1325
Rose Canon
Alignment

BANTA

FIELD BOOK

No. 335 F

Our Leather Bound Engineers Note Books are carried in the following rulings:

No. 380 LEVEL BOOK. Left and Right Hand Page the same as Left Hand Page of this Book.

No. 382 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 4 x 4 to the inch, Center Line Red.

No. 384 MINING TRANSIT BOOK. Left Hand Page as in this Book, Right Hand Page 8x8 to the inch, Center Line Red.

No. 385 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 8 vertical and 4 horizontal lines to the inch, Center Line Red.

We also carry the Note Books listed above, bound in extra strong Fabri-Hide (otherwise the same quality of book), which can be furnished at a somewhat lower price.

In ordering Fabri-Hide covered books, add the letter *"F"* to catalog number.

THE FREDERICK POST CO.

ENGINEERING and DRAFTING SUPPLIES

IRVING PARK STATION

CHICAGO, ILL.

INDEX

Page		Sta.
58	See Note	
72	℄ shift at End of Curve	Sta. 288

10/12/30 Calif. Highway Commission

Set Lead + Tack at all curve points after paving.

White
Cal. Hiway Comm.

Sta	Align.	Defl'n	True Bearing	Curve Data	Magnetic Bearing
+50		4°00.66'			
+25		3°32.01			
4+00		3°03.36	✓	~~Δ=9°31'40"~~	See change below
				~~R=1500'~~	
+75		2°34.72		~~T=125.01~~	
+50		2°06.07		~~L=249.41~~	
				Δ=9°29'	
+25		1°37.42		R=1500'	
3+00		1°08.77 ✓		T=124.42 ✓	
+75		49	0°40		
+50		0°11.47		L=248.27	
2+39.97 - B.C. ✓					
2+39.29	B.C.				
2+00					
1+00			N17°39'W		
0+00					

+95 — 10' ● #4665

+90 — #7328US ● 28'

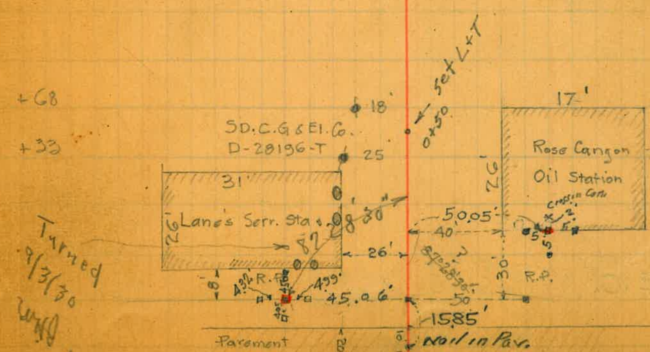
+65 — #7329-US ● 8'

20' ● S.D.C.&G.El.Co. #4633

+49 — 7330-US ● 17'

+68 — ● 18'

+33 — S.D.C.G.&El.Co. D-28196-T ● 25



Turned 9/3/30 WJJ

Set L.+T. in pav. at 0+50.29

C.H.C. Oct 1932.

Note: For Detail this Tie see Book 1216-2-9

STA	Alignm.	Defl. ∠	True Bearing	Curve Data
9+00				
8+00			N 8°07'20" W	
7+00				
6+00				
5+00				
4+88.24 = E.C.		4°44'.50"		
4+89.40		4°45.83		
+75		4°29.31		

+34' # 7375-US ℄ 41'

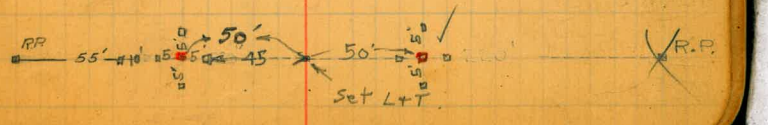
+70' 28'

+45' 2 16' ℄ SO.Q&E. # 4735

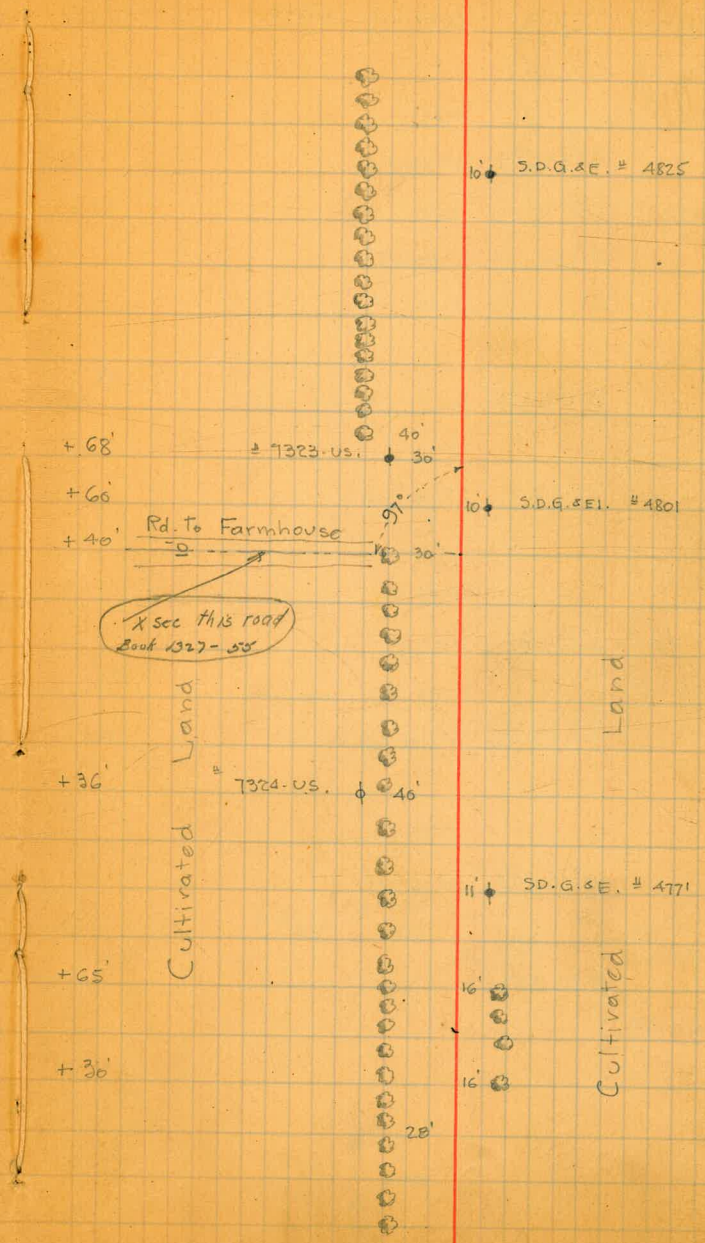
+21' # 7386-US. ℄ 45'

+95' 14' ℄ # 4701 S.D.C&Q&EL.

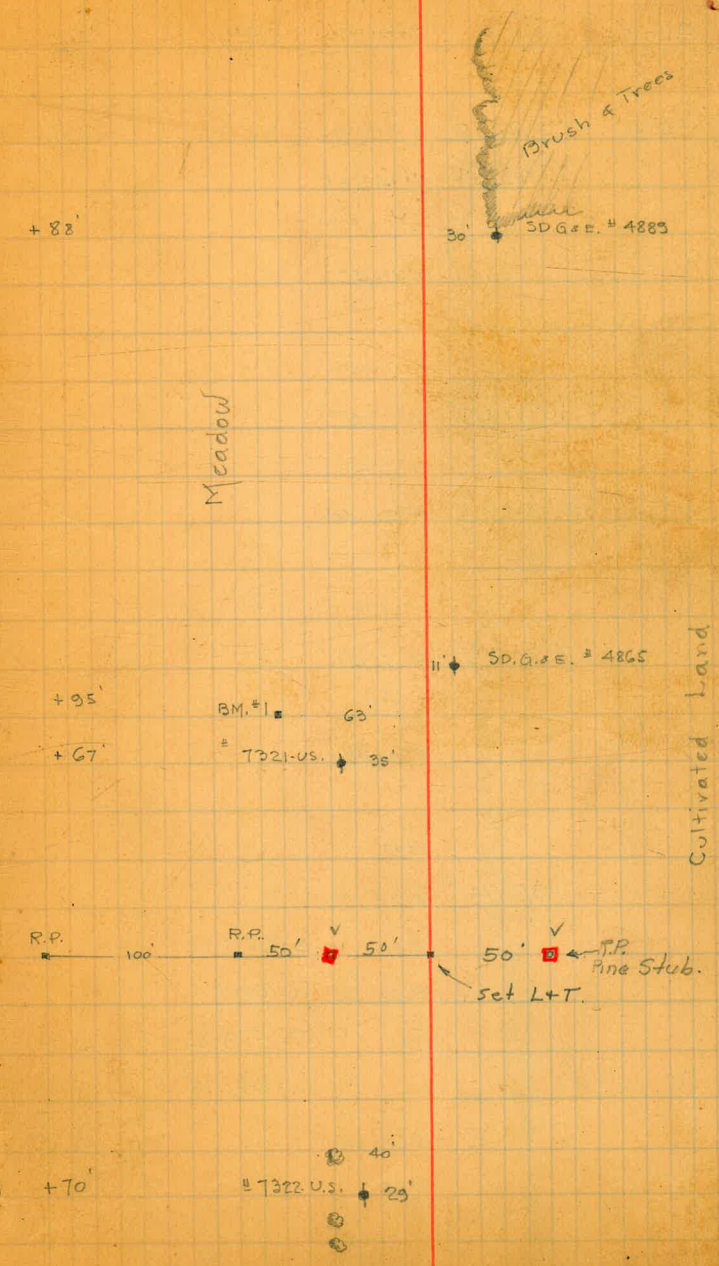
+20' # 7327-US ℄ 43'



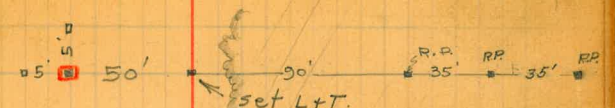
STA	Align.	Defl. ±	True Bearing	Curve Data
14 + 00				
13 + 00				
12 + 18				
12 + 00				
	109349'			
	1191.98'			
11 + 00				
10 + 00				



Sta	Align.	Defl. ∠	New Def ∠ for this curve — True Bearing	Curve Data
+25			4°55	
19+00		4°33.84'	4°38.58'	
+75			4°12	
+50		3°50.86'	3°50.68'	
+25			3°29	
18+00		3°07.89'	3°07.62'	
+75			2°46	
+50		2°24.91'	2°24.64'	
+25			2°03	
17+00		1°41.94'	1°41.66'	
+75			1°20	
+50		0°58.96'	0°58.68'	
+25			0°37	
16+00		0°15.99'	0°15.70'	
15+91.73 = B.C. 38				
15+81	B.C.			
	1093.49'			
15+00				



STA	Align.	Defl. ∠	True Bearing	Curve Data
24+28.51 = E.C.				
24+28 16'	E.C.	12°07.75'	12°07.75'	
+25				12°05
24+00		11°43.59'	11°43.38'	
+75			11°22	
+50		11°0.61'	11°00.40'	
+25			10°39	
23+00		10°17.64'	10°17.42'	
+75			9°56	
+50		9°34.66'	9°34.44'	
+25			9°13	
22+00		8°51.69'	8°51.46'	
+75			8°30	
+50		8°08.71'	8°08.48'	
+25			7°47	
21+00		7°25.74'	7°25.50'	
+75			7°04	Δ = 24°15'30" ✓
+50		6°42.76'	6°42.52'	R = 2000' ✓
+25			6°21	T = 429.83' ✓
	P.I.			L = 846.78' ✓
20+00		5°59.79'	5°59.54'	
+75			5°38	
+50		5°16.81'	5°16.56'	



+69'

15' S.D.G. & El. # 2

+14'

36' S.D.G. & E. # 4911

STA	Align.	Defl. ∠	True Bearing	Curve Data
29+00				
28+00				
	640.71'			
	641.21		N32°22'50"W	
27+00				
26+00				
25+00				

+78' # 7315-US 50'

+35' 33' SD.G&E. # 5011

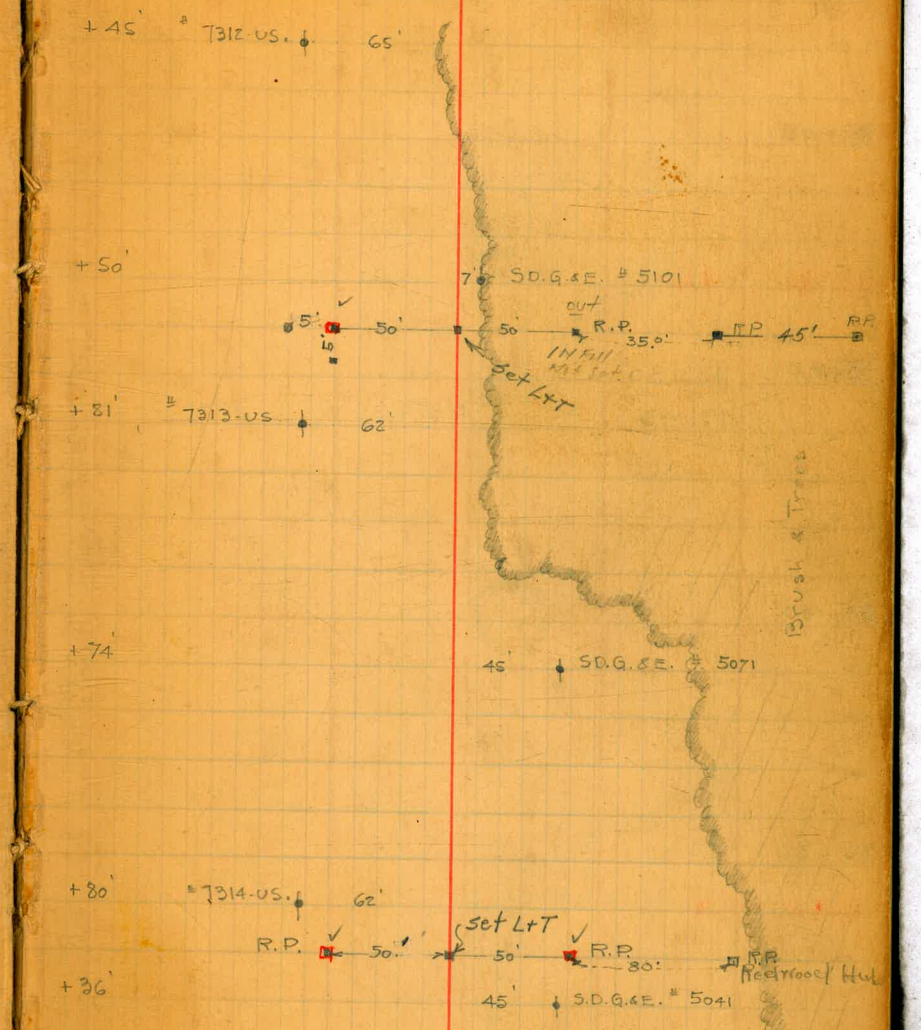
+80' # 7316-US. 52'

+56' 20' S.D.G.E. # 4971

Brush & Trees

Brush & Trees

STA	Align.	Defl. ∠	True Bearing	Curve Data
34+00				
33+21.06=E.C.				
33+21	E.C.	2°24.58'		
33+00		2°12.13'		
+75		1°58		
+50		1°43.50'		
+25		1°29		Δ=4°48'35" ✓ 4.48.35
32+00		1°14.84'		R=3000' ✓ 4.48.35
	P.I			T=126.00 ✓ 125.98 ✓ 9.37.10
+25		1°00.52		L=251.84 ✓
+50		0°46.20		
+25		0°31.87		
31+00		0°17.55'		
+75		0°03		
30+69.22=B.C.				
30+69.27	B.C. ✓	Lt.		
30+00				



Sta	Align	Defl. ∠	True Bearing	Curve Data
39+00				
38+00	1132.30'			
	+131.43'		N37°11'25"W	
37+00				
36+00				
35+00				

+85'

+85' ⊥ T310-US. 53'

+20' ⊥ T311-US. 63'

+85'

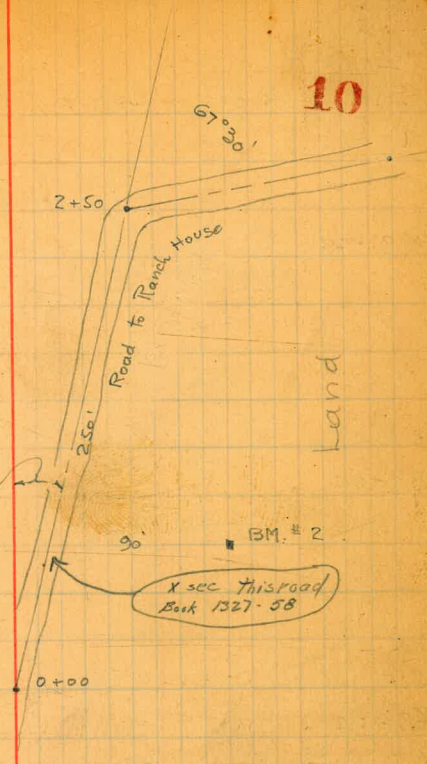
5' SD. G. & E. # 5165

Pasture Land

10'

4' SD. G. & E. # 5125

STA.	Align.	Defl. ∠	True Bearing	Curve Data
44+00				
		+90'	# 7307-US.	41'
43+00				
		+71'		
		+ 16 30		
42+00		+90'	# 7308-US.	48'
		+61'		
41+00				
40+00		+83'	# 7309-US.	50'



Sta.	Align.	Defl. Δ	True Bearing	Curve Data
49+00				
			N41°42'50"W	
48+00				
47+00				
46+89.50	E.C.	2°15.71'	2°16.25'	
+75		2°07'		
+50		1°53.08'	1°52.8'	Δ=4°31'25"
+40.94		1°48'		R=3000'
+25		1°39'		
46+00		1°24.43'	1°24.15'	T=118.50'
+71	P.I.			L=236.86'
+75		1°10'		Δ=4°32'15"
+50		0°55.79'	0°55.5'	T=118.85'
+03.36	+25	0°41'		L=237.58'
45+00		0°27.14'	0°26.95'	R=3000'
+75		0°13'		
44+53.36	B.C.	L+		
44+52.64				

See change Below

+72.22

+65' # 7304-US +22'

+05'

+57'

+30'

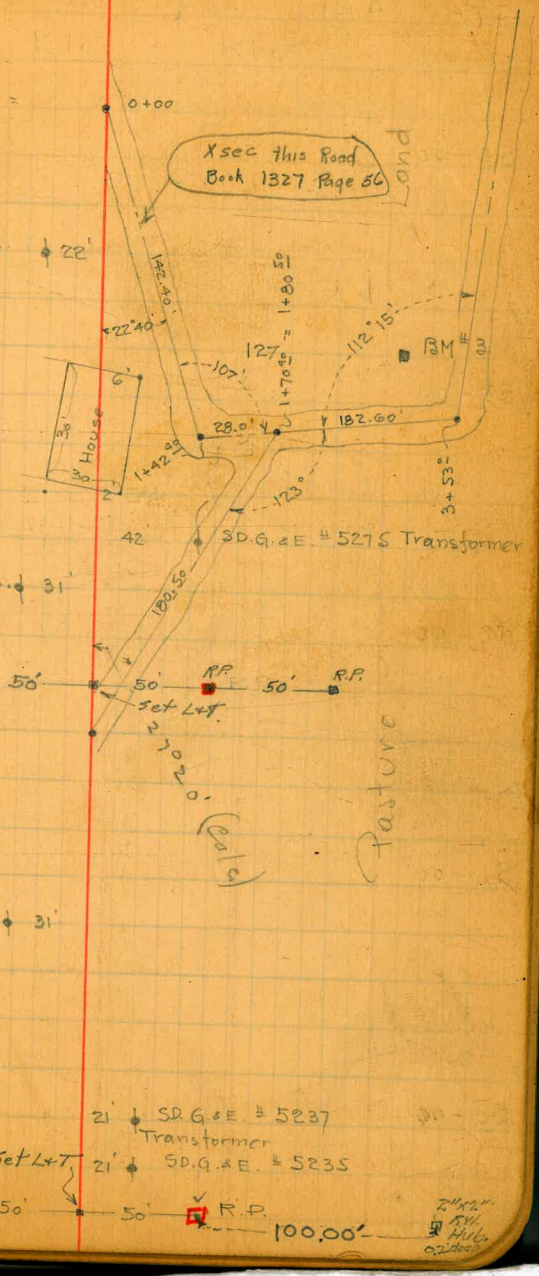
+10' # 7305-US +31'

+84.00

+89' # 7306-US +31'

+70'

+55'



STA	Align.	Defl. ∠	True Bearing	Curve Data
54+00				
53+00				
	2088.56'			
	2088.45'		N 41°42'50"W	
52+00				
51+00				
50+00				

12

+26' 42' ⊕ 15'dia. Water Tank

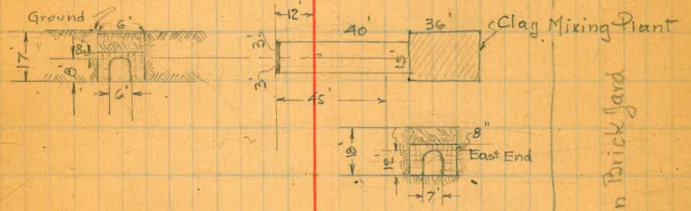
+75' ± 7301-US. ∮ 36'

+50'

+27' ± 7302-US ∮ 33'

+03'

51+94 ℄



Building & Plant of Union Brick Yard

± 7303-US. ∮ 29'

100

STA.	Align.	Defl. ∠	True Bearing	Curve Data
59+00				
	2088.56'			
58+00				
57+35.22		P.O.T.		
57+00				
56+00				
55+37.14	P.O.T.			
55+00				

+15' 45' # 7300-US.

+58' SDG.&E. # 5460 12'

50' 50'

+15' 28' # D-30618-T

Pasture Land

+64' SDG.&E. # 5430 18'

+73' # D-30619-T 39'

+5' 29' Garage

+85' 40'

+60 30' House

Sta	Align.	Defl. Δ	True Bearing	Curve Data
64+00				
63+00				
	2088.56'			
62+00				
61+00				
60+00				

+15' 71' ↓ # 7298-US.

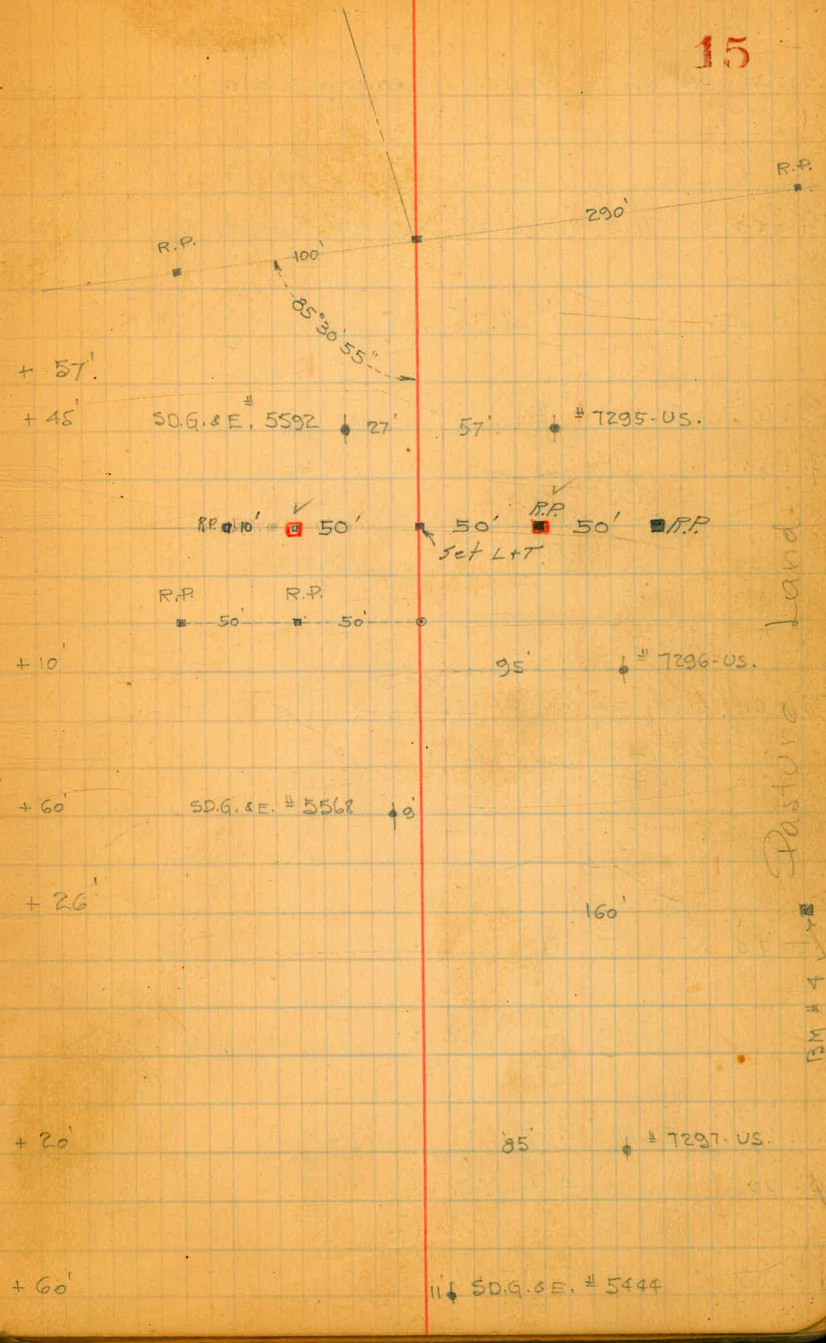
+60' 2'↓ SD.G.&E. # 5520

Pasture land

+18' 60' ↓ # 7299-US.

+60' SD.G.&E # 5490 ↓6'

STA	Align.	Defl. ∠	True Bearing	Curve Data
				A = 8°58'10" ✓
69+00	P.I.	2°19.89'	✓	R = 1500' ✓
				T = 117.65' ✓
				L = 234.82' ✓
+50		1°22.60'	✓	
68+00		0°25.30'	✓	
67+79.50 = B.C.				
67+77	B.C.	Lt.		
67+42 17	P.O.T.			
67+00				
	2088.56'			
66+00				
65+00				



STA	Align.	Defl. ∡	~~True Bearing~~ New Defl ∡ for this Curve	Curve Data
74+00		1°05.02'	1°04.08'	
+50		0°28.75'	0°27.84'	
73+11.59=BC				
73+10.19	B.C.	Rt.		
73+00				
~~72+00~~	297.27' ~~297.42'~~			
71+00				
70+14.32'=E.C.				
70+12.77	E.C.	4°29.11'	✓	
70+00		4°14.48'	✓	
+50		3°17.19	✓	

+ 05' SD.G.&E. # 5658 5'

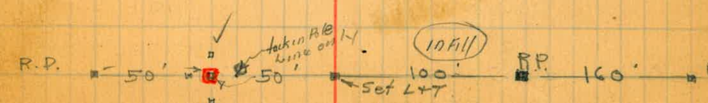
+ 73' 70' # 4248-US.

+ 60' SD.G.&E. # 5638 15'

+ 95' 52' # 4249-US.

Pasture Land

+ 57' SD.G.&E. # 5618 26'



30' # 7294-US.

STA	Align.	Defl. ∠	New Def ∠ For this Curve — True Bearing	Curve Data
	P.I.			Δ = 28°29'25" - R
				R = 2369.37'
79+00		7°07.72'	7°06.46'	T = 601.53'
				L = 1178.17' — See Change Below
+50		6°31.45'	6°30.22'	Δ = 28°28'
				R = 2371.62'
				T = 601.58'
78+00		5°55.18'	5°53.98'	L = 1178.31'
+50		5°18.91'	5°17.74'	
77+00		4°42.64'	4°41.51'	
+50		4°06.37'	4°05.27'	
76+00		3°30.10'	3°29.03'	
+50		2°53.83'	2°52.79'	
75+00		2°17.56'	2°16.55'	
+50		1°41.29'	1°40.32'	

+36' SD.G.&E. # 5718 ϕ 41'

+14' 16' ϕ # 4246 - US.

+50 Construct Culvert

Pasture Land

+70' SD.G.&E. # 5698 ϕ 19'

+90' 55' ϕ # 4247 - US.

+60' SD.G.&E. # 5678 ϕ 10'

Sta	Align	Defl. ∠	New def ∆ For this Curve ~~True~~ Bearing	Curve Data	
+50		13°46.69'	13°45.06'		
84+00		13°10.42'	13°08.82'		
+50		12°34.15'	12°32.58'		
83+00		11°57.88'	11°56.34'		
+50		11°21.61'	11°20.11'		
82+00	/	10°45.34'	10°43.87'	—	
+50		10°09.07	10°07.64'		
81+00		9°32.80'	9°31.40'		
+50		8°56.53'	8°55.16'		
80+00		8°20.26'	8°18.94'		
+50		7°43.99	7°42.70'	✓ ∠	

+30' SD.G.&E. #5790 • 60'

+60' 28' • #4244-US.

+28' SD.G.&E. #5762 • 40'

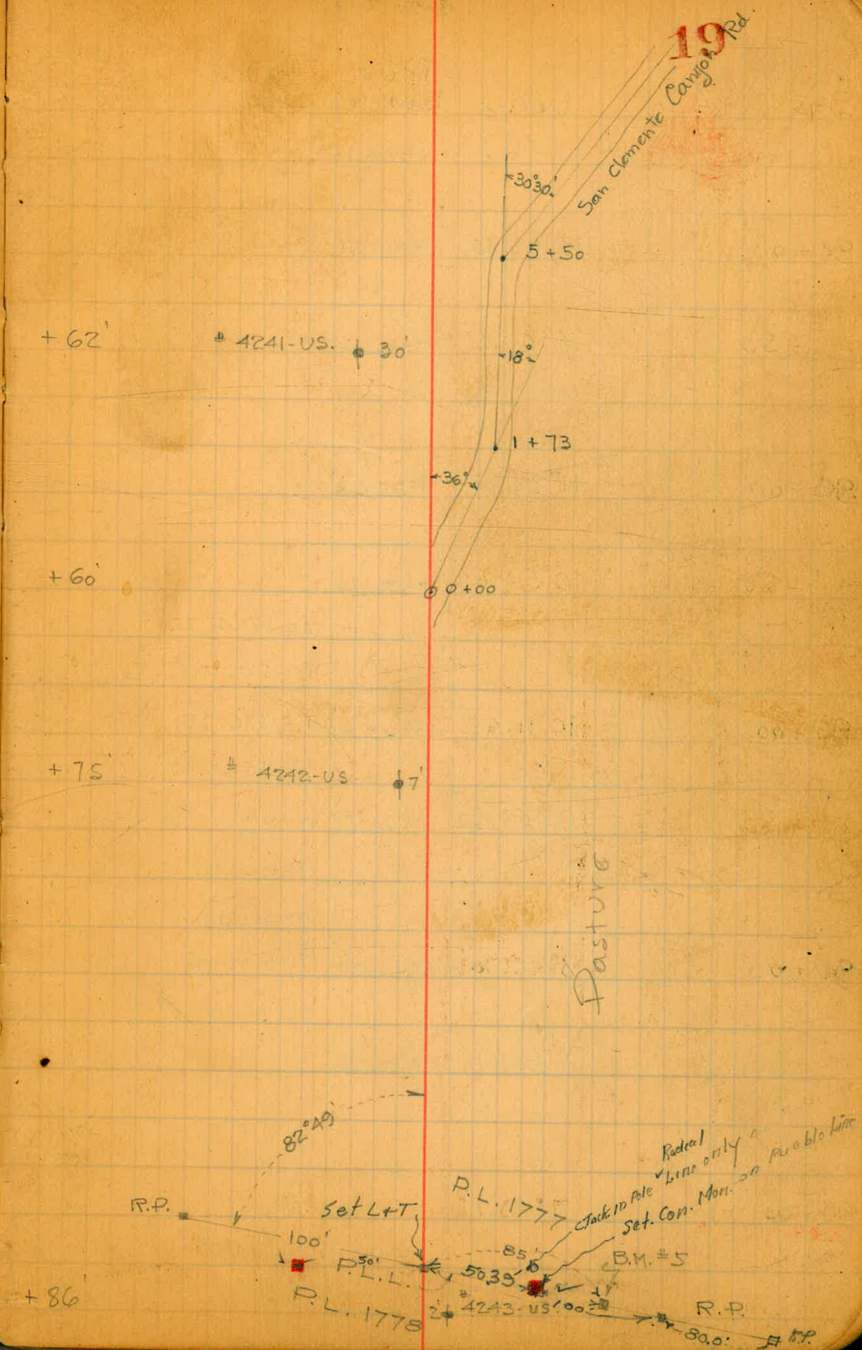
Land

Pasture

+37' 31' • #4245-US.

+32' SD.G.&E. #5740 • 30'

STA	Align.	Defl. ∠	New Def ∠ For this Curve ~~True~~ Bearing	Curve Data
89+00		5°53.80'	5°52.16'	✓
+50		5°10.82'	5°09.22'	✓
88+00		4°27.85'	4°26.28'	✓
+50		3°44.87	3°43.34'	✓
87+00		3°01.90'	3°00.40'	✓
+50		2°18.12'	2°17.46'	✓
86+00		1°35.95'	1°34.52'	✓
+50		0°52.97'	0°51.58	
85+00		0°10.00'	0°08.67'	
84+89.90 = P.C.C.				
~~84+88~~.56 –	P.C.C.	14°14.70'	14°14.0'	



Sta	Align	Defl. Δ	Next def Δ for this Curve — True Bearing	Curve Data
+50		13°46.5'	13°44.50'	
91+00		13°03.55'	13°01.56'	
+50		12°20.57'	12°18.62'	
92+00		11°37.60'	11°35.68'	
+50		10°54.67'	10°52.74'	
	P.I.			Δ = 47°47'55"
				R = 2001.18'
				T = 886.78'
				L = 1669.47'
				} See Chart Below.
92+00		10°11.65'	10°09.80'	
+50		9°28.67'	9°26.86'	Δ=47°47'00"
				R=2001.54'
				T=886.61'
91+00		8°45.70'	8°43.92'	L=1669.24'
				Long chd.= 1621.29'
+50		8°02.72'	8°00.98'	
90+00		7°19.75'	7°18.04'	
+50		6°36.77'	6°35.10'	

Land

+35' SD.G.&E. # 5910 ϕ 18'

+30'

35' ϕ # 4238-US.

Farm House

+50' 150±

gas

+70'

2' ϕ # 4239-US. Water Tank

+40' 100±

45' 12" Tree

+35' SD.G.&E. # 5888 ϕ 46'

12" Tree

Pasture

+23' # 4240-US ϕ 28' 150± Barn

+10'

Construct Culvert

STA	Align.	Defl. ∠	New def. ∠ for this Curve True Bearing	Curve Data
+50		20°56.27'	20°53.90'	
99+00		20°13.30'	20°10.96'	
+50		19°30.32'	19°28.02'	
98+00		18°47.35'	18°45.08'	
+50		18°04.37'	18°02.14'	
97+00		17°21.40'	17°19.20'	
+50		16°38.42'	16°36.26'	
96+00		15°55.45'	15°53.32'	
+50		15°12.47'	15°10.38'	
95+00		14°29.50'	14°27.44'	

+35' 36" Eucalyptus 5'

+90' Clay Quarry SD.G.&El. 60505 14' 24" Eucalyptus Tree

+60'

+45 # 4235-US. 35'

+35

140' Cultivated Field BM.# 6

+90' Construct Culvert

+34' # 4236-US. 20'
SD.G.&E.# 5988 44

+90' 11' 24" Eucalyptus Tree

+15' SD.G.&El. # 5960 33' 38' 18" E.T.

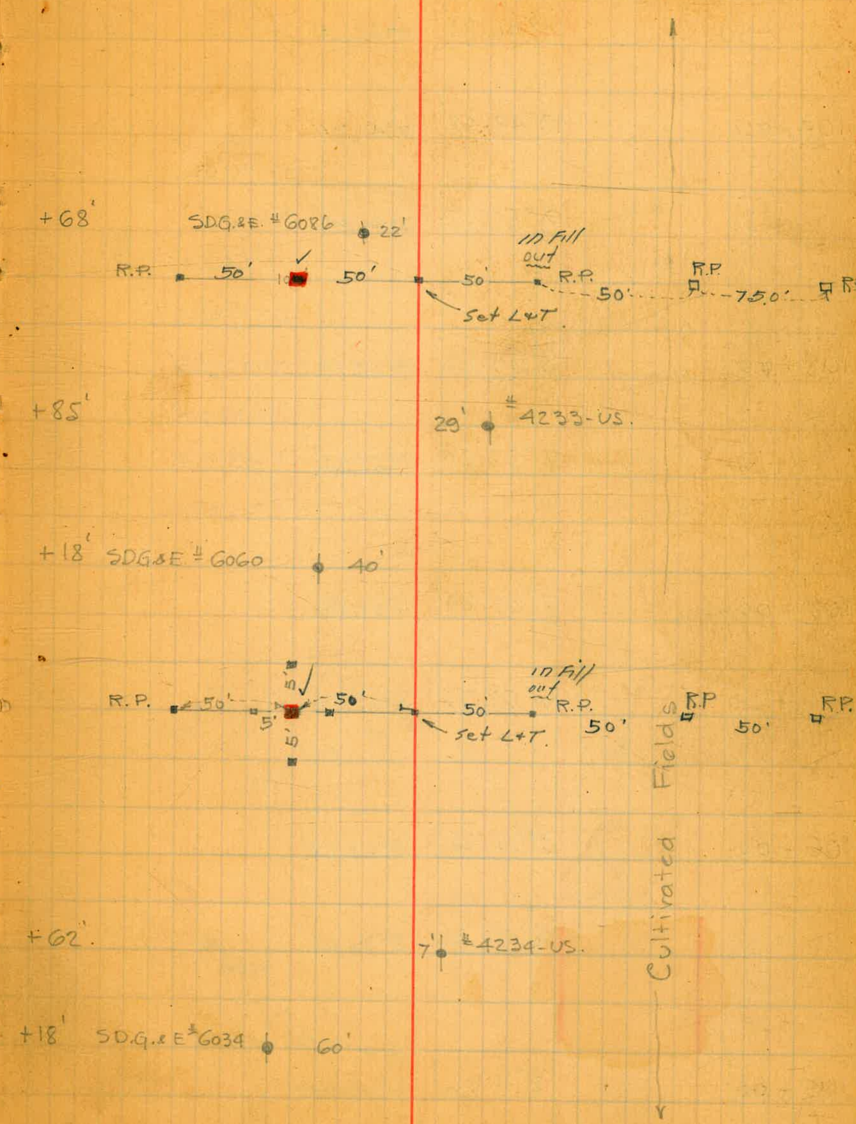
38' 18" Eucipt. Tree

Grazing Land

SD.G.&E # 5932 12'

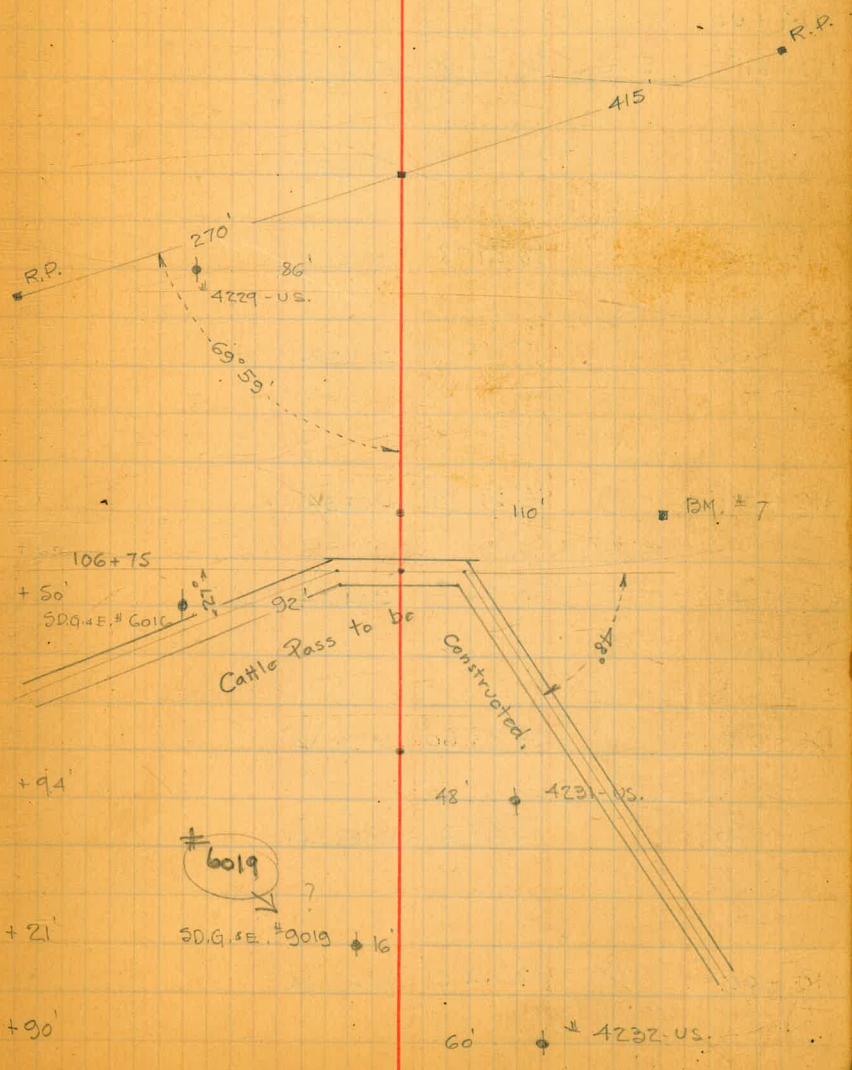
+90' 50' # 7293-US.

STA	Align	Defl ∠	~~True~~ Bearing (New def ∠ For this Curve)	Curve Data
104+00		1°16.47'	1°14.74'	
~~+50~~ 103+34.78 (27) = BC		0°19.17	0°17.44'	
103+33	B.C.	Lt.		
103+00				
	175.64' ~~175.44~~			
102+00				
101+59.14 (83) = EC				
101+57	E.C.	23°53.96	23°53.50'	
+50		23°48.17	23°45.66'	
101+00		23°05.20	23°02.72'	
+50		22°22.22	22°19.78'	
100+00		21°39.25	21°36.84'	

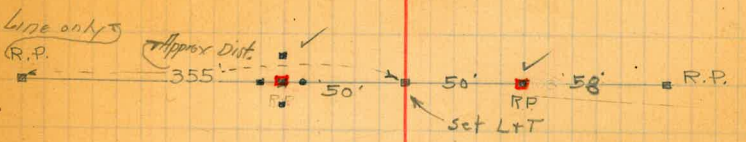


Sta	Align.	Defl. Δ	New def Δ for this curve — True Bearing	Curve Data
+50		11°46.72'	11°45.04'	
109+00		10°49.42'	10°47.74'	
				Δ = 40°02'
+50		9°52.13'	9°50.44'	R = 1500'
	P.I.			T = 546.45'
				L = 1048.07'
108+00		8°54.83'	8°53.14'	Δ=39°58'
				R=1500'
+50		7°57.54'	7°55.84'	T=545.46'
				L=1046.32'
107+00		7°00.24'	6°58.54'	
+50		6°02.95'	6°01.24'	
106+00		5°05.65'	5°03.94'	
+50		4°08.36'	4°06.64'	
105+00		3°11.06'	3°09.34'	
+50		2°13.77'	2°12.04'	

See change Below



Sta	Align.	Defl. ∠	New def ∠ for this Curve — Tgt Bearing	Curve Data
114+00				
113+81.10 = E.C.				
113+81 — 34	E.C.	20°01.00'	19°59.00'	
+50		19°25.08'	19°23.44'	
113+00		18°27.78'	18°26.14'	
+50		17°30.49'	17°28.84'	
112+00		16°33.19'	16°31.54'	
+50		15°35.90'	15°34.24'	
111+00		14°38.60'	14°36.94'	
+50		13°41.31'	13°39.64'	
110+00		12°44.01'	12°42.34'	



Cultivated Fields

Cultivated Fields

Sta	Align.	Defl. ∠	True Bearing	Curve Data
119+00				
	1471.41' = by Walker & Party			
118+00				
	1474.61			
117+00				
116+00				
115+00				

Cultivated Fields

Cultivated Fields

+95'

100'

B.M. #8

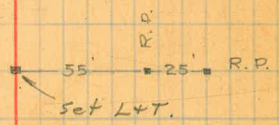
Sta	Align.	Defl. ∠	True Bearing	Curve Data
124+00				
123+00				
122+00				
121+00				
120+00				

121+91.87 = P.T. = 121+96.67 (EQUA.)

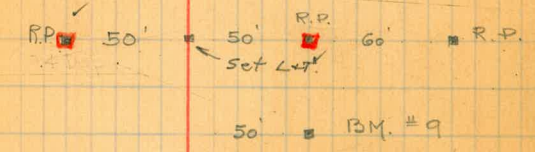
121+90.68 : P.O.T. = (121+85.88) = 121+95.48

Cultivated Fields

Cultivated Fields



Sta	Align.	Defl. ∢	True Bearing	Curve Data
+50		1°47.78'	1°46.13'	
+07.31			0-57.30	
129+00		0°50.48'	0°48.83'	
128+57.31 = B.C.				
128+55.95	B.C.	Lt.		
128+00				
127+00				
126+00				
125+00				



Sta	Align	Defl. ∠	True Bearing	Curve Data	
	1364.30'				
134+00					
133+00					
132+97.77					
132+95	E.C.	8°24.00'	8°24.00'		
+50		7°31.55'	7°29.93'		
+47.15			7°26'30"		
132+00		6°34.25'	6°32.63'		
+50		5°36.96'	5°35.33'		
131+00		4°39.66'	4°38.03'	Δ = 16°48'	✓
	P.I.			R = 1500'	✓
+50		3°42.37'	3°40.73'	T = 221.51'	✓
				L = 439.82'	✓
130+00		2°45.07'	2°43.73'	✓	

STA	Align.	Defl.	True Bearing	Curve Data
139+00				
	1364.30'			
138+00				
137+00				
136+00				
135+00				

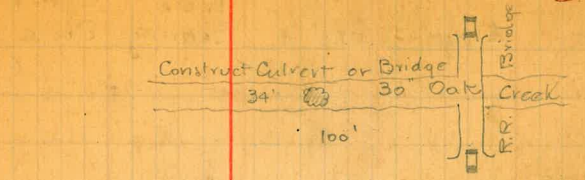
STA.	Align.	Defl. ∠	True Bearing	Curve Data
144+00				
	1364.30'			
143+00				
	~~1364.22'~~			
142+00				
141+00				
140+00				

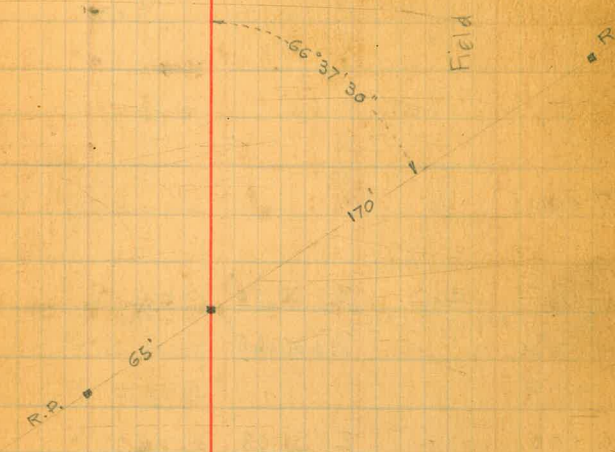
50' ■ BM # 10

Sta.	Align.	Defl. ∠	True Bearing	Curve Data
+50		6°44.29'	6°42.26'	~
149+00		5°34.75'	5°32.53'	~ x
+50		4°24.81'	4°22.80'	~
148+00		3°15.27'	3°13.07'	~
+50		2°05.34'	2°03.34'	~
+11.43			1°01.01'	~
147+00		0°55.80'	0°53.61'	~
+85.99		0°34.77'		
14C+61.43 = B.C.				
146+59.99	B.C.	Rt.		
146+00				
	1364.30'			
145+00				

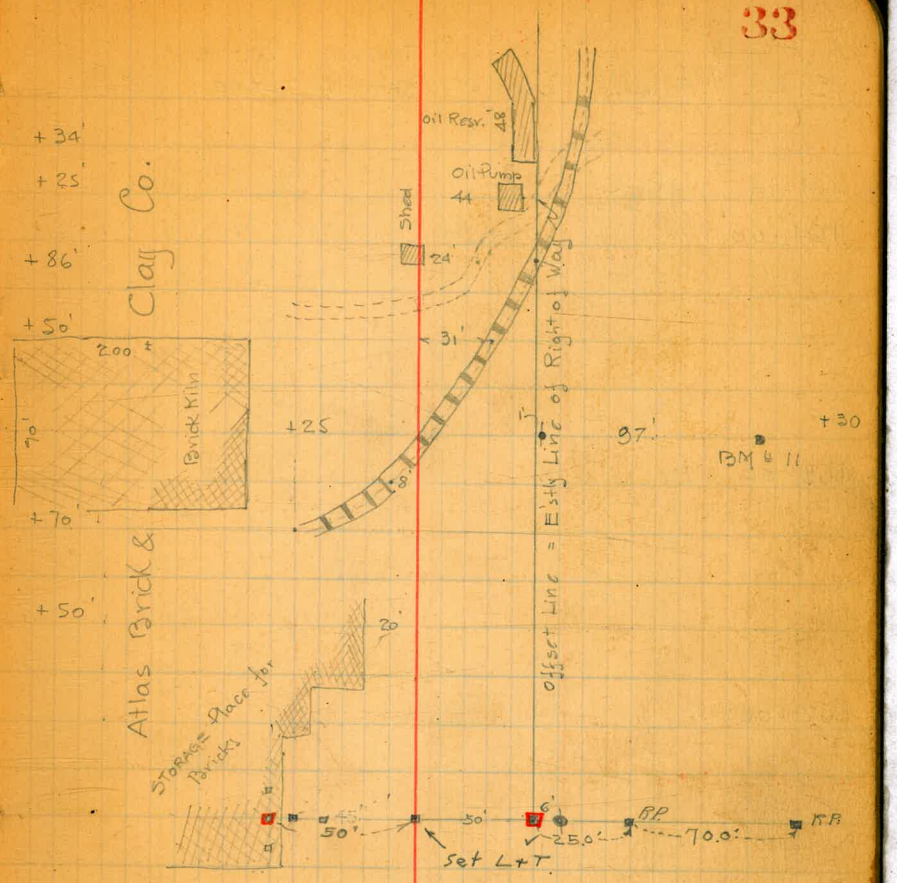
Sta.	Align.	Defl. +	True Bearing	Curve Data
+50		18°21.66'	18°19.57'	
154+00		17°12.12'	17°09.84'	
+50		16°02.19'	16°00.11'	
153+00		14°52.65'	14°50.38'	
+50		13°42.71'	13°40.65'	
152+00		12°33.17'	12°30.92'	
				Δ = 46°45'
+50	P.I.	11°23.24'	11°21.19'	R = 1232.42'
				T = 532.67'
				L = 1005.58
151+00		10°13.70'	10°11.46'	
+50		9°03.76'	9°01.73'	
150+00		7°54.22'	7°52.0'	

+38

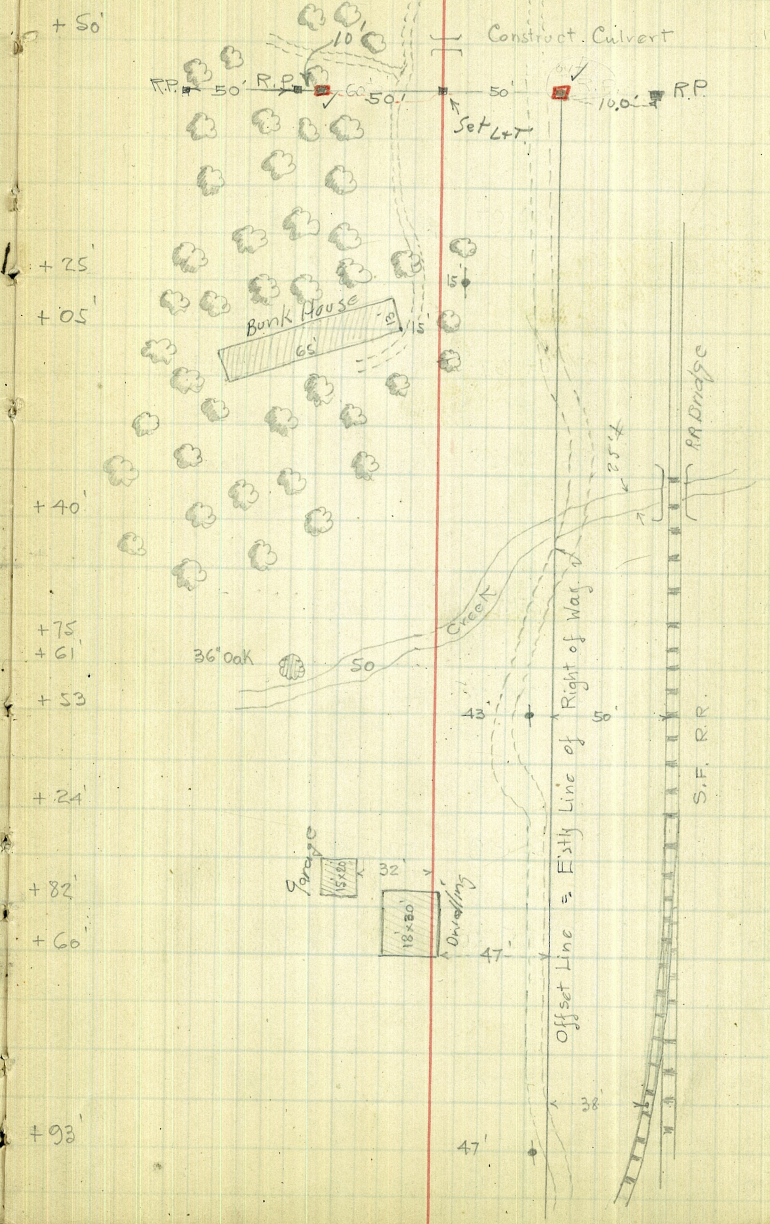




STA	Align	Defl. ∠	True Bearing	Curve Data
159+00				
	749.32'			
158+00				
157+00				
156+67.01=E.C.				
156+65	E.C.	23°22.50'	23°22.50'	
+50		23°00.62'	22°58.5'	
+17.01			22°12.96	
156+00		21°51.08'	21°48.76'	
+50		20°41.14'	20°39.03'	
155+00		19°31.60'	19°29.3'	

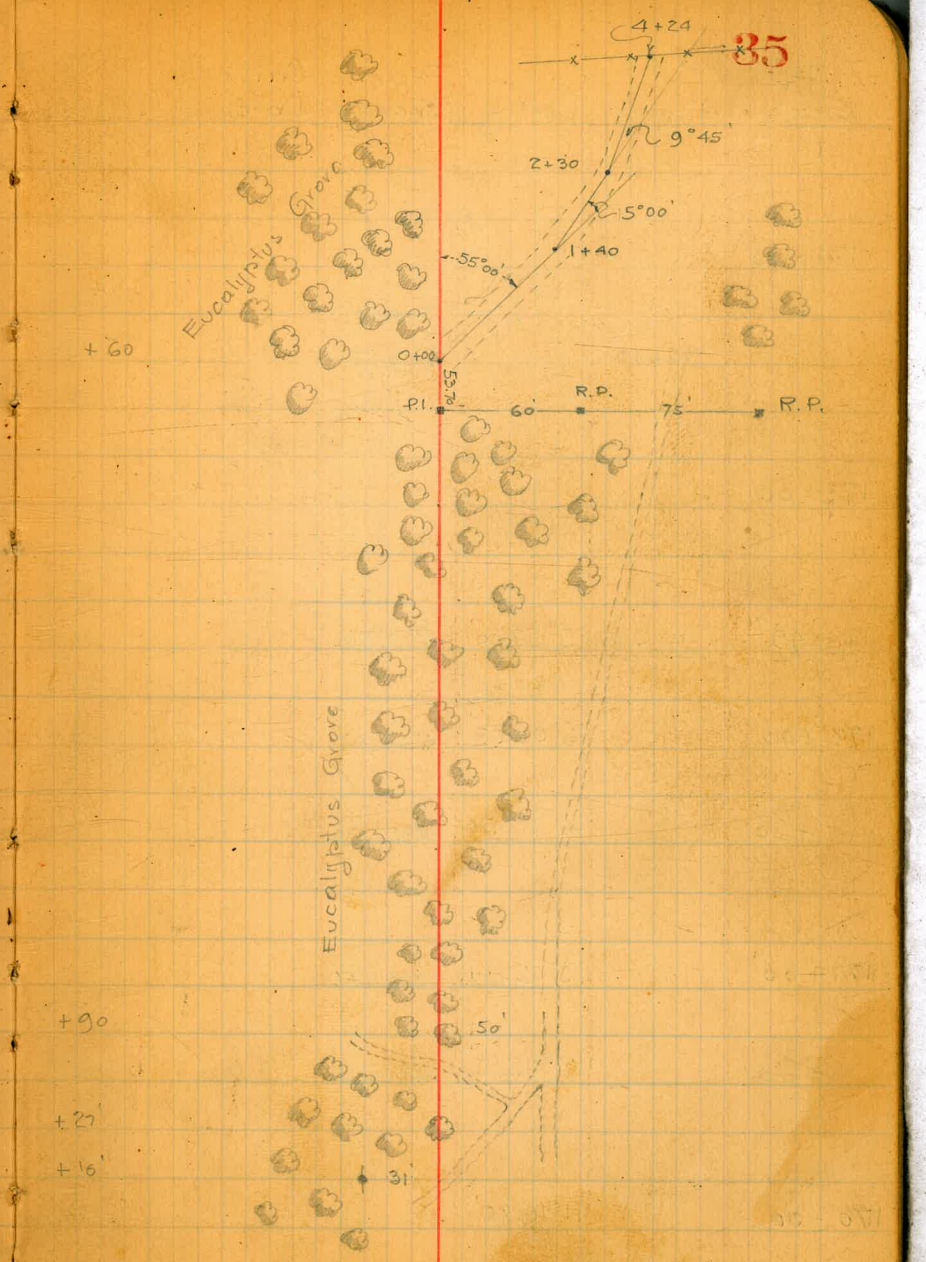


STA	Align.	Defl. ∠	True Bearing	Curve Data
164+16.33 = B.C.				
164+14 57	B.C.	L+.		
164+00				
163+00				
162+00				
161+00				
	749.32'			
	749.00			
160+00				

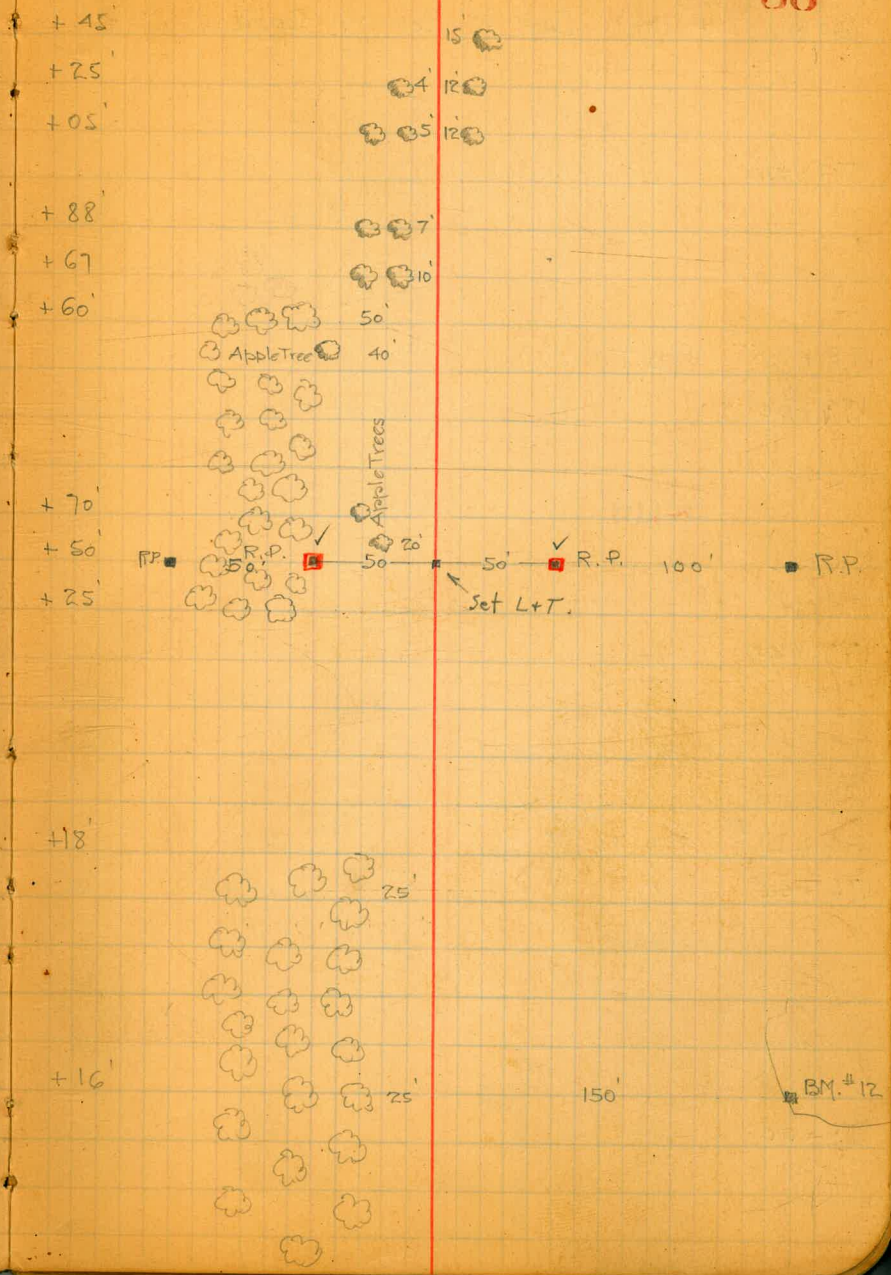


Near. Def Δ for this Curve

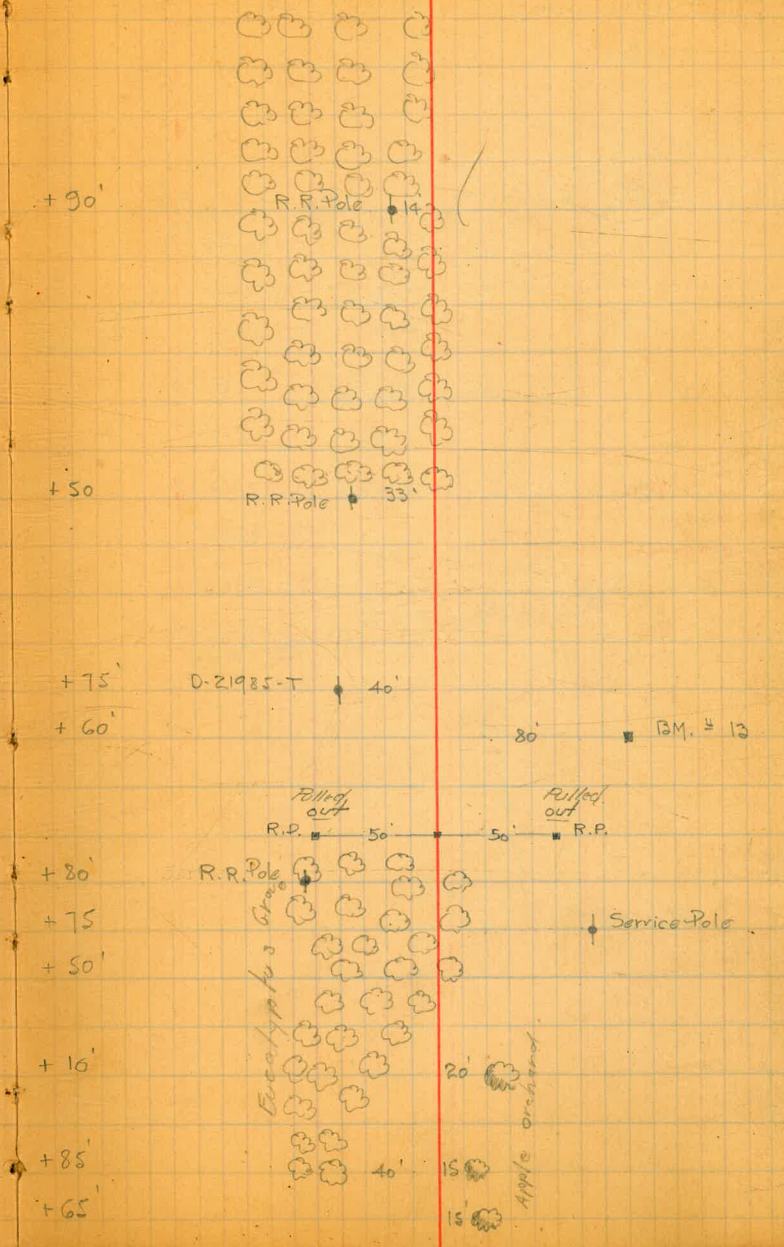
Sta	Align.	Defl. Δ	True Bearing	Curve Data
+50		10°23.56'	10°11.56'	
169+00		9°16.26'	9°14.27'	
+50		8°18.97'	8°16.97'	Δ=31°54'
	P.I.			R=1500'
				T=428.70' (See change Below)
168+00		7°21.67'	7°19.67'	L=835.14
				Δ=31°53'
+50		6°24.38'	6°22.37'	R=1500'
				T=428.47'
				L=834.70'
167+00		5°27.08'	5°25.07'	
+50		4°29.79'	4°27.77'	
166+00		3°32.49'	3°30.47'	
+50		2°35.20'	2°33.17'	
165+00		1°37.90'	1°35.87'	
+50		0°40.60'	0°38.57'	



Sta.	Align.	Defl. ∠	True Bearing	Curve Data
174+00				
	961.10'			
173+00				
172+51.03 = E.C.				
172+49 71	E.C.	15°57.00'	14°56.50'	
172+00		15°00.03'	14°58.03	
+50		14°02.74'	14°00.74'	
171+00		13°05.44'	13°03.44'	
+50		12°08.15'	12°06.15'	
170+00		11°10.85'	11°08.85	



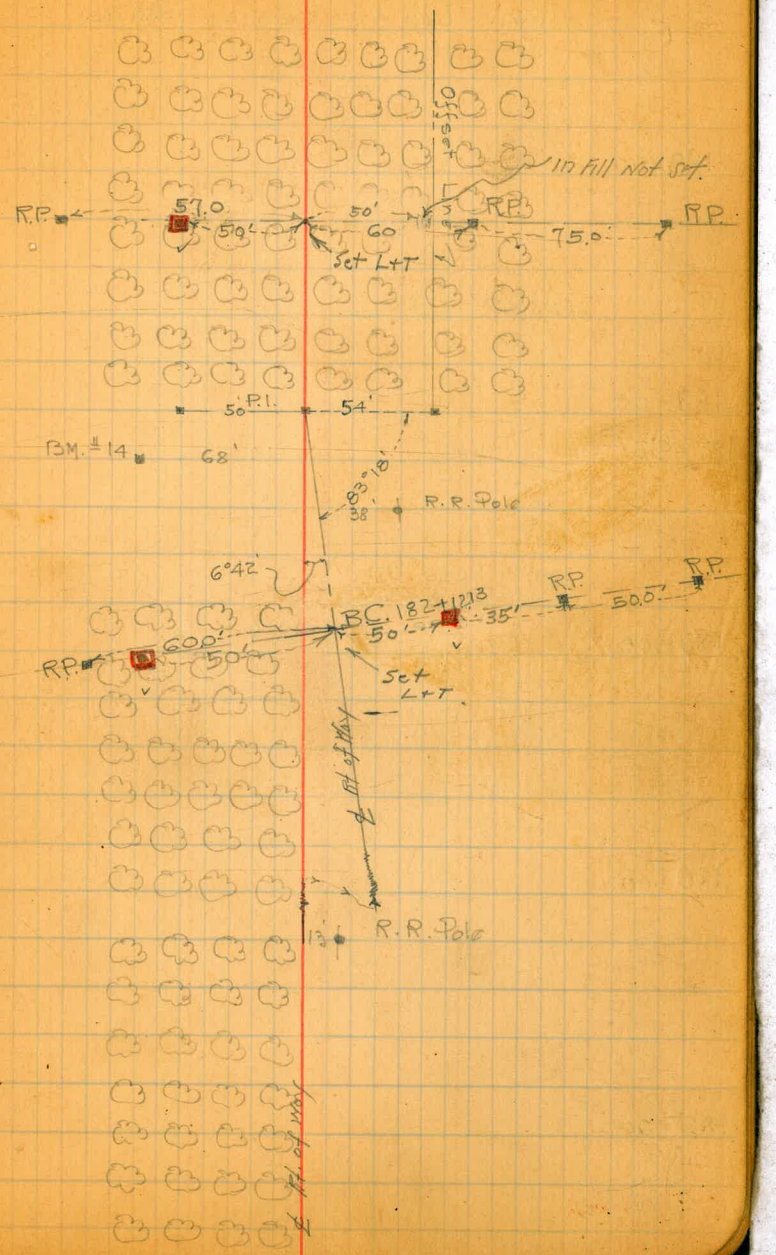
STA	Align	Defl. ∠	True Bearing	Curve Data.
179+00				
178+25.58	P.O.T.			
178+00				
	961.10'			
177+00				
176+27.58	P.O.T.			
176+00				
175+00				



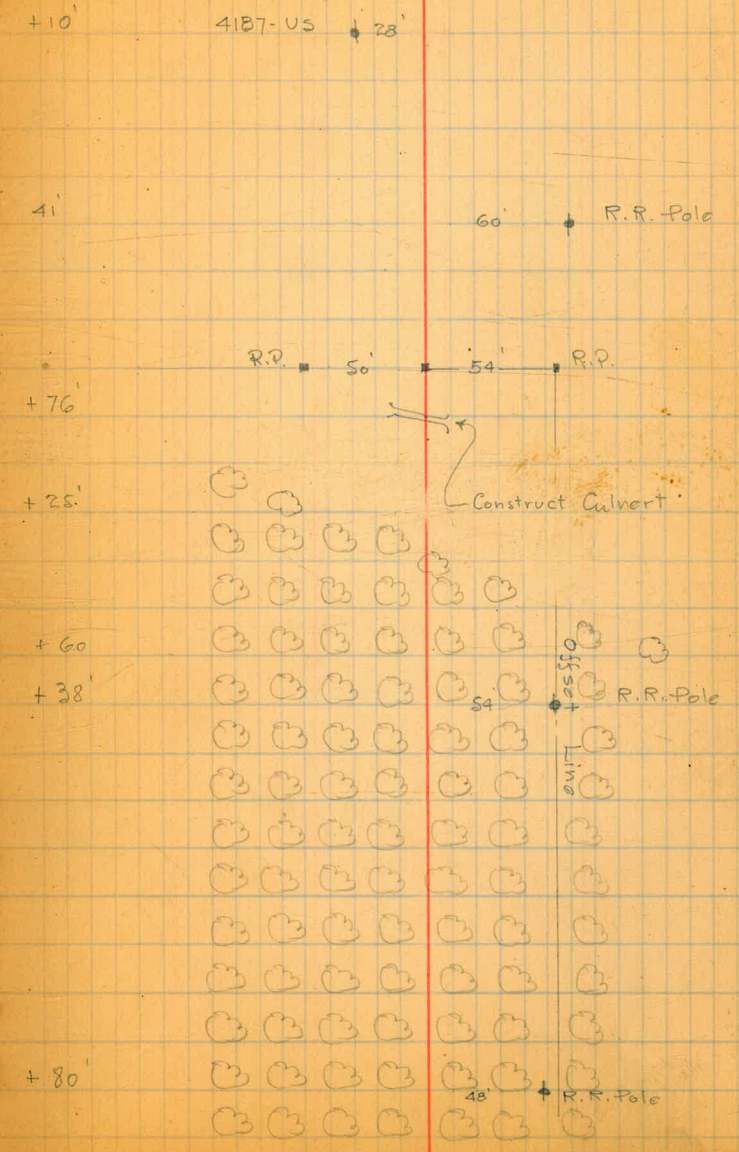
STA	Align	Defl ∠	True Bearing NEW Def For this Curve	Curve Data
	913.62			
184+00				
183+88.12 = E.C.				
183+86.72	E.C.	3°21.00'	3°21.68'	
				Δ = 6°42'
+50		2°38.93'	2°38.00'	R = 1500'
+38.12			2°24	T = 87.81
183+00	P.I.	1°41.63'	1°40.70'	L = 175.40
+62.13			0°57'	
+50		0°44.33'	0°43.56'	Δ=6°43'20"
				R = 1500'
182+12.13 = B.C.				T = 88.10'
182+11.32	B.C.	Rt.		L=175.99'
182+00				Long chd = 175.90'
181+00				
	961.10'			
180+00				

See Change Below.

+64'
+46'
+75'



Sta	Align.	Defl. ∠	True Bearing	Curve Data
189+00				
	913.62'			
188+00				
187+92.33				
187+00				
186+00				
185+00				



Sta	Align	Defl. ∠	New def. for this curve ~~True~~ Bearing	Curve Data
+50			1°24.95'	
194+00		0°57.32'	0°56.30'	
+50			0°27.65'	
~~193+00~~		0°00.03'		
193+01.74 new = B.C.		Rt.		
192+99.94 = old BC				
	913.62'			
192+00				
			N 9°40'40" W	
191+00				
190+00				

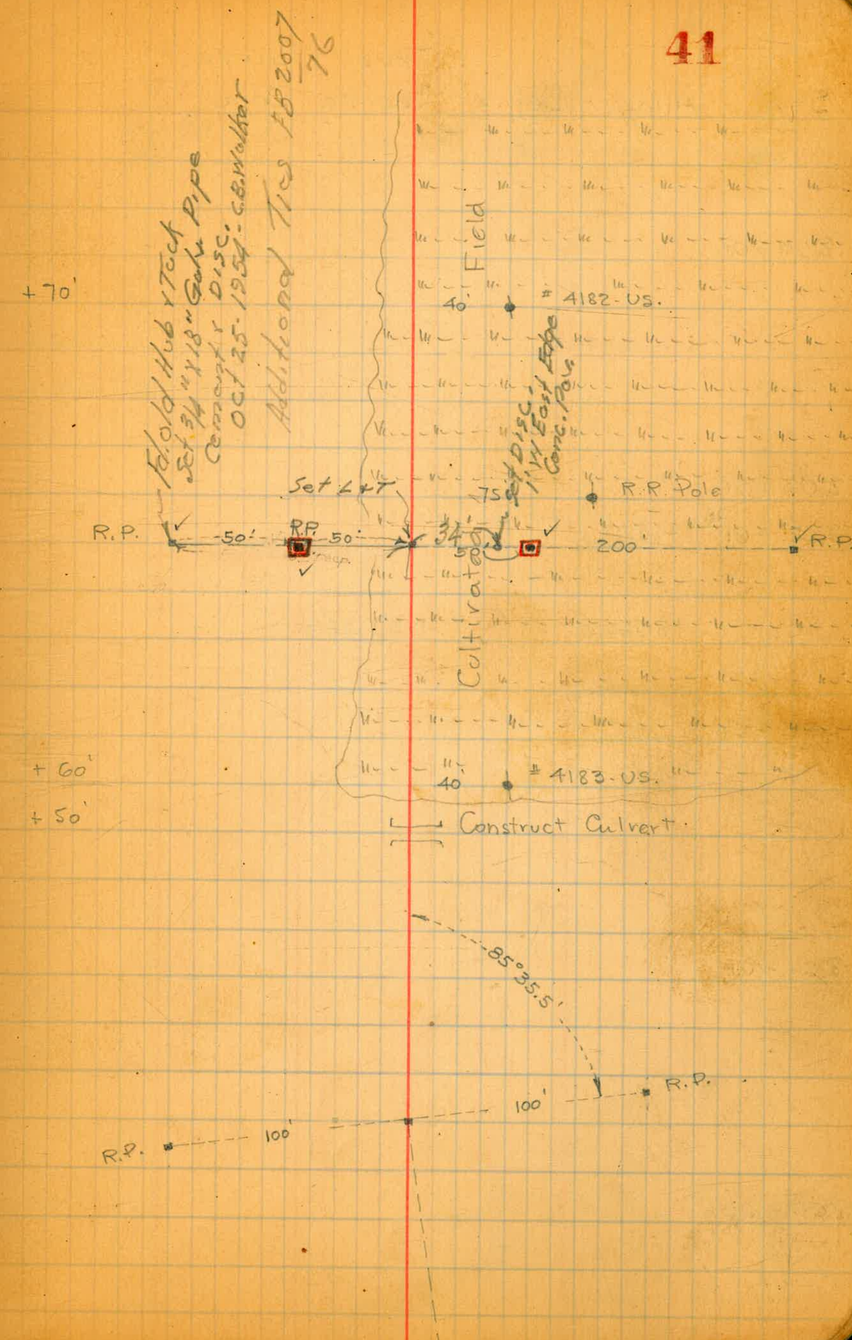
+50' — 31' — #4184-US.
+17' — 75' — R.R. Pole

set ∠+T.
R.P. — 50' — R.P. — 50' — 50' — 50' — R.P.
+70' — 15' — #4185-US.

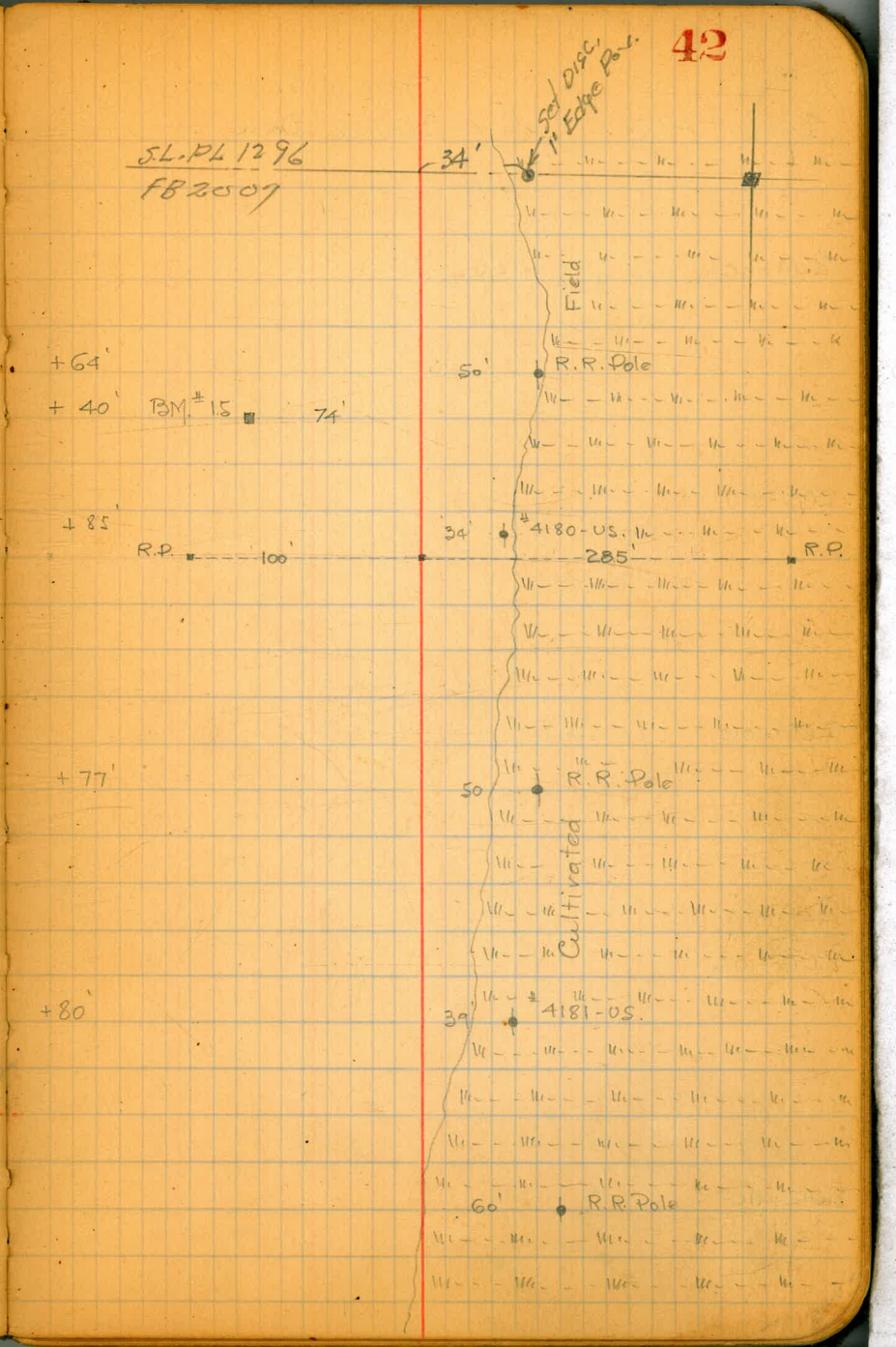
+24' — 70' — R.R. Pole

+90' — #4186-US. 4
+72' — 66' — R.R. Pole

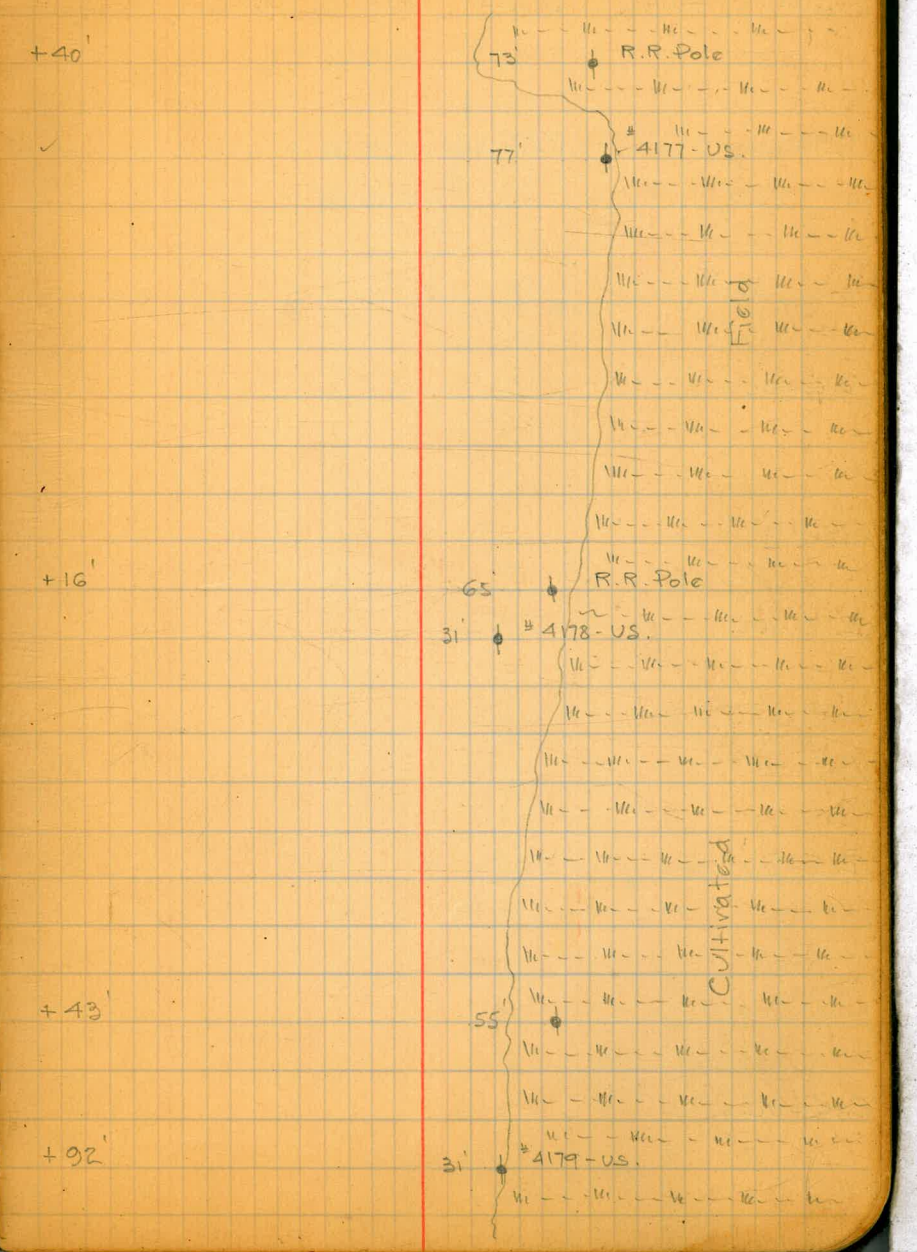
Sta	Align.	Defl. ∠	Def. Δ for this curve ~~True~~ ~~Bearing~~	Curve Data	
199+00					
198+00					
197+61.63=EC.					
~~197+61 15~~	E.C.	4°24.60'	4°23.50'		
+50			4°16.75'		
197+00		3°49.19'	3°48.10'		
+50			3°19.45'	Δ=8°49'12"	See change below
				R=3000'	
				T=231.36'	
196+00		2°51.90'	2°50.85'	L=461.81	
				Δ=8°47'	
+50			2°22.20'	R=3000'	
	P.I.			T=230.40'	
				L=459.89	
195+00		1°54.61'	1°53.55'		



Sta.	Align.	Defl. ∠	True Bearing	Curve Data
204+00				
	1566.50'			
203+00				
202+61.48	P.O.T.			
	1565.10'		N0°51'28"W	
202+00				
201+00				
200+00				

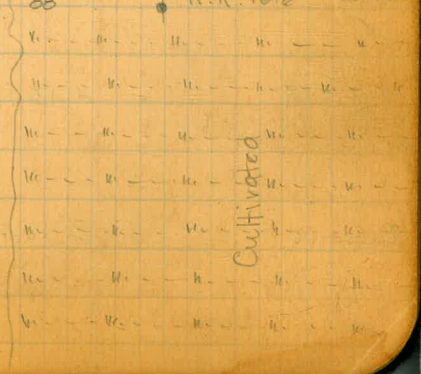


Sta	Align.	Defl. ∠	True Bearing	Curve Data
209+00				
208+00				
207+00				
206+00				
205+00				



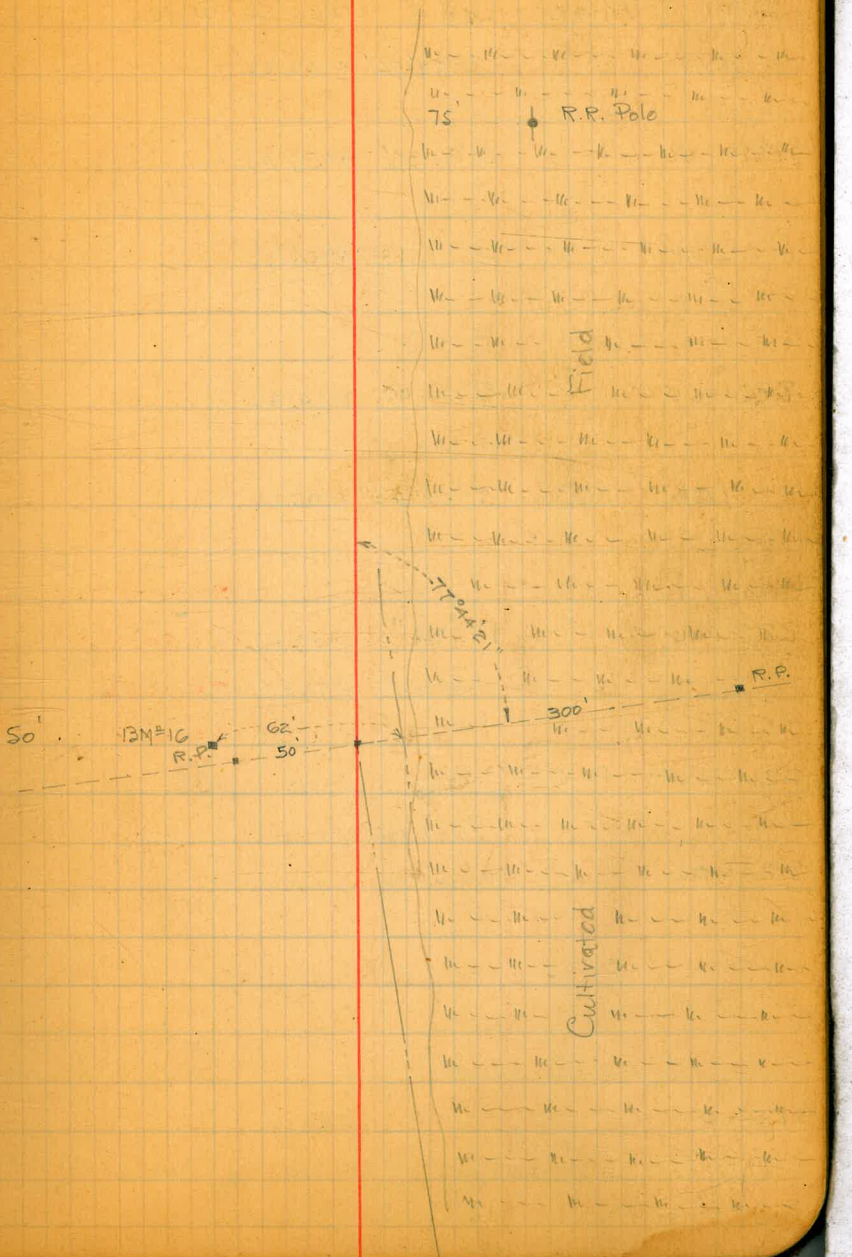
Never Def Δ for this Curve

STA	Align.	Defl. Δ	True Bearing	Curve Data
+50		2°21.12'	2°19.66'	
214+00		1°23.83'	1°22.36'	
+50			0°25.06'	
213+28.13 = B.C.				
213+26.85	B.C.	Rt.		
213+00				
212+00				
211+00				
210+00				

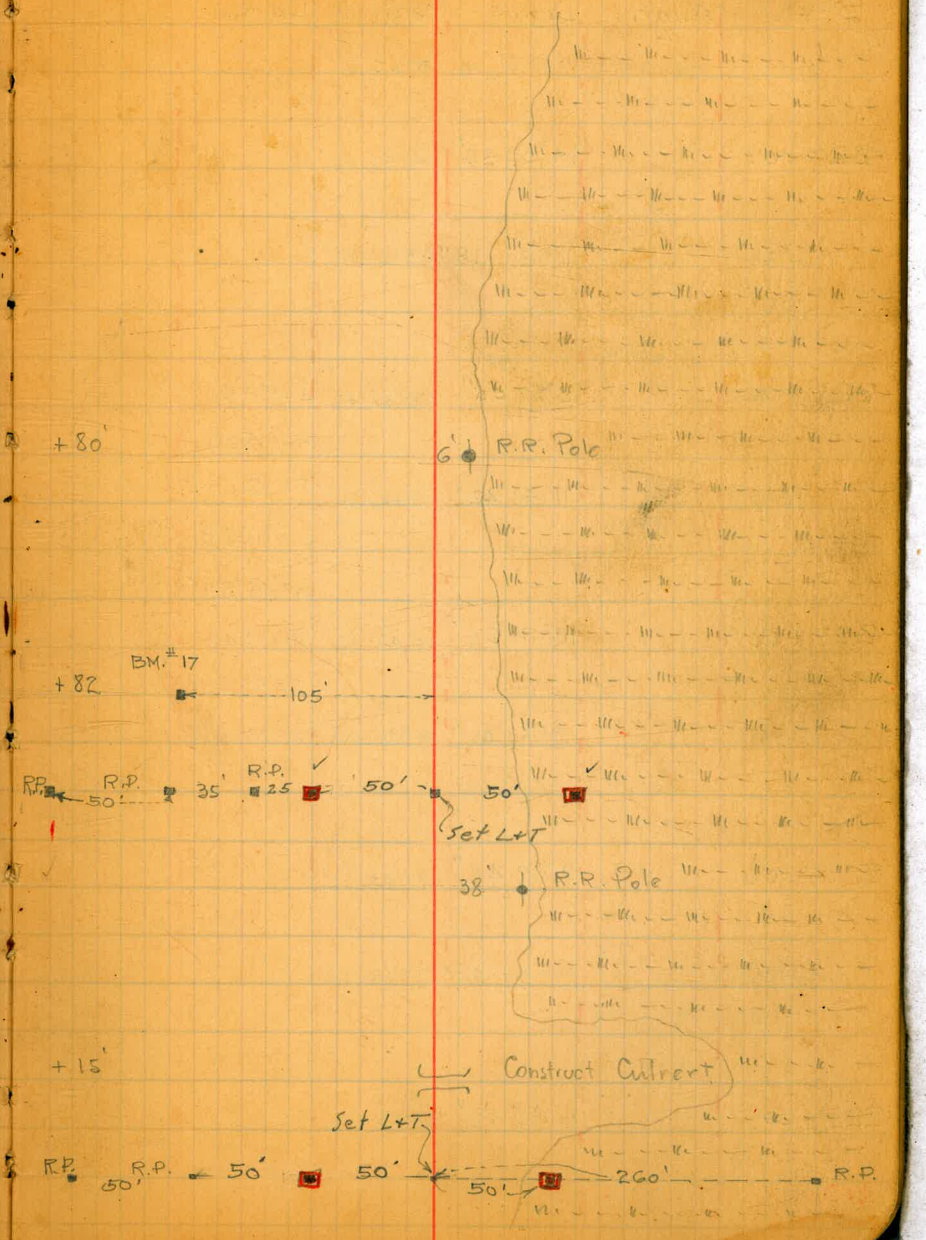


Sta	Align	Defl. Δ	True Bearing	Curve Data
+50		11°36.21'	11°52.36'	
219 +00		10°56.78'	10°55.36'	
+50		9°59.48'	9°58.06'	
218 +00		9°02.19'	9°00.76'	Δ = 24°31'18"
				R = 1500'
+60		8°04.89'	8°03.46'	T = 325.98'
				L = 641.98'
				R = 1500'
217 +00		7°07.66'	7°06.16'	Δ = 24°30'
				T = 325.68'
+50	P.I.	6°10.31'	6°08.86'	L = 641.41'
216 +00		5°13.01'	5°11.56'	
+50		4°15.71'	4°14.26'	
215 +00		3°18.42'	3°16.96'	

See change below



Sta	Align	Defl. Δ	New Defs for this Curve True Bearing	Curve Data
+50		5°57'54"	5°56.32'	
224+00		5°00'36"	4°59.02'	✓
+50		4°03'18"	4°01.72'	✓
223+00		3°06'00"	3°04.42'	✓
+50		2°08'42"	2°07.12'	✓
222+00		1°11'24"	1°09.82'	✓
+50		0°14'06"	0°12.52'	✓
221+39.07 = B.C.				
221+37.53	B.C.			
	Lt.			
221+00				
	154.60'			
	153.77'			
220+00				
219+84.47'				
219+83.76	E.C. Equation			
219+69.54		12°15.65	12°15.00'	
219+68.83				



Sta	Align.	Defl. Δ	New Def Δ for this Curve True Bearing	Curve Data
+50		15°31'00"	15°29.32'	
229+00		14°33'36"	14°32.02'	
+50		13°36'18"	13°34.72'	
228+00		12°39'08"	12°37.42'	Δ = 44°41'
				R = 1500'
+50		11°41'42"	11°40.12'	T = 616.47'
				L = 1169.81'
				Δ = 44°39'
227+00		10°44'33"	10°42.82'	R = 1500'
				T = 615.96
+50		9°47'06"	9°45.52'	L = 1168.93'
226+00		8°49'48"	8°48.22'	
+50		7°52'30"	7°50.92'	
225+00		6°55'12"	6°53.62'	

See Change Below

+45'

67' R.R. Pole

+17'

55' RR. Pole

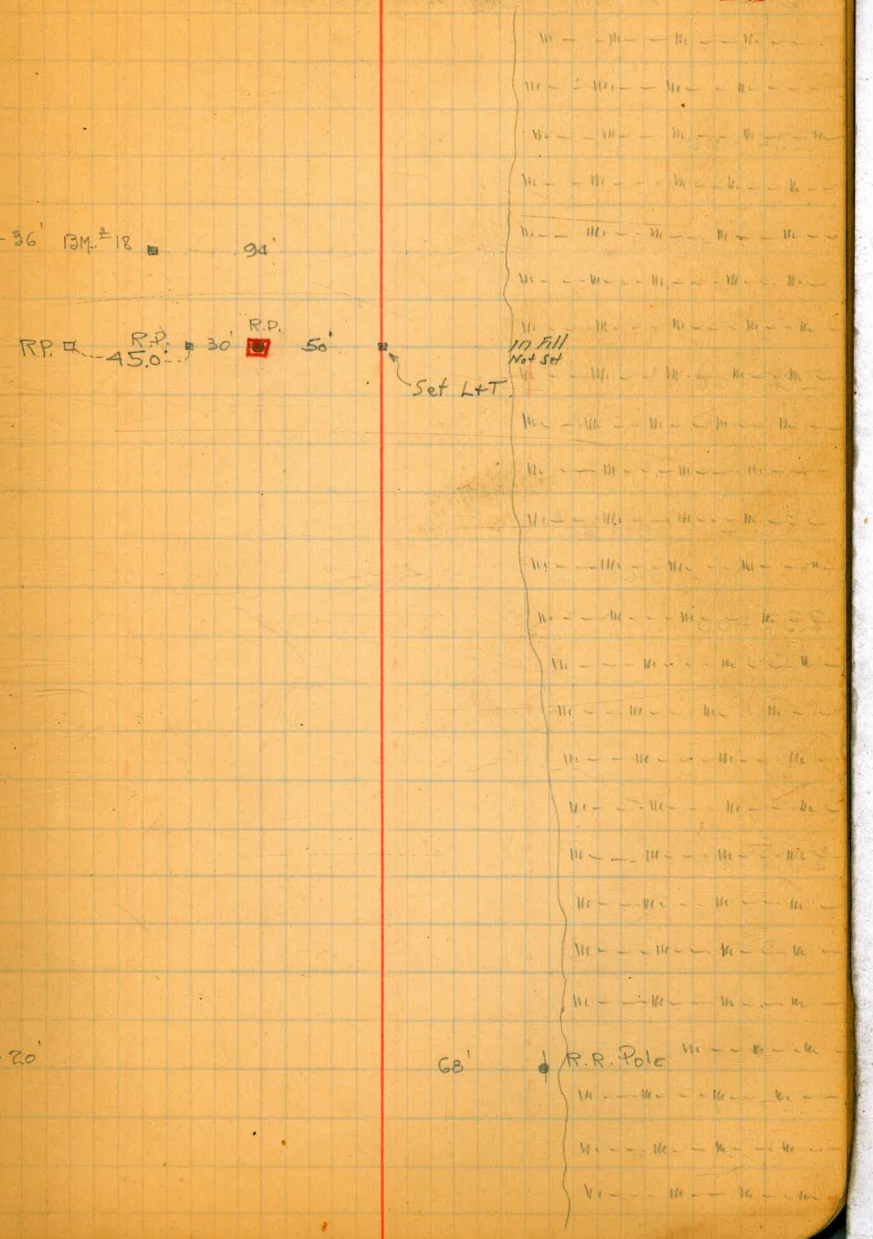
+19'

38' R.R. Pole

+80'

17' R.R. Pole

Sta	Align.	Defl. ∠	True Bearing	Curve Data
	1167.83'			
234+00				
233+08.00=E.C.				
233+07.34=E.C.		22°20'25"	22°19.50'	
233+00		22°12'03"	22°10.42'	✓
258.00 B.T.			21°22	
+50		21°14'45"	21°13.12'	✓
232+00		20°17'28"	20°15.82'	✓
+50		19°20'10"	19°18.52'	✓
231+00		18°22'53"	18°21.22'	✓
+50		17°25'35"	17°23.92'	✓
230+00		16°28'18"	16°26.62'	✓



Sta	Align.	Defl. ∠	True Bearing	Curve Data
239+00				
238+00				
	1167.83'			
	~~1163.55~~			
237+00				
236+00				
235+00				

+80' BM. # 19 107'

Sta	Align.	Defl.'s	True Bearing	Curve Data
244+00				
243+00				
	1167.83'			
242+00				
241+00				
240+00				

+ 13'

Construct Culvert

Sta	Align.	Defl. ∠	New Def. For this curve True Bearing Defl.	Curve Data
249 +50		6°51'43"	6°47.49'	Δ = 28°21'50"
				T = 505.40'
249+00		6°08'45"	6°04.52'	L = 990.09'
				R = 2000'
				Void See change Below.
+50		5°25'47"	5°21.55'	Δ = 28°16'40"
				R = 2000'
				T = 503.81'
248+00		4°42'49"	4°38.58'	L = 987.08'
+50		3°59'51"	3°55.61'	
247+00		3°16'53"	3°12.64'	
+50		2°33'55"	2°29.67'	
246+00		1°50'57"	1046.70'	
+50		1°07'59"	1003.73'	
			42.03	
245+00		0°25'01"	0°20.76'	
244+75.83 = B.C.				
244+70.89	B.C.	Pt.		

R.P. = 50' R.P. 50' 50' Set L+T

Sta.	Align.	Defl. Δ	New Def. for this Curve. True Bearing	Curve Data
254+62.91 = EC.				
254+60 ~~.98~~	E. C.	14° 18' 55"	14° 08' 33"	
+50		14° 01' 23"	13° 57.19'	
			13- 25' 00	
254 +00		13° 18' 25"	13° 14.22"	
+50		12° 35' 27"	12° 31.25'	
253+00		11° 52' 29"	11° 48.28"	
+50		11° 09' 31"	11° 05.31'	
252+00		10° 26' 33"	10° 22.34"	
+50		9° 43' 35"	9° 39' 37"	
251+00		9° 00' 37"	8° 56' 40"	
+50		8° 17' 39"	8° 13' 43"	
250+00		7° 34' 41"	7° 30.46"	

R.P. = 50.00 R.P. 50.00'

Not set in Fill

Set L&T

55' "A156-US.

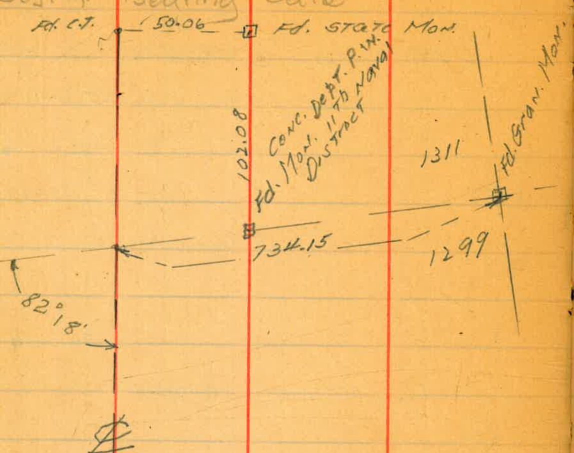
+86 Construct Culvert

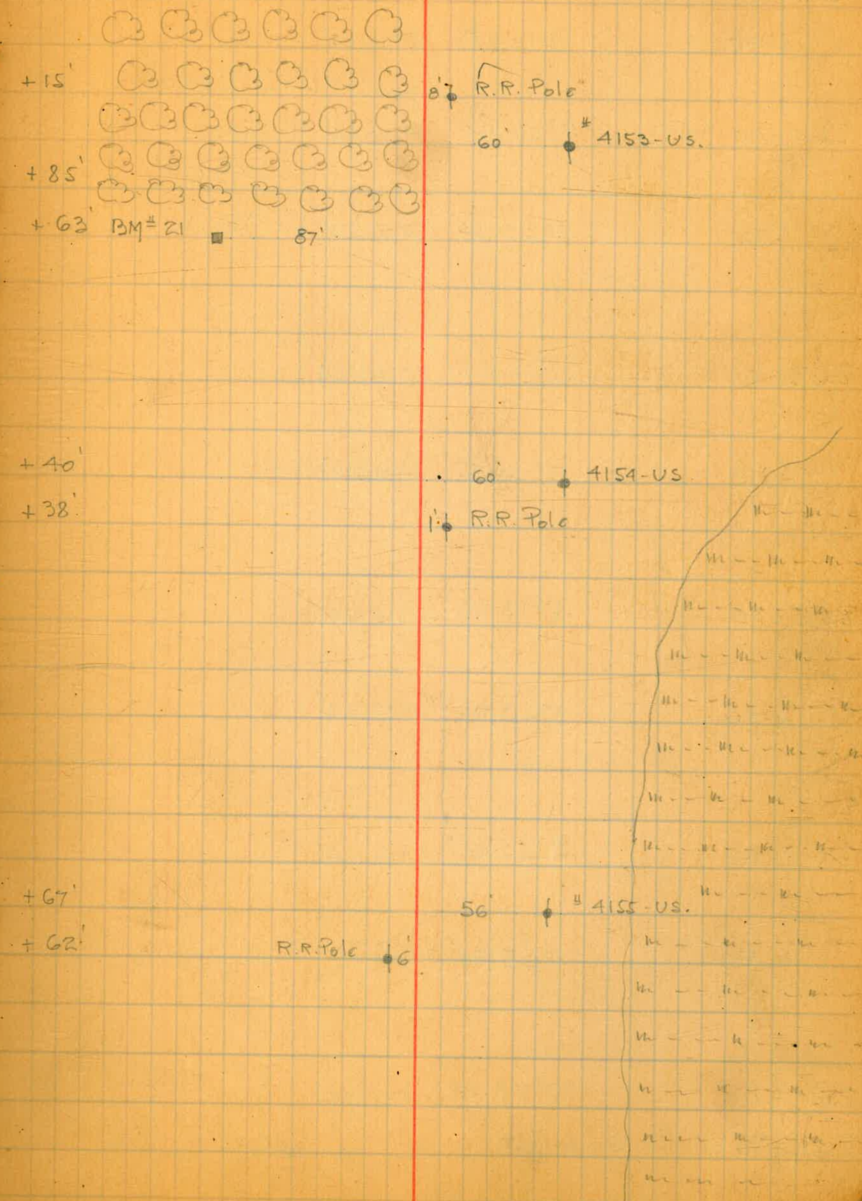
+15' 50' R.R. Pole

+50' 80'

+90' BM# 20 = 78'

Sta	Align.	Defl. ∠	True Bearing	Curve Data
	Moore Sisson Northern 9-15-37			
259+00				
258+69.03				
To Conc. Mon.				
258+00				
	514.89'			
	~~514.52'~~			
257+00				
256+00				
255+00				





NEW! Def. Δ for this Curve

STA.	Align.	Defl. Δ	True Bearing	Curve Data
+50		9°03.53'	9°01.14'	
				Δ = 36°23'40"
264+00	P.I.	8°06.49'	8°03.84'	R = 1500'
				T = 493.09'
+50		7°09.14'	7°06.54'	L = 952.80'
263+00		6°11.90'	6°09.24'	
+50		5°14.55'	5°11.94'	
262+00		4°17.26'	4°14.64'	
+50		3°19.96'	3°17.34'	
261+00		2°22.67'	2°20.04'	
+50		1°25.42'	1°22.74'	
260+00		0°28.08'	0°25.44'	
259+77.80 = BC				
259+75.50	B.C.	Lt.		

+08' R.R. Pole 8'

+45' 55' # 4151-US

+50' R.R. Pole 22'

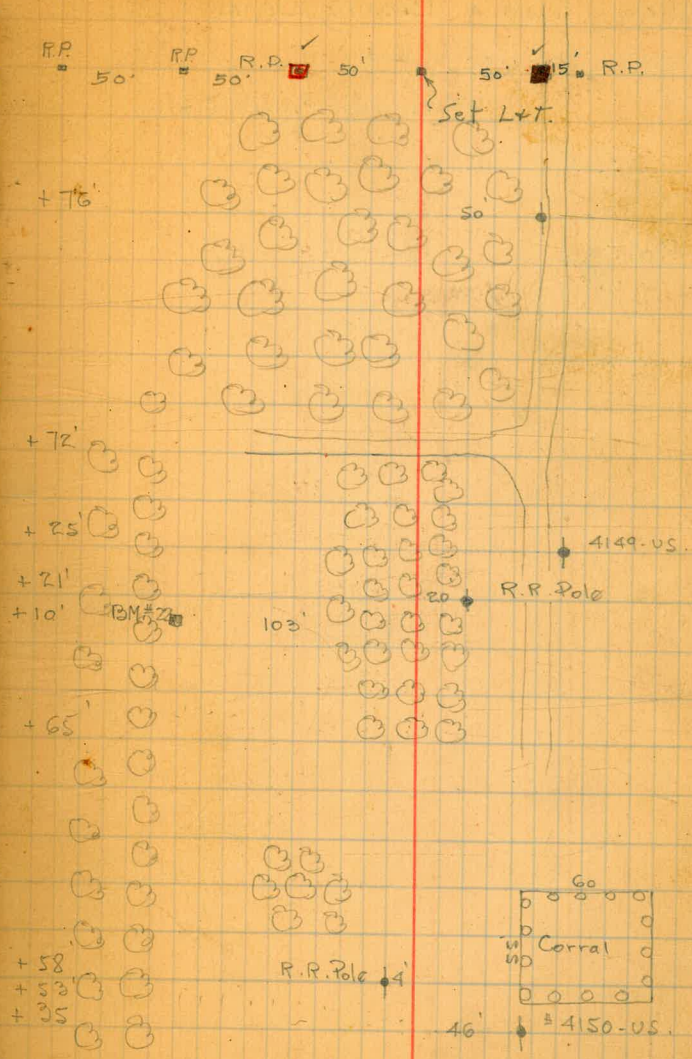
+26' 44' # 4152-US

+64' 16' R.R. Pole

R.P. 40' R.P. 50' 50' R.P.

Set L + T.

Sta	Align.	Defl. Δ	Near Def. Δ for this Curve ~~True~~ Bearing	Curve Data
269+30.60 = E.C.				
269+28.30	E.C.	18°11.83'	18°11.83'	
269+00		17°39.~~39~~ 44'	17°36.84'	
+50		16°42.~~09~~ 14'	16°39.24'	
268+00		15°44.85'	15°42.24'	
+50		14°47.50'	14°44.94'	
267+00		13°50.26'	13°47.64'	
+50		12°52.95'	12°50.34'	
266+00		11°55.67'	11°53.04'	
+50		10°58.~~32~~ 37'	10°55.74'	
265+00		10°01.08'	9°58.44'	



Sta	Align.	Defl. ∠	True Bearing	Curve Data
274+97 55	P.O.T.	Set L.+T. in Par't.		
		11/5/30. Calif. Highway Comm.		
274+00				
273+50	P.O.T			
273+00				
272+00				
271+00				
270+00				

R.P. ▪ 50' ▪ 50' ▪ R.P.

+50

Sta	Align.	Defl. ∠	True Bearing	Curve Data	
279+00					
278+00					
277+00					
276+00	1156.38'				
	H56.82				
275+00					

Sta	Align	Defl. ∆	True Bearing	Curve Data
	P.I.			∆ = 29°16'
284+00		6°01.17'	5°58.72'	R = 1500'
				T = 391.65
+50		5°03.87'	5°01.42'	L = 766.20
				∆=29°15'30"
283+00		4°06.58'	4°04.12'	R= 1500'
				T=391.53'
+50		3°09.28'	3° 06.82'	L=765.98'
282+00		2°11.99'	2°09.52'	
+50		1° 14.69'	1°12.22'	
281+36.98				
281+00		0° 17.40'	0°14.92'	
280+86.98=B.C.				
280+84.82	P.C.	Rt.		
280+00				

See Change Below.

∆ = 9°41'
E = 5.35
T = 126.55

0.57% Biological Grade

Fd. C.T.

12.64'

45.54'

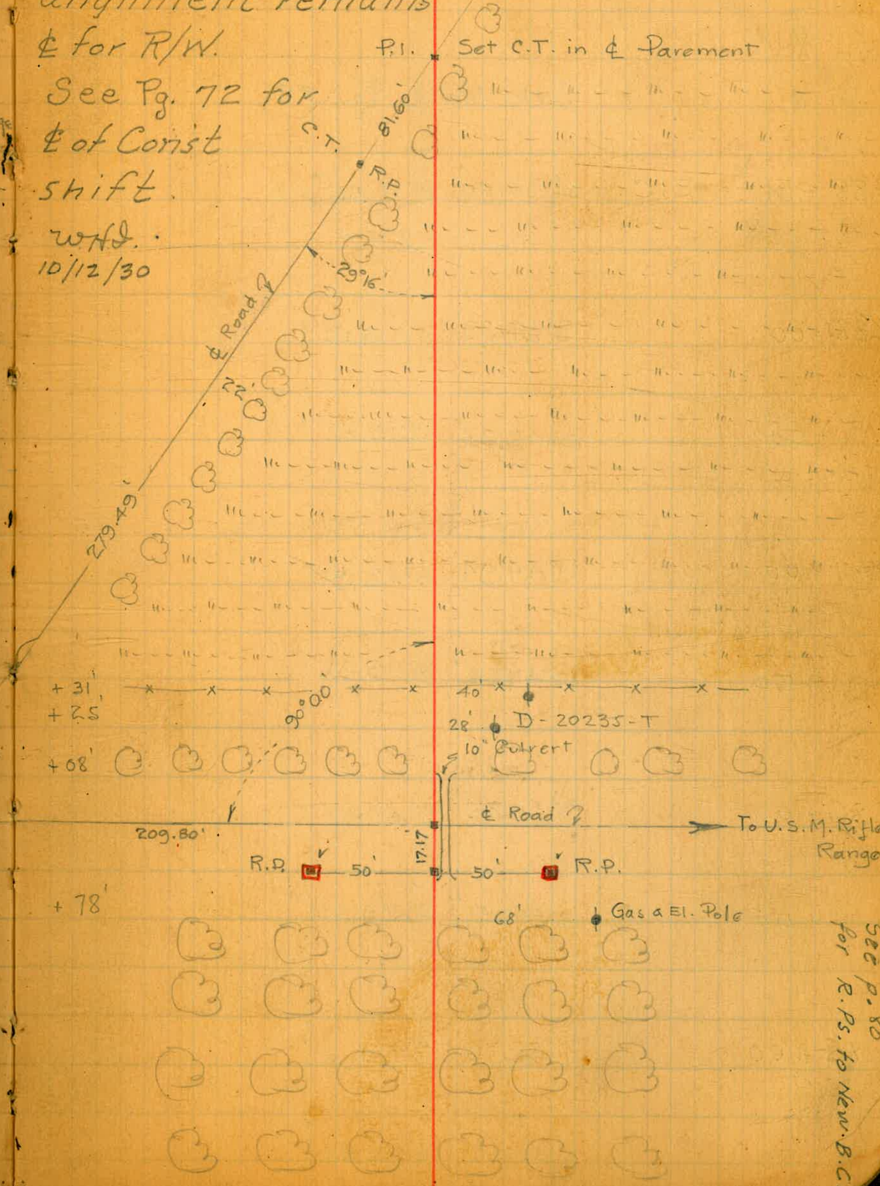
263.70'

68.07'

Fd. C.T.

E.C.

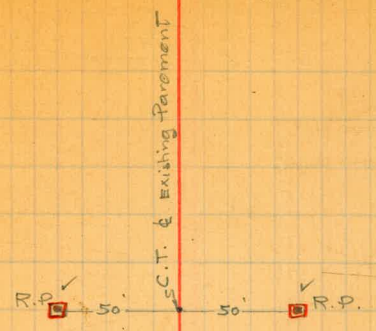
Note: This alignment remains ₵ for R/W.
See Pg. 72 for ₵ of Const shift.
W.H.J.
10/12/30



See p. 80 for R.Ps. to New B.C.

		Def. Δ	New Def. Δ for this Curve
		See Note Pg. 58	
288+52.96=E.C.			
288+51.02	E.C.	14°38.00'	14°37.75'
			13°40.45
288+00		13°39.53'	13°37.12'
+50		12°42.23'	12°39.82'
287+00		11°44.94'	11°42.52'
+50		10°47.64'	10°45.22'
286+00		9°50.35'	9°47.92'
+50		8°53.05'	8°50.62'
285+00		7°55.76'	7°53.32'
+50		6°58.46'	6°56.02'

See p. 60 for R.Ps. to New E.C.



See p. 72 for Sketch of & Shift of E.C.

Location of Spur from S.F.R.R. to Atlas Brick & Clay Co.

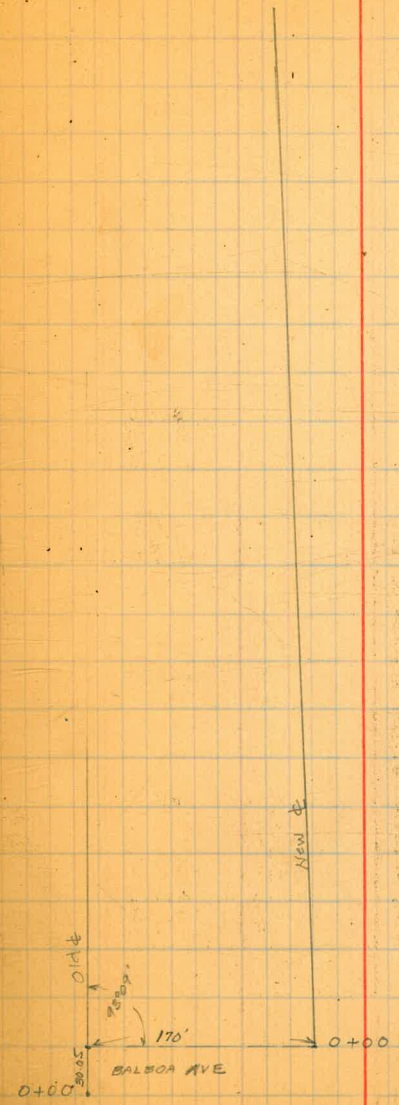
STA	Align	Defl.	True Bearing	Curve Data
6 + 60				
6 + 00				
5 + 50				
5 + 00				
4 + 80.00	E.C.	28°15'		
4 + 50		26°02'		
4 + 00		22°25'		
3 + 50		17°02'		
3 + 00		14°09'		
+ 50		11°25'		
+ 43.83		11°05'		
2 + 00		8°31'		
+ 50		5°47'		
1 + 00		3°57'		
+ 50		2°19'		
0 + 00	B.C.	Rt.		

West Rail of Santa Fee

Easterly Right of Way Line

B.C. of Spur @ 46.77' @ 161 + 29.05

158 + 91.83


NEW ℄
OLD ℄
85°00'
170'
0+00
0+00
BALBOA AVE

5+00

4+00

3+00

2+00

1+00

0+30.05

0+00

NL. Balboa

12+00

11+00

10+00

9+00

8+00

7+00

6+60 P.O.T.

6+00

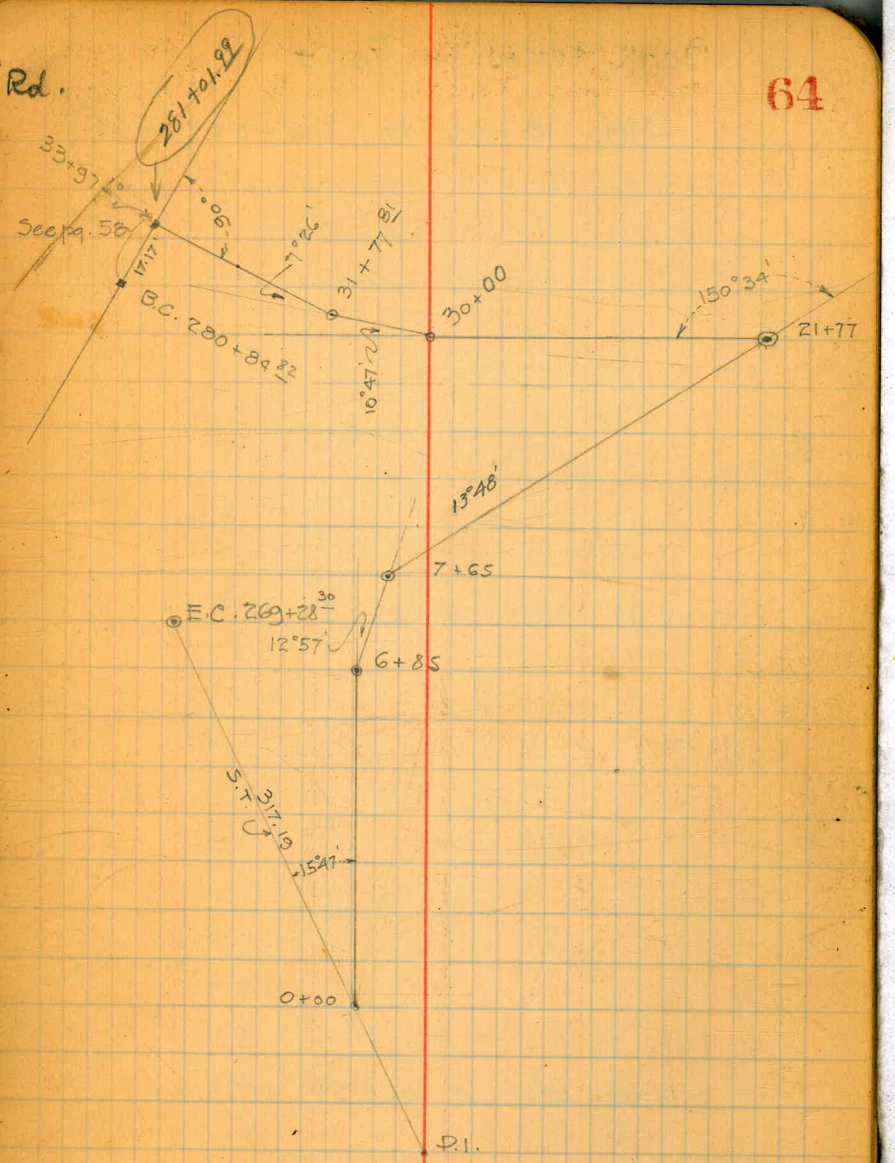
50' L

50' R

Alignment of Part of Rds to Sorrento and Rifle Range. Ties to ℄ Rose Canyon Rd.

STA	Align.	Defl. ∠
33+97 10		
31+77 81		7°26'-R
30+00		10°47'-R
21+77		150°34'-L
7+65		13°48'-R
6+85		12°57-R
0+00		15°47'-R

X.sec. Book 1327-73



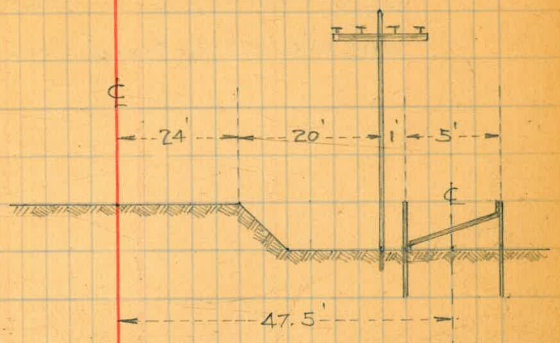
Jaeger
Bailey
Clarert
Morgan
} Oct. 13th 1929

"Bank Protection Fone"

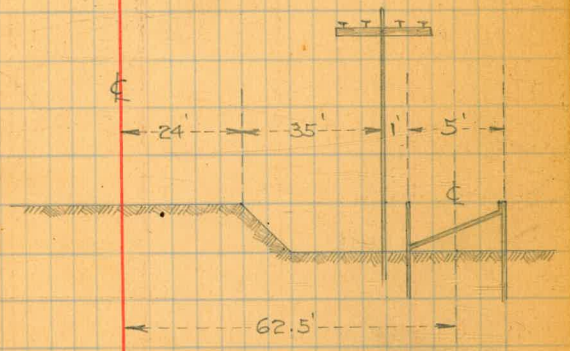
Sta. 18+00 to 26+00

Nails with Red Cloth & Lath were set 47.5' right of ℄ of Road. Distance was chained on Radial Line of Curve.

BM #1					25.46
		32.84 H.I.			
18+00				12.9	19.9
+50				10.0	22.8
19+00				9.8	23.8
+50				10.4	22.4
20+00				9.2	23.6
+50				11.1	21.7
21+00				10.3	22.5
+50				10.4	22.4
	T.P.	7.22	37.77 H.I.	2.29	30.55
22+00				14.9	22.9
+50				15.0	22.8
23+00				13.8	24.0
+50				14.1	23.7
24+00				13.8	24.0
+50				13.8	24.0
25+00				13.3	24.5
+50				12.2	25.6
26+00				12.5	25.3
	T.P.			0.94	36.83



Sta. 18+00 to Sta. 26+00



Sta. 32+00 to Sta. 36+00

Sta. 32 to Sta. 36

Nails with red cloth & Lath were set 62.5' right of ℄ of Road. Distance was chained on Radial lines of Curve.

Walker. Looker. Mattoon. Salgado 11-20-29

Bank Protection Fence

AND

Sta. 4+00 to Sta. 6+00 — Staked (47.5' Rt of ℄ Rt of Way)

Sta. 8+00 to Sta. 12+00

Sta. 26+00 to Sta. 26+77.37

6+00 = End Bank Protection Fence		9.8	
+82 = on Fill		5.2	
+55 = " "		4.4	
+40		10.6	
5+00		10.1	
+50		9.8	
4+00 = Beginning B.P. Fence		9.7	
	C.51 25.82		19.31

U.S.G.S. S.W. Balboa Ave. & Rose Canon Rd.

12+00 = End Bank Protection Fence		11.0	14.95
+50		10.9	15.05
11+00		11.1	14.85
+50		11.8	14.15
10+00		11.6	14.35
+75		16.2	09.75
+50		13.3	12.65
+25		14.5	11.45
9+00		11.6	14.35
+50		13.0	12.95
8+00		16.1	09.85
	0.49 25.95		25.46

New Levels on P-68

B.M. #1 638 Et. 17+95

Walker
Leckey
McHoon
Nancy
12-12-29

Bank Protection Fence
New Levels
from sta. 8+45 to sta. 12+00
" " 16+00 " " 18+00

18+00			7.3	19.8	
+75			6.9	20.2	
+50			7.3	19.8	
+25			7.6	19.5	
17+00			7.7	19.4	
+75			7.9	19.2	
+50			8.0	19.1	
+25			8.4	18.7	
16+00			8.3	18.8	
12+00			12.1	15.0	
+50			12.1	15.0	
11+00			12.3	14.8	
+50			12.6	14.5	
10+00			12.0	15.1	
+50			12.2	14.9	
9+00			12.7	14.4	
+50			14.0	13.1	
8+45			14.5	12.6	BM #1 C3 Lt. Sta. 17+95
	1.64	27.10		25.46	

Walker
Wambliss
Diebert
Mathews
2-18-30

PRELIMINARY LEVELS

For Ditch Line 2' East of E Toe Slope
From sta. 156+67.01 to sta. 163+00

					sta 162+50 on Lt.
+50			5.2	117.0	=Elev 117.0
					sta 162+25 on Lt.
162+00			4.8	117.4	=Elev 116.5
+75			3.1	119.1	
+50			3.1	119.1	
+40			4.9	117.3	
161+00			5.4	116.8	
+50			5.4	116.8	
+25			5.7	116.5	
160+00			6.0	116.2	
+75			4.5	117.7	
+50			5.0	117.2	
+25			7.4	114.8	
159+00			6.3	115.9	
+75			6.7	115.5	
+50			8.1	114.1	
+25			9.6	112.6	
158+00			7.3	114.9	
+75			8.0	114.2	
+65			5.3	116.9	
+50			5.4	116.8	
+35			5.8	116.4	
+30			8.8	113.4	
157+00			9.7	112.5	
156+67.01			10.5	111.7	Temp BM. Book 166-40
	2.12	122.18		120.06	

163+00		2.3	119.9

Markers
Wm Bliss
Drobert
McHenry
3-6-30

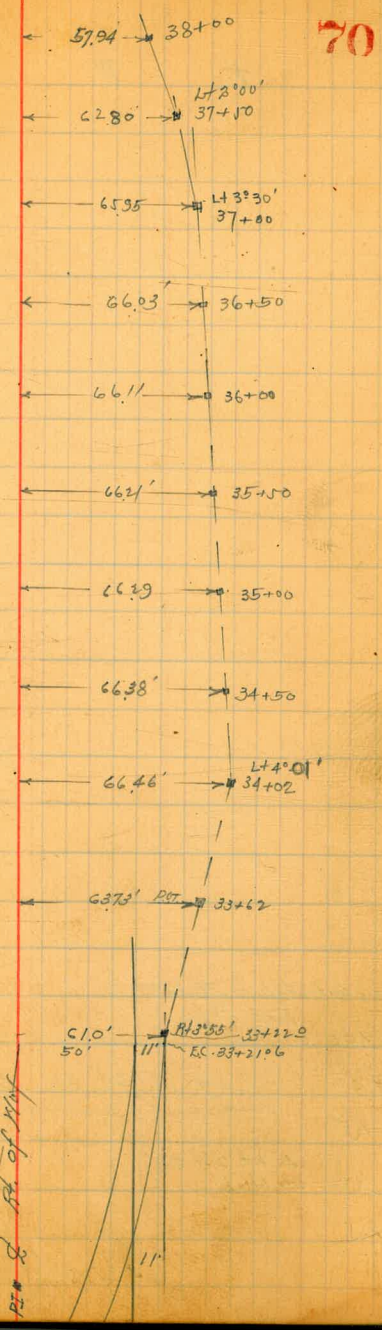
BANK Protection Fence

Bet Sta. 33+22 AND 38

Cont. on P. 71

			Grade	Cuts
37+00 = ∠ Lt. 3°30'	9.43	33.32	32.87	C 0.45
+75	10.2	32.6		
+65	11.2	31.6	B.R.K. 31.6	0.0
36+50 on	10.83	31.92	✓ 31.5	C 0.41
+40	10.8	32.0		
+15	11.9	30.9		
36+00	11.90	30.85	✓ 31.22	F 0.37
+95	11.5	31.3		
35+50 on Hub.	11.43	31.32	✓ 30.93	C 0.39
+45	12.6	30.2		
+10	12.8	30.0		
35+00 on Hub.	12.50	30.25	✓ 30.64	F 0.39
+75	12.5	30.3	B.R.K. 30.5	F 0.20
34+50 on Hub	13.04	29.71	✓ 30.5	F 0.79
+35	13.5	29.3		
+25	12.2	30.6		
+18	12.6	30.2		
34+02 = ∠ Lt 3°25'	12.18	30.57	✓ 30.5	C 0.07
+93	10.7	32.1		
+80	10.4	32.4		
+75	12.1	30.7		
33+62 on Stake	11.69	31.06	✓ 30.5	C 0.56
+42	12.5	30.3		
33+22	12.09	30.66	✓ 30.5	C 0.16

42.75 = T Book 166-3



	+	π	−	El.	Grade	Sats.
				0.0 = Error 37.8 = Elev. Stub		
Chk. on cut Stub on Pt 38+00			4.0	37.8		
38+00 on Hub.	Find Fence.		5.33	36.47	v 36.5	F 0.03
T.P.	7.09	41.80	8.04	34.71		
+75			7.1	35.7		
37+50	Δ LH 2° 06' on Hub		8.04	34.71	134.68	C = 0.03
37+25			9.2	33.6		
		4275				

S.D. 2 E. Cont. 27 VC 7

ROSE CANYON.

Oct. 12 - 1930

W.H.I.

Calif. Highway Comm.

See Pg. 58

Shift for ℄ of Const.

To bring W. edge of new 30' Pavt. flush with W. edge of Pres. 16' Pavt.

$\Delta = 29°15'30"$

$R = 1500$

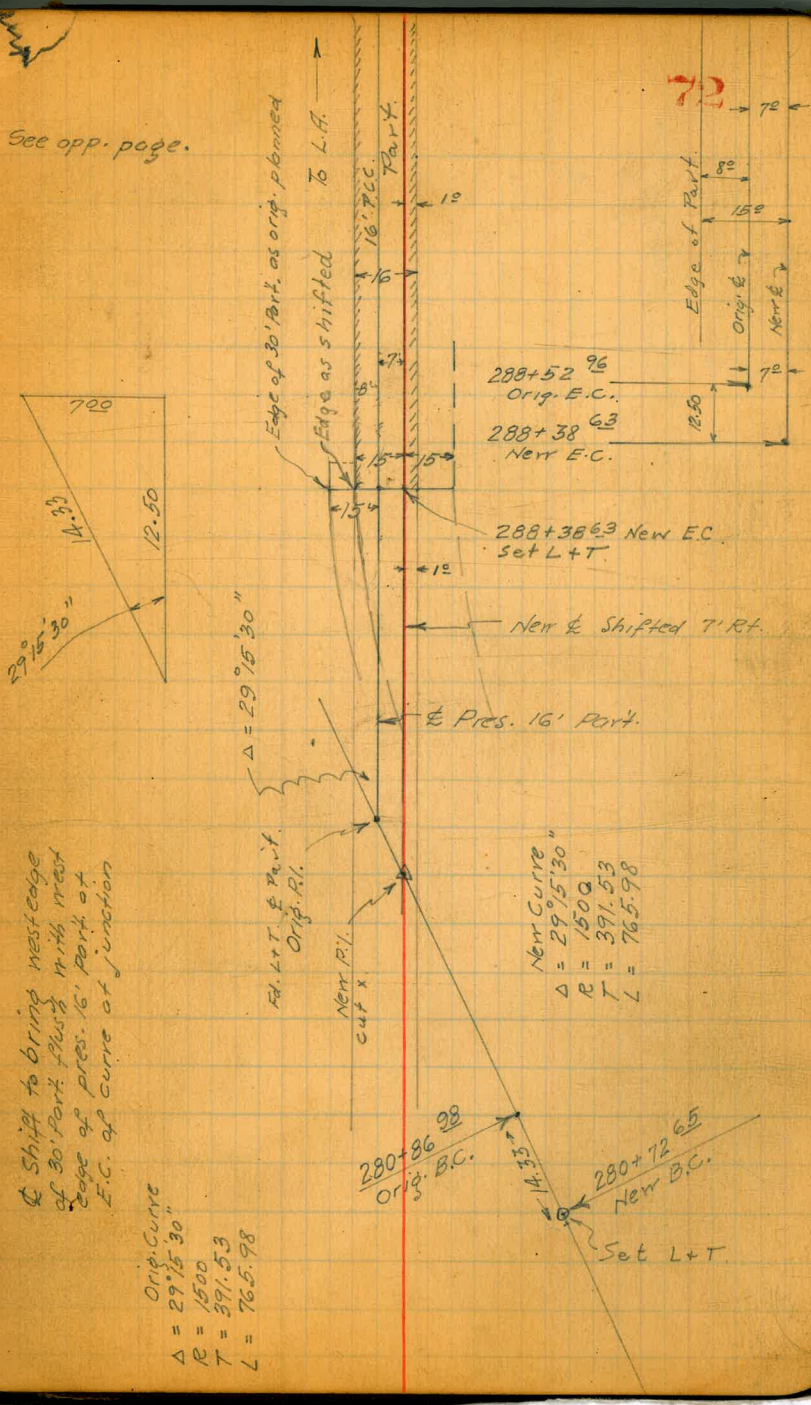
$T = 391.53$

$L = 765.98$

280+72 $^{6.5}$	B.C. 0°00'
281	0°31½
+25	1°00'
+50	1°28½
+75	1°57
282	2°26
+25	2°54½
+50	3°23
+75	3°52
283	4°20½
+25	4°49
+50	5°18
+75	5°46½
284	6°15
+25	6°44
+50	7°12½
+75	7°41
285	8°10'
+25	8°38
+50	9°07
+75	9°35½
286	10°04½
+25	10°33
+50	11°01½
+75	11°30'
287	11°59
+25	12°27½
+50	12°56
+75	13°25
288	13°53½
+25	14°22
288+38 $^{6.3}$ E.C.	14°37'.75"

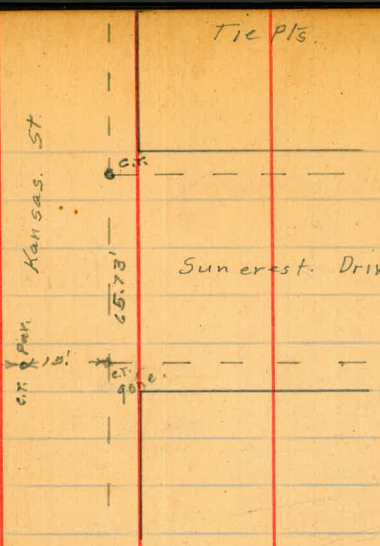
W. H. Irish - Chief
N. D. Soderblom - Instr.
A. M. Hoy - Level
A. H. Killen - H. Chain
E. F. Burge - R. Chain
B. W. Hubbard - Rod

See opp. page.



Tie Pts.

12-15-36
Miller
Walker
Bliss

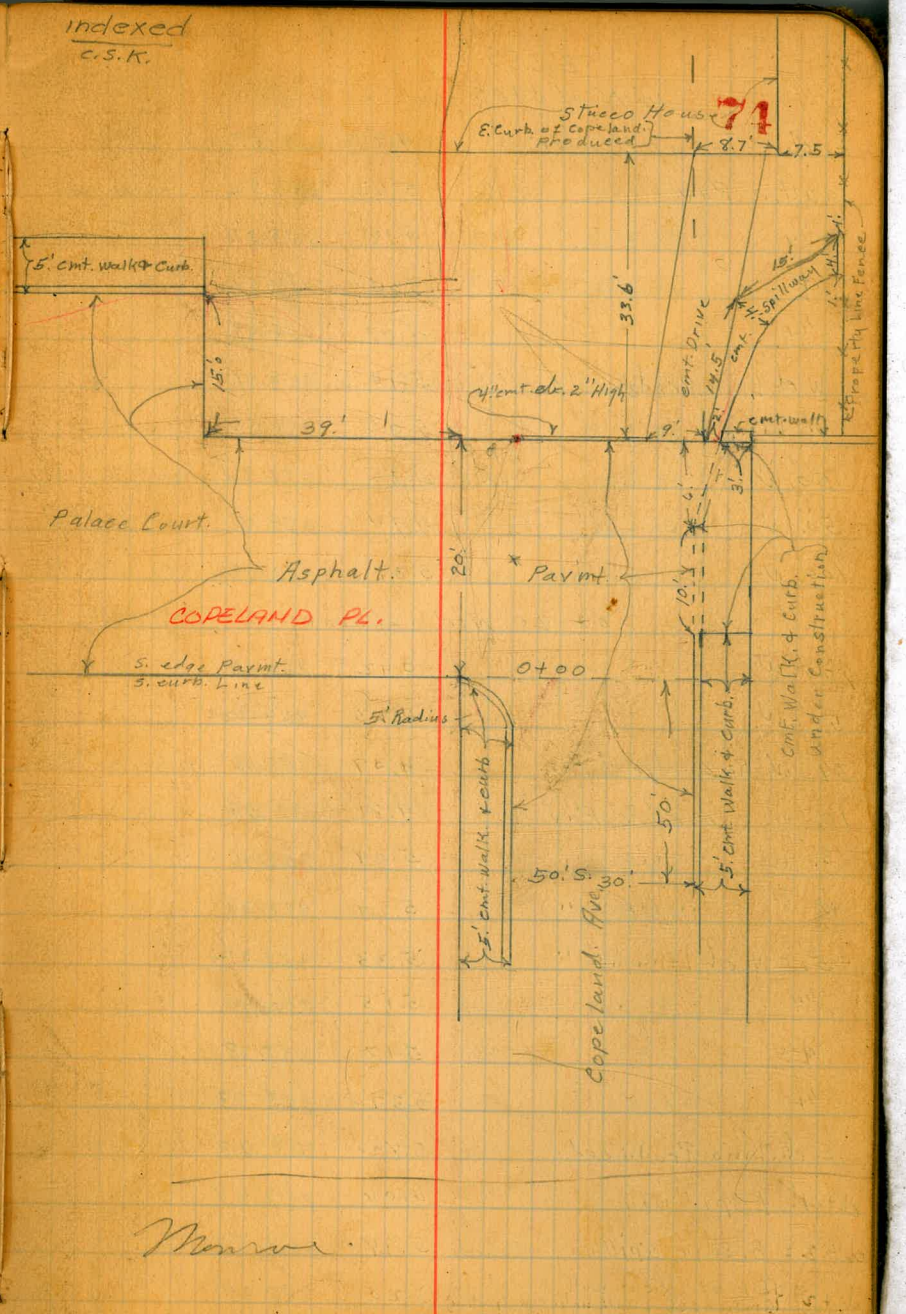


12-15-36
Miller.
Walker.
Bliss.

X Sec. Copeland and Palace Court for Drainage

B.M. B.P.	4.00	368.47		364.47 ✓	N.W. Copeland & Meade
T.P.	2.80	363.55	7.72	360.75	
Set B.M. B.P.			4.51	359.04	S.W. Copeland & Palace Place
0+00 - 40. = 40 S. of S. cb. Palace Place					
E. cb			4.66	358.89	
gutter			5.21	58.34	
l.p.			4.90	58.65	
℄			4.60	58.90	
l.p.			4.59	58.96	
gutter			4.80	58.75	
W. cb.			4.22	59.33	
5' S. of 0+00 = S. End Return on W.					
W. cb. S. end Ret			4.55	359.00	
gutter			5.10	358.45	
0+00 = S. Edge Palace Place Pav.					
100' W. of M. Line = S. Edge Pav.			3.50	360.08	
50 " " " = " " "			4.25	359.30	
E. W. = S. edge pav			5.04	358.51	
E. W. = W. End cb. Return			4.59	58.96	
+5' = W. cb. Line			5.10	58.45	
l.p.			4.95	58.60	
℄			4.93	58.62	
l.p.			5.14	58.41	
gutter			5.52	58.03	
E. curb			4.96	58.59	

Indexed
C.S.K.



363.55

10' N. of 0+00

E. ch. = Top of Header	4.96	358.59
gutter Pav.	5.63	357.92
¼	5.18	358.37
℄	5.04	358.51
¼	5.07	358.48
W. ch. Line Produced	5.14	358.41
W. Line	5.05	358.50
10' W	4.75	358.80
50' W	4.14	359.41
100' W.	3.37	360.18
0+20' North of 0+00		
100' W	3.42	360.13
50' W.	4.23	359.32
39' W Rt. L. edge of Pav.	4.39	359.16
10' W. = N. edge Pav	4.86	358.69
3' W " " "	5.09	358.46
W " " "	5.27	358.28
+5' = W. ch. Line " "	5.33	358.22
¼	5.15	358.40
℄	5.17	358.38
¼	5.32	358.23
E. ch. Line Produced	5.82	357.73
ch+1' ℄ spillway	6.06	357.49
ch+2 = E. Edge spillway = gutter grade	5.98	357.57
ch+2 {Top. of Ex. Cmt. Wall. W. End. Grade of ch.+Walk under construction}	5.20	358.35
ch+5 {Top. of Ex. cmt. wall E. End. Grade of Walk under Construction}	5.15	358.40

363.55

75

Levels on spillway.

14.5' N.E. of 0+20. N. at △ in spillway

W. edge	8.12	355.43
+3' = Flow Line	8.50	355.05
+4 = E. edge	8.22	355.33

15' N.E. of above = N.E. End. of spillway

S. Edge	9.79	353 76
+2' = Flow Line	10.27	353.28
N. edge	10.24	353 29

N.E. End. of spillway empties in. Natural drainage channel on unimproved Lot.

0+35' N. of Sec. 0+00

39' W. of W. Line gutter pav. E. End.	4.96	358.59
39' W. of W. Line cmt. ch. E. End.	4.41	359.14
50' W. of W. Line cmt. ch	4.28	359.27
50' " " " " gutter pav	4.78	358.77
100' " " " " " "	3.96	359.59
100' " " " " cmt. ch.	3.41	360.14
T.P. 6.76 363.80	4.51	359.04
T.P. 6.40 368.89	3.31	362.49
chk. orig B.M.	4.42	364.47

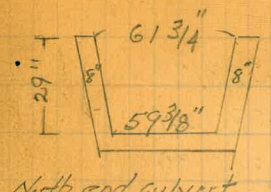
5-13-37
Walker
81.58

Location And Elevation
Existing Drain Box
Wightman st. East of 50th st.

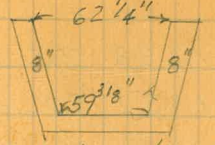
					B.M. B.P. S.W. Univ. 65
	1.77	331.90		330.13	
T.P.	0.07	319.49	12.48	319.42	
T.P.	0.33	307.04	12.78	306.71	
T.P.	0.26	294.32	12.98	294.06	
T.P.	0.87	282.48	12.71	281.61	
T.P.	3.70	275.53	10.65	271.83	Elec. Pole 40' W. Culvert.
0+00	& ditch		6.8	268.7	
+60	Δ 30° Lt.		7.1	268.4	
+90	Δ 34°06' Lt.		7.7	267.8	
1+16.6	= N end culvert		8.40	267.13	Conc. Flow line
+16.6	on Wood Deck.		5.05	270.48	
+35.6	= S. end culvert		5.15	270.38	on Wood deck
+35.6	" " "		9.10	266.43	Concrete Flow line
1+53	Δ 48°30' Rt.		10.8	264.7	
+61			10.5	265.0	
+76			8.8	266.7	
2+00			8.8	266.7	
+30			10.8	264.7	
+50			11.2	264.3	
40' Rt. of 1+25			3.7	271.8	In Roadway Wightman St
60' " "			2.4	273.1	"
30' Lt. of 1+25			5.3	270.2	"
60' " "			4.6	270.9	"
90' " "			3.4	272.1	"
T.P.	11.45	283.28	3.70	271.83	

Cont. on P-77

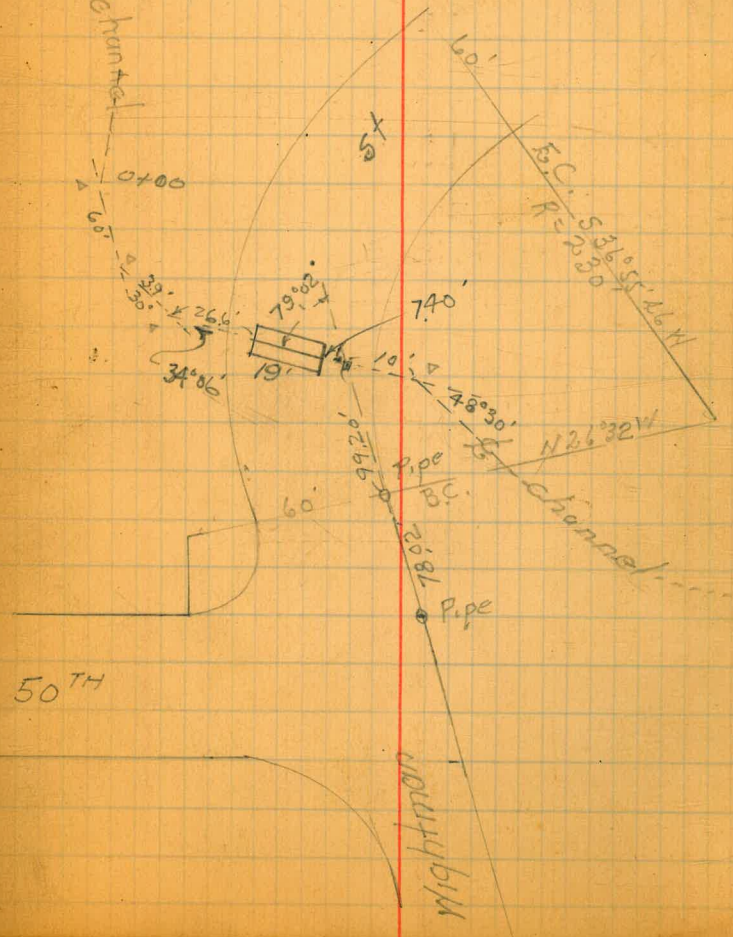
Indexed
C.S.K.



North end culvert
Concrete With Wooden Deck



South end culvert.



LEVELS —

Cont. from Page 76

		283.28		
T.P.	12.33	295.61	0.00	283.28
T.P.	13.21	308.62	0.20	295.41
T.P.	12.46	320.85	0.23	308.39
T.P.	11.95	332.64	0.16	320.69
chk.	S.W. B.P.	Univ. & 50th	2.54	330.10
				330.13 = B.M.
				0.03 = Error.

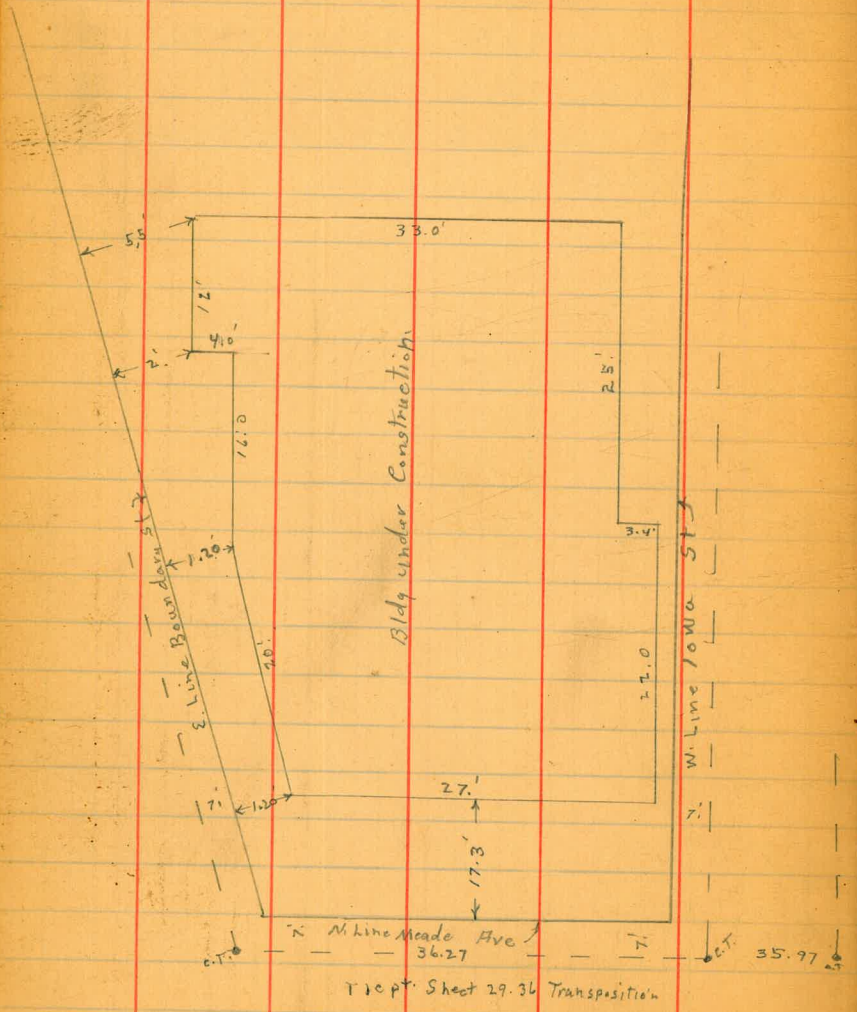
9-2-37
Miller
Walker
Blow

Survey at Boundary & Meade.

Indexed
C.S.K.

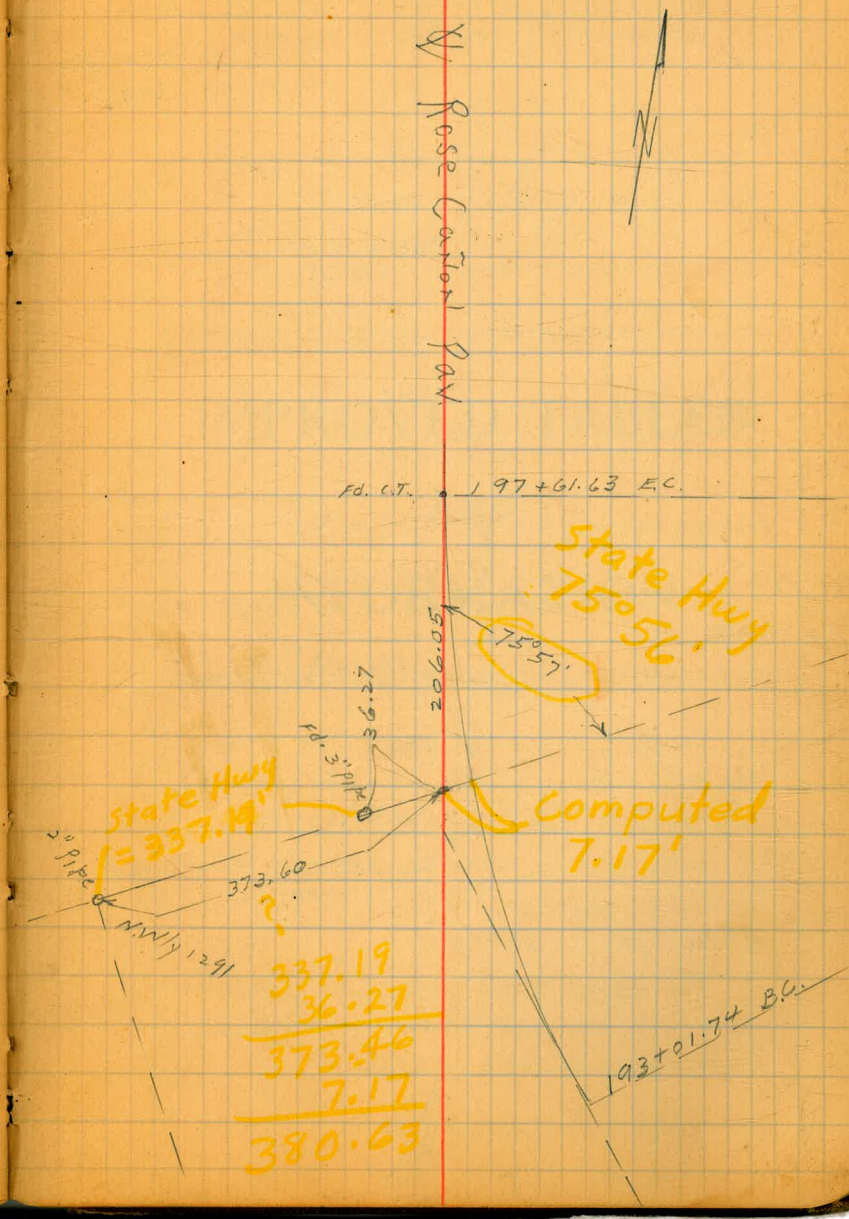
78

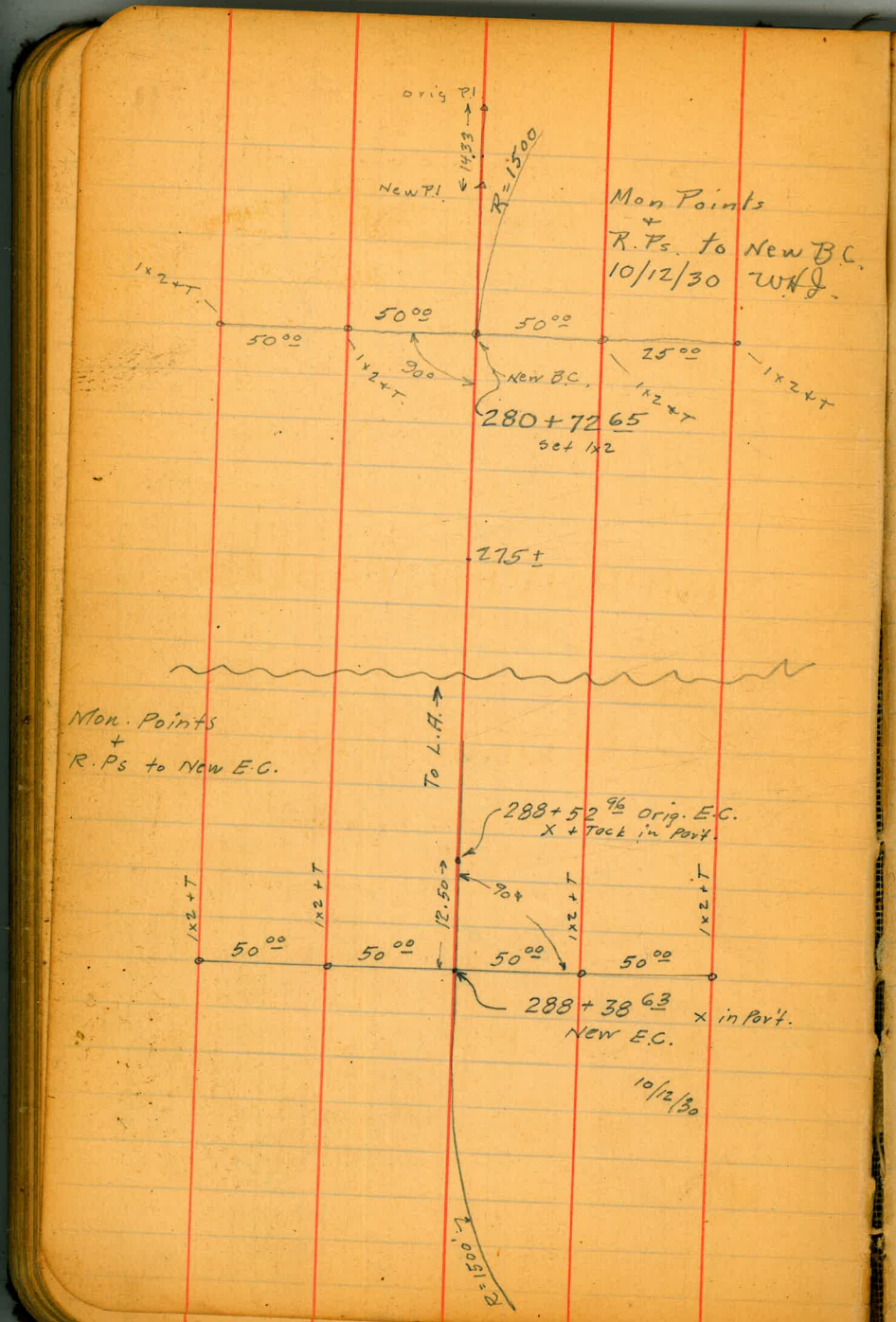
24.3
7
17.3



Tie on N'ly Line of PL. 1291.

79





IMPROVED TABLES AND INFORMATION

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope 1½ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

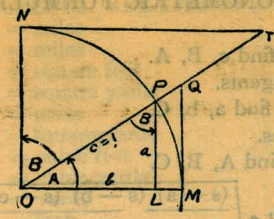


TABLE II

TRIGONOMETRIC FORMULÆ.

$\angle A = \angle MOP \qquad \angle B = \angle PON = \angle OPL$

$R = OB = c = 1$

$$\sin A = \frac{a}{c} = \frac{a}{1} = a = \cos B = LP$$

$$\cos A = \frac{b}{c} = \frac{b}{1} = b = \sin B = OL$$

$$\tan A = \frac{a}{b} = \frac{MQ}{OM} = \frac{MQ}{1} = MQ = \cot B = MQ$$

$$\cot A = \frac{NT}{ON} = \frac{NT}{1} = NT = \tan B = NT$$

$$\sec A = \frac{OQ}{OM} = \frac{OQ}{1} = OQ = \csc B = OQ$$

$$\csc A = \frac{OT}{ON} = \frac{OT}{1} = OT = \sec B = OT$$

$$\text{vers } A = \frac{LM}{OP} = LM = \text{covers } B \#$$

$$\text{covers } A = \frac{OP - LP}{OP} = OP - LP = \text{vers } B$$

$$\text{exsec } A = PQ = \text{coexsec } B$$

$$\text{coexsec } A = PT = \text{exsec } B$$

$$\sin \tfrac{1}{2} A = \sqrt{\frac{1 - \text{Cos } A}{2}} \qquad \cos \tfrac{1}{2} A = \sqrt{\frac{1 + \text{Cos } A}{2}}$$

$$\sin 2A = 2 \sin A \cos A \qquad \cos 2A = \cos^2 A - \sin^2 A$$

$$\text{Law of Sines} \quad \frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C^1}{C}$$

$$\text{Law of Cosines} \quad c^2 = a^2 + b^2 - 2ab \cos C$$

$$\text{Law of Tangents} \quad \frac{a+b}{a-b} = \frac{\tan \tfrac{1}{2}(A+B)}{\tan \tfrac{1}{2}(A-B)}$$

Table VI (continued)
SINES, COSINES, TANGENTS, COTANGENTS (continued)

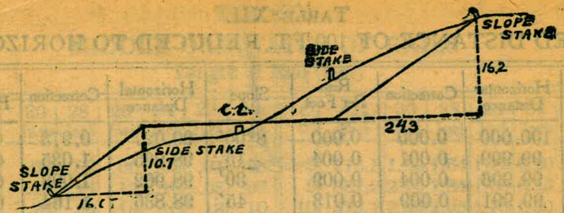
deg.	sin 0′	tan 0′	sin 10′	tan 10′	sin 20′	tan 20′	sin 30′	tan 30′	sin 40′	tan 40′	sin 50′	tan 50′	deg.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	1.2203	7753	1.2276	39
51	771	2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	9995	31.242	9996	34.368	997	38.189	997	42.964	9998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	30′ cot	10′ cos	10′ cot	deg.

TABLE VII
RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16—6	21	346—6	41	676—6	61	1006—6	81	1336—6
2	33—0	22	363—0	42	693—0	62	1023—0	82	1353—0
3	49—6	23	379—6	43	709—6	63	1039—6	83	1369—6
4	66—0	24	396—0	44	726—0	64	1056—0	84	1386—0
5	82—6	25	412—6	45	742—6	65	1072—6	85	1402—6
6	99—0	26	429—0	46	759—0	66	1089—0	86	1419—0
7	115—6	27	445—6	47	775—6	67	1105—6	87	1435—6
8	132—0	28	462—0	48	792—0	68	1122—0	88	1452—0
9	148—6	29	478—6	49	808—6	69	1138—6	89	1468—6
10	165—0	30	495—0	50	825—0	70	1155—0	90	1485—0
11	181—6	31	511—6	51	841—6	71	1171—6	91	1501—6
12	198—0	32	528—0	52	858—0	72	1188—0	92	1518—0
13	214—6	33	544—6	53	874—6	73	1204—6	93	1534—6
14	231—0	34	561—0	54	891—0	74	1221—0	94	1551—0
15	247—6	35	577—6	55	907—6	75	1237—6	95	1567—6
16	264—0	36	594—0	56	924—0	76	1254—0	96	1584—0
17	280—6	37	610—6	57	940—6	77	1270—6	97	1600—6
18	297—0	38	627—0	58	957—0	78	1287—0	98	1617—0
19	313—6	39	643—6	59	973—6	79	1303—6	99	1633—6
20	330—0	40	660—0	60	990—0	80	1320—0	100	1650—0

Table VIII
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0- 7.92	18	11-10.56	35	23- 1.20	52	34- 3 84	69	45- 6 48	86	56- 9 12
2	1- 3.84	19	12- 6.48	36	23- 9.12	53	34-11 76	70	46- 2 40	87	57- 5 04
3	1-11.76	20	13- 2.40	37	24- 5.04	54	35- 7 68	71	46-10 32	88	58- 0 96
4	2- 7.68	21	13-10.32	38	25- 0.96	55	36- 3 60	72	47- 6.24	89	58- 8.88
5	3- 3.60	22	14- 6.24	39	25- 8.88	56	36-11 52	73	48- 2 16	90	59- 4 80
6	3-11.52	23	15- 2.16	40	26- 4.80	57	37- 7 44	74	48-10 08	91	60- 0 72
7	4- 7.44	24	15-10.08	41	27- 0.72	58	38- 3 36	75	49- 6 00	92	60- 8 64
8	5- 3.36	25	16- 6.00	42	27- 8.64	59	38-11 28	76	50- 1 92	93	61- 4 56
9	5-11.28	26	17- 1.92	43	28- 4.56	60	39- 7 20	77	50- 9.84	94	62- 0 48
10	6- 7.20	27	17- 9.84	44	29- 0.48	61	40- 3.12	78	51- 5 76	95	62- 8 40
11	7- 3.12	28	18- 5.76	45	29- 8.40	62	40-11 04	79	52- 1 68	96	63- 4 32
12	7-11.04	29	19- 1.68	46	30- 4.32	63	41- 6.96	80	52- 9 60	97	64- 0 24
13	8- 6.96	30	19- 9.60	47	31- 0.24	64	42- 2.88	81	53- 5 52	98	64- 8 16
14	9- 2.88	31	20- 5.52	48	31- 8.16	65	42-10.80	82	54- 1 44	99	65- 4 08
15	9-10.80	32	21- 1 44	49	32- 4.08	66	43- 6.72	83	54- 9 36	100	66- .000
16	10- 6.72	33	21- 9.36	50	33- 0.00	67	44- 2.64	84	55- 5.28	101	66 -7 92
17	11- 2.64	34	22- 5.28	51	33- 7.92	68	44-10.56	85	56- 1.20	102	67- 3.84



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3.45	3.60	3.75	3.90	4.05	4.20	4.35	2
3	4.50	4.65	4.80	4.95	5.10	5.25	5.40	5.55	5.70	5.85	3
4	6.00	6.15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85	7
8	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85	9
10	15.00	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.20	16.35	10
11	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	11
12	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.05	19.20	19.35	12
13	19.50	19.65	19.80	19.95	20.10	20.25	20.40	20.55	20.70	20.85	13
14	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.35	14
15	22.50	22.65	22.80	22.95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35	16
17	25.50	25.65	25.80	25.95	26.10	26.25	26.40	26.55	26.70	26.85	17
18	27.00	27.15	27.30	27.45	27.60	27.75	27.90	28.05	28.20	28.35	18
19	28.50	28.65	28.80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30.00	30.15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31.50	31.65	31.80	31.95	32.10	32.25	32.40	32.55	32.70	32.85	21
22	33.00	33.15	33.30	33.45	33.60	33.75	33.90	34.05	34.20	34.35	22
23	34.50	34.65	34.80	34.95	35.10	35.25	35.40	35.55	35.70	35.85	23
24	36.00	36.15	36.30	36.45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37.80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39.00	39.15	39.30	39.45	39.60	39.75	39.90	40.05	40.20	40.35	26
27	40.50	40.65	40.80	40.95	41.10	41.25	41.40	41.55	41.70	41.85	27
28	42.00	42.15	42.30	42.45	42.60	42.75	42.90	43.05	43.20	43.35	28
29	43.50	43.65	43.80	43.95	44.10	44.25	44.40	44.55	44.70	44.85	29
30	45.00	45.15	45.30	45.45	45.60	45.75	45.90	46.05	46.20	46.35	30
31	46.50	46.65	46.80	46.95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48.00	48.15	48.30	48.45	48.60	48.75	48.90	49.05	49.20	49.35	32
33	49.50	49.65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51.00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52.50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54.00	54.15	54.30	54.45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55.50	55.65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57.45	57.60	57.75	57.90	58.05	58.20	58.35	38
39	58.50	58.65	58.80	58.95	59.10	59.25	59.40	59.55	59.70	59.85	39
40	60.00	60.15	60.30	60.45	60.60	60.75	60.90	61.05	61.20	61.35	40
41	61.50	61.65	61.80	61.95	62.10	62.25	62.40	62.55	62.70	62.85	41
42	63.00	63.15	63.30	63.45	63.60	63.75	63.90	64.05	64.20	64.35	42
43	64.50	64.65	64.80	64.95	65.10	65.25	65.40	65.55	65.70	65.85	43
44	66.00	66.15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67.50	67.65	67.80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69.00	69.15	69.30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70.50	70.65	70.80	70.95	71.10	71.25	71.40	71.55	71.70	71.85	47
48	72.00	72.15	72.30	72.45	72.60	72.75	72.90	73.05	73.20	73.35	48
49	73.50	73.65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

Set lead + tack 0+50 00 0.91
" " + 274+97 55 P.O.T.

60)50.00
.50
60
30.00
75
60
45.00

5 - 59 - 79
42 - 97
6 - 42 - 76
42 97
7 - 25 79
42 97
8 - 08 71
42 97
8 51.68
42 97
9 - 34 66
42.97
10 - 17.6
42.97
11 - 00.61
42.97
11 - 43.58

1581.38
333.30
1248.08

1-41.94
15.99
1-25.95

239.99
125.01
365.00

54.04
52.64
1.40

129-60
81-54
48-06

45.06
4.99
50.05

1-41.94
0-15.99
1-25.95
0-42.97

52.64
1.40
54.04

393.40
113.91
279.49

45.84
12.64
58.48
126.55
68.07
45.84
113.91

376.51

129-60
29-26
150-34

267.90
50.00
317.90

R = 2371.62 {50' = 36.24, 1' = .7248}

R = 2001.54 {50' = 42.94, 1' = .8588}

10.6
5
1.66

683.70
50.46
734.16

19°08'29

R = 1500 {50' = 0° 57.30', 25' = 0° 28.65'} 1' = 1.146

R = 2000 {50' = 0° 42.95', 25' = 0° 21.48'} 1' = 0.859

R = 3000 {50' = 0° 28.65', 25' = 0° 14.32} 1' = 0.573