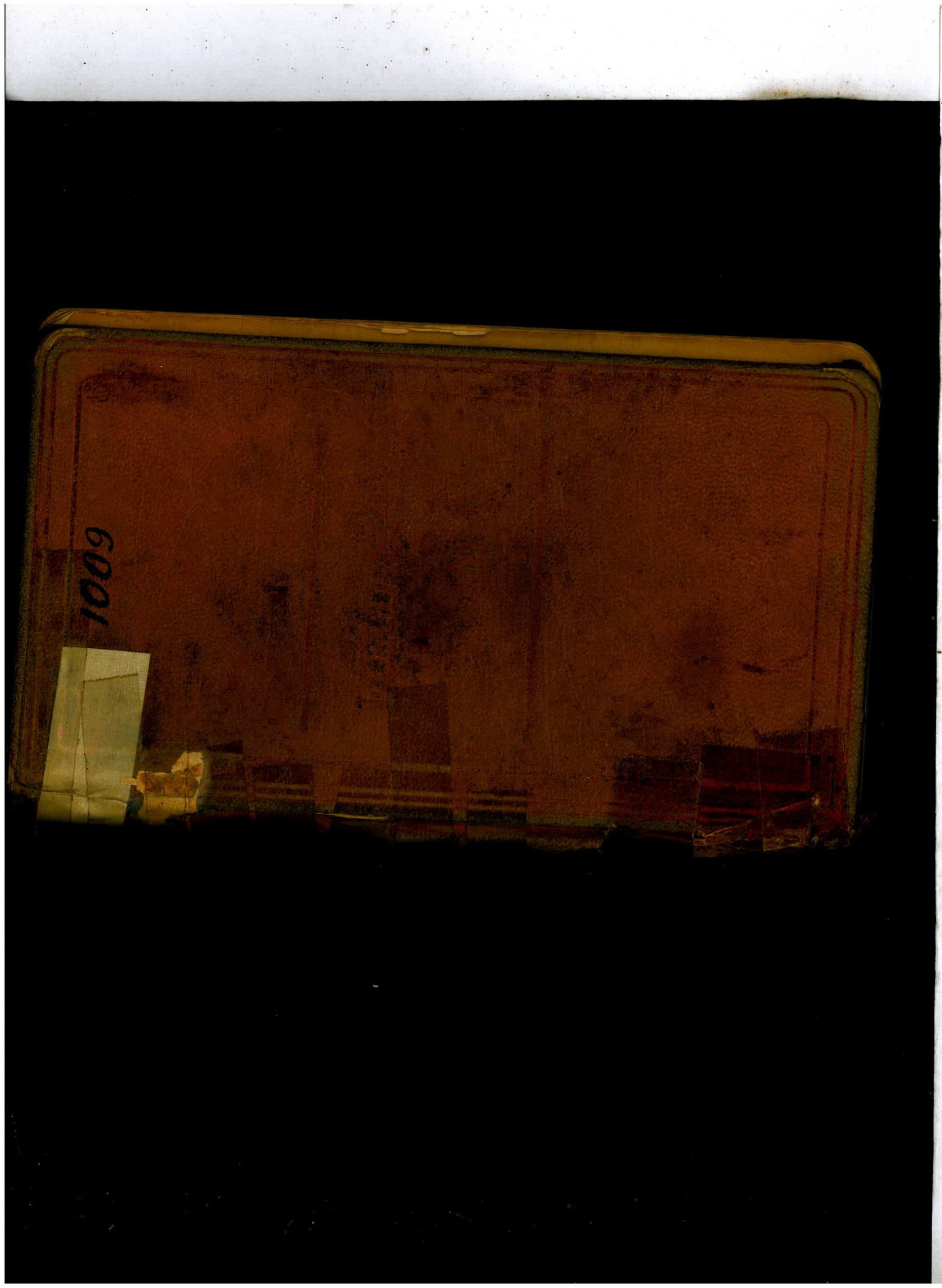

1009

EUGENE DIETZGEN CO

Drawing Materials and Surveying Instru

NEW YORK. CHICAGO. SAN

TABLES FOR EXCAVATIONS AND EMBANKM

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SE

ROADWAY 20 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9
1	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9
2	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9
3	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9
4	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9
5	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9
6	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9
7	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9
8	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9
9	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9
10	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9
11	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9
12	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9
13	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9
14	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9
15	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9
16	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9
17	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9
18	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9
19	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9
20	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9
21	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9
22	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9
23	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9
24	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9
25	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9
26	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9
27	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9
28	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9
29	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9
30	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9
31	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9
32	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9
33	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9
34	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9
35	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9
36	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	
37	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7		
38	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7		
39	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	4	
40	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	5	

Calculated by F. E. Paradis, C. E.

1009

2980-B

(16)

30

10

30

30

A

S½ of SE¼

N½ of NE¼

10

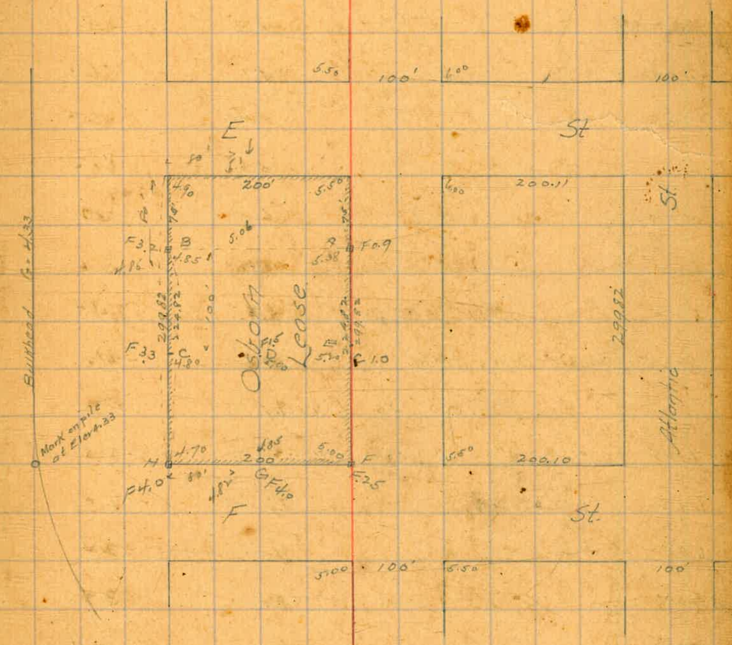
30

(29)

Sta	+	HI	−	Elev	
	4.92	11.81		6.89	BM Bwdy 30th [illegible]
T.P	4.20	8.97	7.04	4.77	on Hub SE [illegible]
A			4.50	4.47	
B			7.30	1.67	
C			7.40	1.52	
D			5.50	3.47	
E			2.70	6.27	
F			6.50	2.47	
G			7.7	1.3	
H			8.2	0.77	
Bulkhead			8.9	0.10	
N.E. Cor Swift's Building Top Concrete footing			3.92	5.05	

6.28 / 4.77 — 11.05 AM 5.37 / 5.74 5.10 / 5.95 4.95 / 6.10 5.07 / 5.98

Survey of Osborn Lease City Tide Lands 3/21/16 {Davis, Hancock, Herrick}



3/24/16 Davis Hancock Harrick

Cross Section of Tide Lands Broadway to Market

H.48 H.T. 113.7 Elev 6.89 Spk Pole Buoy 330 W Al

So Line Broadway

W. Line Atlantic	7.1	4.3
100' W "	6.3	5.1
200 "	5.1	6.3
300 "	5.4	6.0
400 "	5.0	6.4
500 "	6.0	5.4
600 "	7.8	3.6
625 "	6.7	4.7
625 Outside Temp Blkhd	15.4	-4.0

100' So Buoy

625 " " "	20.2	-8.8
617	13.4	-2.0
608	9.0	2.4
600	8.0	3.4
500	5.7	5.7
450	6.0	5.4
400	4.4	7.0
400 - 30' So	6.3	5.1
300	5.1	6.3
300 - 30' So	3.6	7.8
300 - 60' So	5.4	6.0
250	4.9	6.5
250 - 50' So	5.1	6.3
250 - 70' So	3.6	7.8

2

11.37

Sta +	100' So Bwdy ⊥	Elev
100 W Atlantic	5.9	5.5
W. Line	7.3	4.1
	200' So Bwdy	
W.L. At.	6.8	4.6
100 W	5.3	6.1
140 "	3.7	7.7
200	4.8	6.6
235 "	4.4	7.0
250	5.2	6.2
300	5.9	5.5
400	7.0	4.4
460	6.7	4.7
460 - 25' So	7.2	4.2
460 - 40' So	5.1	6.3
500	6.5	4.9
600	7.6	3.8
608	8.3	3.1
6 Ex	14.0	- 2.6
6 x 5	18.0	- 6.6

	275' So Bwdy	Elev
W.L. At.	7.1	4.3
40 W	7.0	4.4
100 "	5.6	6.4
180 "	4.7	6.7
200 "	5.5	5.9
270 "	6.3	5.1
270 - 15' So	4.4	7.0
300	5.8	5.6
300 - 15' So	5.2	6.2
360	5.2	6.2
360 - 10' So	6.1	5.3
360 - 20' So SD Elect Blkhd	8.6	2.8
" 22 So	12.5	- 1.1
" 26' So bot m	21.0	- 9.6
400	7.3	4.1
400 - 10' So SD Elect Blkhd	8.6	2.8
400 - 17 So	12.5	- 1.1
400 - 21 So	12.9	- 1.5
400 - 23' So bot m	21.3	- 9.9
425	7.0	4.4
425 - 20' No	7.5	3.9
450	9.2	2.2
450 - 10 No	6.6	5.4
500	9.5	1.9
500 - 15 No	6.9	4.5

11.37

275' So Bwdy		Elev
5-00 W - 13' So SD Elect BlKhd	10.3	1.1
" 15' So	13.6	-2.2
" 18' So - botm	22.6	-11.2
600 W	8.7	2.7
600 " - 2' So	12.2	-0.8
" 6' So	19.4	-8.0
601 "	14.2	-2.8
625'	19.5	-8.1

300' So No Line "E"		
300' W of W.L. Atlantic SD Elect BlKhd.	8.1	3.3
" 5' No	7.7	3.7
" 1' So	12.3	-0.9
" 4' So	12.6	-1.2
" 6' So	20.0	-8.6
230' W	7.0	4.4
" " 6' So - SD Elect BlKhd	7.1	4.0
" 7' "	10.7	0.7
" 10 "	10.8	0.6
" 20 "	19.0	-7.6
212 W	7.0	4.4
" 40' So	7.7	3.7
200 W	6.7	4.7
100 "	6.1	5.3
W.L. Atlantic	7.1	4.3

4

So Line E St. 75 Wide		Elev
W.L. At.	7.7	3.7
100 W	6.6	4.8
200 "	6.5	4.9
212'	6.5	4.9
230 "	8.2	3.2
230 - 9' No.	11.1	0.3
" 10 " - botm	19.7	-8.3
300	11.0	0.4
" 8' W. BlKhd SD Elect	12.0	-0.6
" 10' " - botm	22.6	-11.2
400	12.2	-0.8
400 W - 4' No. BlKhd SD Elect	12.3	-0.9
400 " - 3' No - botm	23.1	-1.7
463	12.5	-1.1
463 - 1' No - botm	23.4	-11.0
463 - 10' So	9.1	2.3

11.37

45 'S. E St.		Elev
W. Line Al.	7.2	4.2
100 W	6.7	4.7
130 "	7.2	4.2
200 "	5.8	5.6
300 "	7.2	4.2
400 "	8.0	3.4
500 "	9.2	2.2
500 " 15' No	9.2	2.2
500 76 " - Blk hol - SD. Flod	12.8	-1.4
500 42 " bottm	22.6	-11.2
592	10.5	0.9
592 - 30' No	11.3	0.1
" 36' No - Blk hd	13.5	-2.1
" 38' " bottm	22.6	-11.2
600	14.5	-3.1
600 38' No - Blk hd	14.7	-3.3
600 - 40" " bottm	22.2	10.8
600 12' So	14.4	-3.0
15' So	9.9	1.5
627	19.2	-7.8
627 35' No	20.3	-8.9
T.P. 4.65 9.06	6.91	4.41

9.06

5

5

100' So. E St		Elev
672 W Al.	16.3	-7.2
600 "	11.9	-2.8
400 "	8.3	0.8
500 "	7.7	1.4
400 "	5.6	3.5
400 - 30' So	6.3	2.8
400 - 50' So	4.4	4.7
3x5	4.0	5.1
3x5 - 20' So.	2.2	6.9
3x5 - 40 So.	5.1	4.0
300 "	3.7	5.4
300 - 40' So.	4.6	4.5
215	2.5	6.6
200	4.1	5.0
100	5.1	4.0
W. L. Al.	5.6	3.5

9.06

200' S. "E" St

419	W of W. Alley	15.6	-6.5
600	"	13.0	-3.9
587	"	11.8	-2.7
516	"	8.3	0.8
500	"	7.5	1.6
488	"	7.0	2.1
450	"	4.1	5.0
450	" 40' No.	7.1	2.0
450	" 30' S.	7.2	1.9
400	"	6.7	2.4
350		5.0	4.1
350	18' S.	7.0	2.1
312		5.5	3.6
312	35' No.	2.2	6.9
312	30' S.	2.7	6.4
300		4.2	4.9
290		3.9	5.2
290	30' No.	4.6	4.5
290	25' S.	6.0	3.1
290	50' S.	4.2	4.9
275		5.1	4.0
250		3.2	5.9
200		3.6	5.5
100		5.0	4.1
W.L. At		6.1	3.0

9.06

300' S. N. Line F

W.L. At		5.6	3.5
100 W		5.2	3.9
200		5.6	3.5
215		4.2	4.9
230		6.1	3.0
250		4.1	5.0
300		6.5	2.6
312		7.7	1.4
312 · 40' N.		6.9	2.2
400		7.9	1.2
500		8.2	0.9
556		8.8	0.3
566		11.7	- 2.6
600		13.4	- 4.3
608		14.2	- 7.2
T.P.	2.70	5.84	3.20

906

So Line F 75' Wide

W.L. Al.		8.7	0.4
40' W		6.0	3.1
100 "		6.0	3.1
180 "		3.6	5.5
200 "		6.0	3.1
2 W		6.2	2.9
250		7.9	1.2
300		7.9	1.2
306.	Line of Swift Plant.	7.5	1.6
306	5.5' So. Cor bldg N.E.	6.7	2.4
Top	concrete footing N.E. Cor Bldg.	3.98	5.08
400		8.2	0.9
448	W.L. Swift's bldg.	8.3	0.8
448	6' So. N.W. Cor Bldg.	8.5	0.6
Top	Concrete footing N.W. Cor Bldg.	3.99	5.07

~~W.L.~~
5.90

23' So. F

W.L. Al	5.2	0.7

55' So F

W.L. Al	2.7	3.2
12' W	5.2	0.7
50' W	4.0	1.9

85' So.

W.L. Al	2.9	3.0

5.90

100' So F

W.L. Al	6.0	- 0.1
10 W	2.8	3.1
35 W	2.7	3.2
40 "	4.9	1.0
100 "	4.3	1.6
160	2.0	3.9
200	4.0	1.9
30 "	5.4	0.5
346 "	5.4	0.5
306. 31.5' No. S.E. Cor Swifts Bldg	4.8	1.1
400	6.4	- 0.5
448'	6.4	- 0.5
448' 31.5' N. SW Cor Swifts Bldg.		
500	6.7	- 0.8
520	7.0	- 1.1
558	12.1	- 6.2.

5.90

130' S. F

W.L.	Ht.	6.3	- 0.4
21	W	5.7	0.2
28	"	28	3.1
45	"	3.0	2.9
58	"	4.4	1.5
100	"	4.9	1.0
152		2.4	3.5
200		4.6	1.3

150' S. F

W.L.	Ht.	6.3	- 0.4
36'	W	5.7	0.2
35	"	3.0	2.9
60	"	3.4	2.5
100	"	7.6	- 0.7
120	"	8.0	- 2.4
143	"	4.2	1.7
160	"	3.4	2.5

5.90

200' S. F

W.L.	Ht.	5.4	0.5
73	W	4.2	1.7
92	"	2.6	3.3
100	"	2.9	3.0
120	"	3.4	2.5
130	"	6.4	- 0.5
200	"	6.4	- 0.5
232	"	5.1	0.8
300	"	5.F	0.1
400	"	6.4	- 0.5
490		6.6	- 0.7
500		8.5	- 2.6
517		12.7	- 6.8
TP	4.13	7.33	2.70 3.20

7.38

280' So. F

W.L. Ht	6.2	1.1
100' W	5.3	2.0
200 "	4.2	3.1
200 " - 20 No	3.5	3.8
215	3.7	3.6
215 - 15' No	4.5	2.8
215 - 30 No	7.9	- 0.6
239	3.9	3.4
239 - 4' No	4.3	3.0
239 - 16' No	9.1	- 1.8
300	6.9	0.4
300	9.6	- 2.3
306' 16' No = S.E Cor S. Swift Bldg.	9.2	- 1.9
330	8.5	- 1.2
330 - 9' No	9.7	- 2.4
330 - 16' No. Bldg.	7.9	- 0.6
356 -	7.1	0.2
356 - 16' No. S.W Cor So. Swift Bldg	7.8	- 0.5
400 "	9.8	- 2.5
400 " 6' No	8.0	- 0.7
450	11.0	- 3.7
450 - 20 No	8.0	- 0.7
450 5' So	10.5	- 3.2
474	11.6	- 4.3

300' So = W.L. "G" St

W.L. At.	6.3	1.0
100 W	5.2	1.9
100' W - 30' S.	4.7	2.6
100 " 82' So	6.6	0.7
200 "	4.9	2.4
200 " 31' So	5.0	2.3
200 " 82 "	6.6	0.7
285	3.2	4.1
285 - 10' So	6.0	1.3
285 - 30' So	4.9	2.4
285 32' So	5.9	1.4
300	3.6	3.7
300 - 15' So	6.0	1.3
370 = End Sprockles Wharf	3.8	3.5
370 - 9' W.	3.5	3.8
370 - 10' So	3.6	3.7
370 - 15' So	5.8	1.4
400	5.2	2.1
400 9' No	4.1	3.2
445	9.6	- 2.3
445 - 14' No	6.4	0.9
445 30' So	11.4	- 4.1
428 - 55' So	6.8	0.5
430 - 55' So = bottom	12.9	- 5.6

Int of G St See P. 11

S.L. G St - 75' Wide

410' W At.	12.4	- 5.1
40[illegible] "	8.4	- 1.1
400 "	7.0	0.3
300 "	6.0	1.3
200	6.1	1.2
100	6.8	0.5
W.L. At.	7.0	0.3

182' So G

W.L. At.	6.3	1.0
50 W.	8.4	- 1.1

244' So G

W.L. At	6.7	0.6
6' W	8.6	- 1.4

285' So G

W.L. At.	4.3	3.0
10' W	4.7	2.6
20 "	8.0	- 0.7
50 "	6.7	0.6
75 "	5.1	2.2
75' " 10' No.	8.0	- 0.7
76' "	10.2	- 2.9

100' So G

326' W At.	12.9	- 5.6
325 " "	6.2	1.1
300 "	6.1	1.2
200	6.0	1.3
100	7.2	0.1
W.L. At.	7.4	- 0.1

200 So G

W.L. At.	8.1	- 0.8
100' W	8.3	- 1.0
200 "	6.9	0.4
217 "	6.5	0.8
218 "	13.6	- 6.3

252' So G

W.L.	4.5	2.8
10' W.	8.2	- 0.9

292' So G

W.L At	4.5	2.8
50' "	4.2	3.1
BM S.E At H Plg. Mt	4.19	3.14 ✓ 3.19 Bui

7.33

W.L. Atlantic

14'5" of N.L. F	6.4	0.9
18 "	4.4	2.9
30 "	4.5	2.8
44 "	4.9	2.4
47 "	6.2	1.1

Cross Section of Tide lands from N. line Juniper to Blkhd.

0.88 10.01 9.13 T.P. on Jupr = Bl

No. line Juniper

110' E of W.L. At.	6.0	4.0
100" " "	8.0	2.0
90' E	6.2	3.8
W.L. Atlantic	5.4	4.6
100 W	4.2	5.8
200 "	3.5	6.5
300 "	2.5	7.5
400 "	4.7	5.3
500 "	5.1	4.9
+33 " Blkhd	5.8	4.2
100' No.		
5+38 W of W.L. Blkhd	12.6	-2.6
5+15 "	7.0	3.0
5+00 "	5.9	4.1
4+00 "	4.4	5.6
3+00 "	3.4	6.6
2+00 "	4.2	5.8
1+00 "	3.7	6.3
W.L. Atlantic	4.9	5.1
+65 E	6.1	3.9
+70 "	8.0	2.0
+90 "	8.3	1.7
1+00 "	6.4	3.6

Continue 57 N Sections

200' No. Juniper

90' E of W.L. At.	5.7	4.3
81 "	8.9	1.1
27 "	8.9	1.1
20 "	5.7	4.3
W.L. Atlantic	5.1	4.9
100 W	5.5	4.5
2 "	4.2	5.8
3 "	3.9	6.1
4 "	4.1	5.9
5 "	5.4	4.6
+36 "	6.4	3.6
+42 " Blkhd	8.3	1.7
300' No. Juniper		
5+46 W of W.L. At. Blkhd	7.3	2.7
5	5.3	4.7
4	4.6	5.4
3	4.2	5.8
2	4.6	5.4
1	5.8	4.2
W.L. Atlantic	6.8	3.2
+13 E	6.8	3.2
+23 "	9.4	0.6
+75 "	9.7	0.3
+80 "	3.7	6.3

10.01

400' No Juniper

0+85 E of W.L. At.	2.9	7.1
+77 "	9.6	0.4
+47 "	9.7	0.3
+34 "	7.5	2.5
W.L. Atlantic	7.3	2.7
1+00 W of W.L. At.	6.7	3.3
2 "	6.7	4.3
3 "	6.4	4.6
4 "	6.2	4.8
5 "	6.4	4.6
+50 = Blkhd.	6.4	3.6

500' No Juniper

5+54 Blkhd	7.6	2.9
5+00 W of W.L. At	5.6	4.4
4	6.3	3.7
3	7.1	2.9
2	7.1	2.9
1	7.8	2.2
W.L. Atlantic	8.1	1.9
+64 E	10.2	-0.2
1+00 "	9.4	0.6
+02 "	8.6	1.4
+39 " = Foot of Bank	8.5	1.5
T.P. 6.14 6.65	10.52	-0.51

6.65

600' No Juniper

1+62 E of W.L. At. Bank	4.6	2.1
1+00 " "	6.2	0.5
0+20 " "	6.1	0.6
W.L. Atlantic	5.6	1.2
15 W of W.L. At.	4.4	2.3
1+00 W " "	4.4	2.3
2 "	4.0	2.7
3 "	4.0	2.7
4 "	3.6	3.1
5 "	1.9	4.8
+60 = Blkhd	3.8	2.9

700' No Juniper

6+46 W of W.L. At. Blkhd	4.4	2.3
6+00	1.6	5.1
4	3.5	3.1
3	4.5	2.2
2	4.9	1.8
1	5.0	1.7
0+50	5.2	1.5
0+41	6.0	0.7
W.L. Atlantic	6.7	0.0
1+00 E "	6.7	0.0
+71	6.6	0.1
+78 = Foot Bank.	3.6	3.1

6.65

800' No Juniper

2+00 E of W.L. At	5.0	1.7
1+76 "	5.3	1.4
1+75 "	6.8	-0.1
1+00 "	7.1	-0.4
0+00 = W.L. Atlantic	72	-0.5
0+66 W "	6.9	-0.2
0+68 "	6.4	1.3
1+00 "	6.6	1.2
2 "	6.7	1.0
3 "	5.0	1.7
4 "	3.6	3.1
5 "	1.6	5.1
+72 " = BlkHd	3.5	3.2

900' No Juniper

5+77' W of W.L. At = BlkHd	4.1	2.6
5 "	3.9	2.8
4 "	4.7	2.0
3 "	5.5	1.2
2 "	7.1	-0.4
1+95 "	6.0	0.7
1+00 "	6.5	0.2
0+73	5.7	1.0
0+70	7.8	-1.1
0+00 W.L. Atlantic	7.6	-0.9
1+00 E of W.L. "	7.8	-1.1
+74	7.1	-0.4
+76	5.8	0.9
2+00	6.1	0.6

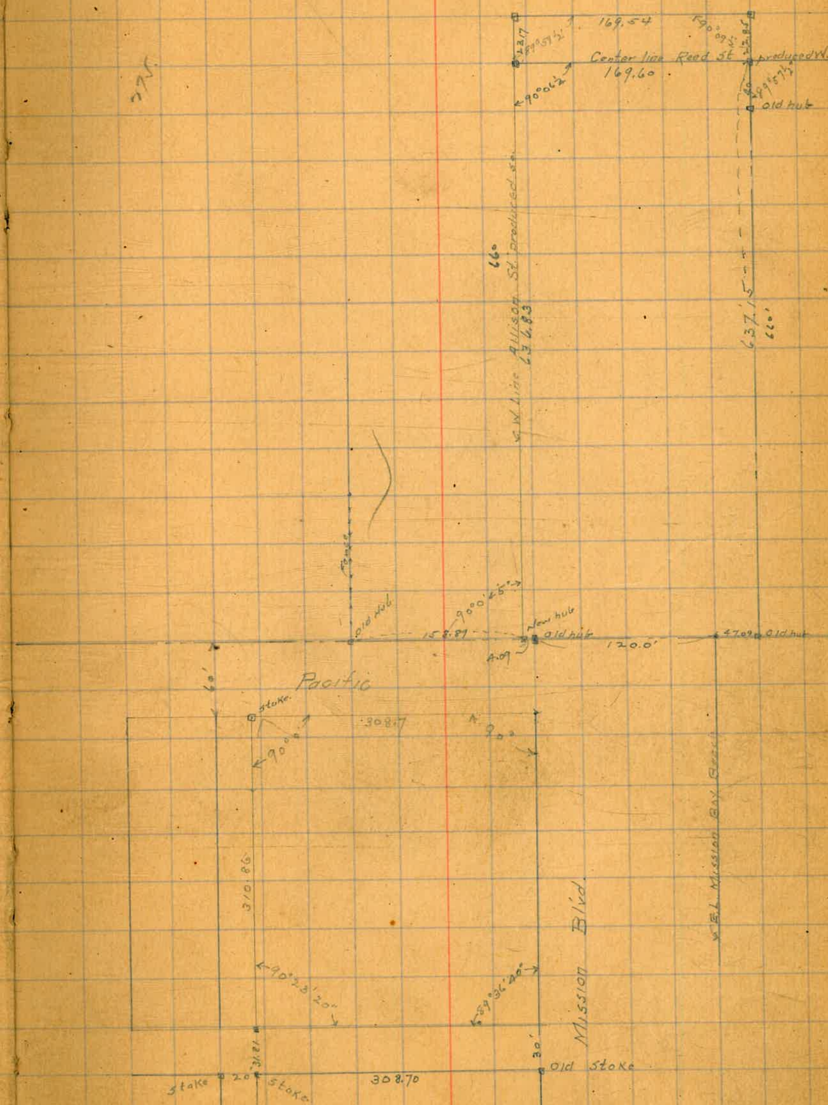
1000' No Juniper

2+00 E of W.L. At.	6.6	0.1
1+65 "	6.5	0.2
1+50 "	6.4	0.3
1+48 "	8.1	-1.4
1+00 "	8.3	-1.6
0+00 W.L. Atlantic	8.3	-1.6
1+00 W of W.L. "	8.9	-2.2
1+10 "	8.8	-2.1
1+13 "	6.2	0.5
1+33 "	8.4	-1.7
1+45 "	6.5	0.2
2+00	8.8	-2.1
+40	6.7	0.0
3	6.9	-0.2
4	6.3	0.4
5	5.2	1.5
+84 - BlkHd	4.8	1.9

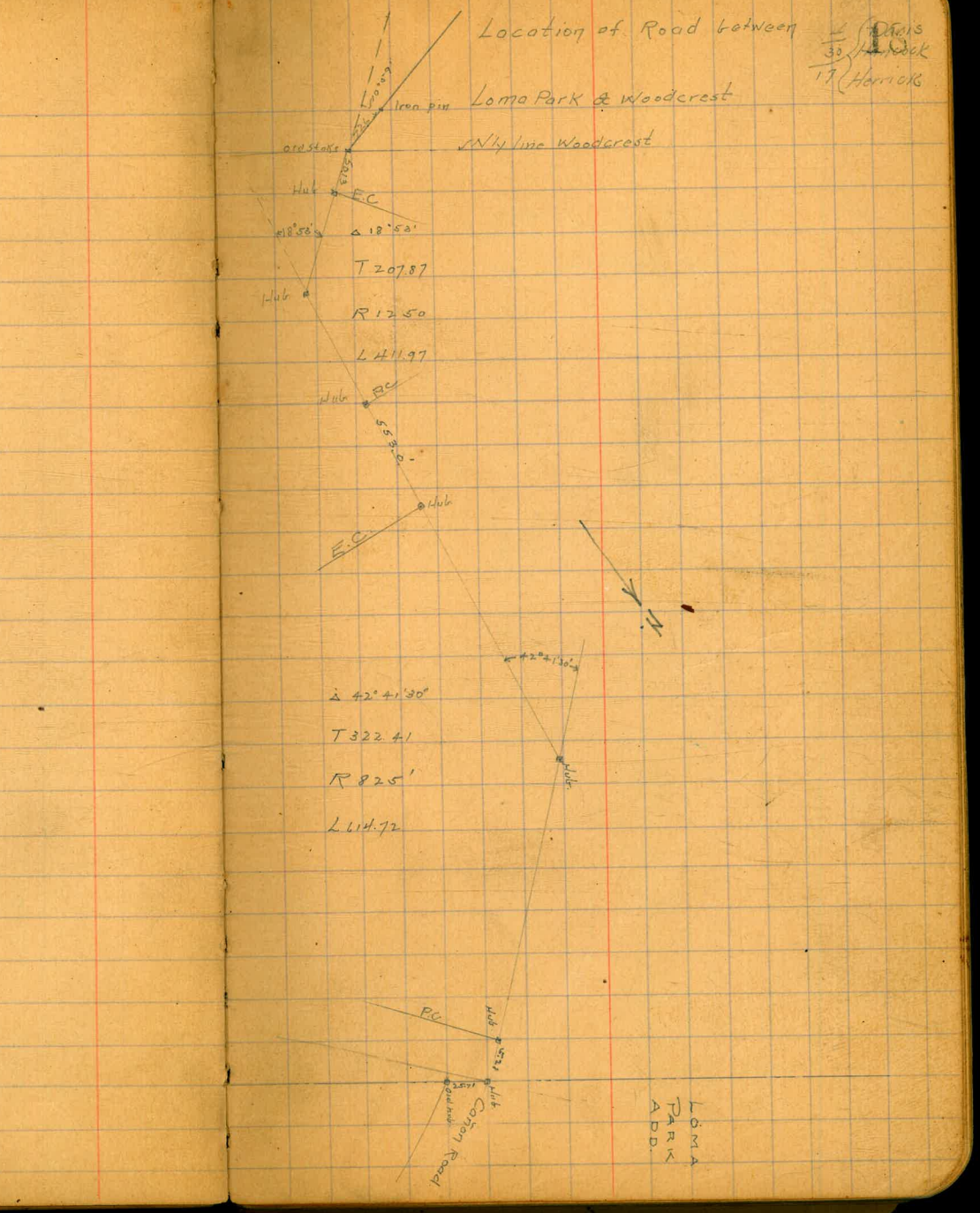
10+60 No. Juniper	= F.P.W. Bulkhead	
5+88 'W of W.L. Pt - Cor Blkhd.	6.0	0.7
5+00	5.7	1.0
4	6.9	-0.2
3+15	6.8	-0.1
3	8.1	-1.4
2	9.8	-3.1
1	9.4	-2.7
0+00 W.L. At.	9.0	-2.3
1+00 E of W.L. "	8.8	-2.1
2+00 "	7.1	-0.4
	6.78	

Cuts for Water Main on "F" St Atlanta to Belt St 7/27 Grid 7/6 Moore

Stg.	6.37 Red	11.14 Ground	Grade	W.77 BM Ht. SE Belt & E St ±
W.L. Belt	7.44	3.70	2.50	+0.8
℄ "	9.3	1.8	2.75	−1.0
E.L. "	8.3	2.8	3.00	−0.2
50' E Belt	6.9	4.2	2.68	+1.6
100' " "	5.4	5.7	2.37	+3.3
150' " "	6.4	4.7	2.06	+2.6
200' " W.L. Pt	9.5	1.6	1.75	0.0


169.54
Center line Reed St produced W.
169.60
old hub
W. Line Allison St. produced So.
66'
634.83
637.15
66'
old hub
158.89
New hub
old hub
120.0'
47.09
old hub
4.09
Pacific
stake
308.7
310.86
Mission Blvd
E.L. Mission Bay Blvd
stake
20'
stake
308.70
old stake
30'

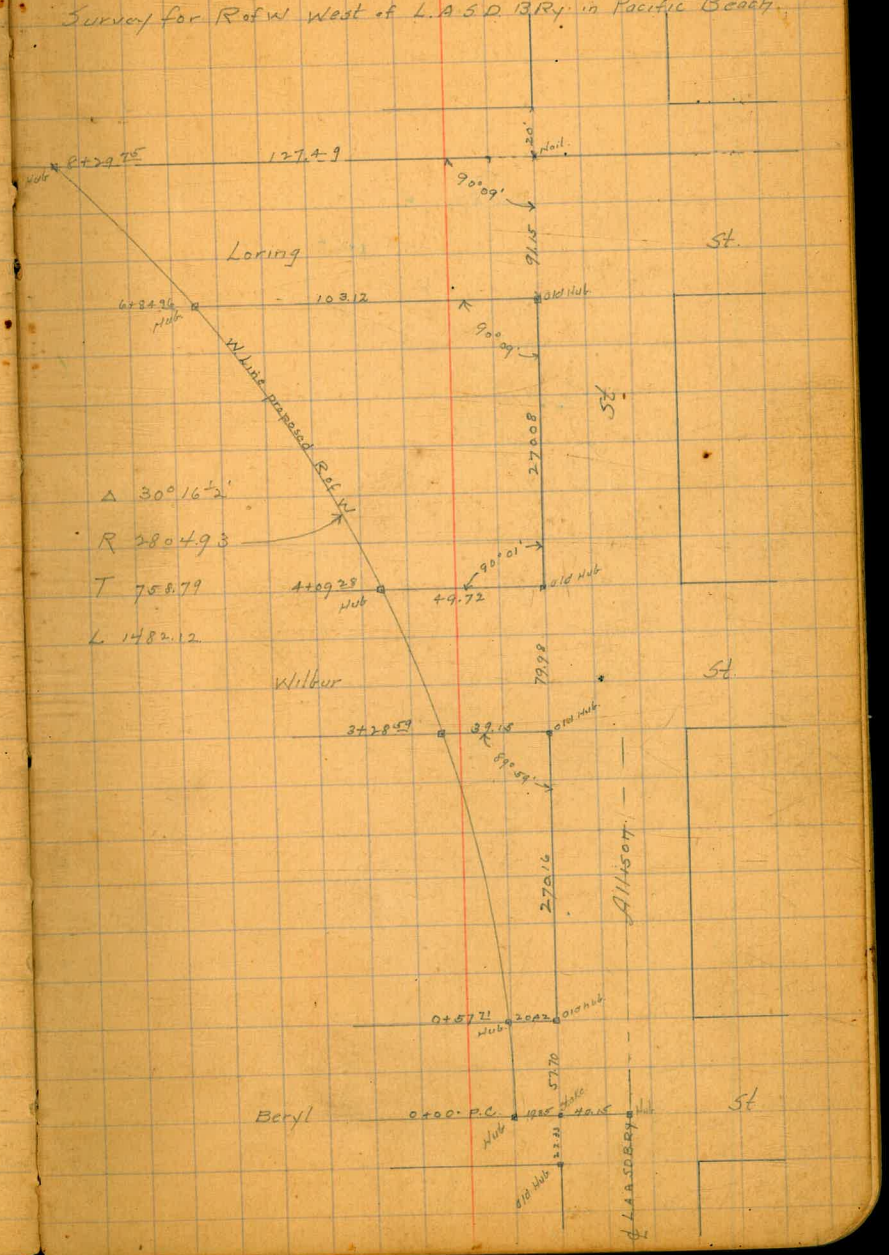
Location of Road between Lomo Park & Woodcrest

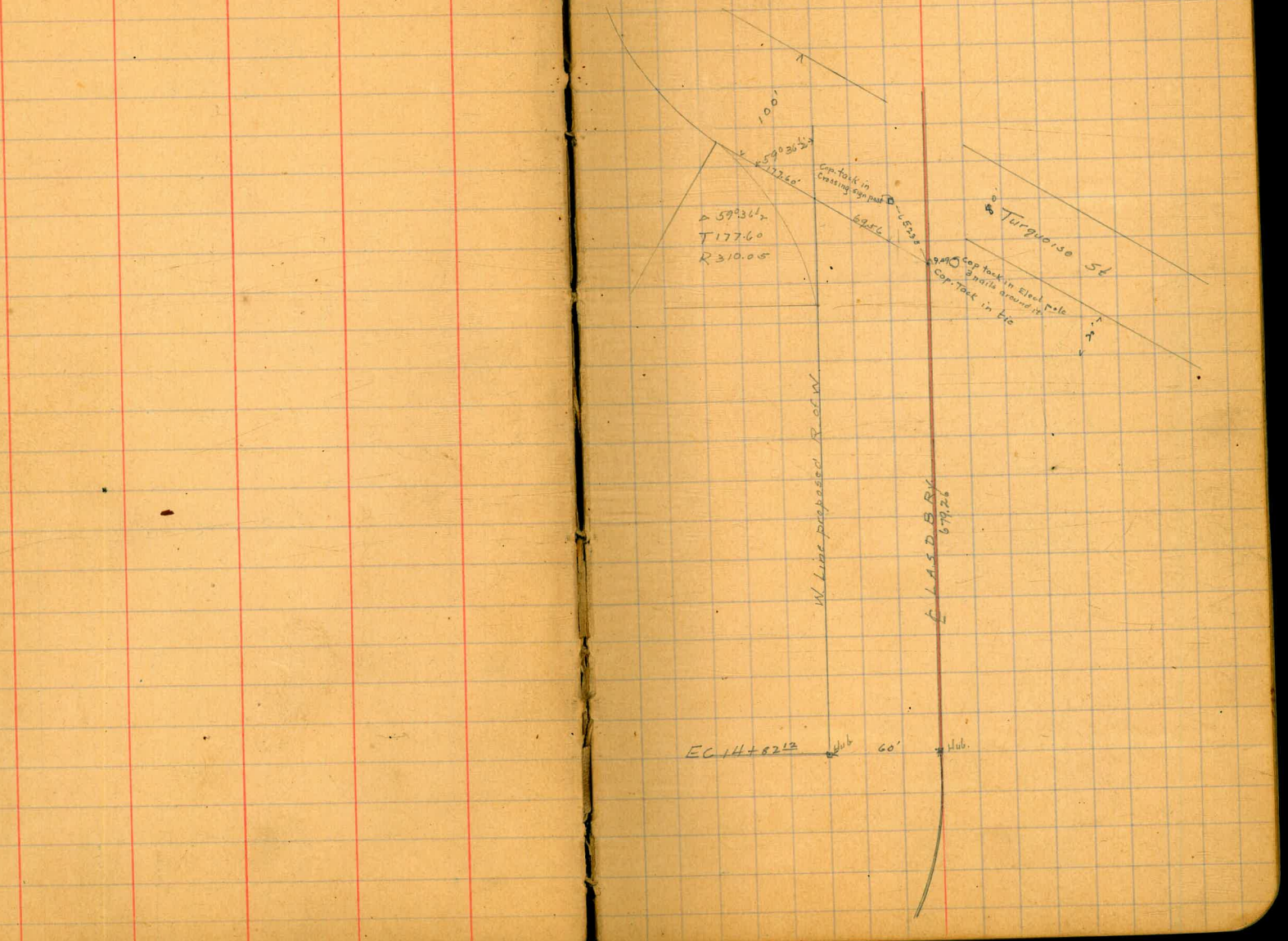


Additional Ties
FB 1679-2-4

Doris
Hancock
Herrick

Survey for R of W West of L.A.S.D. B.Ry. in Pacific Beach.

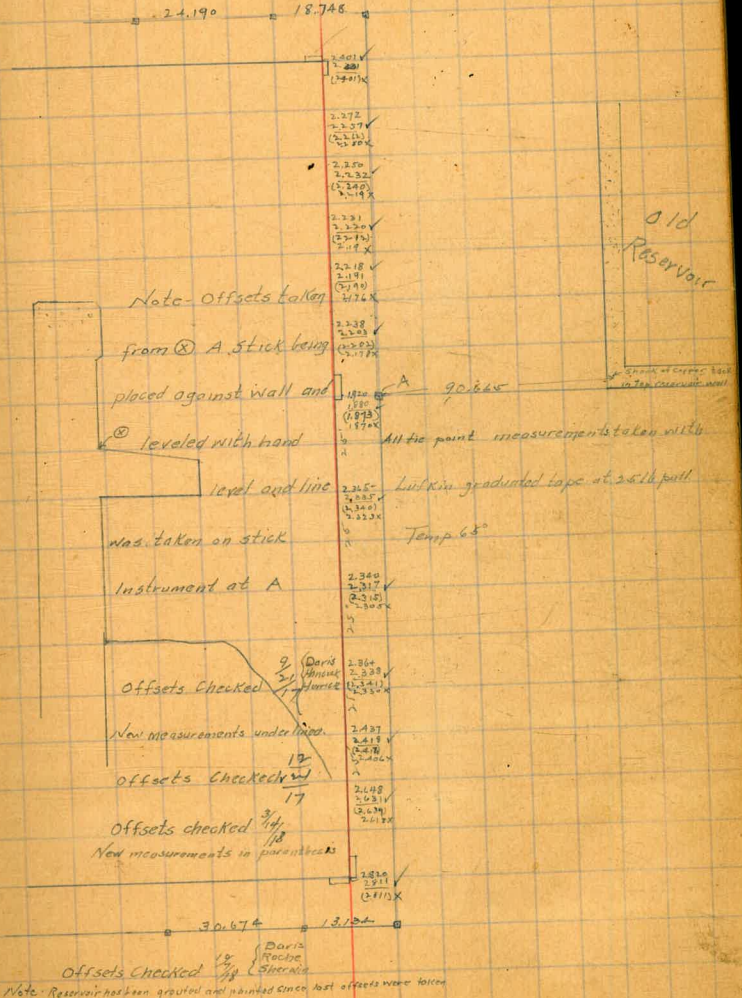



100'
Δ 59°36'½"
T 177.60'
Cap. tack in Crossing sign post
6956
Δ 59°36'½"
T 177.60
R 310.05
Cap tack in Elect. Pole
Spike around it
Cap. Tack in Pole
Turquoise St
W. Line proposed R of W
℄ LASDBRK
6926
EC 14+82.12
Hub
60'
Hub.

5/4/17 Davis Hancock Hoffman

21

Offset Line along North Wall of Reservoir to determine movement of wall.



5/4/19 { Davis, Hancock, Herrick

Offset Line Along apron
N. of Municipal Pier 20

determine movement of Apron Wall

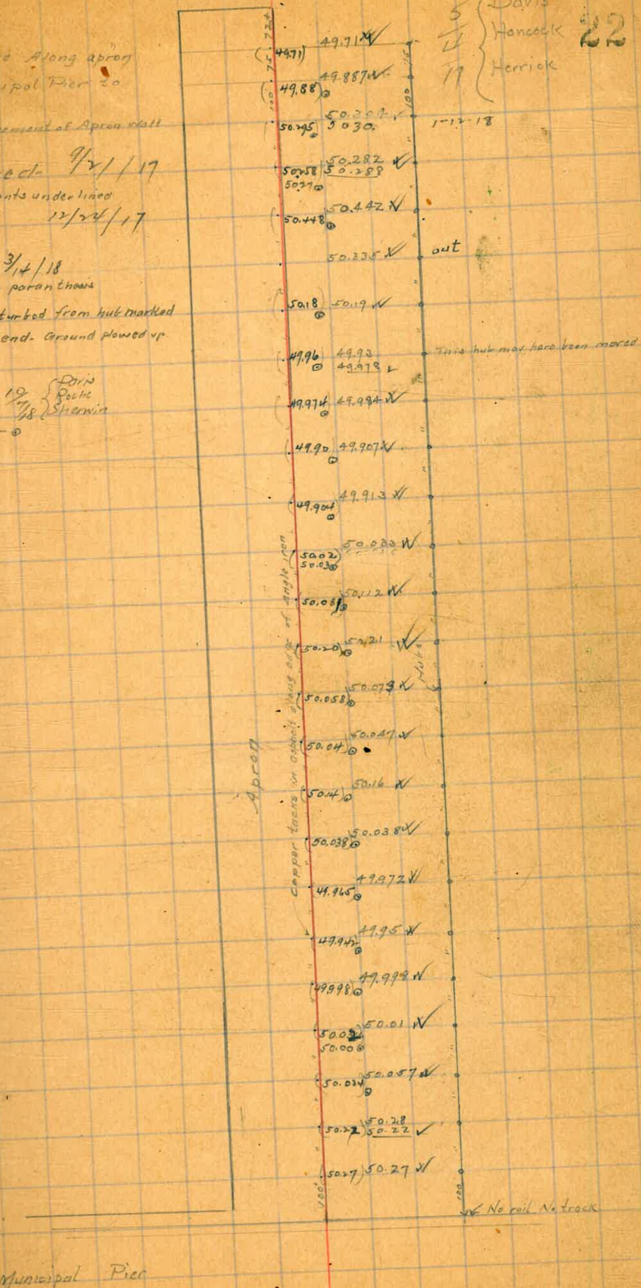
Remeasured 9/2/17
New measurements underlined

Remeasured 12/24/17

Remeasured 3/14/18
Measurements in parantheses

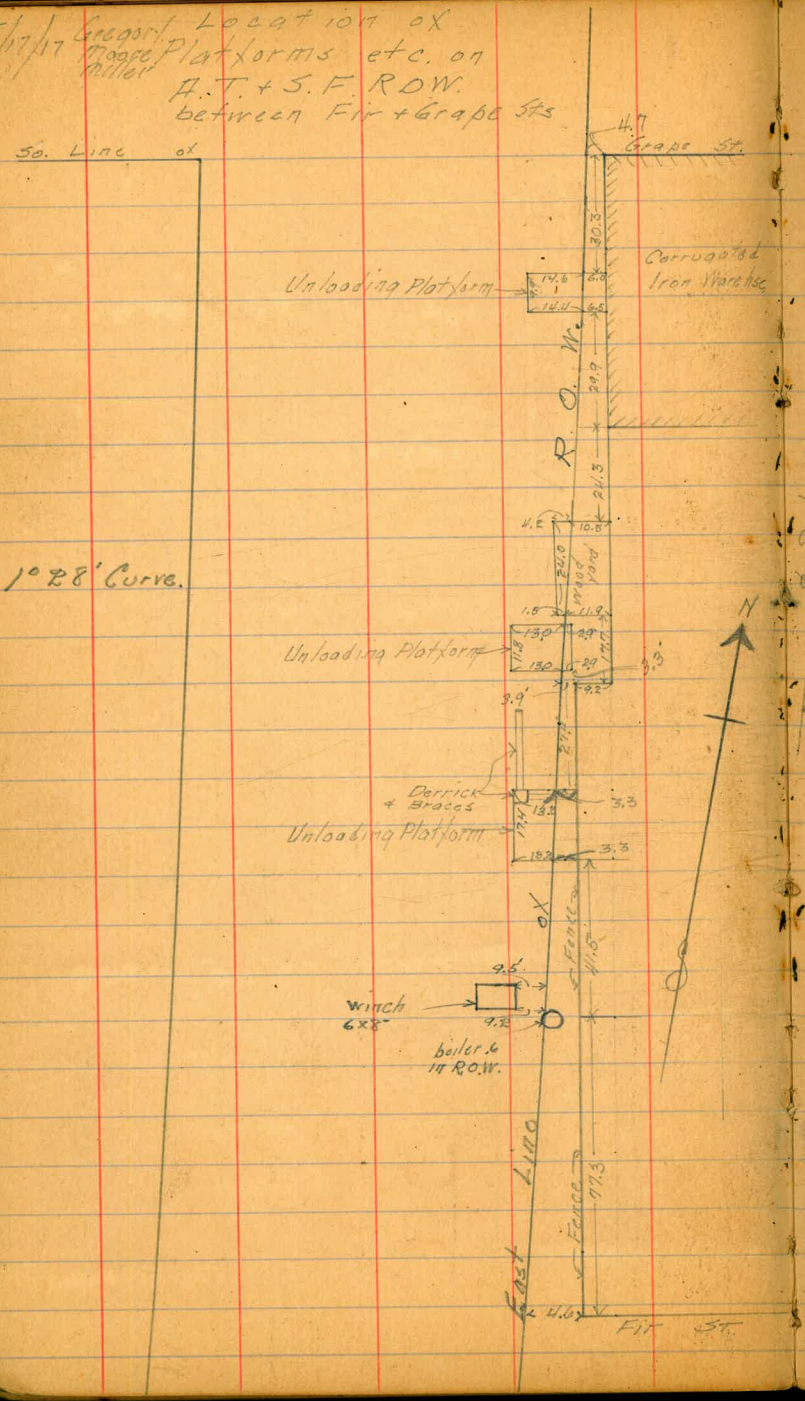
Note- Hubs disturbed from hub marked
out to north end- Ground plowed up

Remeasured 10/?/18 { Davis, Roche, Sherwin
New measurements - ⊙



5/17/17 Gregory Maple Miller

Location of Platforms etc. on A.T. & S.F. R.O.W. between Fir & Grape Sts

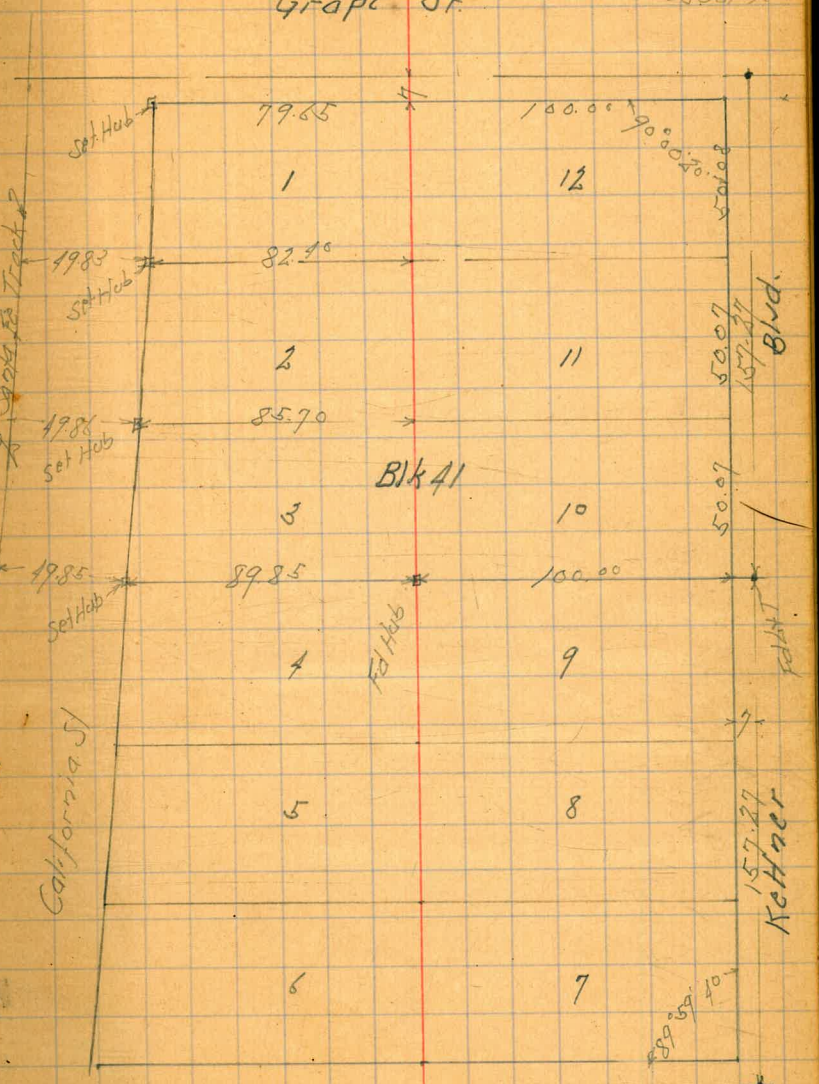


Survey of Lots 1-2-3-10 Block 41 Middletown

Indexed

24

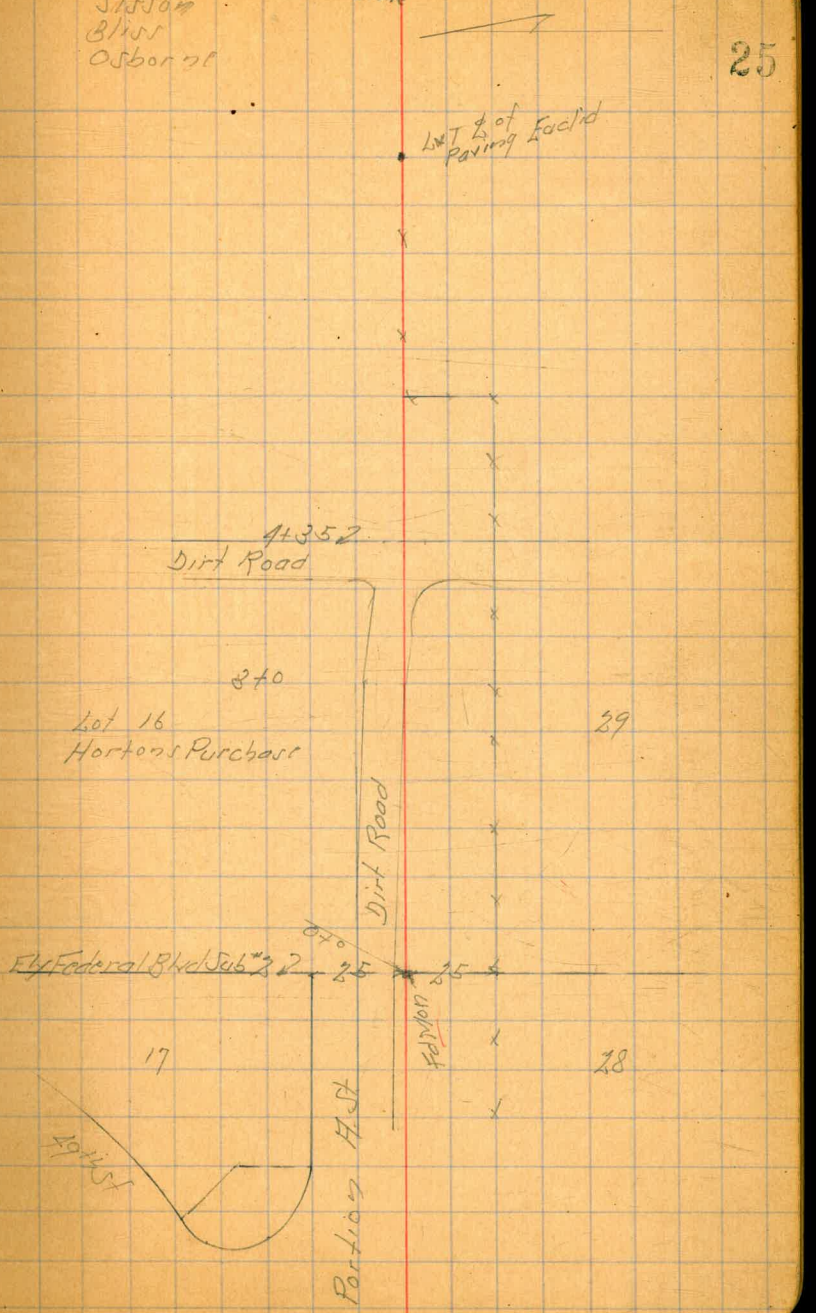
Oct 7-17
Sisson
Bliss
Osborne



Location of Dirt Road in
Lot 16 + 29 Hortons Purchase
Extension of H St. East of 49th St

Oct. 6-44
Sisson
Bliss
Osborne

Indexed
C.S.R.



5/25/m Gregory LINE and LEVELS
Moore
Miller. FOR PIPE LINE
from Pumping Plant in
Mission Valley
To Army Cantonment
on Mesa

22+17½ △ Stake + Tack.

Line

20+22.50 ⊡ Mon

Boundary

City

0+00 △ Stake + tack River Bank No. Side

88+2

66+50 △ 48°32' R.

47+60

28+20

10.27

Redwood hub

Harold's Random Linehub

						59.0		
					16	8.0	45.0	
					+45	7.0	46.0	
					+40	9.2	43.8	
					35	9.2	43.8	
					34	9.3	43.7	
					+30	9.4	43.6	
					23	8.5	44.5	
					22	7.8	45.2	
					21	7.8	45.2	
					20	7.7	45.3	
					19	6.6	46.4	
					18	6.3	46.7	
					17	4.7	48.3	
					16	5.2	47.8	
					15	5.1	47.9	
					+60	6.8	46.2	
					54	7.2	45.8	
						6.6	46.4	
					3+24	8.5	44.5	Δ
					+85	8.6	44.4	
					72	8.1	44.9	
					+52	8.7	44.3	
					51	8.6	44.4	River
					+65	7.8	45.2	
	1.60	56.91		55.31	+35	6.4	46.6	
on top Coping	N Floor Sump 1.78	59.00	5.69	5.12 2 = 4276	+20	7.6	45.4	✓
+31			8.0	45.00	00	3.7	49.3	

Assumed elev Floor of Pump House
Top Coping So. Sump.

LEVELS ON ARMY PIPE LINE

510.0 from Pipe 28

0+00 "B" Line	3.50	52.82	3.68	49.32	on stake
1			3.5	49.3	
2			3.7	49.1	
+35			4.6	48.2	
+40			7.3	45.5	
3			7.4	45.4	
+40			2.4	50.4	
+92			0.0	52.8	
T.P.	12.01	64.34	0.49	52.33	
4			10.6	53.7	
5			2.9	61.4	
T.P.	12.04	75.95	0.43	63.91	
T.P.	11.78	86.90	0.83	75.12	
+60			5.9	81.0	
6			0.9	86.0	
T.P.	5.54	92.20	0.24	86.66	
+50			2.3	89.9	
7			3.9	88.3	
+15			8.5	83.7	
+25			5.4	86.8	
+75			6.1	86.1	
8			11.0	81.2	
+23			10.3	81.9	off road.
+85			8.2	84.0	
9			3.6	88.6	
+70			6.1	86.1	
T.P.	12.79	104.53	0.46	91.74	
10			12.3	92.2	
T.P.	12.71	117.08	0.16	104.37	
+80			3.3	113.8	
11			1.1	116.0	
T.P.	12.55	129.01	0.62	116.46	
T.P.	12.84	141.72	0.13	128.88	
12			12.6	129.1	
T.P.	13.64	154.09	0.67	141.05	
13			12.0	142.1	
T.P.	12.85	166.42	0.52	153.57	
14			13.9	153.5	
+50			3.1	163.3	
T.P.	10.75	176.88	0.39	166.13	
15			12.4	164.5	
+50			0.9	176.0	
+85			8.6	168.3	
+90			13.3	163.6	
16			12.7	164.2	
+25			5.4	171.5	
+50			7.1	169.8	
+62			6.3	170.6	
T.P.	12.80	188.81	0.87	176.01	
17			3.1	185.7	
T.P.	12.53	201.23	0.11	188.70	
+60			4.7	196.5	

18			5.7	195.5	
+40			4.5	196.7	
+50			4.7	191.5	
19			4.2	197.0	
T.P.	13.11	213.51	0.83	200.46	
+65			7.6	205.9	
20			2.4	211.1	
T.P.	12.55	225.20	0.86	212.65	
20+22.50			6.49		Mon.
T.P.	12.64	237.78	0.61	224.59	
T.P.	12.72	249.29	0.66	236.57	
21			10.2	239.1	
T.P.	13.07	261.18	1.18	248.11	
+50			12.0	249.2	
22			4.9	256.3	
T.P.	11.51	272.56	0.13	261.05	
23			9.4	263.2	
24			6.7	265.9	
T.P.	12.85	285.37	0.04	272.52	
25			11.3	274.1	
T.P.	12.40	297.56	0.21	285.16	
26			8.3	289.3	
T.P.	11.81	308.92	0.45	297.11	
27			4.9	304.0	
T.P.	12.63	321.10	0.47	308.45	
+50			8.4	312.7	

28			0.5	320.6	
+20			+0.2	321.3	
+40			0.8	320.3	
29			5.3	315.8	
30			7.3	313.8	
T.P.	0.95	309.45	12.60	308.50	
31			3.8	305.7	
T.P.	0.69	297.68	RH6	296.99	Stake 82
32			1.5	296.2	
33			11.0	286.7	
T.P.	1.31	285.70	13.39	284.39	
+50			7.4	278.3	
+80			17.0	268.7	
34			17.2	268.5	
+50			14.1	271.6	
35			13.7	272.0	
+45			17.8	267.9	
36			10.4	275.3	
+60			5.5	280.2	
37			8.9	276.8	
T.P.	12.09	297.37	0.32	285.38	
38			2.3	296.1	
T.P.	12.45	309.71	1.11	297.26	
39			1.6	308.1	
T.P.	12.48	321.91	0.48	309.43	
40			1.2	320.7	

		32191			
T.P.	12.93	334.24	0.60	321.31	Top 5+40
41			1.1	333.1	
T.P.	12.76	346.53	0.47	333.77	Top 41
42			1.0	45.5	
T.P.	12.64	358.17	0.35	346.18	
43			5.9	52.9	
44			4.0	54.8	
+55			4.7	54.1	
T.P.	13.17	371.32	0.67	358.15	
45			10.7	60.6	
T.P.	12.83	383.31	0.84	370.48	
46			5.4	77.9	
T.P.	12.09	393.80	1.60	381.71	
+65			3.3	90.5	
T.P.	8.44	400.08	2.16	391.64	
47			6.8	93.3	
48			5.3	94.8	
49			6.7	93.4	
T.P.	4.88	391.76	13.20	386.88	
50			8.2	83.6	
T.P.	0.17	378.97	12.96	378.80	
51			3.9	75.1	
+20			5.0	74.0	
+50			9.0	70.0	
52			17.7	61.3	
53			16.7	62.3	

		379.0			
54			10.9	68.1	
+75			4.9	74.1	
55			0.5	78.5	
T.P.	12.33	390.75	0.55	378.42	
+50			1.5	89.3	
T.P.	10.87	400.85	0.77	389.98	
56			9.7	191.2	
57			10.2	908	
58			9.2	91.7	
59			7.3	93.6	
60			6.0	94.9	
61			4.2	96.7	
62			2.3	98.6	
63			1.8	99.1	
T.P.	8.48	407.82	1.48	399.37	
64			7.2	00.6	
65			6.6	01.2	
66			6.2	01.6	
+50 A	43°35' R.		5.43	02.4	
67			5.3	02.5	
68			5.4	2.4	
69			6.4	1.4	
70			9.5	98.3	
+40			14.2	95.6	
TP.	1.74	396.91	12.65	395.17	
+90			13.0	83.9	

		396.91		
71+40			8.6	388.3
72			10.4	86.5
+45			21.0	75.9
73			7.0	89.9
+50			1.9	95.0
T.P.	12.0	407.95	0.96	395.95
74			11.1	96.8
75			7.1	00.8
76			4.0	03.9
T.P.	7.90	412.65	3.20	404.75
77			6.8	5.8
78			5.5	7.2
79			4.8	7.9
80			4.8	7.9
81			7.8	4.9
82			8.7	4.0
83			8.5	4.2
84			10.0	2.7
T.P.	4.18	407.67	9.16	403.49
85			6.8	0.9
86			4.9	2.8
87			4.9	2.8
88			5.2	2.5
89			4.0	3.7
90			2.2	5.5
91			1.5	6.2

T.P.	7.15	413.50	1.32	406.35	
92			6.7	6.8	
93			5.7	7.8	
94			5.8	7.7	
95			4.3	9.2	
96			5.1	8.4	
97			5.2	8.3	
98			2.7	10.8	
99			3.1	10.4	
100			3.1	10.4	
101			3.0	10.5	
T.P.	6.43	416.56	3.37	410.13	
102			7.2	9.4	
103			6.4	10.2	
104			6.0	10.6	
105			5.2	11.4	
106			4.5	12.2	
107			4.7	12.9	
108			4.1	12.6	
+35	& 16°30 Left		3.8	12.8	Crosses to W side Rock
109+35			4.0	12.6	ctr Rd.
110			3.2	13.4	
T.P.	5.92	418.53	3.98	412.58	
111			5.3	13.2	
112			6.3	12.2	
113			6.8	11.7	

418.53

114			5.4	13.1
115			4.8	13.7
116			4.7	13.8
117			5.1	13.4
118			3.9	14.6
119			2.9	15.6
120			4.0	14.5
T.P.	2.06	418.03	2.56	415.97
121			1.5	16.5
122			2.8	15.2
123			2.1	15.9
124			2.5	15.5
125			3.2	14.8
126			4.2	13.8
127			4.8	13.2
128			4.7	13.3
129			3.6	14.4
130			2.0	15.0
131			2.7	15.7
T.P.	6.00	421.39	2.64	415.39
132			5.5	15.9
133			5.5	15.9
134			5.0	16.4
135			4.6	16.8
136			5.2	16.2
137			5.3	16.1
138			5.6	15.8
139			3.9	17.5
T.P.	3.78	422.00	3.17	418.22 OR=418.91
140			3.8	18.2
141			4.2	17.8
142			4.9	17.1
143			5.0	17.0
144			5.5	16.5
145			5.2	16.8
146			4.4	17.6
147			3.5	18.5
148			3.8	18.2
149			3.5	18.5
150			2.9	19.1
T.P.	6.63	425.77	2.86	419.14
151			6.9	18.9
152			6.3	19.5
153			5.5	20.3
154			5.3	20.5
155			4.4	21.4
156			5.3	20.5
157			7.0	18.8
158			7.2	18.6
159			7.5	18.3
160			6.7	19.1
T.P.	8.67	427.77	6.67	419.10

		427.77		
161			7.6	20.2
162			7.4	20.4
163			7.2	20.6
164			6.8	21.0
165			5.7	22.1
166			4.3	23.5
167			3.7	24.1
168			3.4	24.4
169			3.8	24.0
170			4.4	23.4
T.P.	6.40	429.77	4.40	423.37
171			7.6	22.2
172			8.3	21.5
173			8.3	21.5
174			8.2	21.6
175			6.9	22.9
176			5.2	24.6
177			5.1	24.7
178			6.0	23.8
179			6.5	23.3
180			8.1	21.7
181			8.5	21.3
T.P.	6.55	427.80	8.52	421.25
182			7.4	20.4
183			6.7	21.1
184			6.3	21.5
185			6.3	21.5
186			5.5	22.3
187			4.7	23.1
188			4.5	23.3
189			3.2	24.6
190			0.1	27.7
T.P.	2.33	430.03	0.10	427.70
+60			0.6	29.4
191			4.0	26.0
192			4.6	25.4
193			5.6	24.4
194			4.9	25.1
195			4.7	25.3
196			4.5	25.5
197			6.5	23.5
T.P.	0.92	423.05	7.90	422.13
198			1.0	22.1
199			1.3	21.7
200			1.9	21.1
201			3.4	19.6
202			4.2	18.8
203			5.7	17.3
204			7.1	15.9
205			10.3	12.7
+50			13.1	10.0
206			11.7	11.3

		423.05				417.7		
207			8.1	15.0	230		3.7	14.0
TP	9.37	424.28	8.14	414.91	231		4.7	13.0
208			7.1	17.2	232		5.2	12.5
209			6.7	17.6	233		7.1	10.6
210			5.2	19.1	234		7.6	10.1
211			4.1	20.3	235		8.3	9.4
212			4.7	19.6	236		14.1	3.6
213			4.3	20.0	237		7.8	9.9
214			4.7	19.6	TP	10.32	420.28	7.77 409.96
215			5.7	18.6	238		9.7	10.6
216			5.3	19.0	239		12.0	8.3
217	△ 4°30 Left		5.8	18.5	240		21.0	99.3
TP	3.08	423.02	4.34	418.94	241		11.6	08.7
218			4.6	18.4	242		7.9	12.4
219	218+24 = Normal to 4°30 L.		4.8	18.2	243		5.7	14.6
220			4.7	18.3	244		2.3	18.5
221			5.4	17.6	246		0.2	20.1
222			6.0	17.0	TP	3.24	423.31	0.21 420.07
223			6.6	16.4	246		3.0	20.3
224			6.3	16.7	247		3.0	20.3
225			7.3	15.7	248		3.7	19.6
TP	1.64	417.73	6.93	416.09	249		3.3	20.0
226			1.4	16.3	250		4.8	18.5
227			1.7	16.0	251		8.5	14.8
228			2.4	15.3	252		5.6	17.7
229			2.8	14.9	253		4.8	18.5

Gov't BM = cmkd elev = 419.78

		423.31		
254			3.5	19.8
255			2.7	20.6
T.P.	5.23	425.88	2.66	420.65
256			5.2	20.7
257			4.8	21.1
258			4.6	21.3
259			5.6	20.3
260			5.3	20.6
261			5.5	20.4
262			5.0	20.9
263			3.2	22.7
264			2.7	23.2
265			2.3	23.6
266			2.4	23.5
+P	6.12	429.57	2.43	423.45
267			5.7	23.9
268			4.5	25.1
269			4.2	25.4
270			4.4	25.2
271			4.8	24.8
272			6.7	23.9
273			8.3	21.3
274			7.7	21.9
275			6.5	23.2
276			6.3	23.3
T.P.	1.91	25.00	6.48	423.09

		425.0		
277			2.9	22.1
278			4.8	20.2
279			7.7	17.3
+45			12.8	12.2
T.P.	0.36	412.66	12.7	412.30
T.P.	0.21	400.04	12.83	399.83
T.P.	0.72	388.11	12.65	387.39
T.P.	0.03	375.39	12.75	375.36
280	1'		4.3	71.1
T.P.	1.07	363.96	12.50	362.89
T.P.	0.97	351.98	12.95	351.01
+50			7.8	44.2
T.P.	1.22	340.61	12.59	339.39
281			2.1	38.5
+40			7.2	33.4
+80			5.9	34.7
283			5.8	34.8
284			7.5	33.1
+85			9.3	31.3
+86			9.2	31.4
+75			9.2	31.4
T.P.	12.37	350.25	2.73	337.88
+50			11.3	39.0
+87			9.2	41.1
+88			3.7	46.6
T.P.	12.83	361.22	1.86	348.39

		361.22			
289			2.7	58.5	road.
T.P.	12.12	372.93	0.41	360.81	
T.P.	13.24	385.72	0.45	372.48	
290			11.6	74.1	
T.P.	12.20	397.92	0.0	385.72	
291	0.		13.3	84.6	
T.P.	12.78	410.17	0.53	397.39	
292			5.7	04.5	
T.P.	12.77	422.79	0.15	410.02	
T.P.	12.01	433.57	1.23	421.56	
293			11.5	22.1	
294			5.0	28.6	
T.P.	1.73	434.85	0.45	433.12	
295			4.5	30.4	
296			4.0	30.1	
T.P.			4.48	430.37	True = 8.46 lower

5/28/19 Gregori "C" LINE + LEVELS
Moore
Miller FOR ARMY PIPE LINE.

Page 26
"B" Line "C" LINE
280+55 = 280+55 Δ 40°45 R (approx) see page 71 for correct Δ + sta.

T.P.	4.54	342.42		337.88
280+55			0.3	342.1
281			6.2	336.2
+65			8.5	333.9
282			6.9	335.5
283			6.1	336.3
+50			6.5	335.9
+55			9.0	333.4
284			6.7	335.7
+45			6.5	335.9
+50			8.7	333.7
+70			7.6	334.8
+75			6.0	336.4
285			5.4	337.0
+55			5.9	336.5
+60			8.1	334.3
286			7.9	334.5
+55			7.1	335.3
T.P.	13.79	355.69	0.02	342.40
+65			10.1	345.6
287			7.5	348.2
T.P.	12.76	367.18	1.27	354.42
288			11.4	355.8
289			1.0	366.2
T.P.	12.95	380.14	+0.01	367.19
290				378.1
T.P.	12.35	392.44	0.05	380.09
291			4.0	388.4
T.P.	12.82	405.26	0.0	392.44
T.P.	12.63	417.78	0.11	405.15
292			12.1	405.7
T.P.	10.39	427.53	0.64	417.14
293			8.2	419.3
+50			8.4	419.1
294+20			20.8	406.7
+60			8.1	419.4
295			5.6	421.9
296			3.1	424.4
TP	8.39	433.58	2.34	425.19
+25			8.7	424.9 ctr rd.
297			7.3	426.3
298			4.1	429.5
299			2.8	430.8
300			1.9	431.7
TP.	10.17	441.81	1.94	431.64
301			9.1	432.7
302			.85	433.3
303			7.3	434.5
304			5.1	436.7
305			4.1	437.7
306			3.6	438.2

		443.81			
307			4.1	437.7	
308			6.0	435.8	
309			5.6	436.2	
310			6.8	435.0	
TP	8.41	443.09	7.13	435.68	
311			9.5	433.6	
312			8.1	435.0	
313			5.8	437.3	
314			5.1	438.0	
315			4.6	438.5	
316			4.6	438.5	
317			4.4	438.7	
318			4.4	438.7	
319			4.1	439.0	
320			3.2	439.9	
TP	8.80	444.81	3.08	441.01	
321			8.1	440.7	
322			7.6	441.2	
323			7.6	441.2	
324			6.4	442.4	
325			5.1	443.7	
+40			5.1	443.7	Ctr rd.
326			5.0	443.8	
327			3.9	444.9	
TP	13.13	458.10	3.84	444.97	
328			12.7	445.4	
329			11.3	446.8	
330			10.8	447.3	
331			10.9	447.2	
332			8.2	449.9	
333			6.1	452.0	
334			2.9	455.2	
TP	9.99	465.64	2.65	455.65	
335			8.7	456.9	
336			6.8	458.8	
337			6.8	458.8	
338			6.8	458.8	
339			5.3	460.3	
TP	11.36	471.70	5.30	460.34	
340			8.4	463.3	
341			6.9	464.8	
342			6.5	465.2	
343			5.8	465.9	
344			4.4	467.3	
345			4.3	467.4	
TP	7.73	475.16	4.27	467.43	
346			7.4	467.8	
347			6.9	468.3	
348			6.8	468.4	
349			6.6	468.6	
350			5.9	469.3	
351			4.9	470.3	

↑ N.G. seepage 56

47516

352			4.7	470.5
T.P.	838	478.89	4.65	470.51
353			8.9	470.0
354			7.6	471.3
355			6.6	472.3
356			6.7	472.2
357			6.3	472.6
358			5.4	473.5
359			5.3	473.6
360			5.2	473.7
361			4.8	474.1
362			4.7	474.2
363			4.7	474.2
364			5.0	473.9
365			4.2	474.7
T.P.			4.18	474.71

N/6 bk 6 page 6

Levels on Reservoir

B Line
127+70 = 00 ∆ 90° R.

6+00 = 00 on Reservoir Traverse 61° L.

2+40 28°30' R.

4+85 55°50' R.

9+85 33°00 R.

11+00 34°00 R.

15+00 66°00 R.

16+60 77°00 R.

19+70 20°00 L

21+50 33°00 L

24+35 41°01 R.

25+37.60 = 00 76°39' R to 2+40

Levels for Reservoir

			Rock	
on T.P	538	420.77	415.39	Sta 131
=127+70 00 on 90° Line.		7.6		
+25		7.3		o/s road
1		7.2		
2		6.2		
3		6.2		
4		5.4		
5		5.2		
6 = 00 on Reservoir Traverse		4.9		
T.P	587	423.55	4.09	416.68 Top 00
00+50		6.4	416.2	
+75		5.5	17.1	
1		6.5	16.1	
+75		6.2	16.4	
2		5.9	16.7	
+40 ∆		5.4	17.2	
+50		6.0	16.6	
3		5.5	17.1	
4		5.0	17.6	
+40		4.7	17.9	
+65		3.7	18.9	
+85 ∆		4.2	18.4	80' R = Water Line 7.2
5		4.6	18.0	
6		4.8	17.8	
+10		4.8	17.8	
+10		3.7	18.9	

+65	5.1	17.5
7	5.1	17.5
8	4.9	17.7
9	5.1	17.5
+85 △	5.1	17.5
10	5.6	17.0
+55	5.5	17.1
+70	4.6	18.0
11 △	5.4	17.2
+50	5.5	17.1
+70	3.1	19.5
12	5.3	17.3
+45	3.6	19.0
+50	4.9	17.7
13	4.6	18.0
14	5.5	17.1
+80	4.6	18.0
15 △	5.3	17.3
+20	6.1	16.5
+40	4.6	18.0
+63	5.5	17.1
+75	4.0	18.6
16	6.3	16.3
+30	6.7	15.9
+60 △	6.2	16.4
+70	5.3	17.3

17	6.2	16.4
+20	6.4	16.2
+60	4.7	17.9
+80	6.1	16.5
18	5.9	16.7
+80	5.2	17.4
19	4.6	18.0
+45	5.1	17.5
+70 △	4.3	18.3
+80	4.1	18.5
20.	5.1	17.5
+20	4.5	18.1
+45	5.0	17.6
+75	3.6	19.1
21	3.9	18.7
+50 △	3.7	18.9
+80	2.7	19.9
22	3.0	19.6
+70	3.7	18.9
23	4.8	17.8
+30	5.3	17.3
+50	4.3	18.3
+80	5.9	16.7
24	5.7	16.9
+45	6.2	16.4
+35 △	5.6	17.0

422.51

+55	4.6	18.0
+80	6.5	16.1
25	6.5	16.1
25 + 32.6	6.7	415.9

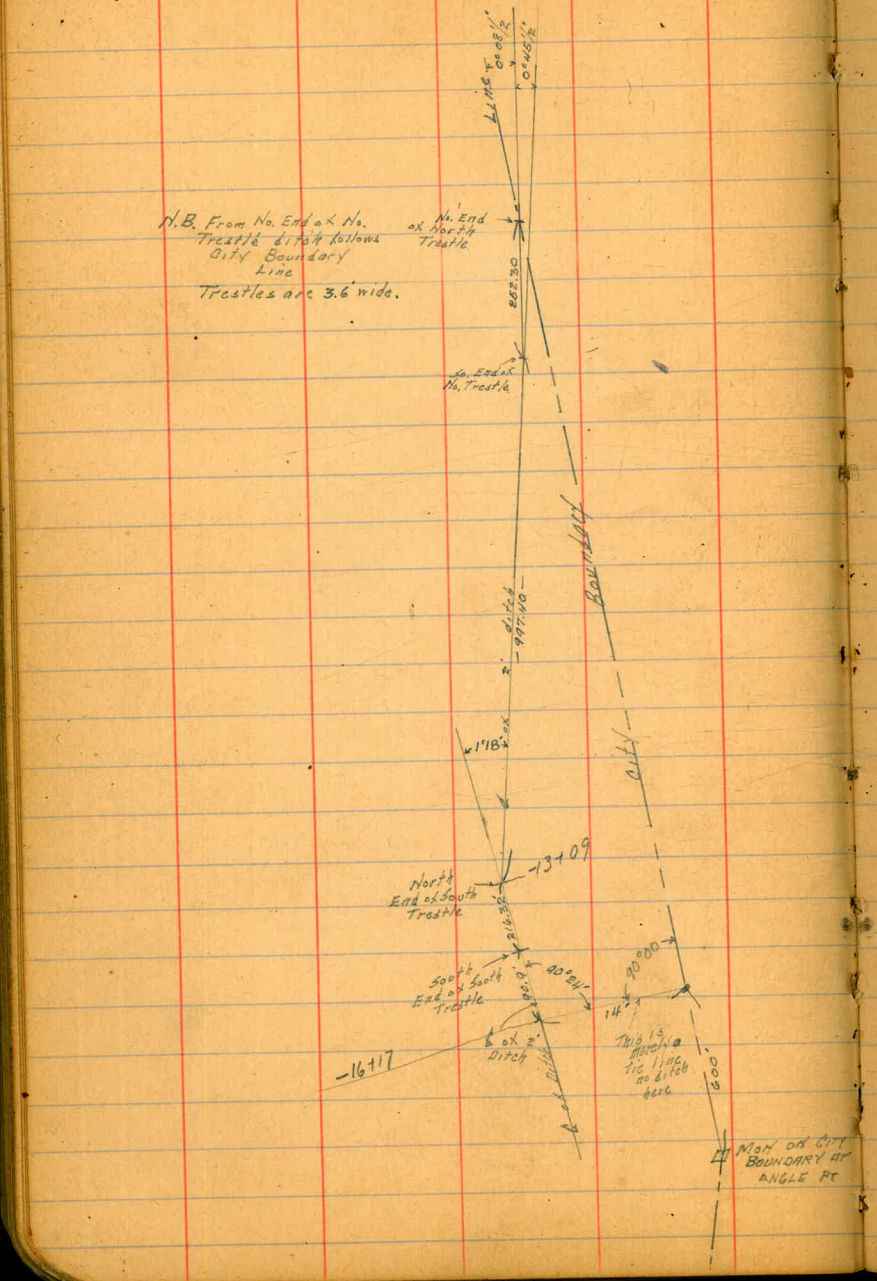
Levels from 0+00 to 9+85 in bed of Lake

422.55

00	6.7	15.9
+80	7.1	15.5 edge of Lake
1	7.3	15.3
2	7.7	14.9
3	7.8	14.8
4	8.2	14.4 = lowest point
5	7.8	14.8
6	7.6	15.0
+75	7.8	15.4 = edge of Lake
7	6.3	16.3
+92.20 = 9+85.	5.1	17.5

6/6/17 Gregory Moore Miller

Location of Contonment Pipe Line Across San Diego River



6/11/12
Gregory Moore Miller

SAN CLEMENTE DAM SITE

Levels on Dam Site

00 = No. End Dam.	1.24	426.24		425.00 = assumed elev	
+20			4.0		
+45			6.7		
+65			12.6		
T.P.	1.08	414.63	12.69	413.55	
+80			6.7		
T.P.	0.55	402.28	12.90	401.73	
1+0			9.1		
+17			9.9		
T.P.	3.21	392.79	12.70	389.58	
+39			11.1		
+47			7.6		
+55			8.1		
+70			7.4		
+80			7.8		
2+10			9.0		
+18			10.8		= check
+28			11.4		= check
+30			9.6		
+35			9.2		
+39			7.5		
+44			2.5		
T.P.	11.93	403.96	0.78	392.01	
+55			9.8		
+64			5.3		
T.P.	13.14	415.73	1.35	402.59	

414.6
3.27
1.98

2+45			11.6		
3+15			9.1		
3+30			7.3		
T.P.	12.19	425.88	2.04	413.69	
+55			11.1		
+75			7.3		
+95			5.0		
4+20			2.5		
4+44.6			0.88		= 20 ft. E. of dam.

6/11/17 Gregory Moore Miller

Traverse around Reservoir.

117.16	△	83°47	L
86.10	△		L
11+60	△		R.
9+59.81	△	16°27'	R
7+80.55	△	23°26'	L
6+66.13	△	33°07'	L
4+48.47	△	6°09'	L
3+71.16	△	16°06	L
0.0 ⊠		83°42'	R from 4+48.6 So. Exterior angle.

~364+00 OK.

365+00	32°33'R	4.30	479.01		474.71
T.P.	371+12	4.98	485.37	1.62	477.39
T.P.	376+52	5.18	486.68	0.87	481.50
T.P.	380+68	5.29	490.70	1.27	485.41
T.P.	384+62	6.21	495.94	0.97	489.73
	387+74				
T.P.	391+54	10.00	503.14	2.80	493.14
	398+94			7.6	495.5 Fence
	394+50			4.94	498.20
	399+50			0.60	502.54

347+76.5

307+50 ⊙

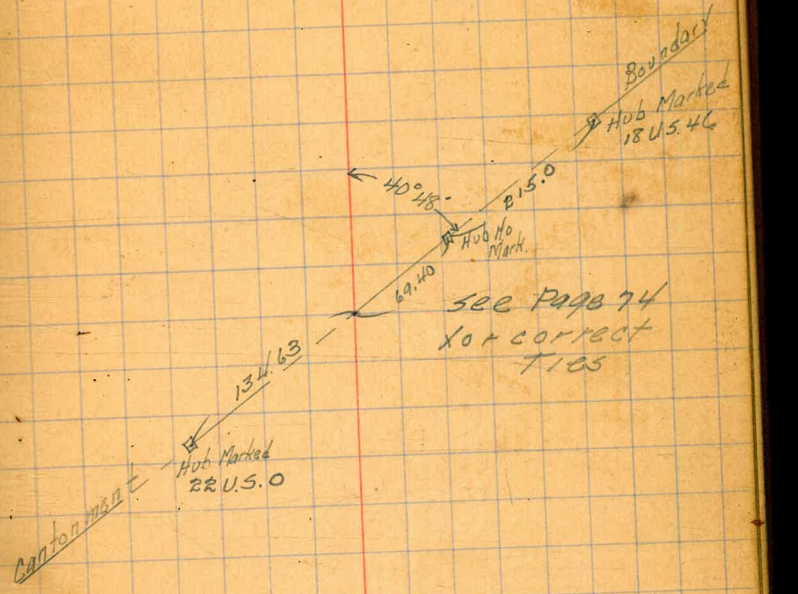
287+80 △ 20°16' R.

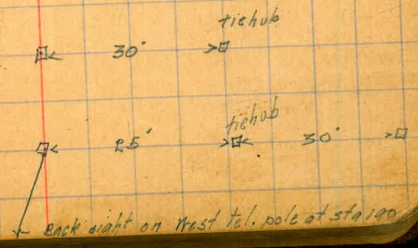
280+59.10 △ 69°48½' R. to Reservoir Line

(280+43.77) △ 39°23' R. to "C" Line see page 71 for correct △

230 △

218+24 △ 4°30' L △

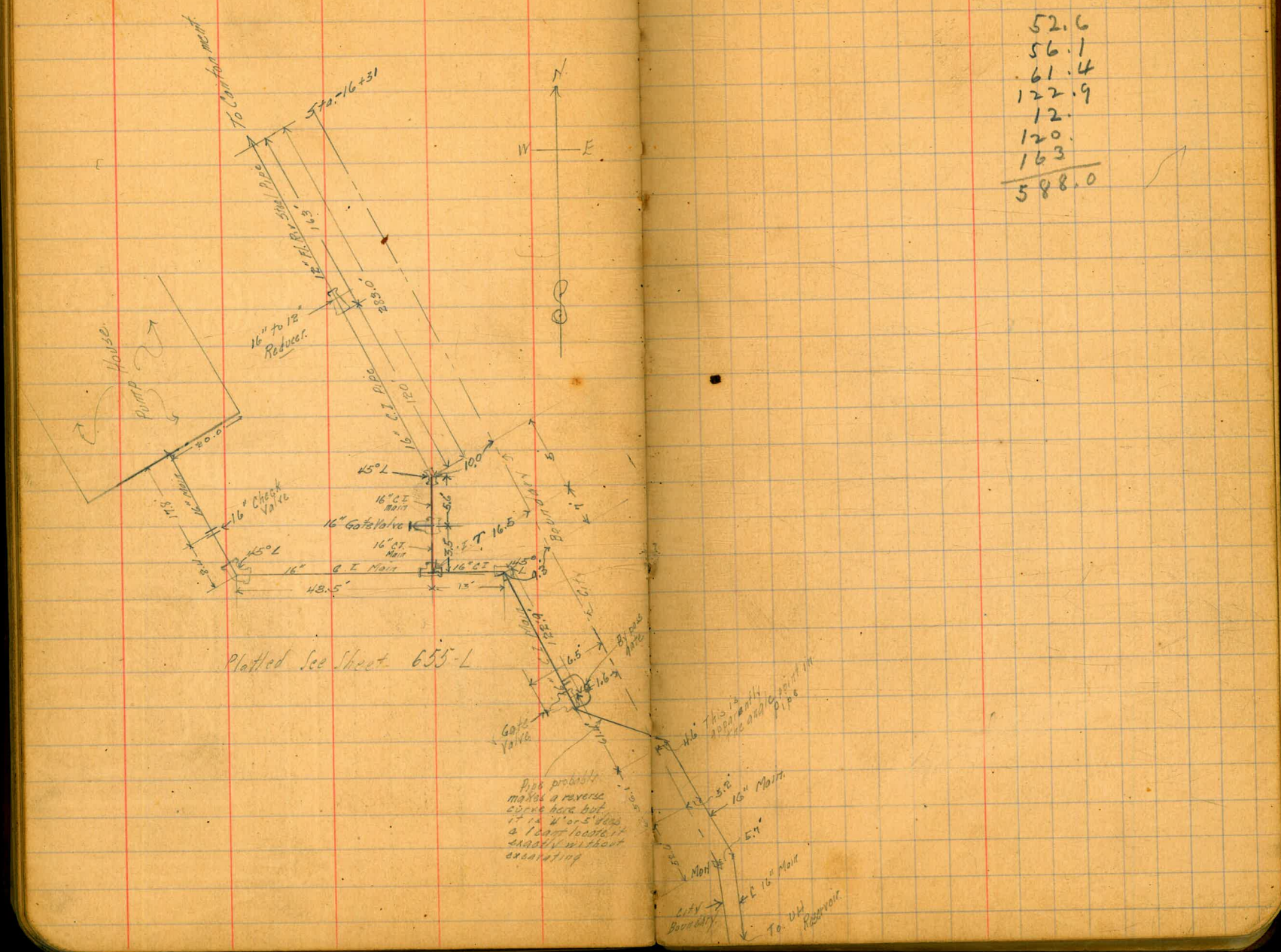




6/24/17

Gregory Moore Miller

Layout of Mains at Mission Valley Pumping Station to connect with Cantonment Pipe Line



52.6
56.1
61.4
122.9
12.
120.
163
588.0

Levels from 16+31 So. to 16" Tee.

B.M.	6.33	57.55		51.22	Top Coping ox Sump.
-16+31			10.0		
-17			8.4		
-17+50			7.4		
-17+74.2			5.9		
-18+00			4.6		
-18+25.4			3.2		
-18+45			2.0		
T.P.	7.57	64.87	0.25	57.30	
-18+62.4			7.2		
-19+00			2.4		
-19+12.2	Δ		1.5		
-19+21.3	Tee		0.9		

6/25/12 Gregory Moore Miller

"D" Line Containment Pipe Line

T.P.	2.60	477.31		474.71	
T.R	5.19	475.61	6.89	470.42	Station 349
349+00 Δ 12°00' R			6.6	469.0	
350			6.4	469.2	
351			5.4	470.2	
352			4.7	470.9	
353			4.4	471.2	
354			4.0	471.6	
355			3.4	472.2	
356			3.0	472.6	
357			2.0	473.6	
T.P.	8.60	482.16	2.05	473.56	
358			8.0	474.2	
359			7.1	475.1	
360			7.2	475.0	
361			6.5	475.7	
362			6.2	476.0	
363			5.4	476.8	
364			4.9	477.3	
365			3.9	478.3	
366			4.3	477.9	
367			3.0	479.2	
T.P.	5.50	484.55	3.11	479.05	
368			6.1	478.5	
369			5.8	478.8	
370			5.2	479.4	

371			5.2	479.4
372			5.5	479.1
373			4.9	479.7
374			4.2	480.4
375			3.1	481.5
376			1.9	482.7
T.P.	10.30	492.68	2.17	482.38
377			8.2	484.5
378			7.6	485.1
379			5.8	486.9
380			5.3	487.4
381			5.3	487.4
382			5.0	487.7
383			5.0	487.7
384			5.3	487.4
385			3.2	489.5
386			3.6	489.1
T.P.	6.32	496.73	2.27	490.41
460			5.3	491.4
387			7.1	489.6
388			5.2	491.5
389			4.5	492.2
390			3.7	493.0
391			2.9	493.8
392			2.5	494.2
TP			2.11	494.68

397+75 = junction of Roads L

6/29/17
Gregory
Moore
Miller

Final Survey of Containment Pipe Line

-16+31

-17+47.20

-17+92.2

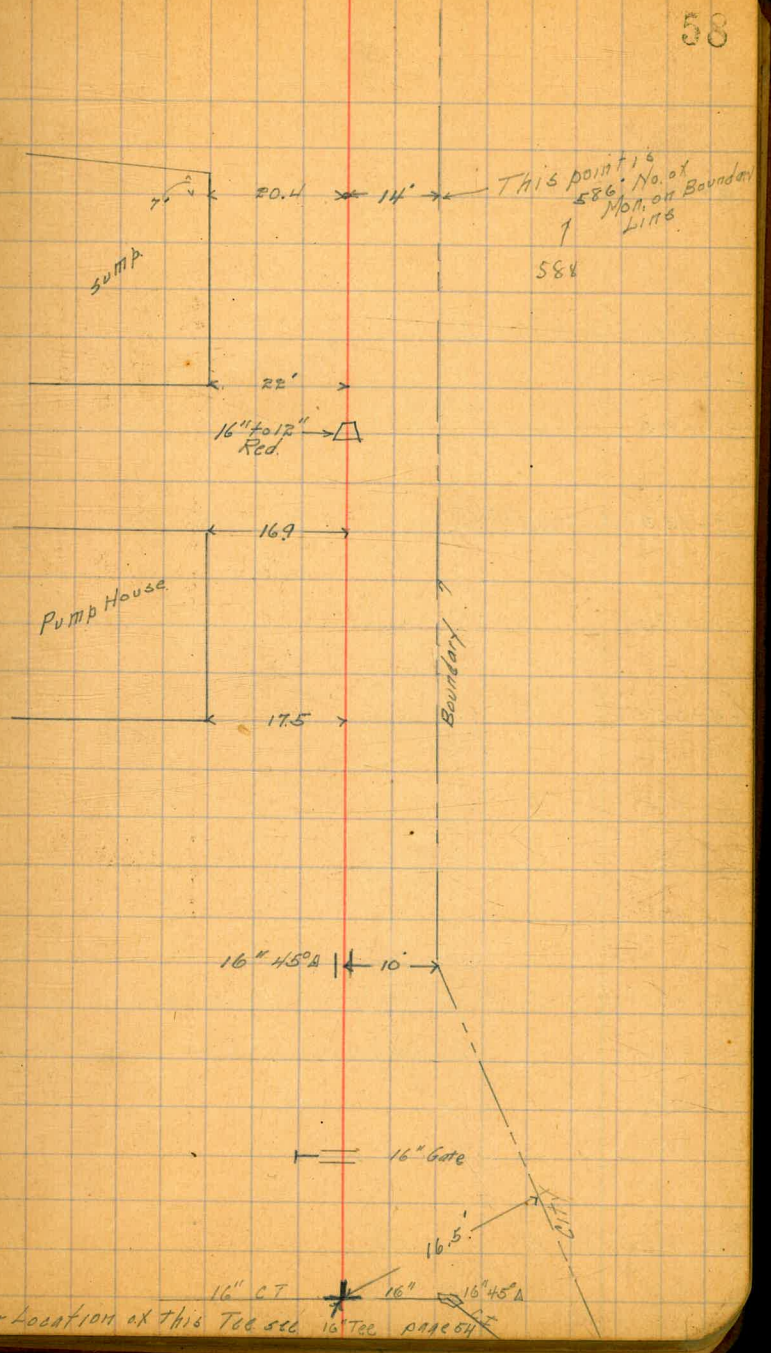
-18+25.4

-18+62.4

-19+12.2 45° L.

-19+17.8

-19+21.3



0+00

-0+60.08 Δ 0°08½' L

-0+70

-1+00

-3+12.38 Δ 0°45½' L

-4+97.5

-9+25.5

-10+28

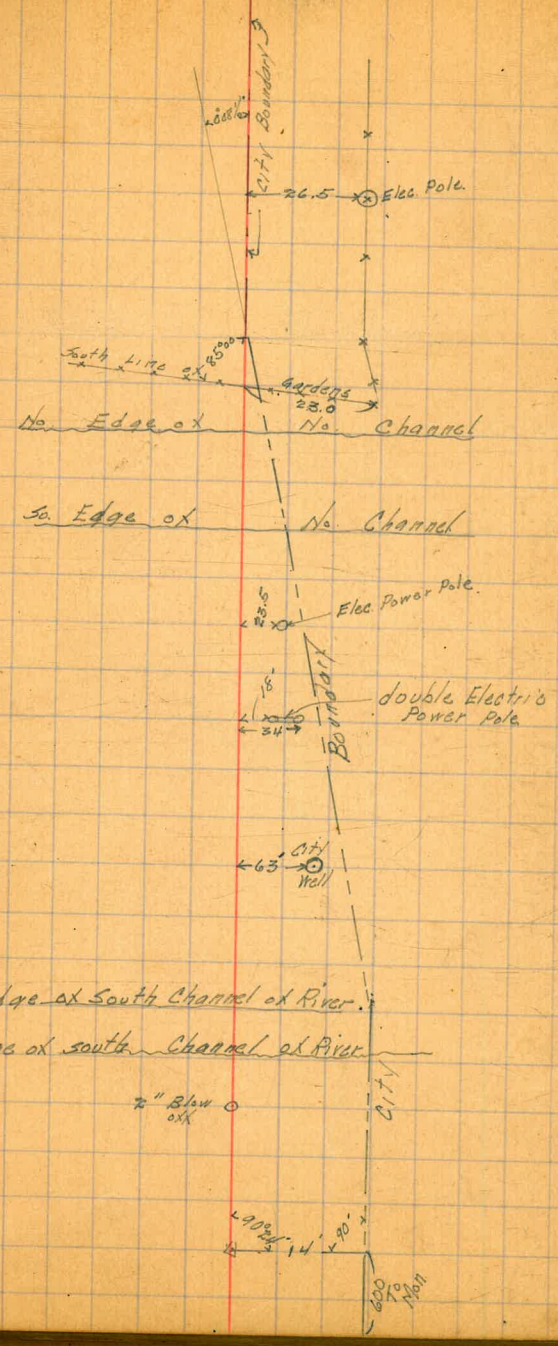
-13+09.78 Δ 1°18' R

-15+26

-15+31

-

-16+17 Δ 0°28' R



7+20.

6+44

5+99.5

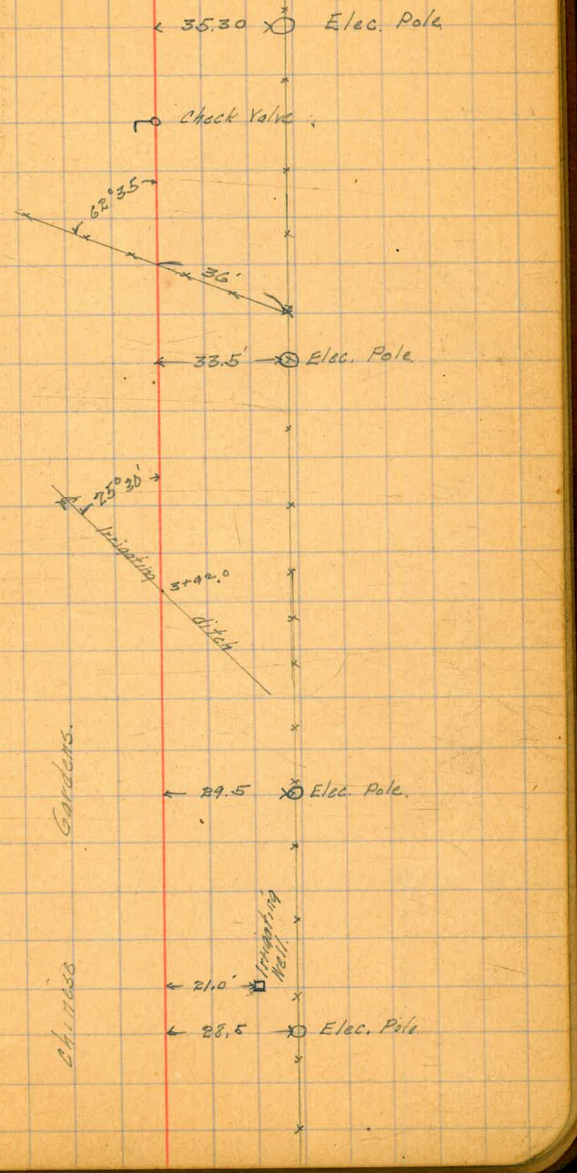
5+71

3+92.0

3+51

1+57

1+48



15+51

12+79

12+74

12+10

11+79

10+85.5

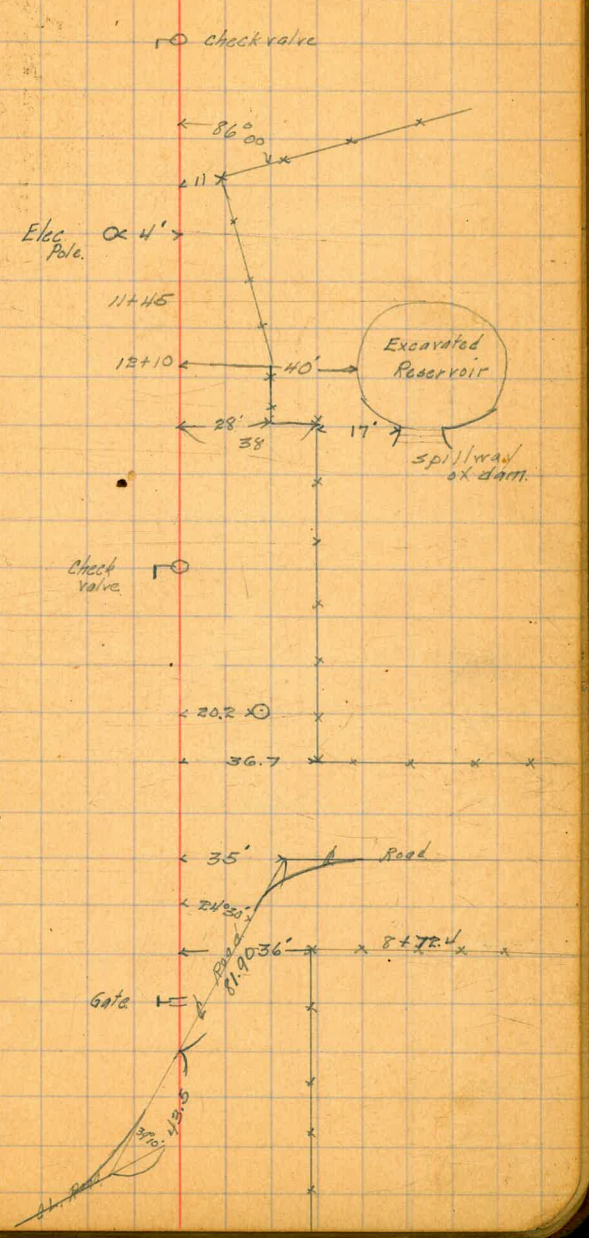
9+25

9+12.5

8+72.4

8+61.2

8+27



26+24

Elec pole ⊙ 45?

23+23

Elec pole ⊙ 45

20+23

Elec Pole ⊙ 45?

18+50

Blow off.

18+00

Pipe is exposed here for 20' it is on a good place to slough off during rains should be braced

17+65

check valve

16+24

Elec Pole ⊙ 45?

15+93

2" Blow off

36+62.3

35+81

35+41

33+80

33+24.5

32+00

31+00

29+75

29+00

Check Valve

<5'>

2" Blow off

2" Blow off

Elec pole <31'>

70.5

<66'> 4x4 post Marked P.L. Line on SE -- 118W - SW

98.5

Elec pole <45'>

1" check valve

53+75

51+97.5

50+74.6

47+99.3

46+76

42+74.5

39+25.3

36+99

Elec pole ⊙ x 45'

Line

2" Blow off

Elec pole ⊙ x 5'

check valve

Elec pole ⊙ x 45'

Elec pole ⊙ x 5'

Power

Elec Pole ⊙ x 5'

2" Blow off.

71+53.0

68+87.0

67+99.0

67+88.4

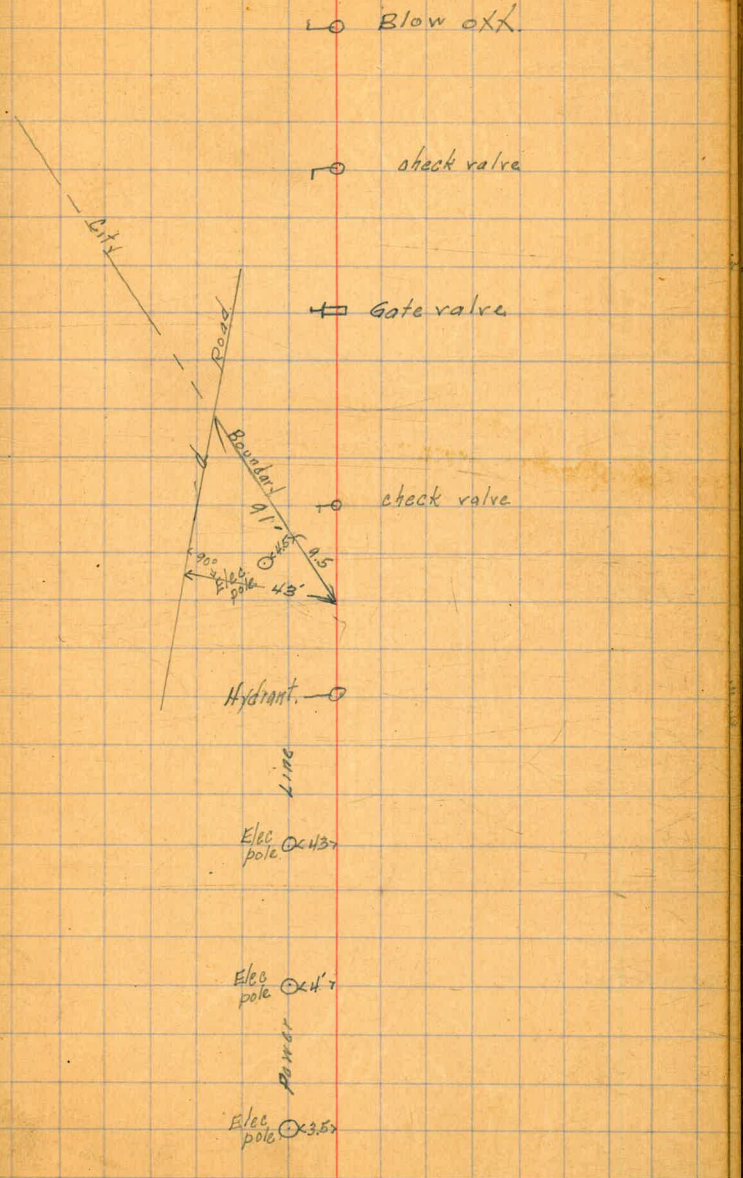
66+56.9 △ 43°35' R.

66+38

64+26

60+76.5

57+25.3



92+79.0

91+22.5

89+64.0

88+07.0

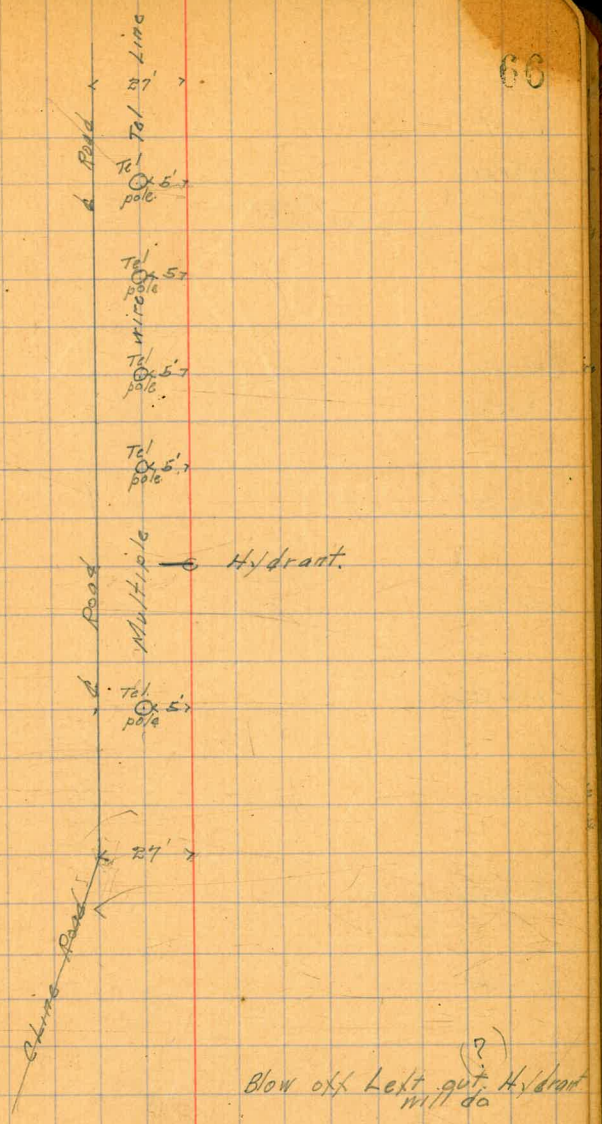
87+28.0

86+81.0

86+38.5

84+98.5

80+03.5



109+16

108+66.3

108+31.0

108+27.5 △ 16°30' Left

107+10.5

105+98.5

105+48.5

103+89

102+25.5

100+62.5

99+04.5

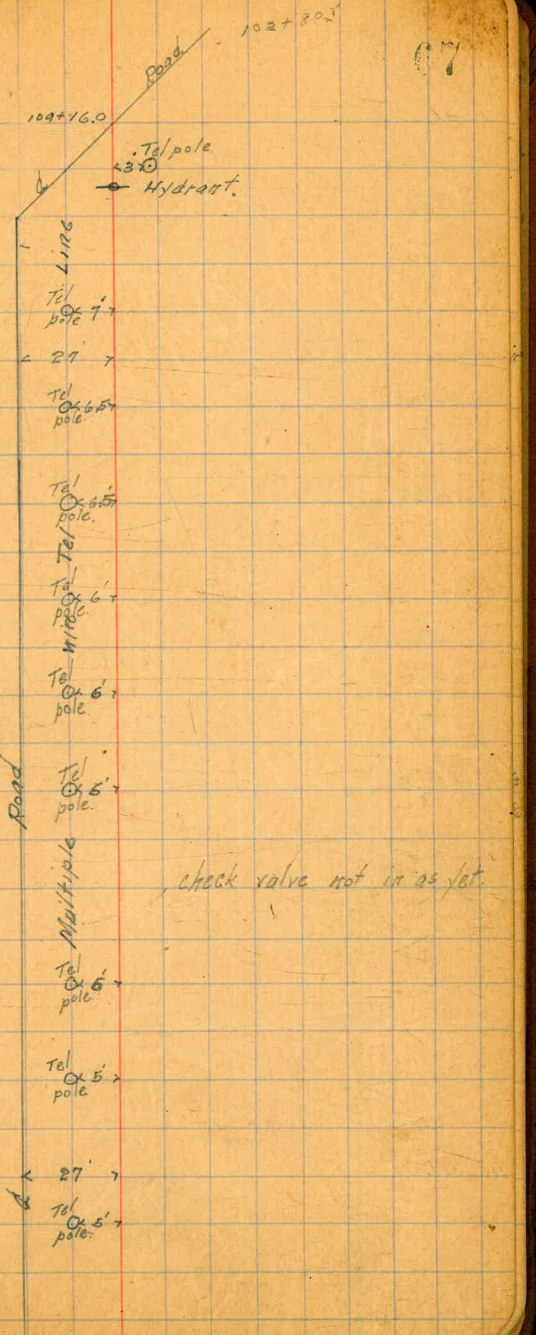
98+08.5

97+47.0

95+89.0

94+98.5

94+28.7



128+72.4

128+62.4

128+39.1

127+80.7

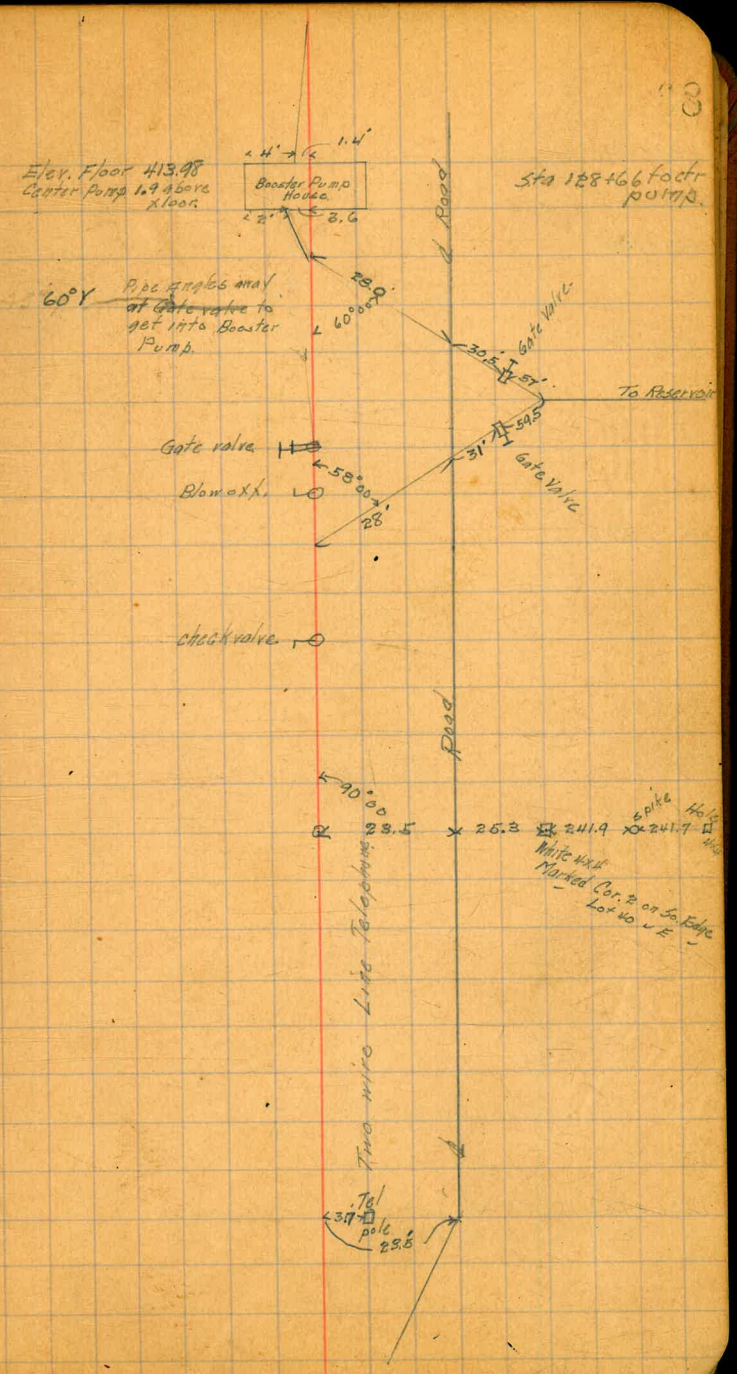
127+6 ±

127+18.5

121+1±

114+38.3

110+11.5



190+10

186+79.5

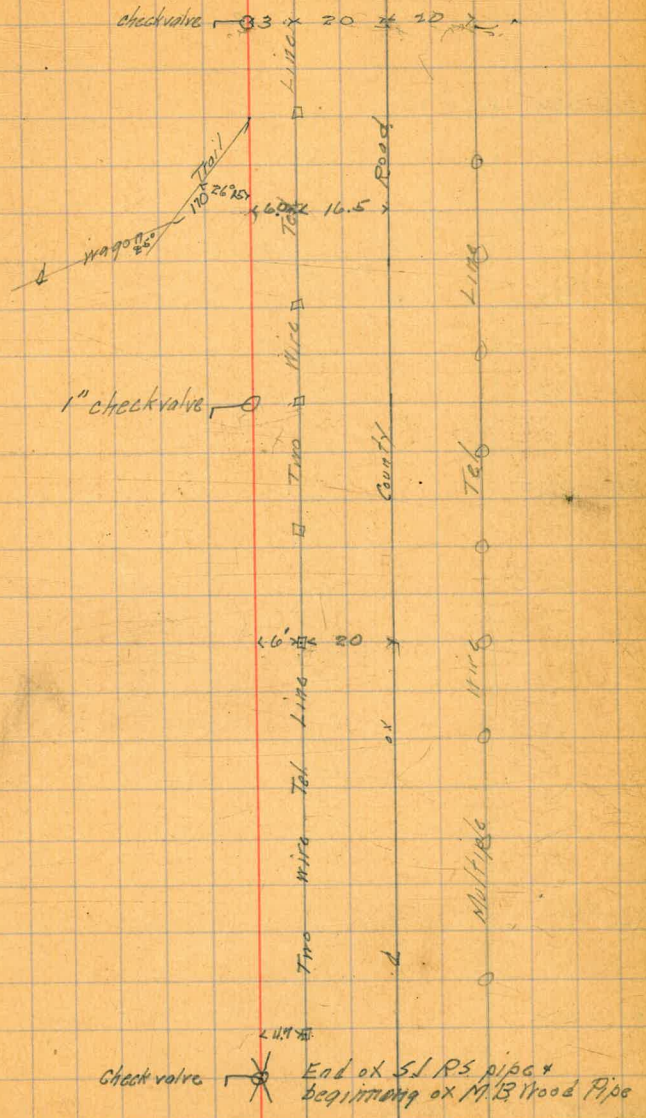
176+50

167+59.5

155+35

140+15

140+09.5



218+33.5 Δ 4°13' L

216+41.8 to Gov. BM.

216+71.8

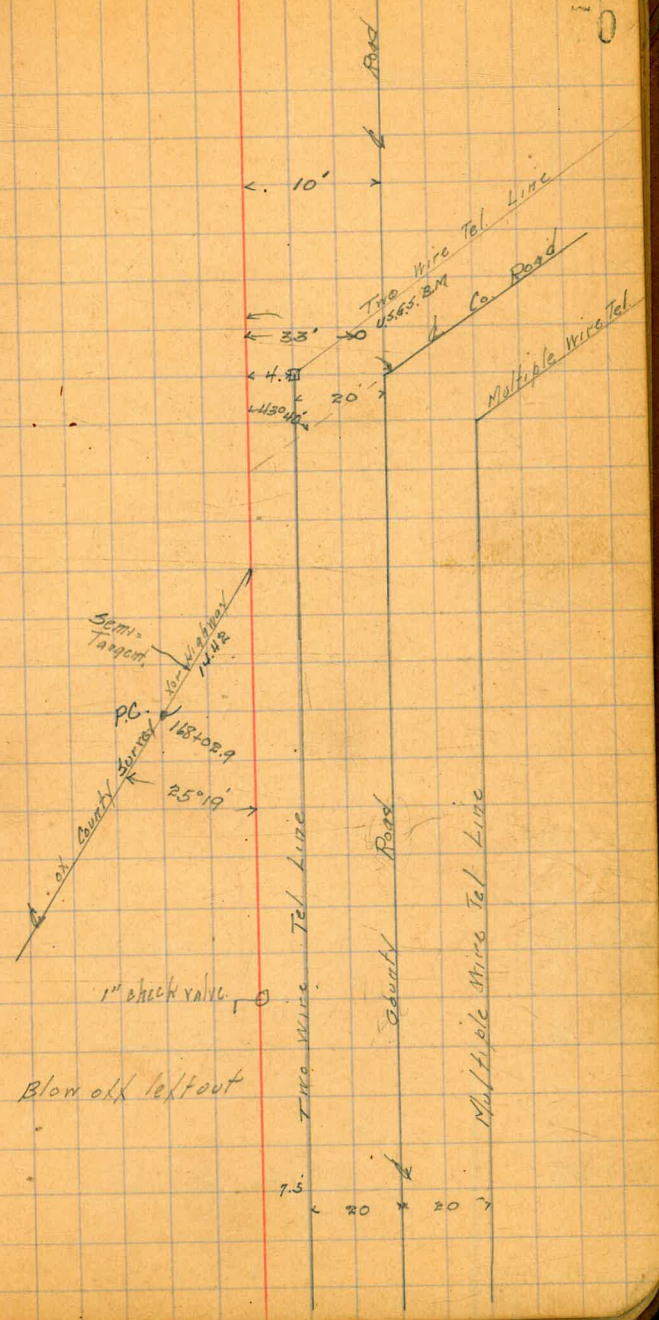
216+37.8

216+08.5

211+99.5

206+09.5

201+00 Δ 0°22' L



From this point on 66.15 subtracted from original stationing

9.5 add to original stations back on the point

280+44.7 Δ 39°23' R.

276+27

276+11

272+26.5

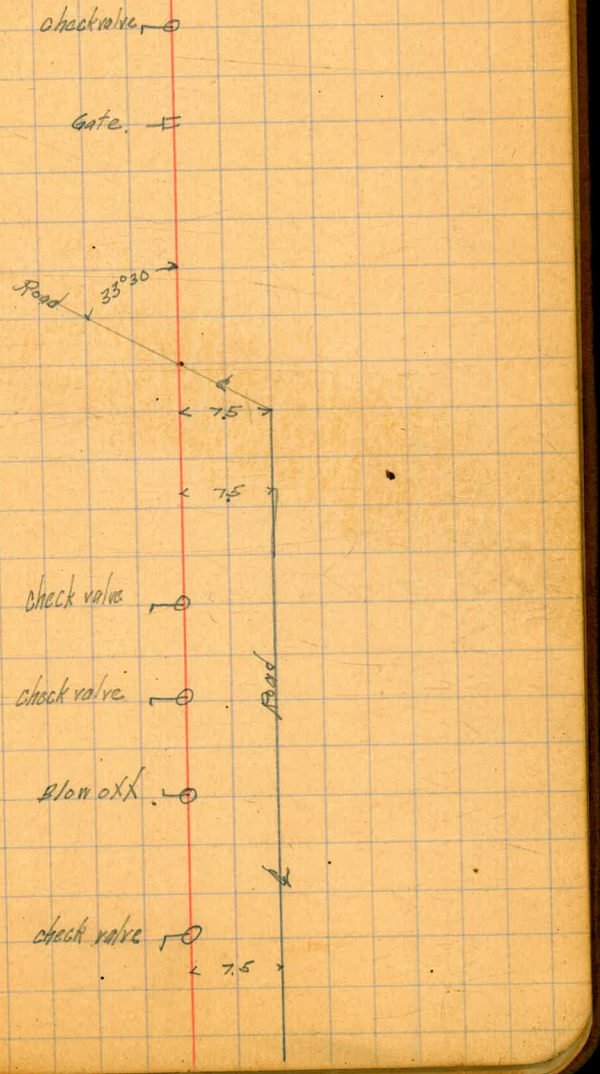
272+15.0

270+10 ✓

267+10

239+76

237+58.5



292+43.4

290+93.4

288+43.4

286+60.

286+55.0

175' Head Wood

150' Head Wood

125' Head Wood Stake

100' Head Wood

River Bank

Blow off

319+92.4

3" Tapped collar with plug.

314+93.4

3" Tapped collar with plug

309+93.4

3" Tapped Collar with plug

305+43.4

2" Check valve

304+93.4

3" Tapped Collar plugged

299+93.0

3" Tapped Collar with plug

296+23.0

Blow off

294+24.4

check valve

293+04.4

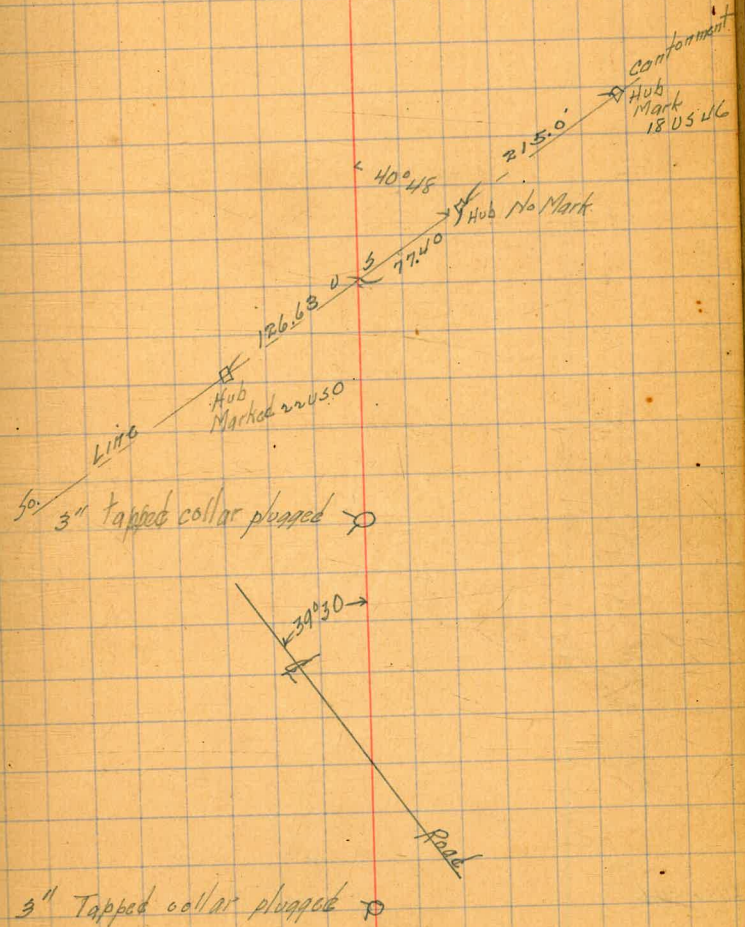
348+93.4 △ 12°00 R.

347+63.8

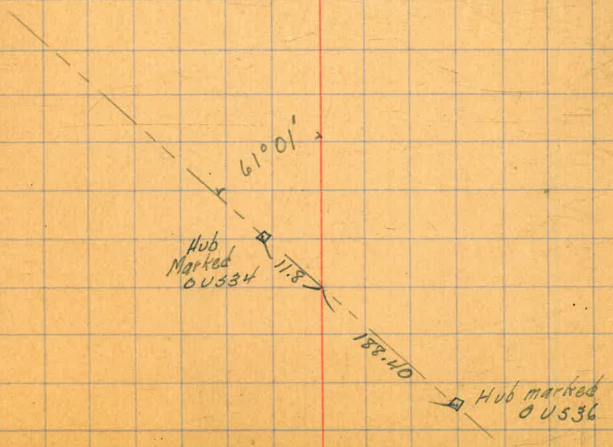
329+88.7

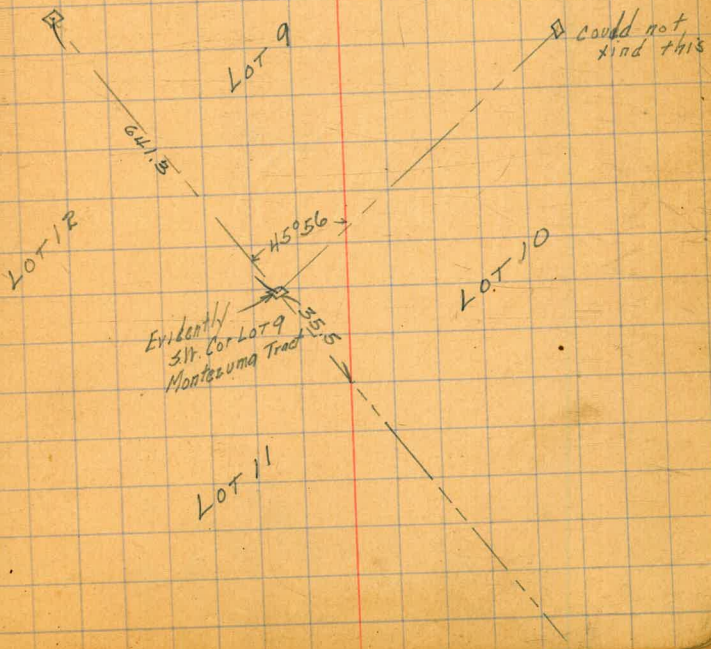
325+46.8

324+90.1

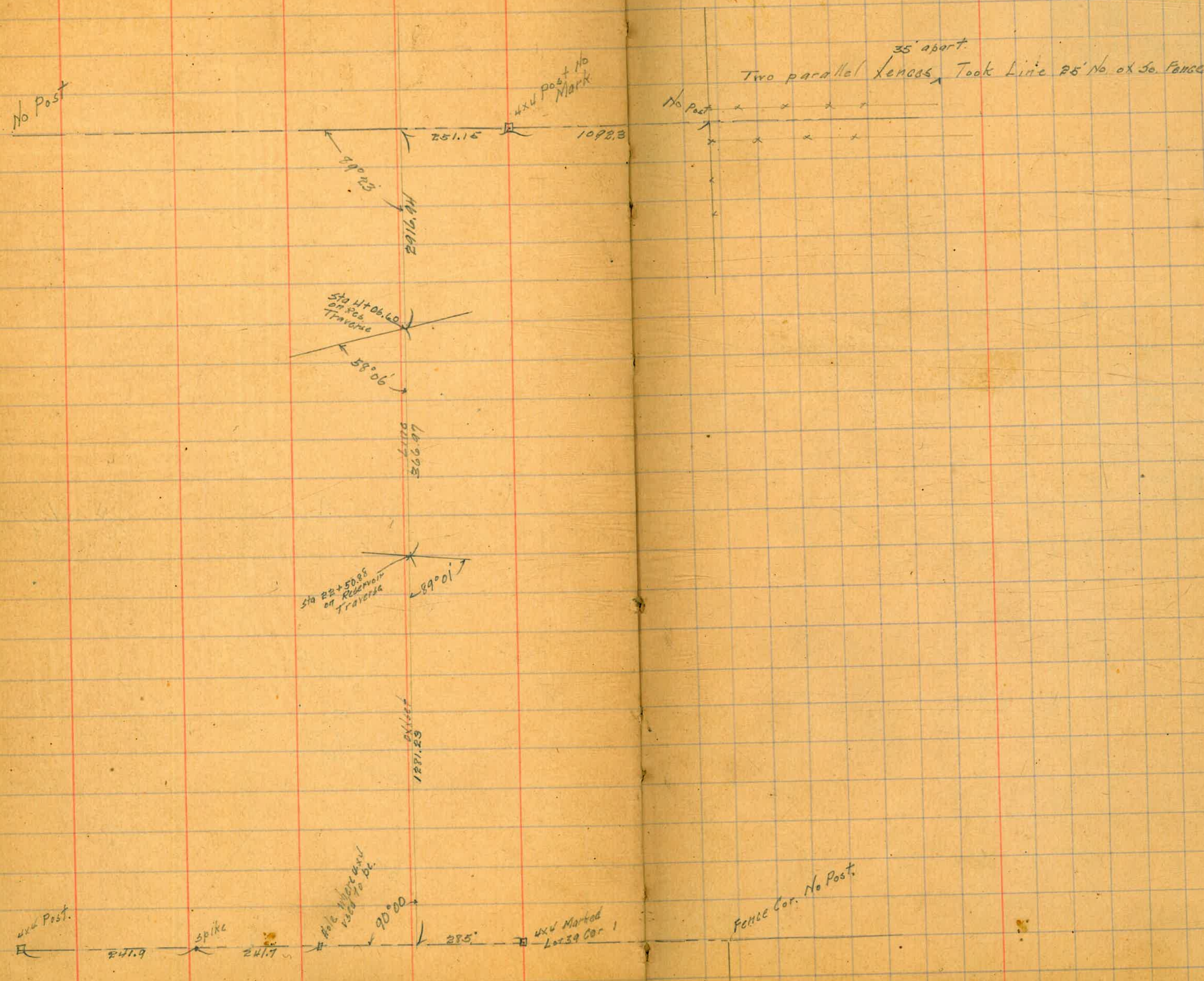


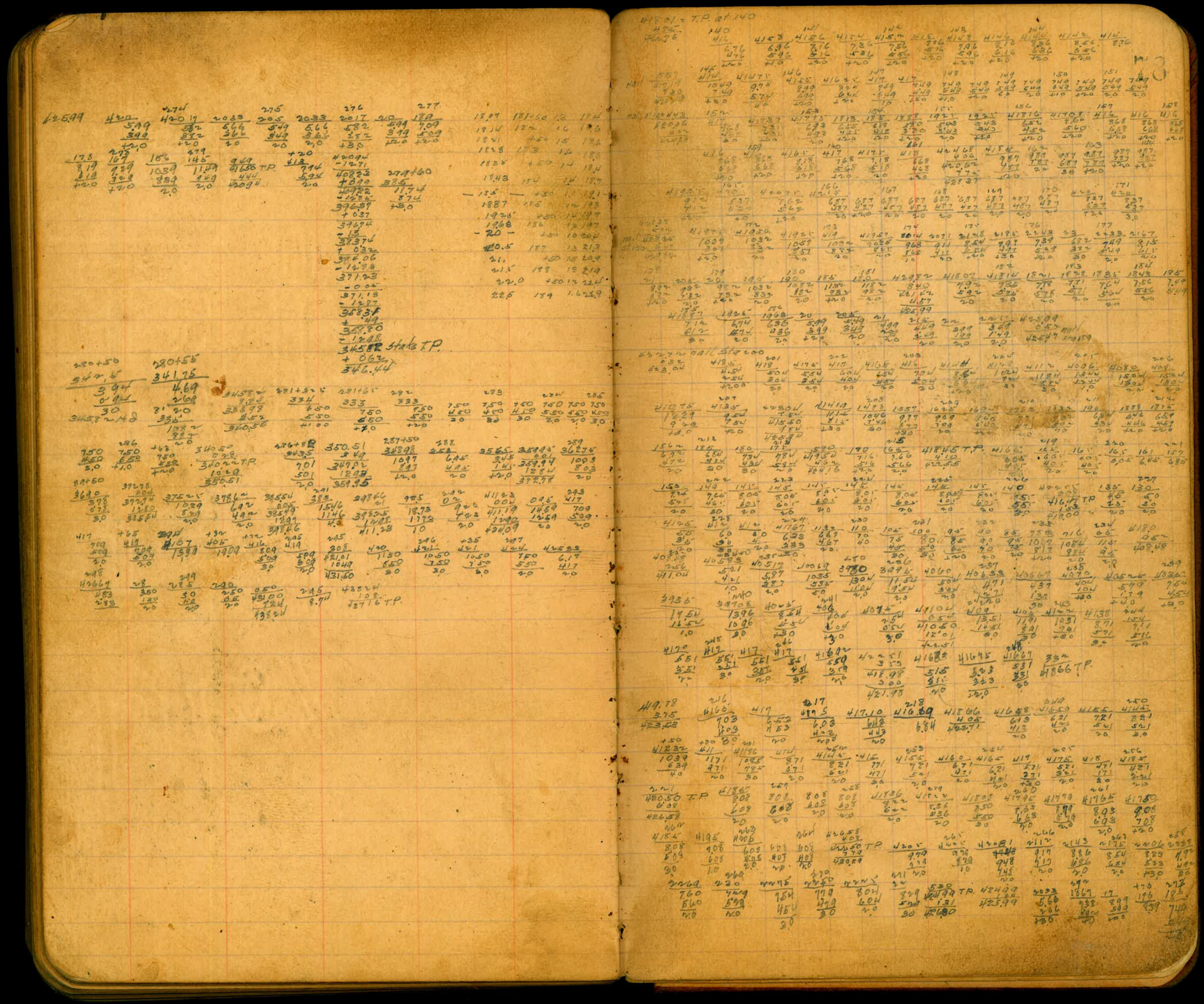
371+54.6

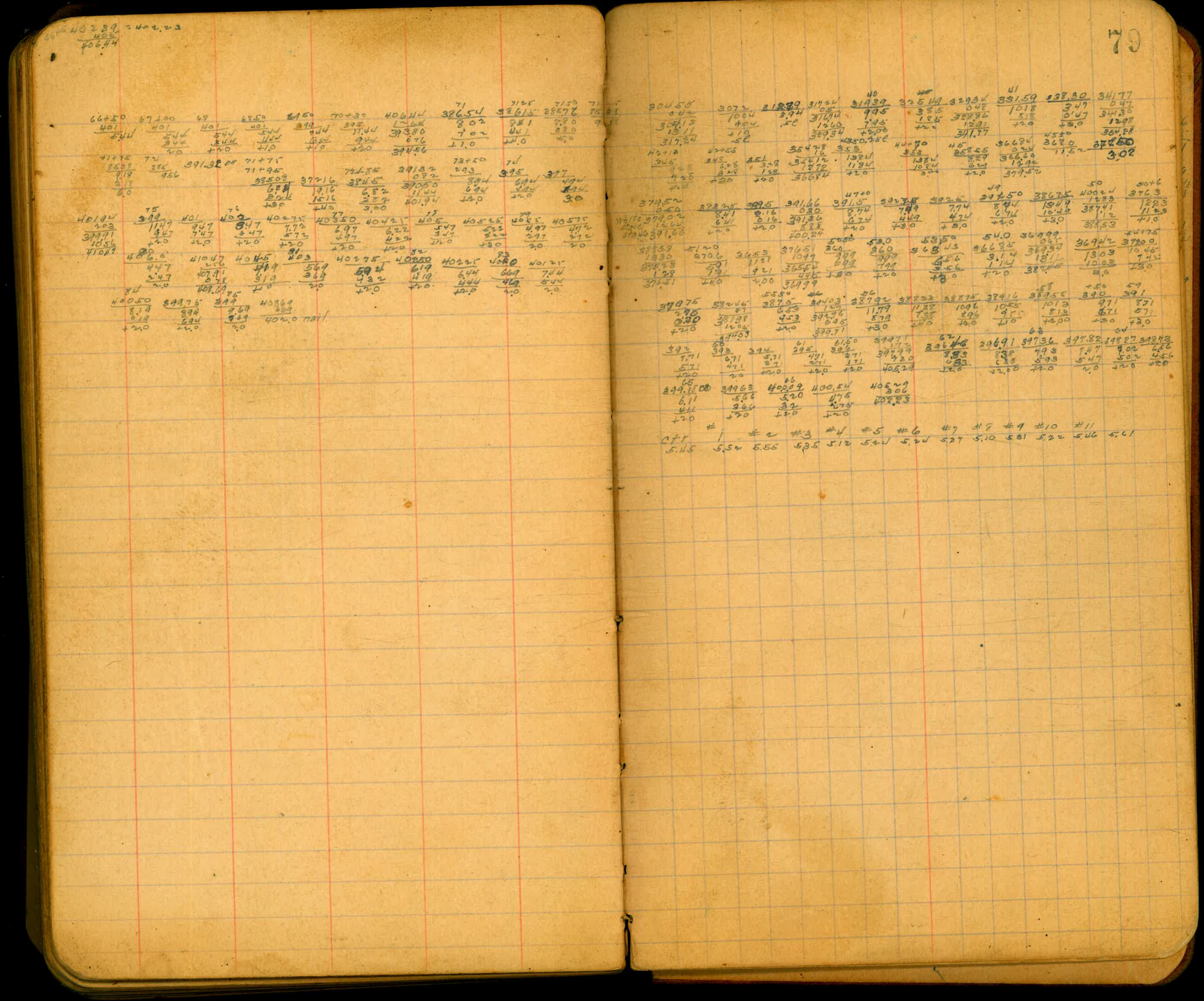



LOT 9
641.5
could not find this
LOT 12
N 5° E 56
LOT 10
Evidently 3/4 Cor LOT 9 Montezuma Tract
35.5
LOT 11

387+88.5


No Post
4x4 Post No Mark
251.15
1092.3
89°23'
2916.94
Sta 41+06.60 on Res Traverse
58°06'
366.97
Sta 22+50.88 on Reservoir Traverse
89°01'
1281.23
4x4 Post.
241.9
spike
241.7
Hole where 4x4 used to be.
90°00'
285.
4x4 Marked Lot 39 Cor. 1
Fence Cor. No Post.
35' apart.
Two parallel fences, Took Line 25' No. of So. Fence
No Post





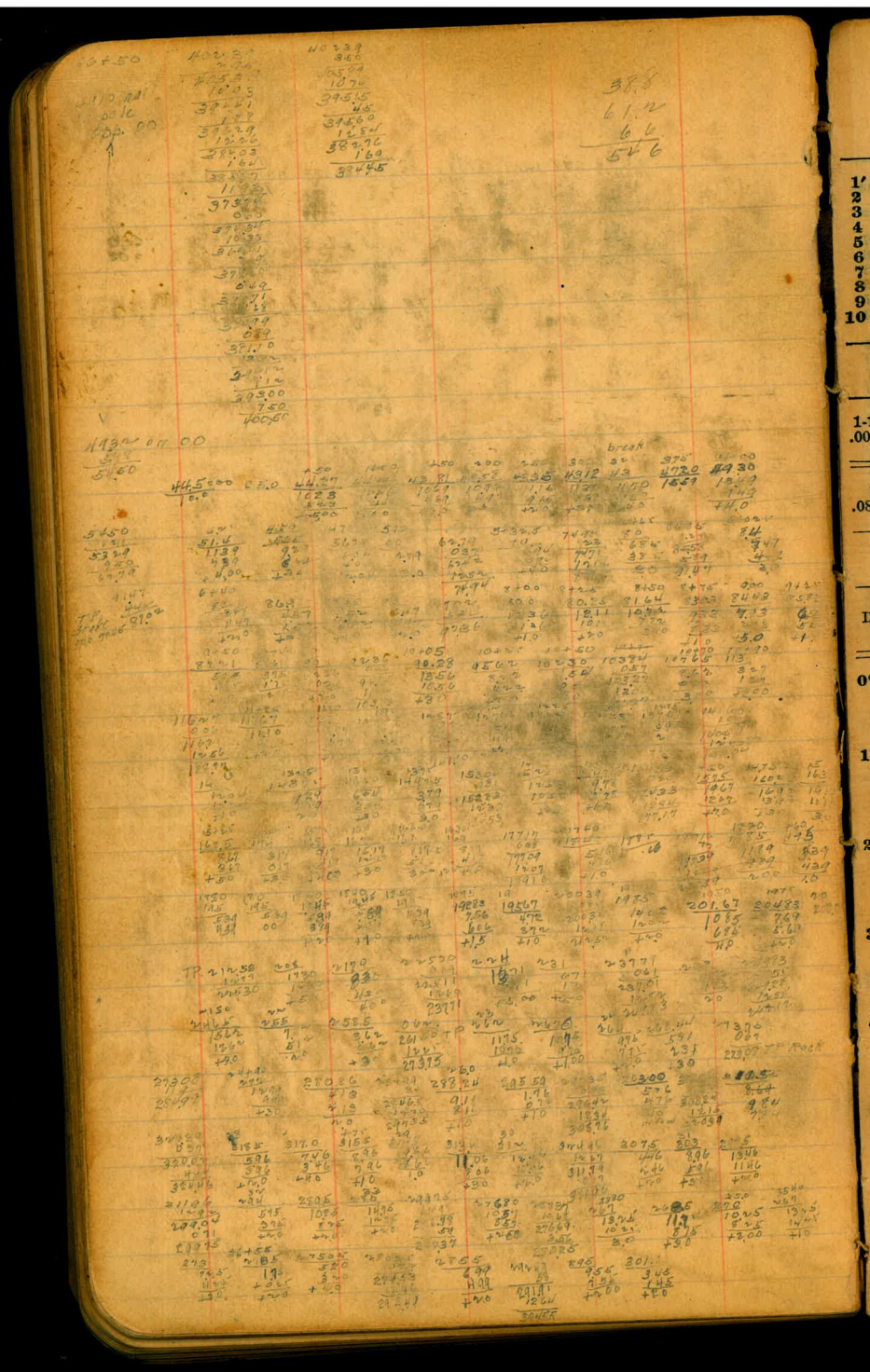


Table IV.—Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

Table V.—Inches in Decimals of a Foot.

1-16 .0052	3-32 .0078	1/8 .0104	3-16 .0156	1/4 .0208	5-16 .0260	3/8 .0313	1/2 .0417	5/8 .0521	3/4 .0625	7/8 .0729

1 .0833	2 .1667	3 .2500	4 .3333	5 .4167	6 .5000	7 .5833	8 .6667	9 .7500	10 .8333	11 .9167

Table VI.—Radii, Ordinates and Deflections.

Deg.	Radius	Mid Ord	Tan Def.	Chd. Def	Def for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Def.	Chd. Def.	Def. for 1 Foot
0° 10′	34377.	.036	.145	.291	0.05′	7°	819.0	1.528	6.105	12.21	2.10′
20	17189.	.073	.291	.582	0.10	20′	781.8	1.600	6.395	12.79	2.20
30	11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.25
40	8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.30
50	6875.5	.182	.727	1.454	0.25	8	716.8	1 746	6.976	13.95	2.40
1	5729.6	.218	.873	1.745	0.30	20	688,2	1.819	7.266	14.53	2.50
10	4911.2	.255	1.018	2.036	0.35	30	674.7	1 855	7.411	14.82	2.55
20	4297 3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
30	3819.8	.327	1.309	2.618	0.45	9	637.3	1.965	7.846	15.69	2.70
40	3437.9	.364	1.454	2.909	0.50	20	614.6	2 037	8.136	16 27	2.80
50	3125 4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2	2864 9	.436	1.745	3 490	0.60	40	593.4	2.110	8.426	16 85	2.90
10	2644.6	.473	1.891	3.781	0.65	10	573.7	2.183	8.716	17.43	3.00
20	2455.7	.509	2.036	4.072	0.70	30	546.4	2.292	9.150	18.30	3.15
30	2292.0	.545	2.181	4.363	0.75	11	521.7	2.402	9.585	19.16	3.30
40	2148.8	.582	2.327	4.654	0.80	30	499.1	2 511	10.02	20.04	3.45
50	2022.4	.618	2.472	4.945	0.85	12	478.3	2.620	10.45	20.91	3.60
3	1910.1	.655	2.618	5.235	0 90	30	459 3	2.730	10.89	21 77	3.75
10	1809.6	.691	2.763	5.526	0.95	13	441.7	2.839	11.32	22.64	3.90
20	1719.1	.727	2.908	5.817	1.00	30	425.4	2.949	11.75	23.51	4.05
30	1637.3	.764	3.054	6.108	1.05	14	410 3	3.058	12.18	24 37	4.20
40	1562.9	.800	3.199	6.398	1.10	30	396 2	3.168	12.62	25.24	4.35
50	1495.0	.836	3.345	6.689	1.15	15	383.1	3.277	13.05	26.11	4.50
4	1432.7	.873	3.490	6.980	1.20	30	370 8	3.387	13.49	26.97	4.65
10	1375.4	.909	3 635	7.271	1.25	16	359.3	3.496	13.92	27 84	4.80
20	1322.5	.945	3.718	7.561	1.30	30	348.5	3.606	14 35	28 70	4 95
30	1273.6	.982	3.926	7.852	1.35	17	338.3	3 716	14.78	29.56	5 10
40	1228.1	1.018	4.071	8.143	1.40	18	319 6	3,935	15 64	31.29	5.40
50	1185.8	1.055	4.217	8.433	1.45	19	302.9	4.155	16 51	33.01	5 70
5	1146.3	1.091	4 362	8.724	1 50	20	287 9	4.374	17.37	34.73	6 00
10	1109.3	1.127	4.507	9.014	1.55	21	274.4	4.594	18.22	36 44	6 30
20	1074.7	1.164	4.653	9.305	1.60	22	262 0	4.814	19 08	38.16	6.60
30	1042.1	1.200	4.798	9.596	1.65	23	250.8	5 035	19.94	39 87	6.90
40	1011.5	1.237	4.943	9.886	1 70	24	240 5	5.255	20.79	41 58	7.20
50	982.6	1.273	5.088	10.18	1.75	25	231.0	5.476	21 64	43.28	7.50
6	955 4	1.309	5.234	10.47	1.80	26	222.3	5.697	22 50	44 99	7.80
10	928 6	1.346	5.379	10.76	1.85	27	214.2	5.918	23.35	46 69	8 10
20	905.1	1.382	5.524	11.05	1 90	28	206 7	6.139	24.19	48.38	8 40
30	881.9	1.418	5.669	11.34	1 95	29	199 7	6.360	25.04	50.07	8.70
40	859.9	1.455	5,814	11.63	2,00	30	193.2	6.583	25.88	51.76	9.00

TABLE VII.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
61°	3375.0	920.2	71°	4086.9	1368.2	81°	4893.6	1805.3
10′	3386.3	925.9	10′	4099.5	1315.6	10′	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937 0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843 1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	72	4162.8	1352.6	82	4980.7	1862 2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881 5
30	3476.8	972.4	30	4201.2	1375.2	30	5024 8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900 9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	73	4239.7	1398.0	83	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084 0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940 3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	74	4317.6	1444.6	84	5159.0	1980 4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174 1	1990.5
20	3603.5	1039.0	20	4343.8	1460 4	20	5189.3	2000 6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219 7	2021.1
50	3638.5	1057.7	50	4383.3	1484 4	50	5234.9	2031.4
65	3650.2	1063.9	75	4396.5	1492.4	85	5250.3	2041 7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436 4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311 9	2083 5
50	3709.0	1095.7	50	4463.1	1533 1	50	5327.4	2094.1
66	3720.9	1102.2	76	4476.5	1541.4	86	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358 6	2115.3
20	3744.6	1115 1	20	4503 4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136 7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405 6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	77	4557.6	1591.6	87	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453 1	2180 2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598 5	1617.1	30	5484 9	2202 2
40	3840.5	1168.1	40	4612 2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	78	4639.8	1643.0	88	5533 1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246 7
20	3889.0	1195.2	20	4667 4	1660 5	20	5565 4	2258.0
30	3901.2	1202.0	30	4681 3	1669.2	30	5581.6	2269.3
40	3913 4	1208.9	40	4695.2	1678.1	40	5597.8	2280 6
50	3925.6	1215.8	50	4709.2	1686 9	50	5614.2	2292 0
69	3937.9	1222.7	79	4723 2	1695.8	89	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315 0
20	3962.5	1236.7	20	4751 2	1713.7	20	5663 4	2326 6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731 7	40	5696 4	2349 8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	80	4807.7	1749.9	90	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836 2	1768.2	20	5763 1	2397.0
30	4049.3	1286.5	30	4850 5	1777.4	30	5779 9	2408 9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796 7	2420 9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

TABLE VII.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
91°	5830.[illegible]	2444.9	101°	6950.6	3278.1	111°	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493 8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	102	7075.5	3374.9	112	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002 7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	103	7203.2	3474.4	113	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	104	7333.6	3576.8	114	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	105	7467.0	3682.3	115	8993.8	4934 1
10	6271.1	2764 8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344 8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	106	7603.5	3791.0	116	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259 0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	107	7743.2	3902.9	117	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	108	7886.2	4018.2	118	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669 2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	109	8032.7	4137.1	119	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	5808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828 3	3184.1	110	8182.8	4259.7	120	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table VIII.—Middle Ordinates for Rails.

Deg. of Curve	Length of Rails. 32	30	28	26	24	22	20	Deg. of Curve	Length of Rails. 32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.037	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.262	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	338	.287	.243	.199
9	201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	245	216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.396	.335	.284	.233
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	242
14	312	.275	239	.207	.175	.148	.122	29	.638	.564	.491	.424	.361	303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

Curve Formulæ.

$T = R \tan. \frac{1}{2} I$

$T = \frac{50 \tan. \frac{1}{2} I}{\text{Sin. D}}$

$\text{Sin. D} = \frac{50}{R}$

$\text{Sin. D} = \frac{50 \tan. \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. D}}$

$E = R \text{ ex. sec. } \frac{1}{2} I$

$E = T \tan. \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{\frac{1}{2} I}{D}$

$\text{Tan. def.} = \frac{1}{2} \text{ chord def.}$

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

Table 7 contains Tangents and Externals to a 1° curve Tan. and Ext. to any other radius may be found, nearly enough, by dividing the Tan. or Ext opposite the given central angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table 7: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.), and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance: Multiply the angle by .01745, and the product by the distance.

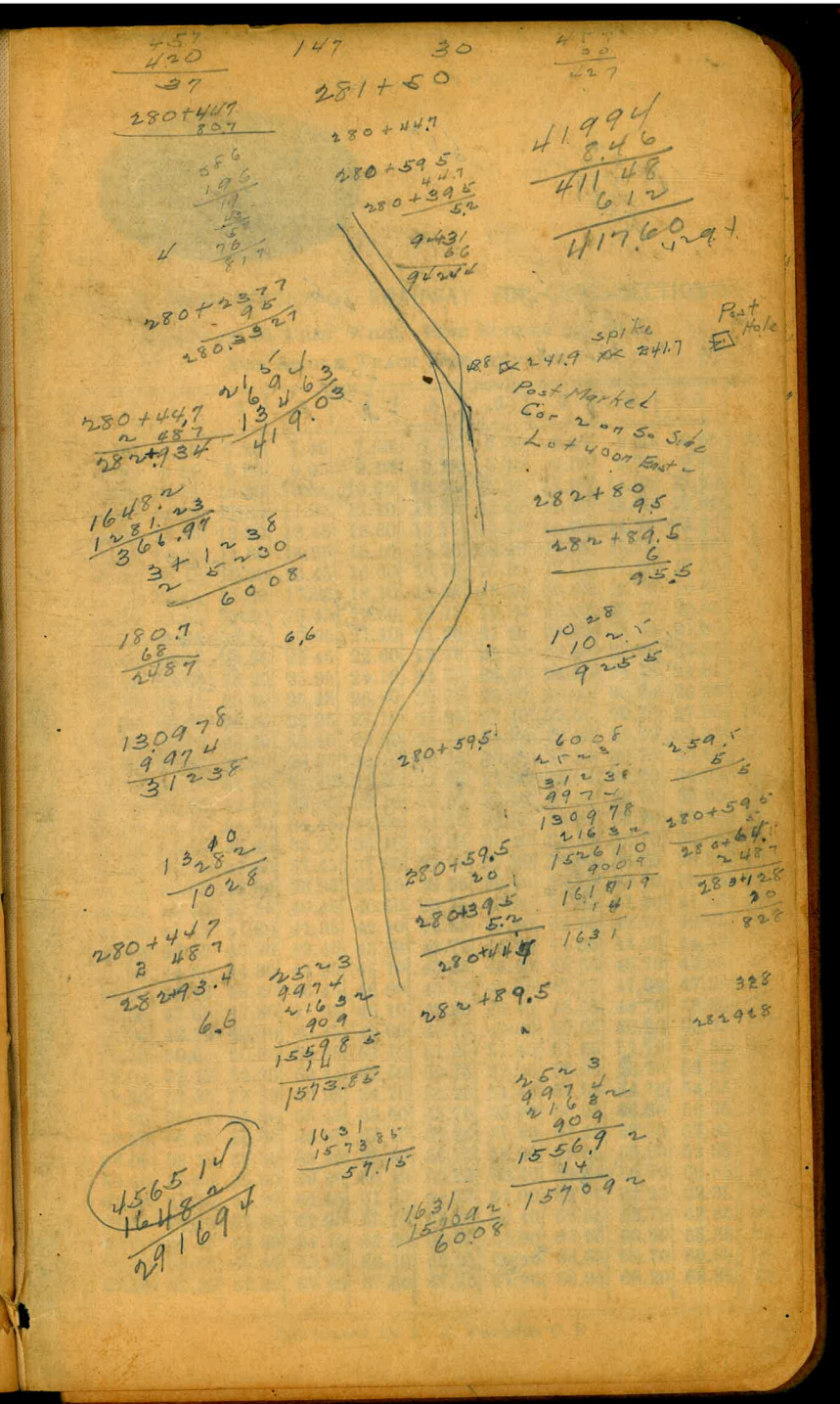
Right Angle Triangles.—Square the altitude, divide by twice the base. Add quotient to base for hypothenuse.

Given Base 100, Alt. 10. $10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. 25. $25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING

Roadway 14 Feet Wide. Side Slopes 1½ to 1.
For Single Track Embankment.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.00	7.15	7.30	7.45	7.60	7.75	7.90	8.05	8.20	8.35	0
.	8.50	8 65	8.80	8.95	9.10	9.25	9.40	9.55	9.70	9.85	1
2	10.00	10.15	10.30	10.45	10.60	10.75	10.90	11.05	11.20	11.35	2
3	11.50	11.65	11.80	11.95	12.10	12.25	12.40	12.55	12.70	12.85	3
4	13.00	13.15	13 30	13.45	13.60	13.75	13.90	14.05	14.20	14.35	4
5	14.50	14.65	14.80	14.95	15.10	15.25	15.40	15.55	15.70	15 85	5
6	16 00	16.15	16.30	16.45	16.60	16.75	16.90	17.05	17.20	17.35	6
7	17.50	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	7
8	19.00	19.15	19.30	19.45	19.60	19.75	19.90	20.05	20.20	20.35	8
9	20.50	20.65	20.80	20.95	21.10	21.25	21.40	21.55	21.70	21.85	9
10	22.00	22.15	22.30	22.45	22.60	22.75	22.90	23.05	23.20	23.35	10
11	23.50	23.65	23.80	23.95	24.10	24.25	24.40	24.55	24.70	24.85	11
2	25.00	25.15	25.30	25.45	25.60	25.75	25.90	26.05	26.20	26.35	12
3	26.50	26.65	26.80	26.95	27.10	27.25	27.40	27.55	27.70	27.85	13
4	28 00	28.15	28.30	28.45	28.60	28.75	28.90	29.05	29.20	29.35	14
5	29.50	29.65	29.80	29.95	30.10	30.25	30.40	30.55	30.70	30.85	15
6	31.00	31.15	31 30	31.45	31.60	31.75	31.90	32.05	32.20	32.35	16
7	32.50	32.65	32.80	32.95	33.10	33.25	33.40	33.55	33.70	33.85	17
8	34.00	34.15	34.30	34.45	34.60	34.75	34.90	35.05	35.20	35.35	18
9	35.50	35.65	35.80	35.95	36.10	36.25	36.40	36.55	36.70	36.85	19
0	37.00	37.15	37.30	37.45	37.60	37.75	37.90	38.05	38.20	38.35	20
1	38.50	38.65	38.80	38.95	39.10	39.25	39.40	39.55	39.70	39.85	21
2	40 00	40.15	40 30	40.45	40.60	40.75	40.90	41.05	41.20	41.35	22
3	41.50	41.65	41.80	41.95	42.10	42.25	42.40	42.55	42.70	42.85	23
4	43.00	43.15	43.30	43.45	43.60	43.75	43.90	44.05	44.20	44.35	24
5	44.50	44.65	44.80	44.95	45 10	45 25	45.40	45 55	45.70	45.85	25
6	46.00	46.15	46.30	46.45	46 60	46.75	46.90	47.05	47.20	47.35	26
7	47.50	47.65	47.80	47.95	48.10	48.25	48.40	48.55	48.70	48.85	27
8	49.00	49.15	49.30	49.45	49.60	49.75	49.90	50.05	50.20	50.35	28
9	50.50	50.65	50 80	50.95	51.10	51.25	51.40	51.55	51.70	51.85	29
0	52.00	52.15	52.30	52.45	52.60	52.75	52.90	53.05	53.20	53 35	30
-	53.50	53.65	53.80	53.95	54.10	54.25	54.40	54.55	54.70	54.85	31
32	55 00	55.15	55.30	55.45	55.60	55.75	55 90	56.05	56.20	56.35	32
33	56.50	56.65	56.80	56.95	57.10	57.25	57.40	57.55	57.70	57.85	33
34	58.00	58.15	58.30	58 45	58.60	58.75	58.90	59.05	59.20	59 35	34
35	59.50	59.65	59.80	59.95	60.10	60.25	60.40	60.55	60.70	60.85	35
36	61.00	61.15	61.30	61.45	61.60	61.75	61.90	62 05	62.20	62.35	36
37	62.50	62.65	62.80	62.95	63.10	63.25	63 40	63.55	63.70	63.85	37
38	64.00	64.15	64.30	64 45	64.60	64.75	64.90	65.05	65.20	65.35	38
39	65 50	65.65	65.80	65.95	66.10	66.25	66.40	66.55	66.70	66.85	39
40	67.00	67.15	67.30	67.45	67.60	67.75	67.90	68.05	68.20	68.35	40

Calculated by F. E. Paradis, C. F