

DEPARTMENT OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. I-70-3(2)251-UNIT I STATE HIGHWAY NO. 2 CLEAR CREEK COUNTY

AS SHOWN ON PLANS

CONVENTIONAL SIGNS

- CENTER LINE
- RIGHT OF WAY LINE
- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- LAND LINES
- BARBED WIRE FENCE
- COMBINATION WIRE FENCE
- SNOW FENCE
- TELEPHONE & TELEGRAPH LINES
- POWER LINE
- PRESENT ROAD (Plan Sheets)

INDEX OF SHEETS

- 1. SKETCH MAP, TITLE PAGE AND TABULATION OF LENGTH.
- 2. TYPICAL SECTION.
- 3. TYPICAL SECTION AND TIMBER DETAILS OF PIONEER TUNNEL, SUMMARY OF APPROXIMATE QUANTITIES AND SUMMARY OF EARTHWORK QUANTITIES.
- 4. CONTOUR LAYOUT OF TUNNELS.
- 5-7. DETAILS OF 8'x9' ROCK TRENCH CULVERT. DELETED.
- 8. DELETED.
- 9-10. STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS. M-29-C
- 11. STANDARD METHODS OF BACKFILL AROUND STRUCTURES. M-60-B
- 12-13. ALIGNMENT PLAN AND PROFILE SHEETS.
- 14-22. CROSS SECTIONS.

SCALES OF ORIGINAL DRAWINGS

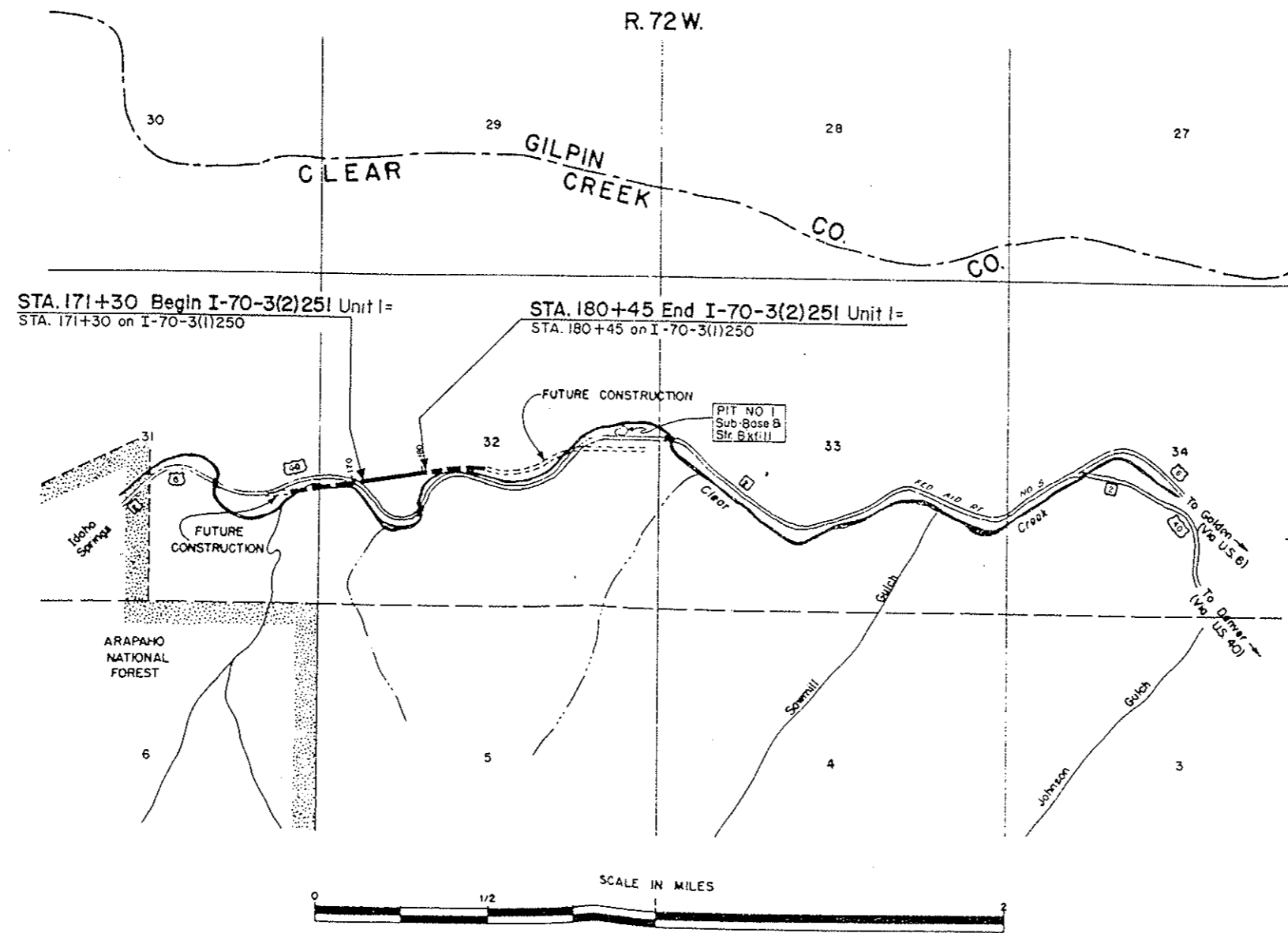
ON PLAN 1 IN = 170 FT
 ON PROFILE 1 IN = 100 FT HORIZONTAL
 1 IN = 10 FT VERTICAL
 GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
 GROSS LENGTH OF PROJECT 9150 FT = 0.173 MI
 NET LENGTH OF PROJECT 8440 FT = 0.160 MI

C. A. ...
...

TABULATION OF LENGTH

STATION	FUTURE CONSTRUCTION		
	PIONEER TUNNEL LIN. FT.	TWIN TUNNELS LIN. FT.	TWIN TUNNEL PORTALS STR. NO. F-15-BV & BO LIN. FT.
171+30.0 Begin I-70-3(2)251 UNIT I = 171+300 on I-70-3(1)250			41.0 ✓
171+71.0	395		395 ✓
172+10.5	804.5	804.5	
180+150			30.0 ✓
180+450 End I-70-3(2)251 UNIT I = 180+450 on I-70-3(1)250			
TOTALS	8440	8045	1105
SUMMARY			
	IN. FT.	MILES	
PIONEER TUNNEL (Net Length I-70-3(2)251 UNIT I)	8440	0.160	
TWIN TUNNELS	8045	0.152	
TWIN TUNNEL PORTALS	1105	0.021	
TOTAL-GROSS LENGTH I-70-3(2)251	9150	0.173	

Based on Average Lengths

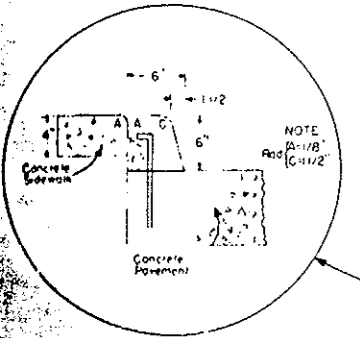
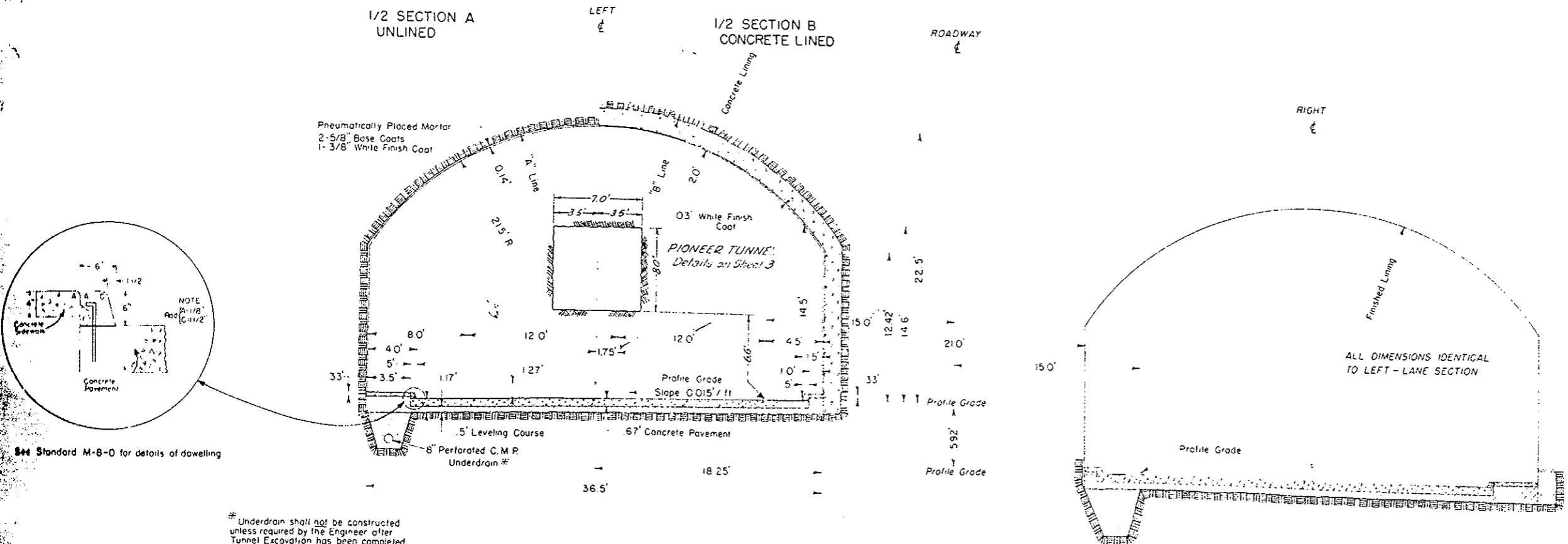


SEE SPECIAL PROVISIONS FOR NOTICE TO BIDDERS

APPROVED
Woodward 2-11-59
 DEPARTMENT OF HIGHWAYS

DEPARTMENT OF HIGHWAYS
 BUREAU OF PUBLIC WORKS
 APPROVED
 DATE
 DIVISION ENGINEER

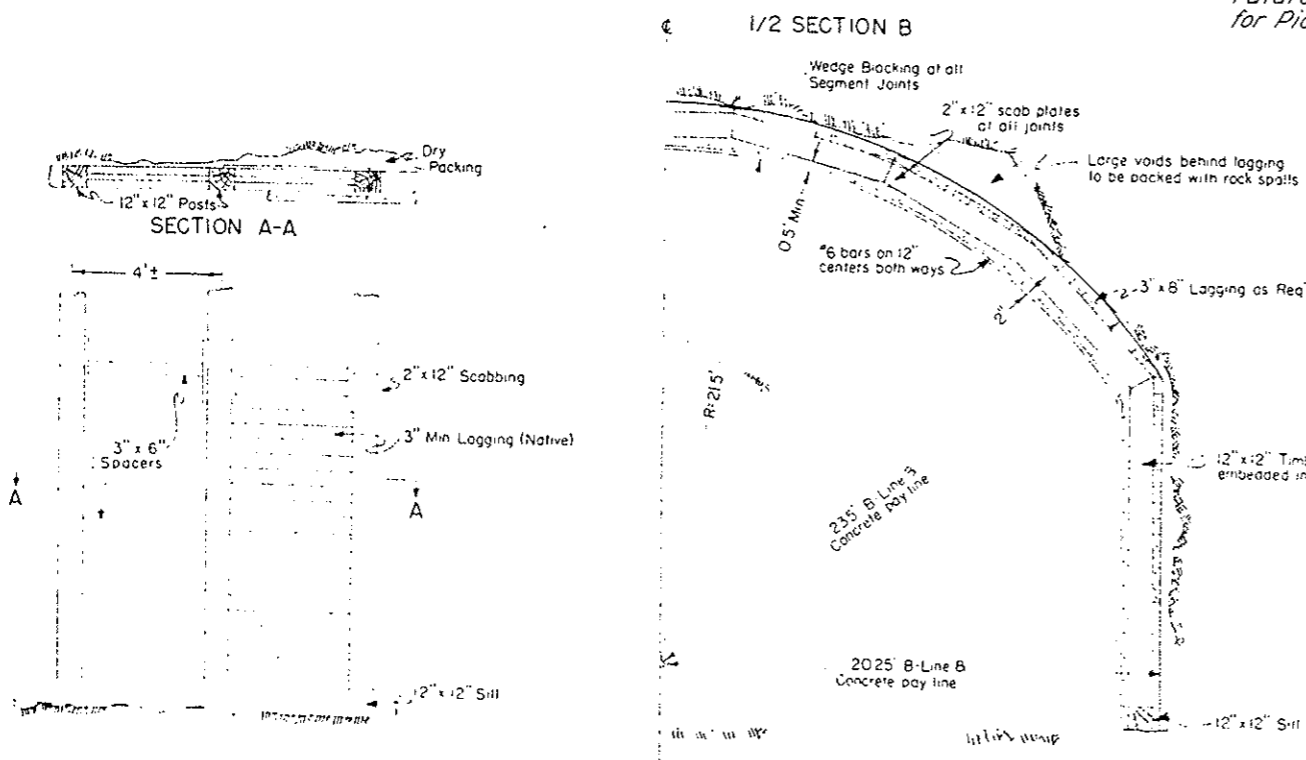
TYPICAL TUNNEL SECTIONS



Standard M-B-D for details of dowelling

Underdrain shall not be constructed unless required by the Engineer after Tunnel Excavation has been completed

DETAILS OF TIMBER LINING AND LAGGING



Future Construction except for Pioneer Tunnel.

NOTE: Timber Supports shall be set on approximate 4 centers. This spacing to be adjusted to suit conditions encountered during construction. All Timber to be full sawn.

NOTE: Volume for Concrete lined section - 2,714 Cu Yds
 Volume occupied by Timber - 528 Cu Yds
 Total Class "A" Concrete - 2,186 Cu Yds
 No deduction allowed for the volume occupied by reinf steel

GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted January 1, 1958.

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

All Unclassified Excavation at entrances to Pioneer Tunnel shall be completed before any Tunnel Excavation is started.

If excavation operations develop materials which will stand on slopes steeper than slope stake lines, the Department reserves the right to change cul slopes during the progress of such excavations.

Reinforcing bars shall be lagged with the designation number and the station number of the project. Secondary bars, when spliced, shall lap 17 diameters of the bar. Dimensions for reinforcing steel not shown as clear shall be to the center-line of the bar.

All structural steel shall be painted one shop coat of zinc chromate and two field coats of aluminum unless otherwise noted.

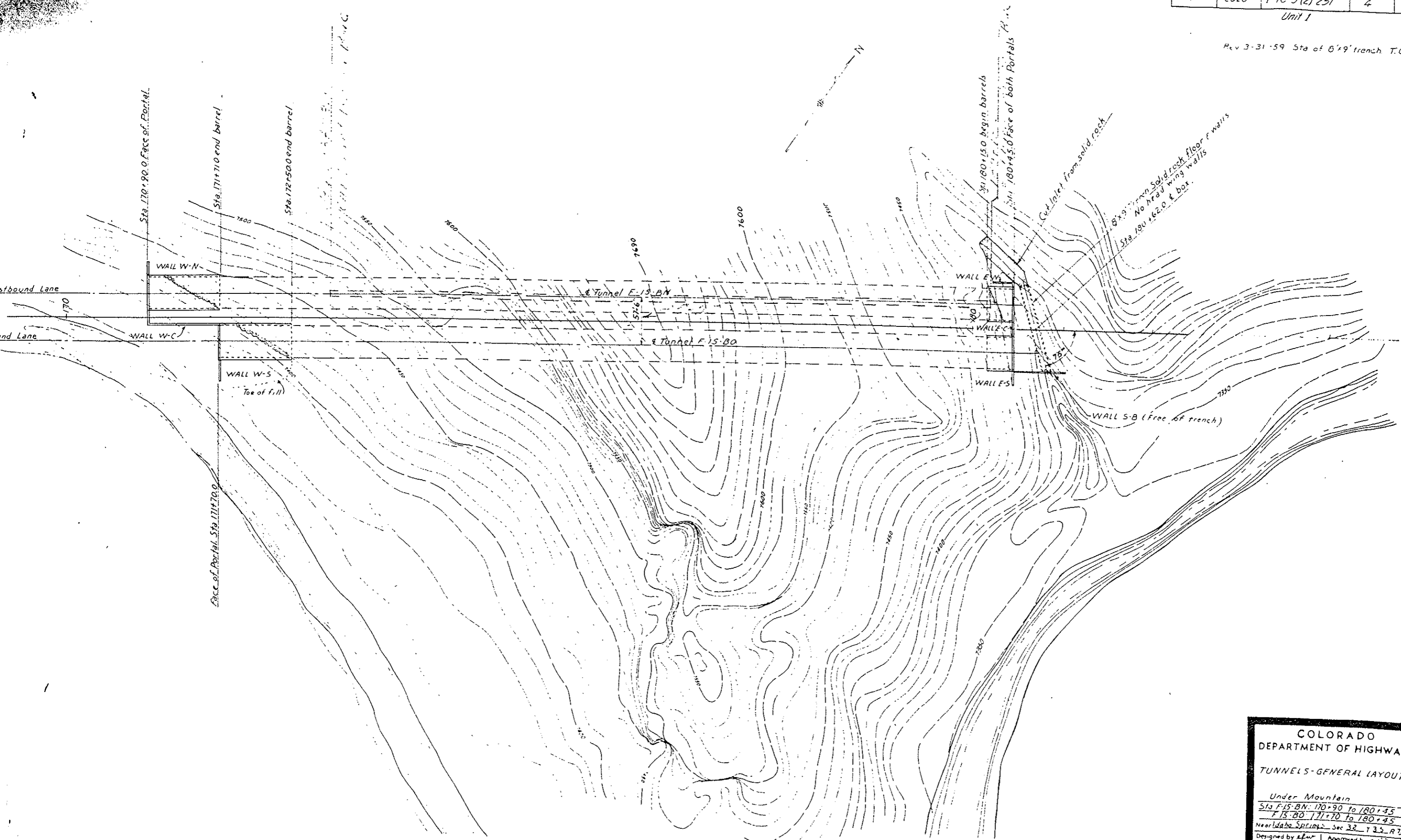
Handrail bolts shall have Hex. Heads, Nuts and Lock Washers unless otherwise specified and all rivets, except as noted, are 3/4" # and shall be power driven.

When excavating for footings the final one foot in depth shall be done by hand labor methods. Soundings and depth of footings shown are in accordance with the best available data and when different conditions are encountered the Bridge Engineer will inspect and determine if redesign is necessary.

RES. NO.	DIVISION	PROJECT NO	SHEET
9	COLO	1-70-3(2) 251	4

Unit 1

Rev 3-31-59 Sta of 6'x9' trench T.G.D.



COLORADO DEPARTMENT OF HIGHWAYS

TUNNELS-GENERAL LAYOUT

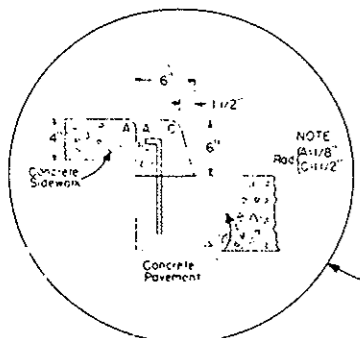
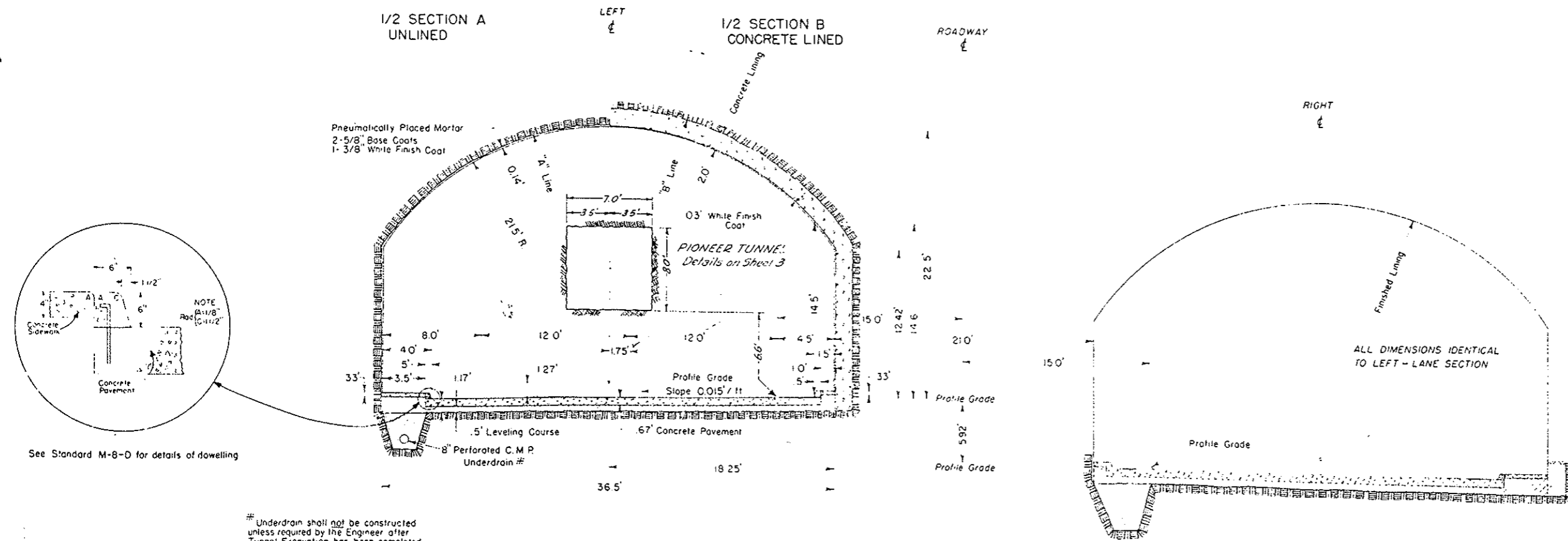
Under Mountain
 Sta F-15-BN: 170+90 to 180+45
 F-15-BO: 171+70 to 180+45
 Near Idaho Springs - Sec 32 T 35 R 72W

Designed by *afw*
 Made by *afw*
 Checked by

Approved by *J. L. ...*
 Bridge Engineer
 Date: Oct 27, 1959

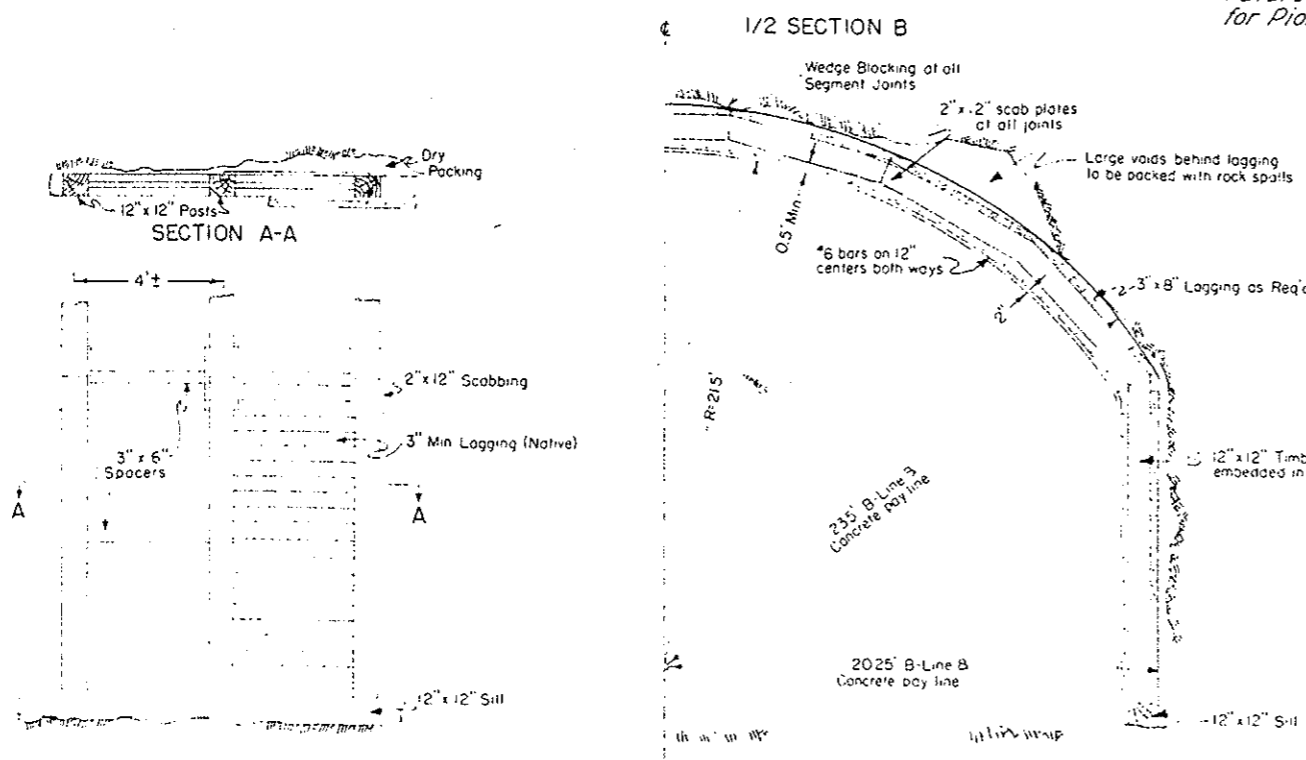
STRUCTURE NO F-15-BN-F-BO

TYPICAL TUNNEL SECTIONS



* Underdrain shall not be constructed unless required by the Engineer after Tunnel Excavation has been completed.

DETAILS OF TIMBER LINING AND LAGGING



Future Construction except for Pioneer Tunnel.

NOTE
 Timber Supports shall be set on approximate 4 centers. This spacing to be adjusted to suit conditions encountered during construction.
 All Timber to be full sawn.

NOTE
 Volume for Concrete lined section - 2,714 Cu Yds
 Volume occupied by Timber - 528 Cu Yds
 Total Class "A" Concrete - 2,186 Cu Yds
 No deduction allowed for the volume occupied by reinf steel

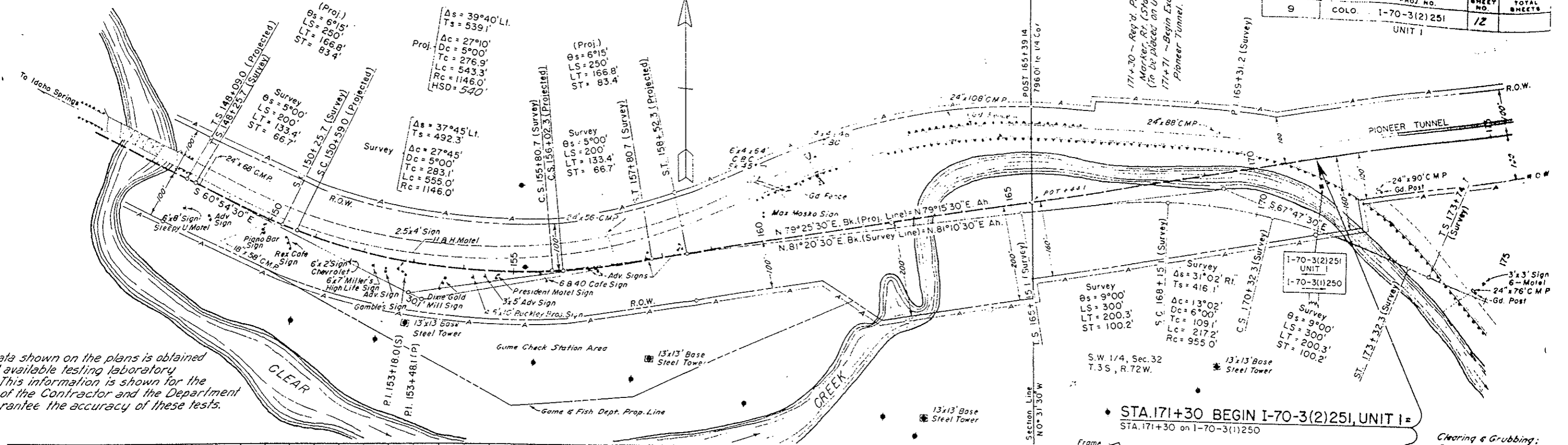
GENERAL NOTES

This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted January 1, 1958.
 All quantities on preliminary plans are to be considered approximate only.
 All Unclassified Excavation at entrances to Pioneer Tunnel shall be completed before any Tunnel Excavation is started.
 If excavation operations develop materials which will stand on slopes steeper than slope stake lines, the Department reserves the right to change cut slopes during the progress of such excavations.
 Reinforcing bars shall be tagged with the designation number and the station number of the project. Secondary bars, when spliced, shall lap 17 diameters of the bar. Dimensions for reinforcing steel not shown as clear shall be to the center-line of the bar.
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 When excavating for footings the final one foot in depth shall be done by hand labor methods.
 Soundings and depth of footings shown are in accordance with the best available data and when different conditions are encountered the Bridge Engineer will inspect and determine if redesign is necessary.

S.E. 1/4, SEC. 31
T.3S, R.72W.

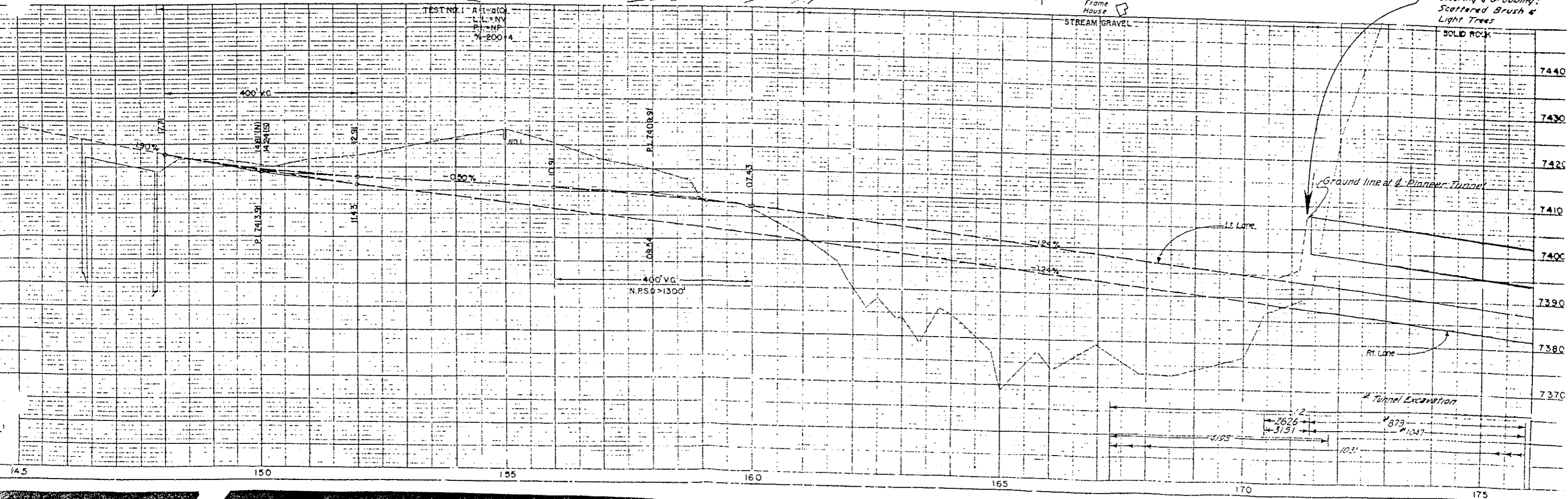


FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	1-70-3(2)251	12	
UNIT I				



All data shown on the plans is obtained from the best available testing laboratory. This information is shown for the convenience of the Contractor and the Department and does not guarantee the accuracy of these tests.

STA. 171+30 BEGIN I-70-3(2)251, UNIT I =
STA. 171+30 on I-70-3(1)250

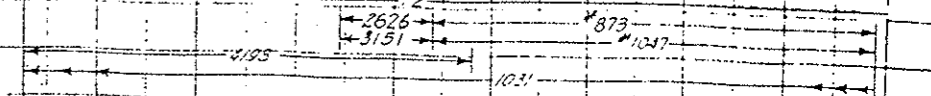


Clearing & Grubbing:
Scattered Brush &
Light Trees

SOLID ROCK

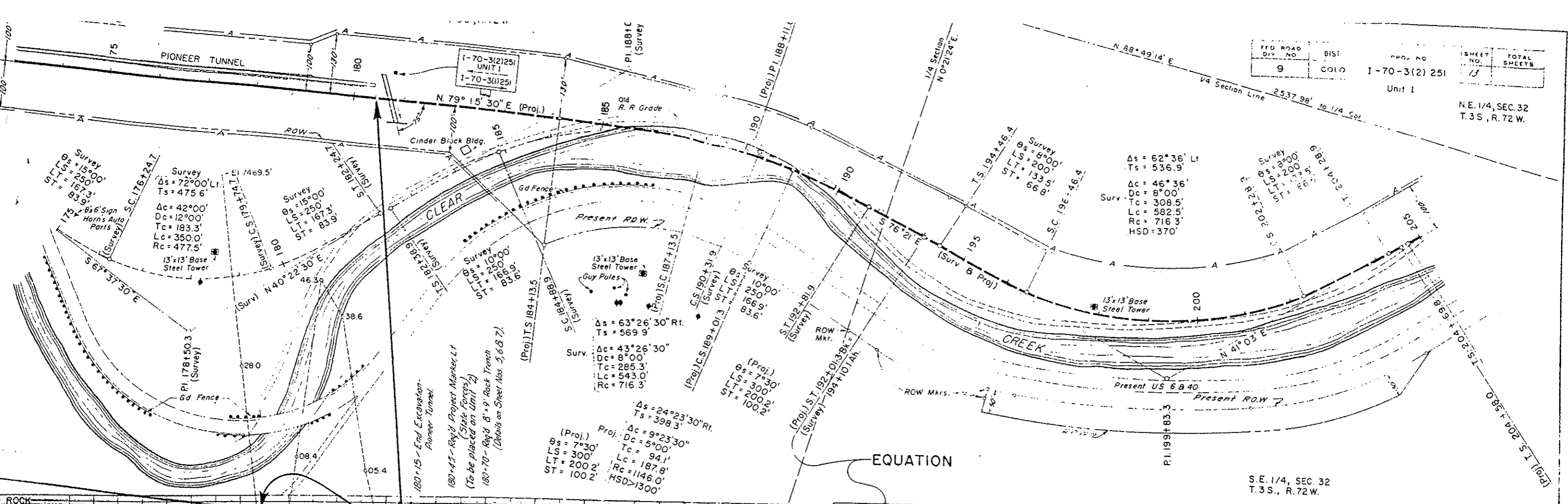
Ground line at Pioneer Tunnel

Tunnel Excavation

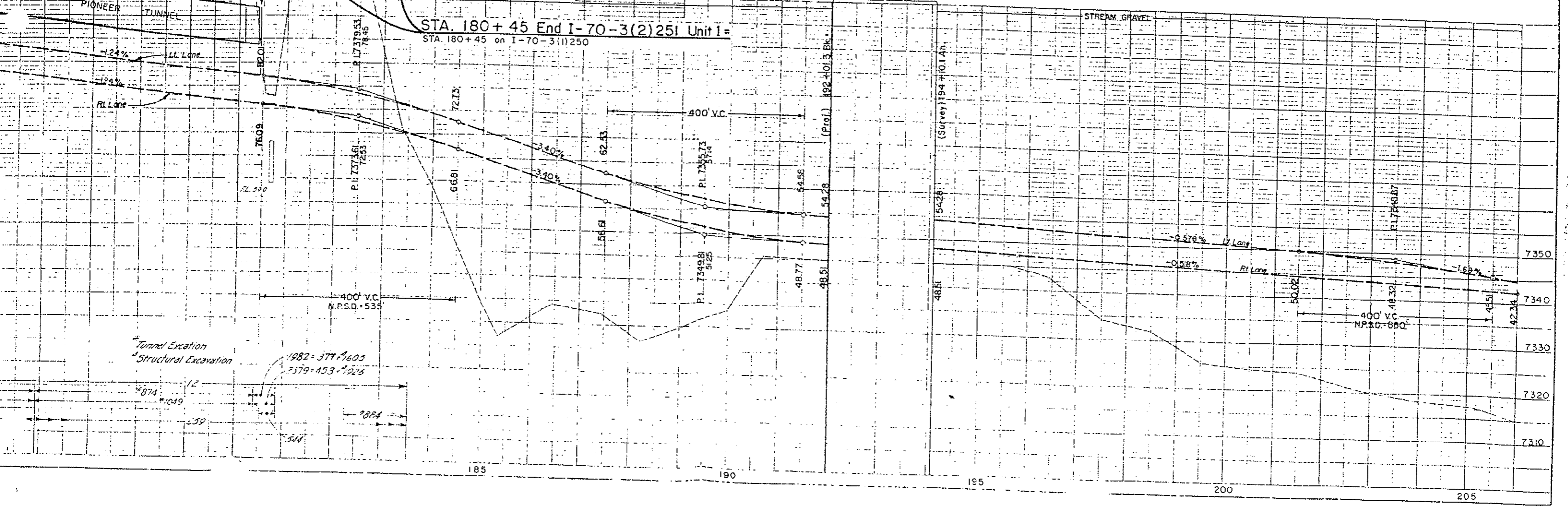


FD ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO	I-70-3(2) 251	13	

Unit I
N.E. 1/4, SEC. 32
T. 3 S., R. 72 W.



STA. 180+45 End I-70-3(2) 251 Unit I
STA. 180+45 on I-70-3(1) 250

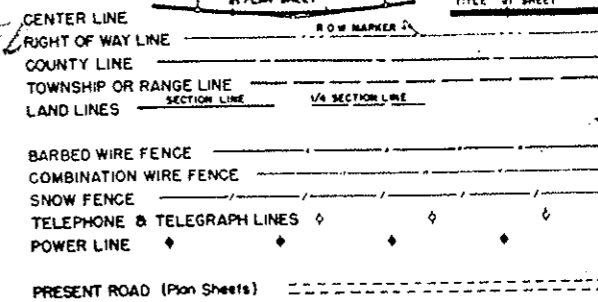


COLORADO DEPARTMENT OF HIGHWAYS

FEDERAL ROAD REGION NO.	DIVISION	PRG. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	I-70-3(2)251 UNIT 2	1	

R.O.W. PURCHASED UNDER I-70-3(1)250
REV. 1-27-60 H.E.P.-INDEX OF SHEETS.
REV. 12-15-60 H.E.P.-INDEX OF SHEETS.

CONVENTIONAL SIGNS



PLAN AND PROFILE OF PROPOSED *AS CONSTRUCTED* FEDERAL AID PROJECT NO. I-70-3(2)251-UNIT 2 STATE HIGHWAY NO. 2 CLEAR CREEK COUNTY *AS CONSTRUCTED 1961*

SCALES OF ORIGINAL DRAWINGS

ON PLAN { 1 IN = 100 FT
ON PROFILE { 1 IN = 100 FT. HORIZONTAL
 1 IN = 10 FT. VERTICAL
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 695.0 Ft. = 0.131 MI.
NET LENGTH OF PROJECT }

INDEX OF SHEETS

- SHEET NO. 1 SKETCH MAP, TITLE PAGE AND TABULATION OF LENGTH & DESIGN DATA.
- 2 TYPICAL TUNNEL SECTIONS, DETAILS OF LINING & DETAILS OF ROCK BOLTS.
- 3 SUMMARY OF APPROXIMATE QUANTITIES, GENERAL NOTES AND TYPICAL SECTION OF ROADWAY.
- 4 SUMMARY OF EARTHWORK QUANTITIES, TYPICAL SECTION OF TRENCH FOR C.M.P. UNDERDRAIN, DETAILS OF CONCRETE MANHOLE AND DETAIL OF ROCK EMBANKMENT & PIT LOCATION.
- 5 LIST OF STRUCTURE QUANTITIES AND DETAIL OF 4" DRAIN TUBE.
- 6 DETAILS OF 8'x8' CONCRETE BOX CULVERT, STA. 180+.
- 7-13 DETAILS OF TWIN TUNNEL PORTALS.
- 14 STANDARD METHODS FOR SUPERELEVATION OF CURVES. M-1-D-1
- 15 DELETED

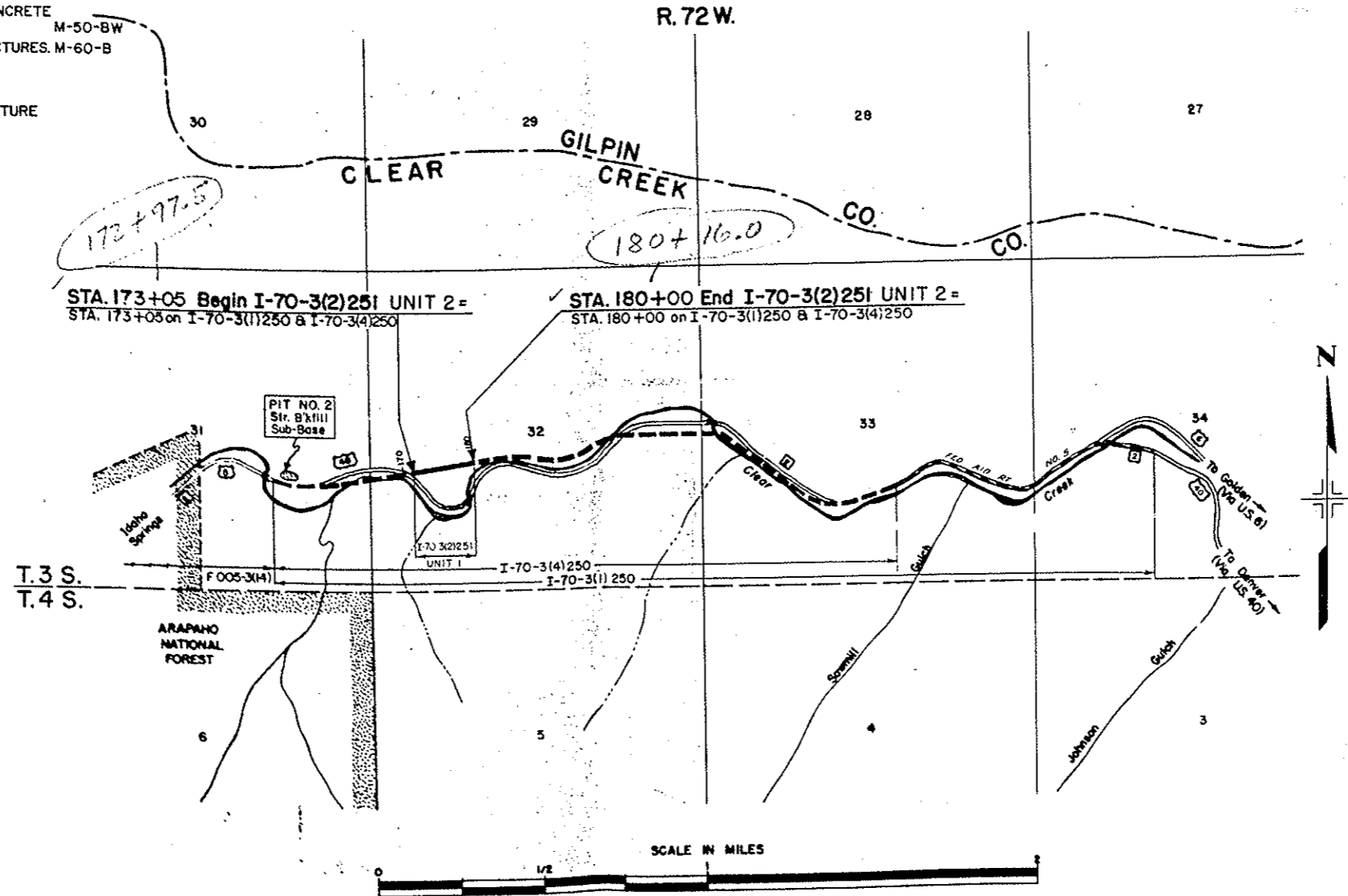
- 16 STANDARD CONCRETE PAVEMENT JOINT DETAILS. M-8-D
- 17 STANDARD LETTERS & FIGURES FOR YEAR NUMBERS AND STRUCTURE NUMBERS. M-10-D
- 18 STANDARD NO. 8 CONCRETE INLET, MANHOLE & PIPE JOINTS ON SEWERS. M-12-E-8
- 19-20 STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS. M-29-C
- 21 STANDARD SINGLE AND DOUBLE CONCRETE BOX CULVERTS. M-50-B
- 22 STANDARD WINGWALLS FOR VARIOUS TYPES OF CONCRETE BOX CULVERTS. M-50-BW
- 23 STANDARD METHODS OF BACKFILL AROUND STRUCTURES. M-60-B
- 24-25 ALIGNMENT PLAN AND PROFILE.
- 26-42 CROSS SECTIONS
- #2-A DETAILS OF ELECTRICAL INSTALLATION FOR FUTURE LIGHTING.

R.C. Hopper, Resident Engineer 1960-1961
Colorado Constructors, Inc.
1-Set to R.C.H. 11-7-61

TABULATION OF LENGTH & DESIGN DATA

STATION	TWIN TUNNELS	TWIN TUNNEL PORTALS
	LIN. FT.	STR. NO. F-15-BN & B0 LIN. FT.
173+05 BEGIN I-70-3(2)251 UNIT 2 = 173+05 ON I-70-3(1)250 & I-70-3(4)250		25.0
173+30.0	656.0	
179+86.0		14.0
180+00 END I-70-3(2)251 UNIT 2 = 180+00 ON I-70-3(1)250 & I-70-3(4)250		
TOTALS	656.0	39.0
SUMMARY	LIN. FT.	MILES
TOTAL-TWIN TUNNELS	656.0	0.124
TOTAL-TWIN TUNNEL PORTALS	39.0	0.007
TOTAL LENGTH -- (Net & Gross)	695.0	0.131
DESIGN DATA		
MAXIMUM DEGREE OF CURVE	NONE	
MAXIMUM GRADE	12.4% ✓	
MINIMUM N.P.S.D.-HORIZONTAL	>1000' ✓	
MINIMUM N.P.S.D.-VERTICAL	>1000' ✓	
MAXIMUM DESIGN SPEED	50 M.P.H. ✓	

Based on average lengths



SEE SPECIAL PROVISIONS FOR NOTICE TO BIDDERS

COLORADO
DEPARTMENT OF HIGHWAYS

APPROVED
M. H. [Signature] 11-13-59
CHIEF ENGINEER DATE

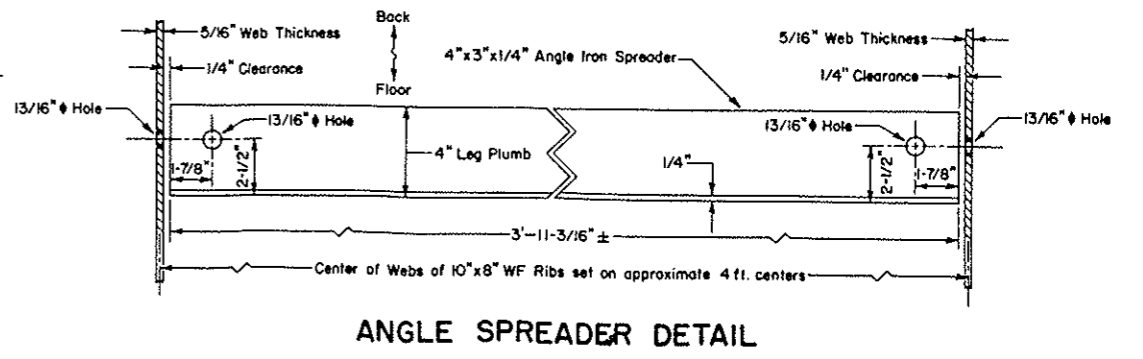
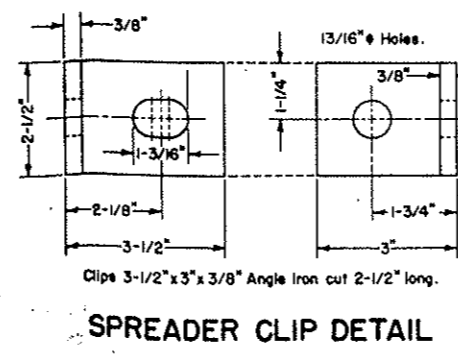
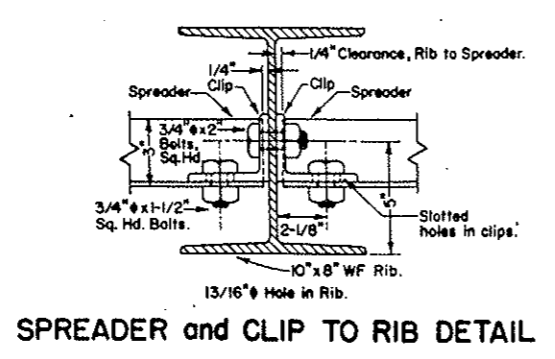
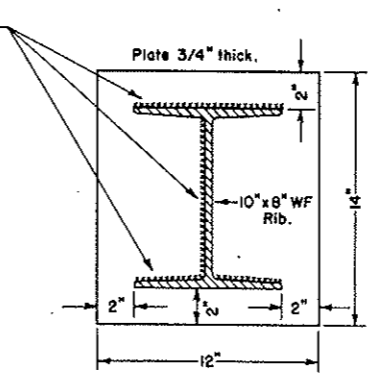
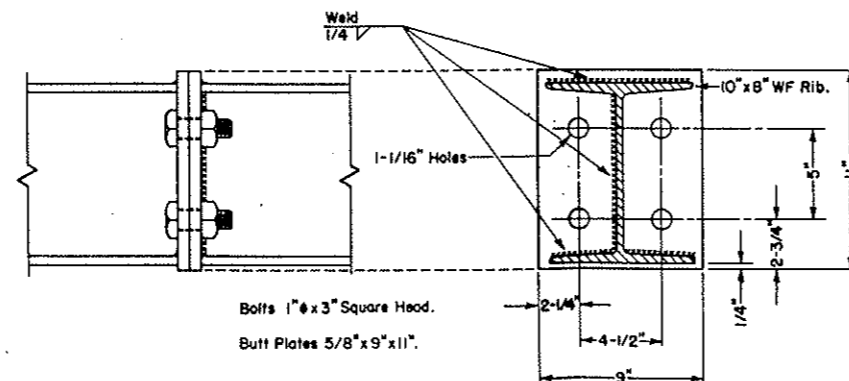
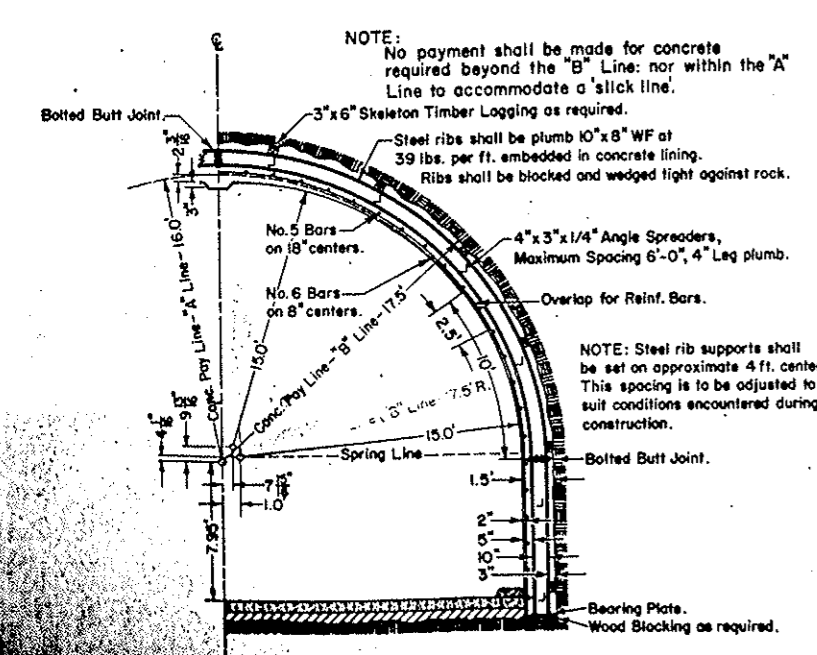
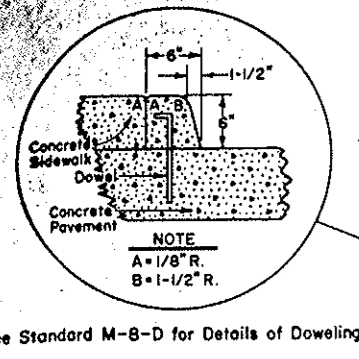
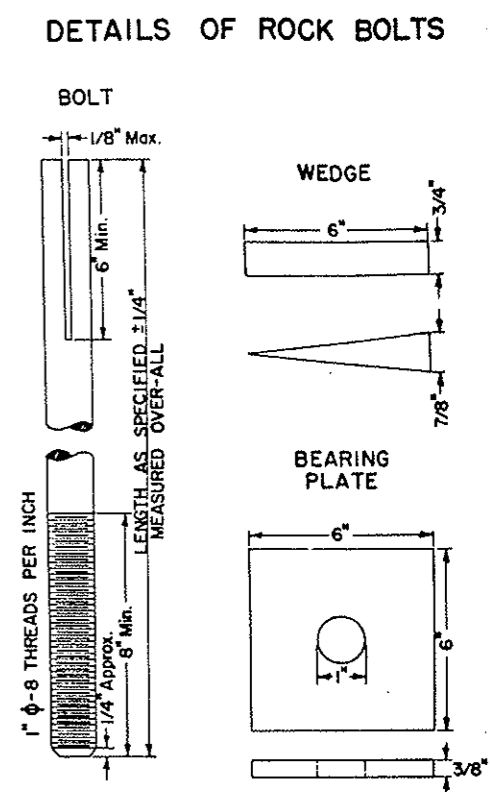
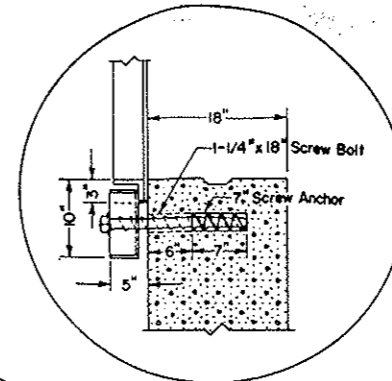
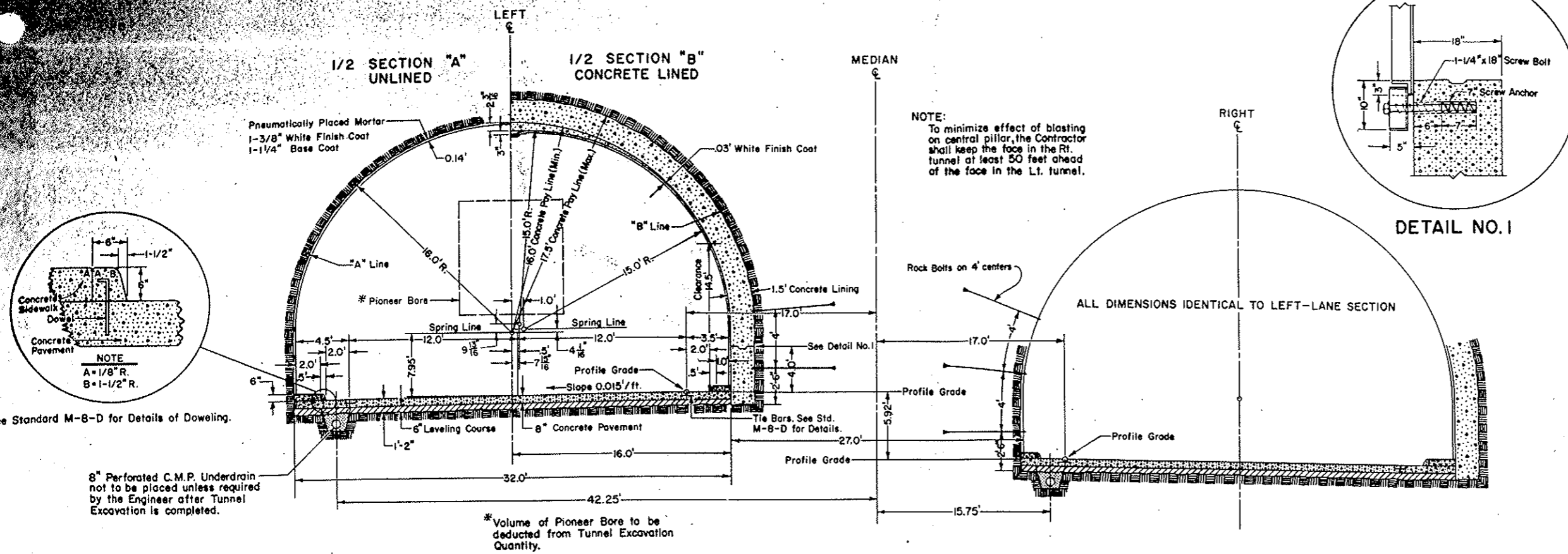
DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED _____ DATE _____
DIVISION ENGINEER

TYPICAL TUNNEL SECTIONS

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	I-70-3(2)251 UNIT 2	2	

Rev. 1-27-60 H.E.P. - Add Rock Bolt Details
 Rev. 5-12-60 - H.E.P. - Section B.
 Rev. 9-29-60 - H.E.P. - Section B.



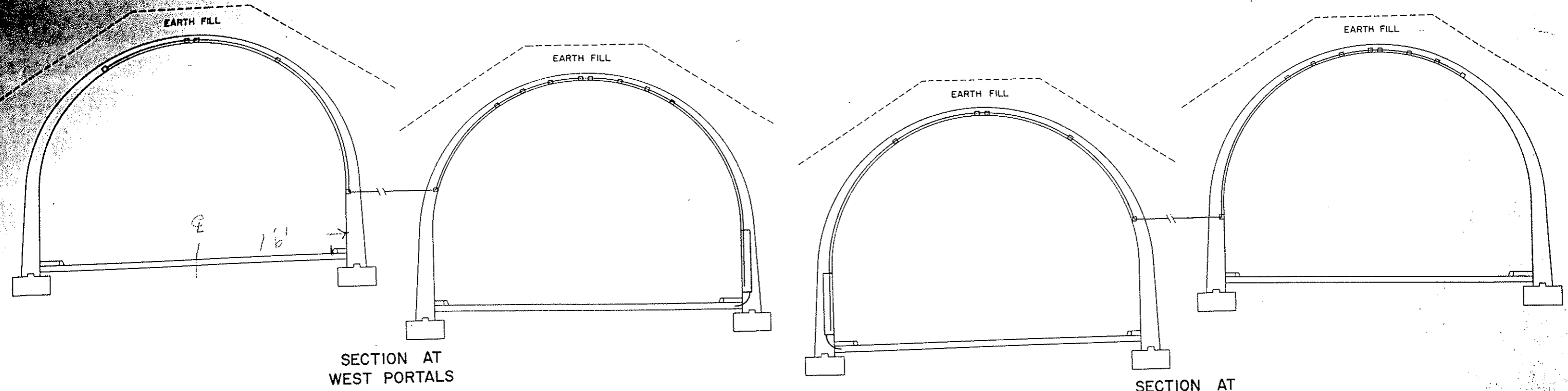
NOTE:
Threaded end fitted with one Am. Std. Reg. Square Unfinished (1-1/2" x 7/8" Tapped 1") or Am. Std. Heavy Hex. Unfinished Nut (1-5/8" x 1" Tapped 1").

Rock Bolts shall be placed on 4' centers along center pier between tunnels 3 bolts high in South Tunnel, and 2 bolts high in North Tunnel.

FEDERAL ROAD REGION NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	170-3(2)251 Unit 2	2-A	

Added new sheet 12-15-60 H.E.P.

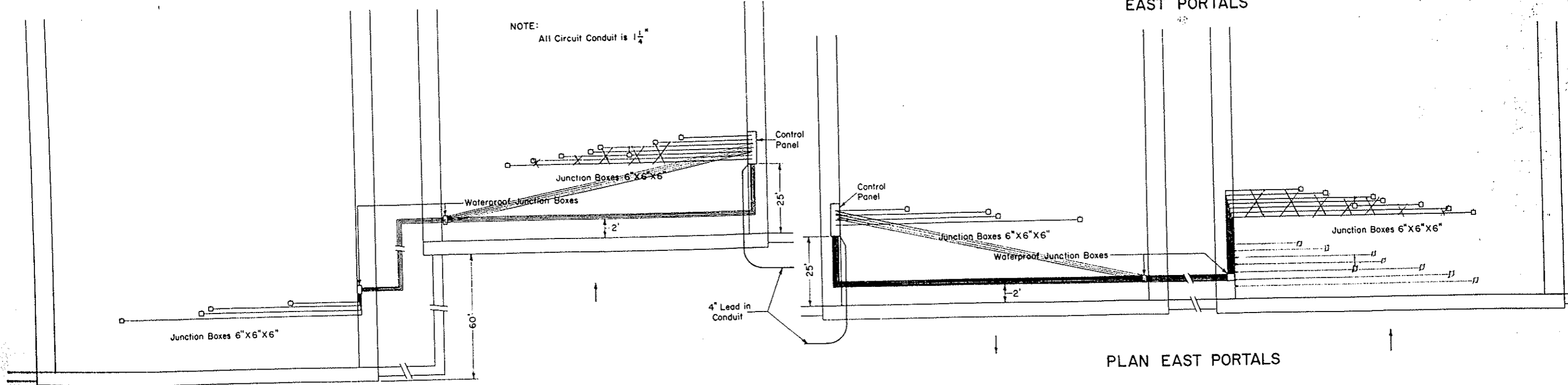
DETAILS OF ELECTRICAL INSTALLATION FOR FUTURE LIGHTING



SECTION AT WEST PORTALS

SECTION AT EAST PORTALS

NOTE:
All Circuit Conduit is 1 1/4"

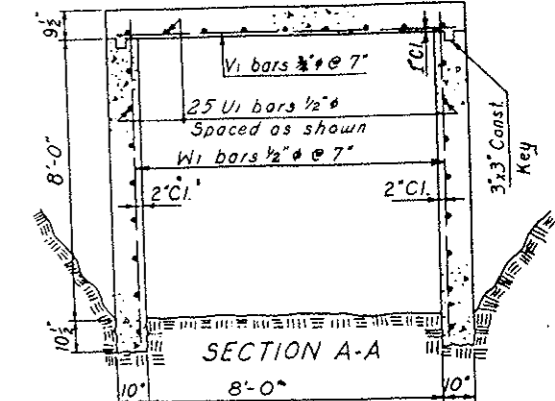
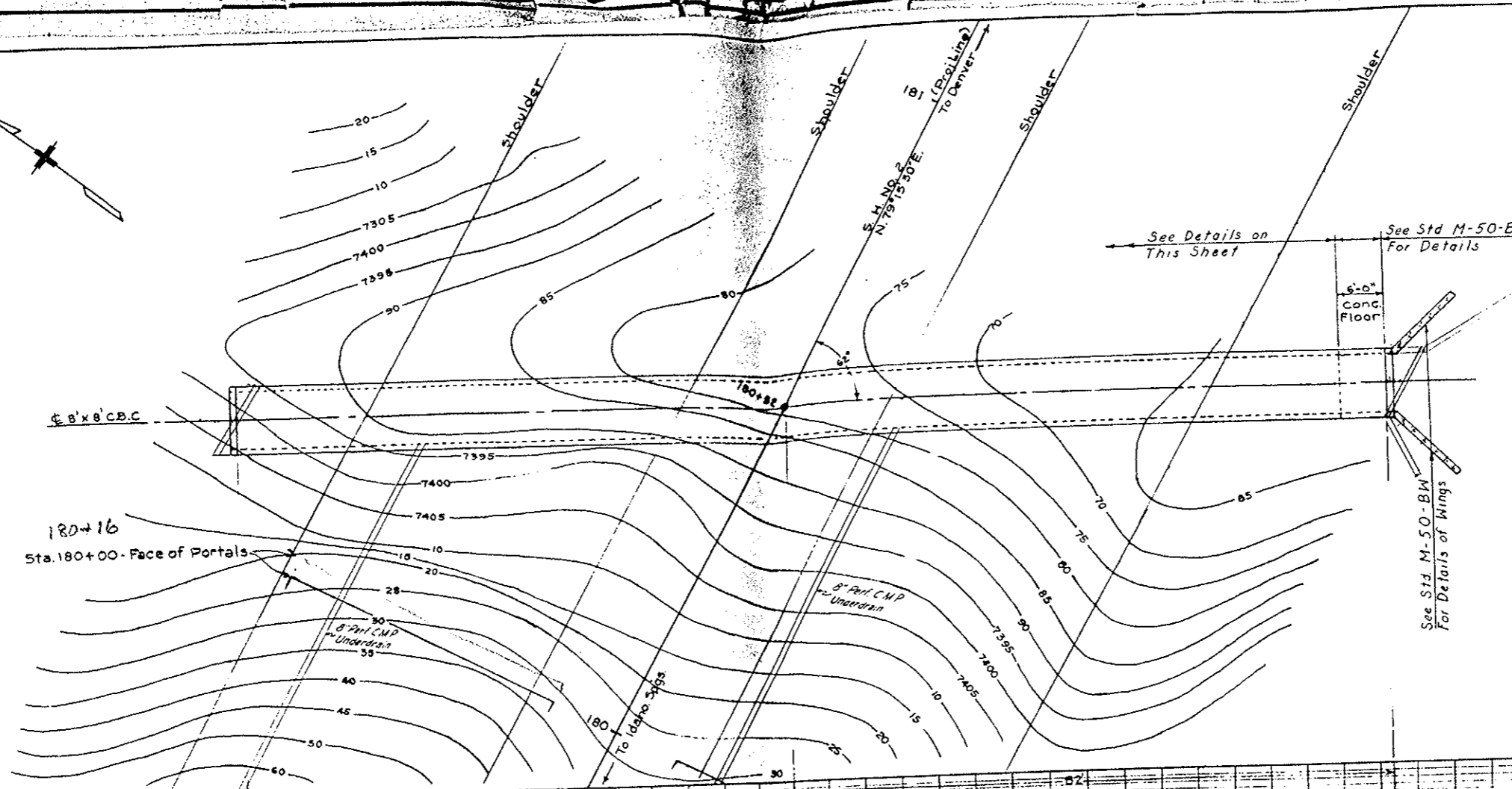
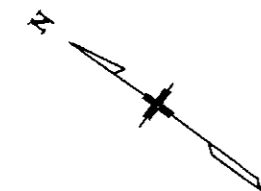


PLAN WEST PORTALS

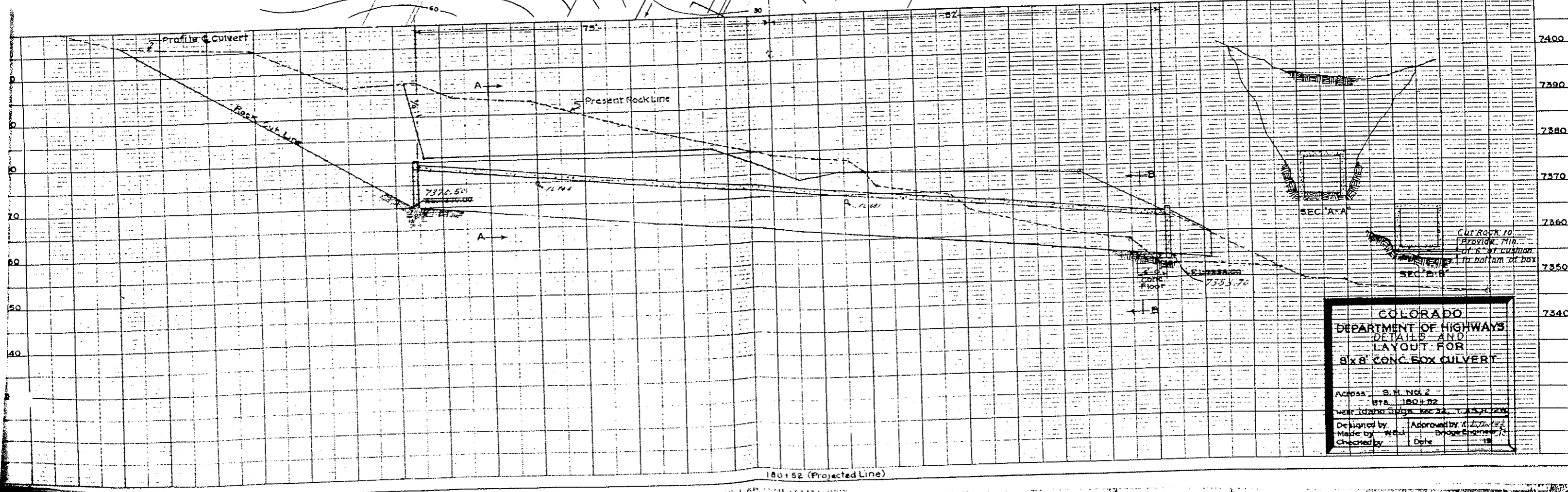
PLAN EAST PORTALS

90
80
70
60
50
40

FED. ROAD REG. NO.	DIVISION	PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	170-3(2)251 UNIT #2	6	



QUANTITIES FOR 8' x 8' C.B.C.	
Quantities for one lin. ft. of box	
Concrete - Cu. Yd.	Steel - Lb.
0.8313	61.3



COLORADO
DEPARTMENT OF HIGHWAYS
DETAILS AND
LAYOUT FOR
8' x 8' CONC. BOX CULVERT

Across S. H. No. 2
Sta. 180+02
Near Utah Bridge, Sec. 24, T. 25 S., R. 70 W.

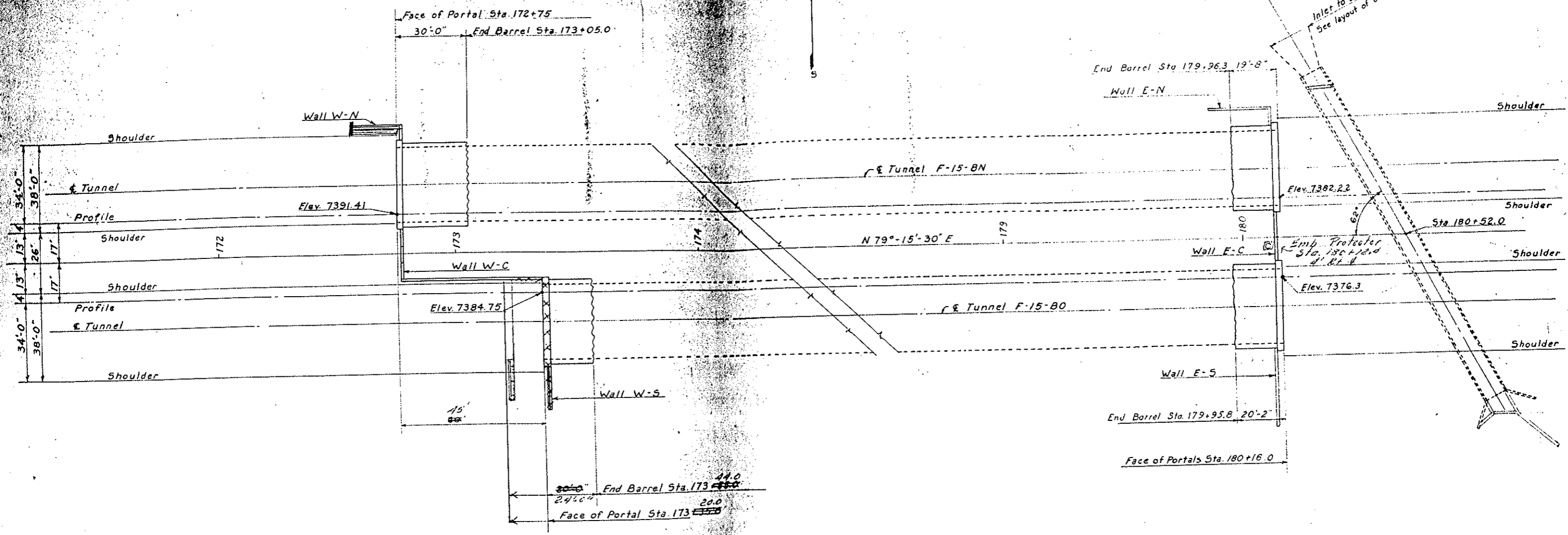
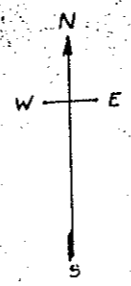
Designed by _____ Approved by _____
 Made by _____ Date _____
 Checked by _____

26'-0"

REVISIONS

Rev Added Item 90. 1-27-60 TGB
 Rev East Portals & Tunnels 18 Nov 60 JWM
 & Items 46 & 47.
 Rev. Deleted Detail of Elec. Conduit, 12-15-60, H.E.P.

FED ROAD REF. NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	1-70-3(2) 251*2	7	



SUMMARY OF QUANTITIES

Item	Description	Unit	East Portal No. Tunnel	East Portal So. Tunnel	West Portal No. Tunnel	West Portal So. Tunnel	Wall W-N	Wall W-C	Wall W-S	Wall E-N	Wall E-C	Wall E-S	Totals
13	Unclassified Excavation	Cu. Yd.	291	291	629	415					23	1	1620
14	Unclass. Struct. Excav. - Misc.	Cu. Yd.	10	10	21	14	18	77	12	1			220
18	Station Yard Overhaul	Sta. Yd.									2	1	20
16	Structure Backfill (Class 1)	Cu. Yd.					1	14	1	1			
46	Class "A" Concrete	Cu. Yd.	115.5	117.4	155.1	116.5	51.7	123.8	29.9	37.6	44.9	24.6	817
47	Reinforcing Steel (Inc. 1% ± Overrun)	Lb.	14775	14775	19,490	15,015	4,975	11,415	2,145	4405	3850	2940	93,785
46	White Cement for Mortar	Bbl.											10
46	Sand for Mortar	Ton											200
90	1 1/2" Electrical Conduit with Junction Boxes	Lin. Ft.	35	35	65	65		49	31		66		146
0	1/2" Exp'n. Jt. Mat'l. (AASHTO M-153-54 Type III)	Sq. Ft.											

0 To be included in the Bid Price for Item 46
 * Layout on Sheet No. 2A.

GENERAL NOTES
 ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.
 ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINED AS SPECIFIED.
 PORTAL FACES & WALL FACES SHALL RECEIVE CLASS 1 SURFACE FINISH.
 CONCRETE GIRDERS, FLOOR SLABS, AND CURBS SHALL BE POURED MONOLITHICALLY.
 FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIP LAP OR TONGUE AND GROOVE LOWEER 3/4" UNLESS FACED WITH PANEL BOARD.
 FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.
 SOUNDINGS AND DEPTH OF FOOTING SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REVISION IS NECESSARY.
 ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305 S07 OR THE LATEST REVISION THEREOF, AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT.
 SECONDARY BARS WHEN SPICED SHALL LAP 27 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.
 ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM. UNLESS OTHERWISE NOTED, EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.
 HANDBOLT BOLTS SHALL HAVE HEX HEADS, NUTS AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL RIVETS, EXCEPT AS NOTED ARE 1/2" DIA. AND SHALL BE POWER DRIVEN.
 WHEN TREATED TIMBER OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CREOSOTE OIL.
 WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.
 FOR DETAILS OF STRUCTURAL EXCAVATION AND STRUCTURE BACKFILL SEE STD. M-90-B.
 IF BY PERMISSION OF THE ENGINEER PRIMARY BARS ARE SPICED THEY SHALL LAP A MIN. OF 28 DIAM. FOR BARS NEAR TOP OF BEAMS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS AND 17 DIAM. FOR BARS NEAR BOTTOM OF MEMBERS.

DESIGNING DATA
 A.A.S.H.O. 1953 UNIT STRESSES, EXCEPT AS NOTED
 Reinforcing Steel Is - 20000 lbs. per sq. in.
 Structural Steel Is - 18000 lbs. per sq. in.
 Ic - 12000 lbs. per sq. in.
 n - 10

COLORADO
 DEPARTMENT OF HIGHWAYS

General layout &
 Summary of Quantities

TUNNELS
 Sta. AS SHOWN
 Near Idaho Springs Sec. 32 T. 3 S. R. 72W

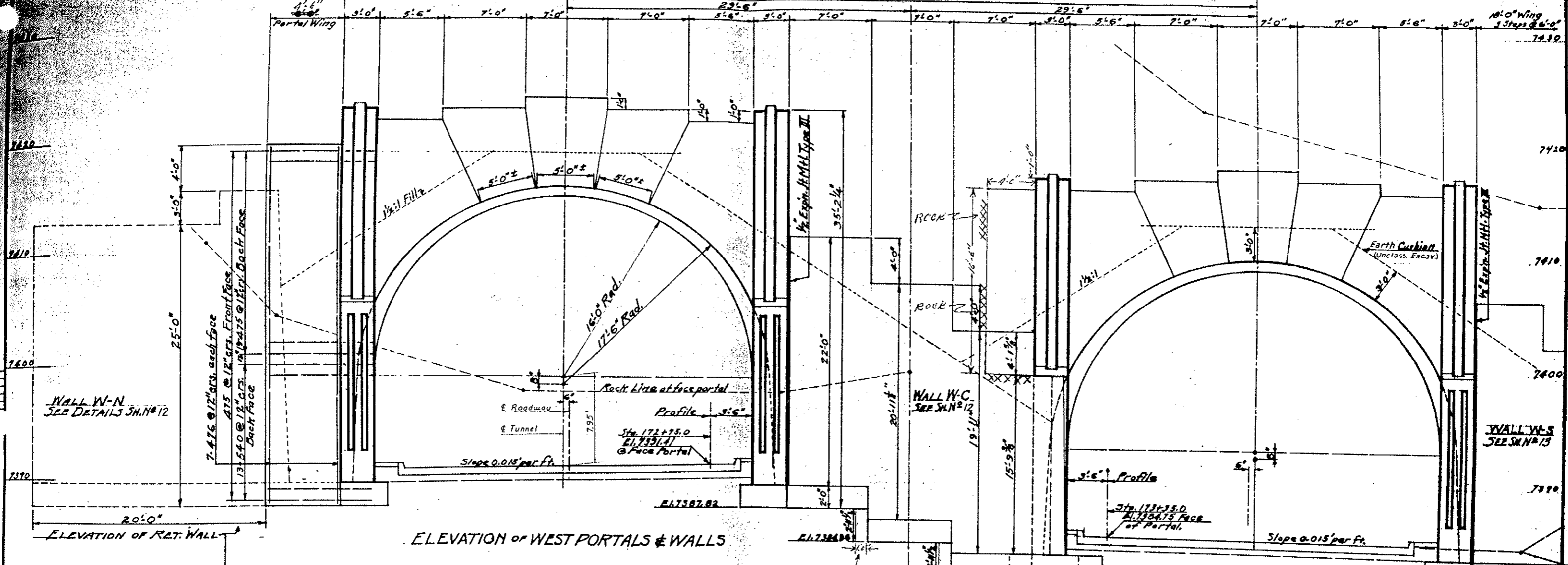
Designed by _____ Approved by *W.D. Kuehler*
 Made by _____ Bridge Engineer
 Checked by _____ Date: *Oct. 20, 1959*

STRUCTURE NO. F-15-BN & F-15-B0

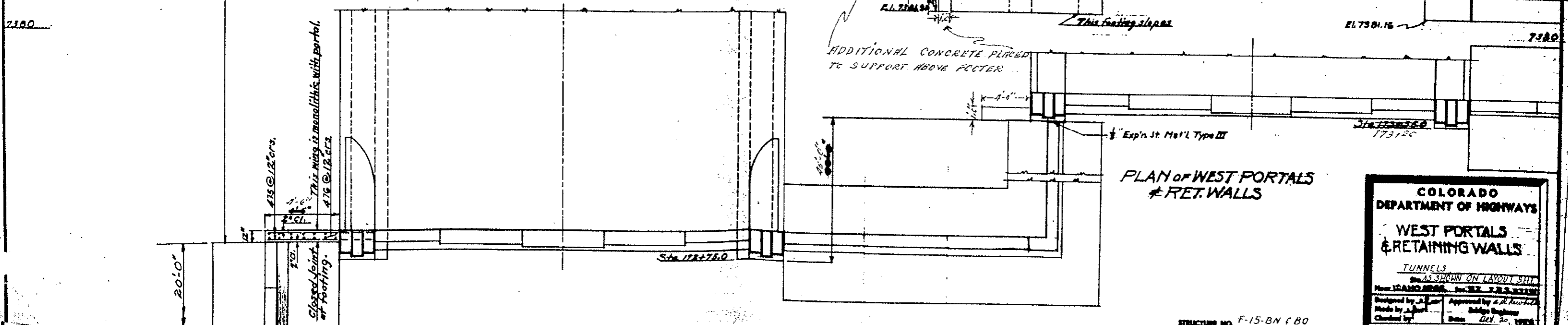
20'-0"

Rev. Added 1 1/2" Elec. Conduit with Junction Boxes 1-27-60 T.G.B.
Rev. Deleted Elec. Conduit, 12-15-60 H.E.P.

REV. NO.	DESCRIPTION	PROJECT NO.	DATE	BY
9	COLO.	152-300000-E	9	



ELEVATION OF WEST PORTALS & WALLS



PLAN OF WEST PORTALS & RET. WALLS

COLORADO DEPARTMENT OF HIGHWAYS

WEST PORTALS & RETAINING WALLS

TUNNELS

AS SHOWN ON LAYOUT SHEET

How TO READ THIS DRAWING

Designed by J. J. [Name] Approved by [Name]

Made by J. [Name] Checked by [Name]

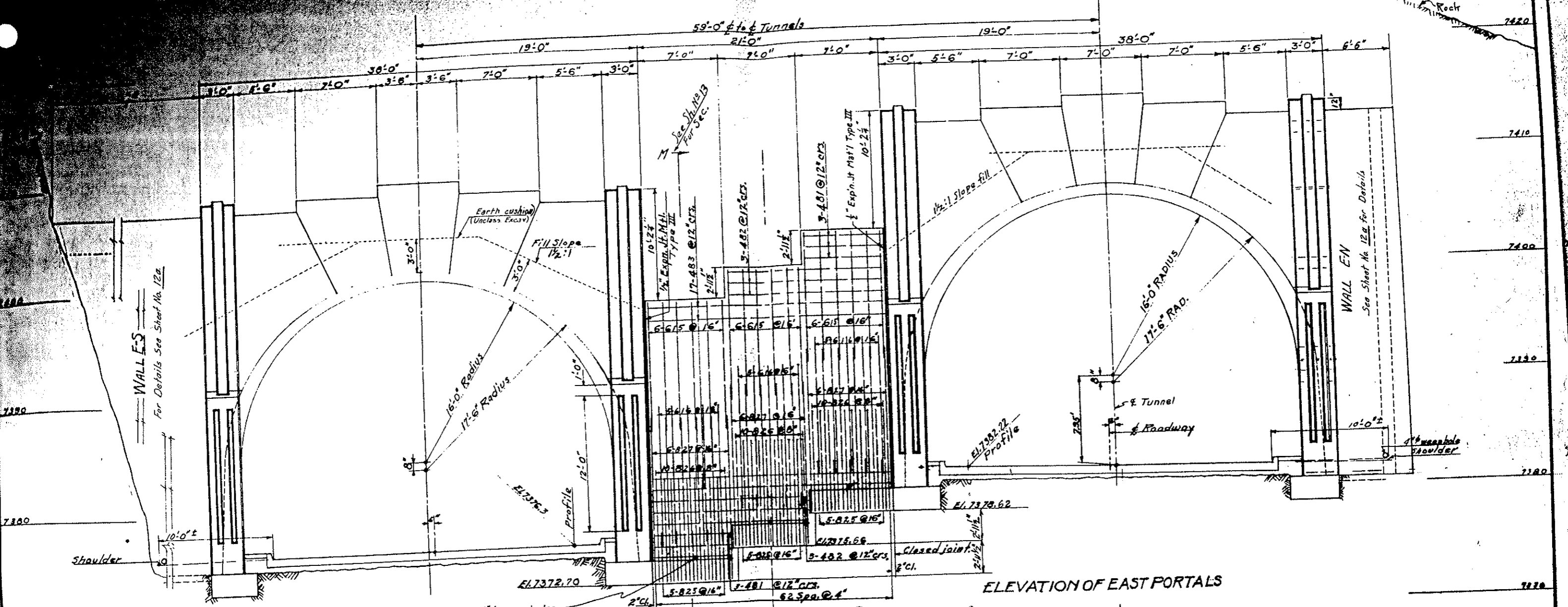
Date Oct. 20, 1958

STRUCTURE NO. F-15-BN & B0

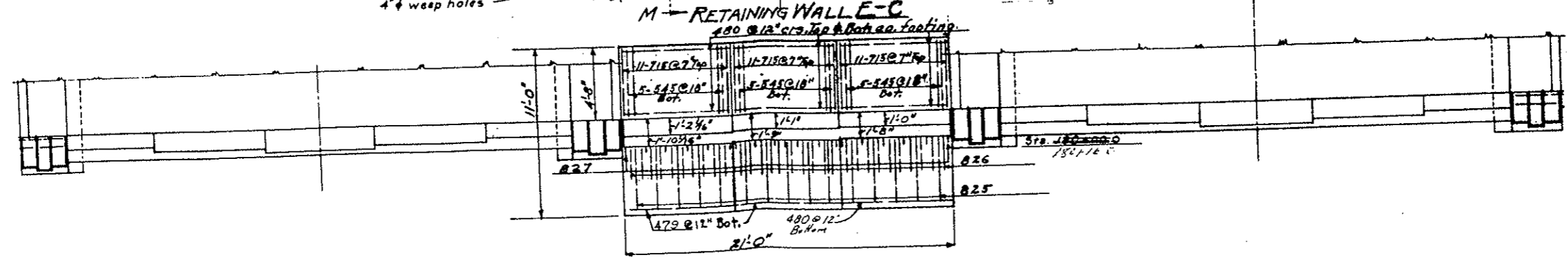
NO. 1000	DIVISION	PROJECT NO.	DATE	ISSUE
REG. NO.	3	1-70-3(2)251.2	10	
9	COLO.			

Rev Added 1/2" Elec Conduit with Junction Boxes 1-21-60 TGB
 Rev. East Portals & Tunnels 11-18-60 M.E.P.
 Rev. Deleted Elec. Conduit 12-15-60 H.E.P.

7427 top of rock at 180+00



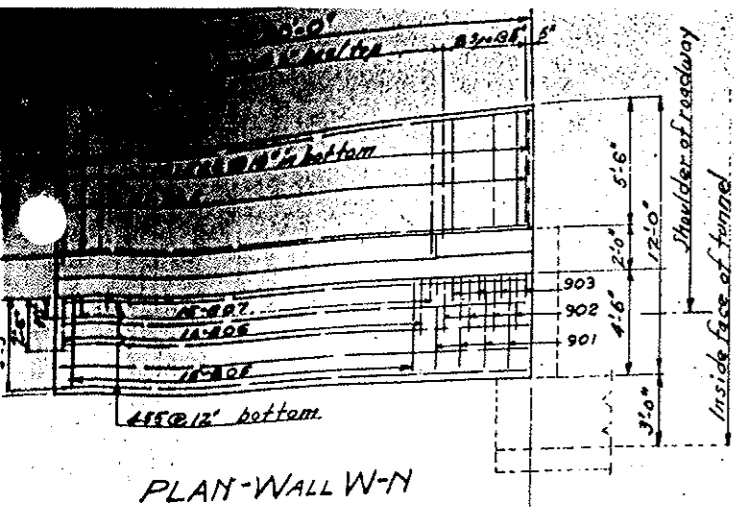
ELEVATION OF EAST PORTALS



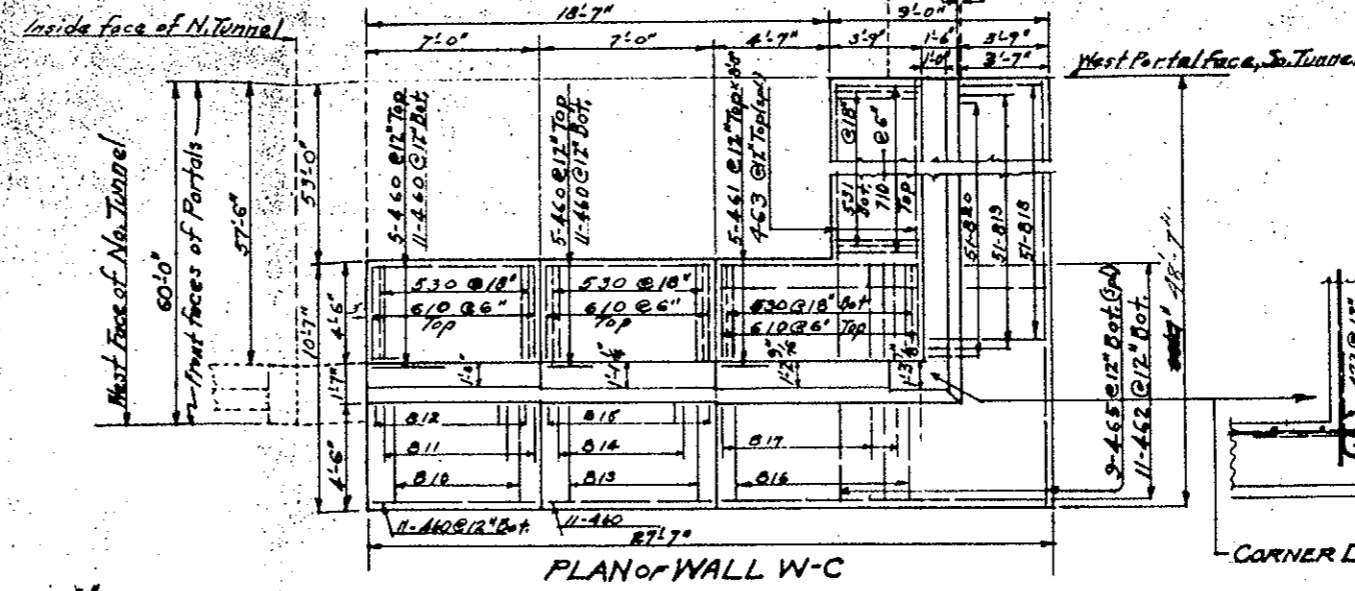
PLAN OF EAST PORTALS

COLORADO DEPARTMENT OF HIGHWAYS
EAST PORTALS & RETAINING WALLS
 TUNNELS
 AS SHOWN ON LAYOUT SHEET
 Near GRAND DOG, Sta. 180+00 to 184+16.0
 Designed by [Signature] Approved by [Signature]
 Made by [Signature] Bridge Engineer
 Checked by [Signature] Date 11/20/60

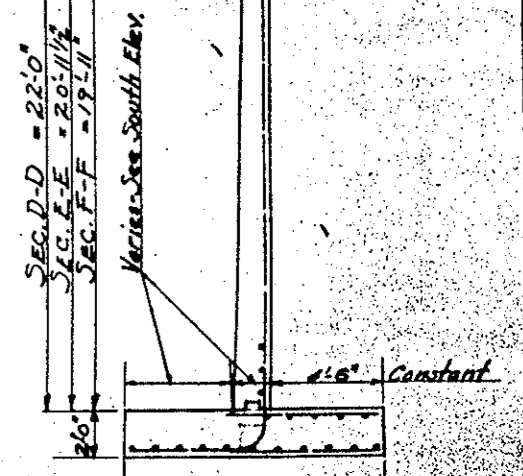
STRUCTURE NO. F-15-DN & BO



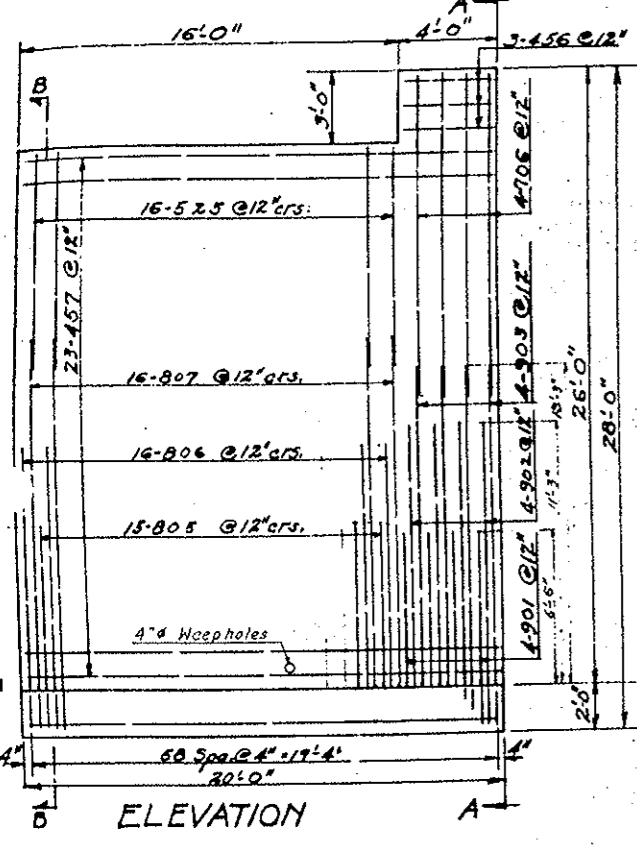
PLAN-WALL W-N



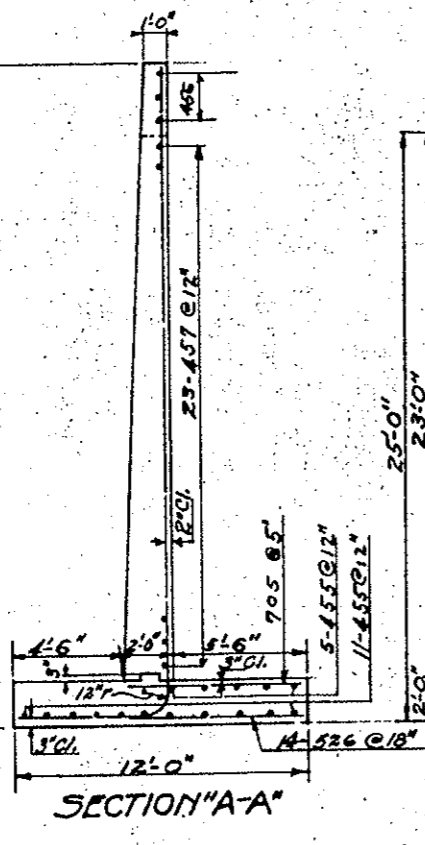
PLAN of WALL W-C



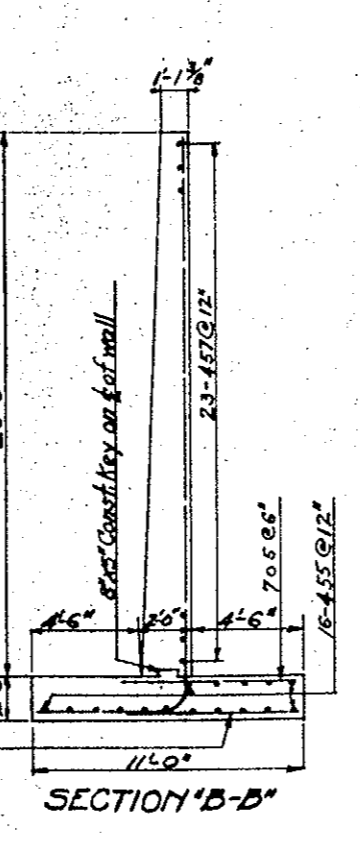
SECTION 'D-D' E-E OR F-F



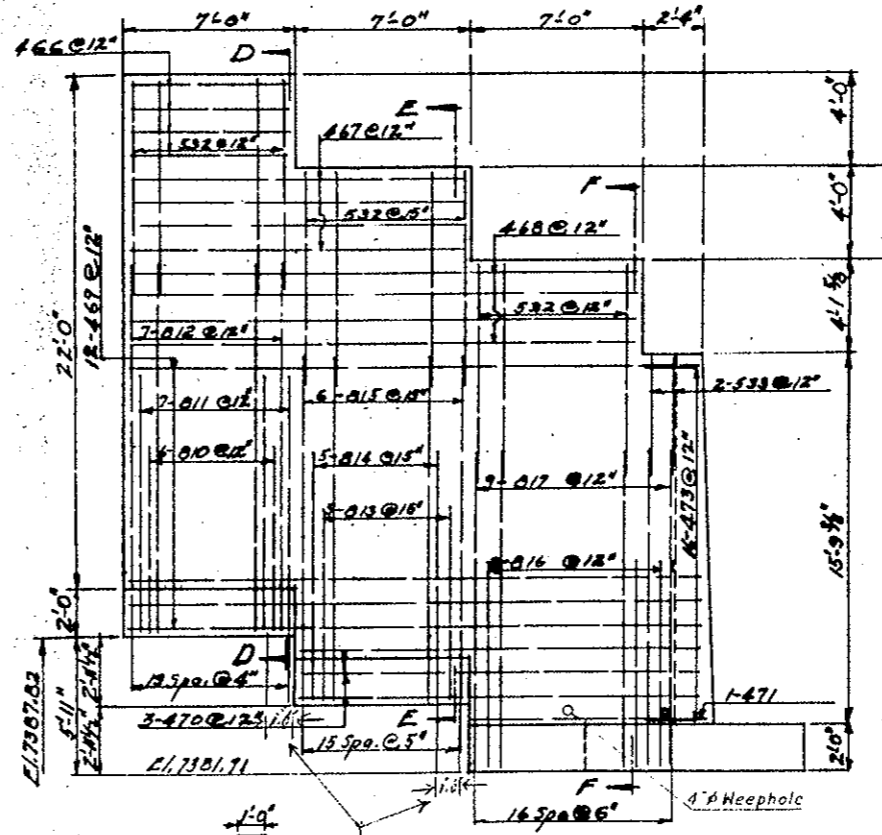
ELEVATION



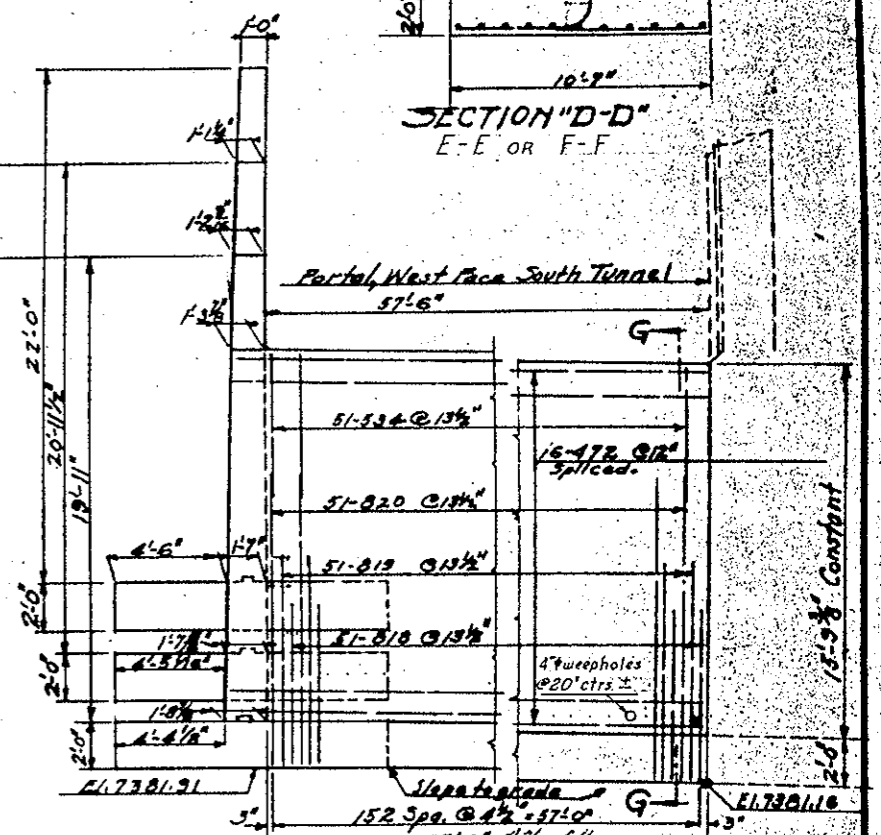
SECTION 'A-A'



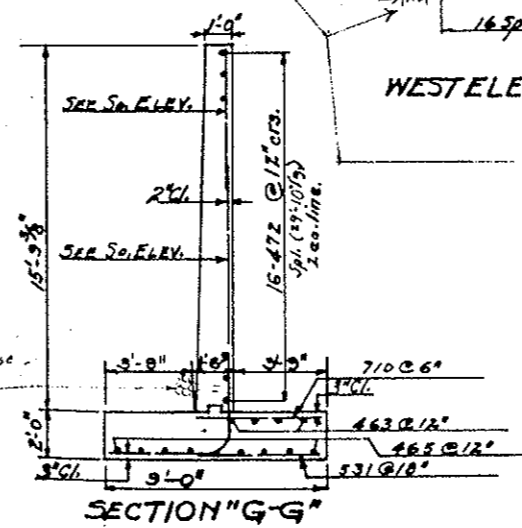
SECTION 'B-B'



WEST ELEV. WALL W-C



SOUTH ELEV. WALL W-C



SECTION 'G-G'

ADDITIONAL CONCRETE PLACED TO SUPPORT ABOVE PORTALS

4\" Weepholes well surrounded with coarse gravel (Typ)

STRUCTURE NO. F-15-BN & DO

COLORADO DEPARTMENT OF HIGHWAYS

RETAINING WALLS W-N & W-C

TUNNEL PORTALS
AS SHOWN ON LAYOUT

Designed by *W.L.*
Made by *W.L.*
Checked by *W.L.*

Approved by *W.L.*
Bridge Engineer
Date: *11-30-1959*

BAR LIST - WALL E-N

MARK	SIZE	NO. REQ'D.	LENGTH	TYPE	DIMENSIONS ft m
415	1/2"	7	29'-6"	Str.	
416	1/2"	7	29'-6"	Str.	
10		1ea.	by 2'-10"		
418	1/2"	3	24'-11"	Str.	
419	1/2"	3	25'-0"	Str.	
590	1/2"	3	23'-6"	Str.	
591	1/2"	3	25'-7"	Str.	
592	1/2"	4	24'-11"	Str.	
593	1/2"	4	24'-9"	Str.	
594	1/2"	30	6'-8"	Str.	
636	1/2"	7	24'-5"	Str.	
637	1/2"	7	24'-0"	Str.	
638	1/2"	30	3'-7"	Str.	

BAR LIST CONT.

750	1/2"	7	23'-9"	Str.	
751	1/2"	7	23'-3"	Str.	
840	1/2"	23	2'-0"	Str.	
841		6	22'-10"		
842		6	22'-5"		
843		4	22'-3"		
844		3	22'-0"		
845			20'-6"		
10		1ea.	by 2'-10"		
853			3'-10"		
854	1/2"	30	4'-0"	Str.	

SUMMARY

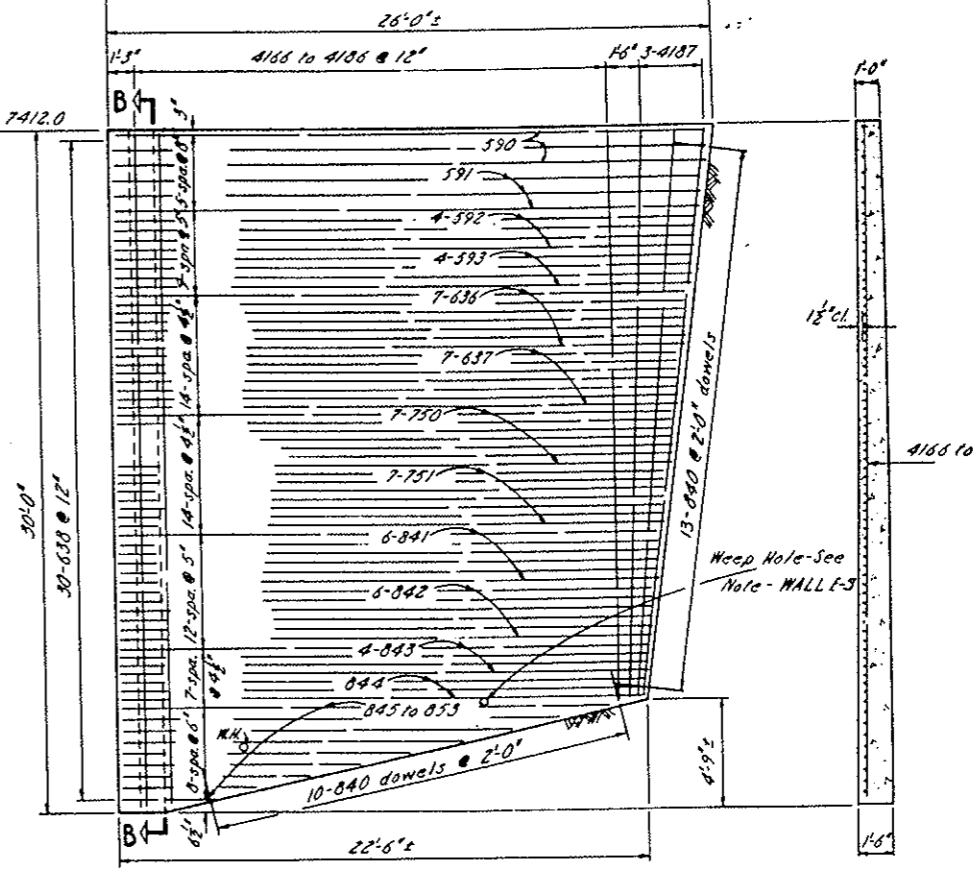
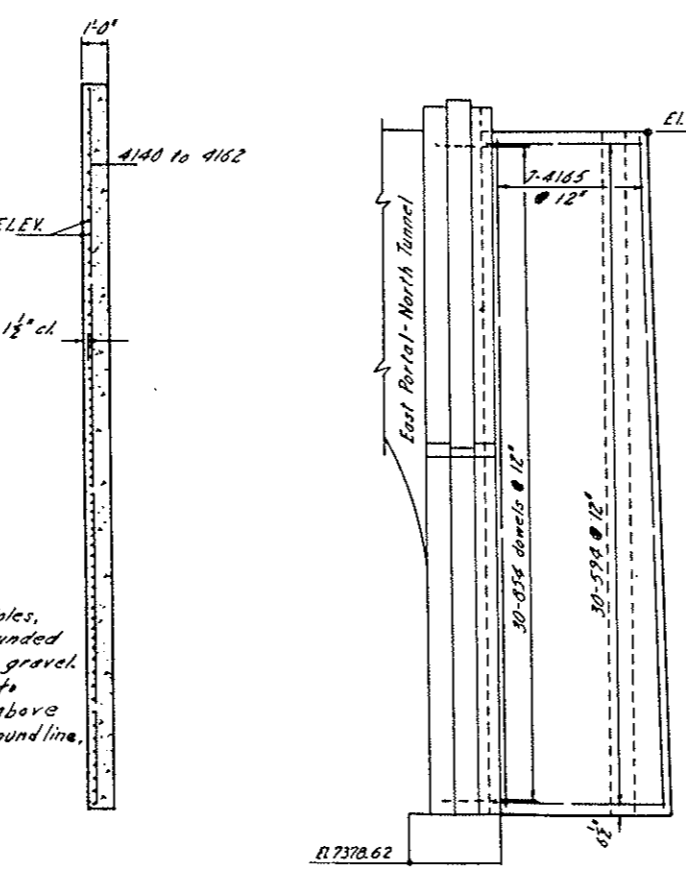
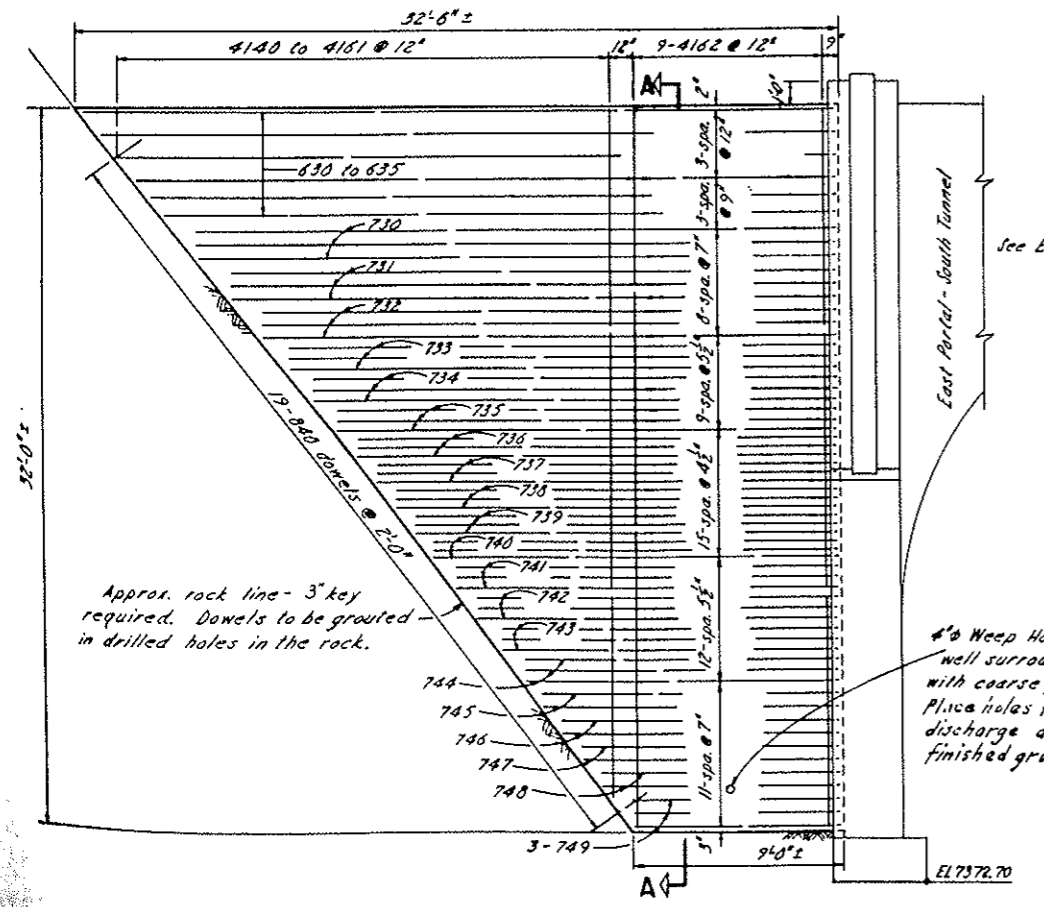
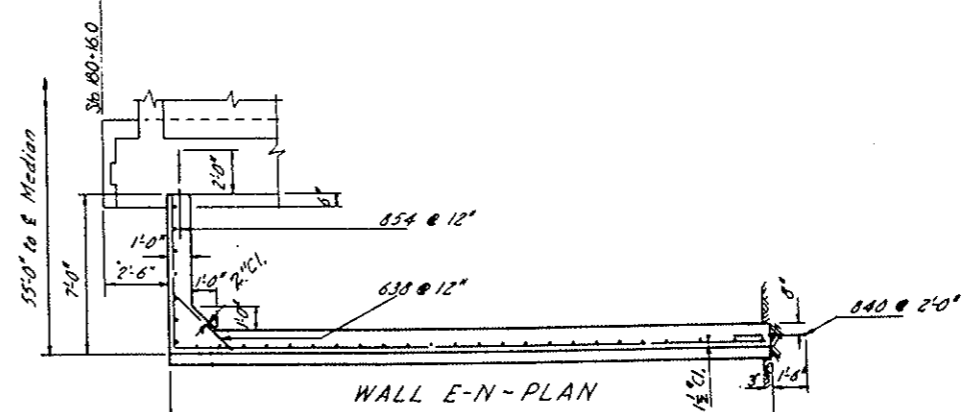
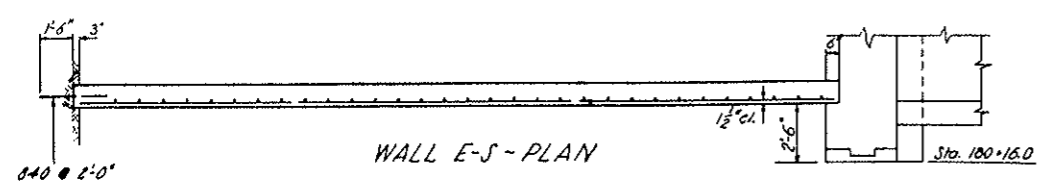
853 Lin. Ft. 1/2" @ 0.660 p/f = 570 Lb.
551 Lin. Ft. 1/2" @ 1.043 p/f = 575 Lb.
446 Lin. Ft. 1/2" @ 1.502 p/f = 670 Lb.
329 Lin. Ft. 1/2" @ 2.044 p/f = 672 Lb.
702 Lin. Ft. 1/2" @ 2.670 p/f = 1874 Lb.
Plus 12" for overrun = 44 Lb.
Total = 4405 Lb.

BAR LIST - WALL E-S

MARK	SIZE	NO. REQ'D.	LENGTH	TYPE	DIMENSIONS ft m
4140	1/2"		2'-1"	Str.	
10		1ea.	by 1'-4" to		
4161	1/2"		30'-1"	Str.	
4162	1/2"	9	31'-8"	Str.	
630	1/2"	1	32'-0"	Str.	
631		1	31'-4"		
632		1	30'-7"		
633		1	29'-11"		
634		1	29'-3"		
635	1/2"	1	28'-7"	Str.	
730	1/2"	3	27'-2"	Str.	
731			25'-9"		
732			24'-6"		
733			23'-4"		
734			22'-4"		
735			21'-4"		
736			20'-6"		
737			19'-6"		
738			18'-9"		
739			18'-0"		
740			17'-3"		
741			16'-2"		
742			15'-2"		
743			14'-3"		
744		3	13'-3"		
745		2	12'-5"		
746		2	11'-7"		
747		2	10'-9"		
748		2	9'-11"		
749	1/2"	3	8'-8"	Str.	
840	1/2"	19	3'-0"	Str.	

SUMMARY

639 Lin. Ft. 1/2" @ 0.668 p/f = 427 Lb.
182 Lin. Ft. 1/2" @ 1.502 p/f = 273 Lb.
1037 Lin. Ft. 1/2" @ 2.044 p/f = 2098 Lb.
57 Lin. Ft. 1/2" @ 2.670 p/f = 152 Lb.
Plus 12" for overrun = 30 Lb.
Total = 2,940 Lb.



NO CHANGES FROM PLANS

SECTION B-B

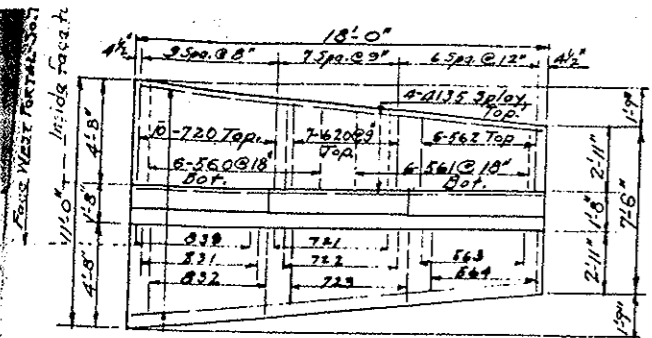
COLORADO DEPARTMENT OF HIGHWAYS
RETAINING WALLS
E-S & E-N
TUNNEL PORTALS

Sta. 10+20 to 10+25
Near Idaho Springs, Sec. 36, T. 5S, R. 22E

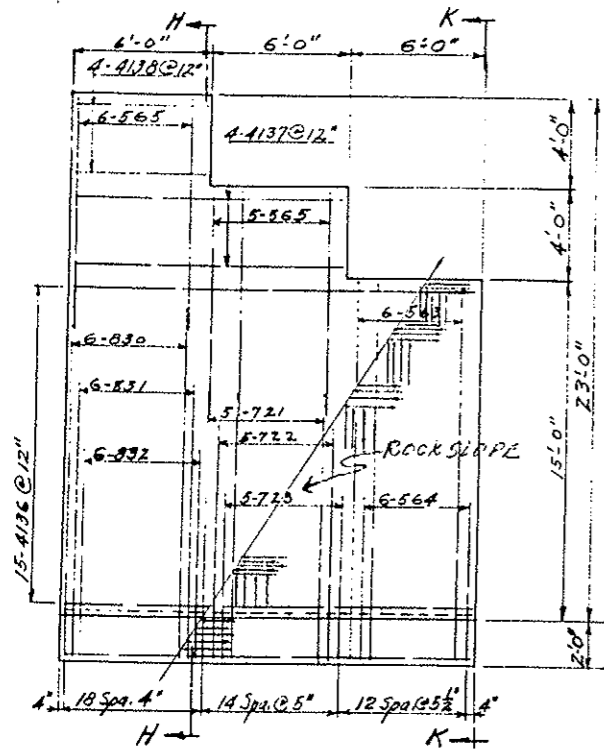
Designed by E.F.W. Approved by _____
Made by J.G.G. Checked by _____
Date: _____

STRUCTURE NO. F-15-BN & BO

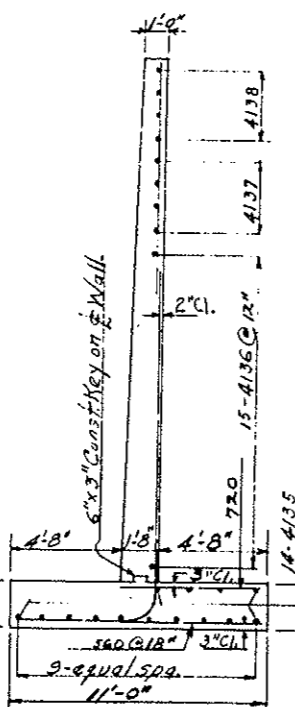
REG. NO.	DIVISION	PROJECT NO.	DATE	SCALE
9	COLO.	7-70-3(2)251#2	1/3	



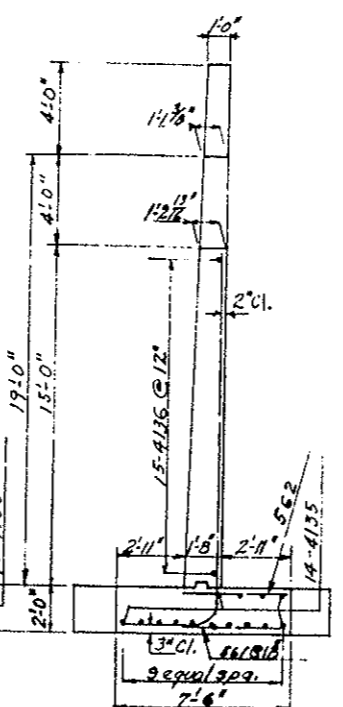
10-4135 Splayed
Dot Form
PLAN OF WALL W-S



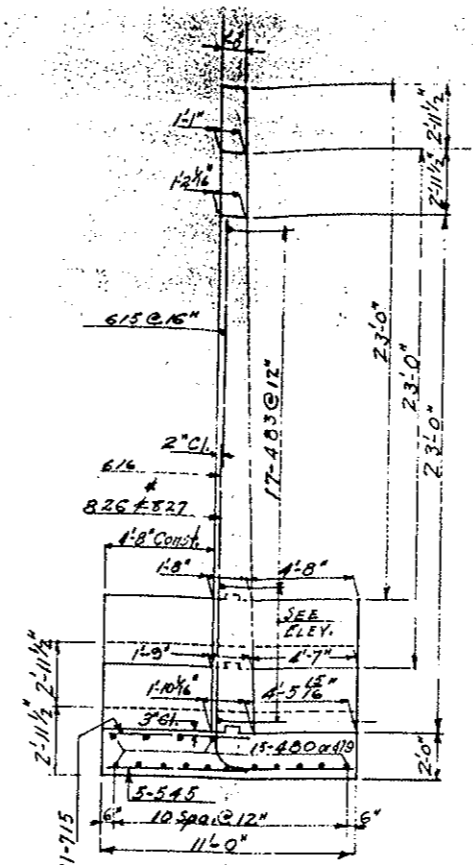
ELEVATION WALL W-S



SECTION "H-H"



END VIEW SECTION "K-K"



SECTION "M-M" SEE SH. 11# 10.
WALL E-C

COLORADO
DEPARTMENT OF HIGHWAYS

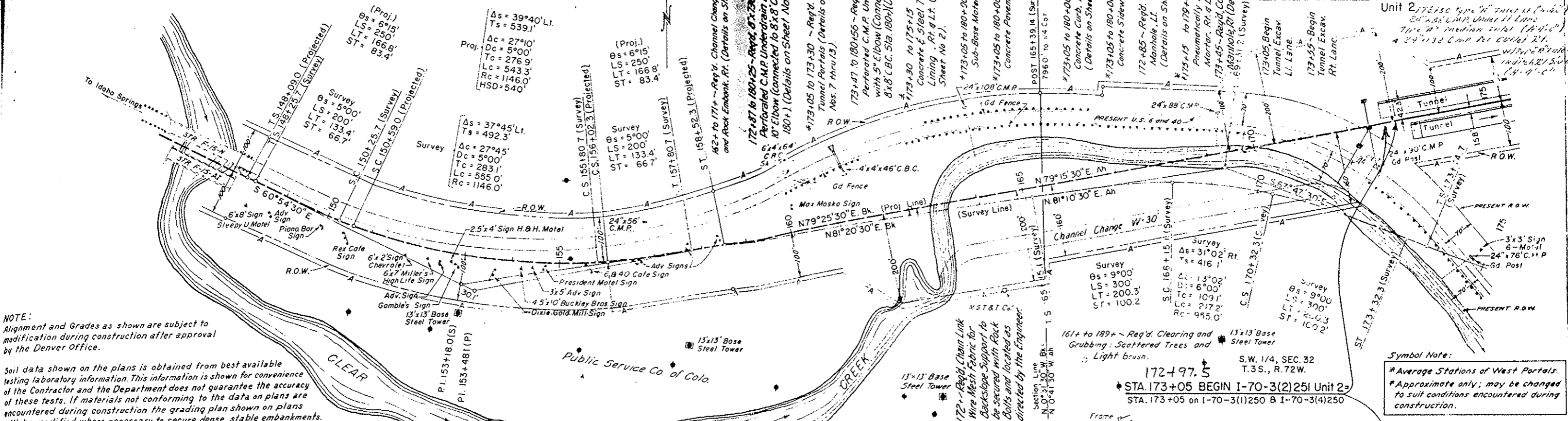
RETAINING WALLS W-S
E-C

TUNNELS
See AS SHOWN ON LAYOUT
Near KIAHO SPINES Sec. 37 T. 33 N. R. 72 W.

Designed by	Approved by
Made by	Bridge Engineer
Checked by	Date: Dec. 20, 1959

STRUCTURE NO. F-15-DN & BO

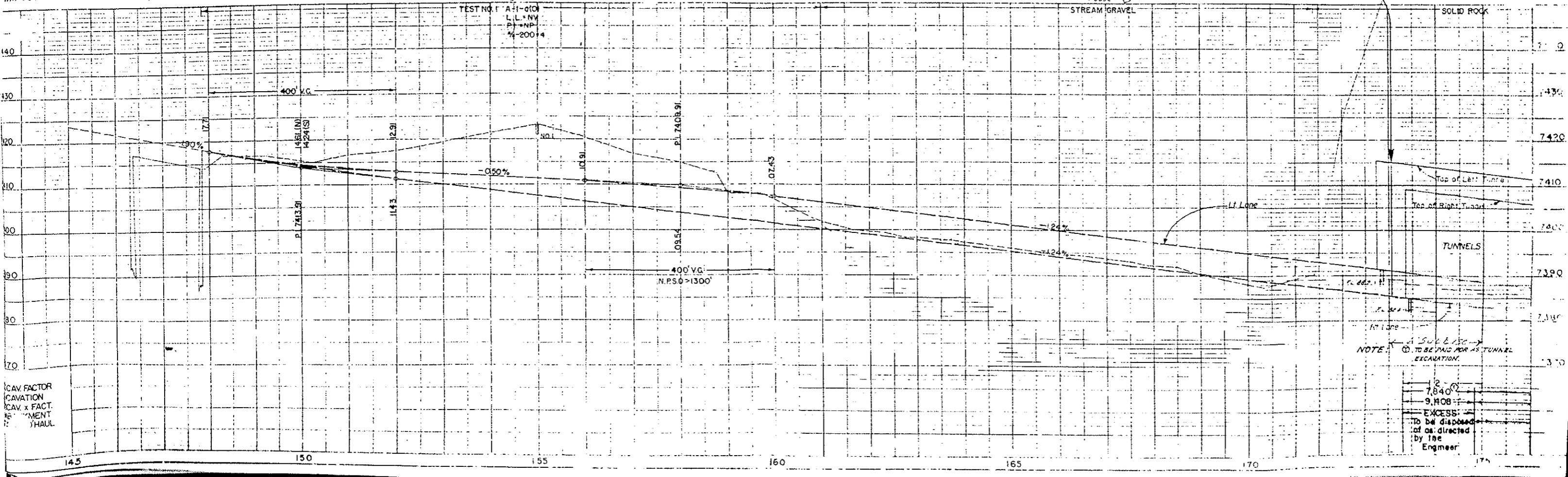
REV. ROAD DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
S	COLO I-70-3(2)251	24	



NOTE:
Alignment and Grades as shown are subject to modification during construction after approval by the Denver Office.

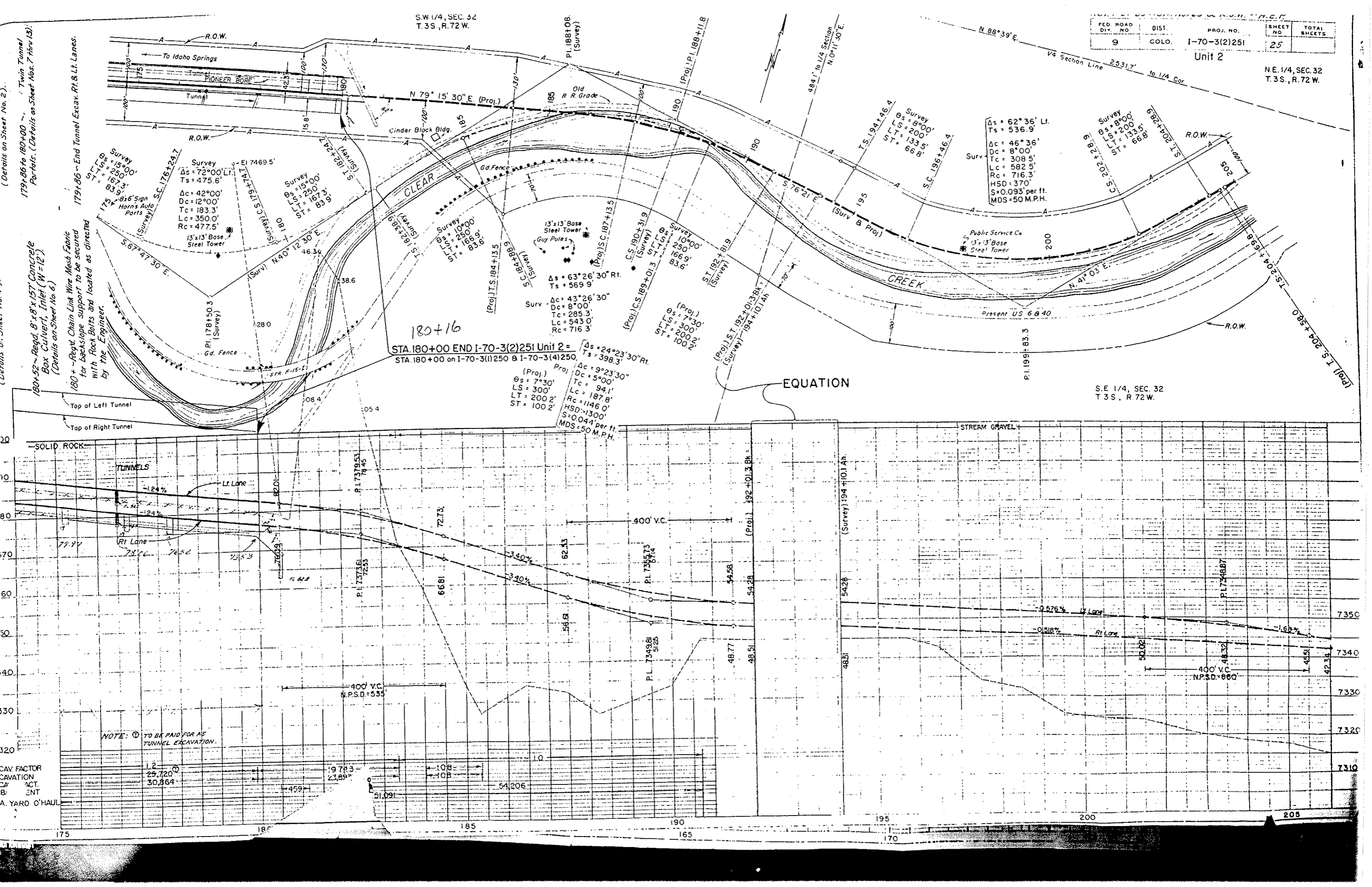
Soil data shown on the plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense, stable embankments.

Symbol Note:
*Average Stations of West Portals.
*Approximate only; may be changed to suit conditions encountered during construction.



CAV. FACTOR
CAVATION
CAV. x FACT.
MENT
HAUL

NOTE: TO BE PAID FOR AS TUNNEL EXCAVATION.
EXCESS: TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER.



FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	I-70-3(2)251	25	

Unit 2

NE 1/4, SEC. 32
T. 3S., R. 72W.

179+86 to 180+00 - Twin Tunnel Portals. (Details on Sheet Nos. 7 thru 13).
180+52 - Req'd. 8' x 8' x 15' Concrete Box Culvert, Inlet (W=12'). (Details on Sheet No. 6).
179+86 - End Tunnel Excav. R.I. & Lt. Lanes.
180+ - Req'd. Chain Link Wire Mesh Fabric for backslope support to be secured with Rock Bolts and located as directed by the Engineer.

Survey
 $\Delta s = 62^{\circ}36' Lt.$
 $Ts = 536.9'$
 $\Delta c = 46^{\circ}36'$
 $Oc = 8^{\circ}00'$
 $Tc = 308.5'$
 $Lc = 582.5'$
 $Rc = 716.3'$
 $HSD = 370'$
 $S = 0.093' per ft.$
 $MDS = 50 M.P.H.$

180+16
 STA 180+00 END I-70-3(2)251 Unit 2 =
 STA 180+00 on I-70-3(1)250 B I-70-3(4)250

(Proj.)
 $\Delta s = 24^{\circ}23'30" Rt.$
 $Ts = 398.3'$
 $\Delta c = 9^{\circ}23'30"$
 $Dc = 5^{\circ}00'$
 $Tc = 94.1'$
 $Lc = 187.8'$
 $Rc = 1146.0'$
 $HSD = 1300'$
 $S = 0.044' per ft.$
 $MDS = 50 M.P.H.$

EQUATION

SE 1/4, SEC. 32
T. 3S., R. 72W.

NOTE: TO BE PAID FOR AS TUNNEL EXCAVATION.

CAV. FACTOR
 CAVATION
 ACT.
 B. ENT
 A. YARD O'HAUL

1.2	25,720	1978.3	108	10
30,864	23,897	51,091	108	54,206
	459			

175 180 185 190 195 200 205