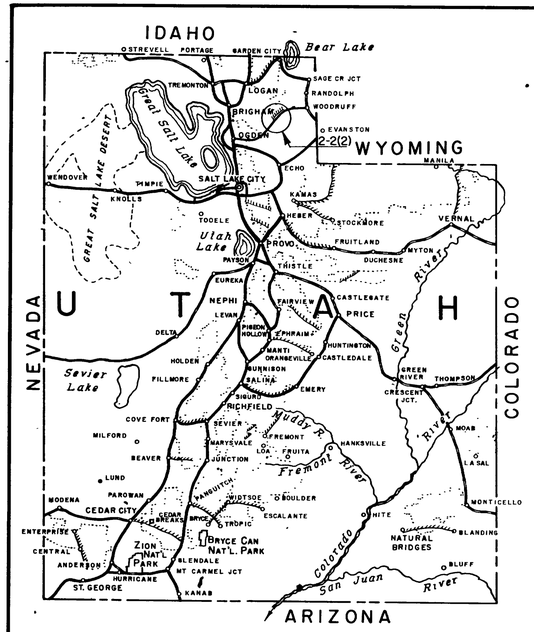


U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

PLANS FOR PROPOSED

UTAH FOREST HIGHWAY PROJECT 2-2(2)

MONTE CRISTO ROAD

LENGTH 12.549 MILES

CLASS 2

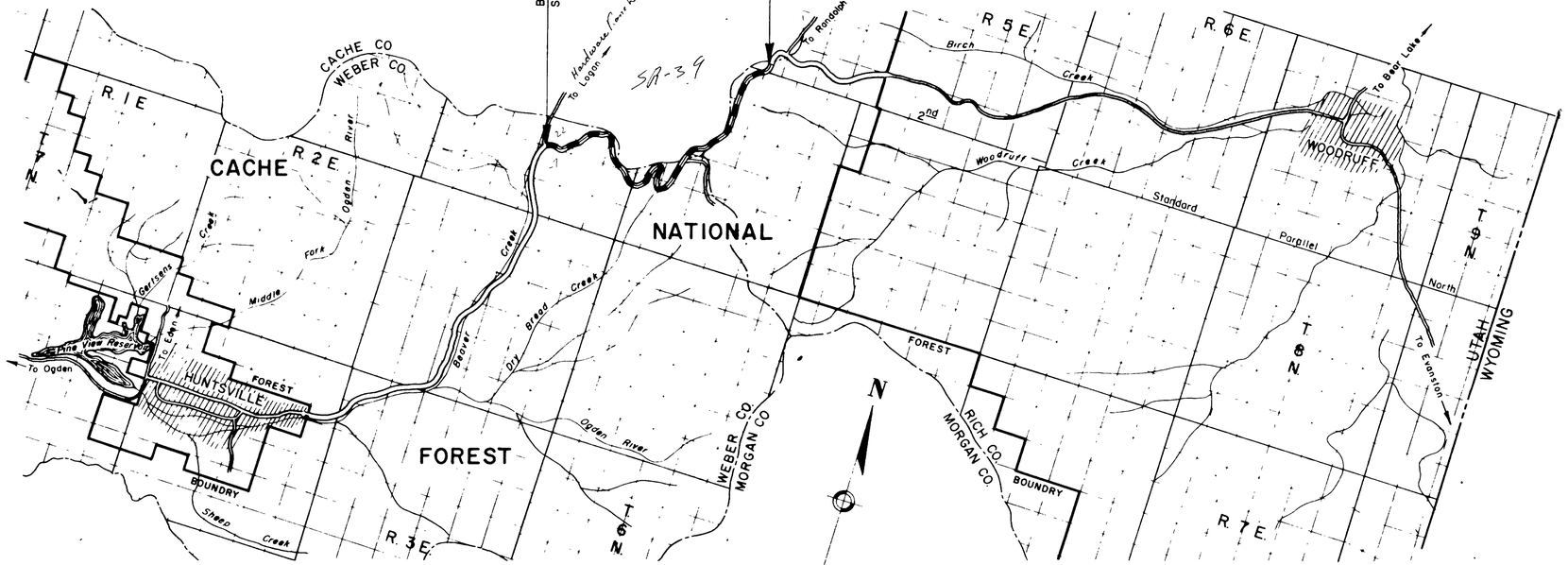
CACHE NATIONAL FOREST

WEBER & RICH COUNTY

REGION 9 STATE UTAH
PROJECT 2-2(2), Monte Cristo Road
SHEET 1 OF _____ SHEETS

INDEX TO SHEETS

SHEET No.	DESCRIPTION	STATION to STATION	



LEGEND

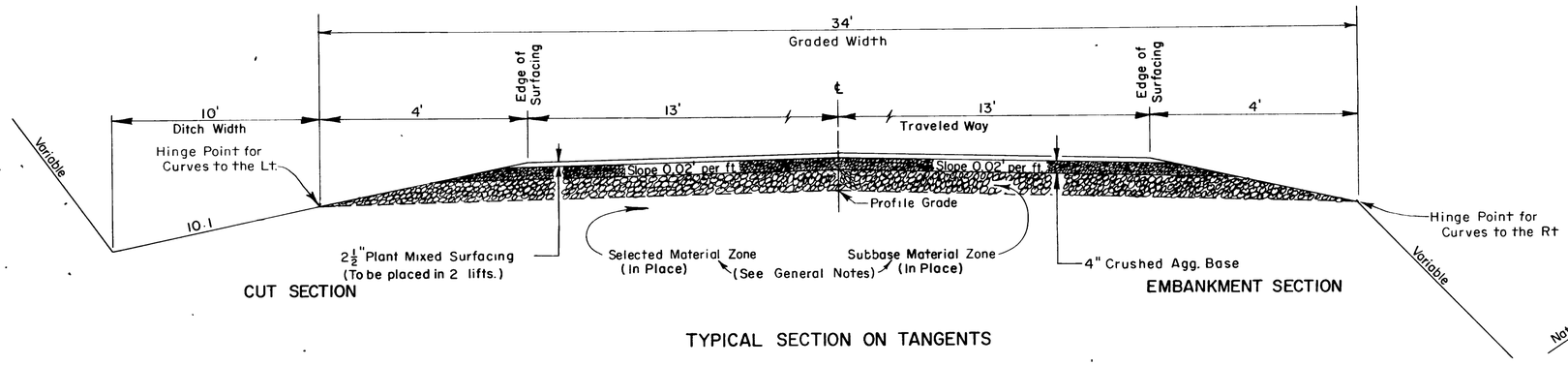
EXISTING ROAD	UNIMPROVED	GRADED	REINFORCED SUBGRADE	BASE COURSE	SURFACE TREATMENT	RD. OR PLANT MIX BITUM	CONCRETE

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

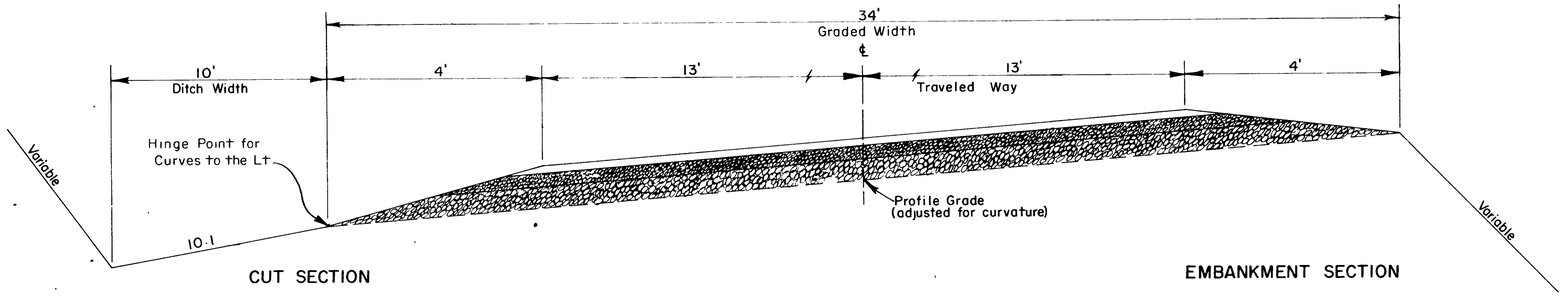
APPROVED:

_____ DATE _____ 19___
REGIONAL ENGINEER

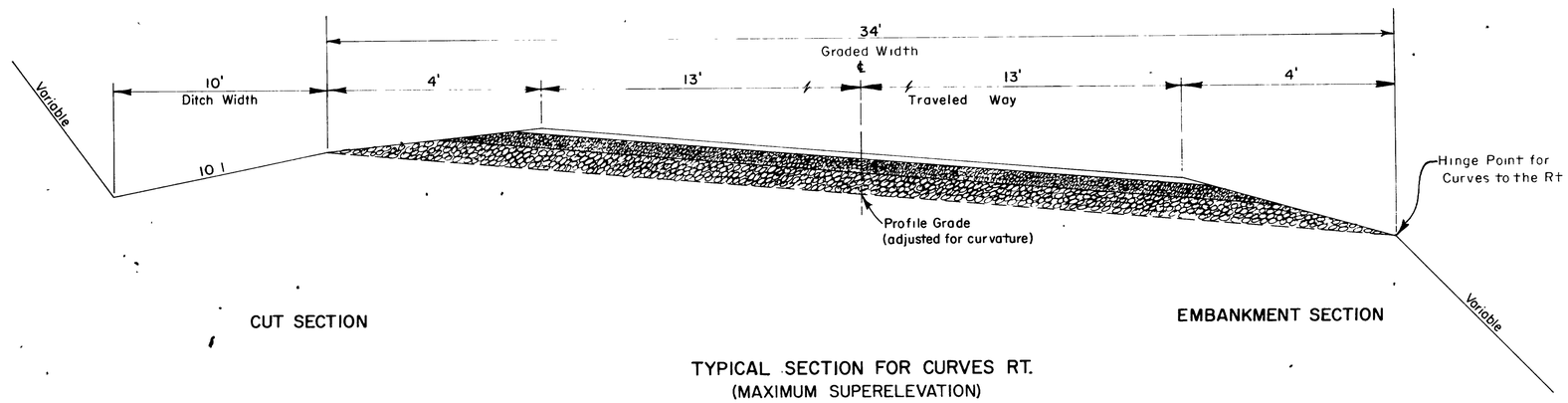
BPR REG 9, JLH 1959



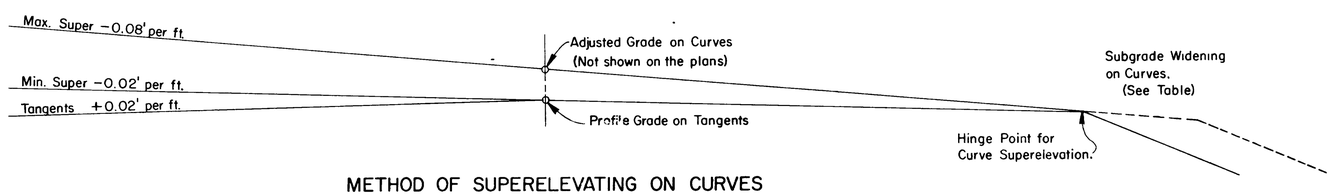
TYPICAL SECTION ON TANGENTS



TYPICAL SECTION FOR CURVES LT.
(MAXIMUM SUPERELEVATION)



TYPICAL SECTION FOR CURVES RT.
(MAXIMUM SUPERELEVATION)

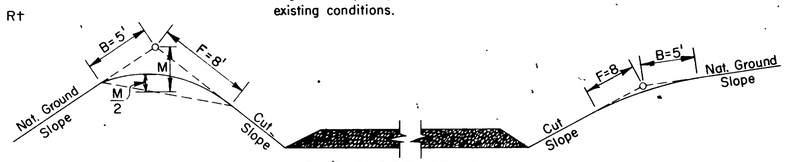


METHOD OF SUPERELEVATING ON CURVES

HEIGHT	EMBANKMENT SLOPE
0' to 3'	6:1
3' to 6'	4:1
6' to 12'	2:1
12' and up	2:1

HEIGHT	CUT SLOPE
0' to 5'	3:1
5' to 10'	2:1
10' and up	1½:1

The above tables are to be used as a guide in the design and construction of the project. The designer or field engineer may vary from these to fit existing conditions.



CUT SLOPE ROUNDING

When the cut slope is less than 8', reduce B & F distance to the actual slope distance.

Slope Rounding shall be considered as a subsidiary part of the work required in dressing the cut slopes and no allowance will be made for materials moved.

Rounding, Warping, and Finishing slopes shall be as provided in Standard Specifications and/or Special Provisions.

STABILIZING MATERIALS

STATION TO STATION		Subbase Material Zone		Selected Material Zone	
		Item	Depth	Item	Depth
449+00	659+00	104(2)	6"	104(2)	3"

GENERAL NOTES

The Typical Section and the table above show a "Selected Material Zone" and a "Subbase Material Zone" These terms are for defining locations and depths of materials only, and are not to be considered as pay items having similar names. The "Selected Material Zone" lies below the profile grade (adjusted for curvature where appropriate). The "Subbase Material Zone" lies above the profile grade and just below the base course zone.

Where the plans show special material to be placed in the "Selected Material Zone," the roadway excavations and embankments shall be constructed to the grade that will allow for the required thickness The thicknesses of materials shown in the above table are based on laboratory analysis of samples taken at random along the proposed construction. During construction, the engineer will adjust the thicknesses as necessary to insure adequate structural stability, including the placing of Section 104 materials in the "Selected Material Zone", and the placing of Section 102 materials in the "Subbase Material Zone." Section 102 materials will not be placed on top of Section 104 materials.

On grades of 3% or less, where wet or unstable conditions exist, the engineer may increase the ditch width 3 feet or more.

Any subsurface data represented on these plans is limited to the specific locations shown and those locations alone.

CURVE WIDENING*

Degree of Curve	Pavement Width		
	20'	22'	24'
5°–10°	2'	—	—
11°–21°	3'	2'	—
22° & Up	4'	3'	2'

* Widen Subgrade, Base and Surfacing.

DESIGNED L.F.K. 4-1963
DRAWN J.R.C. 4-1963

Revisions 7/1963, 5/1964

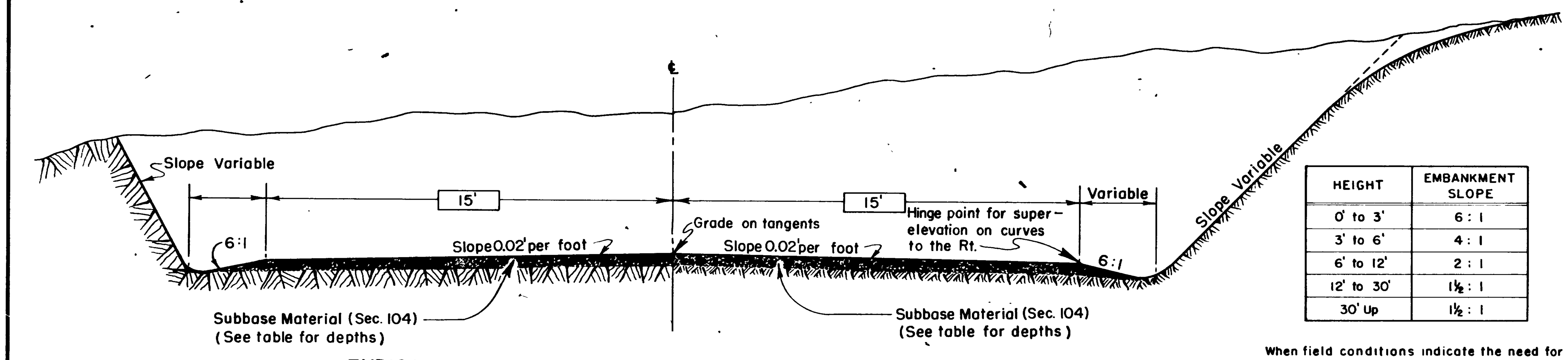
U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION NO. 9 DENVER, COLORADO

TYPICAL CROSS SECTIONS

STATION 449+00 TO 659+00
NATIONAL FOREST HIGHWAYS

ROUTE: Monte Cristo Road
PROJECT: 2-2(2)
NATIONAL FOREST: Cache
COUNTY Cache, Weber and Rich
STATE: Utah

ROADBED WIDTHS
GRADED: 34' SH. to SH
BASE: 27.34' SH to SH.
SURFACE: 26' SH to SH.



TYPICAL HALF CUT SECTION IN ROCK

TYPICAL HALF CUT SECTION IN COMMON

(IN PLACE)

HEIGHT	EMBANKMENT SLOPE
0' to 3'	6 : 1
3' to 6'	4 : 1
6' to 12'	2 : 1
12' to 30'	1½ : 1
30' Up	1½ : 1

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

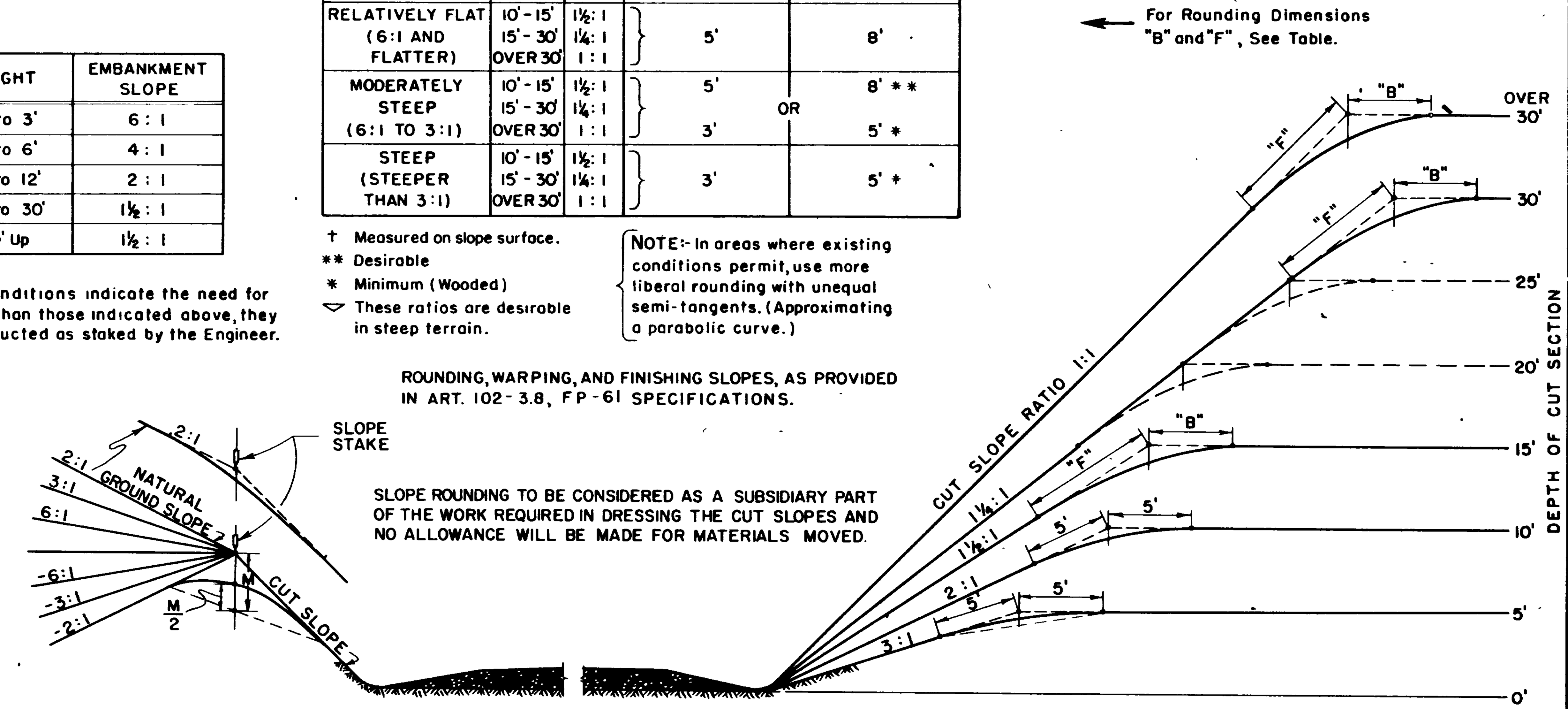
SLOPE ROUNDING FACTORS			ALTERNATE ROUNDING DIMENSIONS	
NATURAL GROUND SLOPE	CUT SLOPE		SEMI-TANGENTS †	
	HEIGHT	RATIO ▽	Back of Slope Stake "B"	Front of Slope Stake "F"
VARIABLE VARIABLE	0'-5' 5'-10'	3:1 2:1	5'	5'
RELATIVELY FLAT (6:1 AND FLATTER)	10'-15' 15'-30' OVER 30'	1½:1 1¼:1 1:1	5'	8'
MODERATELY STEEP (6:1 TO 3:1)	10'-15' 15'-30' OVER 30'	1½:1 1¼:1 1:1	5' OR 3'	8' ** OR 5' *
STEEP (STEEPER THAN 3:1)	10'-15' 15'-30' OVER 30'	1½:1 1¼:1 1:1	3'	5' *

† Measured on slope surface.
** Desirable
* Minimum (Wooded)
▽ These ratios are desirable in steep terrain.

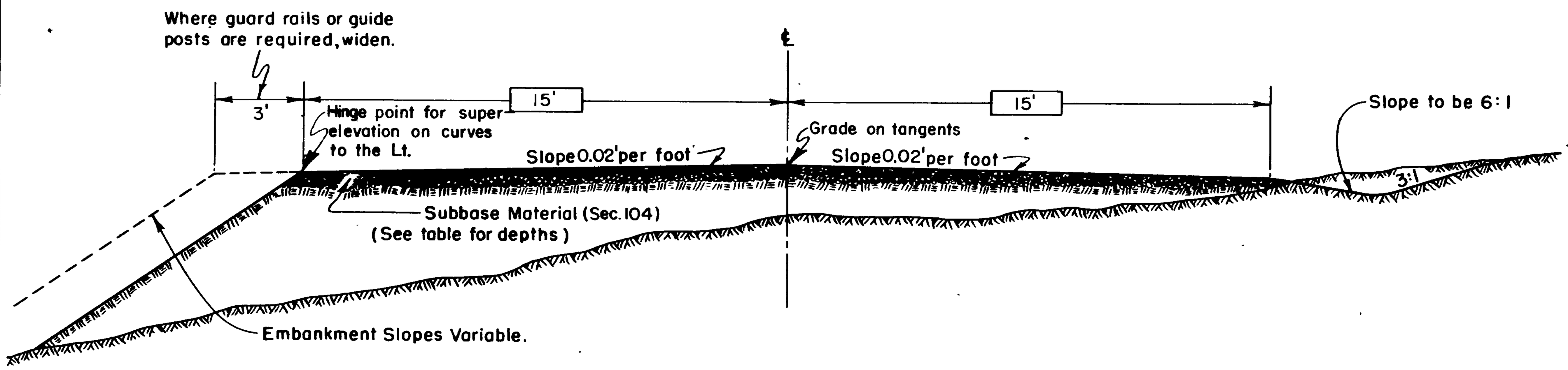
NOTE:- In areas where existing conditions permit, use more liberal rounding with unequal semi-tangents. (Approximating a parabolic curve.)

ROUNDING, WARPING, AND FINISHING SLOPES, AS PROVIDED IN ART. 102-3.8, FP-61 SPECIFICATIONS.

SLOPE ROUNDING TO BE CONSIDERED AS A SUBSIDIARY PART OF THE WORK REQUIRED IN DRESSING THE CUT SLOPES AND NO ALLOWANCE WILL BE MADE FOR MATERIALS MOVED.



CUT SLOPE ROUNDING

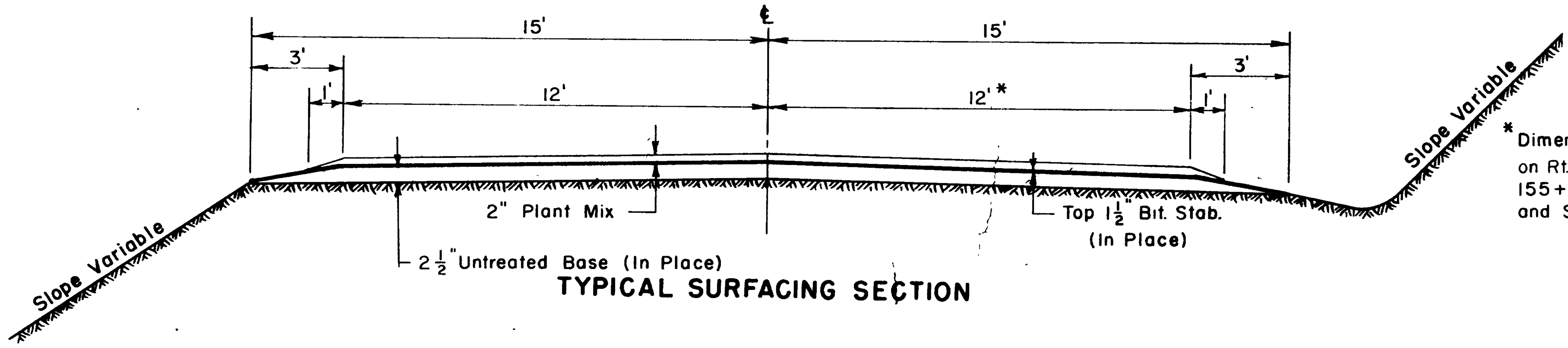


TYPICAL HALF EMBANKMENT SECTION

TYPICAL HALF SHALLOW EMBANKMENT SECTION

(IN PLACE)

		Depth	
Base	(In Place)	4"	Inches (Top 1½" Bit. Sta.)
Bituminous Wearing Surface, or Plant Mix		2"	Inches (To be placed in two 1" Lifts)



TYPICAL SURFACING SECTION

* Dimension is 24' where passing Lanes are on Rt. side. Sta. 102+00 to 120+00, Sta. 155+00 to 165+00, Sta. 336+00 to 351+00 and Sta. 408+00 to 428+00.

SPECIAL STABILIZING MATERIAL

STATION to STATION		SUBBASE Item 104(2)	~~SELECTED BORROW Item 102( )~~
(In Place) 0+031	7+00	9"	
7+00	32+00	12"	
32+00	97+00	9"	
97+50	122+50	6"	
122+50	200+84	9"	
200+84	499+00	9"	

GENERAL NOTES

Where Borrow is specified in the contract and satisfactory material is found in the roadway excavation, the right is reserved to increase the amount of Unclassified Excavation and reduce the Borrow Excavation When additional material is needed for completing embankments, stabilizing the subgrade, or for selected cushion or topping, it may be secured by uniformly widening thru or sidehill cuts or flattening cut slopes where satisfactory material is available. The slopes at the ends of all cuts shall be flattened and flared to improve appearance.

Furrow ditches shall be constructed on approximate one percent grades following the ground contour and when possible shall be so constructed that the direction of flow will be away from the roadway

Topsoil shall be conserved and either placed in stockpiles or spread over cut and embankment slopes as directed and in accordance with the specifications.

Roadway ditches at the ends of cuts shall be constructed so as to carry the flow away from the adjacent embankment slopes.

Embankment slopes shall be uniformly warped between one rate of slope and another. The transition shall cover a distance of not less than fifty feet.

The grade line shown on the plan and profile sheets is centerline grade, not corrected for curvature.

Curves are superelevated and widened in accordance with AASHO standards.

SOILS DATA

Any materials soils data shown on these plans are based on tests of samples obtained from the locations and depths shown, and are only for informational purposes. They do not reflect classification of the excavation. No responsibility is assumed by the Government as to the extent of materials represented by these tests. Any assumption by the contractor as to the extent of the materials represented by these samples is strictly his responsibility. The contractor must satisfy himself as to the nature of materials to be encountered by personal inspection of the project on the ground. If materials not conforming to the data show on these plans are encountered during construction, the grading plan will be modified where necessary to insure proper design.

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

TYPICAL CROSS SECTIONS

NATIONAL FOREST & PARK HIGHWAYS

STATION 0+03.10 TO 449+00 *(In Place)*

REGION No. 9 STANDARD ROADBED:
- GRADED *30' Roadbed-12' Passing Lanes*
- BASE *24' Shoulder to Shoulder (In Place)*
- BITUMINOUS WEARING SURFACE *24' Sh. to Sh.*

PROJECT *2-2(2) Monte Cristo Road*
NATIONAL *Forest: Cache*
COUNTY *Cache, Weber and Rich*
STATE *Utah*

APPROVED: [signature] Date: *2/26/58*
Federal Highway Projects Engineer

Drawn & Traced W.A.G. June, 1954 — Rev. J.L.H. 4-10-59 — Rev. J.K.C. 6-6-61

SUMMARY OF ESTIMATED QUANTITIES

The following quantities are approximate. Payment will be made only for the quantities of work performed or materials furnished in accordance with the contract.

SUMMARY OF QUANTITIES

ITEM №	102(1)	107(1)	108(1)	109(1)	200(4)	201(1)	310(4)	311(4)	313(12)	317(1)	317(3)
STATION TO STATION	Unclassified Excavation	Finishing Previously Constructed Roadbed	Watering	Rolling	Crushed Aggregate Base, Grading E	Reconditioning of Roadbed	Asphalt Grade MC-0 or MC-1 Prime Coat	Emulsified Asphalt, Grade SS-1, Tack Coat	Emulsified Asphalt, Grade SS-1 Seal Coat	Plant Mixture	Asphalt Cement, 120-150 Penetration, Plant Mixture
	Cu Yd	Mile	Unit	Hour	Ton	Mile	Ton	Ton	Ton	Ton	Ton
	Subgrading Climbing Lanes, Est.: 5,000	Sta 449+00 to 659+00 = 4.037 Mi.	Base 50 per 100 Ft. = 610	Recondition of Roadbed, Est. 60	235,348 × 151 / 2000 = 17,014	Various Sections, Est. = 0.463 Mi.	8,422 × 0.30 / 240 = 102	[illegible] × 0.06 / 240 = 37	238,3[illegible] × 0.075 / 240 = 74	370,535 × 153 / 2000 = 28,346	28,346 × 0.06 = 1,604
Totals	5,000	4.037	610	60	17,014	0.463	102	37	74	28,346	1,604
Use	5,000	4.04	650	100	18,000	0.50	105	38	75	29,000	1,700

Parking Areas:

Station	Side
375+00	Lt
380+00	Rt.

Climbing Lanes:

Station	to	Station	Side	Length Ft.	Width Ft.
101+00	to	121+00	Rt.	2000	12
154+00	to	166+00	Rt.	1,200	12
335+00	to	352+00	Rt.	1,700	12
407+00	to	429+00	Rt	2,200	12
			Total	7,100	

Curve Widening (2 feet).

Station	to	Station	Side	Transition (Ft.)
75+11	to	81+16	Lt.	200
[illegible]	to	134+97	Rt	200
164+6[illegible]	to	171+03	Lt	200
206+50	to	211+00	Lt.	200
234+15	to	240+65	Lt.	200
252+35	to	253+95	Lt.	200
305+55	to	313+15	Rt	200
344+00	to	350+00	Lt	150
353+90	to	354+55	Rt.	150
357+50	to	365+25	Lt	150

Road Approaches:

Station	Side
10+00	Lt
29+75	Rt.
89+50	Lt.
130+00	Rt.
131+00	Lt.
185+00	Rt.
220+00	Lt
235+10	Rt.
2[illegible]+50	Lt
272+50	Rt.
303+65	Lt.
347+75	Rt.
383+00	Lt.
383+50	Rt.
403+50	Rt.
4[illegible]+[illegible]	Rt.
459+50	Lt
476+50	Lt.
477+00	Rt
485+70	Lt.
500+00	Rt
519+00	Rt.
551+00	Lt
552+00	Rt.
603+80	Lt.
616+25	Lt.
616+25	Rt.
626+20	Lt.
640+50	Lt.

Location of Project

Station	Section	Feet 2" Plant Mixture	Feet Base & 2½" Plant Mix
0+03 to 136+97.85	2-A	13,694.75	
136+[illegible] to 173+03.74	2-A	3,638.35	
[illegible] to 200+84	2-A	2,7[illegible]	
200+84 to 204+55.50	2-B	371.50	
204+[illegible] to 26[illegible]+35.98	2-B	6,859.8	
26[illegible] to 315+[illegible]	2-B	4,692.[illegible]	
315+30 to 393+03.50	2-B	7,773.50	
393+[illegible] to 449+00	2-B	5,580.00	
449+00 to 486+14.50	2-2(1)		3,7[illegible]
486+10 to 499+48.08	2-2(1)		1,338.08
499+[illegible] to 603+81.9	2-2(1)		10,431.75
600+71.45 to [illegible]	2-2(1)		5,[illegible]
	Totals	44,943.38	21,313.05
	Miles	8.512	4.037
	Total Miles	12.549	

Reconditioning of Roadbed:

Station to Station	Length Ft	Width Ft.
Variable (On Sections 2A & 2B)	Variable*	26

Plant Mix Leveling Course:

Station to Station		
Variable (On Sections 2A & 2B)	Variable*	24'

Finishing Previously Constructed Roadbed:

Station to Station	Length Ft.	Width Ft.
449+00 to 659+00 (On Section 2-2(1))	21,313.05	30'

	Crushed Aggregate Base: Length	Width	Sq. Yd.	Depth	Cu. Ft.	Plant Mix: Width	Sq. Ft.	Depth	Cu. Ft.	Prime Coat: Width	Sq. Ft.	Sq. Yd.	Tack Coat: Width	Sq. Ft.	Sq. Yd.	Seal Coat: Width	Sq. Ft.	Sq. Yd.
Sta. 0+03 to 449+00:																		
Roadway	44,922					24'	1,339,656	2"	179,[illegible]				26'	1,169,546	1[illegible],838	30'	1,34[illegible]	149,813
Shoulders	44,944					1'	44,944	2"	7,491									
Climbing Lanes	[illegible]					12'	85,[illegible]		[illegible]				12'	[illegible]	9,467	12'	85,200	9[illegible]
Curve Widening	[illegible]49					2'	15,[illegible]		[illegible]				2'	15,[illegible]	1,7[illegible]		15,[illegible]	[illegible]
Widening for Ex. Curbs (Cuts)	1,[illegible]					9' (Ave.)	15,[illegible]		2,535	9' (Ave.)	15,010	1,690				[illegible] (Ave.)	10,140	[illegible]
Widening for Ex. Curbs (Fills)	12,840					3'	38,5[illegible]	2'	6,[illegible]				2'	25,680	[illegible]			
Bituminous Curb	14,[illegible]								4,[illegible]				1'	14,530	1,6[illegible]			
[illegible]	400					4'	1,600	[illegible]	533				4'	1,600	178	4'	[illegible]	178
Approaches	Variable					Variable	[illegible]	[illegible]	4,[illegible]				Variable	26,[illegible]	[illegible]5	Variable	[illegible]	4[illegible]
Parking Areas	Variable					Variable	[illegible],000	[illegible]	[illegible]	Variable	7,200	800						
Rework & Repair Sections*	Variable	26	Variable	Variable	18,000					30	[illegible]	6,667						
Leveling Courses*	Variable					Variable	Variable	Variable	20,000									
Sta 449+00 to 659+00:																		
Roadway	21,313	27.54	582,[illegible]	4"	194,232	26'	554,138	2½	115,465	30'	639,[illegible]	71,043				30'	639,[illegible]	71,043
Shoulders	21,313	1.33	[illegible]	4"	[illegible]	[illegible]	[illegible]	2½	[illegible]									
Widening for Ex. Curbs (Fills)	6,525					[illegible]'	19,575	2'	4,[illegible]								6,5[illegible]	725
Bituminous Curb	[illegible]								1,358				1	[illegible]	[illegible]			
[illegible]	120					4'	480	4'	160							[illegible]	480	53
Approaches	Variable	Variable	11[illegible]	4'	3,667	Variable	10,[illegible]	2½	2,083	Variable	[illegible]	1,222				Variable	[illegible]	[illegible]
Totals					235,340				370,535			81,422			139,553			238,3[illegible]

* Estimated Quantities; Locations to be determined by the Engineer

RECAPITULATION OF ITEMS

ITEM No	NAME	UNIT	QUANTITY
	See Sheet 2		

Project:

Stations: 0+03.10 to 200+84 (Section 2-A)
200+84 to 449+00 (Section 2-B)
449+00 to 659+00 (Section 2-2(1))

Length: 12.549 Miles

Width:
Bituminous Surfacing:
24 feet - (Sta 0+03.10 to 449+00)
26 feet - (Sta 449+00 to 659+00)

Crushed Aggregate Base, Grading E:
Sta 0+03 to 449+00 - Intermediate repair Sections, Length Variable, depth variable, width 26 feet.
Sta 449+00 to 659+00 - Length 4.037 mi., width 27.5 feet, depth 4 inches.
Weight 151 lbs. per cu. ft.

Emulsified Asphalt, Grade SS-1, Tack Coat, 0.06 gal per sq. yd.

Asphalt, grade MC-0 or MC-1, Prime Coat, 0.30 gal per sq. yd.

Asphalt Cement, 120-150 penetration, 6.0 percent by weight, with 1 percent heat stable additive, equivalent to Acra 300.

Plant Mixture.
Sta 0+03.10 to 449+00, depth 2 inches, plus intermediate leveling courses
Sta 449+00 to 659+00, depth 2.5 inches
Wt. 153 lbs per cu. ft.

Emulsified Asphalt, Grade SS-1, Seal Coat, 0.075 gal per sq. yd.

Type Code: 4241 Sta 449+00 to 659+00
4242 Sta 0+03.10 to 449+00

SUMMARY OF QUANTITIES

Monte Cristo Road ROUTE: 2

PROJECT: 2-2(1)

STATE: Utah COUNTY: Cache Weber and Rich

NATIONAL: Forest: Cache

Sheet 1 of 2 Sheet

Compiled by: [illegible] Date: 4/4/66
Checked by: [illegible] Date: 4-5-66
Correct: Date:

Bureau of Public Roads Region 9 Denver, Colo.

SUMMARY OF ESTIMATED QUANTITIES

The following quantities are approximate. Payment will be made only for the quantities of work performed or materials furnished in accordance with the contract.

SUMMARY OF STRUCTURE QUANTITIES

ITEM Nº	103(1)	461(1)	461(2)	461(3)	533(1)
STATION TO STATION	Excavation for Structures	6 Inch Galv Corr Metal Drain Pipe	Metal Drain Inlets	Metal Drain Outlets	Bituminous Curbs
	Cu Yd	Lin Ft	Each	Each	Lin Ft.
6 Inch Metal Drain Pipe					
213+50 Rt	12	88	1	1	
243+00 Rt.	5	34	1	1	
266+40 Rt	5	34	1	1	
303+75 Rt.	2	12	1	1	
328+00 Rt.	1	8	1	1	
353+50 Rt.	1	10	1	1	
356+50 Rt.	9	62	1	1	
372+00 Rt	2	14	1	1	
[illegible]+00 Rt.	3	20	1	1	
514+00 Lt.	2	16	1	1	
518+00 Lt.	4	30	1	1	
585+00 Rt.	4	26	1	1	
[illegible]+50 Rt	10	70	1	1	
634+50 Lt.	7	50	1	1	
640+00 Lt	3	24	1	1	
Bituminous Curbs					
45+[illegible] to 48+25 Rt					250
[illegible] to 80+20 Rt.					710
58+[illegible] to 92+50 Rt.					375
89+[illegible] to 93+00 Lt.					375
95+00 to 100+00 Lt.					440
106+60 to 109+50 Lt.	8				290
130+25 to 134+00 Rt.					375
144+00 to 150+00 Lt.	17				600
[illegible]+70 to 166+75 Rt.					405
169+75 to [illegible]+75 Rt.					300
181+50 to 185+00 Lt.					350
185+00 to 192+00 Rt.					700
213+50 to 217+00 Rt.					350
219+75 to 226+00 Rt.					625
243+00 to 244+50 Rt.					150
246+00 to 250+25 Rt.					425
266+40 to 271+50 Rt.					510
282+00 to 286+50 Rt.					450
288+20 to 291+20 Lt.	8				300
298+00 to 301+00 Lt.					300
303+75 to 305+25 Rt.					150
304+50 to 307+50 Lt.	8				300
309+25 to 313+25 Rt.					400
321+00 to 342+00 Rt.					2,120
336+70 to 338+70 Lt.	6				200
352+50 to 356+00 Rt.					350
368+00 to [illegible]+00 Rt.					1,000
402+00 to 410+00 Lt.					800
431+00 to 435+00 Lt.					400
[illegible] to 445+00 Lt.					520
450+[illegible] to 456+50 Lt.					600
[illegible] to 460+00 Rt.					300
[illegible] to 474+50 Lt.					500
494+50 to [illegible]+50 Rt.					300
504+00 to [illegible]+00 Lt.					1,200
544+00 to [illegible]+00 Rt.					400
564+00 to 572+00 Rt.					300
[illegible] to 590+75 Rt.					775
[illegible] to 600+50 Rt.					550
631+00 to 646+00 Lt.					700
Struct Excav for Bit Rundowns					
	26				
Totals	143	446	15	15	21,055
Use	150	500	15	15	[illegible]

Station to Station	534(2) Bituminous Rundowns	583(2) Galv. Beam Type Guard Rail
	Lin Ft	Lin Ft
Bituminous Rundowns		
45+75 Rt.	20	
73+10 Rt.	20	
88+75 Rt	20	
89+25 Lt.	20	
95+60 Lt.	20	
130+25 Rt.	20	
162+70 Rt.	20	
169+75 Rt	20	
181+50 Lt.	20	
185+00 Rt	20	
219+75 Rt.	20	
246+30 Rt.	20	
282+00 Rt.	20	
[illegible]+00 [illegible]	20	
[illegible] Rt	20	
321+00 Rt.	20	
368+00 Rt	20	
4[illegible]+00 Lt.	20	
435+00 Lt.	20	
445+00 Lt.	20	
456+50 Lt	20	
474+50 Lt	20	
[illegible] Rt	20	
553+00 Rt.	20	
576+00 Rt	20	
595+00 Rt	20	
Guard Rail		
46+[illegible] to 48+50 Lt.		200
46+50 to 53+50 Rt.		700
57+50 to 61+00 Rt		350
97+25 to 100+00 Rt		275
142+00 to 145+00 Rt		300
211+00 to 215+00 Rt		400
280+00 to 283+00 Rt.		300
349+50 to 354+00 Rt		450
361+00 to 363+50 Rt		250
553+00 to 559+00 Rt		600
578+25 to 590+75 Rt		1,250
633+50 to 643+00 Lt		950
634+25 to 639+25 Rt		500
Totals	550	6,575
Use	550	6,600

RECAPITULATION OF ITEMS

ITEM Nº	NAME	UNIT	QUANTITY
10	Miscellaneous Force Account	C.S.	C.S.
102(1)	Unclassified Excavation	Cu. Yd	5,000
103(1)	Excavation for Structures	Cu. Yd	150
107(1)	Finishing Prev Const. Roadbed	Mile	4.04
108(1)	Watering	Unit	650
109(1)	Rolling	Hour	100
200(4)	Crushed Aggregate Base, Grading E.	Ton	18,000
201(1)	Reconditioning of Roadbed	Mile	0.5
310(4)	Asphalt, grade MC-0, or MC-1, Prime Coat	Ton	105
311(4)	Emulsified Asphalt, Grade SS-1, Tack Coat	Ton	38
313(12)	Emulsified Asphalt, Grade SS-1, Seal Coat	Ton	75
317(1)	Plant Mixture	Ton	29,000
317(3)	Asphalt, 120-150 Penetration Plant Mix	Ton	1,700
461(1)	6 Inch Galv. Corr. Metal Drain Pipe	Lin. Ft.	500
461(2)	Metal Drain Inlets	Ea.	15
461(3)	Metal Drain Outlets	Ea	15
533(1)	Bituminous Curbs	Lin Ft.	21,500
534(2)	Bituminous Rundowns	Lin. Ft.	550
583(2)	Galvanized Beam Type Guard Rail	Lin Ft.	6,600

SUMMARY OF QUANTITIES

Monte Cristo Road ROUTE: 2

PROJECT: 2-2 (2)

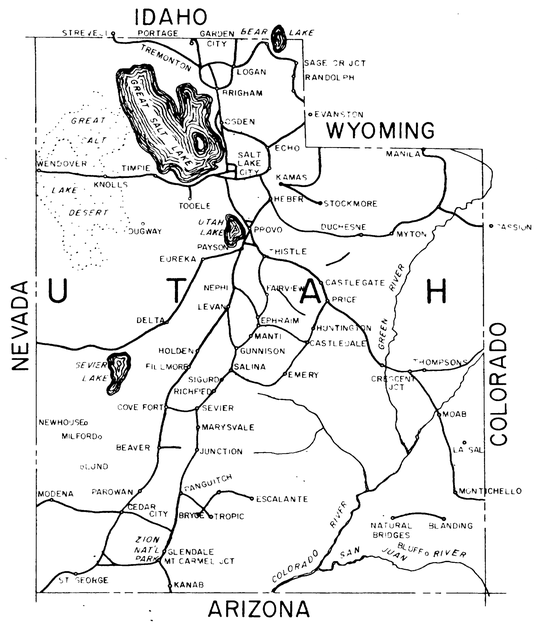
STATE: Utah COUNTY: Rich, Cache and Weber

NATIONAL: Forest: Cache

Sheet 2 of 2 Sheet

Compiled by: [illegible] Date: 4/6/66
Checked by: [illegible] Date: 4-5-66
Correct: Date:

Bureau of Public Roads Region 9 Denver, Colo.



U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

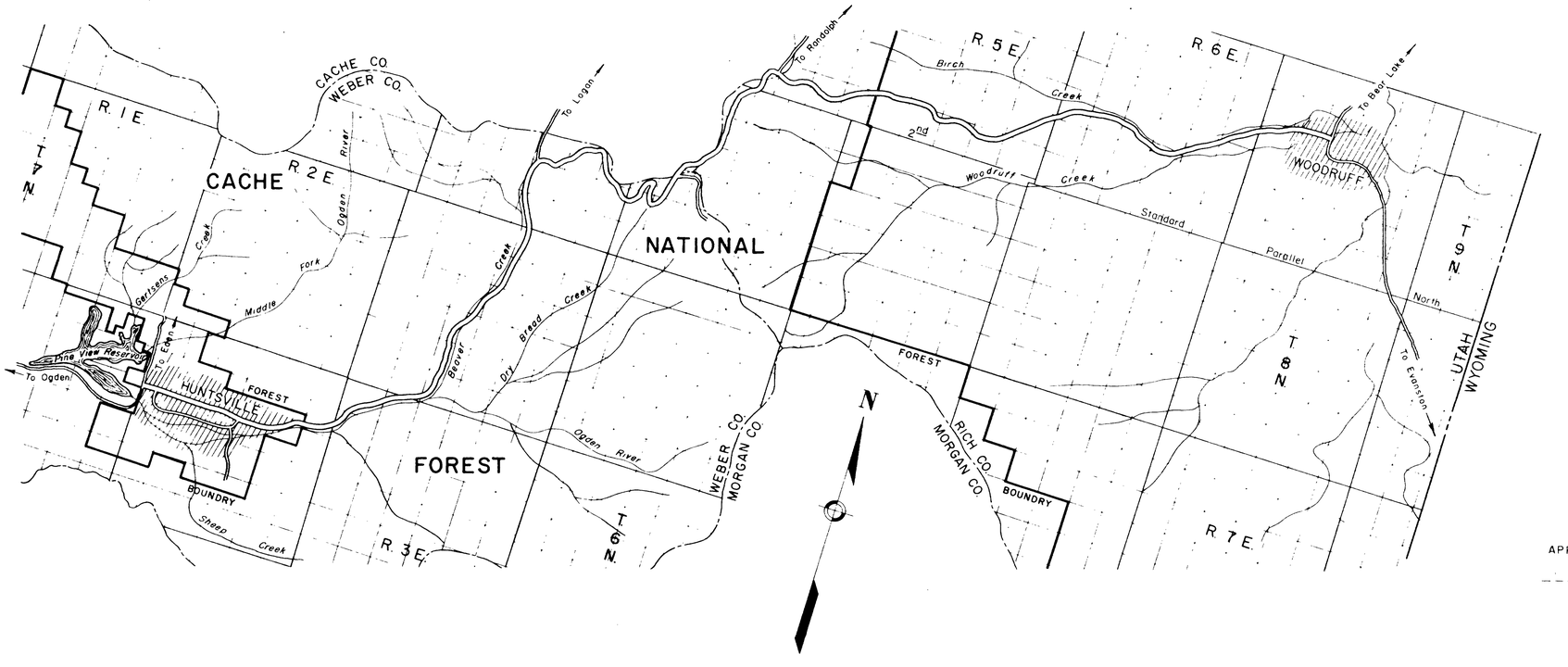
REGION 9 STATE UTAH
PROJECT
SHEET 1 OF SHEETS

PLANS FOR PROPOSED
UTAH FOREST HIGHWAY PROJECT 2-A
WOODRUFF HUNTSVILLE
LENGTH MILES
CLASS-2

CACHE NATIONAL FOREST
CACHE, WEBER & RICH COUNTIES

INDEX TO SHEETS

SHEET NO	DESCRIPTION	STATION to STATION	



LEGEND

OTHER ROADS	UNIMPROVED	GRADED	REINFORCED SUBGRADE	BASE COURSE	SURFACE TREATMENT	RD OR PLANT MIX BITUM	CONCRETE

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

APPROVED:

_____ DATE _____ 19___
REGIONAL ENGINEER

BPR REG. 9, JLH 1959


9 Utah 2 A 4
PLAN
PROFILE
Present Road
Vehicle Tracks
S.W.¼, Sec. 22 T.8N, R.3E.
S.E.¼, Sec. 22 T.8N, R.3E.
N.W.¼, Sec. 27 T.8N, R.3E.
N.E.¼, Sec. 27 T.8N, R.3E.
North
East
N. 39°52'E.
N. 40°52'E.
S.78°08'E.
R/W Line
(2) Janet Byram, et al Ogden, Utah (Owner)
(1) State of Utah (Owner)
TΔ=62°00' TS=789.38' Δc=52°00' D=5° Rt. L=1040'
TΔ=61°00' TS=944.41' Δc=53°00' D=4° Lt. L=1325'
Δs=5°00' Ls=200'
Δs=4°00' Ls=200'
P.S. 0+00
P.S.C. 2+00
P.C.S. 12+40
P.S.T. 14+40
P.S. 17+90
P.S.C. 19+90
P.C.S. 33+15
(Sc) 975' (Sc) Sta. 30+48
¼ Cor.
Const. Rd. Appr. Rt.
T-1 7011.0
T-2 7053.89
T-3 7086.97
T-4 7138.27
T-5 7153.56
100,000 N
99,500 N
99,500 E
100,000 E
101,000 E
102,000 E
△ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
Heavy Sagebrush
Refl. Guide Posts Lt.
600' V.C.
7002.7
7035.0
5+00 ~ 24" C.M.P. 56' Long ~ 2 M.E.S. P.I. 7017.0
11+50 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Rt.
16+50 ~ 24" C.M.P. 52' Long ~ 1 Hdwl. Rt. 1 M.E.S. Lt.
20+00 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Rt. 1 M.E.S. Lt.
25+50 ~ 30" C.M.P. 42' Long ~ 2 Hdwls.
Road Appr. Rt. 29+75 ~ 18" C.M.P. 36' Long ~ No Hdwls.
+3.1%
+6.0%
+6.0%
U.S.G.S. Datum shown.
Prism Quantities shown.
Uncl. Excav. 9,905 Cu. Yds.
Emb't. 11,639 " "
To Sta. 37+45
To Sta. 34+70
7000 7010 7020 7030 7040 7050 7060 7070 7080
7080 7090 7100 7110 7120 7130 7140 7150 7160
0 1 2 3 4 5 6 7 8 9 10 1 2 3 4 15 6 7 8 9 20 1 2 3 4 25 6 7 8 9 30
Drawn & Traced W.H.T. 2-59
Drawn & Traced W.H.T. 4-59


9 Utah 2 A 5
① State of Utah (Owner)
② Janet Byram, et al Ogden, Utah (Owner)
③ M. S. Marriott 1657 Washington Ave. Ogden, Utah (Owner)
TΔ = 61°00′ TS = 944.41′ Δc = 53°00′ D = 4° Lt. L = 1325′
P.C.S. 33+15
P.S.T. 35+15
Δs = 4°00′ Ls = 200′
N. 40°52′ E. R/W Line
R/W Line
Vehicle Tracks
Road
Present
975′ (Sc.)
(Sc.) Sta. 30+48 East
N.E. ¼ Sec. 27 T.8N., R.3E.
S.E. ¼ Sec. 22 T.8N., R.3E.
S.W. ¼ Sec. 23 T.8N., R.3E.
P.S. 37+45
Δs = 5°00′ Ls = 200′
P.S.C. 39+45
TΔ = 36°30′ TS = 478.33′ Δc = 26°30′ D = 5° Lt. L = 530′
P.C.S. 44+75
Δs = 5°00′ Ls = 200′
P.S.T. 46+75
N. 77°22′ E.
P.S. 48+25
Δs = 9°00′ Ls = 200′
P.S.C. 50+25
TΔ = 55°48′ TS = 438.38′ Δc = 37°48′ D = 9° Lt. L = 420′
P.C.S. 54+45
Sta. 51+45 (Sc.)
Δs = 9°00′ Ls = 200′
P.S.T. 56+45
1112′ (Sc.)
N. 21°34′ E.
North
N
Δ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 0+00
Heavy Sagebrush
Lt. Aspen
Refl. Guide Posts Lt.
To Sta. 66+00
+6.0%
+4.0%
+4.0%
+4.0%
+6.2%
1000′ V.C.
800′ V.C.
31+00 ~ 24″ C.M.P. 52′ Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
7182.0
P.I. 7212.0
7232.0
47+81 ~ 30″ C.M.P. 176′ Long ~ No Hdwl's. (12 Gage)
52+50 ~ 24″ C.M.P. 96′ Long ~ 1 Hdwl. Lt.
7278.0
P.I. 7294.0
59+00 ~ 24″ C.M.P. 126′ Long ~ 1 Hdwl. Lt.
U.S.G.S. Datum shown
Prism Quantities shown
Refl. Guide Posts Rt.
From Sta. 28+12 Uncl. Excav. 1,674 Cu. Yds. Emb't. 2,151 " "
Uncl. Excav. 13,153 Cu. Yds. Emb't. 13,023 " "
Uncl. Excav. 14,835 Cu. Yds. Emb't. 14,061 " "
To Sta. 64+87
PLAN
PROFILE
Drawn & Traced W.H.T. 2-59
Drawn & Traced W.H.T. 4-59


9 Utah 2 A 6
Δ=17°30'
T=251.97'
D=3°30' Lt.
L=500'
P.C. 66+15
P.T. 71+15
N. 21°34' E.
N. 4°04' E.
R/W Line
Present Road
Vehicle Tracks
Sta. 68+47 (Sc)
P.S. 73+11
P.S.C. 75+11
C.S. 80+16
P.S.T. 82+16
Δs=14°00'
Ls=200'
TΔ=98°42'
TS=581.20'
Δc=70°42'
D=14° Rt.
L=505'
S. 77°14' E.
Const. R/W Appx. Lt.
③ M.S. Marriott
1657 Washington Ave.
Ogden, Utah
(Owner)
S.W.¼ Sec. 23
T.8N., R.3E.
N.W.¼ Sec. 23
T.8N., R.3E.
Δ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
PLAN
Drawn & Traced W.H.T. 2-59
From Sta. 44+50
Heavy Sagebrush
Med. Aspen
Refl. Guide Posts Rt.
Heavy Sagebrush
To Sta. 94+00
Lt. Aspen
Refl. Guide Posts Lt.
To Sta. 93+00
+6.2%
+6.4%
+2.0%
7318.8
7343.6
P.I. 7356.0
7368.8
400' V.C.
7391.2
P.I. 7429.6
1200' V.C.
7441.6
7445.6
66+00 ~ 24" C.M.P. 52' Long ~ 1 Hdwl. Lt.
71+50 ~ 24" C.M.P. 58' Long ~ 1 Hdwl. Lt.
75+50 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
80+00 ~ 24" C.M.P. 48' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
84+50 ~ 24" C.M.P. 100' Long ~ No Hdwls.
U.S.G.S. Datum shown.
Prism Quantities shown.
From Sta. 57+50 Refl. Guide Posts Rt.
From Sta. 55+51 Uncl. Excav. Emb't.
19,601 Cu. Yds.
18,451 " "
Uncl. Excav. Emb't.
11,120 Cu. Yds.
11,679 " "
Refl. Guide Posts Rt.
Uncl. Excav. Emb't.
24,189 Cu. Yds.
22,593 " "
Refl. Guide Posts Rt.
To Sta. 92+50
PROFILE
Drawn & Traced W.H.T. 4-59

PLAN		BY	DATE
NOTE BOOK	SURVEYED Aerial (Ptgr.) Ground Control	J.L.M.S. T.L.H.	1958 1958
NO.	ALIGNMENT CHECKED		
	RT OF WAY CHECKED		
	Drawn & Traced	W.H.T.	3-59

M. S. Marriott
1657 Washington Ave.
Ogden, Utah
(Owner)
P.S. 93+60
Sta. 95+00 (Sc.)
Δs = 6°00'
Ls = 200'
P.S.C. 95+60
Δc = 45°36'
T = 401.41'
D = 6° Lt.
L = 760'
P.C.S. 103+20
Δs = 8°00'
Ls = 200'
ST = 83.55'
LT = 116.92'
P.S.C. 105+20
Δc = 15°36'
T = 392.45'
D = 2° Lt.
L = 780'
P.C.S. 113+00
Δs = 2°00'
Ls = 200'
P.S.T. 115+00
P.S. 121+44.52
Utah 2 A 7
R/W Line
S. 77°14' E.
S. 83°14' E.
N. 51°10' E.
N. 43°10' E.
N. 27°34' E.
N. 25°34' E.
610' (Sc.) North
NW. 1/4 Sec. 23
T.8N., R.3E.
NE. 1/4 Sec. 23
T.8N., R.3E.
Present Road
Δ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."

PROFILE		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	GRADES CHECKED		
	B. M.S NOTED		
	STRUCTURE NOTAT'NS CHK'D.		
	Drawn & Traced	W.H.T.	4-59

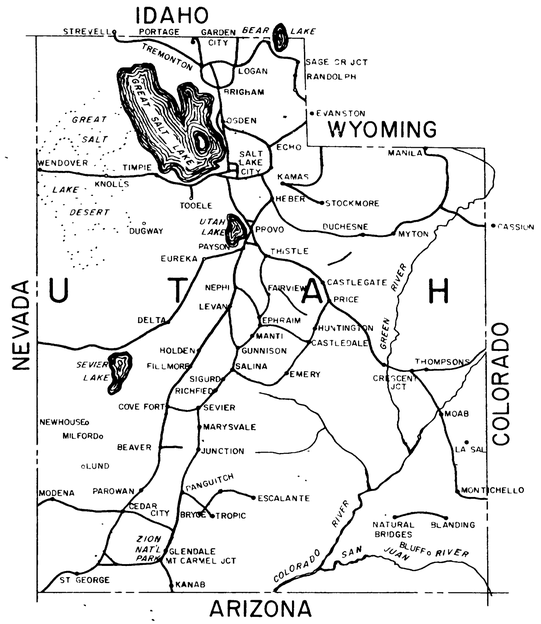
From Sta. 76+50 Heavy Sagebrush
Lt. Aspen
Med. Aspen
Heavy Sagebrush
To Sta. 128+50
From Sta. 89+50 Refl. Guide Posts Lt.
Refl. Guide Posts Lt.
800' V.C.
90+50 ~ 48" C.M.P. 152' Long ~ No Hdwl's. (10 Gage)
P.I. 7453.6
7480.8
+6.8%
+2.0%
98+95 ~ 48" C.M.P. 110' Long ~ No Hdwl's.
106+00 ~ 24" C.M.P. 74' Long ~ 1 Hdwl. Lt.
109+00 ~ 24" C.M.P. 74' Long ~ 1 Hdwl. Lt.
113+50 ~ 24" C.M.P. 72' Long ~ 1 Hdwl. Lt.
120+00 ~ 24" C.M.P. 58' Long ~ 1 Hdwl. Lt.
7586.2
P.I. 7627.0
1200' V.C.
+3.0489%
From Sta. 89+00 Refl. Guide Posts Rt.
U.S.G.S. Datum shown.
Prism Quantities shown.
From Sta. 81+14
Refl. Guide Posts Rt.
Uncl. Excav. 39,209 Cu. Yds.
Emb't. 38,274 " "
Refl. Guide Posts Rt.
To Sta. 122+00

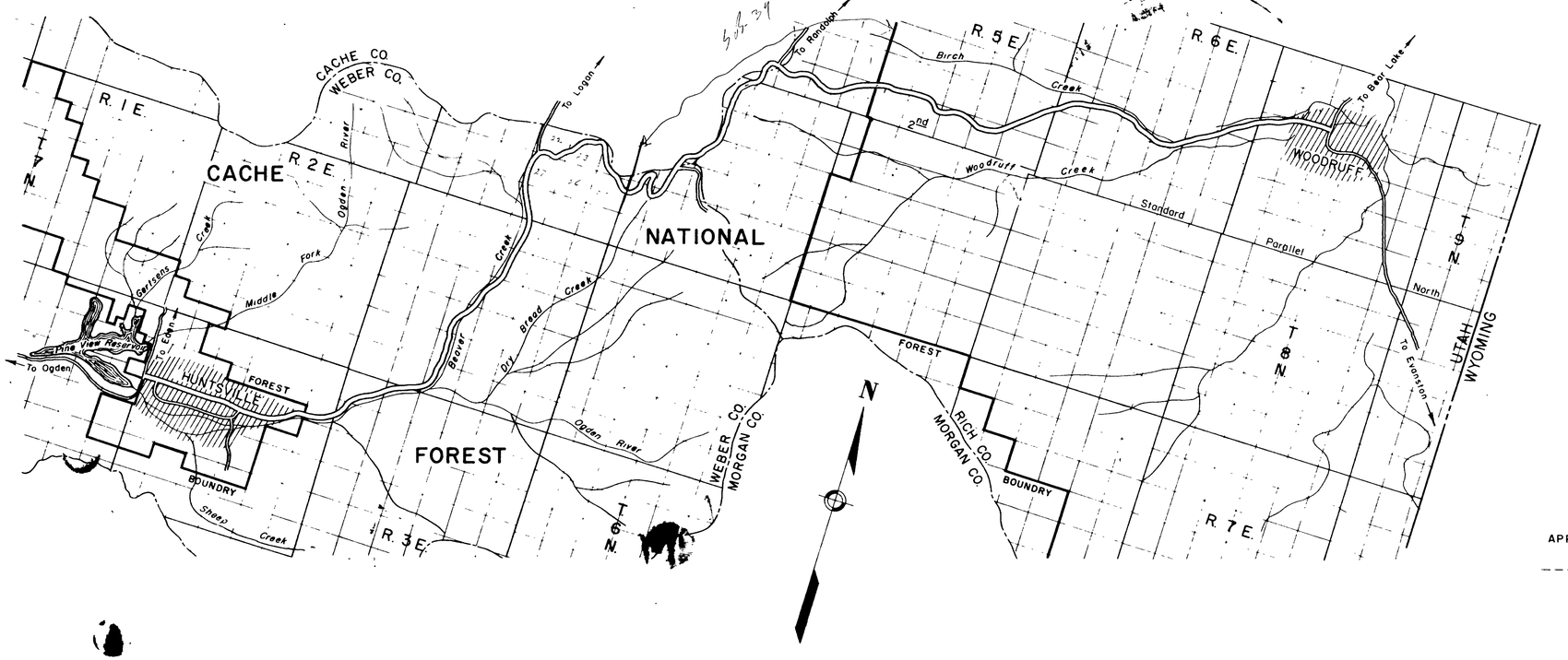

9 Utah 2 A 8
PLAN
Drawn & Traced W.H.T. 3-59
E.R. Mc kay
Huntsville, Utah
(Cache County)
M.S. Marriott
Ogden, Utah
(Assessed in Weber Co.
M.S. Marriott
(Assessed in Cache Co.
△ = Ground Control Station
N.E.¼ Sec. 23
T.8N., R.3E.
"The Alignment and Grade as hereon
shown are subject to adjustment."
TΔ = 109°12'
TS = 873.77'
Δc = 88°12'
D = 10°30' Lt.
L = 840'
Δc = 184°32'
D = 16° Rt.
L = 1153.33'
R = 358.10'
P.S.T. 149+20
P.C.S. 147+20
P.S. 136+80
P.S.C. 138+80
P.C.S. 134+97.85
P.S.T. 136+97.85 Bk. = 136+65.39 Ah.
P.S.C. 123+44.52
P.S. 121+44.52
EQUATION
Present Sta. 135+25 (SC)
Δs = 10°30'
Ls = 200'
Δs = 16°00'
Ls = 200'
ST = 67.17'
LT = 133.88'
R/W Line
Road
North
East
N. 25°34' E.
S. 47°06' E.
S. 62°06' W.
109,000 E
108,500 E
108,000 E
104,500 N
104,000 N
105,500 N
PROFILE
Drawn & Traced W.H.T. 4-59
From Sta. 99+50
Heavy Sagebrush
Med. Aspen
Heavy Segebrush
To Sta. 156+50
125+00 ~ 24" C.M.P. 58' Long ~ 2 M.E.S.
132+50 ~ 36" C.M.P. 82' Long ~ No Hdwl's.
LONG EQUATION Sta. 136 to 137 = 132.46'
136+97.85 Bk. = EQUATION 136+65.39 Ah.
P.I. 7684.93
136+80 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
142+00 ~ 24" C.M.P. 92' Long ~ 1 Hdwl. Lt.
148+00 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
7645.3
7717.4
+3.0489%
+3.0489%
+3.0%
Refl. Guide Posts Lt.
Refl. Guide Posts Rt.
U.S.G.S. Datum shown.
Prism Quantities shown.
From Sta. 90+91
Uncl. Excav. 4,156 Cu. Yds.
Emb't. 4,687 " "
Uncl. Excav. 6,076 Cu. Yds.
Emb't. 6,119 " "
Uncl. Excav. 7,333 Cu. Yds.
Emb't. 7,066 " "
To Sta. 154+00
To Sta. 159+80
7630 7640 7650 7660 7670
7660 7670 7680 7690 7700 7710 7720 7730
120 1 2 3 4 125 6 7 8 9 130 1 2 3 4 135 6 6 7 8 9 140 1 2 3 4 145 6 7 8 9 150

9 Utah 2 A 9
PLAN
SURVEYED Ground Control Aerial (Proj.)
ALIGNMENT CHECKED
RT OF WAY CHECKED
NOTE BOOK
Drawn & Traced W.H.T. 3-59
N.W. 1/4 Sec. 24 T.8N., R.3E.
N.E. 1/4 Sec. 23 T.8N., R.3E.
S.W. 1/4 Sec. 24 T.8N., R.3E.
North
P.S.T. 149+20
S. 47°06' E.
R/W Line
P.S. 157+52.66
Δs=10°00' Ls=200'
P.S.C. 159+52.66
P.C.S. 160+27.49
Δs=10°00' Ls=200
TΔ=27°29' TS=240.82' Δc=7°29' D=10° Lt. L=74.83'
P.S.T. 162+27.49
S. 74°35' E.
P.S. 162+68.05
Δs=12°00' Ls=200'
P.S.C. 164+68.05
TΔ=100°17' TS=675.93' Δc=76°17' D=12° Rt. L=635.69'
P.C.S. 171+03.74
Δs=12°00' Ls=200'
EQUATION P.S.T. 173+03.74 Bk. = 172+94.70 Ah.
S. 25°42' W.
P.S. 174+75
Δs=8°00' Ls=200'
P.S.C. 176+75
TΔ=66°00' TS=566.55' Δc=50°00' D=8° Lt. L=625'
S. 40°18' E.
Present Road
110,500 E
101,500 N
103,000 N
109,000 E
103,500 N
108,500 E
102,500 N
109,500 E
625' (Sc.) Sta. 153+20
Not Found
℄ Sec. 24
5 M.S. Marriott Ogden, Utah (Assessed in Weber Co.)
6 M.S. Marriott (Assessed in Cache Co.)
△ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
PROFILE
SURVEYED
P.L.
GRADES CHECKED
B.M.'s NOTED
STRUCTURE NOTAT'NS CH.KD.
Drawn & Traced W.H.T. 4-59
From Sta. 146+00
Heavy Sagebrush
Med. Aspen
Scattered Aspen
To Sta. 215+50
From Sta. 140+00 Refl. Guide Posts Rt.
U.S.G.S. Datum shown.
Prism Quantities shown.
154+00 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
158+50 ~ 24" C.M.P. 68' Long ~ 1 M.E.S. Lt.
165+50 ~ 24" C.M.P. 84' Long ~ No. Hdwl's.
171+00 ~ 24" C.M.P. 72' Long ~ No Hdwl's.
174+50 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
+6.0%
+3.9602%
+4.0%
+3.0% From Sta. 143+02
P.I. 7729.4
7753.4
7795.4
P.I. 7837.4
7865.1
P.I. 7873.4
800' V.C.
1400' V.C.
173+03.74 Bk. = EQUATION 172+94.70 Ah.
LONG STATION STA. 173 to 174 = 109.04'
Refl. Guide Posts Rt.
Unclas. Excav. 4,285 Cu. Yds.
Emb't. 13,820
Borrow 9,221
Uncl. Excav. 8,009 Cu. Yds.
Emb't. 8,028
Uncl. Excav. 3,681 Cu. Yds.
Emb't. 3,800
Uncl. Excav. 8,267 Cu. Yds. To Sta. 184+62
Emb't. 8,493
7720 7730 7740 7750 7760 7770 7780 7790 7800
7780 7790 7800 7810 7820 7830 7840 7850 7860
7860 7870 7880 7890
150 1 2 3 4 155 6 7 8 9 160 1 2 3 4 165 6 7 8 9 170 1 2 3 3 4 175 6 7 8 9 180


9 Utah 2 A 10
S.W.¼ Sec. 24
T.8N., R.3E.
S.E.¼ Sec. 24
T.8N., R.3E.
N.E.¼ Sec. 25
T.8N., R.3E.
(7) M.S. Marriott
Ogden, Utah
(Assessed in Weber Co.)
(6) M.S. Marriott
(Assessed in Cache Co.)
N.W.¼ Sec. 25
T.8N., R.3E.
P.S.C. 176+75
TΔ=66°00'
TS=566.55'
Δc=50°00'
D=8° Lt.
L=625'
P.C.S. 183+00
P.S.T. 185+00
Δs=8°00'
Ls=200'
S. 25°42' W.
S. 40°18' E.
N. 61°42' E.
P.R.S. 213+00
P.C.S. 211+00
Δs=12°00'
Ls=200'
P.S.C. 206+50
TΔ=78°00'
TS=489.32'
Δc=54°00'
D=12° Lt.
L=450'
P.S. 204+50
Δs=12°00'
Ls=200'
R/W Line
Present Road
Const. Rd. Appr. Rt.
Sta. 198+15 (Sc.)
Sta. 202+75 (Sc.)
△ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 164+50
To Sta. 215+50
Scattered Aspen
Refl. Guide Posts Rt.
Refl. Guide Posts Lt.
183+00 ~ 24" C.M.P. 78' Long ~ No Hdwl's.
Road Appr. Rt. 185+50 ~ 18" C.M.P. 38' Long ~ No Hdwl's.
188+00 ~ 24" C.M.P. 62' Long ~ 2 M.E.S.
192+00 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
199+00 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Lt.
206+00 ~ 24" C.M.P. 74' Long ~ 1 M.E.S. Lt.
7965.4
P.I. 7973.4
7979.0
7992.8
400' V.C.
+4.0%
+2.775%
U.S.G.S. Datum shown.
Prism Quantities shown.
From Sta. 173+29
Uncl. Excav. 8,930 Cu. Yds.
Emb't. 9,608 " "
PLAN
PROFILE
Drawn & Traced W.H.T. 3-59


9 Utah 2 A 11
S.E.¼ Sec.24
T.8N.,R.3E.
N.E.¼ Sec.25
T.8N.,R.3E.
N.W.¼ Sec.30
T.8N.,R.4E.
T.8N.,R.4E.
T.8N.,R.3E.
N. 1°46' E. (Resurvey)
N. 61°42' E.
S. 40°18' E.
S. 20°48' E.
N. 40°12' E.
P.R.S. 213+00
P.C.S. 211+00
P.S. 204+50
P.S.C. 206+50
Δs=12°00'
Ls=200'
TΔ=78°00'
TS=489.32'
Δc=54°00'
D =12° Lt.
L =450'
P.S.C. 215+00
Δs=10°00'
Ls=200
TΔ=97°30'
TS=756.57'
Δc=77°30'
D =10° Rt.
L =775'
P.C.S. 222+75
Δs=10°00'
Ls=200'
P.S.T. 224+75
P.S. 232+15
Δs=14°00'
Ls=200'
P.S.C. 234+15
TΔ=119°00'
TS=801.49'
Δc=91°00'
D =14° Lt.
L =650'
P.R.S. 242+65
P.C.S. 240+65
Δs=14°00'
Ls=200
R/W Line
Present
Road
M.S. Marriott
Ogden, Utah
(Assessed in Weber Co.)
△ = Ground Control Station
"The Alignment and Grade as hereon
shown are subject to adjustment."
Sec.24
Sec.25
East
U.S.G.S. Datum shown
Prism Quantities shown
+2.775%
+4.7%
1000' V.C.
P.I. 8006.7
7992.8
8030.2
211+00 ~ 24" C.M.P.
52' Long ~ 1 Hdwl. Lt.
213+50 ~ 24" C.M.P.
136' Long ~ No Hdwls.
221+50 ~ 30" C.M.P.
114' Long ~ No Hdwls.
225+50 ~ 24" C.M.P.
46' Long ~ 1 Hdwl. Lt.
1 M.E.S. Rt.
229+50 ~ 24" C.M.P.
46' Long ~ 1 Hdwl. Lt.
1 M.E.S. Rt.
234+00 ~ 24" C.M.P.
74' Long ~ 1 Hdwl. Lt.
238+50 ~ 24" C.M.P.
72' Long ~ 1 Hdwl. Lt.
PLAN
PROFILE
Drawn & Traced
W.H.T.
3-59
4-59





LEGEND

OTHER ROADS	UNIMPROVED	GRADED	REINFORCED SUBGRADE	BASE COURSE	SURFACE TREATMENT	RD OR PLANT MIX BITUM	CONCRETE

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

PLANS FOR PROPOSED

UTAH FOREST HIGHWAY PROJECT 2-A

WOODRUFF HUNTSVILLE

LENGTH MILES

CLASS-2

CACHE NATIONAL FOREST

[redacted], WEBER [redacted] COUNTIES

REGION 9 STATE UTAH
PROJECT
SHEET 1 OF SHEETS

INDEX TO SHEETS

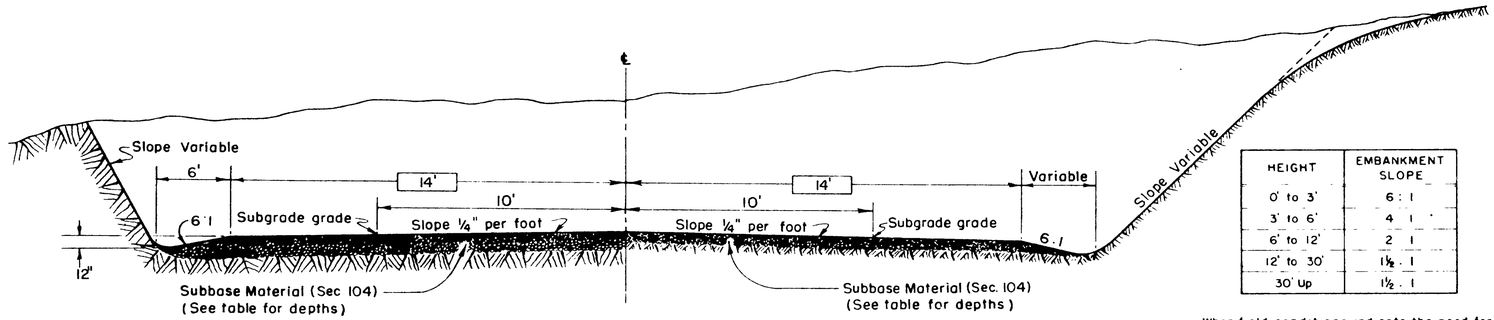
SHEET NO.	DESCRIPTION	STATION	to STATION

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

APPROVED:

_____ DATE _____ 19__
REGIONAL ENGINEER

BPR REG 9, JLH 1959



TYPICAL HALF CUT SECTION IN ROCK

TYPICAL HALF CUT SECTION IN COMMON

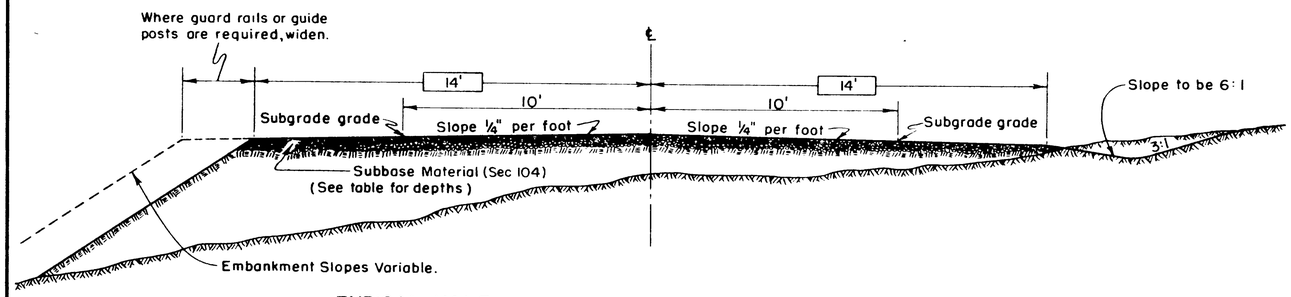
HEIGHT	EMBANKMENT SLOPE
0' to 3'	6 : 1
3' to 6'	4 : 1
6' to 12'	2 : 1
12' to 30'	1½ : 1
30' up	1½ : 1

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

SLOPE ROUNDING FACTORS			ALTERNATE ROUNDING DIMENSIONS	
NATURAL GROUND SLOPE	CUT SLOPE		SEMI-TANGENTS †	
	HEIGHT	RATIO ▽	Back of Slope Stake "B"	Front of Slope Stake "F"
VARIABLE	0'-5'	3:1	5'	5'
VARIABLE	5'-10'	2:1		
RELATIVELY FLAT (6:1 AND FLATTER)	10'-15'	1½:1	5'	8'
	15'-30'	1¼:1		
	OVER 30'	1:1		
MODERATELY STEEP (6:1 TO 3:1)	10'-15'	1½:1	5' OR 3'	8' ** 5' *
	15'-30'	1¼:1		
	OVER 30'	1:1		
STEEP (STEEPER THAN 3:1)	10'-15'	1½:1	3'	5' *
	15'-30'	1¼:1		
	OVER 30'	1:1		

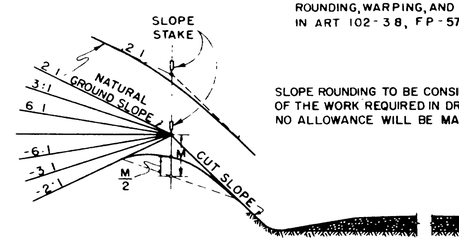
† Measured on slope surface.
** Desirable
* Minimum (Wooded)
▽ These ratios are desirable in steep terrain.

NOTE:- In areas where existing conditions permit, use more liberal rounding with unequal semi-tangents. (Approximating a parabolic curve.)



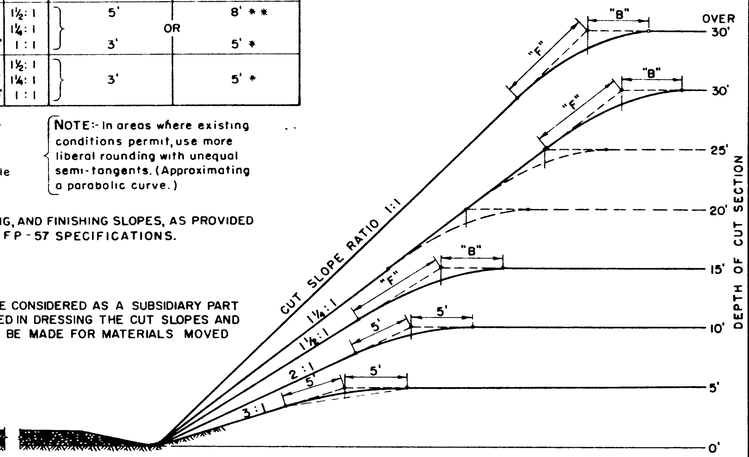
TYPICAL HALF EMBANKMENT SECTION

TYPICAL HALF SHALLOW EMBANKMENT SECTION



SLOPE ROUNDING TO BE CONSIDERED AS A SUBSIDIARY PART OF THE WORK REQUIRED IN DRESSING THE CUT SLOPES AND NO ALLOWANCE WILL BE MADE FOR MATERIALS MOVED

← For Rounding Dimensions "B" and "F", See Table.



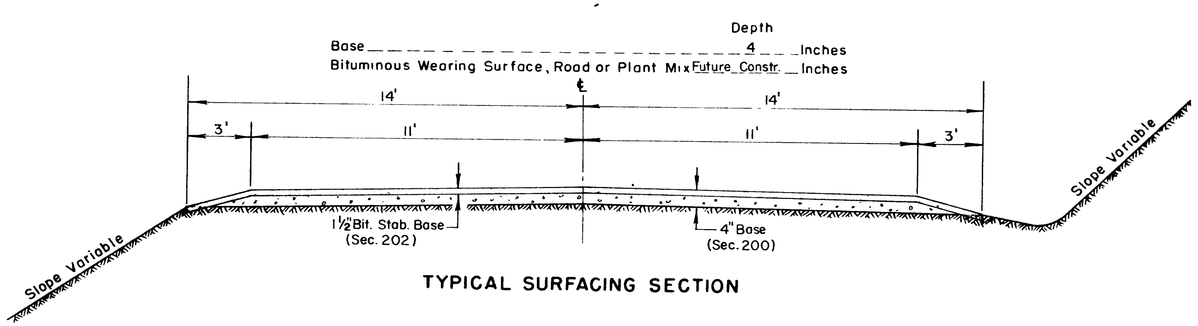
ROUNDING, WARPING, AND FINISHING SLOPES, AS PROVIDED IN ART 102-38, FP-57 SPECIFICATIONS.

CUT SLOPE ROUNDING

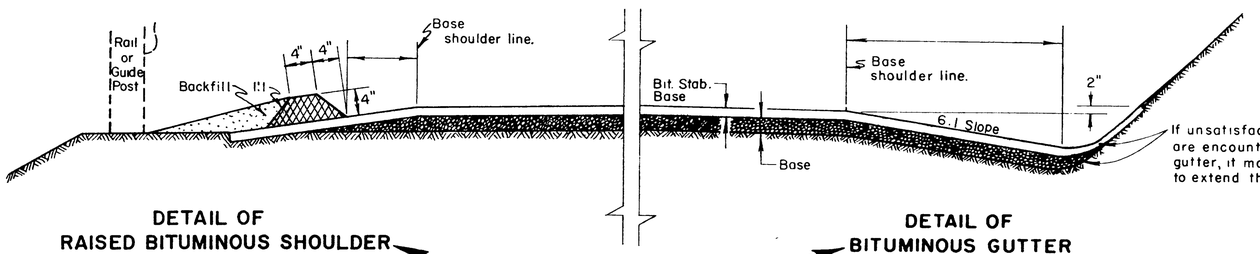
SPECIAL STABILIZING MATERIAL

STATION to STATION		SUBBASE Item 104(2)	SELECTED BORROW Item 102( )
0+00	200+84	9"	

Any materials encountered in the Roadway and Borrow Excavation Section 102, which are in the opinion of the engineer, equal in quality to the above Item 104(2) shall be used in place thereof and Item 104(2) reduced accordingly



TYPICAL SURFACING SECTION



DETAIL OF RAISED BITUMINOUS SHOULDER ON WIDENED SECTIONS

DETAIL OF BITUMINOUS GUTTER

Not included in this contract

GENERAL NOTES

Where Borrow is specified in the contract and satisfactory material is found in the roadway excavation, the right is reserved to increase the amount of Unclassified Excavation and reduce the Borrow Excavation. When additional material is needed for completing embankments, stabilizing the subgrade, or for selected cushion or topping, it may be secured by uniformly widening thru or sidehill cuts or flattening cut slopes where satisfactory material is available. The slopes at the ends of all cuts shall be flattened and flared to improve appearance.

Furrow ditches shall be constructed on approximate one percent grades following the ground contour and when possible shall be so constructed that the direction of flow will be away from the roadway.

Topsoil shall be conserved and either placed in stockpiles or spread over cut and embankment slopes as directed and in accordance with the specifications.

Roadway ditches at the ends of cuts shall be constructed so as to carry the flow away from the adjacent embankment slopes.

Embankment slopes shall be uniformly warped between one rate of slope and another. The transition shall cover a distance of not less than fifty feet.

Subgrade grade to be on the surface of stabilized graded road and located ten feet from center line on tangents and insides of curves.

Bureau of Public Roads book of, "Transition Curves for Highways," shall be used to determine superelevation and transition lengths (Table I), and widening of curves (Table II).

SOILS DATA

The materials soils data shown on these plans are based on tests of samples obtained from the locations and depths shown, and are only for informational purposes. They do not reflect classification of the excavation. No responsibility is assumed by the Government as to the extent of materials represented by these tests. Any assumption by the contractor as to the extent of the materials represented by these samples is strictly his responsibility. The contractor must satisfy himself as to the nature of materials to be encountered by personal inspection of the project on the ground. If materials not conforming to the data show on these plans are encountered during construction, the grading plan will be modified where necessary to insure proper design.

APPROVED: W. E. Bennington Date: 2/26/58
Federal Highway Projects Engineer

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

TYPICAL CROSS SECTIONS

NATIONAL FOREST & PARK HIGHWAYS

REGION No. 9 STANDARD ROADBED: GRADED 28' Shoulder to Shoulder; BASE 22 " " "; BITUMINOUS WEARING SURFACE Future Constr.
PROJECT Utah 2-A, Woodruff-Huntsville
NATIONAL Forest: Cache
COUNTY: Cache, Weber & Rich
STATE Utah

Rev J L H 4-10-59, 6-22-59
Drawn & Traced W.A.G. June, 1954

SUMMARY OF ESTIMATED QUANTITIES

The following is an approximate estimate of quantities and no responsibility for their accuracy is assumed. No allowance will be made for anticipated profit or loss incurred due to the increase, decrease or elimination of any of the quantities shown that may be found necessary during construction.

SUMMARY OF QUANTITIES

ITEM №		100(3)	106		102(1)			102(5)	102(9)	104(2)	105(1)
STATION TO STATION		Clearing & Grubbing	Embankment From Item 104(2)	Embankment Prism	Unclassified Excavation Prism	Subgrade for Embankment	Over-Break & Slides	Borrow Excavation Case 2	Furrow Ditches	Special Subbase Grading B	Over-haul
		Acre	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Lin. Ft.	Ton	Sta-Yd.
0+00	28+12	4.55	2795	8844	9,905						55,434
28+12	34+70	1.24	656	1495	1,674						
34+70	47+80	2.56	1279	11,744	13,153						4,590
47+80	55+51	1.89	815	13,246	14,835	1393					
55+51	64+87	1.96	950	17,501	19,601	344					
64+87	81+14	2.94	1750	9,929	11,120	2240					3,532
81+14	90+91	2.38	996	21,597	24,189	324					
90+91	122+00	6.42	3266	35,008	39,209	158					226,665
122+00	131+45	1.81	976	3,711	4,156						
131+45	137+95	1.69	694	5,425	6,076						
137+95	143+02	1.30	519	6,547	7,333						
143+02	159+80	3.01	1761	12,059	4,285			9221			
159+80	168+46	1.39	877	7,151	8,009						
168+46	173+29	0.90	513	3,287	3,681						
173+29	184+62	2.16	1112	7,381	8,267						[illegible]
184+62	200+84	2.21	1635	7,973	8,930						8,086
Road Approaches:											
29+75	Rt.		50	240				270			
89+50	Lt.		75	1000				1120			
126+50	Rt.		50	250				[illegible]			
185+50	Lt.		75	860				960			
Sub Totals		38.40	20,844	175,248	184,423	4,459	3,000	11,851	3,800		298,979
Totals		38.40		175,248	184,?47			11,851	3,800	39,[illegible]	298,979
Use		40		75,300	194,000			12,000	4,000	39,500	300,000

ITEM №	108(1)	108(2)	109(1)	200(4)	202(1)	202(2)	202(3)	203(1)
	Water	Prov. & Maint. Water Pond or Plants	Rolling	Crushed Aggregate Base Grading E-1	Processing Bituminous Base	Asphalt Grade MC-0, 1, 2, or 3	Emulsified Asphalt Grade SS-1	Bituminous Additive Commercial Grade
	Unit	Lump Sum	Hour	Ton	Sq. Yd.	Ton	Ton	Ton
Totals	4,357		1,043	12,093	61,663	324.83	28.[illegible]3	2.27
Use	4,500	$1,000	1100	12,500	61,700	325	29	2.3

560(4) Guide Posts

Station	to Station	Distance	Number
			Ea.
3+00	12+00	900	19 L.
32+00	34+00	200	5 R.
46+00	48+50	250	5 L.
46+50	50+00	350	6 R.
52+00	53+50	150	4 R.
57+50	61+00	350	4 R.
64+50	80+00	1550	30 R.
82+00	85+00	300	4 R.
89+00	92+50	350	4 R.
89+50	93+00	350	4 L.
96+00	99+50	350	8 L.
98+00	115+00	1700	35 R.
119+00	120+00	100	2 R.
122+50	125+50	300	7 R.
130+69	133+75	306	8 R.
132+22	133+24	102	3 L.
140+00	154+00	1400	24 R.
156+50	161+00	450	9 R.
163+50	166+00	250	6 R.
165+50	166+00	50	2 L.
169+50	172+50	300	7 R.
182+00	191+50	950	13 R.
183+00	185+00	200	5 L.
199+00	199+50	50	1 R.
			215
Totals			215
Use			215

Summary of Unclassified Excavation:

	Cu. Yd.
Prism	184,423
Subgrade for Embankment	4,459
Over Break & Slides	3,000
Inlet & Outlet Ditches	1,775
Total	193,657

Length of Project	Feet	Miles
0+00 to 136+97.85	13,697.85	
136+65.33 to 173+03.78	3,638.35	
172+94.30 to 200+84	2,789.30	
Total	20,125.50	3.812

Base Course Surfacing:

	Length Feet	Width Feet	Sq. Ft.	Depth (inches)	Cu. Ft.
Roadway	20,126	22	442,772	4	
Shoulders	20,126	4	80,504	4	
Curve Widening	2,094	2	4,188	4	
Approach Roads	500	20	10,000	4	
Total			537,464		179,154

Processing Prime & Seal Coats:

	Width	Sq. Ft.	Sq. Yd.
Roadway	30	603,780	67,087
Curve Widening		4,188	4[illegible]
Approach Roads		10,000	[illegible]
Total			67,663

Compiled by: RHS Date: 4-29-59
Checked by: R.E.T. Date: 2-?-59
Correct: Date:
Bureau of Public Roads Region 9 Denver, Colo.

SUMMARY OF QUANTITIES

Woodruff-Huntsville ROUTE: 2-A
PROJECT: 2-A
STATE: UTAH COUNTY: WEBER
NATIONAL: CACHE NAT. FOREST

04

SUMMARY OF ESTIMATED QUANTITIES

The following is an approximate estimate of quantities and no responsibility for their accuracy is assumed. No allowance will be made for anticipated profit or loss incurred due to the increase, decrease or elimination of any of the quantities shown that may be found necessary during construction.

SUMMARY OF STRUCTURE QUANTITIES

ITEM №	102(1)	103(1)		406(1)	453 (1)							460(2)
STATION TO STATION	Unclass. Excav. for Culverts Inlets & Outlets	Excavation for Structures	Headwalls Number & Type	Class A Concrete	A 18"	B 24"	C 30	D 30" 12 Ga.	E 36"	F 48"	G 48" 10 Ga.	Metal End Sections for 24" Pipe Culvert
	Cu. Yd.	Cu. Yd.		Cu. Yd.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Ea.
5+00	5	20				56						2
11+50	35	15	1L, Rt	3.16		54						
16+50	50	25	1L, Rt	3.16		52						1-Lt
20+00	15	5	1L, Rt	3.16		50						1-Lt.
25+50	300	30	1L, Rt	4.16								
" "			1I, Lt	2.08			42					
29+75 Rd. Appr. Rt.					36							
31+00	50	20	1L, Lt	3.16		52						1-Rt
47+81	-	-						76				
52+50	95	100	1L, Lt	3.16		96						
59+00	35	1	1I, Lt	1.52		126						
66+00	150	20	1L, Lt	3.16		52						
71+50	130	20	1L, Lt.	3.16		58						
75+50	65	15	1L, Lt	3.16		54						
80+00	105	30	1L, Lt.	3.16		48						1-Rt
84+50	-	-		-		100						
90+50	-			-							152	
98+95	-									110		
106+00	45	2	1L, Lt	3.16		74						
109+00	60	50	1L, Lt	3.16		74						
113+50	60	45	1L, Lt	3.16		72						
120+00	170	25	1L, Lt	3.16		56						
125+00	-	-		-		58						2
132+50	-	-		-					82			
136+80	55	30	1I, Lt	1.52		46						1-Rt
142+00	5	5	1I, Lt	1.52		92						
148+00	35	25	1I, Lt	1.52		54						
154+00	35	35	1L, Lt	3.16		54						
158+50	0	15	-	-		68						1-Lt
165+50	0	10	-	-		64						
171+00	-	5	-	-		72						
174+50	180	25	1I, Lt	1.52		46						1-Rt
183+00	0	1	-	-		78						
185+50 Rd Appr Rt.	-	-	-	-	38							
188+00		-		-		62						2
192+00	45	20	1I, Lt.	1.52		50						1-Rt.
199+00	50	25	1I, Lt.	1.52		50						
Totals	1775	619		61.12	74	1890	42	176	82	110	152	14
Totals		619		61.12	74	1890	42	176	82	110	152	14
Use		650		65	74	1890	42	176	82	110	152	14

RECAPITULATION OF ITEMS

ITEM №	NAME	UNIT	QUANTITY
10	Miscellaneous Force Account Work	Contingent Sum	
100(3)	Clearing & Grubbing	Acre	40
102(1)	UNCLASSIFIED EXCAVATION	Cu. Yd.	94,000
102(5)	Borrow Excavation	Cu. Yd.	12,000
102(9)	Furrow Ditches	Lin. Ft.	4,000
103(1)	Excavation For Structures	Cu. Yd.	650
104(2)	Special Subbase, Grading B	Ton	30,500
105(1)	Overhaul	Sta.-Yd.	300,008
108(1)	Water	Unit	4,500
108(2)	Providing & Maintaining Water Plant or Plants	Lump Sum.	
109	[illegible]	Hr.	1,106
111(2)	Obliteration of Old Roadways	Force Account	
200(4)	Crushed Aggregate Base, Grading E-1	Ton	12,500
202(1)	Processing Bituminized Base.	Sq. Yd.	68,700
202(2)	Asphalt, Grades MC0, 1, 2 or 3	Ton	320
202(3)	Asphalt, Emulsified, Grade SS-1	Ton	28
203(1)	Bituminous Additive, Commercial Grade	Ton	2.8
406(1)	Class A Concrete	Cu. Yd.	65
453(1A)	18" Galvanized Corrugated Metal Pipe	Lin. Ft.	74
453(1B)	24" " " "	"	1890
453(1C)	30" " " " "	"	42
453(1D)	30" 12 Ga. " " " "	"	176
453(1E)	36" " " " "	"	82
453(1F)	48" " " " "	"	110
453(1G)	48" 10 Ga. " " " "	"	152
460(2)	Metal End Sections for 24" Pipe Culverts	Ea.	14
560(4)	Guide Posts	Ea.	215

Project: Sta 0+00 to 200+84
Length of Project: 3.812 Miles
Stabilized Gravel Roadbed
Special Subbase 9-inch depth, weight 135 lbs per Cu. Ft.
Type Code: 2013

SUMMARY OF QUANTITIES

Woodruff-Huntsville ROUTE: 2-A.
PROJECT: 2-A
STATE: Utah COUNTY: Weber
NATIONAL: Cache Nat. Forest

Sheet 2 of 2 Sheet

Compiled by: R.A.S. Date: 4-29-59
Checked by: D.L.T. Date: 4-30-59
Correct: Date:

Bureau of Public Roads Region 9 Denver, Colo.

9 Utah 2 A 4

PLAN — SURVEYED 4-59 BY W.H.T. M.S. — PLOTTED 5-59 — NOTE BOOK — ALIGNMENT CHECKED 5-59 — R/W CHECKED — NO. — DRAWN & TRACED W.H.T. 2-59

N. 39°52'E.

99,500 E

100,000 N

Present Road

T-1 7011.0

T-2 7053.89

T-3 7086.97

S.W. ¼ Sec. 22 T.8N., R.3E.

S.E. ¼ Sec. 22 T.8N., R.3E.

North

Vehicle Tracks

R/W

R/W

R/W Line 1

S.78°08'E.

P.S. 17+90

Δs = 4°00'
Ls = 200'

P.C. 19+90

¼ Cor.

(Sc.) 975'
(Sc.) Sta. 30+48

(Sc.) Sta. 29+25

252'

② Janet Byram, et al
Ogden, Utah
(Owner)

TΔ = 61°00'
TS = 944.41'
Δc = 53°00'
D = 4° Lt.
L = 1325'

P.C.S. 33+15

East

42,000 E

100,000 N

Vehicle Tracks

Const. Rd Appr. Rt.

T-4 7138.27

T-5 7153.56

TΔ = 62°00'
TS = 789.38'
Δc = 52°00'
D = 5° Rt.
L = 1040'

99,500 N

100,000 E

P.C.S. 12+40

Δs = 5°00'
Ls = 200'

P.S.T. 14+40

Δs = 5°00'
Ls = 200'

P.S.C. 2+00

P.S. 0+00

R/W Line 2

N.W. ¼ Sec. 27 T.8N., R.3E.

101,000 E

99,500 N

N.E. ¼ Sec. 27 T.8N., R.3E.

N. 40°52'E.

① State of Utah
(Owner)

△ = Ground Control Station

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

PROFILE — SURVEYED — PLOTTED — NOTE BOOK — GRADES CHECKED — B.M.'S NOTED — NO. — DRAWN & TRACED W.H.T. 4-59 — STRUCTURES CHKD.

Heavy Sagebrush

Refl. Guide Posts Lt.

7080
7070
7060
7050
7040
7030
7020
7010
7000

7007.77

7035.0

5+00 ~ 24" C.M.P.
56' Long ~ 2 M.E.S.
P.I. 7017.0

600' V.C.

+6.0%

+3.1%

11+50 ~ 24" C.M.P.
54' Long ~ 1 Hdwl. Rt.

16+50 ~ 24" C.M.P.
52' Long ~ 1 Hdwl. Rt.
1 M.E.S. Lt.

20+00 ~ 24" C.M.P.
50' Long ~ 1 Hdwl. Rt.
1 M.E.S. Lt.

25+50 ~ 30" C.M.P.
42' Long ~ 2 Hdwl's.

Road Appr. Rt.
29+75 ~ 18" C.M.P.
36' Long ~ No Hdwl's.

U.S.G.S. Datum shown.

Prism Quantities shown.

Unclassified Excav. 9,905 Cu. Yds.
Emb't. 11,639 " "

To Sta 37+45

To Sta. 34+70

7160
7150
7140
7130
7120
7110
7100
7090
7080

0 1 2 3 4 5 6 7 8 9 10 1 2 3 4 15 6 7 8 9 20 1 2 3 4 25 6 7 8 9 30

PLATE 1 - PLAN - PROFILE © P.R.&R.C. STANDARD
NEUFFEL & ESSER CO., NEW YORK


06
9 Utah 2 A 5
① State of Utah (Owner)
② Janet Byram, et al Ogden, Utah (Owner)
③ M. S. Marriott 1657 Washington Ave. Ogden, Utah (Owner)
TΔ = 61°00'
TS = 944.41'
Δc = 53°00'
D = 4° Lt.
L = 1325'
P.C.S. 33+15
P.S.T. 35+15
Δs = 4°00', Ls = 200'
N. 40°52' E.
R/W Line
Vehicle Tracks
Road
Present
P.S. 37+45
P.S.C. 39+45
Δs = 5°00' Ls = 200'
TΔ = 36°30'
TS = 478.33'
Δc = 26°30'
D = 5° Lt.
L = 530'
P.C.S. 44+15
P.S.T. 46+15
Δs = 5°00' Ls = 200'
N. 77°22' E.
P.S. 48+25
Δs = 9°00 Ls = 200'
P.S.C. 50+25
TΔ = 55°48'
TS = 438.38'
Δc = 37°48'
D = 9° Lt.
L = 420'
P.C.S. 54+45
Δs = 9°00' Ls = 200'
P.S.T. 56+45
Sta. 51+45 (Sc.)
North
N. 21°34' E.
975' (Sc.)
(Sc.) Sta. 30+48 East
1112' (Sc.)
N.E. ¼ Sec. 27 T.8N., R.3E.
S.E. ¼ Sec. 22 T.8N., R.3E.
S.W. ¼ Sec. 23 T.8N., R.3E.
Δ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 0+00
To Sta. 66+00
Heavy Sagebrush
Lt. Aspen
Refl. Guide Posts Lt.
+4.0%
+6.0%
+6.2%
1000' V.C.
800' V.C.
31+00 ~ 24" C.M.P. 52' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
7182.0
P.I. 7212.0
7232.0
47+81 ~ 30" C.M.P. 176' Long ~ No Hdwl's (12 Gage)
52+50 ~ 24" C.M.P. 96' Long ~ 1 Hdwl. Lt.
7278.0
P.I. 7294.0
59+00 ~ 24" C.M.P. 126' Long ~ 1 Hdwl. Lt.
U.S.G.S. Datum shown
Prism Quantities shown
Refl. Guide Posts Rt.
From Sta. 28+12 Uncl. Excav. 1,674 Cu. Yds.
Emb't. 2,151 " "
Uncl. Excav. 13,153 Cu. Yds.
Emb't. 13,023 " "
Uncl. Excav. 14,835 Cu. Yds.
Emb't. 14,061 " "
To Sta. 64+87
PLAN
NOTE BOOK: Survey-Aerial (Proj.), Ground Control; Alignment Checked; Rt. of Way Checked
BY: J.L.M.S., T.V.H.
DATE: 1958, 1958
Drawn & Traced W.H.T. 2-59
PROFILE
NOTE BOOK: Surveyed; Plotted; Grades Checked; B.M.'s Noted; Structure Notations Chk'd.
Drawn & Traced W.H.T. 4-59
PLATE 1 - PLAN - PROFILE O.P.R. & R.E. STANDARD
KEUFFEL & ESSER CO.

PLAN		BY	DATE
NOTE BOOK	SURVEYED Aerial (Proj.)	L.L.McK.	1938
NO.	Ground Control	T.V.H.	1938
	ALIGNMENT-CHECKED		
	RT. OF WAY CHECKED		
	Drawn & Traced	W.H.T.	2-39

PROFILE		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	GRADES CHECKED		
	B. M.S NOTED		
	STRUCTURE NOTAT'NS CH'KD		
	Drawn & Traced	W.H.T.	4-39

9 Utah 2 A 6
Δ=17°30'
T=251.97'
D=3°30' Lt.
L=500'
P.C. 66+15
P.T. 71+15
N. 21°34' E.
N. 4°04' E.
R/W Line
Present Road
Vehicle Tracks
Sta. 68+47 (S.C.)
P.S. 73+11
P.S.C. 75+11
P.C.S. 80+16
P.S.T. 82+16
Δs=14°00' Ls=200'
TΔ=98°42'
TS=581.20'
Δc=70°42'
D=14° Rt.
L=505'
S. 77°14' E.
Const. R. Appr. Lt.
M.S. Marriott
1657 Washington Ave.
Ogden, Utah
(Owner)
S.W.¼ Sec. 23
T.8N., R.3E.
N.W.¼ Sec. 23
T.8N., R.3E.
Δ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 44+50
Heavy Sagebrush
Med. Aspen
Refl. Guide Posts Rt.
Lt. Aspen
To Sta. 94+00
To Sta. 93+00
Refl. Guide Posts Lt.
+6.2%
+6.4%
+2.0%
400' V.C.
1200' V.C.
P.I. 7356.0
P.I. 7429.6
7318.8
7343.6
7368.8
7391.2
7441.6
7445.6
66+00 ~ 24" C.M.P. 52' Long ~ 1 Hdwl. Lt.
71+50 ~ 24" C.M.P. 58' Long ~ 1 Hdwl. Lt.
75+50 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
80+00 ~ 24" C.M.P. 48' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
84+50 ~ 24" C.M.P. 100' Long ~ No Hdwls.
U.S.G.S. Datum shown.
Prism Quantities shown.
From Sta. 57+50 Refl. Guide Posts Rt.
To Sta. 92+50
From Sta. 55+51 Uncl. Excav. 19,601 Cu. Yds.
Emb't. 18,451 " "
Uncl. Excav. 11,120 Cu. Yds.
Emb't. 11,679 " "
Uncl. Excav. 24,189 Cu. Yds.
Emb't. 22,593 " "
60 1 2 3 4 65 6 7 8 9 70 1 2 3 4 75 6 7 8 9 80 1 2 3 4 85 6 7 8 9 90

PLAN — SURVEYED: Aerial (Eng.) & Ground Control — NOTE BOOK: ALIGNMENT CHECKED: — NO.: RT. OF WAY CHECKED: — BY: J.T. Hs. F.T. H. — DATE: 1958 — Drawn & Traced W.H.T. 4-59

PROFILE — SURVEYED: — PLOTTED: — GRADES CHECKED: — NOTE BOOK: — NO.: — BY: W.H.T. — DATE: 4-59

3 M.S Marriott
1657 Washington Ave.
Ogden, Utah
(Owner)

N

Sta. 95+00 (Sc.)

P.S. 93+60

Δs=6°00'
Ls=200'

P.S.C. 95+60

R/W Line

R/W Line

Δc=45°36'
T=401.41'
D=6° Lt.
L=760'

P.C.S. 103+20

Δs=8°00'
Ls=200'
ST=83.55'
LT=116.92'

P.S.C. 105+20

Δc=15°36'
T=392.45'
D=2° Lt.
L=780'

P.C.S. 113+00

Δs=2°00'
Ls=200'

P.S.T. 115+00

P.S. 121+44.52

Present Road

T-17
7537.91

T-18
7545.77

T-19
7585.17

T-20
7651.71

T-22
7671.54

△ = Ground Control Station

NW.¼ Sec.23
T.8N., R.3E.

NE.¼ Sec.23
T.8N., R.3E.

S. 77°14' E.

S. 83°14' E.

N. 51°10' E.

N. 43°10' E.

N. 25°34' E.

N. 27°34' E.

610' (Sc.) North

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

106,500 E
103,000 N

107,000 E
104,000 N

107,500 E
104,500 N

108,000 E
101,000 N

108,500 N
105,000 N

9 Utah 2 A 7

From Sta. 76+50 Heavy Sagebrush

Lt. Aspen

Med. Aspen

Heavy Sagebrush

To Sta. 128+50

From Sta. 89+50

Refl. Guide Posts Lt.

Refl. Guide Posts Lt.

Refl. Guide Posts Lt.

800' V.C.

90+50 ~ 48" C.M.P.
152' Long ~ No Hdwl's.
(10 Gage)

P.I. 74536

+6.8%

+2.0%

7480.8

98+95 ~ 48" C.M.P.
110' Long ~ No Hdwl's.

106+00 ~ 24" C.M.P.
74' Long ~ 1 Hdwl. Lt.

109+00 ~ 24" C.M.P.
74' Long ~ 1 Hdwl. Lt.

113+50 ~ 24" C.M.P.
72' Long ~ 1 Hdwl. Lt.

1200' V.C.

7566.2

P.I. 76270

+6.8%

+3.04 69%

120+00 ~ 24" C.M.P.
58' Long ~ 1 Hdwl. Lt.

From Sta. 89+00

Refl. Guide Posts Rt.

U.S.G.S. Datum shown

Prism Quantities shown

From Sta. 81+14

Refl. Guide Posts Rt.

To Sta. 122+00

Unc. Excav. 39,209 Cu. Yds.
Emb't. 38,274 " "

7410 7420 7430 7440 7450 7460 7470 7480 7490 7500 7510 7520 7530 7540 7550 7560 7570 7580 7590 7600 7610 7620 7630 7640 7650

90 1 2 3 4 95 6 7 8 9 100 1 2 3 4 105 6 7 8 9 110 1 2 3 4 115 6 7 8 9 120

PLATE 1 PLAN PROFILE O.P.R.R.E. STANDARD
KELLFFEL & ESSER CO., NEW YORK


9 Utah 2 A 8
PLAN
PROFILE
Drawn & Traced W.H.T. 3-59
Drawn & Traced W.H.T. 4-59
North
East
109,000 E
105,500 N
104,500 N
108,500 E
103,500 N
108,000 E
104,000 N
Present Sta. 135+25 (Sc)
95' (Sc)
128+90
P.S. 136+80
Δs=10°30'
Ls=200'
P.S.C. 138+80
TΔ = 109°12'
TS = 873.77'
Δc = 88°12'
D = 10°30' Lt.
L = 840'
P.C.S. 147+20
P.S.T. 149+20
Δc = 184°32'
D = 16° Rt.
L = 1153.33'
R = 358.10
P.C.S. 134+97.85
Δs=16°00'
Ls=200'
ST=67.17'
LT=133.88'
P.S.T. 136+97.85 Bk.=
136+65.39 Ah.
EQUATION
P.S.C. 123+44.52
P.S. 121+44.52
Const. Rd. Appr. Rt.
Road
R/W Line
N. 25°34' E.
S. 47°06' E.
S. 62°06' W.
N.E.¼ Sec. 23
T.8N., R.3E.
E.R. Mckay
Huntsville, Utah
(Cache County)
M.S. Marriott
Ogden, Utah
(Assessed in Weber Co.
M.S. Marriott
(Assessed in Cache Co.
△ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 99+50
Heavy Sagebrush
Med. Aspen
Heavy Sagebrush
To Sta. 156+50
125+00 ~ 24" C.M.P. 58' Long ~ 2 M.E.S.
7645.3
+3.0489%
132+50 ~ 36" C.M.P. 82' Long ~ No Hdwl's.
LONG EQUATION Sta. 136 to 137 = 132.46'
136+97.85 Bk. = EQUATION
136+65.39 Ah.
P.I. 7684.93
136+80 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
+3.0%
142+00 ~ 24" C.M.P. 92' Long ~ 1 Hdwl. Lt.
7717.4
148+00 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
U.S.G.S. Datum shown
Prism Quantities shown
Refl. Guide Posts Rt.
Refl. Guide Posts Lt.
From Sta. 90+91
Uncl. Excav. 4,156 Cu. Yds.
Emb't. 4,687 " "
Uncl. Excav. 6,076 Cu. Yds.
Emb't. 6,119 " "
Uncl. Excav. 7,333 Cu. Yds.
Emb't. 7,066 " "
To Sta. 154+00
To Sta. 159+80
7630 7640 7650 7660 7670
7660 7670 7680 7690 7700 7710 7720 7730
120 1 2 3 4 125 6 7 8 9 130 1 2 3 4 135 6 6 7 8 9 140 1 2 3 4 145 6 7 8 9 150


9 Utah 2 A 9
N.W. 1/4 Sec. 24 T.8N., R.3E.
TΔ = 27°29'
TS = 240.82'
Δc = 7°29'
D = 10° Lt.
L = 74.83'
P.S.T. 162+27.49
S. 74°35' E.
P.C.S. Δs = 10°00' Ls = 200'
P.S.C. 159+52.66 160+27.49
P.S. 157+52.66 Δs = 10°00' Ls = 200'
P.S.T. 149+20
North
S. 47°06' E.
R/W Line
Present
TΔ = 100°17'
TS = 675.93'
Δc = 76°17'
D = 12° Rt.
L = 635.69'
P.S.C. 164+68.05
P.S. 162+68.05 Δs = 12°00' Ls = 200'
P.C.S. 171+03.74 Δs = 12°00' Ls = 200'
EQUATION P.S.T. 173+03.74 Bk. = 172+94.70 Ah.
S. 25°42' W.
P.S. 174+75 Δs = 8°00' Ls = 200'
P.S.C. 176+75
TΔ = 66°00'
TS = 566.55'
Δc = 50°00'
D = 8° Lt.
L = 625'
Sta. 163+25 (SC) 1005' (SC)
625' (SC) Sta. 153+20
Not Found
℄ Sec. 24
S.W. 1/4 Sec. 24 T.8N., R.3E.
N.E. 1/4 Sec. 23 T.8N., R.3E.
(5) M.S. Marriott Ogden, Utah (Assessed in Weber Co.)
(6) M.S. Marriott (Assessed in Cache Co.)
Δ = Ground Control Station
Road
S. 40°18' E.
"The Alignment and Grade as hereon shown are subject to adjustment."
From Sta. 146+00
Heavy Sagebrush
Med. Aspen
Scattered Aspen
To Sta. 215+50
From Sta. 140+00 Ref'l. Guide Posts Rt.
U.S.G.S. Datum shown.
Prism Quantities shown.
154+00 ~ 24" C.M.P. 54' Long ~ 1 Hdwl. Lt.
158+50 ~ 24" C.M.P. 68' Long ~ 1 M.E.S. Lt.
165+50 ~ 24" C.M.P. 84' Long ~ No. Hdwls.
171+00 ~ 24" C.M.P. 72' Long ~ No Hdwls.
174+50 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
173+03.74 Bk. = EQUATION 172+94.70 Ah.
LONG STATION STA. 173 to 174 = 109.04'
+3.0%
+6.0%
+3.9602%
+4.0%
800' V.C.
1400' V.C.
P.I. 7729.4
P.I. 7783.74
P.I. 7873.4
7753.4
7795.4
7865.1
Ref'l. Guide Posts Rt.
Ref'l. Guide Posts Lt.
From Sta. 143+02
Uncl. Excav. 4,285 Cu. Yds.
Emb'k. 13,820
Borrow 9,221
Uncl. Excav. 8,009 Cu. Yds.
Emb'k. 8,028
Uncl. Excav. 3,681 Cu. Yds.
Emb'k. 3,800
Uncl. Excav. 8,267 Cu. Yds.
Emb'k. 8,493
To Sta. 184+62
150 155 160 165 170 175 180

PLAN — SURVEYED Ground Control Aerial; NOTE BOOK; ALIGNMENT CHECKED; RT OF WAY CHECKED; Drawn & Traced W.H.T. 3-59

PROFILE — SURVEYED; GRADES CHECKED; STRUCTURE NOTES CHECKED; Drawn & Traced W.H.T. 4-59

9 Utah 2 A 10

P.S.C. 176+75

TA=66°00'
TS=366.55'
Δc=50°00'
D=8°Lt.
L=625'

P.C.S. 183+00

Δs=8°00'
Ls=200'

P.S.T. 185+00

S.W.¼ Sec.24 T8N., R3E.

S.E.¼ Sec.24 T8N., R3E.

N.E.¼ Sec.25 T8N., R3E.

NW.¼ Sec.25 T8N., R3E.

⑦ M.S. Marriott Ogden, Utah (Assessed in Weber Co.)

⑥ M.S. Marriott (Assessed in Cache Co.)

S. 40°18' E.

S. 25°42' W.

N. 61°42' E.

100'

R/W Line

Present Road

Const. Rd. & Appr. Rft.

P.R.S. 213+00

P.C.S. 211+00

Δs=12°00'
Ls=200'

TA=76°00'
TS=469.32'
Δc=54°12' Lt.
D=12°45'

P.S. 204+50

Δs=12°00'
Ls=200'

P.C.S. 206+50

900'(Sc.) Sta. 198+15 (Sc.)

360'(Sc.) Sta. 202+75 (Sc.)

T-31 7876.15

T-32 7951.62

T-33 7980.91

T-34 7992.63

T-35 7988.60

T-36 7992.79

△ = Ground Control Station

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

PLAN
SURVEYED: Aerial (Proj.) — BY: J.L.M.S. — DATE: 10-58
NOTE BOOK: ALIGNMENT CHECKED: AT OF WAY CHECKED — BY: W.H.T. — DATE: 3-59
NO. ——— Drawn & Traced

PROFILE
SURVEYED: — BY: W.H.T. — DATE: 4-59
NOTE BOOK: PLOTTED: — CHECKED: — STRUCTURE NOTE: NS CH KD. B.M.'s NOTED:
NO. ——— Drawn & Traced

From Sta. 164+50

To Sta. 215+50

Ref'l. Guide Posts Rt.

Scattered Aspen

183+00 ~ 24" C.M.P. 78' Long ~ No Hdw'l's.

Road Appr. Rt. 185+50 ~ 18" C.M.P. 38' Long ~ No Hdw'l's.

188+00 ~ 24" C.M.P. 62' Long ~ 2 M.E.S.

192+00 ~ 24" C.M.P. 50' Long ~ 1 Hdw'l. Lt. 1 M.E.S. Rt.

199+00 ~ 24" C.M.P. 50' Long ~ 1 Hdw'l. Lt.

206+00 ~ 24" C.M.P. 74' Long ~ 1 M.E.S. Lt.

Ref'l. Guide Posts Lt.

Ref'l. Guide Posts Rt.

+4.0%

+4.0%

+2.715%

400' V.C.

7965.4

P.I. 7973.4

7979.0

7992.8

U.S.G.S. Datum shown.

Prism Quantities shown.

From Sta. 173+29

Unc'l Excav. 8,930 Cu. Yds.

Emb't. 9,608 " "

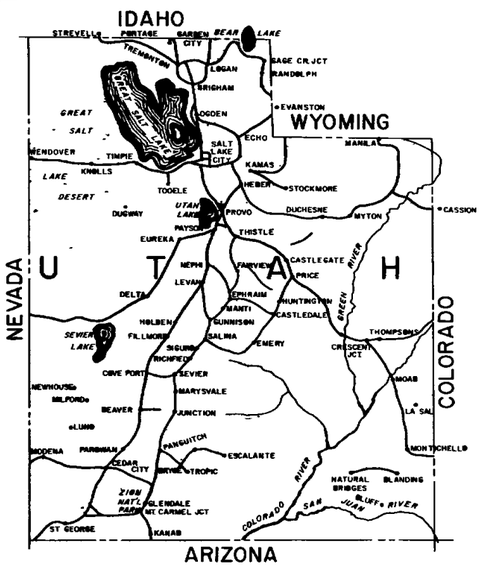
7950 7940 7930 7920 7910 7900 7890 7880

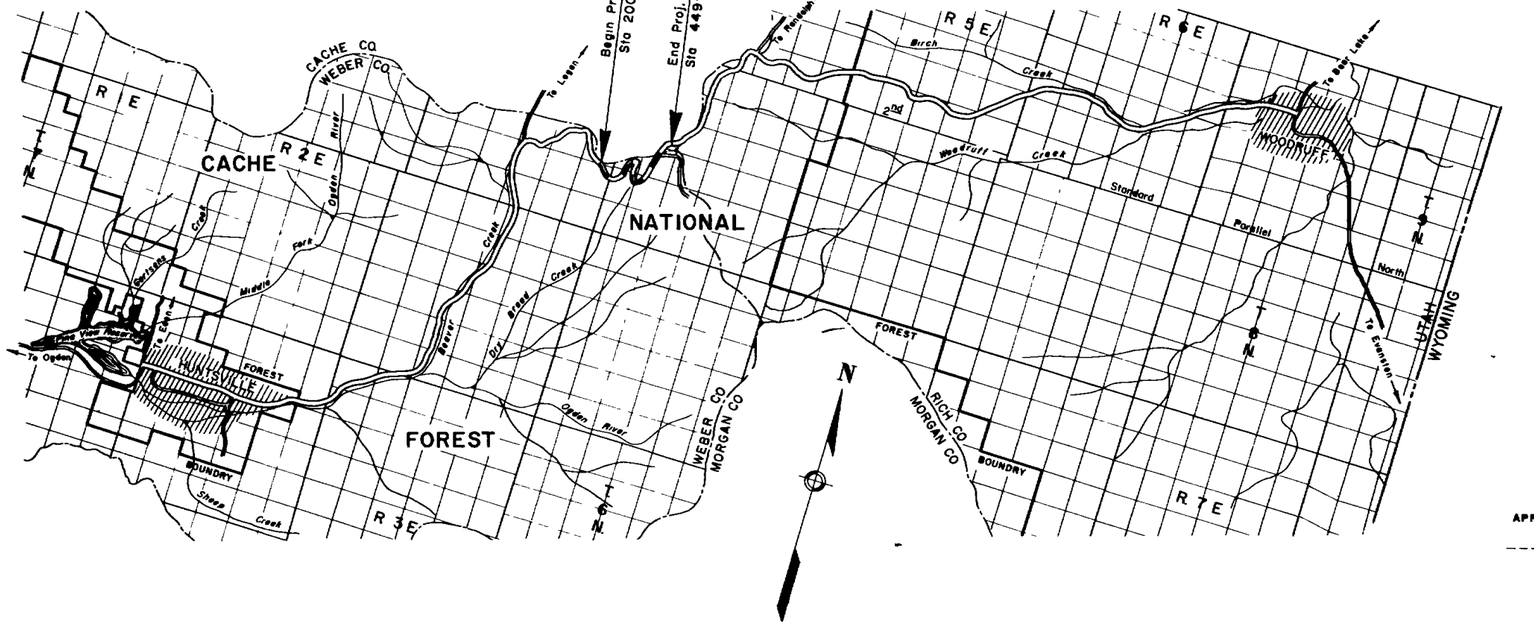
8020 8010 8000 7990 7980 7970 7960 7950 7940

180 1 2 3 4 185 6 7 8 9 190 1 2 3 4 195 6 7 8 9 200 1 2 3 4 205 6 7 8 9 210

PLATE 1 PLAN PROFILE O. P. R. & R. E. STANDARD
NEWELL & ESSER CO., NEW YORK


S.E.¼ Sec.24
T.8N.,R.3E.
N.E.¼ Sec.25
T.8N.,R.3E.
Sec.24
Sec.25
East
N. 61°42' E.
T.8N.,R.4E.
N.1°46' E. (Resurvey)
T.8N.,R.3E.
9 Utah 2 A 11
N.W.¼ Sec.30
T.8N.,R.4E.
TΔ=119°00'
TS=801.49
Δc=91°00'
D =14° Lt.
L =650'
P.R.S. 242+65
Δs=14°00'
Ls=200'
P.C.S. 240+65
P.S. 232+15
Δs=14°00'
Ls=200'
P.S.C. 234+15
S.C. 239+10 (Sc.)
P.R.S. 213+00
P.C.S. 211+00
Δs=12°00'
Ls=200'
TΔ=78°00'
TS=489.32
Δc=54°00'
D =12° Lt.
L =450'
P.S. 204+50
Δs=12°00'
Ls=200'
P.S.C. 206+50
P.S.C. 215+00
Δs=10°00'
Ls=200'
TΔ=97°30'
TS=756.57
Δc=77°30'
D =10° Rt.
L =775'
P.C.S. 222+75
Δs=10°00'
Ls=200'
P.S.T. 224+75
S. 20°48' E.
S. 40°18' E.
N. 40°12' E.
R/W Line
Present
Road
7 M.S. Marriott
Ogden, Utah
(Assessed in Weber Co.)
"The Alignment and Grade as hereon
shown are subject to adjustment."
Δ = Ground Control Station
T-36 7992.79
T-35 7988.60
T-37 8093.57
T-38 8097.98
T-39 8113.40
T-40 8130.29
PLAN
Surveyed Ground Control 1958
Aerial Prod. 1958
Drawn & Traced W.H.T. 3-59
PROFILE
Drawn & Traced W.H.T. 4-59
7992.8
211+00 ~ 24" C.M.P.
52' Long ~ 1 Hdwl. Lt.
213+50 ~ 24" C.M.P.
136' Long ~ No Hdwls.
P.I. 8006.7
8030.2
+4.7%
+2.775%
1000' V.C.
U.S.G.S. Datum shown.
Prism Quantities shown.
221+50 ~ 30" C.M.P.
114' Long ~ No Hdwls.
225+50 ~ 24" C.M.P.
46' Long ~ 1 Hdwl. Lt.
1 M.E.S. Rt.
229+50 ~ 24" C.M.P.
46' Long ~ 1 Hdwl. Lt.
1 M.E.S. Rt.
234+00 ~ 24" C.M.P.
74' Long ~ 1 Hdwl. Lt.
238+50 ~ 24" C.M.P.
72' Long ~ 1 Hdwl. Lt.
+4.7%
210 1 2 3 4 215 6 7 8 9 220 1 2 3 4 225 6 7 8 9 230 1 2 3 4 235 6 7 8 9 240





LEGEND

OTHER ROADS	UNIMPROVED	GRADED	REINFORCED SUBGRADE	BASE COURSE	SURFACE TREATMENT	HOT OR PLANT MIX BITUM	CONCRETE

BPR REG 9, J.L.H. 1959

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

PLANS FOR PROPOSED

UTAH FOREST HIGHWAY PROJECT 2-B

WOODRUFF HUNTSVILLE

LENGTH 4.703 MILES

CLASS-2

CACHE NATIONAL FOREST

CACHE & WEBER COUNTIES

REGION 9 STATE UTAH
PROJECT Woodruff - Huntsville 2-B
SHEET 1 OF SHEETS

INDEX TO SHEETS

SHEET NO.	DESCRIPTION	STATION	to STATION
1	Title Sheet		
2	Typical Sections		
3	Summary (2 Sheets)		
10-18	Plan & Profile	200+84	449+00
R9-Std. 117A	Conc End Sec., Hdwl's & Inlets		
R9-Std 129A	Std Miscellaneous Structures		
R9-Std 131	Std Maintenance Posts		
R9-Std 143	Typical Construction Signs		
R9-Std 166	Requirements for Placing C M P		
R9-Std 168	Straight Type Conc Hdwl's		
DWG U-G-13	Timber Guide Posts W/Refl.		
	Excav. Quantities Computed by I B M		

Plans prepared by B P R
Date April 25, 1960

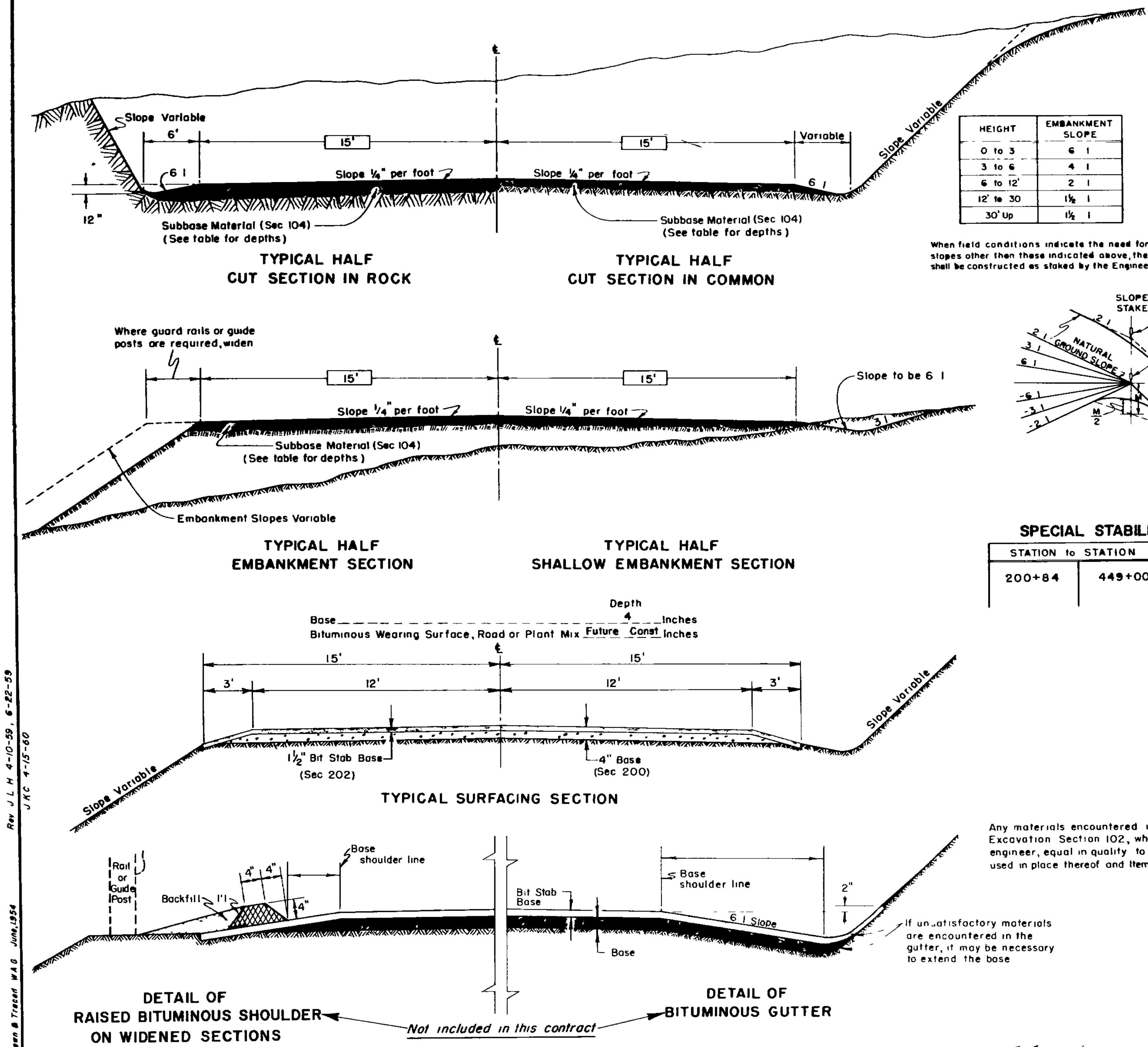
Description of Project
Improvement Grading & Bit Stab Base
Roadbed Width - Grading 30', Base 24'
Type Code 2013

Traffic Volume
A D T (1957) 120
A D T (1977) 400
D.H.V. 15
D 65%
T 50%
V 30

US DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION NO. 9 DENVER, COLORADO

APPROVED

_____ DATE _____ 19__
REGIONAL ENGINEER



HEIGHT	EMBANKMENT SLOPE
0 to 3	6 1
3 to 6	4 1
6 to 12'	2 1
12' to 30	1½ 1
30' Up	1½ 1

When field conditions indicate the need for slopes other than these indicated above, they shall be constructed as staked by the Engineer

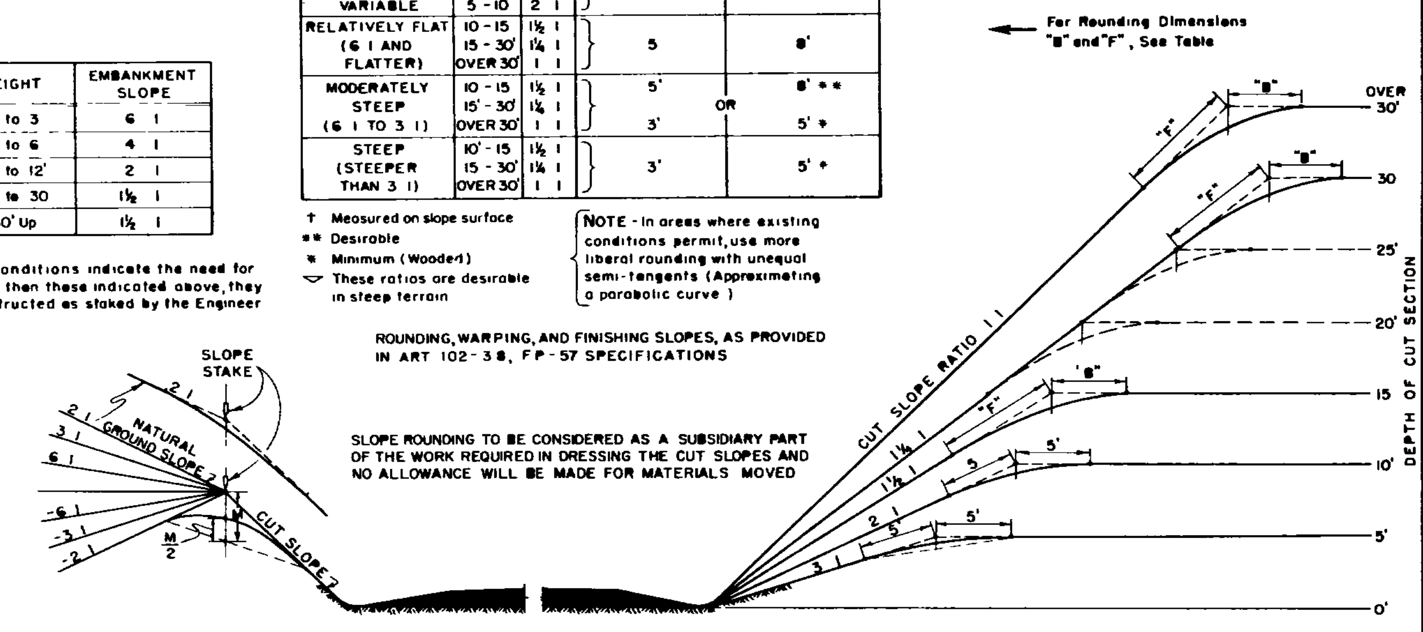
SLOPE ROUNDING FACTORS			ALTERNATE ROUNDING DIMENSIONS	
NATURAL GROUND SLOPE	CUT SLOPE HEIGHT	CUT SLOPE RATIO ▽	SEMI-TANGENTS † Back of Slope Stake "B"	SEMI-TANGENTS † Front of Slope Stake "F"
VARIABLE VARIABLE	0'-5' 5-10	3 1 2 1	5'	5'
RELATIVELY FLAT (6 1 AND FLATTER)	10-15 15-30' OVER 30'	1½ 1 1¼ 1 1 1	5	8'
MODERATELY STEEP (6 1 TO 3 1)	10-15 15'-30' OVER 30'	1½ 1 1¼ 1 1 1	5' OR 3'	8' ** OR 5' *
STEEP (STEEPER THAN 3 1)	10'-15 15-30' OVER 30'	1½ 1 1¼ 1 1 1	3'	5' *

† Measured on slope surface
** Desirable
* Minimum (Wooded)
▽ These ratios are desirable in steep terrain

NOTE - In areas where existing conditions permit, use more liberal rounding with unequal semi-tangents (Approximating a parabolic curve)

ROUNDING, WARPING, AND FINISHING SLOPES, AS PROVIDED IN ART 102-3 8, FP-57 SPECIFICATIONS

SLOPE ROUNDING TO BE CONSIDERED AS A SUBSIDIARY PART OF THE WORK REQUIRED IN DRESSING THE CUT SLOPES AND NO ALLOWANCE WILL BE MADE FOR MATERIALS MOVED



CUT SLOPE ROUNDING

SPECIAL STABILIZING MATERIAL

STATION to STATION		SUBBASE Item 104(2)	SELECTED BORROW Item 102( )
200+84	449+00	9"	

Any materials encountered in the Roadway and Borrow Excavation Section 102, which are in the opinion of the engineer, equal in quality to the above Item 104(2) shall be used in place thereof and Item 104(2) reduced accordingly

GENERAL NOTES

Where Borrow is specified in the contract and satisfactory material is found in the roadway excavation, the right is reserved to increase the amount of Unclassified Excavation and reduce the Borrow Excavation When additional material is needed for completing embankments, stabilizing the subgrade, or for selected cushion or topping, it may be secured by uniformly widening thru or sidehill cuts or flattening cut slopes where satisfactory material is available The slopes at the ends of all cuts shall be flattened and flared to improve appearance.

Furrow ditches shall be constructed on approximate one percent grades following the ground contour and when possible shall be so constructed that the direction of flow will be away from the roadway

Topsoil shall be conserved and either placed in stockpiles or spread over cut and embankment slopes as directed and in accordance with the specifications

Roadway ditches at the ends of cuts shall be constructed so as to carry the flow away from the adjacent embankment slopes

Embankment slopes shall be uniformly warped between one rate of slope and another The transition shall cover a distance of not less than fifty feet

Subgrade grade to be on the surface of stabilized graded road and located on center line on tangents

Bureau of Public Roads book of, "Transition Curves for Highways", shall be used to determine superelevation and transition lengths (Table I), and widening of curves (Table IX)

SOILS DATA

The materials soils data shown on these plans are based on tests of samples obtained from the locations and depths shown, and are only for informational purposes They do not reflect classification of the excavation No responsibility is assumed by the Government as to the extent of materials represented by these tests Any assumption by the contractor as to the extent of the materials represented by these samples is strictly his responsibility The contractor must satisfy himself as to the nature of materials to be encountered by personal inspection of the project on the ground If materials not conforming to the data shown on these plans are encountered during construction, the grading plan will be modified where necessary to insure proper design

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

TYPICAL CROSS SECTIONS

NATIONAL FOREST & PARK HIGHWAYS

REGION No 9 STANDARD ROADBED
GRADED 30' Shoulder to Shoulder
BASE 24' " " "
BITUMINOUS WEARING SURFACE Future Constr.
PROJECT Utah 2-B, Woodruff-Huntsville
NATIONAL Forest - Cache
COUNTY Cache & Weber
STATE Utah

APPROVED [signature] Date 2/26/58
Federal Highway Projects Engineer

Rev J L H 4-10-59, 6-22-59
J K C 4-15-60
Drawn & Traced W A G June, 1954

03

3

SUMMARY OF ESTIMATED QUANTITIES

The following is an approximate estimate of quantities and no responsibility for their accuracy is assumed. No allowance will be made for anticipated profit or loss incurred due to the increase, decrease or elimination of any of the quantities shown that may be found necessary during construction

SUMMARY OF QUANTITIES

ITEM No.	100(3)	106		102(1)			102(4)	102(9)	104(2)	105(1)	108(1)	109(1)	200(4)	202(1)	202(2)	202(3)	203(1)
STATION TO STATION	Clearing and Grubbing	Embankment From Item 104(2)	Embankment Prism	Unclassified Excavation Prism	Unclassified Excavation Subgrade for Embankment	Unclassified Excavation Overbreak and Slides	Borrow Excavation, Case 1	Furrow Ditches	Special Subbase Grading B	Overhaul	Water	Rolling	Crushed Aggregate Base, Grading E	Processing Bituminized Base	Asphalt Grade MC-0, 1, or 3	Emulsified Asphalt Grade SS-1 Seal Coat	Bituminous Additive (Commercial grade)
	Acre	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu.Yd.	Cu. Yd.	Cu. Yd.	Lin.Ft.	Ton	Sta.Yd.	Unit	Hour	Ton	Sq. Yd.	Ton	Ton	Ton
200+84 to 214+72	2.888	1104	19,312	21,877						8,736							
214+72 to 221+28	1.544	666	11,796	13,236													
221+28 to 231+93	1.975	1075	7,670	8,703	92					207							
231+93 to 238+82	1.330	718	4,209	4,777													
238+82 to 253+82	2.949	1646	12,350	13,825	2,264					9,045							
253+82 to 263+57	1.710	1037	7,754	8,857	171												
263+57 to 268+65	1.020	516	9,601	10,878													
268+65 to 291+80	4.004	2316	15,529	15,343			1920			54,900							
291+80 to 300+10	1.548	863	9,164	10,351													
300+10 to 315+60	2.667	1592	9,596	11,374													
315+60 to 326+60	2.035	1124	13,931	15,715						1,100							
326+60 to 334+30	1.361	829	6,116	6,736													
334+30 to 348+25	2.976	1863	18,919	11,216	991		10,000			5,764							
348+25 to 359+60	2.453	1294	10,176	10,534			1,000										
359+60 to 366+30	1,592	670	9,884	11,063													
366+30 to 376+00	2.038	1019	10,976	12,263													
376+00 to 387+50	2.304	1162	10,817	12,412						515							
387+50 to 403+10	2.196	1642	7,624	8,854						2,400							
403+10 to 414+30	1.929	1697	10,919	12,016						1,400							
414+30 to 433+00	2.968	1819	14,794	16,815						50,000							
431+10 to 441+10	1.499	999	4,845	5,634													
441+10 to 449+00	1.439	863	7,273	4,149			3,302										
Connection		280		1,500													
Road Approaches:																	
272+50 Rt.		30		100													
272+50 Lt.		30	200														
303+90 Lt.		20	250														
321+00 Rt.		30	200														
347+65 Rt.		30		40													
383+00 Lt.		30	200														
383+50 Rt.		30	300														
402+60 Rt.		70	300														
443+50 Lt.		30	200														
Sub Totals		27,394	234,905	248,268	3,518	1,000											
Totals	46.425			254,756			16,222	4,700	49,926	134,067	7,100	1,394	16,549	90,000	383.6	36.7	5.48
Use	47			255,000			16,500	5,000	50,000	150,000	7,100	1,400	17,000	90,000	390	37	5.5

Computations written in columns:

- 102(1) Overbreak and Slides: 1,000 Cu. Yd. Estimated
- 102(9) Furrow Ditches: Est. 1000' per mile = 4,700
- 104(2) Special Subbase: 27,394 X 27 X 135# / 2000 = 49,926 Ton
- 108(1) Water: Embankment: 234,905 X 0.020 = 4,698; Subbase: 49,926 X 0.030 = 1,498; Base: 16,549 X 2% = 310; Traffic Maintenance (Est.) 594; = 7,100
- 109(1) Rolling: Embankment: 234,905 ÷ 200 = 1,175; Subbase: 27,394 ÷ 125 = 219; = 1,394 Hrs.
- 200(4) Crushed Aggregate Base: 245,169 X 135# / 2,000 = 16,549 Tons
- 202(1) Processing: 90,000 Sq. Yd.
- 202(2) Asphalt: Prime: 90,000 X 0.30 / 245 = 110.2; Mix: 810,000 X 1.5 X 135 X 0.04 / 12 X 2000 = 273.4; = 383.6 Ton
- 202(3) Emulsified Asphalt: 90,000 X 0.10 / 245 = 36.7 Ton
- 203(1) Bituminous Additive: Mix: 274 X .02 = 5.48 Ton

560(4) Guide Posts

Station	to Station	Distance	Number (Each)
205+00	207+00	200	5 R.
211+00	216+00	500	11 R.
213+50	214+50	100	3 L.
219+50	222+50	300	7 R.
220+50	222+00	150	4 L.
225+50	(Culvert)		1 R.
227+50	228+00	50	2 R.
229+50	(Culvert)		1 R.
232+00	235+00	300	7 R.
237+50	244+00	650	14 R.
246+00	250+00	400	7 R.
266+50	271+00	450	11 R.
267+00	268+50	150	4 L.
273+00	275+50	250	6 L.
274+50	276+00	150	4 R.
282+00	287+50	550	12 L.
283+50	285+00	150	4 R.
295+00	302+50	750	16 R.
299+50	300+50	100	4 L.
305+00	(Culvert)		1 R.
310+00	313+00	300	7 R.
321+00	346+00	2500	39 R.
349+50	357+50	800	17 R.
351+00	(Culvert)		1 R.
361+00	363+50	250	6 R.
368+50	378+00	950	21 R.
376+00	377+00	100	3 L.
384+00	397+50	1350	20 L.
385+00	(Culvert)		1 R.
401+50	410+00	850	19 L.
403+50	405+00	150	4 R.
417+00	418+50	150	3 L.
423+50	434+50	1100	20 L.
430+50	433+50	300	4 R.
439+50	444+50	500	11 L.
440+50	442+50	200	5 R.
Totals			305
Use			310

Summary of Unclassified Excavation

Item	Cu. Yd.
Prism	248,268
Subgrade for Embankment	3,518
Overbreak and Slides	1,000
Inlet and Outlet Ditches	1,970
Total	254,756

Length of Project	Feet	Miles	
200+84 to 204+55 2 Bk.	371.50		
204+50 Ah to 266+36 23 Bk.	6185.93		
266+25 Ah to 315+15 Bk.	4890.00		
315+20 Ah to 393+23 2 Bk.	7803.50		
393+20 Ah to 418+00	2480.00		
Sub Total	21,730.93	4.116	(Weber Co.)
418+00 to 449+00	3,100.00	.587	(Cache Co.)
Total	24,830.93	4.703	

Base Course Surfacing	Length Feet	Width Feet	Sq. Ft.	Depth (Inches)	Cu. Ft.
Roadway	24,831	24	595,944	4	
Shoulders	24,831	3	74,493	4	
Curve Widening	3,135	2	6,270	4	
Climbing Lanes	3,900	12	46,800	4	
Approach Roads	600	20	12,000	4	
Totals			735,507		245,169

Processing, Prime, and Seal Coats

Width	Sq.Ft.	Sq. Yd.
30'	744,930	82,770
2'	6,270	697
12'	46,800	5,200
20'	12,000	1,333
	810,000	90,000

Project: Stas. 200+84 to 449+00
Length of Project: 4.703 miles
Weber County = 4.116 miles
Cache County = 0.587 mile

Graded roadbed width 30 feet
Special subbase, Grading B, depth 9", weight 135# per cu. ft.
Crushed aggregate base, grading E., width 24', depth 4".
weight 135# per cu. ft.
Bituminous stabilization of base, depth 1½"
Asphalt, grade MC-o or 1, for prime, 0.30 gal. per sq. yd.
Asphalt, Grade MC-3 for stabilization, 4% by weight.
Emulsified, asphalt, grade SS-1, seal coat, 0.1 gal. per sq. yd.
Bituminous additive (commercial grade) 2% by weight.

Type Code 2013

Compiled by R. A. Stack Date 3/8/60
Checked by J. T. Isaacson Date 4/7/60
Correct E. W. Martin Date 4/28/60
Bureau of Public Roads Region 9 Denver, Colo

SUMMARY OF QUANTITIES

Woodruff-Huntsville ROUTE 2
PROJECT 2-B
STATE Utah COUNTY Weber and Cache
NATIONAL Forest: Cache

Sheet 1 of 2 Sheets

SUMMARY OF ESTIMATED QUANTITIES

The following is an approximate estimate of quantities and no responsibility for their accuracy is assumed. No allowance will be made for anticipated profit or loss incurred due to the increase, decrease or elimination of any of the quantities shown that may be found necessary during construction

SUMMARY OF STRUCTURE QUANTITIES

ITEM Nº	102(1)	103(1)		406(1)	453(1)			460(2)
STATION TO STATION	Unclass Excav. for Culvert Inlets and Outlets	Excavation for Structures	Headwalls, Number and Type	Class A Concrete *(See Note)	Galvanized Corrugated Metal Pipe A 18"	B 24"	C 30"	Metal End Sections for 24" Pipe Culverts
	Cu. Yd.	Cu. Yd.		Cu. Yd.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Each
206+00						74		1 Lt.
211+00	125	25	1I, Lt.	152		52		
213+50		110				136		
221+50							114	
225+50	65	30	1L, Lt.	3.16		46		1 Rt.
229+50	130	30	1L, Lt.	3.16		46		1 Rt.
234+00	25	5	1L, Lt.	3.16		74		
238+50	55	10	1L, Lt.	3.16		72		
243+50	55	20	1L, Lt.	3.16		58		
247+00	20	5	1L, Lt.	3.16		66		
250+50	115	30	1L, Lt.	3.16		70		
257+00	100	30	1I, Lt.	1.52		86		
261+50	140	40	1I, Lt.	1.52		58		
267+50						100		
287+50	30	25	1L, Rt.	3.16		50		
295+00	40	25	1L, Lt.	3.16		50		
299+00		20				94		
303+90 Rd. Appr. Lt.					32			
305+00	40	35	1L, Lt.	3.16		48		1 Rt.
311+00						76		
313+86	90	35	1L, Lt.	3.15		46		
323+50						80		1 Lt.
328+50	70	30	1L, Lt.	3.16		58		
336+00	50	15	1L, Lt.	3.16		72		
343+00	150	50	1L, Lt.	3.15		72		
347+65 Rd. Appr. Rt.					30			
351+00	30	15				100		1 Lt.
354+00	50	35	1L, Lt.	3.16		72		
362+00						132		
368+00	180	30	1I, Lt.	1.52		46		1 Rt.
373+50		10				94		1 Lt.
376+60						94		
378+20	30	15	1I, Lt.	1.52		50		
385+00						62		1 Rt.
388+50	20	15	1L, Rt.	3.16		56		
394+00	70	40	1L, Rt.	3.16		60		
402+75		10				84		1 Rt.
409+50	60	30	1L, Rt.	3.16		70		1 Lt.
416+50	60	20	1L, Rt.	3.16		60		
423+50	80	15	1I, Rt.	1.52		60		1 Lt.
432+00		30				96		
439+50	30	35	1I, Rt.	1.52		56		
442+00						86		
448+50	60	40	1I, Rt.	1.52		48		
Totals	1970	910		72.20	62	2910	114	12
Use		950		75	62	2910	114	12

*Note: Payment for Class A concrete will include payment for reinforcement steel.

RECAPITULATION OF ITEMS

ITEM Nº	NAME	UNIT	QUANTITY
10	Miscellaneous Force Account	Contingent Sum	
100(3)	Clearing and Grubbing	Acre	47
102(1)	UNCLASSIFIED EXCAVATION	Cu. Yd.	255,000
102(4)	Borrow excavation, Case 1	Cu. Yd.	16,500
102(9)	Furrow ditches	Lin. Ft.	5,000
103(1)	Excavation for Structures	Cu. Yd.	950
104(2)	Special Subbase, Grading B	Ton	50,000
105(1)	Overhaul	Sta.Yd.	150,000
108(1)	Water	Unit	7,100
108(2)	Providing and Maint. Water Plant or Plants	Lump Sum	
109(1)	Rolling	Hr.	1,400
111(2)	Obliteration of old roadways	Force Account	
200(4)	CRUSHED AGGREGATE BASE, GRADING E	Ton	17,000
202(1)	Processing bituminized base	Sq. Yd.	90,000
202(2)	ASPHALT GRADE MC-0, 1 or 3	Ton	390
202(3)	Emulsified asphalt, grade SS-1, seal coat	Ton	37
203(1)	Bituminous additive (commercial grade)	Ton	5.5
406(1)	Class A concrete	Cu. Yd.	75
453(1A)	18" Galvanized, corrugated metal pipe	Lin.Ft.	62
453(1B)	24" GALVANIZED, CORRUGATED METAL PIPE	Lin.Ft.	2910
453(1C)	30" Galvanized, corrugated metal pipe	Lin.Ft.	114
460(2)	Metal end sections ror 24" pipe culverts	Each	12
560(4)	Guide Posts	Each	310

Compiled by R. A. Stack Date Feb. 1, 1960
Checked by J. T. Isaacson Date Apr. 1, 1960
Correct E. M. Martin Date Apr. 28, 1960

Bureau of Public Roads Region 9 Denver, Colo

SUMMARY OF QUANTITIES

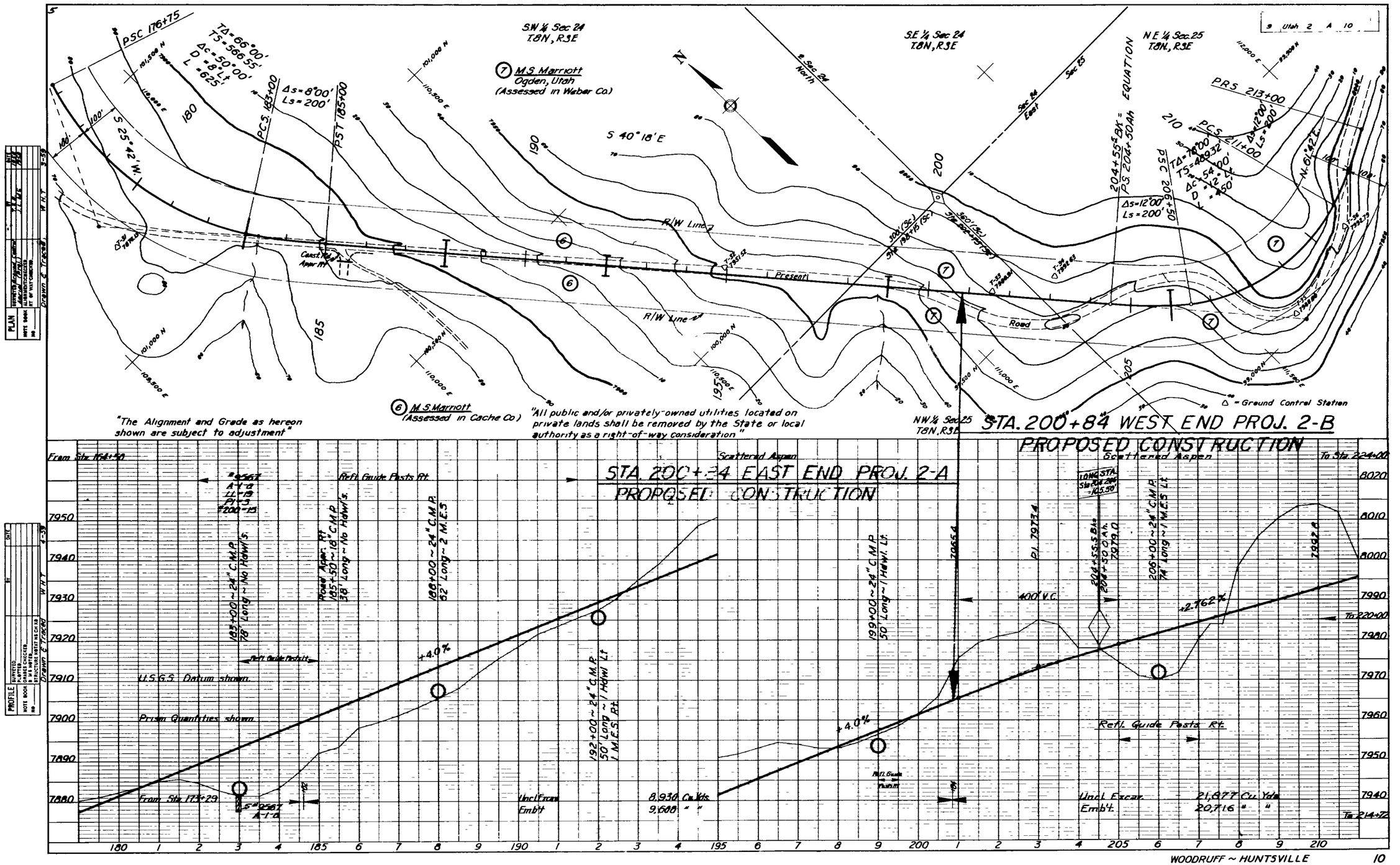
Woodruff-Huntsville ROUTE 2

PROJECT 2-a

STATE Utah COUNTY Weber and Cache

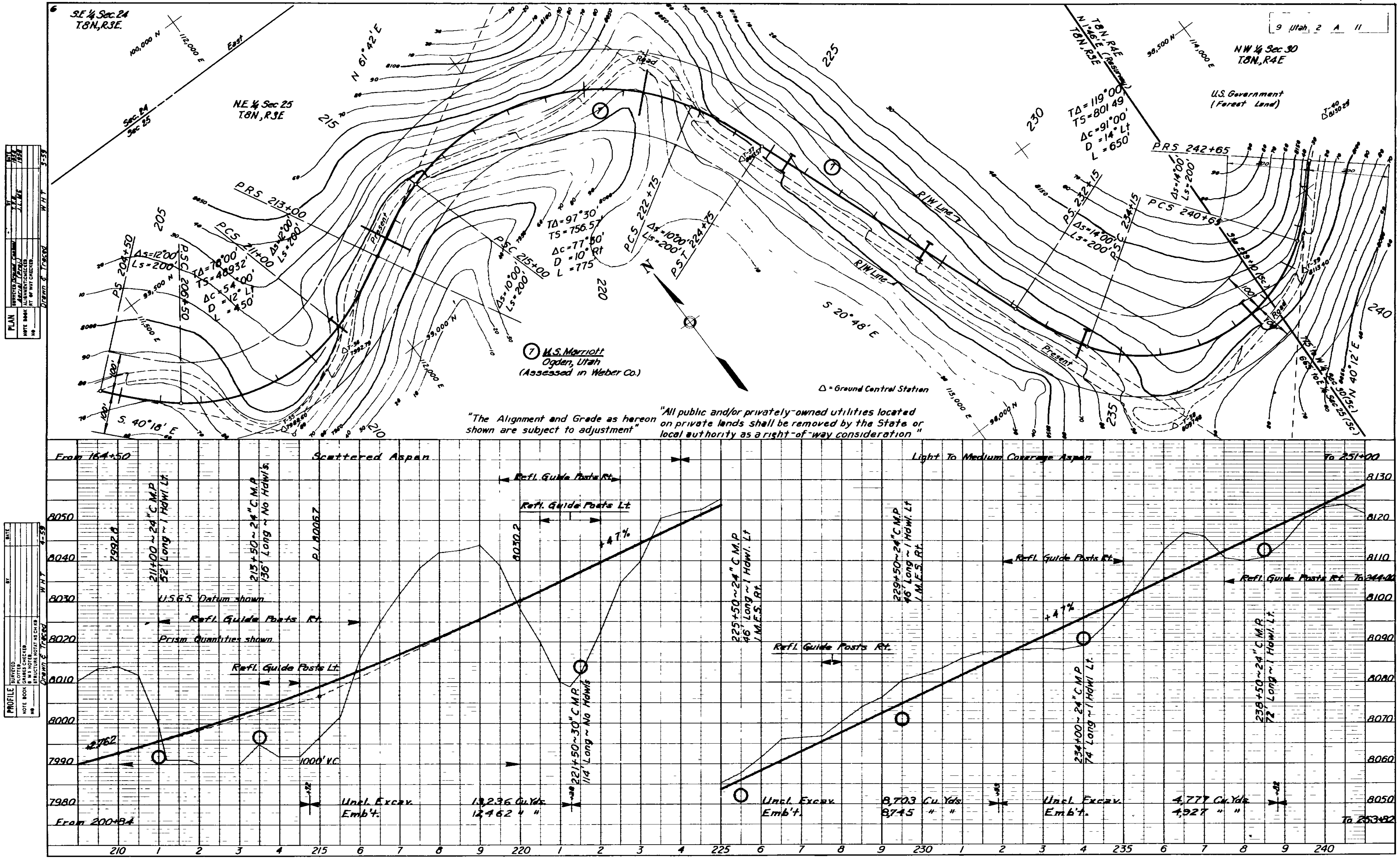
NATIONAL Forest: Cache

Sheet 2 of 2 Sheets

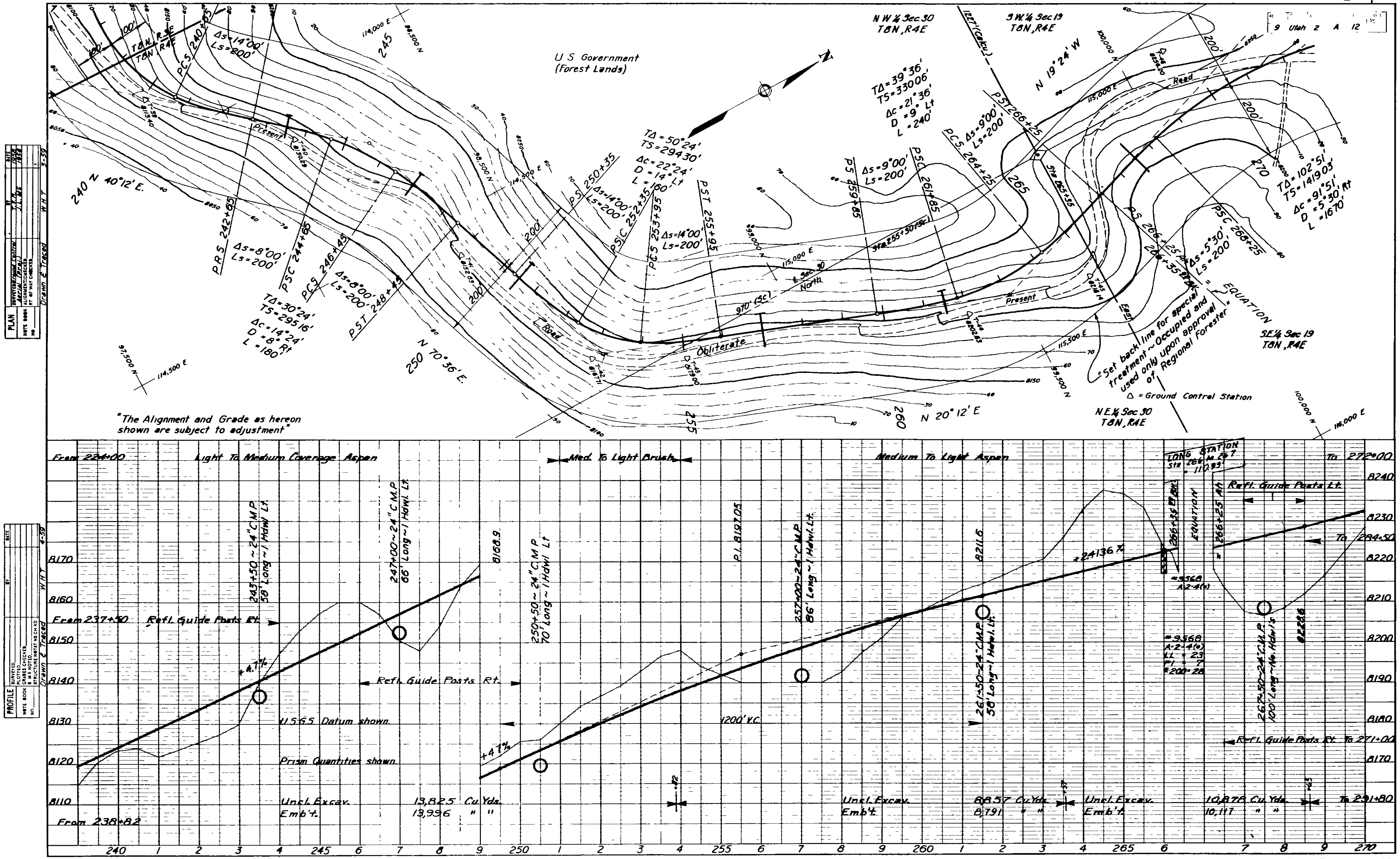


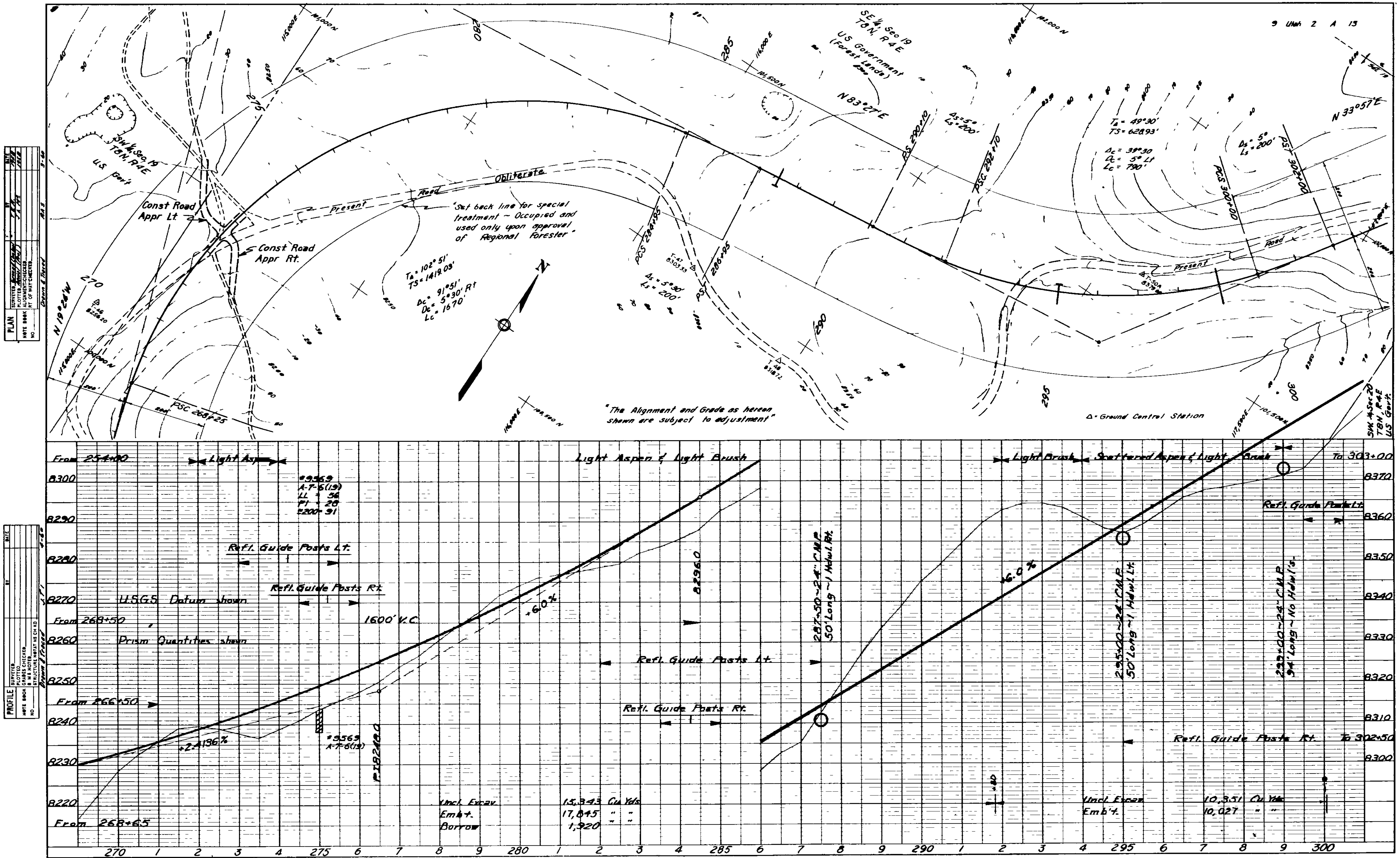
WOODRUFF ~ HUNTSVILLE 10

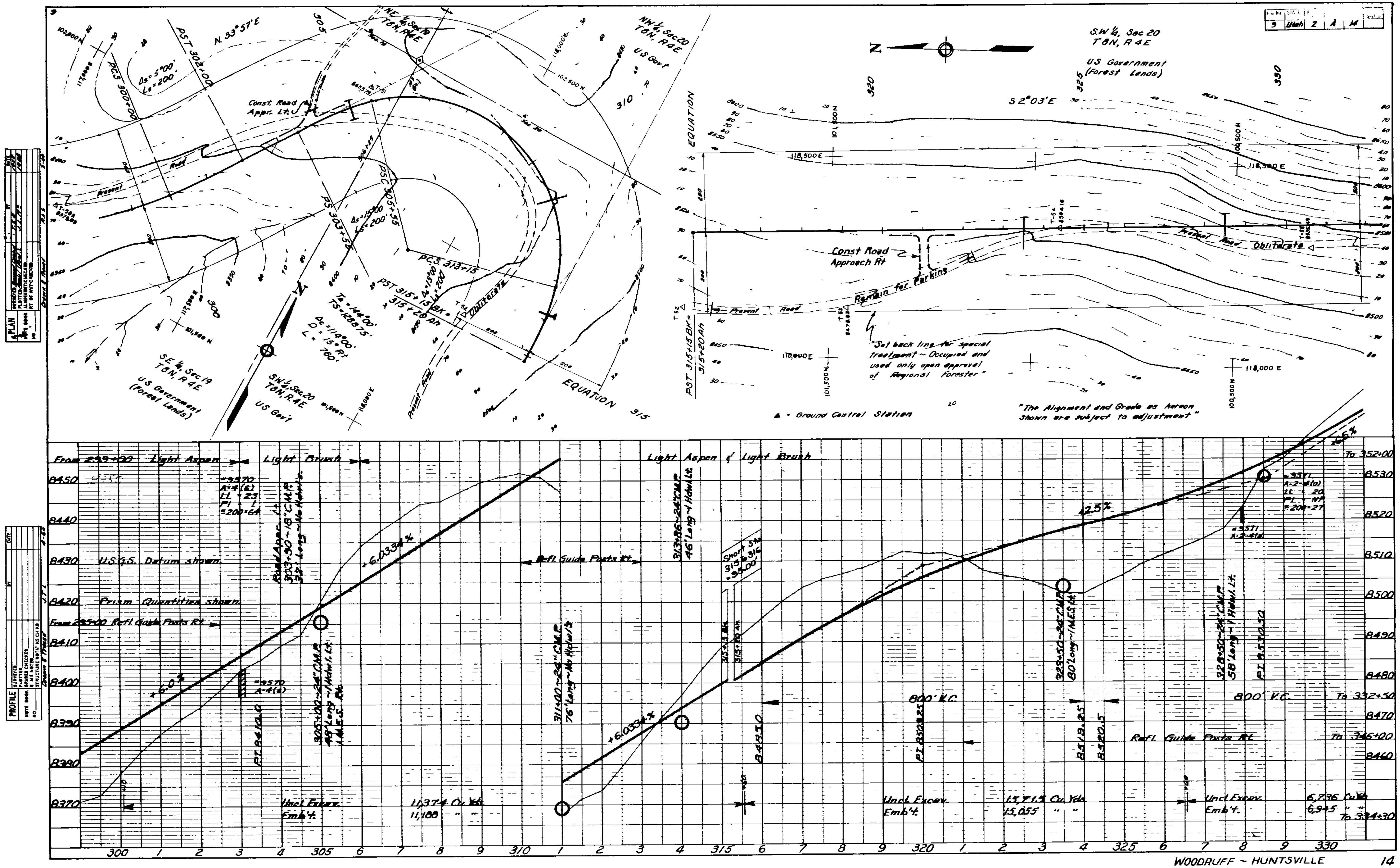
06



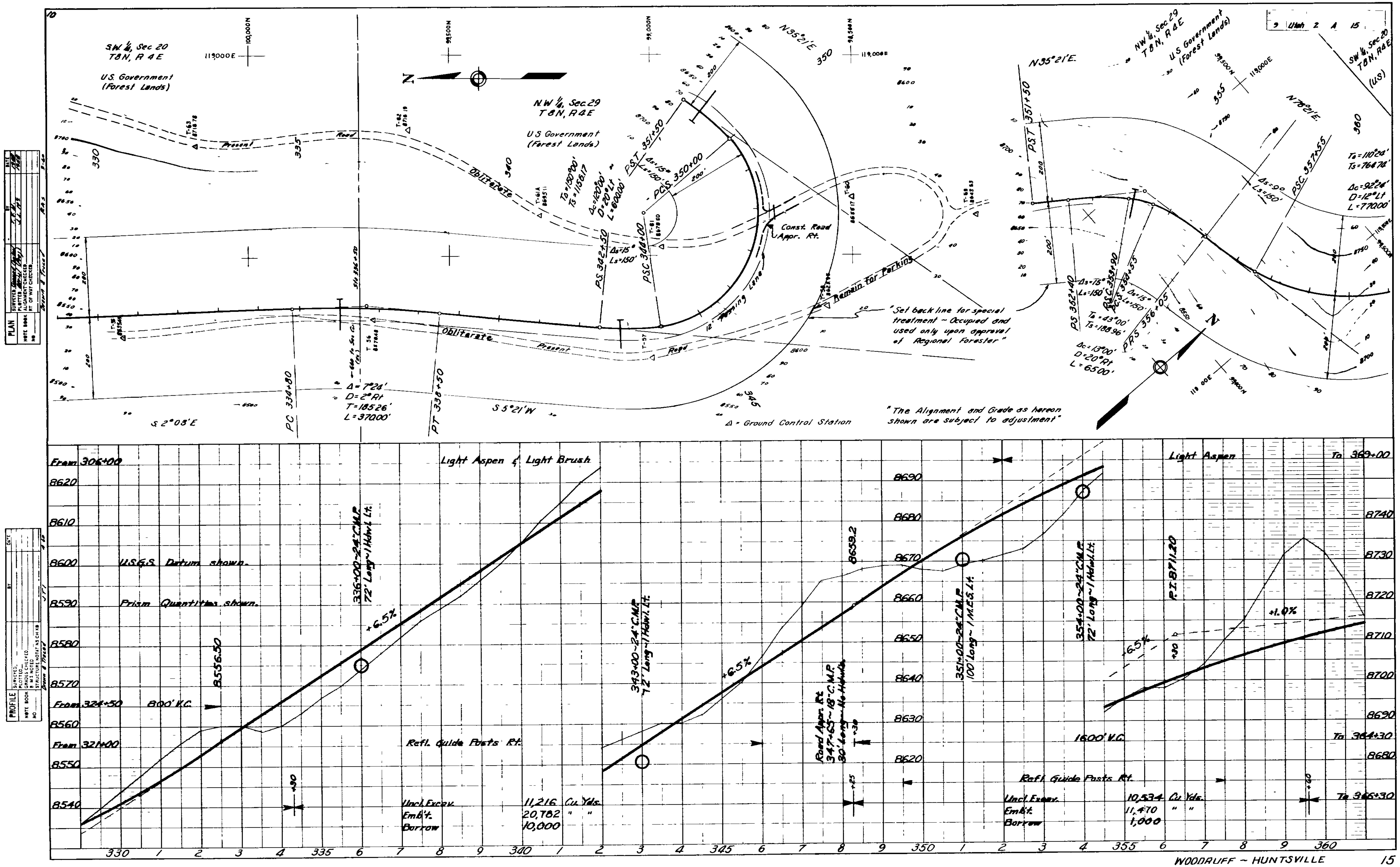
S.E.¼ Sec.24 T.8N., R.3E.
N.E.¼ Sec.25 T.8N., R.3E.
N.W.¼ Sec.30 T.8N., R.4E
U.S. Government (Forest Land)
9 Utah 2 A 11
N 61°42' E
S. 40°18' E
S 20°48' E
N 40°12' E
PS 204+50
P.S.C. 206+50
PRS 213+00
PCS 211+00
TΔ=70°00' TS=489.32' Δc=54°00' D=12° Lt L=450'
Δs=12°00' Ls=200'
TΔ=97°30' TS=756.57' Δc=77°30' D=10° Rt L=775'
PSC 215+00
Δs=10°00' Ls=200'
P.C.S. 222+75
P.S.T. 224+75
TΔ=119°00' TS=801.49 Δc=91°00' D=14° Lt L=650'
P.S. 232+15
P.S.C. 234+15
Δs=14°00' Ls=200'
PCS 240+65
PRS 242+65
R/W Line
Present
Road
7 U.S. Marriott Ogden, Utah (Assessed in Weber Co.)
Δ = Ground Control Station
"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"
From 164+50
Scattered Aspen
Light To Medium Coverage Aspen
To 251+00
Refl. Guide Posts Rt.
Refl. Guide Posts Lt.
U.S.G.S. Datum shown
Prism Quantities shown
211+00 ~ 24" C.M.P. 52' Long ~ 1 Hdwl. Lt.
213+50 ~ 24" C.M.P. 136' Long ~ No Hdwls.
P.I. 8006.7
8030.2
221+50 ~ 30" C.M.P. 114' Long ~ No Hdwls.
225+50 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
229+50 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
234+00 ~ 24" C.M.P. 74' Long ~ 1 Hdwl Lt.
238+50 ~ 24" C.M.P. 72' Long ~ 1 Hdwl. Lt.
+4.7%
+.762
1000' V.C.
Uncl. Excav. 13,236 Cu. Yds.
Emb't. 12,462 " "
Uncl. Excav. 8,703 Cu. Yds.
Emb't. 8,745 " "
Uncl. Excav. 4,777 Cu. Yds.
Emb't. 4,927 " "
From 200+84
To 253+82
PLAN
PROFILE
Drawn & Traced WHT

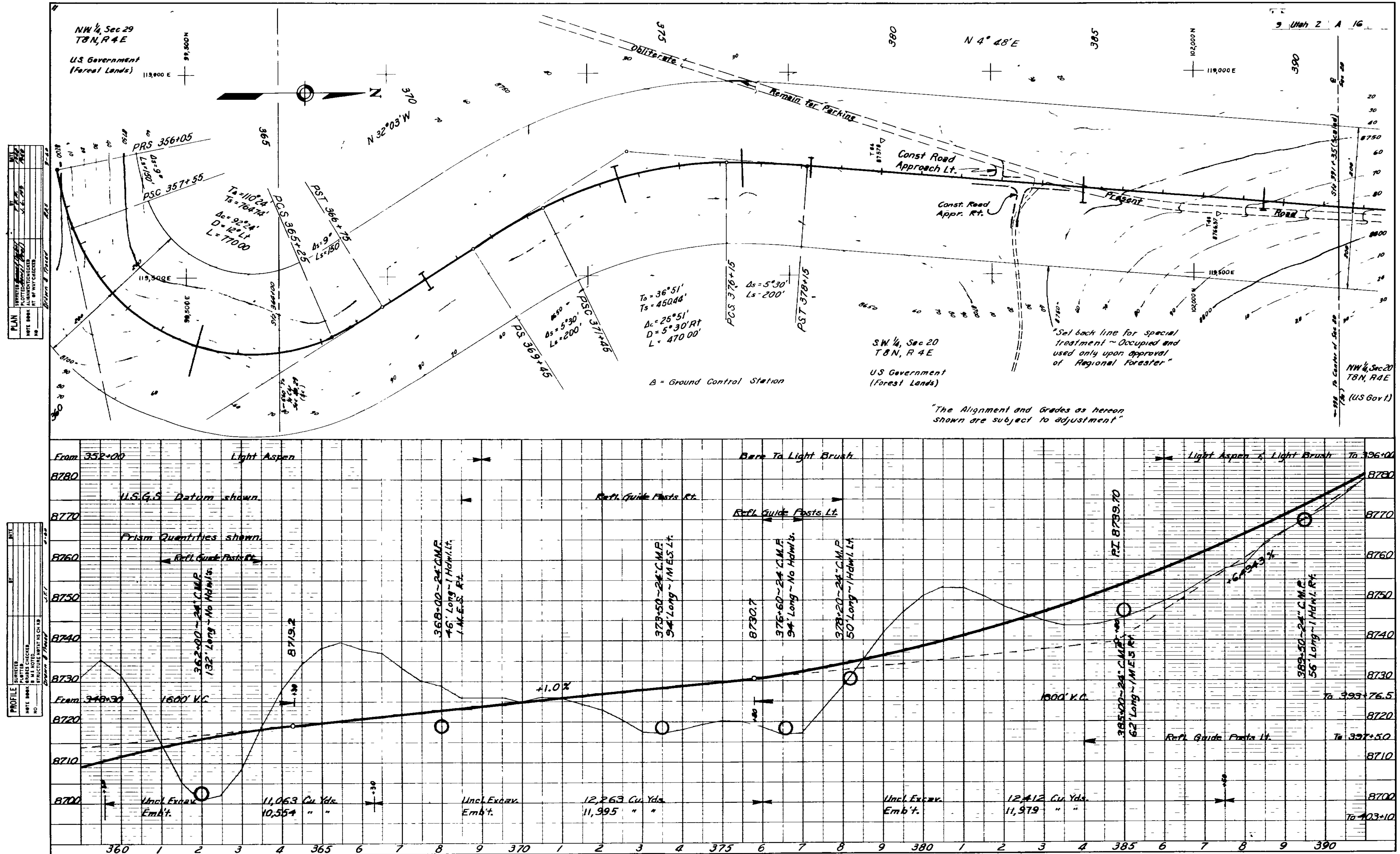

9 Utah 2 A 12
NW¼ Sec 30 T8N, R4E
SW¼ Sec 19 T8N, R4E
U S Government
(Forest Lands)
T8N, R4E
PC.S. 240+25
Δs=14°00'
Ls=200'
TΔ=39°36'
TS=33006'
Δc=21°36'
D=9° Lt
L=240'
N 19°24' W
PST 266+25
PC.S. 264+25
Δs=9°00'
Ls=200'
TΔ=50°24'
TS=29430'
Δc=22°24'
D=14° Lt
L=160'
PS 250+35
Δs=14°00'
Ls=200'
PSC 252+35
PCS 253+95
PST 255+95
Δs=14°00'
Ls=200'
PS 259+85
PSC 261+85
Δs=9°00'
Ls=200'
TΔ=102°51'
TS=141903'
Δc=91°51'
D=5°30' Rt
L=1670'
PS 266+25 Ah
266+35.27 Bk
Δs=5°30'
Ls=200'
PSC 268+25
EQUATION
SE¼ Sec 19 T8N, R4E
240 N 40°12' E.
PRS 242+65
Δs=8°00'
Ls=200'
PSC 244+65
PCS 246+45
Δs=8°00'
Ls=200'
PST 248+45
TΔ=30°24'
TS=295 16'
Δc=14°24'
D=8° Rt
L=180'
250 N 70°36' E.
Present
Obliterate
Road
"Set back line for special treatment ~ Occupied and used only upon approval of Regional Forester"
Δ = Ground Control Station
NE¼ Sec 30 T8N, R4E
N 20°12' E
255
260
265
270
"The Alignment and Grade as hereon shown are subject to adjustment"
PLAN
Drawn & Traced W.H.T. 3-59
From 224+00
Light To Medium Coverage Aspen
Med. To Light Brush
Medium To Light Aspen
To 272+00
LONG STATION Sta. 266 = 247 + 11.93
Refl. Guide Posts Lt.
To 284+50
From 237+50
Refl. Guide Posts Rt.
243+50 ~ 24" C.M.P. 58' Long ~ 1 Hdwl. Lt.
247+00 ~ 24" C.M.P. 86' Long ~ 1 Hdwl. Lt.
8168.9
250+50 ~ 24" C.M.P. 70' Long ~ 1 Hdwl. Lt.
P.I. 8197.05
257+00 ~ 24" C.M.P. 86' Long ~ 1 Hdwl. Lt.
8211.6
261+50 ~ 24" C.M.P. 58' Long ~ 1 Hdwl. Lt.
266+35.27 Bk
EQUATION
266+25 Ah
+2.4136%
267+50 ~ 24" C.M.P. 100' Long ~ No Hdwl's
8228.6
+4.7%
+4.7%
Refl. Guide Posts Rt.
U.S.G.S. Datum shown.
Prism Quantities shown.
1200' V.C.
Refl. Guide Posts Rt. To 271+00
Uncl. Excav. 13,825 Cu. Yds.
Emb't. 13,996 " "
Uncl. Excav. 8,857 Cu. Yds.
Emb't. 8,791 " "
Uncl. Excav. 10,878 Cu. Yds.
Emb't. 10,117 " "
To 291+80
From 238+82
PROFILE
Drawn & Traced W.H.T. 4-59
8110 8120 8130 8140 8150 8160 8170
8170 8180 8190 8200 8210 8220 8230 8240
240 1 2 3 4 245 6 7 8 9 250 1 2 3 4 255 6 7 8 9 260 1 2 3 4 265 6 7 8 9 270


PLAN
PROFILE
9 Utah 2 A 13
SE¼ Sec 19 T6N, R4E
U.S Government (Forest Lands)
SW¼ Sec 19 T6N, R4E U.S Gov't
N 83°27'E
N 33°57'E
N 19°28'W
Const Road Appr Lt
Const Road Appr Rt.
Present Road Obliterate
"Set back line for special treatment ~ Occupied and used only upon approval of Regional Forester"
T_a = 102°51' TS = 1419.03'
Δ_c = 91°51' D_c = 5°30' Rt L_c = 1670'
Δ_s = 5°30' L_s = 200'
Δ_s = 5° L_s = 200'
T_a = 49°30' TS = 628.93'
Δ_c = 39°30 D_c = 5° Lt L_c = 790'
PSC 268+25
PCS 284+95
PST 286+95
PS 290+10
PSC 292+10
PCS 300+00
PST 302+00
"The Alignment and Grade as hereon shown are subject to adjustment"
Δ - Ground Control Station
SW¼ Sec 20 T6N, R4E U.S. Gov't
From 254+00
Light Aspen
Light Aspen & Light Brush
Light Brush
Scattered Aspen & Light Brush
To 303+00
#3569 A-7-6(19) LL = 56 PI = 28 #200 = 91
#3563 A-7-6(19)
Refl. Guide Posts Lt.
Refl. Guide Posts Rt.
U.S.G.S. Datum shown
From 268+50
Prism Quantities shown
1600' V.C.
From 266+50
+2.4136%
+6.0%
PI 8240.0
8296.0
287+50 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Rt.
295+00 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Lt.
299+00 ~ 24" C.M.P. 94' Long ~ No Hdwl's.
To 302+50
Uncl. Excav. 15,343 Cu Yds
Emb't. 17,845 " "
Borrow 1,920 " "
Uncl. Excav. 10,351 Cu Yds
Emb't. 10,027 " "
From 268+65
8300
8290
8280
8270
8260
8250
8240
8230
8220
8370
8360
8350
8340
8330
8320
8310
8300
270 1 2 3 4 275 6 7 8 9 280 1 2 3 4 285 6 7 8 9 290 1 2 3 4 295 6 7 8 9 300

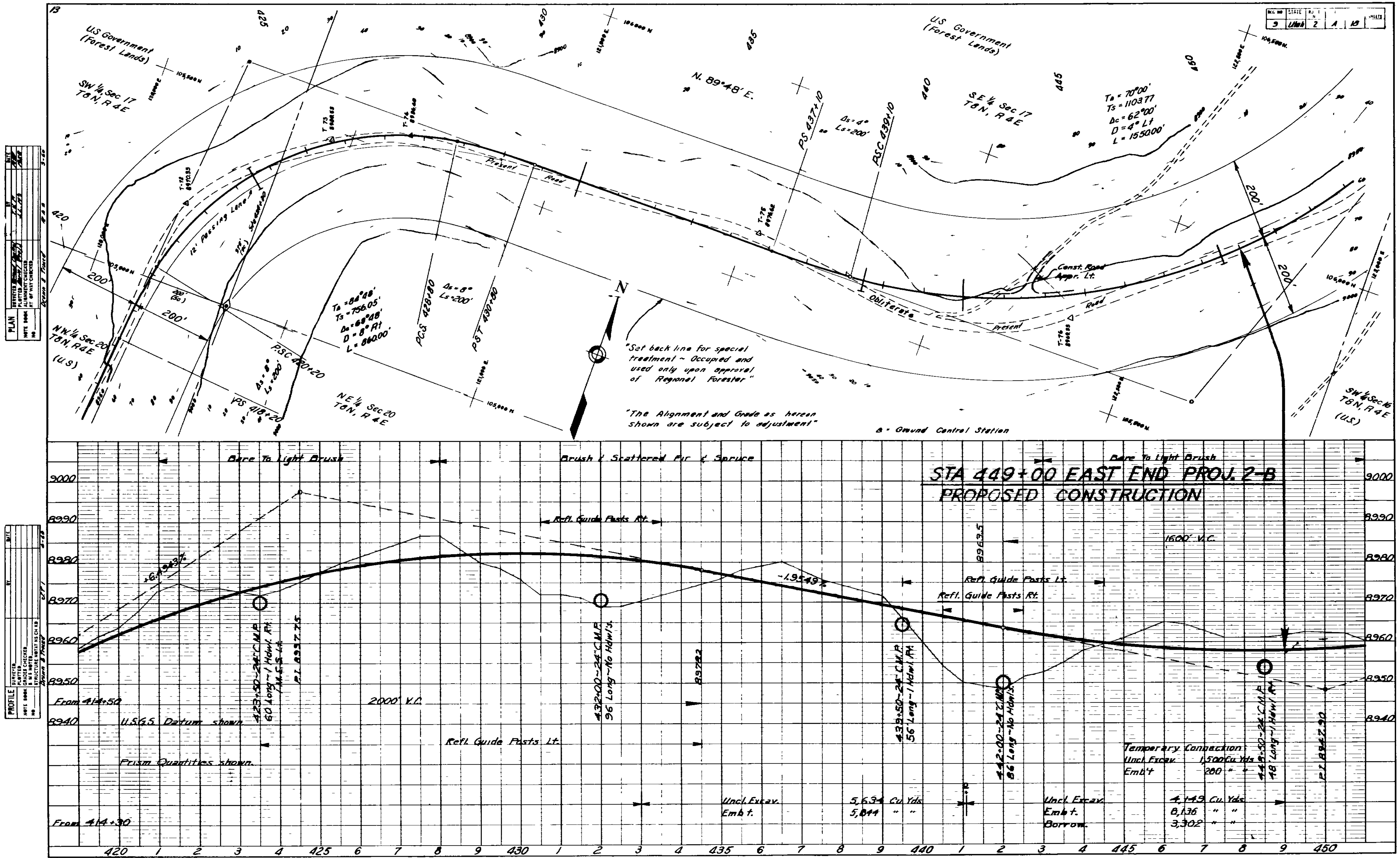


9 Utah 2 A 14
SW ¼, Sec 20
T8N, R4E
US Government
(Forest Lands)
S 2°03'E
EQUATION
PST 315+15 BK=
315+20 Ah
Const Road
Approach Rt
Present Road Obliterate
Remain for Parking
"Set back line for special treatment ~ Occupied and used only upon approval of Regional Forester"
▲ = Ground Control Station
"The Alignment and Grade as hereon shown are subject to adjustment"
N 33°57'E
PST 302+00
PCS 300+00
Δs=5°00'
Ls=200'
Const. Road
Appr. Lt.
NE ¼ Sec 19
T8N, R4E
NW ¼, Sec 20
T8N, R4E
US Govt
PS 303+55
PSC 305+55
Δs=15°00'
Ls=200
PCS 313+15
PST 315+15 BK=
315+20 Ah
Tn=144.00'
TS=128.75'
Δc=114°00'
D=15° Rt
L=760'
SE ¼, Sec 19
T8N, R4E
US Government
(Forest Lands)
SW ¼ Sec 20
T8N, R4E
US Gov't
Present Road
EQUATION 315
PLAN
PROFILE
From 299+00 Light Aspen Light Brush
Light Aspen & Light Brush
USGS Datum shown
Prism Quantities shown
From 299+00 Refl Guide Posts Rt
Refl Guide Posts Rt
+6.0%
+6.0334%
+2.5%
+6%
Road Appr. Lt.
303+90 ~ 18" CMP
32' Long ~ No Hdwl's
305+00 ~ 24" CMP
48' Long ~ 1 Hdwl. Lt.
1 M.E.S. Rt.
311+00 ~ 24" CMP
76' Long ~ No Hdwl's
313+86 ~ 24" CMP
46' Long ~ 1 Hdwl. Lt.
Short Sta
315 to 316
=95.00'
315+15 Bk
315+20 Ah
323+50 ~ 24" CMP
80' Long ~ 1 M.E.S. Rt.
328+50 ~ 24" CMP
58' Long ~ 1 Hdwl. Lt.
P.I. 8410.0
8485.0
P.I. 8528.25
8519.25
8520.5
P.I. 8530.30
800' V.C.
800' V.C.
Uncl Excav. 11,374 Cu Yds
Emb't. 11,188
Uncl Excav. 15,715 Cu Yds
Emb't. 15,055
Uncl Excav. 6,796 Cu Yds
Emb't. 6,945
To 332+50
To 346+00
To 334+30
To 352+00
8370 8380 8390 8400 8410 8420 8430 8440 8450
8460 8470 8480 8490 8500 8510 8520 8530
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

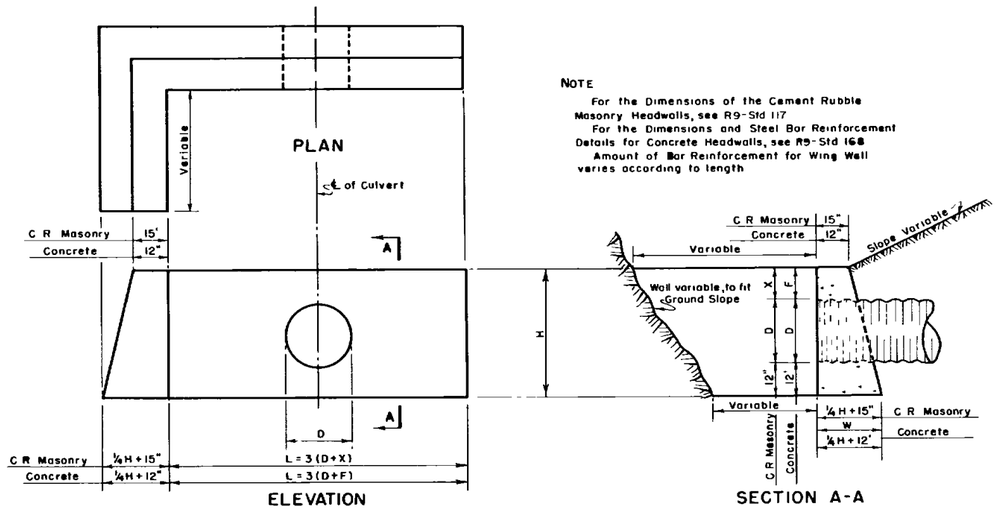

PLAN
PROFILE
9 Utah 2 A 15
S.W. ¼, Sec 20
T8N, R4E
U.S. Government
(Forest Lands)
N.W. ¼, Sec 29
T8N, R4E
U.S. Government
(Forest Lands)
NW ¼, Sec 29
T8N, R4E
U.S. Government
(Forest Lands)
SW ¼, Sec 20
T8N, R4E
(US)
Present Road
Obliterate
Const. Road Appr. Rt.
Remain for Parking
12' Passing Lane
"Set 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"
Δ = Ground Control Station
N35°21'E
N78°21'E
S 2°08'E
S 5°21'W
PC 334+80
PT 338+50
Δ=7°24'
D=2° Rt
T=185.26'
L=370.00'
PS 342+50
PSC 344+00
PCS 350+00
PST 351+50
Δs=15°
Ls=150'
Tc=150.00'
Ts=1156.17
Δc=120°00'
D=20° Lt
L=600.00
PS 352+40
PCS 353+90
PSC 357+55
PCS 356+05
Tc=43.00'
Ts=188.96'
Δc=13°00'
D=20° Rt
L=65.00'
Δs=90
Ls=150'
Tc=110.24'
Ts=764.70'
Δc=92°24'
D=12° Lt
L=770.00'
From 306+00
Light Aspen & Light Brush
Light Aspen
To 369+00
U.S.G.S. Datum shown.
Prism Quantities shown.
336+00~24" C.M.P. 72' Long~1 Hdwl. Lt.
343+00~24" C.M.P. 72' Long~1 Hdwl. Lt.
347+65~18" C.M.P. 30' Long~No Hdwls. Road Appr. Rt.
351+00~24" C.M.P. 100' Long~1 M.E.S. Lt.
354+00~24" C.M.P. 72' Long~1 Hdwl. Lt.
8659.2
P.I. 8711.20
8556.50
+6.5%
+6.5%
-6.5%
+1.0%
From 324+50 800' V.C.
From 321+00
1600' V.C.
To 364+30
To 366+30
Refl. Guide Posts Rt.
Refl. Guide Posts Rt.
Uncl. Excav. 11,216 Cu. Yds.
Emb'k't. 20,782 " "
Borrow 10,000
Uncl. Excav. 10,534 Cu. Yds.
Emb'k't. 11,470 " "
Borrow 1,000
8540 8550 8560 8570 8580 8590 8600 8610 8620
8620 8630 8640 8650 8660 8670 8680 8690
8680 8690 8700 8710 8720 8730 8740
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


9 Utah 2 A 16
NW 1/4, Sec 29
T8N, R4E
US Government
(Forest Lands)
SW 1/4, Sec 20
T8N, R4E
US Government
(Forest Lands)
NW 1/4, Sec 20
T8N, R4E
(US Govt)
N 32°03'W
N 4° 48'E
Obliterate
Remain for Parking
PRS 356+05
PSC 357+55
PCS 365+25
PST 366+75
PS 369+45
PSC 371+45
PCS 376+15
PST 378+15
Ta = 110.24
Ts = 764.74'
Δc = 92°24'
D = 12° Lt
L = 770.00
Δs = 9°
Ls = 150
Δs = 5°30'
Ls = 200'
Ta = 36°51'
Ts = 450.44'
Δc = 25°51'
D = 5°30' Rt
L = 470.00'
Const Road Approach Lt.
Const. Road Appr. Rt.
Present Road
Δ = Ground Control Station
"Set back line for special treatment ~ Occupied and used only upon approval of Regional Forester"
"The Alignment and Grades as hereon shown are subject to adjustment"
PLAN
From 352+00
Light Aspen
Bare To Light Brush
Light Aspen & Light Brush
To 396+00
U.S.G.S. Datum shown
Prism Quantities shown
Refl. Guide Posts Rt.
Refl. Guide Posts Lt.
362+00 ~ 24" C.M.P. 132' Long ~ No Hdwls.
8719.2
368+00 ~ 24" C.M.P. 46' Long ~ 1 Hdwl. Lt. 1 M.E.S. Rt.
373+50 ~ 24" C.M.P. 94' Long ~ 1 M.E.S. Lt.
8730.7
376+60 ~ 24" C.M.P. 94' Long ~ No Hdwls.
378+20 ~ 24" C.M.P. 50' Long ~ 1 Hdwl. Lt.
P.I. 8739.70
385+00 ~ 24" C.M.P. 62' Long ~ 1 M.E.S. Rt.
389+50 ~ 24" C.M.P. 56' Long ~ 1 Hdwl. Rt.
+1.0%
+6.943%
From 348+30
1600' V.C.
1800' V.C.
To 393+76.5
To 397+50
To 403+10
Uncl. Excav. 11,063 Cu. Yds.
Emb't. 10,554 " "
Uncl. Excav. 12,263 Cu. Yds.
Emb't. 11,995 " "
Uncl. Excav. 12,412 Cu. Yds.
Emb't. 11,979 " "
PROFILE

REG NO 9
STATE Utah
ROUTE NO 2
SECTION 4
SHEET No 17
TOTAL SHEETS
PLAN
NOTE BOOK NO
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT OF WAY CHECKED
Drawn & Traced
PROFILE
SURVEYED
GRADES CHECKED
B.M.S NOTED
STRUCTURE NOTATIONS CH'KD
390
395
400
405
410
415
420
N 4°48' E
N 45°00' E
N. 5°00' E
8750
8800
8900
9000
T-67
T-68
T-69
T-70
T-71
T-72
Ta = 40°00'
Ts = 309.50'
Δc = 20°
D = 10° Lt
L = 200.00'
Δs = 10°
Ls = 200'
PS 403+10
PSC 405+10
PCS 407+10
PST 409+10
Δs = 6°
Ls = 200'
PS 393+20 Ah. = EQUATION
393+23.5 Bk.
PSC 395+20
Ta = 40°12'
Ts = 453.67
Δc = 28°12'
D = 6° Rt
L = 470.00'
PCS 399+90
PST 401+90
391+88.2 (Scaled)
Const. Road Appr. Rt.
Present Road
Remain for Parking
12' Passing Lane
"Set back line for special treatment – Occupied and used only upon approval of Regional Forester"
NW ¼, Sec. 20 T8N, R4E
US Government (Forest Lands)
SW ¼ Sect 17 T8N, R4E
SW ¼, Sec 20 T8N, R4E
U.S. Government (Forest Lands)
120,000 E
119,500 E
120,500 E
"The Alignment and Grade as hereon shown are subject to adjustment"
Δ = Ground Control Station
NE ¼, Sec 20 T8N, R4E
(US Govt)
PS 418+20
PSC 420+20
SE ¼ Sec 17 T8N, R4E
US Gov't
From 386+00
Light Aspen & Light Brush
Aspen & Brush
Aspen, Scattered Fir & Spruce
Light Brush
Light Aspen
U.S.G.S. Datum shown
Prism Quantities shown
From 375+60
1800' V.C.
From 384+00
From 387+50
Long Sta 393+23.5 = 109.5'
393+23.5 Bk. = 393+20.0 Ah.
8798.15
394+00 – 24" CMP 60' Long – 1 Hdwl. Rt.
Refl. Guide Posts Lt.
+6.4943%
Uncl. Excav. 8,854 Cu. Yds.
Emb't. 9,266 " "
Refl. Guide Posts Lt.
Refl. Guide Posts Rt.
402+75 – 24" CMP 84' Long – 1 M.E.S. Rt.
+6.4943%
8932.81
409+50 – 24" C.M.P. 70' Long – 1 Hdwl. Rt. 1 M.E.S. Lt.
Uncl. Excav. 12,016 Cu. Yds.
Emb't. 12,616 " "
Refl. Guide Posts Lt.
+6.4943%
2000' V.C.
416+50 – 24" C.M.P. 60' Long – 1 Hdwl. Rt.
Uncl. Excav. 16,815 Cu. Yds.
Emb't. 16,613 " "
Ta 434+50
To 433+00
8770
8780
8790
8800
8810
8820
8830
8840
8850
8860
8870
8880
8890
8900
8910
8920
8930
8940
8950
8960
8970
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

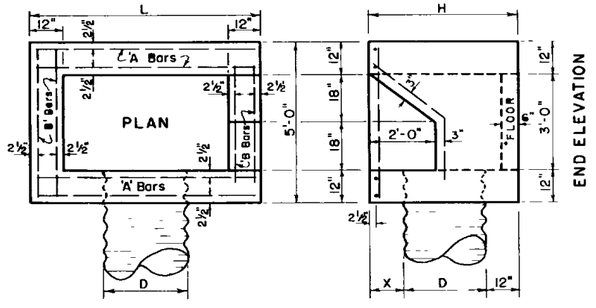


US Government (Forest Lands)
SW 1/4 Sec 17 T8N, R4E
SE 1/4 Sec 17 T8N, R4E
NW 1/4 Sec 20 T8N, R4E (U.S)
NE 1/4 Sec 20 T8N, R4E
SW 1/4 Sec 16 T8N, R4E (U.S)
N. 89°48' E.
Ta = 84°48' Ts = 756.05' Δc = 68°48' D = 8° Rt L = 860.00'
Ta = 70°00' Ts = 1103.77 Δc = 62°00' D = 4° Lt L = 1550.00'
PS 418+20
P.S.C 420+20
PCS 428+80
PST 430+80
PS 437+10
PSC 439+10
Δs = 8° Ls = 200'
Δs = 4° Ls = 200'
12' Passing Lane
Present Road
Obliterate
Const. Road Appr. Lt.
"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"
Ground Control Station
Bare To Light Brush
Brush & Scattered Fir & Spruce
STA 449+00 EAST END PROJ. 2-B
PROPOSED CONSTRUCTION
Refl. Guide Posts Rt.
Refl. Guide Posts Lt.
1600' V.C.
2000' V.C.
+6.1943%
-1.9549%
423+50 ~ 24" C.M.P 60' Long ~ 1 Hdwl. Rt. 1 M.E.S. Lt.
P.I. 8997.75
432+00 ~ 24" C.M.P 96' Long ~ No Hdwls.
8978.2
439+50 ~ 24" C.M.P 56' Long ~ 1 Hdwl. Rt.
8963.5
442+00 ~ 24" C.M.P 86' Long ~ No Hdwls.
448+50 ~ 24" C.M.P 48' Long ~ 1 Hdwl. Rt.
P.I. 8947.90
From 414+50
From 414+30
U.S.G.S. Datum shown
Prism Quantities shown.
Uncl. Excav. 5,634 Cu. Yds
Emb't. 5,844 " "
Uncl. Excav. 4,143 Cu. Yds
Emb't. 8,136 " "
Borrow 3,302 " "
Temporary Connection:
Uncl. Excav. 1,500 Cu. Yds
Emb't 200 " "
9000
8990
8980
8970
8960
8950
8940
420 1 2 3 4 425 6 7 8 9 430 1 2 3 4 435 6 7 8 9 440 1 2 3 4 445 6 7 8 9 450
PLAN
PROFILE



ANGLE TYPE - CONCRETE HEADWALLS

USE



QUANTITIES IN ONE HEADWALL AND INLET

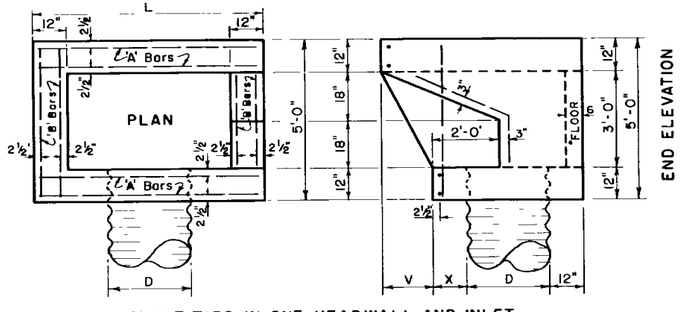
Dimensions		Class 'A' Concrete							Reinforcing Steel				
		X = 1'-0"		X = 1'-6"		X = 2'-0"		*Floor	'A' Bars		'B' Bars		Total
D	L	H	Cu Yds	H	Cu Yds	H	Cu Yds	Cu Yds	No	Length	No	Length	Lbs
18"	6'-0"	3'-6"	2 10	4'-0"	2 43	4'-6"	2 77	0 22	4	5'-7"	4	4'-7"	273
24"	6'-6"	4'-0"	2 53	4'-6"	2 88	5' 0"	3 24	0 25	4	6 -1"	4	4'-7"	286
30"	7'-0"	4' 6"	2 98	5'-0"	3 36	5'-6"	3 71	0 28	4	6'-7"	4	4 -7'	299
36"	7'-6"	5'-0"	3 46	5'-6"	3 85	6 0"	4 23	0 31	4	7 -1"	4	4'-7"	313

*Floor to be constructed where required.

TYPE 2

HEADWALL & INLET USED FOR SIDE HILL SECTION

INLET WITH FRONT, SIDE & BACKWALL TOPS ALL IN THE SAME PLANE



QUANTITIES IN ONE HEADWALL AND INLET

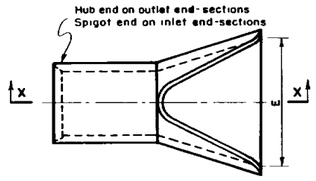
Dimensions		Class 'A' Concrete										Reinforcing Steel				
		X = 1'-0"			X = 1'-6"			X = 2'-0"			*Floor	'A' Bars		'B' Bars		Total
D	L	V=6'	V=12"	V=18'	V=6"	V=12"	V=18"	V=6"	V=12"	V=18"	Cu Yds	No	Length	No	Length	Lbs
18"	6 -0"	2 25	2 41	2 56	2 59	2 74	2 89	2 92	3 07	3 23	0 22	4	5'-7"	4	4'-7"	273
24"	6 6"	2 69	2 86	3 02	3 05	3 21	3 37	3 40	3 56	3 72	0 25	4	6'-1"	4	4'-7"	286
30"	7'-0"	3 16	3 33	3 50	3 53	3 70	3 87	3 88	4 05	4 27	0 28	4	6' 7"	4	4 -7"	299
36"	7'-6"	3 64	3 82	4 00	4 03	4 21	4 39	4 42	4 60	4 78	0 31	4	7'-1"	4	4'-7"	313

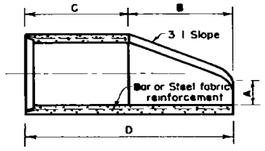
*Floor to be constructed where required

TYPE 3

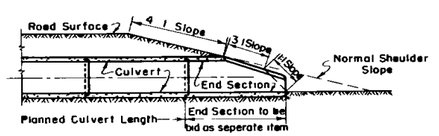
HEADWALL & INLET USED FOR SIDE HILL SECTION

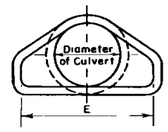
INLET WITH VARIABLE HEIGHT BACK & SIDEWALLS BUILT TO RETAIN HIGH CUT BANKS





CONCRETE END SECTION





END-SECTION DIMENSIONS					
DIAM	A	B	C	D	E
12"	4"	2 - 0"	4 - 0⅞	6'-0⅞	2 - 0"
15"	6"	2' - 3"	3' - 10"	6 - 1"	2' - 6"
18"	9"	2' - 3"	3' - 10"	6' - 1"	3' - 0"
24"	9½"	3 - 7½	2' - 6"	6' - 1½"	4' - 0"
30"	1' - 0"	4' - 6"	1' - 7⅝"	6' - 1⅝"	5' - 0"
36"	1' - 3"	5' - 3"	2 - 10⅜	8' - 1⅝"	6 - 0"
42"	1 - 9"	5' - 3"	2' - 11"	8' - 2"	6' - 6"
48"	2 - 0"	6 - 0"	2 - 2	8' 2"	7 - 0"

Note Design of end-section shall conform to Standard Reinforced Sectional Concrete Culvert Pipe

GENERAL NOTES

Concrete All concrete to be Class "A", made with Type II (Low Alkali) Portland Cement, with an air-entraining admixture Concrete to be poured monolithically All exposed edges shall be chamfered 1" All exposed surfaces to be given a "Rubbed Finish"

*Reinforcing Steel To be ½" round bars, and placed as shown in drawings Dimensions are to the center of bar

Foundations If foundation materials under headwalls are found unsuitable, either remove and replace with satisfactory selected material, or extend the concrete to provide a satisfactory footing

Construction Methods The minimum earth cover on top of the pipe shall not be less than ½ D, with a minimum cover of one foot Headwalls in all cases to be built parallel to the center line of the road

*Payment for reinforcing steel to be included in price bid for concrete

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

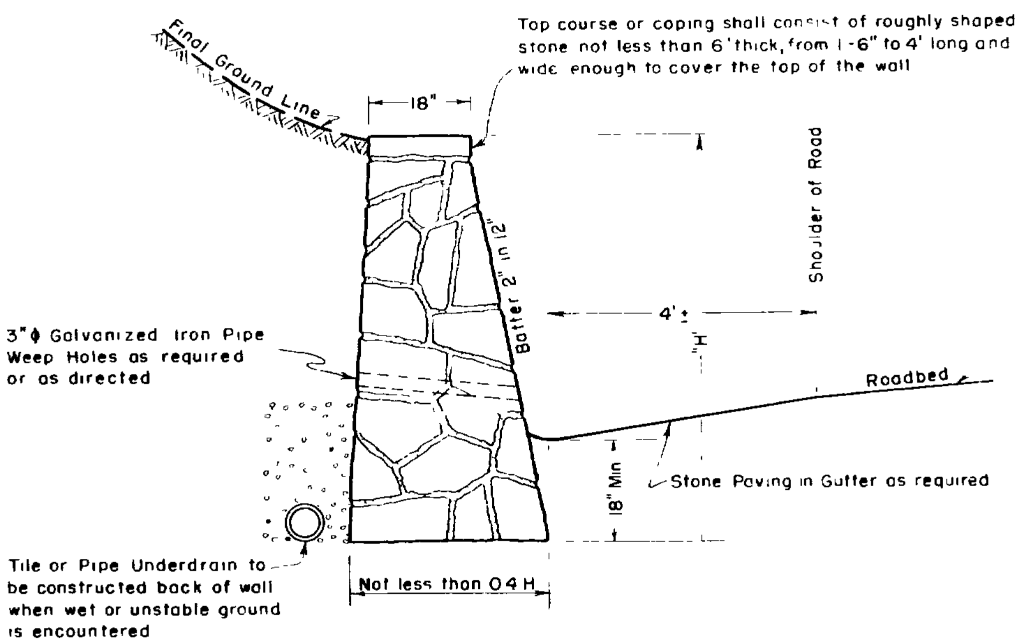
CONCRETE END SECTIONS HEADWALLS AND INLETS FOR PIPE CULVETS

APPROVED _____ DATE 3-29-58
FEDERAL HIGHWAY PROJECTS ENGINEER

R9-STD 117A

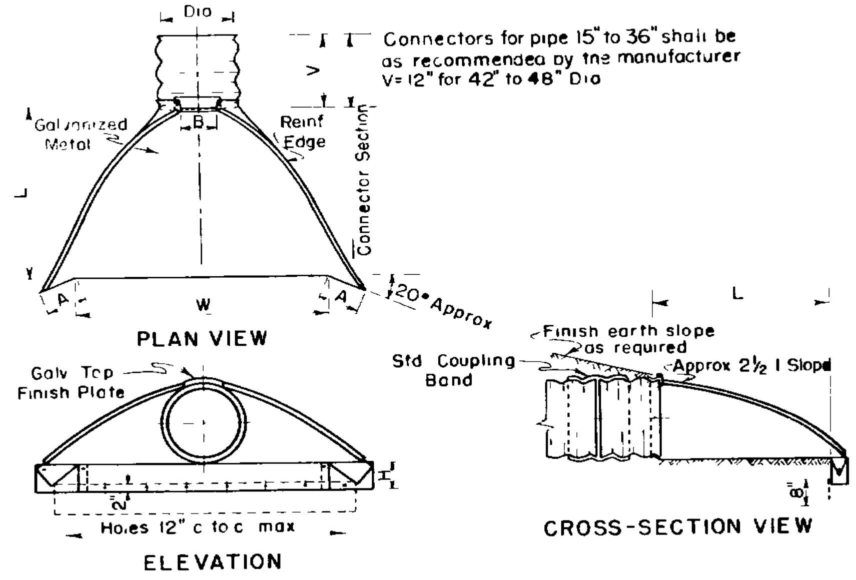
Rev. 5/27/59 J.L.H.

Drawn & Traced W.A.G. March 1953



Cement Rubble Masonry to be constructed in accordance with Item 242, PRA Form FP 41

CEMENT RUBBLE MASONRY RETAINING WALL



STANDARD END SECTION FOR CORRUGATED METAL PIPE CULVERTS

USE

Pipe Diam	Gage	DIMENSIONS				
		A 1" Tol	B Max	H 1" Tol	L 1½" Tol	W 2" Tol
15"	16	6"	8"	6"	26"	30"
18"	16	7	9	6	31	36
24"	14	9½	12	6	42	48
30"	14	12	15	7½	52½	60
36"	12	14	18	9	63	72
42"	12	16	21	10½	73½	84
48"	12	18	27	12	84	90

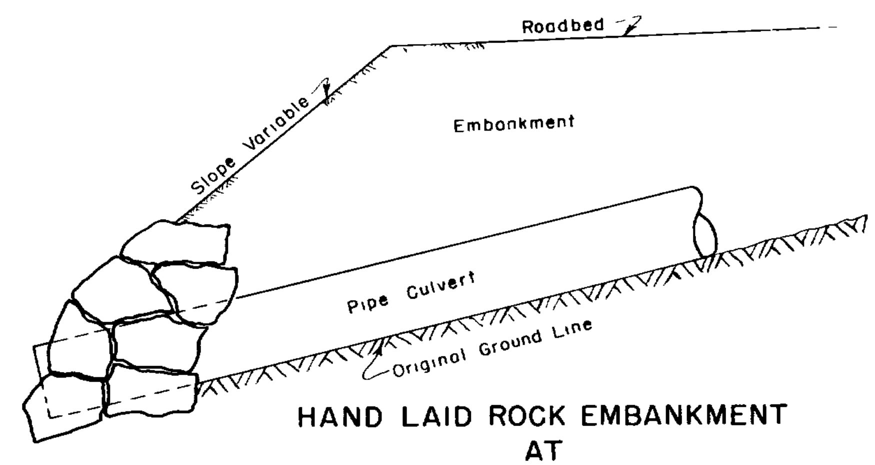
GENERAL NOTES

Toe plate, where needed, to be punched to match holes in skirt lip ⅜" galvanized bolts to be furnished Length of toe plate is W + 10" for 12" to 30" dia pipe incl and W + 22" for 36" to 48" dia pipe incl

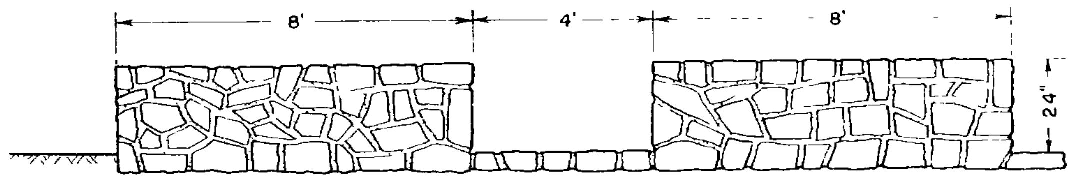
Skirt section for 12" to 24" dia pipe incl to be made in one piece

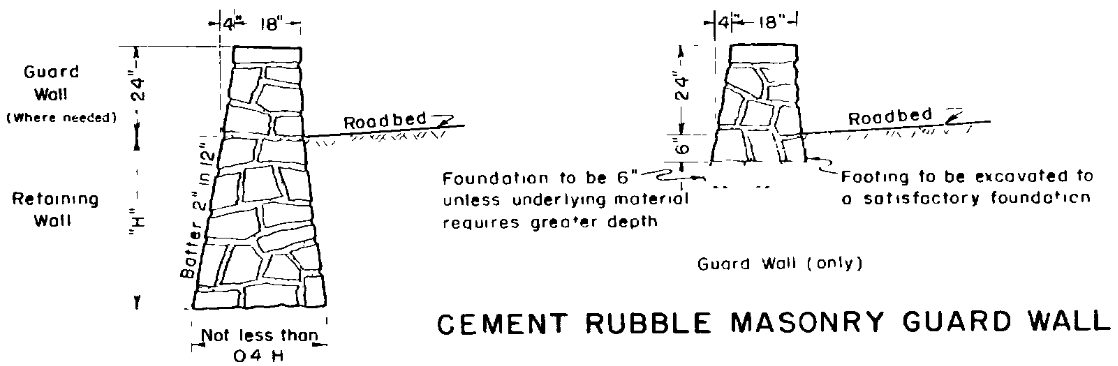
Skirt section for 30" to 48" dia pipe incl may be made from two sheet joined by riveting or bolting on center line

Connector Section, Corner Plate and Toe Plate to be same gage as skirt and each to be galvanized



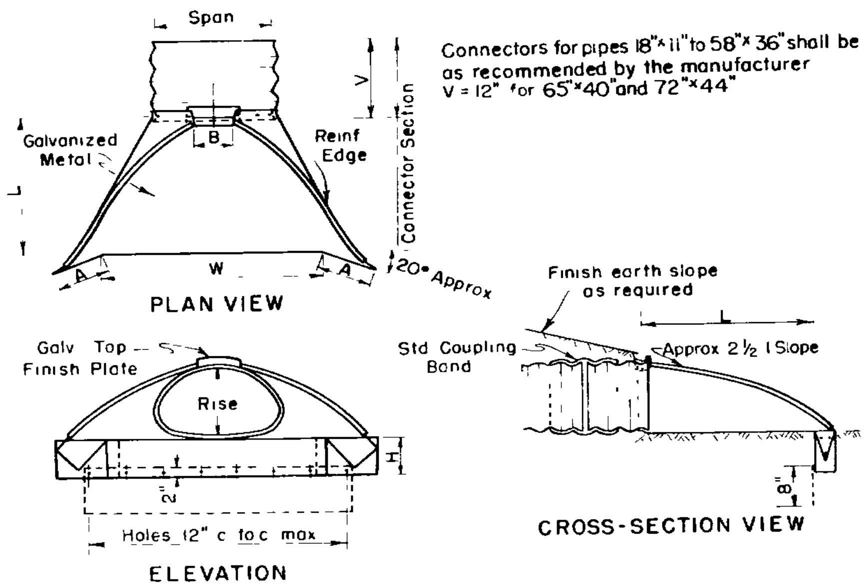
HAND LAID ROCK EMBANKMENT AT END OF PIPE CULVERTS





Guard Wall placed on top of Retaining Wall

CEMENT RUBBLE MASONRY GUARD WALL



STANDARD END SECTION FOR CORRUGATED METAL PIPE ARCH CULVERTS

Norm Culv Dia	Arch Dimen		Gage	DIMENSIONS				
	Span	Rise		A 1" Tol	B Max.	H 1" Tol	L 1½" Tol	W 2" Tol
15"	18"	11"	16	4½"	9"	6"	19"	30"
18"	22"	13"	16	5¼	10	6	23	36
24"	29"	18"	14	7	14	6	31½	48
30"	36"	22"	14	8¾	16	6	38½	60
36"	43"	27"	12	10¾	17½	7⅝	47	75
42"	50"	31"	12	12¼	20	9⅛	54	85
48"	58"	36"	12	14	26	10⅝	63	96
54"	65"	40"	12	15¾	23	10⅝	70	112
60"	72"	44"	10	17¼	24	12⅛	77	128

GENERAL NOTES

Toe plate, where needed, to be punched to match holes in skirt lip ⅜" galv bolts to be furnished Length of toe plate is W + 10" for Pipe-Arches with Rise of 11" to 27" incl and W + 18" min for Pipe-Arches with Rise of 31" to 44" incl

Skirt Section for Pipe-Arches with Rise of 11" to 22" incl to be made in one piece

Skirt Section for Pipe-Arches with Rise of 27" to 36" incl may be made from two sheets joined by riveting or bolting on center line

Skirt Section for Pipe-Arches with Rise of 40" to 44" incl may be made from three sheets joined by riveting or bolting at equal distances from center line

Connector Section, Corner Plate and Toe Plate to be same gage as Skirt and each to be galvanized

Designed By	C E L	Jan 1946
Drawn By	W H C	Jan 1946
Traced By	W A G	May 1950
Checked By		

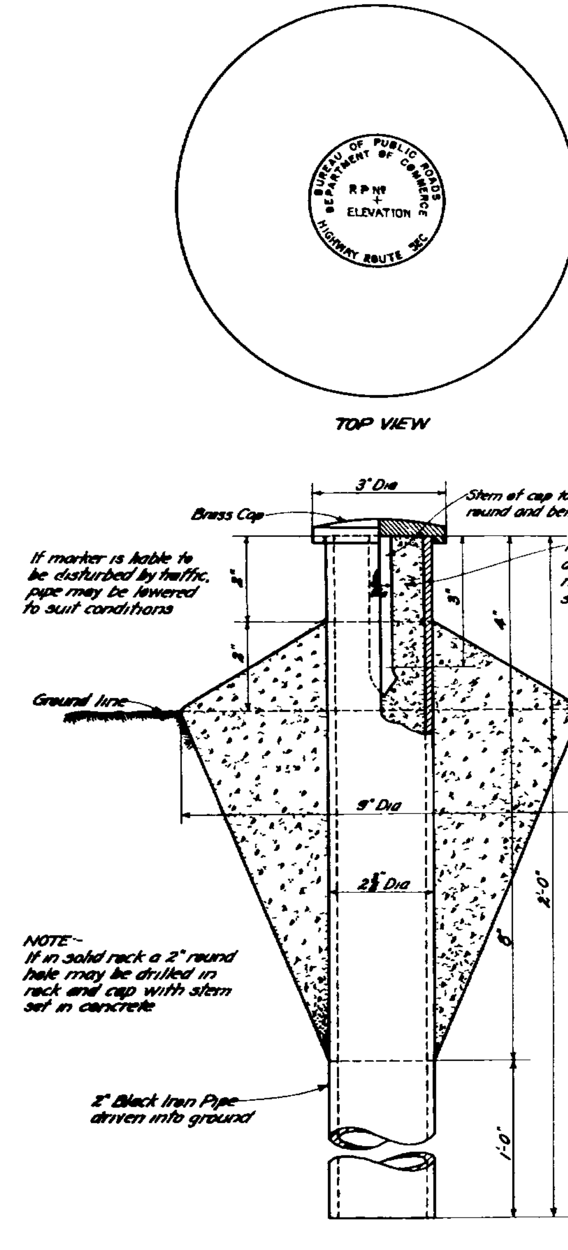
U S DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION NO 9 DENVER, COLO

STANDARD MISCELLANEOUS STRUCTURES

APPROVED [signature] DATE 2/26/58
Federal Highway Projects Engineer

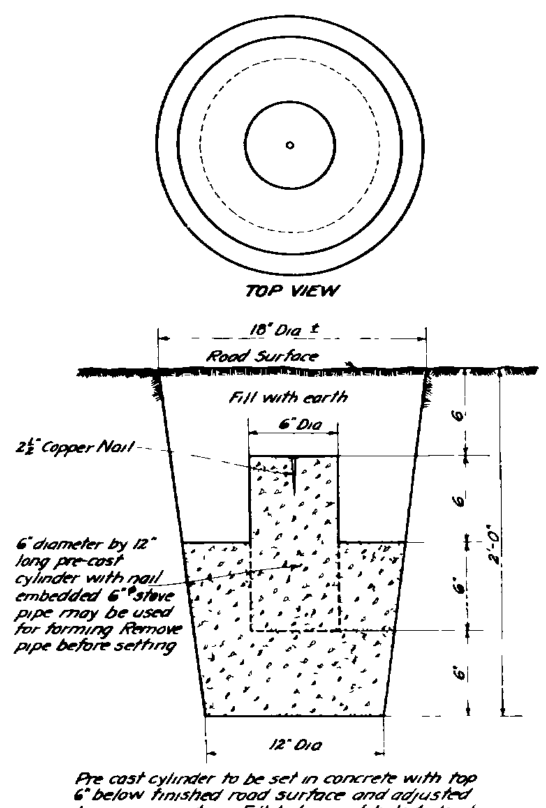
R9-STD 129-A

16



REFERENCE POINT MONUMENT

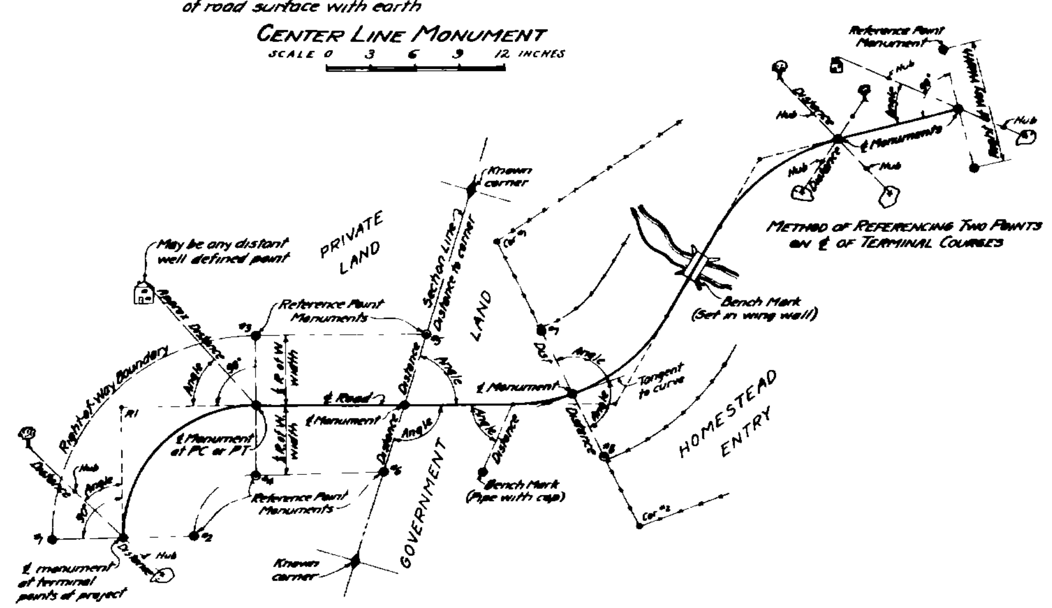
SCALE 0 1 2 3 4 INCHES



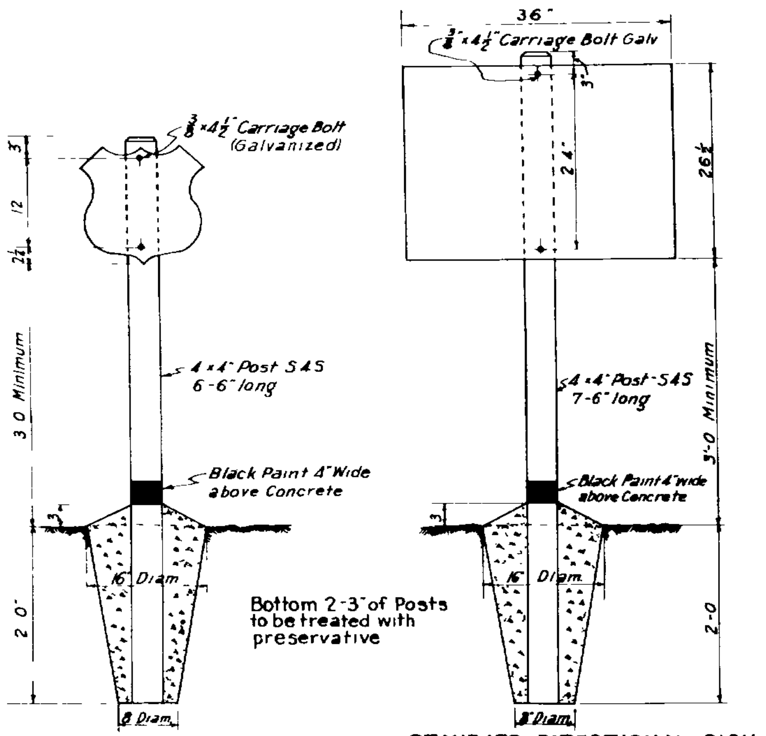
Pre cast cylinder to be set in concrete with top 6" below finished road surface and adjusted to proper position Fill balance of hole to level of road surface with earth

CENTER LINE MONUMENT

SCALE 0 3 6 9 12 INCHES



METHODS OF PLACING REFERENCE MONUMENTS



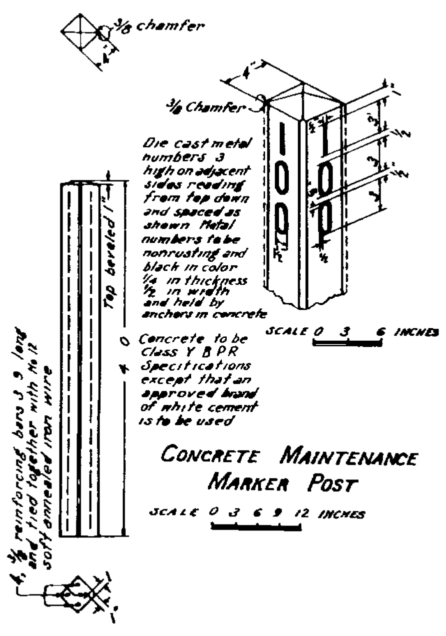
STANDARD U S MARKER

SCALE 0 3 6 9 12 INCHES

STANDARD DIRECTIONAL SIGN

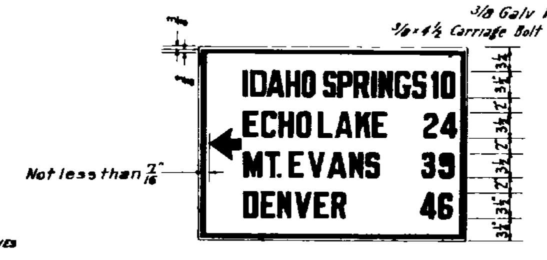
STANDARD TWO LINE DIRECTIONAL SIGN SIZE	36" x 14½" - 18 Ga
" THREE " "	36" x 20½" - "
FOUR " "	36" x 26½" - "

SCALE 0 3 6 9 12 INCHES

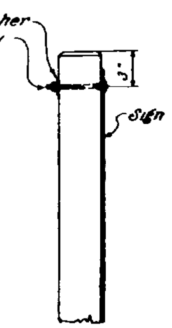


CONCRETE MAINTENANCE MARKER POST

SCALE 0 3 6 9 12 INCHES



COLOR White background (3 coats of outside white) with Black letters



DETAIL OF MOUNTING

SCALE 1½" = 1 0

SCALE 0 3 6 INCHES

NOTE Posts to be painted 3 Coats of Approved White Paint

NOTES -

The center line shall be monumented at mile and half-mile intervals or intersections of public land lines, and at two points on the terminal courses including initial point and end of survey

On all projects not located on Government land right-of way boundaries shall be permanently marked with brass capped pipes on which the point number the route, and the section of project are stamped These should be set at terminal points of survey, on all public land lines crossing ℄ of survey, and at other points necessary to define right of-way boundaries When placed on curves they shall be located on radial lines, except when on public land lines.

Permanent bench marks shall be set at intervals of approximately one mile They shall be set on conspicuous permanent objects such as top of wing wall of bridge abutments, headwalls, suitable rock surfaces, or a brass capped pipe marker may be set in ground

All markers shall be accurately located with reference to the center line and an accurate record made of distances and angles to the various points, which shall be shown on the "As Constructed" plans

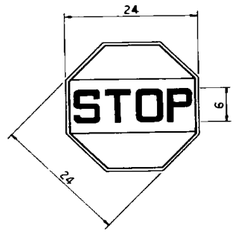
Designed by ... Date Mar. 1930
Drawn by E.W. Martin Date Mar. 1930
Traced by E.W. Martin Date Mar. 1930
Checked by ... Date Apr. 1930

APPROVED [signature] FEDERAL HIGHWAY PROJECTS ENGINEER DATE 5/22/30

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

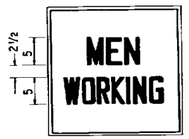
STANDARD
MAINTENANCE POSTS
AND REFERENCE MONUMENTS

R9-STD-131

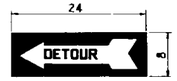


W-3
(Reflectorized)

C-5
(Reflectorized)

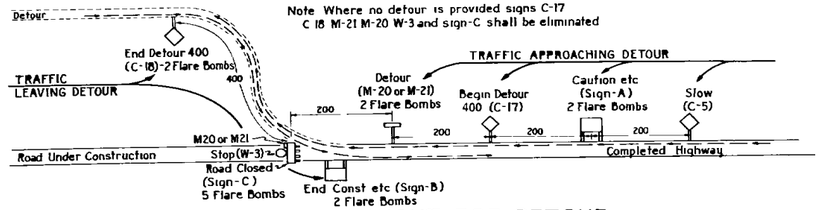


C-29



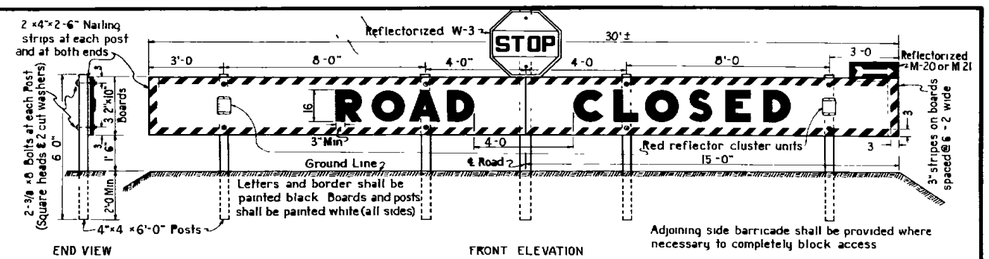
1½" Letters
White Arrow Black
Letters and Background
(M-20 Pointing Right)

M-21
(Reflectorized)



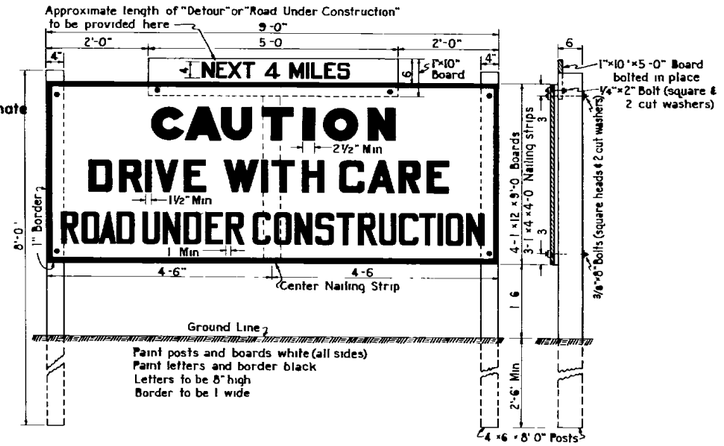
Note Where no detour is provided signs C-17 C-18 M-21 M-20 W-3 and sign-C shall be eliminated

TYPICAL SIGN LAYOUT FOR DETOUR



SIGN 'C'

Signs of similar wording and approximate size as "A" and "B" meeting state specifications may be used.



SIGN 'A'

NOTE This sign is the same size and of the same construction as sign A shown above, and requires the same supports

Paint posts and boards white (all sides)
Paint letters and border black

SIGN 'B'

STANDARD SIGNS

DESIGN (From "Manual and Specifications for U S Standard Road Markers and Signs)
This set of designs is based on definite principles calculated to produce uniformity of significance in the signs themselves, and make familiarity with them easy to acquire on the part of the most casual driver These principles are a set of shapes each having its own significance, a set of color combinations, each having its own significance, a few obvious symbols and uniformity of erection and application
Standard Signs not shown are, C-8 (Fresh Oil), C-13 (Loose Gravel), C-17 (Begin Detour 400 Ft), and C-18 (End Detour 400 Ft) These signs are from "Manual and Specifications for U S Standard Road Markers and Signs"

SHAPE
The Octagonal sign is used to indicate "Stop" The Diamond shaped signs, commonly called "Slow" signs, are used to indicate any condition inherent in the road itself requiring slow speed and caution on the part of the driver The Square shaped signs, commonly called "Caution" signs are used to indicate any condition requiring caution that is not inherent in the road itself, but which is due to contiguous or adjacent conditions which often are also intermittent Rectangular signs of various dimensions are used to carry directions information and restrictions of use or benifit to the driver

COLOR
All standard signs of a precautionary character, including the octagonal stop sign, the diamond slow sign, and the square caution sign have black designs on a yellow background
All direction, information and restriction signs are black on a white background

SPECIAL SIGNS SIGNS-A- B & C

MATERIAL
First grade lumber, reasonably free from knots and other defects shall be used All dimensions shall be in accordance with working drawings

FABRICATION
These signs shall be securely nailed and bolted to withstand high wind pressures Bolts shall be used where shown on working drawings The finished sign shall be free from all defects and made in a neat and workman like manner

FINISH
These signs shall have black letters on a white background The number of coats and quality of paint used shall be sufficient to give a neat and finished sign that will withstand weather without cracking or peeling
The back of the sign shall be painted white

GENERAL NOTES

ERECTION AND DISPLAY OF SIGNS
The signs are to be erected for the purpose of directing traffic over a specific route and shall be so located as to be conspicuously visible day and night They shall be set facing, and on the right hand side of approaching traffic They shall be so located that they will be seen at all times by approaching traffic with the minimum of effort
Signs shall be fastened with 2-3/8 carriage bolts to substantial posts when they are necessary for an extended period Portable supports, such as tripods are permitted for short periods, provided the construction is such that wind or other agents can not readily upset the sign
All signs required shall be furnished installed, and maintained in good order by the contractor Payment will not be direct but will be considered included in the price bid for the regular construction items

USE
Sign C-5 shall be used separately or in conjunction with other signs, (C-5 slow sign to precede by at least 100') whenever the condition of the road requires a reduction of speed
Signs M-20 and M 21 shall be erected at the beginning of detour at intervals of ¼ mile, and at junctions with other roads, also when necessary shall be attached to sign C
Sign W-3 shall be erected from 25 to 50 feet in advance of the point where a full stop is required, and shall be preceded at approximately 500 feet by a slow sign
Sign C shall be erected where it is necessary to completely block access to the new construction Under special conditions, where local traffic must pass through barrier, special provision may be made to provide restricted access by gate This sign shall be preceded by the cautionary signsshown in the above sketch

LIGHTS
Lights shall be kept burning from sunset to sunrise at all points considered dangerous In general the lights shall be torch bombs unless there is a danger from fire, when lanterns shall be substituted
Some specific points where lights must be placed
1 At the end of the section where work is under way, placed so as to illuminate the warning signs
2 At all points where particular caution is required, as at turns or sharp curves, temporary bridge approaches, and sudden or large grade changes, placed so as to illuminate the corresponding signs
3 Sign C shall be furnished with 2 red reflector cluster units, each unit having a minimum of 15 red reflector buttons, each of a diameter not less than 5/8 inch These units shall be securely fastened on the sign in locations as shown in the sketch In addition to these reflectors a minimum of five torch bombs or similiar lights shall be placed in front of the barrier

GENERAL
Selection and placement of signsshall be subject to approval of the engineer Where signs other than those on the plans are required, they shall conform to the standards for the same class of signs as shown on the plans The use of special signs shall be limited Upon opening the work to the public, all construction signs must be removed immediately, so that there will be no confusion

Rev 5/27/59 J L H
Drawn & Traced W A W 5 40

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

TYPICAL SIGNS FOR USE ON CONSTRUCTION

R9-STD-143

18

Table 1.--Specifications FP-57, Corrugated Metal Pipe Culverts Gages, Weight, and Fabrication Data

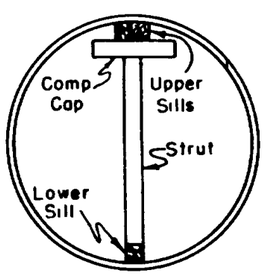
Nominal diameter	Length of sheet before forming	Minimum width of lap	Gage	Computed weight per foot	Connecting bands	
inches	inches	inches		pounds	Gage	Width
8	28½	1½	16	7.3	16	7"
10	35	1½	16	9.0	16	7"
12	41	1½	16	10.5	16	7"
15	50½	1½	16	12.9	16	7"
18	60	1½	16	15.3	16	7"
21	69½	1½	16	17.7	16	7"
24	80	2	14	25.2	16	7"
30	98	2	14	30.9	16	7"
36	117	2	12	51.0	14	12"
*42	137	3	12	59.5	14	12"
*48	156	3	12	68.0	14	12"
54	1-80 1-98	3	12	77.8	14	12"
60	2-98	3	10	108.9	12	12"
72	2-117	3	10	130.4	12	24"
84	2-137	3	8	195.2	12	24"

*Two sheets may be used by allowing sufficient total sheet lengths to provide for an additional standard lap.

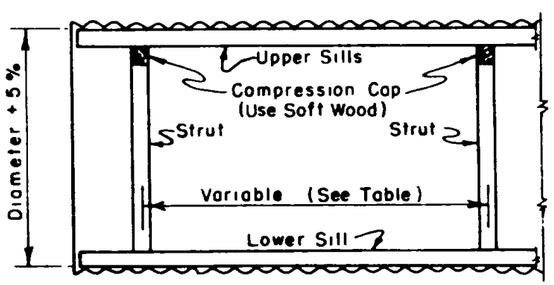
Table 3.-----Corrugated Metal Pipe-Arches Gage Table and Height of Cover

Span	Height	Height of Cover (Feet) 1-2	2-4	5-9	10-15	16-20	Connecting bands	
		Gage	Gage	Gage	Gage	Gage	Gage	Width
22"	13"	16	16	16	16	16	16	7"
29"	18"	14	14	14	14	14	16	7"
36"	22"	14	14	14	14	14	16	7"
43"	27"	12	12	12	12	12	14	12"
50"	31"	12	12	12	12	10	14	12"
58"	36"	10	12	12	10	10	14	12"
65"	40"	10	12	12	10	8	14	12"
72"	44"	8	10	10	8	-	12	12"

DETAIL FOR STRUTTING



END VIEW



LONGITUDINAL SECTION

Table 2.--Gage Required for Corrugated Metal Pipe Placed under Various Heights of Embankments

Diam. in Inches	Area in Sq.Ft.	Height of Cover above Top of Culvert--in Feet 1-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-60	61-70	71-80	81-100
15	1.2	16	16	16	16	16	16	16	16	16	14	14	12	12
18	1.8	16	16	16	16	16	16	16	14	14	14	12	12	12
21	2.4	16	16	16	16	16	16	14	14	14	12	12	12	10
24	3.1	14	14	14	14	14	14	14	14	12	12	12	10	10
30	4.9	14	14	14	14	14	12	12	12	10	10	10	8*	8*
36	7.1	12	12	12	12	12	10	10	10	10*	10*	10*	8*	8*
42	9.6	12	12	12	12	10	10	10*	10*	10*	10*	10*	8*	8*
48	12.6	12	12	12	12	10	10	10	10	10	10	10	8	8
54	15.9	12	12	12	10	10	10	10	10	10	8	8	8	8
60	19.6	10	10	10	10	10	10	10	10	8	8	8	8	
66	23.8	10	10	10	10	10	10	8	8	8	8	8		
72	28.3	10	10	10	10	8	8	8	8	8	8			
78	33.2	8	8	8	8									
84	38.5	8	8	8										

*When pipes of 30-, 36-, and 42-inch diameters are placed under fills as indicated above, the pipes shall be factory-formed to produce a 5 percent elongation of the vertical axis.

GENERAL NOTES

The gages indicated above the dashed line in Tables 2 and 3 are gages supported by Specifications FP-57. The gages below and to right of the dashed line are in excess of Specifications FP-57 and, when used, will require payment based on the heavier gage.

All full-circle corrugated metal culvert pipe of 48- to 84-inch diameters shall be factory-formed to produce a 5 percent elongation of the vertical axis. Where such pipes are placed under embankments up to 30 feet in depth, no strutting will be required. Where such pipes are placed under embankments in excess of 30 feet, strutting will be required as shown.

These tables are supplemental to Specification Items 453 and 454 of FP-57.

Table 4.-----Spacing and Size of Timber Struts

Pipe Diam.	Strut Size	Height of Cover (Feet) 30	40	50	60	70	80	100
48"	4" x 4"	5.0	3.5					
	4" x 6"	6.0	5.0	4.0	3.5	3.0		
	6" x 6"			6.0	5.0	4.5	4.0	3.5
	6" x 8"						6.0	5.0
60"	4" x 4"	4.0	3.0					
	4" x 6"	6.0	4.5	3.5	3.0			
	6" x 6"			5.5	4.5	4.0	3.5	3.0
	6" x 8"					5.5	4.5	4.0
72"	4" x 4"	3.0						
	4" x 6"	5.0	3.5	3.0				
	6" x 6"		6.0	4.5	4.0	3.5	3.0	3.0
	6" x 8"				5.0	4.5	4.0	3.5
84"	6" x 6"	6.0	5.0	4.0	3.5	3.0		
	6" x 8"			5.0	4.5	4.0	3.5	3.0
	8" x 8"						4.5	3.5

Traverse caps and sills should be of same size timber as struts and placed with least dimension vertically.

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

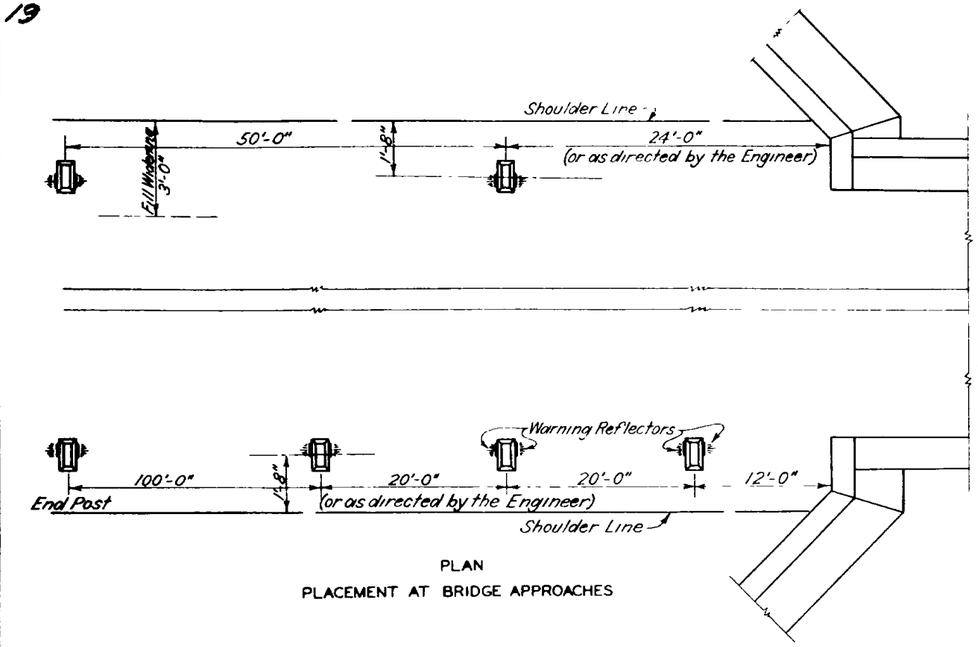
REQUIREMENTS FOR PLACING CORRUGATED METAL PIPE CULVERTS

APPROVED J. C. Thompson Date 11/13/57
FEDERAL HIGHWAY PROJECTS ENGINEER

R9-STD. 166

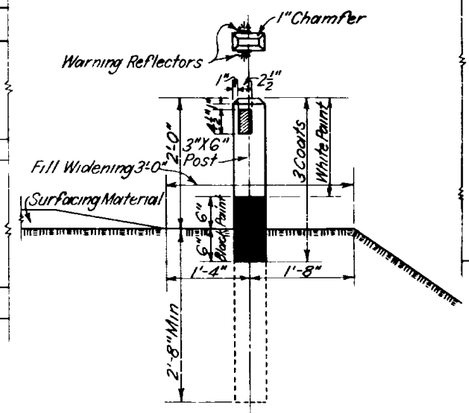
19

DIV. NO.	STATE	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
9	UTAH	35	A	30	30



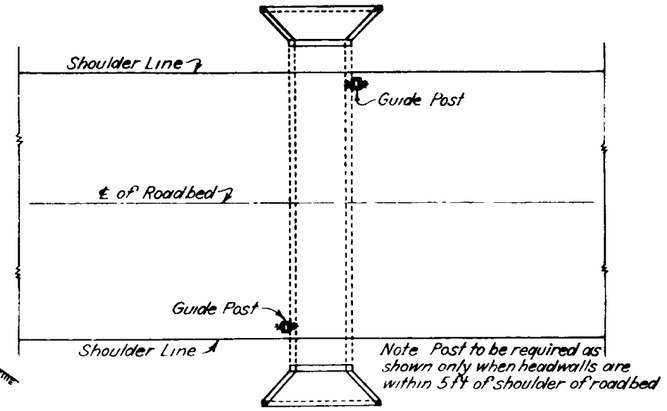
PLAN

PLACEMENT AT BRIDGE APPROACHES

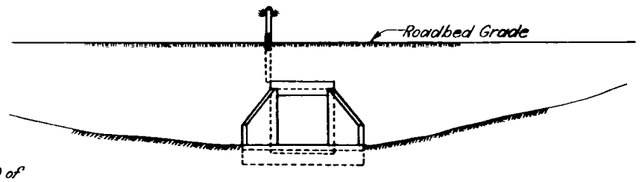


POST DETAIL

SCALE 1" = 1'-0"

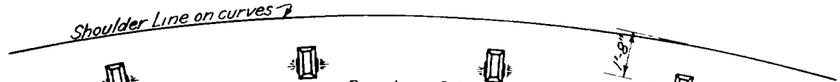


PLAN



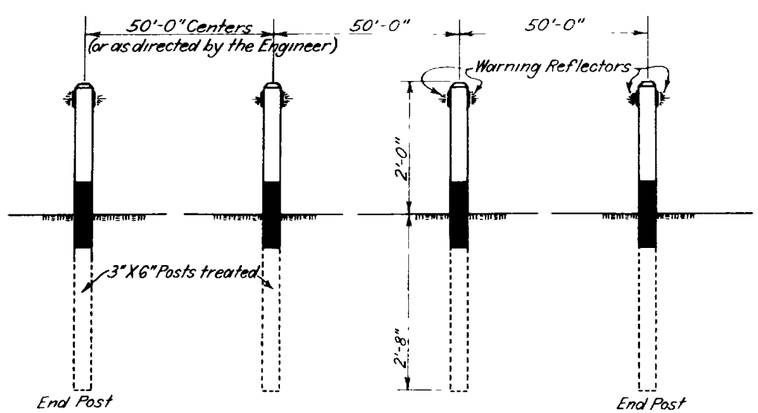
ELEVATION

PLACEMENT AT MINOR STRUCTURES



PLAN FOR HORIZONTAL CURVES

PLAN FOR TANGENTS



ELEVATION

PLACEMENT ON TANGENTS AND HORIZONTAL CURVES

Materials All posts shall be Coast Region Douglas Fir Select Structural Grade 1400# f West Coast Lumberman's Ass'n Grading Rule 12, 1943

Treatment All posts shall be treated as provided under Item 430 of Specifications FP-57 The following preservatives may be used with a minimum absorption as given per cubic foot of wood - Chromated zinc chloride 1.15 pounds, Chromated zinc arsenate 1 pound, Osmosalts 3.5 pounds; Wolman salts 3.5 pounds

Timber shall not be incised

Reflector Units Reflector Units shall be the reflecting panel type mounted on 20 gauge galvanized sheets The reflecting panel shall be silver "Scotchlite" as manufactured by the Minnesota Mining and Manufacturing Co of St Paul, Minnesota or an acceptable equivalent

Construction Methods Reflector Units on all posts shall be placed in such position that the units will function at a distance of 500 feet A test shall be made to assure the position of the Reflector Units to be the most effective possible

The Engineer will determine the spacing and location of the Timber Guide Posts with reference to the curvature and height of fill

The Reflector Panels shall be fastened to the posts with two 8d galvanized barbed nails on both sides of the posts

Painting Posts shall be painted two coats before erecting and a third or final coat after erecting as shown and in accordance with the specifications for Item 430 - Treated and Untreated Timber of Specifications FP-57

U S DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
UTAH DISTRICT OGDEN, UTAH

TIMBER GUIDE POSTS WITH REFLECTORS

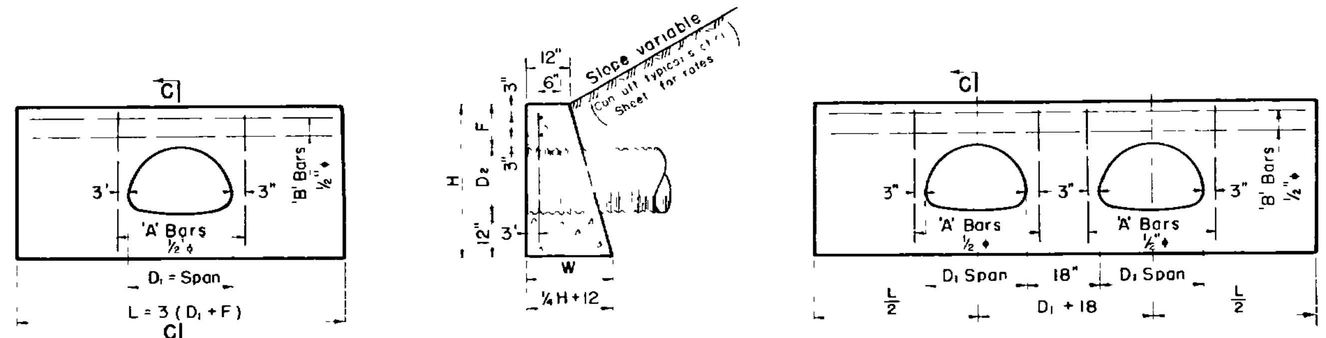
REVISED 4-18-50
REVISED 2-20-50
REVISED 1-6-53

DWG U-G-13

C W S 1-6-53

20

HEADWALLS FOR ARCH PIPE CULVERTS



ELEVATION SECTION C-C ELEVATION

QUANTITIES IN ONE HEADWALL - SINGLE PIPE (ARCH)

EQUIV D	PIPE ARCH Span - Rise D_1 - D_2	F = 9" Dimensions L	H	W	'A' Bars No.	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class A	F = 12" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class A
15"	18" x 11"	5'-0"	2'-8"	20"	2	2'-2"	4	4-6"	149	061	5'-9"	2-11"	20¾"	2	2-5"	4	5-3"	172	079
18"	22" x 13"	5'-6"	2'-10	20½"	2	2'-4"	4	5'-0"	165	070	6-3"	3' 1"	21¼"	2	2-7"	4	5'-9"	188	091
24"	29" x 18"	6'-9"	3' 3"	21¾"	2	2'-9"	4	6-3"	204	100	7'-6	3 6"	22½"	2	3'-0"	4	7'-0"	227	125
30"	36" x 22"	7'-9"	3'-7"	22¾"	2	3'-1"	4	7'-3"	235	126	8-6	3' 10"	23½"	2	3'-4"	4	8-0"	258	154
36"	43" x 27"	9'-0"	4'-0	24"	2	3'-6"	4	8'-6"	274	165	9'-9	4-3"	24¾"	2	3'-9"	4	9-3"	297	199
42"	50" x 31"	10'-0"	4'-4"	25"	2	3'-10"	4	9'-6"	305	199	10'-9"	4'-7"	25¾"	2	4'-1"	4	10'-3"	328	236
48"	58" x 36"	11'-3"	4'-9"	26¼"	2	4'-3"	4	10'-9"	344	250	12-0"	5'-0"	27"	2	4'-6"	4	11'-6"	367	293
54"	65" x 40"	12'-3"	5'-1"	27¼"	2	4'-7"	4	11'-9"	375	292	13-0"	5'-4"	28"	2	4'-10"	4	12'-6"	399	340
60"	72" x 44"	13'-3"	5'-5"	28¼"	2	4'-11"	4	12'-9"	406	339	14-0"	5' 8"	29"	2	5'-2"	4	13'-6"	430	391

EQUIV D	PIPE ARCH Span - Rise D_1 - D_2	F = 15" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class A	F = 18" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class A
15"	18" x 11"	6'-6"	3'-2"	21½"	2	2'-8"	4	6'-0"	196	101	7-3"	3'-5"	22¼"	2	2-11"	4	6'-9"	219	125
18"	22" x 13"	7'-0"	3'-4"	22"	2	2-10"	4	6'-6"	211	114	7'-9"	3-7"	22¾"	2	3-1"	4	7'-3"	235	140
24"	29" x 18"	8'-3"	3' 9"	23¼"	2	3'-3"	4	7'-9"	251	153	9'-0"	4'-0"	24"	2	3'-6"	4	8-6"	274	184
30"	36" x 22"	9' 3"	4'-1"	24¼"	2	3'-7"	4	8'-9"	282	186	10-0"	4'-4"	25"	2	3-10"	4	9'-6"	305	221
36"	43" x 27"	10'-6	4'-6"	25½"	2	4'-0"	4	10'-0"	321	236	11-3"	4'-9"	26¼"	2	4'-3"	4	10'-9"	344	276
42"	50" x 31"	11' 6"	4'-10"	26½"	2	4'-4"	4	11'-0"	352	278	12'-3"	5'-1"	27¼"	2	4'-7"	4	11'-9"	375	323
48"	58" x 36"	12'-9"	5'-3"	27¾"	2	4-9"	4	12-3"	391	339	13'-6	5'-6"	28½"	2	5-0"	4	13'-0"	414	390
54"	65" x 40"	13' 9"	5-7"	28¾"	2	5'-1"	4	13'-3"	422	391	14'-6	5'-10	29½"	2	5'-4"	4	14'-0"	445	447
60"	72" x 44"	14-9"	5'-11"	29¾"	2	5-5"	4	14'-3"	453	447	15'-6"	6'-2"	30½"	2	5' 8"	4	15'-0"	476	507

QUANTITIES IN ONE HEADWALL DOUBLE PIPE (ARCH)

F = 9" Lbs Reinf Steel	F = 9" Cu Yds Conc Class 'A'	F = 12" Lbs Reinf Steel	F = 12" Cu Yds Conc Class 'A'	F = 15" Lbs Reinf Steel	F = 15" Cu Yds Conc Class 'A'	F = 18" Lbs Reinf Steel	F = 18" Cu Yds Conc Class 'A'
258	095	285	118	312	144	341	173
285	110	312	135	338	164	365	195
345	152	372	183	399	217	425	255
396	189	423	225	450	264	47.6	307
456	243	483	285	510	330	537	380
508	290	534	337	561	388	588	442
570	361	597	415	623	472	650	534
621	420	648	479	675	543	701	610
672	484	700	548	726	617	753	691

GENERAL NOTES

Specifications Public Roads Administration, Form FP 41 - Supplement 8-1-45

Concrete All to be Class "A" with Portland Cement, Type II (Low Alkali) with an Air-Entraining Admixture Concrete to be poured monolithically All exposed edges and corners shall be chamfered 1" All Exposed surfaces to be given a "Rubbed Finish"

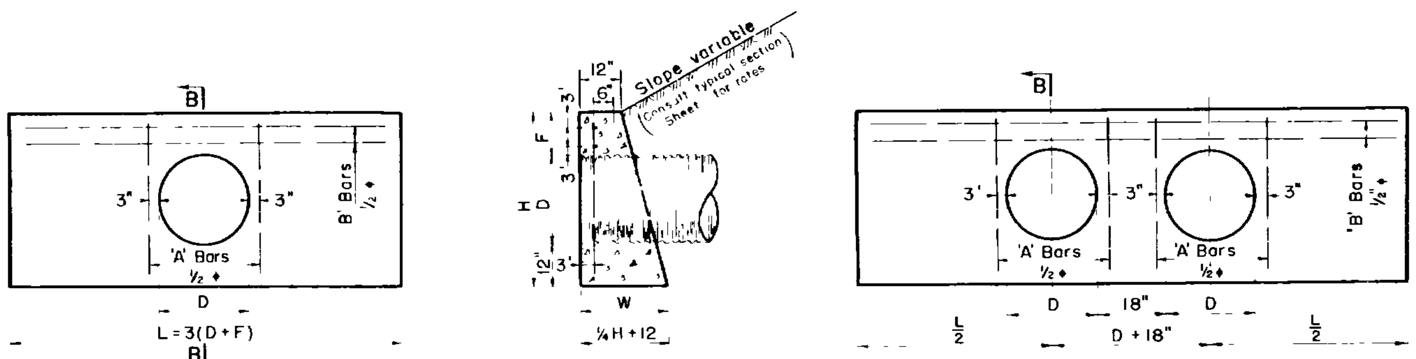
*Reinforcing Steel To be ½" round bars, placed 3" from surface of concrete Dimensions are to the center of bar

Foundations If foundation materials under headwalls are found unsuitable, either remove and replace with satisfactory selected material, or extend the concrete to provide a satisfactory footing

Construction Methods The minimum earth cover on top of the pipe shall not be less than ½ D or ½ D_2 (vertical diameter of the pipe) with a minimum cover of one foot Headwalls in all cases to be built parallel to the center line of the road

*Payment for reinforcing steel to be included in the price bid for concrete

HEADWALLS FOR CIRCULAR PIPE CULVERTS



ELEVATION SECTION B-B ELEVATION

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

QUANTITIES IN ONE HEADWALL - SINGLE PIPE (CIRCULAR)

D	F = 9" Dimensions L	H	W	'A' Bars No.	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class 'A'	F = 12" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class 'A'
15"	6-0"	3'-0"	21"	2	2'-6"	4	5'-6"	180	086	6-9"	3-3"	21¾"	2	2-9	4	6'-3	204	108
18"	6'-9"	3-3"	21¾"	2	2-9"	4	6-3"	204	105	7'-6	3-6"	22½"	2	3 0"	4	7' 0"	227	130
24"	8'-3"	3'-9"	23¼"	2	3-3"	4	7-9"	251	152	9'-0"	4' 0"	24"	2	3'-6"	4	8'-6	274	183
30"	9' 9"	4' 3"	24¾"	2	3-9"	4	9-3"	297	208	10'-6"	4 6'	25½"	2	4 0"	4	10 0'	321	245
36"	11'-3"	4-9"	26¼"	2	4-3"	4	10'-9'	344	275	12-0"	5 0"	27"	2	4-6"	4	11'-6'	367	319
42"	12'-9"	5'-3'	27¾"	2	4'-9"	4	12' 3"	391	353	13'-6"	5' 6"	28½"	2	5'-0"	4	13' 0"	414	404
48"	14'-3"	5-9"	29¼"	2	5'-3"	4	13 9"	438	443	15-0"	6-0"	30	2	5'-6"	4	14'-6"	461	502
54"	15'-9	6'-3"	30¾"	2	5' 9"	4	15'-3"	484	546	16'-6'	6'-6'	31½"	2	6-0'	4	16'-0"	508	613
60"	17-3"	6-9"	32¼"	2	6' 3"	4	16-9'	531	663	18' 0	7' 0"	33"	2	6 6"	4	17' 6'	554	739

D	F = 18" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No.	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class A	F = 24" Dimensions L	H	W	'A' Bars No	'A' Bars Length	'B' Bars No	'B' Bars Length	Lbs Reinf Steel	Cu Yds Conc Class 'A'
15"	8 3	3'-9	23¼	2	3-3"	4	7 9'	251	161	9 9	4' 3	24¾"	2	3' 9"	4	9-3"	297	228
18"	9' 0	4-0"	24'	2	3'-6'	4	8' 6"	274	190	10 6"	4'-6"	25½	2	4-0"	4	10 0	321	262
24"	10'-6"	4 6"	25½"	2	4'-0"	4	10-0"	321	255	12'-0"	5'-0"	27"	2	4-6'	4	11 6"	367	341
30"	12 0	5'-0'	27'	2	4 6	4	11 6"	367	330	13-6'	5-6"	28½'	2	5' 0'	4	13' 0	414	431
36"	13-6'	5' 6"	28½"	2	5'-0'	4	13'-0"	414	418	15' 0"	6 0"	30'	2	5-6"	4	14 6	461	534
42"	15-0'	6 0'	30	2	5'-6'	4	14 6'	461	519	16' 6"	6-6'	31½'	2	6-0'	4	16'-0	508	651
48"	16'-6"	6' 6"	31½"	2	6 0"	4	16'-0	508	633	18' 0"	7' 0'	33"	2	6'-6"	4	17'-6"	554	782
54"	18-0	7' 0"	33"	2	6 6"	4	17 6"	554	761	19' 6"	7'-6'	34½"	2	7'-0"	4	19'-0'	601	928
60"	19' 6"	7' 6'	34½"	2	7'-0	4	19 0"	601	904	21-0"	8 0'	36"	2	7-6'	4	20'-6"	648	1090

QUANTITIES IN ONE HEADWALL DOUBLE PIPE (CIRCULAR)

F = 9" Lbs Reinf Steel	F = 9" Cu Yds Conc Class 'A'	F = 12" Lbs Reinf Steel	F = 12" Cu Yds Conc Class 'A'	F = 18" Lbs Reinf Steel	F = 18" Cu Yds Conc Class 'A'	F = 24" Lbs Reinf Steel	F = 24" Cu Yds Conc Class 'A'
287	122	314	148	367	210	421	286
321	147	347	177	401	246	454	330
387	206	414	243	468	327	521	426
454	277	481	321	534	420	588	536
521	360	548	412	601	527	655	660
588	456	615	516	668	649	721	800
655	566	681	634	735	785	788	956
721	691	748	768	802	938	855	1129
788	831	815	918	868	1108	922	1321

CONCRETE STRAIGHT TYPE HEADWALLS FOR PIPE CULVERTS

TYPE I

APPROVED [signature] Design Engineer DATE [illegible]

Designed by RTT April 1948
Drawn by RTT April 1948
Traced by WAG April 1948

D3-Std.-168

GPO 839492