DIV	STATE	ROUTE NO	SECTION	SHEET NO	TOTAL SHEETS
9	COLO	24	A4, B2	1	~~22~~ 19

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

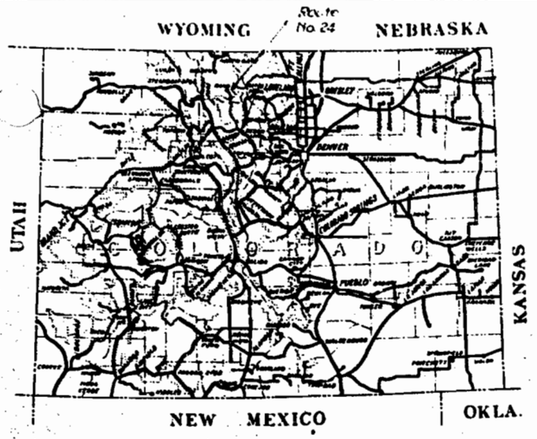
PROJ. 24-A4, B2

AS CONSTRUCTED
ROUTE 24 WILLOW CREEK PASS HIGHWAY
JUNCTION U.S. 40 TO RAND
33 MILES CLASS 2

COLORADO FOREST HIGHWAY SYSTEM

ARAPAHO & ROUTT NATIONAL FOREST
GRAND & JACKSON CO'S.

COLORADO

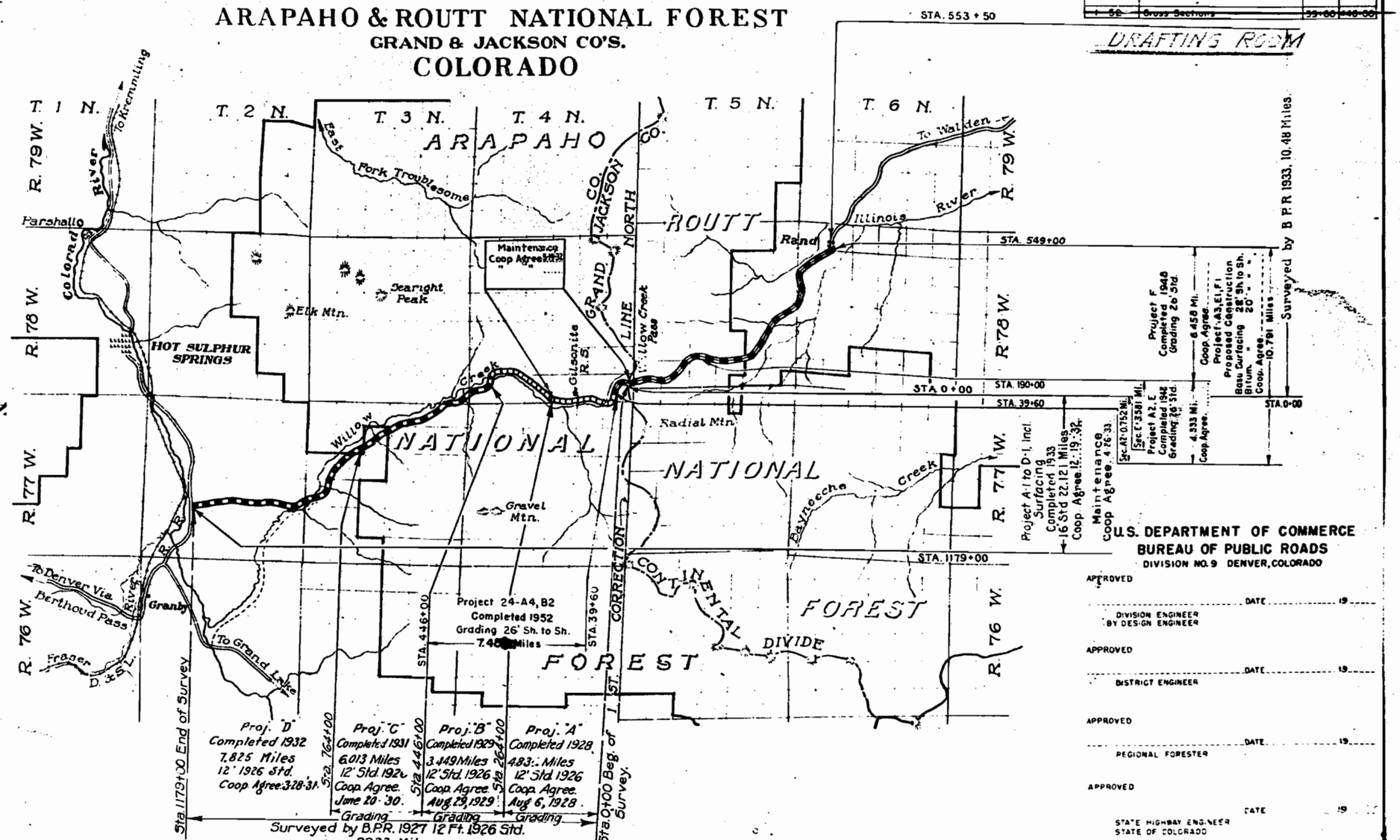


Federal Aid Highway System — Primary / Secondary
Forest Highway System
National Forests

INDEX TO SHEETS

SHEET NO	DESCRIPTION	STATION	STATION
1	Title Sheet		
2	Typical Sections		
~~3-4~~	~~Bridge Summary~~		
5 — 18	Plan & Profile	39+60	446+00
~~Rev D3-Std147~~	~~Std. O.P.M. Inlets for O.M.P. Culverts~~		
Rev D3-Std129	Std. Miscellaneous Structures		
~~D3-Std131~~	~~Std. Maintenance Posts~~		
~~Rev D3-Std126~~	~~Std. Barbed Wire Fence~~		
~~Rev D3-Std143~~	~~Typical Construction Signs~~		
~~D3-Std166~~	~~Chutting Detail for Large Drs. O.M.P. Culverts~~		
D3-SP377 (2 Sh.)	Triple 10'x7'x56'-0" " "	"	376+15
~~1-56~~	~~Cross Sections~~	~~39+60~~	~~446+00~~

DRAFTING ROOM



INDEX MAP
Scale Miles
0 1 2 3 4 5 6

LEGEND

EXISTING ROADS	UNIMPROVED	GRADED	REINFORCED SUBGRADE	BASE COURSE	K.B. ROCK-GRAV MACADAM	BITUMINOUS	TYPES

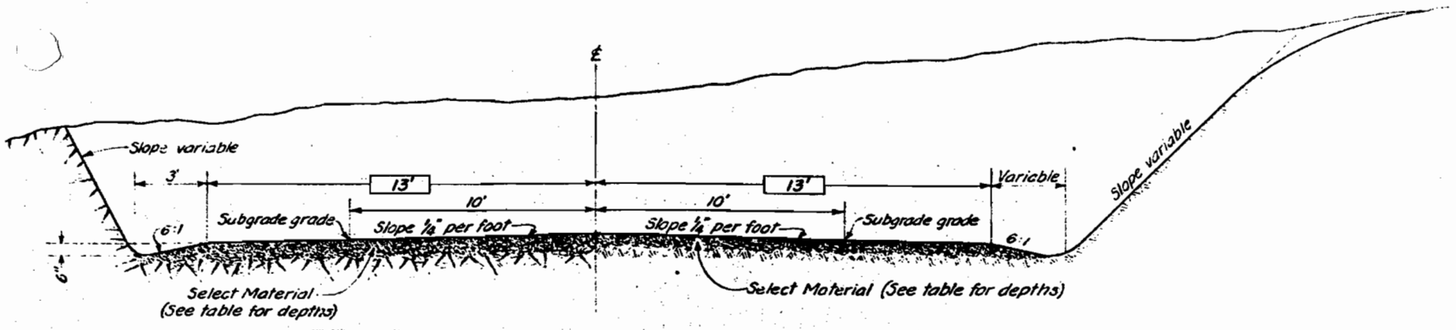
U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
DIVISION NO. 9 DENVER, COLORADO

APPROVED
DATE 19
DIVISION ENGINEER
BY DESIGN ENGINEER

APPROVED
DATE 19
DISTRICT ENGINEER

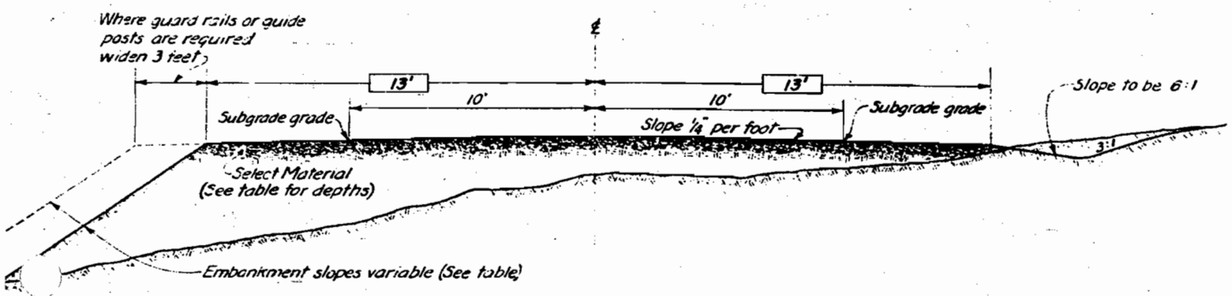
APPROVED
DATE 19
REGIONAL FORESTER

APPROVED
DATE 19
STATE HIGHWAY ENGINEER
STATE OF COLORADO



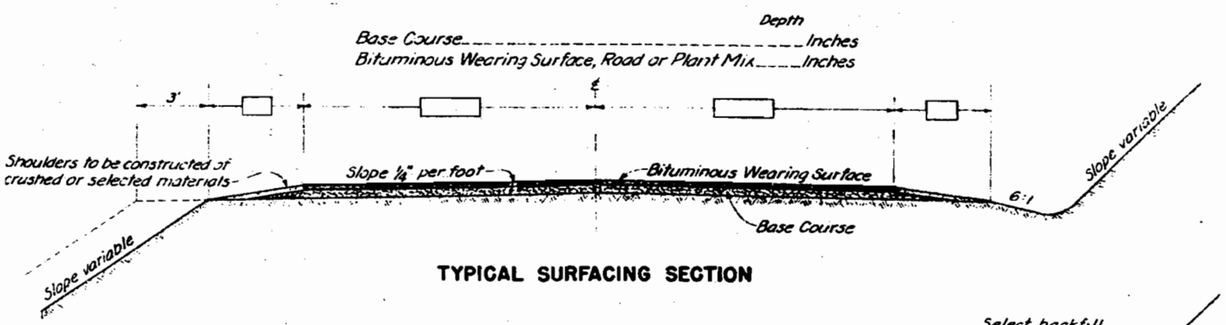
TYPICAL HALF CUT SECTION IN ROCK

TYPICAL HALF CUT SECTION IN COMMON

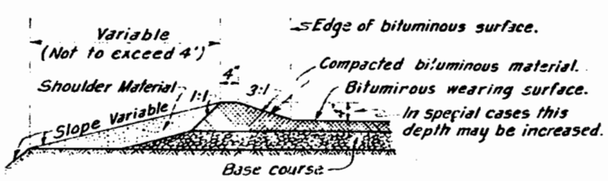


TYPICAL HALF EMBANKMENT SECTION

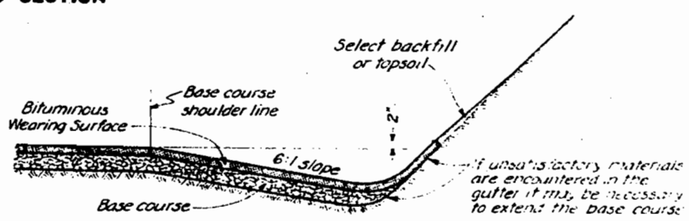
TYPICAL HALF SHALLOW EMBANKMENT SECTION



TYPICAL SURFACING SECTION



DETAIL OF RAISED BITUMINOUS SHOULDER ON WIDENED SECTIONS



DETAIL OF BITUMINOUS GUTTER

Not included in this contract

GENERAL NOTES:

[illegible]

[illegible]

SLOPE TREATMENT IN EARTH CUTS

SELECT MATERIAL

STATION TO STATION		DEPTH
39+60	446+00	4"

SLOPES

HEIGHT	EMBANKMENT SLOPE	EARTH CUT SLOPE	ROCK CUT SLOPE
0' to 3	6:1	3:1	
3' to 6'	4:1	3:1	[illegible]
6' to 12'	2:1	2:1	to
12' to 30'	[illegible]	[illegible]	[illegible]
30' up	[illegible]	[illegible]	

When field conditions indicate the need for slopes other than those indicated above they shall be constructed as stated by the Engineer.

Slopes above the height of embankments of 30 feet shall be rounded. When one side of a slope [illegible]

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
DIVISION NO 9 DENVER, COLO.

TYPICAL CROSS SECTIONS

NATIONAL FOREST & PARK HIGHWAYS

GRADED 26' Shoulder to Shoulder
BASE COURSE Not included in this contract.

DIVISION No 9 STANDARD ROADBED: BITUMINOUS WEARING SURFACE - - - - -
PROJECT Colo. 24-A4,B2 Willow Creek Pass
NATIONAL Forest: Arapaho
COUNTY Grand
STATE Colorado

APPROVED [illegible] DATE JANUARY 1946

U.S. Government (Forest Lands)

Set back line for special treatment-Occupied and used only upon approval of Regional Forester.

The Materials data shown on these plans have been secured from available information and are shown for the convenience of the Project Engineer and Contractor. The Government neither guarantees nor assumes any responsibility for the accuracy of these data. If materials not conforming to the data as shown on the plans are encountered during construction, the grading plan will be modified where necessary to secure proper design.

TΔ = 133°57'
TS = 2799.7'
ΔC = 123°57'
D = 5° L.
L = 2479.0'

ΔC = 46°00'
D = 4° Lt.
T = 608.0'
L = 1150'

ΔS = 5°00'
L = 200.0'

ΔS = 4°00'
LS = 200'

ΔS = 3°00'
LS = 150'

ΔS = 6°00'
LS = 150'

TΔ = 46°00'
TS = 594.4'
ΔC = 36°00'
D = 8° Rt.
L = 450'

Bearing Equation
S 43° 14' E. Bk.
S 43° 15' E. Ah.

Ref. Monu.
Rly. Monu.
℄ Mon.
℄ Monu.

N. 78° 45' E.

¼ Cor. Center Sec 2 T. 4 N R. 78 W.

The Alignment and Grade as hereon shown are subject to adjustment.

PROJ. 24-A2.E
SOUTH END CONSTRUCTION
STA. 39+60
1948 CONSTRUCTION PROJ. 24-A2
NORTH END
1952

Pine & Spruce Med.

Clearing

Small to Medium Lodge Pole Pine

Small to Medium Lodge Pole Pine & Small Aspen

Ref. Guide Post - Lt.
Ref. Guide Post - Right

#5720
A-2-4(0)
LL=25
PI=7
-#200=14
Depth Select=0

B.M.-Spike in 6" Pine 50' Lt. Sta. 56+00 Elev. 9366.51

B.M.-Nail in 20" Pine 75' Rt. Sta. 36+00 Elev. 9466.96

B.M.-Nail in 18" Pine 60' Lt. Sta. 45+60 Elev. 9419.01

U.S.G.S. Datum shown

Total Prism Quantities shown

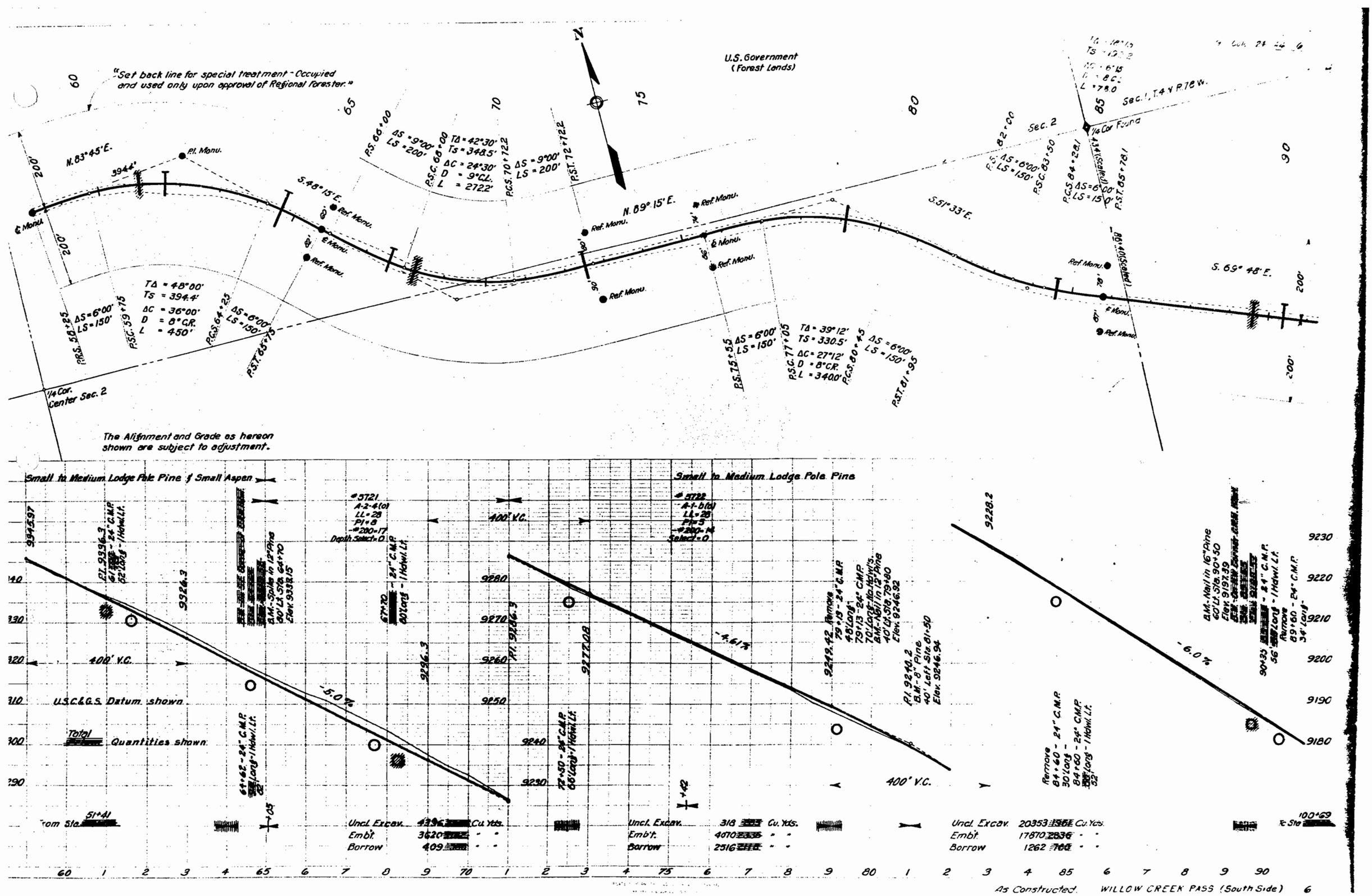
From Sta. 26+50

Uncl. Excav.	8216	Cu. Yds.	
Embt.	7680	" "	

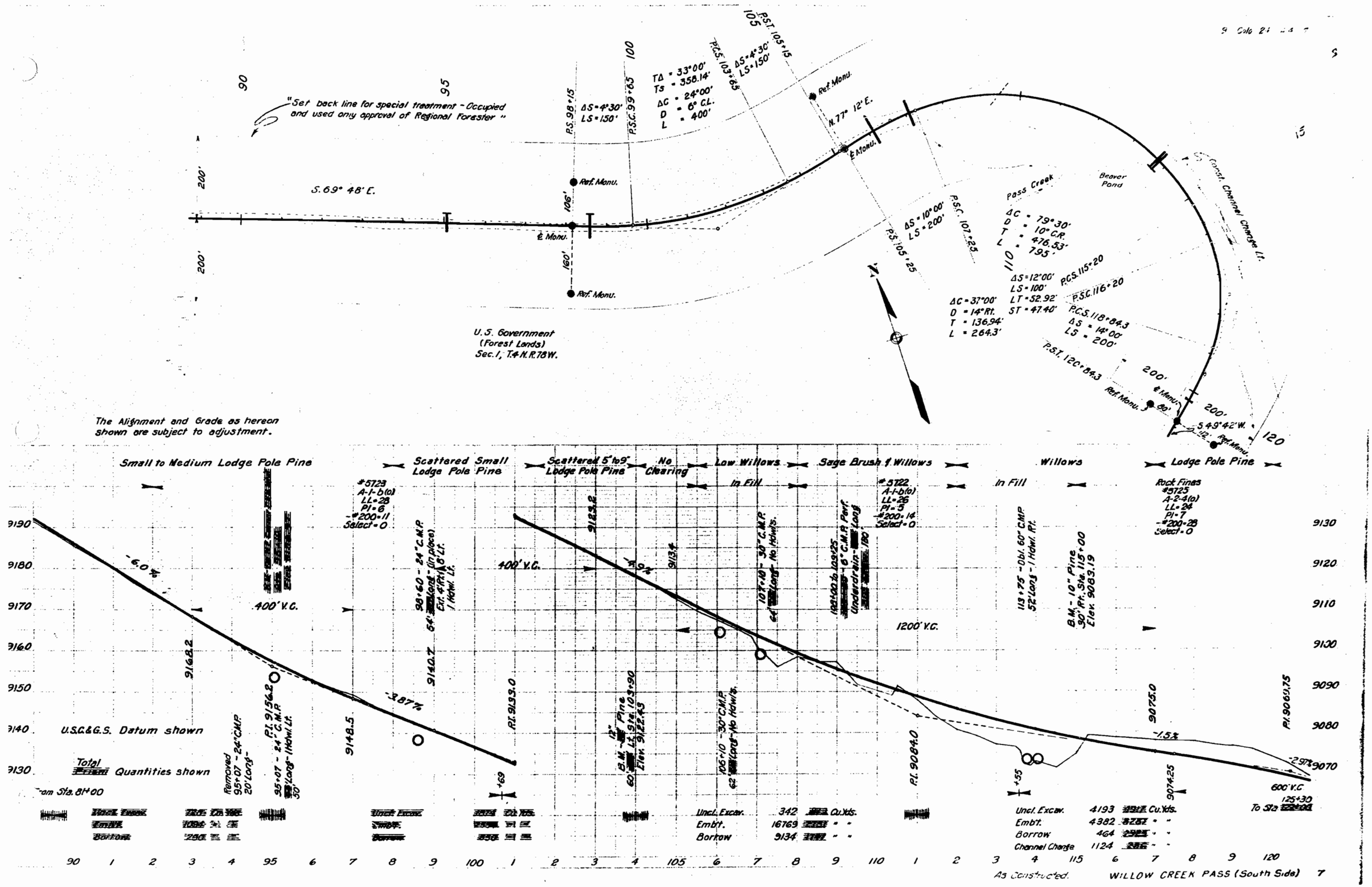
Uncl. Excav.	7438	5515	Cu. Yds.
Embt.	6285	5571	" "
Borrow	466	260	" "

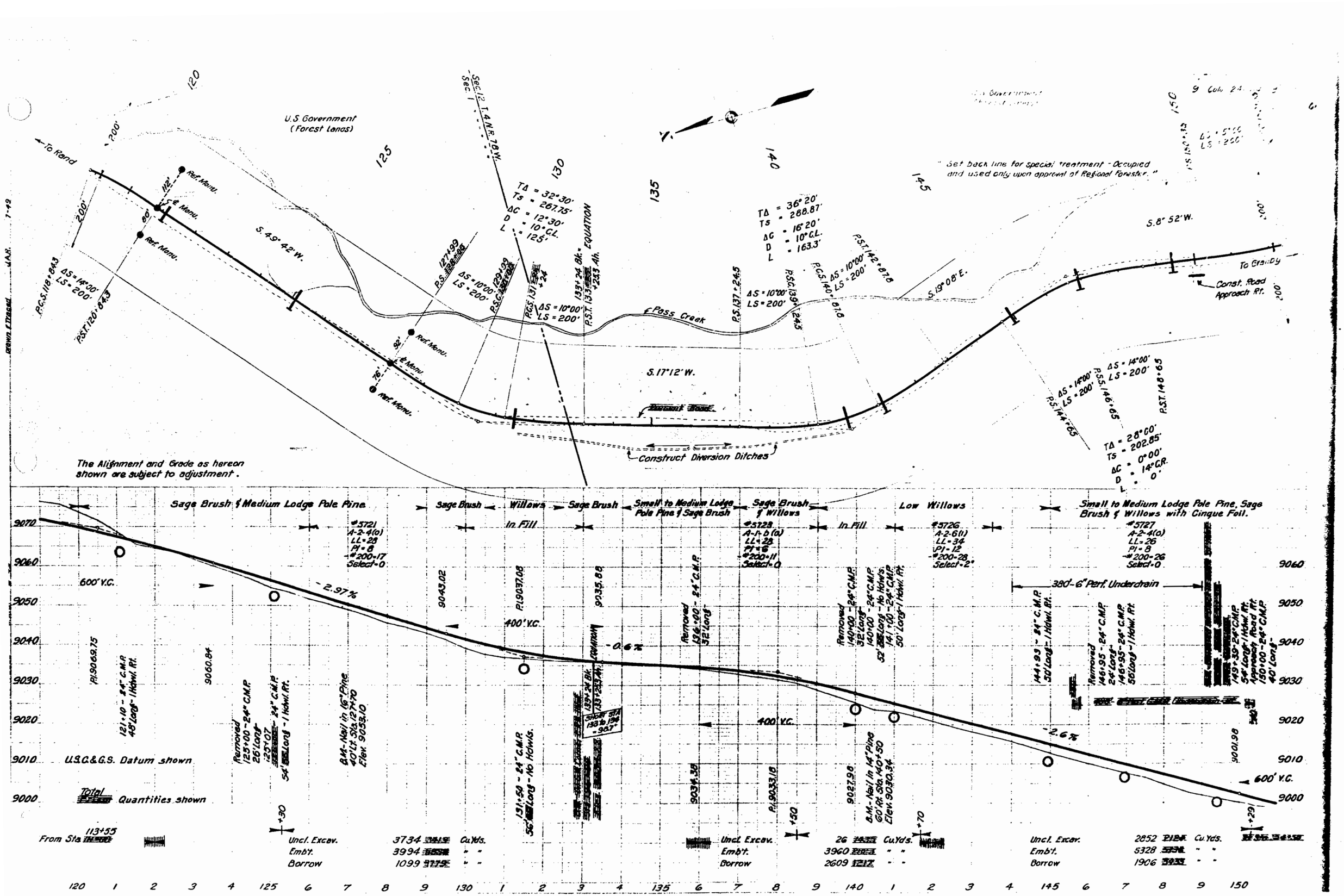
Uncl. Excav.	7562	2948	Cu. Yds.
Embt.	6268	2935	" "
Borrow	538	130	" "

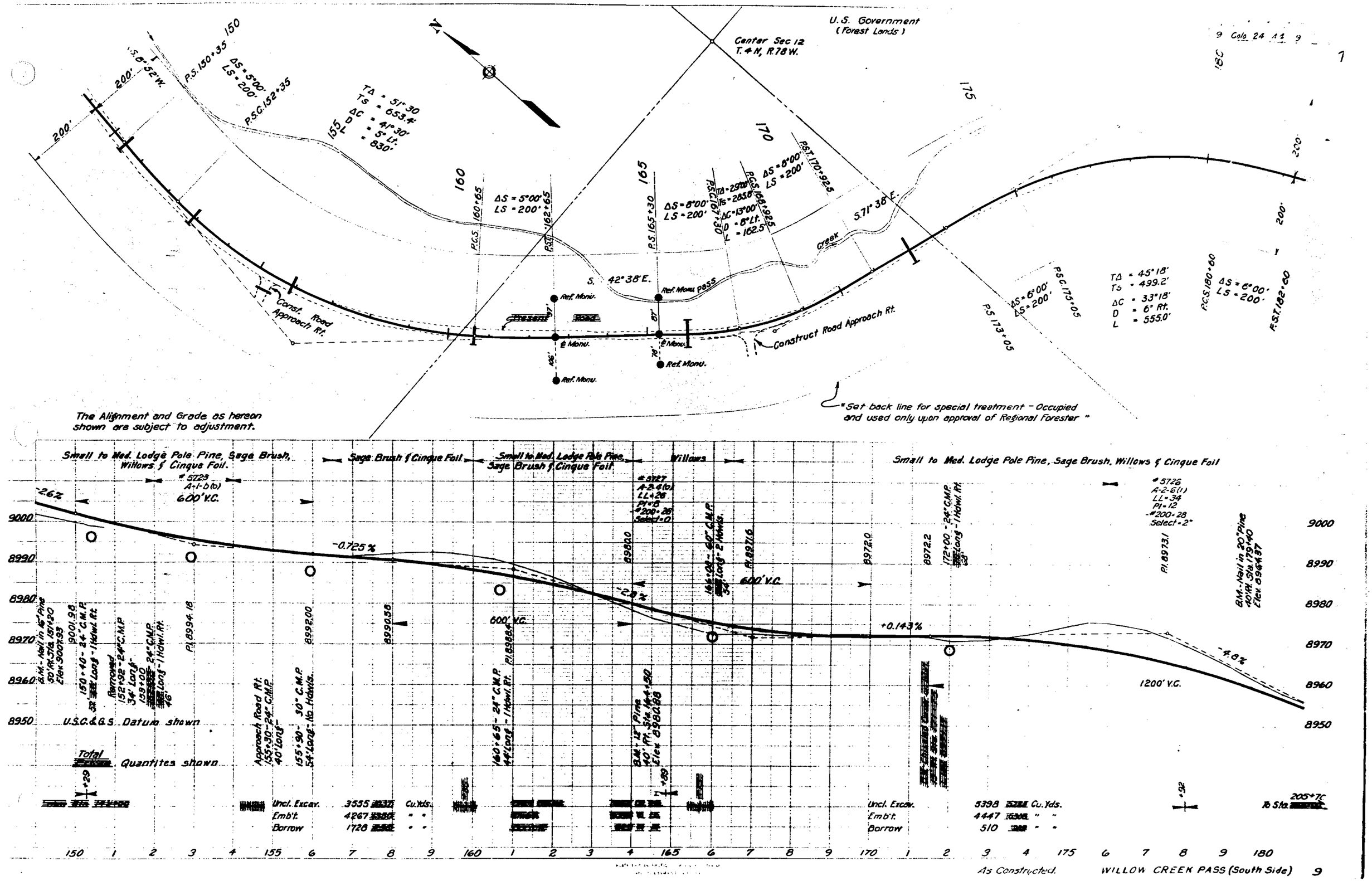
As Constructed Rev. 7-4-45 Rev. 4-5-45 WILLOW CREEK ROAD (Sheet 5)



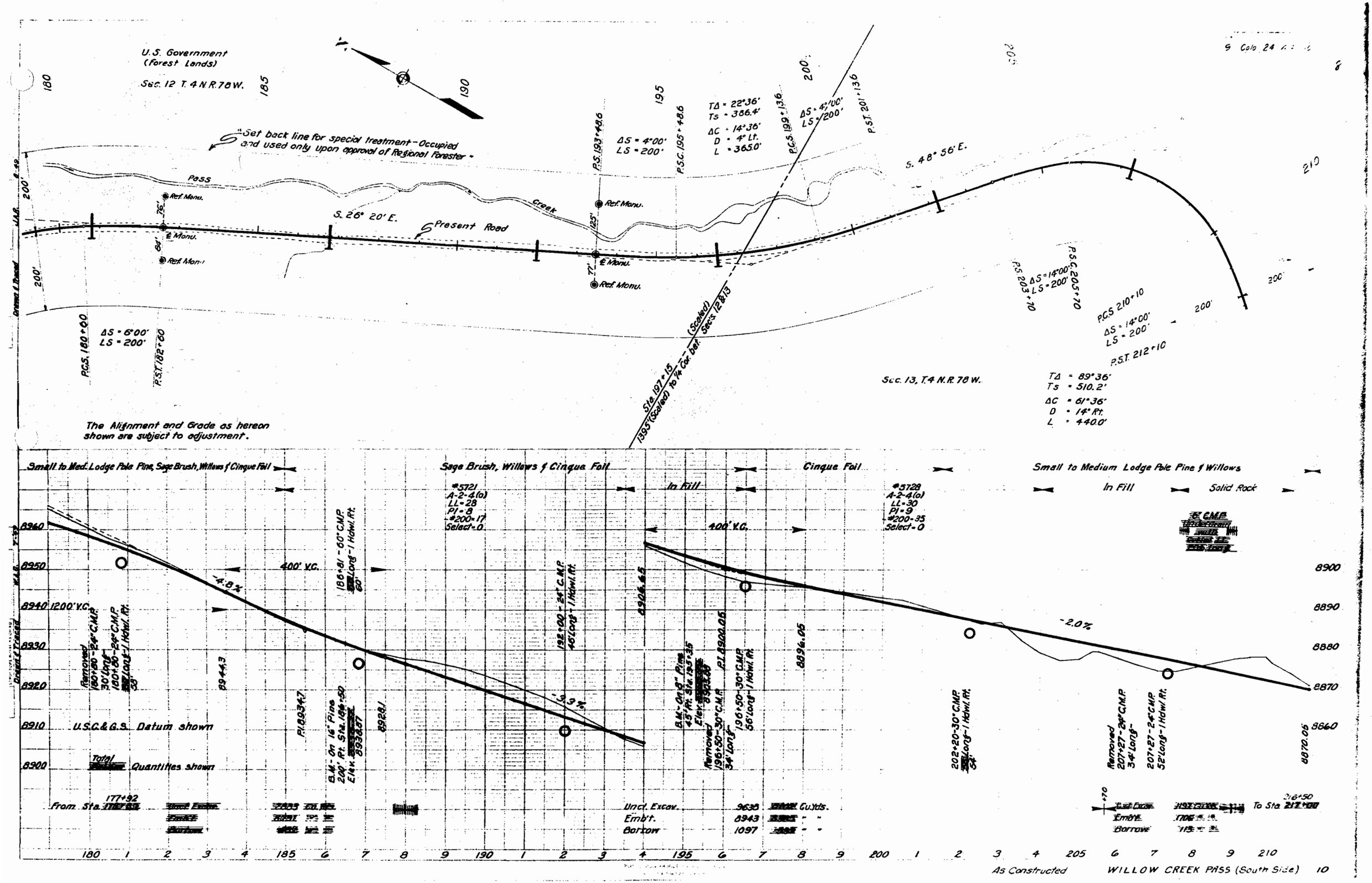
As Constructed. WILLOW CREEK PASS (South Side) 6

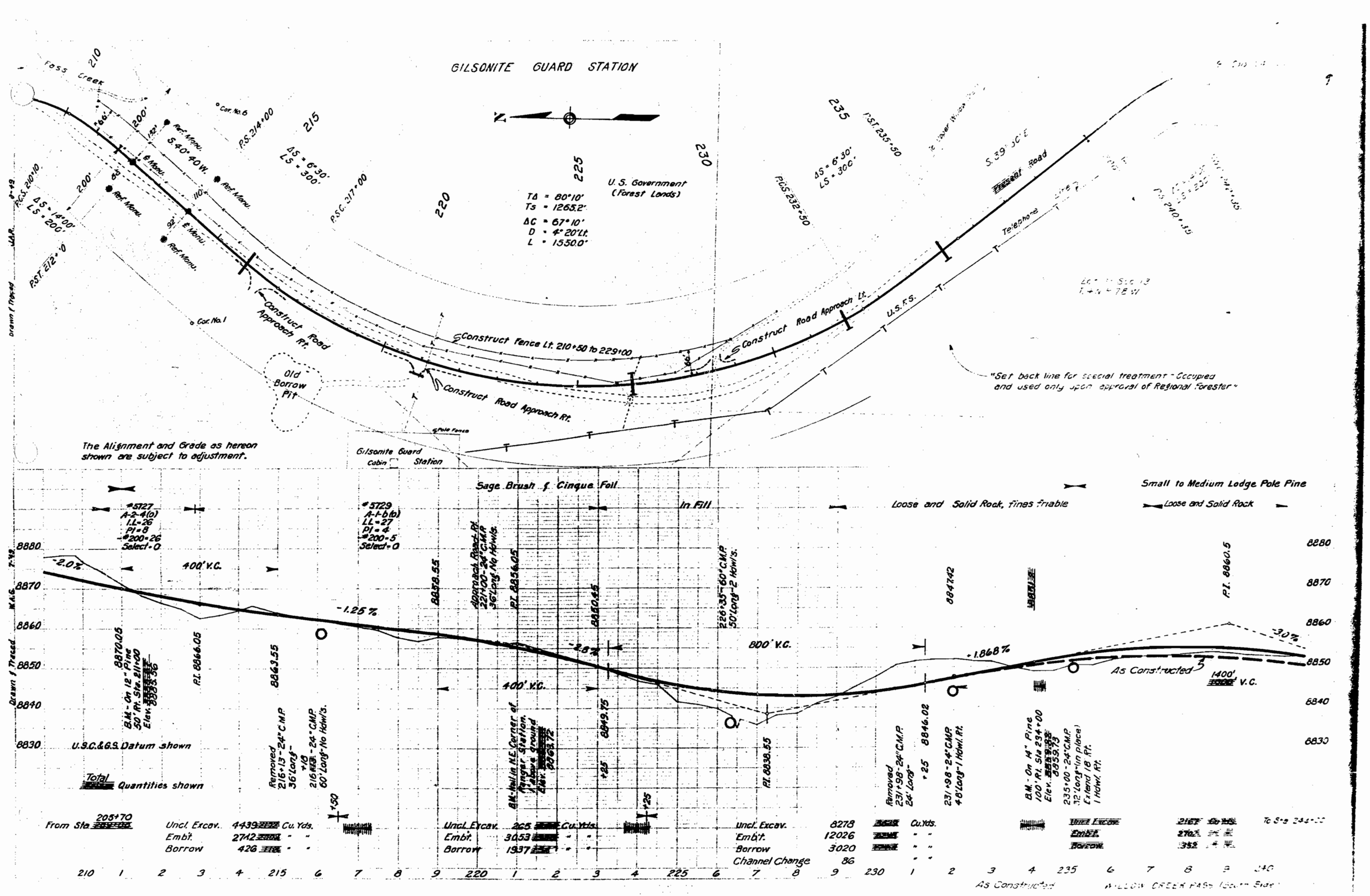

"Set back line for special treatment - Occupied and used only approval of Regional Forester"
S. 69° 48' E.
P.S. 98+15
ΔS = 4°30'
LS = 150'
P.S.C. 99+65
TΔ = 33°00'
Ts = 358.14'
ΔC = 24°00'
D = 6° C.L.
L = 400'
P.C.S. 103+65
ΔS = 4°30'
LS = 150'
P.S.T. 105+15
Ref. Monu.
N. 77° 12' E.
℄ Monu.
Pass Creek
Beaver Pond
Const. Channel Change Lt.
ΔC = 79°30'
D = 10° C.R.
T = 476.53'
L = 795'
ΔS = 10°00'
LS = 200'
P.S.C. 107+25
P.S. 105+25
ΔS = 12°00'
LS = 100'
LT = 52.92'
ST = 47.40'
P.C.S. 115+20
P.S.C. 116+20
P.C.S. 118+84.3
ΔS = 14°00'
LS = 200'
P.S.T. 120+84.3
ΔC = 37°00'
D = 14° Rt.
T = 136.94'
L = 264.3'
S. 49° 42' W.
U.S. Government
(Forest Lands)
Sec. 1, T.4 N. R.7 8 W.
The Alignment and Grade as hereon shown are subject to adjustment.
Small to Medium Lodge Pole Pine
Scattered Small Lodge Pole Pine
Scattered 5" to 9" Lodge Pole Pine
No Clearing
Low Willows In Fill
Sage Brush & Willows
Willows In Fill
Lodge Pole Pine
#5723 A-1-b(o) LL=28 PI=6 #200=11 Select=0
#5722 A-1-b(o) LL=26 PI=5 #200=14 Select=0
Rock Fines #5725 A-2-4(o) LL=24 PI=7 #200=28 Select=0
400' V.C.
1200' V.C.
600' V.C.
-6.0%
-3.87%
-1.9%
-1.5%
-2.97%
U.S.C.&G.S. Datum shown
Total Quantities shown
Removed 95+07 - 24" C.M.P. 20' Long
95+07 - 24" C.M.P. 50' Long - 1 Hdwl. Lt.
90+60 - 24" C.M.P. 64' Long - (in place) Ext. 4 Rt. 8 Lt. 1 Hdwl. Lt.
103+10 - 30" C.M.P. 64' Long - No Hdwls.
106+10 - 30" C.M.P. 62' Long - No Hdwls.
Underdrain - 180' Long
113+75 - Obl. 60" C.M.P. 52' Long - 1 Hdwl. Pt.
B.M. - 10" Pine 30' Rt. Sta. 115+00 Elev. 9083.19
B.M. - 12" Pine 60' Lt. Sta. 103+90 Elev. 9122.43
Pl. 9136.2
Pl. 9139.0
Pl. 9084.0
Pl. 9061.75
9148.5
9140.7
9168.2
9183.2
9113.4
9075.0
9074.25
Uncl. Excav. 342 Cu. Yds.
Embt. 16769 " "
Borrow 9134 " "
Uncl. Excav. 4193 Cu. Yds.
Embt. 4382 " "
Borrow 464 " "
Channel Change 1124 " "
As Constructed.
WILLOW CREEK PASS (South Side)

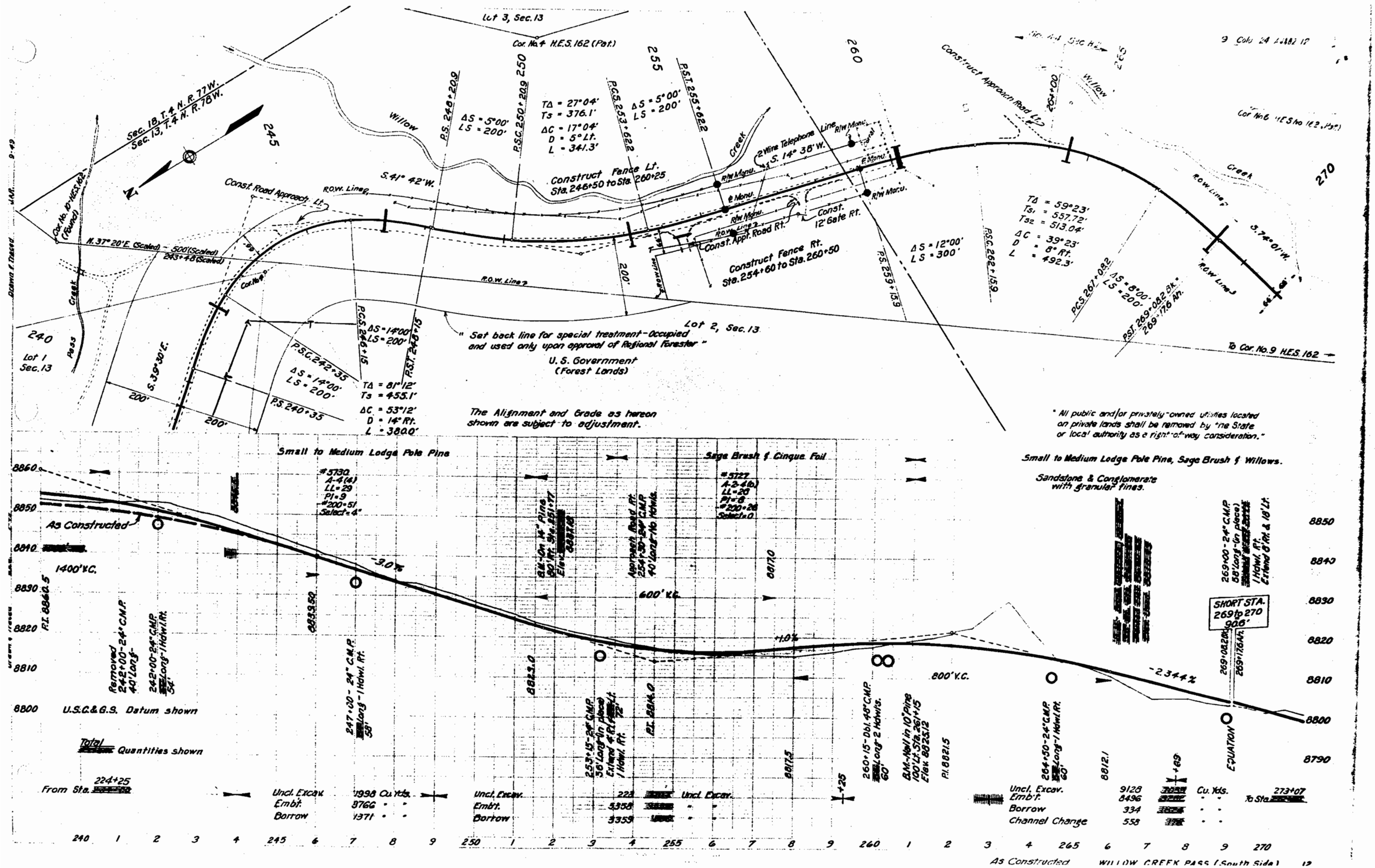

To Rand
U.S. Government (Forest Lands)
Sec. 12 T.4 N. R.7 W.
S.49°42'W.
Ref. Mon.
℄ Mon.
P.C.S.118+84.3
ΔS = 14°00'
LS = 200'
P.S.T.120+84.3
127+99
P.S.
ΔS = 10°00'
LS = 200'
P.C.S.129+99
P.C.S.137+24
ΔS = 10°00'
LS = 200'
TΔ = 32°30'
Ts = 267.75'
ΔC = 12°30'
D = 10° C.L.
L = 125'
133+24 Bk. = EQUATION
P.S.T. 133+33 Ah. = 233 Ah.
℄ Pass Creek
S.17°12'W.
Construct Road
Construct Diversion Ditches
P.S.137+24.5
TΔ = 36°20'
Ts = 288.87'
ΔC = 16°20'
D = 10° C.L.
L = 163.3'
P.C.S.139+24.5
ΔS = 10°00'
LS = 200'
P.C.S.140+81.8
P.S.T.142+87.8
S.19°08'E.
"Set back line for special treatment - Occupied and used only upon approval of Regional Forester."
S.8°52'W.
To Granby
Const. Road Approach Rt.
ΔS = 14°00'
LS = 200'
P.S.S.146+65
P.S.T.148+65
TΔ = 28°00'
Ts = 202.85'
ΔC = 0°00'
D = 14° C.R.
L = 0'
The Alignment and Grade as hereon shown are subject to adjustment.
Sage Brush & Medium Lodge Pole Pine
Sage Brush
Willows In Fill
Sage Brush
Small to Medium Lodge Pole Pine & Sage Brush
Sage Brush & Willows
In Fill
Low Willows
Small to Medium Lodge Pole Pine, Sage Brush & Willows with Cinque Foil.
#5721 A-2-4(0) LL=28 PI=8 #200=17 Select=0
#5728 A-1-b(0) LL=28 PI=6 #200=11 Select=0
#5726 A-2-6(1) LL=34 PI=12 #200=28 Select=2°
#5727 A-2-4(0) LL=26 PI=8 #200=26 Select=0
600' V.C.
-2.97%
400' V.C.
-0.6%
400' V.C.
-2.6%
600' V.C.
380'-6" Perf. Underdrain
P.I.9069.75
9060.84
P.I.9037.08
9043.02
9035.88
9034.38
P.I.9033.18
9027.98
9001.98
121+10 - 24" C.M.P. 48' Long - 1 Hdwl. Rt.
Removed 125+00 - 24" C.M.P. 26' Long
123+07 - 24" C.M.P. 54' Long - 1 Hdwl. Rt.
B.M.-Nail in 16" Pine 40' Lt. Sta. 127+70 Elev. 9053.10
131+50 - 24" C.M.P. 56' Long - No Hdwls.
Removed 136+00 - 24" C.M.P. 32' Long
Removed 140+00 - 24" C.M.P. 32' Long
140+00 - 24" C.M.P. - No Hdwls.
52' Long - 24" C.M.P.
141+00 - 24" C.M.P. 50' Long - 1 Hdwl. Rt.
B.M.-Nail in 14" Pine 60' Rt. Sta. 140+50 Elev. 9030.34
144+93 - 24" C.M.P. 50' Long - 1 Hdwl. Rt.
Removed 146+95 - 24" C.M.P. 24' Long
146+95 - 24" C.M.P. 56' Long - 1 Hdwl. Rt.
149+39 - 24" C.M.P. 54' Long - 1 Hdwl. Rt.
Approach Road Rt. 150+00 - 24" C.M.P. 40' Long
U.S.C.&G.S. Datum shown
Total Quantities shown
From Sta. 113+55
Uncl. Excav. 3734 Cu.Yds.
Embt. 3994 " "
Borrow 1099 " "
Uncl. Excav. 26 Cu.Yds.
Embt. 3960 " "
Borrow 2609 " "
Uncl. Excav. 2852 Cu.Yds.
Embt. 5328 " "
Borrow 1906 " "
9070
9060
9050
9040
9030
9020
9010
9000
120 1 2 3 4 125 6 7 8 9 130 1 2 3 4 135 6 7 8 9 140 1 2 3 4 145 6 7 8 9 150

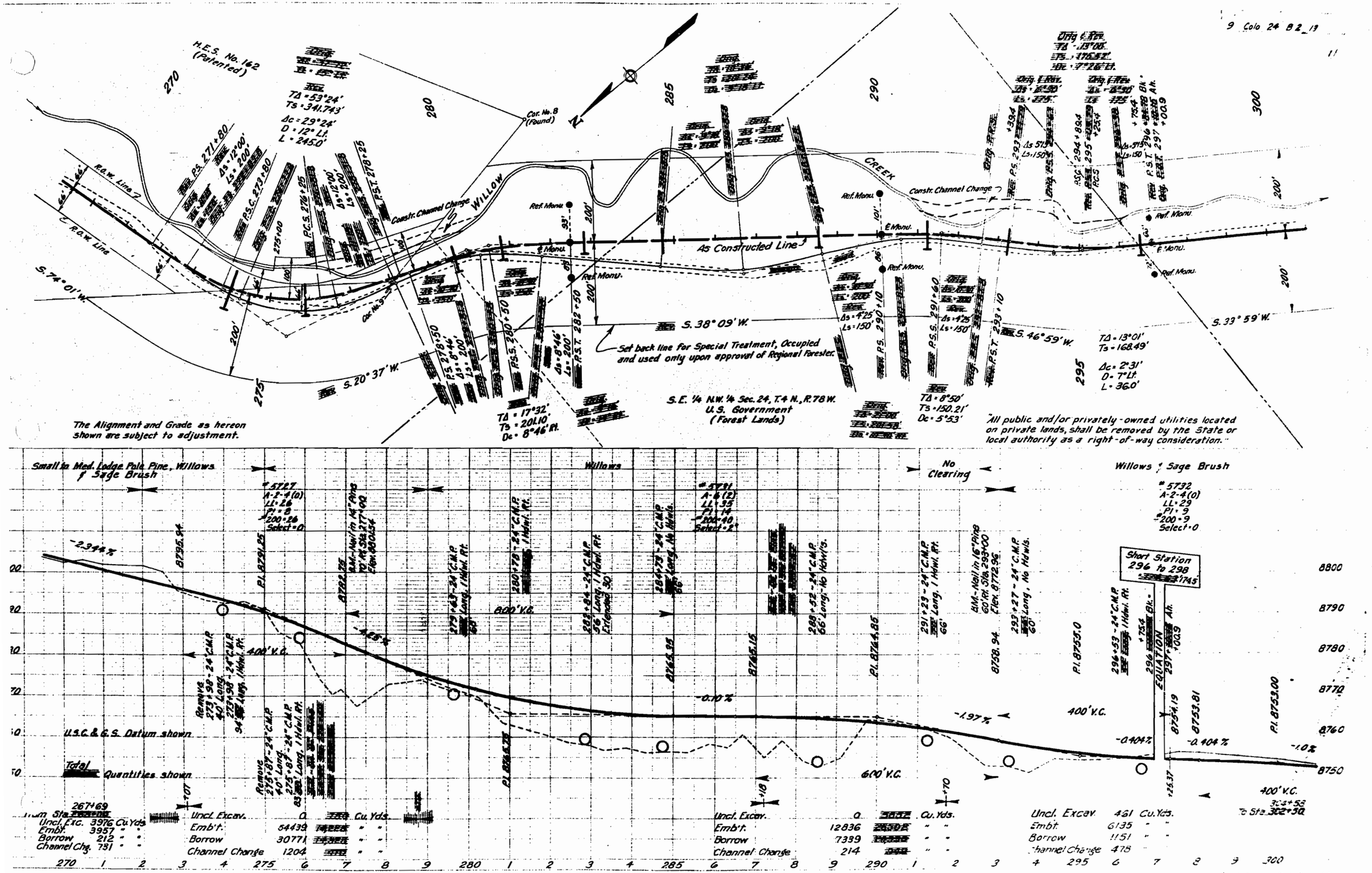


As Constructed. WILLOW CREEK PASS (South Side) 9


U.S. Government
(Forest Lands)
Sec. 12 T. 4 N. R. 78 W.
"Set back line for special treatment - Occupied and used only upon approval of Regional Forester"
Pass
Creek
Present Road
Ref. Monu.
℄ Monu.
S. 26° 20' E.
S. 48° 56' E.
P.C.S. 180+00
ΔS = 6°00'
LS = 200'
P.S.T. 182+00
P.S. 193+48.6
ΔS = 4°00'
LS = 200'
P.S.C. 195+48.6
TΔ = 22°36'
Ts = 386.4'
ΔC = 14°36'
D = 4° Lt.
L = 365.0'
P.C.S. 199+36
ΔS = 4°00'
LS = 200'
P.S.T. 201+36
P.S. 203+70
ΔS = 14°00'
LS = 200'
P.S.C. 205+70
P.C.S. 210+10
ΔS = 14°00'
LS = 200'
P.S.T. 212+10
Sta. 197+15
1395' (Scaled) to 1/4 Cor. bet. Secs. 12 & 13
Sec. 13, T. 4 N. R. 78 W.
TΔ = 89°36'
Ts = 510.2'
ΔC = 61°36'
D = 14° Rt.
L = 440.0'
The Alignment and Grade as hereon shown are subject to adjustment.
Small to Med. Lodge Pole Pine, Sage Brush, Willows & Cinque Foil
Sage Brush, Willows & Cinque Foil
Cinque Foil
Small to Medium Lodge Pole Pine & Willows
In Fill
Solid Rock
#5721
A-2-4(0)
LL-28
PI-8
#200-17
Select-0
#5728
A-2-4(0)
LL-30
PI-9
#200-35
Select-0
400' V.C.
1200' V.C.
-4.8%
-2.0%
U.S.C.&G.S. Datum shown
Total Quantities shown
From Sta. 177+92
To Sta. 216+50
Unc'l. Excav. 9638 Cu.Yds.
Emb't. 8943
Borrow 1097
As Constructed
WILLOW CREEK PASS (South Side)


GILSONITE GUARD STATION
Foss Creek
Cor. No. 6
Cor. No. 1
Ref. Mon.
E. Mon.
S. 40° 40' W.
P.C.S. 210+10
P.S.T. 212+0
P.S.C. 214+00
P.S.C. 217+00
P.C.S. 232+50
P.S.T. 235+50
ΔS = 14°00'
LS = 200'
ΔS = 6°30'
LS = 300'
TΔ = 80°10'
Ts = 1265.2'
ΔC = 67°10'
D = 4°20' Lt.
L = 1550.0'
U. S. Government (Forest Lands)
Construct Road Approach Rt.
Construct Road Approach Lt.
Construct Fence Lt. 210+50 to 229+00
Old Borrow Pit
Gilsonite Guard Station
Cabin
Pole Fence
U.S.F.S.
Telephone
Road
"Set back line for special treatment - Occupied and used only upon approval of Regional Forester"
The Alignment and Grade as hereon shown are subject to adjustment.
Sage Brush & Cinque Foil
In Fill
Loose and Solid Rock, fines friable
Small to Medium Lodge Pole Pine
Loose and Solid Rock
#5727 A-2-4(0) LL-26 PI-8 #200-26 Select-0
#5729 A-1-b(0) LL-27 PI-4 #200-5 Select-0
400' V.C.
800' V.C.
1400' V.C.
-2.0%
-1.25%
-2.5%
+1.868%
-3.0%
As Constructed
8870.05
P.I. 8866.05
8863.55
8858.55
P.I. 8856.05
8850.45
8849.75
P.I. 8838.55
8847.42
P.I. 8860.5
B.M. - On 12" Pine 50' Rt. Sta. 211+00 Elev. 8883.36
U.S.C.&G.S. Datum shown
Total Quantities shown
From Sta 205+70
Uncl. Excav. 4439 Cu. Yds.
Embk. 2742 " "
Borrow 426 " "
Uncl. Excav. 265 Cu. Yds.
Embk. 3053 " "
Borrow 1937 " "
Uncl. Excav. 8278 Cu. Yds.
Embk. 12026 " "
Borrow 3020 " "
Channel Change 86 " "
To Sta 244+00
As Constructed
WILLOW CREEK PASS (South Side)


Lot 3, Sec. 13
Cor. No. 4 H.E.S. 162 (Pat.)
Sec. 18, T. 4 N. R. 77 W.
Sec. 13, T. 4 N. R. 78 W.
Willow Creek
P.S. 248+20.9
P.S.C. 250+20.9
P.C.S. 253+62.2
P.S.T. 255+62.2
ΔS = 5°00'
LS = 200'
TΔ = 27°04'
Ts = 376.1'
ΔC = 17°04'
D = 5° Lt.
L = 341.3'
Construct Fence Lt.
Sta. 246+50 to Sta. 260+25
S. 41° 42' W.
Const. Road Approach Lt.
R.O.W. Line
N. 37° 20' E. (Scaled) - 500 (Scaled)
243+48 (Scaled)
Cor. No. 10 H.E.S. 162 (Found)
Cor. No. 9
Pass Creek
Lot 1 Sec. 13
S. 39° 30' E.
P.S.C. 242+35
ΔS = 14°00'
LS = 200'
P.S. 240+35
P.C.S. 246+15
P.S.T. 248+15
ΔS = 14°00'
LS = 200'
TΔ = 81°12'
Ts = 455.1'
ΔC = 53°12'
D = 14° Rt.
L = 380.0'
2 Wire Telephone Line
S. 14° 38' W.
R/W Monu.
℄ Monu.
Const. 12' Gate Rt.
Const. Appr. Road Rt.
Construct Fence Rt.
Sta. 254+60 to Sta. 260+50
Lot 2, Sec. 13
" Set back line for special treatment - Occupied and used only upon approval of Regional Forester "
U. S. Government (Forest Lands)
The Alignment and Grade as hereon shown are subject to adjustment.
Construct Approach Road Lt.
P.S. 259+15.9
P.C.S. 262+15.9
ΔS = 12°00'
LS = 300'
TΔ = 59°23'
Ts1 = 557.72'
Ts2 = 513.04'
ΔC = 39°23'
D = 8° Rt.
L = 492.3'
P.C.S. 267+08.2
ΔS = 8°00'
LS = 200'
P.S.T. 269+08.2 Bk. = 269+17.6 Ah.
S. 74° 01' W.
To Cor. No. 9 H.E.S. 162
* All public and/or privately-owned utilities located on private lands shall be removed by the State or local authority as a right-of-way consideration."
Small to Medium Lodge Pole Pine
Sage Brush & Cinque Foil
Small to Medium Lodge Pole Pine, Sage Brush & Willows.
Sandstone & Conglomerate with granular fines.
As Constructed
1400' V.C.
-3.0%
600' V.C.
+1.0%
800' V.C.
-2.344%
SHORT STA. 269 to 270 906'
EQUATION
U.S.C.&G.S. Datum shown
Total Quantities shown
From Sta. 224+25
Uncl. Excav. 1998 Cu. Yds.
Embk. 9766
Borrow 1371
Uncl. Excav. 222
Embk. 5358
Borrow 3359
Uncl. Excav. 9128 Cu. Yds.
Embk. 8496
Borrow 334
Channel Change 558
To Sta. 273+07
As Constructed
WILLOW CREEK PASS (South Side)


H.E.S. No. 162 (Patented)
TΔ = 53°24'
Ts = 341.743'
Δc = 29°24'
D = 12° Lt.
L = 245.0'
Cor. No. 8 (Found)
R.O.W. Line
S. 74° 01' W.
P.S. 271+80
Δs = 12°00'
Ls = 200'
P.S.C. 273+80
P.C.S. 276+25
P.S.T. 278+25
Constr. Channel Change
WILLOW
CREEK
Ref. Mon.
℄ Mon.
As Constructed Line
S. 20° 37' W.
S. 38° 09' W.
S. 33° 59' W.
S. 46° 59' W.
P.S. 278+50
Δs = 8°46'
Ls = 200'
P.S.S. 280+50
P.S.T. 282+50
P.S. 290+10
Δs = 4°25'
Ls = 150'
P.S.S. 291+60
P.S.T. 293+10
P.S. 293+39.4
Δs = 5°19'
Ls = 150'
P.S.T. 296+75.4
Set back line for Special Treatment, Occupied and used only upon approval of Regional Forester.
TΔ = 17°32'
Ts = 201.10'
Dc = 8°46' Rt.
S.E. ¼ N.W. ¼ Sec. 24, T.4 N., R.78 W.
U.S. Government
(Forest Lands)
TΔ = 8°50'
Ts = 150.21'
Dc = 5°53'
TΔ = 13°01'
Ts = 168.49'
Δc = 2°31'
D = 7° Lt.
L = 36.0'
The Alignment and Grade as hereon shown are subject to adjustment.
"All public and/or privately-owned utilities located on private lands, shall be removed by the State or local authority as a right-of-way consideration."
Small to Med. Lodge Pole Pine, Willows & Sage Brush
Willows
No Clearing
Willows & Sage Brush
#5727 A-2-4(0) LL-26 PI-8 -200-26 Select-0
#5731 A-6(2) LL-35 PI-14 -200-40 Select-2
#5732 A-2-4(0) LL-29 PI-9 -200-9 Select-0
-2.94%
-4.65%
-0.10%
-1.97%
-0.404%
-1.0%
600' V.C.
400' V.C.
600' V.C.
400' V.C.
Short Station 296 to 298
EQUATION
U.S.C.&G.S. Datum shown
Total Quantities shown
From Sta. 267+69
Uncl. Exc. 3976 Cu. Yds.
Embt. 3957 " "
Borrow 212 " "
Channel Chg. 731 " "
Uncl. Excav. 0 Cu. Yds.
Embt. 64439 " "
Borrow 30771 " "
Channel Change 1204 " "
Uncl. Excav. 0 Cu. Yds.
Embt. 12836 " "
Borrow 7339 " "
Channel Change 214 " "
Uncl. Excav. 461 Cu. Yds.
Embt. 6135 " "
Borrow 1151 " "
Channel Change 478 "
To Sta. 302+30
270 275 280 285 290 295 300
8800 8790 8780 8770 8760 8750

Willow Creek P--(South Side) Sec. Sta. 300+00 to 330+00 Sh. No. 14

U.S. Government (Forest Lands)

300 305 310 315 320 325 330

TΔ = 22°00'
Ts = 201.7'
D = 11° Lt.

TΔ = 34°00'
Ts = 217.9'
ΔC = 4°00'
D = 15° Lt.
L = 26.7'

*Set back line for special treatment -- Occupied and used only upon approval of Regional Forester -

P.S. 308+66.3 — ΔS = 11°00' LS = 200'
P.S.S. 310+66.3 — ΔS = 11°00' LS = 200'
P.S.T. 312+66.3
P.S. 316+63.7 — ΔS = 15°00' LS = 200'
P.C.S. 320+63.7 — ΔS = 15°00' LS = 200'
P.S.T. 322+90.4

S. 33° 59' W.
Const. Channel Change Lt.
Willow Creek
Ref. Monu.
℄ Monu.
Const. Channel Change
S. 11° 59' W.
U.S.F.S.
Telephone Line
S. 56° 59' W.
Const. Channel Change Lt.
S. 22° 59' W.
Ref. Monu.
℄ Monu.
Ref. Monu.

200' 200' 200' 200'

P.S. 313+30.2 — ΔS = 14°00' LS = 200'
P.S.C. 315+30.2
P.C.S. 316+51.6 — ΔS = 14°00' LS = 200'
P.S.T. 318+51.6

TΔ = 45°00'
Ts = 271.0'
ΔC = 17°00'
D = 14° Rt.
L = 121.4'

T. 4 N. R. 78 W.
Sec. 24 Sec. 25 Sec. 23 Sec. 26

The Alignment and Grade as hereon shown are subject to adjustment.

Willows & Sage Brush

#5733 A-2-4(0) LL-27 PI-7 -#200-12 Select-0

B.M. U.S.C.&G.S., Bronze Cap in Concrete flush with ground. K-153 - 1954 45° Rt. Sta. 316+50 Elev. 8738.21

#5732 A-2-4(0) LL-29 PI-9 -#200-9 Select-0

B.M.-Nail in 10" Pine 90' Lt. Sta. 322+80 Elev. 8725.40

#5734 A-2-6(1) LL-32 PI-12 -#200-35 Select-2"

Pl. 8753.0 — 8751.0 — 400' V.C. — -1.0% — 400' V.C. — -0.1% — 8737.4 — Pl. 8733.15 — 8729.5 — -1.449% — 500' V.C.

8760 8750 8740 8730 8720

U.S.C.&G.S. Datum shown

Total Quantities shown

301+35 — 24" C.M.P. 32' Long - 1 Hdwl. Rt. 48'

304+70 - 24" C.M.P. 52' Long - 1 Hdwl. Rt. 54'

B.M. - On 16" Pine 150' Rt. Sta. 304+50 Elev. 8727.73

Remove 309+80 - 24" C.M.P. 24' Long.
309+80 - 24" C.M.P. 54' Long. (No Hdwl.)

Remove 312+90 - 24" C.M.P. 40' Long.
312+90 - 24" C.M.P. 32' Long, 1 Hdwl. Rt.

316+75 - 24" C.M.P. 36' Long. (In Place) 1 Lt. - 1 Hdwl. Rt. 24'

Pl. 8734.0

Remove 320+50 - 24" C.M.P. 40' Long
320+50 - 24" C.M.P. 52' Long, 1 Hdwl. Rt. 8733.8

Remove 323+50 - 24" C.M.P. 30' Long.
323+30 - 24" C.M.P. 52' Long - 1 Hdwl. Rt. 42' Extra for 52'

Remove 326+15 - 24" C.M.P. 24' Long.
326+45 - 24" C.M.P. 56' Long - 1 Hdwl. Rt. 34' Extra for 56'

330+00 - 24" C.M.P. 54' Long - 1 Hdwl. Rt.

291+70 From Sta. 278+79

+58

Uncl. Excav.	687	Cu. Yds.
Emb't.	4903	" "
Borrow	2176	" "
Channel Change	1042	" "

+06

Uncl. Excav.	1671	Cu. Yds.
Emb't.	1919	" "
Borrow	359	" "
Channel Change	51	" "

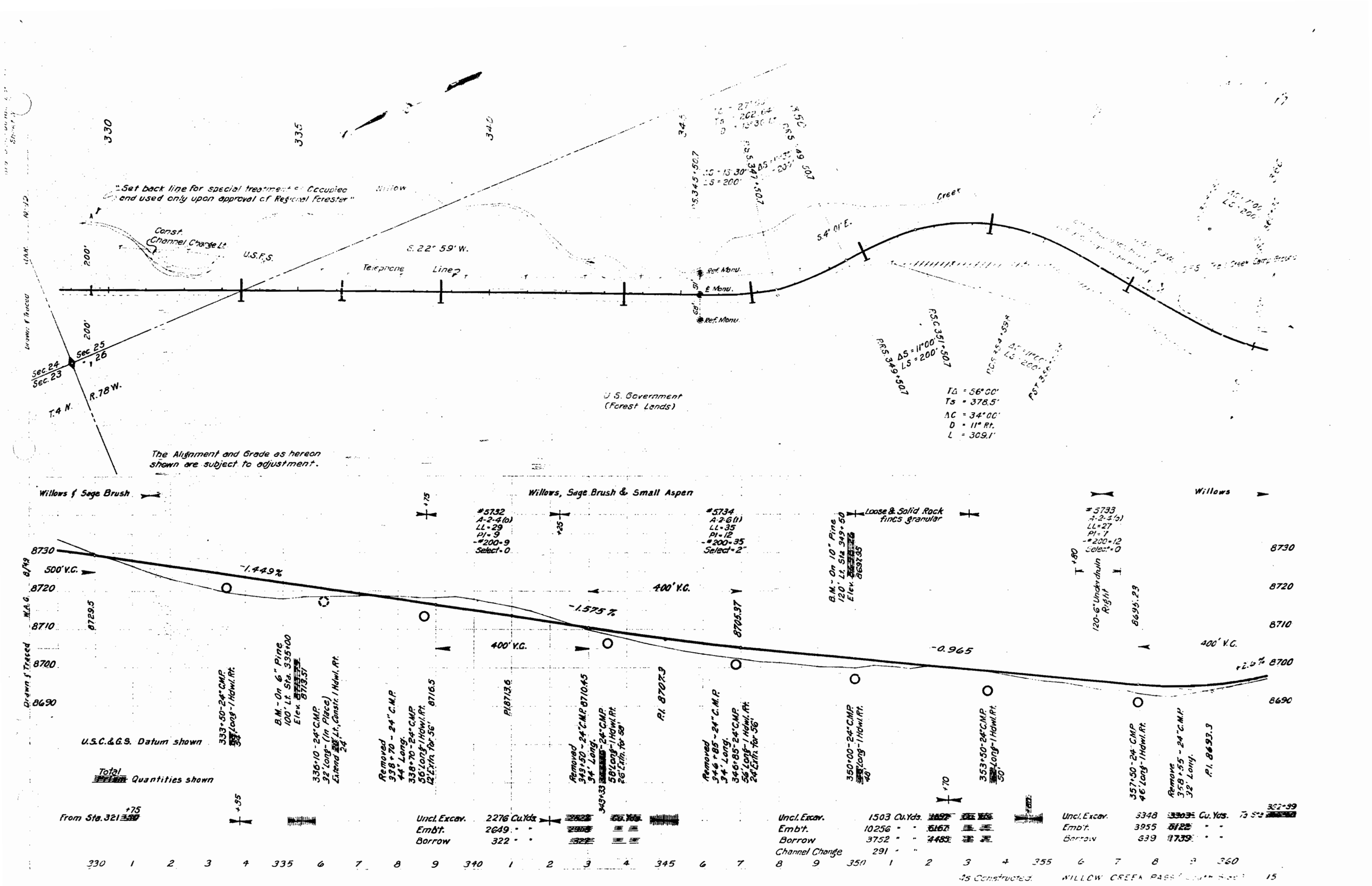
+75

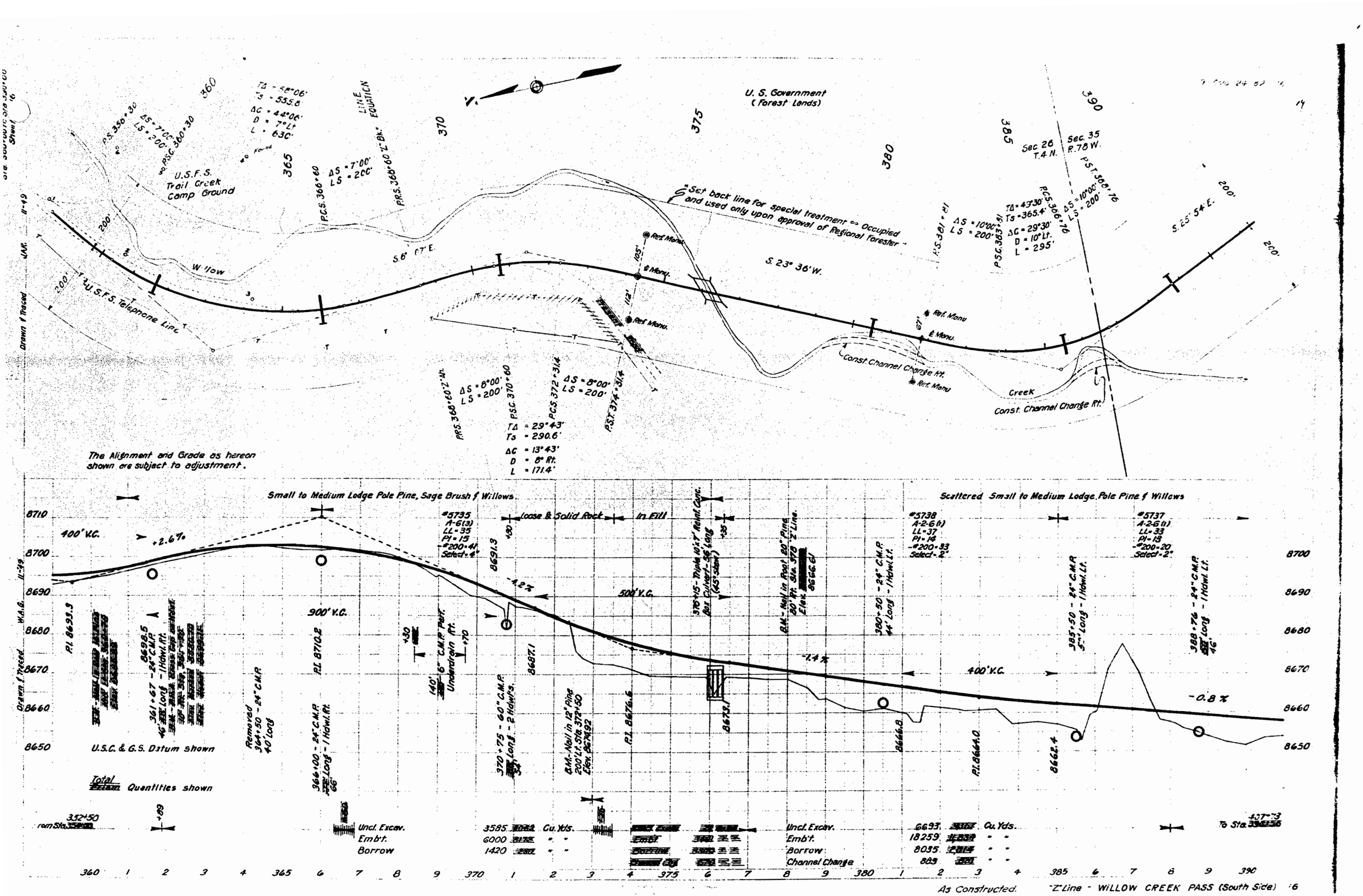
Uncl. Excav.	4724	5648	Cu. Yds.
Emb't.	5759	7337	" "
Borrow	478	524	" "
Channel Change	433	2005	" "

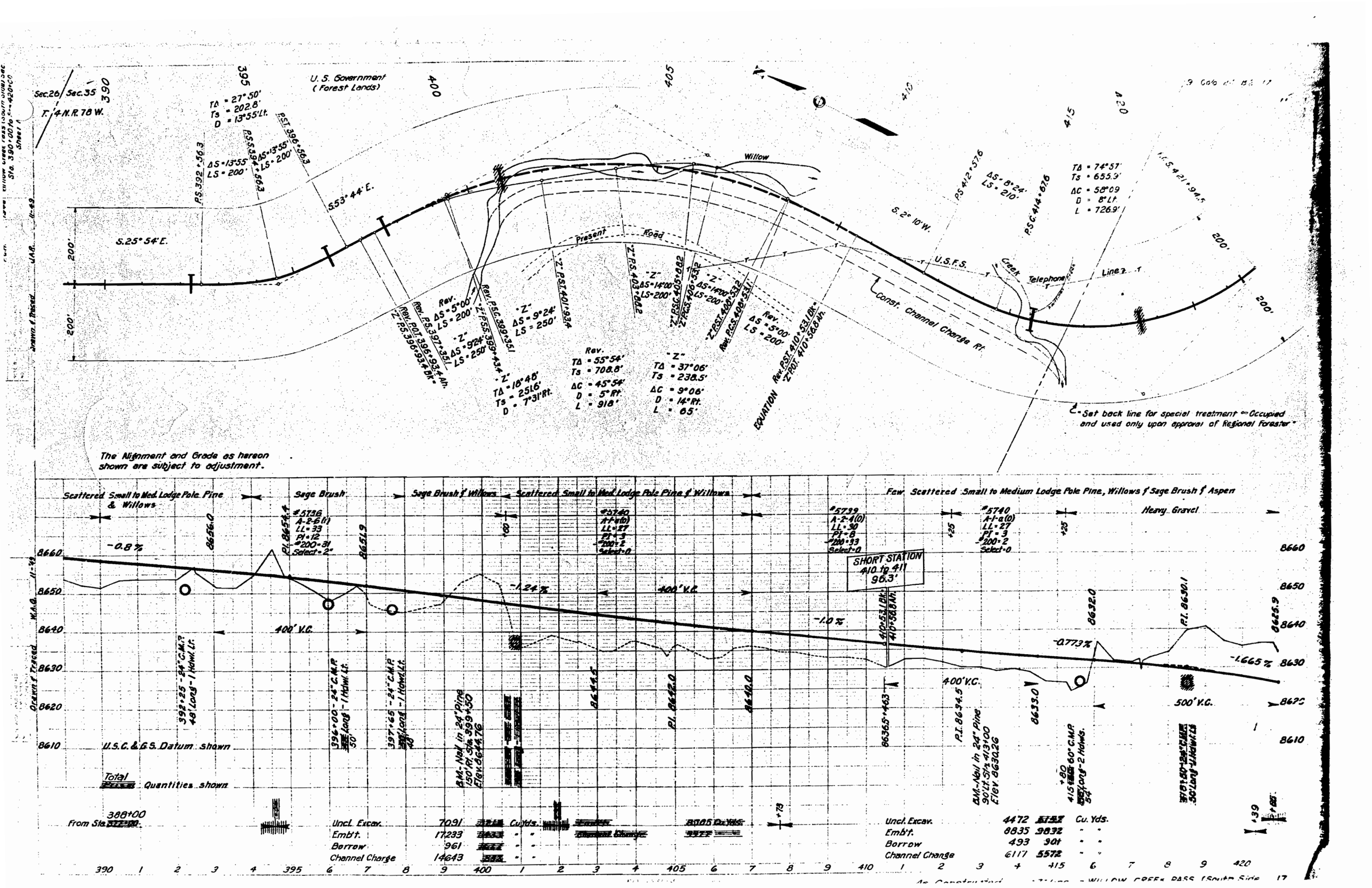
To Sta. 333+55

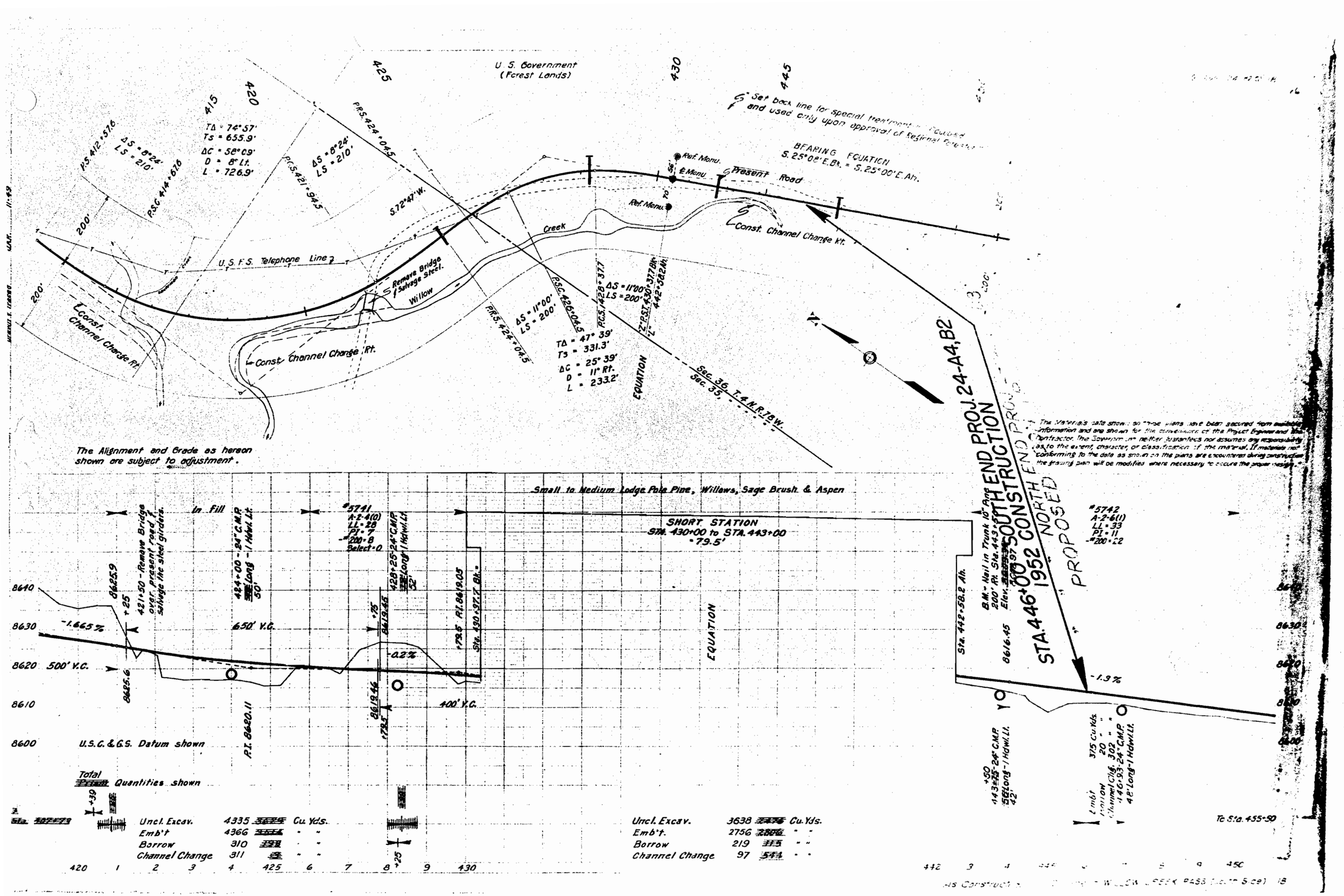
300 1 2 3 4 305 6 7 8 9 310 1 2 3 4 315 6 7 8 9 320 1 2 3 4 325 6 7 8 9 330

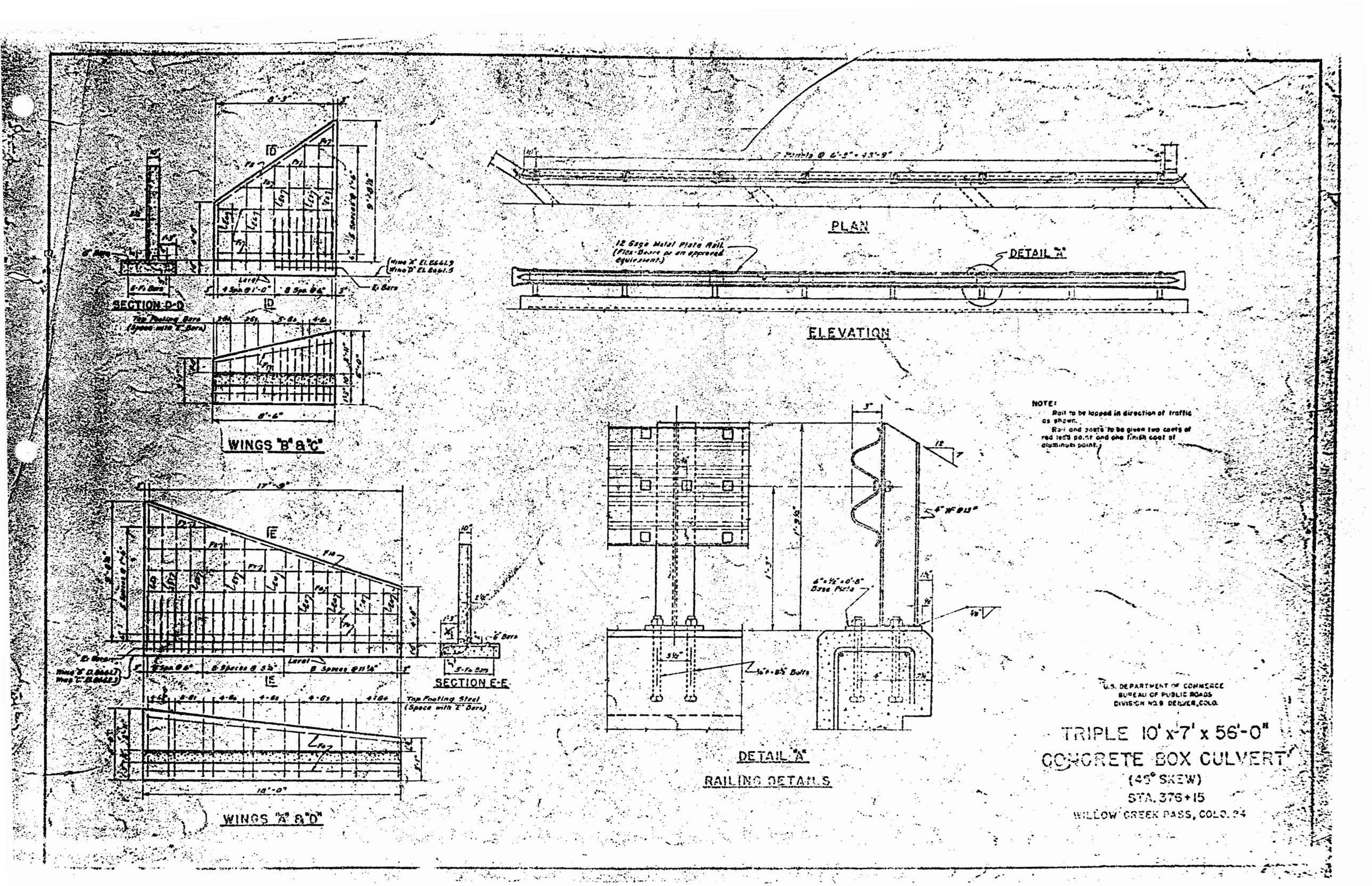
As Constructed WILLOW CREEK PASS (South Side) 14

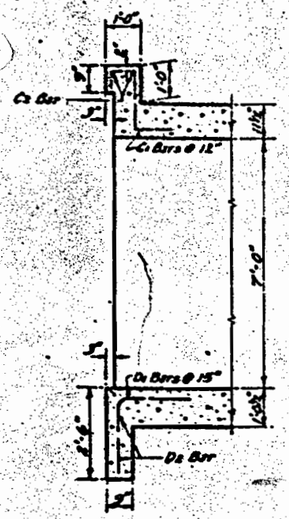

"Set back line for special treatment of Occupied and used only upon approval of Regional Forester"
Willow
Const. Channel Change Lt.
U.S.F.S.
S. 22° 59' W.
Telephone Line
Ref. Monu.
E. Monu.
Ref. Monu.
S. 4° 01' E.
Creek
Sec. 24
Sec. 23
Sec. 25
26
T. 4 N.
R. 78 W.
U.S. Government (Forest Lands)
TΔ = 56°00'
Ts = 378.5'
ΔC = 34°00'
D = 11° Rt.
L = 309.1'
The Alignment and Grade as hereon shown are subject to adjustment.
Willows & Sage Brush
Willows, Sage Brush & Small Aspen
Loose & Solid Rock fines granular
Willows
#5732 A-2-4(0) LL-29 PI-9 -#200-9 Select-0
#5734 A-2-6(1) LL-35 PI-12 -#200-35 Select-2"
#5733 A-2-4(0) LL-27 PI-7 -#200-12 Select-0
B.M. - On 10" Pine 120' Lt. Sta. 349+50 Elev. 8691.85
120-6" Underdrain Right
8691.23
500' V.C.
-1.449%
400' V.C.
-1.575%
400' V.C.
-0.965
400' V.C.
+2.5%
8730
8720
8710
8700
8690
8729.5
8705.37
B.M. - On 6" Pine 100' Lt. Sta. 335+00 Elev. 8713.57
U.S.C.&G.S. Datum shown
Total Quantities shown
333+50-24" C.M.P. 34' Long-1 Hdwl. Rt.
336+10-24" C.M.P. 32' Long-(In Place) Extend 24' Lt., Const. 1 Hdwl. Rt.
Removed 338+70-24" C.M.P. 44' Long. 338+70-24" C.M.P. 56' Long-1 Hdwl. Rt. 12' Extn. for 56'
8716.5
PI. 8713.6
Removed 343+50-24" C.M.P. 34' Long. 343+33 24" C.M.P. 58' Long-1 Hdwl. Rt. 26' Extn. for 58'
8710.45
PI. 8707.9
Removed 346+85-24" C.M.P. 34' Long. 346+85-24" C.M.P. 56' Long-1 Hdwl. Rt. 24' Extn. for 56'
350+00-24" C.M.P. 48' Long-1 Hdwl. Rt.
353+50-24" C.M.P. 50' Long-1 Hdwl. Rt.
357+50-24" C.M.P. 46' Long-1 Hdwl. Rt.
Remove 358+55-24" C.M.P. 32' Long.
PI. 8693.3
From Sta. 321
Uncl. Excav. 2276 Cu. Yds.
Emb't. 2649 " "
Borrow 322 " "
Uncl. Excav. 1503 Cu. Yds.
Emb't. 10256 " "
Borrow 3752 " "
Channel Change 291 " "
Uncl. Excav. 3348 Cu. Yds.
Emb't. 3955 " "
Borrow 339 " "
330 1 2 3 4 335 6 7 8 9 340 1 2 3 4 345 6 7 8 9 350 1 2 3 4 355 6 7 8 9 360
As Constructed. WILLOW CREEK PASS


U. S. Government
(Forest Lands)
U.S.F.S.
Trail Creek
Camp Ground
Willow
U.S.F.S. Telephone Line
"Set back line for special treatment as Occupied and used only upon approval of Regional Forester."
S. 23° 36' W.
S. 6° 17' E.
S. 25° 54' E.
Sec. 26
T. 4 N.
Sec. 35
R. 78 W.
Ref. Monu.
℄ Monu.
Const. Channel Change Rt.
Creek
The Alignment and Grade as hereon shown are subject to adjustment.
Small to Medium Lodge Pole Pine, Sage Brush & Willows
Scattered Small to Medium Lodge Pole Pine & Willows
Loose & Solid Rock In Fill
400' V.C.
+2.6%
900' V.C.
500' V.C.
400' V.C.
-1.2%
-1.4%
-0.8%
#5735
A-6(3)
LL-35
PI-15
-#200-41
Select-4"
#5738
A-2-6(1)
LL-37
PI-14
-#200-33
Select-2"
#5737
A-2-6(1)
LL-33
PI-13
-#200-20
Select-2"
U.S.C. & G.S. Datum shown
Total Quantities shown
Uncl. Excav.
Emb't.
Borrow
3585 Cu. Yds.
6000
1420
Uncl. Excav.
Emb't.
Borrow
Channel Change
6693 Cu. Yds.
18259
8035
869
As Constructed. "Z" Line - WILLOW CREEK PASS (South Side) 6


Sec.26 Sec.35
T. 4 N. R. 78 W.
U. S. Government (Forest Lands)
TΔ = 27°50'
Ts = 202.8'
D = 13°55' Lt.
P.S.T. 396+56.3
P.S.S. 394+56.3
ΔS = 13°55'
LS = 200'
P.S. 392+56.3
S.53° 44' E.
S.25° 54' E.
Willow
Present Road
"Z" P.S.T. 401+93.4
"Z" P.S.S. 399+35.1
"Z" P.S.S. 399+43.4
"Z" P.S.C. 399+35.1
Rev. P.S.C. 397+35.1
Rev. P.O.T. 396+93.4 Ah.
"Z" P.S.S. 396+93.4 Bk.
Rev. ΔS = 5°00'
LS = 200'
"Z" ΔS = 9°24'
LS = 250'
"Z" ΔS = 9°24'
LS = 250'
"Z" TΔ = 18°48'
Ts = 251.6'
D = 7°31' Rt.
"Z" P.S.C. 403+06.2
"Z" P.S.T. 403+06.2
"Z" ΔS = 14°00'
LS = 200'
"Z" P.S.C. 405+08.2
"Z" P.S.S. 405+53.2
"Z" P.S.T. 406+53.2
Rev. P.S.S. 408+53.1
Rev. ΔS = 5°00'
LS = 200'
Rev. P.S.T. 410+53.1 Bk.
"Z" P.O.T. 410+56.8 Ah.
EQUATION
Rev.
TΔ = 55°54'
Ts = 708.8'
ΔC = 45°54'
D = 5° Rt.
L = 918'
"Z"
TΔ = 37°06'
Ts = 238.5'
ΔC = 9°06'
D = 14° Rt.
L = 65'
S.2° 10' W.
P.S. 412+57.6
ΔS = 8°24'
LS = 210'
P.S.C. 414+67.6
TΔ = 74°57'
Ts = 655.9'
ΔC = 58°09
D = 8° Lt.
L = 726.9'
P.S. 421+94.5
U.S.F.S.
Creek
Telephone
Line
Const. Channel Change Rt.
℄ - Set back line for special treatment = Occupied and used only upon approval of Regional Forester
The Alignment and Grade as hereon shown are subject to adjustment.
Scattered Small to Med. Lodge Pole Pine & Willows
Sage Brush
Sage Brush & Willows
Scattered Small to Med Lodge Pole Pine & Willows
Few Scattered Small to Medium Lodge Pole Pine, Willows & Sage Brush & Aspen
Heavy Gravel
-0.8 %
-1.24 %
-1.0 %
-0.773 %
-1.665 %
400' V.C.
500' V.C.
SHORT STATION 410 to 411 96.3'
#5736 A-2-6(1) LL=33 PI=12 #200=31 Select=2"
#5740 A-1-a(0) LL=27 PI=3 #200=2 Select=0
#5739 A-2-4(0) LL=30 PI=8 #200=33 Select=0
8656.0
8654.4 P.I.
8651.9
8644.5
8642.0 P.I.
8640.0
8632.0
8630.1 P.I.
8625.9
8634.5 P.I.
8633.0
8660
8650
8640
8630
8620
8610
392+25 - 24" C.M.P. 48' Long - 1 Hdwl. Lt.
396+00 - 24" C.M.P. 50' Long - 1 Hdwl. Lt.
397+65 - 24" C.M.P. 40' Long - 1 Hdwl. Lt.
B.M.-Nail in 24" Pine 150' Rt. Sta. 399+50 Elev. 8644.76
8636.5+63
410+53.1 Bk.
410+56.8 Ah.
B.M.-Nail in 24" Pine 90' Lt. Sta. 413+00 Elev. 8630.26
415+80 60" C.M.P. 54' Long - 2 Hdwls.
417+81 60" C.M.P. 50' Long - 1 Hdwl.
U.S.C. & G.S. Datum shown
Total Quantities shown
From Sta. 388+00
Uncl. Excav. 7091 Cu. Yds.
Emb't. 17233 "
Borrow 961 "
Channel Change 14643 "
Uncl. Excav. 4472 4752 Cu. Yds.
Emb't. 8835 9832 "
Borrow 493 901 "
Channel Change 6117 5572 "
390 1 2 3 4 395 6 7 8 9 400 1 2 3 4 405 6 7 8 9 410 1 2 3 4 415 6 7 8 9 420
As Constructed WILLOW CREEK PASS (South Side)

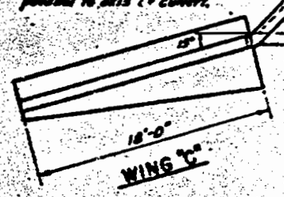

U. S. Government
(Forest Lands)
Set back line for special treatment required and used only upon approval of Regional Forester
BEARING EQUATION
S. 25°08' E. Bk. = S. 25°00' E. Ah.
Present Road
Ref. Monu.
℄ Monu.
Ref. Monu.
Const. Channel Change Rt.
Creek
Willow
Remove Bridge & Salvage Steel.
U.S.F.S. Telephone Line
Const. Channel Change Rt.
Const. Channel Change Rt.
TΔ = 74° 57'
Ts = 655.9'
ΔC = 58° 09'
D = 8° Lt.
L = 726.9'
ΔS = 8° 24'
LS = 210'
P.S. 412+57.6
P.S.C. 414+67.6
P.R.S. 424+04.5
P.C.S. 421+94.5
S. 72° 47' W.
ΔS = 11° 00'
LS = 200'
P.S.C. 426+04.5
P.C.S. 428+37.7
ΔS = 11° 00' 37" Bk.
LS = 200'
442+58.2 Ah.
TΔ = 47° 39'
Ts = 331.3'
ΔC = 25° 39'
D = 11° Rt.
L = 233.2'
EQUATION
Sec. 36, T. 4 N. R. 78 W.
Sec. 35,
END PROJ. 24-A4, B2
SOUTH END CONSTRUCTION
NORTH END PROPOSED
STA. 446+00
1952
The Alignment and Grade as hereon shown are subject to adjustment.
The Materials data shown on these plans have been secured from available information and are shown for the convenience of the Project Engineer and the Contractor. The Government neither guarantees nor assumes any responsibility as to the extent, character, or classification of the material. If materials not conforming to the data as shown on the plans are encountered during construction the grading plan will be modified where necessary to secure the proper design.
Small to Medium Lodge Pole Pine, Willows, Sage Brush & Aspen
In Fill
#5741
A-2-4(0)
LL-28
PI-7
#200-8
Select-0
424+00 - 24" C.M.P. Long - 1 Hdwl. Lt. 50'
421+50 - Remove Bridge over present road & salvage the steel girders.
428+25 - 24" C.M.P. Long 1 Hdwl. Lt. 52'
SHORT STATION
STA. 430+00 to STA. 443+00
= 79.5'
Sta. 430+97.7 Bk.
+79.5' P.I. 8619.05
650' V.C.
500' V.C.
400' V.C.
-1.665%
-0.2%
-1.9%
P.I. 8620.11
U.S.C. & G.S. Datum shown
Sta. 442+58.2 Ah.
B.M. - Nail in Trunk 10" Pine 200' Rt. Sta. 443+00
Elev. 8616.97
8616.45
#5742
A-2-6(1)
LL-33
PI-11
#200-22
+50
443+25 - 24" C.M.P. Long - 1 Hdwl. Lt. 42'
375 Cu. Yds.
20 " "
Channel Chg. 302 " "
446+93 - 24" C.M.P. 48' Long - 1 Hdwl. Lt.
Total Quantities shown
Uncl. Excav. 4335 Cu. Yds.
Emb't 4366 " "
Borrow 310 " "
Channel Change 311 " "
Uncl. Excav. 3638 Cu. Yds.
Emb't. 2756 " "
Borrow 219 " "
Channel Change 97 " "
To Sta. 455+50
420 1 2 3 4 425 6 7 8 9 430
442 3 4 5 9 450

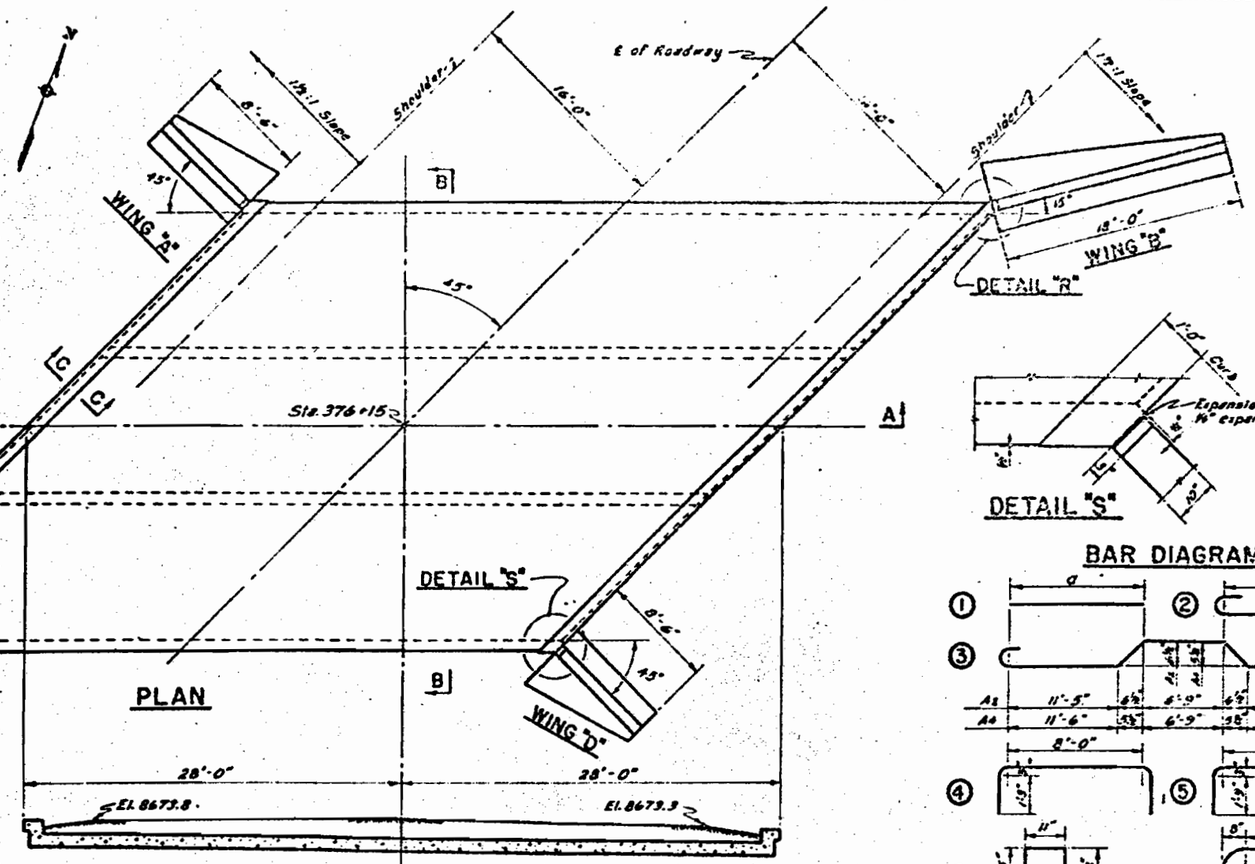

SECTION D-D
WINGS "B" & "C"
WINGS "A" & "D"
SECTION E-E
PLAN
ELEVATION
DETAIL "A"
RAILING DETAILS
12 Gage Metal Plate Rail (Flex-Beam or an approved equivalent.)
DETAIL "A"
Base Plate
Bolts
Top Footing Steel (Space with "E" Bars)
NOTE:
Rail to be lapped in direction of traffic as shown.
Rail and posts to be given two coats of red lead paint and one finish coat of aluminum paint.
U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
DIVISION NO. 9 DENVER, COLO.
TRIPLE 10' x 7' x 56'-0"
CONCRETE BOX CULVERT
(45° SKEW)
STA. 376+15
WILLOW CREEK PASS, COLO. 94



SECTION C-C

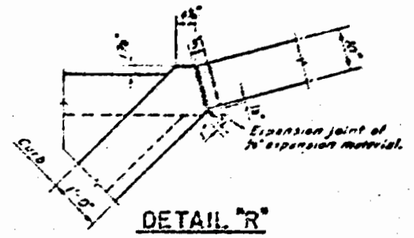
Note: Place Cc and Cb bars parallel to axis of culvert.



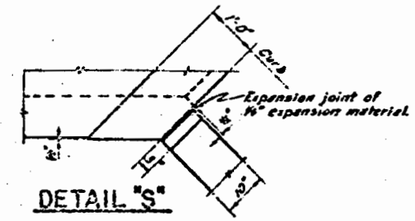


PLAN

SECTION A-A

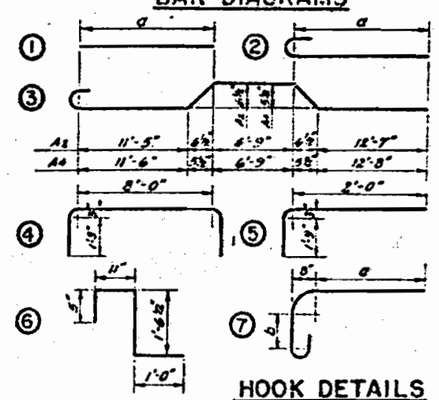


DETAIL "R"



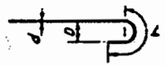
DETAIL "S"

BAR DIAGRAMS



NOTE:
All dimensions are to center line of bars.

HOOK DETAILS



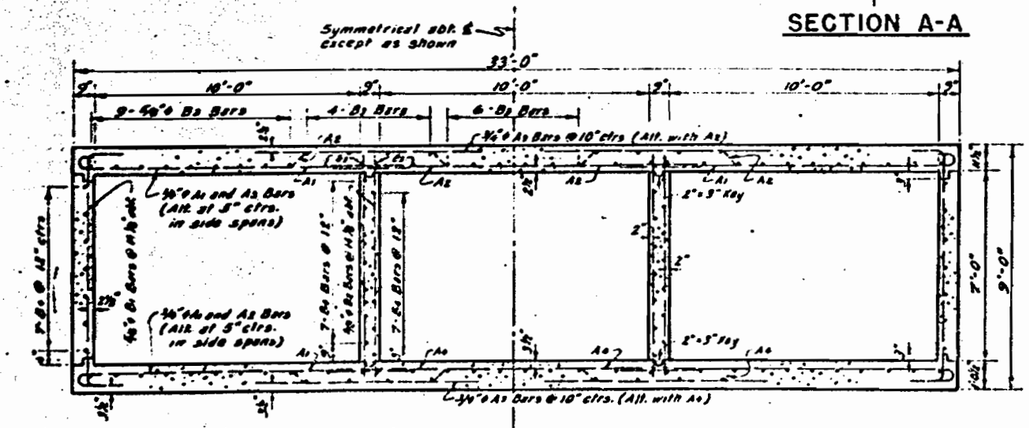
d	D	L
½"	3½"	8"
⅝"	4⅝"	10"
¾"	5½"	12"

BAR LIST

Bar	Type	Location	No.	Size	Length	a	b
A1	2	Barrel	146	½"ø	17'-7"	16'-7"	
A2	1		3		11'-3"		
A3	1		126		12'-7"		
A4	1		3		12'-8"		
B1	4		24		11'-6"		
C1	1		123	⅝"ø	8'-6"		
C2			160		18'-6"		
C3			6		16'-6"		
C4			6		16'-6"		
C5	6	Curbs	60	½"ø	3'-10"		
C6	1		6		24'-7"		
C7	2		12		4'-2"		
C8	1	Cut-off Walls	3	½"ø	12'-7"		
C9	7		21		3'-10"	1'-1"	0'-10½"
C10			4		7'-6"		
C11	1		4	⅝"ø	8'-6"		
C12			4		8'-6"		
C13	7		4		6'-4"	3'-10½"	0'-10½"
C14			8		6'-4"	4'-1"	0'-10½"
C15	1		4	½"ø	6'-10"		
C16			4		6'-10"		
C17			4		7'-4"		
C18			4		7'-4"		
C19	7		4		8'-6"	3'-10½"	0'-10½"
C20			4		7'-10"	4'-1"	
C21			4		7'-10"	4'-1"	
C22		Wing Walls	16		8'-0"		
F1	1		2	½"ø	6'-6"		
F2			2		6'-6"		
F3			2		5'-2"		
F4			2		5'-2"		
F5			2		6'-11"		
F6			16		17'-6"		
F7			2		14'-2"		
F8			2		3'-6"		
F9			2		5'-10"		
F10			2		13'-6"		
G1	1		18	½"ø	6'-3"		
G2			18		2'-6"		
G3			12		2'-3"		
G4			12		2'-3"		
G5			6		2'-3"		
G6			6		2'-3"		

ESTIMATED QUANTITIES

Class "A" Concrete	205.5 Cu. Yds.
Reinforcing Steel	28500 Pounds
Excavation for Bridges	320.0 Cu. Yds.
Railing	87.5 Lin. Ft.



SECTION B-B

Note:
Place all "A" bars parallel to ℄ of roadway. Spacings shown for these bars.

GENERAL NOTES

Specifications: Public Roads Administration, Form E.P. 41.

Loading: H15-S12-44.

Design Stresses: fc = 1000 p.s.i., fs = 18000 p.s.i., n = 10

Concrete: All concrete to be Class "A", made with Type II (Low Alkali) Portland Cement, with an air-entraining admixture. Curbs to be poured monolithically with top slab. All exposed edges to be chamfered ¾". All exposed surfaces to be given a "Rubbed Finish."

Reinforcing Steel: All bars to be deformed. Shop details to be submitted and approved before fabrication.

Revisions: Any revisions found necessary in the field must be approved by the Bridge Engineer.

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
DIVISION NO. 9 DENVER, COLO.

TRIPLE 10' x 7' x 56'-0" CONCRETE BOX CULVERT

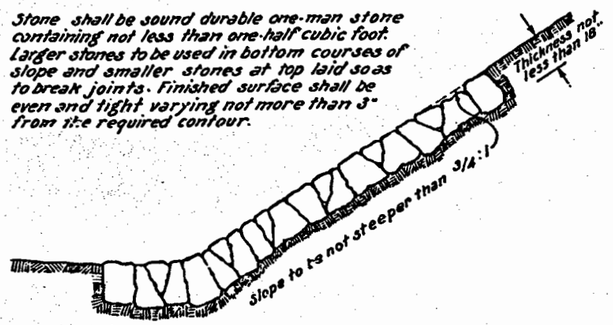
(45° SKEW)

STA. 376+15

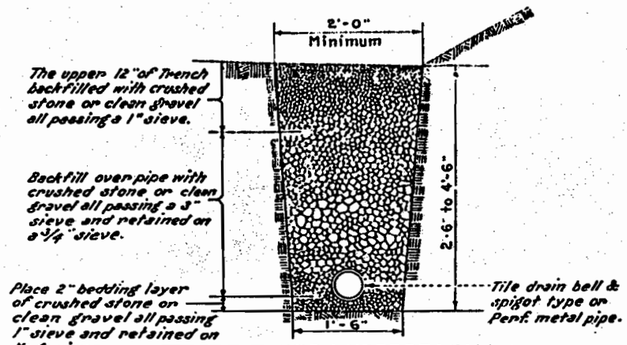
WILLOW CREEK PASS, COLO. 24

APPROVED: [signature] Date: Mar. 8, 1951

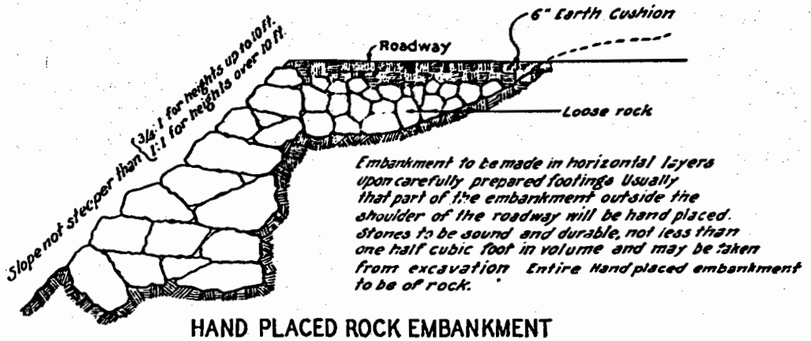
Sheet 1 of 2



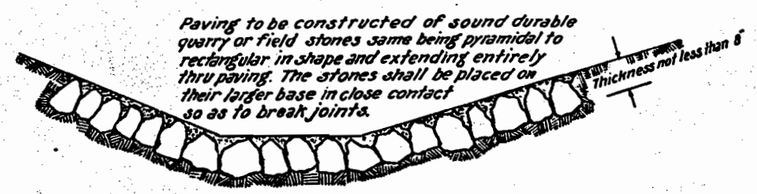
HAND LAID RIPRAP



TILE OR PIPE UNDERDRAIN USE

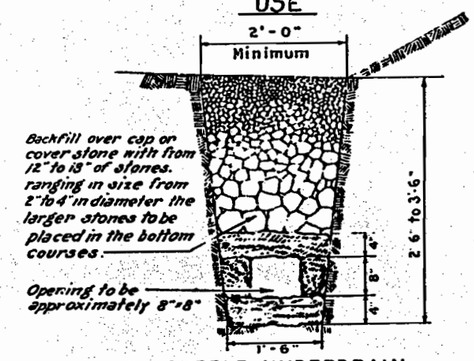


HAND PLACED ROCK EMBANKMENT
FULL HEIGHT

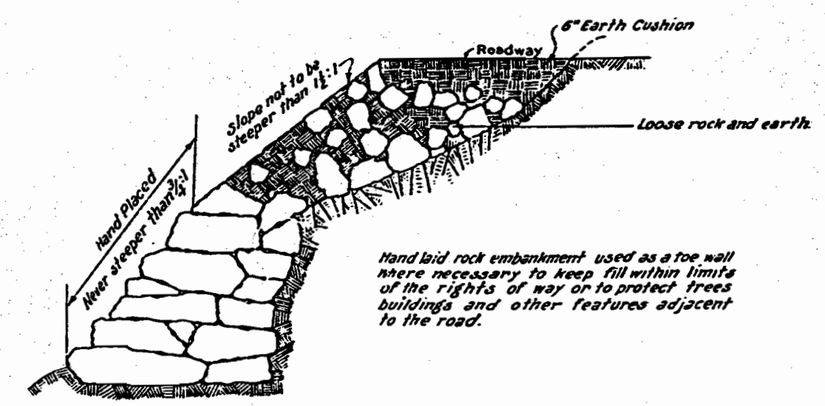


Each stone shall be carried by the underlying material and not by the adjacent stones. The surface of the rocks shall not vary more than one inch from the required finished section. The spaces between the stones shall be flushed full using either a mortar of the proportion of 1 part cement to three parts sand, or concrete of the proportion of one part cement, two parts fine aggregate and four parts coarse aggregate, which shall be of a consistency that will flow and fill the voids between the the individual rocks. The finished surface shall be smooth and show no projecting rock. See Special Provisions for this class of work.

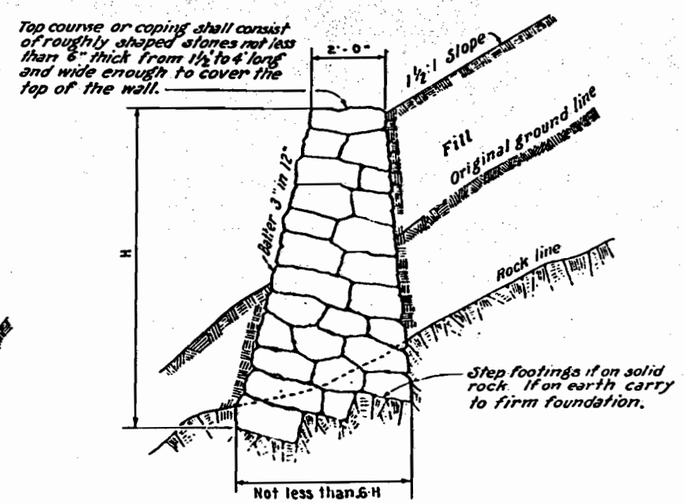
STONE PAVING
MORTAR OR CONCRETE FILLED JOINTS



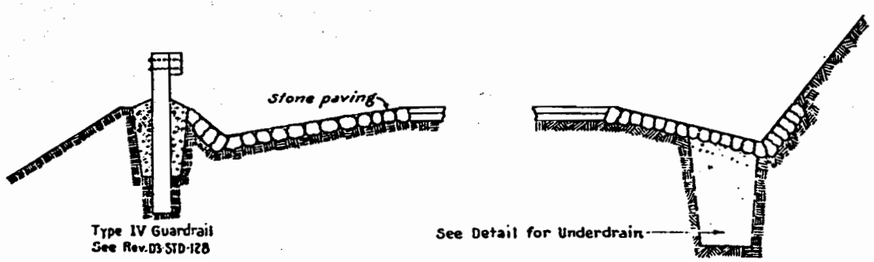
RUBBLE UNDERDRAIN



HAND PLACED ROCK EMBANKMENT
WHEN USED FOR TOE WALL ONLY



DRY RUBBLE RETAINING WALL
NOT TO BE USED FOR HEIGHTS OVER 8 FEET



TYPICAL SECTIONS IN CUTS AND EMBANKMENTS

APPROVED May 1st 1934
Clyde E. Stannard
MAJOR HIGHWAY ENGINEER

APPROVED July 14 1934
J. W. Bessom
DISTRICT ENGINEER

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DISTRICT NO 3 DENVER COLORADO

STANDARD MISCELLANEOUS STRUCTURES

APRIL 16 1934

Rev D3-STD-129