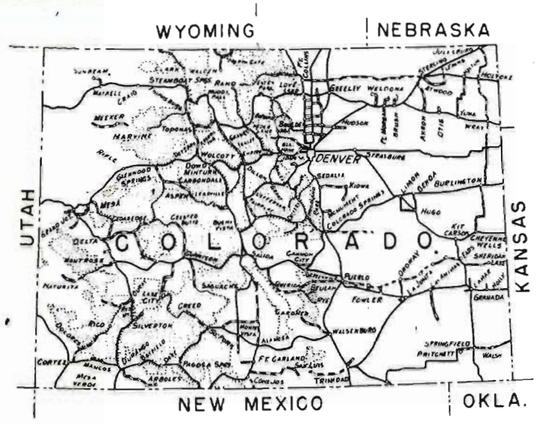
Return to Dwr. 44

A.F.H. 10-1(1)



U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

AS CONSTRUCTED

COLORADO FOREST HIGHWAY PROJECT A.F.H. 10-1(1)

CUCHARAS PASS

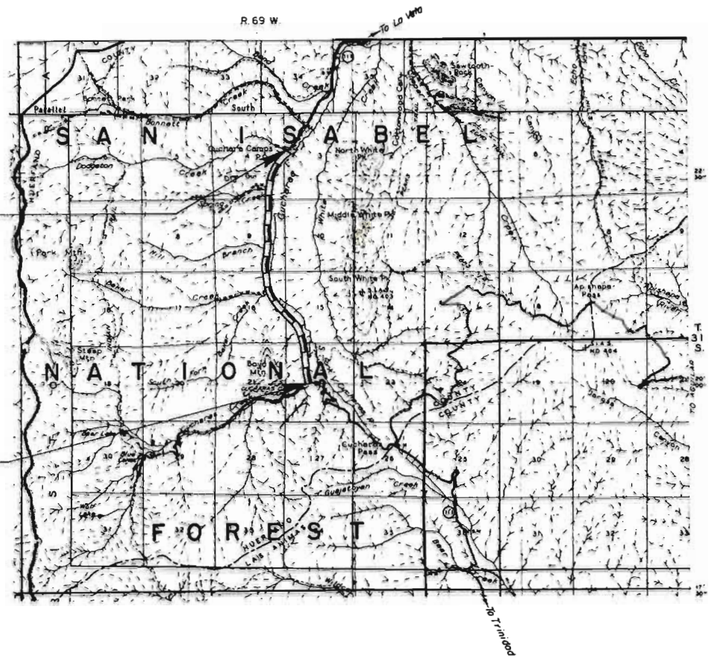
LENGTH 3.580 MILES

CLASS ~~3~~ 2

S.H. 12

SAN ISABEL NATIONAL FOREST

HUERFANO COUNTY



Begin Proj. A.F.H. 10-1(1)
Sta. 0+00.48

Completed 1963

End Proj. A.F.H. 10-1(1)
Sta. 189+00

N

LEGEND

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

REGION 9 STATE COLORADO
PROJECT A.F.H. 10-1(1), Cucharas Pass
SHEET 1 OF SHEETS

INDEX TO SHEETS

SHEET No	DESCRIPTION	STATION	TO STATION
1	Title Sheet		
2	Typical Sections		
	Summary (2 Sheets)		
4-10	Plan & Profile	0+00.48	189+00
Std. 107	Emb. Drains, Bit Curbs, Gutters & Rundowns		
Std 113	Type "A" & "B" Conc. Headwalls		
Std. 116	Concrete Headwalls		
Std. 118	Concrete and Metal End Sections		
Std. 119	Underdrain		
Std. 121	Rock Structures		
Std. 131	Maintenance Posts and Delineators		
Std 136	Wire Fences with Steel Posts		
Std. 143	Project Identification Signs		
R9-Std-168	Straight Type Conc. Headwalls		
D3-Spl-354	Bin Type Metal Cribbing (2 Sheets)		

Plans prepared by: BPR
Date: May, 1963

Description of Project
Improvement: Grading & Bit. Stab. Base
Roadbed Widths:
Grading: 30'
Base: 24'
Type Code: 2013

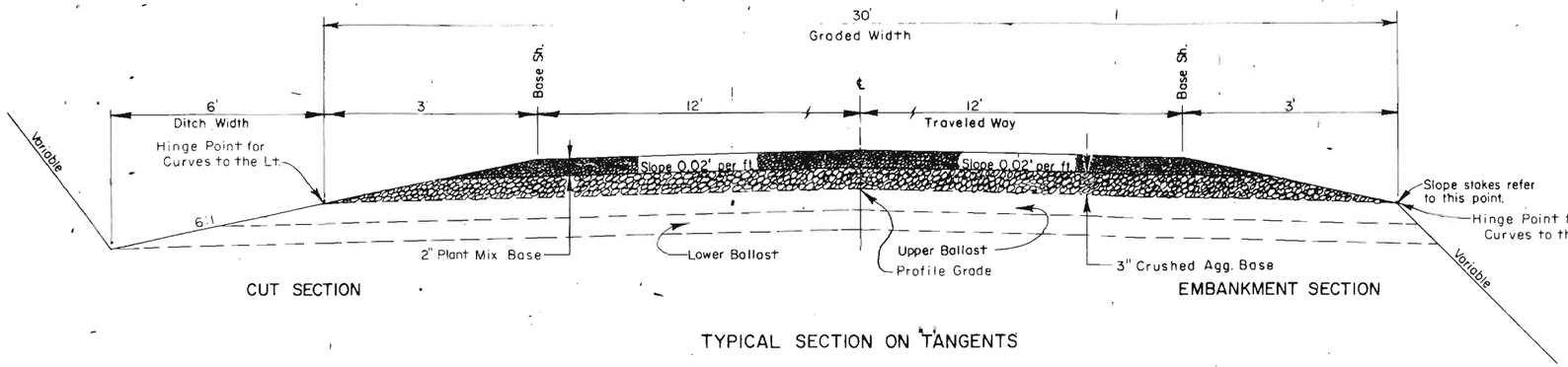
Traffic Volume:
A.D.T. (1961): 80
A.D.T. (1981): 250
D.H.V.: 40
D. 65%
T. 10%
V. 35

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

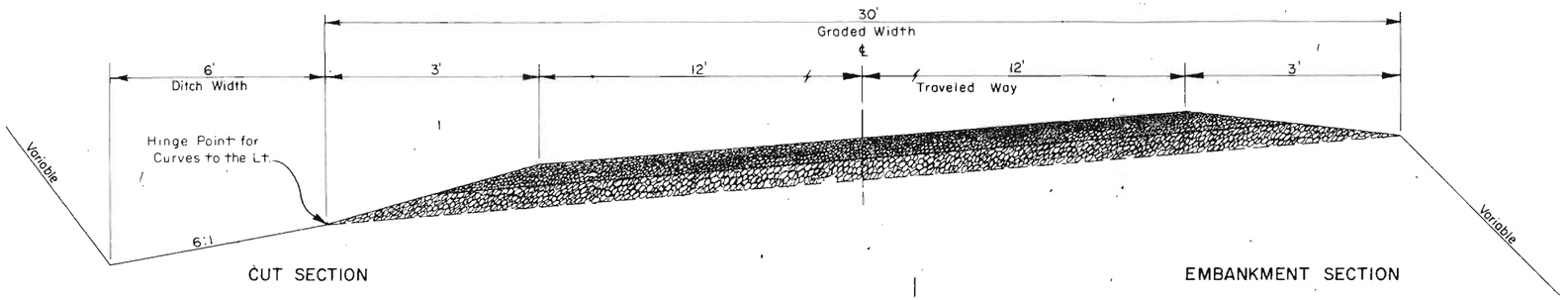
APPROVED:

_____ DATE _____ 19____
REGIONAL ENGINEER

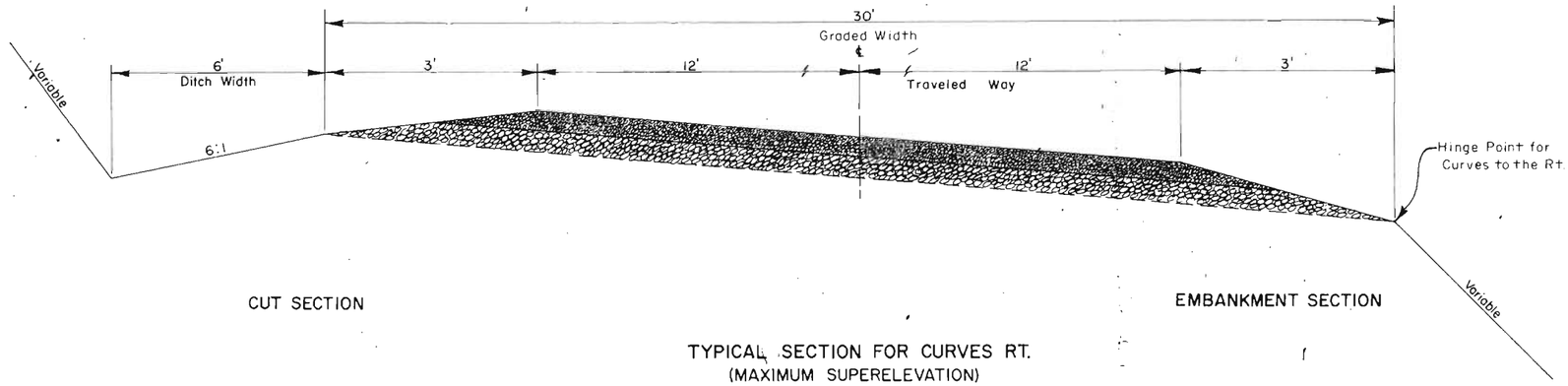
W.A.G. 1951



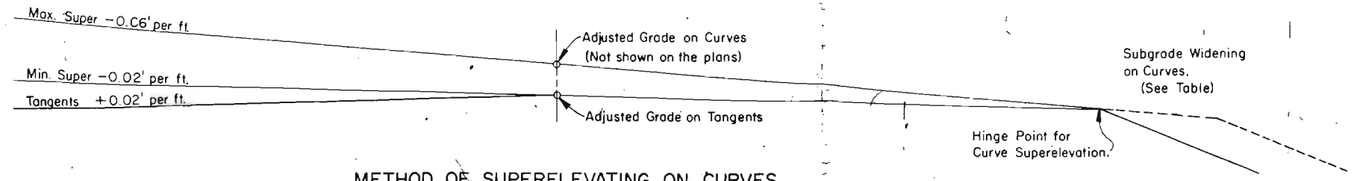
TYPICAL SECTION ON TANGENTS



TYPICAL SECTION FOR CURVES LT.
(MAXIMUM SUPERELEVATION)



TYPICAL SECTION FOR CURVES RT.
(MAXIMUM SUPERELEVATION)

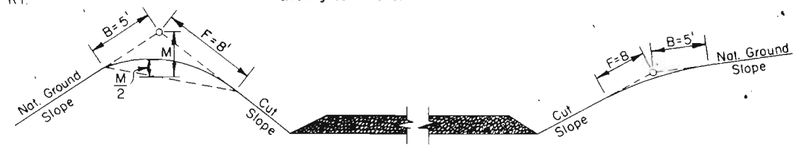


METHOD OF SUPERELEVATING ON CURVES

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.

BALLAST MATERIALS

STA	TO STA	UPPER BALLAST		LOWER BALLAST	
		Item	Depth	Item	Depth
0+00	20+00	104(2)	8"	102(7)	6"
20+00	30+00	104(2)	6"	102(7)	4"
30+00	60+00	104(2)	8"	102(7)	6"
60+00	189+00	104(2)	14"		

GENERAL NOTES

If the Plans require the placing of lower ballast, the roadway section shall be constructed to accomodate the required thickness of upper and lower ballast below adjusted grade.

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.

The planned thickness of Ballast Materials is based on laboratory analysis of samples, taken at random along the proposed improvement. During construction, the engineer will adjust the thickness as necessary to insure adequate Structural Stability.

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.K.C. 4-1963

Revisions

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

TYPICAL CROSS SECTIONS

NATIONAL FOREST HIGHWAYS

ROUTE: A.FH:10 Cucharas Pass
PROJECT: 10-1(1)
NATIONAL FOREST: San Isabel
COUNTY: Huerfano
STATE: Colorado

ROADBED WIDTHS
GRADED: 30' SH. to SH.
BASE: 24' SH to SH.
SURFACE: ____ SH to SH.

PLAN — SURVEYED | PLOTTED | GRADES CHECKED | R. M.S. NOTED | STRUCTURE QUANTITIES CHECKED | NOTE BOOK | ALIGNMENT CHECKED | NO. | RT. OF WAY CHECKED | BY | DATE

PROFILE — SURVEYED | PLOTTED | GRADES CHECKED | R. M.S. NOTED | STRUCTURE QUANTITIES CHECKED | NOTE BOOK | NO. | BY | DATE

STA. 0+00.48 NORTH END PROJ. A.F.H. 10-1(1)
1963 CONSTRUCTION

"The Alinement and Grade as hereon shown are subject to adjustment"

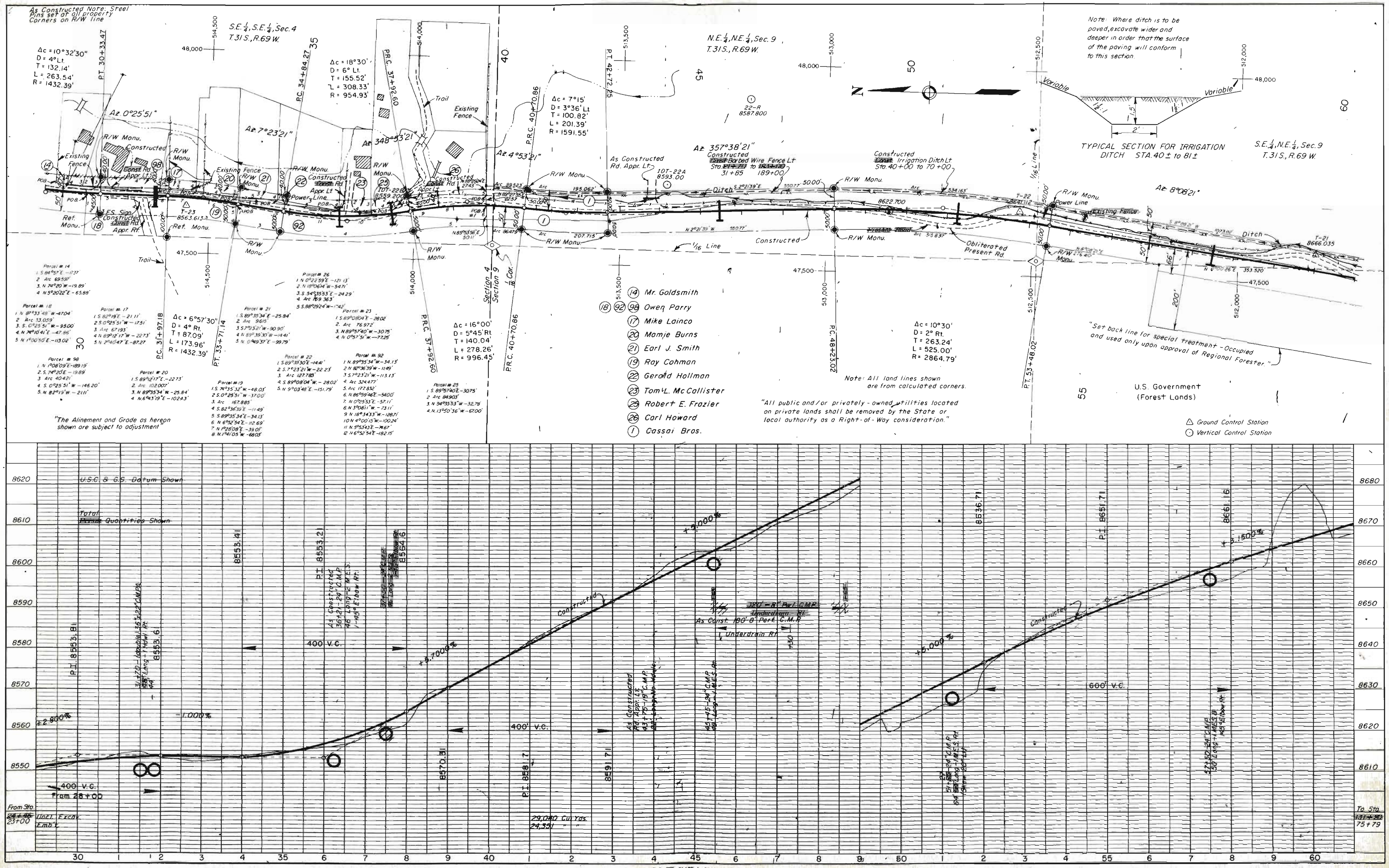
"All public and/or privately-owned utilities located on private lands shall be removed by the State or local authority as a Right-of-Way consideration."

94 95 Mrs. Lloyd Johnson
91 93 W. Dean Vickery
96 97 J.B. Crain
12 Arthur & Pearl Robinson

△ Ground Control Station
⊙ Vertical Control Station

K•E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.

(As Constructed). CUCHARAS PASS 10-1(1) 4



(As Constructed) CUCHARAS PASS 10-1(1)

PLAN — SURVEYED / PLOTTED / GRADES CHECKED / ALIGNMENT CHECKED / ETC. OR MAT CHECKED — NOTE BOOK — NO. — STRUCTURE NOTATIONS ON NO.

PROFILE — SURVEYED / PLOTTED / GRADES CHECKED / ALIGNMENT CHECKED / ETC. OR MAT CHECKED — NOTE BOOK — NO. — STRUCTURE NOTATIONS ON NO.

48,000

S.E. 1/4 N.E. 1/4 Sec. 9 T. 31 S., R. 69 W.

Δc = 2°00'
D = 1° Lt.
T = 100.01'
L = 200'
R = 5729.58'

P.C. 64+21.04

P.T. 66+21.04

Δc = 9°00'
D = 5°30' Lt.
T = 81.99'
L = 163.64'
R = 1041.74'

P.C. 70+06.02

P.R.C. 71+69.66

N.E. 1/4 S.E. 1/4 Sec. 9 T. 31 S., R. 69 W.

19-R ⊙ 8697.2

Δc = 34°30'
D = 18°30' Lt.
T = 96.17'
L = 186.49'
R = 309.71'

P.T. 77+17.20

S.E. 1/4 S.E. 1/4 Sec. 9 T. 31 S., R. 69 W.

Δc = 30°30'
D = 15° Lt.
T = 104.14'
L = 203.33'
R = 381.97'

P.C. 84+38.21

P.T. 87+01.54

Az. 8°08'21"

Az. 6°08'21"

Az. 357°08'21"

Az. 17°08'21"

Az. 342°38'21"

Az. 357°46'13"

Az. 23°08'21"

Az. 352°38'21"

R/W Line

R/W Monu.

Constructed Barbed Wire Fence Lt. Sta. 21+20 to 183+00 189+00

Constructed Irrigation Ditch Lt. Sta. 40+00 to 70+00

Hay Yard

Constructed Rd. Appr. Lt. R/W Monu.

Constructed Texas Gate Lt.

As Const. Rd. Appr. Lt.

Wood Pole Corral

1/16 Line

Set back Line

Power Line

Existing Fence

Obliterated Road

Ref. Monu.

T-21 8666.035

T-20 8721.150

T-19 8721.465

T-18 8759.643

T-17 8761.571

T-16 8788.839

Constructed Irrigation Ditch Rt. Sta. 75+00 to 81+00

Constructed Barbed Wire Fence Rt. Sta. 66+00 to 106+50

Oil Terrace Road

S. 8° 08' 21" W.

S. 6° 08' 21" W.

S. 2° 21' 39" E.

S. 17° 08' 21" W.

S. 7° 21' 39" E.

S. 2° 13' 47" E.

S. 23° 08' 21" W.

S. 7° 21' 29" E.

"Set back line for special treatment—Occupied and used only upon approval of Regional Forester"

U.S. Government (Forest Lands)

Cassai Brothers

Note: All land lines shown are from calculated corners.

Δc = 20°00'
D = 4°45' Rt.
T = 212.69'
L = 421.05'
R = 1206.16'

P.R.C. 75+90.71

Δc = 15°07'52"
D = 6° Rt.
T = 126.83'
L = 252.19'
R = 954.93'

P.T. 80+79.03

P.C. 78+26.84

Δc = 25°22'08"
D = 18°30' Rt.
T = 69.71'
L = 137.14'
R = 309.71'

P.C. 83+59.57

P.T. 84+96.41

Set back Line

T-15 8820.38

P.C. 89+83.21

U.S. Goverment (Forest Lands)

"The Alinement 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."

Vertical Control

Ground Control Station

47,500 — 511,500 — 47,000 — 510,500 — 47,000 — 509,500 — 47,000

8676.91

63+42.24" C.M.P. 46' Long - 1 M.E.S. Rt.

P.I. 8686.36

600' V.C.

8701.36

+5.000%

Constructed

+3.1500%

8706.36

68+60 24" C.M.P. 44' Long - 2 M.E.S. & 1-45° Elbow Rt.

Appr. Rd. Lt. 18" C.M.P. Sta. 71+00 Reference 25' Long No Hours

As Constructed Rd. Appr. Rt. Sta. 72+90 18" C.M.P. 22' Long No Hours

P.I. 8721.36

15" C.M.P. 23' Long No Hours Extra Pass

+1.8000%

8726.76

8733.06

P.I. 8736.66

61+26 24" C.M.P. 18' Long 2 M.E.S. & 2-30° Elbows 1 Not Shown

400' V.C.

+1.6000%

8747.86

84+50 24" C.M.P. 48' Long 1 M.E.S. Rt.

+5.6000%

Constructed

8778.66

87+44 30" C.M.P. 112' Long - No Hours 1-30° Elbow

600' V.C. To 95+00

8790 8780 8770 8760 8750 8740 8730

USC.M.G.S. Datum Shown

Total Quantities Shown

17,024 Cu. Yds.
14,406 " "

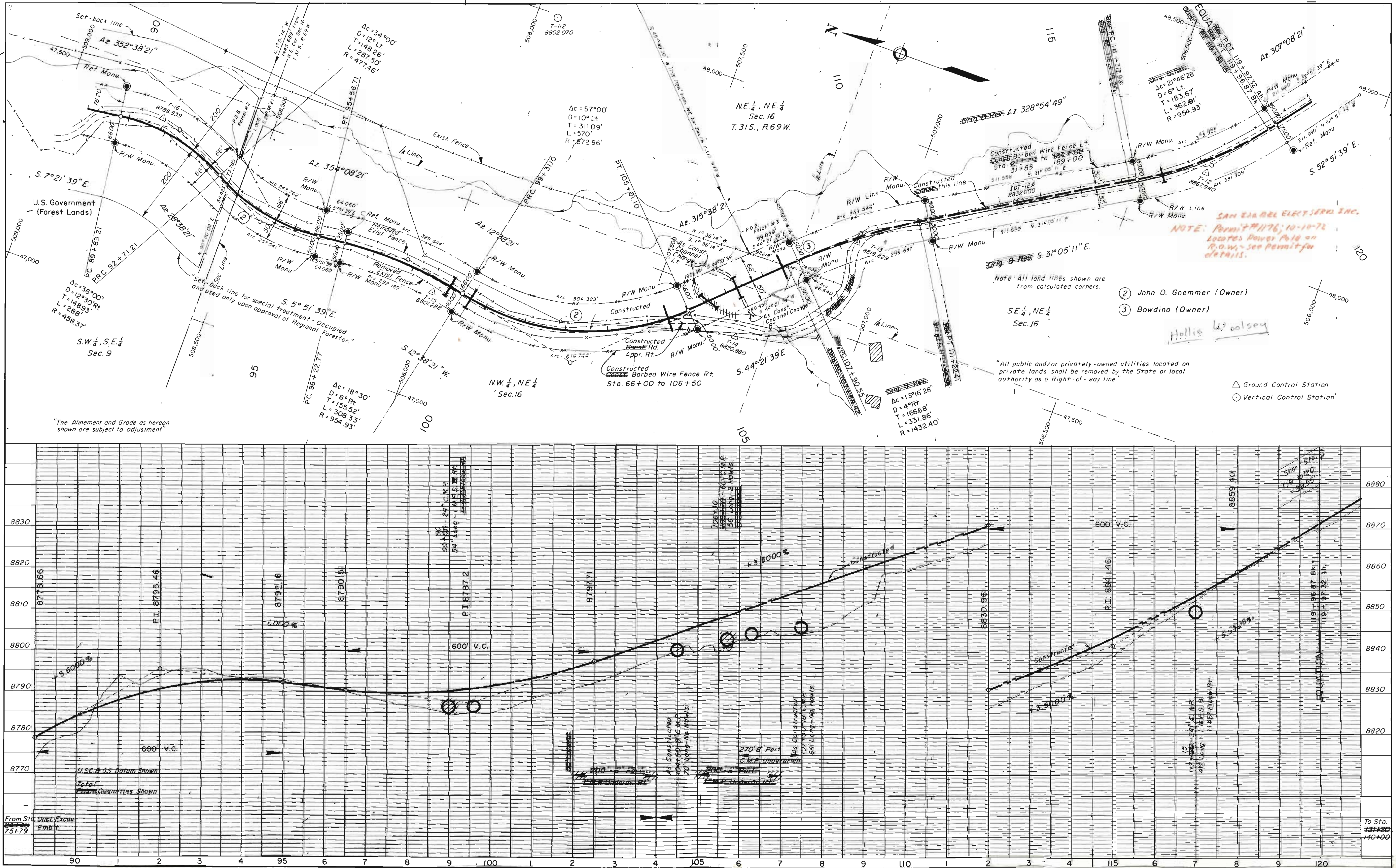
From Sta. Unct. Excav. Emb't. 23+00

To Sta. 104+00

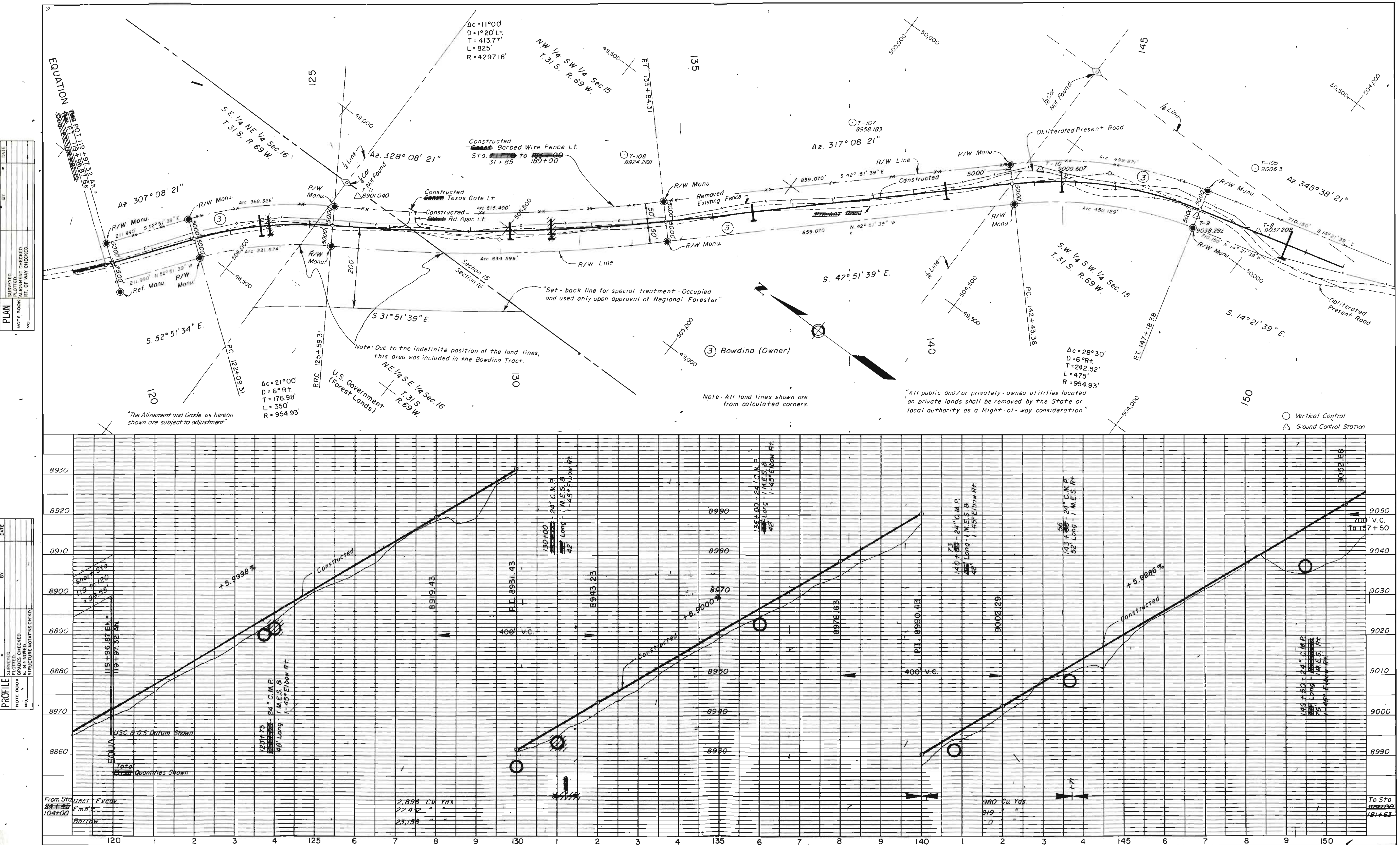
60 1 2 3 4 65 6 7 8 9 70 1 2 3 4 75 6 7 8 9 80 1 2 3 4 85 6 7 8 9 90

K·E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.

(As Constructed) CUCHARAS PASS 10-1(1) 6

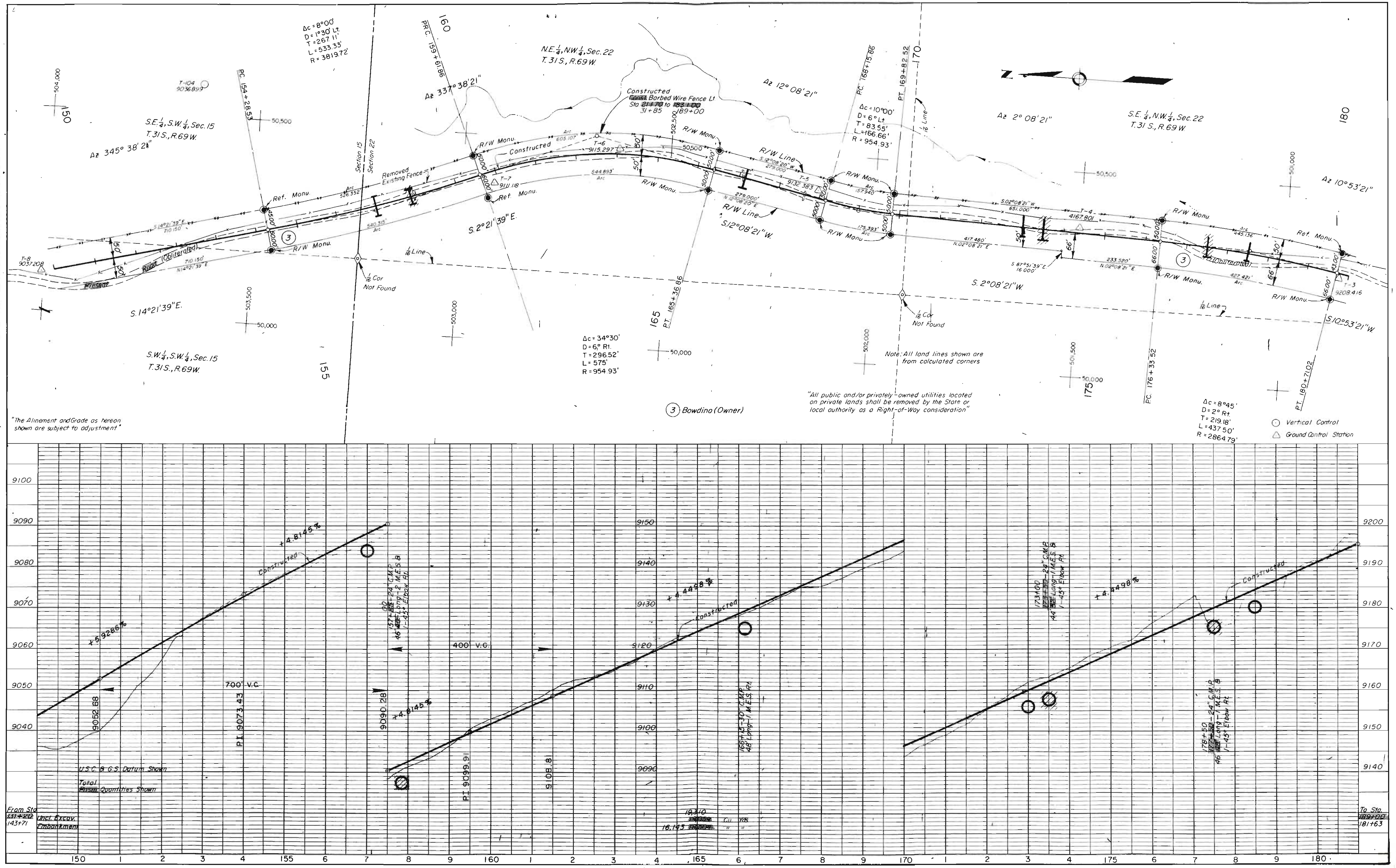


Set-back line
Az 352°38'21"
Ref. Monu.
R/W Monu.
S. 7°21' 39" E.
U.S. Government (Forest Lands)
Az 354°08'21"
Az 28°38'21"
Δc = 36°00'
D = 12°30' Rt.
T = 148.93'
L = 288'
R = 458.37'
S.W.1/4, S.E.1/4
Sec. 9
"Set-back line for special treatment - Occupied and used only upon approval of Regional Forester."
S. 5° 51' 39" E.
Δc = 34°00'
D = 12° Lt.
T = 148.26'
L = 287.50'
R = 477.46'
PT 95+58.71
PC 89+83.21
PRC 92+71.21
PC 96+22.77
Δc = 18°30'
D = 6° Rt.
T = 155.52'
L = 308.33'
R = 954.93'
S. 12°38'21" W.
Removed Exist. Fence
Exist. Fence
Δc = 57°00'
D = 10° Lt.
T = 311.09'
L = 570'
R = 572.96'
PRC 99+31.10
Az 12°38'21"
PT 105+01.10
N.W.1/4, N.E.1/4
Sec. 16
N.E.1/4, N.E.1/4
Sec. 16
T. 31S., R 69W.
Az 315°38'21"
Constructed Barbed Wire Fence Rt.
Sta. 66+00 to 106+50
Constructed Rd. Appr. Rt.
As Const. Channel Change
S. 44°21' 39" E.
Δc = 13°16'28"
D = 4° Rt.
T = 166.68'
L = 331.86'
R = 1432.40'
Orig. & Rev. Az 328°54'49"
Constructed Barbed Wire Fence Lt.
Constructed this line
Orig. & Rev. S. 31°05'11" E.
Note: All land lines shown are from calculated corners.
Δc = 21°46'28"
D = 6° Lt.
T = 183.67'
L = 362.81'
R = 954.93'
Az 307°08'21"
S. 52°51'39" E.
R/W Line
2 John O. Goemmer (Owner)
3 Bowdino (Owner)
S.E.1/4, N.E.1/4
Sec. 16
SAN ISABEL ELECT. SERV. INC.
NOTE: Permit #1176; 10-10-72 Locates Power Pole on R.O.W. - see Permit for details.
"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 line."
△ Ground Control Station
⊙ Vertical Control Station
"The Alinement and Grade as hereon shown are subject to adjustment"
+5.6000%
-1.000%
+3.5000%
600' V.C.
Constructed
P.I. 8795.46
P.I. 8787.2
P.I. 8841.46
EQUATION
119+96.87 Bk.
119+97.32 Ah.
U.S.C.&G.S. Datum Shown
Total Prism Quantities Shown
From Sta. 75+79
To Sta. 140+00



K+E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.

(As Constructed) CUCHARAS PASS 10-1(1) 8



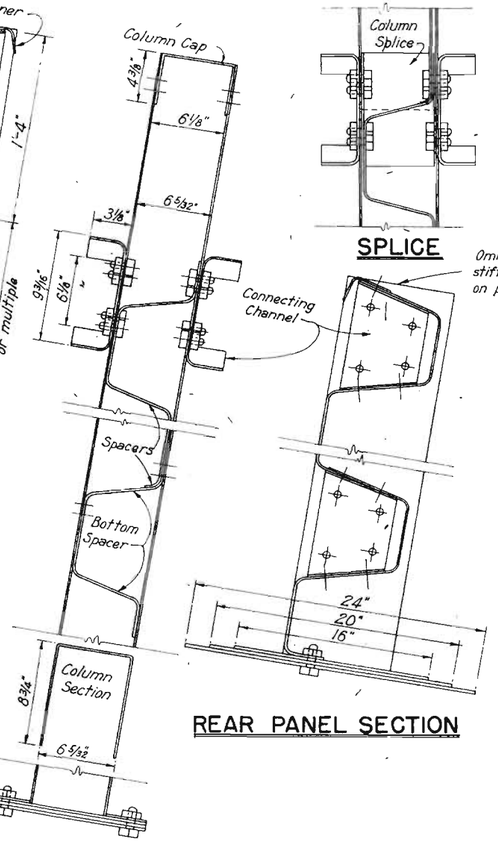
K+E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.

(As Constructed) CUCHARAS PASS 10-1(1)

K+E PLATE 1. PLAN-PROFILE KEUFFEL & ESSER CO.

(As Constructed) CUCHARAS PASS 10-1(1) 10

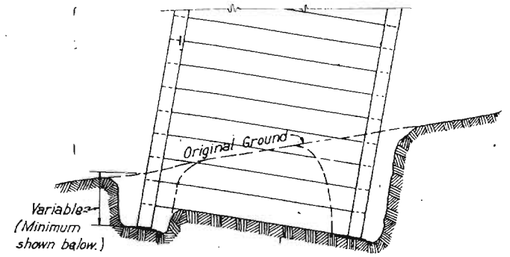
FRONT PANEL SECTION



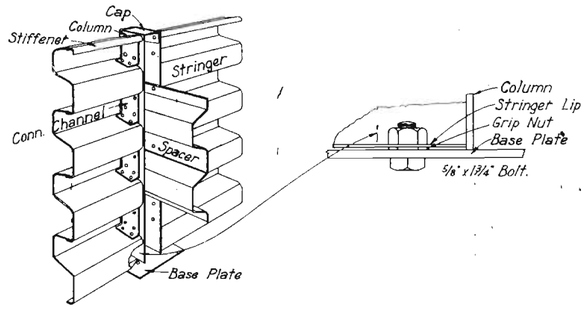
TRANSVERSE SECTION

SPLICE

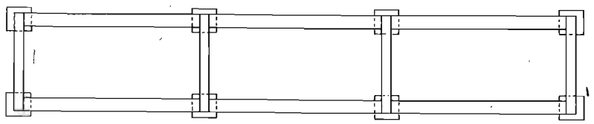
REAR PANEL SECTION



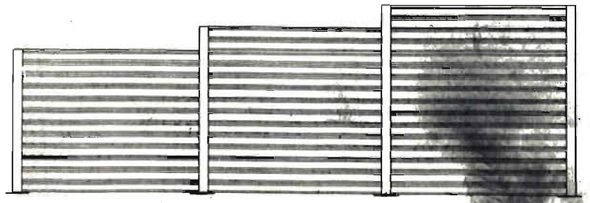
FOUNDATION SECTION



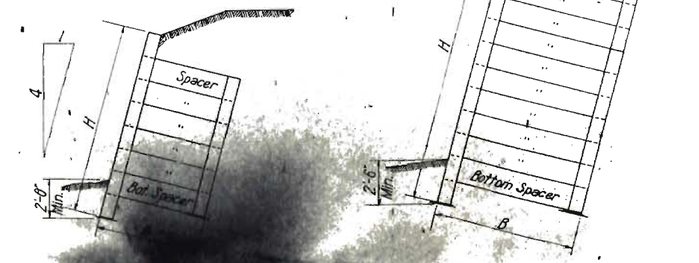
CORNER OF BIN ASSEMBLY



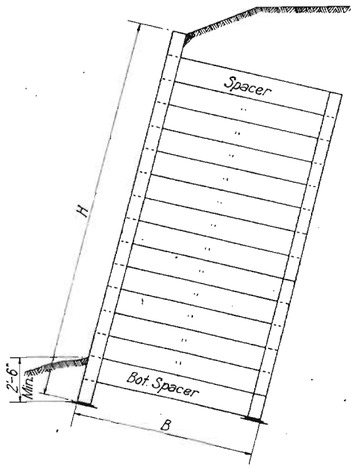
FOUNDATION PLAN



TYPICAL FACE ELEVATION



TYPICAL END ELEVATIONS



GENERAL NOTES

1 Generally in the design of Bin Type Metal Cribbing, a base width equal to approximately 45% of the wall height is to be used with level surcharge. Base width equal to approximately 50% of the wall height is to be used with slight surcharge when superimposed traffic loads are near the wall. Base width equal to approximately 55% of the wall height is to be used with high surcharge. The base width to be used will be shown on the plans.

In the construction of a wall on a curve the proper curvature for the face shall be obtained by the use of shorter stringers in the front or rear panels of Retaining Walls as designated on the plans or by the Engineer.

The wall height may be varied, but not to exceed the maximum height shown for the design selected. Two or more designs of Retaining Walls may be incorporated in the same wall by the use of special split columns to make the connection on the step-back.

All necessary stringer stiffeners, connecting channels, column splices, column caps, base plates, bolts, fittings, and any other parts required to make complete wall installation, shall be furnished and installed by the contractor and the cost included in the original contract unit price per square foot of Metal Cribbing

Bin Type Metal Cribbing shall be backfilled in layers not exceeding 6" inches in depth and thoroughly compacted into place by hand tamping as construction progresses to insure stability of the bins. The cost of backfill to the top of the wall as indicated shall be included in the original contract unit price per square foot of Metal Cribbing.

For details of gauges see Sheet 2 of 2.

Designed 5-44
Drawn G.A.L.
Traced
Checked

APPROVED [illegible] Bridge Engr.

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

BIN TYPE METAL CRIBBING

Sheet 1 of 2 Sheets

D3-SP. 354

DESIGN	WALL HEIGHT	UNIT	UNITS REQUIRED IN PANEL SECTIONS (FRONT & REAR) AND TRANSVERSE SECTION																				
			STRINGER				SPACER					BOTTOM SPACER					STR. ST.	COLUMN (FEET)	COL. CAP.	COL. SPL.	BEAR. PLATE		
		GAGE	16	14	12	10	16	16	14	12	12	16	16	14	12	12	8	8	12	14	1	1	1
		LENGTH	9.5	9.5	9.5	9.5	5.2	7.4	9.6	11.8	14.0	5.2	7.4	9.6	11.8	14.0	9.5	TOTAL	—	—	16"	20"	24"
A	4.00	P. SEC.	4														1						
		T. "										1						5.52	1		2		
	5.33	P. "	6														1						
		T. "					1					1						8.19	1		2		
	6.67	P. "	8														1						
		T. "					2					1						10.85	1		2		
	8.00	P. "	10														1						
		T. "					3					1						13.52	1		2		
	9.33	P. "	12														1						
		T. "					4					1						16.19	1		2		
	10.67	P. "	14														1						
		T. "					5					1						18.85	1		2		
B	9.33	P. "	12														1						
		T. "						4					1					16.19	1		2	2	
	10.67	P. "	14														1						
		T. "						5					1					18.85	1		2	2	
	12.00	P. "	14	2													1						
		T. "						6					1					21.52	1		2	2	
	13.33	P. "	14	4													1						
		T. "						7					1					24.19	1	1	2	2	
	14.67	P. "	14	6													1						
		T. "						8					1					26.85	1	1	2	2	
	16.00	P. "	14	8													1						
		T. "						9					1					29.52	1	2	2	2	
	17.33	P. "	14	8	2												1						
		T. "						10					1					32.19	1	3	2	2	
C	14.67	P. "	14	6													1						
		T. "							8					1				26.85	1	1	2	2	
	16.00	P. "	14	8													1						
		T. "							9					1				29.52	1	2	2	2	
	17.33	P. "	14	8	2												1						
		T. "							10					1				32.19	1	3	2	2	
	18.67	P. "	14	8	4												1						
		T. "							11					1				34.85	1	3	2	2	
	20.00	P. "	14	8	6												1						
		T. "							12					1				37.52	1	3	2	2	
	21.33	P. "	14	8	8												1						
		T. "							13					1				40.19	1	3	2	2	
D	18.67	P. "	14	8	4												1						
		T. "								11					1			34.85	1	3	2	2	2
	20.00	P. "	14	8	6												1						
		T. "								12					1			37.52	1	3	2	2	2
	21.33	P. "	14	8	8												1						
		T. "								13					1			40.19	1	3	2	2	2
	22.67	P. "	14	8	10												1						
		T. "								14					1			42.85	1	3	2	2	2
	24.00	P. "	14	8	12												1						
		T. "								15					1			45.52	1	4	2	2	2
	25.33	P. "	14	8	14												1						
		T. "								16					1			48.19	1	5	2	2	2
	26.67	P. "	14	8	14	2											1						
		T. "								17					1			50.85	1	5	2	2	2
E	22.67	P. "	14	8	10												1						
		T. "									14					1		42.85	1	3	2	2	2
	24.00	P. "	14	8	12												1						
		T. "									15					1		45.52	1	4	2	2	2
	25.33	P. "	14	8	14												1						
		T. "									16					1		48.19	1	5	2	2	2
	26.67	P. "	14	8	14	2											1						
		T. "									17					1		50.85	1	5	2	2	2
	28.00	P. "	14	8	14	4											1						
		T. "									18					1		53.52	1	5	2	2	2
	29.33	P. "	14	8	14	6											1						
		T. "									19					1		56.19	1	5	2	2	2
	30.67	P. "	14	8	14	8											1						
		T. "									20					1		58.85	1	5	2	2	2

COLUMN ARRANGEMENT FOR VARIOUS WALL HEIGHTS

WALL HEIGHT (FT. IN.)	WALL HEIGHT (FEET)	FRONT COLUMN HEIGHT					REAR COLUMN HEIGHT				FRONT & REAR COL. HT.
		FIRST LIFT	SECOND LIFT	THIRD LIFT	FOURTH LIFT	TOTAL HEIGHT	FIRST LIFT	SECOND LIFT	THIRD LIFT	TOTAL HEIGHT	
4'-0"	4.00	4.09				4.09	1.43			1.43	5.52
5'-4"	5.33	5.43				5.43	2.76			2.76	8.19
6'-8"	6.67	6.76				6.76	4.09			4.09	10.85
8'-0"	8.00	8.09				8.09	5.43			5.43	13.52
9'-4"	9.33	9.43				9.43	6.76			6.76	16.19
10'-8"	10.67	10.76				10.76	8.09			8.09	18.85
12'-0"	12.00	12.09				12.09	9.43			9.43	21.52
13'-4"	13.33	6.33	7.09			13.43	10.76			10.76	24.19
14'-8"	14.67	6.33	8.43			14.76	12.09			12.09	26.85
16'-0"	16.00	6.33	9.76			16.09	10.33	3.09		13.43	29.52
17'-4"	17.33	6.33	8.00	3.09		17.43	10.33	4.43		14.76	32.19
18'-8"	18.67	6.33	8.00	4.43		18.76	10.33	5.76		16.09	34.85
20'-0"	20.00	6.33	8.00	5.76		20.09	10.33	7.09		17.43	37.62
21'-4"	21.33	6.33	8.00	7.09		21.43	10.33	8.43		18.76	40.19
22'-8"	22.67	6.33	8.00	8.43		22.76	10.33	9.76		20.09	42.85
24'-0"	24.00	6.33	8.00	9.76		24.09	10.33	8.00	3.09	21.43	45.52
25'-4"	25.33	6.33	8.00	8.00	3.09	25.43	10.33	8.00	4.43	22.76	48.19
26'-8"	26.67	6.33	8.00	8.00	4.43	26.76	10.33	8.00	5.76	24.09	50.85
28'-0"	28.00	6.33	8.00	8.00	5.76	28.09	10.33	8.00	7.09	25.43	53.52
29'-4"	29.33	6.33	8.00	8.00	7.09	29.43	10.33	8.00	8.43	26.76	56.19
30'-8"	30.67	6.33	8.00	8.00	8.43	30.76	10.33	8.00	9.76	28.09	58.85

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

BIN TYPE METAL CRIBBING

Drawn & Traced W.A.G. May, 1946

D3-SP. 354
GPO 834458