIMINARY
 DATED 10-20-76 BY *John E. Ray*

MAT'L REQ'D. PER COURSE OF RIBS.

COMMERCIAL IRONWORKING CO.
 1100 BROADWAY, NEW YORK, N.Y. 10038
 PETER KENT SONS CO. AND SONS, INC.
 1100 BROADWAY, NEW YORK, N.Y. 10038

DATE 11-10-76 BY *R.A.* CHECKED BY *K.V.*

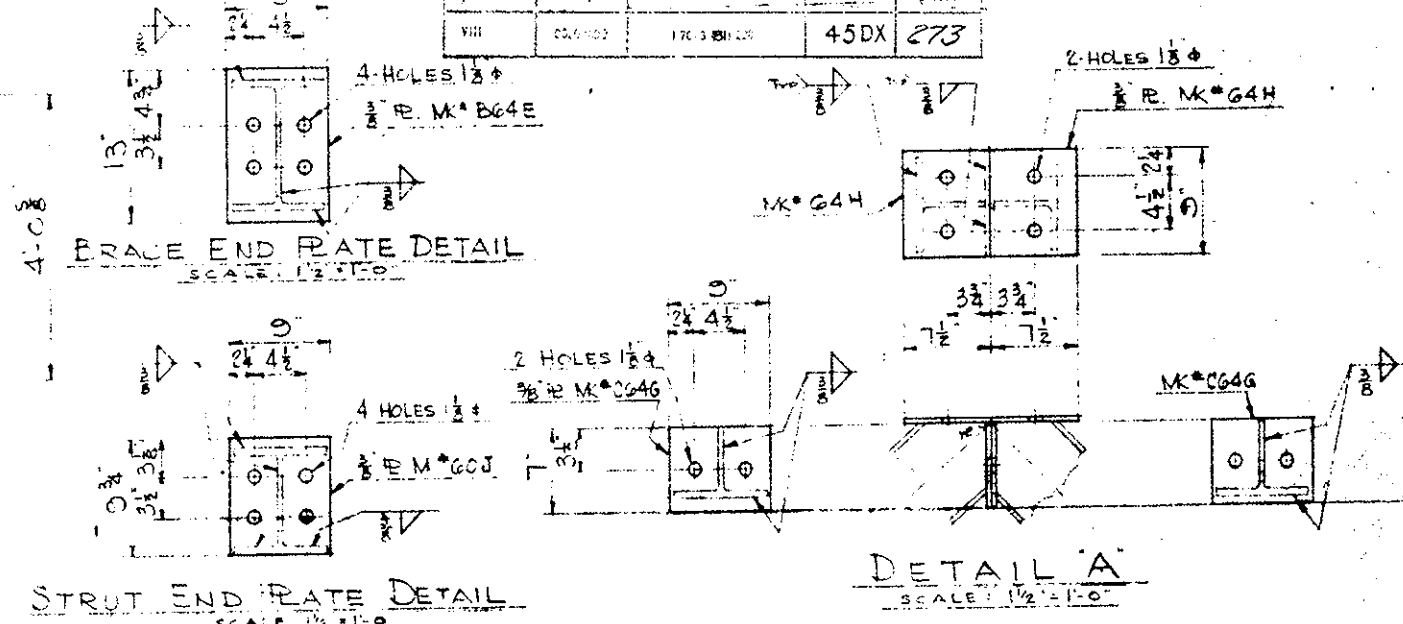
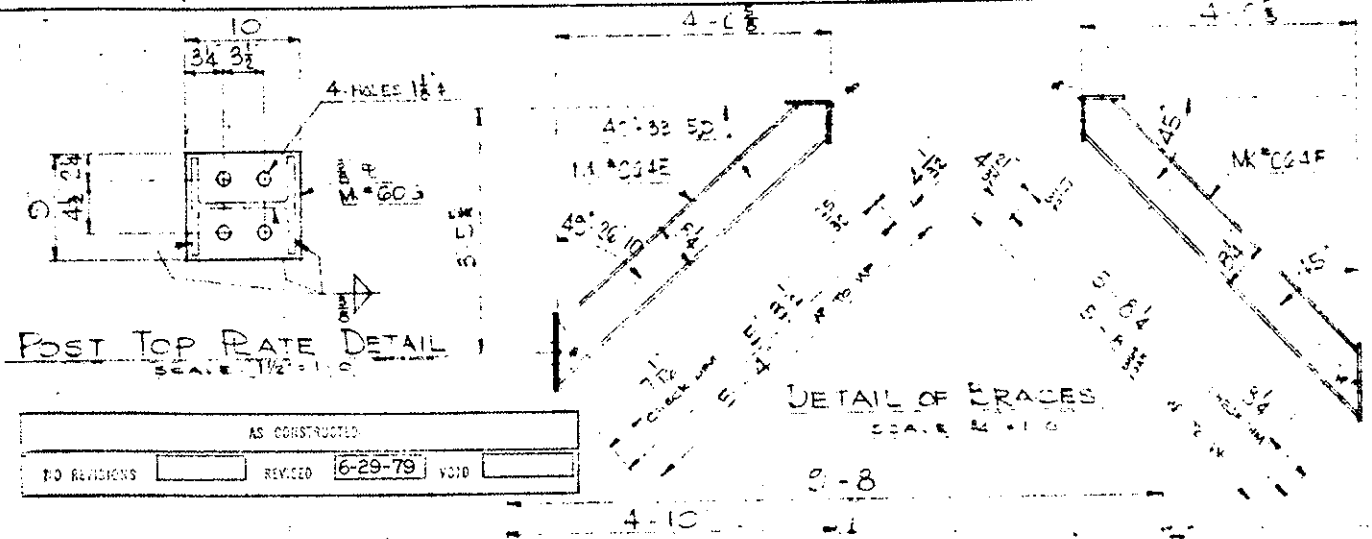
REV. NO. DATE REVISION

DR. NO. CHG. BY CHG. NO.

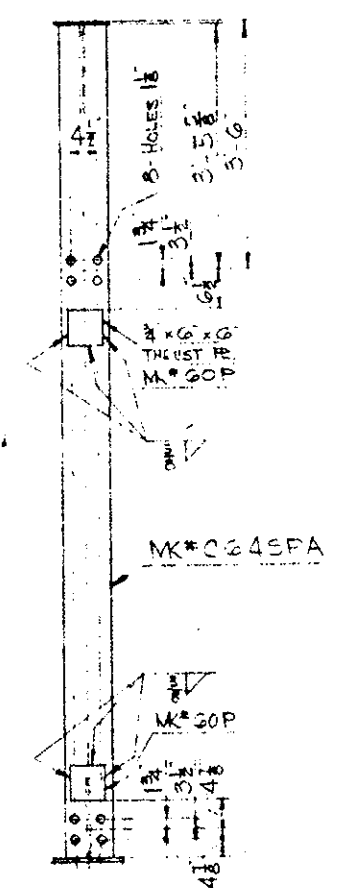
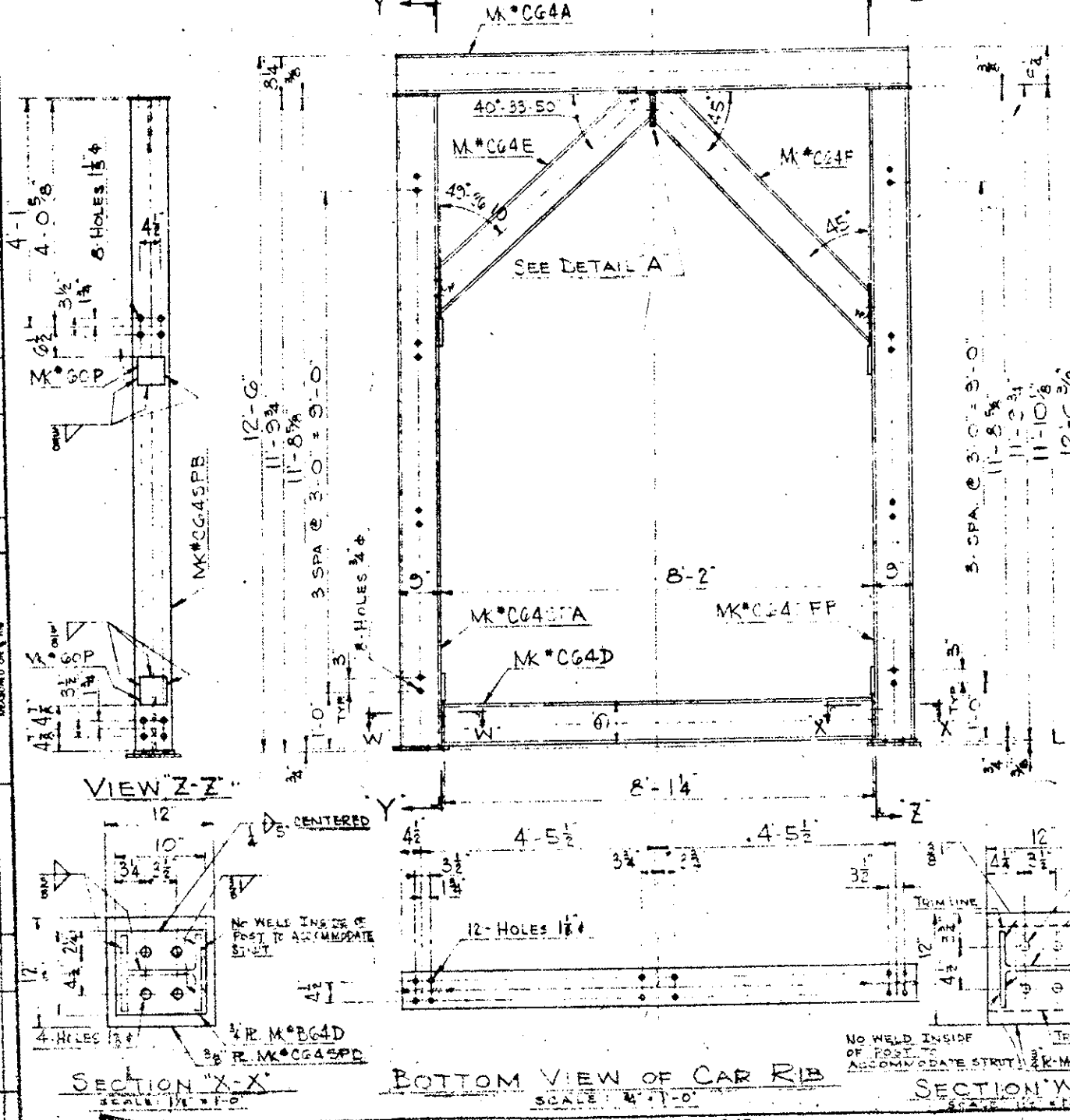
D5-559-5AAB-C64

| | | | | |
|------|----------|---------------|------|-----|
| VIII | 02-0-002 | 170-3-001-000 | 45DX | 273 |
|------|----------|---------------|------|-----|

| | | | |
|---------|----------|---------------|------|
| SECTION | MARK NO. | OPERATION | DATE |
| WB X 40 | CG4E | CUT TO LENGTH | |
| | | TRIM ENDS | |
| | | ASSEMBLY MARK | |



| | | | |
|---------|----------|---------------|------|
| SECTION | MARK NO. | OPERATION | DATE |
| WB X 40 | CG4E | CUT TO LENGTH | |
| | | TRIM ENDS | |
| | | ASSEMBLY MARK | |



| | | | |
|-------|--------------------|--------|---------------------------------|
| 16 | 10 | 16 | 1/2 SG TL NUTS (2 PER ROD) |
| 271 | 339 | 6 | 1/2 x 32 TIE RODS (W/ 1/2 x 32) |
| 95 | 25 | 34 | 1" HEX TL NUTS |
| 35 | 103 | 34 | 1/4 x 5 HEX HD TL BOLTS |
| 104 | DE-559-5AAB-011 P. | 04E | 1 1/2 x 9 x 13 END RATE |
| 67 | | 043 | 1 1/2 x 7 x 9 END RATE |
| 72 | | 04H | 1 1/2 x 7 1/2 x 9 END RATE |
| 2117 | | 04F | 1 1/2 x 40" x 5-8 1/2 NNA |
| 2080 | 039 0 | 04E | BRACE ASSY CONSISTING OF: |
| 93 | | 008 | 2 1/2 x 9 x 9 1/2 END RATES |
| 543.0 | | 043 | 1 1/2 x 7 x 9 END RATE |
| 5412 | 0612 | 04D | STRUT ASSY CONSISTING OF: |
| 15.2 | | 064SPD | 1 1/2 x 12 x 12" BASE RATE |
| 76 | | 00P | 2 1/2 x 6 x 6" THR ST RATES |
| 13.1 | | 04F | 1 1/2 x 9 x 10" FOOT RATE |
| 96 | | 00G | 1 1/2 x 2 x 10" TOP RATE |
| 7532 | | 064SPB | 1 1/2 x 27" x 11-8 1/2 NNA |
| 843.3 | 0442 | 064SPB | POST ASSY CONSISTING OF: |
| 76 | | 00P | 2 1/2 x 2 x 6" THRUST RATES |
| 30.6 | | 064SP2 | 1 1/2 x 12 x 12" FOOT RATE |
| 96 | | 005 | 1 1/2 x 2 x 10" TOP RATE |
| 7532 | | 064SPA | 1 1/2 x 27" x 11-8 1/2 NNA |
| 843.3 | 0442 | 064SPA | POST ASSY CONSISTING OF: |
| 3847 | 0667 | 064A | CAP RIB OF WB X 40" x 9-8" NNA |

APPROVED FINAL
DATE 10/11/77
BY Jack E. Ray

APPROVED FINAL
DATED 9-27-77 BY JACK E. GAY
SPACE FOR REVIEWED OR APPROVAL SIGNATURE

| | | | | | | | |
|---|---------|------------|--------------------------|---------|---------|-------------|------------|
| TOTAL WT | UNIT WT | DRAWING NO | RYTHAL PAY WT PER COURSE | MARK NO | NO REQS | DESCRIPTION | UNIT PRICE |
| MATERIAL REQUIRED PER COURSE OF RIBS | | | | | | | |
| COMMERCIAL BURNING, INC. MIDDLE ARCH TUBULAR STRUCTURE EISENHOWER MEMORIAL JUNCTION (EIA SEE PLAN) 2ND FLOOR PERM. NO. 110-3-51720 - COL. FERRELL KENT SONS CO. AND BURNING, INC. | | | | | | | |
| REV | DATE | REVISION | DR. NO. | CHK. BY | DATE | SCALE | AS NOTED |
| D5-559-5AAB-CG4SE | | | | | | | |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-----------------------|-----------|--------------|
| VIII | COLORADO I70-3(8)/220 | 46 | 275 |

| REVISIONS | | | |
|-----------|--------|----------------|--------|
| R-1 | 7-3-75 | Rev. Block-out | B.R.L. |
| | | | |
| | | | |

AS SHOWN

| | | | |
|--------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-23-75 | VOID |
|--------------|---------|---------|------|

North Foundation Drift

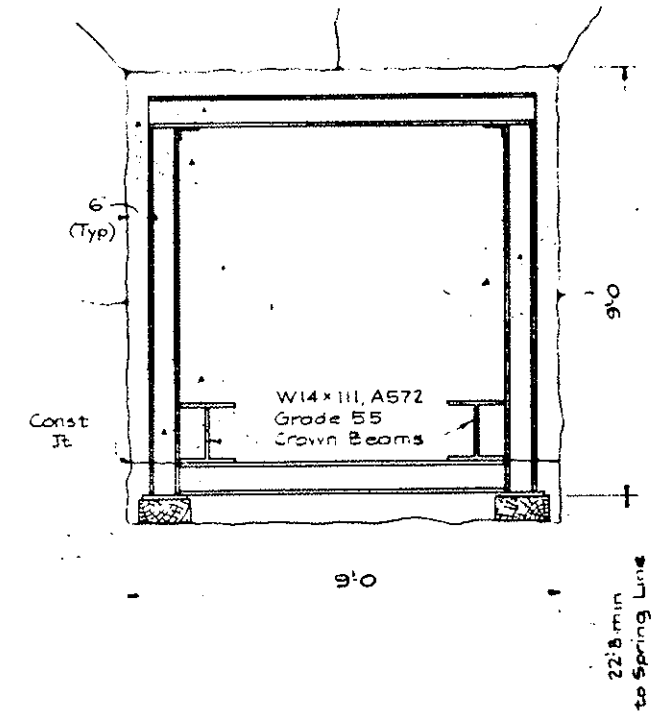
| | Cap | Post | Brace | Invert |
|---------------|-------|-------|-------|--------|
| Light Support | W8x24 | W8x40 | W8x40 | W8x24 |
| Heavy Support | W8x24 | W8x58 | W8x24 | W8x31 |
| | A572 | A572 | A572 | A572 |

Light Support used:
 Sta 94+86 to Sta 97+06
 Sta 98+86 to Sta 101+90
 Sta 103+62 to Sta 104+90
 Sta 107+98 to Sta 108+46
 Sta 109+42 to Sta 118+50

Heavy Support used:
 Sta 87+56 to Sta 94+86
 Sta 97+06 to Sta 98+86
 Sta 101+90 to Sta 103+62
 Sta 104+90 to Sta 107+98
 Sta 108+46 to Sta 109+42
 Sta 118+50 to Sta 120+22

| Summary of Quantities for Information Only | | |
|--|------|--------|
| Descriptions | Unit | Total |
| Excavation | CuYd | 14,815 |
| Concrete Class T-2 | CuYd | 8,076 |
| Concrete Class T-4 | CuYd | 6,742 |
| Drift Support Steel | Ton | 907 |

Not for Basis of Payment



CROWN DRIFT

All drift support steel spaced at 3'-0" C/C.

Crown Drift:

| | Cap | Post | Invert |
|---------------|-------|-------|--------|
| Light Support | W8x40 | W8x24 | W8x24 |
| Heavy Support | W8x67 | W8x40 | W8x24 |
| | A572 | A572 | A572 |

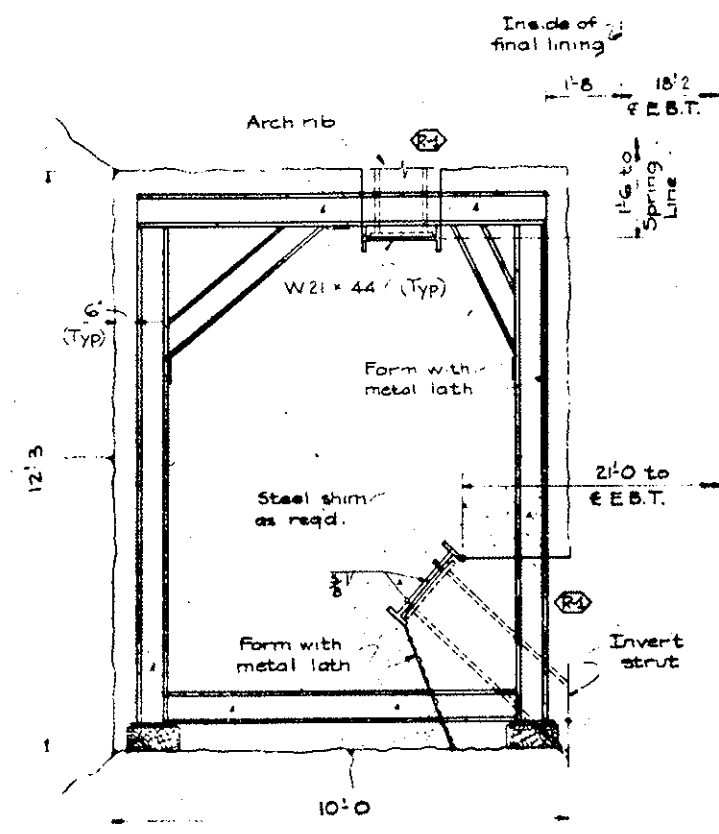
Light Support used:
 Sta. 94+86 to Sta. 97+06
 Sta. 98+86 to Sta 101+90
 Sta 103+62 to Sta 104+90
 Sta 107+98 to Sta 108+46

Heavy Support used:
 Sta. 87+56 to Sta 94+86
 Sta. 97+06 to Sta 98+86
 Sta 101+90 to Sta 103+62
 Sta 104+90 to Sta 107+98
 Sta. 108+46 to Sta 109+42

| Summary of Quantities for Information Only | | |
|--|------|-------|
| Descriptions | Unit | Total |
| Excavation | CuYd | 6,558 |
| Concrete Class T-2 | CuYd | 6,558 |
| Drift Support Steel | Ton | 427 |
| Crown Beams | Ton | 564 |

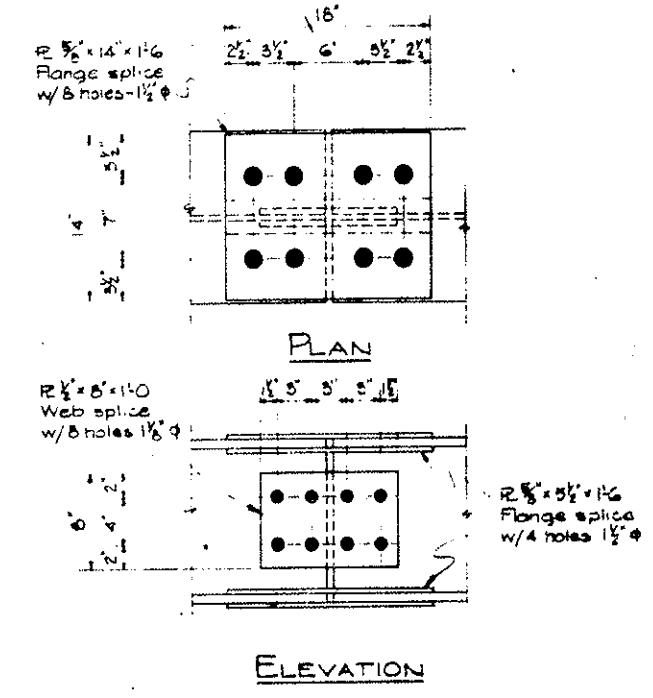
Not for Basis of Payment

Note: See Dwg. No. B-19 for drift structural details.



NORTH FOUNDATION DRIFT

All drift support steel spaced at 3'-0" C/C.



SPICE DETAIL - CROWN BEAMS

DIVISION OF HIGHWAYS

DRIFT DETAILS
 FOR TUNNEL SUPPORT 3 DRIFT AND
 2 DRIFT, DIVISIONS PROPOSED
 METHOD OF CONSTRUCTION

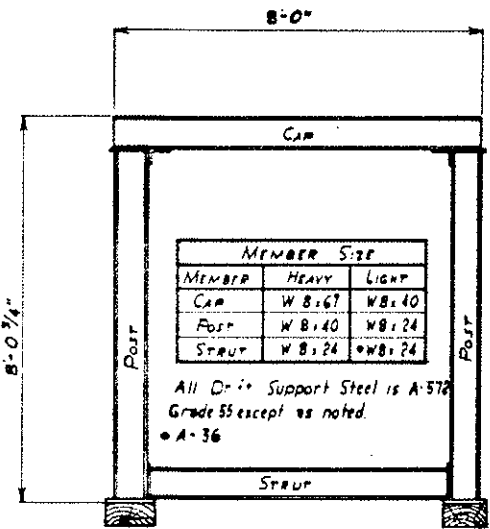
| | | |
|---------------------|-----------|----------|
| Designer C.D.O.H. | Structure | F-13-X |
| Detailer B.R. Lere | Number | |
| Drawing Number 8-15 | of 60 | Drawings |

| | | |
|-------------|------------|------|
| DESIGNED BY | CHECKED BY | DATE |
| BY | BY | |
| BY | BY | |
| BY | BY | |

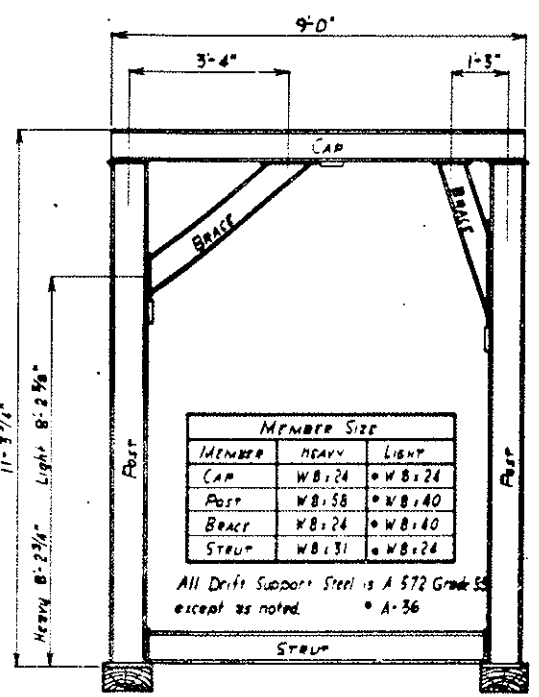
| | |
|----------------|--------------|
| AS CONSTRUCTED | |
| NO REVISIONS | REVISION |
| | Y810 6-29-79 |

| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 70-3(81) 220 | 47 | 273 |

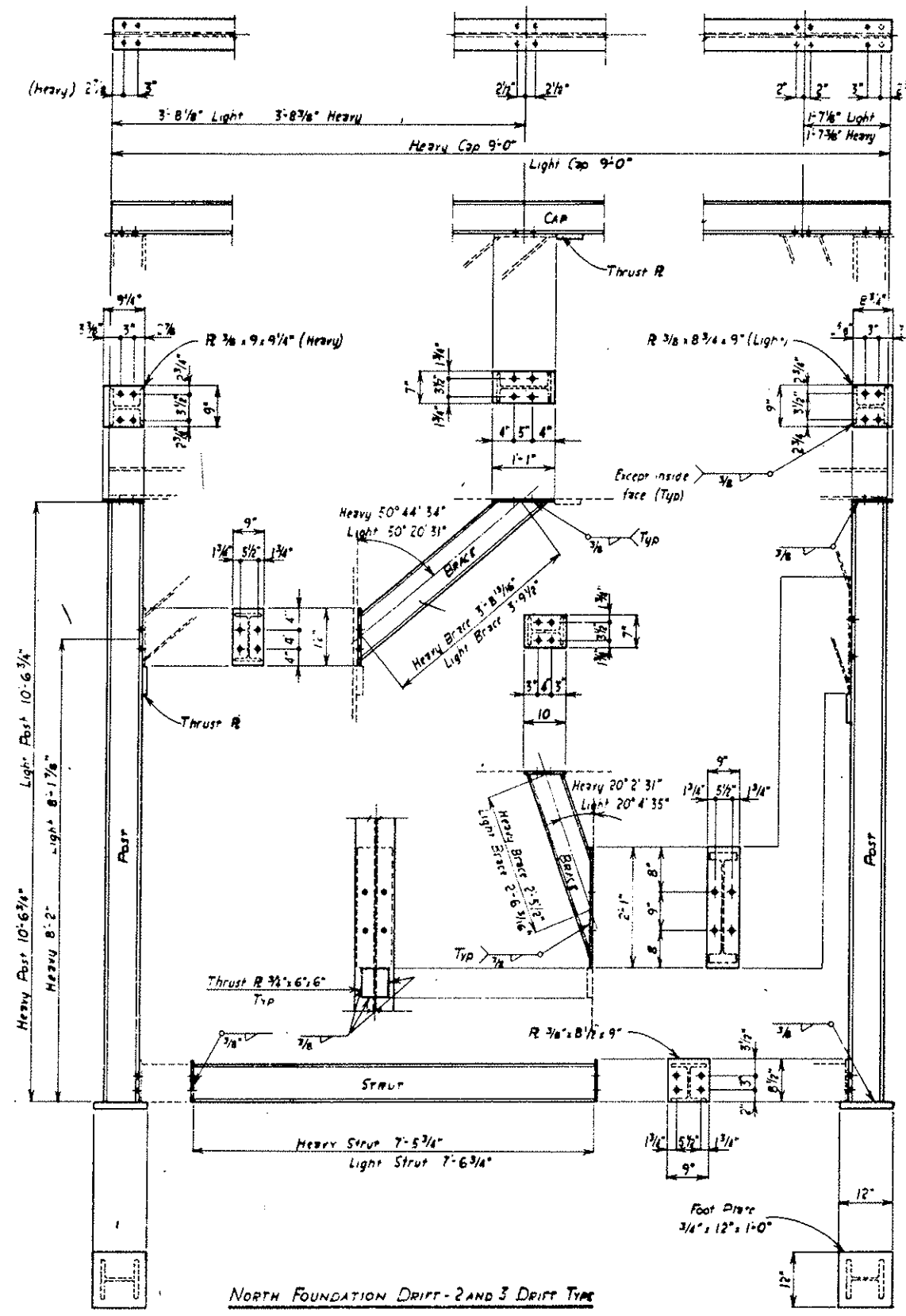
| REVISIONS | |
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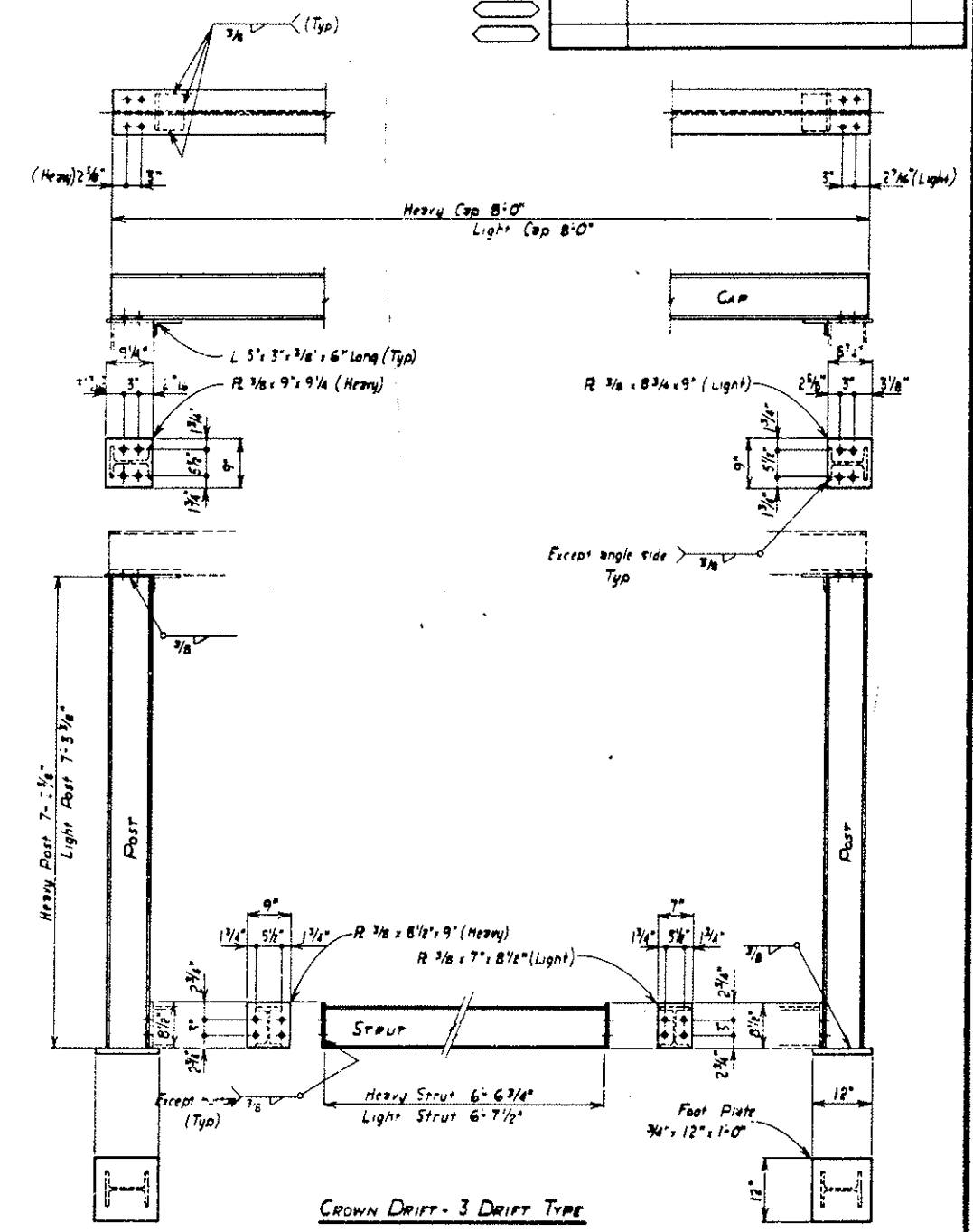
CROWN DRIFT - 3 DRIFT TYPE



NORTH FOUNDATION DRIFT - 2 AND 3 DRIFT TYPE



NORTH FOUNDATION DRIFT - 2 AND 3 DRIFT TYPE



CROWN DRIFT - 3 DRIFT TYPE

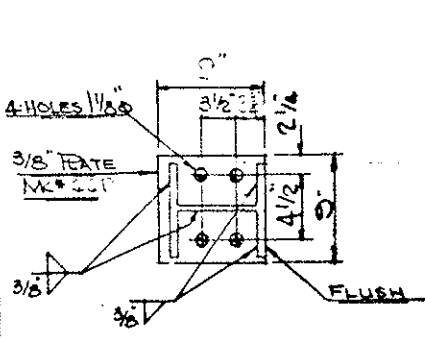
Notes:
 All bolts shall be A-307
 All tolerances 1/8"

| DIVISION OF HIGHWAYS | | | |
|--|-----------|----------|--|
| DETAILS | | | |
| CROWN DRIFT - 3 DRIFT TYPE | | | |
| AND | | | |
| NORTH FOUNDATION DRIFT - 3 DRIFT AND 2 DRIFT TYPES | | | |
| DIVISIONS PROPOSED METHOD OF CONSTRUCTION | | | |
| Designer C.D.G.H. | Structure | P-15-X | |
| Detailer R. Seylhouer | Numbers | | |
| Drawing Number B 15 | of 60 | Drawings | |

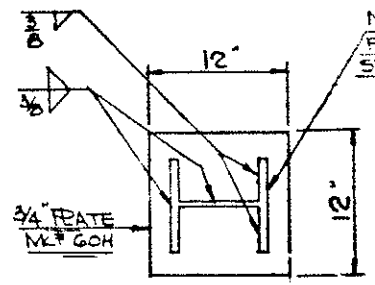
| | | |
|---------------|----------|------|
| CHECKED BY | INITIAL | DATE |
| QUANTITIES BY | C.D.G.H. | 4-73 |
| CHECKED BY | R.W.G. | 4-73 |
| DETAILS BY | T.L.A. | 4-73 |
| CHECKED BY | R.J.S. | 4-73 |

| | | | | | |
|---------|-----|---------|---------|-----|---------|
| REVISED | BY | DATE | REVISED | BY | DATE |
| 1 | WJH | 6-29-79 | 1 | WJH | 6-29-79 |

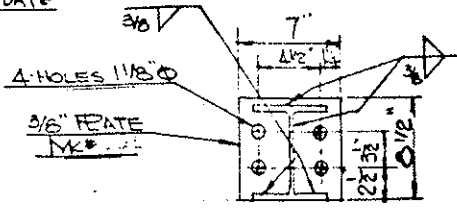
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|---------|----------|-----------|---------------|
| SECTION | MARK NO. | OPERATION | CUT TO LENGTH |
| SECTION | MARK NO. | OPERATION | CUT TO LENGTH |
| SECTION | MARK NO. | OPERATION | CUT TO LENGTH |
| SECTION | MARK NO. | OPERATION | CUT TO LENGTH |



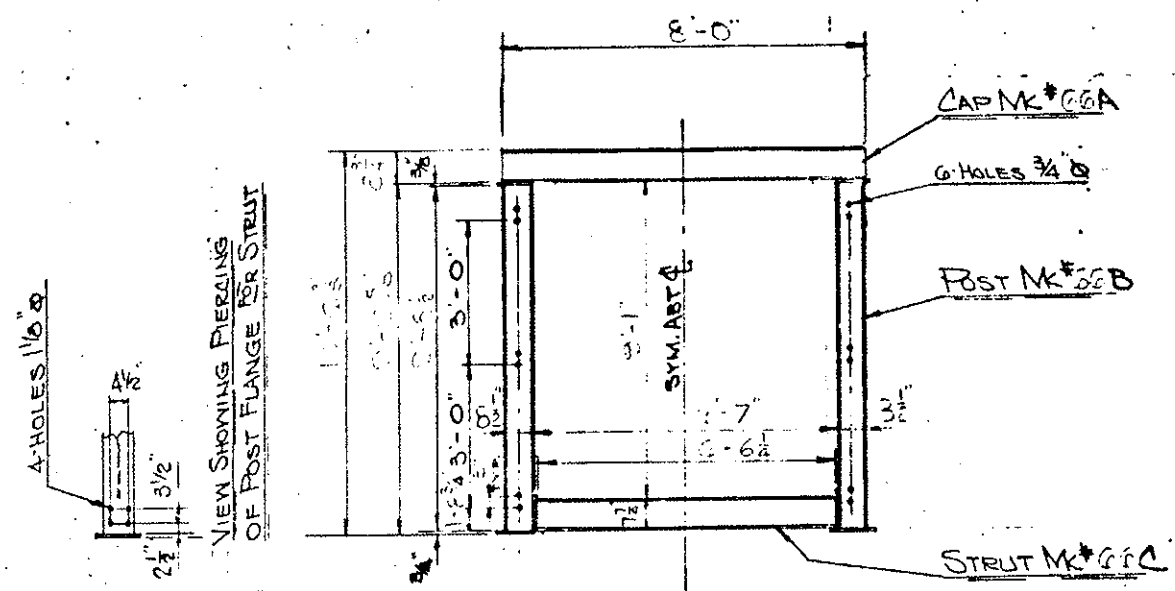
POST TOP PLATE DETAIL



FOOT PLATE DETAIL



STRUT END PLATE DETAIL



BOTTOM VIEW OF CAP RIB

USED FROM:

| | | |
|-----------|----|-----------|
| STA 21+84 | To | STA 21+06 |
| 25+36 | To | 121+52 |
| 103+62 | To | 104+30 |
| 107+38 | To | 108+46 |

Approved: R. A. Sundstrom

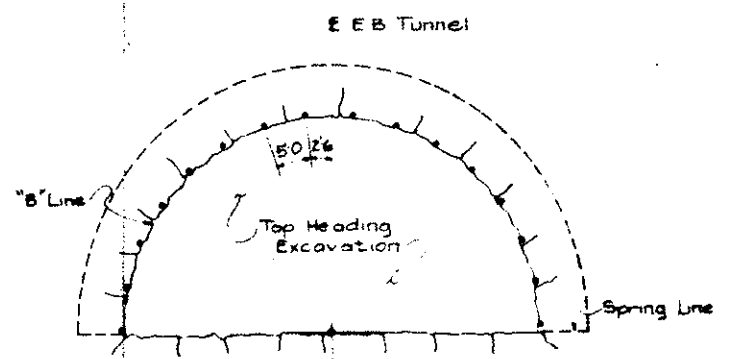
APPROVED FINAL
DATE 6-1-76
BY Jack E. Gray

| QTY | UNIT | DESCRIPTION | MARK NO. | NO. REQD. | REVISION |
|-----|---|-------------|----------|-----------|----------|
| 12 | 5/8" S.T.L. NUTS | | | | |
| 6 | 5/8" X 5 1/2" TIE RODS WITH 3" OATHD. END | | | | |
| 16 | 1" HEX T.L. NUTS | | | | |
| 16 | 1" X 3" HEX HD. T.L. BOLTS | | | | |
| 2 | 2 1/2" X 3" X 3/4" END PLATE | | | | |
| 1 | 1" X 8" X 24" X 3/4" RINA | | | | |
| 1 | STRUT ASSY CONSISTING OF: | | | | |
| 2 | 1 3/4" X 12" X 12" FOOT PLATE | | | | |
| 2 | 1 1/8" X 3" X 3" POST TOP PLATE | | | | |
| 2 | 1" X 8" X 24" X 3/4" RINA | | | | |
| 2 | POST ASSYS EA. CONSISTS OF: | | | | |
| 2 | 2 1/2" X 3" X 3/4" THRUST PLATE | | | | |
| 1 | 1" X 8" X 24" X 3/4" RINA | | | | |
| 1 | CAP RIB CONSISTING OF: | | | | |

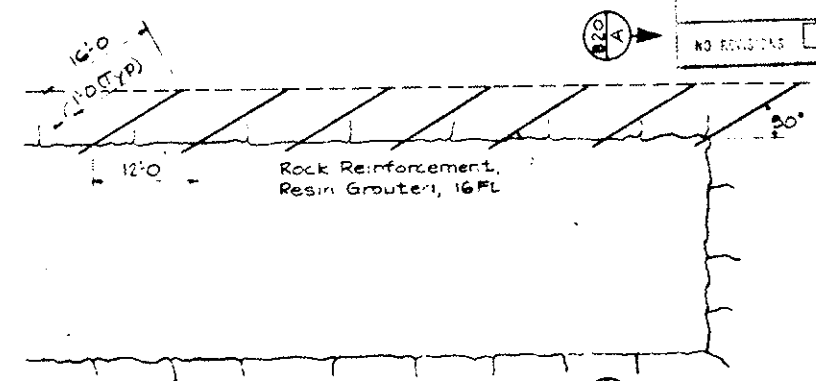
AS CONSTRUCTED
NO REVISIONS
REVISED 6-23-79
1310

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-----------------------|-----------|--------------|
| VIII | COLORADO I70-3(81)220 | 48 | 273 |

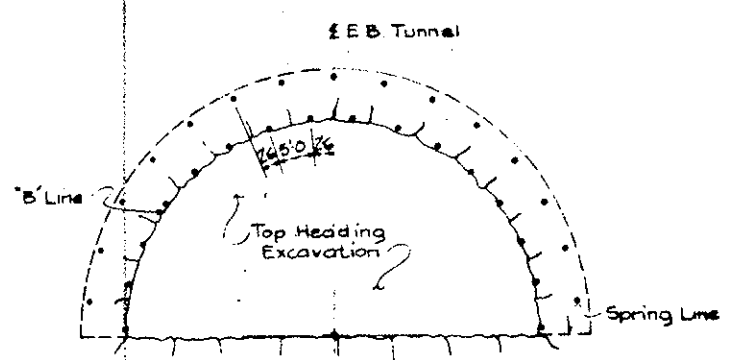
| REVISIONS | |
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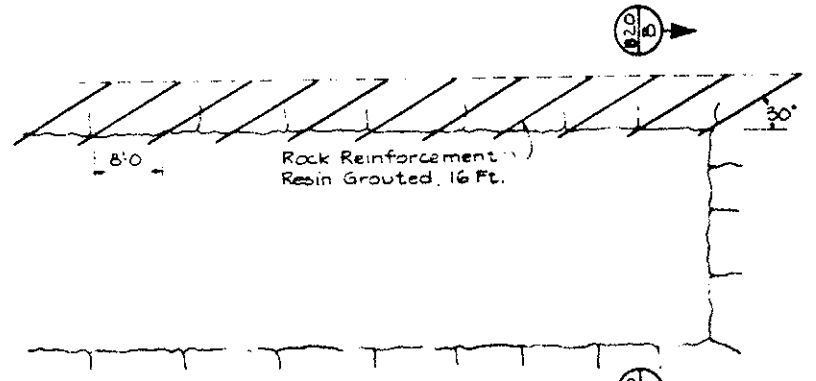
SECTION A



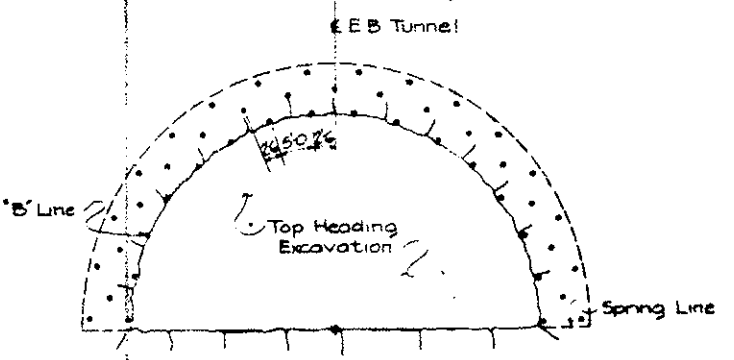
TYPE 1



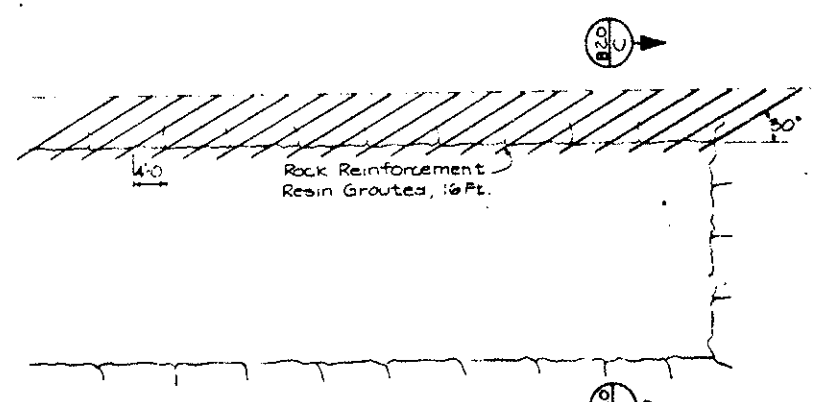
SECTION B



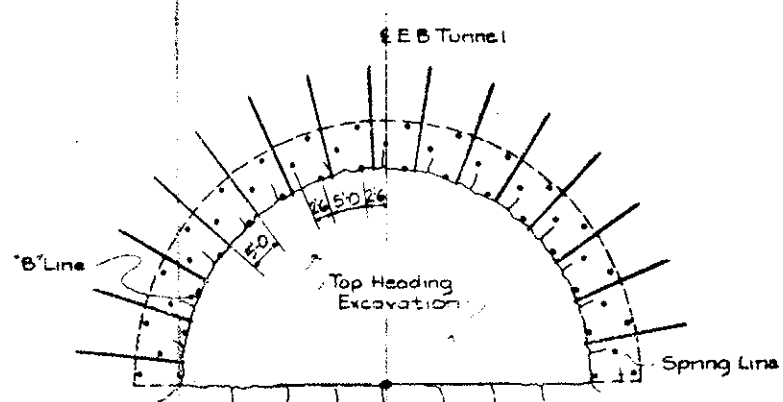
TYPE 2



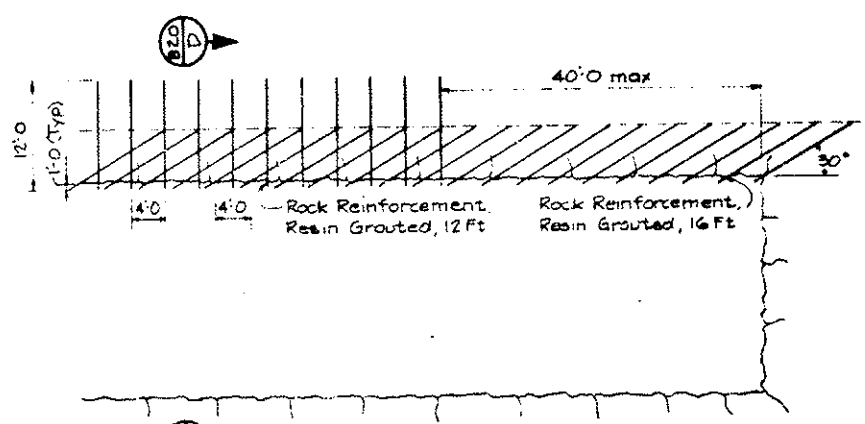
SECTION C



TYPE 3



SECTION D



TYPE 4

NOTES:

1. Resin grouted rock reinforcement types shall be located along the length of the east bound tunnel in accordance with the following table:
See Sheet No. 48 for Final Summary

| Stations | Type | No. Required | |
|--------------------------|------|--------------|-----|
| Sta 40+98 to Sta 41+30 | 5 | 100 | |
| Sta 41+30 to Sta 41+43 | 1 | 25 | |
| Sta 41+43 to Sta 41+82 | 5 | 125 | |
| Sta 62+06 to Sta 63+86 | 4 | 653 | 653 |
| Sta 63+86 to Sta 64+15 | 3 | 116 | |
| Sta 64+15 to Sta 65+15 | 4 | 563 | 363 |
| Sta 65+15 to Sta 65+42 | 3 | 116 | |
| Sta 69+62 to Sta 71+40 | 3 | 653 | |
| Sta 71+40 to Sta 71+85 | 2 | 87 | |
| Sta 71+85 to Sta 72+90 | 4 | 392 | 377 |
| Sta 72+90 to Sta 74+58 | 3 | 624 | |
| Sta 79+98 to Sta 80+77 | 3 | 290 | |
| Sta 80+77 to Sta 81+85 | 4 | 592 | 592 |
| Sta 81+85 to Sta 82+50 | 3 | 247 | |
| Sta 87+56 to Sta 88+70 | 4 | 378 | 364 |
| Sta 88+70 to Sta 89+10 | 2 | 66 | |
| Sta 89+10 to Sta 92+00 | 4 | 950 | 936 |
| Sta 92+00 to Sta 92+80 | 3 | 260 | |
| Sta 92+80 to Sta 94+87 | 4 | 676 | 676 |
| Sta 94+87 to Sta 97+10 | 5 | 728 | |
| Sta 97+10 to Sta 98+78 | 4 | 546 | 534 |
| Sta 98+78 to Sta 99+55 | 2 | 130 | |
| Sta 99+55 to Sta 101+45 | 3 | 624 | |
| Sta 101+45 to Sta 101+95 | 2 | 92 | |
| Sta 101+95 to Sta 103+52 | 4 | 520 | 508 |
| Sta 103+52 to Sta 103+60 | 1 | 14 | |
| Sta 103+60 to Sta 104+35 | 3 | 248 | |
| Sta 104+35 to Sta 104+84 | 2 | 92 | |
| Sta 104+84 to Sta 107+85 | 4 | 988 | 976 |
| Sta 107+85 to Sta 108+50 | 1 | 78 | |
| Sta 108+50 to Sta 109+35 | 4 | 284 | 274 |
| Sta 109+35 to Sta 110+20 | 1 | 125 | |
| Sta 110+20 to Sta 110+95 | 5 | 295 | |
| Sta 110+95 to Sta 111+33 | 2 | 78 | |
| Sta 111+33 to Sta 113+35 | 3 | 791 | |
| Sta 113+35 to Sta 115+75 | 1 | 62 | |
| Sta 113+75 to Sta 117+60 | 3 | 1504 | |
| Sta 117+60 to Sta 117+95 | 1 | 47 | |
| Sta 117+95 to Sta 119+10 | 5 | 450 | |
| Sta 119+10 to Sta 120+22 | 4 | 450 | 434 |

Sum (Rock Reinforcement Quantities) = 14,459 6,487
Bid Quantity (Sum + 10% Sum) = 16,125 7,136

- From Sta 87+56 to Sta 109+42 the patterns shown shall be interrupted, 5'0" ± on both sides of the centerline of tunnel by the presence of the crown drift.
- All rock reinforcement shall be No 11, Grade 60.
- Rock reinforcement installed in advance of the face shall be in place at least one hour prior to advancing the face.
- Radial rock reinforcement must be installed so that it does not lag more than 40 FT behind the heading face.

One Scale: 1" = 10'

DIVISION OF HIGHWAYS

ROCK REINFORCEMENT

TOP HEADING

| | |
|----------------------|-------------------|
| Designer: CDH | Structure: F-13-2 |
| Dataper: B.R. Lane | Numbers: |
| Drawing Number: B 20 | of 60 Drawings |

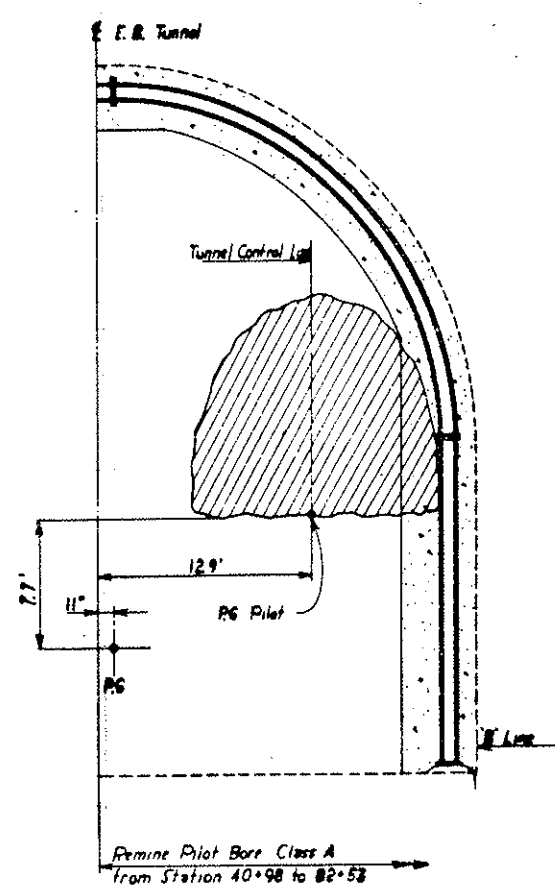
Revised Date: (Preliminary Scale Only)

| | | | |
|-------------|------|----|------|
| DESIGNED BY | DATE | BY | DATE |
| CHECKED BY | DATE | BY | DATE |
| REVISIONS | DATE | BY | DATE |

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | I 70-3(8)220 | 48 AX | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | | REVISED | 6-28-79 | VOID |

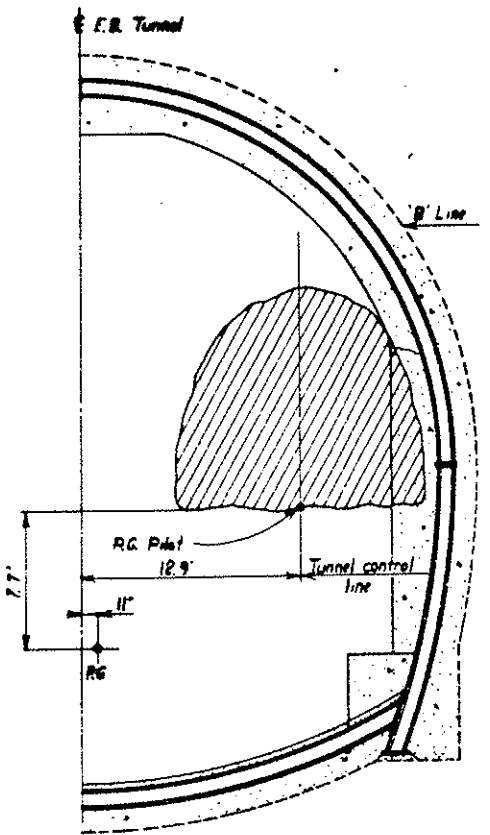
| FINAL SUMMARY OF ROCK REINFORCEMENT | | | |
|-------------------------------------|-----------------|-----------------|--------|
| RESIN GROUTED NO. 11 REBAR | | | |
| STATIONING | TYPE | NUMBER IN PLACE | |
| | | 16 FT. | 12 FT. |
| STA. 40+94 TO STA. 41+26 | 3 | 101 | |
| STA. 41+32 TO STA. 41+41 | 1 | 40 | |
| STA. 41+53 TO STA. 41+81 | 3 | 97 | |
| STA. 45+38 TO STA. 45+45 | FORM 105 | 14 | |
| STA. 57+84 TO STA. 57+97 | FORM 105 | 11 | |
| STA. 62+08 TO STA. 63+86 | 4 | 746 | 649 |
| STA. 63+90 TO STA. 64+10 | 3 | 88 | |
| STA. 64+14 TO STA. 65+14 | 4 | 516 | 362 |
| STA. 67+77 TO STA. 67+89 | 3 | 57 | |
| STA. 69+62 TO STA. 71+22 | 3 | 561 | |
| STA. 71+30 TO STA. 71+62 | 2 | 55 | |
| STA. 71+70 TO STA. 71+86 | 3 | 120 | |
| STA. 71+90 TO STA. 72+90 | 4 | 399 | 366 |
| STA. 72+94 TO STA. 74+46 | 2 | 298 | |
| STA. 79+92 TO STA. 80+72 | 3 | 293 | |
| STA. 80+76 TO STA. 81+84 | 4 | 648 | 414 |
| STA. 81+88 TO STA. 82+44 | 3 | 239 | |
| STA. 82+53 LT. | SIDE WALL DRIFT | | 9 |
| STA. 87+64 TO STA. 89+72 | 4 | 798 | 724 |
| STA. 89+76 TO STA. 90+48 | 3 | 335 | |
| STA. 90+52 TO STA. 91+40 | 4 | 389 | 292 |
| STA. 91+44 TO STA. 92+28 | 3 | 311 | |
| STA. 92+32 TO STA. 94+32 | 4 | 1058 | 690 |
| STA. 94+36 TO STA. 96+48 | 3 | 481 | |
| STA. 96+52 TO STA. 98+40 | 4 | 769 | 614 |
| STA. 98+48 TO STA. 99+72 | 2 | 269 | |
| STA. 99+76 TO STA. 100+12 | 4 | 148 | 114 |
| STA. 100+16 TO STA. 101+32 | 3 | 307 | |
| STA. 101+36 TO STA. 101+56 | 4 | 66 | 68 |
| STA. 101+60 TO STA. 101+82 | 3 | 68 | |
| STA. 101+86 TO STA. 102+02 | 4 | 61 | 61 |
| STA. 102+06 TO STA. 104+46 | 3 | 431 | |
| STA. 104+50 TO STA. 107+38 | 4 | 996 | 844 |
| STA. 107+42 TO STA. 108+42 | 1 | 108 | |
| STA. 108+46 TO STA. 108+78 | 4 | 111 | 97 |
| STA. 108+82 TO STA. 108+94 | 3 | 41 | |
| STA. 109+02 TO STA. 110+10 | 1 | 107 | |
| STA. 110+14 TO STA. 111+54 | 3 | 352 | |
| STA. 111+58 TO STA. 112+10 | 2 | 95 | |
| STA. 112+18 TO STA. 113+18 | 3 | 251 | |
| STA. 113+30 TO STA. 113+70 | 2 | 59 | |
| STA. 113+78 TO STA. 117+34 | 3 | 1127 | |
| STA. 117+46 TO STA. 118+02 | 2 | 90 | |
| STA. 118+10 TO STA. 118+46 | 3 | 120 | |
| STA. 118+53 TO STA. 119+07 | 2 | 156 | |
| STA. 119+10 TO STA. 120+20 | 4 | 804 | 357 |
| ACCESS CROWN DRIFT | | 136 | |

| REVISIONS | | |
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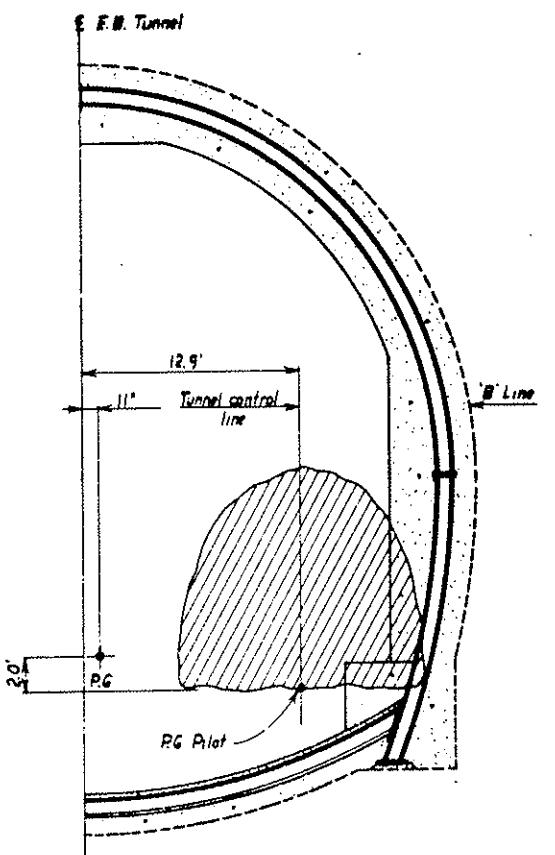
STATION 40+98

Eastbound Tunnel remains constant from Sta. 40+98 to 41+81



STATION 41+81 to 58+50

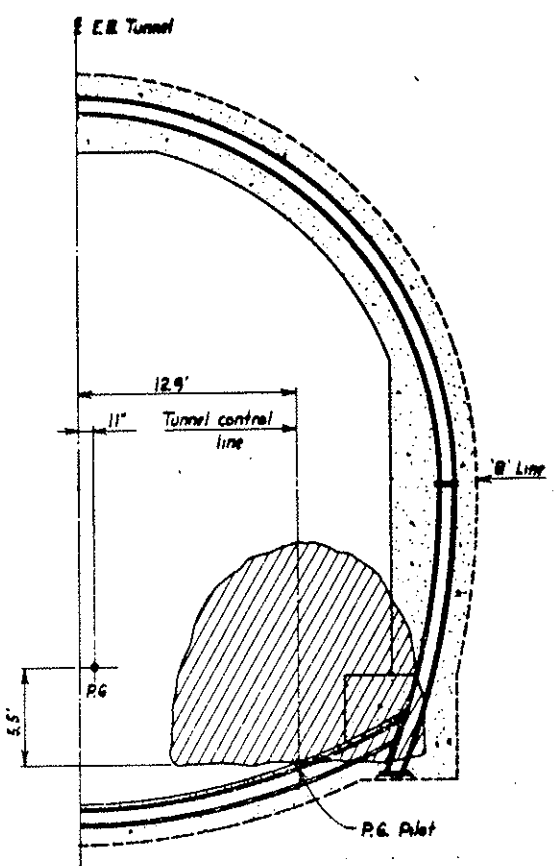
Eastbound Tunnel transition upward from Sta. 58+50 to 68+07 1/2



STATION 68+07 1/2

Top of Pilot Bore approx. at spring line

Eastbound Tunnel transitions upward from Sta. 68+07 1/2 to 72+98



STATION 72+98

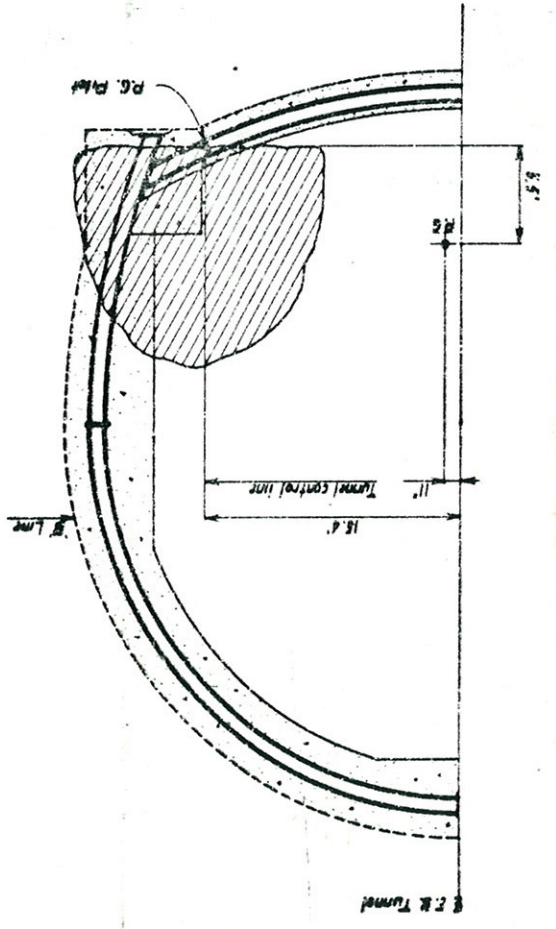
Original scale: 3/16" = 1'-0"

Note:
 The cross-section area of the pilot bore as shown represents approximate configuration.

| | | | |
|-------------|----------|-------------|--------|
| DESIGNED BY | C.D.O.H. | DATE | 3-73 |
| CHECKED BY | R.H.G. | QUANTITY BY | J.A. |
| DRAWN BY | R.H.G. | CHECKED BY | R.H.G. |

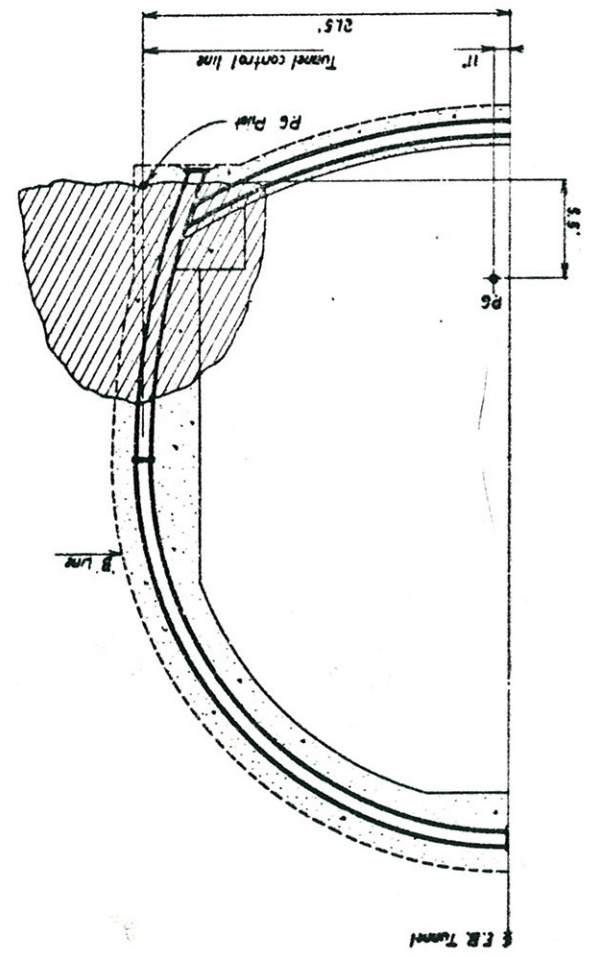
| | | | |
|--|--------------|-----------|----------|
| DIVISION OF HIGHWAYS | | | |
| MAIN BORE, EASTBOUND TUNNEL, LOCATION RELATIVE TO LOCATION OF PILOT BORE | | | |
| Designer | C.D.O.H. | Structure | F-17-Y |
| Detailer | R. Seythamer | Number | |
| Drawing Number | B 21 | of 60 | Drawings |

| | | | |
|-------------|------|------------|----------|
| DESIGNED BY | DATE | ORDERED BY | QUANTITY |
| CHDH | 2-78 | CHDH | 1.4 |
| CHECKED BY | 3-78 | CHECKED BY | 3-78 |
| INITIALS | | INITIALS | |



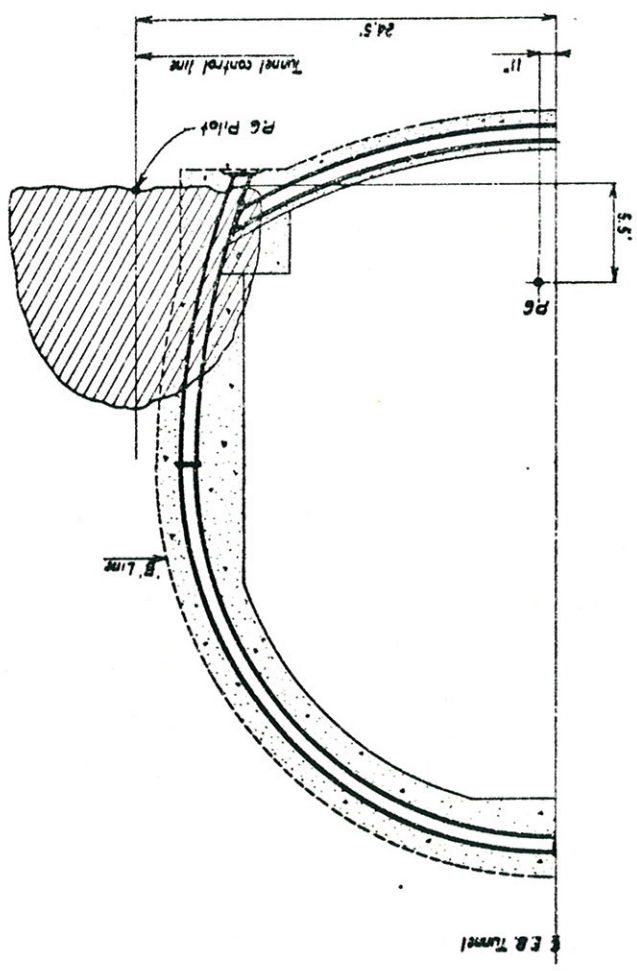
STATION 74.50

South walls of Pilot and Main Bore approx. coincide
 Eastbound Tunnel transition to the North from Sta. 74.50 to 78+20
 Westbound Tunnel transition to the North from Sta. 78+20 to 80+00



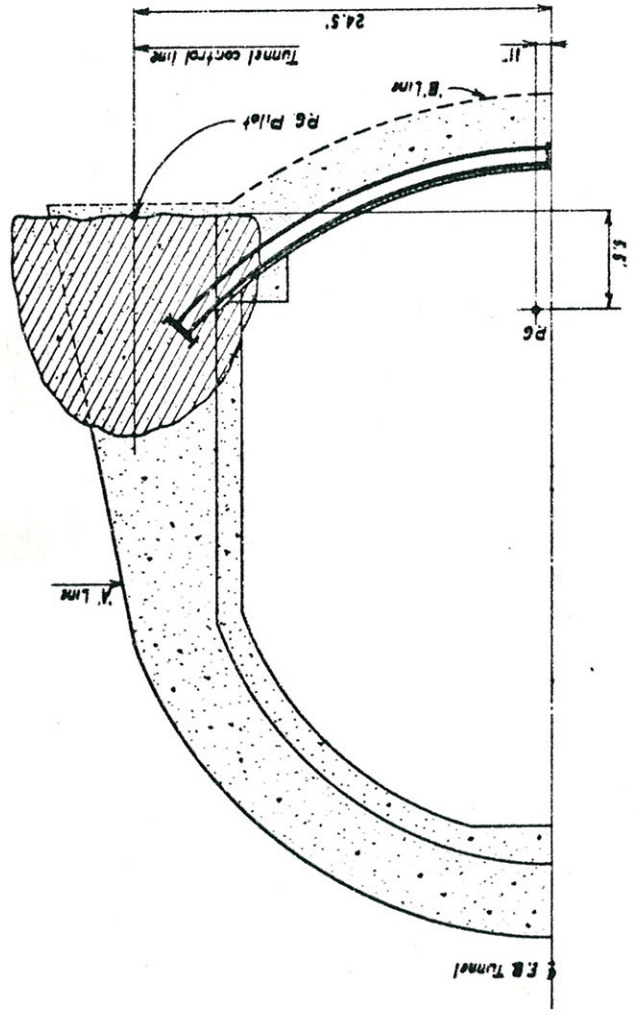
STATION 78+20

Tunnel Control line approximate below Arch Rib
 Eastbound Tunnel transition to the North from Sta. 78+20 to 80+00
 Westbound Tunnel transition to the North from Sta. 78+20 to 80+00



STATION 80+00 to 82+53

Prime Pilot Bore Class "A"
 40+98 to 82+53



STATION 82+53 to 87+56

Multiple Drift Support

DIVISION OF HIGHWAYS

MAIN BORE, EASTBOUND TUNNEL, LOCATION
 RELATIVE TO LOCATION OF
 PILOT BORE

| | |
|----------------|--------|
| DESIGNER | C.D.H. |
| STRUCTURE | F-13-X |
| DRAWING NUMBER | B-22 |
| OF 60 | |
| DRAWINGS | |

| | | | |
|-----------------------|-----------|-------|--------------|
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET | TOTAL SHEETS |
| | | 50 | 273 |
| REVISIONS | | | |
| | | | |
| | | | |

| | | |
|--------------|-----------|------|
| NO REVISIONS | REVISIONS | DATE |
| | | |

(81) CANT
 AS CONST

Note:
 The cross-section area of the pilot bore as shown represents approximate configuration

| | | | |
|-------------|-------------|------------|-------------|
| DESIGNED BY | DATE | CHECKED BY | DATE |
| C.D.H. | 2-77 | C.D.H. | 5-77 |
| DRAWN BY | QUANTITY BY | DRAWN BY | QUANTITY BY |
| P.S.J. | 5-77 | P.S.J. | 5-77 |

Remain Pilot Bore Cross B.
87+56 to 120+22

Eastbound Tunnel transition downward
from Sta. 88+00 to 96+00

Eastbound Tunnel transitions downward
from Sta. 111+00 to 116+00

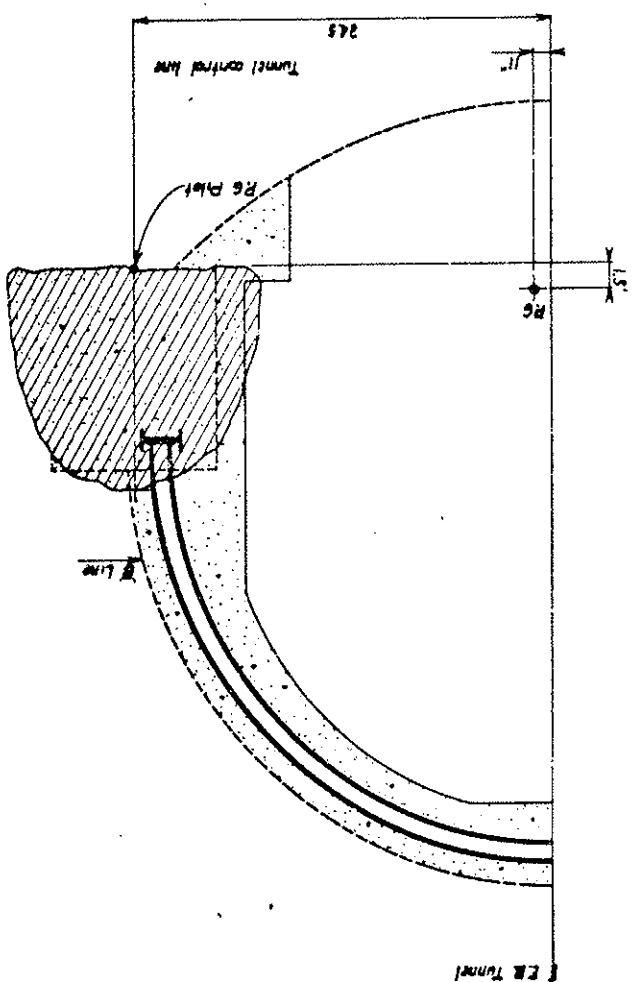
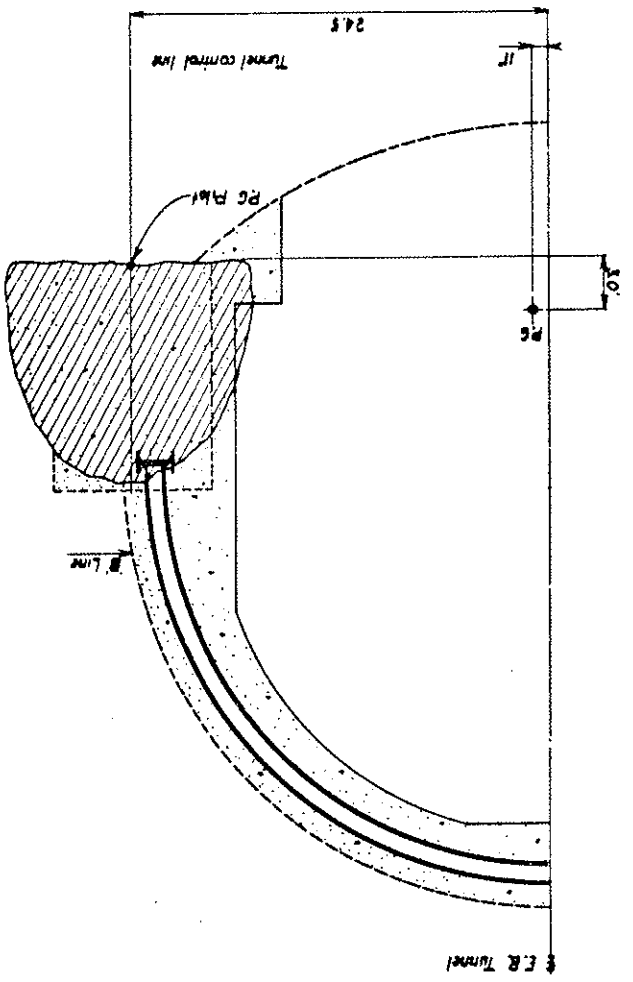
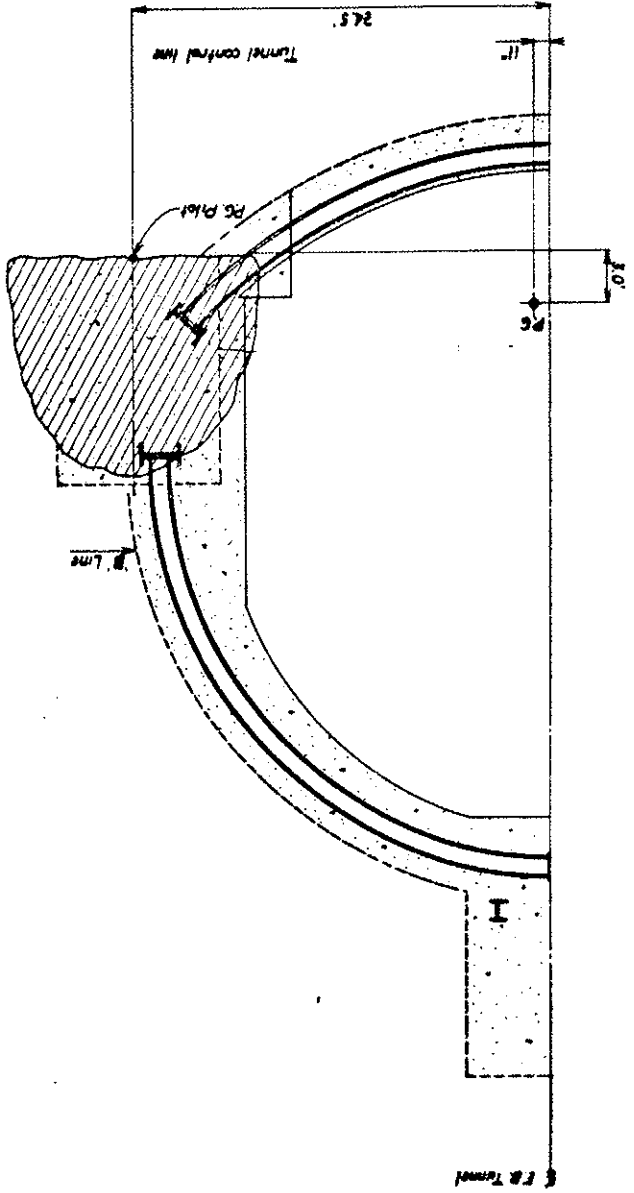
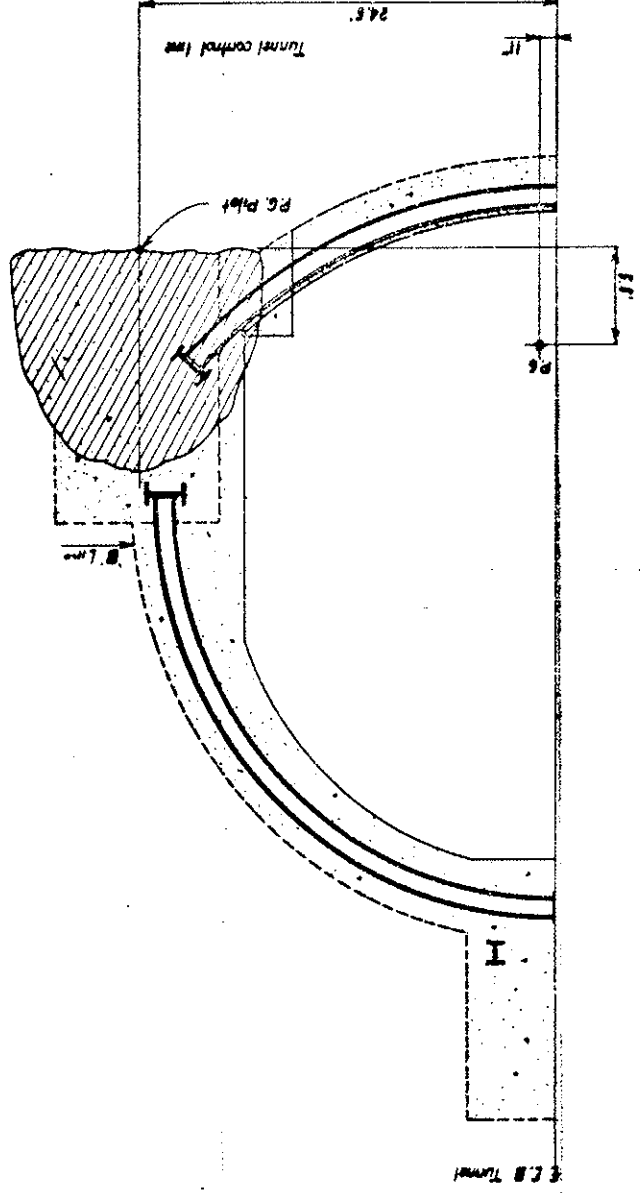
STATION 87+56 to 88+00

STATION 96+00 to 109+42

STATION 109+42 to 111+00

STATION 116+00

Left location of Pilot Bore offset = 24.5'



Note:
The cross-section area of the pilot bore as shown
represents approximate configuration

DIVISION OF HIGHWAYS

MAIN BORE, EASTBOUND TUNNEL, LOCATION
RELATIVE TO LOCATION OF
PILOT BORE

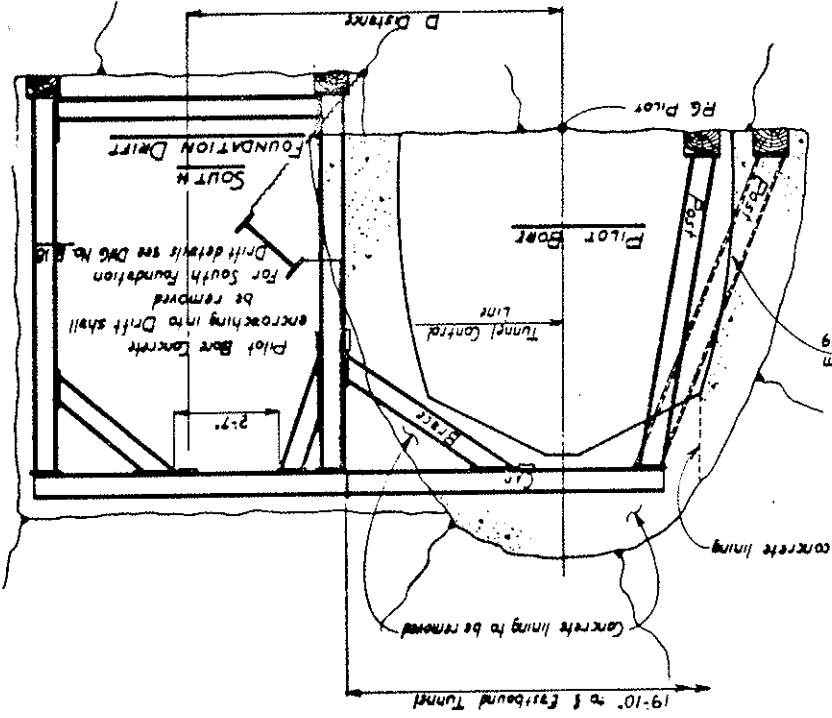
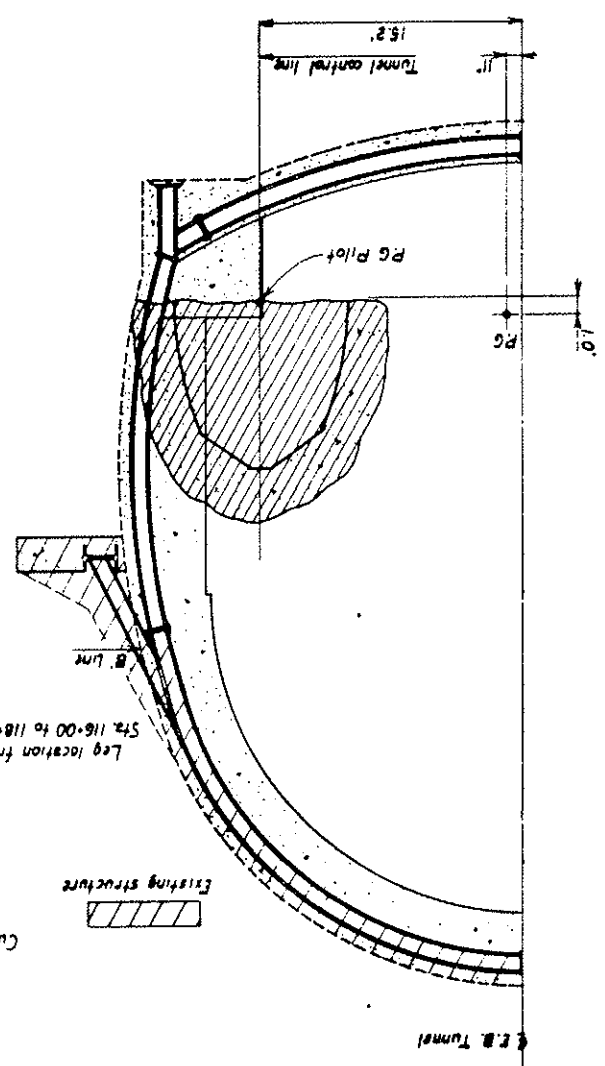
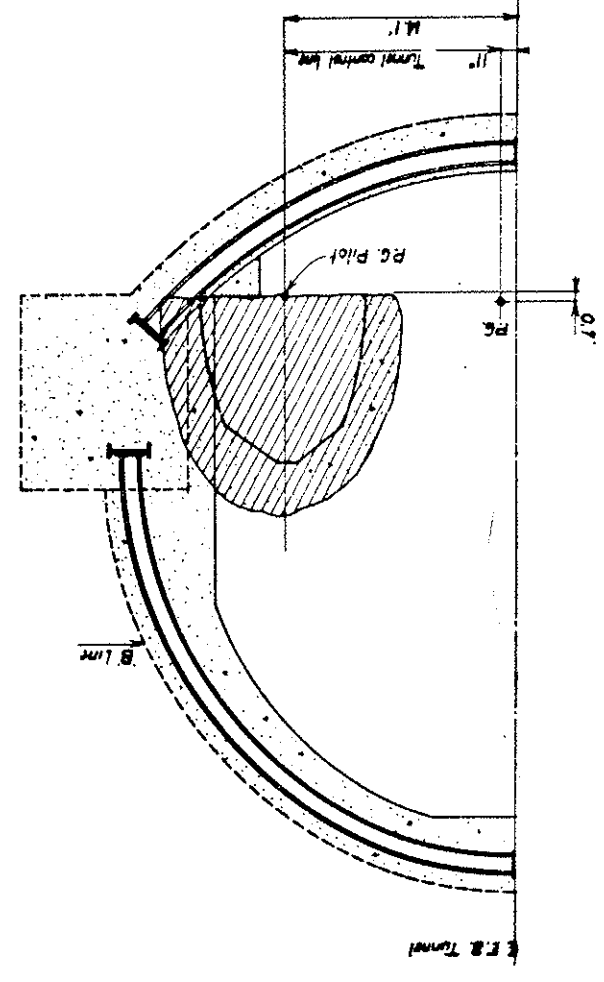
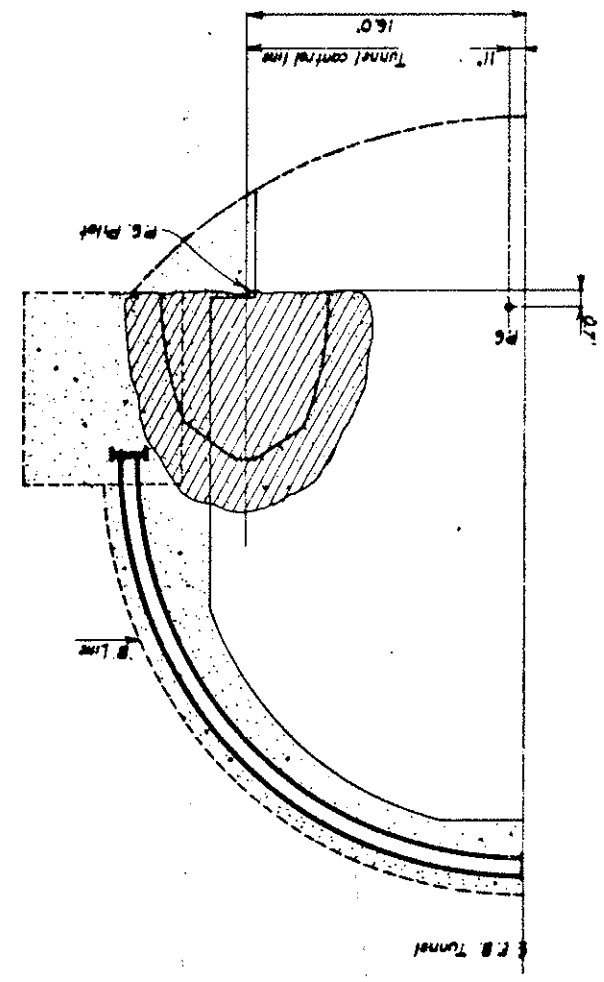
Original scale: 3/16" = 1'-0"

| | |
|----------|---------------|
| Designer | C.D.H. |
| Checker | R. S. WILSON |
| Drawn | P.S.J. |
| Sheet | 273 |
| Project | I 70-5(B) 220 |
| District | 51 |
| Region | 1 |
| Total | 273 |

| | | | |
|---------------|---------|----|--------|
| NO. REVISIONS | DATE | BY | REASON |
| 1 | 6-29-79 | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

| | |
|--------------|---------------|
| TOTAL SHEETS | 273 |
| TOTAL PAGES | 51 |
| PROJECT NO. | I 70-5(B) 220 |
| DISTRICT | 51 |
| REGION | 1 |
| NO. SHEETS | 273 |

| | | | |
|-------------|-------------|------------|------|
| DESIGNED BY | DATE | CHECKED BY | DATE |
| COOK | 2-73 | RYG | 3-73 |
| DRAWN BY | QUANTITY BY | CHANGED BY | DATE |
| WJF | 3-73 | JLA | 3-73 |



| STATION | D | Cap | Lrg | Dist | Length | Port | Cap | BRACK |
|---------|--------|------|------|------|--------|------|--------|--------|
| 116+00 | 0 | 0 | 0 | 0 | 0 | 0 | W 8.40 | W 8.24 |
| 117+00 | 2-0" | 3-0" | 8-9" | 8-9" | 8-9" | 8-9" | W 8.24 | None |
| 118+00 | 6-6" | 5-9" | 8-6" | 8-6" | 8-6" | 8-6" | None | None |
| 118+49 | 8-6" | 8-0" | 8-3" | 8-3" | 8-3" | 8-3" | W 8.40 | W 8.24 |
| 118+52 | 8-6" | 8-0" | 8-0" | 8-0" | 8-0" | 8-0" | W 8.58 | W 8.24 |
| 119+50 | 10-11" | 9-6" | 9-6" | 9-6" | 9-6" | 9-6" | W 8.58 | W 8.24 |
| 120+22 | 10-7" | 9-6" | 8-3" | 8-3" | 8-3" | 8-3" | W 8.58 | W 8.24 |

From Station 116+00 to 118+49 Steel shall be A-36
From Station 118+52 to 120+22 Steel shall be A-572, Grade 55 Steel
supports are spaced at 3-0" c/c

DIVISION OF HIGHWAYS
LOCATION OF EASTBOUND TUNNEL RELATIVE
TO PILOT BORE
AND
DIVISIONS PROPOSED SUPPORT OF SOUTH
FOUNDATION DRIFT AND PILOT BORE
STATION 116+00 TO 120+22
Designer C.D.O.H.
Structures F-11-X
Numbers
Detailer F. S. JOURNAL
Drawing Number B 24
of 60 Drawings
Revision 5/18

Note:
The cross-section area of the pilot bore as
shown represents approximate configuration

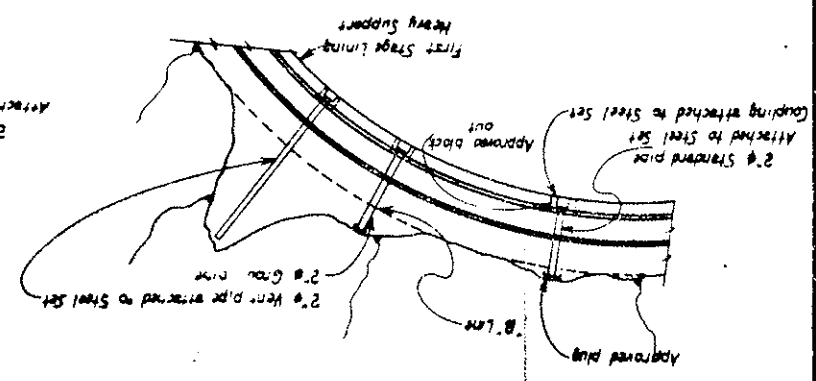
Eastbound Tunnel transitions
downward and southward from
Sta. 116+00 to 118+49
Beginning of Pilot Bore Lining
Station 118+49
End of Heavy Tunnel Support - Two-Drift Type
Station 120+22
Eastbound Tunnel remains in approximately
constant vertical relation to Pilot Bore, and
transitions southward from Sta. 118+49 to 120+22

| REVISIONS | NO. | DATE | BY | DESCRIPTION |
|-----------|-----|------|----|-------------|
| 52 | | | | |
| 273 | | | | |

NO. 6-29-79
PROJECT NO. I 70-3(01)270
SHEET NO. 52
TOTAL SHEETS 273

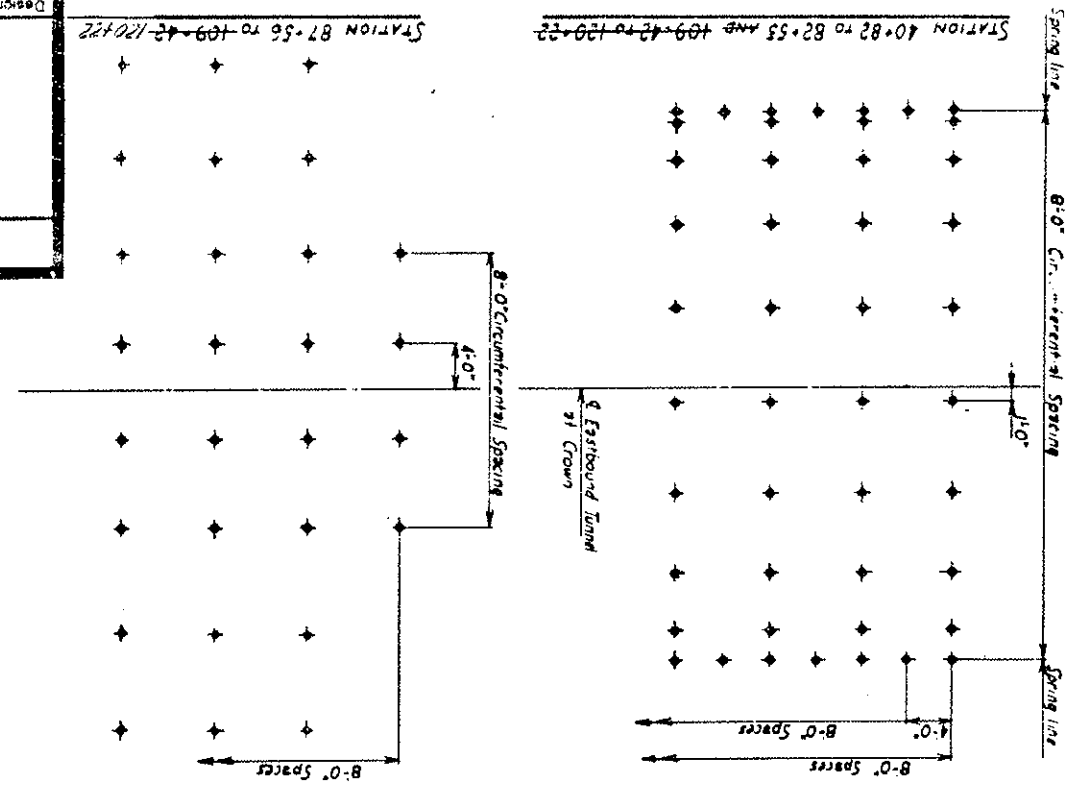
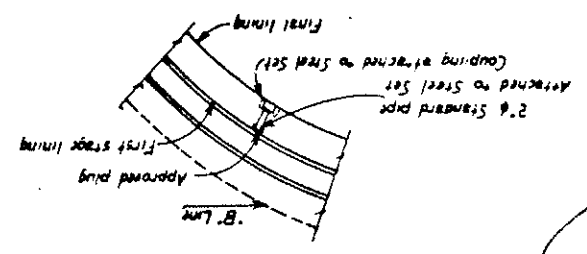
| | | | |
|-------------|------|-------------|-----|
| DESIGNED BY | CDH | CHECKED BY | JLA |
| DRAWN BY | JJS | QUANTITY BY | JLA |
| DATE | 4-75 | CHECKED BY | JJS |
| REVISED | 4-75 | | |

TYPICAL CONTACT GROUT DETAILS



Note:
 Maximum grout pressure 30 P.S.I. at collar of hole.
 2" Grout pipes shall be provided at the crown, 6" north of
 & Eastbound in the final lining at 16 Ft. 5% longitudinal
 to provide contact grout between final and first stage linings

CONTACT GROUT BETWEEN FIRST AND FINAL LINING



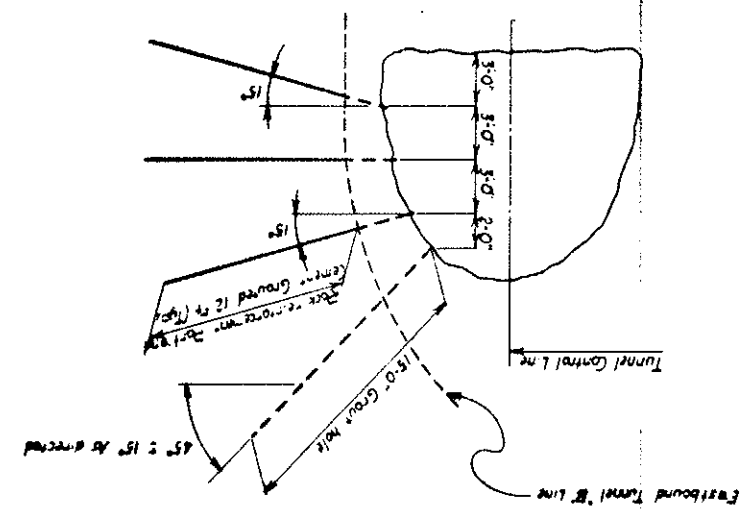
DIVISION OF HIGHWAYS

PRE-GROUT AND CONTACT GROUT REQUIREMENTS

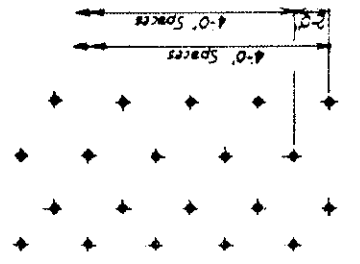
Designer C.D.H.
 Structures F-13-X
 Numbers
 Drawing Number B 25
 of 60 Drawings

Revision Data
 Preliminary Stage Grout

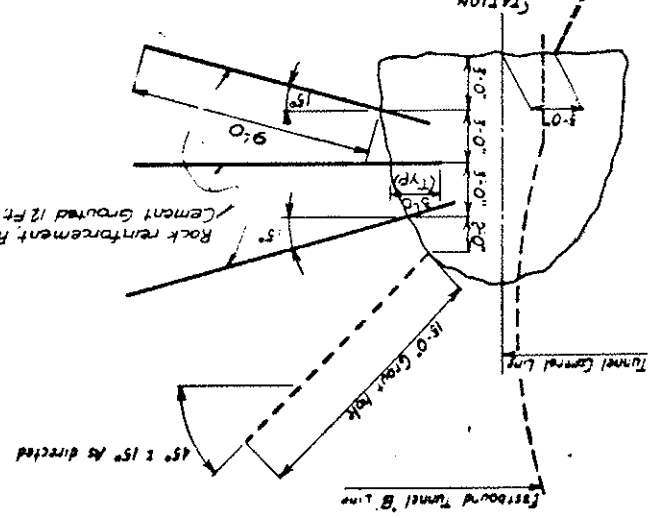
STATION 40+98 TO 79+98



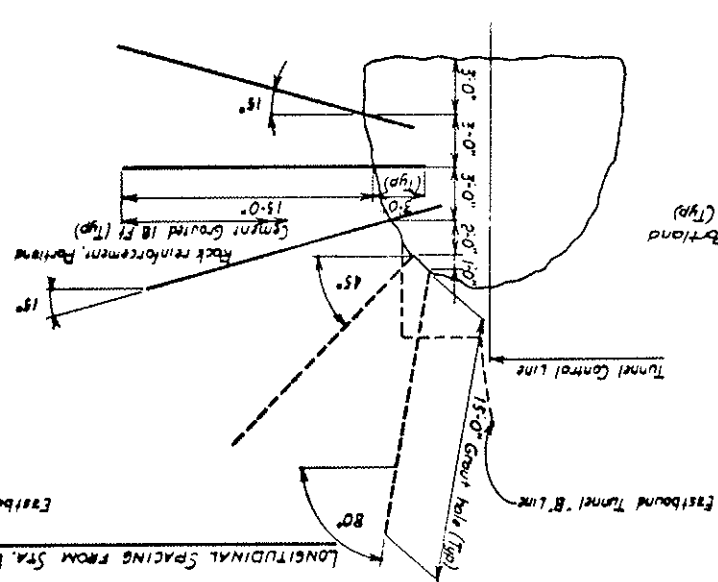
LONGITUDINAL SPACING FROM STA. 40+98 TO 82+53



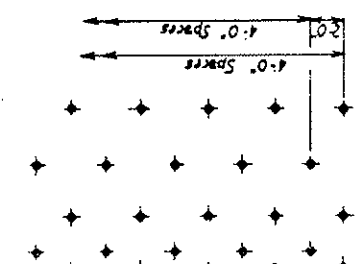
STATION 79+98 TO 82+53



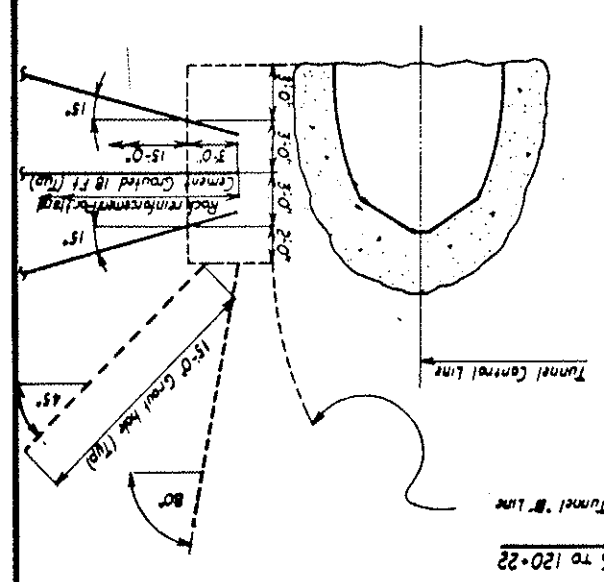
STATION 87+56 TO 117+00



LONGITUDINAL SPACING FROM STA. 87+56 TO 120+22



STATION 117+00 TO 120+22



Rock reinforcement and Grout holes are typical for North Foundation Drift Sta. 87+56 to 120+22. Pilot Bore concrete lining from Sta. 118+49 to 120+72.

| REVISIONS | NO. | DATE | BY | REASON |
|-----------|-----|------|----|--------|
| | | | | |
| | | | | |

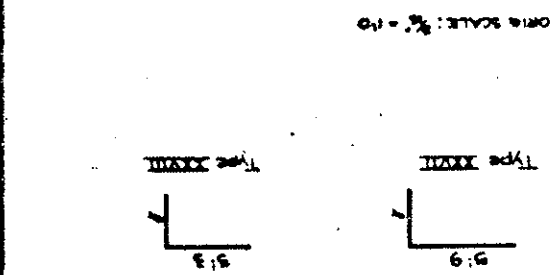
| | |
|--------------|----------------|
| PROJECT NO. | I 70-3(81) 220 |
| DISTRICT | COLORADO |
| TOTAL SHEETS | 53 |
| TOTAL | 273 |

NO REVISIONS

DATE: 6-29-78

BY: [Signature]

DIVISION OF HIGHWAYS
WEST TRANSITION
SECTIONS



B.C.I. - By Equal Increments

| | | |
|------|----------------|---------------|
| Mark | NA Read Length | Type |
| 401 | 7'-9" | 2 |
| TD | 100 | BEI TO XXVIII |
| 4101 | 10'-5" | 4'-6" |
| 4102 | 5'-3" | 2'-0" |
| TD | 100 | BEI TO XXVIII |
| 4202 | 7'-9" | 4'-6" |

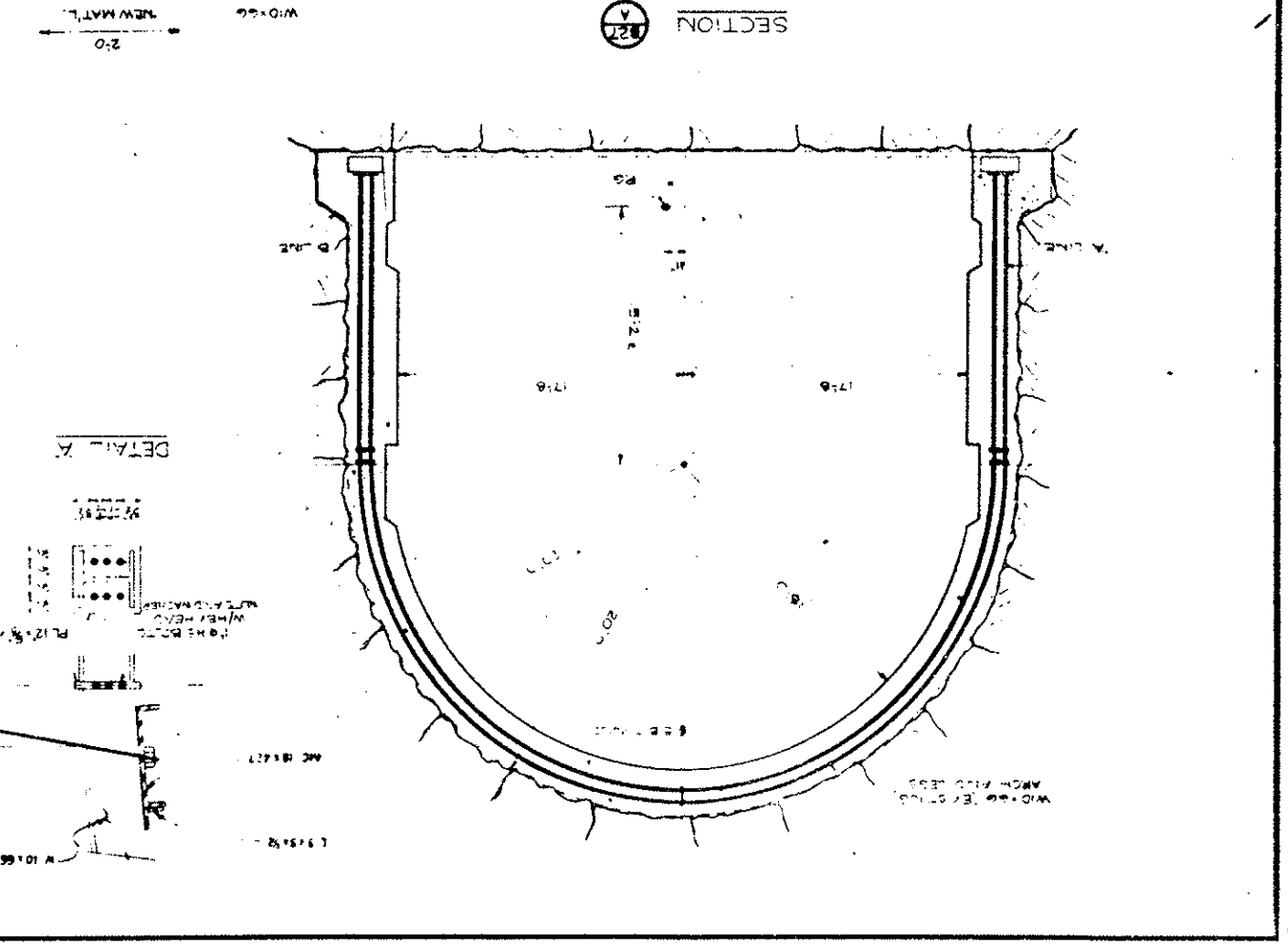
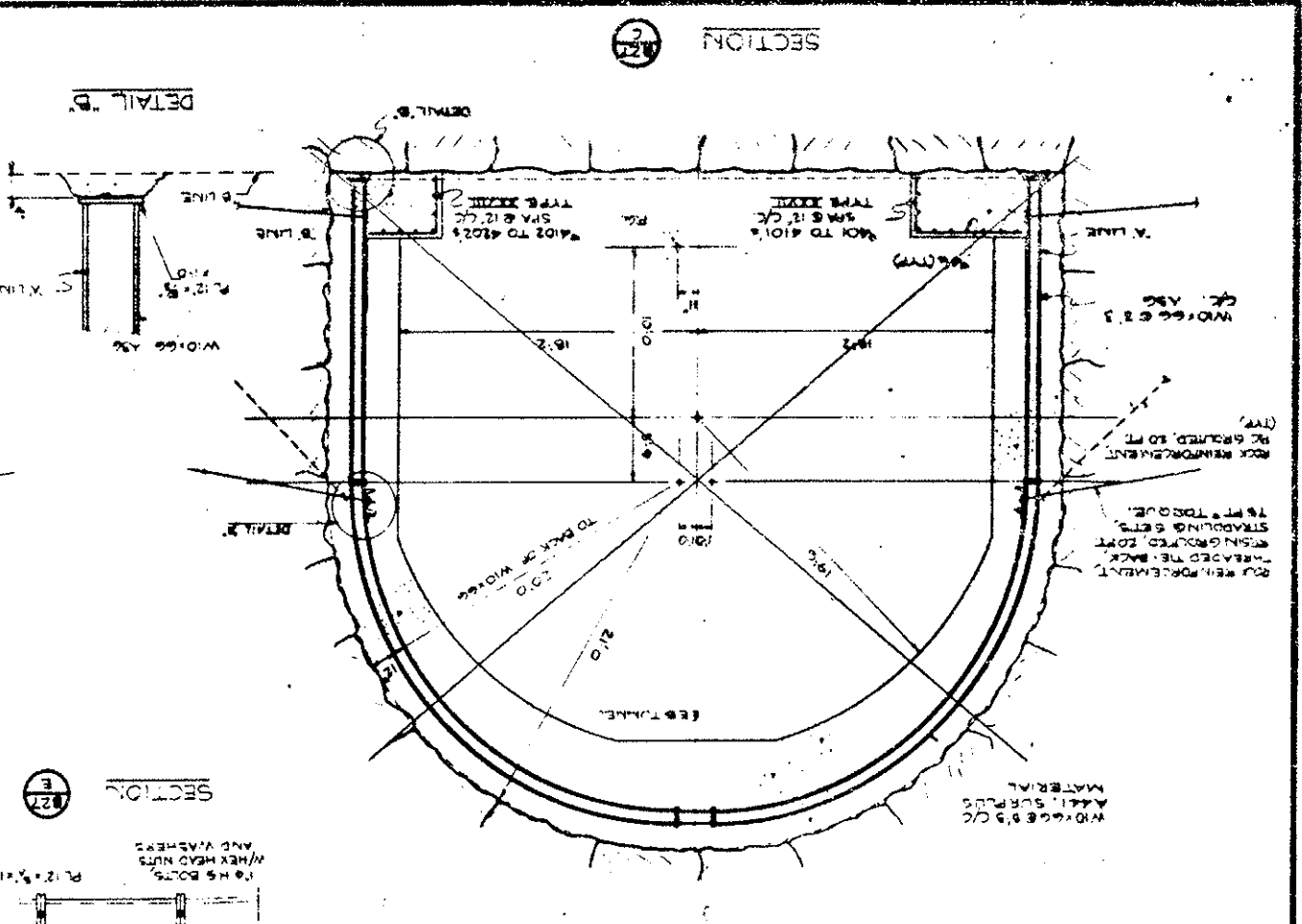
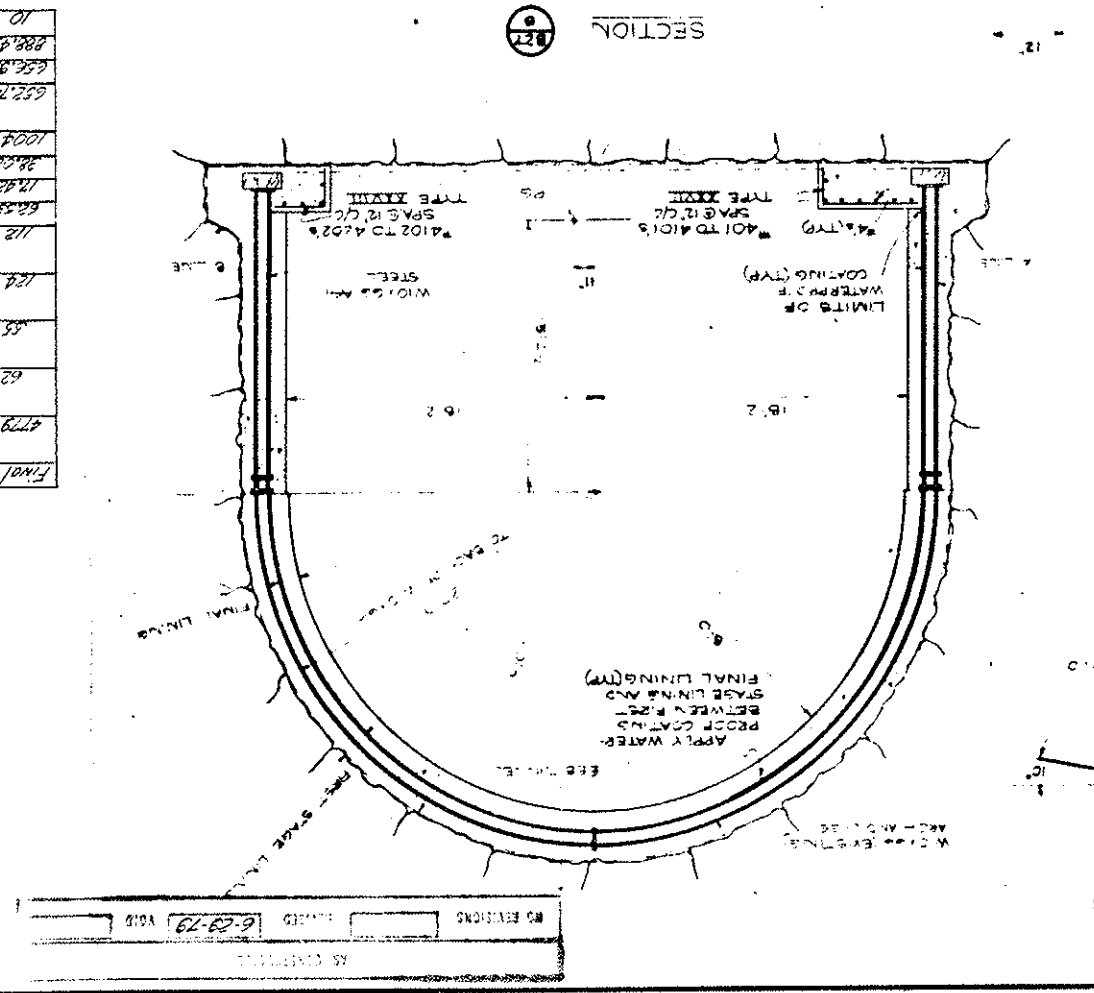
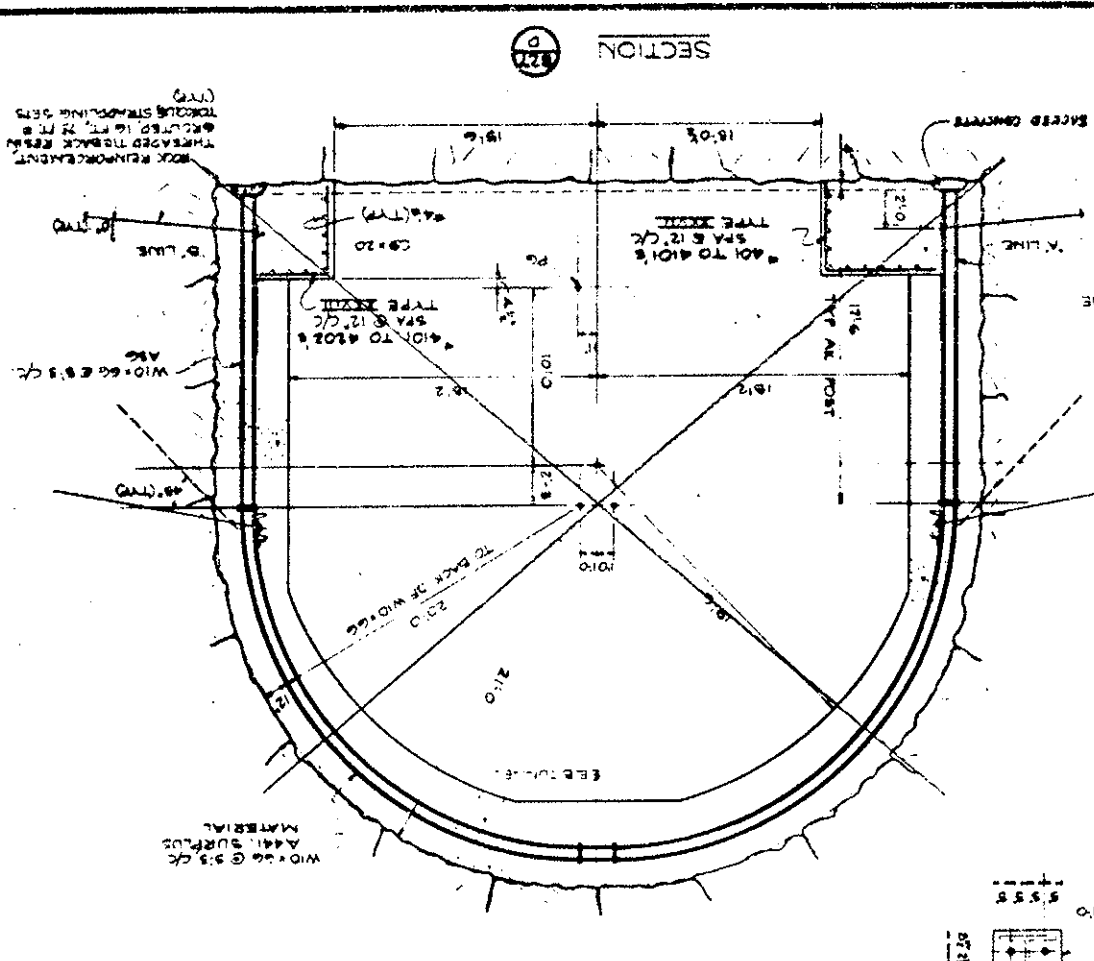
SUMMARY OF QUANTITIES - WEST TRANSITION

| Final | Description | Unit | Total |
|-------|---|-------|--------|
| 4729 | Tunnel Excavation, Class A, (10' to 5280) | Cu Yd | 5280 |
| 62 | Cement Grouted, (12 Ft) | Ea | 63 |
| 211 | Rock Reinforcement Portland | Ea | 56 |
| 211 | Rock Reinforcement, Threaded | Ea | 112 |
| 211 | Rock Reinforcement, Threaded | Ea | 112 |
| 112 | Tebook, Resin Grouted, (20 Ft) | Ea | 112 |
| 509 | Rock Structural Steel | Ton | 59 |
| 509 | Structural Steel (Misc) | Ton | 16 |
| 509 | Structural Steel (W10x66) | Ton | 57 |
| 515 | Waterproof Coating | Sq Yd | 1105 |
| 601 | Concrete, Class T-1 (First Stage) | Cu Yd | 210 |
| 601 | Lining | Sq Yd | 552.74 |
| 601 | Concrete, Class T-2 (Final Lining) | Cu Yd | 520 |
| 601 | Concrete, Class T-2 (Misc) | Cu Yd | 151 |
| 602 | Reinforcing Steel | Ton | 10 |

NOTES:
 1 ALL FIRST STAGE CONCRETE IS CLASS T-1
 2 ALL FINAL STAGE CONCRETE IS CLASS T-2

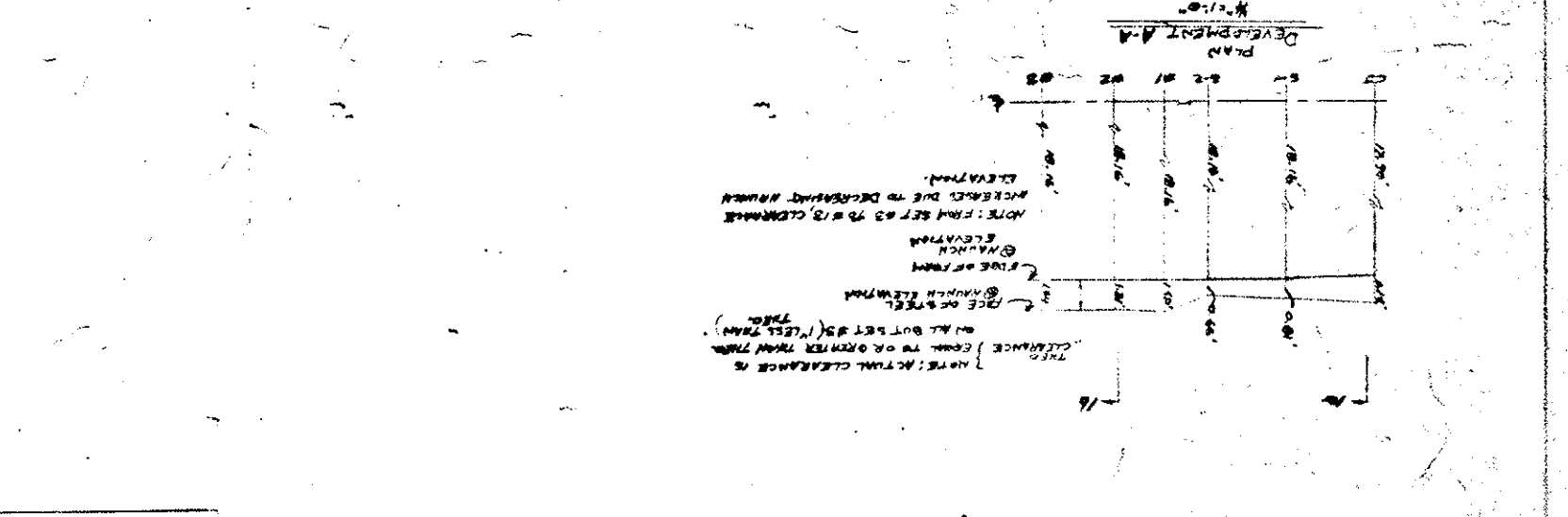
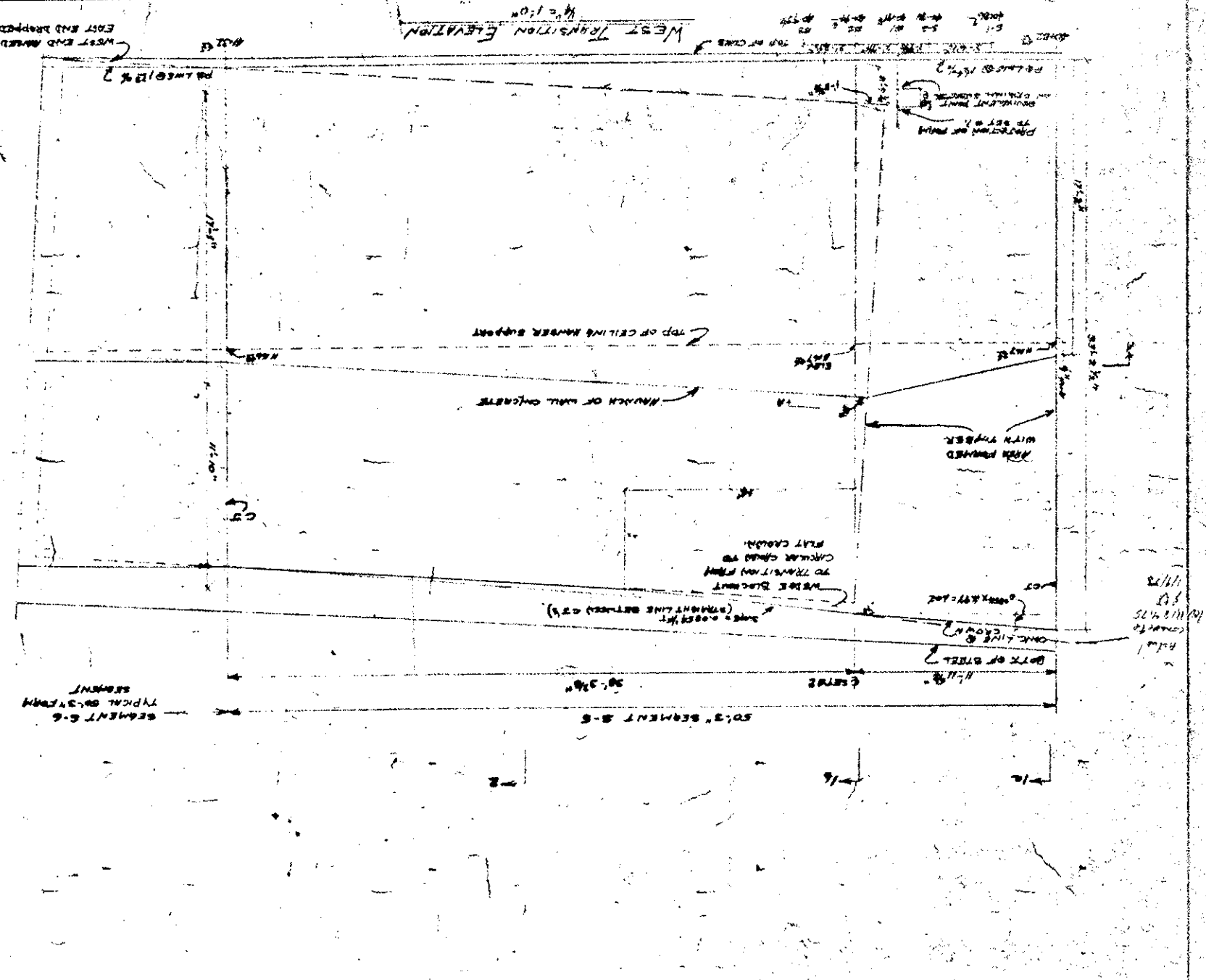
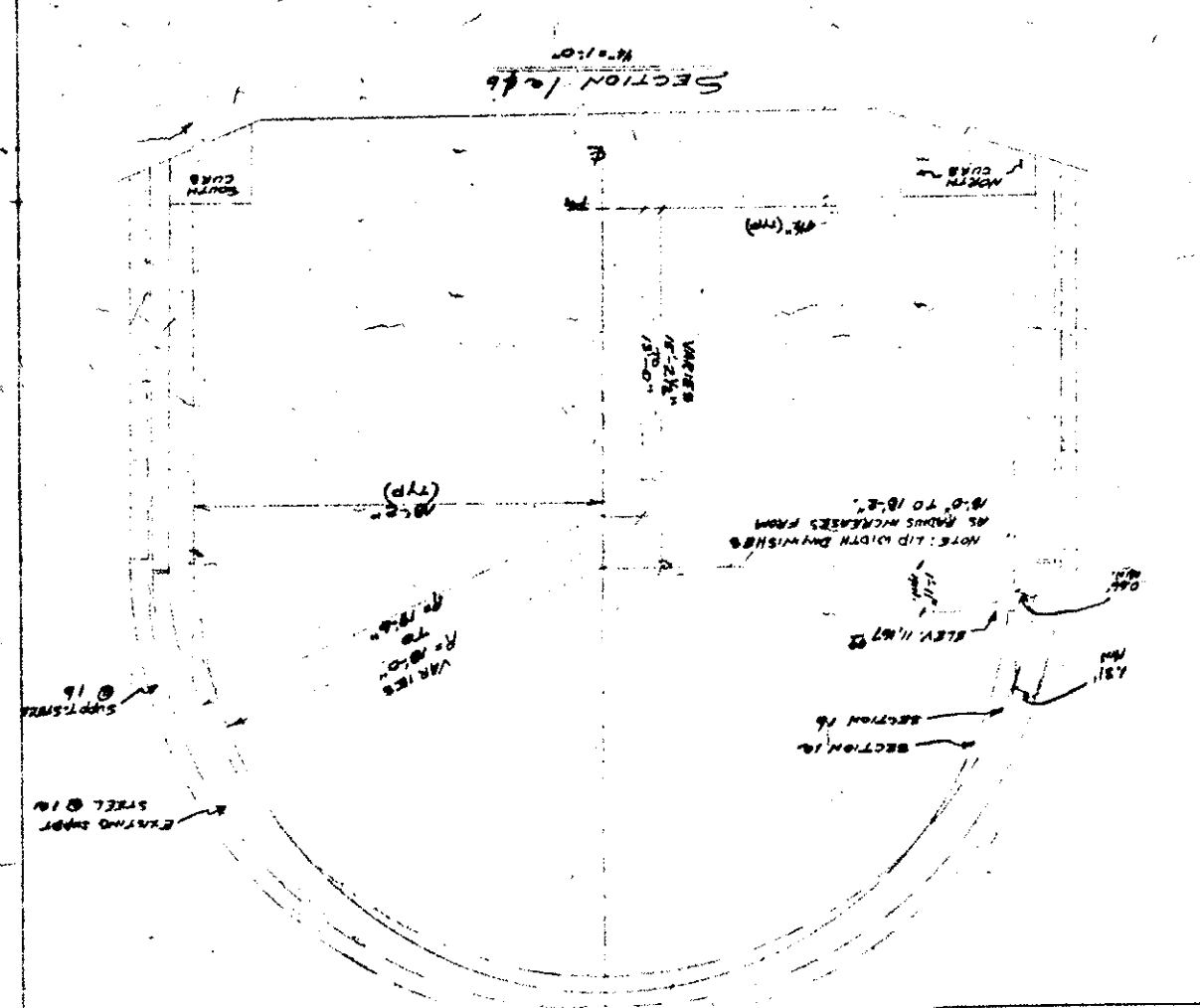
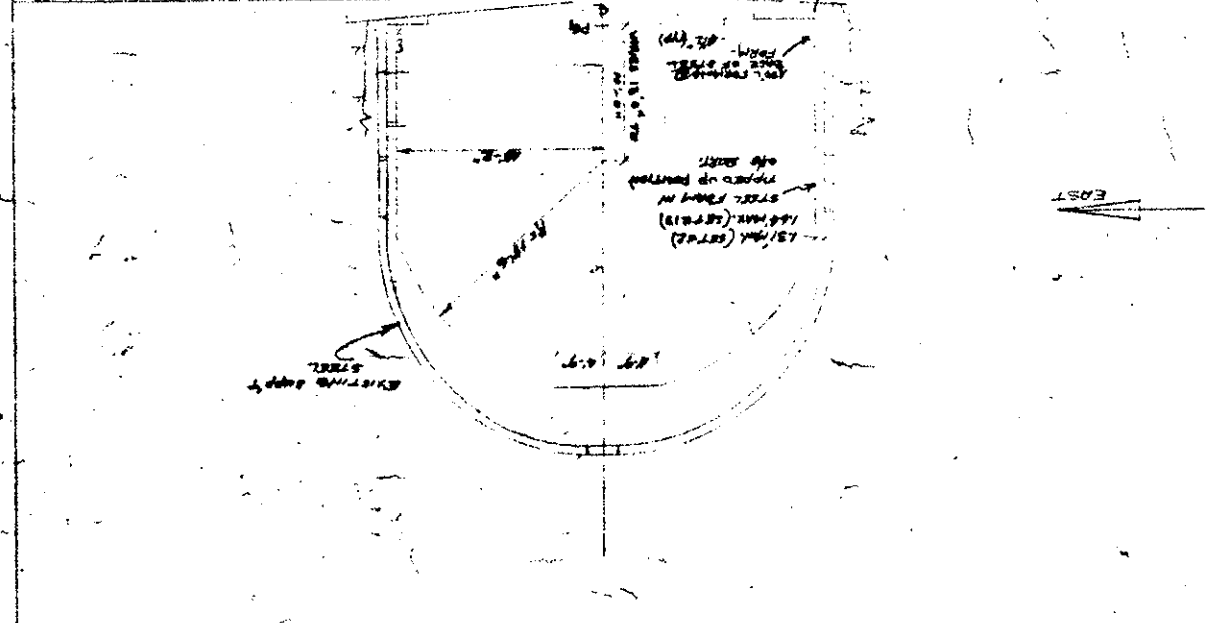
REVISIONS

| NO | DATE | DESCRIPTION |
|-----|--------------|-------------|
| 56 | 120-5-6-1220 | COOKMADO |
| 273 | | |



| | |
|---------------|------|
| DESIGNED BY | CDOH |
| CHECKED BY | 5-74 |
| QUANTITIES BY | 5-74 |
| ESTIMATED BY | 5-74 |
| DATE | 5-74 |
| SCALE | 5-74 |
| FILE NO. | 5-74 |

WEST TRANSITION ELEVATION
 EAST END MARKED 5'0" IN 2025
 EAST END DROPPED ON 11.25'
 DATE 12/16/77
 BY G. S. & M. J.
 APPROVED FINAL
 PETER KIEWIT SONS CO.
 and
 BROWN & ROOT, INC.
 SCALE: 1/4" = 1'-0"
 DATE: 12/16/77
 DRAWN BY: G.S. & M.J.
 CHECKED BY: G.S. & M.J.
 PROJECT: EISENHOWER MEMORIAL TUNNEL

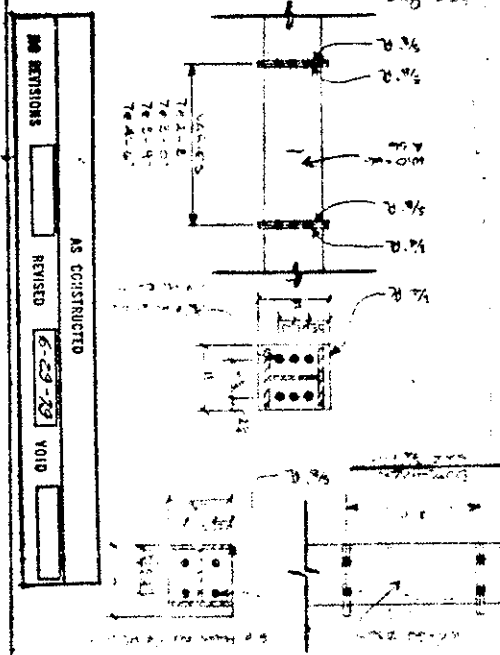
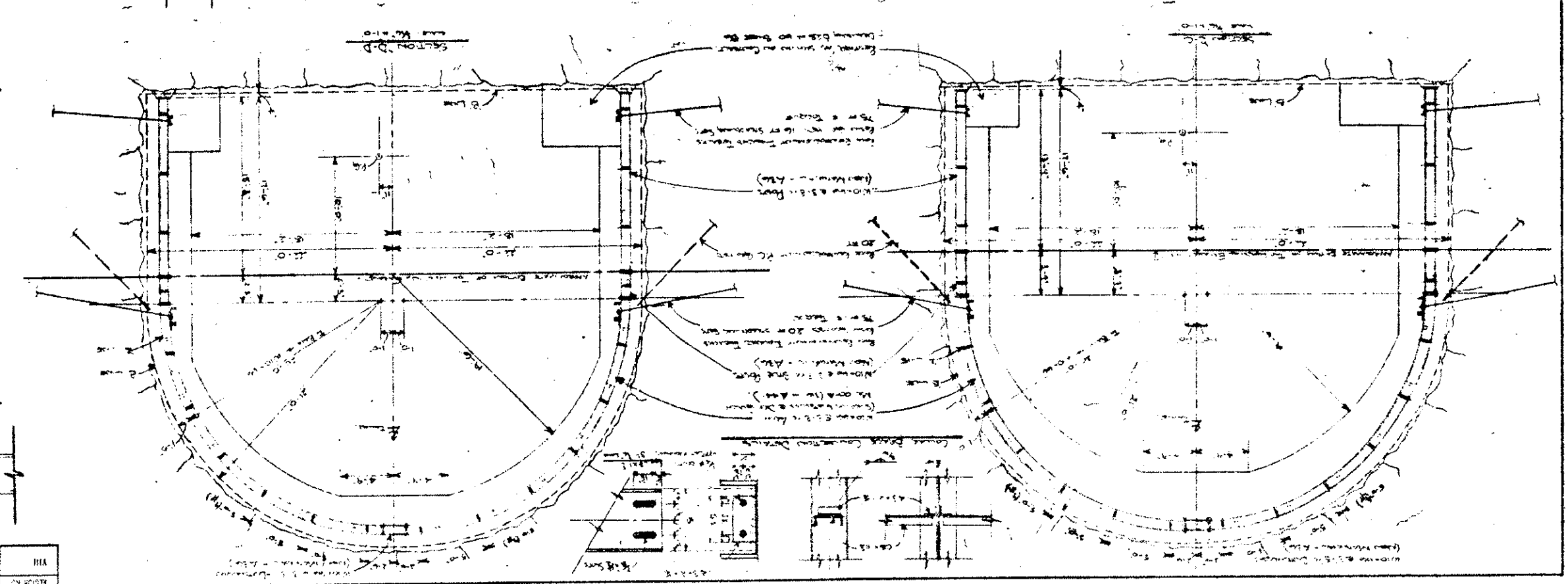
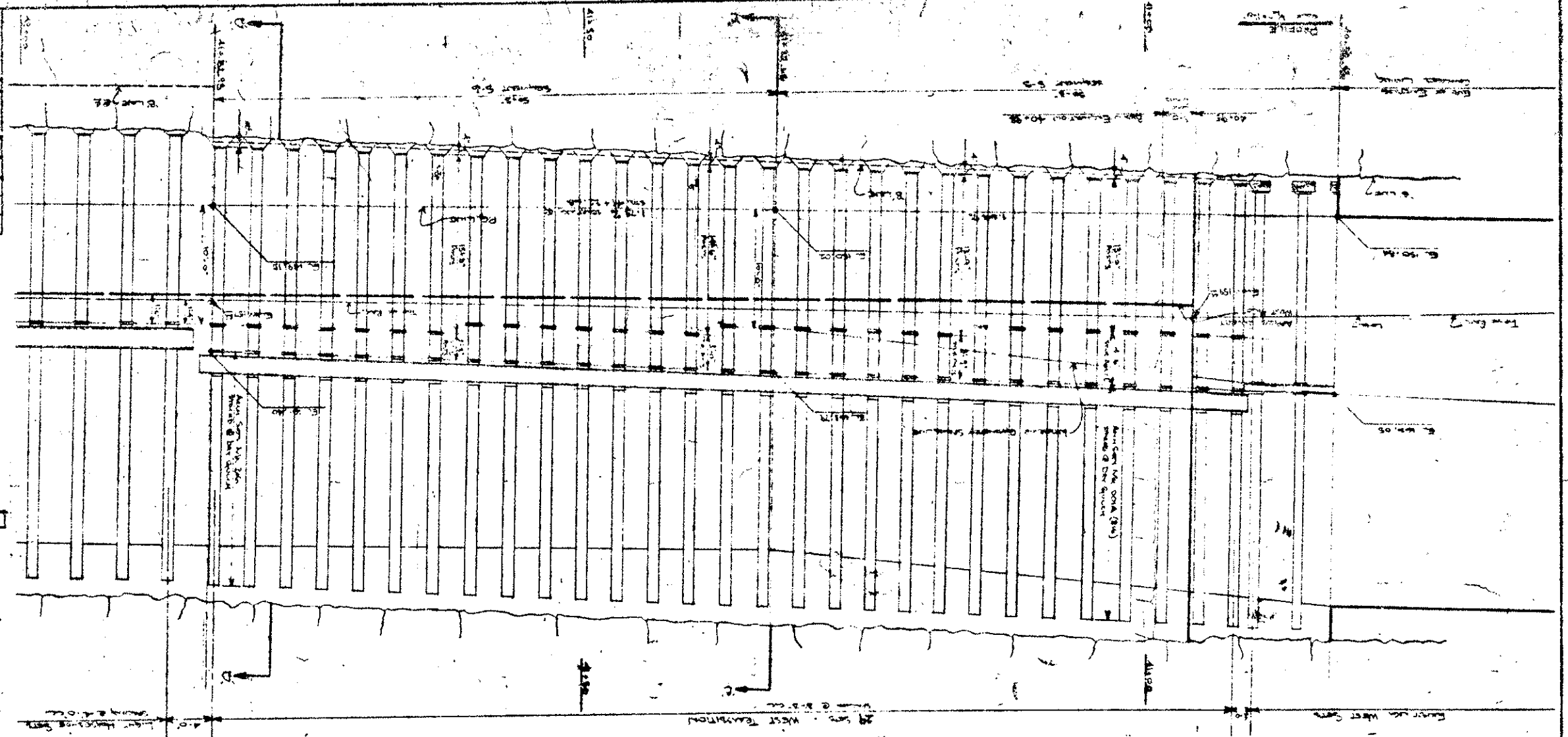


| | | | |
|-------|----------|-------------|----------------|
| NO. 1 | DATE | BY | DESCRIPTION |
| 1 | 12/16/77 | G.S. & M.J. | AS CONSTRUCTED |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

| | |
|--|---------|
| Eisenhower Memorial Tunnel | |
| PETER KIEWITZ SONS CO. and BROWN & ROOT INC. | |
| REV. NO. | DATE |
| 1 | 1/27/76 |
| 2 | 2/10/76 |
| 3 | 3/10/76 |
| 4 | 5/1/76 |

APPROVED FINAL
DATE 5/1/76
BY *J. E. King*
Head Engineer
Approved for Construction
J. E. King

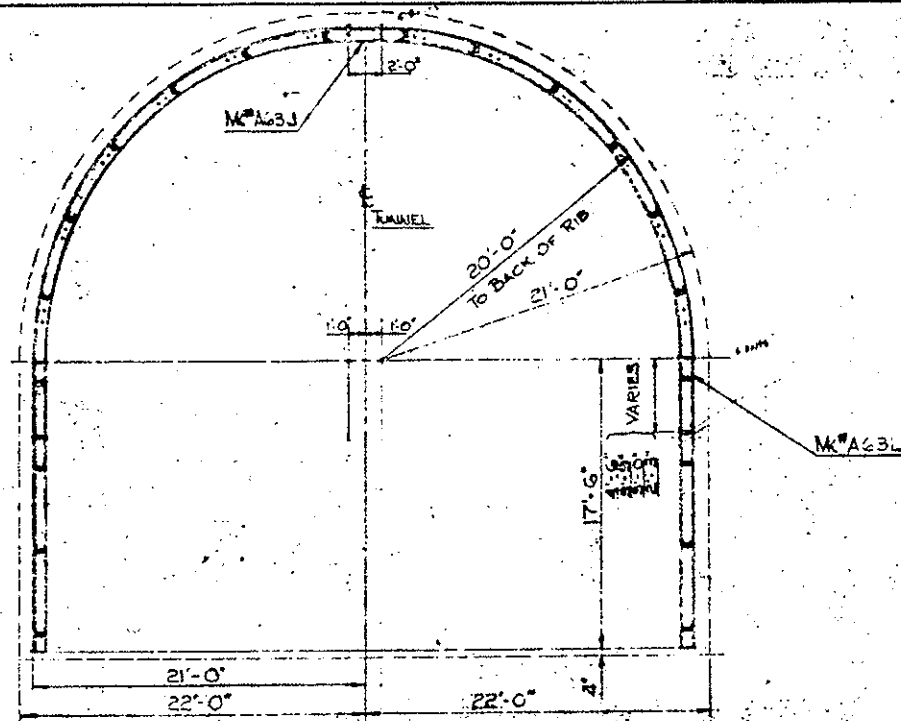
ICE 2 Contract, Book DS-594-544B-443
ICE 2 Contract, Book DS-594-544C-001
ICE 2 Contract, Book DS-594-544D-001
ICE 2 Contract, Book DS-594-544E-001
ICE 2 Contract, Book DS-594-544F-001
ICE 2 Contract, Book DS-594-544G-001
ICE 2 Contract, Book DS-594-544H-001
ICE 2 Contract, Book DS-594-544I-001
ICE 2 Contract, Book DS-594-544J-001
ICE 2 Contract, Book DS-594-544K-001
ICE 2 Contract, Book DS-594-544L-001
ICE 2 Contract, Book DS-594-544M-001
ICE 2 Contract, Book DS-594-544N-001
ICE 2 Contract, Book DS-594-544O-001
ICE 2 Contract, Book DS-594-544P-001
ICE 2 Contract, Book DS-594-544Q-001
ICE 2 Contract, Book DS-594-544R-001
ICE 2 Contract, Book DS-594-544S-001
ICE 2 Contract, Book DS-594-544T-001
ICE 2 Contract, Book DS-594-544U-001
ICE 2 Contract, Book DS-594-544V-001
ICE 2 Contract, Book DS-594-544W-001
ICE 2 Contract, Book DS-594-544X-001
ICE 2 Contract, Book DS-594-544Y-001
ICE 2 Contract, Book DS-594-544Z-001



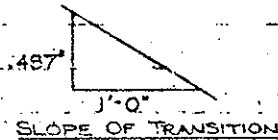
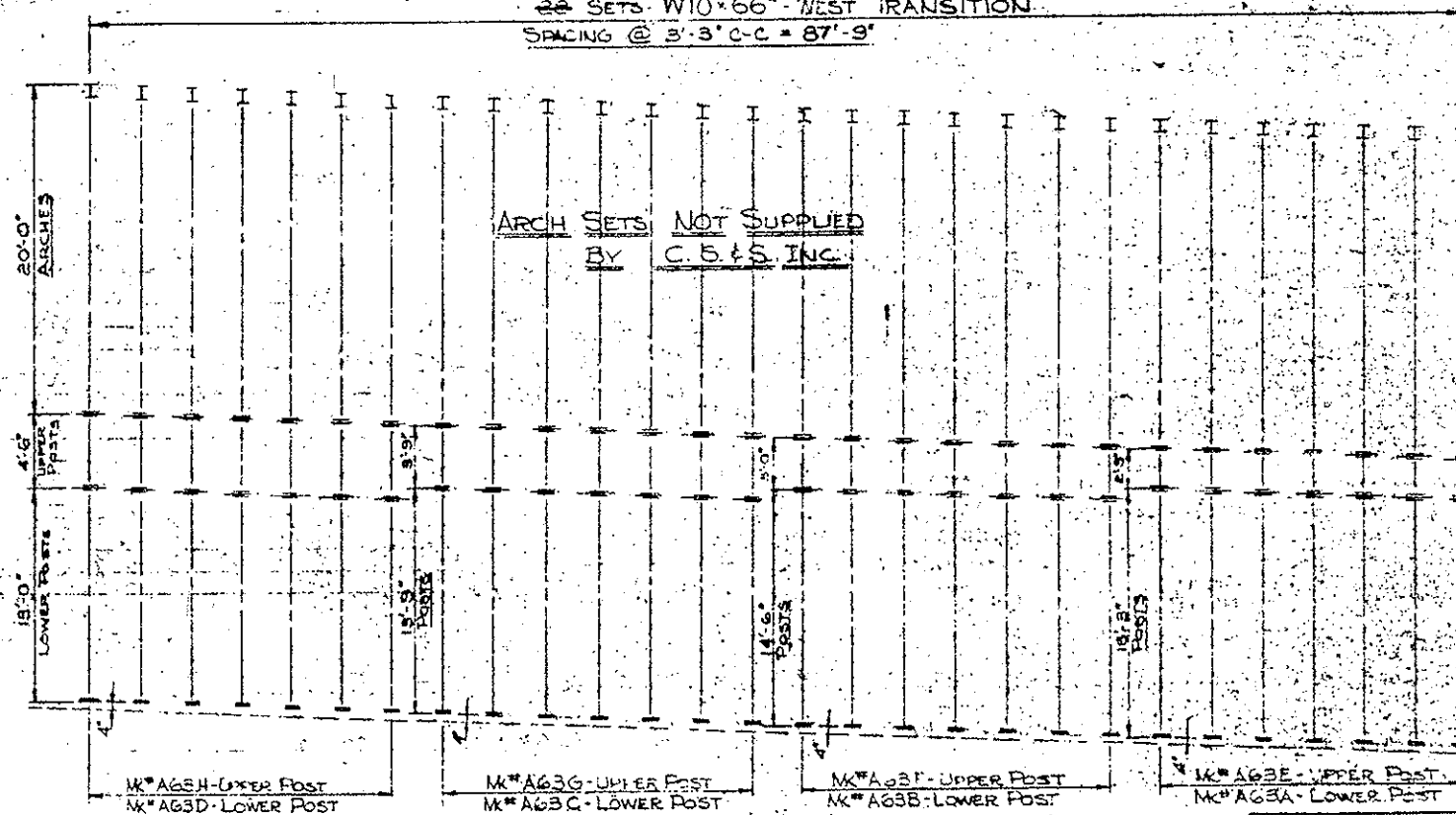
| | | |
|------------|-------------|--------------|
| FIGURE NO. | SHEET NO. | TOTAL SHEETS |
| VIII | 564X | 273 |
| SCALE | 1" = 10'-0" | 1" = 20'-0" |
| DATE | 5/1/76 | |
| BY | J. E. King | |
| CHECKED | | |
| APPROVED | | |

| | | | | |
|---------------------------|---------|-------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | SECTION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| VIII | 662410 | 100 3 81110 | 568X | 273 |

| |
|----------------|
| AS CONSTRUCTED |
| 7.0 REVISIONS |



SCALE $\frac{3}{16} = 1'-0"$
 28 SETS W10x66 WEST TRANSITION
 SPACING @ 3'-3" C-C = 87'-9"



SCALE $\frac{1}{16} = 1'-0"$

Note: The weight of one built plate only per post will be used for payment purposes.

APPROVED FINAL AS NOTED
 DATE 3-1-76
 BY [Signature]

| QTY | UNIT | DESCRIPTION | WEIGHT | MARK NO. | NO. REQD. | REMARKS |
|---------------------------------|-----------------|------------------------------------|--------|----------|-----------|---------|
| 10 | | STD. FLAT WASHERS FOR 3/4" BOLTS | | A607 | | |
| 14 | | 1/4" SQ. T.L. NUTS | | | | |
| 37 | | 3/4" x 6 1/2" SQ. HD. T.L. BOLTS | | | | |
| 502 | D5-559-5AAB-A63 | COLLAR BRACES @ CBALLS | 39.16 | A63L | 196.2 | |
| 500 | | Lock Indicator Washers | 67.2 | | 12 | |
| 89.6 | 10 | H.S. WASHERS FOR 1/2" BOLTS | | A605 | | |
| 385.3 | 43 | 1/2" HI STRENGTH NUTS | 655.2 | A625 | | |
| 824.3 | 92 | 1/2" HI STRENGTH BOLTS | | A625 | | |
| 4824.4 | 172.3 | DUTCHMAN ASSY @ W10x66x2'-0" LG | 27.9 | A63J | 28 | |
| 4783.6 | 34.7 | POST ASSY @ W10x66x4'-6" LG | 137.8 | A63H | 14 | |
| 4765.6 | 34.2 | POST ASSY @ W10x66x3'-9" LG | 137.8 | A63G | 14 | |
| 3353.8 | 24.7 | POST ASSY @ W10x66x3'-0" LG | 137.8 | A63F | 14 | |
| 2690.8 | 19.2 | POST ASSY @ W10x66x2'-3" LG | 140.2 | A63E | 14 | |
| 12759.6 | 91.4 | LOWER POST ASSY @ W10x66x13'-0" LG | 139.7 | A63D | 14 | |
| 13452.6 | 94.9 | LOWER POST ASSY @ W10x66x13'-9" LG | 137.2 | A63C | 14 | |
| 14145.6 | 100.4 | LOWER POST ASSY @ W10x66x14'-6" LG | 138.6 | A63B | 14 | |
| 14518.6 | 105.9 | LOWER POST ASSY @ W10x66x15'-3" LG | 137.2 | A63A | 14 | |
| TOTAL WT. | | | | | | |
| MATERIAL REQUIRED PER STRUCTURE | | | | | | |

COMMERCIAL ENGINEERING INC.
 1000 EAST 1000 SOUTH, SALT LAKE CITY, UTAH 84143

WEST JEROME BRIDGE
 JEROME, IDAHO
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: 1-14-76

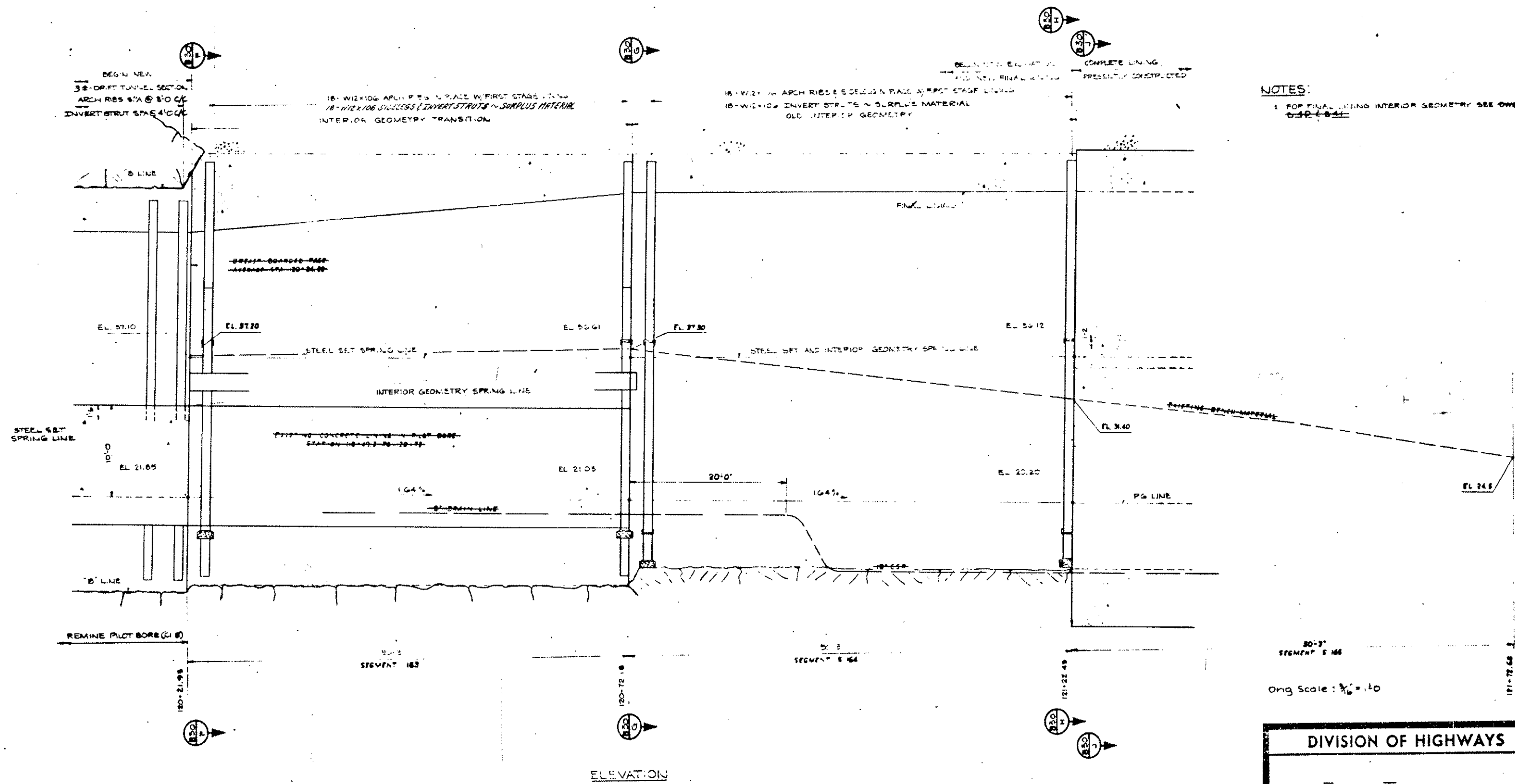
NO. 25-559-5AAB-063

| | | | |
|--------------|---------|---------|------|
| AS COMPLETED | | | |
| NO REVISIONS | REVISED | 6-23-59 | 1958 |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|---------------|-----------|--------------|
| XIII COLORADO | 170-3(A), 420 | 57 | 273 |

| REVISIONS | | | |
|-----------|--|--|--|
| | | | |
| | | | |
| | | | |

NOTES:
1. FOR FINAL LINING INTERIOR GEOMETRY SEE OWS NO. 0-30-6-54



| | | | |
|---------------|-------------|------------|-----------|
| DESIGNED BY | COCH. 5-74 | CHECKED BY | EMH 7-74 |
| QUANTITIES BY | EMH 7-74 | CHECKED BY | RMIA 1-14 |
| DETAILS BY | S.R.L. 7-74 | CHECKED BY | |

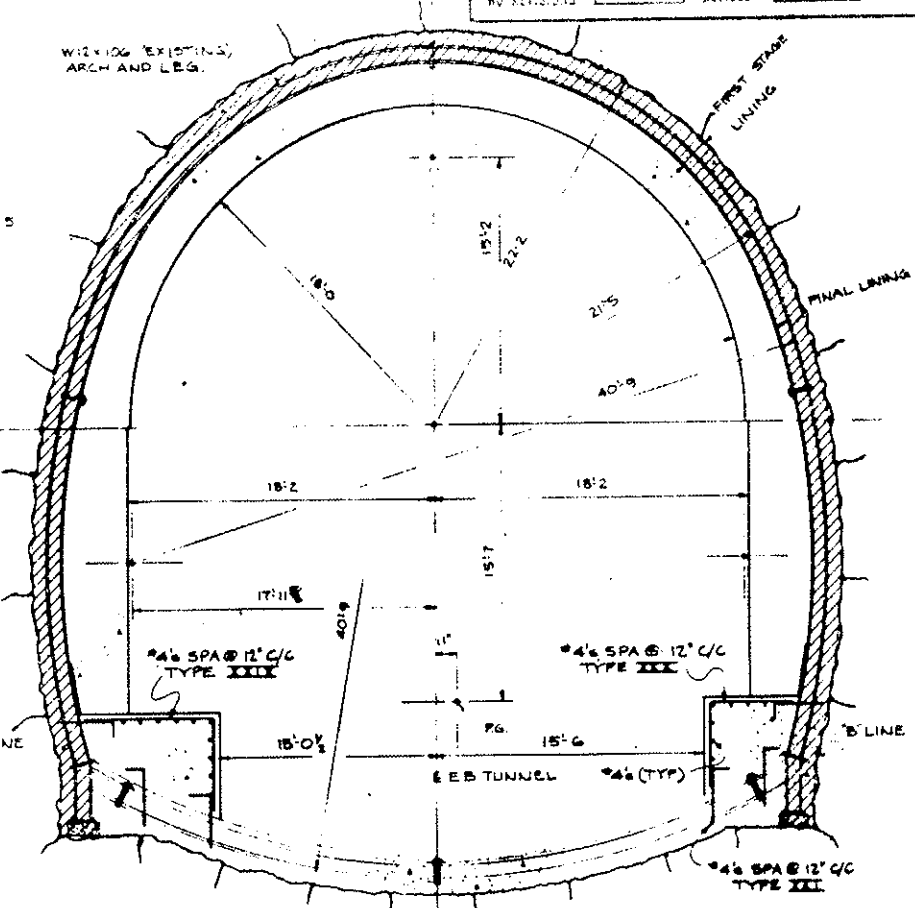
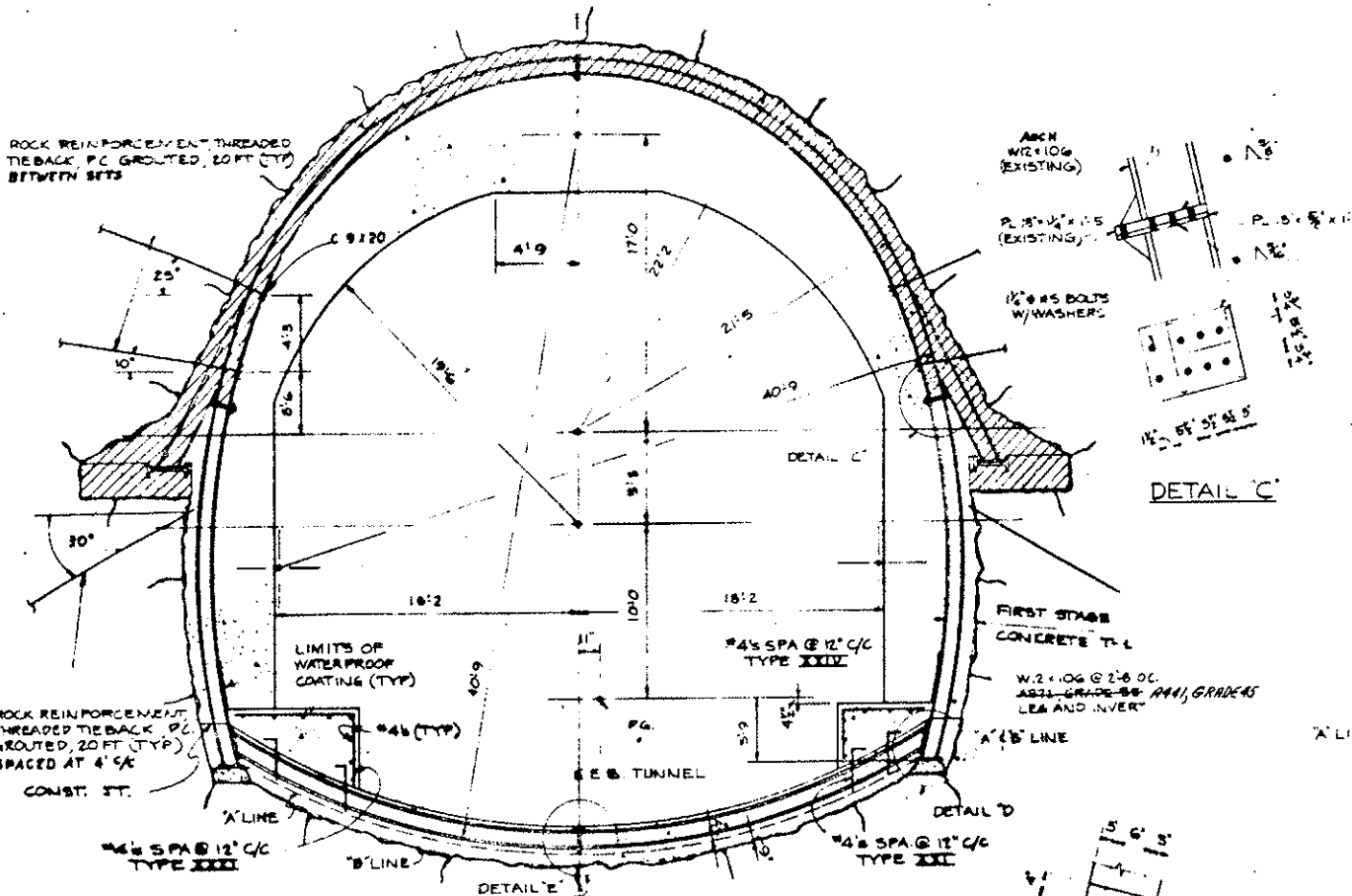
30'-0" SEGMENT 163
Orig Scale: 1/8" = 1'-0"

| | | | |
|----------------------|-----------|--------------------------|-------------|
| DIVISION OF HIGHWAYS | | | |
| EAST TRANSITION | | | |
| ELEVATION | | | |
| Designer | CDCH | Structure | F-13-X |
| Detailer | B.R. Lere | Number | |
| Drawing Number | B 29 | of | 60 Drawings |
| Revision Date | 7-7-74 | (Preliminary Scale Only) | |

| | | | |
|--------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-29-79 | 1010 |
|--------------|---------|---------|------|

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|------------------------|-----------|--------------|
| XIII | COLORADO I 70-5(5) 210 | 58 | 273 |

| REVISIONS | |
|-----------|--|
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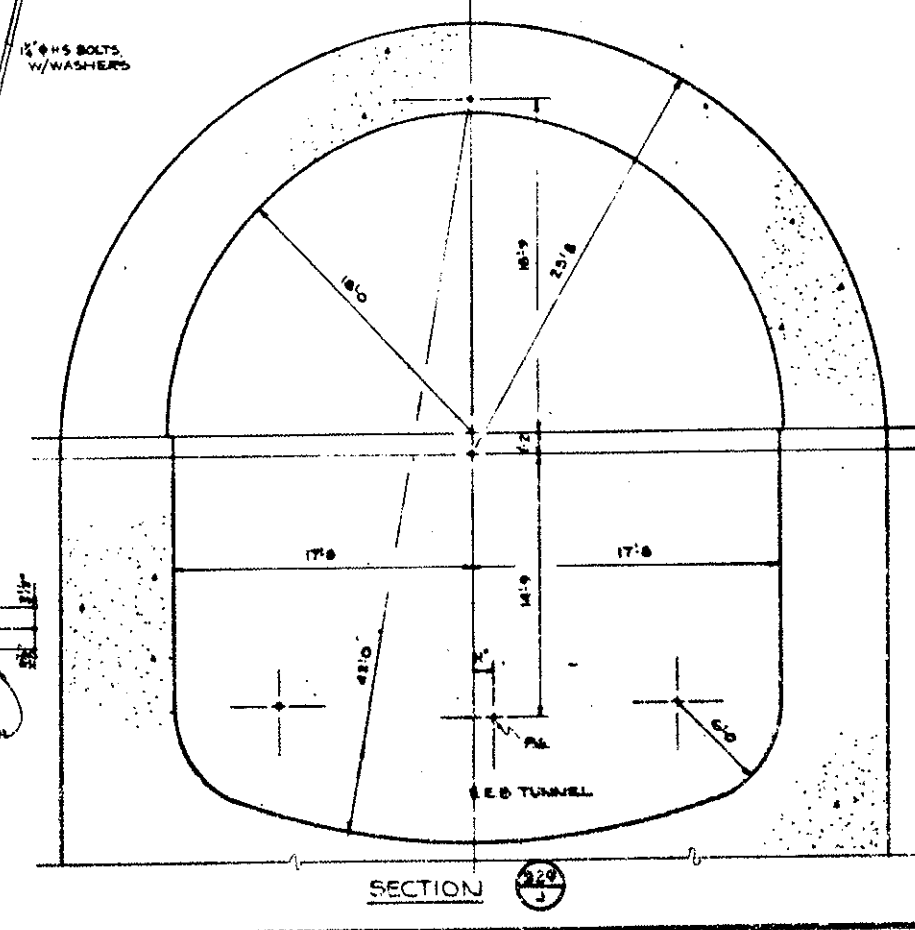
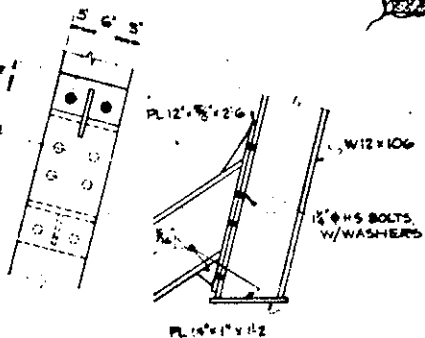
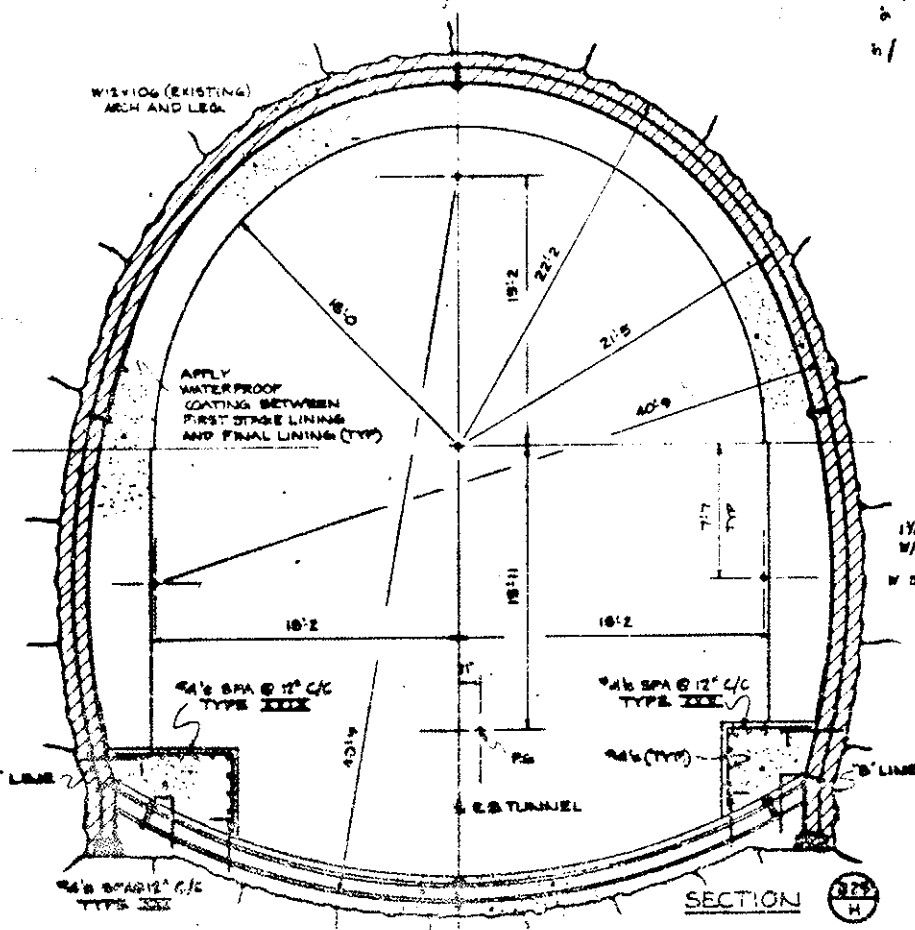
NOTES:
Concrete strength for Section F:
First Stage Lining T-1
Invert T-2
Final Lining T-2
Miscellaneous T-2

Existing structure

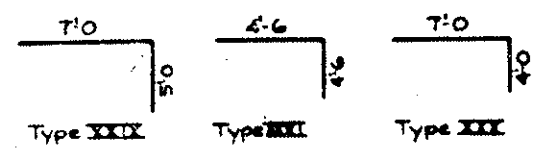
| Final Item | DESCRIPTION | Unit | Total |
|------------|---|------|-------|
| 3885 | 211 Tunnel Excavation (Class C) | CuYd | 2500 |
| 0 | 211 Rock Reinforcement, Portland Cement Grouted, (18 Ft) | Ea | 59 |
| 22 | 211 Rock Reinforcement, Portland Cement Grouted, (20 Ft) | Ea | 24 |
| 76 | 211 Rock Reinforcement Threaded Tieback, Portland Cement Grouted, (20 Ft) | Ea | 72 |
| 41.84 | 509 Plate Structural Steel | Ton | 59 |
| 34.80 | 509 Structural Steel (W12x106) | Ton | 89 |
| 6.52 | 509 Structural Steel (Misc) | Ton | 7 |
| 1125 | 515 Waterproof Coating | SqYd | 1125 |
| 126.30 | 601 Concrete, Class T-1 (First Stage Lining) | CuYd | 142 |
| 1247 | 601 Concrete, Class T-2 (Final Lining) | CuYd | 1047 |
| 408.08 | 601 Concrete, Class T-2 (Invert) | CuYd | 580 |
| 370.41 | 601 Concrete, Class T-2 (Misc) | CuYd | 152 |
| 2 | 602 Reinforcing Steel | Ton | 2 |

| | |
|-------------|--|
| DESIGNED BY | |
| CHECKED BY | |
| DATE | |
| | |

EXISTING STRUCTURE



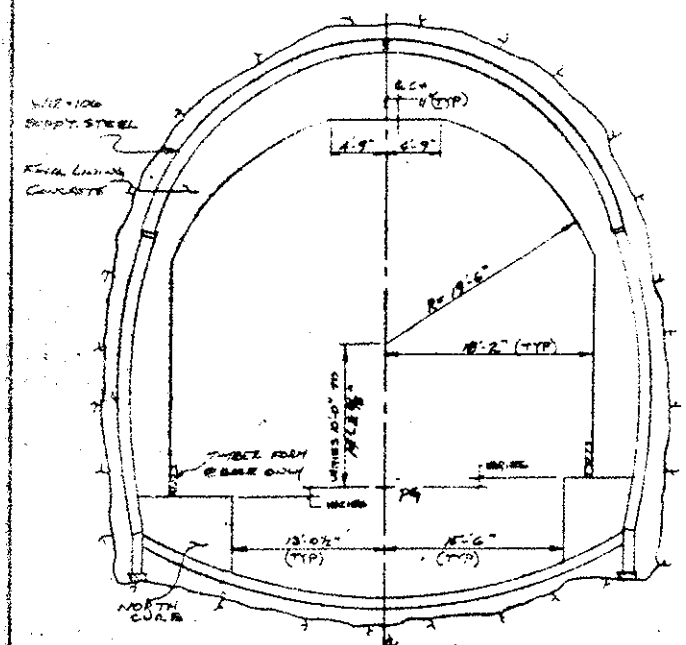
Includes 87 Tons of A-572 Steel



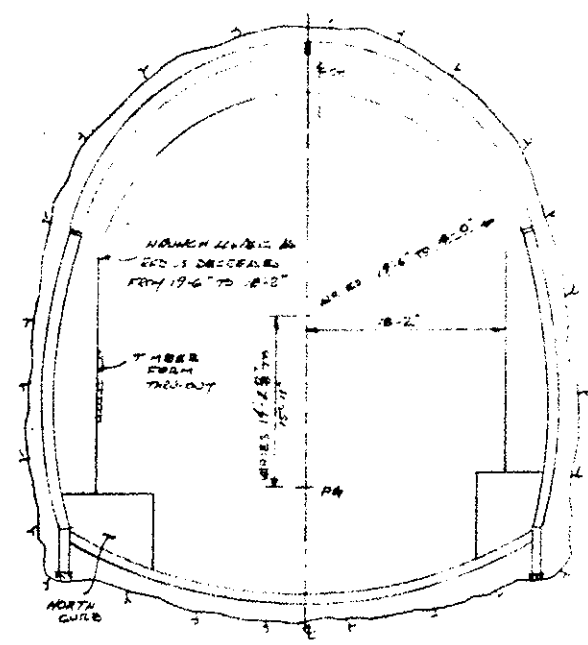
ORIG. SCALE: 1/4" = 1'-0"

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|---------------------------------|--|
| DIVISION OF HIGHWAYS | |
| EAST TRANSITION SECTIONS | |
| DESIGNED BY | |
| CHECKED BY | |
| DATE | |
| | |

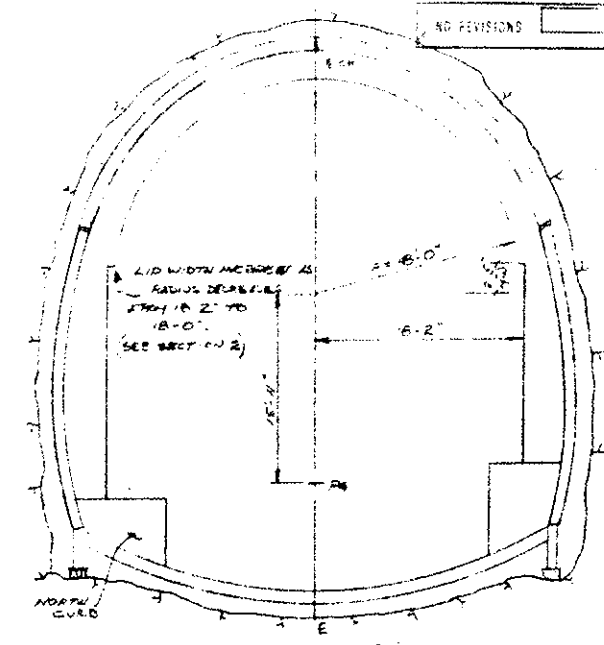
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|----------------|--------------|-----------------|------|-------------|----------|-------------|------|-----|
| AS CONSTRUCTED | NO REVISIONS | REVISED 6-29-79 | V310 | SECTION NO. | DIVISION | PROJECT NO. | 58AX | 273 |
|----------------|--------------|-----------------|------|-------------|----------|-------------|------|-----|



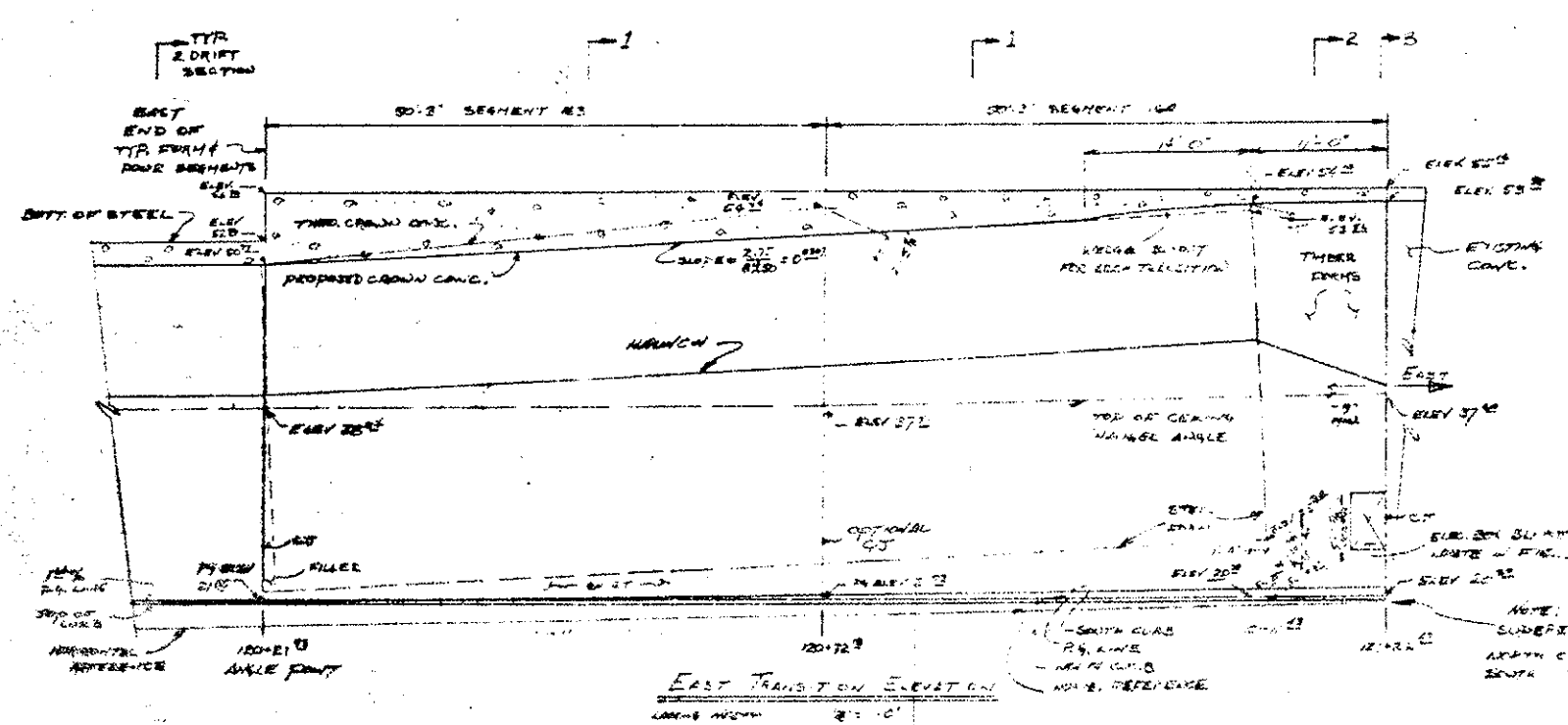
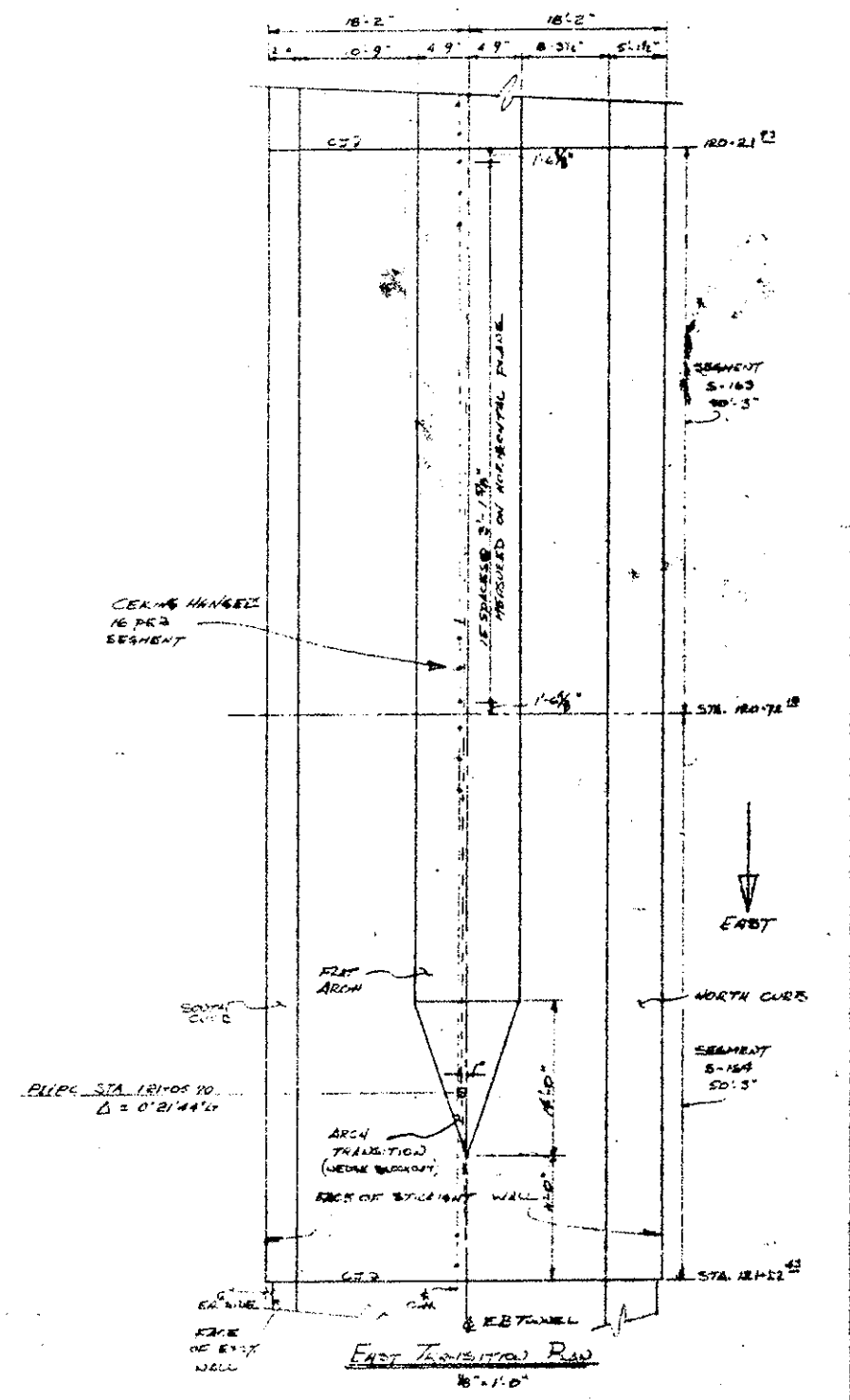
SECTION 1
18'-1-0"



SECTION 2
18'-1-0"



SECTION 3
18'-1-0"



Approved: *Richard J. [Signature]*

APPROVED FINAL
DATE 7-16-78

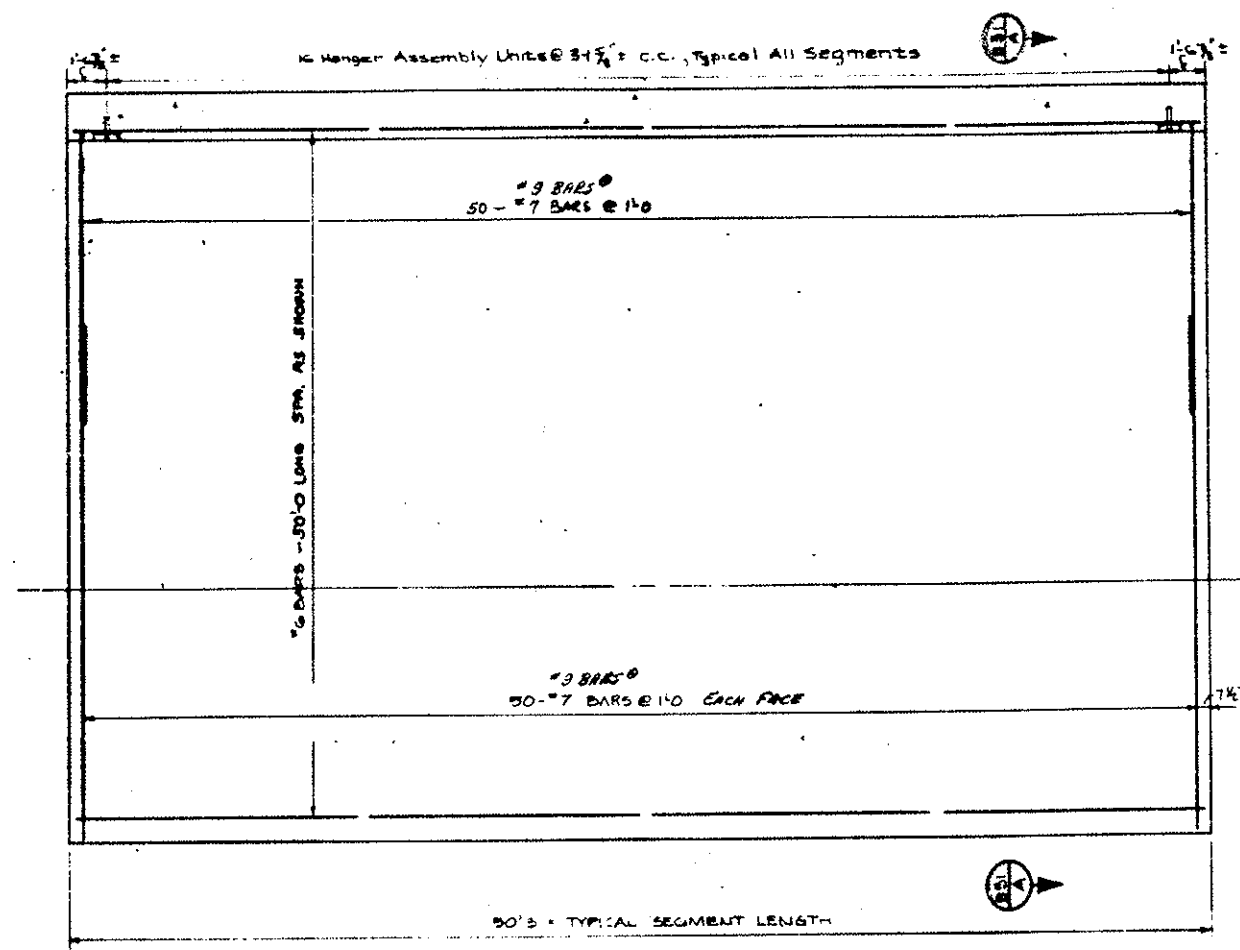
BY *Joseph E. [Signature]*
AT NO ADDITIONAL COST TO THE DPT.

| | | | | |
|---|---------|------------------------------|---------|----|
| 1 | 6/29/79 | SOUTH CURVE ELEV @ 120+72.75 | PREP BY | JS |
| DIV NO | DATE | REVISION | BY | |
| PETER KIEWIT SONS' CO. and BROWN & ROOT, INC. | | | | |
| Eisenhower Memorial Tunnel | | | | |
| EAST TRANSITION GEOMETRY | | | | |

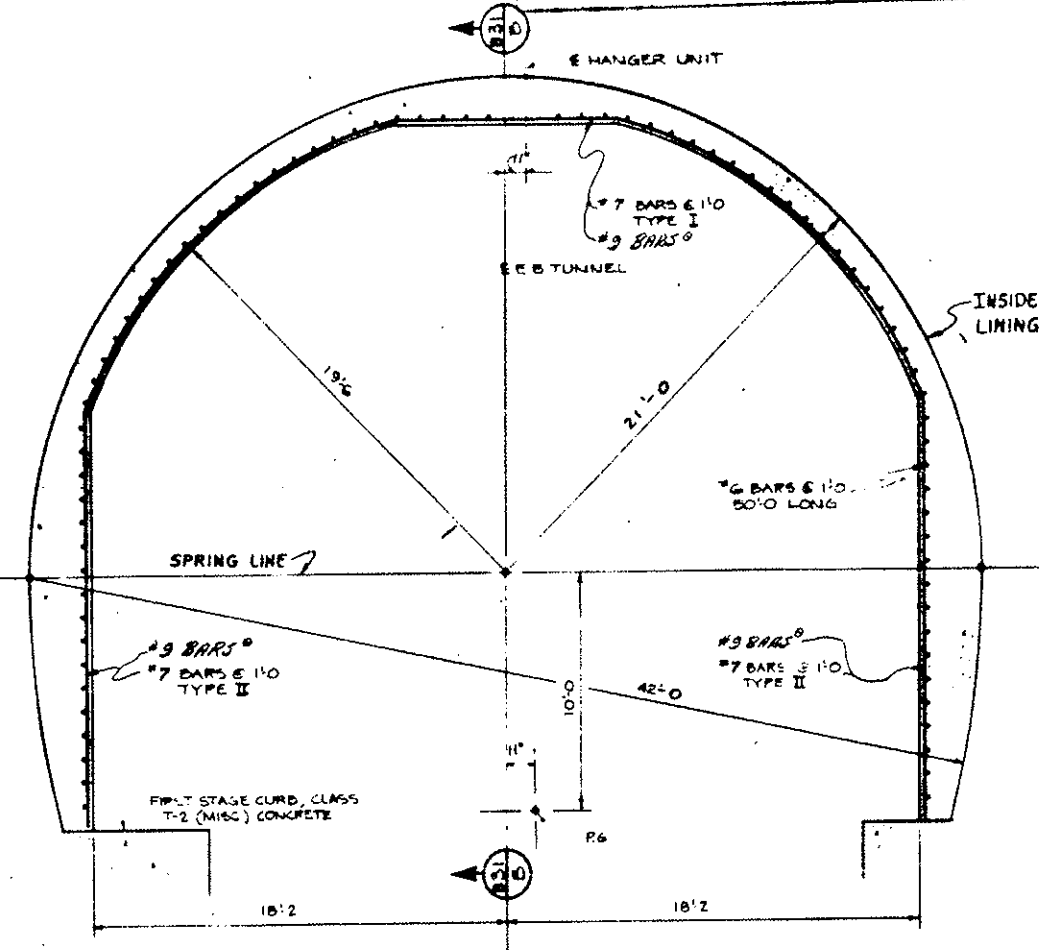
| | | | |
|----------------|----------|------|----|
| AS CONSTRUCTED | | | |
| NO REVISIONS | REV. NO. | DATE | BY |
| | 6-29-79 | | |

| FEDERAL ROAD DISTRICT NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| XIII | COLORADO | I70-5,81)220 | 59 | 273 |

| REVISIONS | | | |
|-----------|--|--|--|
| | | | |
| | | | |
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SECTION **B-D**



SECTION **B-1**

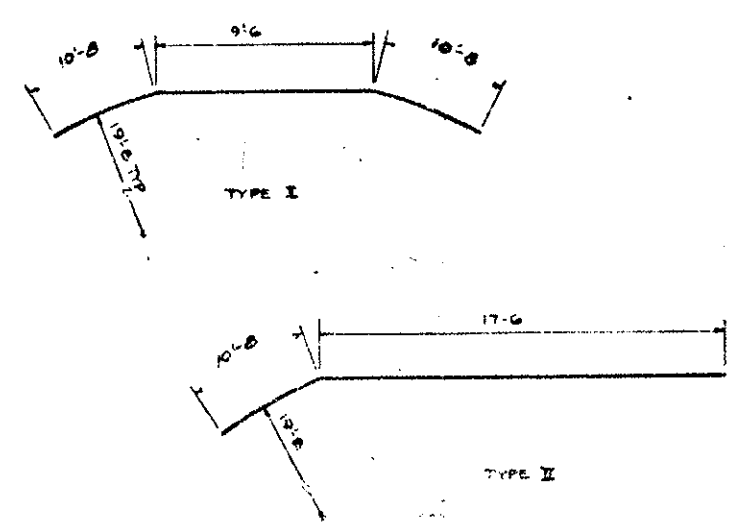
SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT FOR SEGMENTS -
57 THRU 541
543 THRU 546
554 THRU 565
569 THRU 581

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|--------|--------------|-------|
| I | 30'-10 | 50 | 1.576 |
| II | 28'-2 | 100 | 2.879 |
| LONGITUDINAL | 50'-0 | 80 | 3.004 |

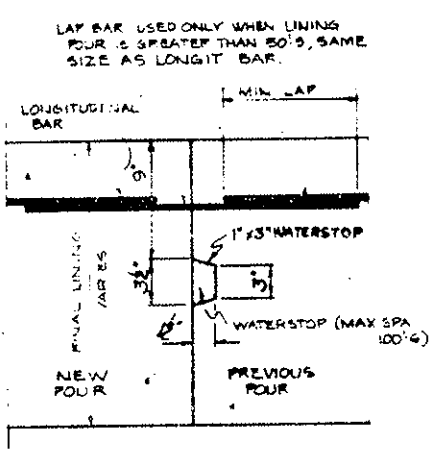
SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT FOR SEGMENTS -
547 THRU 553
566 THRU 585
583
585 THRU 587

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|--------|--------------|-------|
| I | 30'-10 | 50 | 1.576 |
| II | 28'-2 | 100 | 2.879 |
| LONGITUDINAL | 50'-0 | 80 | 3.004 |

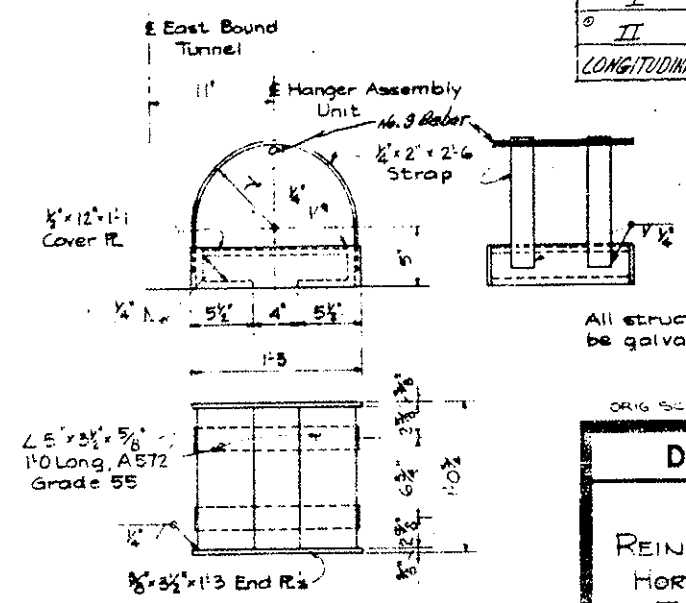
| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|---------|--------------|-------|
| I | 32.4167 | 50 | 2.755 |
| II | 28.3523 | 100 | 4.923 |
| LONGITUDINAL | 50.00 | 80 | 3.004 |



REINFORCING DIAGRAMS



TYPICAL CONSTRUCTION JOINT DETAIL



TYPICAL HANGER UNIT FOR DUCT DIVIDER WALL 1 1/2" x 1'-0"

All structural steel for hanger unit to be galvanized after fabrication.

ORIG SCALE 1/4" = 1'-0" OR AS NOTED

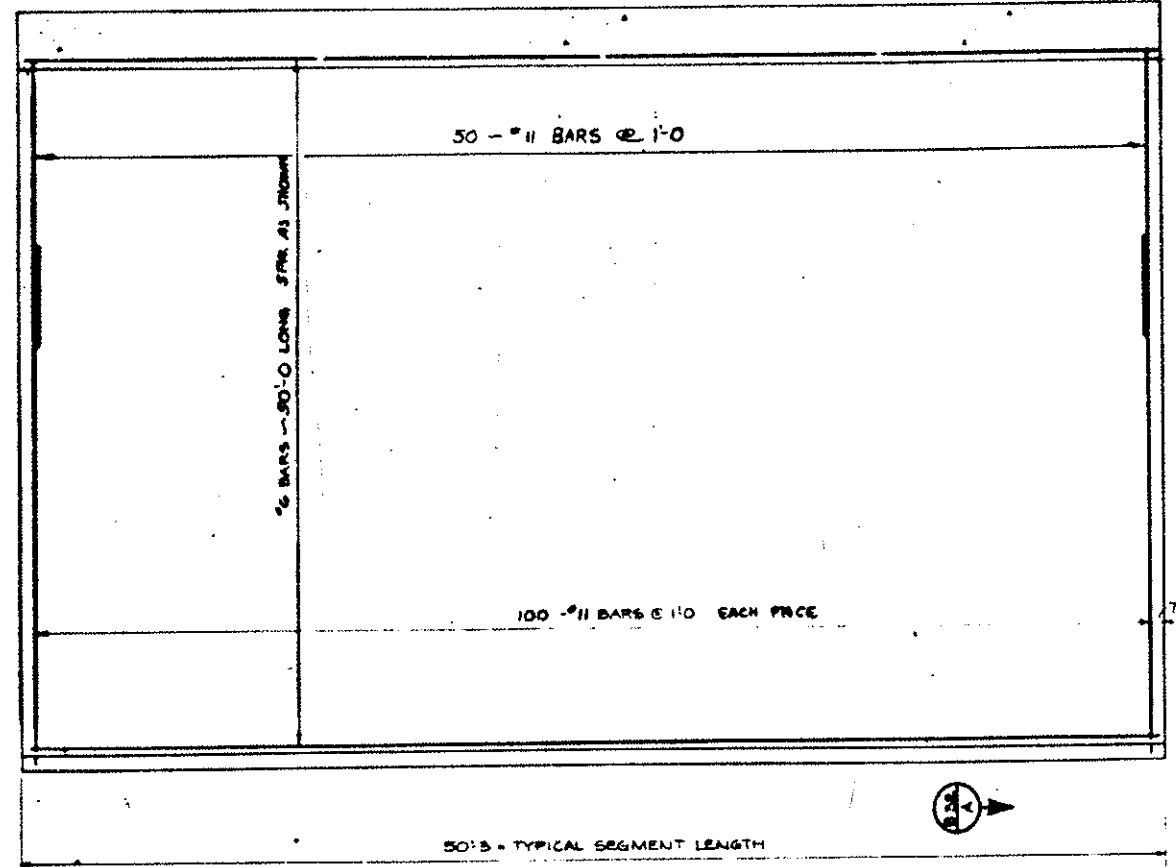
| | | | |
|---|---------|------------|----------|
| DIVISION OF HIGHWAYS | | | |
| REINFORCEMENT-FINAL LINING HORSESHOE TUNNEL SUPPORT TYPICAL MISC. DETAILS | | | |
| Designer | CDOH | Structures | F-13-X |
| Director | BR Lere | Numbers | |
| Drawing Number | B 51 | of 60 | Drawings |

DESIGNED BY: CDH
 CHECKED BY: BRL
 DATE: 1-14-74
 QUANTITIES BY: MEB
 DATE: 3-78
 RETIRED BY: BRL
 DATE: 5-78

| | | | | |
|---------------|---------|--------|--|------|
| NO. REVISIONS | 6-29-79 | REASON | | YOID |
|---------------|---------|--------|--|------|

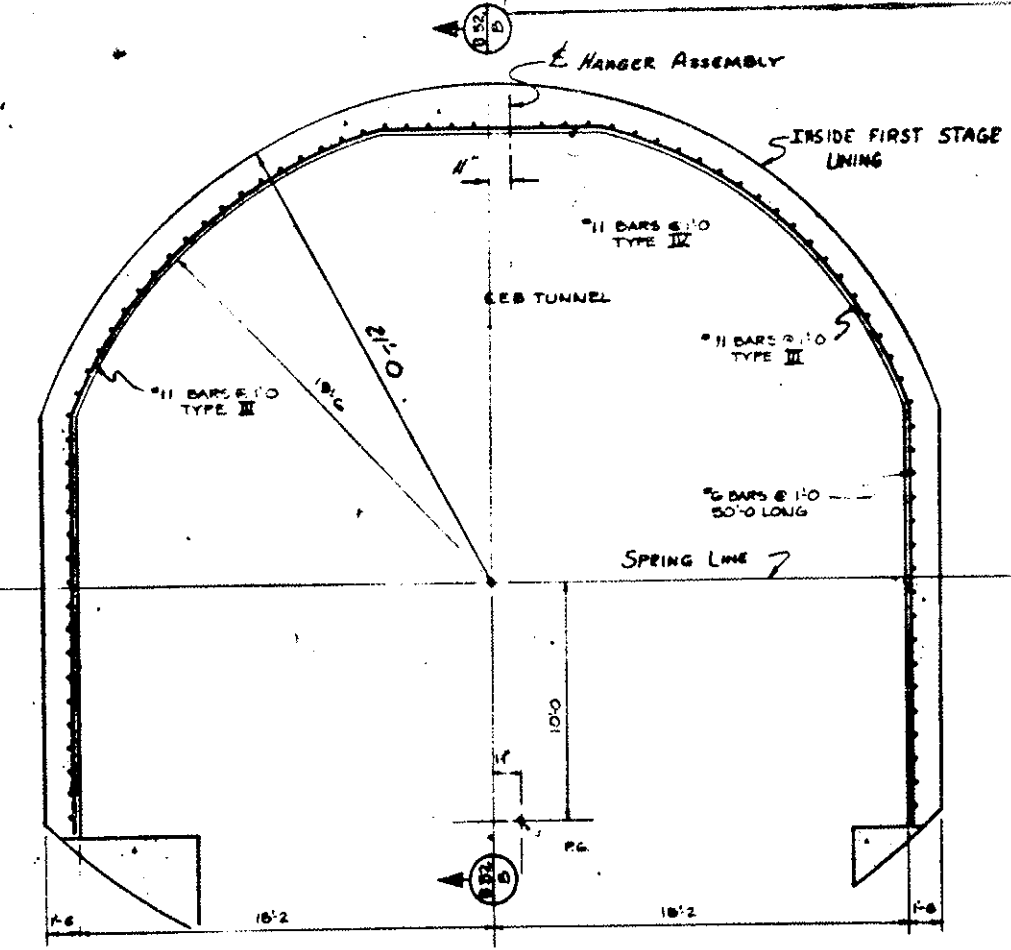
| PROJECT NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------|----------|--------------|-----------|--------------|
| 100 | COLORADO | ITO-B(8)-220 | 60 | 275 |

| REVISIONS | |
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| | |



50'-5\"/>

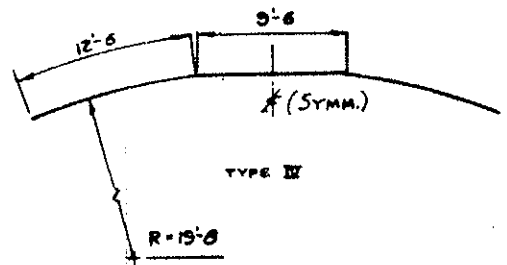
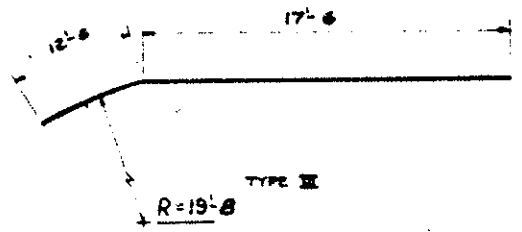
SECTION **B**



SECTION **A**

SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT FOR SEGMENTS - 508 THRU 537

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|--------|--------------|-------|
| IV | 34'-6 | 30 | 4.582 |
| III | 30'-0 | 100 | 7.969 |
| LONGITUDINAL | 50'-0 | 80 | 3.004 |



BENDING DIAGRAMS

ORIG SCALE: 1/4" = 1'-0"

DIVISION OF HIGHWAYS

REINFORCEMENT-FINAL LINING
 MULTIPLE DRIFT
 TUNNEL SUPPORT

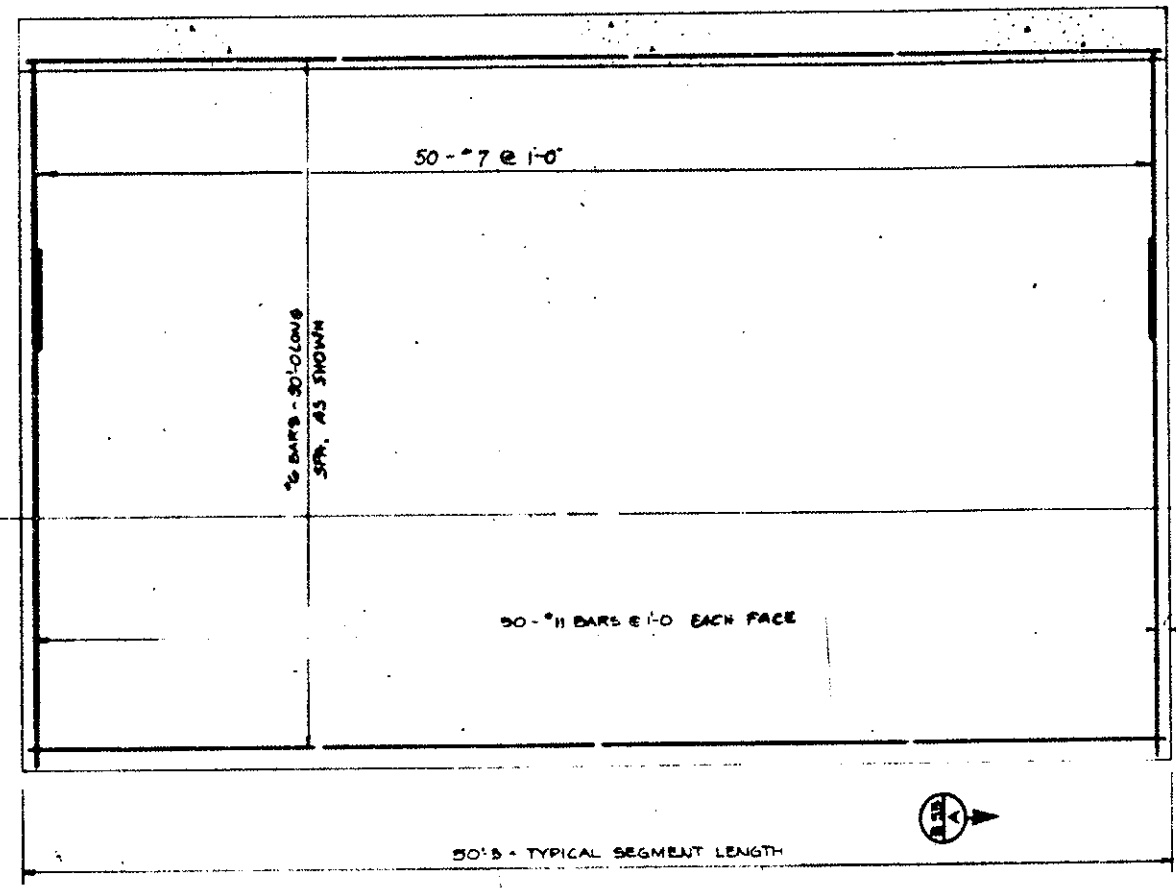
| | |
|----------------------|-------------------|
| Designer: C.D.O.H. | Structure: F-15-X |
| Detailer: B.R.L.e.e. | Number: |
| Drawing Number: 52 | of 60 Drawings |

| | |
|-------------|--|
| DESIGNED BY | |
| CHECKED BY | |
| APPROVED BY | |
| DATE | |

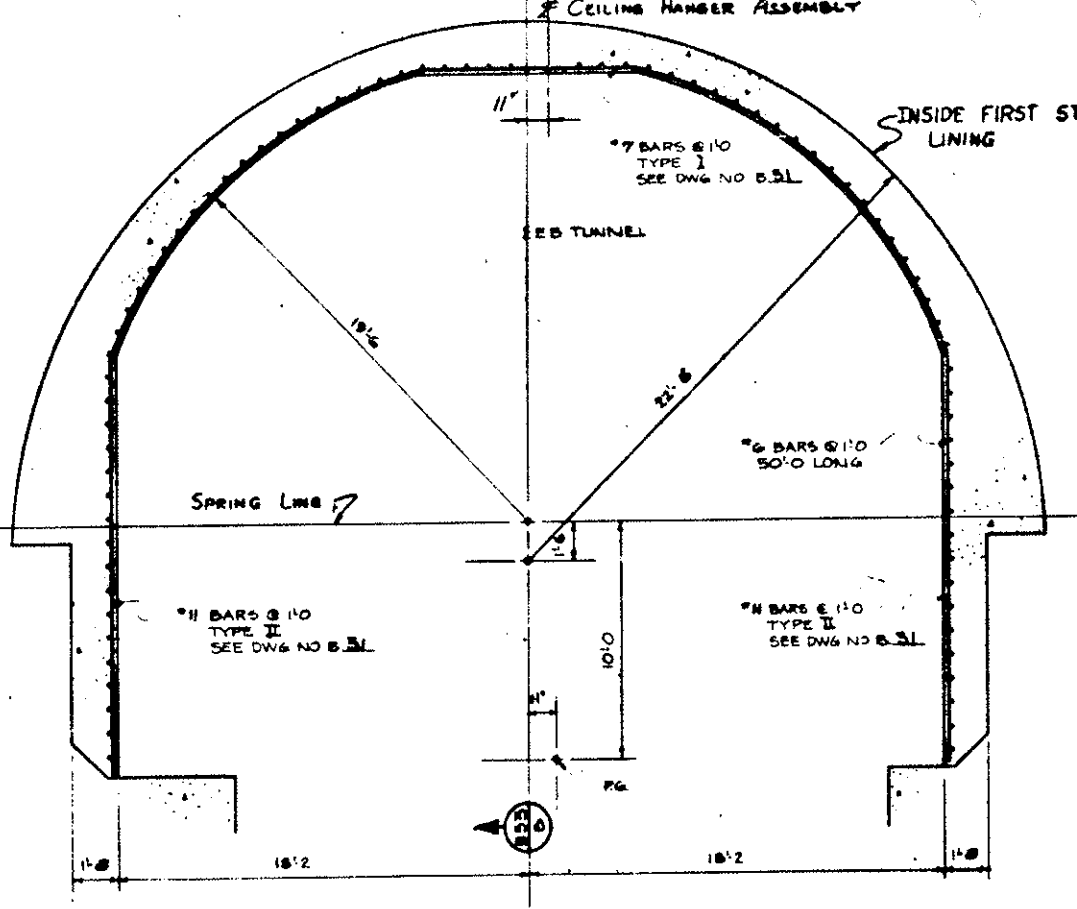
NO REVISIONS
 6-29-79

| REGIONAL NO. | DISTRICT | PAQU. NO. | NO. | REV. |
|--------------|----------|--------------|-----|------|
| VIII | COLORADO | 170-D.A. 370 | 61 | 273 |

| REVISIONS | | | | |
|-----------|--|--|--|--|
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SECTION **B-B**



SECTION **A-A**

SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT FOR SEGMENTS -
 S95 THRU S125
 S127 THRU S162/131
 S136 THRU S162

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|---------|--------------|-------|
| I | 30'-10" | 50 | 1.576 |
| II | 25'-2" | 100 | 7.402 |
| LONGITUDINAL | 50'-0" | 80 | 3.004 |

S132 THRU S135

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|--------|--------------|-------|
| IV | 34'-6" | 50 | 4.582 |
| III | 30'-0" | 100 | 7.969 |
| LONGITUDINAL | 50'-0" | 80 | 3.004 |

| | |
|-------------|----------|
| DESIGNED BY | CDH |
| CHECKED BY | BRL |
| DATE | 12-18-74 |
| REVISIONS | |

ORIG. SCALE: 1/4" = 1'-0"

DIVISION OF HIGHWAYS

REINFORCEMENT-FINAL LINING
 3 DRIFT AND 2 DRIFT
 TUNNEL SUPPORT

| | | | |
|----------------|--------|-----------|-------------|
| Designer | CDH | Structure | F-13-X |
| Detailer | BRLere | Number | |
| Drawing Number | B 33 | of | 60 Drawings |

AS CONSTRUCTED

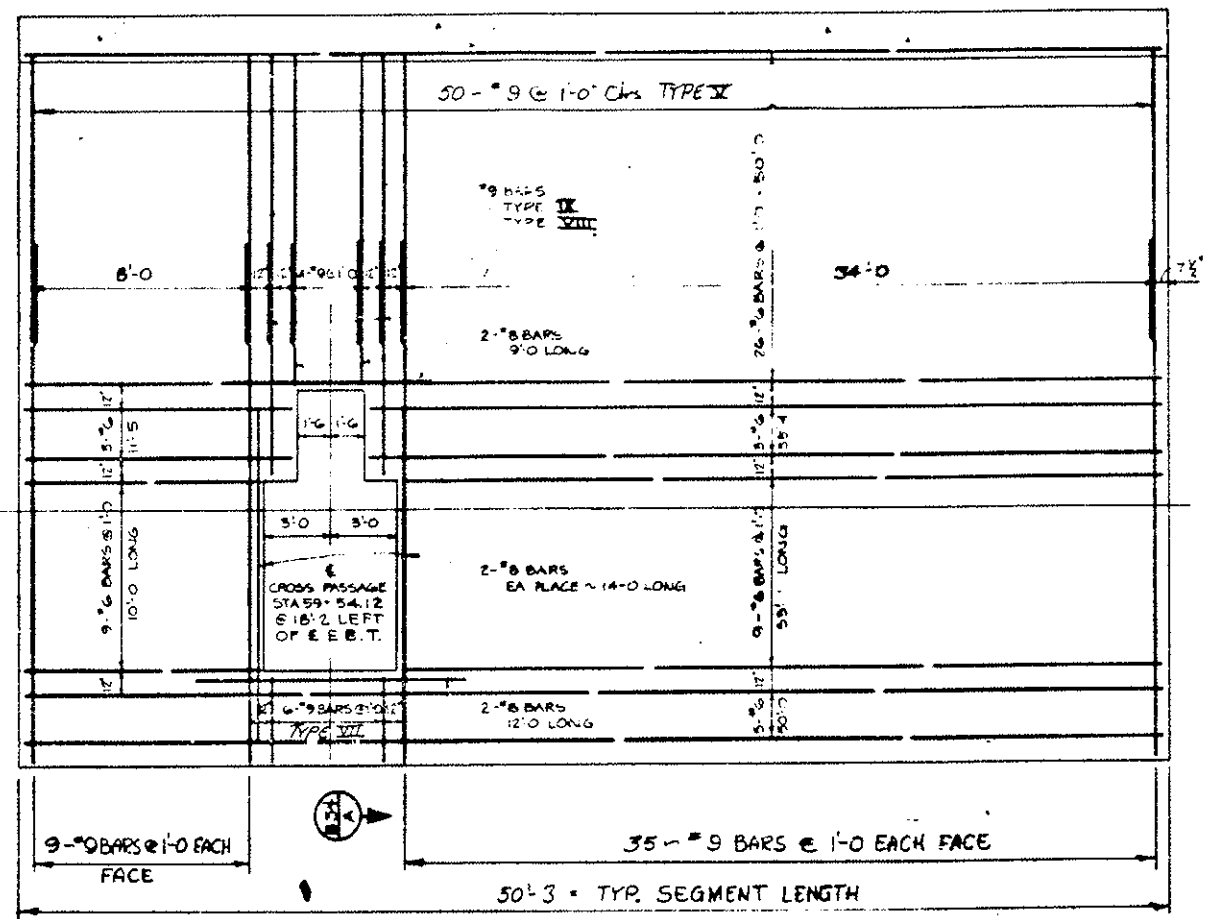
REVISIONS 6-29-79 REVISED _____ VOID _____

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|---------------------|-----------|--------------|
| VIII | COLORADO 1-10-6-220 | 62 | 273 |

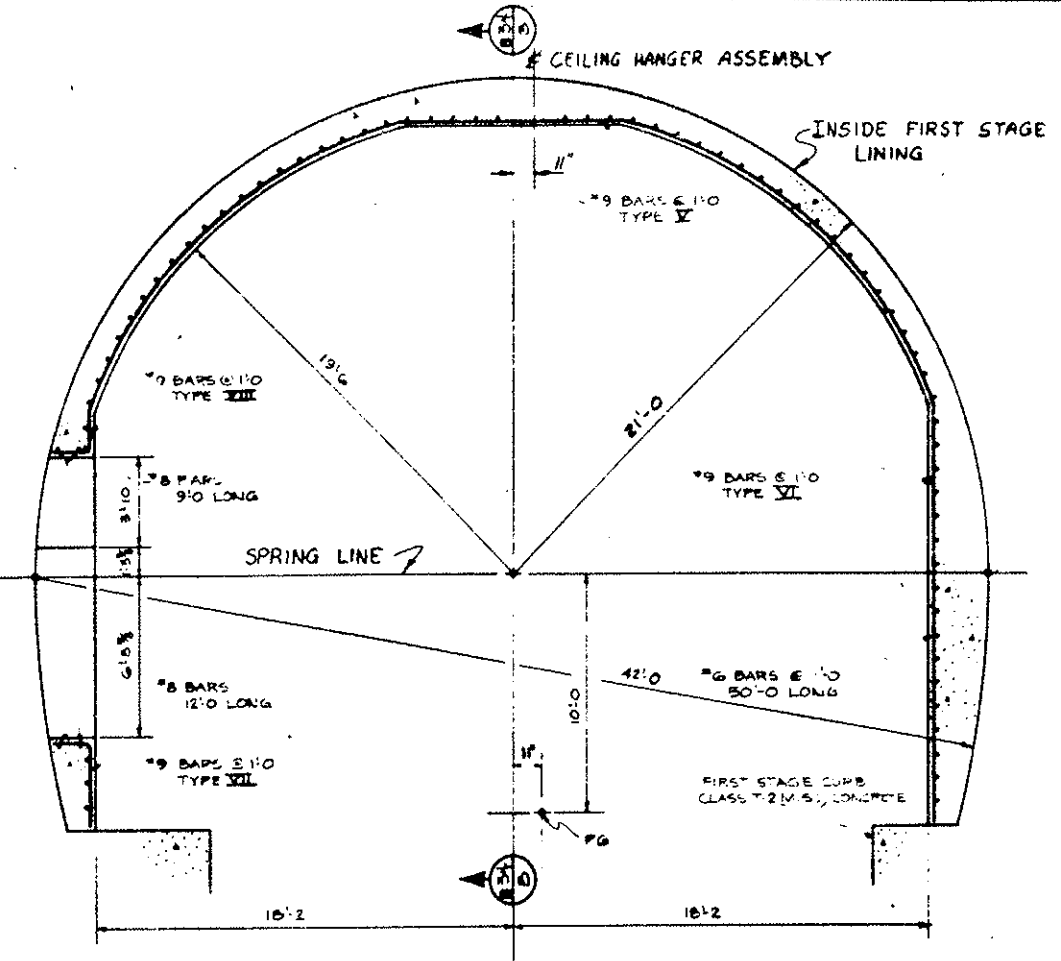
| REVISIONS | |
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SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT FOR SEGMENT No. 5-42

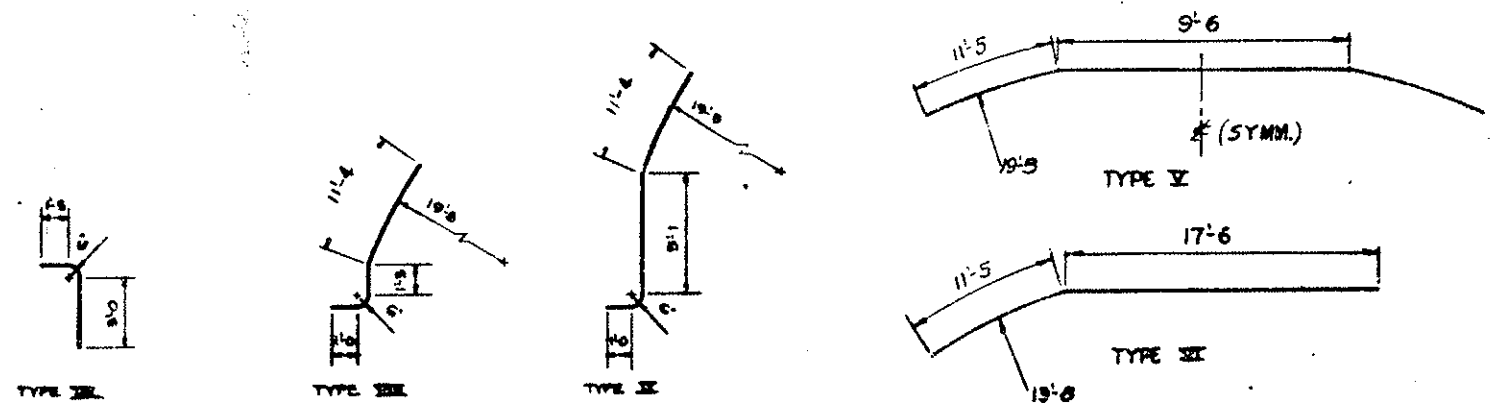
| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|---------|--------------|-------|
| V | 32'-4" | 50 | 2.745 |
| VI | 37'-3" | 93 | 5.889 |
| VII | 5'-1" | 6 | 0.052 |
| VIII | 14'-5" | 4 | 0.098 |
| IX | 18'-3" | 2 | 0.062 |
| LONGITUDINAL | 50'-0" | 68 | 2.553 |
| | 12'-0" | 2 | 0.032 |
| | 9'-0" | 2 | 0.024 |
| | 35'-4" | 3 | 0.080 |
| | 11'-5" | 3 | 0.086 |
| | 33'-11" | 9 | 0.229 |
| | 10'-0" | 9 | 0.068 |
| LONGITUDINAL | 14'-0" | 4 | 0.075 |



SECTION B-B



SECTION A-A



BENDING DIAGRAMS

| | | | |
|---------------|------|-------------|------|
| DESIGNED BY | 2-74 | CHECKED BY | MEP |
| QUANTIFIED BY | 3-72 | APPROVED BY | 3-72 |
| REVIEWED BY | 3-72 | | |

ORIG SCALE: 1/4" = 1'-0"

DIVISION OF HIGHWAYS

REINFORCEMENT - FINAL LINING
AT
WEST CROSS PASSAGE - 542

| | | | |
|----------------|--------|----------|--------|
| Designer | C.D.H. | Station | P-15-X |
| Designer | B.R.L. | Revision | |
| Drawing Number | S-84 | of | 60 |

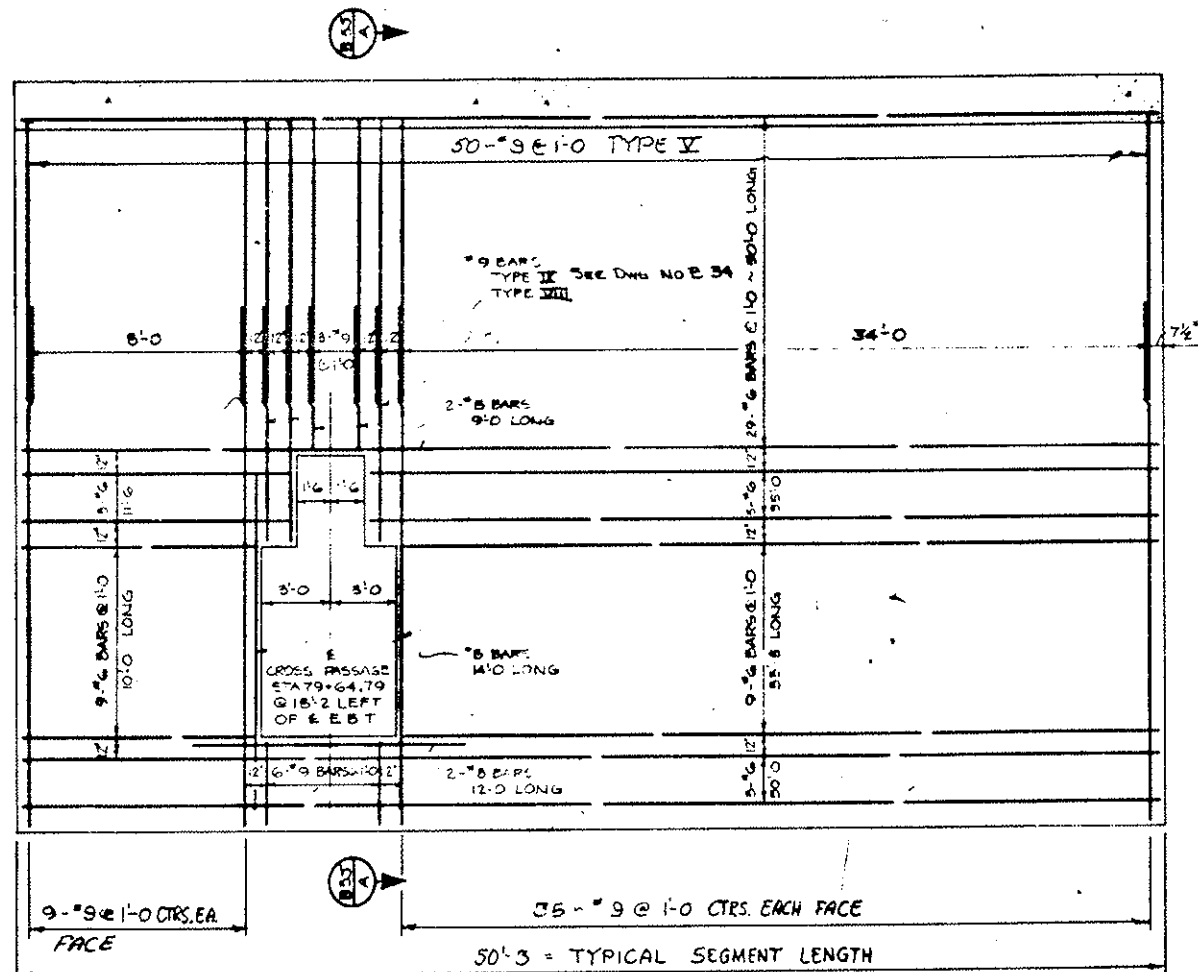
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|---------------|-----------|--------------|
| VIII COLORADO | I 70-5(6) 220 | 63 | 273 |

| REVISIONS | |
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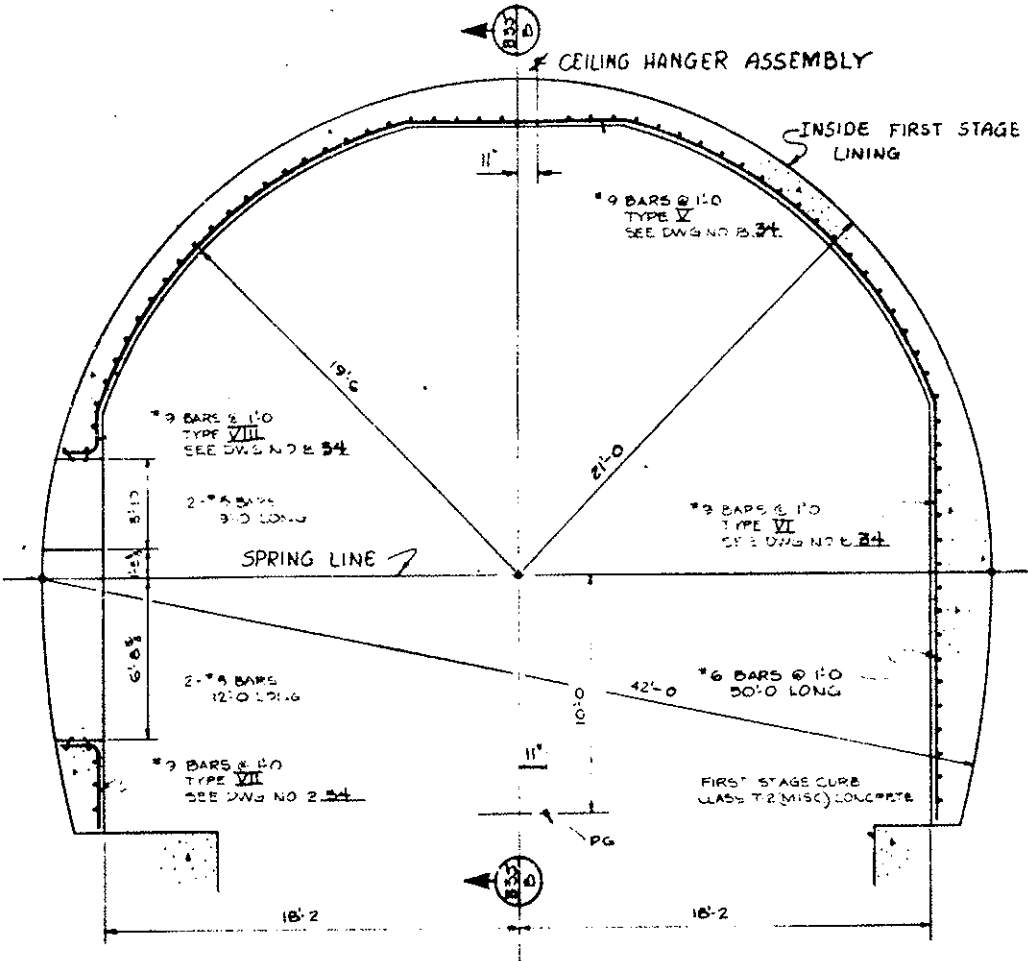
AS CONSTRUCTED
NO REVISIONS 6-29-79 REVISED _____ VOID _____

SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT No. 582

| BAR TYPE | LENGTH | NUMBER REQD. | TONS |
|--------------|--------|--------------|-------|
| V | 32'-4" | 50 | 2.748 |
| VI | 37'-3" | 94 | 5.953 |
| VII | 5'-1" | 6 | 0.052 |
| VIII | 14'-5" | 3 | 0.049 |
| IX | 18'-3" | 3 | 0.093 |
| LONGITUDINAL | 50'-0" | 68 | 2.553 |
| | 9'-0" | 2 | 0.024 |
| | 12'-0" | 2 | 0.032 |
| | 35'-0" | 3 | 0.079 |
| | 33'-8" | 9 | 0.228 |
| | 11'-6" | 3 | 0.026 |
| | 10'-0" | 9 | 0.068 |
| LONGITUDINAL | 14'-0" | 4 | 0.075 |



SECTION B-B



SECTION A-A

| | | |
|---------------|--------|------|
| DESIGNED BY | CDOM | 2-74 |
| CHECKED BY | B.R.L. | 9-74 |
| DATE | 2-74 | |
| QUANTITIES BY | ASD | 3-74 |
| CHECKED BY | K.S. | 3-74 |

SCALE: 1/4" = 1'-0"

DIVISION OF HIGHWAYS

REINFORCEMENT-FINAL LINING
AT
CENTER CROSS PASSAGE-582

| | |
|----------------------|-------------------|
| Designer: CDOM | Structure: F-13-X |
| Detour: B.R.L.ENG | Number: _____ |
| Drawing Number: B 35 | of 60 Drawings |

Revision Date: _____ (Primary Scale Only)

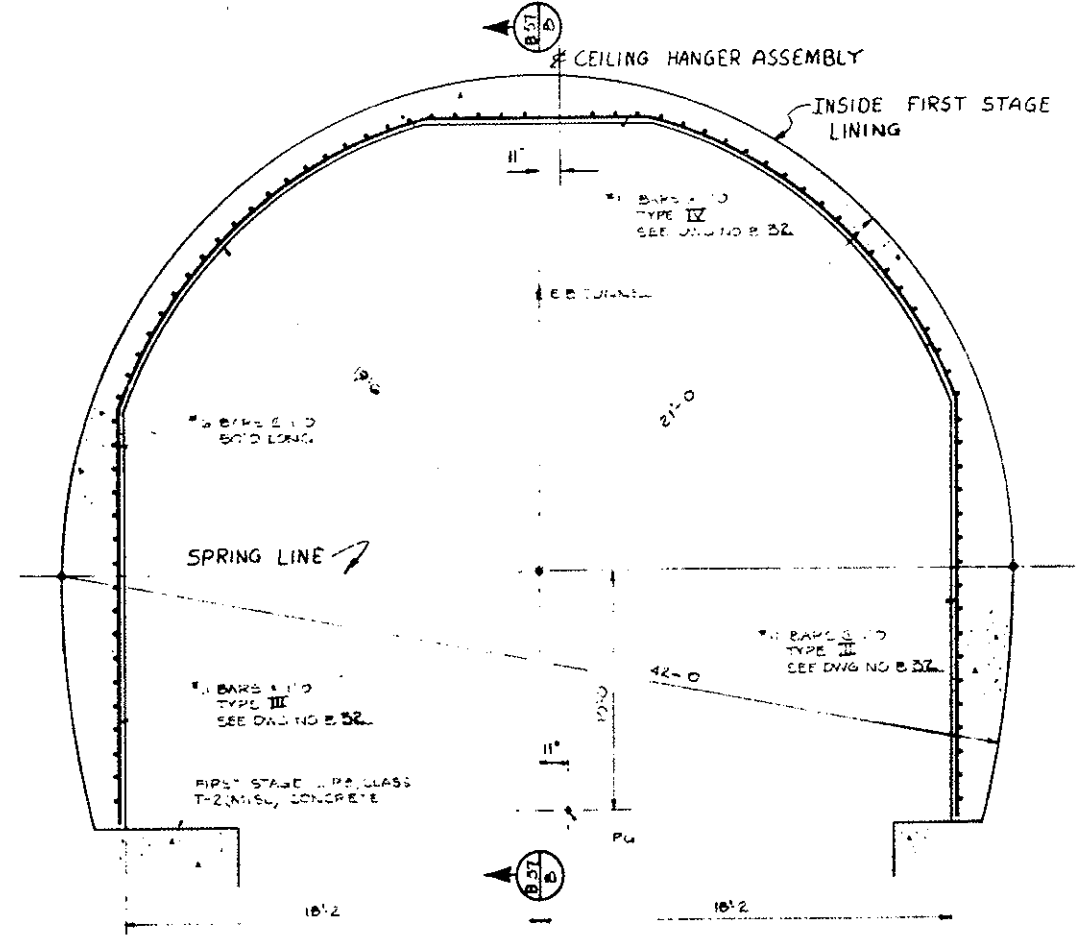
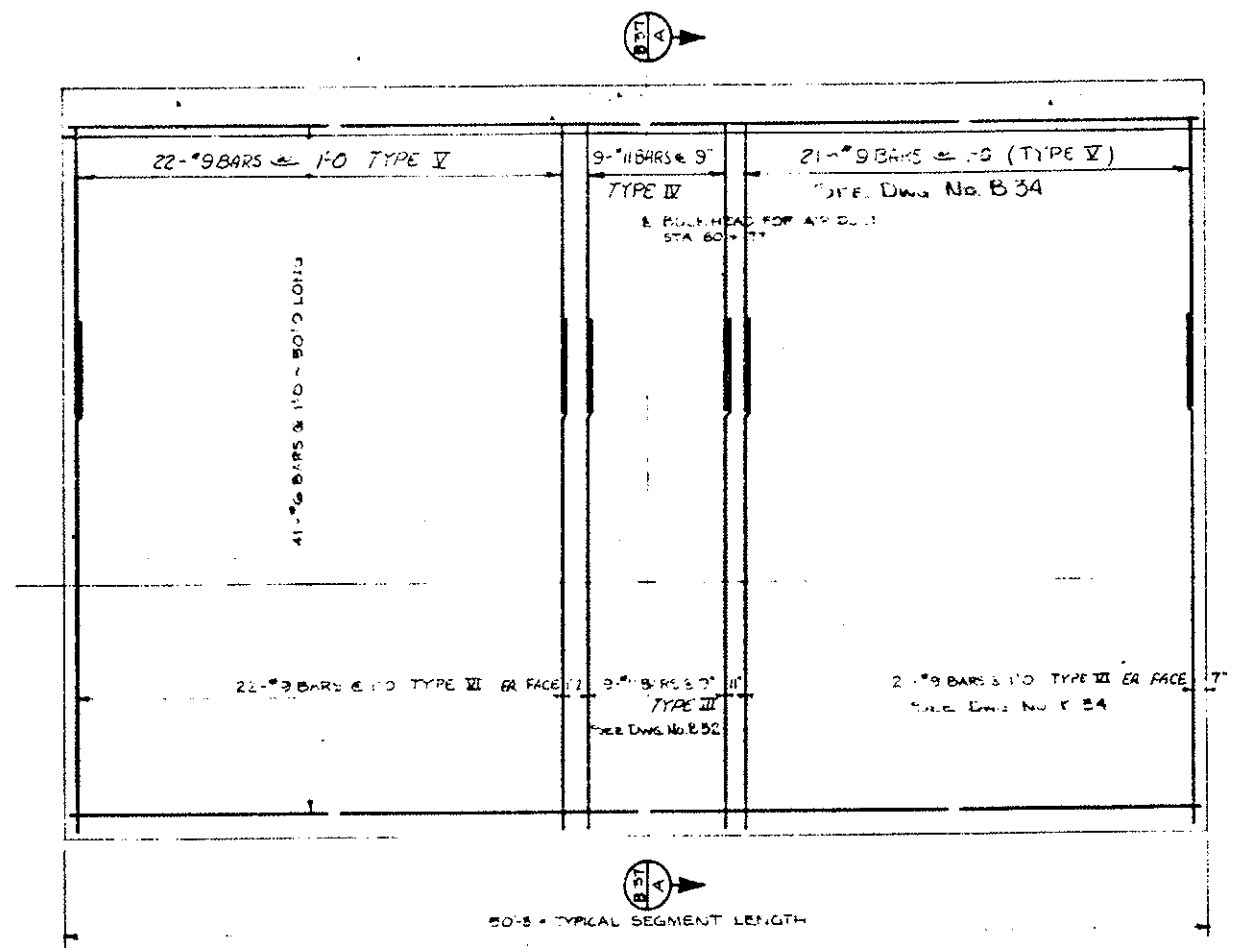
| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|----------------|-----------|--------------|
| XIII | COLORADO | 270-3(81), 220 | 65 | 273 |

| REVISIONS | |
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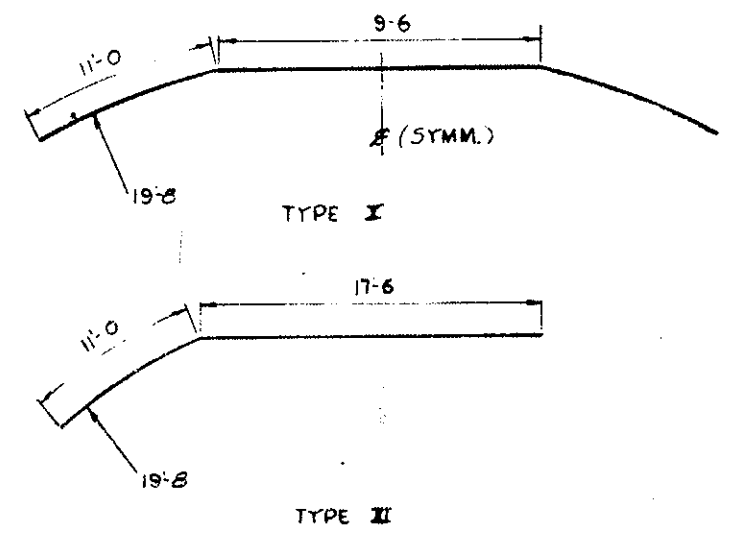
| AS CONSTRUCTED | |
|----------------|---------|
| NO REVISIONS | 6-29-79 |
| | |

SUMMARY OF REINFORCING STEEL QUANTITIES PER SEGMENT No. 584

| BAR TYPE | LENGTH | NUMBER REQD | TONS |
|--------------|--------|-------------|-------|
| IV | 34'-6" | 9 | 0.825 |
| III | 30'-0" | 18 | 1.435 |
| V | 32'-4" | 43 | 2.364 |
| VI | 37'-3" | 86 | 5.446 |
| LONGITUDINAL | 50'-0" | 80 | 3.004 |



| | | | |
|-------------|----------|------|------------|
| DESIGNED BY | INITIAL | DATE | CHECKED BY |
| C.O.O.H. | C.O.O.H. | 5-14 | 3-75 |
| CHECKED BY | B.R.L. | 6-74 | 3-75 |
| DETAILED BY | | | |



SCALE: 1/4" = 1'-0"

DIVISION OF HIGHWAYS

REINFORCEMENT - FINAL LINING
AT CENTER AIR BULKHEAD - 584

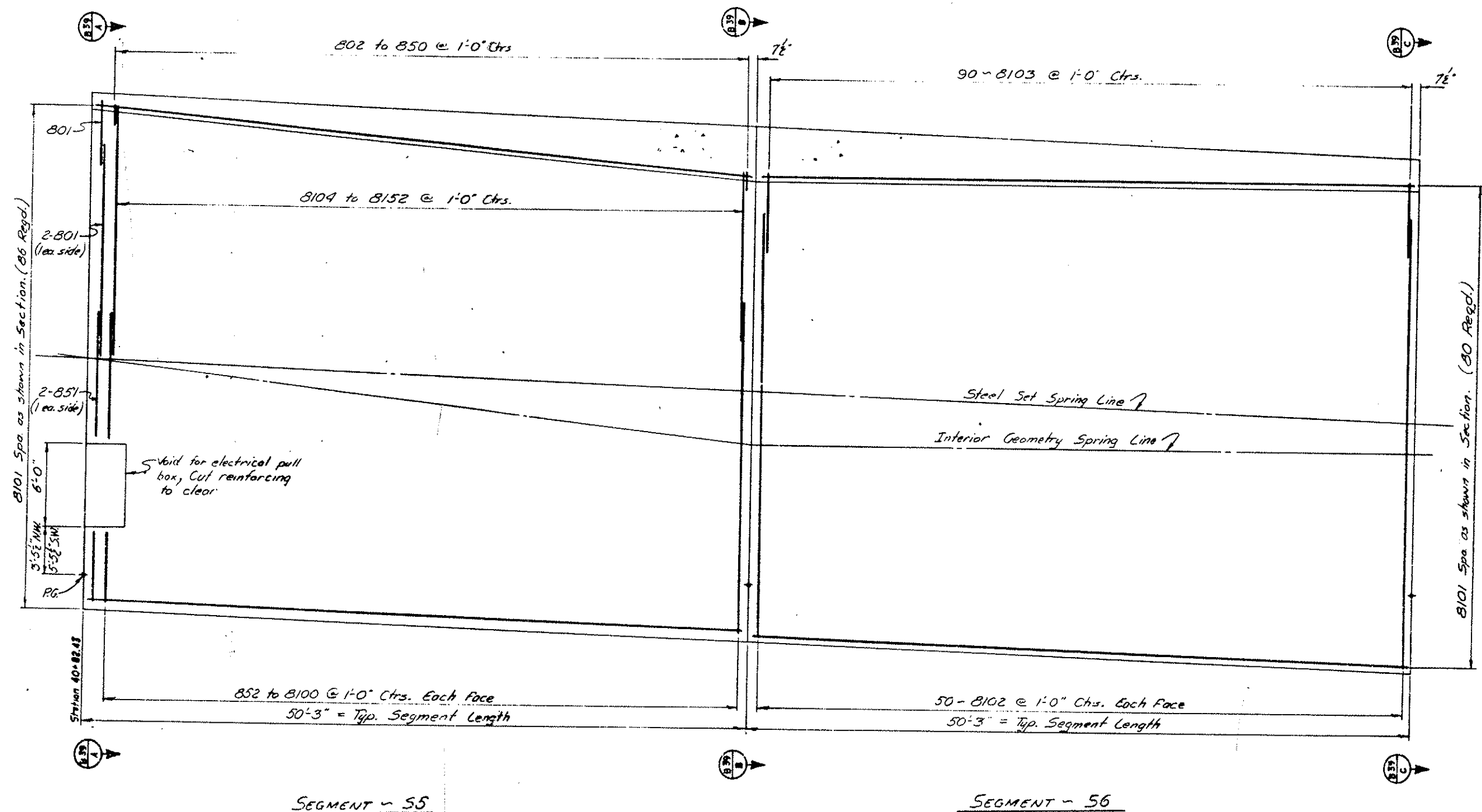
| | |
|----------------------|-------------------|
| Designer: C.O.O.H. | Structure: F-13-X |
| Detailer: B.K. Lenz | Number: |
| Drawing Number: B-57 | of 60 Drawings |

Revision Data: (Preliminary Stages Only)

| |
|----------------------|
| AS CONSTRUCTED |
| NO REVISIONS 6-29-79 |

| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XII | COLORADO | I 70-3(B)/220 | 66 | 275 |

| REVISIONS | |
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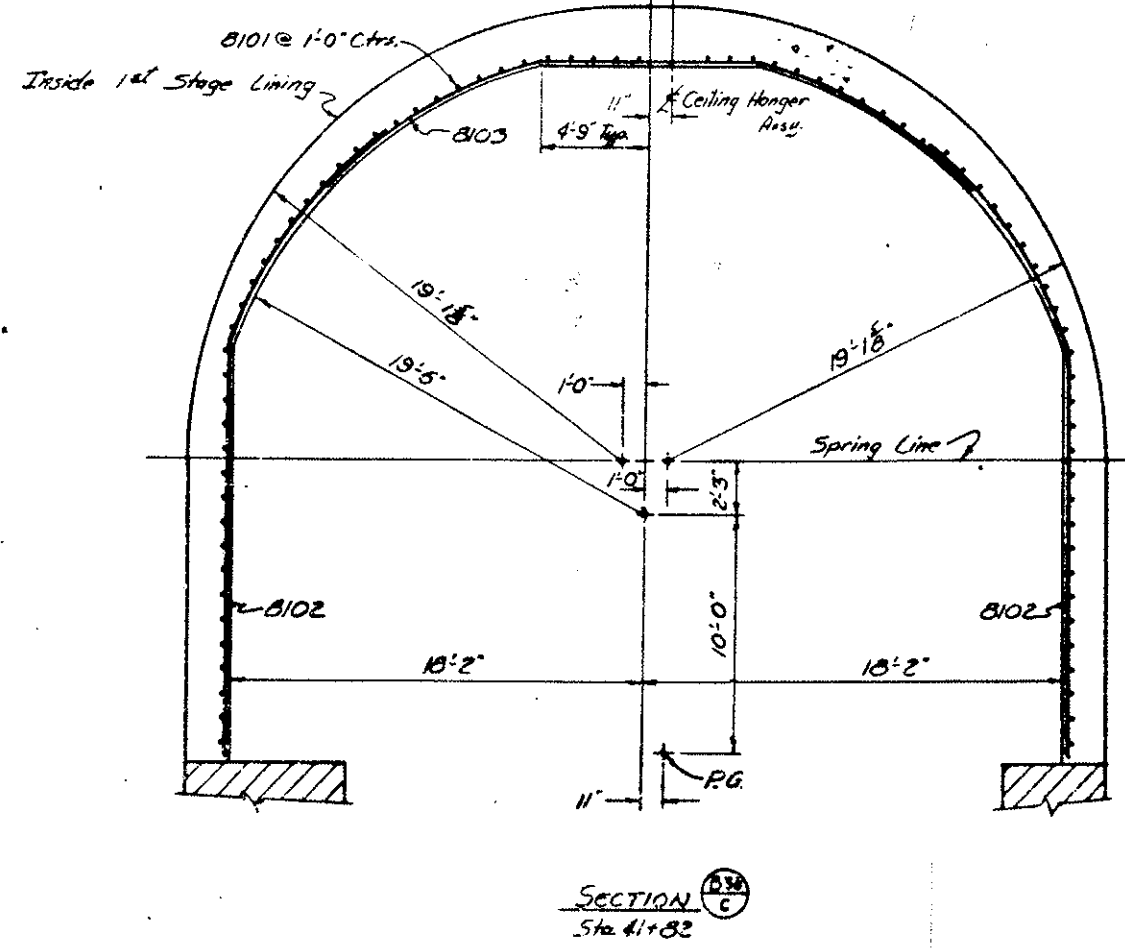
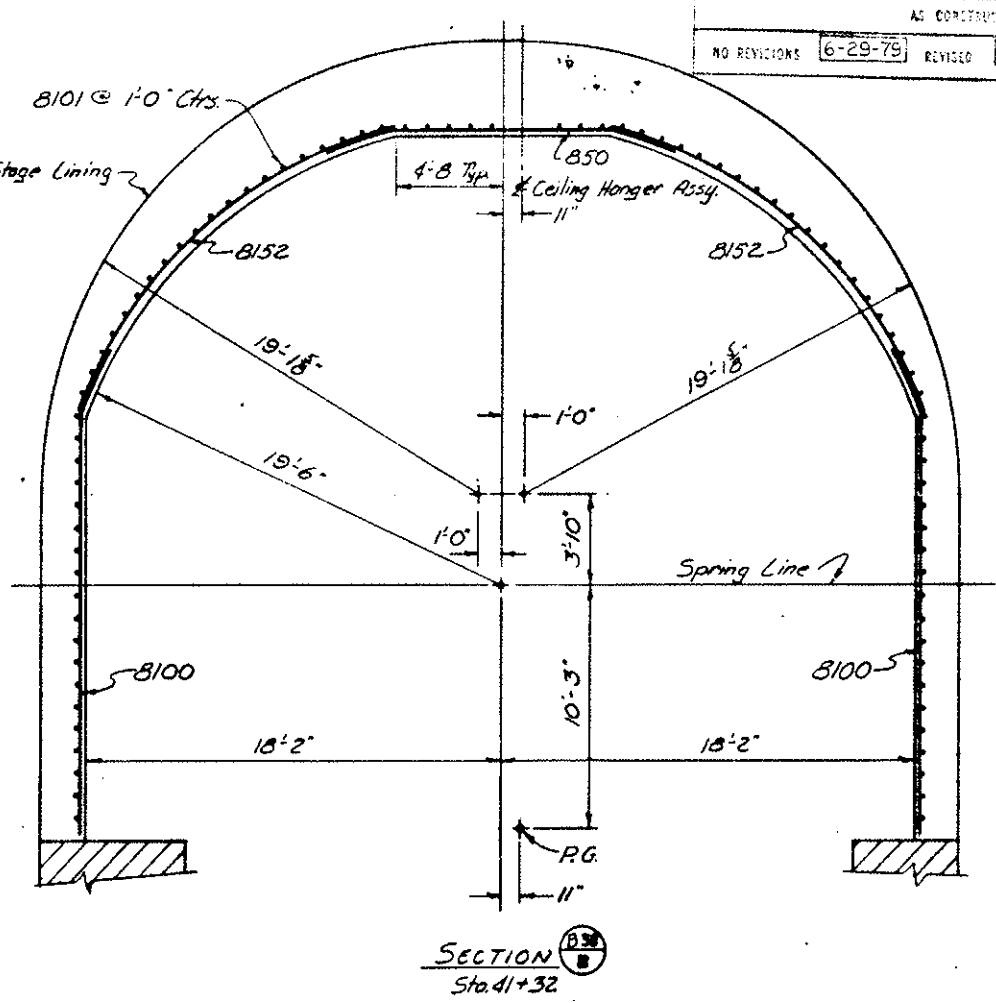
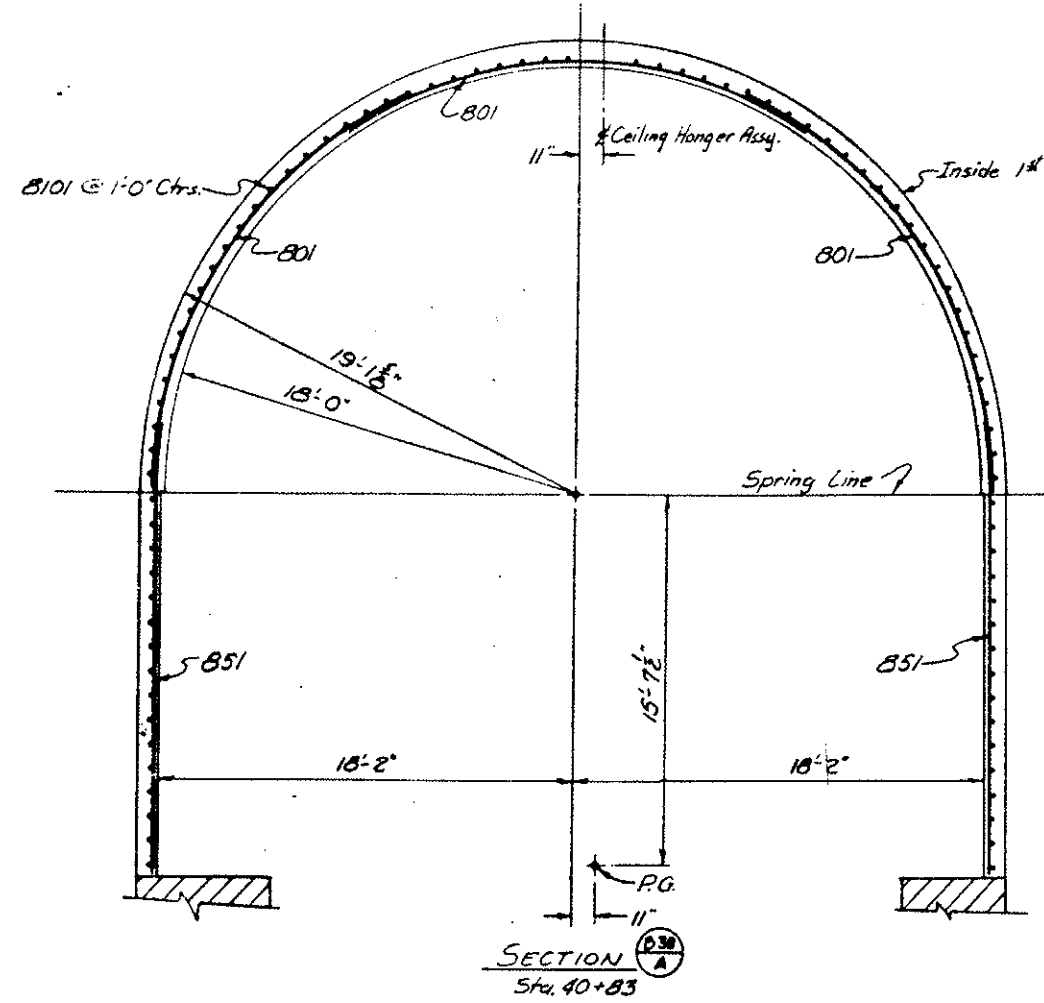
| | | | |
|-------------|---------|-------------|---------|
| DESIGNED BY | CDM | QUANTITY BY | TJA |
| CHECKED BY | MEB | CHECKED BY | THE |
| DATE | 6-29-79 | DATE | 6-29-79 |

| | |
|---|--------------------------|
| DIVISION OF HIGHWAYS | |
| REINFORCEMENT - FINAL LINING SEGMENTS 55 & 56 ELEVATION | |
| Designer CDM | Structure F-13-X |
| Detailer M. P. ... | Numbers |
| Drawing Number B 22 | of 60 Drawings |
| Revision Date | (Preliminary Stage Only) |

AS CONSTRUCTED
NO REVISIONS 6-29-79 REVISED _____ VOID _____

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-------------|-----------|--------------|
| VIII COLORADO | I70-3(8)220 | 67 | 273 |

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |



SUMMARY OF REINFORCING STEEL QUANTITIES FOR SEGMENTS 55 & 56

| Mark | No. Reqd | Length | Type | L | r | Tons |
|---------|----------|------------|-------|----------|--------|---------|
| B01 | 3 | 21'-2" | XV | 18'-3" | 0.0848 | |
| B02 | | 6'-1" | | 1" | 18'-3" | |
| to 1ea. | to | | XIV | B.E.I. | B.E.I. | 0.7059 |
| B50 | | 15'-6" | | 9'-6" | 19'-9" | |
| B51 | 2 | 19'-1" | XVI | 16'-1" | 18'-3" | 0.0510 |
| B52 | | 19'-1 1/2" | | 16'-1/2" | 18'-3" | |
| to 2ea. | to | | XVI | B.E.I. | B.E.I. | 2.6193 |
| B100 | | 20'-11" | | 17'-11" | 19'-9" | |
| B101 | 166 | 50'-0" | Str. | | | 11.0805 |
| B102 | 100 | 28'-8" | XI | 17'-6" | 19'-9" | 3.8270 |
| B103 | 50 | 3'-6" | XVIII | 11'-0" | 19'-9" | 2.1026 |
| B104 | | 28'-8" | | | 18'-3" | |
| to 2ea. | to | | XV | | B.E.I. | 3.1141 |
| B152 | | 19'-0" | | | 19'-9" | |

For Bending Diagrams See DWG. No. 41

DESIGNED BY: J.A. A.S.T.
 CHECKED BY: J.A. A.S.T.
 DRAWN BY: J.A. A.S.T.
 DATE: 6-29-79

DIVISION OF HIGHWAYS

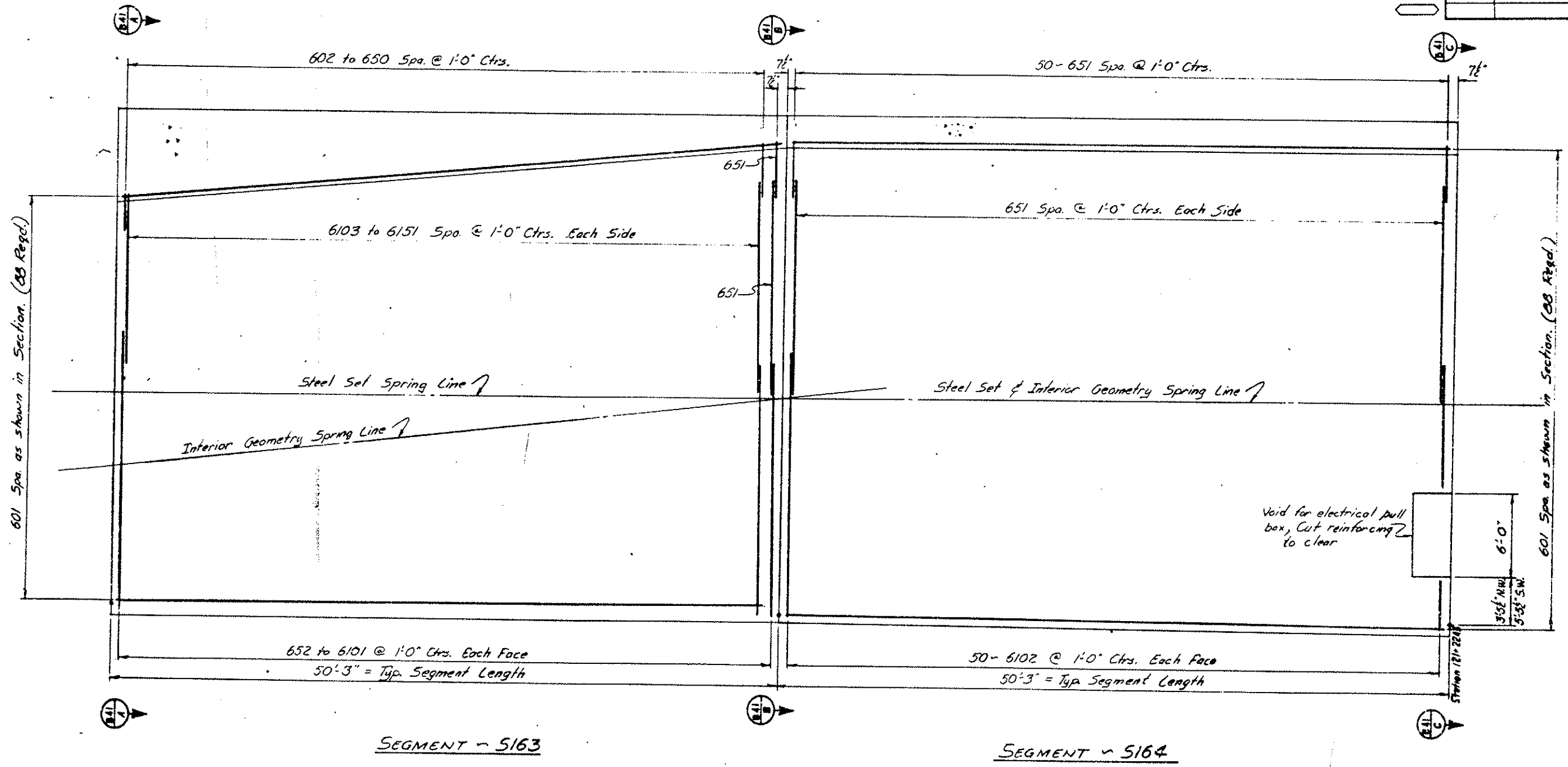
**REINFORCEMENT - FINAL LINING
SEGMENTS 55 & 56
SECTIONS**

| | |
|---------------------|--------------------|
| Designer: CDH | Structural: F-13-X |
| Checker: F.V.P. | Number: _____ |
| Drawing Number: 111 | of 63 Drawings |

| | | | |
|--------------|---------|---------|------|
| AS COMPLETED | | | |
| NO REVISIONS | 6-29-79 | REVISED | VOID |

| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(B) 220 | 68 | 273 |

| REVISIONS | | |
|-----------|--|--|
| | | |
| | | |
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| | |
|---------------|------|
| DESIGNED BY | CDOR |
| CHECKED BY | |
| DATE | 7/2 |
| QUANTITIES BY | JLA |
| CHECKED BY | RJ |
| DETAILS BY | |

601 Spa. as shown in Section (BB Regd.)

601 Spa. as shown in Section (BB Regd.)

SEGMENT ~ 5163

SEGMENT ~ 5164

| | | | |
|---|----------|--------------------------|-------------|
| DIVISION OF HIGHWAYS | | | |
| REINFORCEMENT - FINAL LINING SEGMENTS 5163 & 5164 ELEVATION | | | |
| Designer | CDOR | Structure | F-13-X |
| Detailer | M. Baker | Number | |
| Drawing Number | B 42 | of | 60 Drawings |
| Revised Date | | (For Ministry Sign Only) | |

| | | | |
|-----------------------|---------------|-----------|--------------|
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII COLORADO | 170-3(81) 220 | 69 | 273 |

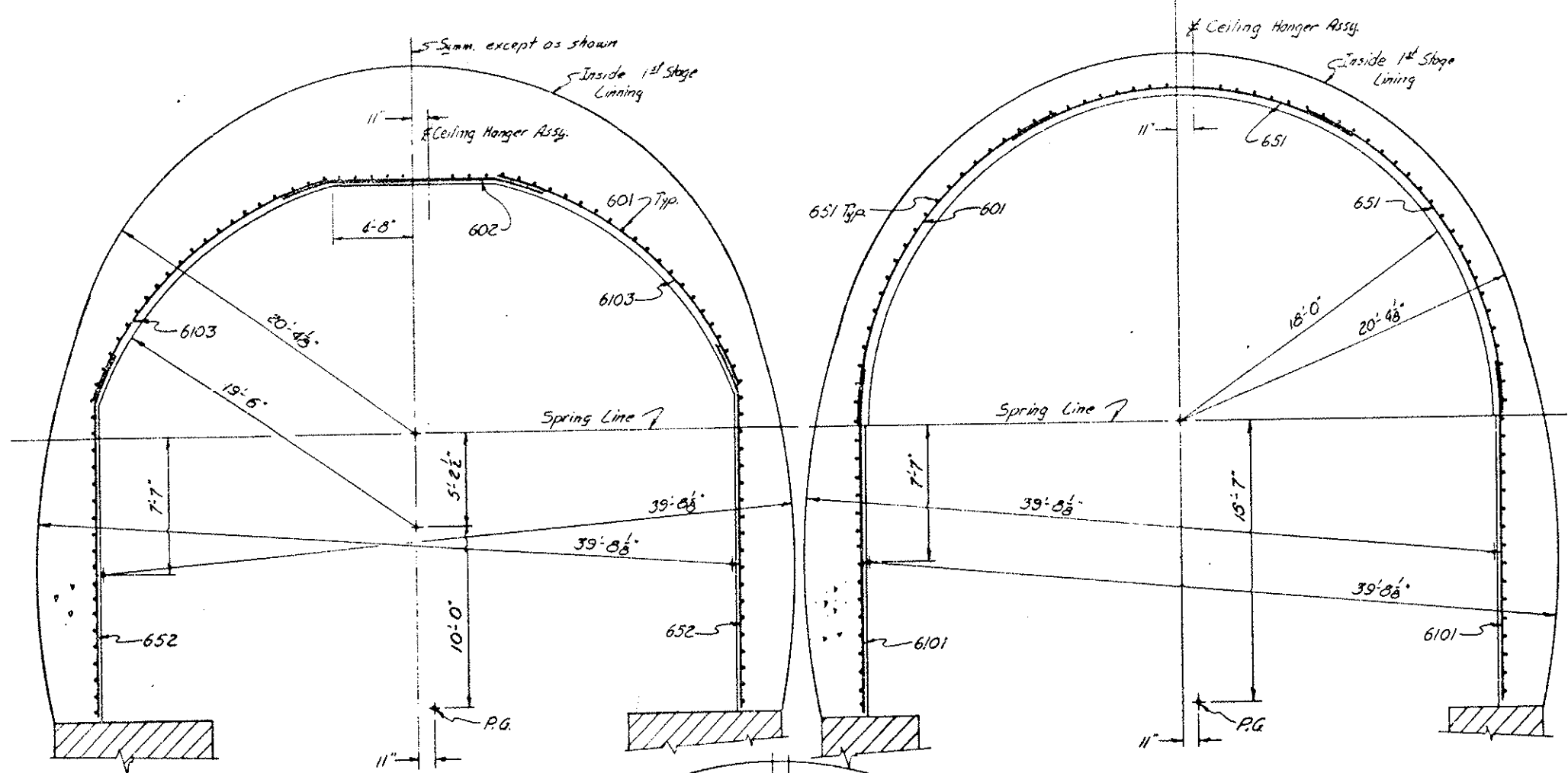
| REVISIONS | |
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| | |

6-29-79

SUMMARY OF REINFORCING STEEL QUANTITIES FOR SEGMENTS S163 & S164

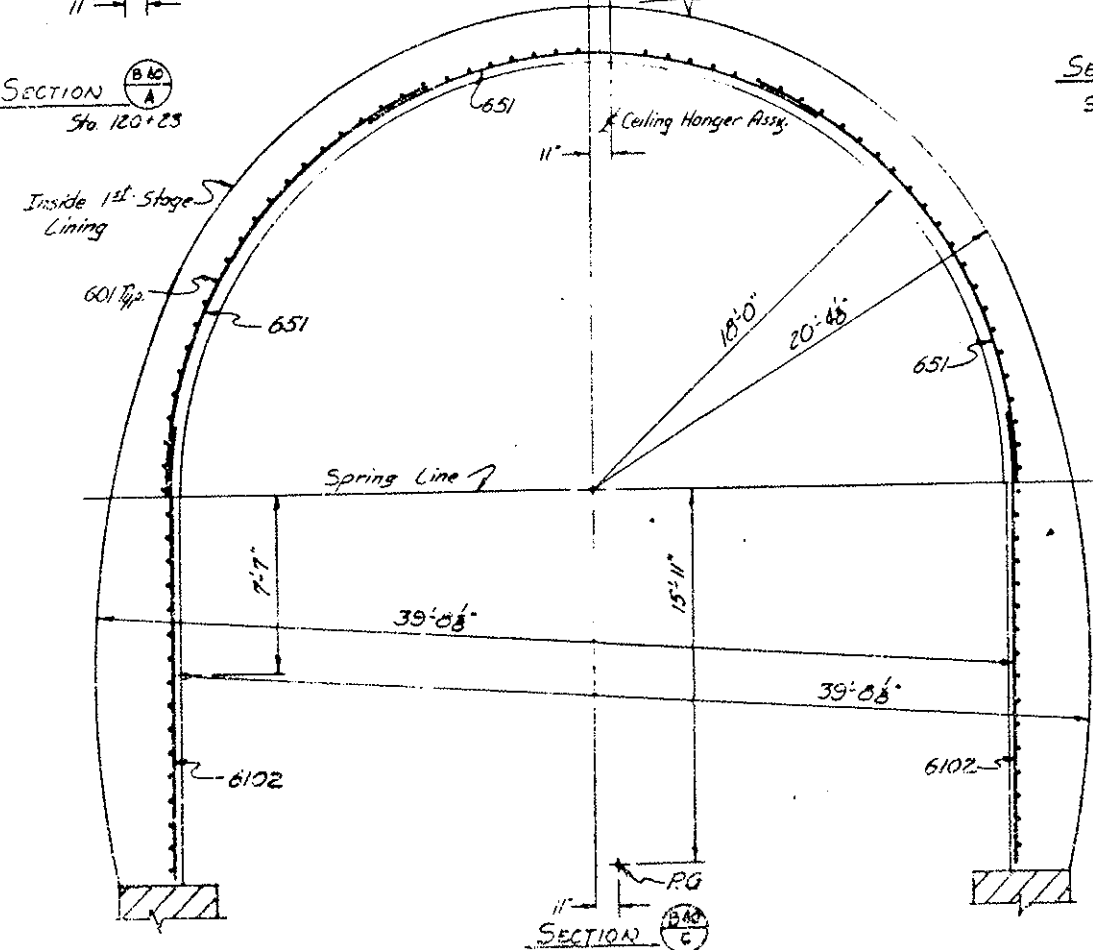
| Mark | No. Rqd. | Length | Type | l | r | Tons |
|--------|----------|------------|--------|------------|--------|--------|
| 601 | 176 | 50'-0" | Str | | | 6.6088 |
| 602 | | 15'-6" | | 9'-6" | 19'-9" | |
| to 1ea | to | XIV | B.E.I. | B.E.I. | | 0.3956 |
| 650 | | 6'-1" | | 1' | 18'-3" | |
| 651 | 153 | 19'-4" | XV | | 18'-3" | 2.2215 |
| 652 | | 20'-7 1/2" | | 17'-7 1/2" | 19'-9" | |
| to 2ea | to | XVI | B.E.I. | B.E.I. | | 1.4911 |
| 6101 | | 19'-1" | | 16'-1" | 18'-3" | |
| 6102 | 100 | 19'-5" | XVI | 16'-5" | 18'-3" | 1.4582 |
| 6103 | | 16'-4" | | | 19'-9" | |
| to 2ea | to | XV | B.E.I. | | | 1.5578 |
| 6151 | | 26'-0" | | | 18'-3" | |

B.E.I. = By Equal Increments.

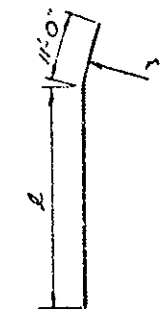
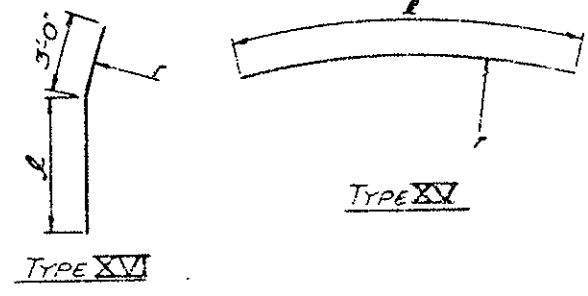
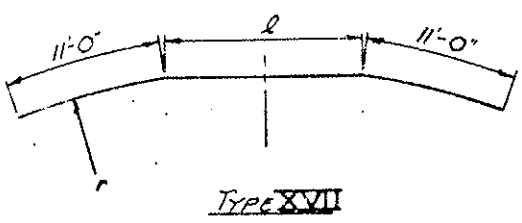
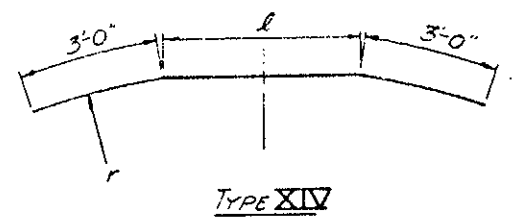


SECTION (B) (A) Sta 120+23

SECTION (B) (B) Sta 120+71



SECTION (B) (C) Sta 121+22



| | | |
|-------------|---------------|------------|
| DESIGNED BY | QUANTITIES BY | CHECKED BY |
| | | |
| | | |

DIVISION OF HIGHWAYS

REINFORCEMENT - FINAL LINING SEGMENTS S163 & S164 SECTIONS

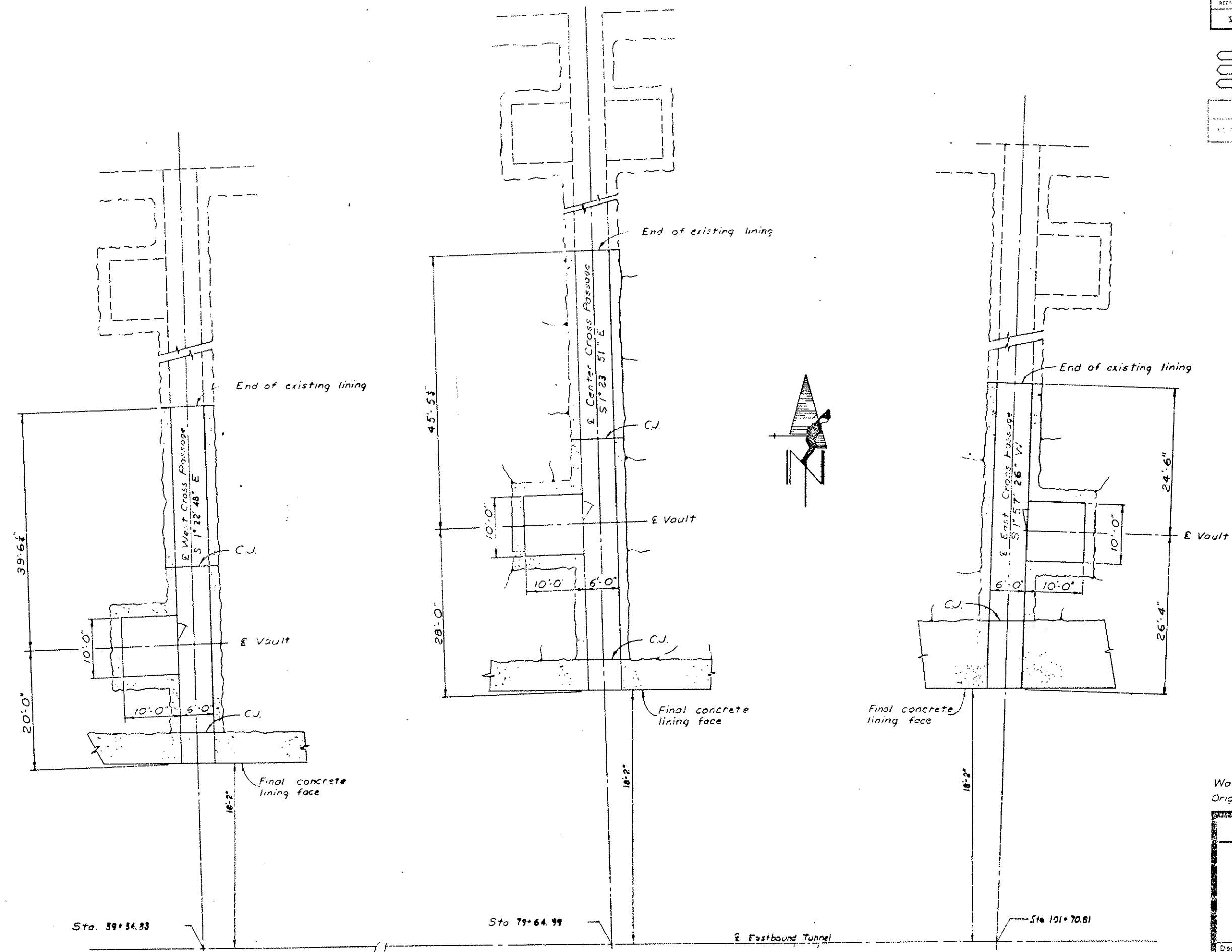
| | | | |
|----------|------|----------|--------|
| Designer | CDOM | Reviewed | F-13-X |
| Checked | | | |
| Drawn | | | |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------|-----------|--------------|
| VIII COLORADO | 170-3-1-1120 | 70 | 273 |

| REVISIONS | | | |
|-----------|--|--|--|
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| | | | |
| | | | |

DATE: 6-29-79

| DESIGNED BY | CHECKED BY | DATE |
|---------------|---------------|------|
| C.D.O.H. 3-74 | E.H.M. 6-74 | |
| CHECKED BY | QUANTITIES BY | |
| E.H.M. 4-74 | R.M.M. 6-74 | |



Sta. 59+34.93

Sta. 79+64.99

Sta. 101+70.81

Eastbound Tunnel

WEST CROSS PASSAGE

CENTER CROSS PASSAGE

EAST CROSS PASSAGE

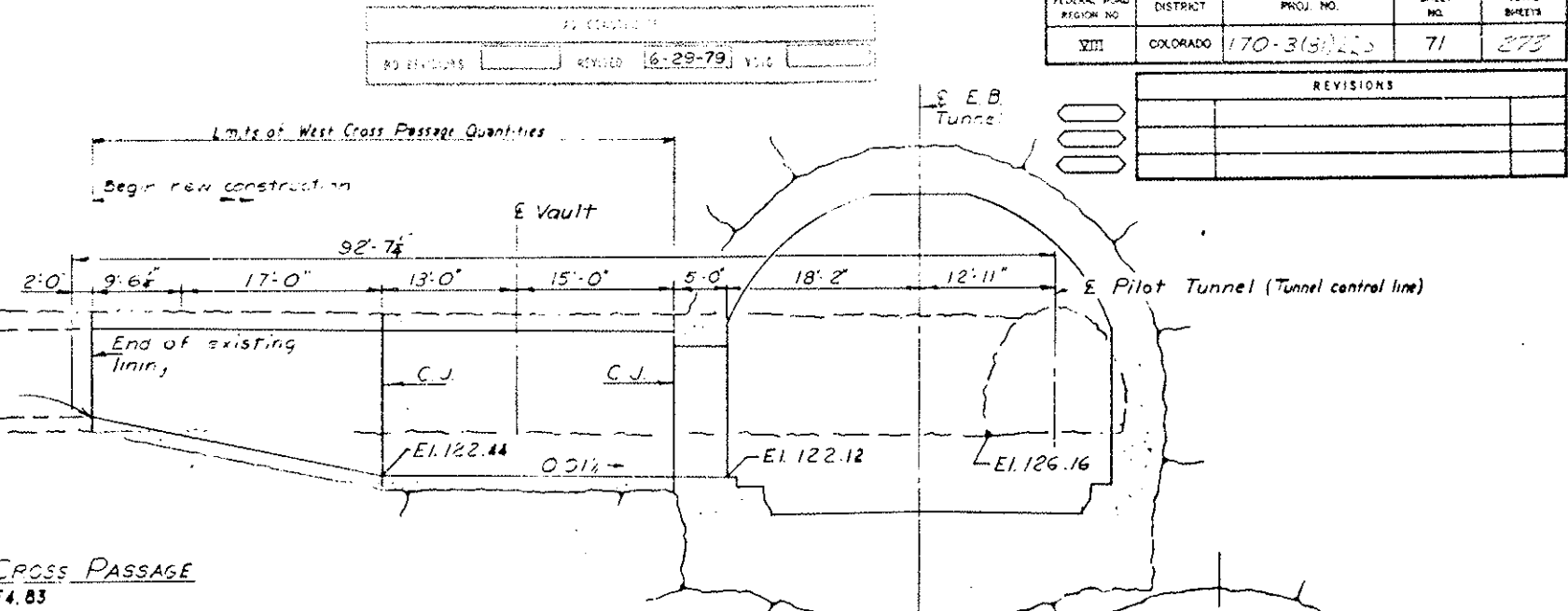
Work with Dwg. No. B.43
Original Scale: 1/4" = 1'-0"

| | | | |
|-----------------------------|-------------------|----------------|--|
| DIVISION OF HIGHWAYS | | | |
| CROSS PASSAGE PLANS | | | |
| Designer: C.D.O.H. | Structure: F-13-X | | |
| Detailer: E. Hodley | Number: 42 | of 60 Drawings | |
| Drawing Number 3 42 | | | |

| | | | |
|-----------------------|-------------|-----------|--------------|
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| XIII COLORADO | 170-3(8)225 | 71 | 273 |

| Item # | Description | Unit | Quantity | Final |
|--------|-----------------------------------|----------|----------|--------|
| 211 | Tunnel Excavation Class D | Cu Yd | 124 | 147 |
| 509 | Structural Steel (Miscellaneous) | Tons | 10 | 12.668 |
| 518 | Waterstop | Lin. Ft. | 70 | 61 |
| 601 | Concrete Class T-2 (Final Lining) | Cu Yd | 132 | 166.78 |
| 602 | Reinforcing Steel | Tons | 3 | 3 |

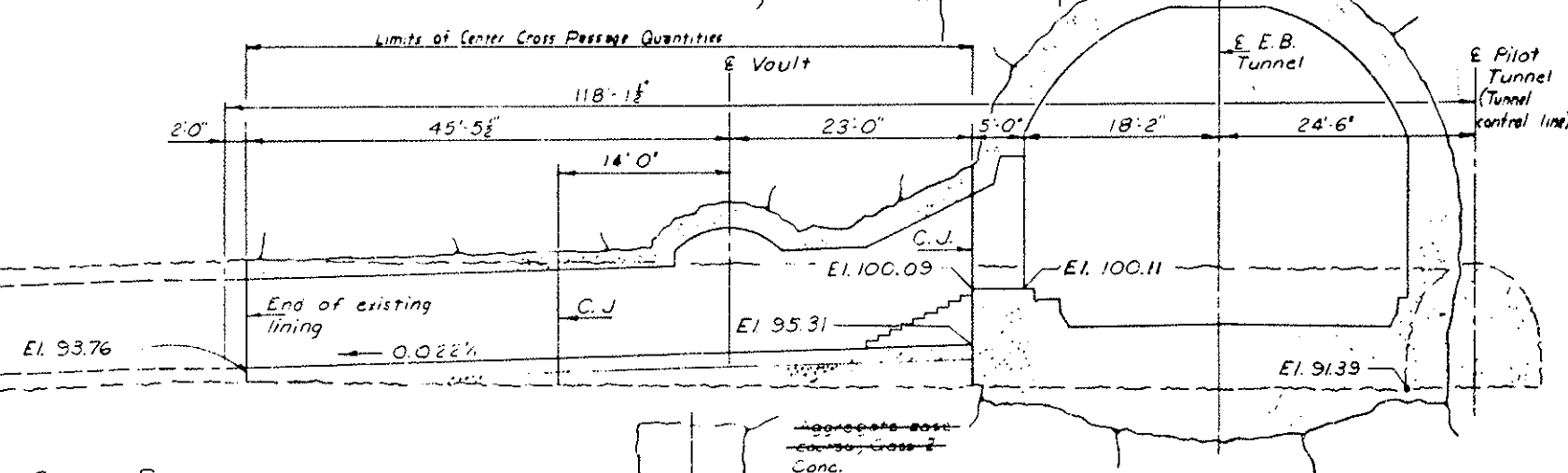
Includes 1.0 Ton A-572 Steel



WEST CROSS PASSAGE
Sta. 59+54.83

| Item # | Description | Unit | Quantity | Final |
|--------|-----------------------------------|----------|----------|--------|
| 211 | Tunnel Excavation (Class D) | Cu Yd | 151 | 161 |
| 509 | Structural Steel (Miscellaneous) | Tons | 16 | 16.651 |
| 518 | Waterstop | Lin. Ft. | 60 | 53.6 |
| 601 | Concrete Class T-2 (Final Lining) | Cu Yd | 182 | 211.26 |
| 602 | Reinforcing Steel | Tons | 3 | 3 |

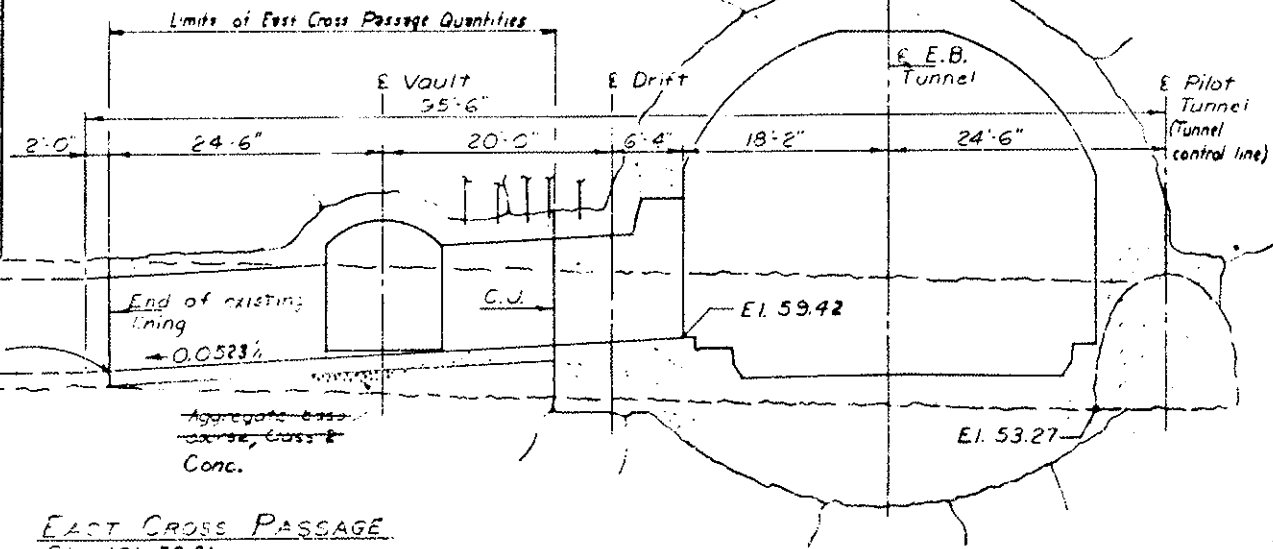
Includes 5.6 Tons A-572 Steel



CENTER CROSS PASSAGE
Sta. 79+64.99

| Item # | Description | Unit | Quantity | Final |
|--------|---|----------|----------|---------|
| 211 | Tunnel Excavation (Class D) | Cu Yd | 123 | 120 |
| 211 | Rock Reinforcing Threaded Tebeck, Resin grouted, 16 Ft. | Ft. | 25 | 12 |
| 509 | Structural Steel (Miscellaneous) | Tons | 11 | 10.8636 |
| 518 | Waterstop | Lin. Ft. | 65 | 60.5 |
| 601 | Concrete Class T-2 (Final Lining) | Cu Yd | 116 | 123.7 |
| 602 | Reinforcing Steel | Tons | 2 | 2 |

Includes 3.3 Tons A-572 Steel



EAST CROSS PASSAGE
Sta. 101+70.81

- NOTES:
- All elevations are plus 11,000 feet.
 - Elevations and dimensions are at center line of cross passage.
 - Existing structure shown.
 - C.J. = construction joint. For details, see Dwg. No. B.3L
 - Contact grout each portion of vaults and Cross Passages

Original Scale: 1" = 10'

DIVISION OF HIGHWAYS

CROSS PASSAGE ELEVATIONS

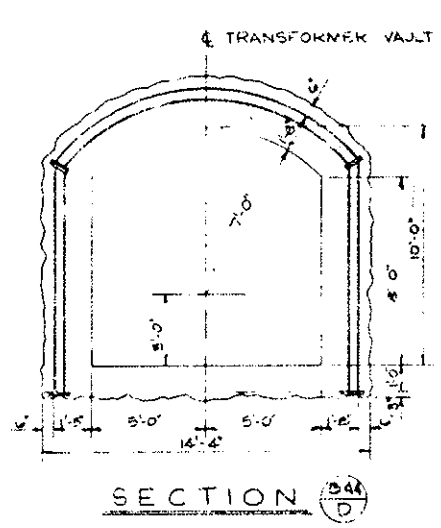
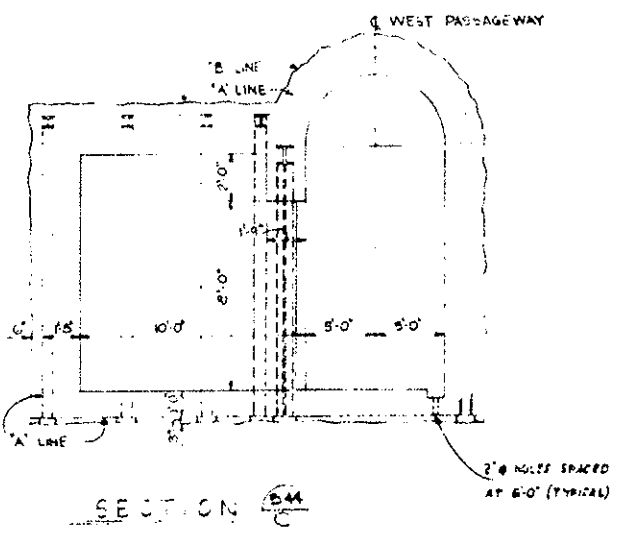
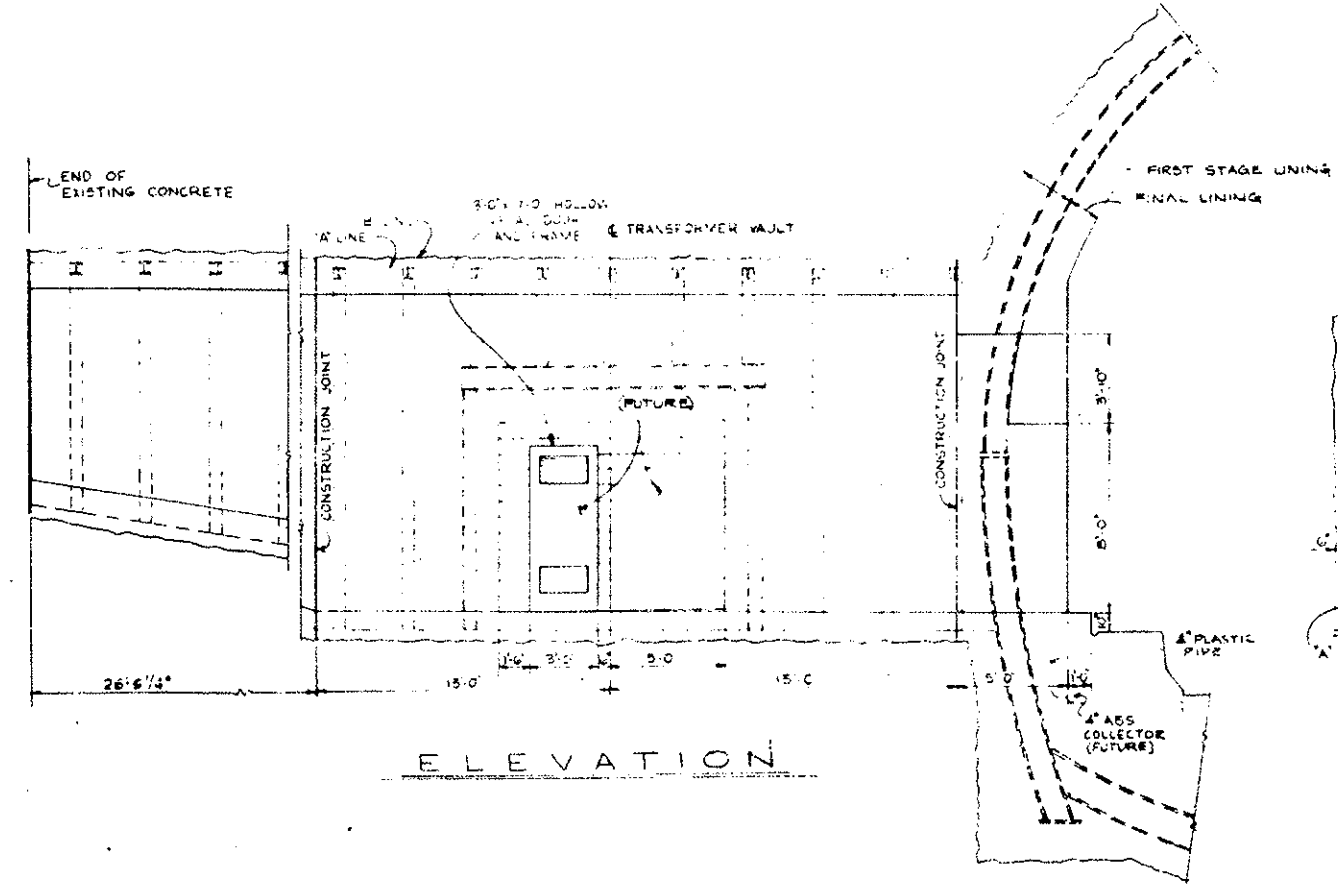
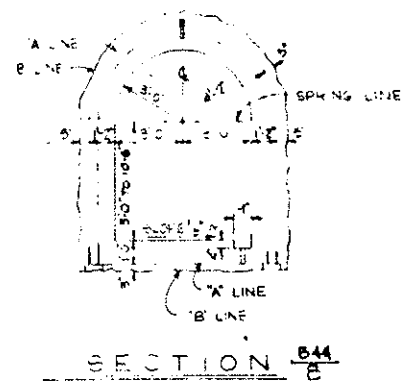
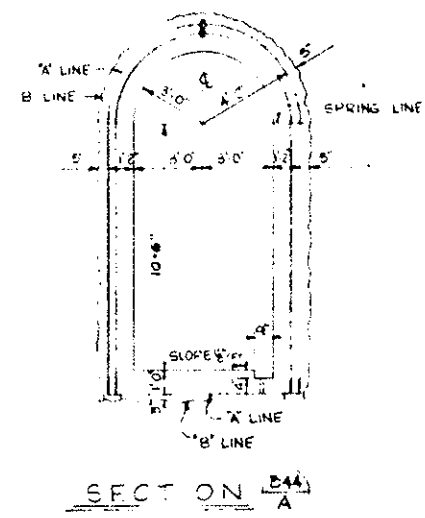
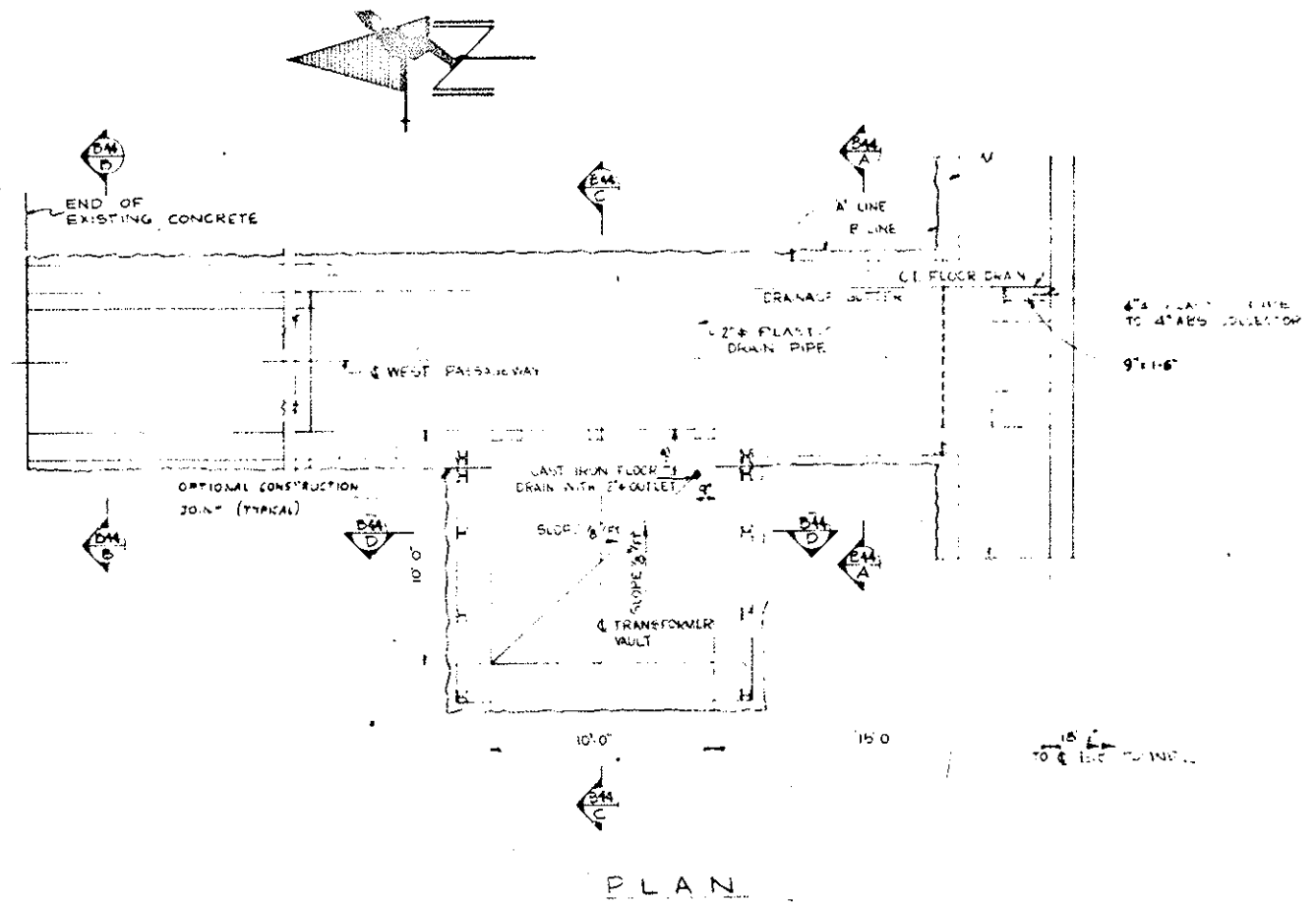
| | |
|--------------------|---------------------|
| Designer: C.D.O.H. | Struct. No.: F-13-X |
| Checker: E. Hedley | |
| Drawing Number: 43 | of 60 Drawings |
| Project: State | Priority: State |

| | | |
|-------------|------------|---------------|
| DESIGNED BY | CHECKED BY | QUANTITIES BY |
| C.D.O.H. | E.H.H. | E.H.H. |
| 5-74 | 6-74 | 6-74 |
| 5-74 | 6-74 | 6-74 |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-----------|--------------|--------------|
| III | COLORADO | 170-3(4) 100 | 72 |

| REVISIONS | |
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| AS NOTED | |
|-------------|---------|
| NO. OF DAYS | 6-25-79 |
| REVISED | |
| VOID | |



| | |
|-------------|--|
| DESIGNED BY | |
| CHECKED BY | |
| APPROVED BY | |
| DATE | |

DIVISION OF HIGHWAYS

WEST CROSS PASSAGE

SECTIONS AND DETAILS

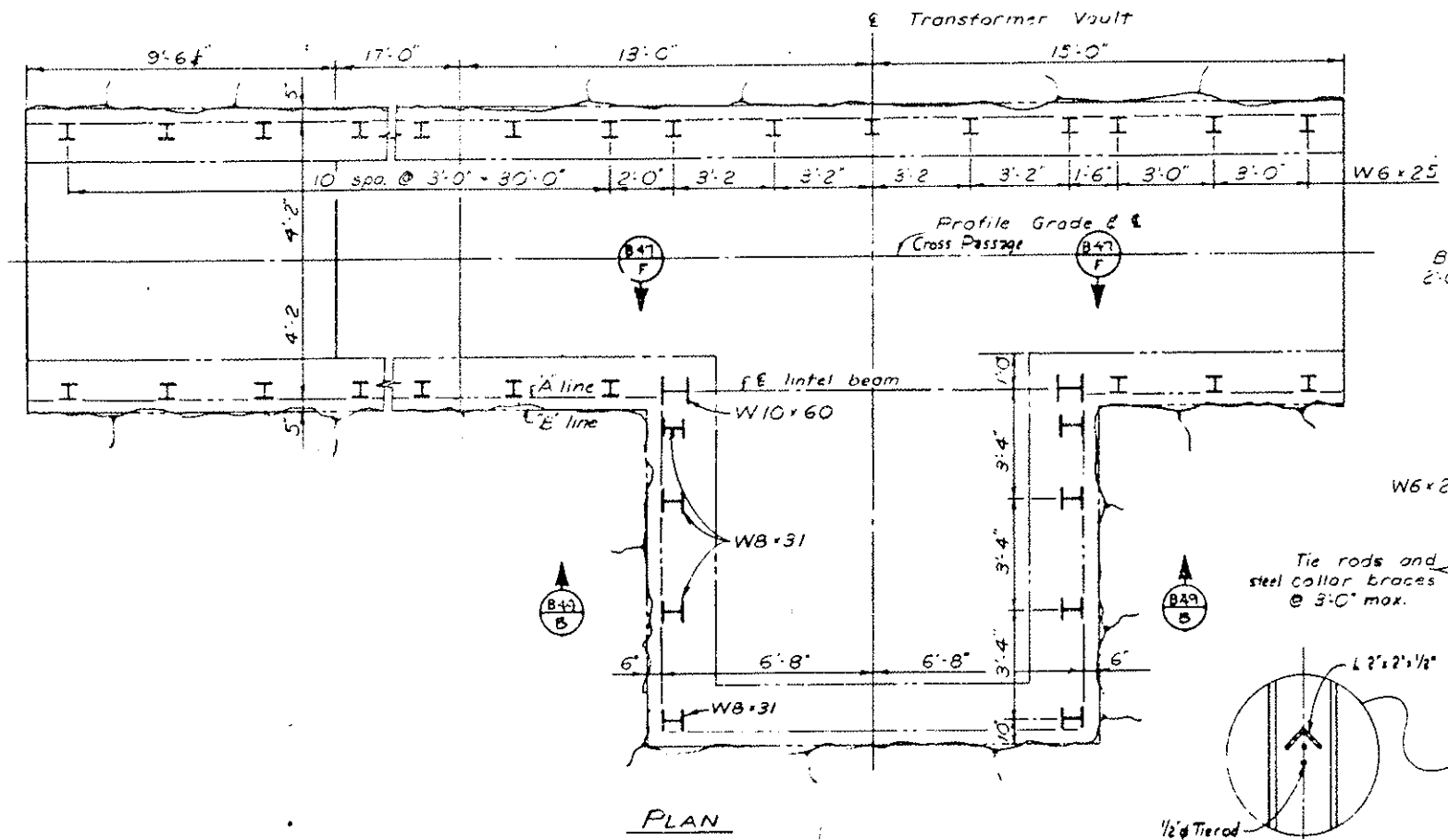
| | | | |
|----------------|------------|-----------|-------------|
| Designer | C.D.H. | Structure | F-13-X |
| Detailer | R.M. McKee | Number | |
| Drawing Number | 844 | of | 60 Drawings |

ORIGINAL SCALE: 1/4" = 1'-0"

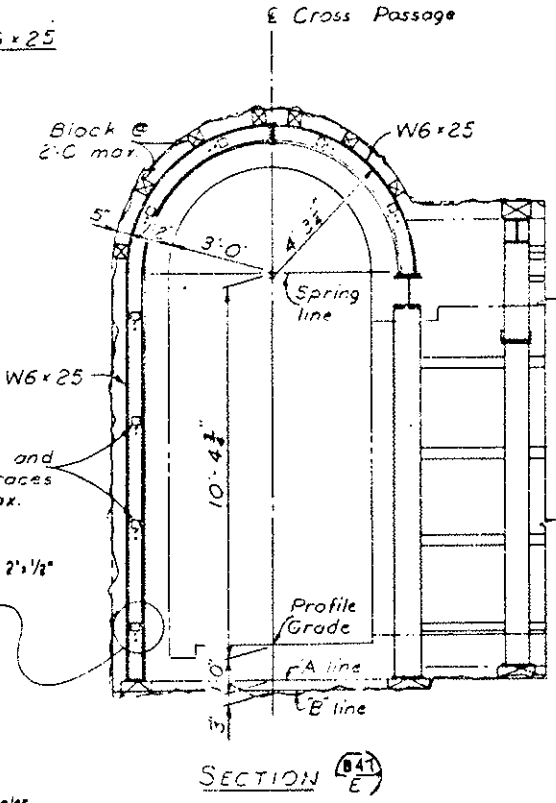
REVISIONS
 NO. 111 ROAD 6-29-78 REVISED 1111

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------|-----------|--------------|
| XIII COLORADO | 170-3(8-1)21 | 75 | 273 |

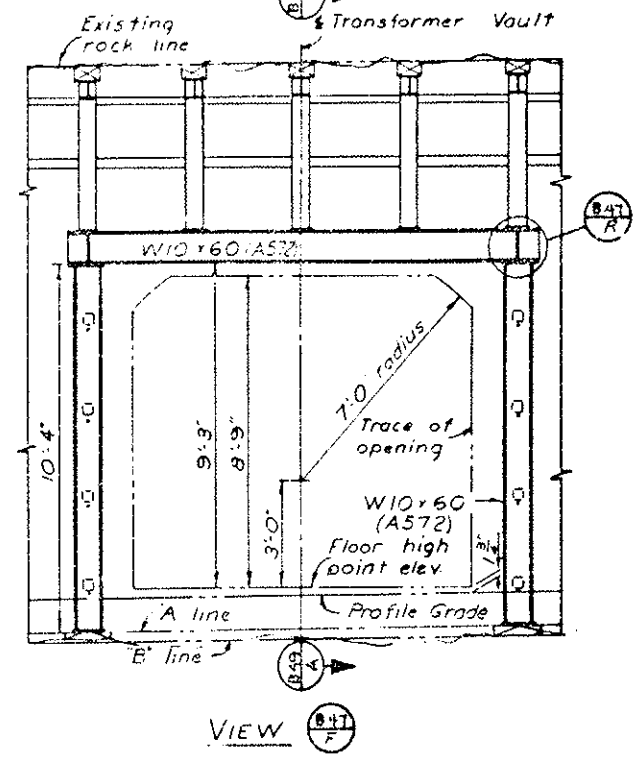
| REVISIONS | |
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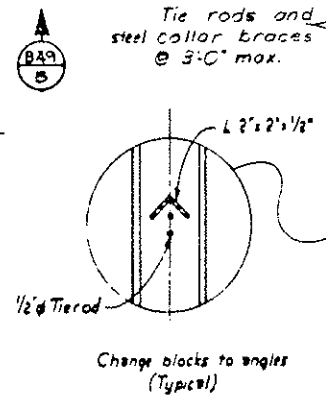
PLAN



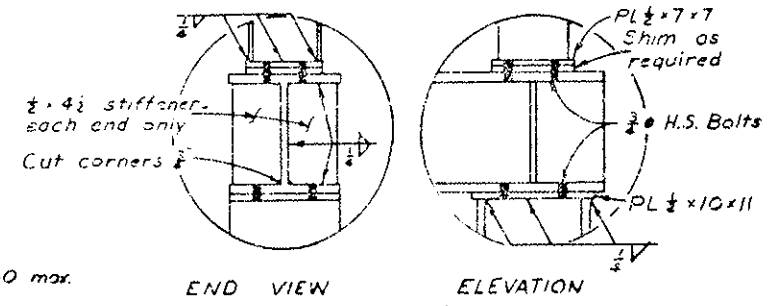
SECTION (B41) E



VIEW (B41) F



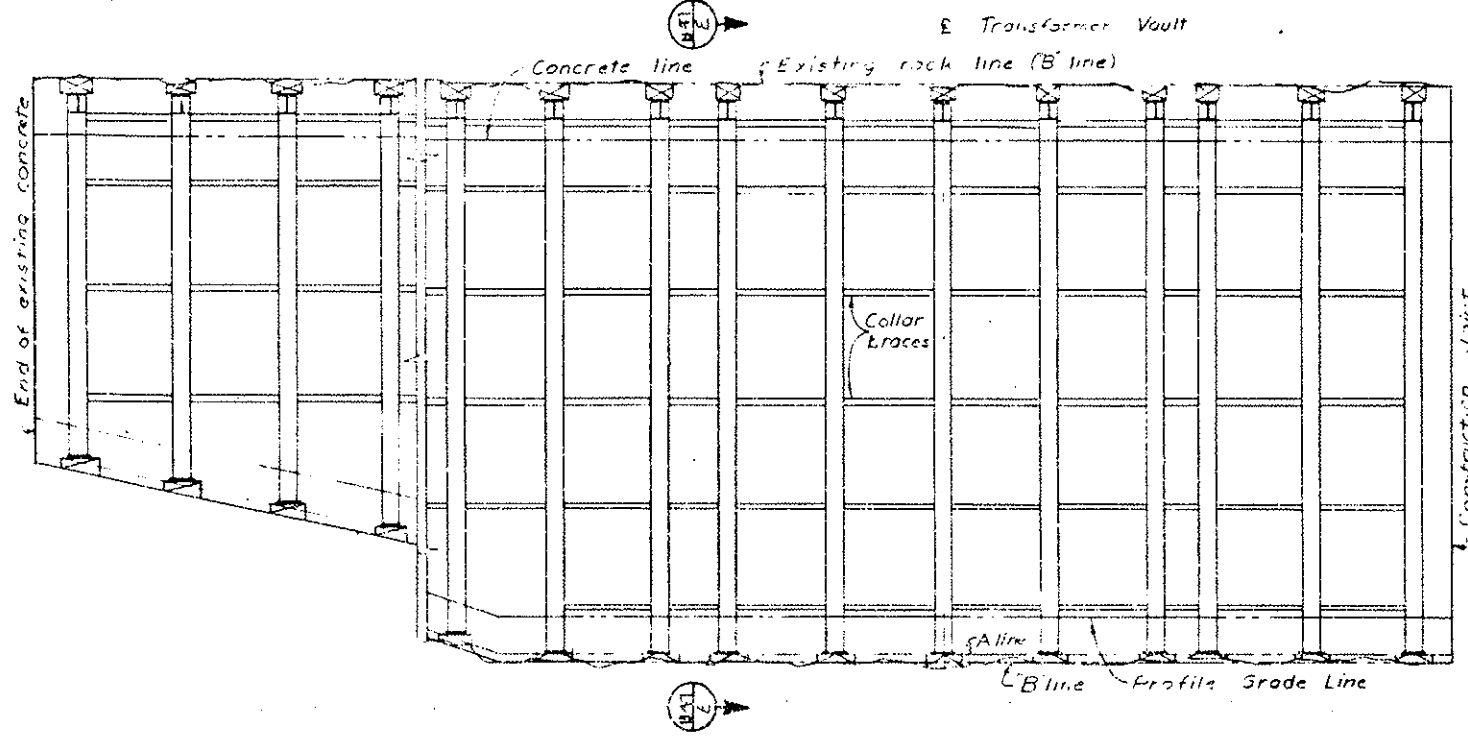
Change blocks to angles (Typical)



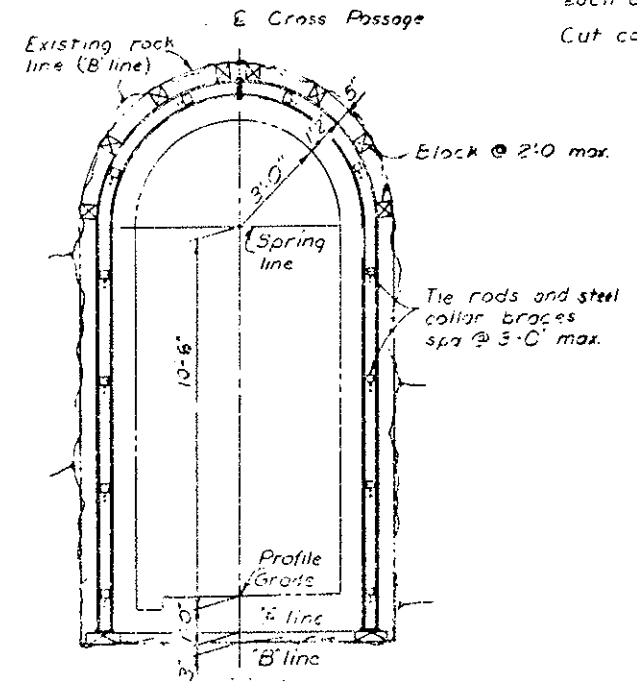
END VIEW

ELEVATION

DETAIL (B41) R
 1 1/2" x 1'-0"



SECTION AT PROFILE GRADE
 West Cross Passage



TYPICAL SECTION

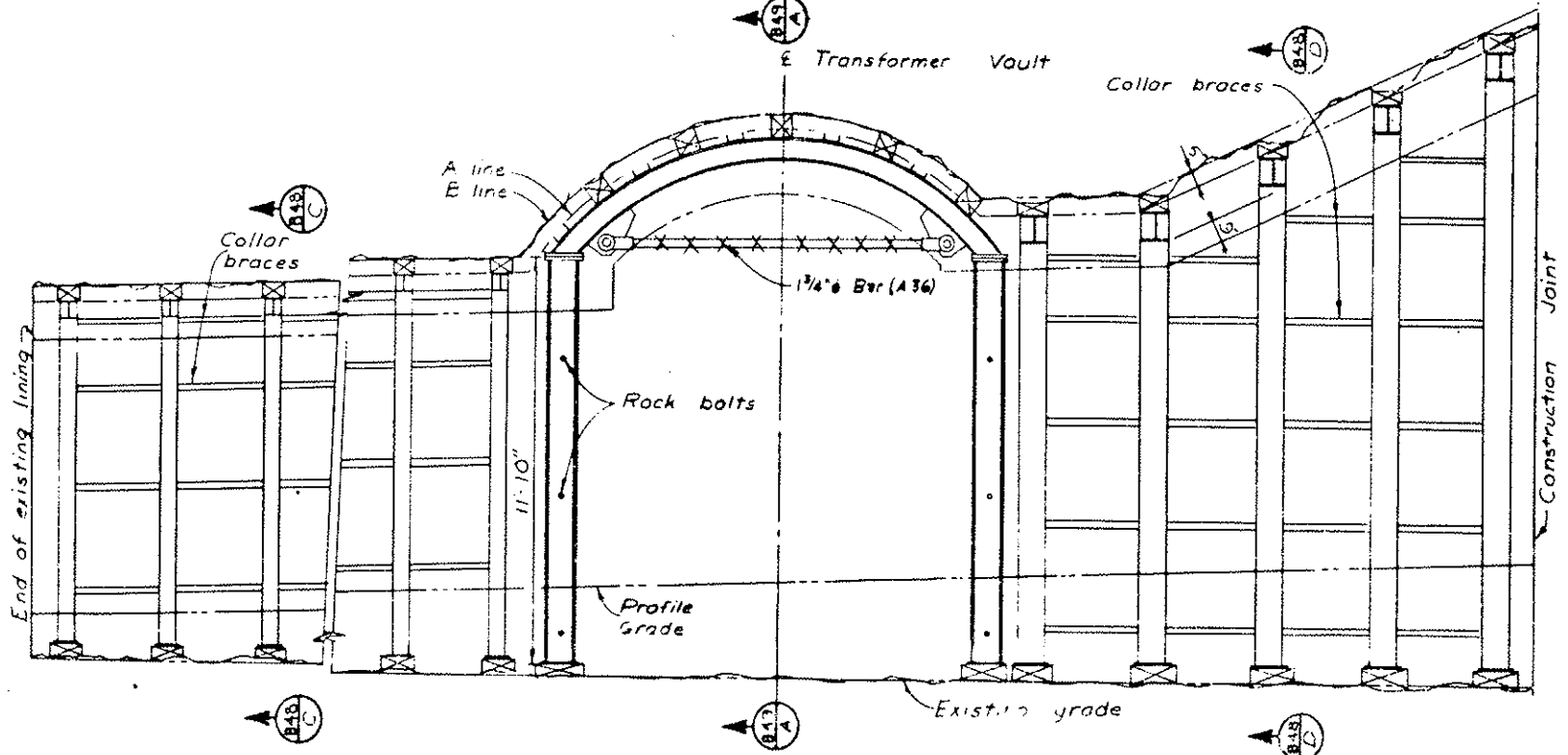
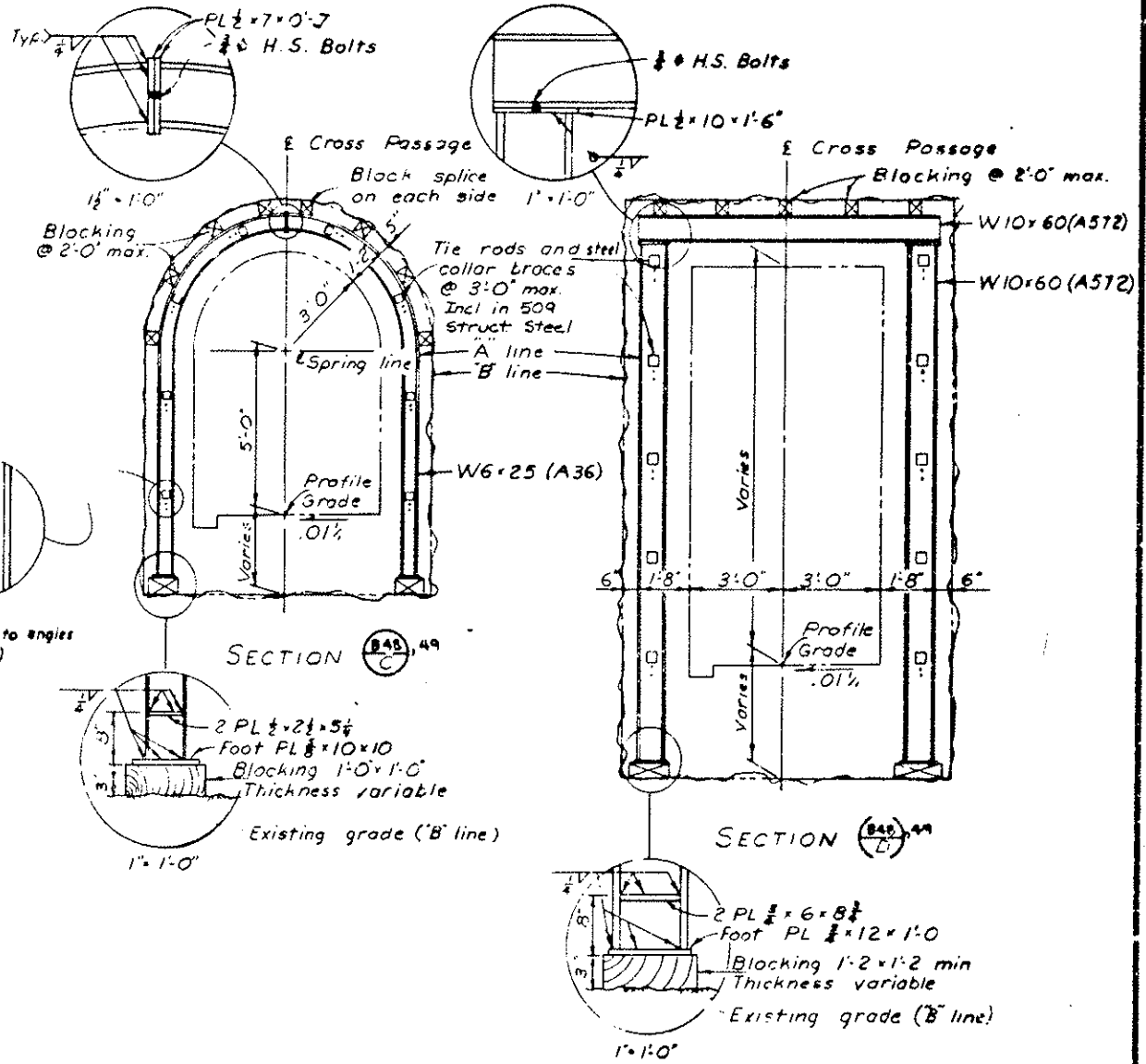
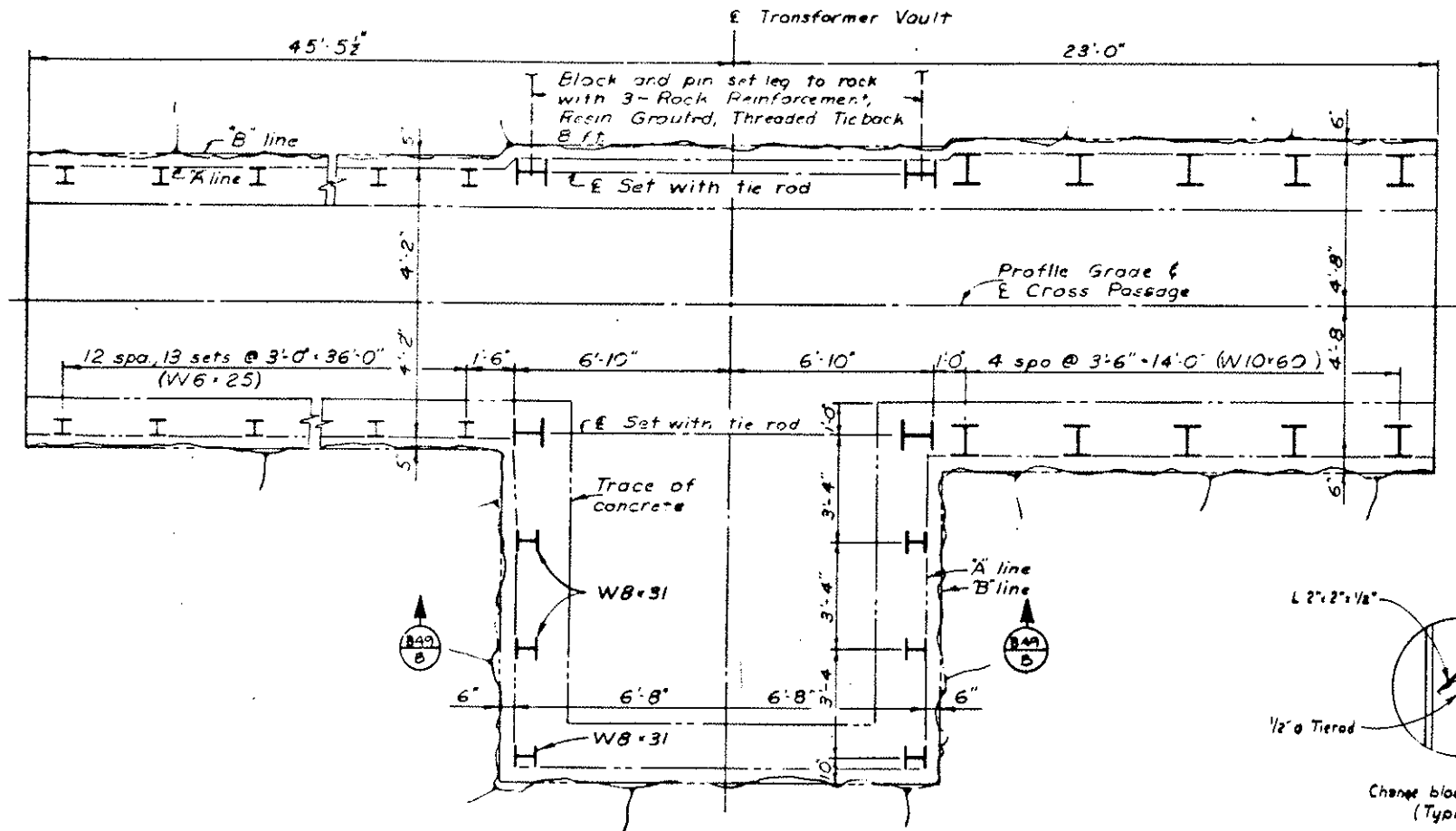
For additional details of Transformer Vault, see Dwg. No. B.49.
 For additional details of cross passage, see Dwg. No. B.66.
 Original Scale 3/8" = 1'-0" or as noted.

| DIVISION OF HIGHWAYS | | | |
|----------------------|------------------|--------------------|--|
| STEEL SUPPORTS | | WEST CROSS PASSAGE | |
| Designer C.D.C.H. | Structure F-13-X | | |
| Detailer E. Hooley | Numbers | | |
| Drawing Number B.41 | of 605 | Drawings | |

| | | | |
|-------------|------------|---------------|--------------|
| DESIGNED BY | CHECKED BY | QUANTITIES BY | SCALE |
| C.D.C.H. | E.H.H. | S-74 | 1/4" = 1'-0" |
| | | | |

| | | | |
|-------------|---------|----------|--|
| NO. REVISED | 6-29-79 | REVISION | |
|-------------|---------|----------|--|

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|---------------------|-----------|--------------|
| XIII | COLORADO 170-3(8)22 | 76 | 279 |
| REVISIONS | | | |
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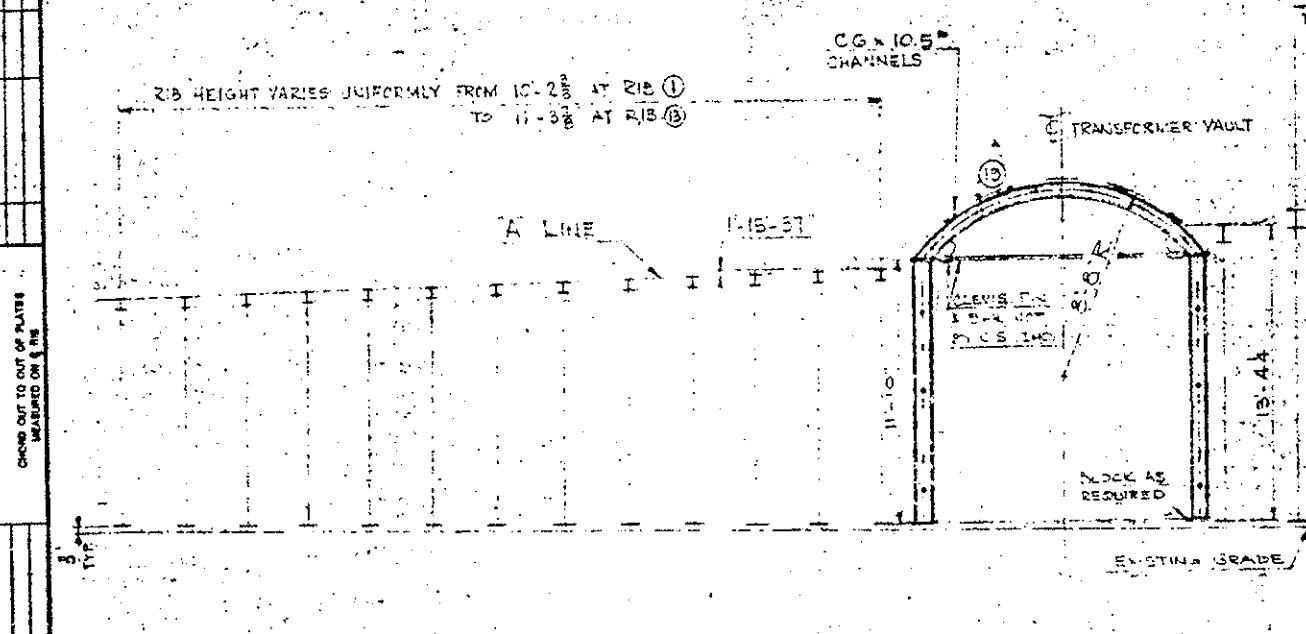
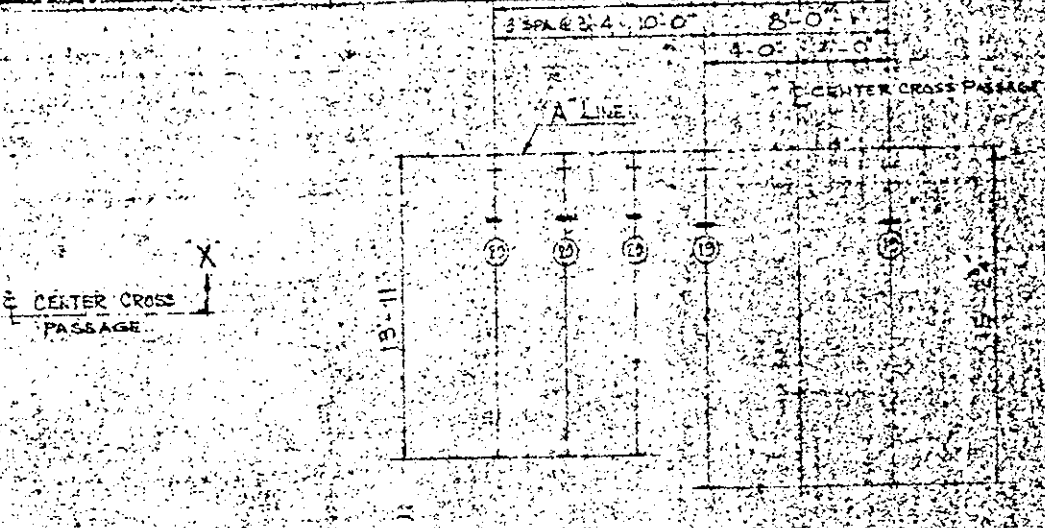
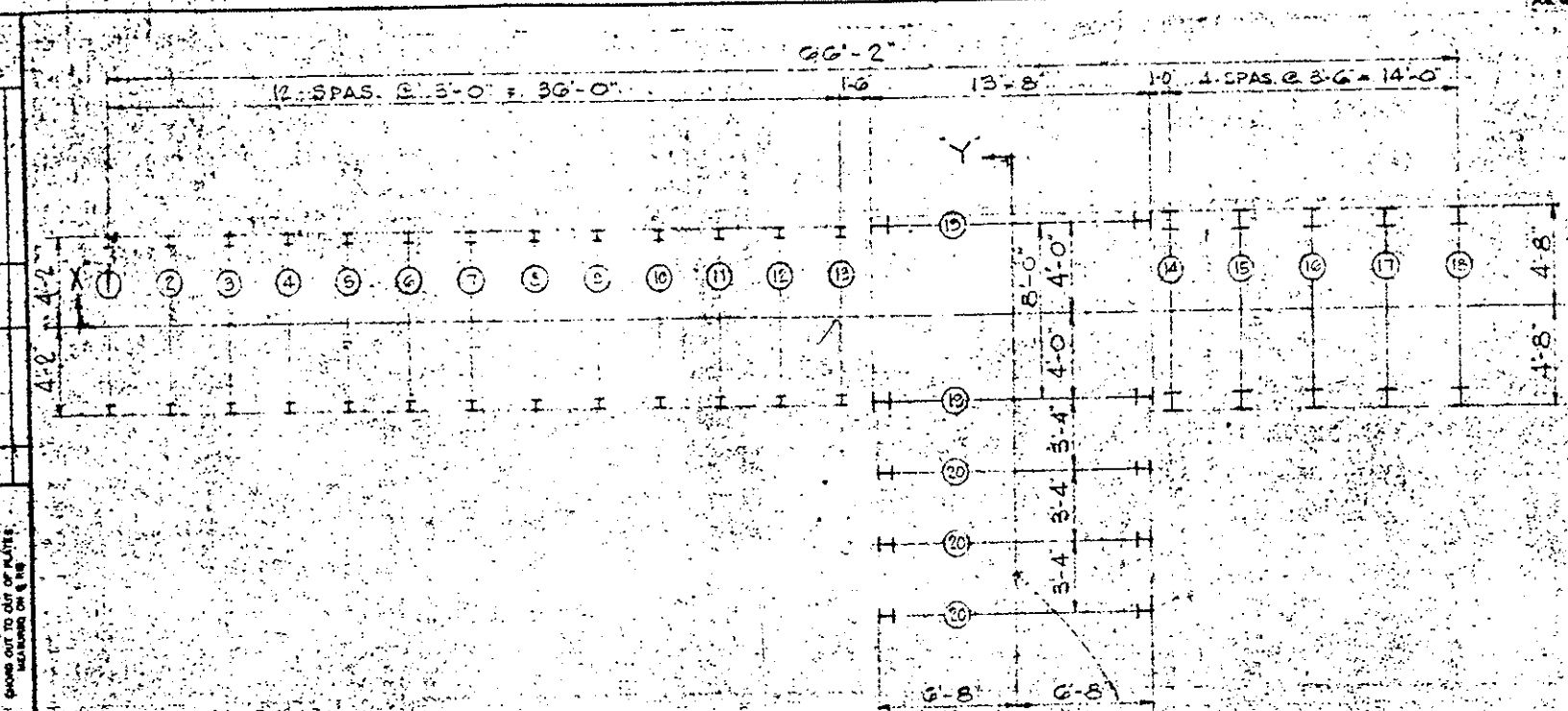


| | |
|---------------|--------|
| DESIGNED BY | CDH |
| CHECKED BY | E.H.H. |
| QUANTITIES BY | E.H.H. |
| DETAILS BY | E.H.H. |

Transformer vaults in east and center cross passages are similar except as noted, but opposite hand. For additional details of vaults and tie rod sets, see Div No. B-49.

Original Scale: 3/8" = 1'-0" or as noted.

| DIVISION OF HIGHWAYS | | | |
|--|----------|-----------|-------------|
| STEEL SUPPORTS CENTER CROSS PASSAGE | | | |
| Designer | CDH | Structure | F-13-X |
| Detailer | F. H. H. | Numbers | |
| Drawing Number | B-49 | of | 60 Drawings |



| | | | | | | |
|--------|------|---------------------------------|--------|------|----------------------------------|------|
| 378.0 | 54.5 | SHIMS & BOLTS (FOR FABRICATION) | 378.0 | 4 | CG x 10.5" x 3'-0" CHANNELS | A/B |
| 40.8 | 10 | | 40.8 | 408 | 3/8" SQ. T.L. NUTS | |
| 106.1 | 26 | | 106.1 | 408 | 1/2" x 2" SQ. HD. FL. BOLTS | |
| 218.0 | 38.1 | DS-559 SAAB-Y220 | 228.6 | Y22D | 6 L x 2 1/2" x 3/8" Lg. SPACER | A36 |
| 612.0 | 17.0 | | 412.0 | Y22C | 36 L x 2 1/2" x 3/8" Lg. SPACER | |
| 683.4 | 16.2 | | 683.4 | Y22B | 120 L x 2 1/2" x 3/8" Lg. SPACER | |
| 1764.0 | 14.7 | | 1764.0 | Y22A | 120 L x 2 1/2" x 3/8" Lg. SPACER | A36 |
| 52 | 66 | INCLUDED | | 86 | 3/4" x 2 1/2" HI. STRENGTH BOLTS | A325 |
| 34 | 62 | IN | | 86 | 3/4" x 2 1/2" HI. STRENGTH BOLTS | A325 |
| 16.3 | 19 | COURSE | | 86 | 3/4" x 2 1/2" HI. STRENGTH BOLTS | A325 |
| 39.6 | 40 | WEIGHT | | 86 | 3/4" x 2 1/2" HI. STRENGTH BOLTS | A325 |

| | | | | | | |
|--------|--------|------------------|--------|---|----------------------------|--|
| 2637.0 | 101.4 | DS-559 SAAB-Y220 | 2637.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 4470.4 | 135.2 | -Y22 | 4470.4 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 2635.4 | 2639.4 | -Y22 | 2637.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 2647.8 | 2472.8 | -Y22 | 2446.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 2454.6 | 358.8 | -Y22 | 2446.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 2665.8 | 2665.2 | -Y22 | 2374.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 2172.8 | 2131.6 | -Y22 | 2130.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 716.4 | 764 | -Y22 | 717.6 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 711.6 | 711.6 | -Y22 | 712.8 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 701.0 | 701.0 | -Y22 | 708.2 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 702.4 | 702.4 | -Y22 | 702.4 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 673.8 | 673.8 | -Y22 | 670.8 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 653.0 | 653.0 | -Y22 | 654.2 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 658.0 | 658.0 | -Y22 | 659.2 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 678.0 | 678.0 | -Y22 | 684.8 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 674.0 | 674.0 | -Y22 | 680.2 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 659.4 | 659.4 | -Y22 | 675.8 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 664.8 | 664.8 | -Y22 | 670.6 | 5 | COURSE OF RIBS OF W4 x 25" | |
| 650.8 | 650.8 | -Y22 | 666.0 | 5 | COURSE OF RIBS OF W4 x 25" | |
| | | -Y22 | 661.4 | 5 | COURSE OF RIBS OF W4 x 25" | |

Approved *R. Lindseth*

APPROVED FINAL
 DATE 11/3/77
 BY *Jack E. Gay*

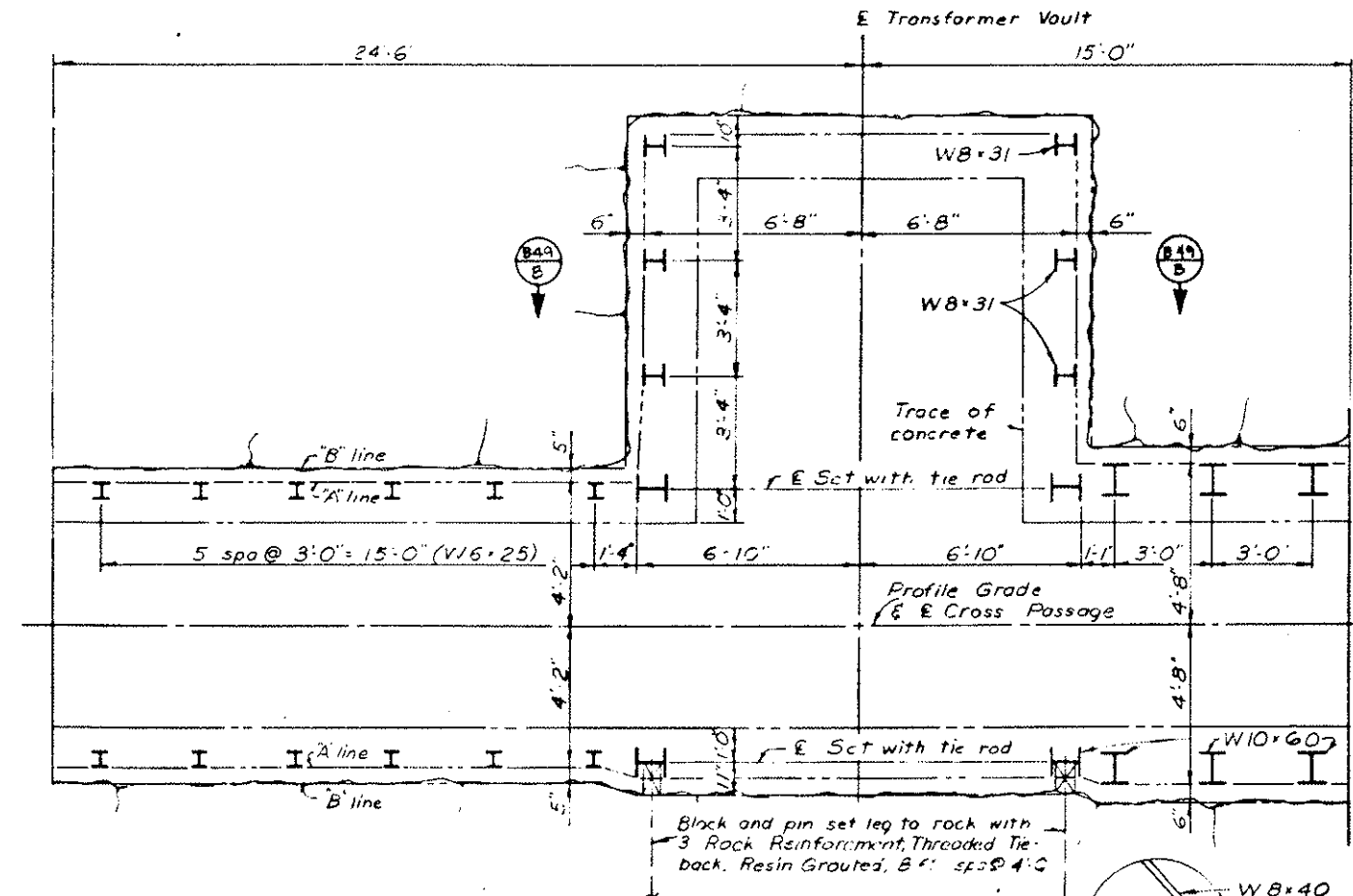
APPROVED PRELIMINARY
 DATE 11/20/76 BY JACK E. GAY

| | | | | | |
|---|----------|--------------------------------|----------|-----------|----------|
| TOTAL WT. | UNIT | DESCRIPTION | MARK NO. | NO. RECD. | REVISION |
| | | | | | |
| TOTAL WT. FOR COURSE MAIL NEWS FOR CENTER CROSS PASSAGE | | | | | |
| COMMERCIAL ENGINEERING INC. CENTER CROSS PASSAGE ELECTRICAL FISHHOWER MEMORIAL TUNNEL AND ROPE PASSING TOWER NEW YORK STATE TROOP 1030 NEW YORK STATE TROOP 1030 | | | | | |
| 1 | 11-13-77 | VAR. OUS CHANGES | 2510 | JJS | REV |
| 2 | 9-8-76 | ADDED PAY WTS. VARIOUS CHANGES | 2420 | XW | REV |
| REV. DATE | REVISION | BY | CHK. BY | DATE | |
| | | | | | |

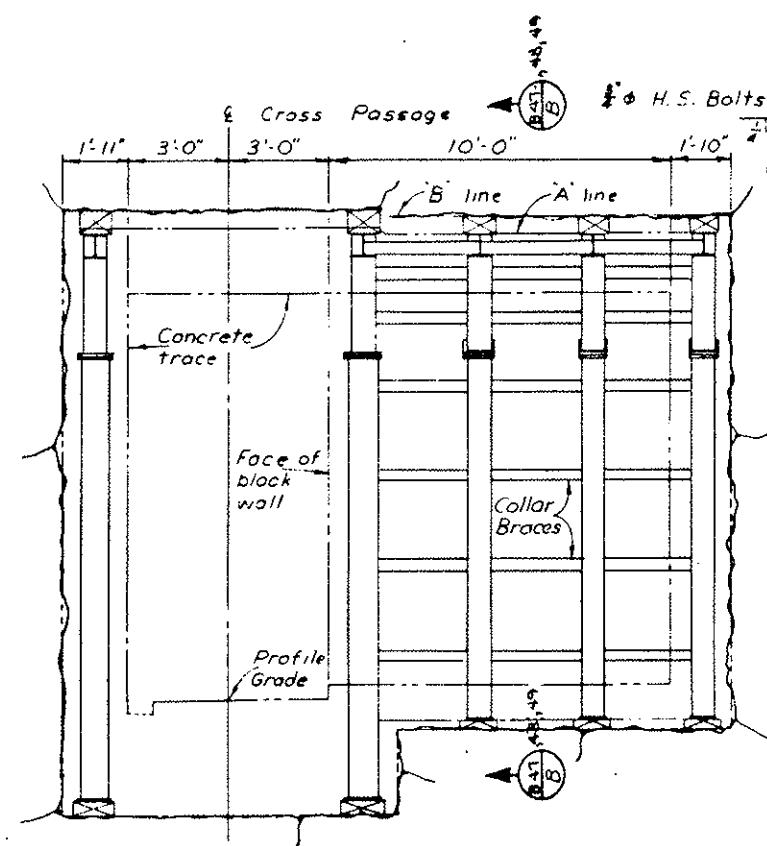
REVISIONS
NO. DESCRIPTION DATE

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|----------------------|-----------|--------------|
| VIII | COLORADO 170-3(6)113 | 77 | 273 |

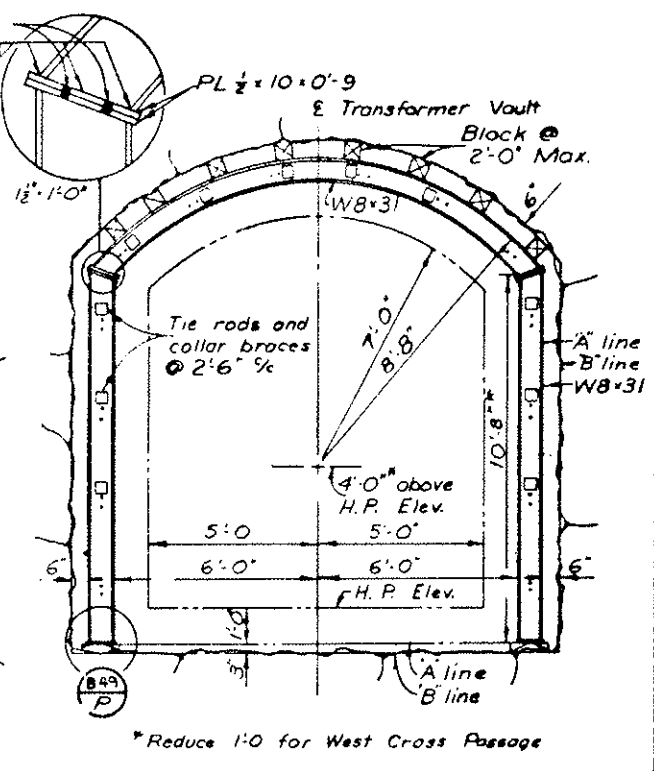
| REVISIONS | | | |
|-----------|--|--|--|
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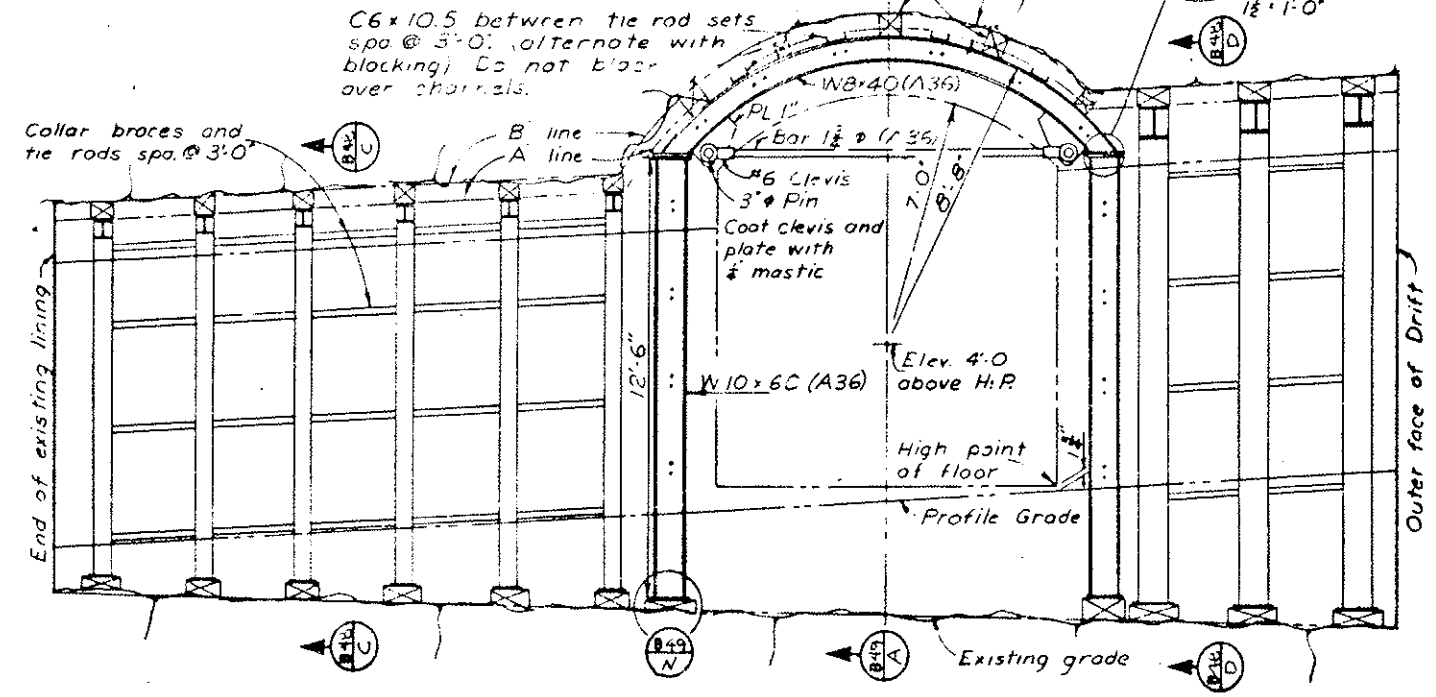
PLAN



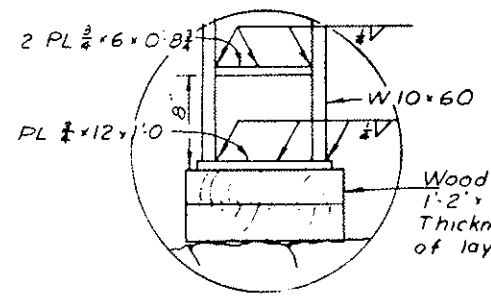
SECTION (B-4) 48, 49



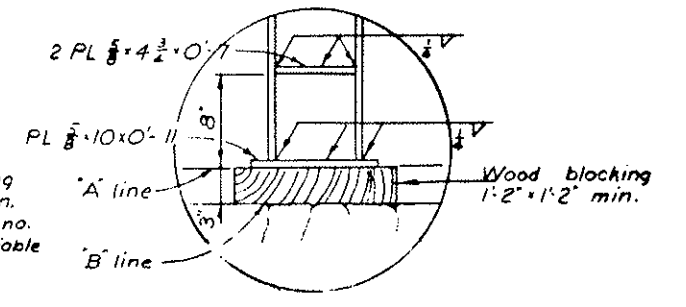
SECTION (B-1) 48, 49



SECTION AT PROFILE GRADE
East Cross Passage



DETAIL (B-4) 48, 49
1/2" x 1'-0"



DETAIL (B-4) 48, 49
1/2" x 1'-0"

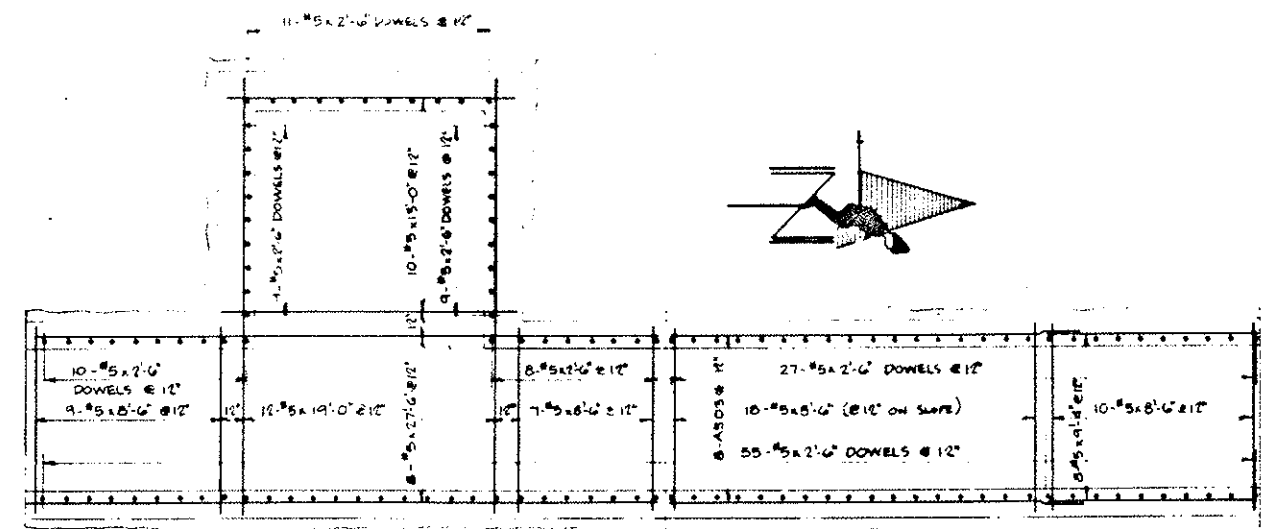
Original Scale 1/8" = 1'-0" or as noted

| | | | |
|--|------------------|----------|--|
| DIVISION OF HIGHWAYS | | | |
| STEEL SUPPORTS EAST CROSS PASSAGE | | | |
| Designer C.D.W | Structure F-13-X | | |
| Detailer E. Hadley | Numbers | | |
| Drawing Number B 49 | of 60 | Drawings | |

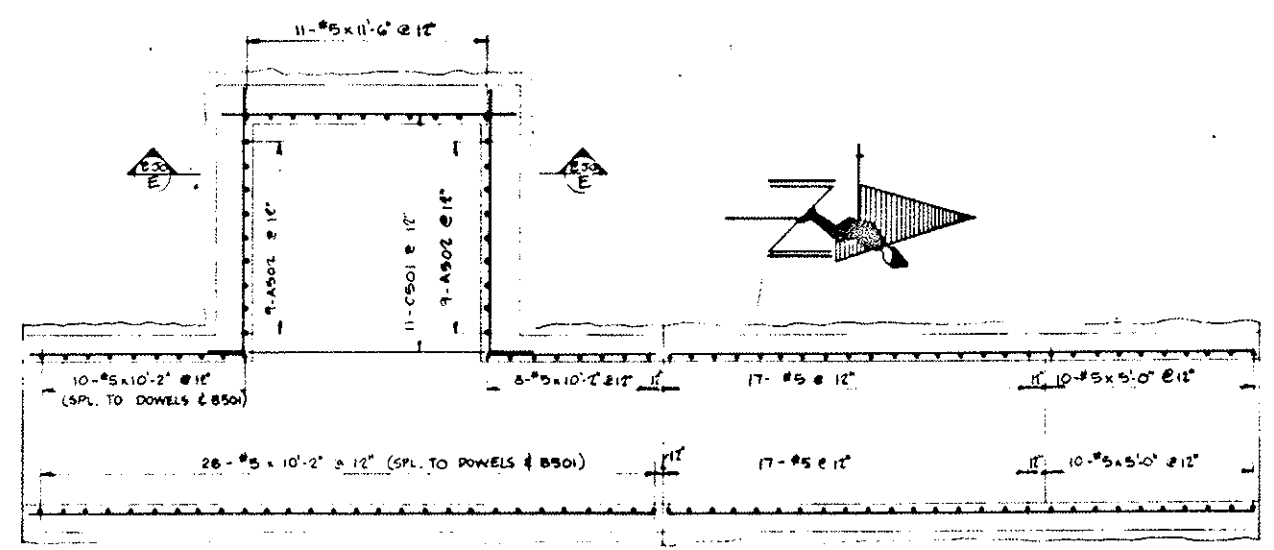
| INITIAL | DATE | CHECKED BY |
|--|-----------------------------|---------------|
| C.D.W. <td>5-74 <td>QUANTITIES BY</td> </td> | 5-74 <td>QUANTITIES BY</td> | QUANTITIES BY |
| E.H.H. <td>4-74 <td>DESIGNED BY</td> </td> | 4-74 <td>DESIGNED BY</td> | DESIGNED BY |
| E.H.H. <td>4-74 <td>CHECKED BY</td> </td> | 4-74 <td>CHECKED BY</td> | CHECKED BY |

| |
|-----------------------|
| AT ESTABLISHED |
| NO. REVISIONS 6-29-79 |
| REVISED |
| VOID |

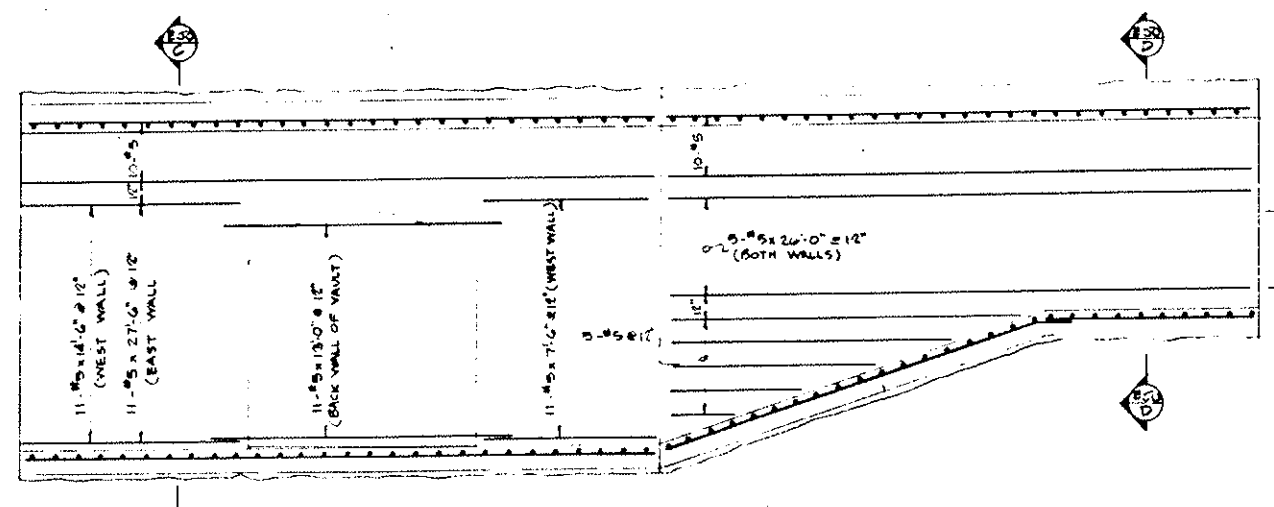
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-------------|-----------|--------------|
| VIII COLORADO | 170-5(H) 22 | 78 | 273 |
| REVISIONS | | | |
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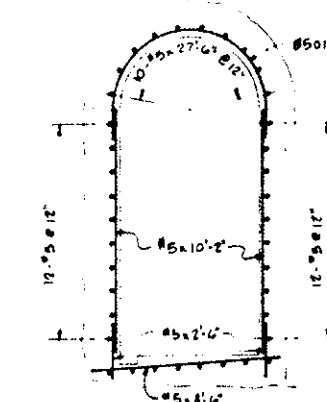
SECTION B30 A



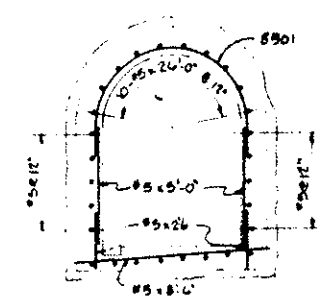
SECTION B30 B



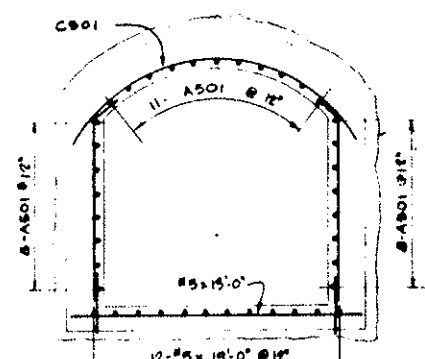
ELEVATION



SECTION B30 C

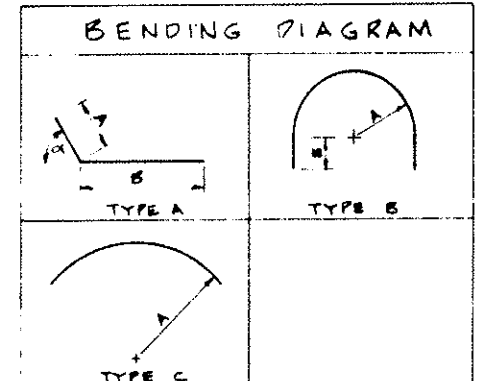


SECTION B30 D



SECTION B30 E

NOTES:
 1. ALL CONCRETE IS CLASS T-2.



| BAR MARK | LENGTH | DIMENSIONS | | | |
|----------|--------|------------|--------|---|-----|
| | | A | B | C | α |
| A501 | 12'-6" | 1'-3" | 11'-3" | | 90° |
| A502 | 4'-2" | 1'-3" | 5'-1" | | 50° |
| A505 | 18'-4" | 1'-3" | 17'-6" | | 18° |
| B501 | 12'-9" | 3'-3" | 11'-3" | | |
| C501 | 15'-0" | 7'-5" | | | |

DIVISION OF HIGHWAYS

REINFORCEMENT DETAILS
 WEST CROSS PASSAGE

| | |
|----------------------|------------------|
| Designer C. D. H. | Structure F-13-2 |
| Detailer R. M. MCKEE | Numbers |
| Drawing Number B 30 | of 60 Drawings |

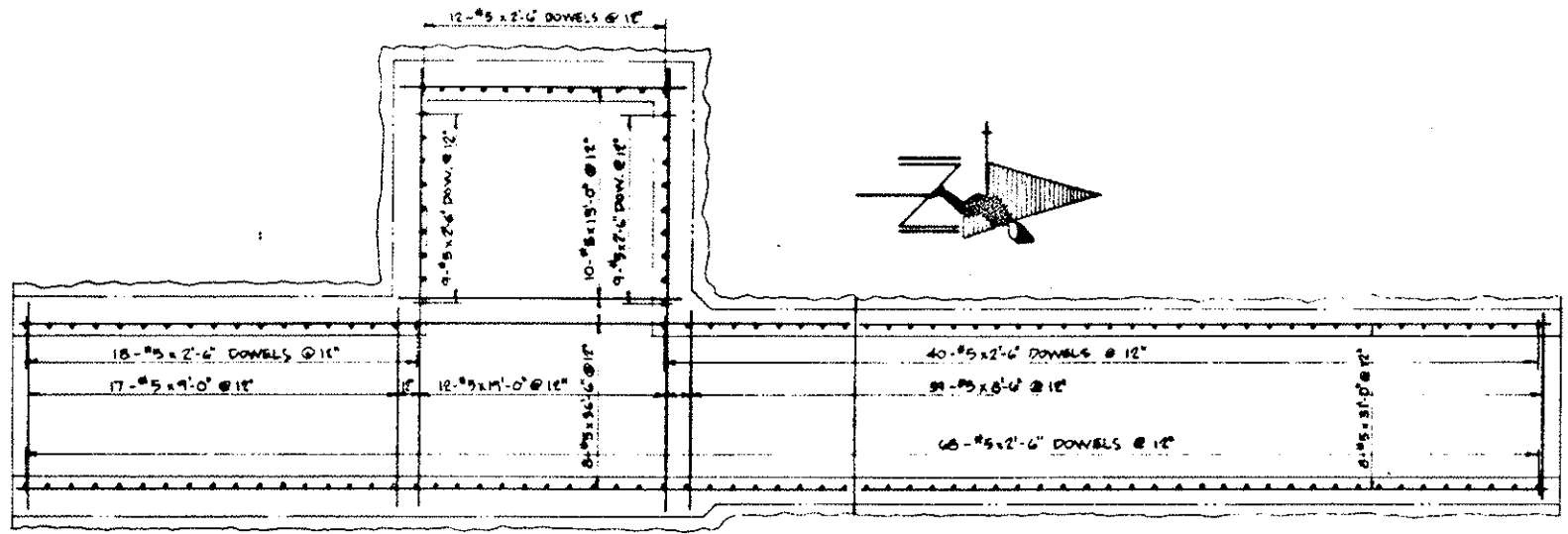
| | |
|-------------|---------------|
| INITIAL | CHECKED BY |
| DATE | QUANTITIES BY |
| DESIGNED BY | SEAL |
| CHECKED BY | DATE |
| DETAILED BY | |

ORIGINAL SCALE: 1/4" = 1'-0"

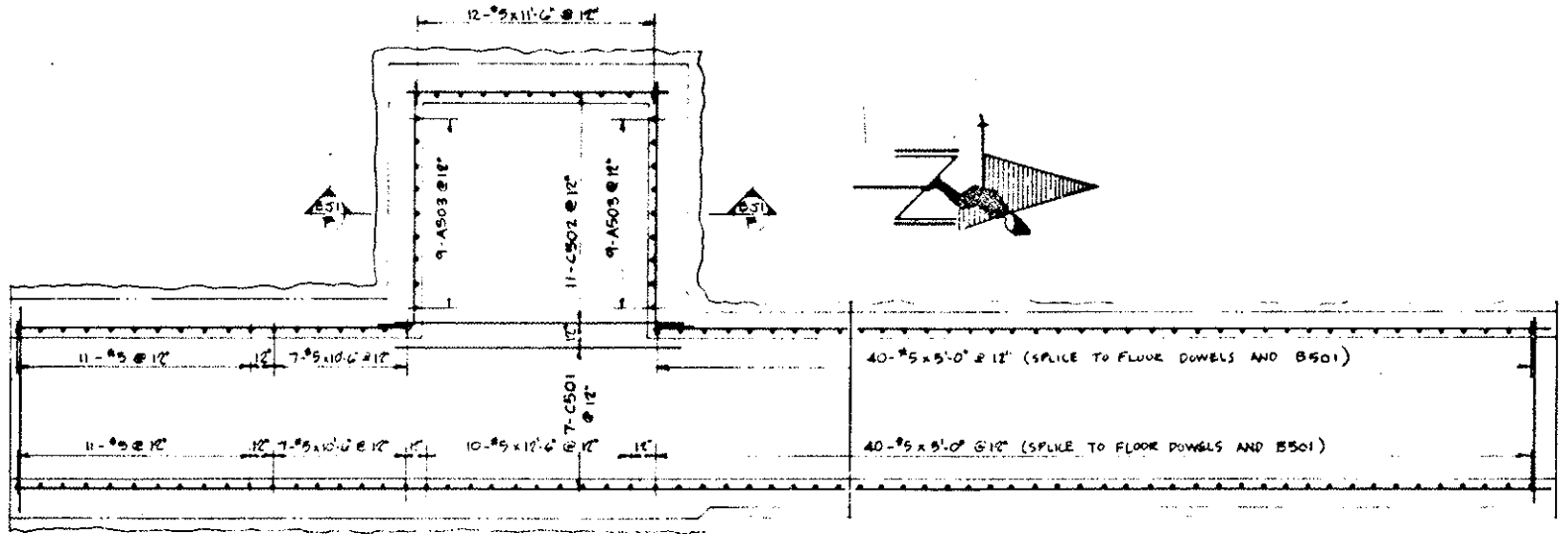
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-------------|-----------|--------------|
| VIII COLORADO | 170-3(8)220 | 79 | 273 |

| REVISIONS | |
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| | |

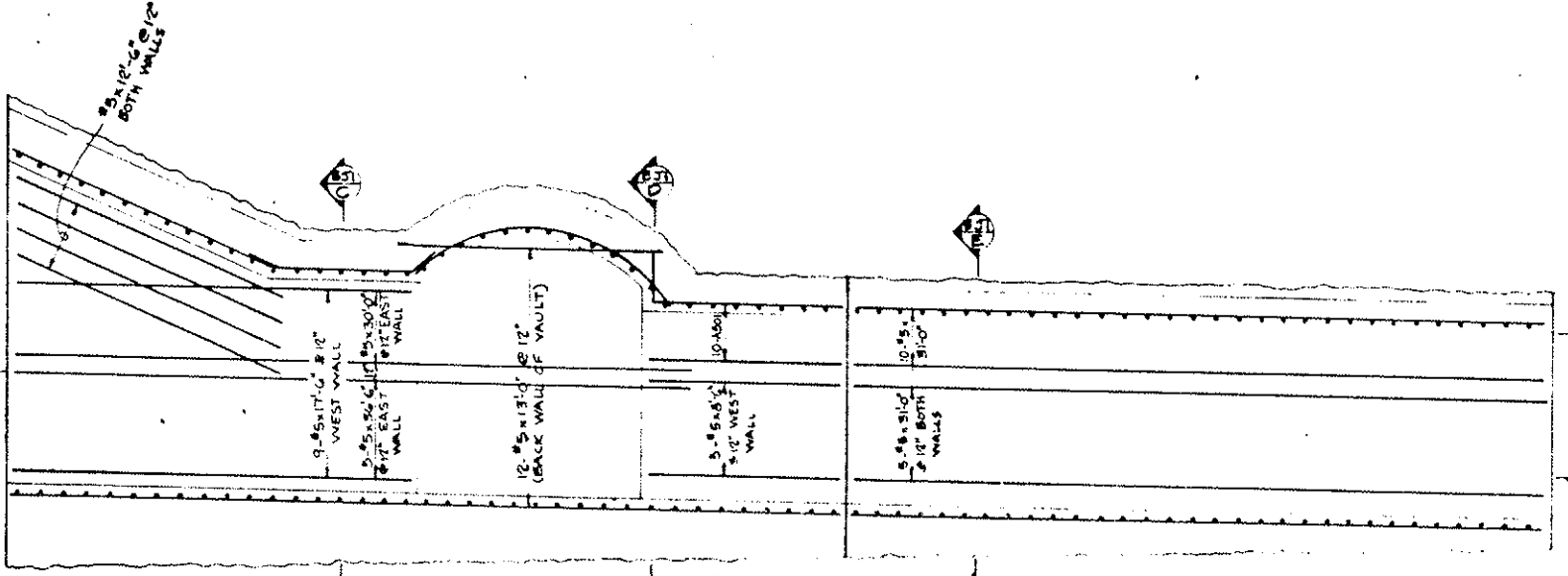
| |
|----------------------|
| AS CONTRACTED |
| 60 REVISIONS 6-29-79 |
| REVISED |
| VOID |



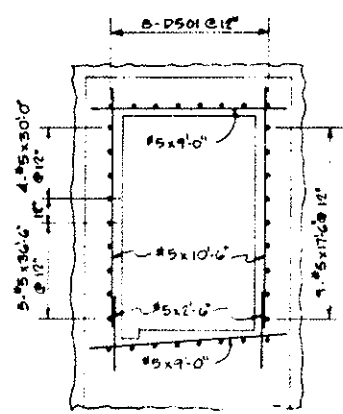
SECTION B51 A



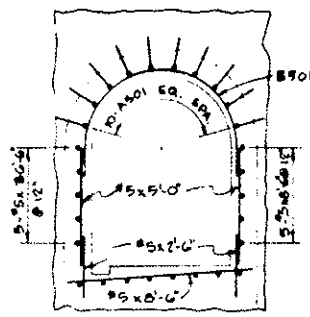
SECTION B51 B



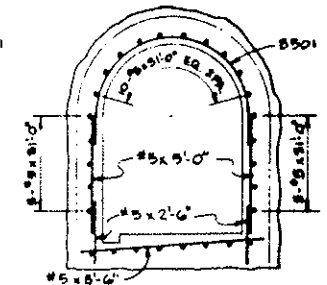
ELEVATION



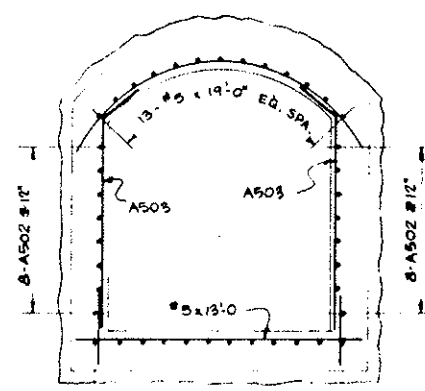
SECTION B51 C



SECTION B51 D

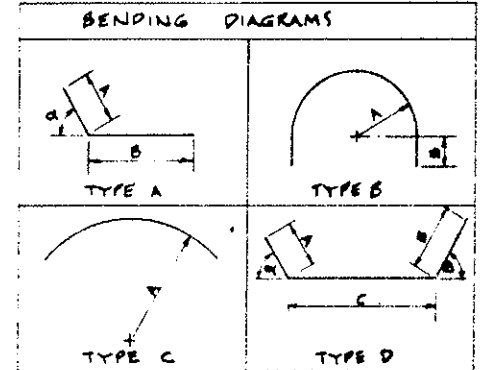


SECTION B51 E



SECTION B51 F

NOTES:
1. ALL CONCRETE IS CLASS T-8.



| BAR MARK | LENGTH | DIMENSIONS | | | | |
|----------|--------|------------|--------|-------|-----|-----|
| | | A | B | C | a | b |
| A501 | 9'-9" | 1'-9" | 6'-6" | | 90" | |
| A507 | 12'-6" | 1'-5" | 11'-3" | | 90" | |
| A503 | 10'-4" | 1'-5" | 9'-1" | | 52" | |
| B501 | 12'-9" | 5'-5" | 1'-5" | | | |
| C501 | 10'-5" | 7'-5" | | | | |
| C502 | 15'-0" | 7'-5" | | | | |
| D501 | 9'-0" | 1'-5" | 1'-5" | 6'-6" | 24" | 30" |

DIVISION OF HIGHWAYS

**REINFORCEMENT DETAILS
CENTER CROSS PASSAGE**

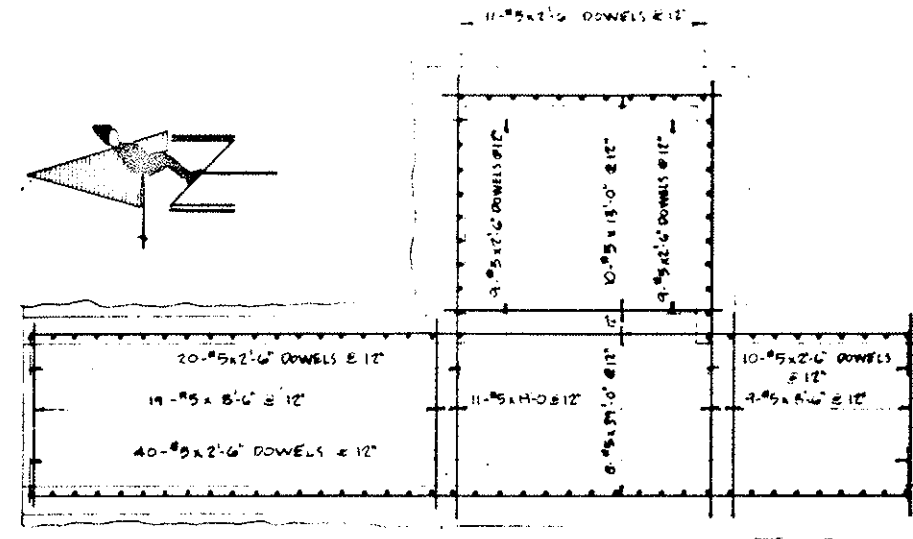
| | |
|------------------------------------|-------------------|
| Designer: C.R.O.H. | Structure: F-13-X |
| Detailer: R.M. MCKEE | Number: |
| Drawing Number B 51 of 60 Drawings | |

| | |
|---------------|----------|
| DESIGNED BY | C.R.O.H. |
| CHECKED BY | R.M.M. |
| DATE | 5-74 |
| QUANTITIES BY | F.M.H. |
| CHECKED BY | R.M.M. |
| DATE | 6-74 |

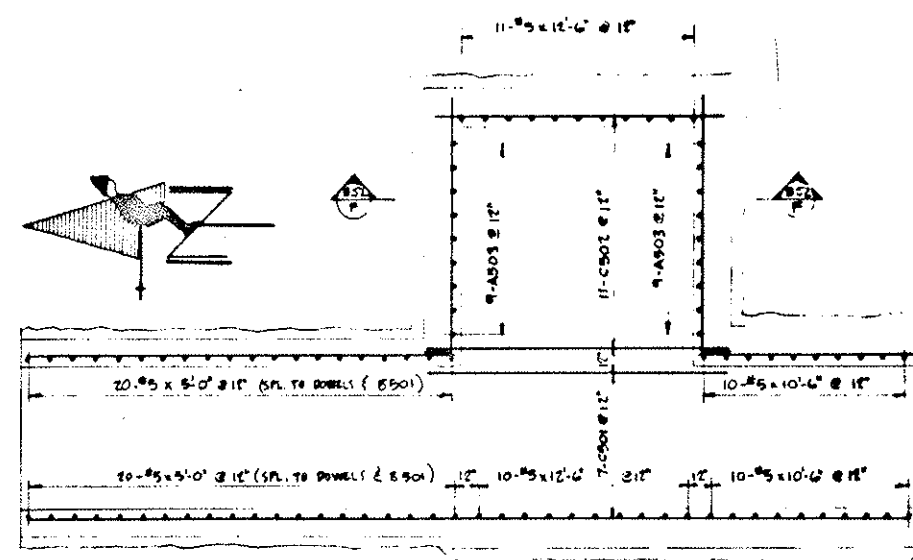
| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|-------------|-----------|--------------|
| VIII | COLORADO | 170-5(5)123 | 80 | 273 |

| REVISIONS | |
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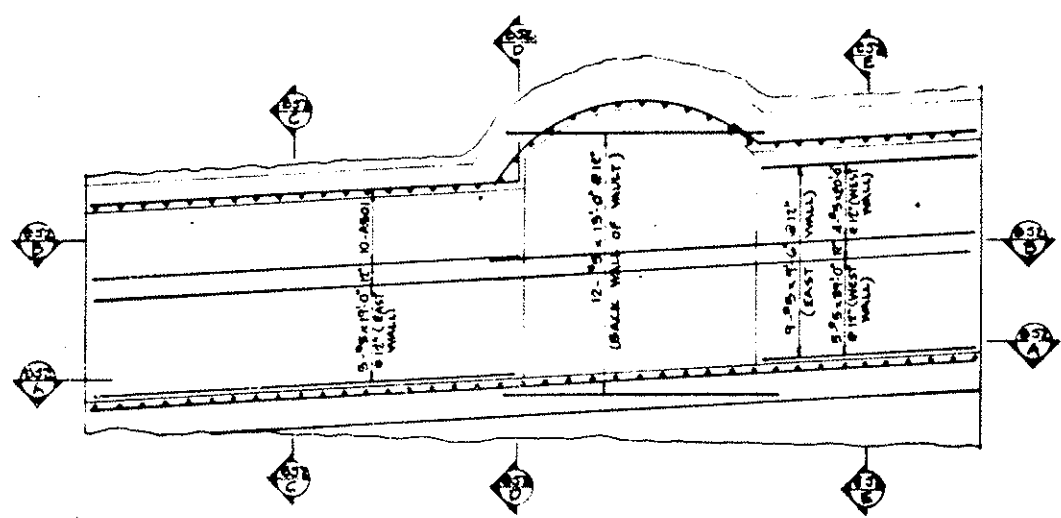
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|---------------|---------|---------|--|------|
| NO. REVISIONS | 6-29-79 | REVISED | | VOID |
|---------------|---------|---------|--|------|



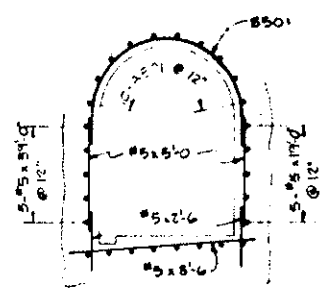
SECTION A-A



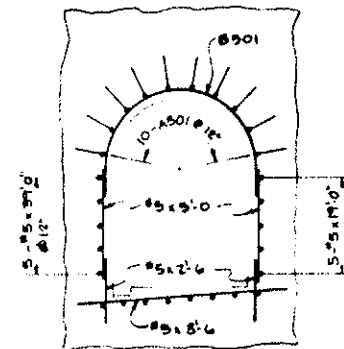
SECTION B-B



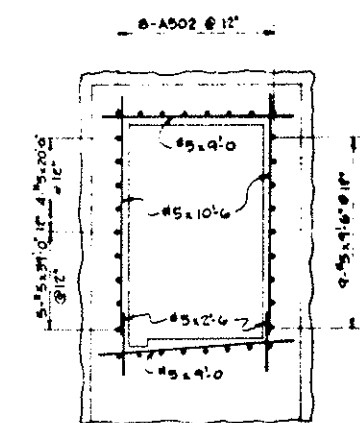
ELEVATION



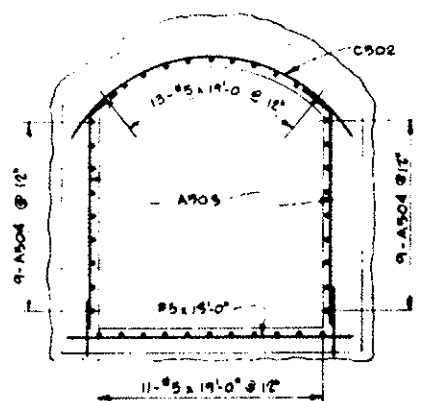
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

NOTES:
 1. ALL CONCRETE IS CLASS-T-2

| BENDING DIAGRAMS | | | | | | |
|------------------|--------|------------|--------|---|-----|---|
| TYPE A | | TYPE B | | | | |
| TYPE C | | | | | | |
| BAR MARK | LENGTH | DIMENSIONS | | | | |
| | | A | B | C | d | h |
| A501 | 20'-8" | 1'-5" | 19'-0" | | 40" | |
| A502 | 11'-1" | 1'-5" | 9'-10" | | 35" | |
| A503 | 10'-4" | 1'-5" | 9'-1" | | 32" | |
| A504 | 12'-6" | 1'-5" | 11'-5" | | | |
| B501 | 12'-9" | 3'-5" | 11'-5" | | | |
| C501 | 10'-8" | 7'-5" | | | | |
| C502 | 15'-0" | 7'-5" | | | | |

| | | |
|-------------|------|------------|
| DESIGNED BY | DATE | CHECKED BY |
| CDQH | 6-74 | |
| CHECKED BY | | |
| | | |

DIVISION OF HIGHWAYS

REINFORCEMENT DETAILS EAST CROSS PASSAGE

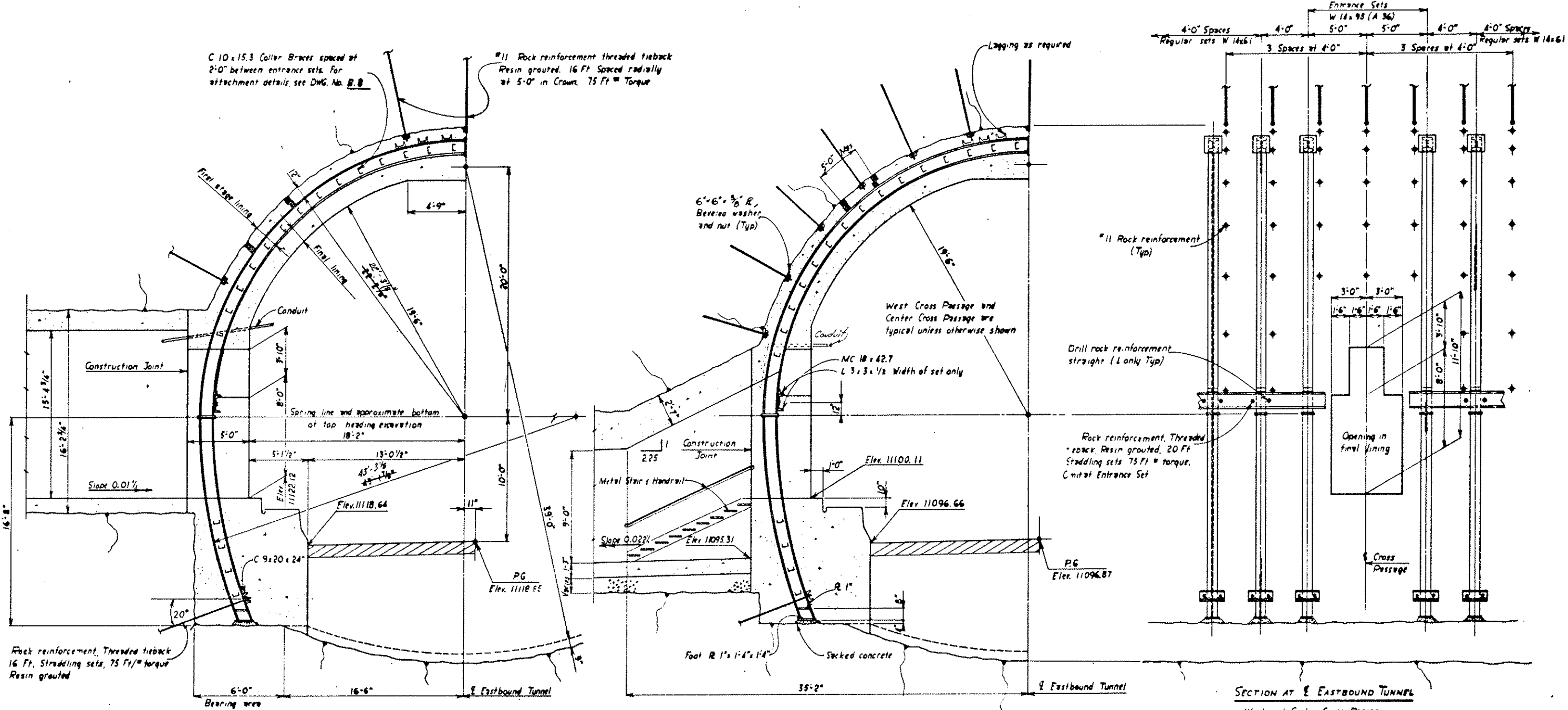
| | | | |
|----------------|-------------|------------------|-------------|
| Designer | CDQH | Structure Number | F-13-X |
| Detailer | R. M. MOYER | | |
| Drawing Number | B 52 | of | 60 Drawings |

ORIGINAL SCALE: 1/4" = 1'-0"

| | | | |
|--------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-29-73 | VOID |
|--------------|---------|---------|------|

| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(B1)220 | 81 | 273 |

| REVISIONS | |
|-----------|--|
| | |
| | |
| | |



| | | | |
|---------------|----------|------------|--------|
| DESIGNED BY | C.D.O.H. | CHECKED BY | J.A.L. |
| QUANTITIES BY | R.T.S. | CHECKED BY | R.M.G. |
| INITIAL | | DATE | |
| | | | |

WEST CROSS PASSAGE STATION 59+54.85

CENTER CROSS PASSAGE STATION 79+64.99

SECTION AT EASTBOUND TUNNEL
West and Center Cross Passage

Original scale 1/4" = 1'-0"

DIVISION OF HIGHWAYS

WEST AND CENTER CROSS PASSAGE
ENTRANCE TO
MAIN BORE

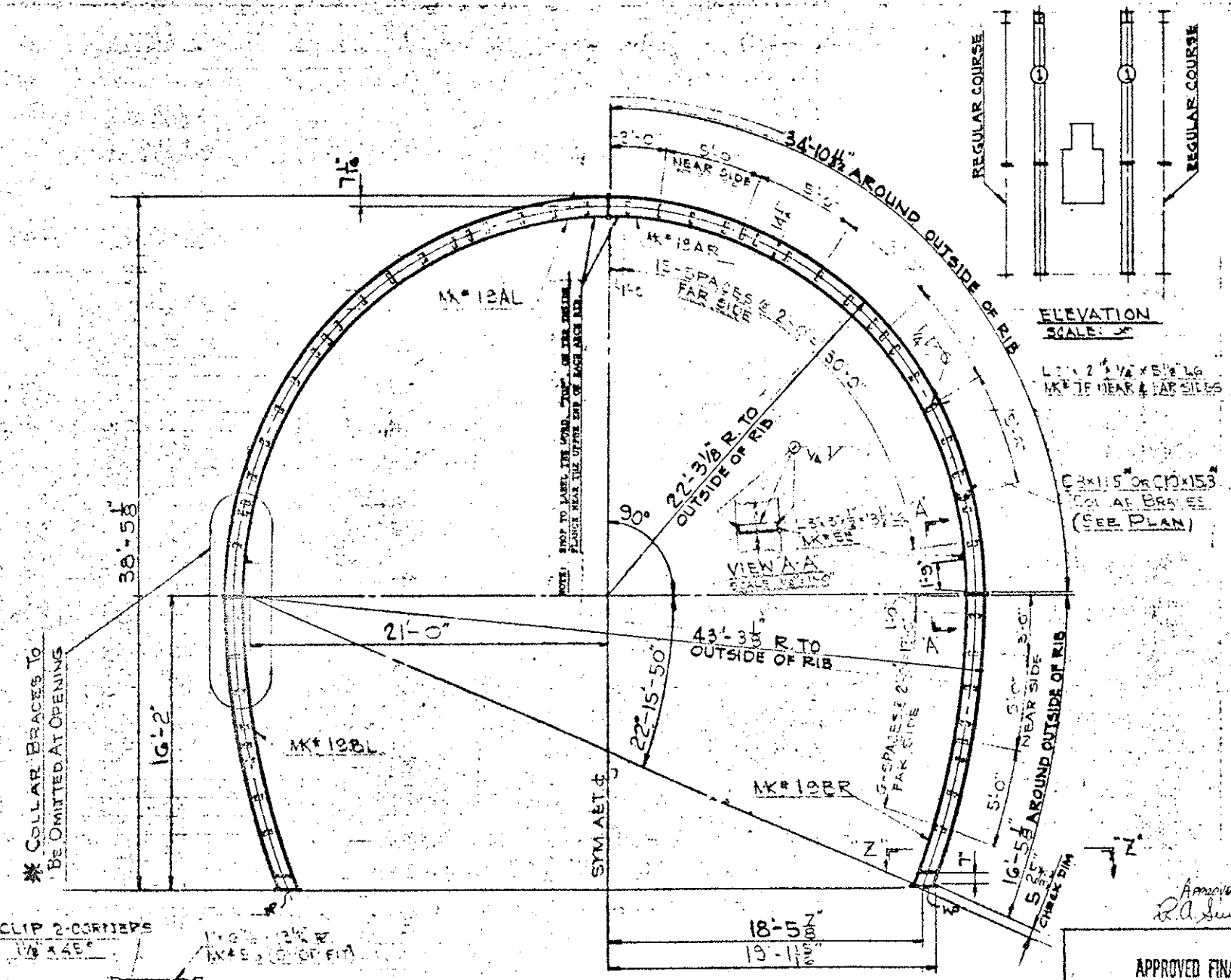
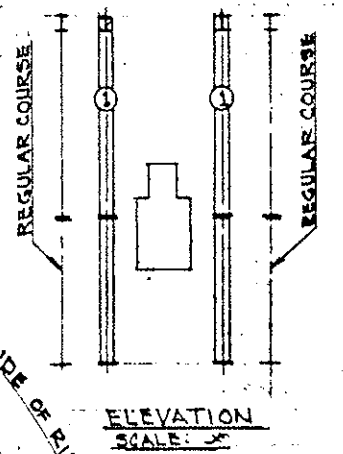
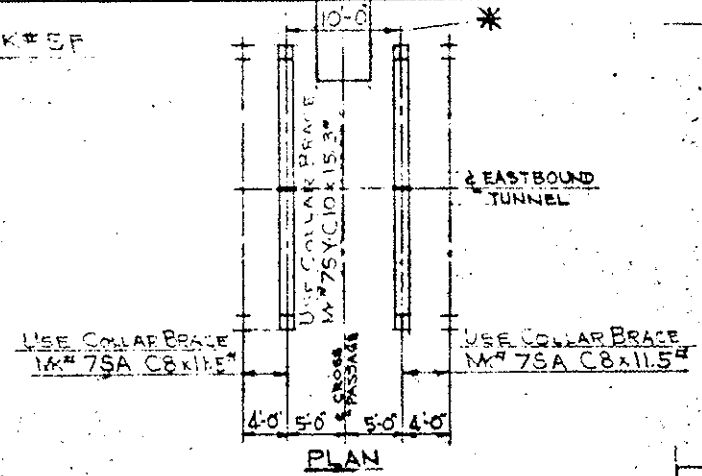
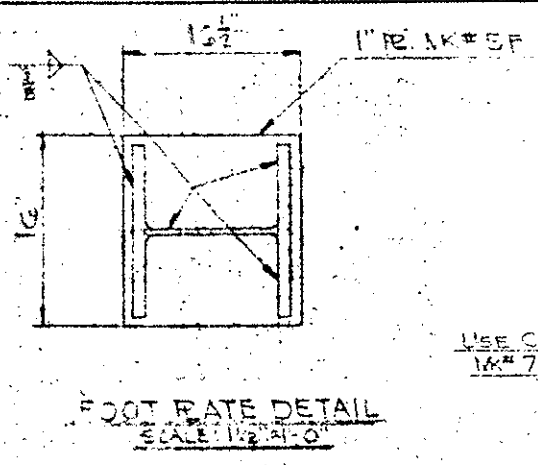
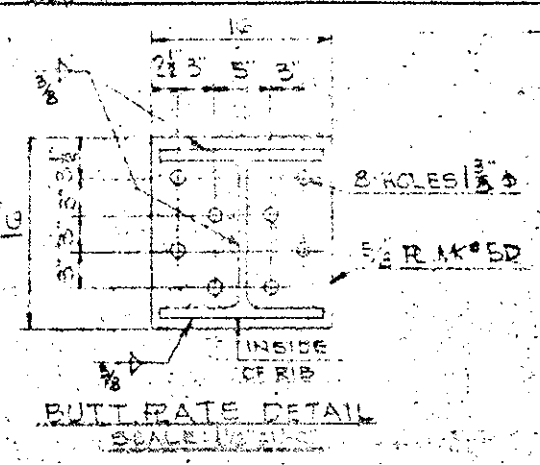
| | | | |
|----------------|------------|-----------|----------|
| Designer | C.D.O.H. | Structure | F-13-X |
| Detailer | R. Seymour | Numbers | |
| Drawing Number | B 53 | of 60 | Drawings |

Revision Dates: (Preliminary Stage Only)

| FEDERAL PROJ. NUMBER | DIVISION | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|----------------------|----------|----------------|-----------|--------------|
| VIII | COLORADO | 170-3 (80) 220 | 81 AX | 273 |

AS CONSTRUCTED

NO REVISIONS REVISED 6-29-73 VOID



| QTY | UNIT | DESCRIPTION | QTY | UNIT | DESCRIPTION |
|------|------|---------------------------------------|------|------|-------------|
| 10 | | STD. FLAT WASHERS FOR 1/2" BOLT | A307 | | |
| 14 | | 3/4" SQ. T.L. NUTS | | | |
| 37 | | 3/4" x 2" SQ. HD. T.L. BOLTS | | | |
| 151 | EA | 21" x 15 3/8" COLLAR BRACES | A36 | | |
| 448 | EA | 75A 8" x 11 5/8" COLLAR BRACES | | | |
| 31 | EA | LOAD INDICATOR WASHERS FOR 1/2" BOLT | A375 | | |
| 34 | EA | HARDENED STEEL WASHERS FOR 1/2" BOLT | | | |
| 190 | EA | 1 1/2" HI STRENGTH NUTS | | | |
| 403 | EA | 1 1/2" x 3" HI STRENGTH BOLTS | | | |
| 263 | EA | 2 1/2" x 6 1/2" x 13 1/2" STIFF PLATE | A36 | | |
| 19 | EA | 10 L3 x 2 1/4 x 5 1/2 LG | | | |
| 748 | EA | 1 1/2" x 16" x 16" FOOT RATE | | | |
| 453 | EA | 1 1/2" x 16" x 16" BUTT RATE | | | |
| 154 | EA | 1 1/2" x 95" x 16" NNA | | | |
| 154 | EA | 1 1/2" x 95" x 33" NNA | | | |
| 154 | EA | LEG RIB ASSYS. EA CONSISTING OF: | | | |
| 10.6 | EA | 1 L3 x 3 x 1/2 x 13 1/2 LG | | | |
| 19 | EA | 1 L3 x 2 x 1/2 x 5 1/2 LG | | | |
| 453 | EA | 2 1/2" x 16" x 16" BUTT RATES | | | |
| 154 | EA | 1 1/2" x 95" x 33" NNA | | | |
| 154 | EA | ARCH RIB ASSYS. EA CONSISTING OF: | | | |

| OPERATION | DATE | BY | REVISION |
|-----------|----------|----|----------|
| W14 x 95 | 10-19-72 | AS | 1 |
| W14 x 95 | 10-19-72 | AS | 2 |
| W14 x 95 | 10-19-72 | AS | 3 |
| W14 x 95 | 10-19-72 | AS | 4 |
| W14 x 95 | 10-19-72 | AS | 5 |
| W14 x 95 | 10-19-72 | AS | 6 |
| W14 x 95 | 10-19-72 | AS | 7 |
| W14 x 95 | 10-19-72 | AS | 8 |
| W14 x 95 | 10-19-72 | AS | 9 |
| W14 x 95 | 10-19-72 | AS | 10 |
| W14 x 95 | 10-19-72 | AS | 11 |
| W14 x 95 | 10-19-72 | AS | 12 |
| W14 x 95 | 10-19-72 | AS | 13 |
| W14 x 95 | 10-19-72 | AS | 14 |
| W14 x 95 | 10-19-72 | AS | 15 |
| W14 x 95 | 10-19-72 | AS | 16 |
| W14 x 95 | 10-19-72 | AS | 17 |
| W14 x 95 | 10-19-72 | AS | 18 |
| W14 x 95 | 10-19-72 | AS | 19 |
| W14 x 95 | 10-19-72 | AS | 20 |
| W14 x 95 | 10-19-72 | AS | 21 |
| W14 x 95 | 10-19-72 | AS | 22 |
| W14 x 95 | 10-19-72 | AS | 23 |
| W14 x 95 | 10-19-72 | AS | 24 |
| W14 x 95 | 10-19-72 | AS | 25 |
| W14 x 95 | 10-19-72 | AS | 26 |
| W14 x 95 | 10-19-72 | AS | 27 |
| W14 x 95 | 10-19-72 | AS | 28 |
| W14 x 95 | 10-19-72 | AS | 29 |
| W14 x 95 | 10-19-72 | AS | 30 |
| W14 x 95 | 10-19-72 | AS | 31 |
| W14 x 95 | 10-19-72 | AS | 32 |
| W14 x 95 | 10-19-72 | AS | 33 |
| W14 x 95 | 10-19-72 | AS | 34 |
| W14 x 95 | 10-19-72 | AS | 35 |
| W14 x 95 | 10-19-72 | AS | 36 |
| W14 x 95 | 10-19-72 | AS | 37 |
| W14 x 95 | 10-19-72 | AS | 38 |
| W14 x 95 | 10-19-72 | AS | 39 |
| W14 x 95 | 10-19-72 | AS | 40 |
| W14 x 95 | 10-19-72 | AS | 41 |
| W14 x 95 | 10-19-72 | AS | 42 |
| W14 x 95 | 10-19-72 | AS | 43 |
| W14 x 95 | 10-19-72 | AS | 44 |
| W14 x 95 | 10-19-72 | AS | 45 |
| W14 x 95 | 10-19-72 | AS | 46 |
| W14 x 95 | 10-19-72 | AS | 47 |
| W14 x 95 | 10-19-72 | AS | 48 |
| W14 x 95 | 10-19-72 | AS | 49 |
| W14 x 95 | 10-19-72 | AS | 50 |
| W14 x 95 | 10-19-72 | AS | 51 |
| W14 x 95 | 10-19-72 | AS | 52 |
| W14 x 95 | 10-19-72 | AS | 53 |
| W14 x 95 | 10-19-72 | AS | 54 |
| W14 x 95 | 10-19-72 | AS | 55 |
| W14 x 95 | 10-19-72 | AS | 56 |
| W14 x 95 | 10-19-72 | AS | 57 |
| W14 x 95 | 10-19-72 | AS | 58 |
| W14 x 95 | 10-19-72 | AS | 59 |
| W14 x 95 | 10-19-72 | AS | 60 |
| W14 x 95 | 10-19-72 | AS | 61 |
| W14 x 95 | 10-19-72 | AS | 62 |
| W14 x 95 | 10-19-72 | AS | 63 |
| W14 x 95 | 10-19-72 | AS | 64 |
| W14 x 95 | 10-19-72 | AS | 65 |
| W14 x 95 | 10-19-72 | AS | 66 |
| W14 x 95 | 10-19-72 | AS | 67 |
| W14 x 95 | 10-19-72 | AS | 68 |
| W14 x 95 | 10-19-72 | AS | 69 |
| W14 x 95 | 10-19-72 | AS | 70 |
| W14 x 95 | 10-19-72 | AS | 71 |
| W14 x 95 | 10-19-72 | AS | 72 |
| W14 x 95 | 10-19-72 | AS | 73 |
| W14 x 95 | 10-19-72 | AS | 74 |
| W14 x 95 | 10-19-72 | AS | 75 |
| W14 x 95 | 10-19-72 | AS | 76 |
| W14 x 95 | 10-19-72 | AS | 77 |
| W14 x 95 | 10-19-72 | AS | 78 |
| W14 x 95 | 10-19-72 | AS | 79 |
| W14 x 95 | 10-19-72 | AS | 80 |
| W14 x 95 | 10-19-72 | AS | 81 |
| W14 x 95 | 10-19-72 | AS | 82 |
| W14 x 95 | 10-19-72 | AS | 83 |
| W14 x 95 | 10-19-72 | AS | 84 |
| W14 x 95 | 10-19-72 | AS | 85 |
| W14 x 95 | 10-19-72 | AS | 86 |
| W14 x 95 | 10-19-72 | AS | 87 |
| W14 x 95 | 10-19-72 | AS | 88 |
| W14 x 95 | 10-19-72 | AS | 89 |
| W14 x 95 | 10-19-72 | AS | 90 |
| W14 x 95 | 10-19-72 | AS | 91 |
| W14 x 95 | 10-19-72 | AS | 92 |
| W14 x 95 | 10-19-72 | AS | 93 |
| W14 x 95 | 10-19-72 | AS | 94 |
| W14 x 95 | 10-19-72 | AS | 95 |
| W14 x 95 | 10-19-72 | AS | 96 |
| W14 x 95 | 10-19-72 | AS | 97 |
| W14 x 95 | 10-19-72 | AS | 98 |
| W14 x 95 | 10-19-72 | AS | 99 |
| W14 x 95 | 10-19-72 | AS | 100 |

APPROVED FINAL
DATE 9-17-76
BY Jack E. Ray

COURSE #1
WEST CROSS PASSAGE STA. 59+54.83
CENTER CROSS PASSAGE STA. 79+64.99
7-PC. SET OF W14 x 95
ENTRANCE TO MAIN BORE

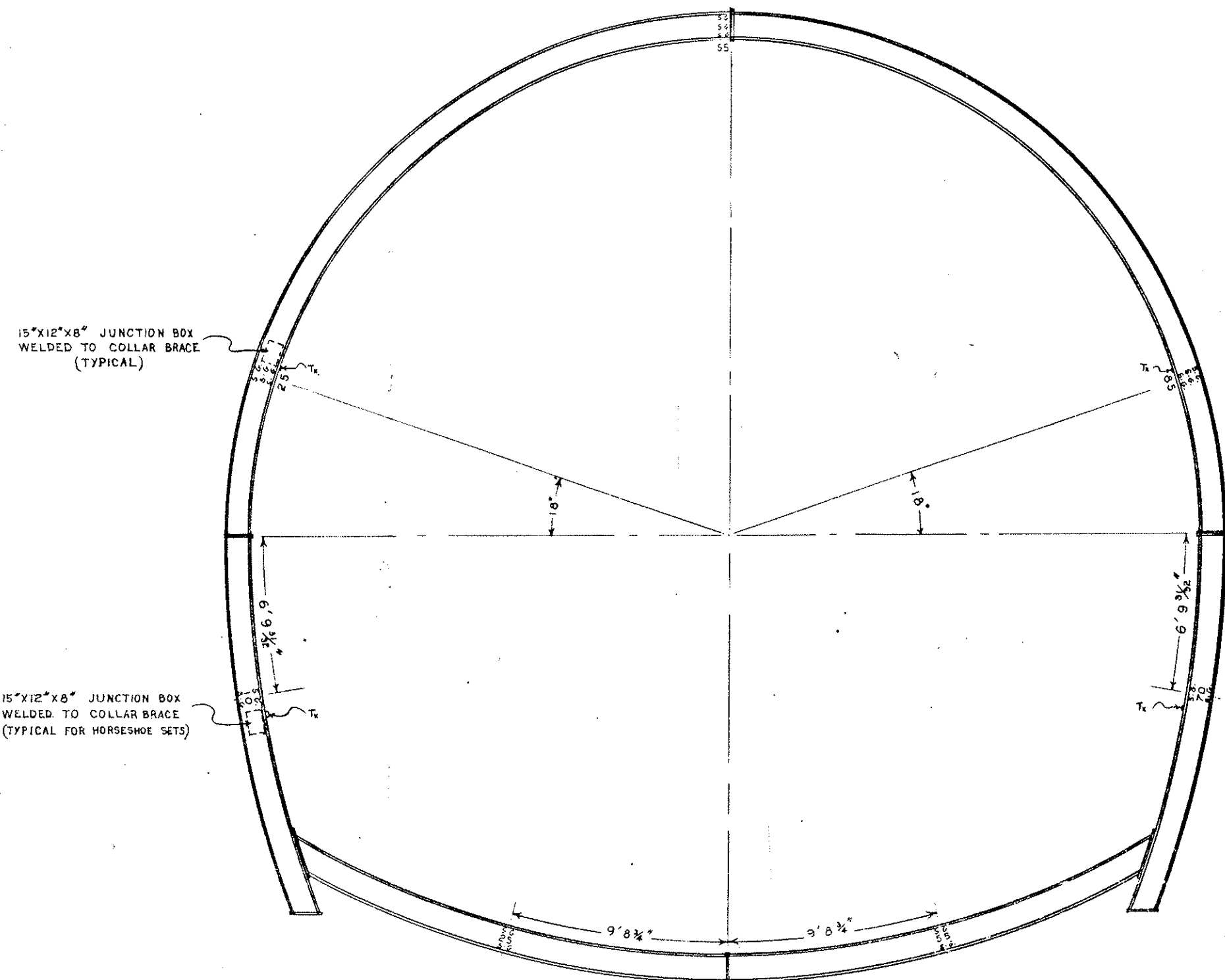
| TOTAL HT FOR COURSE | UNIT | DESCRIPTION | TOTAL PAY PER COURSE | DATE | REVISION | BY |
|---------------------|------|------------------------|----------------------|------|----------|----|
| 10.2 | | MAT'L REQ'D PER COURSE | | | | |

COMMERCIAL BRIDGE AND STRUCTURE CO.
1000 W. 10TH ST. DENVER, CO. 80202
TELEPHONE 733-1111
FAX 733-1111

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|-----------|-----------|--------------|
| VIII | COLORADO | 170-3(81) | 83AX | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | | REVISIONS | VOID | |
| | | 6-23-79 | | |

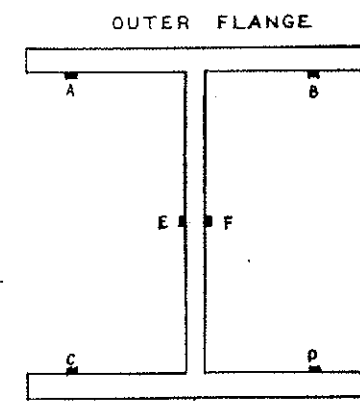
ORIGINAL SCALE $\frac{3}{8}'' = 1'0''$

ORIGINAL SCALE $3'' = 1'0''$



15"x12"x8" JUNCTION BOX
 WELDED TO COLLAR BRACE
 (TYPICAL)

15"x12"x8" JUNCTION BOX
 WELDED TO COLLAR BRACE
 (TYPICAL FOR HORSESHOE SETS)



OUTER FLANGE
 INNER FLANGE
 DETAIL OF GAGE CONFIGURATION
 FOR ARCH ONLY

LOCATION USED
 STATION
 81+86

INSTRUMENT ARRAY
 SET 1027

NO REVISIONS REVISION 6-23-79

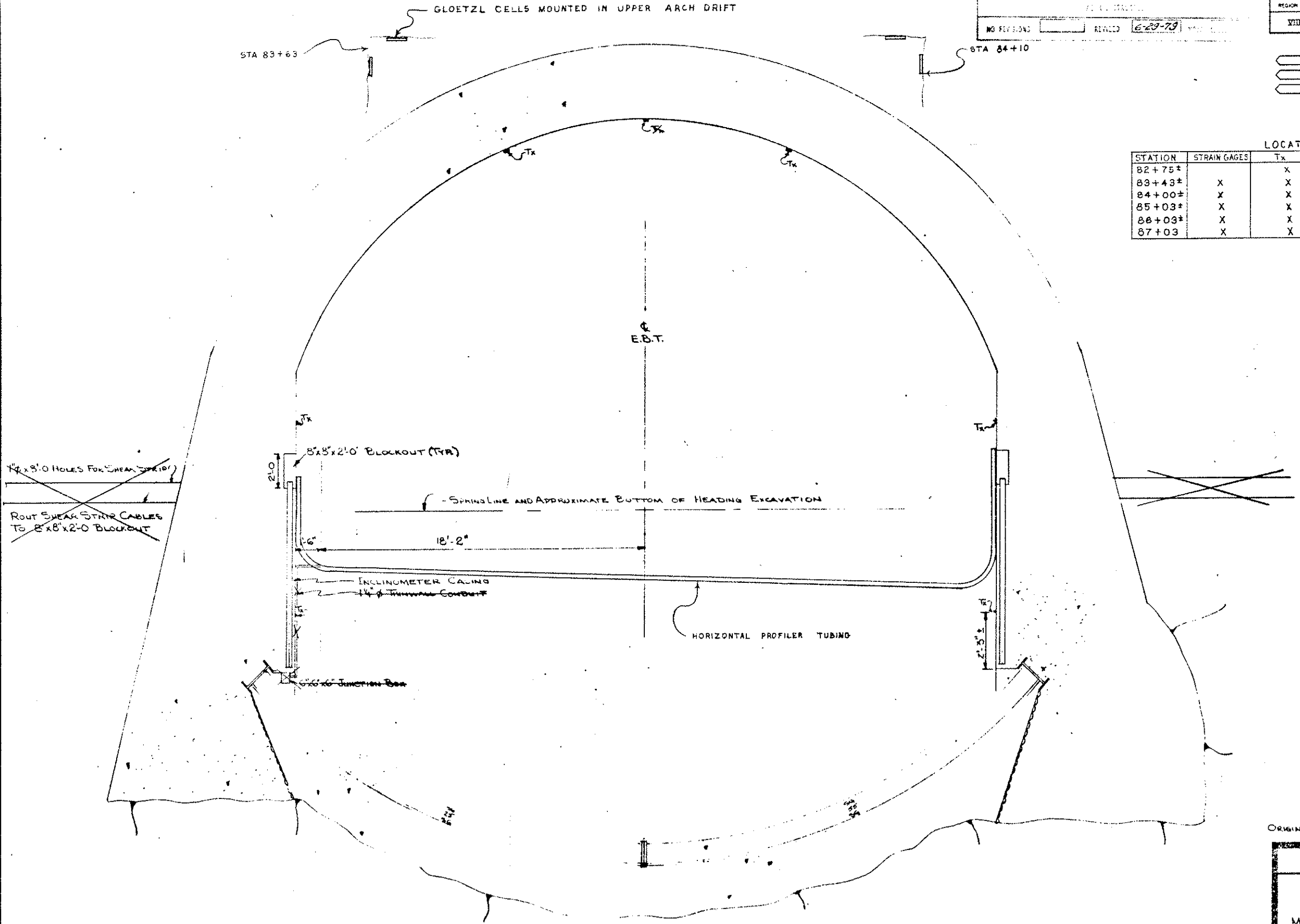
| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I-70-3(BI)220 | 84 | 273 |
| REVISIONS | | | | |
| | | | | |
| | | | | |

GLOETZL CELLS MOUNTED IN UPPER ARCH DRIFT
 STA 83+63 STA 84+10

LOCATIONS USED

| STATION | STRAIN GAGES | T _x | SLOPE INDICATOR | HORIZONTAL PROFILER |
|---------|--------------|----------------|-----------------|---------------------|
| 82+75± | | X | NES | X |
| 83+43± | X | X | N | X |
| 84+00± | X | X | N | |
| 85+03± | X | X | NES | X |
| 86+03± | X | X | NES | |
| 87+03 | X | X | | X |

| | |
|-------------|---------------|
| CHECKED BY | QUANTITIES BY |
| DESIGNED BY | CHECKED BY |
| | |
| | |
| | |



ORIGINAL SCALE: 3/8" = 1'-0"

DIVISION OF HIGHWAYS

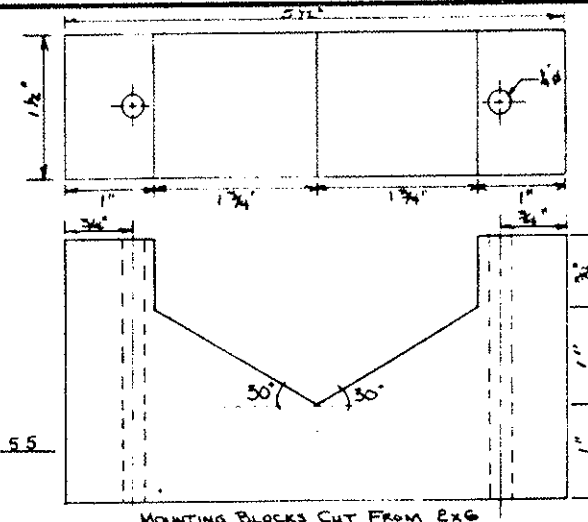
**INSTRUMENT ARRAY
 MULTIPLE DRIFT TUNNEL SUPPORT**

| | |
|-----------------------------------|-------------------|
| Designer: CDCH | Structure: F-13-X |
| Drawer: J. M. ... | Numbers: ... |
| Drawing Number B 5 of 60 Drawings | |

| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|-------------|-----------|--------------|
| XIII COLORADO | 170-3(B)220 | 85 | 273 |

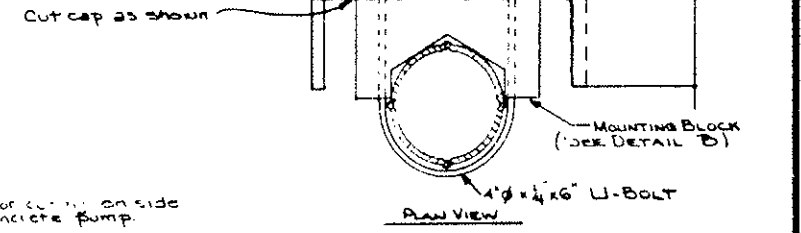
| REVISIONS | | |
|---------------|----------|------|
| NO. REVISIONS | REVISION | DATE |
| | | |

| AS CONSTRUCTED | | |
|----------------|----------|------|
| NO. REVISIONS | REVISION | DATE |
| | | |

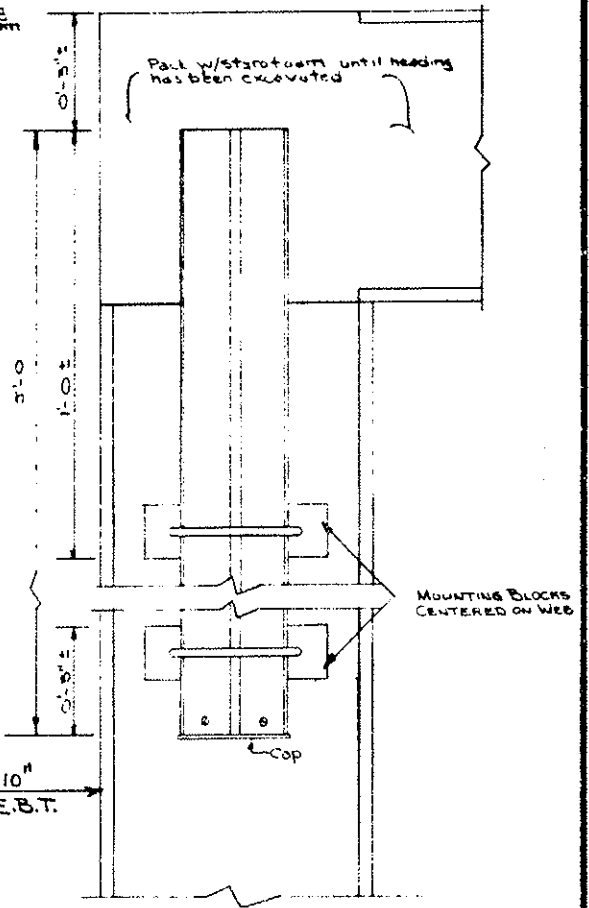


DETAIL B

Note: Install slope indicator casing on side of cut away to in concrete pump.
 Do not cut the flange of cap until heading has been excavated. Puck with try square after installation of slope indicator casing.



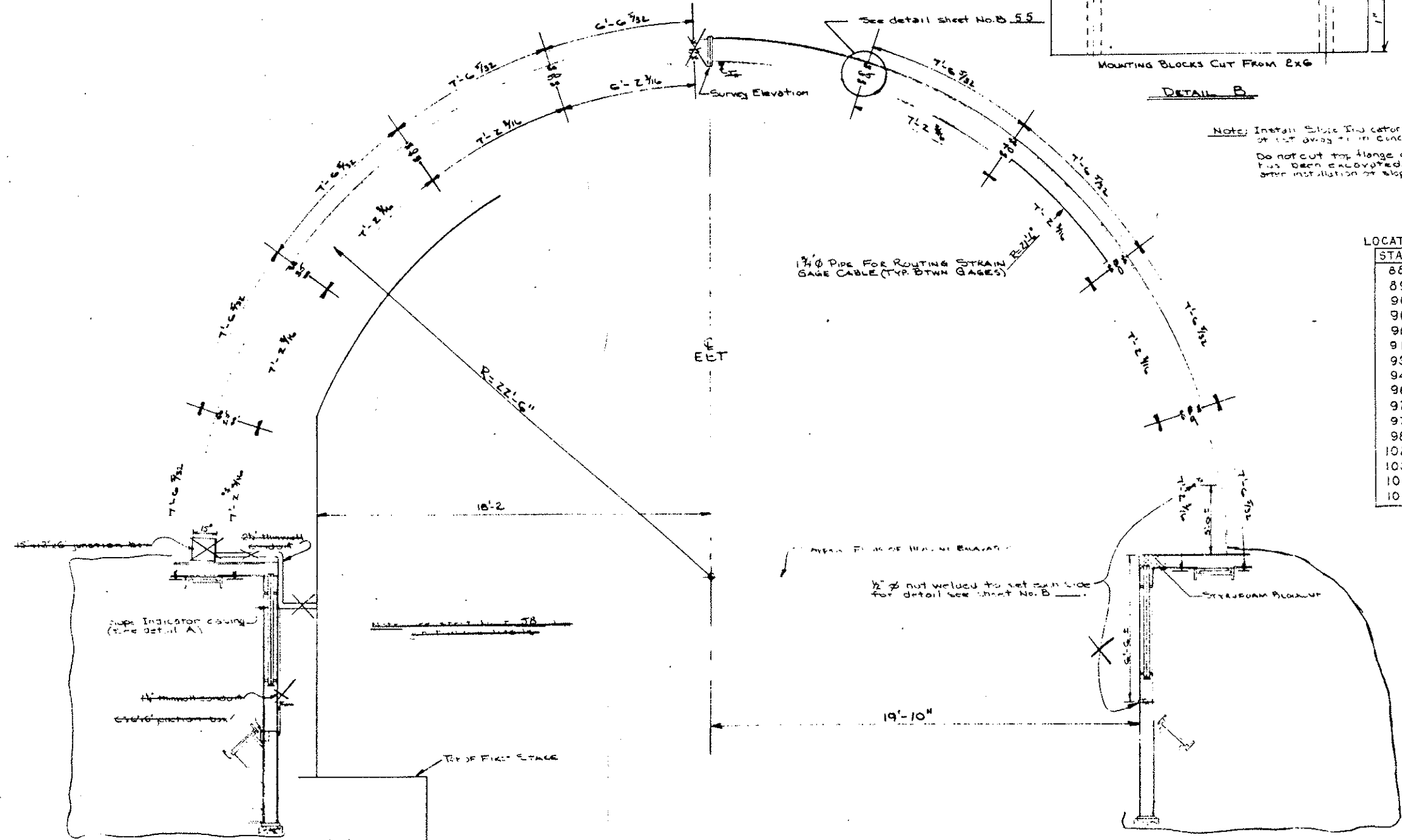
PLAN VIEW



**ELEVATION VIEW
 DETAIL A
 SCALE 3/4" = 1'-0"**

LOCATIONS USED

| STATION |
|---------|
| 88+18 |
| 89+38 |
| 90+02 |
| 90+46 |
| 90+98 |
| 91+94 |
| 93+02 |
| 94+10 |
| 96+02 |
| 97+02 |
| 97+50 |
| 98+26 |
| 102+52 |
| 103+00 |
| 105+48 |
| 105+96 |



| DESIGNED BY | CHECKED BY | QUANTITIES BY | CHECKED BY |
|-------------|------------|---------------|------------|
| C.D.O.H. | S.74 | W.M. | 4.75 |

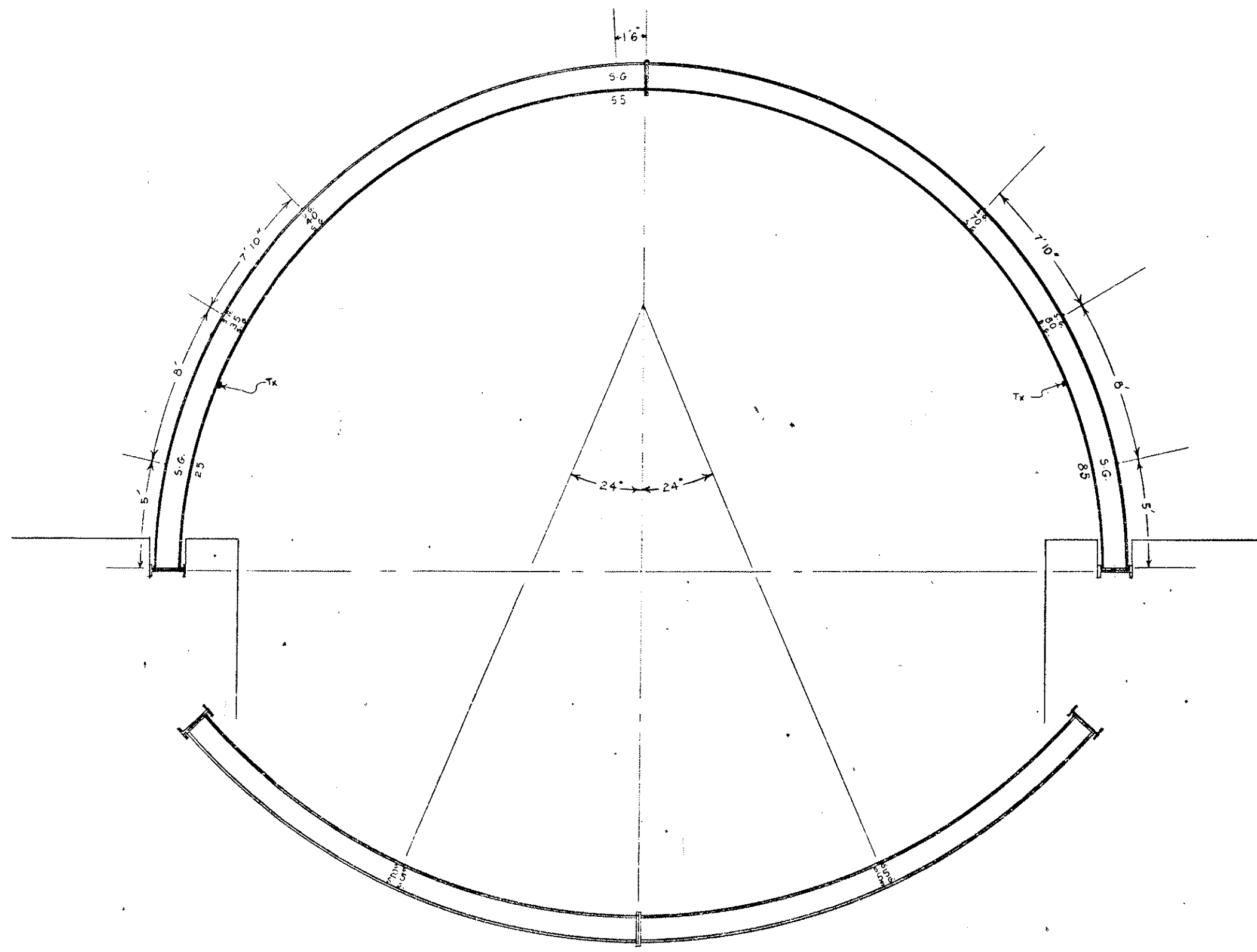
DIVISION OF HIGHWAYS

INSTRUMENT ARRAY

342 DRIFT SUPPORT

| | |
|----------------|----------------|
| Designer | Structure |
| Detailer | Numbers |
| Drawing Number | of 60 Drawings |

| | | | | |
|-------------------------|----------|-----------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 170-3(81) | 254X | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | | REVISED | 6-23-77 | VOID |



NOTE: GAGES ON ARCH AT 25', 55' & 85'
 LOCATIONS WERE PLACED ON NEUTRAL
 AXIS, ONE ON EACH SIDE OF THE WEB.
 SEE DETAIL 'A', DRAWING B55 FOR
 CONFIGURATION OF OTHER GAGES.

| |
|----------------|
| LOCATIONS USED |
| STATIONS |
| 106+36 |
| 108+64 |

ORIG. SCALE 3/8" = 1'-0"

INSTRUMENT ARRAY
 3 DRIFT SUPPORT

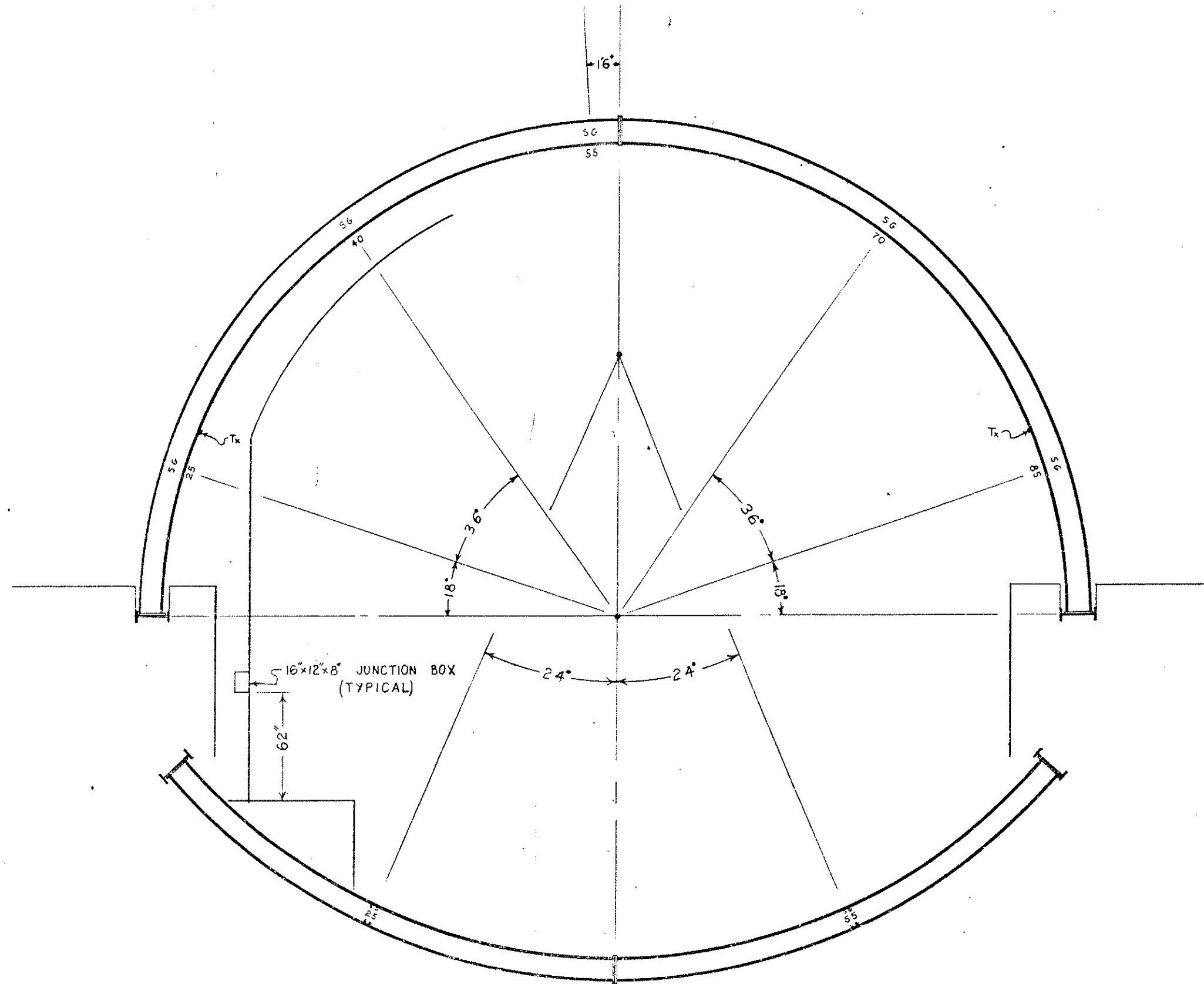
| | | | | |
|-------------------------|----------|-----------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | 70-3(81) | 251 | 273 |
| AS CONSTRUCTED | | | | |
| NO REVISIONS | | REVISED | 6-23-73 | VOID |

LOCATIONS USED:

| STATION |
|----------|
| 103 + 84 |
| 113 + 88 |
| 118 + 77 |
| 119 + 59 |

NOTE: GAGES ON ARCH WERE PLACED ON NEUTRAL AXIS, ONE ON EACH SIDE OF THE WEB.

FOR CONFIGURATION OF INVERT GAGES SEE DETAIL 'A' ON DRAWING NUMBER B55



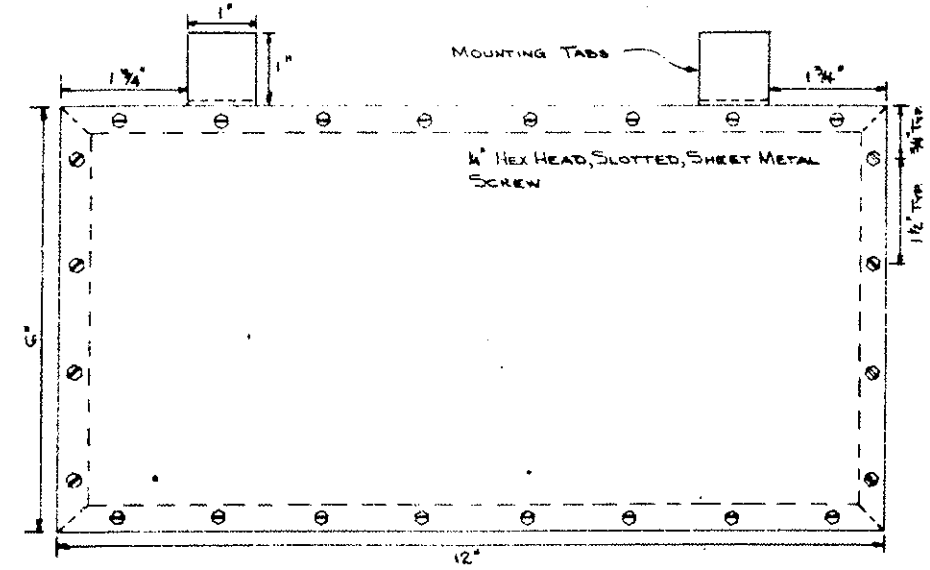
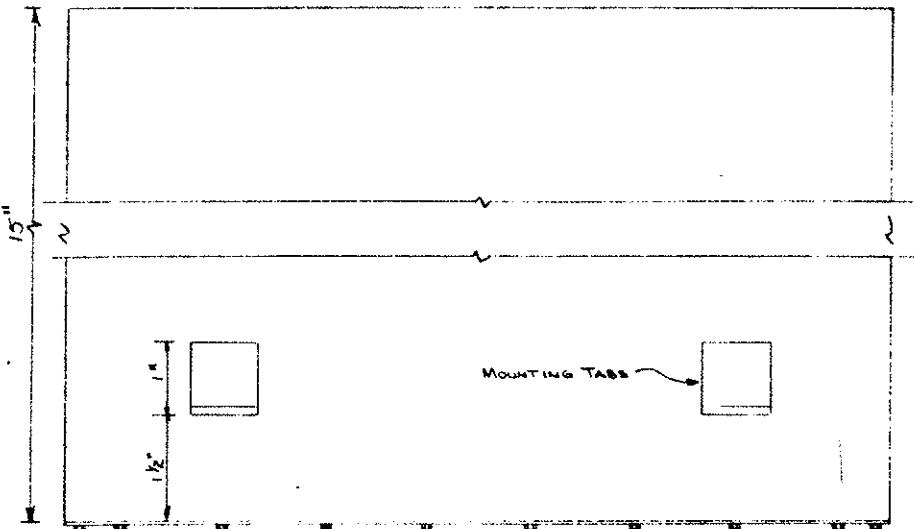
ORIG. SCALE 3/8" = 1'-0"

INSTRUMENT ARRAY
 3 1/2" DRIFT SUPPORT

| | | | |
|--------------|---------|------|---------|
| NO REVISIONS | REVISED | DATE | 6-23-73 |
|--------------|---------|------|---------|

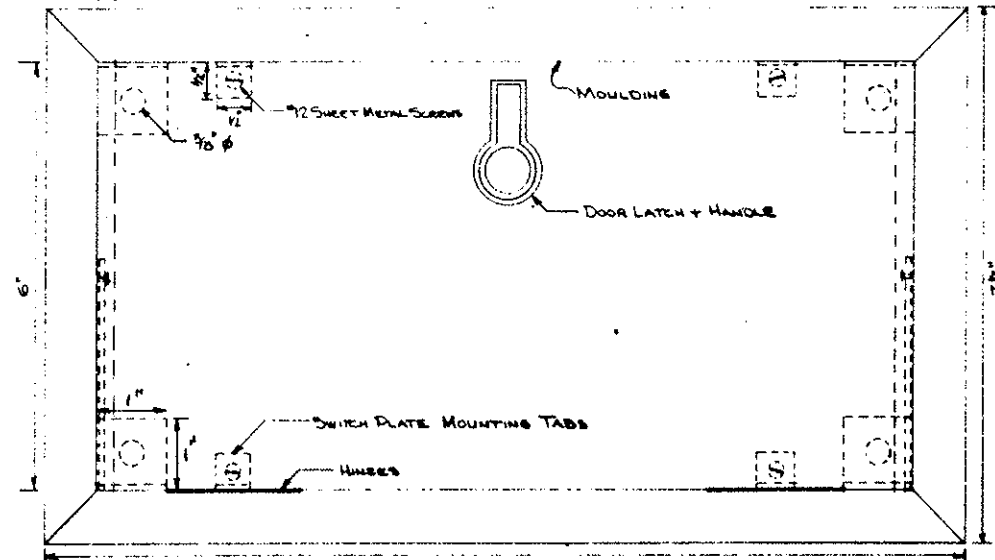
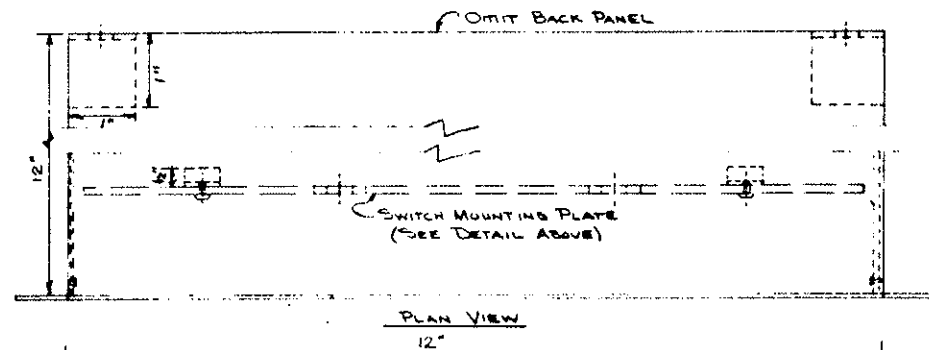
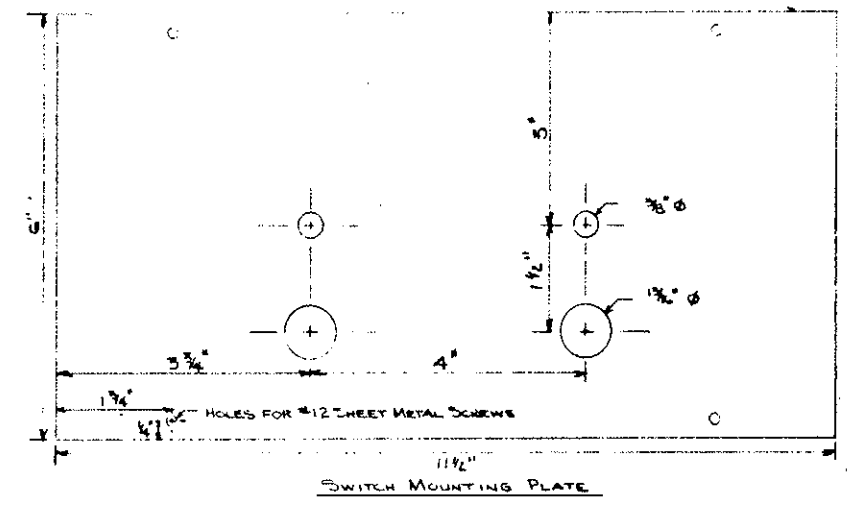
| FEDERAL ROAD DISTRICT | PROJ NO. | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------|-----------|--------------|
| XIII COLORADO | I70-3(81)220 | 86 | 273 |

| REVISIONS | | |
|-----------|--|--|
| | | |
| | | |
| | | |

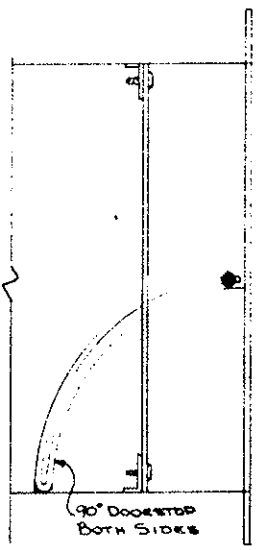


MATERIAL: TEMPERED SHEET METAL

12"x6"x15" TEMPORARY JUNCTION BOX



MATERIAL: TO CONFORM TO PRELECT SPECIFICATIONS FOR PERMANENT BOXES



SIDE VIEW

12"x6"x12" PERMANENT JUNCTION BOX
 TO BE INSTALLED UNDER I70-3(85)220

| | | |
|---------------|------|---------------|
| CHECKED BY | DATE | CHECKED BY |
| | | |
| QUANTITIES BY | DATE | QUANTITIES BY |
| | | |
| DESIGNED BY | DATE | DESIGNED BY |
| | | |
| DETAILS BY | DATE | DETAILS BY |
| | | |

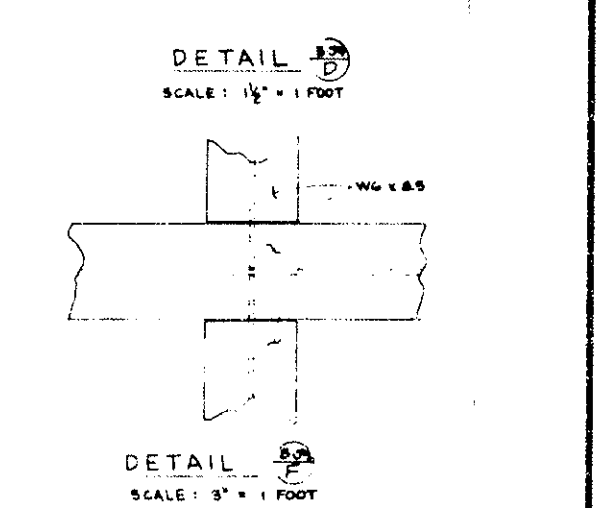
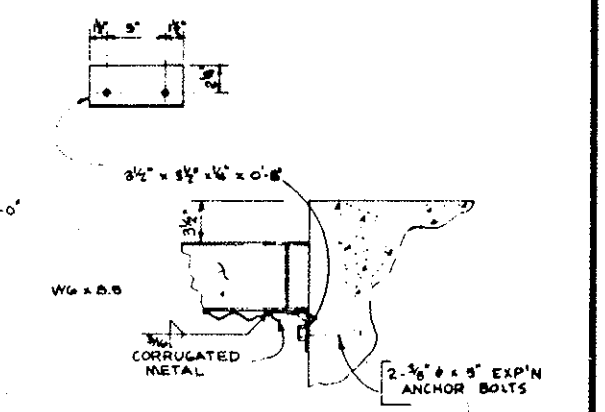
DIVISION OF HIGHWAYS

INSTRUMENTATION
 JUNCTION BOXES

| | | | |
|----------------|---------------|-----------|----------|
| Designer | CDW | Structure | |
| Detailer | W. MYSTROWSKI | Numbers | |
| Drawing Number | 8 | of 60 | Drawings |

| FEDERAL ROAD REGION NO. | DISTRICT | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VII | COLORADO | 170-3(81)220 | 87 | 273 |

| REVISIONS | | | |
|-----------|---------|----|-------------|
| NO. | DATE | BY | DESCRIPTION |
| 1 | 6-29-79 | | |

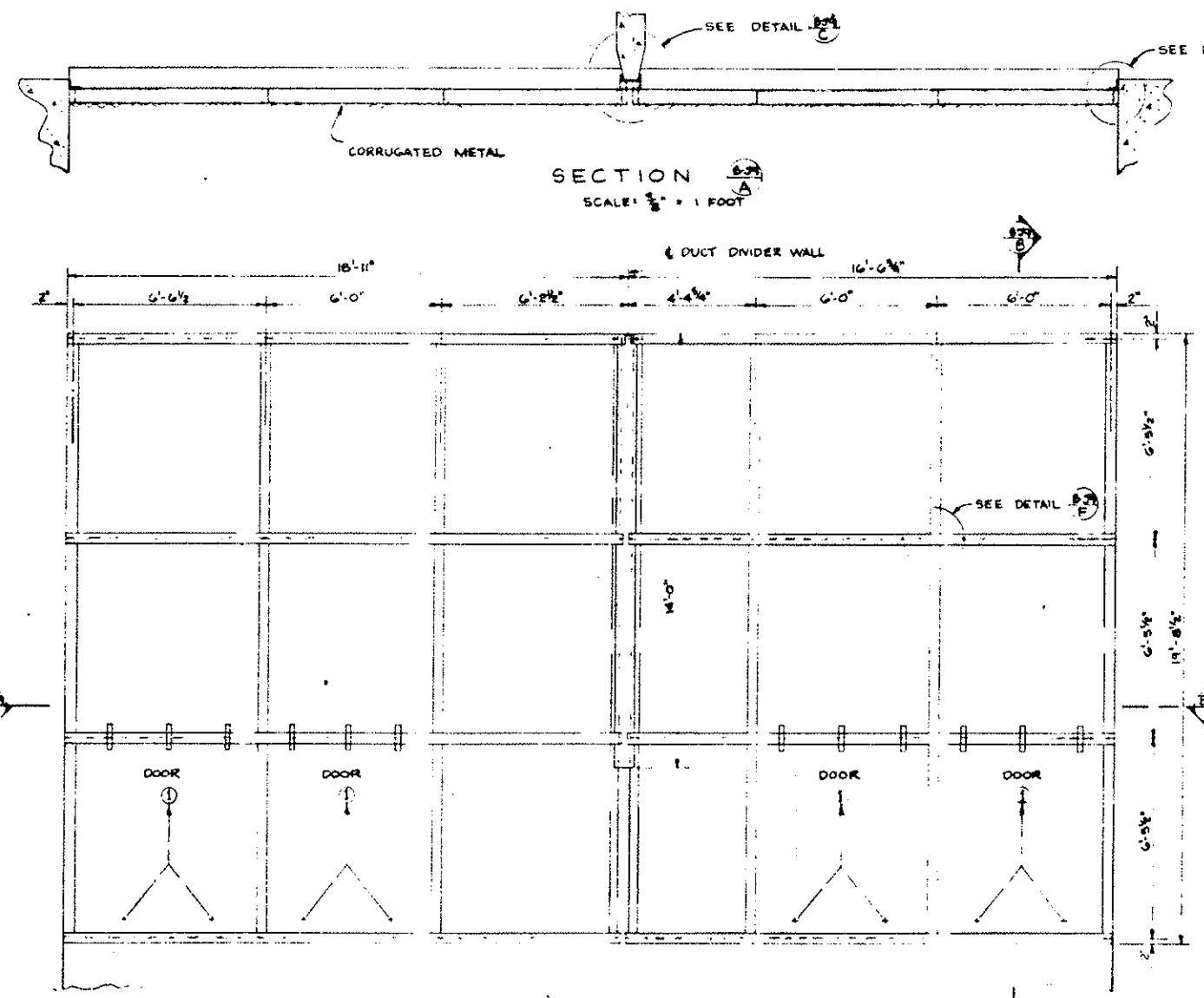


NOTES:
ALL FRAME MEMBERS SHALL BE WG x 8.5 - A36 STEEL.
CORRUGATED METAL SHALL BE 10-GAUGE, 6\"/>

DIVISION OF HIGHWAYS

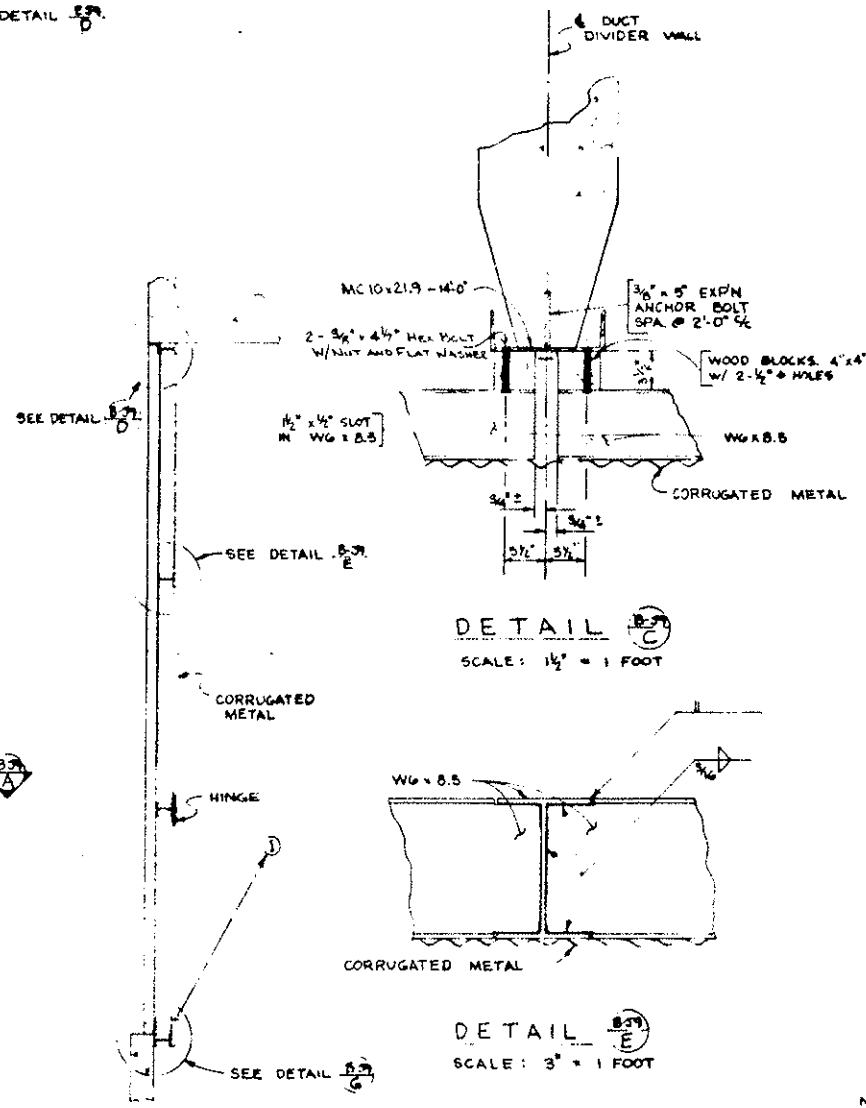
BLAST PROTECTION SHIELD FOR VENTILATION BUILDINGS

| | |
|----------------------|---------------------------|
| Designer: C.D.W. | Structure: F-15-X |
| Detailer: R.M. McKee | Number: 89 of 60 Drawings |

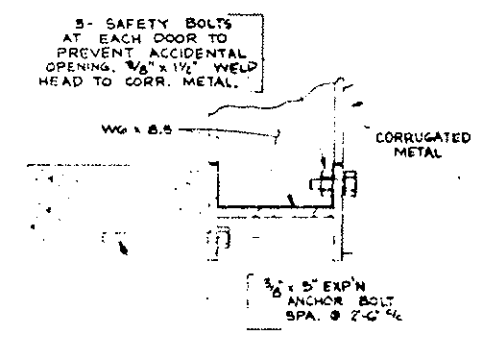


ELEVATION SCALE: 3/8\"/>

DOORS SHALL BE PROVIDED IN THE BAYS SHOWN SO THE CORRUGATED METAL OPENS FROM THE BOTTOM. 3-3/8\"/>



SECTION SCALE: 3/8\"/>



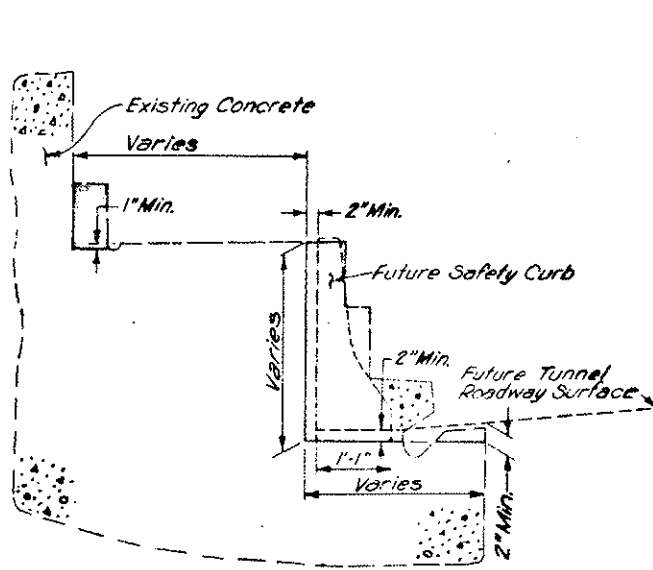
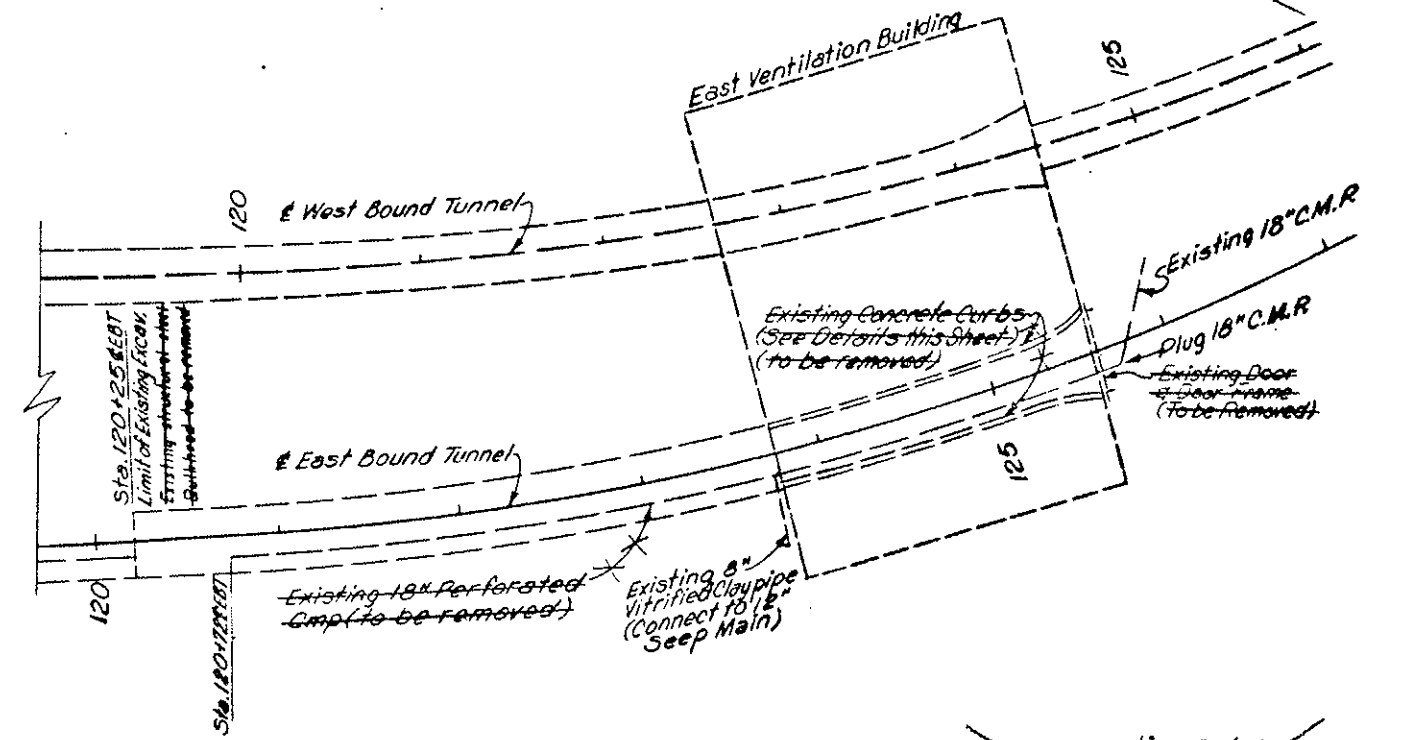
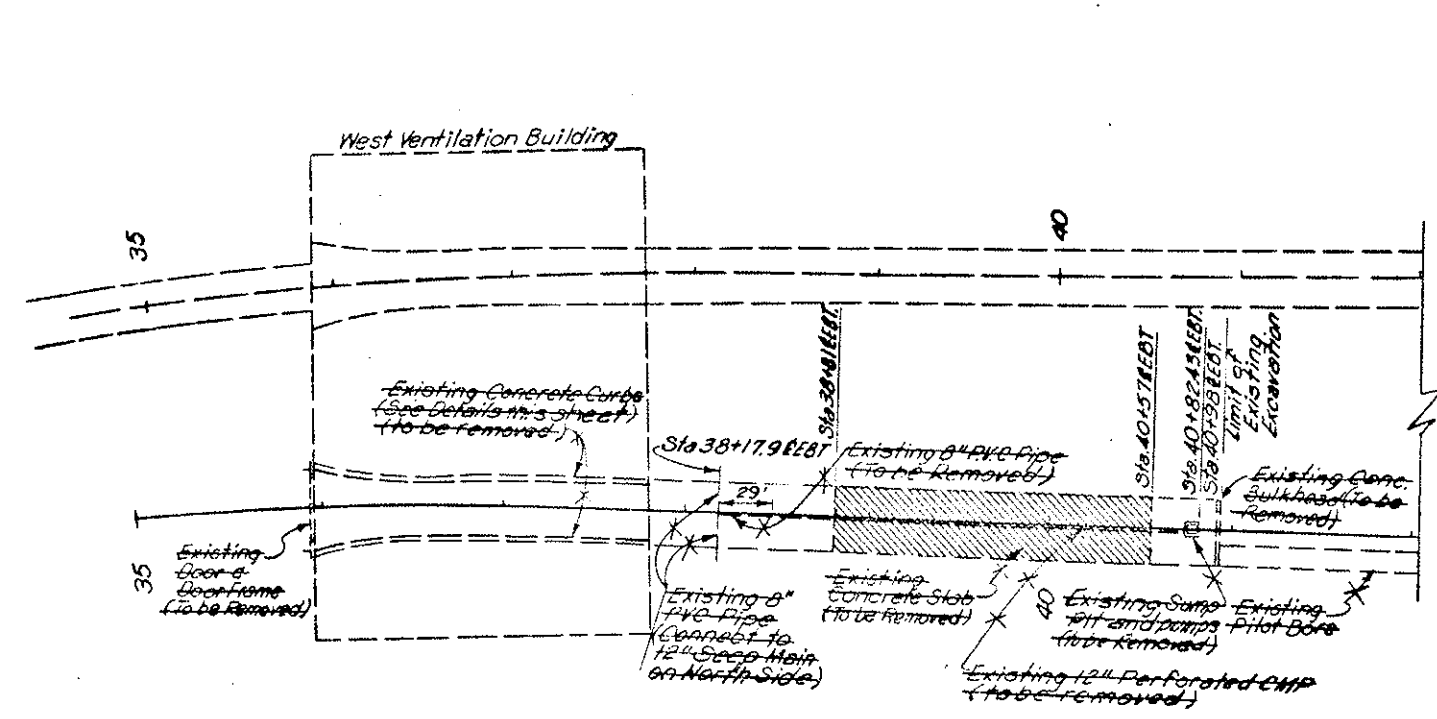
DETAIL SCALE: 3\"/>

| | | | |
|-------------|------|---------------|------|
| DESIGNED BY | 5/74 | QUANTITIES BY | 5/74 |
| CHECKED BY | 5/74 | CHECKED BY | 5/74 |
| DETAILS BY | 5/74 | DETAILS BY | 5/74 |

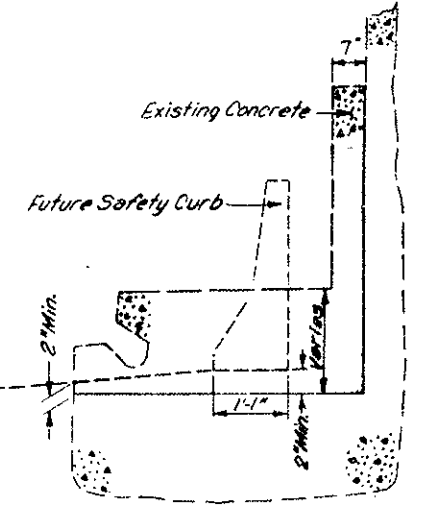
| | | | | | | |
|---------------|--|-------------------------|----------|--------------|-----------|--------------|
| AS SHOWN | | FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| NO. REVISIONS | | VIII | COLORADO | I 70-3(8)220 | 88 | 273 |

Payment for the Removal of the following obstructions will be made under the Pay Item "Removal of Structures and Obstructions." This Item shall include but not be limited to the following:

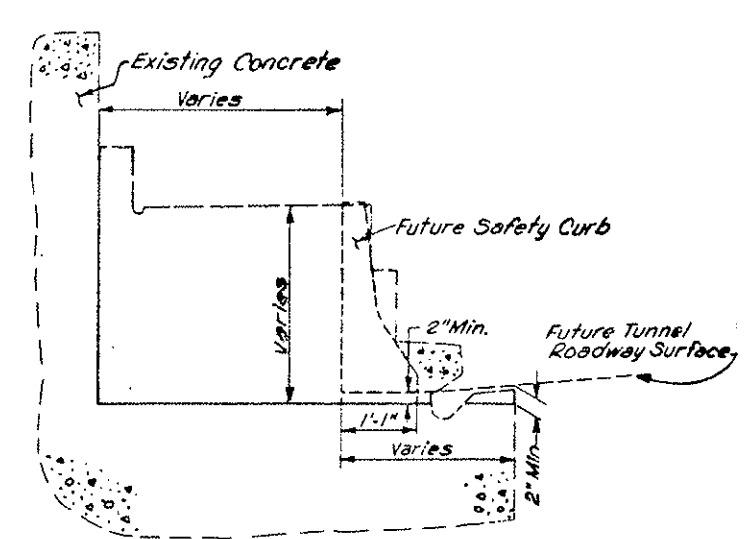
- A. Concrete bulkhead and sump at station 40+ in the West Stub Tunnel.
- B. Doors and Door Frames at the East and West Portals.
- C. Concrete Floor in the West Stub Tunnel.
- D. Concrete Curbs, left and right in both ventilation Buildings to the lines shown on the Plans
- E. Approximately 800 Lin. Ft. of Pipe.



CONCRETE CURB REMOVAL
 NORTH SIDE OF TUNNEL
 STA. 35+99± to 36+90 AND
 124+45 to 125+52±



CONCRETE CURB REMOVAL
 SOUTH SIDE OF TUNNEL
 STA. 35+99± to 37+79± AND
 STA. 123+75± to 125+52±



CONCRETE CURB REMOVAL
 NORTH SIDE OF TUNNEL
 STA. 36+90 to 37+79± AND
 STA. 123+75± to 124+45

~~For Information Only:~~
 The amount of concrete to be removed is estimated to be as follows:
 1. Curbs = 200 cy
 2. Slab = 95 cy
 3. Bulkhead = 140 cy
 Approximate Total = 435 cy

□ Represents curb concrete Area to be removed.

| | | | |
|--|------------------|----------|--|
| DIVISION OF HIGHWAYS | | | |
| DETAILS | | | |
| REMOVAL OF STRUCTURES AND OBSTRUCTIONS | | | |
| Designer C. D. H. | Structure F-12-X | | |
| Detailer J. Hoffmeister | Numbers | | |
| Drawing Number B 60 | of 60 | Drawings | |

(R-1) Correct Item Description 7-3-75 T.A.L.

| | | |
|-------------|---------|------|
| NO. REVISED | REVISED | DATE |
| | 6-29-75 | |

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | BIDEST FIG. | TOTAL BUDGET |
|-------------------------|----------|--------------|-------------|--------------|
| VII | COLORADO | 170-3(81)220 | 69 | 273 |

FINAL
 SUMMARY OF TUNNEL DRAINAGE QUANTITIES

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | FINAL |
|-----------|---|----------|--------------------|------------|
| 206 | Structure Excavation | Cu. Yd. | 4,268 | 15,045 |
| 206 | Structure Backfill (Class 2) | Cu. Yd. | 16,975 | 8,443 |
| 206 | Filter Material (Class C) | Cu. Yd. | 968 | 1,156 |
| 211 | 1/4 Inch Drilled Hole | Lin. Ft. | 102,121 | 10,779 |
| 211 | 3 Inch Drilled Hole | Lin. Ft. | 4,960 | 5,448 |
| 211 | Steel Pipe For Grouting | Pound | 100,610 | 12,343 |
| 211 | Sheet Metal For Panning | Pound | 48,000 | 2,980 |
| 304 | Aggregate Base Course (Class 2) (Haul) | Ton | 65,818 | 100,561.94 |
| 604 | Inlet Special | Each | 113 | 113 |
| 604 | Manhole Special | Each | 46 | 46 |
| (R-1) 604 | 6 Inch Ductile Iron Pipe Sewer | Lin. Ft. | 1,354 | 1,575 |
| (R-1) 604 | 12 Inch Ductile Iron Pipe Sewer | Lin. Ft. | 8,985 | 8,885 |
| (R-1) 604 | 2 Inch Plastic Pipe Sewer (Polyethylene) | Lin. Ft. | 94,361 | 95,285 |
| (R-1) 604 | 2 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | 4,184 | 3,628 |
| (R-1) 604 | 4 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | 20,285 | 20,975 |
| (R-1) 604 | 12 Inch Plastic Pipe Sewer (Polyvinyl Chloride) | Lin. Ft. | 17,303 | 17,283 |
| 605 | 4 Inch Perforated Plastic Pipe (Polyvinyl Chloride) | Lin. Ft. | 33,632 | 33,441 |

SUMMARY OF TUNNEL
 DRAINAGE QUANTITIES

AT 6:29 PM
 6-29-79

| | | | | |
|---------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| XX | COLORADO | 170-3(81)220 | 90 | 273 |

FINAL DRAINAGE SYSTEM QUANTITIES

| LOCATION | MANHOLE SPECIAL | | | | | | INLET SPECIAL | | WASTE MAIN | INLET SPECIAL COLLECTOR PIPE | SEEP MAIN | SEEP COLLECTOR & CROSSOVER | CROSSOVER | PERFORATED SEEP COLLECTOR | RADIAL SEEP DRAIN | RADIAL DRAIN COLLECTOR | DRILLED HOLE | SHEET METAL FOR PANNING | FILTER MATERIAL | STRUCTURE EXCAVATION | STRUCTURE BACKFILL | AGGREGATE BASE COURSE |
|--|-----------------|----|----|-----|----|----|---------------|----------------------|-----------------------|------------------------------|--------------------|----------------------------|-------------------|------------------------------|-------------------------|------------------------|--------------------|-------------------------|------------------|----------------------|--------------------|-----------------------|
| | EACH | | | | | | EACH | | LIN. FT. | LIN. FT. | LIN. FT. | LIN. FT. | LIN. FT. | LIN. FT. | POUND | LIN. FT. | LIN. FT. | POUND | CU. YD. | CU. YD. | CU. YD. | TON |
| | I | IA | II | III | IV | V | TYPE S | TYPE T | 12" DUCTILE IRON PIPE | 6" DUCTILE IRON PIPE | ▲ 12" PLASTIC PIPE | ● 4" PLASTIC PIPE | ● 2" PLASTIC PIPE | ● 4" PERFORATED PLASTIC PIPE | STEEL PIPE FOR GROUTING | ● 2" PLASTIC PIPE | 1/4" 3" | 22 GAUGE | CLASS C | | CLASS 2 | CLASS 2 |
| 36+44.99 to 125+18.36 (Varied Spacing) | 28 | I | II | 4 | I | | | | | | | | | | | | | | | | | |
| 36+71.35 to 124+14.85 | | | | | | 83 | 30 | | | | | | | | | | | | | | | |
| 36+46.99 to 125+15.36 | | | | | | | | 8985 8885 | | | | | | | | | | | | | | |
| 36+72.68 to 124+16.18 | | | | | | | | | 1354 1575 | | | | | | | | | | | | | |
| 36+87.50 to 124+37.40(N) | | | | | | | | | | 8759 | | | | | | | | | | | | |
| 39+56.85 to 124+37.40(S) | | | | | | | | | | 8481 | | | | | | | | | | | | |
| Equalizer Pipes | | | | | | | | | | 63 | | | | | | | | | | | | |
| Seep Collectors: | | | | | | | | | | | | | | | | | | | | | | |
| 40+83 to 120+21(N&S Sides) | | | | | | | | | | | 15,876 | | | | | | | | | | | |
| Crossovers: | | | | | | | | | | | | | | | | | | | | | | |
| Non-drift Areas(N&S Sides) | | | | | | | | | | | 700 | | | | | | | | | | | |
| Drift Area(N&S Sides) | | | | | | | | | | | 1,013 | | | | | | | | | | | |
| Risers: | | | | | | | | | | | | | | | | | | | | | | |
| Invert Areas(N&S Sides) | | | | | | | | | | | 2,490 | | | | | | | | | | | |
| Cleanouts(N&S Sides) | | | | | | | | | | | 206 | | | | | | | | | | | |
| 82+54 to 87+62 | | | | | | | | | | | | 4,160 | | | | | | | | | | |
| Drains at Cross-Passageways | | | | | | | | | | | | 24 | | | | | | | | | | |
| Under Roadway: | | | | | | | | | | | | | | | | | | | | | | |
| 35+75 to 125+50(N Side) | | | | | | | | | | | | | 8,896 | | | | | | | | | |
| 35+75 to 125+15.6(S Side) | | | | | | | | | | | | | 8,862 | | | | | | | | | |
| Non-Drift Area: | | | | | | | | | | | | | | | | | | | | | | |
| 40+83 to 82+53(N&S) | | | | | | | | | | | | | | | | | | | | | | |
| Drift Area: | | | | | | | | | | | | | | | | | | | | | | |
| 82+54 to 120+21(N&S) | | | | | | | | | | | | | | | | | | | | | | |
| 40+83 to 82+53 and 87+62 to 120+22 | | | | | | | | | | | | | | | | | | | | | | |
| 40+82 to 82+54 | | | | | | | | | | | | | | | | | | | | | | |
| 82+54 to 87+62 | | | | | | | | | | | | | | | | | | | | | | |
| 87+62 to 109+50 | | | | | | | | | | | | | | | | | | | | | | |
| 109+50 to 120+22 | | | | | | | | | | | | | | | | | | | | | | |
| 40+82 to 82+54 | | | | | | | | | | | | | | | | | | | | | | |
| 87+62 to 109+50 | | | | | | | | | | | | | | | | | | | | | | |
| 109+50 to 120+22 | | | | | | | | | | | | | | | | | | | | | | |
| Panning Area | | | | | | | | | | | | | | | | | | | | | | |
| 61+80 to 65+50 | | | | | | | | | | | | | | | | | | | | | | |
| 69+30 to 73+50 | | | | | | | | | | | | | | | | | | | | | | |
| 80+00 to 109+50 | | | | | | | | | | | | | | | | | | | | | | |
| 116+50 to 120+22 | | | | | | | | | | | | | | | | | | | | | | |
| Panning Areas(as directed) | | | | | | | | | | | | | | | | | | | | | | |
| 40+83 to 120+21 | | | | | | | | | | | | | | | | | | | | | | |
| 35+75 to 125+50 | | | | | | | | | | | | | | | | | | | | | | |
| 35+75 to 125+50 | | | | | | | | | | | | | | | | | | | | | | |
| 41+82 to 120+72 | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | 46 | | | | | | 113 | | 8855 | 1,873 | 17,283 | 25,975 | 3,628 | 33,441 | 128,343 | 96,285 | 106,795 | 2,980 | 1,156 | 13,350 | 8,243 | 100,561.94 |
| | | | | | | | | | 8985 | 1,354 | 17,303 | 20,285 | 4,184 | 33,632 | 100,610 | 94,361 | 102,121 | 49,000 | 1,156 | 4,268 | 10,973 | 65,818 |

▲ PVC } No Pressure Rating Req'd.
 ● PVC }
 ● PE > 100 Psi

DRAINAGE SYSTEM QUANTITIES

SHEET 0-2

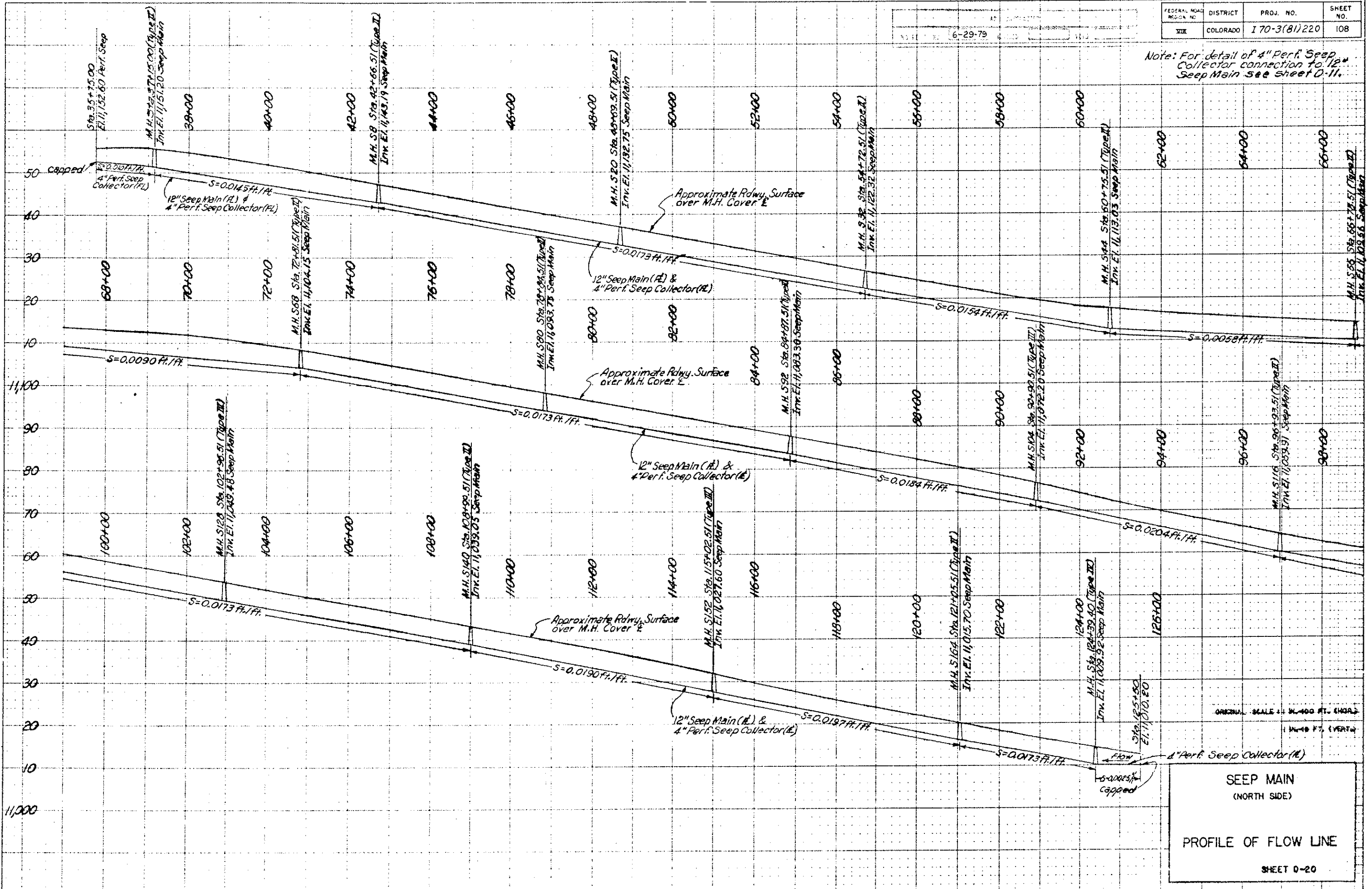
| | | |
|-----------------------|-------------|-----------|
| FEDERAL ROAD DISTRICT | PROJ. NO. | SHEET NO. |
| VII COLORADO | 170-3(8)220 | 108 |

6-29-79

Note: For detail of 4" Perf. Seep Collector connection to 12" Seep Main see sheet 0-11.

| | |
|--------------|----------|
| FINAL SURVEY | DATE |
| NO. 10 | APR 1979 |

| | |
|-----------------|----------|
| ORIGINAL SURVEY | DATE |
| NO. 10 | APR 1979 |

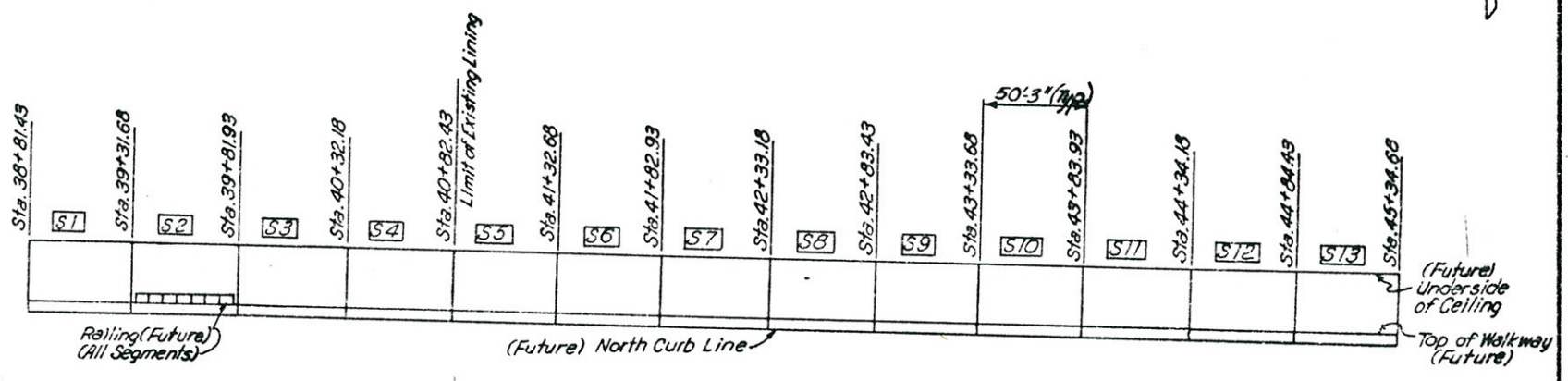


SEEP MAIN
(NORTH SIDE)
PROFILE OF FLOW LINE
SHEET 0-20

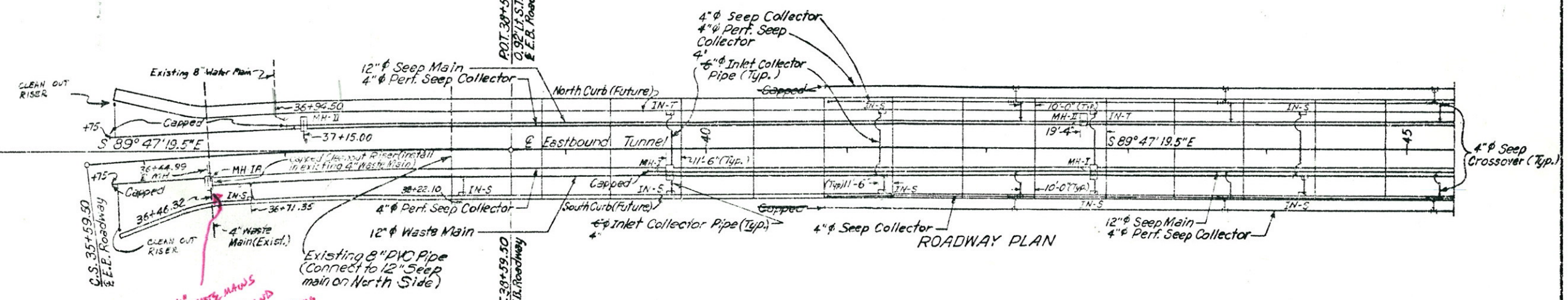
ORIGINAL SCALE 1" = 400 FT. (HORIZ)
1" = 40 FT. (VERT)

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| XIII | COLORADO | I 70-3(81)220 | 100 | 273 |

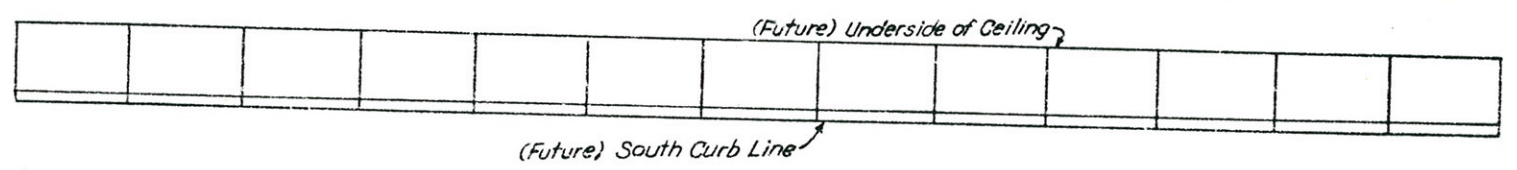
| | | |
|----------------|---------|------|
| AS CONSTRUCTED | | |
| NO REVISIONS | REVISED | VOID |
| | 6-29-79 | |



ELEVATION-NORTH WALL



ROADWAY PLAN



REFLECTED ELEVATION-SOUTH WALL

4" WASTE MAINS FROM CENTER AND SOUTH SECTION REFORMS DUMP INTO MANHOLE 4" SEWER MAIN

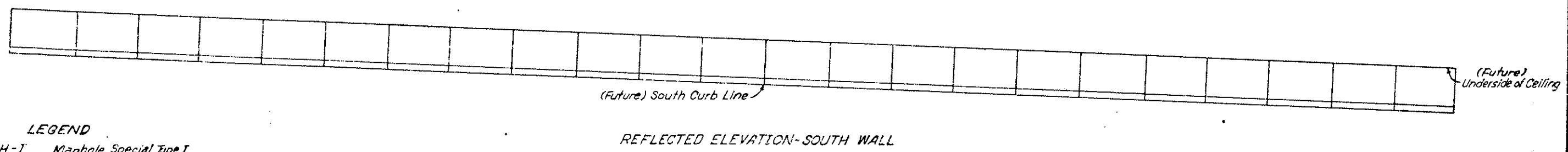
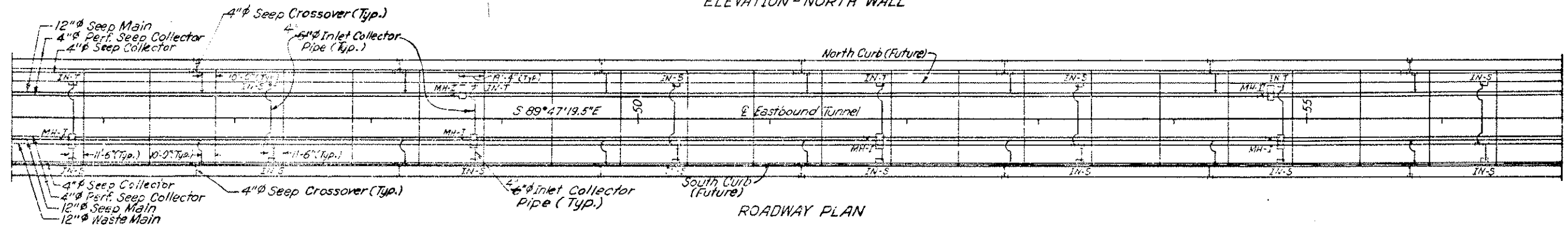
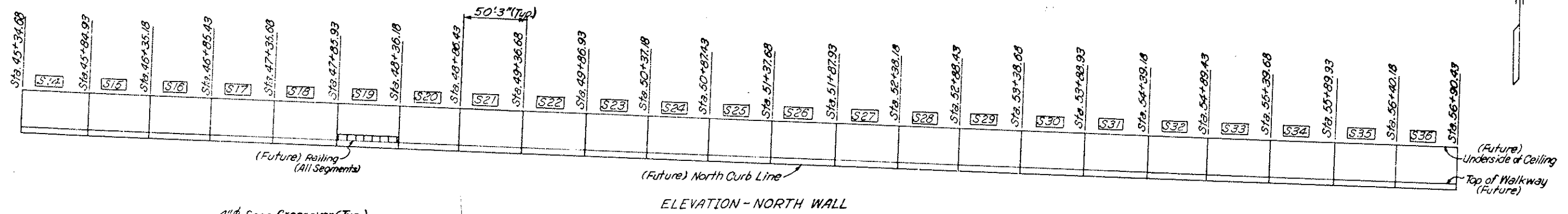
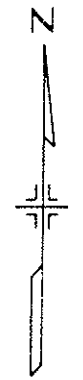
LEGEND

- MH-I Manhole Special Type I
- MH-IA Manhole Special Type IA
- MH-II Manhole Special Type II
- MH-III Manhole Special Type III (Equalizer)
- IN-S Inlet Special Type S
- IN-T Inlet Special Type T
- S-I Segment No. (Length=50'-3") (Typ.)

TUNNEL
GENERAL ARRANGEMENTS
WEST PORTAL TO STA. 45+34.68

| FEDERAL ROAD REGION NO. | DIVISION | PROJ NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | 101 | 273 |

| NO. REVISIONS | REVISED | BY | DATE |
|---------------|---------|----|---------|
| | | | 6-29-79 |

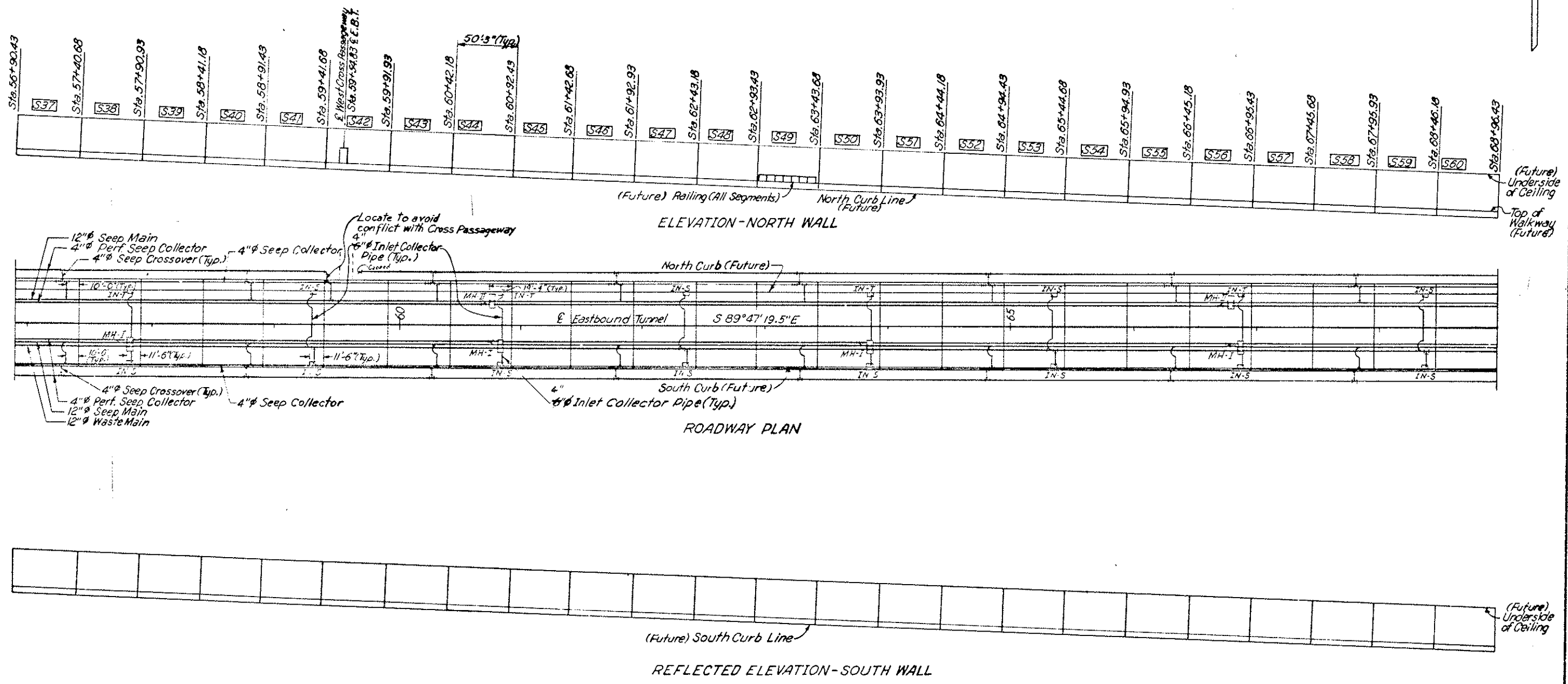


- LEGEND**
- MH-I Manhole Special Type I
 - MH-II Manhole Special Type II
 - MH-III Manhole Special Type III (Equalizer)
 - IN-S Inlet Special Type S
 - IN-T Inlet Special Type T
 - S21 Segment No. (Length = 50'-3") (Typ.)

TUNNEL
GENERAL ARRANGEMENTS
STA. 45+34.68 TO STA. 56+90.43

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | 102 | 273 |

DATE: 6-29-79
 DRAWN BY: [Signature]



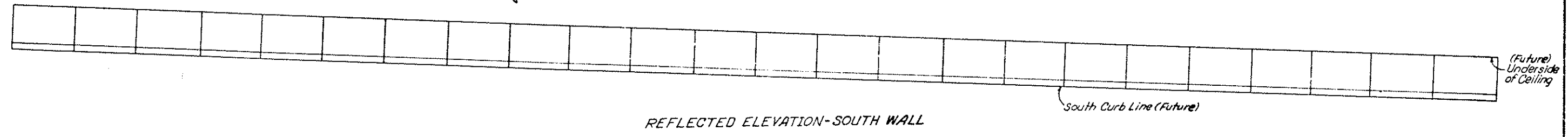
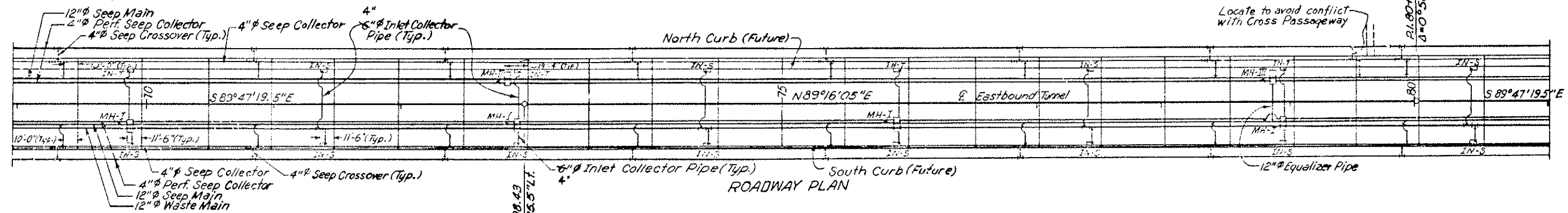
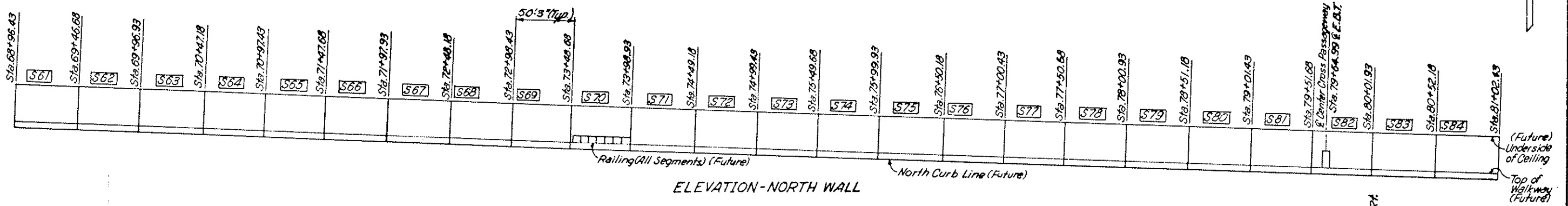
LEGEND

- MH-I Manhole Special Type I
- MH-II Manhole Special Type II
- MH-III Manhole Special Type III (Squalizer)
- IN-S Inlet Special Type S
- IN-T Inlet Special Type T
- S37 Segment No. (Length = 50' 3") (Typ.)

TUNNEL
GENERAL ARRANGEMENTS
 STA. 56+90.43 TO STA. 68+96.43

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XIII | COLORADO | I 70-3(81)220 | 103 | 273 |

| AS CORRECTED | |
|--------------|-----------------|
| NO REVISIONS | REVISED 6-29-79 |

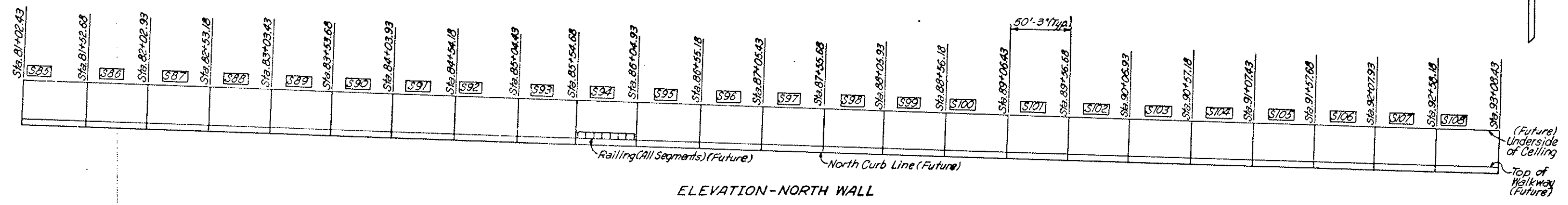


- LEGEND**
- MH-I Manhole Special Type I
 - MH-II Manhole Special Type II
 - MH-III Manhole Special Type III (Equalizer)
 - IN-S Inlet Special Type S
 - IN-T Inlet Special Type T
 - S61 Segment No. (Length = 50'-3") (Typ.)

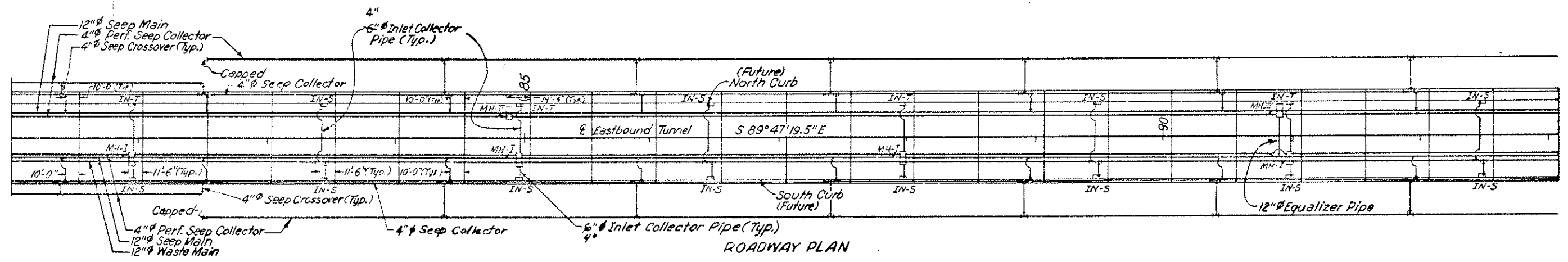
TUNNEL
GENERAL ARRANGEMENTS
STA. 68+96.43 TO STA. 81+02.43

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XIII | COLORADO | I 70-3(81)220 | 104 | 273 |

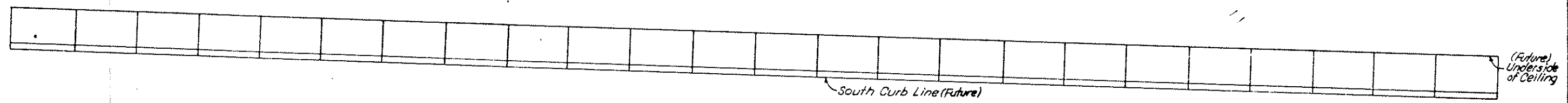
| NO. REVISIONS | REVISION | DATE |
|---------------|----------|---------|
| 1 | REVISED | 6-29-79 |



ELEVATION-NORTH WALL



ROADWAY PLAN



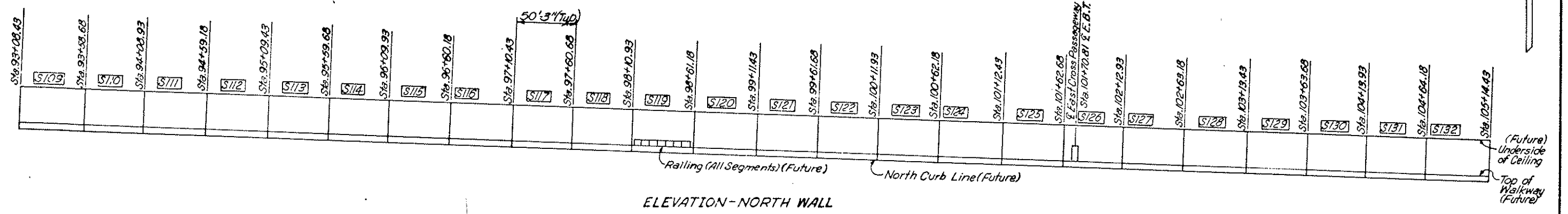
REFLECTED ELEVATION-SOUTH WALL

- LEGEND**
- MH-I Manhole Special Type I
 - MH-II Manhole Special Type II
 - MH-III Manhole Special Type III (Equalizer)
 - IN-S Inlet Special Type S
 - IN-T Inlet Special Type T
 - S85 Segment No. (Length = 50'-3") (Typ.)

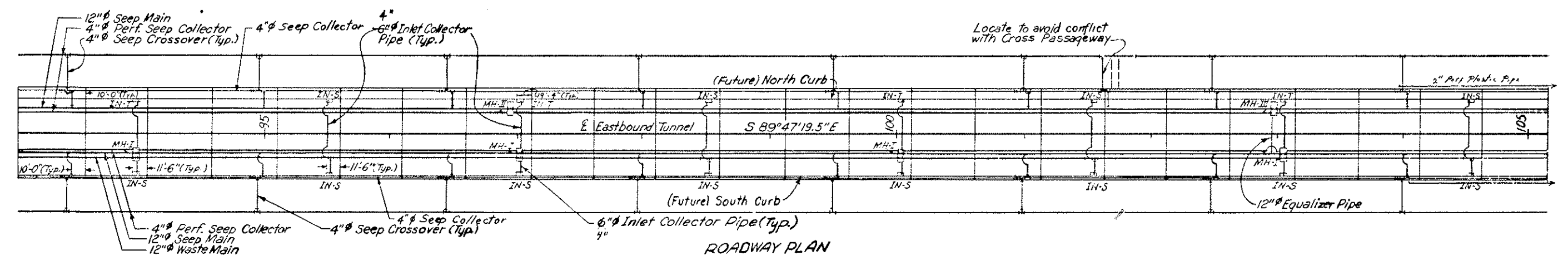
TUNNEL
GENERAL ARRANGEMENTS
STA. 81+02.43 TO STA. 93+08.43

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | 105 | 273 |

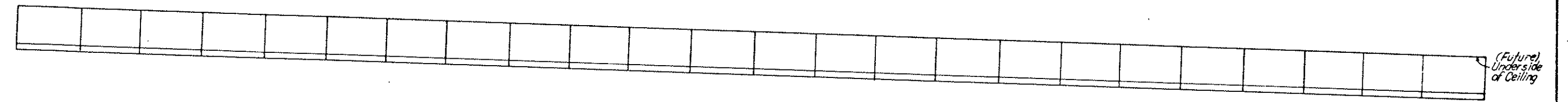
DATE: 6-29-79



ELEVATION-NORTH WALL



ROADWAY PLAN



REFLECTED ELEVATION-SOUTH WALL

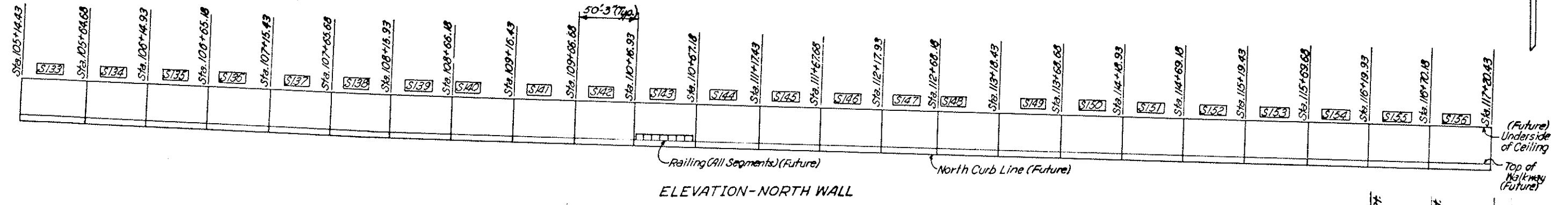
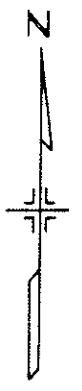
LEGEND

- MH-I Manhole Special (Type I)
- MH-II Manhole Special (Type II)
- MH-III Manhole Special (Type III) (Equalizer)
- IN-S Inlet Special Type S
- IN-T Inlet Special Type T
- S109 Segment No. (Length = 50'-3") (Typ.)

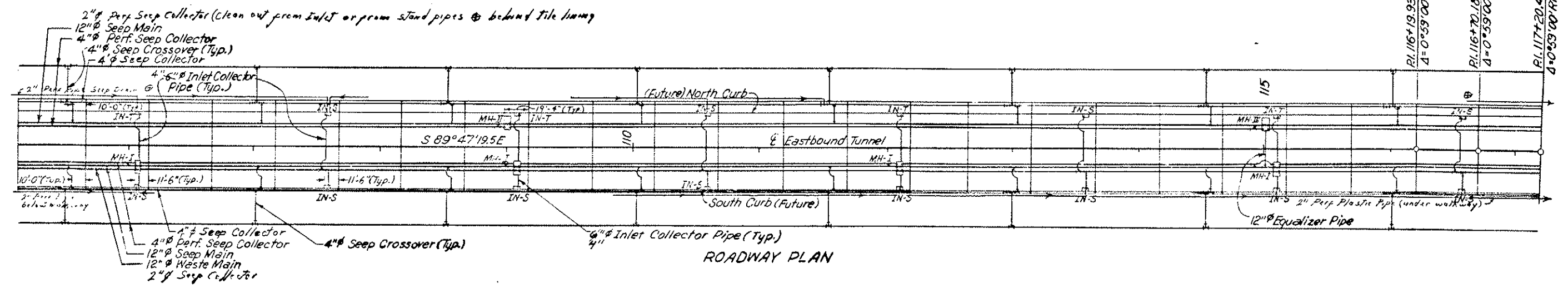
TUNNEL
GENERAL ARRANGEMENTS
 STA. 93+08.43 TO STA. 105+14.43

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | 106 | 273 |

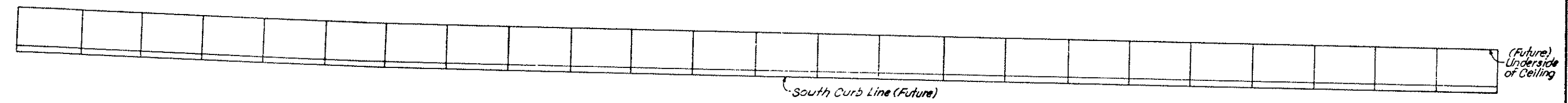
REVISED 6-29-79



ELEVATION-NORTH WALL



ROADWAY PLAN



REFLECTED ELEVATION-SOUTH WALL

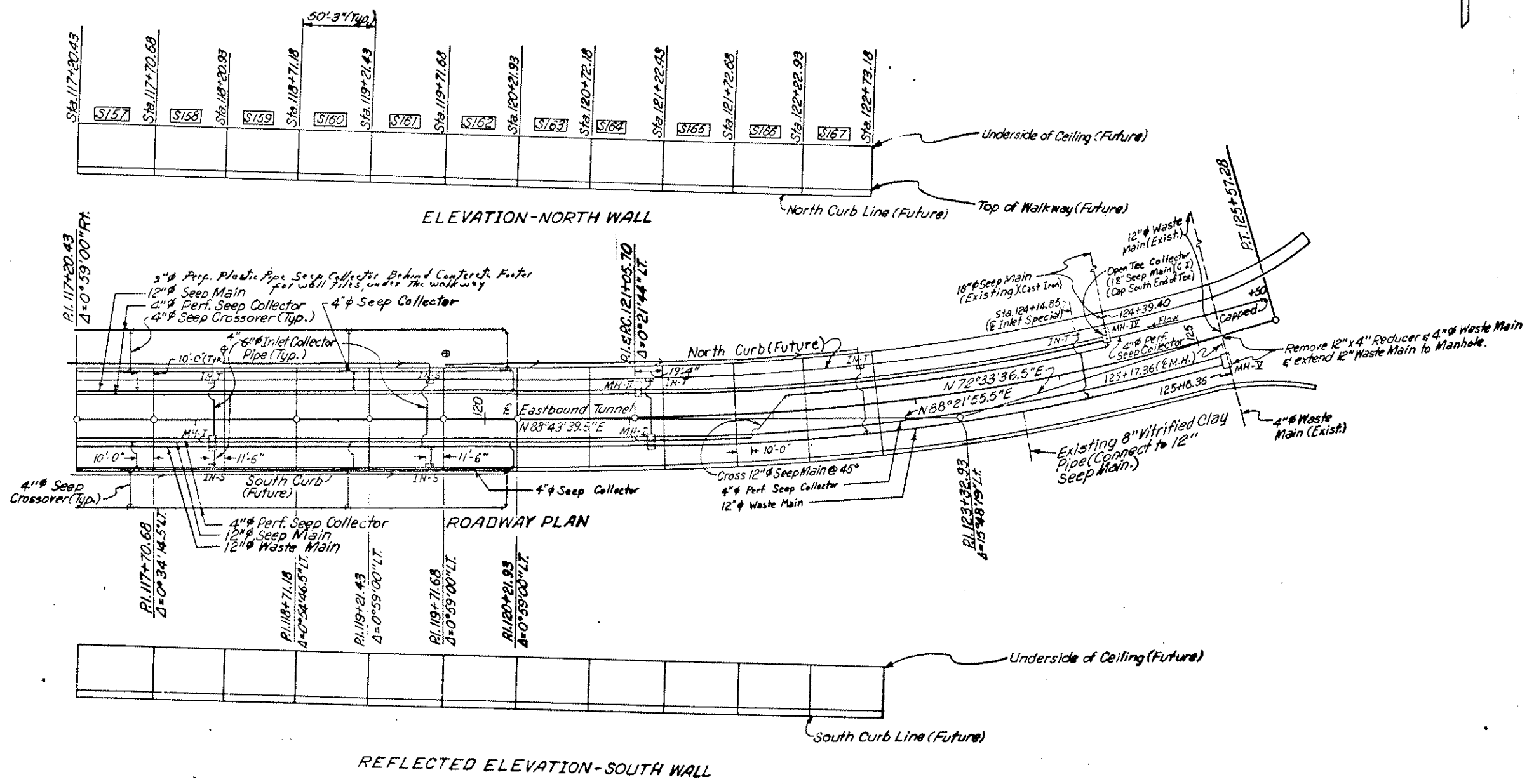
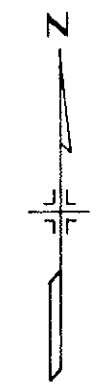
LEGEND

- MH-I Manhole Special (Type I)
- MH-II Manhole Special (Type II)
- MH-III Manhole Special (Type III) (Equalizer)
- IN-S Inlet Special Type S
- IN-T Inlet Special Type T
- S133 Segment No. (Length=50'-3") (Typ.)

TUNNEL
GENERAL ARRANGEMENTS
STA. 105+14.43 TO STA. 117+20.43

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VIII | COLORADO | I 70-3(81)220 | 107 | 273 |

| | | |
|-------------|---------|----|
| NO. REVISED | DATE | BY |
| | 6-29-79 | |



LEGEND

- MH-I Manhole Special (Type I)
- MH-II Manhole Special (Type II)
- MH-III Manhole Special (Type III) (Equalizer)
- MH-IV Manhole Special (Type IV)
- MH-V Manhole Special (Type V)
- IN-S Inlet Special Type S
- IN-T Inlet Special Type T
- S157 Segment No. (Length=50'-3") (Typ.)

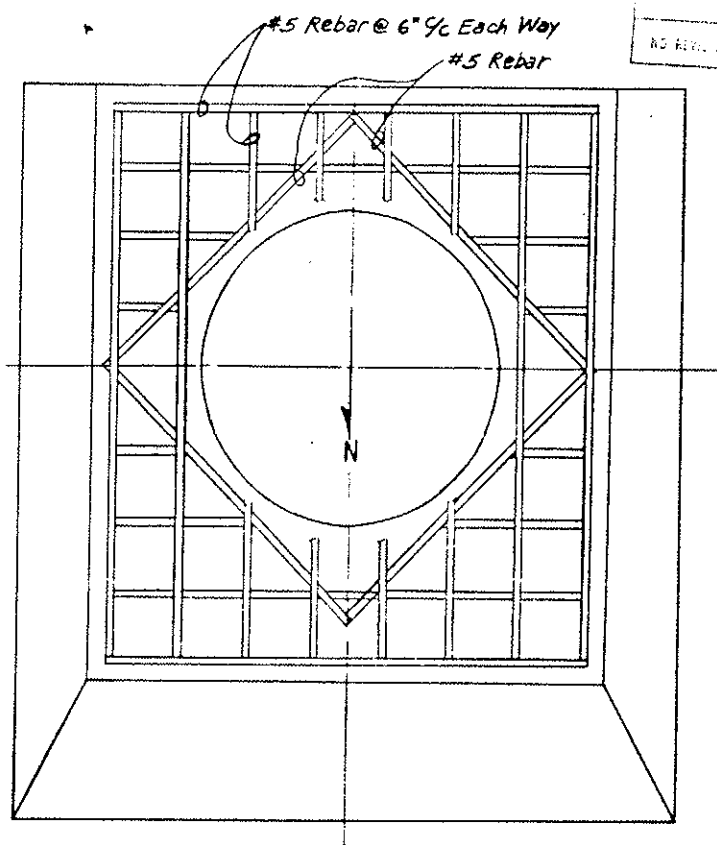
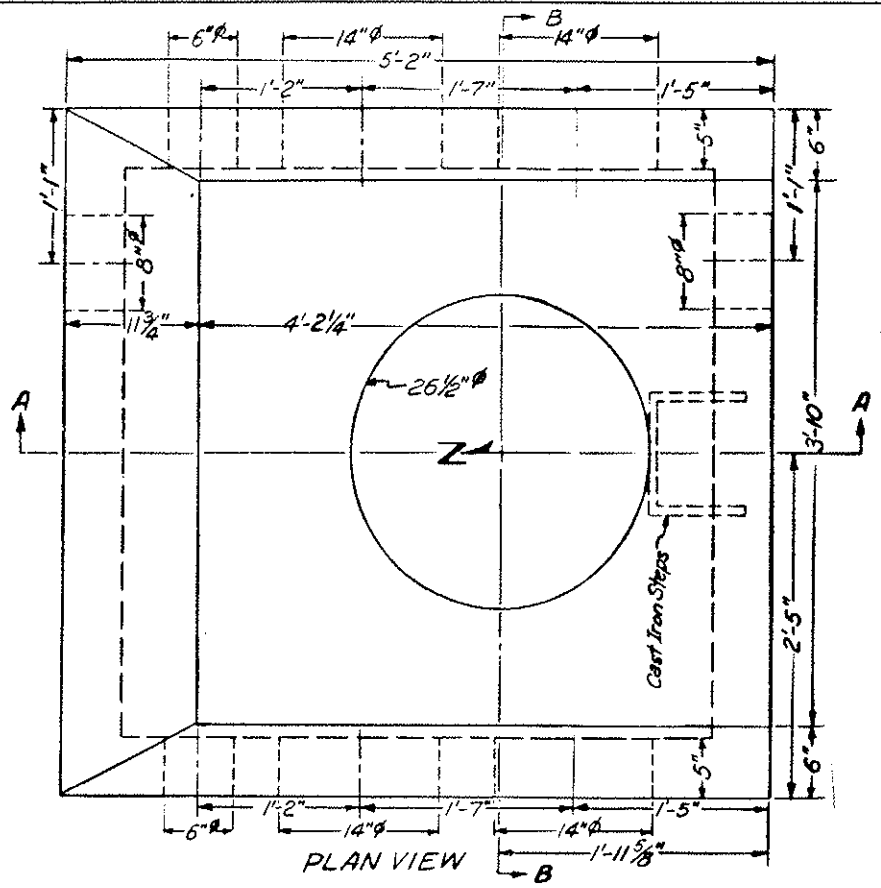
TUNNEL
GENERAL ARRANGEMENTS
STA. 117+20.43 TO EAST PORTAL

DETAILS OF MANHOLE SPECIAL (TYPE I)

| | | | | |
|-------------------------|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| 5E | COLORADO | I70-3(31)220 | 110 | 273 |

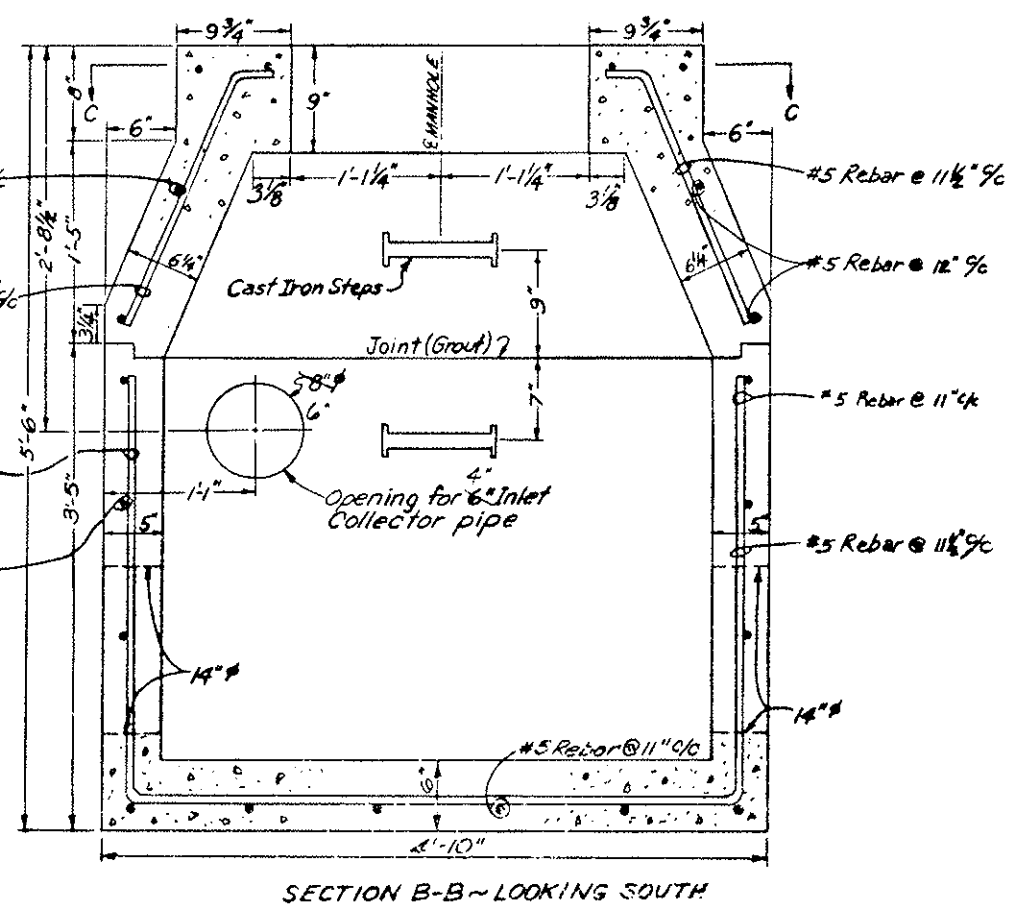
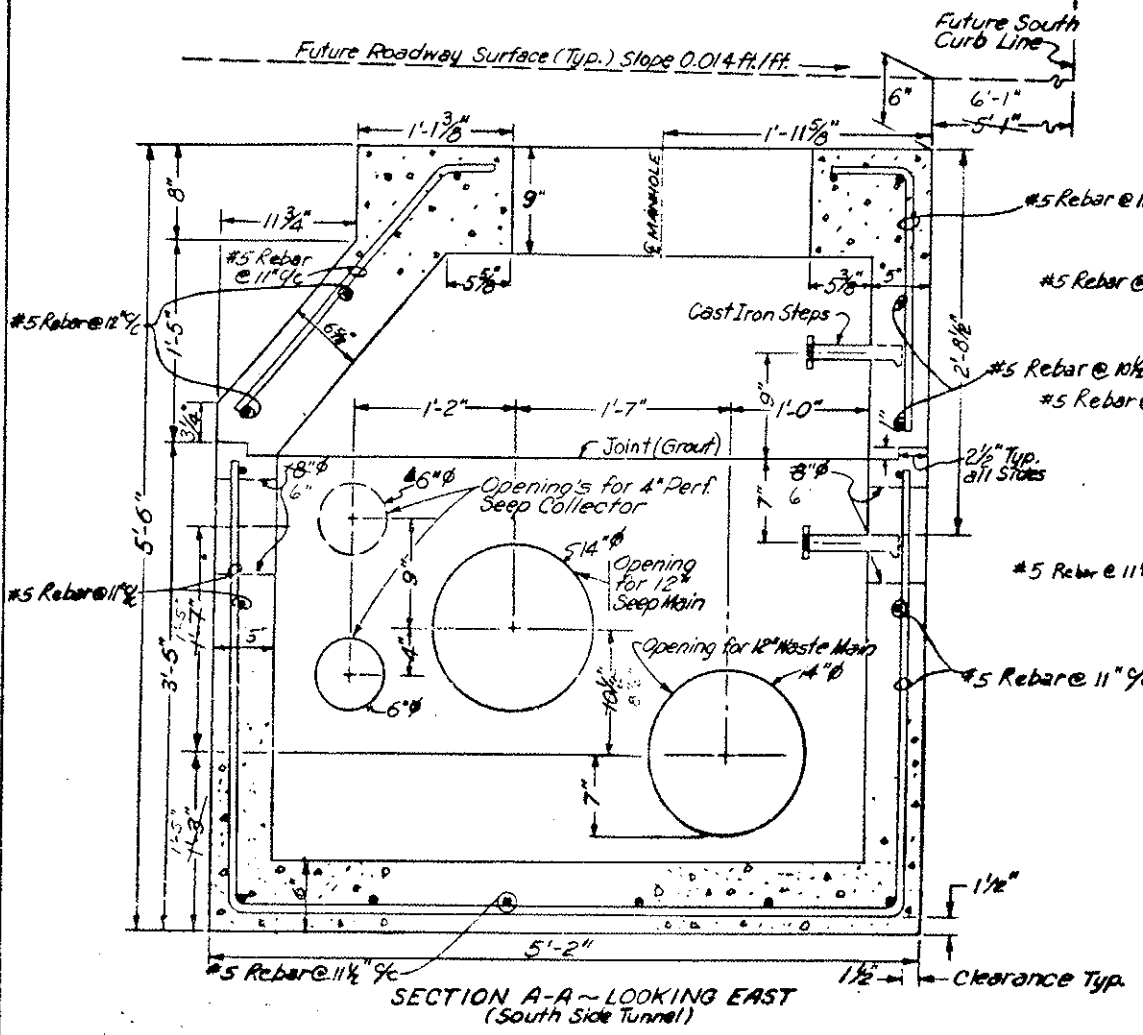
AS CONSTRUCTED
 NO REVISIONS
 REVISED 6-29-79

NOTE:
 ▲ This hole is located on West Wall of Manhole (See Plan View) and is shown here for information only. (SECTION A-A)
 ∅ Indicates circular hole.



Locations of Manhole Special (Type I) (South Side Tunnel)

| SEGMENT # | STATION |
|-----------|-----------|
| 2 | 39+72.85 |
| 8 | 42+74.36 |
| 14 | 45+75.85 |
| 20 | 48+77.35 |
| 26 | 51+78.85 |
| 32 | 54+80.35 |
| 38 | 57+81.85 |
| 44 | 60+83.35 |
| 50 | 63+84.85 |
| 56 | 66+86.35 |
| 62 | 69+87.85 |
| 68 | 72+89.35 |
| 74 | 75+90.85 |
| 80 | 78+92.35 |
| 86 | 81+93.85 |
| 92 | 84+95.35 |
| 98 | 87+96.85 |
| 104 | 90+98.35 |
| 110 | 93+99.85 |
| 116 | 97+01.35 |
| 122 | 100+02.85 |
| 128 | 103+04.35 |
| 134 | 106+05.85 |
| 140 | 109+07.35 |
| 146 | 112+08.85 |
| 152 | 115+10.35 |
| 158 | 118+11.85 |
| 164 | 121+13.35 |



GENERAL NOTES

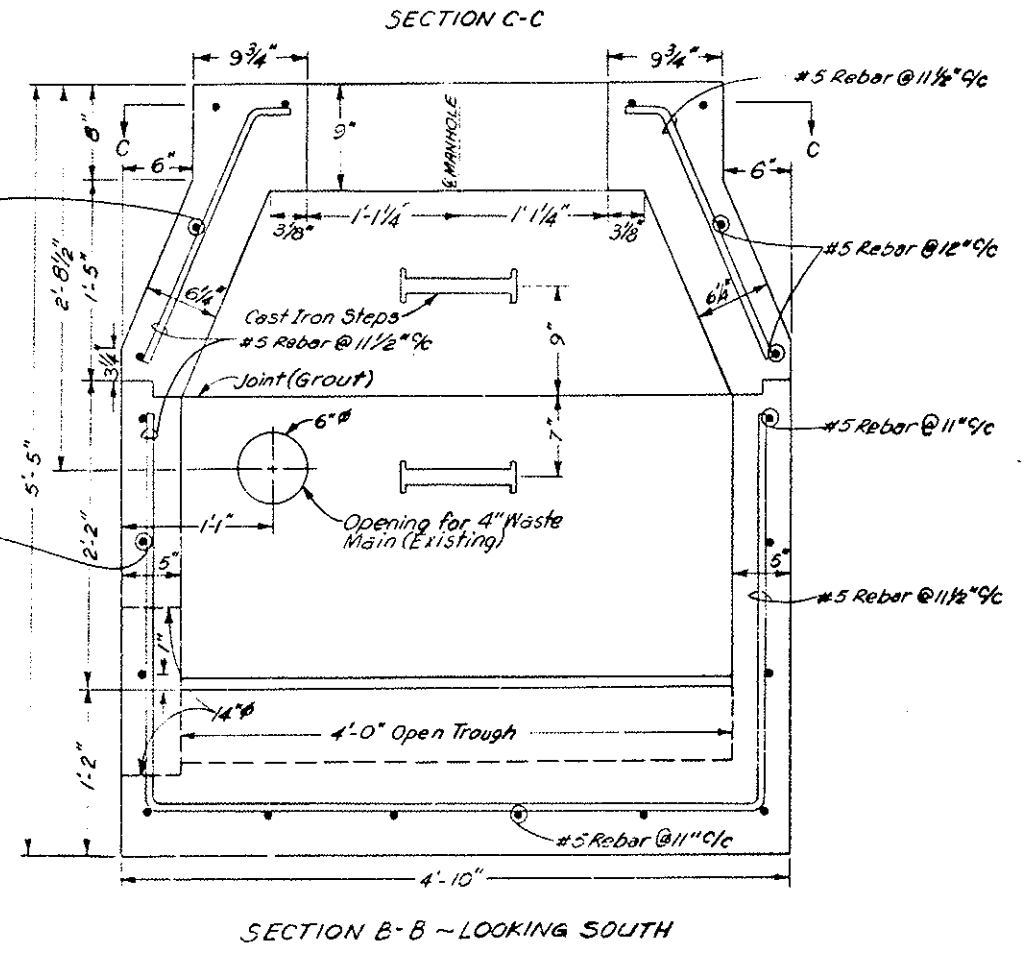
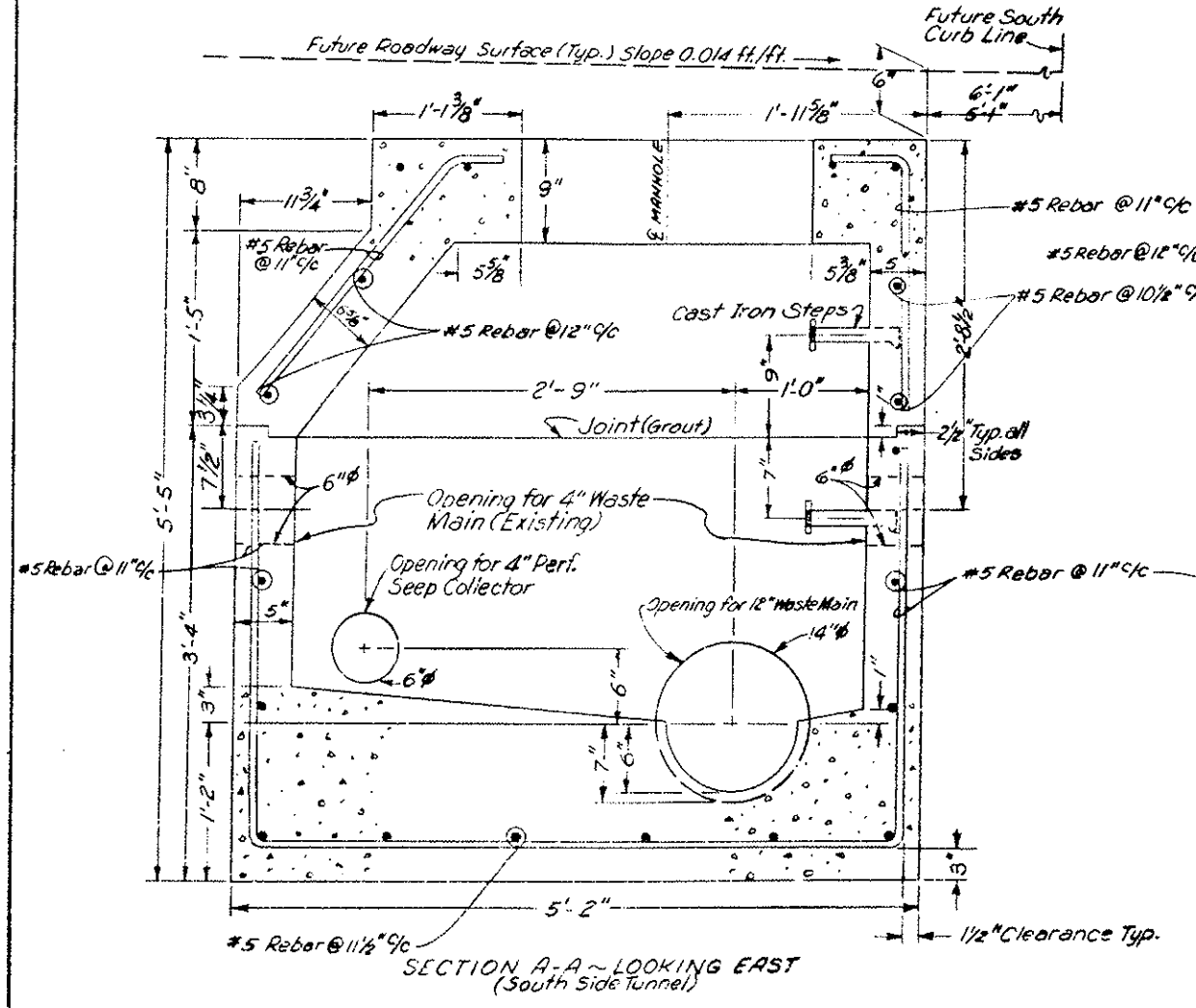
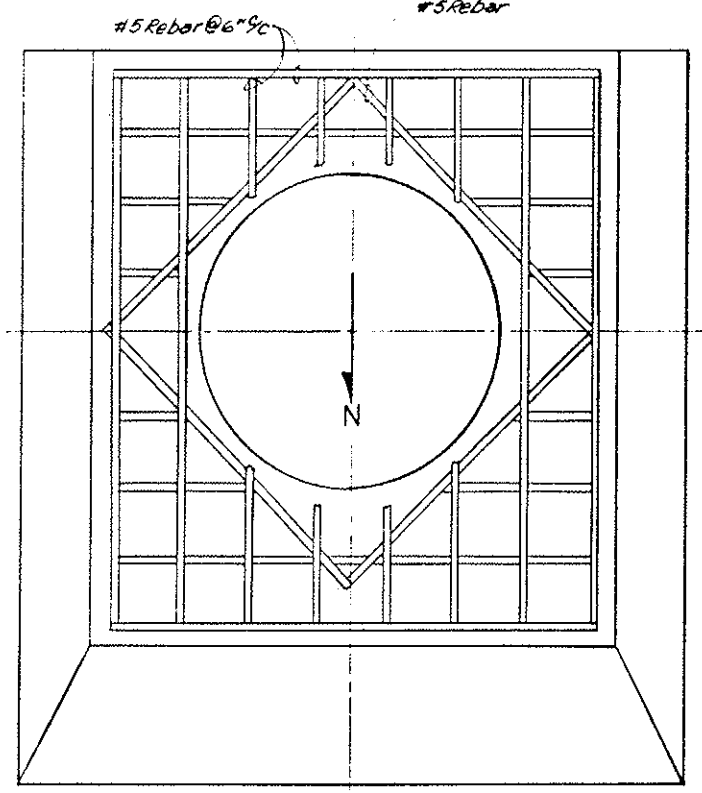
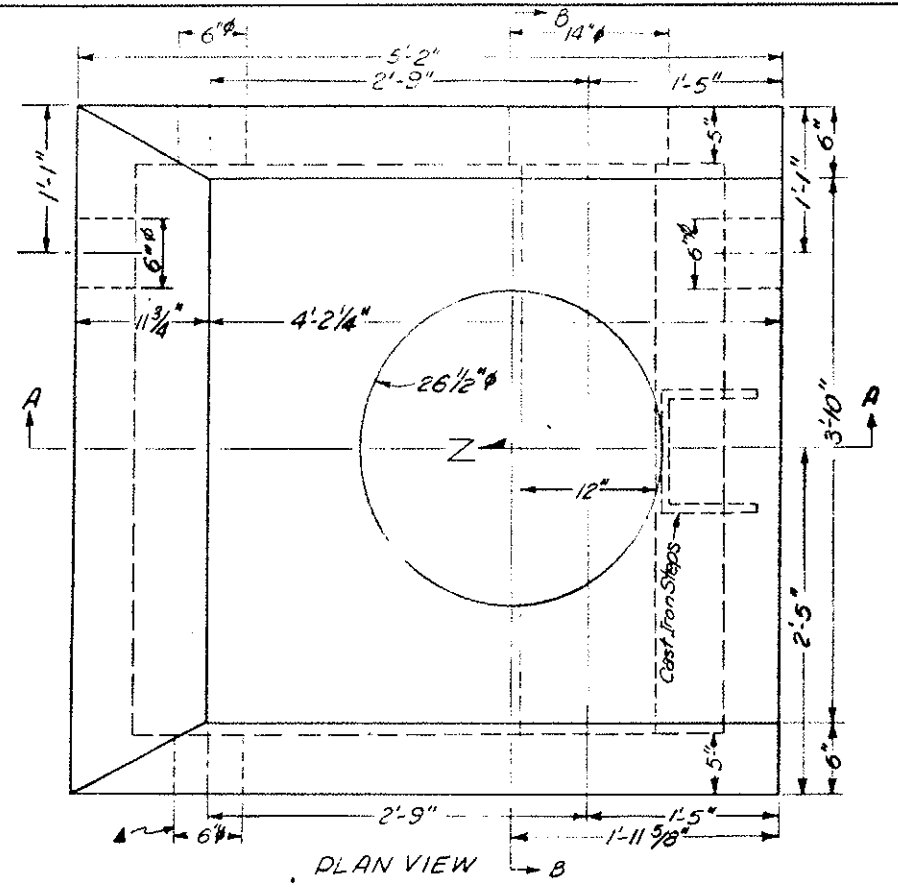
For detail of Cast Iron Steps see Standard M-604-D
 Grout around pipes at Manhole Specials.
 Precast Manholes shall conform to ASTM Designation C478.
 Cast in place Manholes shall be Class A, B or D Concrete.
 The Contractor shall make the approved adjustments, that are necessary to assure that the surfaces of the Concrete invert strut, do not interfere with the proper location, of Manholes. Any work, that is required to achieve the approved adjustments will not be paid for separately, but shall be included in the work.

DETAILS OF MANHOLE SPECIAL (TYPE IA) (Sta. 36+44.99 South Side)

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|---------------|-----------|--------------|
| VIII | COLORADO | I 70-3(81)220 | III | 273 |

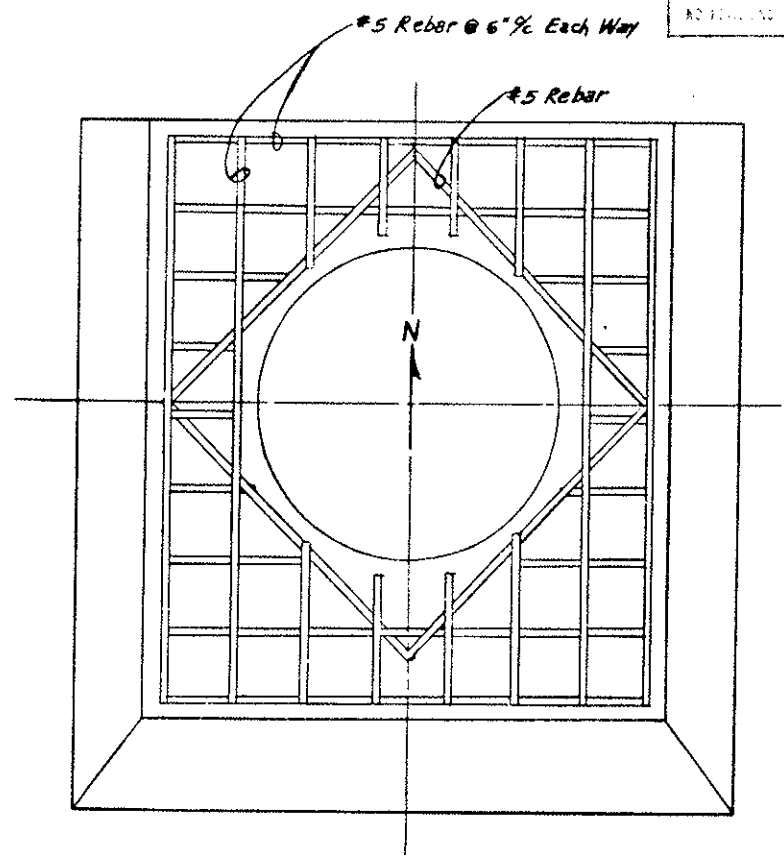
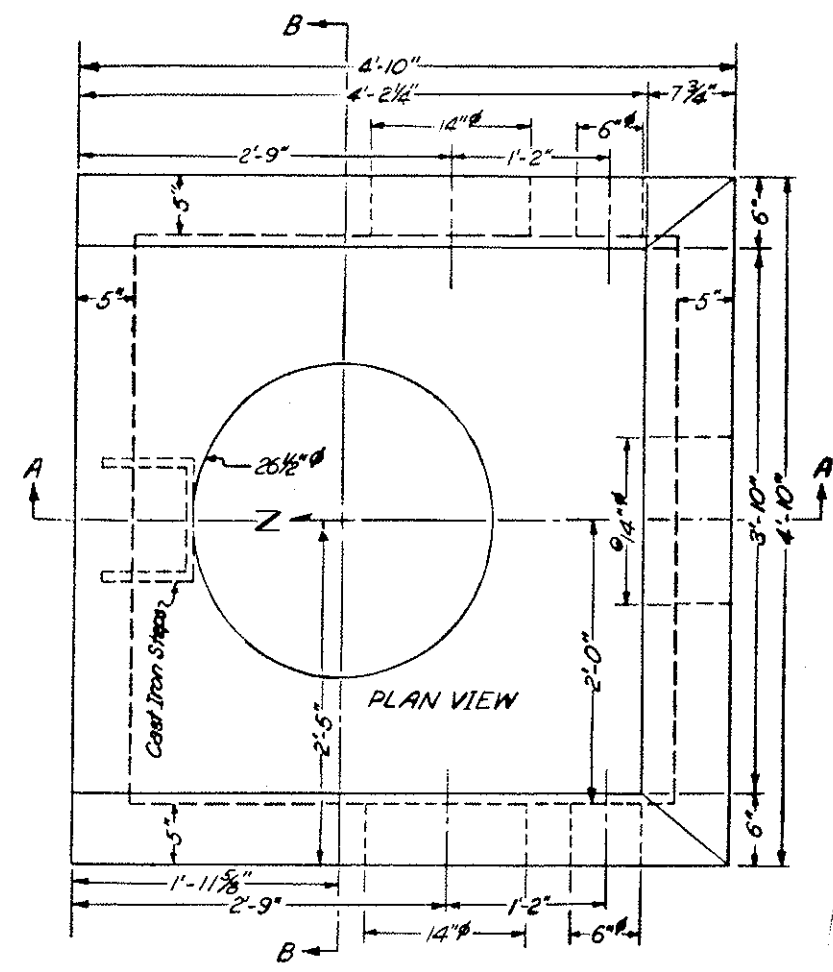
Notes:
 ▲ This hole same elevation as 6" hole on east side. See Section A-A for placement.
 ⌀ Indicates circular hole.

| AS CONSTRUCTED | |
|----------------|-----------------|
| NO REVISIONS | REVISED 6-29-72 |



DETAILS OF MANHOLE SPECIAL (TYPE II & III)

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XX | COLORADO | 170-3(81) 220 | 112 | 273 |

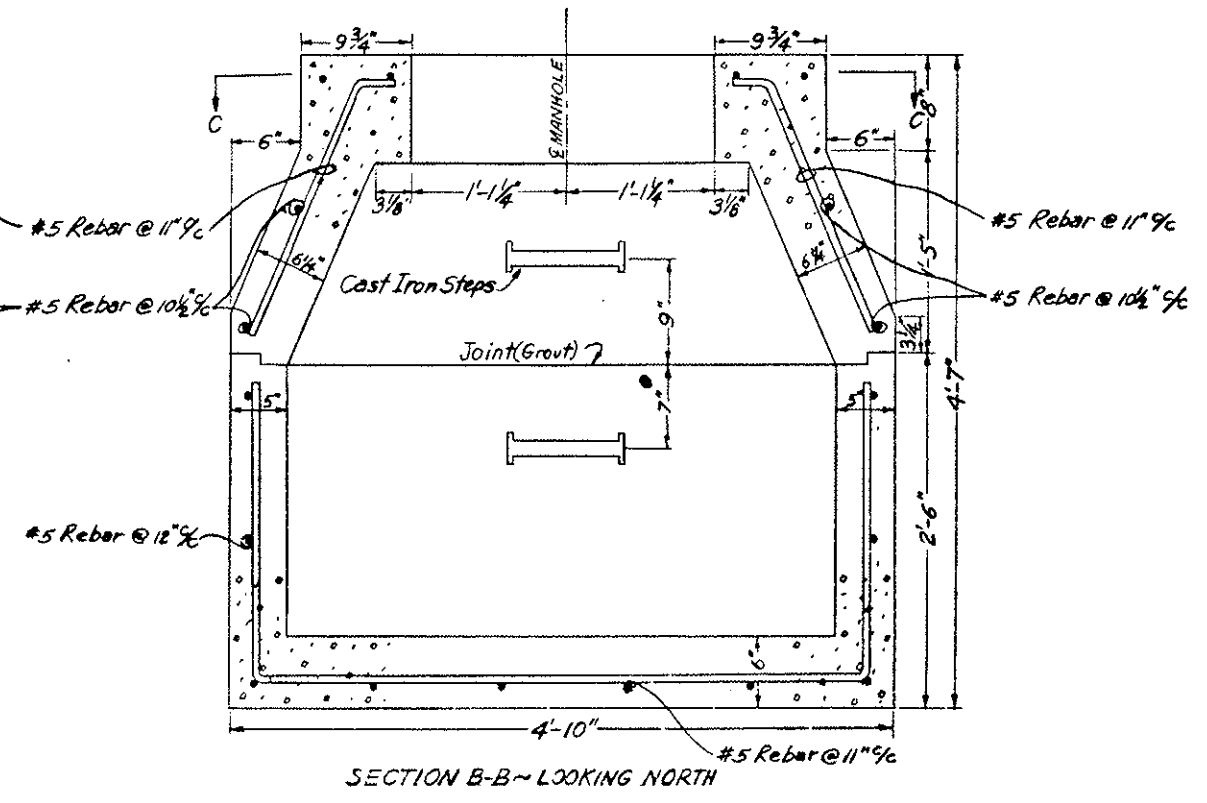
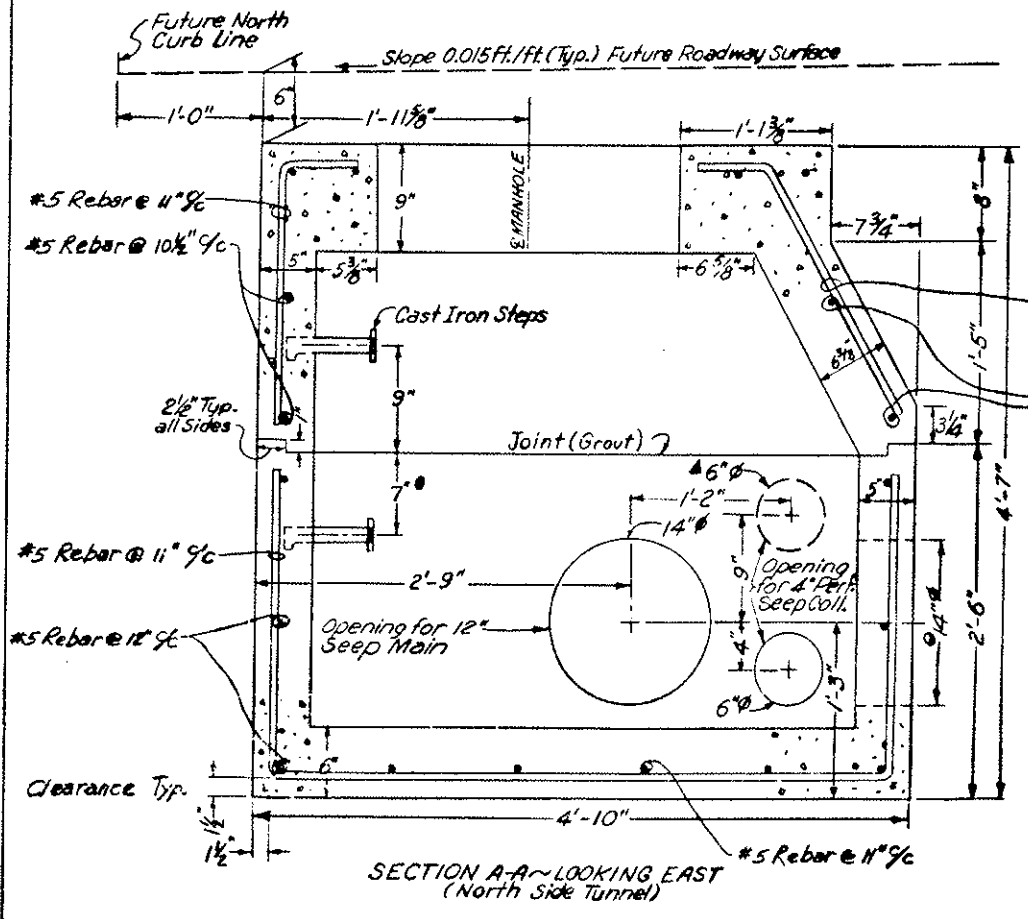


AS SHOWN IN
 REVISIONS 16-29-79

- NOTES:**
- ▲ This hole is located on West Wall of Manhole (See Plan View) and is shown here for information only. (SECTION A-A)
 - Opening in Manhole Special (Type III) only. (Segments 80, 104, 128 and 152)
 - Delete this step in Manhole Special (Type III) (Segments 80, 104, 128 and 152)
 - ⊙ Indicates circular hole.

Locations of Manhole Special (Type II & III) (North Side Tunnel)

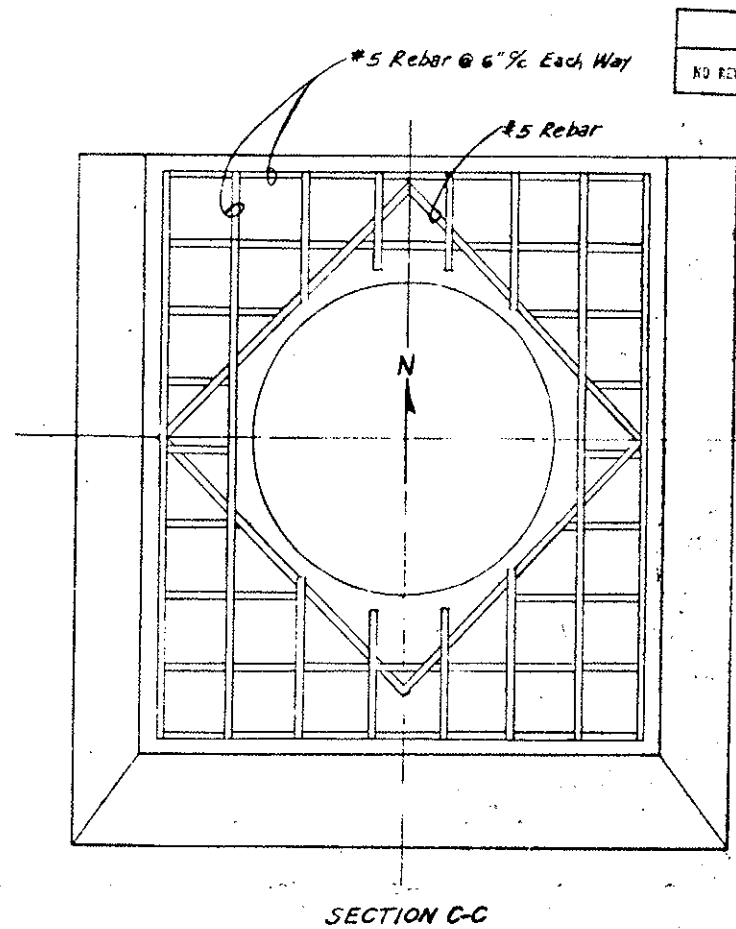
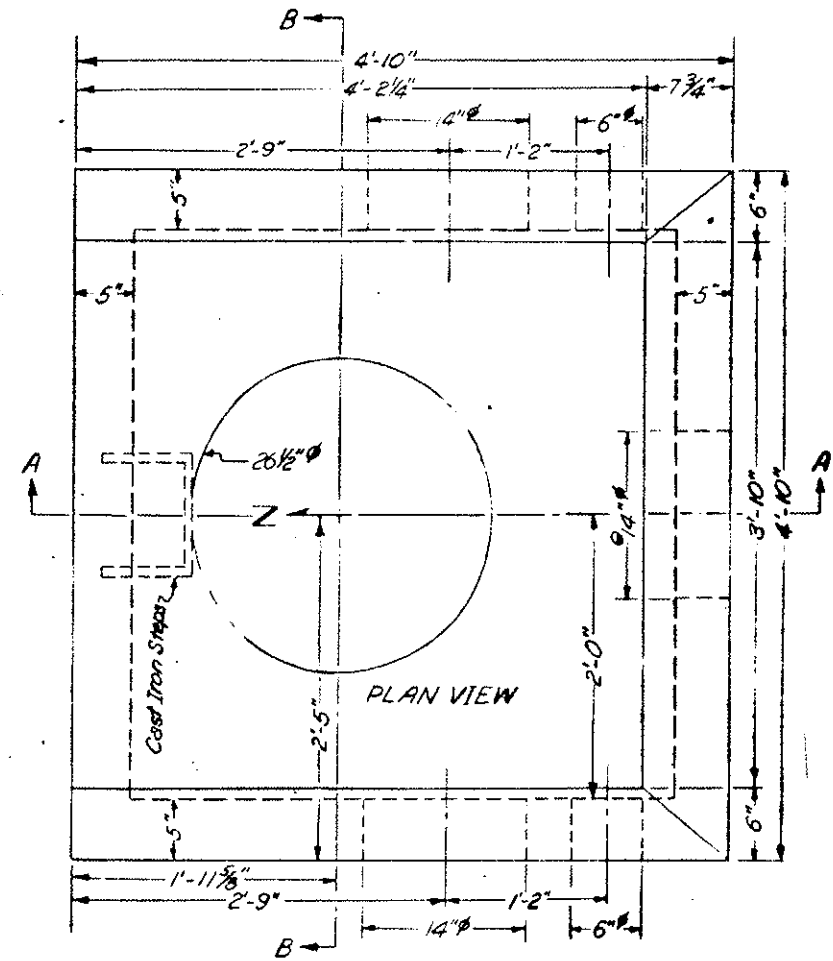
| Type II | | Type III | |
|-----------|-----------|-----------|-----------|
| SEGMENT # | STATION | SEGMENT # | STATION |
| — | 37+15.00 | 80 | 78+84.51 |
| B | 42+66.51 | 104 | 90+90.51 |
| 20 | 48+69.51 | 128 | 102+96.51 |
| 32 | 54+72.51 | 152 | 115+02.51 |
| 44 | 60+75.51 | | |
| 56 | 66+78.51 | | |
| 68 | 72+81.51 | | |
| 92 | 84+87.51 | | |
| 116 | 96+93.51 | | |
| 140 | 108+99.51 | | |
| 164 | 121+05.51 | | |



MANHOLE SPECIAL TYPE II & III
 DETAILS

DETAILS OF MANHOLE SPECIAL (TYPE IIA & IIIA)

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| XX | COLORADO | 170-3(61) 220 | 112Ax | 273 |



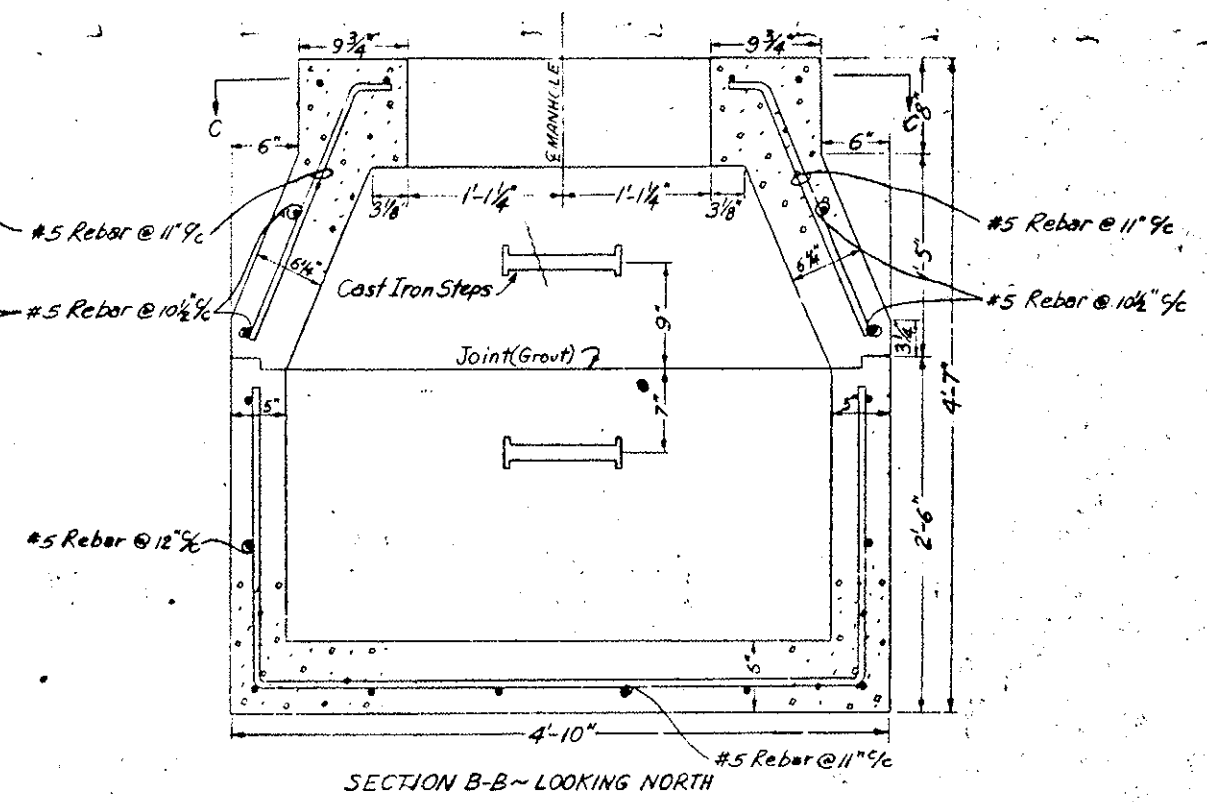
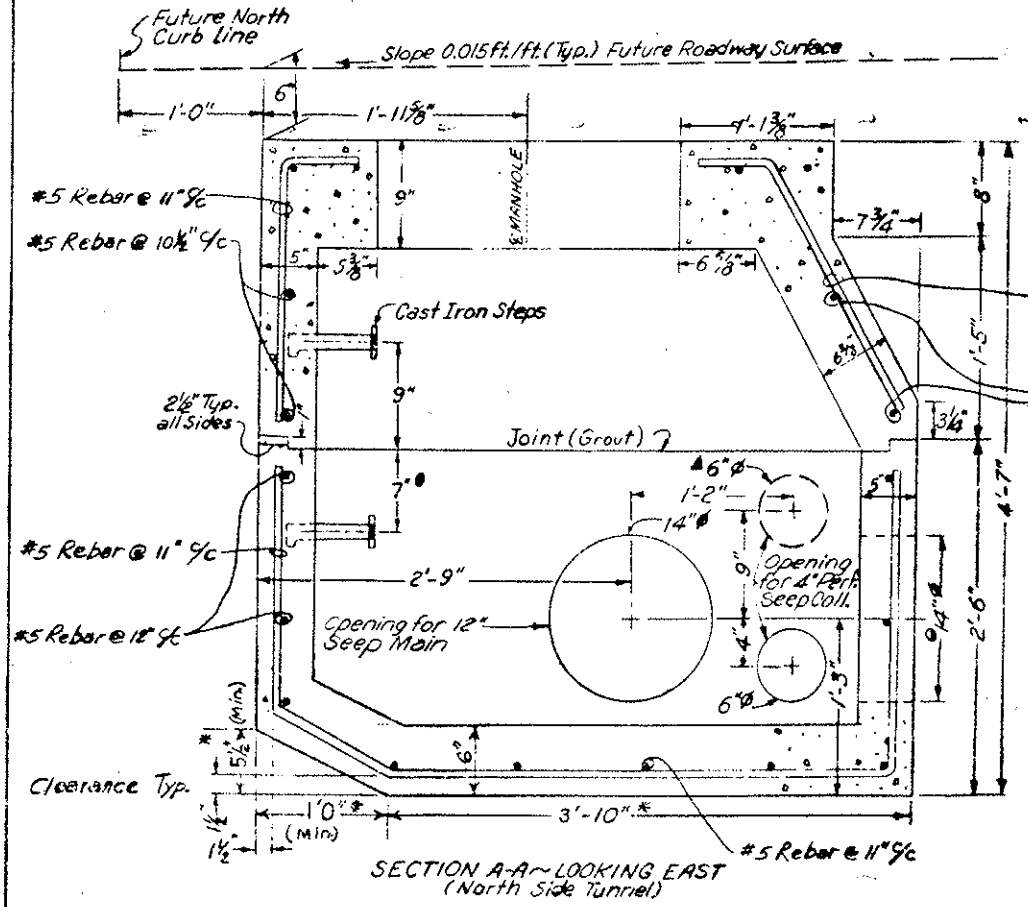
| | | | |
|----------------|--------------|---------|------|
| AS CONSTRUCTED | NO REVISIONS | REVISED | VOID |
| | | 6-29-79 | |

- NOTES:
- ▲ This hole is located on West Wall of Manhole (See Plan View) and is shown here for information only. (SECTION A-A)
 - ⊙ Opening in Manhole Special (Type IIIA) only. (Segments 104 and 12B)
 - ⊙ Delete this step in Manhole Special (Type IIIA) (Segments 104 and 12B)
 - ⊙ Indicates circular hole.

⊙ Locations of Manhole Special (Type IIA & IIIA) (NORTH SIDE TUNNEL)
 Type IIA
 Type IIIA

| ⊙ SEGMENT # | STATION |
|-------------|-----------|
| | 92+87.51 |
| | 96+93.51 |
| | 102+96.51 |
| | 108+99.51 |

| ⊙ SEGMENT # | STATION |
|-------------|-----------|
| 104 | 90+96.51 |
| 12B | 102+96.51 |

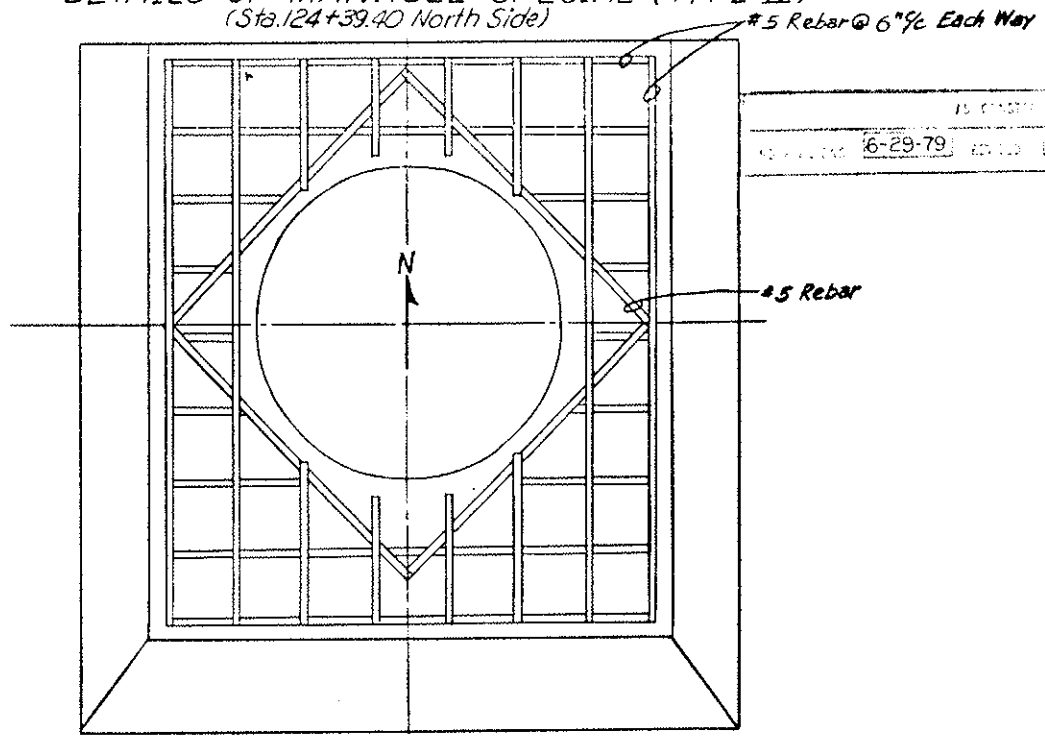
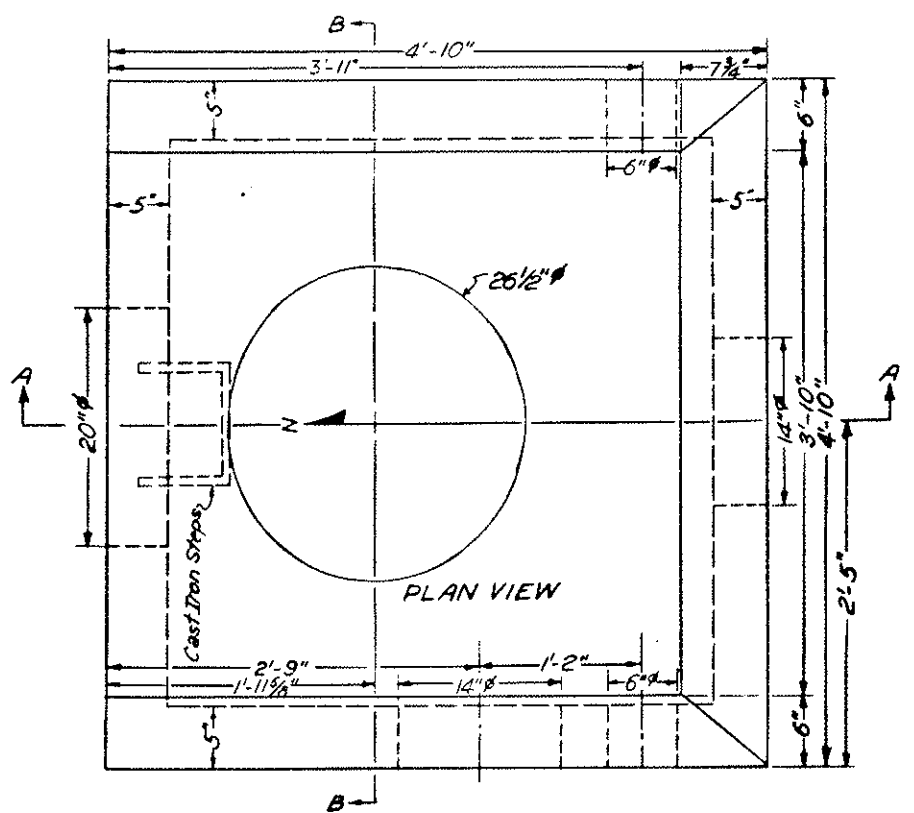


⊙ * These dimensions will clear invert if invert concrete is at or below Plan elevation.

Revised 3-31-77 AS
 MANHOLE SPECIAL TYPE IIA & IIIA
 DETAILS
 NO SCALE SHEET D-24A

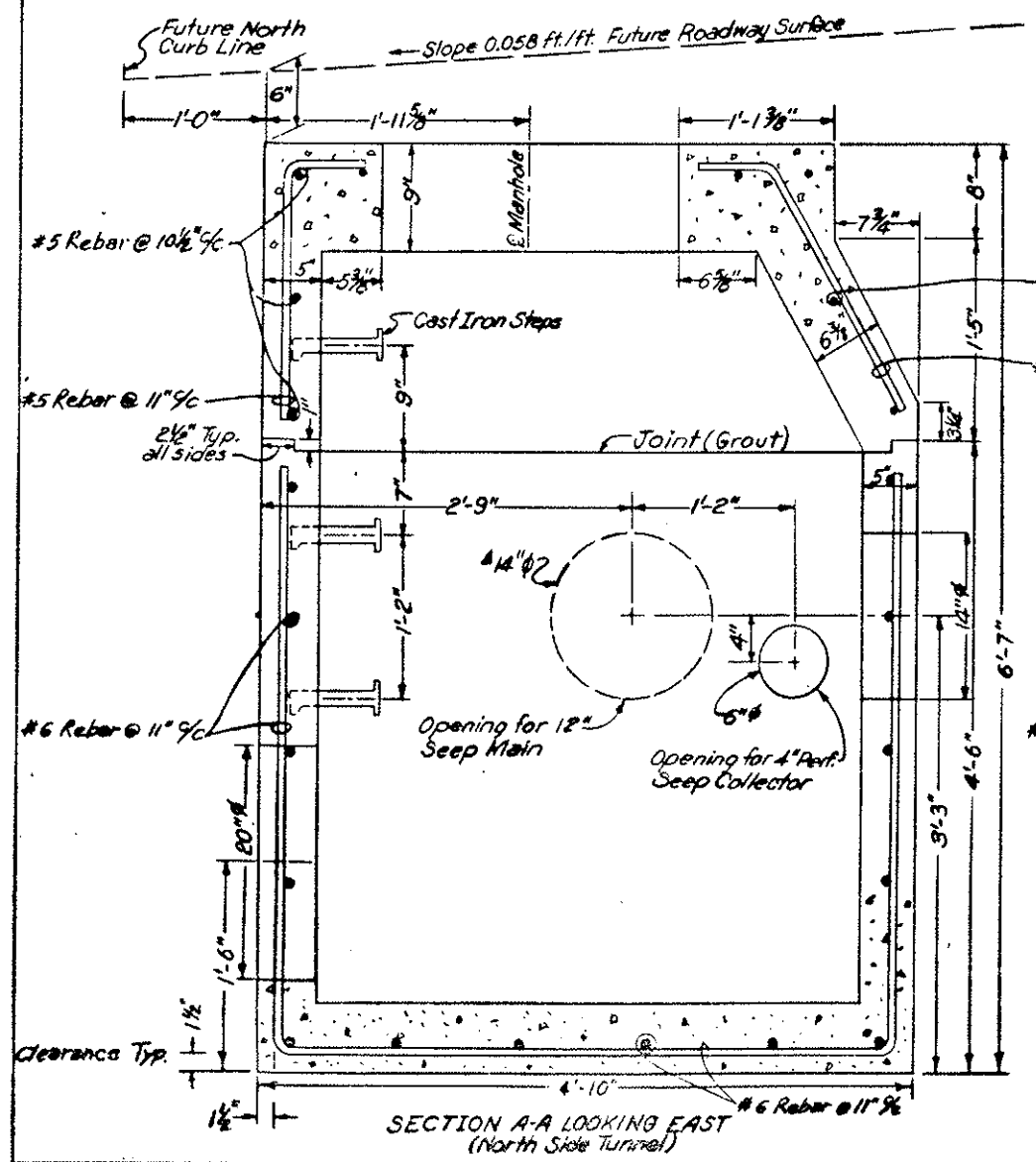
DETAILS OF MANHOLE SPECIAL (TYPE IV)
 (Sta. 124+39.40 North Side)

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VII | COLORADO | I70-3(81)220 | 113 | 273 |

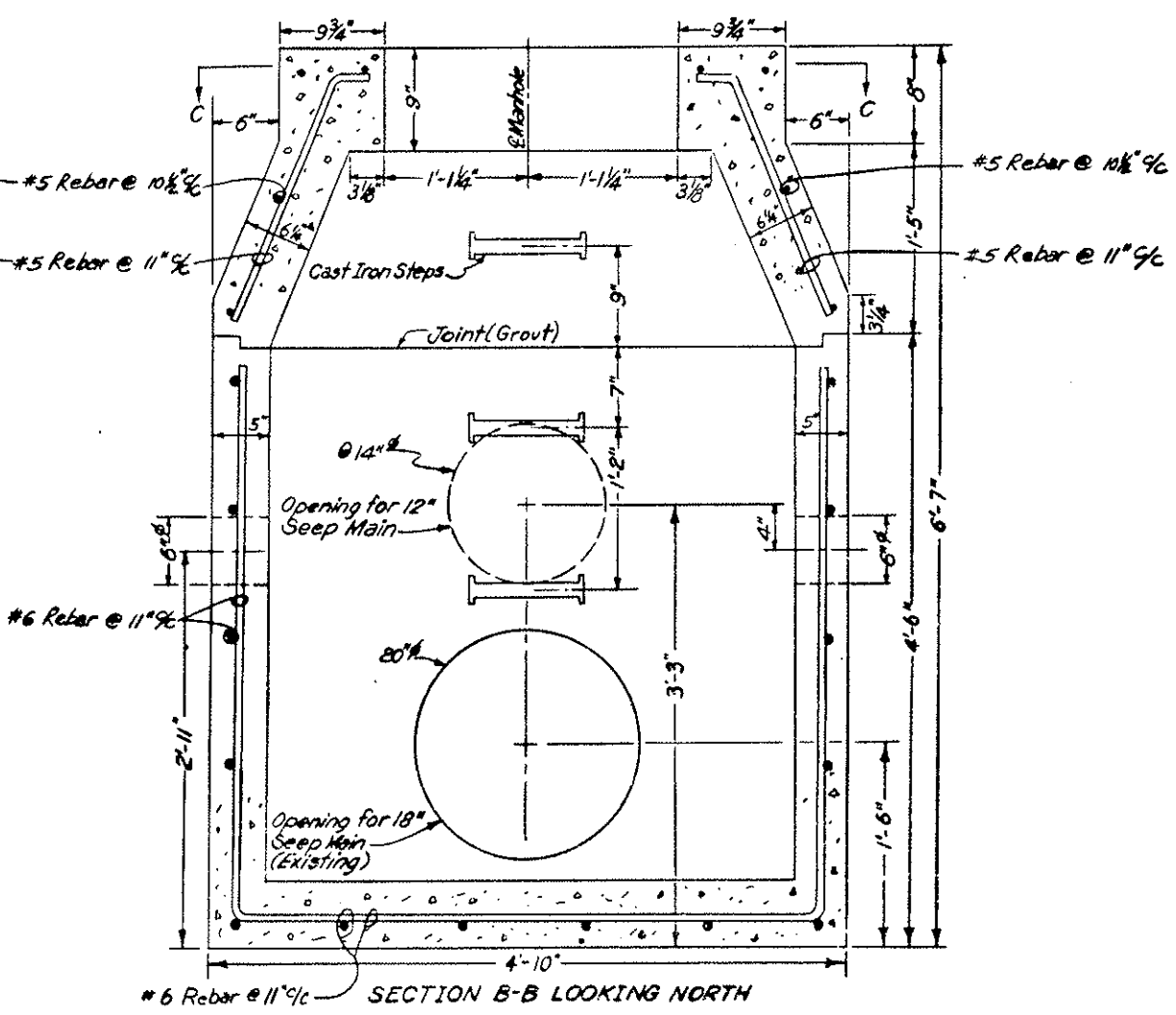


NOTES:
 ▲ This hole is located on West Wall of Manhole (See Plan View) and is shown here for information only. (SECTION A-A)
 ● This hole is located on South Wall of Manhole (See Plan View) and is shown here for information only. (SECTION B-B)
 φ Indicates circular hole.

SECTION C-C



SECTION A-A LOOKING EAST
 (North Side Tunnel)



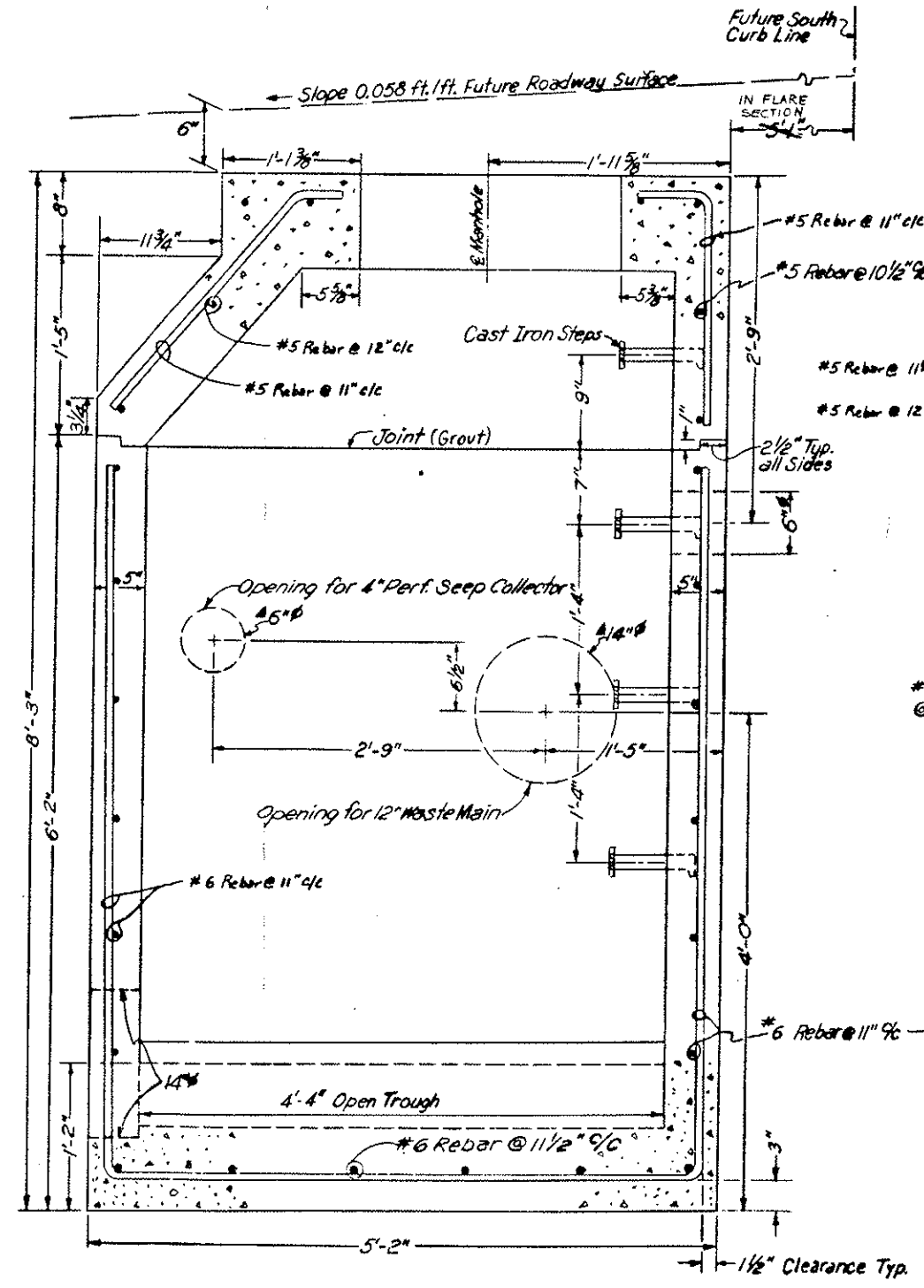
SECTION B-B LOOKING NORTH

MANHOLE SPECIAL TYPE IV
 DETAILS
 NO SCALE SHEET D-25'

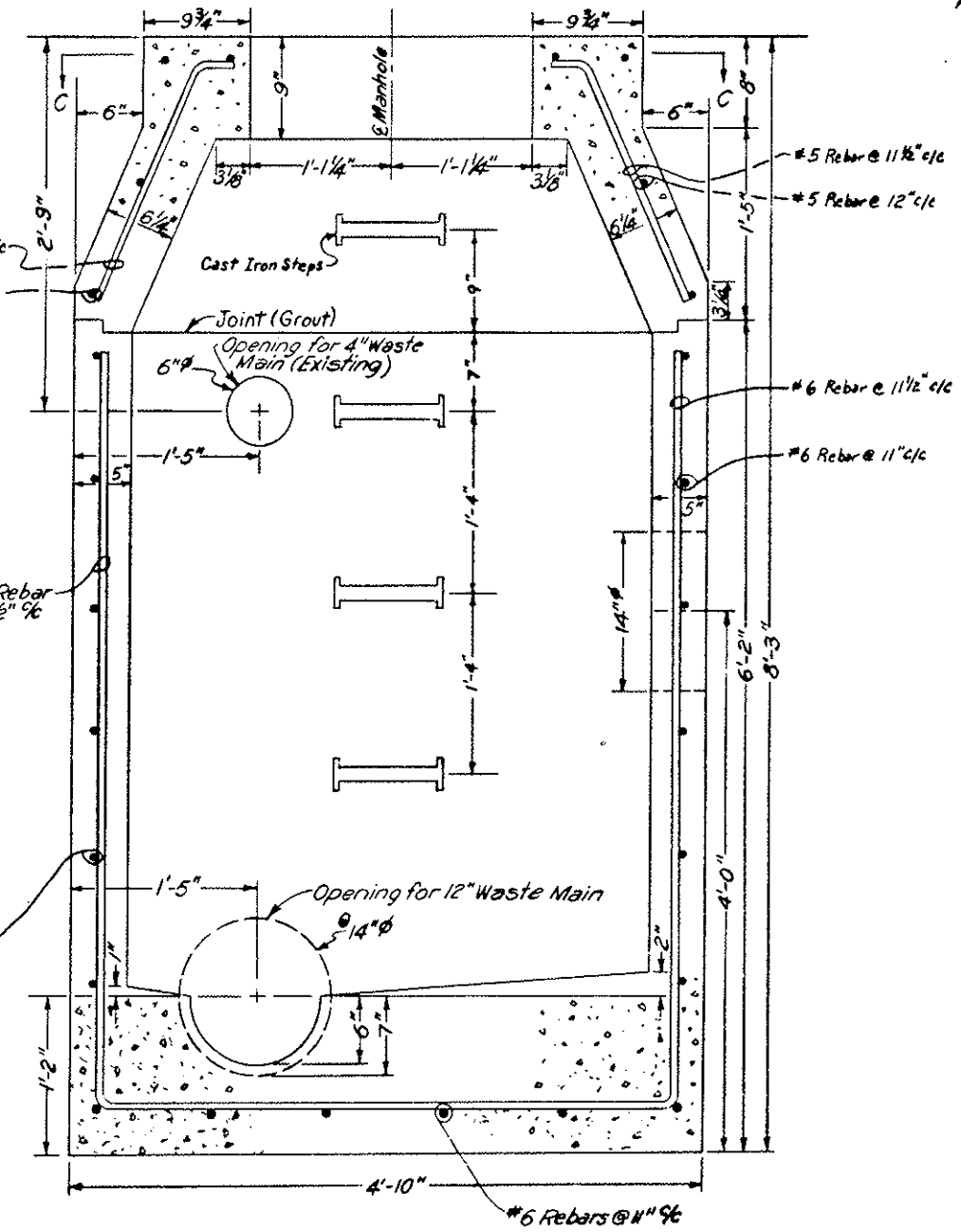
DETAILS OF MANHOLE SPECIAL (TYPE V) (Sta. 125+77.36 South Side)

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VII | COLORADO | 170-3(81)220 | 114 | 273 |

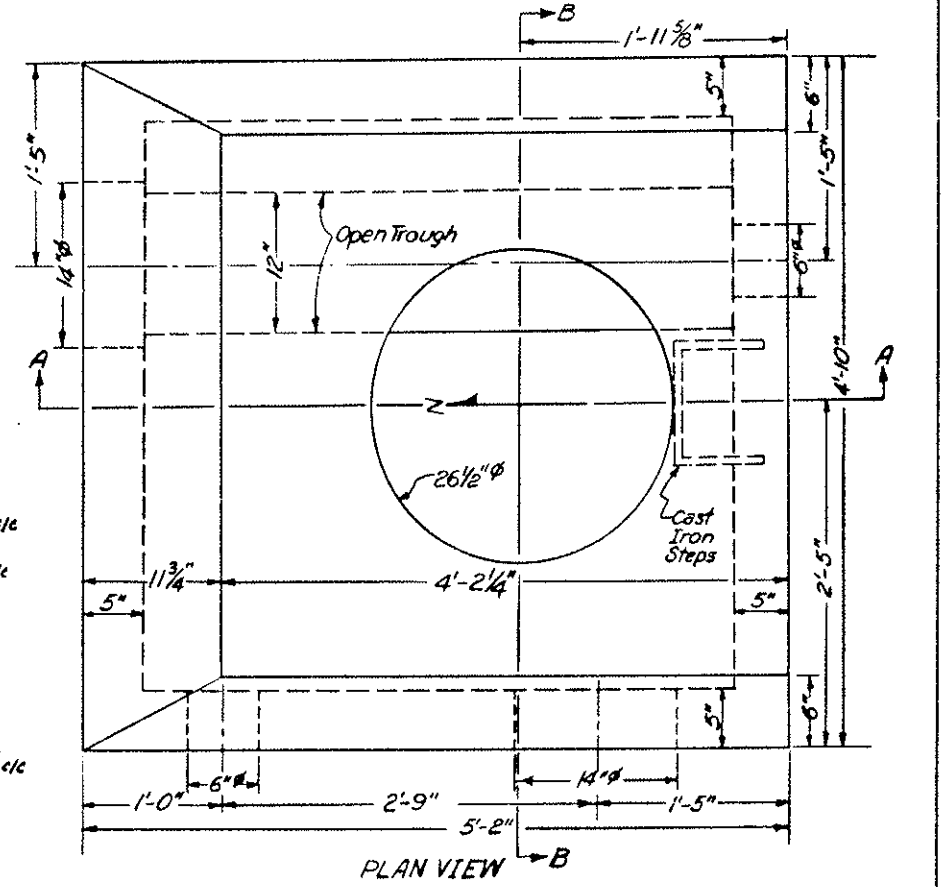
NOTES:
 ▲ This hole is located on West Wall of Manhole (See Plan View) and is shown here for information only. (SECTION A-A)
 ● This hole is located on North Wall of Manhole (See Plan View) and is shown here for information only. (SECTION B-B)
 φ Indicates circular hole.



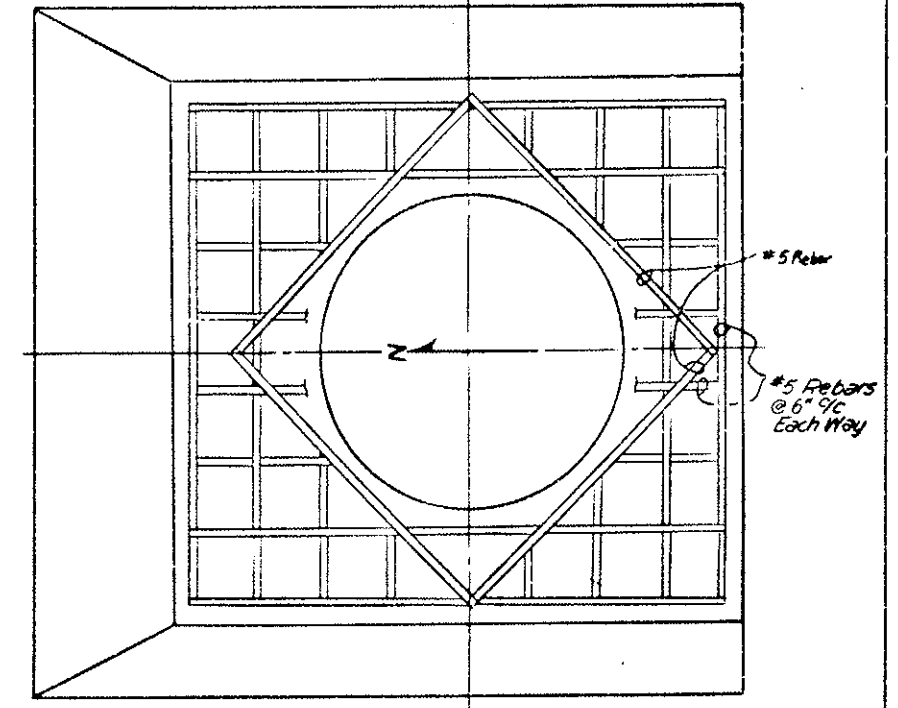
SECTION A-A LOOKING EAST



SECTION B-B LOOKING SOUTH



PLAN VIEW



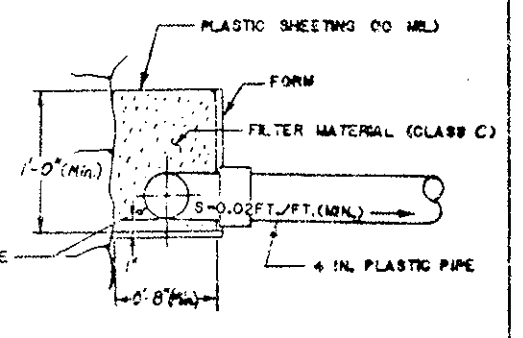
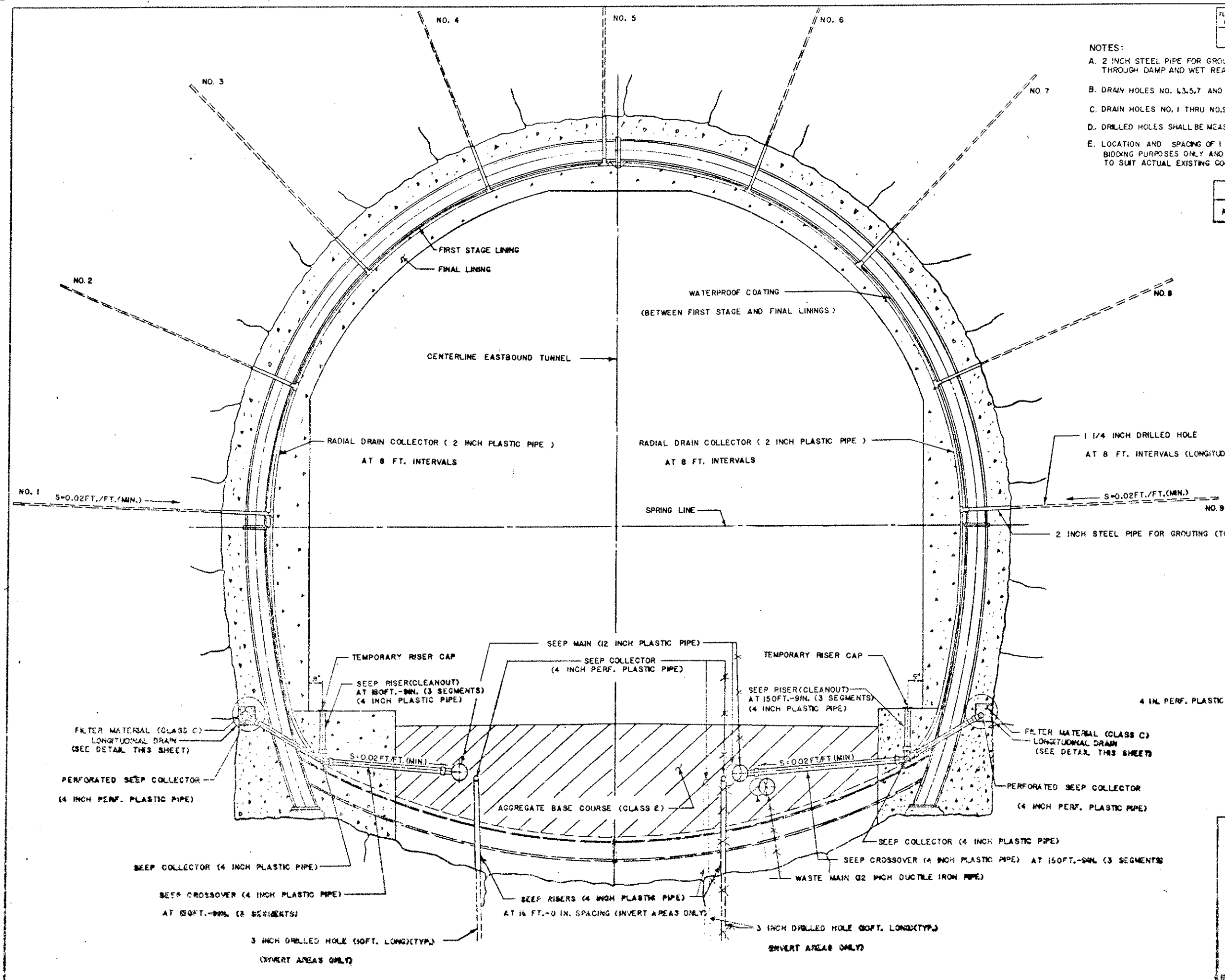
SECTION C-C

MANHOLE SPECIAL TYPE V
 DETAILS

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|----------------|-----------|--------------|
| 10 | COLORADO | I 70-3(81) 220 | 91 | 273 |

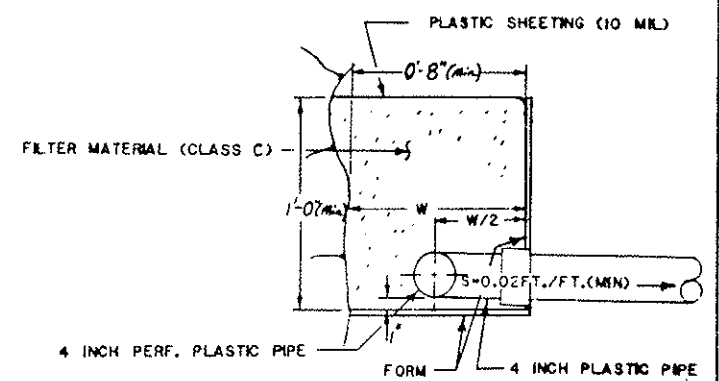
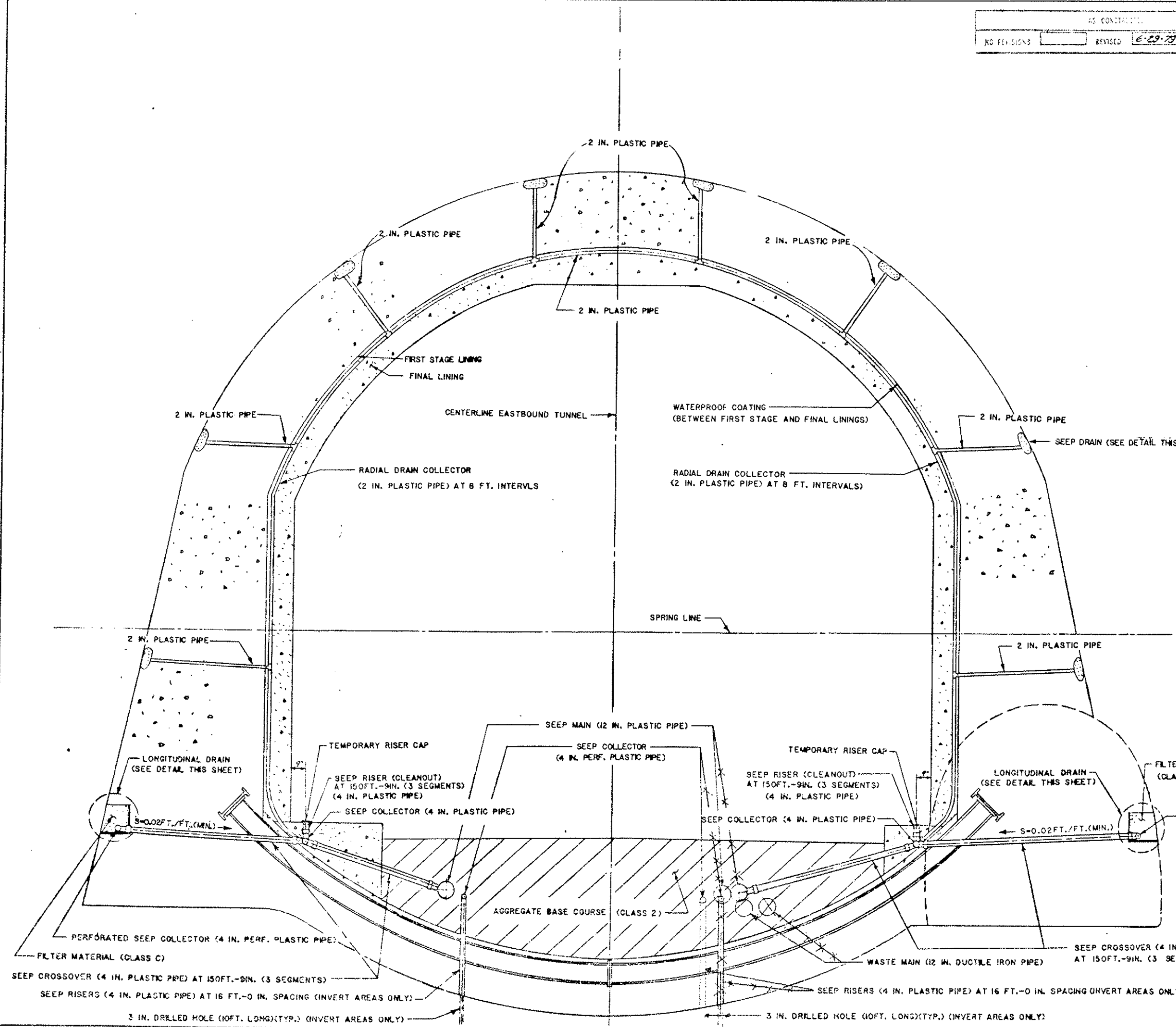
- NOTES:
- A. 2 INCH STEEL PIPE FOR GROUTING (TO ROCK), NO.1 THROUGH NO.9 SHALL BE INCLUDED THROUGH DAMP AND WET REACHES FOR GROUTING PURPOSES.
 - B. DRAIN HOLES NO. 1,3,5,7 AND 9 WILL BE USED THROUGH DAMP REACHES OF THE TUNNEL.
 - C. DRAIN HOLES NO. 1 THRU NO.9 WILL BE USED THROUGH WET REACHES OF THE TUNNEL.
 - D. DRILLED HOLES SHALL BE MEASURED FROM FACE OF FIRST STAGE LINING.
 - E. LOCATION AND SPACING OF 1/4" DRILLED HOLES AS SHOWN ARE TENTATIVELY SET FOR BIDDING PURPOSES ONLY AND MAY BE MODIFIED IN FIELD, AS DIRECTED BY THE ENGINEER, TO SUIT ACTUAL EXISTING CONDITIONS.

| AS CONSTRUCTED | | | |
|----------------|---------|---------|------|
| NO REVISIONS | REVISED | 6-29-77 | FOID |

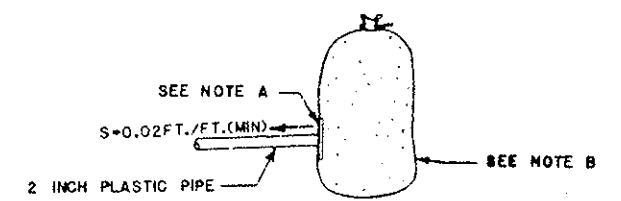


SEEP DRAINAGE SYSTEM
 STA. 40+82 TO 82+54

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| AS CONTRACTED | | | | |
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| VII | COLORADO | I 70-3(B) 220 | 92 | 273 |



DETAIL OF LONGITUDINAL DRAIN



DETAIL OF SEEP DRAIN

- NOTES:
- A. 6 IN. SQUARE ALUMINUM OR GALVANIZED STEEL WIRE NO. 4 MESH HARDWARE CLOTH (MIN. WIRE DIAMETER 0.03 IN.) TIED SECURELY TO PIPE AND BURLAP.
 - B. ONE CUBIC FOOT FILTER MATERIAL (CLASS A) IN A BURLAP SACK, SECURELY TIED.
 - C. DRILLED HOLES SHALL BE MEASURED FROM FACE OF FIRST STAGE LINING.
 - D. FLUSH AND CLEAN 2 IN. PLASTIC PIPES BEFORE MAKING FINAL CONNECTIONS.

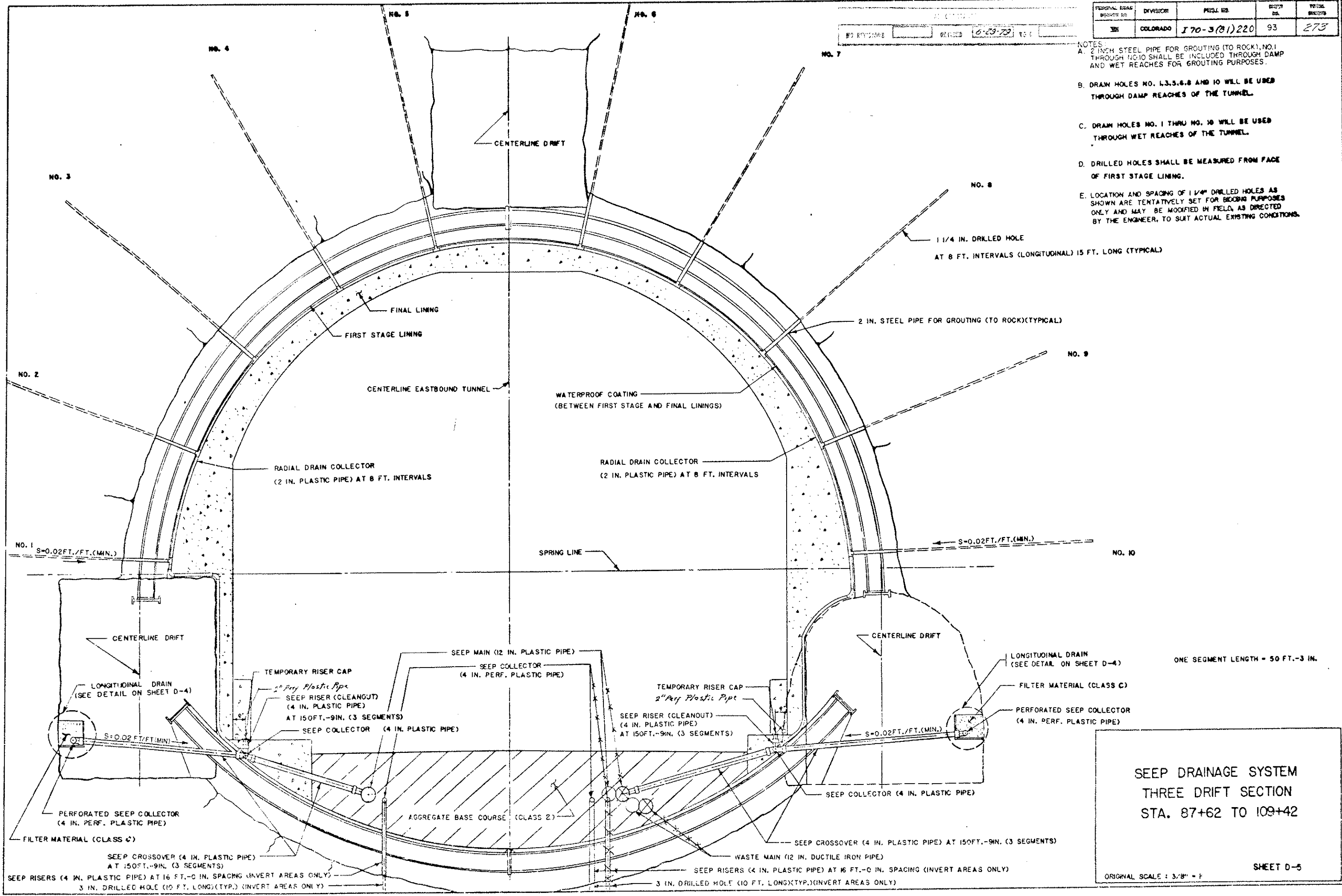
ONE SEGMENT LENGTH = 50 FT.-3 IN.

**SEEP DRAINAGE SYSTEM
 MULTIPLE DRIFT SECTION
 STA. 82+54 TO 87+52**

ORIGINAL SCALE 1 3/8" = 1' SHEET D-4

| | | | | |
|------------------|-----------------|------|----|-----|
| NO. 170-3(81)220 | REVISED 6-23-72 | DATE | 93 | 273 |
|------------------|-----------------|------|----|-----|

- NOTES:
- A. 2 INCH STEEL PIPE FOR GROUTING (TO ROCK), NO. 1 THROUGH NO. 10 SHALL BE INCLUDED THROUGH DAMP AND WET REACHES FOR GROUTING PURPOSES.
 - B. DRAW HOLES NO. 1, 3, 5, 6, 8 AND 10 WILL BE USED THROUGH DAMP REACHES OF THE TUNNEL.
 - C. DRAW HOLES NO. 1 THRU NO. 10 WILL BE USED THROUGH WET REACHES OF THE TUNNEL.
 - D. DRILLED HOLES SHALL BE MEASURED FROM FACE OF FIRST STAGE LINING.
 - E. LOCATION AND SPACING OF 1 1/4" DRILLED HOLES AS SHOWN ARE TENTATIVELY SET FOR GROUTING PURPOSES ONLY AND MAY BE MODIFIED IN FIELD, AS DIRECTED BY THE ENGINEER, TO SUIT ACTUAL EXISTING CONDITIONS.



ONE SEGMENT LENGTH = 50 FT. - 3 IN.

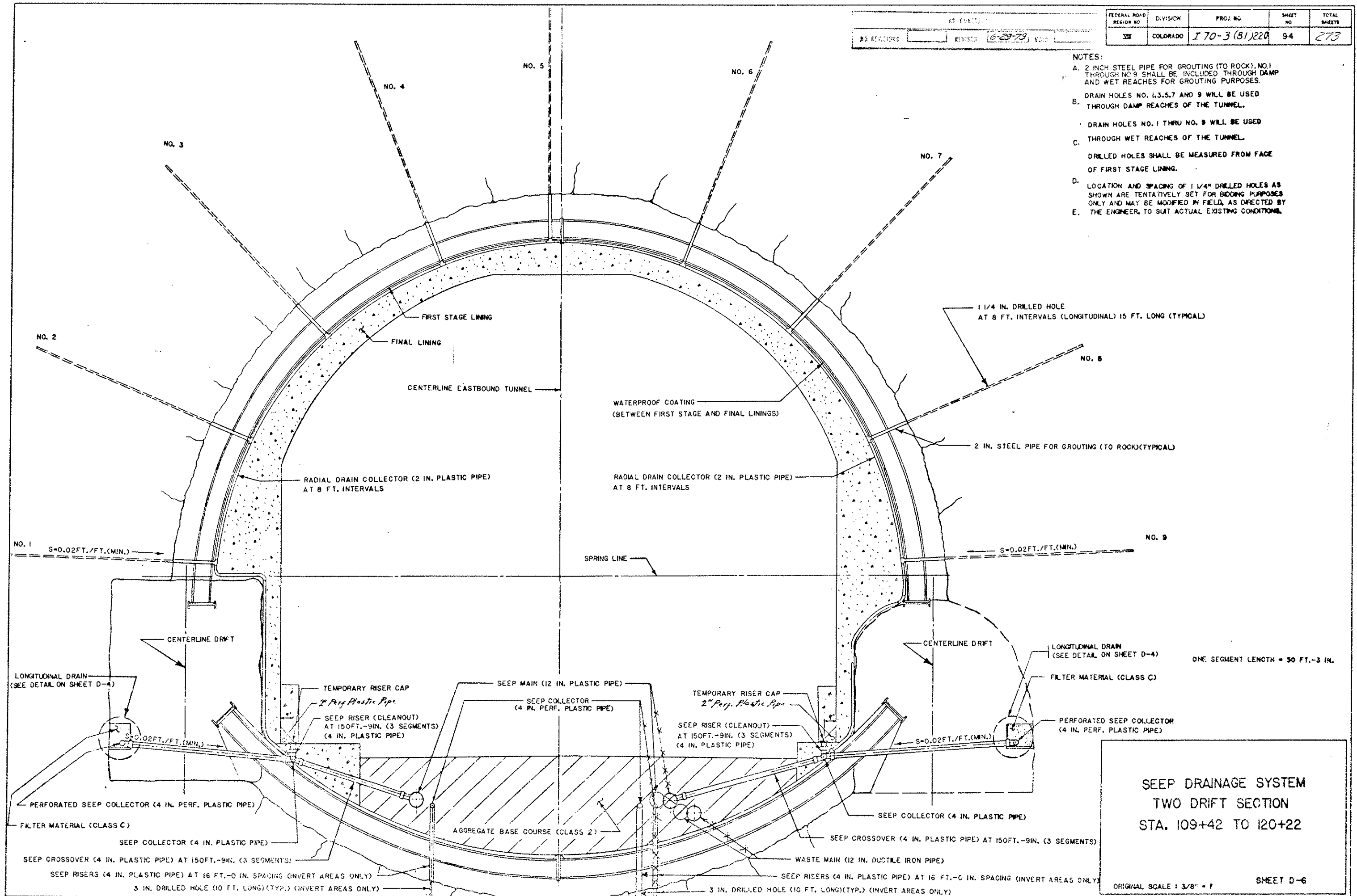
**SEEP DRAINAGE SYSTEM
 THREE DRIFT SECTION
 STA. 87+62 TO 109+42**

ORIGINAL SCALE : 3/8" = 1'

SHEET D-5

| | | | | | | |
|---------------|---------|---------------------------|----------|----------------|-----------|--------------|
| AS SHOWN | | FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| NO. REVISIONS | REVISED | III | COLORADO | I 70-3 (81)220 | 94 | 273 |

- NOTES:
- 2 INCH STEEL PIPE FOR GROUTING (TO ROCK), NO. 1 THROUGH NO. 9 SHALL BE INCLUDED THROUGH DAMP AND WET REACHES FOR GROUTING PURPOSES.
 - DRAIN HOLES NO. 1, 3, 5, 7 AND 9 WILL BE USED THROUGH DAMP REACHES OF THE TUNNEL.
 - DRAIN HOLES NO. 1 THRU NO. 9 WILL BE USED THROUGH WET REACHES OF THE TUNNEL.
 - DRILLED HOLES SHALL BE MEASURED FROM FACE OF FIRST STAGE LINING.
 - LOCATION AND SPACING OF 1 1/4" DRILLED HOLES AS SHOWN ARE TENTATIVELY SET FOR BIDDING PURPOSES ONLY AND MAY BE MODIFIED IN FIELD, AS DIRECTED BY THE ENGINEER, TO SUIT ACTUAL EXISTING CONDITIONS.



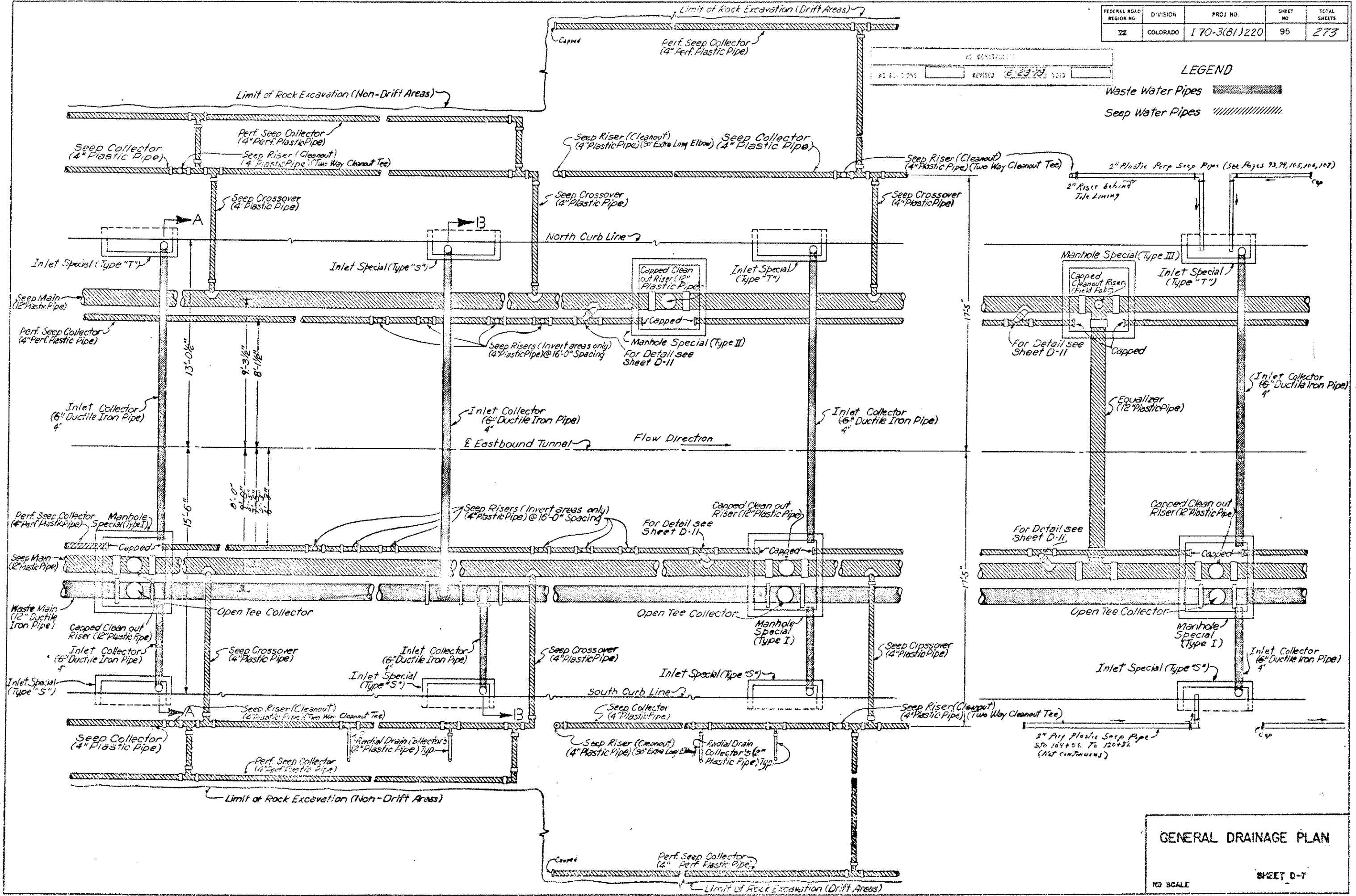
**SEEP DRAINAGE SYSTEM
 TWO DRIFT SECTION
 STA. 109+42 TO 120+22**

ORIGINAL SCALE : 3/8" = 1' SHEET D-6

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XII | COLORADO | I 70-3(81)220 | 95 | 273 |

AS CONSTRUCTED
 NO. 100-10000
 REVISED 6-23-72
 VOID

LEGEND
 Waste Water Pipes [Hatched Pattern]
 Seep Water Pipes [Diagonal Line Pattern]

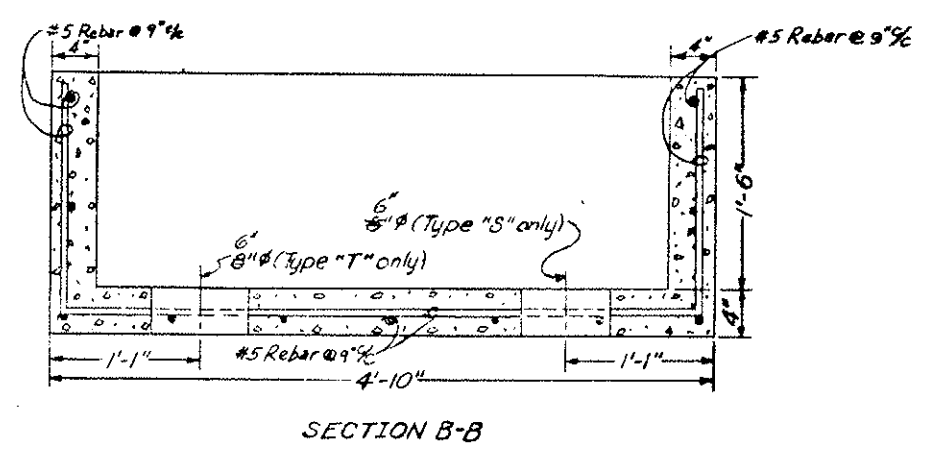


GENERAL DRAINAGE PLAN

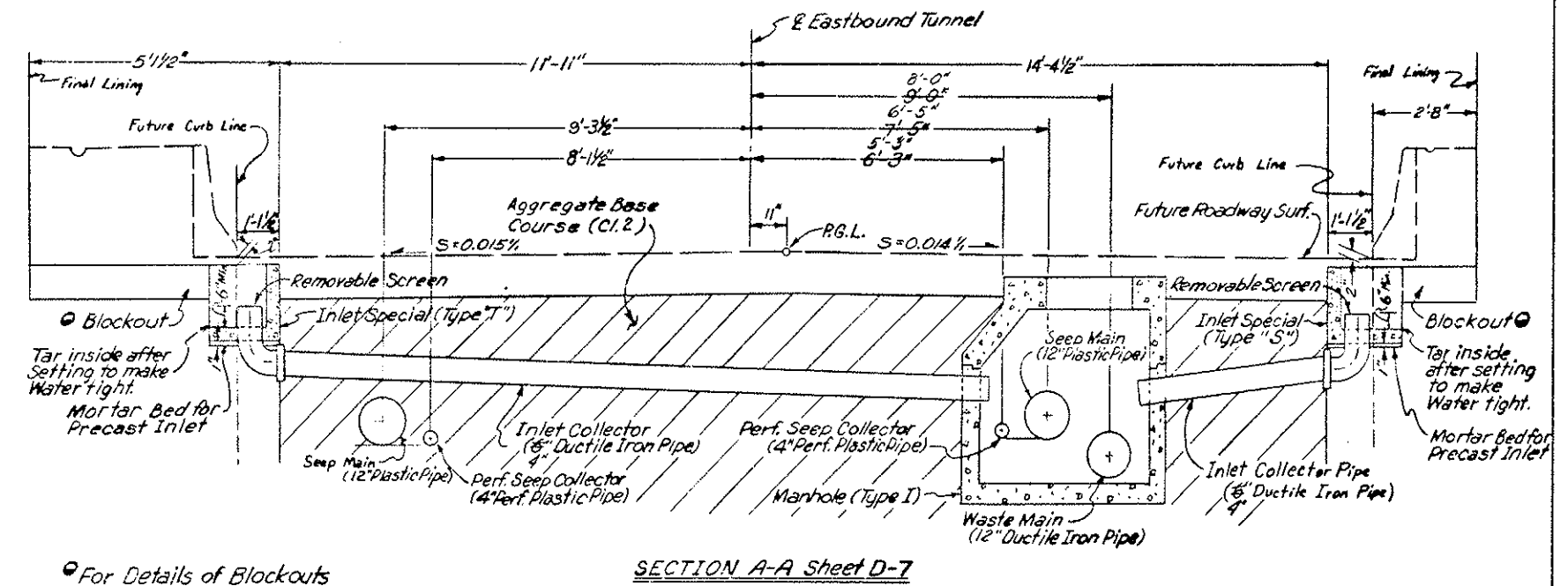
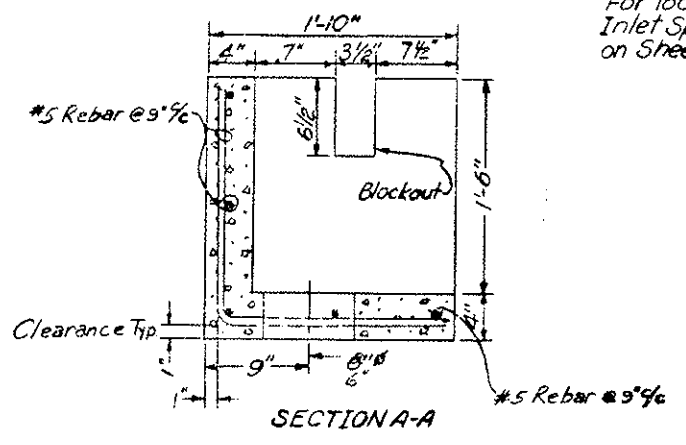
NO SCALE
 SHEET D-7

| | | | | | |
|-------------------------|--|----------|--------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| CO. 000000 | | COLORADO | 170-3(81)220 | 96 | 273 |

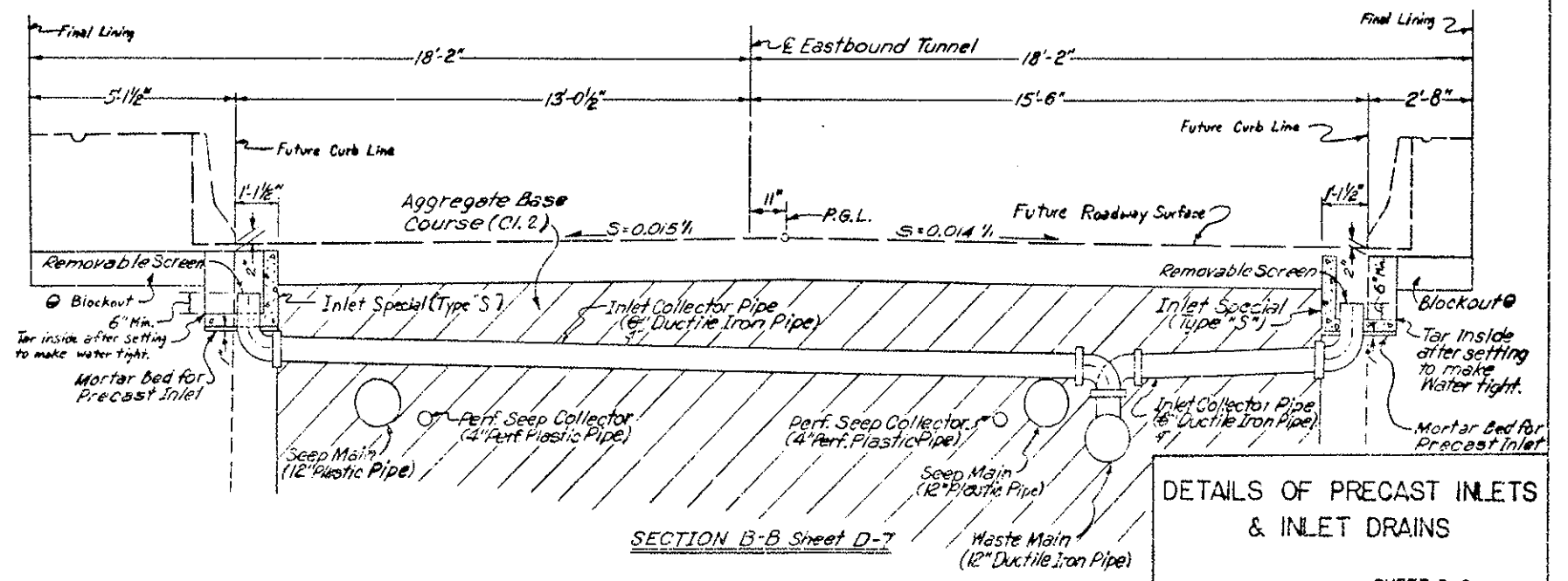
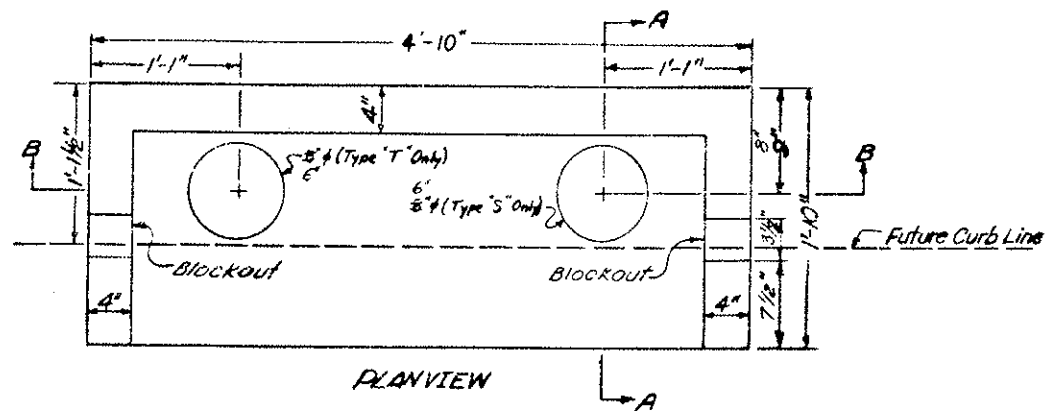
DETAILS OF PRECAST INLET SPECIAL, TYPE "S" & "T"



Note: Grout around pipes at Inlet Specials.
 For locations of Precast Inlet Specials see Tabulation on Sheet D-9.

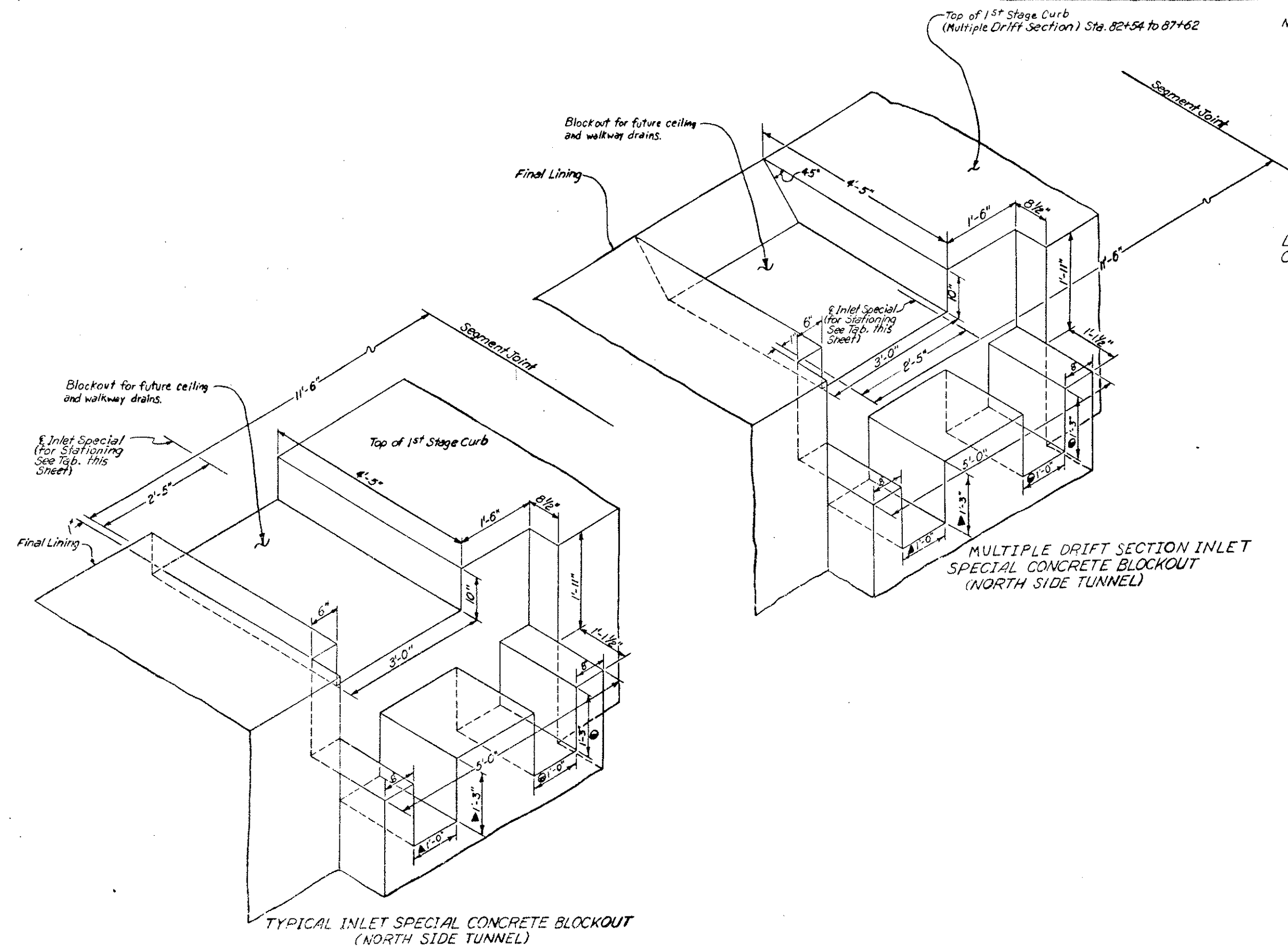


For Details of Blockouts See Sheets D-9 & D-10.



DETAILS OF PRECAST INLETS & INLET DRAINS

NOTES:
 ▲ This slot to be constructed at Inlet Special (Type "S") locations only.
 ● This slot to be constructed at Inlet Special (Type "T") locations only.



LOCATION OF TYPICAL INLET SPECIAL CONCRETE BLOCKOUTS (North Side Tunnel)

| TYPE "S" | | TYPE "T" | |
|-------------|-----------|-------------|-----------|
| SEGMENT NO. | STATION | SEGMENT NO. | STATION |
| 5 | 41+23.60 | 2 | 39+72.85 |
| 11 | 44+25.10 | 8 | 42+74.35 |
| 17 | 47+26.60 | 14 | 45+75.85 |
| 23 | 50+28.10 | 20 | 48+77.35 |
| 29 | 53+29.60 | 26 | 51+78.85 |
| 35 | 56+31.10 | 32 | 54+80.35 |
| 41 | 59+32.60 | 38 | 57+81.85 |
| 47 | 62+34.10 | 44 | 60+83.35 |
| 53 | 65+35.60 | 50 | 63+84.85 |
| 59 | 68+37.10 | 56 | 66+86.35 |
| 65 | 71+38.60 | 62 | 69+87.85 |
| 71 | 74+40.10 | 68 | 72+89.35 |
| 77 | 77+41.60 | 74 | 75+90.85 |
| 83 | 80+43.10 | 80 | 78+92.35 |
| 101 | 89+47.60 | 86 | 81+93.85 |
| 107 | 92+49.10 | 98 | 87+96.85 |
| 113 | 95+50.60 | 104 | 90+98.35 |
| 119 | 98+52.10 | 110 | 93+99.85 |
| 125 | 101+53.60 | 116 | 97+01.35 |
| 131 | 104+55.10 | 122 | 100+02.85 |
| 137 | 107+56.60 | 128 | 103+04.35 |
| 143 | 110+58.10 | 134 | 106+05.85 |
| 149 | 113+59.60 | 140 | 109+07.35 |
| 155 | 116+61.10 | 146 | 112+08.85 |
| 161 | 119+62.60 | 152 | 115+10.35 |
| | | 158 | 118+11.85 |
| | | 164 | 121+13.35 |
| | | 167 | 122+14.10 |
| | | 168 | 124+14.85 |

LOCATION OF MULTIPLE DRIFT SECTION INLET SPECIAL CONCRETE BLOCKOUTS (North Side Tunnel)

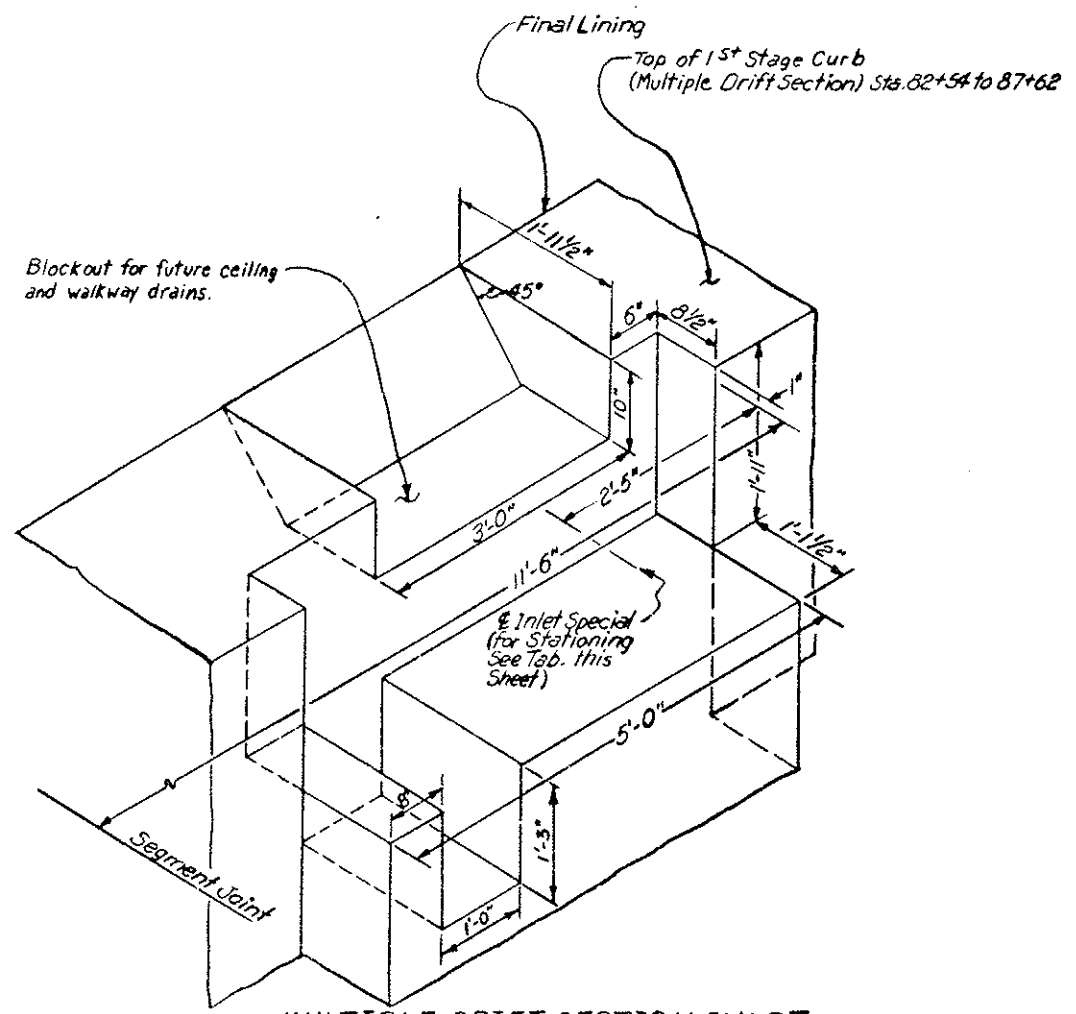
| TYPE "S" | | TYPE "T" | |
|-------------|----------|-------------|----------|
| SEGMENT NO. | STATION | SEGMENT NO. | STATION |
| 89 | 83+44.60 | 92 | 84+95.35 |
| 95 | 86+46.10 | | |

FIRST STAGE CURB BLOCKOUT DETAILS

NORTH SIDE OF TUNNEL (LOOKING NORTHEAST)

| | | | |
|-------------|---------|----------|------|
| NO. REVISED | 6-23-72 | REVISION | VOID |
|-------------|---------|----------|------|

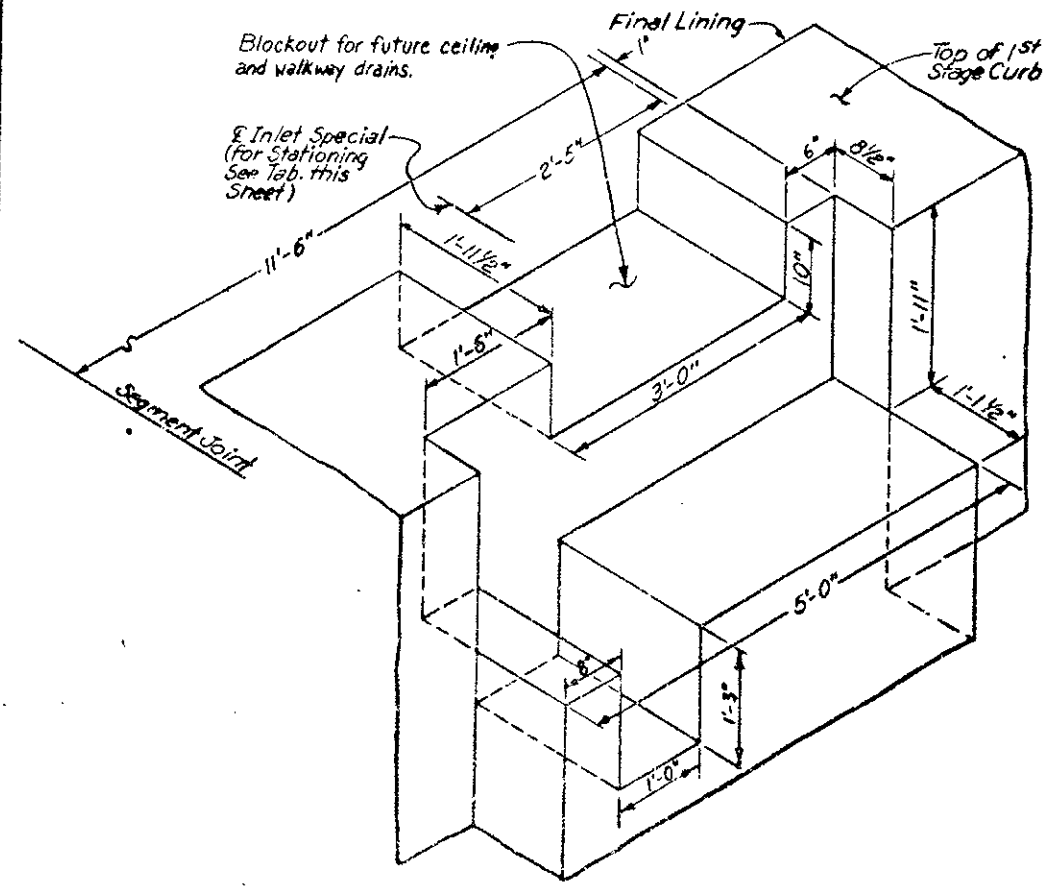
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XII | COLORADO | I 70-3(81)220 | 98 | 273 |



MULTIPLE DRIFT SECTION INLET SPECIAL CONCRETE BLOCKOUT (SOUTH SIDE TUNNEL)

LOCATION OF TYPICAL INLET SPECIAL CONCRETE BLOCKOUTS (South Side Tunnel)

| TYPE "S" | | | |
|-------------|----------|-------------|-----------|
| SEGMENT NO. | STATION | SEGMENT NO. | STATION |
| West Portal | 35+71.35 | 77 | 77+41.60 |
| West Portal | 38+22.10 | 80 | 78+32.35 |
| 2 | 39+22.85 | 83 | 80+43.10 |
| 5 | 41+23.60 | 86 | 81+53.85 |
| 8 | 42+74.35 | 98 | 87+56.85 |
| 11 | 44+25.10 | 101 | 89+47.60 |
| 14 | 45+75.85 | 104 | 90+58.35 |
| 17 | 47+26.60 | 107 | 92+49.10 |
| 20 | 49+77.35 | 110 | 93+59.85 |
| 23 | 50+28.10 | 113 | 95+50.60 |
| 26 | 51+78.85 | 116 | 97+01.35 |
| 29 | 53+29.60 | 119 | 98+52.10 |
| 32 | 54+80.35 | 122 | 100+02.85 |
| 35 | 56+31.10 | 125 | 101+53.60 |
| 38 | 57+81.85 | 128 | 103+04.35 |
| 41 | 59+32.60 | 131 | 104+55.10 |
| 44 | 60+83.35 | 134 | 106+05.85 |
| 47 | 62+34.10 | 137 | 107+56.60 |
| 50 | 63+84.85 | 140 | 109+07.35 |
| 53 | 65+35.60 | 143 | 110+58.10 |
| 56 | 66+86.35 | 146 | 112+08.85 |
| 59 | 68+37.10 | 149 | 113+59.60 |
| 62 | 69+87.85 | 152 | 115+10.35 |
| 65 | 71+38.60 | 155 | 116+61.10 |
| 68 | 72+89.35 | 158 | 118+11.85 |
| 71 | 74+40.10 | 161 | 119+62.60 |
| 74 | 75+90.85 | | |



TYPICAL INLET SPECIAL CONCRETE BLOCKOUT (SOUTH SIDE TUNNEL)

LOCATION OF MULTIPLE DRIFT SECTION INLET SPECIAL CONCRETE BLOCKOUTS (South Side Tunnel)

| TYPE "S" | |
|-------------|----------|
| SEGMENT NO. | STATION |
| 89 | 83+44.60 |
| 92 | 84+35.35 |
| 95 | 86+46.10 |

INLET SPECIAL
 [FIRST STAGE CURB BLOCKOUT]
 DETAILS

SOUTH SIDE OF TUNNEL (LOOKING SOUTHWEST)

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| III | COLORADO | I 70-3(81)220 | 99 | 273 |

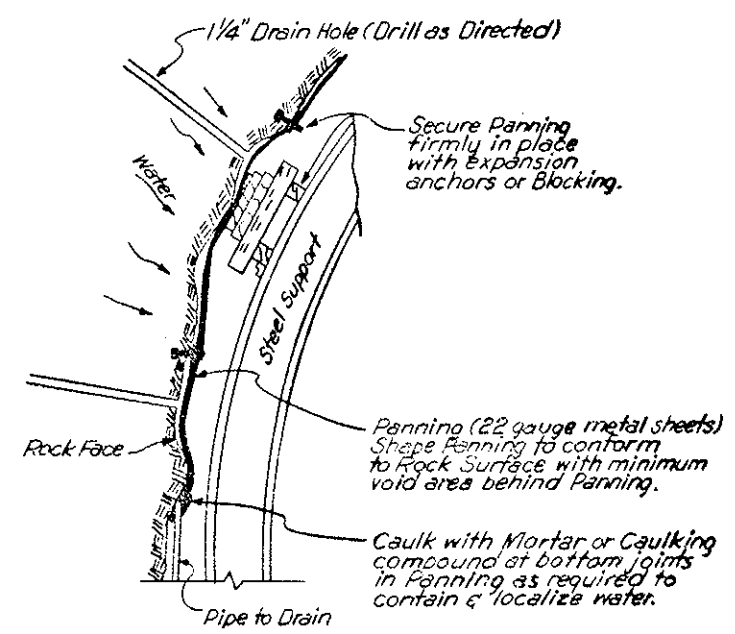
| | | |
|---------------|-----------------|---------|
| DATE: 6-29-78 | BY: [Signature] | NO. [] |
|---------------|-----------------|---------|

| APPROXIMATE IDENTIFICATION OF DAMP & WET REACHES | | | |
|--|----------------------|-----------|-----------|
| STA TO STA | APPROX LENGTH (L.F.) | DAMP | WET |
| WEST PORTAL to 44+00 | 590 | | ✓ |
| 44+00 to 45+30 | 30 | ✓ | |
| 45+30 to 45+50 | 20 | | ✓ |
| 45+50 to 46+00 | 50 | ✓ | |
| 46+00 to 48+50 | 250 | | ✓ |
| 48+50 to 48+90 | 40 | ✓ | |
| 48+90 to 49+10 | 20 | | ✓ |
| 49+10 to 50+30 | 120 | ✓ | |
| 50+30 to 50+50 | 20 | | ✓ |
| 50+50 to 53+30 | 280 | ✓ | |
| 53+30 to 53+50 | 20 | | ✓ |
| 53+50 to 60+30 | 680 | ✓ | |
| 60+30 to 60+80 | 50 | | ✓ |
| 60+80 to 61+20 | 40 | ✓ | |
| 61+20 to 61+60 | 40 | | ✓ |
| 61+60 to 62+20 | 60 | ✓ | |
| 62+20 to 65+80 | 360 | | ✓ |
| 65+80 to 66+60 | 80 | ✓ | |
| 66+60 to 71+20 | 460 | | ✓ |
| 71+20 to 72+50 | 130 | ✓ | |
| 72+50 to 73+00 | 50 | | ✓ |
| 73+00 to 73+60 | 60 | ✓ | |
| 73+60 to 74+10 | 50 | | ✓ |
| 74+10 to 74+50 | 40 | ✓ | |
| 74+50 to 74+80 | 30 | | ✓ |
| 74+80 to 76+10 | 130 | ✓ | |
| 76+10 to 77+00 | 90 | | ✓ |
| 77+00 to 78+20 | 120 | ✓ | |
| 78+20 to 78+50 | 30 | | ✓ |
| 78+50 to 79+50 | 100 | ✓ | |
| 79+50 to 80+80 | 130 | | ✓ |
| 80+80 to 83+50 | 270 | ✓ | |
| 83+50 to 83+90 | 40 | | ✓ |
| 83+90 to 89+60 | 570 | ✓ | |
| 89+60 to 90+50 | 90 | | ✓ |
| 90+50 to 92+80 | 230 | ✓ | |
| 92+80 to 94+10 | 130 | | ✓ |
| 94+10 to 95+10 | 100 | ✓ | |
| 95+10 to 98+20 | 310 | | ✓ |
| 98+20 to 99+60 | 140 | ✓ | |
| 99+60 to 100+30 | 70 | | ✓ |
| 100+30 to 101+20 | 90 | ✓ | |
| 101+20 to 101+30 | 10 | | ✓ |
| 101+30 to 102+70 | 140 | ✓ | |
| 102+70 to 102+90 | 20 | | ✓ |
| 102+90 to 105+80 | 290 | ✓ | |
| 105+80 to 109+00 | 320 | | ✓ |
| 109+00 to 111+30 | 230 | ✓ | |
| 111+30 to 117+00 | 570 | | ✓ |
| 117+00 to 119+00 | 200 | ✓ | |
| 119+00 to 120+00 | 100 | | ✓ |
| 120+00 to East Portal | 340 | ✓ | |
| TOTALS | 8530 L.F. | 4660 L.F. | 3870 L.F. |

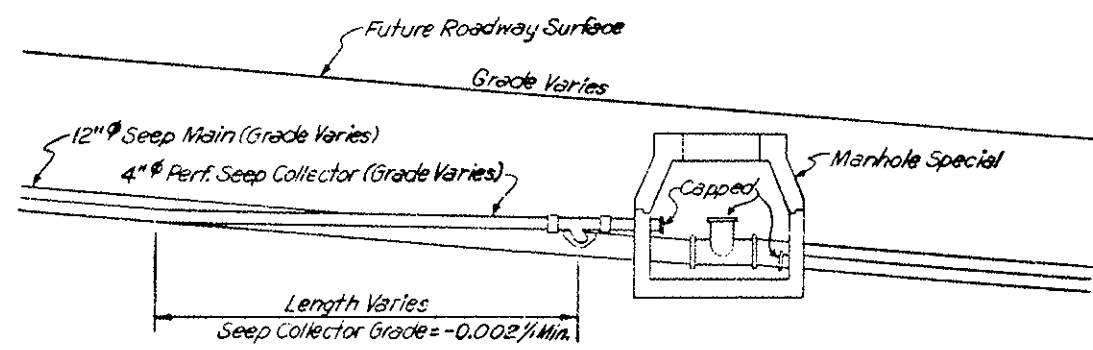
LIMITS OF 3" DRILLED HOLES IN INVERT AREAS

| Sta. to Sta. |
|------------------|
| 62+06 to 65+42 |
| 69+62 to 74+58 |
| 79+98 to 109+42 |
| 118+50 to 121+22 |

DETAILS OF SHEET METAL FOR PANNING



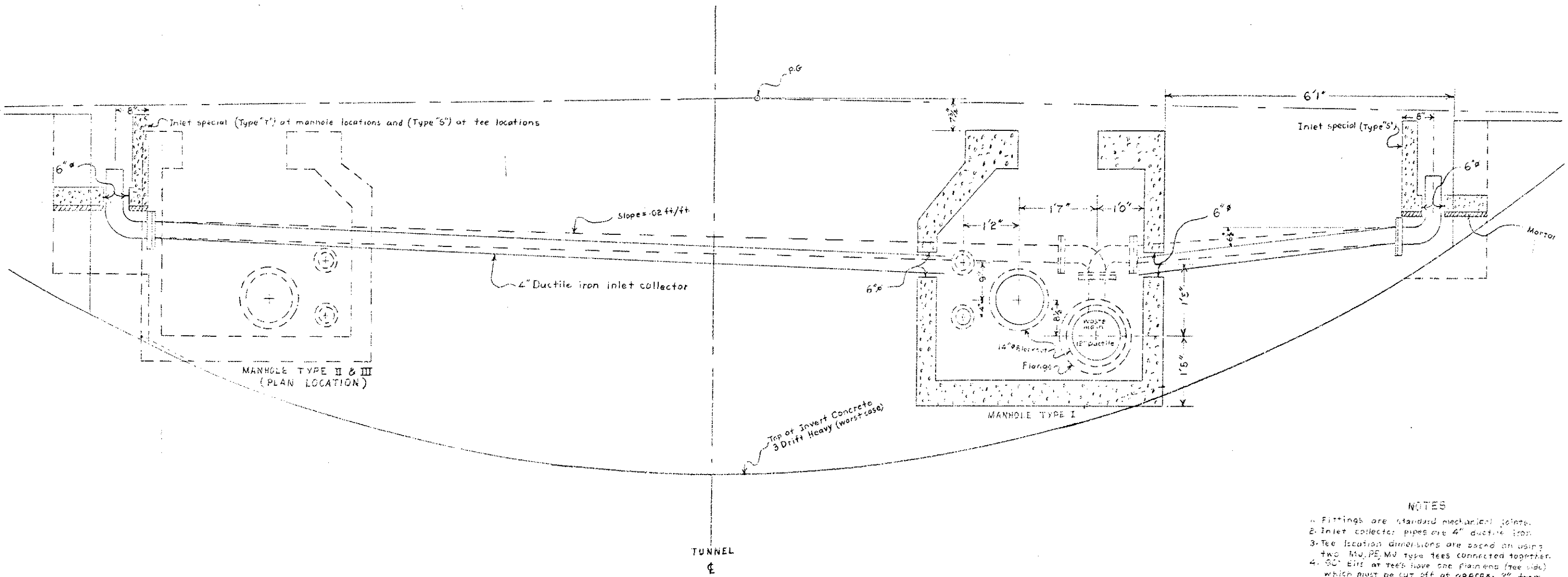
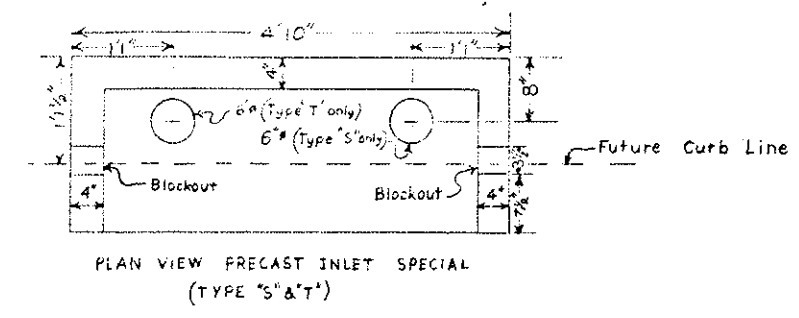
DETAIL OF SEEP COLLECTOR CONNECTION TO SEEP MAIN



DRAINAGE SYSTEM TABLES, PANNING & SEEP CONNECTION DETAILS

AS CONE...
 REVISED 6-23-79

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|----------------|-----------|--------------|
| VIII | COLORADO | 170-3 (80) 220 | 99 AX | 270 |



- NOTES
1. Fittings are standard mechanical joints.
 2. Inlet collector pipes are 4" ductile iron.
 3. Tee location dimensions are based on using two MU, PE, MJ type tees connected together.
 4. 90° Elbs at tees have one plain end (tee side) which must be cut off at approx. 3" from beginning of bend - 10 ft.
 5. Blockouts must be grouted after installing pipe.

CONTRACT MODIFICATION ORDER NO. 15

SEEP & WASTE
 DRAINAGE
 REVISED
 ORIGINAL SCALE 1"=1'

DATE 2-23-77 DRAWN & CALC BY JSE

FINAL SUMMARY OF ROADWAY QUANTITIES

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 115 | 273 |

AS CONSTRUCTED

NO REVISIONS REVISED 6-29-79 TSD

| Item No. | Description | Unit | West Approach (Summit County) | Final East Approach (Summit County) | East Approach (Clear Creek County) | Final East Approach (Clear Creek County) | Roadway Totals | Final |
|----------|---|---------|----------------------------------|--|---------------------------------------|---|----------------|----------|
| 201 | Clearing and Grubbing | L.S. | 0.5 | | 0.5 | | 1 | 1 |
| 202 | Removal of Structure | Each | 1 | | 1 | | 2 | 2 |
| 202 | Removal of Asphalt Mat | Sq.Yd. | | | 25 | | 25 | 79 |
| 203 | Unclassified Excavation (Haul) | Cu.Yd. | 33,200 | 86,733 | 40,800 | 51,298 | 74,000 | 138,031 |
| 203 | Dozing | Hour | 100 | 109 | 100 | 109 | 200 | 218 |
| 203 | Dozing (Landscaping) | Hour | 50 | 15.5 | 50 | 52.5 | 100 | 68 |
| 206 | Structure Excavation | Cu.Yd. | 740 | 3,204 | 120 | 629 | 860 | 3,833 |
| 206 | Structure Backfill (Class 1) | Cu.Yd. | 95 | 1,463 | 0 | 677 | 95 | 2,140 |
| 206 | Structure Backfill (Class 2) | Cu.Yd. | 1010 | 331 | 140 | 0 | 1,150 | 331 |
| 207 | Topsoil (Haul) | Cu.Yd. | 1,300 | 0 | 3,100 | 5,500 | 4,400 | 5,500 |
| 210 | Adjust structure | Each | 8 | 8 | 3 | 1 | 11 | 9 |
| 212 | Seeding | LB | 51 | 126 | 111 | 274 | 162 | 400 |
| 213 | Fertilizing | Acre | 2.5 | 3.1 | 5.5 | 6.9 | 8.0 | 10 |
| 213 | Mulching | Ton | 5 | 6.2 | 11 | 13.8 | 16 | 20 |
| 213 | Soil Retention Blanket (Jute) | Sq.Yd. | 11,670 | 14,633 | 27,170 | 34,069 | 38,840 | 48,702 |
| 304 | Aggregate Base Course (Class 2) (Haul) | Ton | 10 | 271 | 10 | 30.5 | 20 | 57.6 |
| 506 | Riprap | Cu.Yd. | 5 | 274 | | | 5 | 274 |
| 507 | Concrete Slope and Ditch Paving (Reinforced) | Cu.Yd. | 17.8 | 9.9 | 7.0 | 11 | 24.8 | 20.9 |
| 507 | Grouted Rubble Slope and Ditch Paving | Cu.Yd. | 18 | 268.48 | 54 | 54 | 72 | 322.48 |
| 521 | Pedestrian Overpass | Each | 1 | 1 | 1 | 1 | 2 | 2 |
| 601 | Concrete Class A (Miscellaneous) | Cu.Yd. | 12 | 28.89 | 12 | 32.46 | 24 | 61.35 |
| 603 | 18 Inch Corrugated Steel Pipe | Lin.Ft. | 88 | 136 | 48 | 102 | 136 | 238 |
| 603 | 24 Inch Corrugated Steel Pipe | Lin.Ft. | 898 | 1,087.5 | 552 | 754.5 | 1,450 | 1,842 |
| 603 | 60 Inch Corrugated Steel Pipe | Lin.Ft. | 320 | 320 | 0 | 230 | 320 | 550 |
| 603 | 66 Inch Corrugated Steel Pipe | Lin.Ft. | 714 | 743 | | | 714 | 743 |
| 603 | 24 Inch Steel End Section | Each | 1 | 1 | 2 | 2 | 2 | 2 |
| 603 | 60 Inch Steel End Section | Each | 1 | 1 | | | 1 | 1 |
| 603 | 66 Inch Steel End Section | Each | 1 | 1 | | | 1 | 1 |
| 604 | Inlet Type C (5 Foot) | Each | 8 | 7 | 5 | 11 | 13 | 18 |
| 604 | Inlet Grating and Frame Type C | Each | 8 | 2 | 2 | 1 | 10 | 3 |
| 605 | 6 Inch Non-Perforated Corrugated Steel Pipe | Lin.Ft. | 16 | 0 | | | 16 | 0 |
| 607 | End Post (Chain Link) | Each | 8 | 15 | 10 | 15 | 18 | 30 |
| 607 | Corner and Line Brace Post (Chain Link) | Each | 8 | 14 | 4 | 17 | 12 | 31 |
| 607 | Fence Chain Link (Industrial) | Lin.Ft. | 1,980 | 2,355 | 2050 | 1,901 | 4030 | 4,256 |
| 607 | 20 Foot Gate Double Driveway | Each | 2 | 5 | 3 | 4 | 5 | 9 |
| 614 | Flagging | Hour | 8,000 | 5,996.75 | 8,000 | 5,996.75 | 16,000 | 11,993.5 |
| 620 | Janitorial Service | Month | 38 | 28 | | | 38 | 28 |
| | Note: Power Poles to be relocated by Public Service Co. under Project No. 170-3(78) | | | | | | | |

SUMMARY
OF
ROADWAY
QUANTITIES
SHEET AR-1

FINAL SUMMARY OF APPROXIMATE QUANTITIES

| | | | | | | |
|----------------|-----------------|--------------|----------|--------------|-----------|--------------|
| AS CONSTRUCTED | | REVISION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| NO REVISIONS | REVISED 6-29-73 | VOID | COLORADO | 170-3(81)220 | 115A | 273 |

| INDEX | | | CONTRACT ITEM NO. | CONTRACT ITEM | UNIT | | | | | | | | | | | * FINAL C.M.O. 18 TOTALS | | |
|-------|------|-------|-------------------|---|----------|--|--|--|--|--|--|--|--|--|--|--------------------------|--|---------|
| BOOK | PAGE | SHEET | | | | | | | | | | | | | | | | |
| | | | 202 | Removal of Structure | Each | | | | | | | | | | | | | 0 |
| | | | 202 | Removal of Delineator | Each | | | | | | | | | | | | | 35 |
| | | | 202 | Removal of Ground Sign | Each | | | | | | | | | | | | | 4 |
| | | | 202 | Plug Structure | Each | | | | | | | | | | | | | 1 |
| | | | 203 | Embankment Material (Complete in Place) | Cu. Yd. | | | | | | | | | | | | | 63595 |
| | | | 206 | Structure Excavation | Cu. Yd. | | | | | | | | | | | | | 237 |
| | | | 206 | Structure Backfill (Class 1) | Cu. Yd. | | | | | | | | | | | | | 27 |
| | | | 209 | Wetting | M. Gal | | | | | | | | | | | | | 253.4 |
| | | | 210 | Reset Ground Sign | Each | | | | | | | | | | | | | 4 |
| | | | 210 | Adjust Structure | Each | | | | | | | | | | | | | 0 |
| | | | 306 | Aggregate Base Course (Class 6)(Haul) | Ton | | | | | | | | | | | | | 3821.9 |
| | | | 403 | Hot Bituminous Pavement (Grading E)(Haul and Asphalt) | Ton | | | | | | | | | | | | | 7898.15 |
| | | | 411 | Emulsified Asphalt (CSS-1H) | Gal. | | | | | | | | | | | | | 1184.5 |
| | | | 411 | Liquid Asphaltic Material (MC-70) | Gal. | | | | | | | | | | | | | 4319 |
| | | | 507 | Concrete Slope and Ditch Paving (Reinforced) | Cu. Yd. | | | | | | | | | | | | | 0 |
| | | | 507 | Grouted Rubble Slope and Ditch Paving | Cu. Yd. | | | | | | | | | | | | | 848 |
| | | | 603 | 18 inch Corrugated Steel Pipe | Lin. Ft. | | | | | | | | | | | | | 0 |
| | | | 603 | 24 inch Corrugated Steel Pipe | Lin. Ft. | | | | | | | | | | | | | 0 |
| | | | 604 | Inlet Type C (5 Foot) | Each | | | | | | | | | | | | | 0 |
| | | | 604 | Inlet Type C (10 Foot) | Each | | | | | | | | | | | | | 2 |

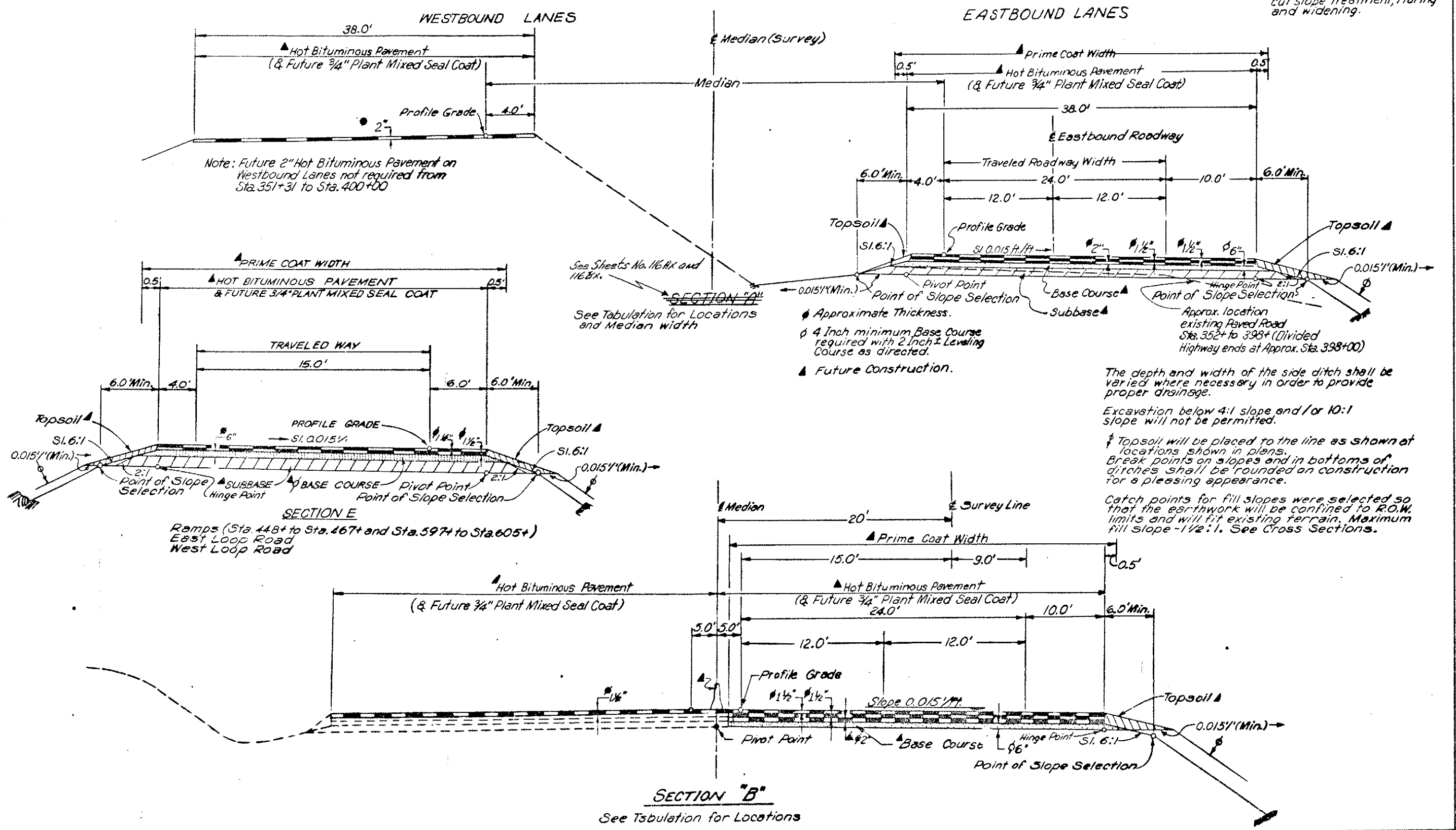
* Quantities paid under C.M.O. 18 only.

TYPICAL SECTIONS

| | | | |
|---------------|--|---------|------|
| NO. REVISIONS | | REVISED | DATE |
| | | 6-23-73 | |

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| 116 | COLORADO | I 70-3(81)220 | 116 | 273 |

NOTE: See Standard for details of cut slope treatment, flaring and widening.



The depth and width of the side ditch shall be varied where necessary in order to provide proper drainage.

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

Topsoil will be placed to the line as shown at locations shown in plans. Break points on slopes and in bottoms of ditches shall be rounded on construction for a pleasing appearance.

Catch points for fill slopes were selected so that the earthwork will be confined to R.O.W. limits and will fit existing terrain. Maximum fill slope - 1 1/2:1. See Cross Sections.

See Sheets No. 116A-X and 116B-X.

See Tabulation for Locations and Median width.

- Approximate Thickness.
- 4 Inch minimum Base Course required with 2 Inch ± Leveling Course as directed.
- Future Construction.

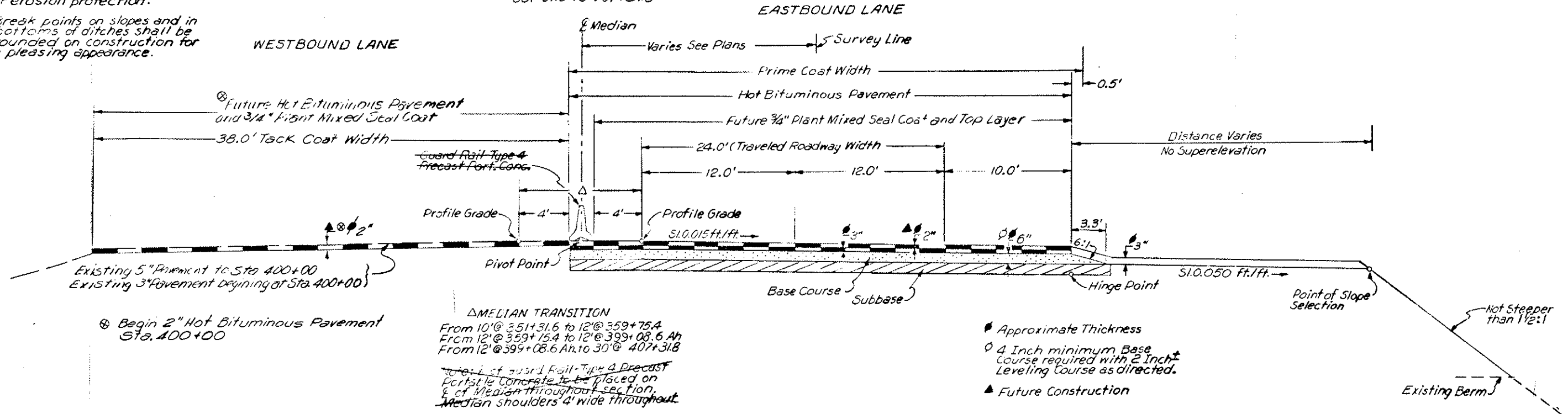
TYPICAL SECTIONS

FOR WORK ORDER #18

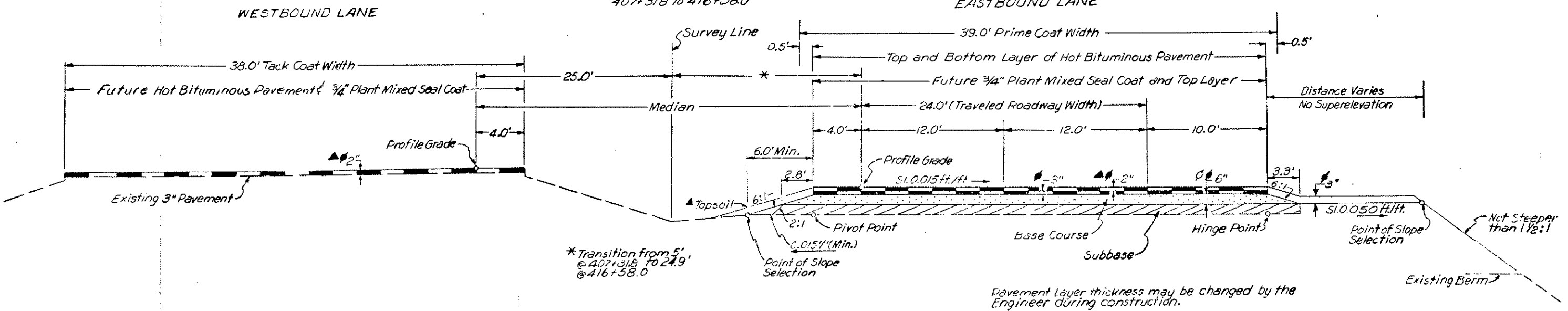
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 11 | 273 |

See standards for details of cut slope treatment, flaring and widening.
 Excavation below 6:1 and/or 10:1 slope will not be permitted.
 Earth slopes shall be disc'd or roughened by other approved methods for mulching or erosion protection.
 Break points on slopes and in bottoms of ditches shall be rounded on construction for a pleasing appearance.

SECTION "A" 351+31.6 TO 407+31.8



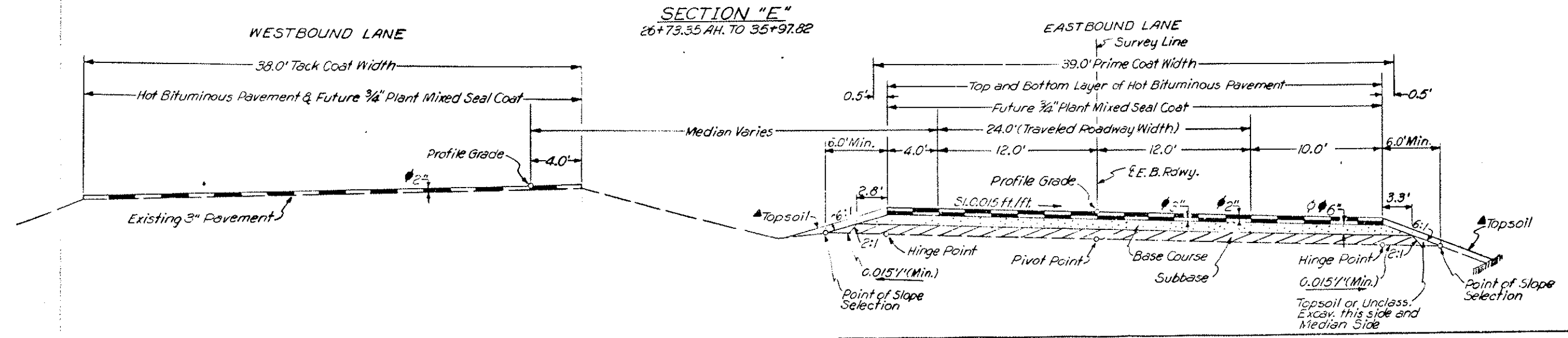
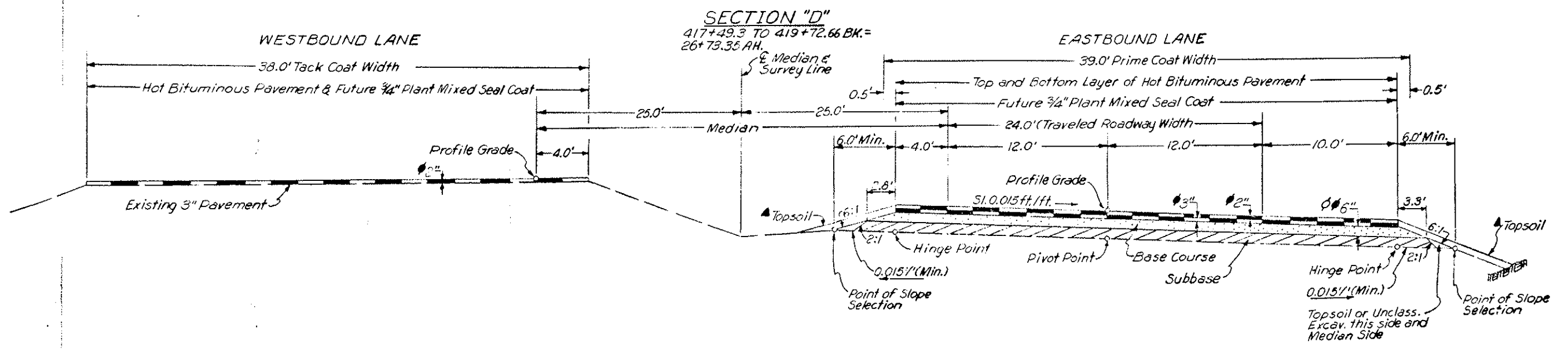
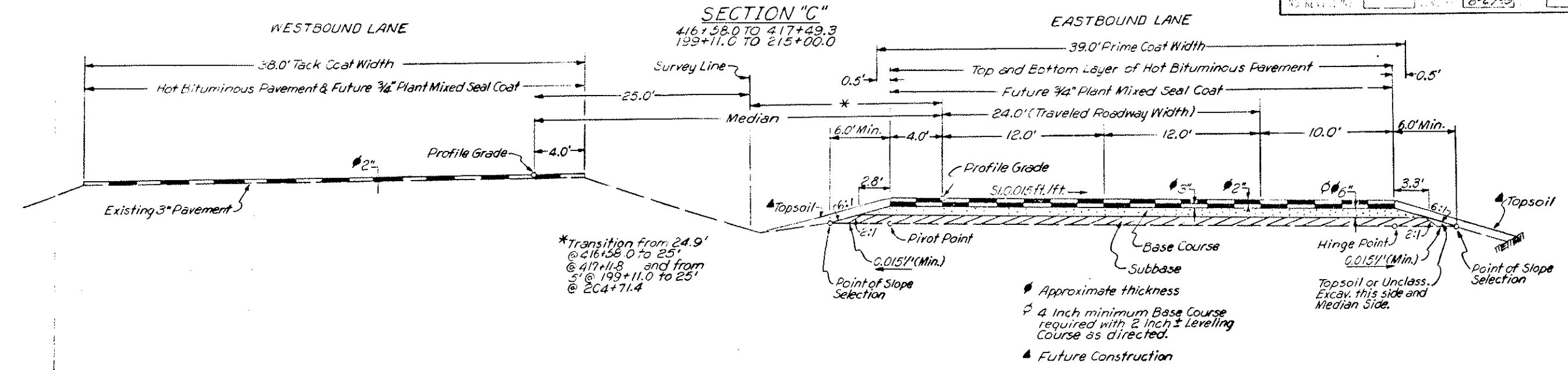
SECTION "B" 407+31.8 TO 416+58.0



TYPICAL SECTIONS

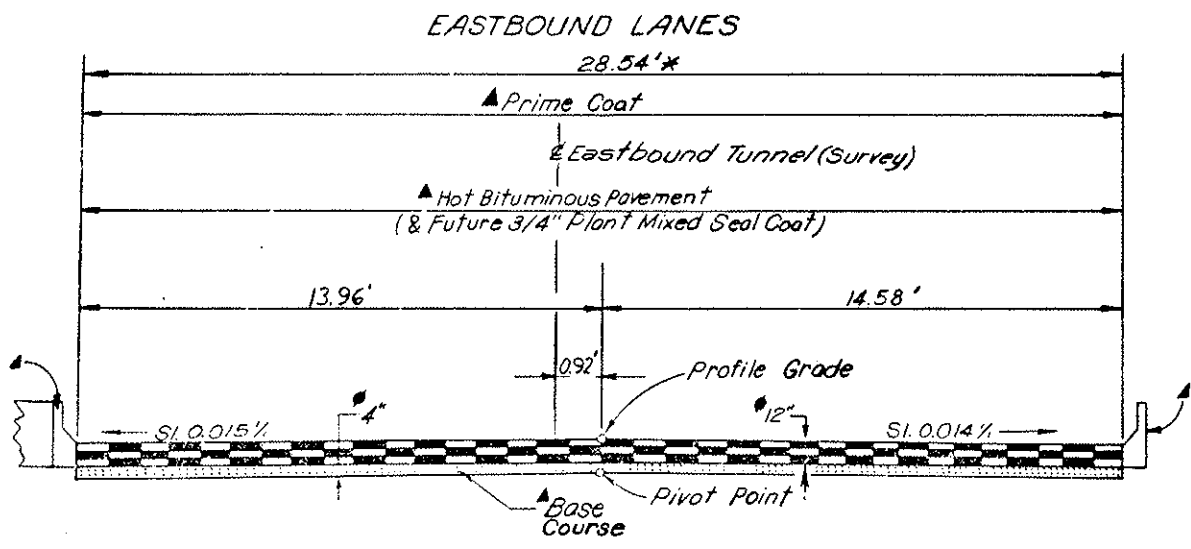
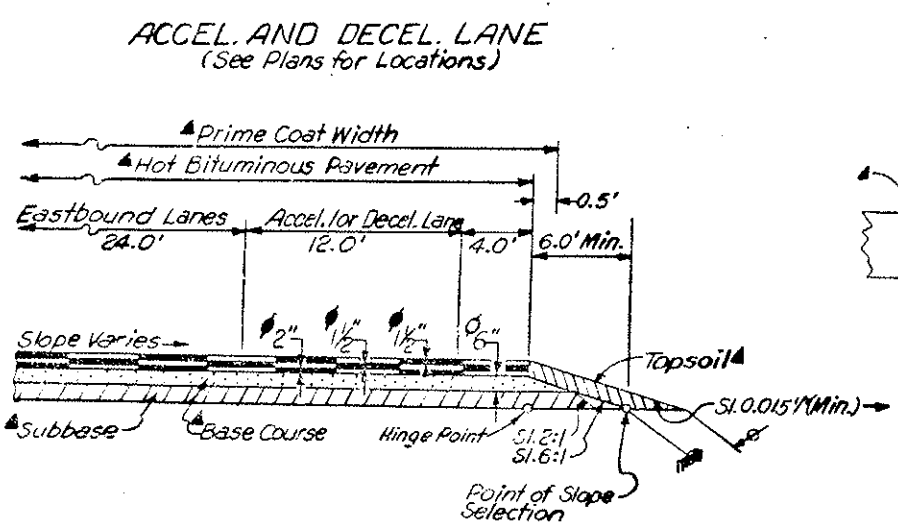
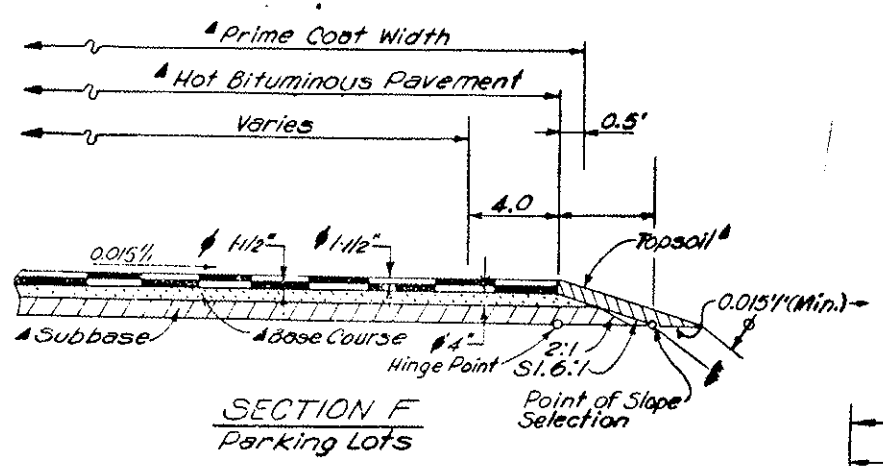
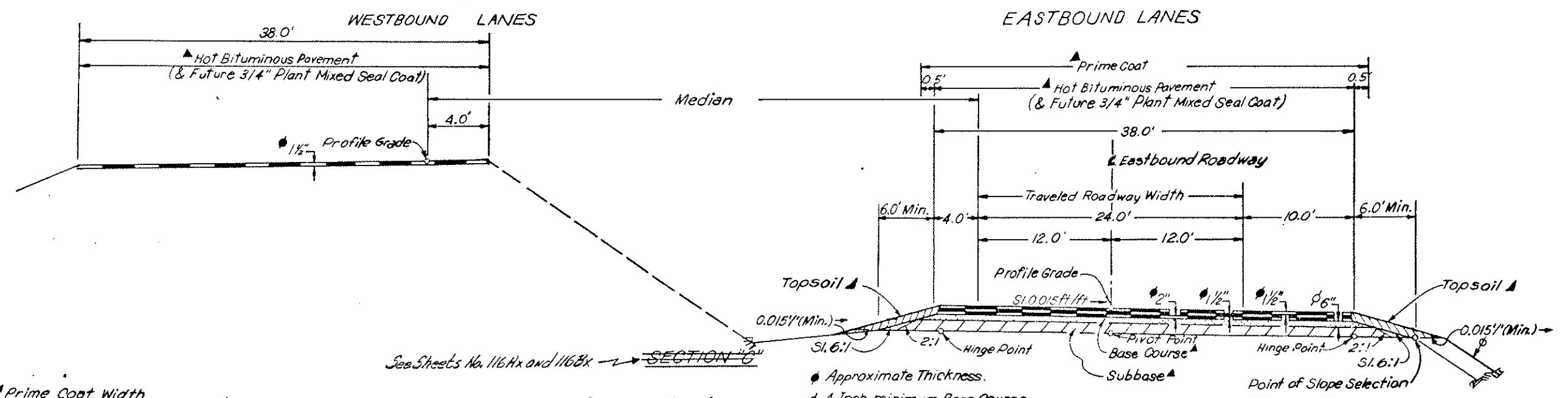
FOR WORK ORDER #18

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 105/1 | 278 |



TYPICAL SECTIONS

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
| 52 | COLORADO | I 70-5(21)220 | 117 | 273 |



SECTION "D"
See Tabulation for Location

TABULATION OF TYPICAL SECTIONS

| LOCATION | TYPICAL SECTION | MEDIAN WIDTH |
|----------------------|-----------------|--------------|
| 351+31.6 to 359+75.4 | A | Varies |
| 359+75.4 to 388+91.6 | A | 42' |
| 388+91.6 to 398+85.9 | A | Varies |
| 398+85.9 to 417+49.3 | A | 50' |
| 417+49.3 to 27+63.0 | C | 50' |
| 27+63.0 to 35+97.8 | C | Varies |
| 35+97.8 to 125+57.3 | D | (Tunnel) |
| 125+57.3 to 149+17.3 | A | Varies |
| 149+17.3 to 193+65.8 | B | 10' |
| 193+65.8 to 204+71.4 | A | Varies |
| 204+71.4 to 215+00 | A | 50' |

GENERAL NOTES FOR APPROACH ROADS

Depth of Moisture-Density Control for this Project shall be as follows:

Full depth of embankments from Sta. 171± to Sta. 176±

Full depth of those embankments that are less than 4 feet in height.

Bases of Cuts 1 Foot

Bases of Fills 4 feet or less in Height, 1 Foot

Excavation required for Compaction of bases of cuts and fills will be considered as subsidiary to that operation and will not be paid for separately.

The minimum thickness of Topsoil shall be 4 inches.

Earth slopes shall be disc'd or roughened by other approved methods for mulching or erosion protection.

It is estimated that 16,000 Hours of Flagging for controlling traffic will be required for this project.

West Approach = 8,000 Hours
 East Approach = 8,000 Hours

Flexible conduits on this project with helical corrugations, joined by dimpled connecting bands, shall use a sealing compound or gasket with the connecting band.

It is estimated that 38 months of janitorial service in the Division's Field Facility will be required.

It is estimated dozing required for this project will be:

| | |
|---------------------------|----------------------|
| Dozing | Dozing (Landscaping) |
| West Approach - 100 hours | 50 hours |
| East Approach 100 hours | 50 hours |

Seeding Fertilizing with Commercial Fertilizer, and Mulching for approximately 8 acres will be required on slopes constructed on this project as directed. The following types and rates shall be used.

| Botanical Name | Common Name | Percent Purity | Percent Germination | Rate PLS/Acre |
|--------------------------|-------------------------|----------------|---------------------|---------------|
| Festuca ovina duriuscula | Hard Fescue | 95.0 | 84 | 14 |
| Agropyron intermedium | Intermediate Wheatgrass | 90.1 | 90 | 8 |
| Bromus inermis | Smooth brome | 98.4 | 89 | 8 |
| Agropyron smithii | Western Wheatgrass | 86.1 | 90 | 6 |
| Trifolium hybridum | Alsike Clover | 99.3 | 80 | 2 |
| Poleum pratense | Timothy | 99.8 | 90 | 2 |

Fertilizer: 50#/acre available N-slow Release: 100#/acre P5O5

It is estimated that the following quantities are required for this project:

| Location | Area (Acres) | Seeding (lbs) | Mulching (Tons) |
|--------------------------------------|--------------|---------------|-----------------|
| 409+50 to 35100 (West Approach Road) | 2.5 | 51 | 5 |
| 137+ to 127+ (East Approach Road) | 5.5 | 111 | 11 |

Additional landscaping will be done on future construction.

| INDEX | | |
|-------|------|-------|
| Book | Page | Sheet |
| | | |

SUMMARY OF EARTHWORK QUANTITIES

| | | | | |
|-------------------------|----------|---------------|-----------|--------------|
| FEDERAL ROAD REGION NO. | DIVISION | PROJ NO. | SHEET NO. | TOTAL SHEETS |
| XII | COLORADO | I 70-3(31)220 | 113 | 273 |

| | West Approach Cu. Yd. | East Approach Cu. Yd. | Total Cu. Yd. |
|--|-----------------------|-----------------------|---------------|
| UNCLASSIFIED EXCAV. (HAUL) | | | |
| Roadway (From Electronic Computer) | 3,026 | 32,478 | 35,504 |
| For Topsoil (See Erosion Control Tab.) | 1,300 | 4,325 | 11,856 |
| For Topsoil (Move Stockpile at West Approach) | 5,000 | 3,025 | 5,279 |
| From Stockpile (See Footnote for Tunnel Excav. Disposal) | 18,945 | | 18,945 |
| Loop Roads | 4,850 | 5,219 | 10,030 |
| Total for Pay Quantity | 33,121 | 40,683 | 73,804 |

| | | | |
|---|--|--|----------------|
| TUNNEL EXCAVATION (For information only) | | | |
| Gross Volume of Tunnel to be Excavated | | | 522,526 |
| Less Pilot Bore Volume to be deducted | | | 15,292 |
| Total Net Quantity to be Excavated from Tunnel | | | 507,233 |

| | West Approach Cu. Yd. | East Approach Cu. Yd. | Total Cu. Yd. |
|---|-----------------------|-----------------------|----------------|
| TUNNEL EXCAVATION DISPOSAL | | | |
| Roadway Embankment | 167,663 | 291,061 | 458,724 |
| Loop Roads | 55 | 1,644 | 1,644 |
| Structure Quantities as Embank. | | 20 | 75 |
| Estimated for Leveling Dry Gulch Pit Area | | 46,790 | 46,790 |
| Total | 167,718 | 339,515 | 507,233 |

| ROADWAY AND TUNNEL BALANCE (For information only) | | | |
|--|---------------------------------|----------------|----------------|
| EXCAVATION X FACTOR (X.O) | | | |
| Tunnel Excav. | For Rdwy. Embank. | 167,663 | 291,061 |
| | For Loop Roads | 55 | 1,644 |
| | For Structure Quant. as Embank. | | 20 |
| | For Leveling Dry Gulch Pit Area | | 46,790 |
| Roadway (From Electronic Computer) | | 3,026 | 32,478 |
| Loop Roads (From X-Sections) | | 4,850 | 5,180 |
| Total | | 175,594 | 377,173 |
| EMBANKMENT NET | | | |
| Roadway (From Electronic Computer) | | 170,950 | 323,539 |
| Loop Roads | | 4,589 | 6,824 |
| Structure Quantities as Embank. | | 55 | 20 |
| Estimated for Leveling Dry Gulch Pit Area | | | 46,790 |
| Total | | 175,594 | 377,173 |

18,945 Cu. Yds. of West Appr. quantity to be Stockpiled as directed and used for Embank. at Sta. 365+ to 398+ when directed.

| | |
|----------------|-----------------|
| AS CONSTRUCTED | |
| NO REVISIONS | REVISED 6-29-79 |

GENERAL ROADWAY NOTES
 EARTHWORK SUMMARY
 SHEET AR-4

FINAL STRUCTURE QUANTITIES

| INDEX BOOK PAGE SHEET | LOCATION | UNCLASSIFIED EXCAVATION CUBIC YARD | STRUCTURE EXCAVATION | | STRUCTURE BACKFILL | | SLOPE RUNDOWN LENGTH | INLET GRATING B FRAME TYPE C | INLET TYPE C 5 FOOT | CONCRETE CLASS "A" | | REINFORCING STEEL TON | CORRUGATED STEEL PIPE LINEAR FEET | | | | "H" OVER CULV. | REINFC. CONCRETE SLOPE AND DITCH PAVING CUBIC YARD | STEEL END SECTION EACH | | | MISCELLANEOUS |
|--------------------------|--|---------------------------------------|----------------------|---------------|--------------------|------------|-------------------------|------------------------------|------------------------|--------------------|-----|--------------------------|--------------------------------------|-----|-----|-----------------------|----------------|---|---------------------------|--|----|---------------|
| | | | CUBIC YARD | CUBIC YARD | CUBIC YARD | CUBIC YARD | | | | MISC. WALL | 18" | | 24" | 60" | 66" | 24" | | | 60" | 66" | | |
| | | | | | | | | | | | | | | | | | | | | | EA | |
| | 352+ See Sh. 113A | 5 | | | | | | 1 | | | | | | | | 11 | | | | 1-ADJUST STRUCTURE, 36 CU. YDS. GROUTED RUBBLE SLOPE & DITCH PAVING | | |
| | 358+ See Sh. 113A | 5 | | | | | | + | | | | | | | | ++ | | | | 1-ADJUST STRUCTURE | | |
| | 359+ See Sh. 113A | 5 | | | | | | + | 1 | | | | | 24 | | 11 | | | | 1-ADJUST STRUCTURE | | |
| | 376+ See Sh. 113A | 5 | | | | | | + | | | | | | | | ++ | | | | 1-ADJUST STRUCTURE | | |
| | 381+ See Sh. 113A | 5 | | | | | | + | | | | | | | | ++ | | | | 1-ADJUST STRUCTURE | | |
| | 388+ See Sh. 113A | 5 | | | | | | + | 1 | 5.0 | | | | 24 | | 11 | | | | 1-ADJUST STRUCTURE | | |
| | 333+00 337+00 | 5 | 7 | 15 | | | 30 | + | 2.5 | | | | | | | + | ++ | | | 18 CU. YDS. GROUTED RUBBLE SLOPE & DITCH PAVING | | |
| | 411+10 423+ See Sh. 113A | 5 | 2 | 4 | | | 4 | + | | | | | | | | 4 | ++ | | | 1-ADJUST STRUCTURE | | |
| | 429+70 35+ 411+ See Sh. 113A | 5 | 7 | 14 | | | 30 | 1 | | | | | | | | 6 | ++ | | | 1-ADJUST STRUCTURE, 32.59 CU. YDS. GROUTED RUBBLE SLOPE & DITCH PAVING | | |
| | 411+ TO 417+ 415+84 417+00 | 5 | 286 671 107 | 446 5 5 | | | 725 29 35 | | 2.5 2.5 | | | | | | | 6 2 2 | | | | 1 5 CU. YD. RIPRAP | | |
| | 30+ TO 32+ 34+10 35+ 35+83 TO 35+97 | 5 | 38 13 15 | 318 177 | 133 17 | | 101 137 230 97 | | | | | | | | | 1 1 1 | | | | 1-REMOVAL OF STRUCTURE 1-PEDESTRIAN OVERPASS 16-TON. ABC (Class 2) | | |
| | 45+02 408+ (Spillway) | 5 | 63 | | | | 34 | | | | | | | | | 144 | | | | 26.7 CU. YDS. GROUTED RUBBLE SLOPE & DITCH PAVING | | |
| | LOOP ROAD 29+85 M.L. 0+70 0+00 TO 23+17.2 6+95 | 5 | 16 | 34 | | | | | 2.5 2.5 | | | | | | | 48 140 | | | | | | |
| | 12+60 11+12 12+50 13+10 14+ | 5 | 15 154 | 10 32 | | | 18 69 | | 2.5 2.5 2.5 | | | | | | | 40 130 58 69 | | | | 1-6 INCH NON-PERFORATED CORRUGATED STEEL PIPE | | |
| | 13+55 13+05 21+75 22+06 | 5 | | 10 10 | | | | | 5.0 5.0 | | | | | | | 40 32 136 | | | | | | |
| | SUB-TOTAL WEST APPROACH | 55 | 152 | 1610 | 95 | 321 | 513 | 82 | 87 | 12 | | | | | | 180 | 140 | 320 | 743 | 963.9 | | |

FOR INFORMATION ONLY
INCLUDED IN EARTHWORK QUANTITIES
REQUIRES 45° ELBOW

REQUIRES SIDE CONNECTION INTO A 60" OR 66" C.S.P.
REQUIRES SIDE CONNECTION TO 24" C.S.P.
REQUIRES 28° ELBOW

STRUCTURE QUANTITIES
SHEET AR-5

THE STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS, STATE OF COLORADO
DDH FORM NO. 125 (M.Y.L.R.)
REV. MARCH 1975

FINAL STRUCTURE QUANTITIES

NO REVISIONS REVISED 2/22/78

| | | | |
|-----------------------|----------|--------------|-----------|
| FEDERAL ROAD DISTRICT | DIVISION | PROJECT NO. | SHEET NO. |
| XIII | COLORADO | I 70-3(8)220 | 129X |

| INDEX | LOCATION | UNCLASSIFIED EXCAVATION CUBIC YARD | STRUCTURE EXCAVATION CUBIC YARD | STRUCTURE BACKFILL CUBIC YARD | SLOPE RUNDOWN LENGTH LIN. FT. | AGGREGATE BASE COURSE SURFACING CLASS | HOT BITUMINOUS PAVEMENT GRADING | ADJUST STRUCTURE EACH | INLET TYPE C | | | | CORRUGATED STEEL PIPE LINEAR FEET | | | | CONCRETE SLOPE B DITCH PAVING OVER (REINF.) CULV. CUBIC YARD | MISCELLANEOUS |
|-------|--|------------------------------------|---------------------------------|-------------------------------|-------------------------------|---------------------------------------|---------------------------------|-----------------------|--------------|---------|-----|-----|-----------------------------------|-----|-----|------|---|---------------|
| | | | | | | | | | 5 FEET | 10 FEET | 18" | 24" | 18" | 24" | 30" | 36" | | |
| | 346+ 348+50 348+50 to 400+ 352+ | | 539 | 530 | 335 | | | | | | | | | | | | 21- Removal of Ground Signs Rt. & Lt. 35- Removal of Delineator Rt. & Lt. 276- Cu. Yd. Grouted Rubble Slope & Ditch Paving | |
| | 358+75.4 363+77 369+71 376+ | | 2 | 7 | 4 | 7 | | + | + | | 22 | | | 8.0 | ## | | 1- Plug Structure | |
| | 381+ 385+00 386+26 | | | | | | | + | | | | | | | | | Reset 1- Removal of Ground Sign @ Sta. 398+ Reset 1- Removal of Ground Sign @ Sta. 339+60 | |
| | 387+00 388+ 394+00 394+60 | | 2 | 7 | 4 | 8 | | + | + | | 22 | | | 8.0 | 11 | | Reset 1- Removal of Ground Sign @ Sta. 340+00 213- Cu. Yd. Grouted Rubble Slope & Ditch Paving 12- Removal of Ground Sign | |
| | 399+ 401+50 403+ | | 300 | 390 | 12 | 12 | | | | | | | | | 1.1 | | 219 56- Cu. Yd. Grouted Rubble Slope and Ditch Paving 1- Removal of Ground Sign | |
| | 407+50 411+ | | 9 | 17 | | 60 | | | | | | | | | | | 56 56- Cu. Yd. Grouted Rubble Slope and Ditch Paving 36- Cu. Yd. Grouted Rubble Slope and Ditch Paving 1- Removal of Structure 36- Cu. Yd. Grouted Rubble Slope and Ditch Paving 84 Paving | |
| | PROJECT TOTALS | | 23 | 1535 | 46 | 27 | | | | + | 5 | 42 | 174 | 128 | | 2522 | | |

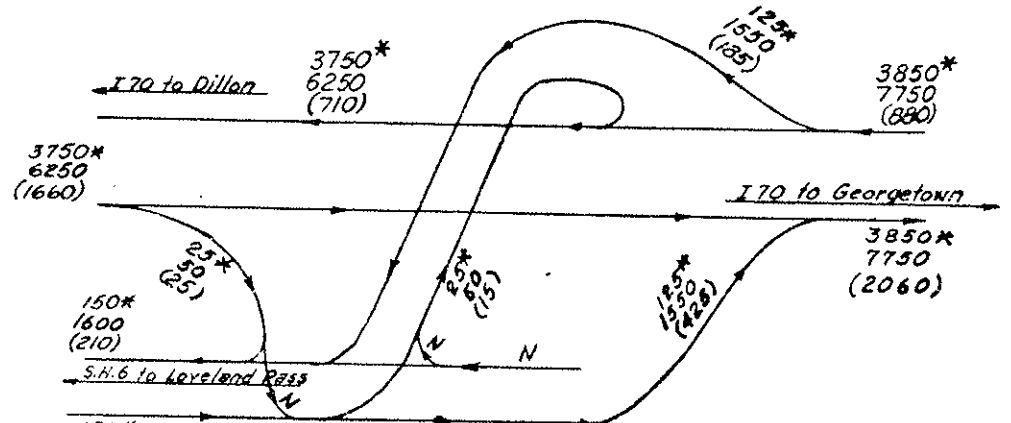
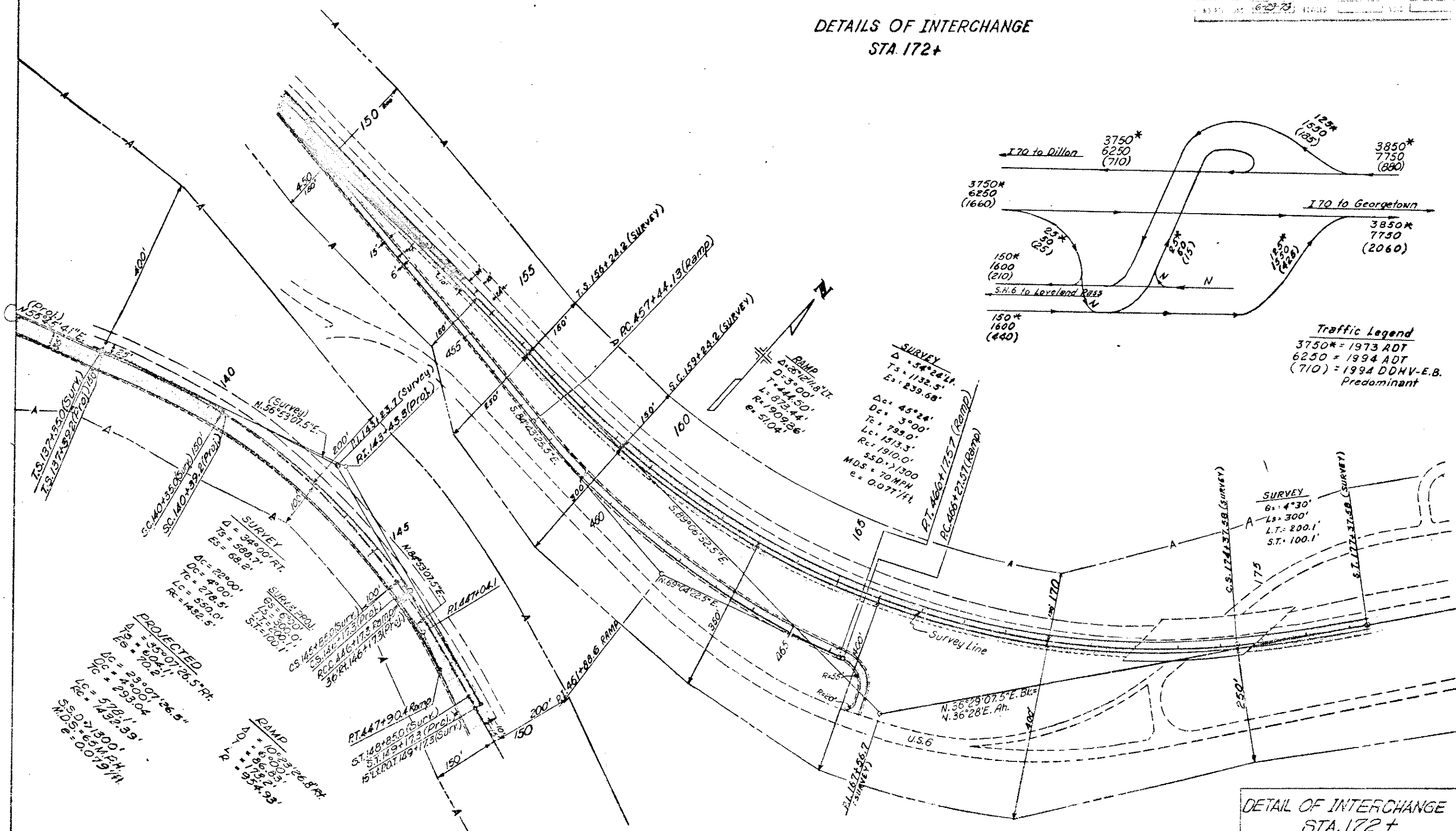
• For Information only.

▲ Included in Embankment Material (Complete in place)

* 100 units added under C.M.C. to provide End Prices
* 237 Cu. Yds. added under C.M.C. to provide Associated Price

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|---------------|-----------|--------------|
| XX | COLORADO | I 70-3(81)220 | 121 | 273 |

DETAILS OF INTERCHANGE STA. 172+



Traffic Legend
 3750* = 1973 ADT
 6250 = 1994 ADT
 (710) = 1994 DDMV-E.B.
 Predominant

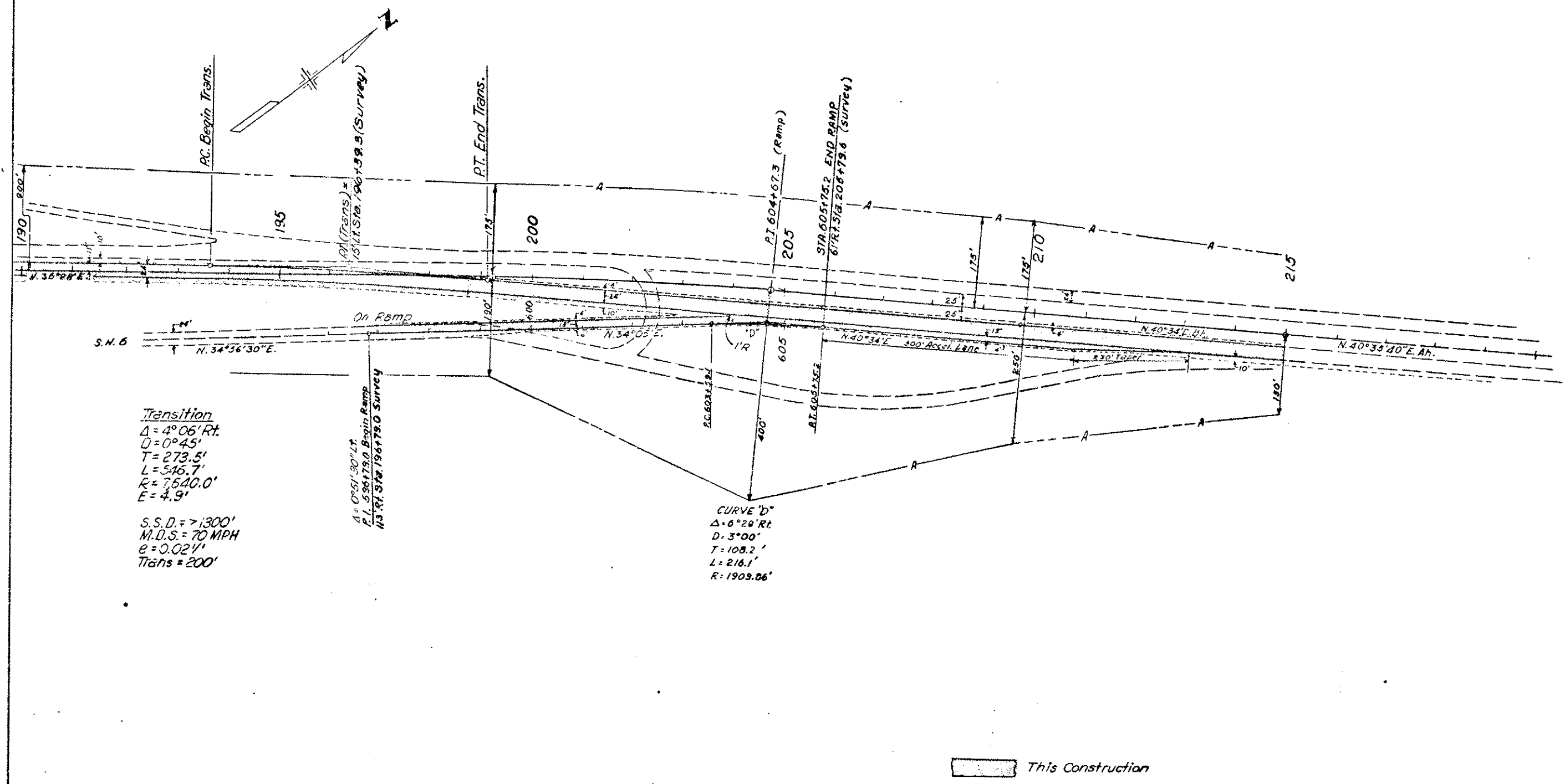
This Construction

DETAIL OF INTERCHANGE
 STA. 172+
 SHEET AR-7

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| 33 | COLORADO | I70-3(81)220 | 122 | 213 |

DETAILS OF INTERCHANGE STA. 172+

6-29-78

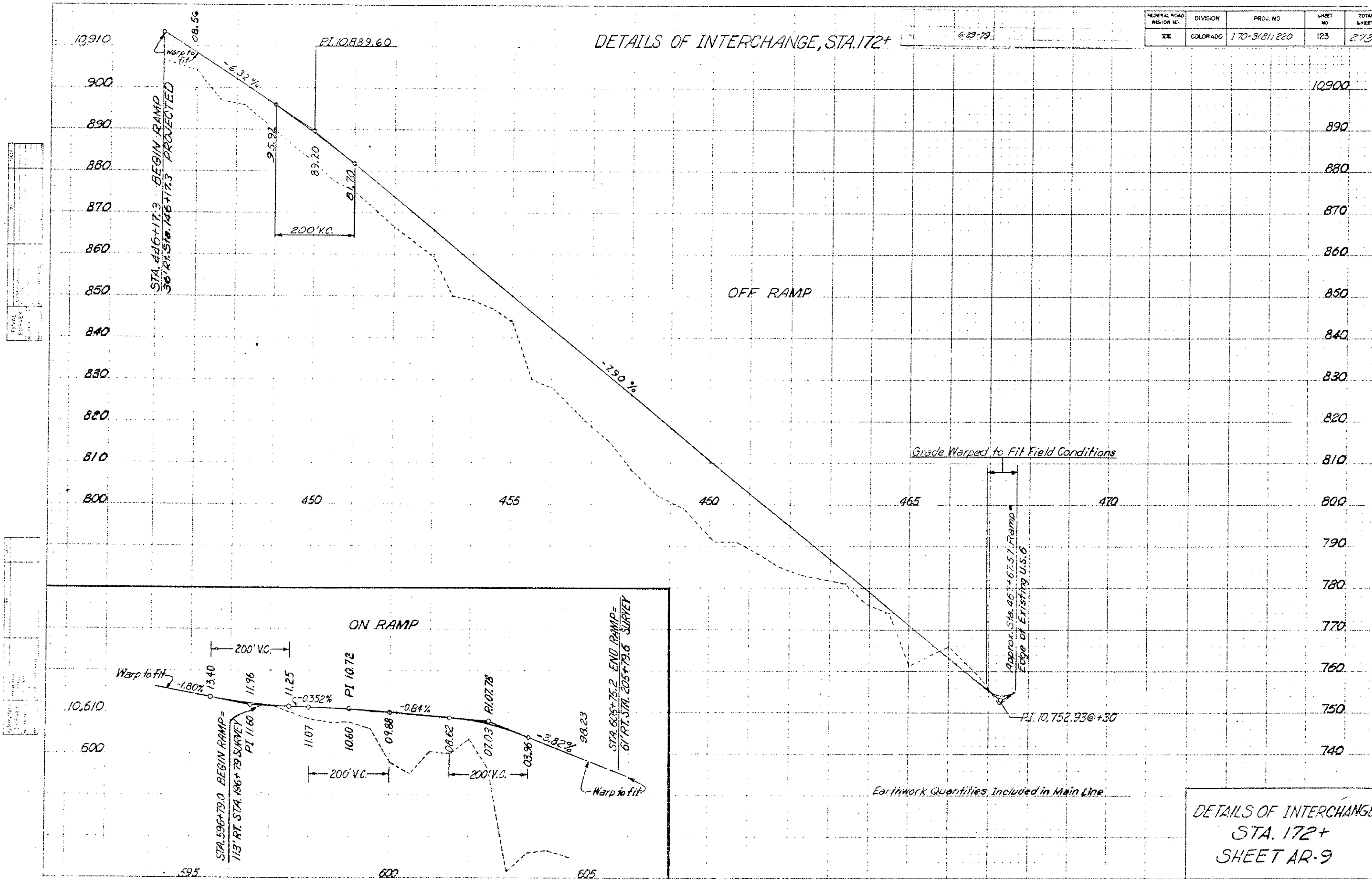


DETAILS OF INTERCHANGE
 STA. 172+
 SHEET AR-8

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| XIII | COLORADO | 170-3(81)220 | 123 | 273 |

DETAILS OF INTERCHANGE, STA. 172+

6-29-79



DETAILS OF INTERCHANGE
STA. 172+
SHEET AR-9

FINAL SURVEY

FINAL SURVEY

10910
900
890
880
870
860
850
840
830
820
810
800

10900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
750
740

STA. 446+17.3 BEGIN RAMP
30' RT. STA. 146+17.3 PROJECTED

STA. 596+79.0 BEGIN RAMP
113' RT. STA. 196+79 SURVEY

STA. 605+75.2 END RAMP
61' RT. STA. 205+75.6 SURVEY

PI 10,889.60
89.20
81.70
200' V.C.

200' V.C.
PI 10.72
10.80
200' V.C.

PI 10.78
07.03
200' V.C.

Warp to fit
-1.80%

Warp to fit

595

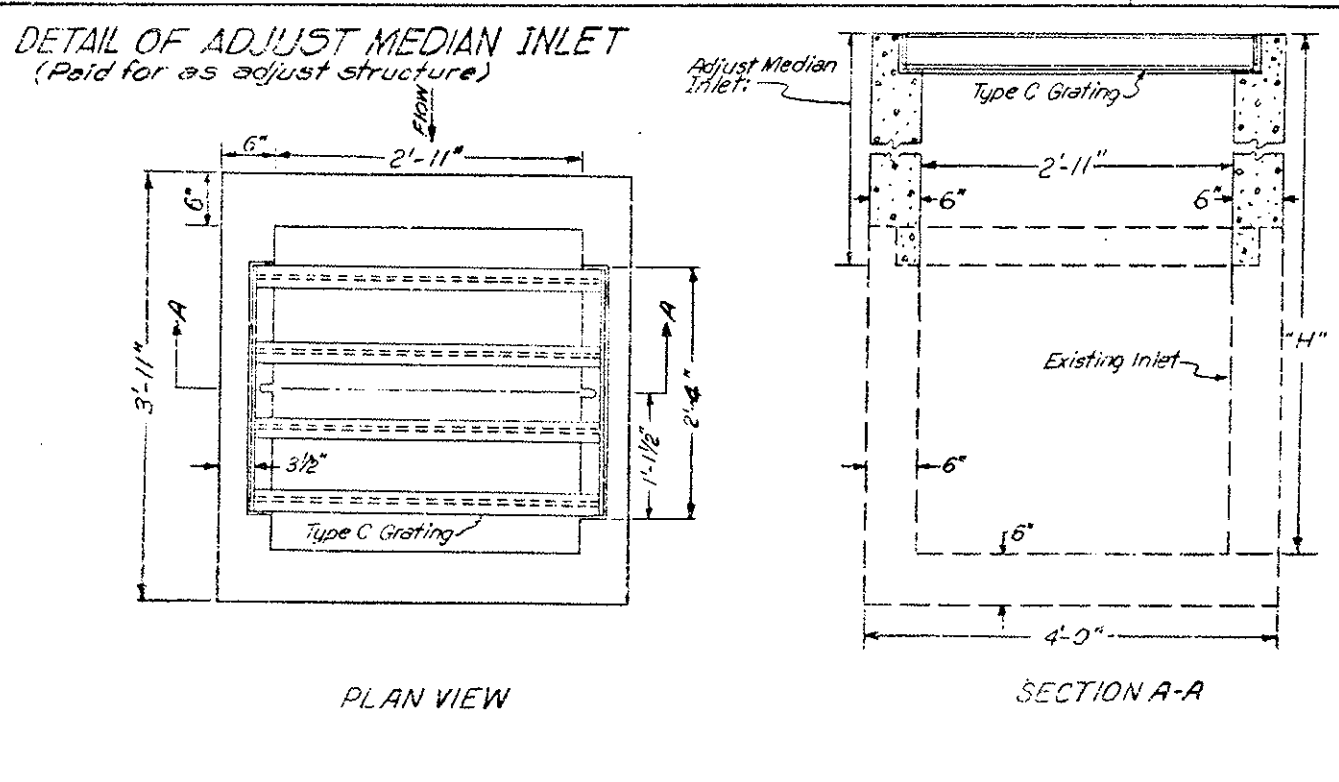
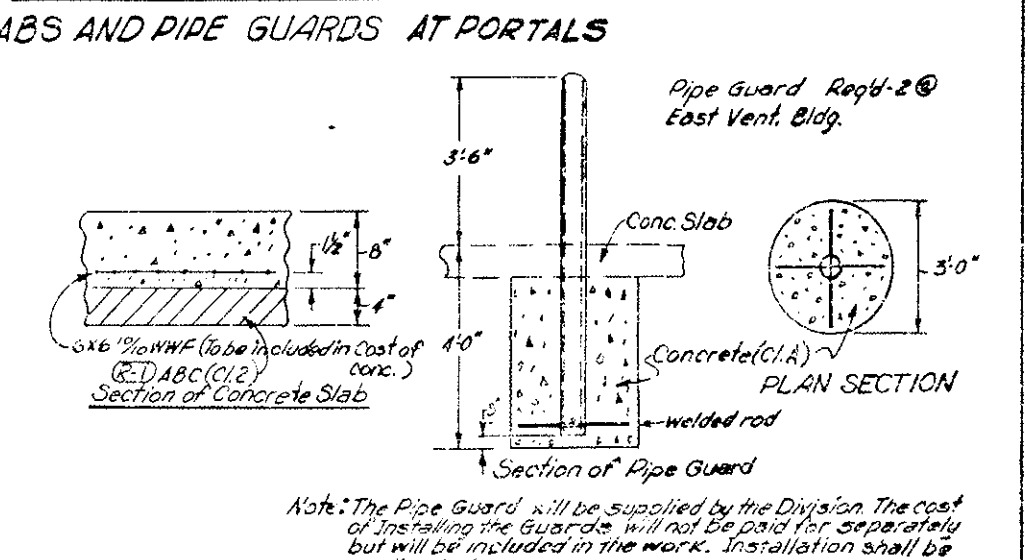
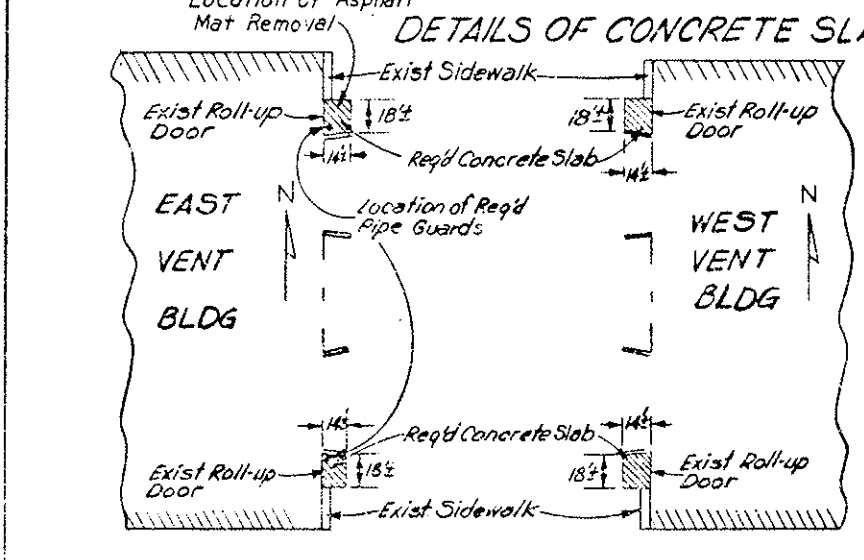
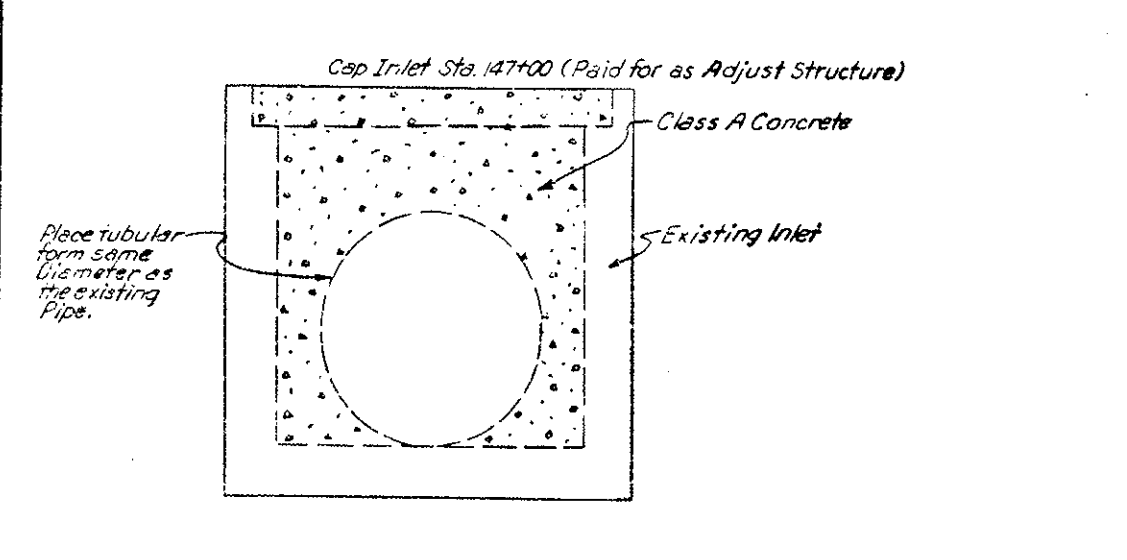
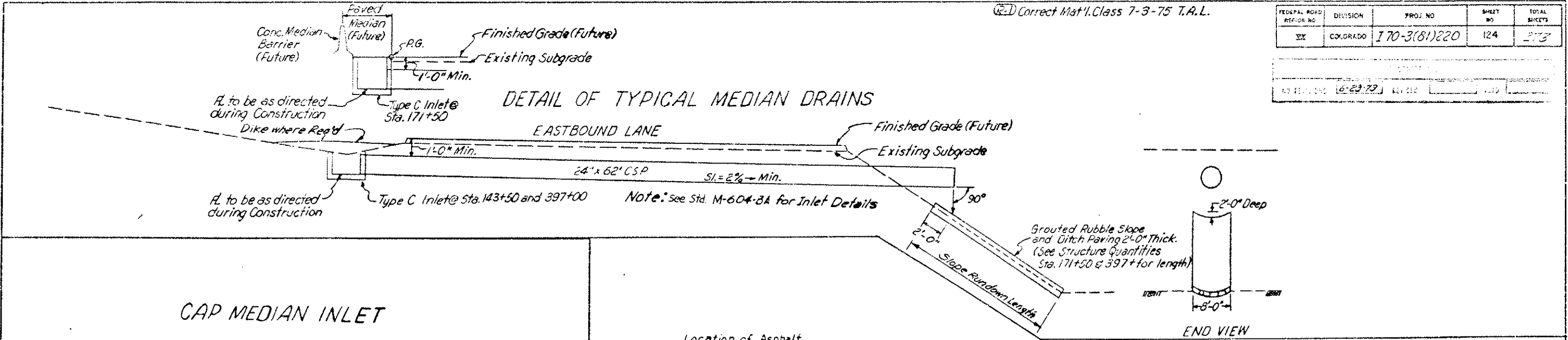
600

605

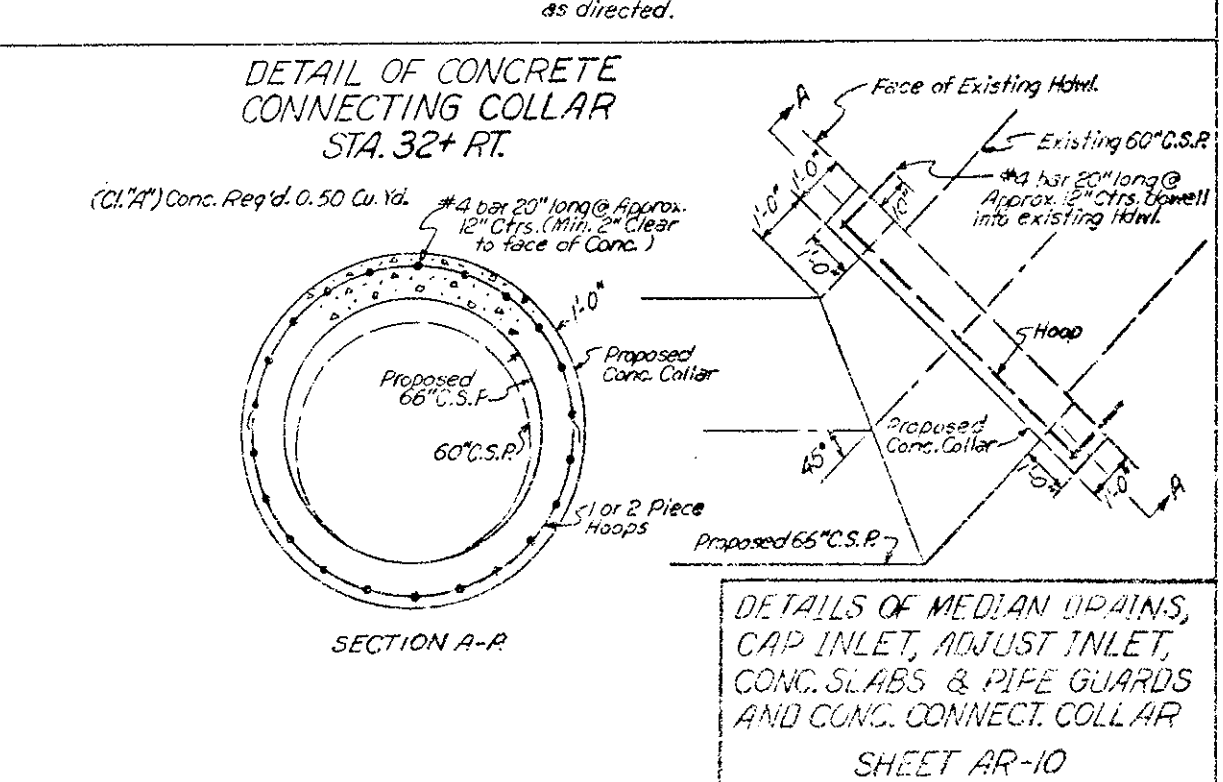
1405

Correct Mat'l. Class 7-3-75 T.A.L.

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| XX | COLORADO | 170-3(81)220 | 124 | 273 |



- Adjust Structure shall include:
1. Adding Concrete to the proper "H"
 2. Furnishing Grating fastener and forming Recess.
 3. Providing Structure Excav. and Structure Backfill as necessary.
- Inlet Grating & Frame, Slope & Ditch Paving and Dike Embankment will be paid for under appropriate Bid Items. (See Std. M-604-BA for Details.)



DETAILS OF MEDIAN DRAINS, CAP INLET, ADJUST INLET, CONC. SLABS & PIPE GUARDS AND CONC. CONNECT. COLLAR SHEET AR-10

TOPSOIL & RETENTION BLANKET

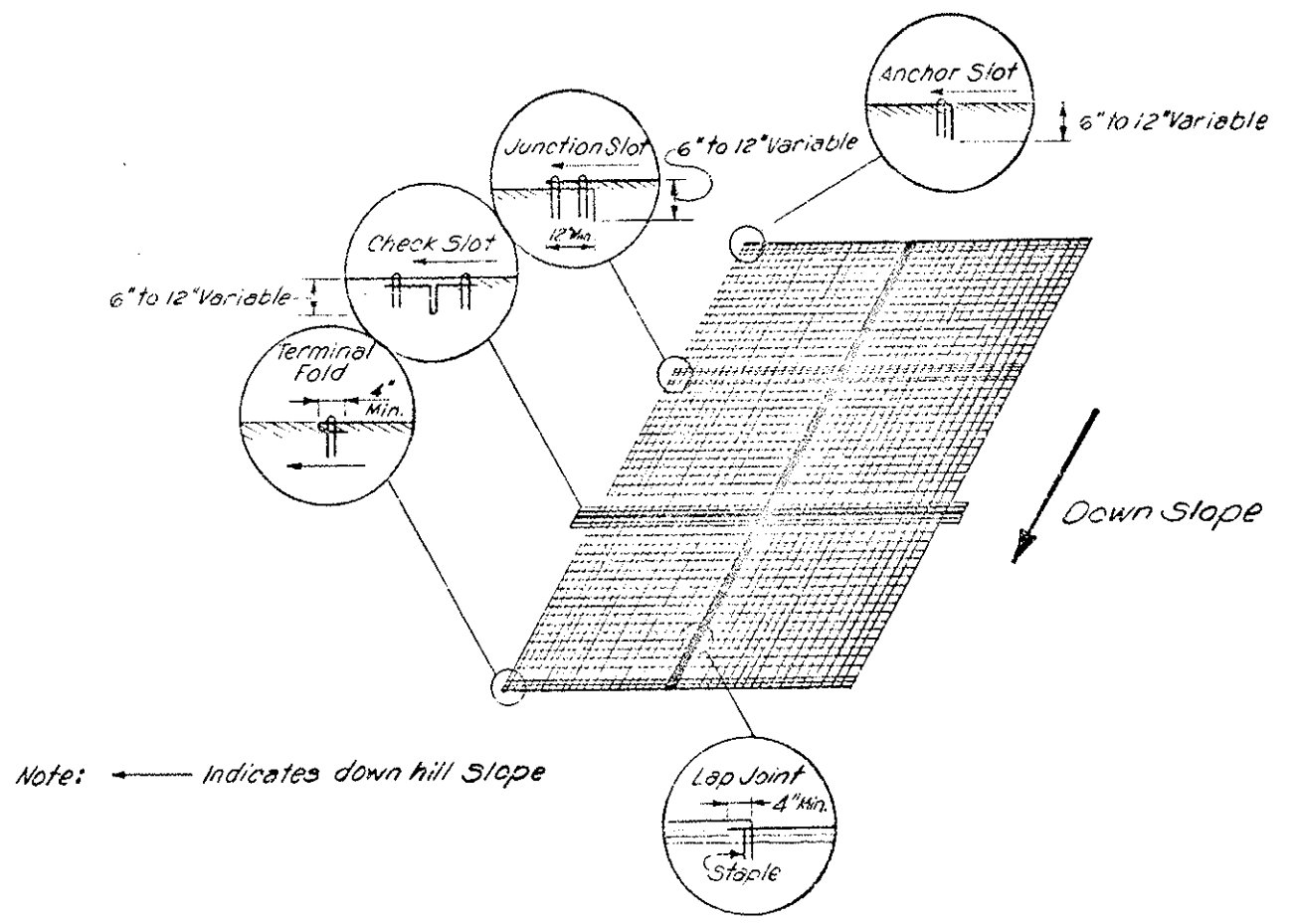
| Location | Side | Soil Retention Blanket Sq. Yds. | Topsoil Cu. Yd. |
|-------------------------|------|---------------------------------|-----------------|
| 409+50 to 35+00 | Rt. | 11,670 | 1,300 |
| Sub-Total West Approach | | 11,670 | 1,300 |
| 137+25 to 139+75 | Rt. | 1,390 | 155 |
| 151+50 to 171+50 | Rt. | 17,780 | 1,980 |
| 175+00 to 197+00 | Rt. | 8,000 | 890 |
| Sub-Total East Approach | | 27,170 | 3,025 |
| Project Totals | | 38,840 | 4,325 |

This Topsoil to be obtained Rt. of On Ramp opposite ML Sta 196+ to 215+

FINAL TOPSOIL & RETENTION BLANKET

| LOCATION | SIDE | SOIL RETENTION BLANKET SQ. YDS. | TOPSOIL CU. YDS. |
|-------------------------|------|---------------------------------|------------------|
| ROAD TO WATER TANK | RT. | 3,304.9 | |
| SUBTOTAL W. APPROACH | | 3,304.9 | |
| 3+00 to 455+00 RAMP | RT. | 11,000.0 | |
| 455+00 to 462+00 RAMP | RT. | 4,266.7 | |
| 70+00 to 81+50 | RT. | 10,113.0 | |
| 137+00 to 202+00 | RT. | 14,817.7 | |
| N. SIDE E. VENT. B.L.G. | | 5,200.0 | |
| SUB TOTAL E. APPROACH | | 45,397.4 | |
| PROJECT TOTALS | | 48,702.0 | 11,858 |

SOIL RETENTION BLANKET JOINT DETAILS

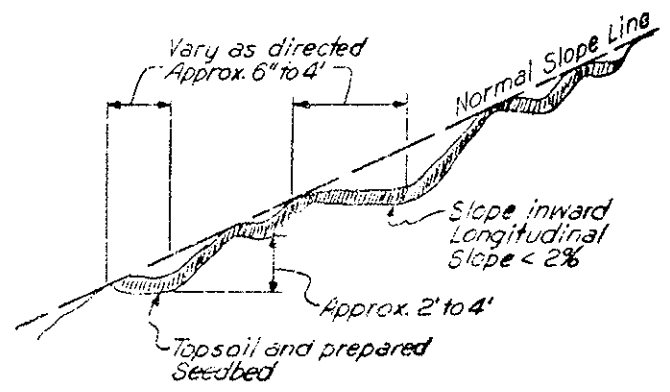


Note: ← Indicates down hill Slope

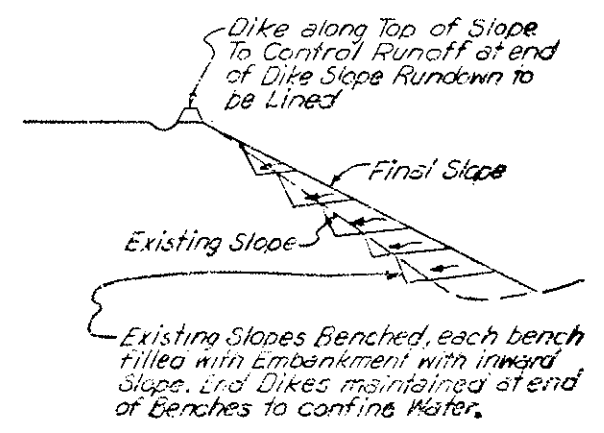
Description of Joints and Slots

- Anchor Slot - Buried upper edge of Blanket.
- Junction Slot - Joint between upper and lower pieces. Upper pieces overlapping buried end of lower piece.
- Check Slot - Extra piece of blanket folded lengthwise and buried perpendicular to the slope. Continuous upper piece overlaying the unfolded portion remaining above ground.
- Terminal fold - Bottom edge of blanket, folded under and stapled.
- Lap Joint - Overlap joint between two rolls, running down the slope.

INFORMAL BENCHING
(To be installed as directed)



SLOPE EROSION CONTROL



DETAILS OF SLOPE EROSION CONTROL, SOIL RETENTION BLANKET, TOP SOIL TABULATION & BENCHING SHEET AR-11

(R-1) Add Totals 7-3-75 T.A.L.

| FEDERAL ROAD REGION NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|----------|--------------|-----------|--------------|
| VIII | COLORADO | 170-3(81)220 | 126 | 273 |

DATE: 6-23-79

(R-1) FENCING TABULATION

| LOCATION | SIDE | FINAL | * FENCE CHAIN LINK (INDUSTRIAL) | FINAL | 20 FOOT GATE DOUBLE DRIVEWAY |
|--------------------------------------|------|-------|---------------------------------|-------|------------------------------|
| | | | LIN. FT. | | EACH |
| 414+90 to 414+98 | Rt. | 21 | 60 | | |
| 415+00 | Rt. | | | 1 | 1 |
| 415+02 to 35+50 33+ | Rt. | 1185 | 700 | | |
| 35+52 33+ | Rt. | | | 1 | 1 |
| 35+75 to 36+00 33+ to 34+ | Rt. | 60 | 65 | 1 | |
| 31+10 to 36+00 | Lt. | | 335 | | |
| 34+ to 35+ | Rt. | 164 | | 1 | |
| 31+ to 36+ | Lt. | 905 | | 1 | |
| Sub Total West Approach | | 2355 | 1960 | 5 | 2 |
| 143+ | | | | | |
| 125+57 to 736+20 | Lt. | 1818 | 7300 | | |
| 126+00 | Lt. | | | 1 | 1 |
| 130+ → 131+75 | Lt. | | | 1 | 1 |
| 138+20 | X | 42 | 60 | | |
| 125+60 to 131+75 138+ | Lt. | 41 | 650 | | |
| Sub Total East Approach | | 1901 | 2050 | 4 | 3 |
| Project Totals | | 4256 | 4030 | 9 | 5 |

Location of Fence and Gates is shown on work and storage Area sheets. Fencing is to define work areas.

It is estimated that ³¹ ~~30~~ Corner and Line Brace Post (Chain Link) and ³⁰ ~~18~~ End Post (Chain Link) will be required as follows.

| | | |
|------------|-----------------|----------------------------|
| was | End Post | Corner and Line Brace Post |
| West Appr. | 6 15 | 8 14 |
| East Appr. | 7 15 | 4 17 |

*Tension Wire Type

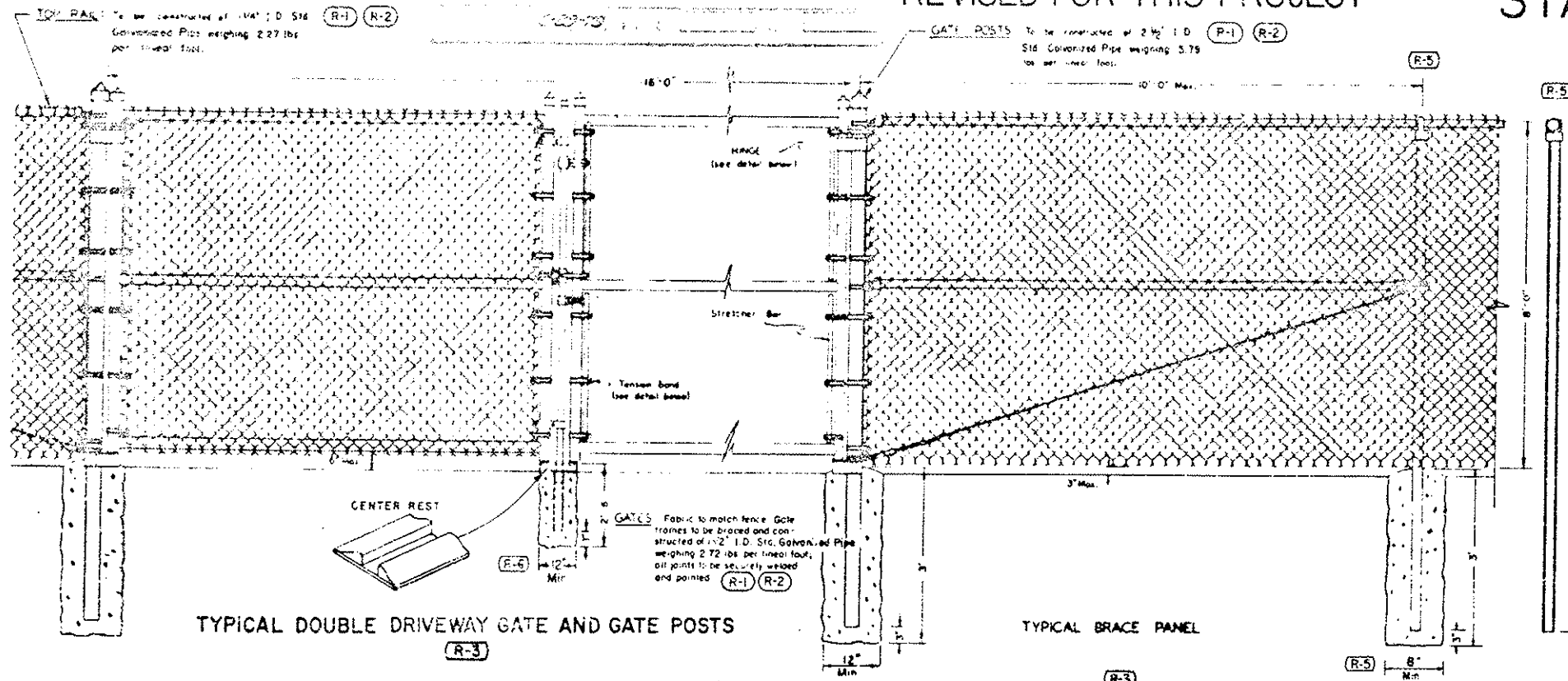
FENCING TABULATION
 AR-12

REVISED FOR THIS PROJECT

STANDARD M-607-B

(JULY 1, 1965)
(SHEET 1 OF 2)

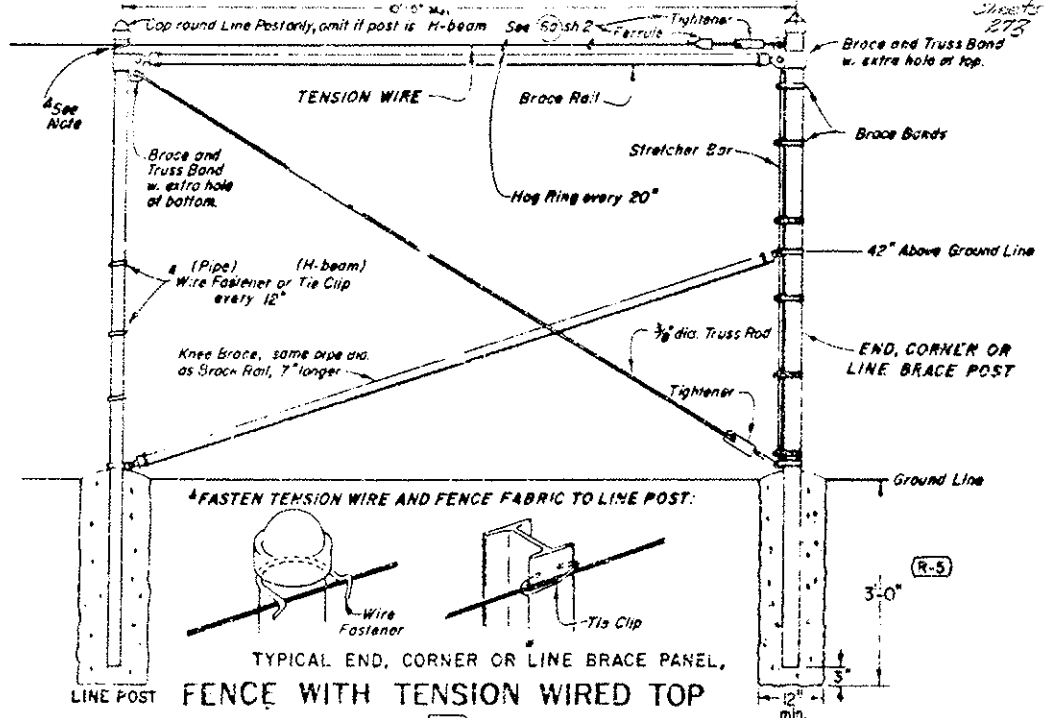
| | | | |
|--------------------|----------|-------------|-----------|
| FED. ROAD REG. NO. | DIVISION | PROJECT NO. | SHEET NO. |
| III | COLORADO | 170-3(8)220 | 127 |



TYPICAL DOUBLE DRIVEWAY GATE AND GATE POSTS (R-3)

TYPICAL BRACE PANEL (R-3)

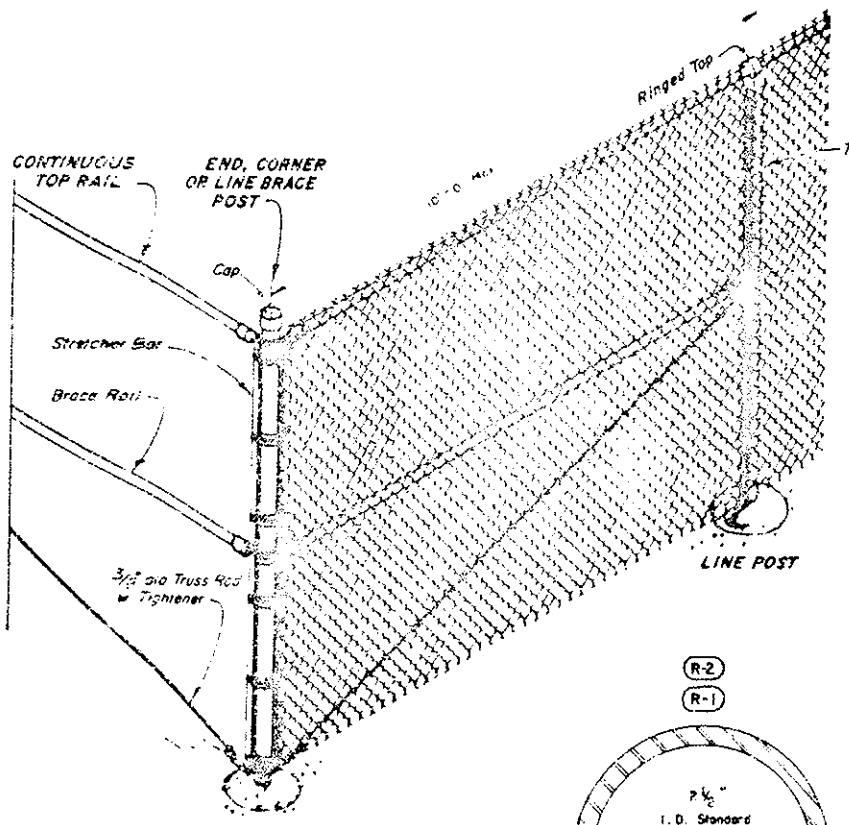
TYPICAL LINE POST (R-5)



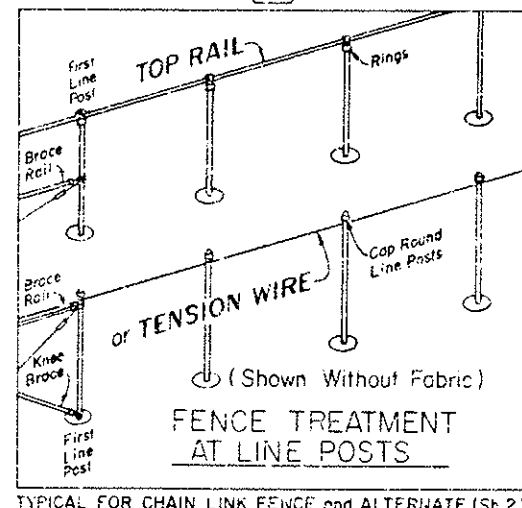
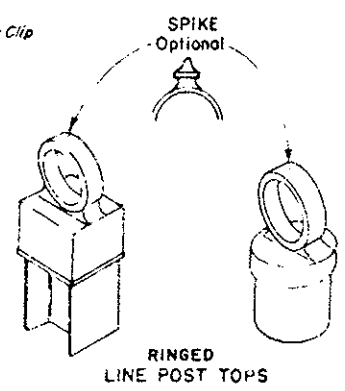
TYPICAL END, CORNER OR LINE BRACE PANEL, FENCE WITH TENSION WIRED TOP (R-6)

| REVISION | | | |
|----------|----------|---------------------------------------|--------|
| (R-1) | 3-29-66 | Pipe, Fence height & Gen'l. Notes | M.R.H. |
| (R-2) | 4-7-66 | Pipe diameters clarified | M.R.H. |
| (R-3) | 2-6-67 | Details spec. Note: add Gen. Note | M.R.H. |
| (R-4) | 7-24-68 | Dept. Name | M.R.H. |
| (R-5) | 7-13-70 | Post holes (foot, Line brace, Ground) | M.R.H. |
| (R-6) | 12-11-70 | Add details for tension wire | M.R.H. |
| (R-7) | 4-20-71 | Conc. in Gen. Note | M.R.H. |

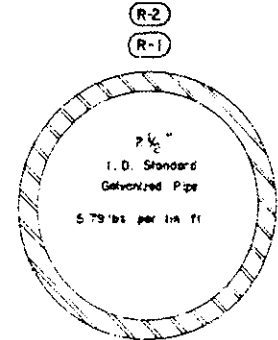
Note: Line Brace Panel shall be used in fence at intervals of not more than 400 feet. (R-6)



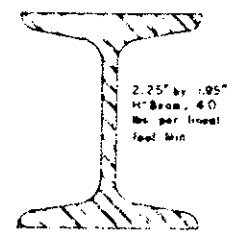
TYPICAL END, CORNER OR LINE BRACE PANEL for FENCE WITH RAILED TOP (R-6)



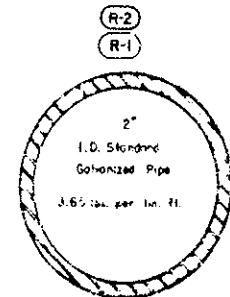
TYPICAL FOR CHAIN LINK FENCE and ALTERNATE (Sh 2) (R-6)



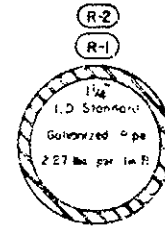
END, CORNER AND LINE BRACE POSTS (R-5)



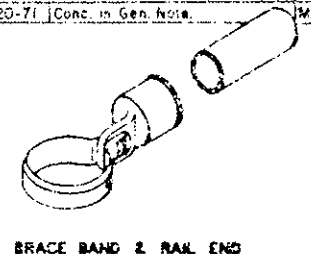
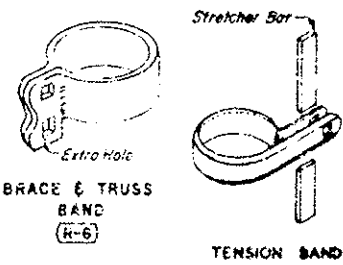
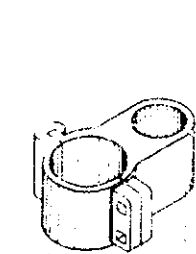
ALTERNATE LINE POST (R-5)



LINE POST (R-5)



BRACE RAIL & TOP RAIL (R-5)



(R-7) GENERAL NOTES

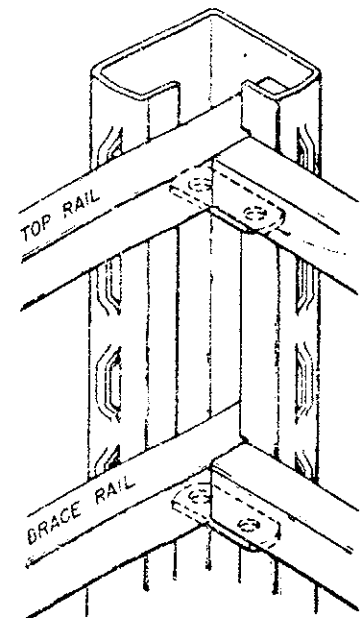
- All work shall be done in accordance with the Standard Specifications applicable to the Project.
- Weights of pipe as shown are nominal for the diameter designated. Pipe for posts shall conform to ASTM Designation A 120, Series 40.
- Alternate equivalent standard fittings, gates, posts, and rails other than as shown may be used subject to approval by the Engineer.
- Chain Link Fabric shall be No 9 gage wire securely fastened to all line Posts, Rails and Braces with No 7 (B&S) gage aluminum wire and/or No 12 1/2 (W&M) gage galvanized steel wire spaced at a minimum of 6 per 10 feet horizontally and one per foot vertically. Suitable attachment bands shall be used on all gate posts, End Posts, Braces, and stretcher bars.
- Chain Link Fabric for use on rock slopes or in conjunction with rock drains shall be No 6 gage wire.
- Maximum Line Post spacing shall be 10' (c to c). Concrete shall be Class A, B or D.
- Lightweight aggregate conforming to ASTM C 350 will be allowed in concrete.
- Concrete footings shall have crowned tops.
- Top rail or tension wire shall be used as shown on the plans.
- Tension wire shall be continuous between end or corner post and line brace post. A turnbuckle or other approved tightening device shall be used for each continuous span of tension wire.
- Tension wire shall be 7 gage galvanized coil spring steel, or approved eq. eq.
- Termination of fence at bridges or other structures shall be as shown on the plans.

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
CHAIN LINK FENCE

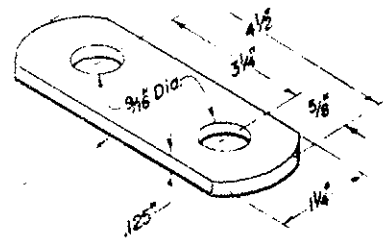
AR-13

Designed by V.L.A. Approved by E.L.M.
Checked by E.L.M. Draft Design Engr.
Date July 1, 1965

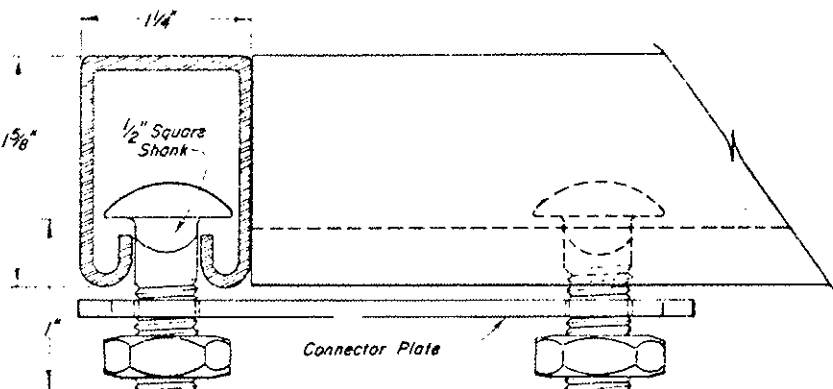
| REVISIONS | | | |
|-----------|----------|-------------------------------------|--------|
| R-5 | 7-13-70 | Entire sheet | M.R.M. |
| R-6 | 12-11-70 | Add details 6a and 13 | M.R.H. |
| R-7 | 4-20-71 | Line brace title Tension wire clamp | M.R.H. |



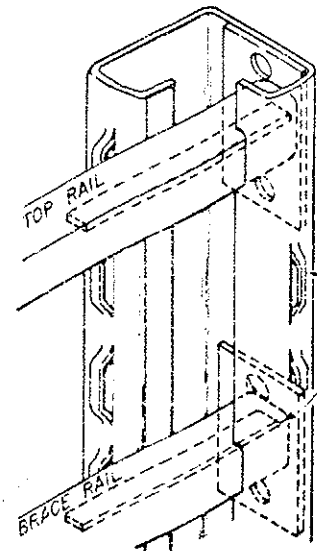
CORNER POST TREATMENT
①



CONNECTOR PLATE
②

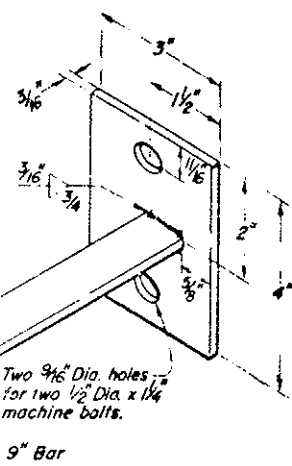


RAIL (Showing Corner Assembly)
14 GAGE ROLL FORMED STEEL, 20' LENGTHS, 1.35 LB. PER LIN. FT.
③

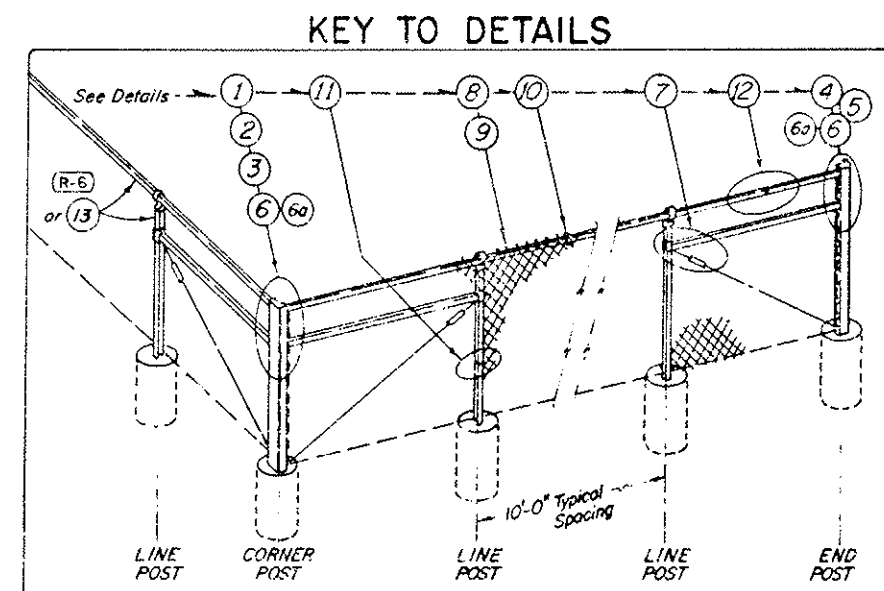


END POST TREATMENT
④

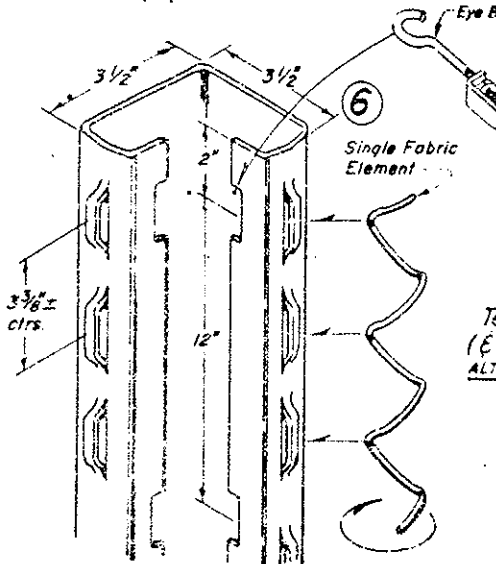
To enhance legibility, loops are not all shown.



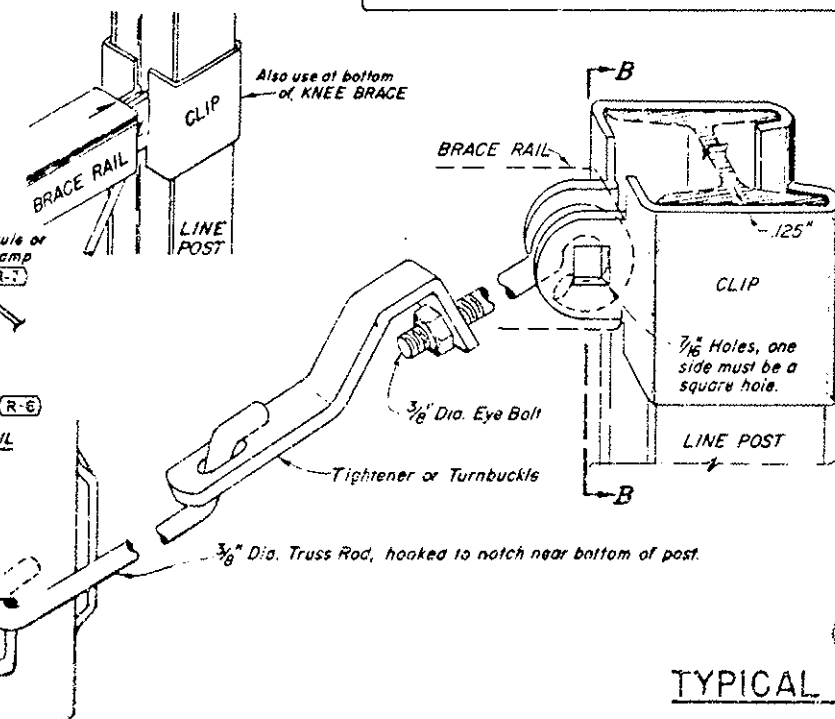
TORQUE BAR
⑤



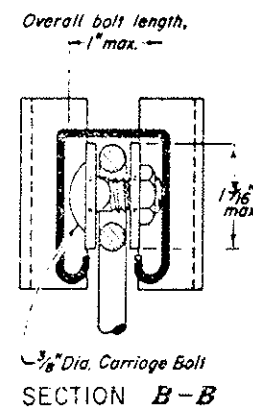
KEY TO DETAILS



END POST OR CORNER POST
10 GAGE ROLL FORMED STEEL, 5.14 LB. PER LINEAR FOOT



TYPICAL BRACING
⑦



SECTION B-B

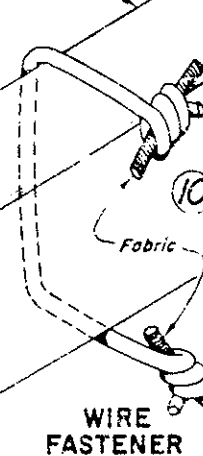


BARBED SELVAGE
⑧



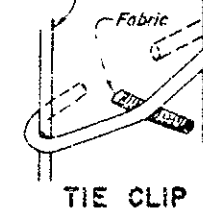
KNUCKLED SELVAGE
Alternate, use only when called for on plans.
⑨

Every 20" horizontally, on Top Rail

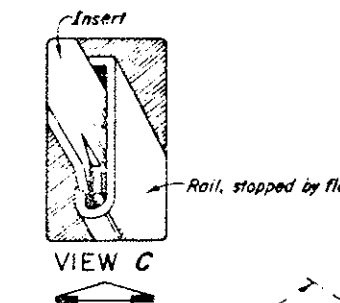


WIRE FASTENER
⑩

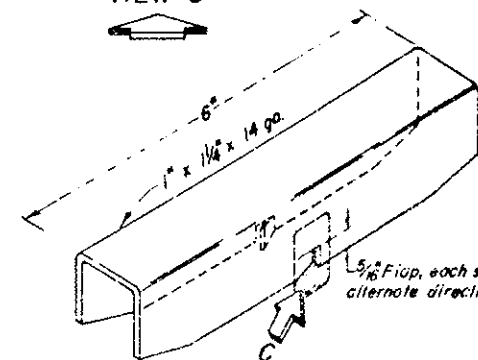
Every 12" vertically, on Line Post



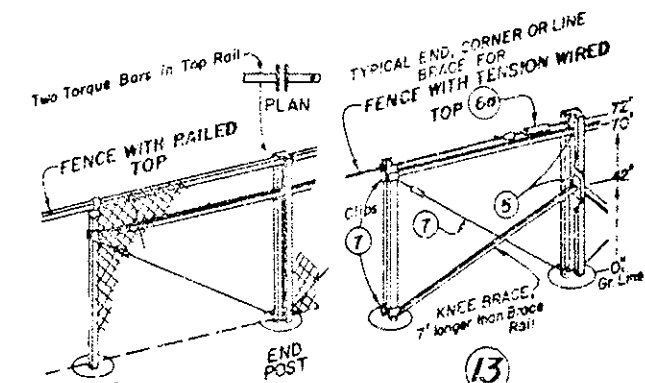
WIRE WORK
⑪



VIEW C
⑫



RAIL SPLICE INSERT
⑫



LINE BRACE (1/2 shown)
400 FT. INTERVALS (R-6)
⑬

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

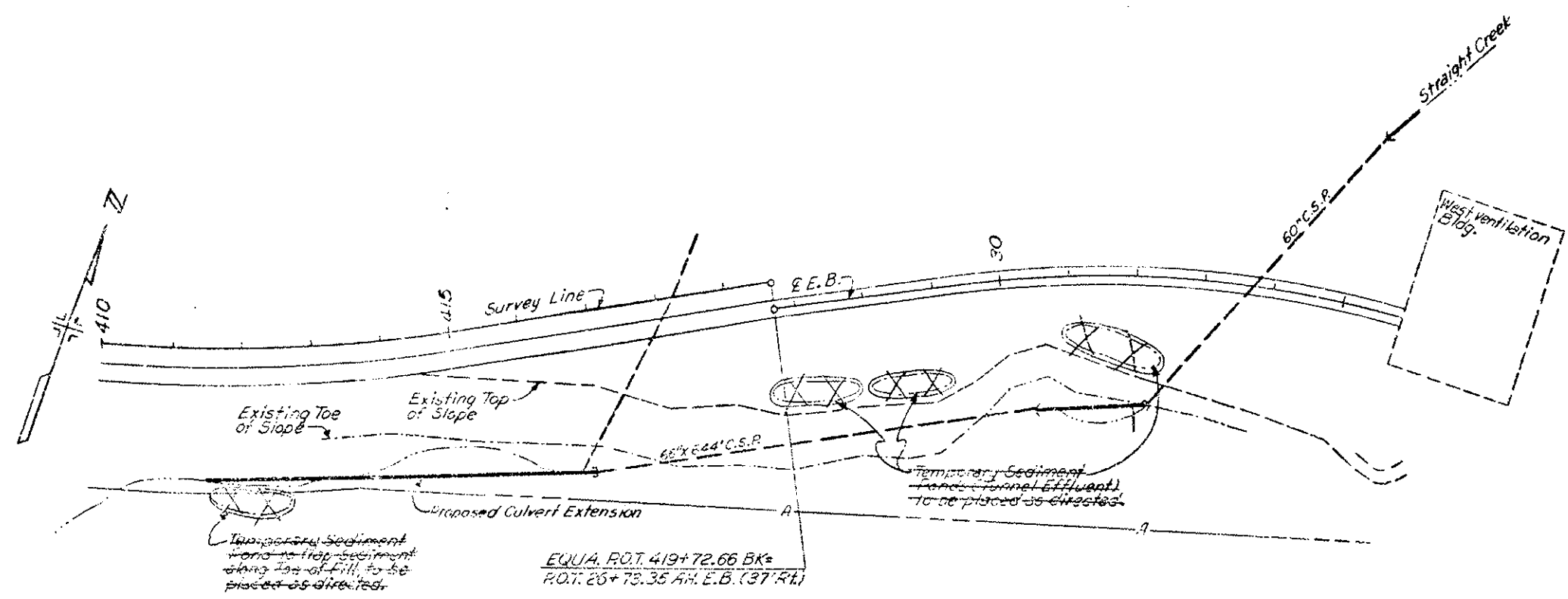
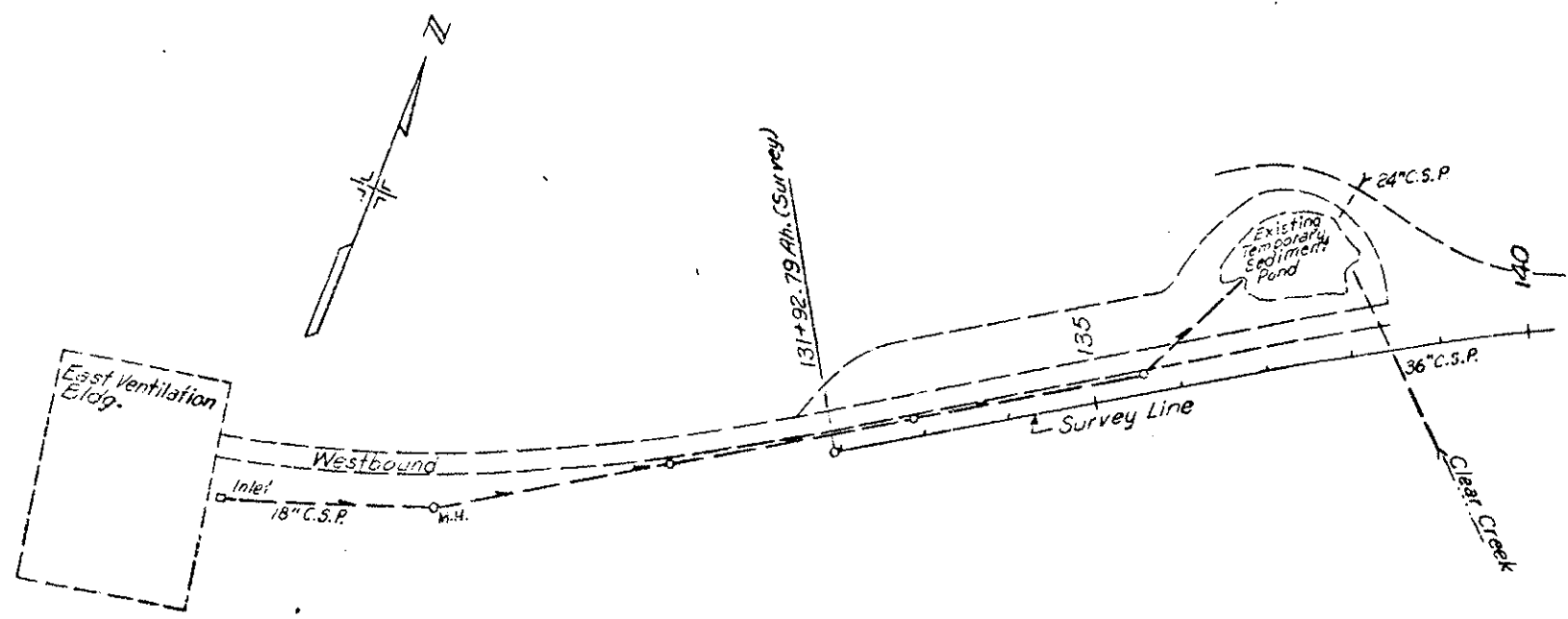
CHAIN LINK FENCE (ALTERNATE)
AR-14

Designed by: R.P.H. Approved by: [Signature]
Made by: J.A.R. Staff Design Engineer
Checked by: R.S.M. Date: July 13, 1970

WATER POLLUTION CONTROL

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|------------------------------|----------|--------------|--------------|-----------------|
| VIII | COLORADO | 170-3(81)220 | 129 | 273 |

DATE: 6-23-79



EQUA. P.O.T. 419+72.66 BK+
 P.O.T. 26+78.35 A.H. E.B. (37' R/L)

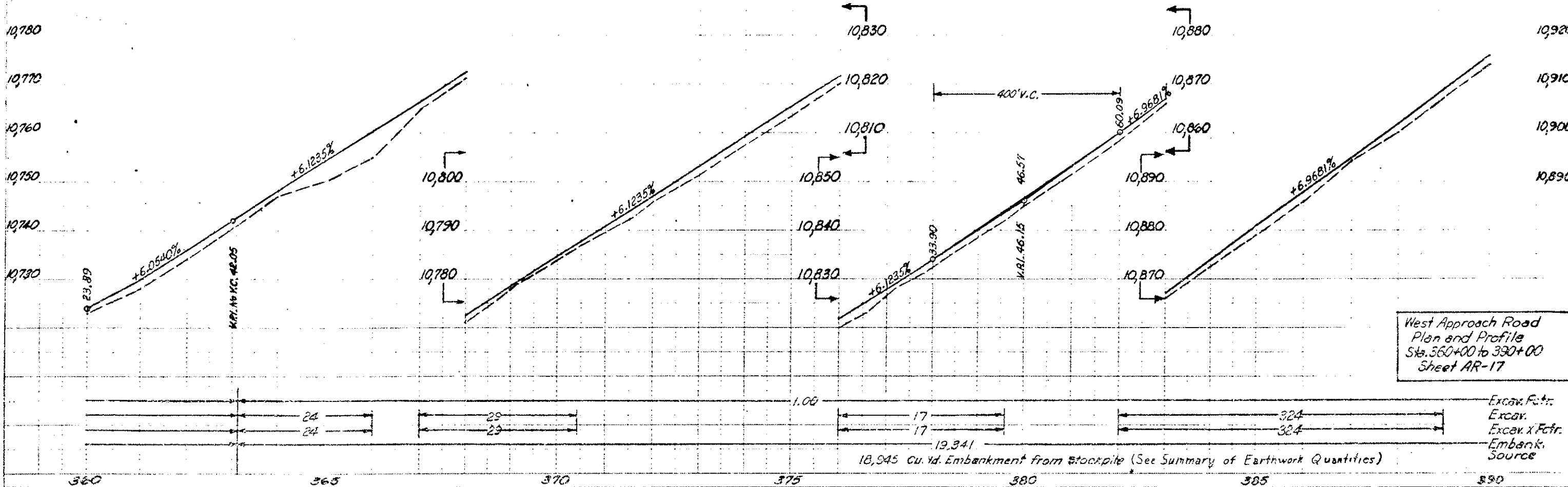
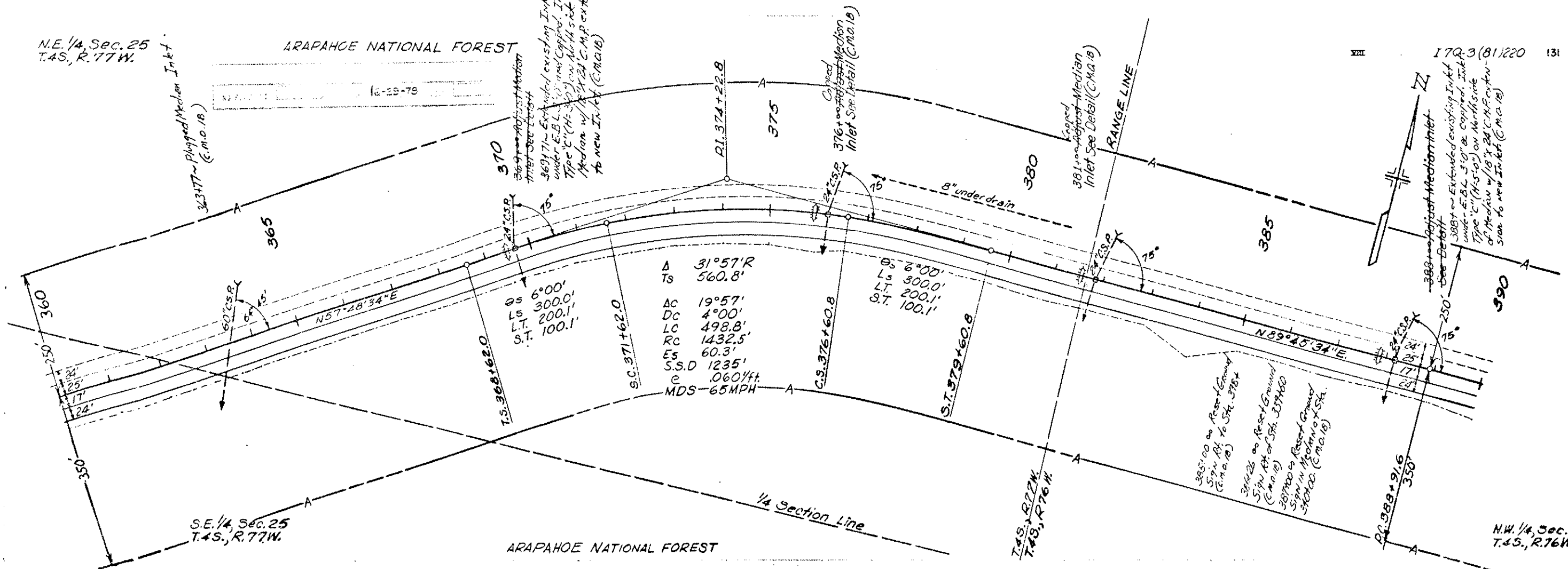
WATER POLLUTION CONTROL

AR-15

NE 1/4 Sec. 25
T.4S., R.77W.

ARAPAHOE NATIONAL FOREST

1703(81)220 131 275

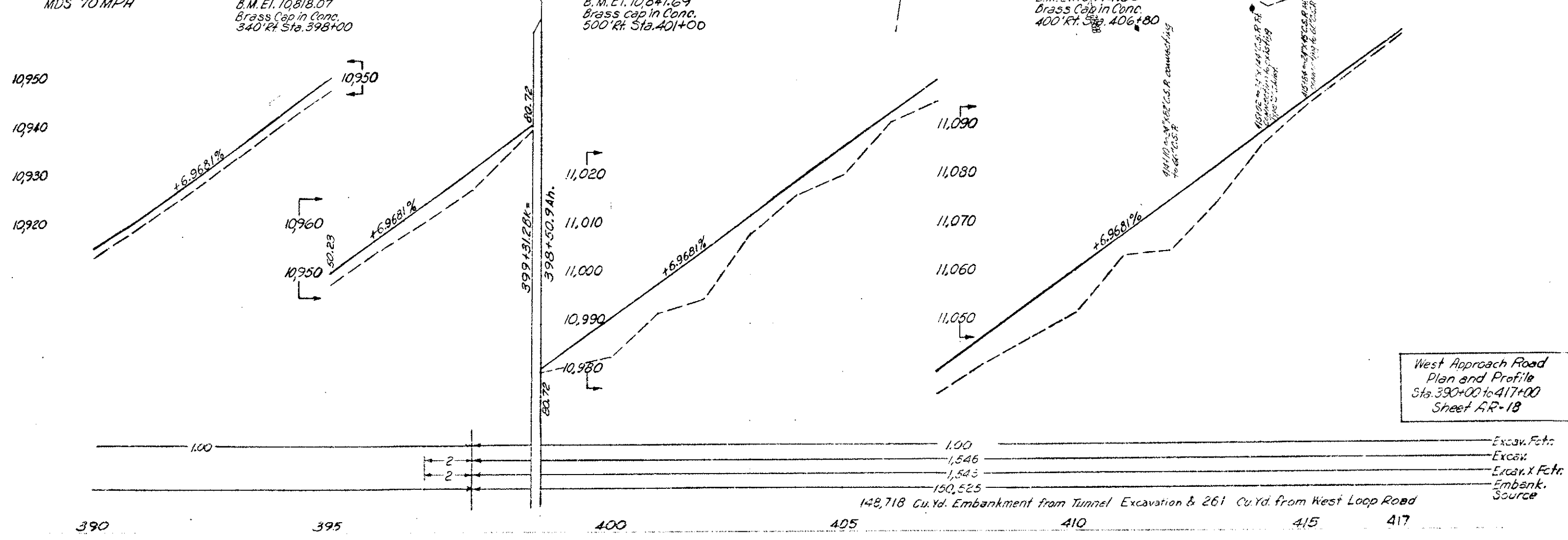
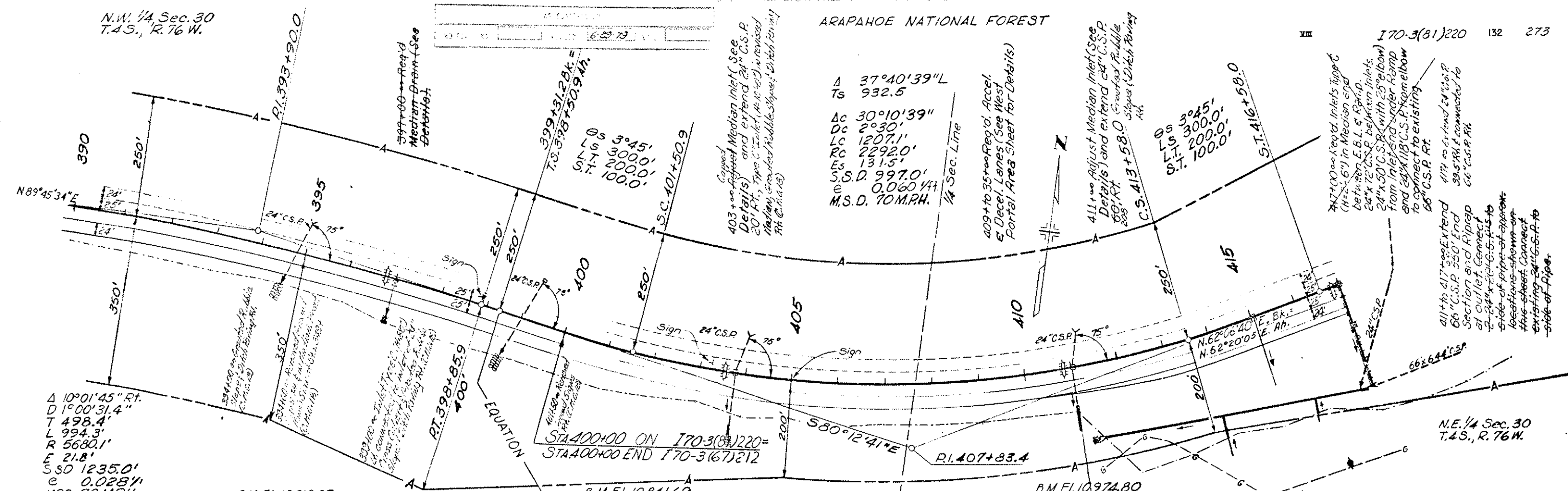


West Approach Road
Plan and Profile
Sta. 360+00 to 390+00
Sheet AR-17

N.W. 1/4 Sec. 30
T.4S., R.76W.

ARAPAHOE NATIONAL FOREST

III 170-3(81)220 132 273



| | |
|--------|-------------|
| Δ | 37°40'39" L |
| Ts | 932.5 |
| Δc | 30°10'39" |
| Dc | 2°30' |
| Lc | 1207.1' |
| Rc | 2292.0' |
| Es | 131.5' |
| S.S.D. | 997.0' |
| e | 0.060 1/4 |
| M.S.D. | 70 M.P.H. |

West Approach Road
Plan and Profile
Sta. 390+00 to 417+00
Sheet AR-18

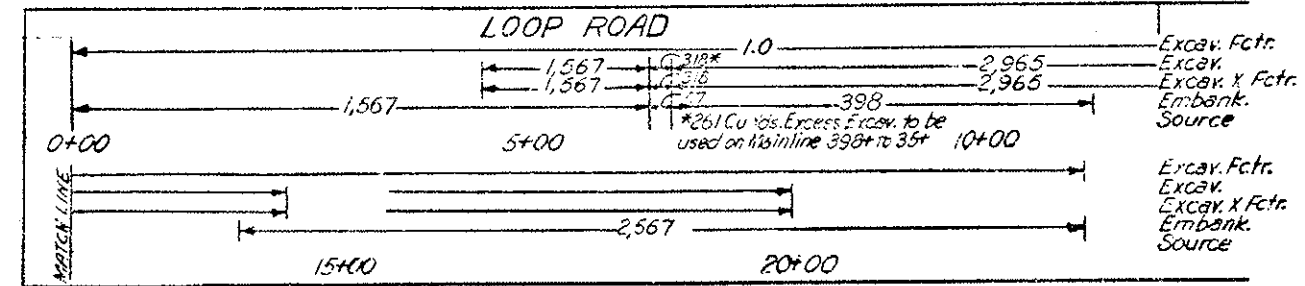
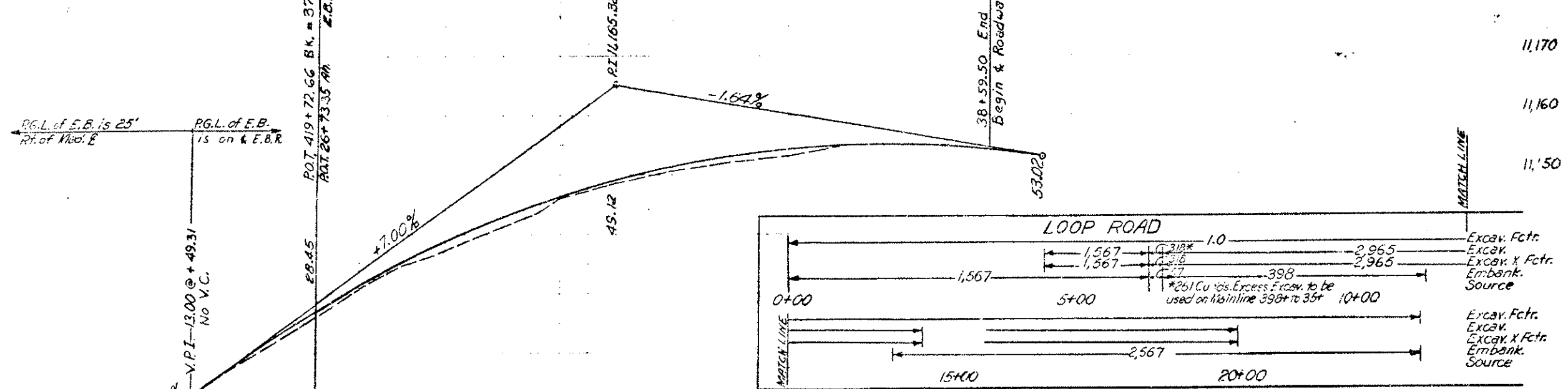
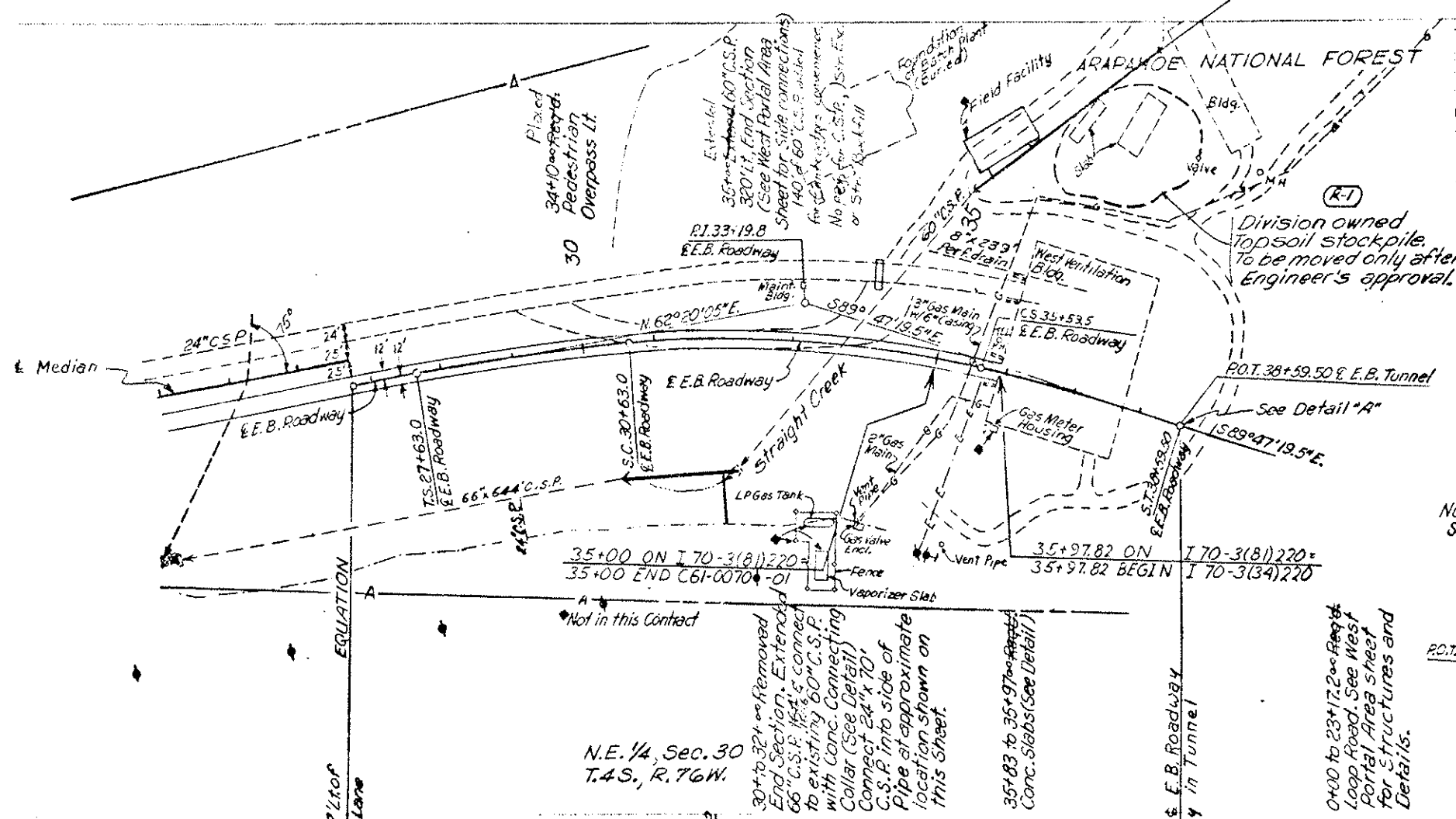
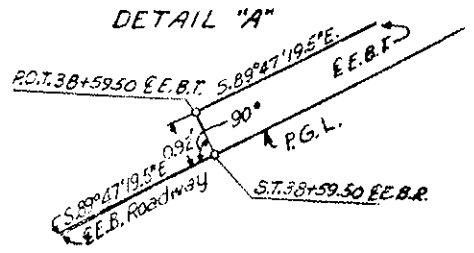
148,718 Cu.Yd. Embankment from Tunnel Excavation & 261 Cu.Yd. from West Loop Road

Excav. Fctr.
Excav.
Excav. X Fctr.
Embank. Source

East Bound Curve Data

| | | |
|----------------|-----------------|-------------|
| A | 27°52'35.5" Rt. | θs 5°15' |
| Ts | 556.8' | Ls 300.0' |
| Δc | 17°22'35.5" | L.T. 200.1' |
| Dc | 3°30' | S.T. 100.1' |
| Lc | 496.5' | |
| Tc | 250.2' | |
| Rc | 1637.0' | |
| Es | 51.8' | |
| E ₂ | 0.0581" | |
| MDS | 50 MPH | |
| S.S.D. | 400' | |

NOTE: For Tunnel Alignment See Sheets A-2 thru A-8.



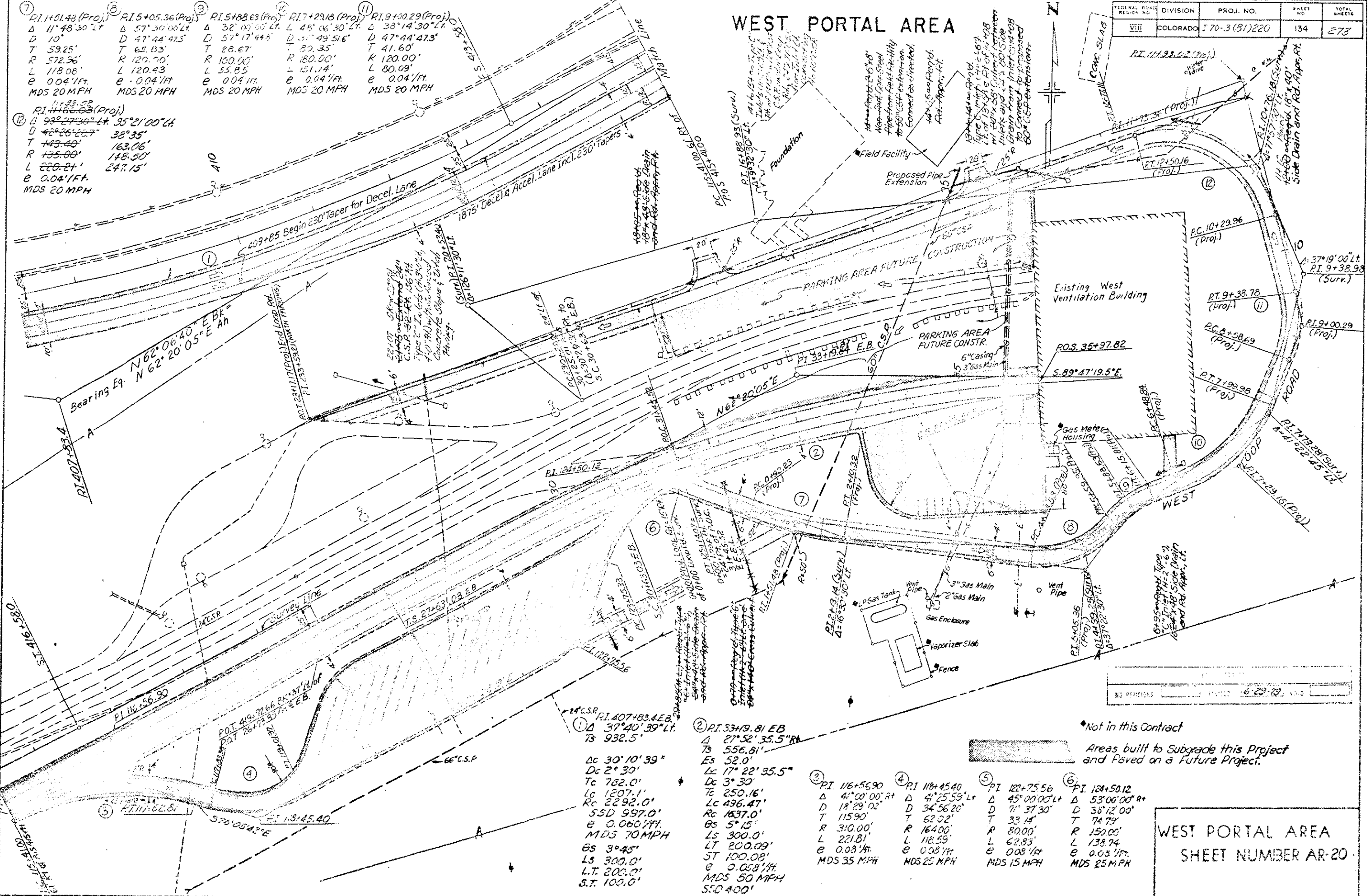
West Approach Road
 Plan and Profile
 Sta. 417+00 to 35+
 Sheet AR-19

Excav. Fctr.
 Excav.
 Excav. X Fctr.
 Embank.
 Source

PLAN

| FEDERAL ROAD DISTRICT NO. | DIVISION | PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-----------------|-----------|--------------|
| VIII | COLORADO | I 70-3 (81) 220 | 134 | 273 |

WEST PORTAL AREA



| | | | | |
|--|---|--|---|---|
| ① PI 1151.48 (Proj.) Δ 11°48'30" Lt D 10' T 59.25' R 572.36' L 118.08' e 0.04'/ft. MDS 20 MPH | ② PI 15+05.36 (Proj.) Δ 57°30'00" Lt D 47'44'47.5" T 65.83' R 120.70' L 120.43' e 0.04'/ft. MDS 20 MPH | ③ PI 15+08.63 (Proj.) Δ 32°09'50" Lt D 57'17'44.8" T 28.67' R 100.00' L 55.85' e 0.04'/ft. MDS 20 MPH | ④ PI 17+29.18 (Proj.) Δ 48°06'30" Lt D 51'49'51.6" T 27.35' R 180.00' L 151.14' e 0.04'/ft. MDS 20 MPH | ⑤ PI 19+30.29 (Proj.) Δ 38°14'30" Lt D 38'14'30" Lt Δ 47°44'47.5" D 47'44'47.5" T 41.60' R 120.00' L 80.09' e 0.04'/ft. MDS 20 MPH |
|--|---|--|---|---|

| | |
|---|---|
| ⑥ PI 116+56.90 (Proj.) Δ 93°27'30" Lt D 42°26'22.7" T 143.40' R 135.00' L 220.21' e 0.04'/ft. MDS 20 MPH | ⑦ PI 117+02.81 (Proj.) Δ 35°21'00" Lt D 42°26'22.7" T 143.40' R 135.00' L 220.21' e 0.04'/ft. MDS 20 MPH |
|---|---|

| | |
|-------------------------------|---|
| ① Δ 37°40'39" Lt Ts 932.5' | ② Δ 30°10'39" Dc 2°30' Tc 782.0' Lc 1207.1' Rc 2292.0' SSD 997.0' e 0.060'/ft. MDS 70 MPH Bs 3°45' Ls 300.0' Lt 200.0' S.T. 100.0' |
|-------------------------------|---|

| | | |
|---|---|--|
| ③ PI 33+19.81 EB Δ 27°52'35.5" Rt Ts 556.81' Es 52.0' Lc 17°22'35.5" Tc 250.16' Lc 496.47' Rc 1637.0' Bs 5°15' Ls 300.0' Lt 200.09' ST 100.08' e 0.058'/ft. MDS 50 MPH SSC 400' | ④ PI 116+56.90 Δ 41°00'00" Rt D 18°29'02" T 115.90' R 310.00' L 221.81' e 0.08'/ft. MDS 35 MPH | ⑤ PI 118+45.40 Δ 41°25'59" Lt D 34°56'20" T 62.02' R 164.00' L 118.59' e 0.08'/ft. MDS 25 MPH |
|---|---|--|

Not in this Contract
 Areas built to Subgrade this Project and Paved on a Future Project.

WEST PORTAL AREA
 SHEET NUMBER AR-20

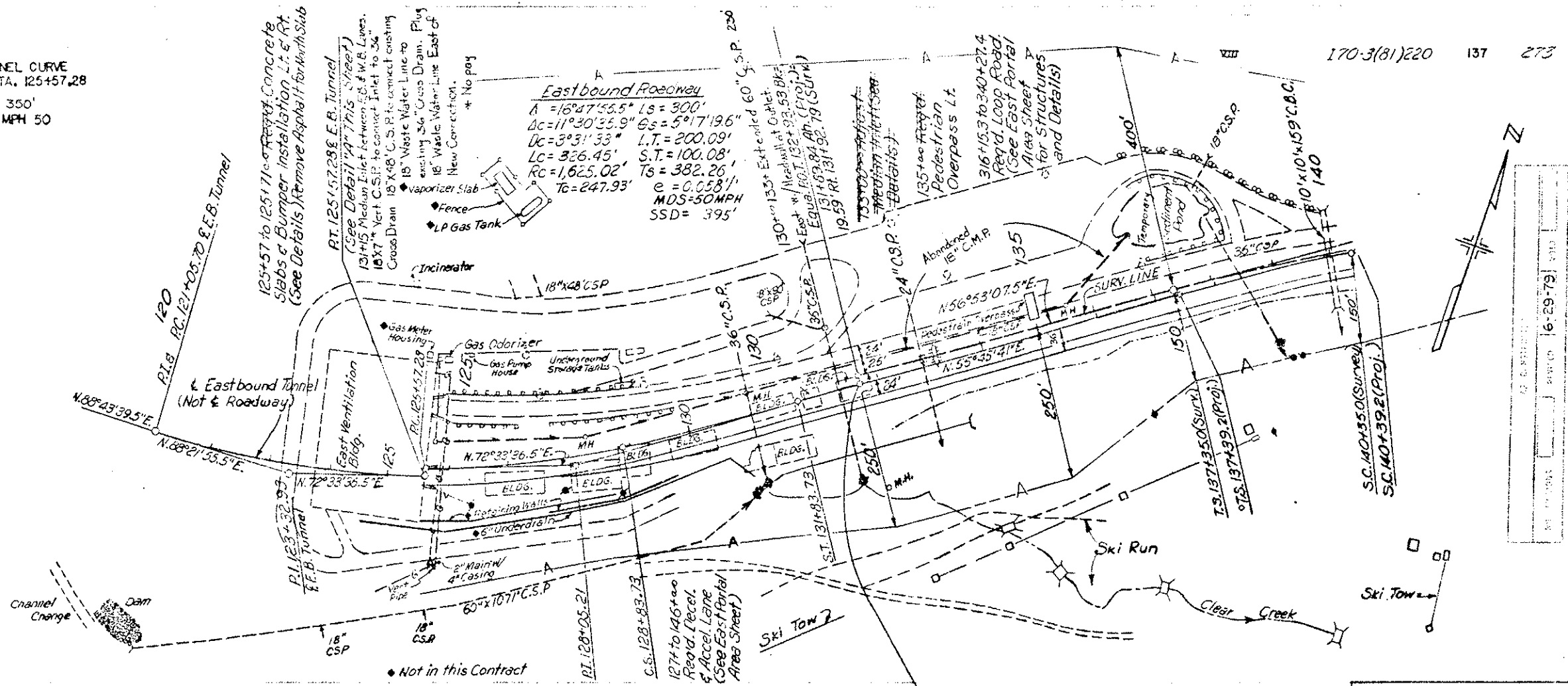
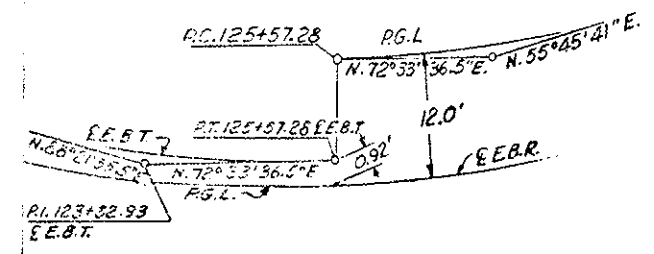
EASTBOUND TUNNEL CURVE
 STA. 124+05.70 TO STA. 125+57.28
 SSD = 335'
 MDS = 50 MPH

Eastbound Roadway
 $\Delta = 16^{\circ}37'55.5''$, $LS = 300'$
 $\Delta c = 11^{\circ}30'33.9''$, $ES = 59'17.196''$
 $LC = 326.45'$, $LT = 200.09'$
 $Rc = 1,625.02'$, $TS = 382.26'$
 $Tc = 247.93'$, $e = 0.0581'$
 MDS = 50 MPH
 SSD = 395'

NOTE: For Tunnel Alignment
 See Sheets A-2 thru A-3

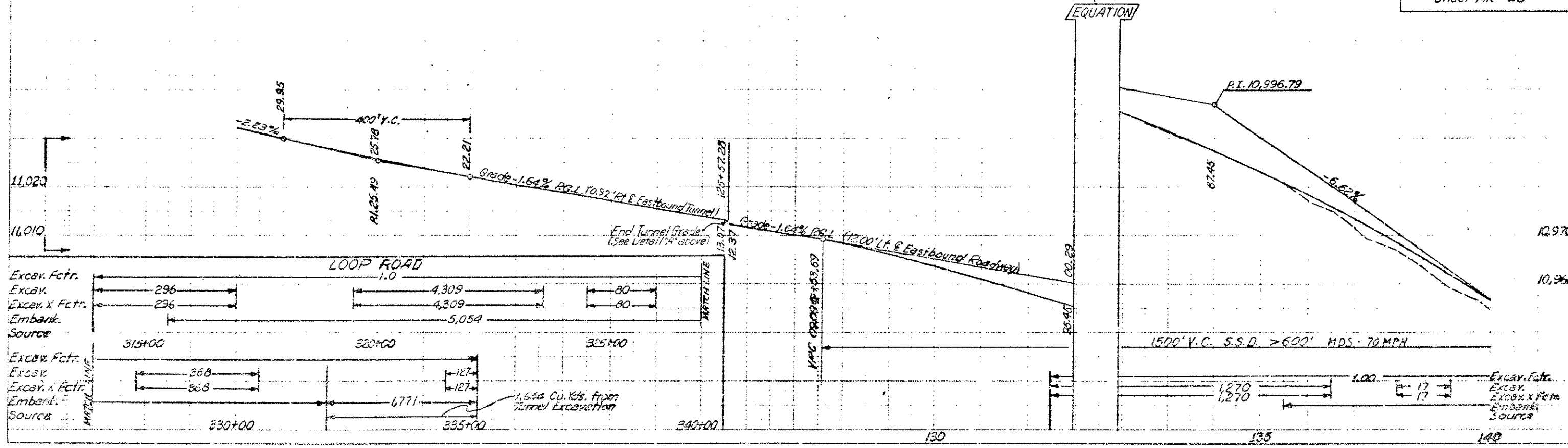
PLAN

DETAIL "A"

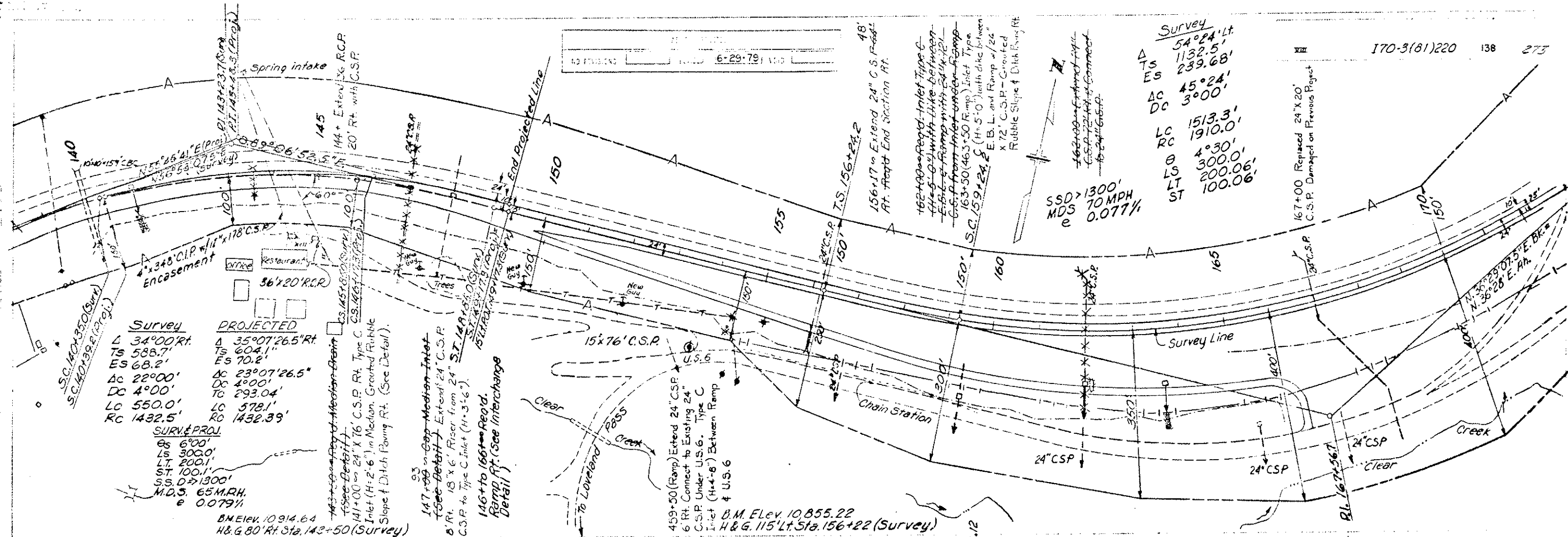


East Approach Road
 Plan and Profile
 Sta. 125+ to 140+00
 Sheet AR-23

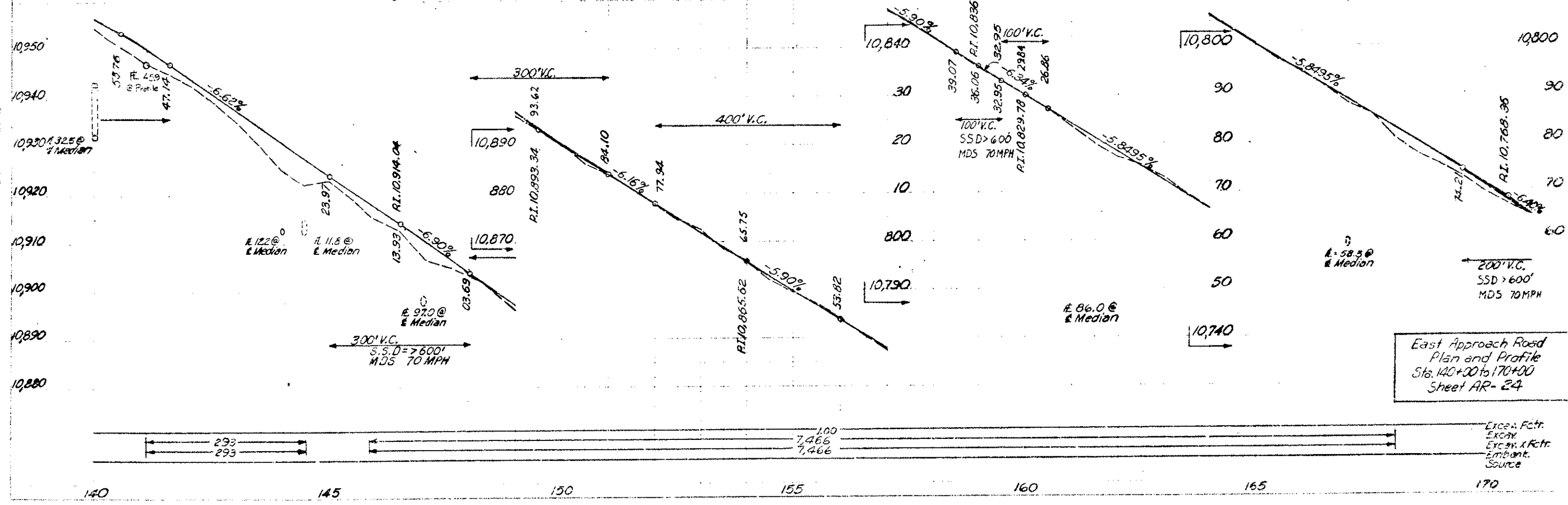
PROFILE



PLAN



PROFILE



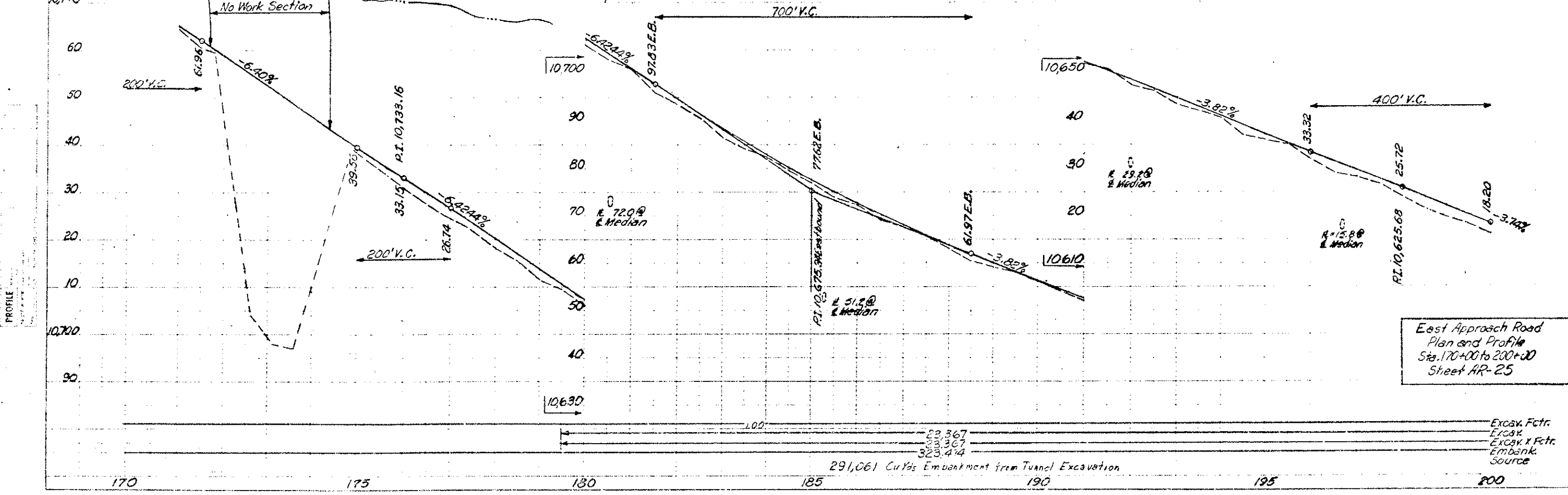
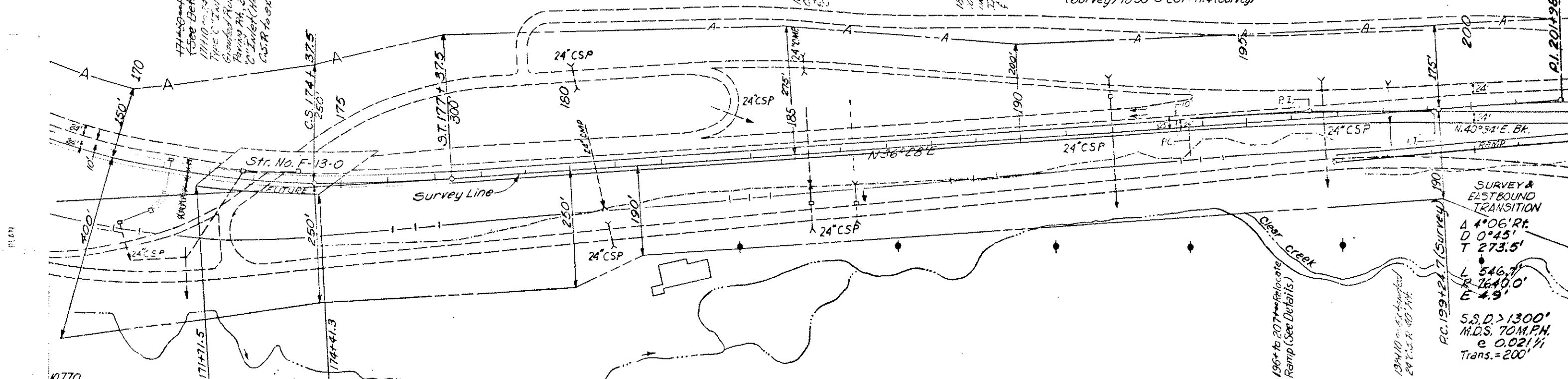
East Approach Road Plan and Profile Sta. 140+00 to 170+00 Sheet AR-24

Note: Transition Eastbound Lanes with a curve whose P.I. is 15' Lt. of Survey P.O.T. 196+59.3 and parallel to Survey Curve at P.I. 201+98.2. The transition will widen Median from 10' @ 193+65.9 (Survey) to 50' @ 201+71.4 (Survey)

171+50 to 171+50.50 Detail of Median Drain (See Details)
17110 to 17110.50 S.S.D. under 24" Type C Trench (17150) in Median
Crowned Roadside Slope of 2:1 to 1:1
Paving Mt. 24" x 50" C.S.P. w/Type C Trench (17150) commencing 171+50 C.S.P. to existing Trench Mt.

185+50 to 185+50.50 Detail of 24" Type C Trench
185+50 to 185+50.50 S.S.D. under 24" Type C Trench (18550) in Median
Crowned Roadside Slope of 2:1 to 1:1
Paving Mt. 24" x 50" C.S.P. w/Type C Trench (18550) commencing 185+50 C.S.P. to existing Trench Mt.

Table with 2 columns: NO. REVISED, DATE. Row 1: 1, 2-12-79.



East Approach Road Plan and Profile Sta. 170+00 to 200+00 Sheet AR-25

Excav. Fctr. 23,367
Excav. 23,367
Excav. x Fctr. 323,474
Embank. 291,061 Cu Yds Embankment from Tunnel Excavation
Source

