

W346

346

FIELD BOOK

10

346

346

Tables for Excavations and Embankments.
Distances from Centre of Roadway for Cross Sectioning.
Roadway 22 feet wide. Side Slopes 1 to 1.
For Single Track Excavation.

MICROFILMED

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	0
1	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	1
2	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	2
3	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	3
4	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	4
5	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	5
6	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	6
7	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	7
8	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	8
9	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	9
10	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	10
11	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	11
12	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	12
13	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	13
14	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	14
15	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	15
16	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	16
17	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	17
18	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	18
19	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	19
20	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	20
21	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	21
22	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	22
23	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	23
24	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	24
25	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	25
26	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	26
27	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	27
28	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	28
29	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	29
30	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	30
31	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	31
32	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	32
33	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	33
34	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	34
35	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	35
36	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	36
37	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	37
38	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	38
39	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	39
40	51.0	51.1	51.2	51.3	51.4	51.5	51.6	51.7	51.8	51.9	40

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.

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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.

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THE FREDERICK POST CO.
ENGINEERING and DRAFTING SUPPLIES
IRVING PARK STATION
CHICAGO, ILL.

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El Monte to Dam

County Road Survey R.P.S

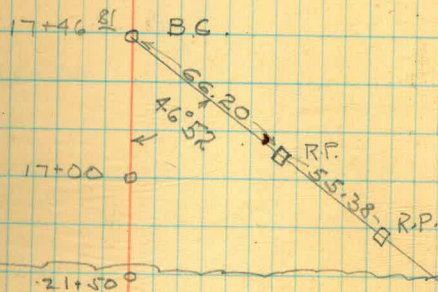
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Soper - Remmon

April 27-'32

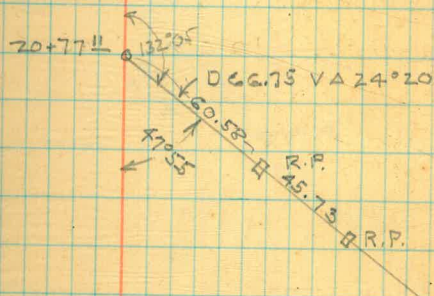
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A 17+46⁸¹ B.C. $133^{\circ}08R$ 66.20

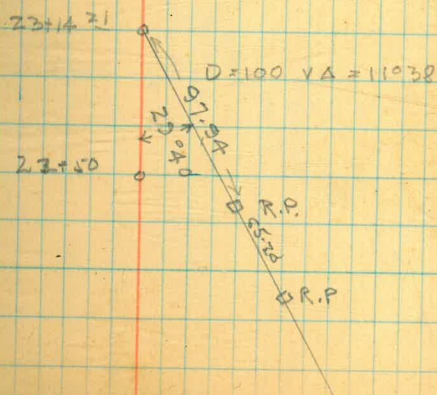
Rwd hub



A 20+77¹¹ E.C. $132^{\circ}05R$ 66.75 VA $24^{\circ}20'$



A 23+14²¹ P.I. $150^{\circ}20R$ 100.00 VA $11^{\circ}38'$



R P \rightarrow contin.

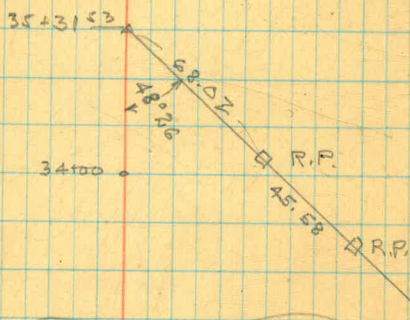
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24+89.60



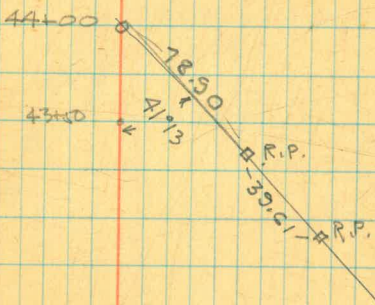
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35+81.43



A 44+00 P.O.T. 138-47

44+00



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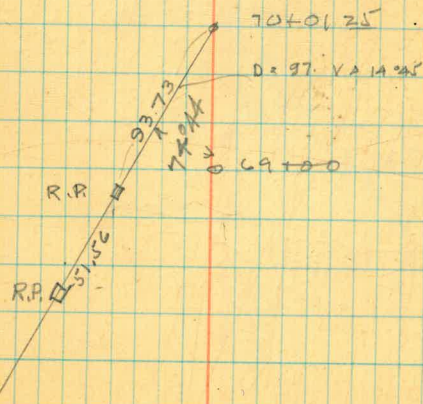
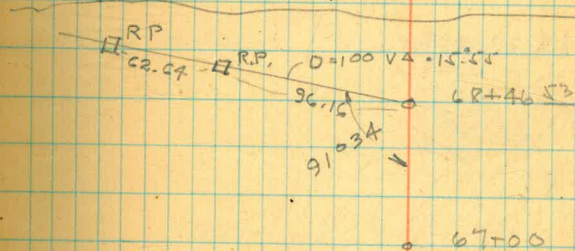
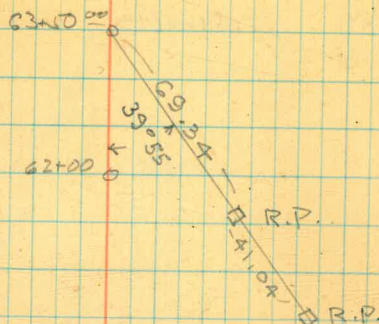
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A 68+46.53 P.I. 88-26L 100.00 VA 15°55

A 70+01.25 P.I. 105-16 97.00 VA 14°45

April. 27-32
P.O.C

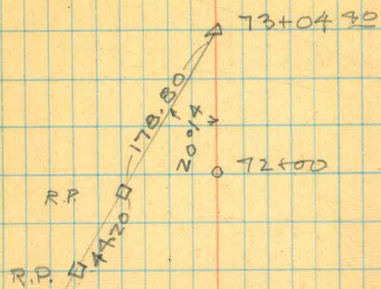
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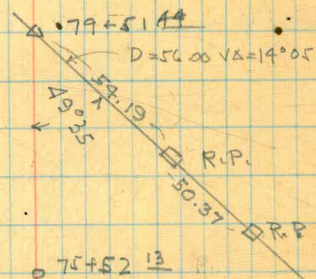
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5

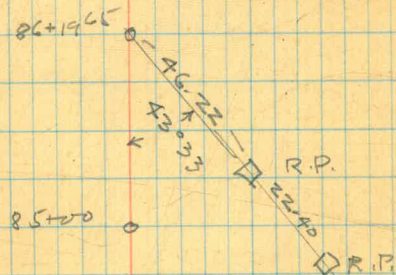
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A79+51.44 P.I. 130-25 R=56.00 VA=14°05



A86+19.65 P.I. 136-27 R



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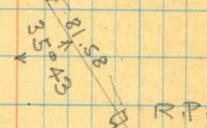
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P.O.G.

6

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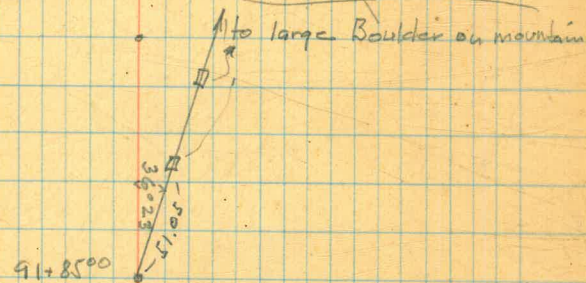
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88+84.95
D=86- VA=18°38



86+19.65 R.P.

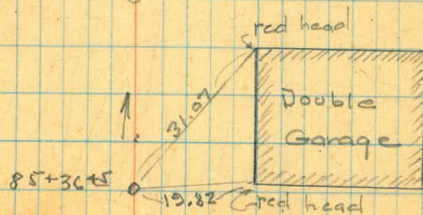
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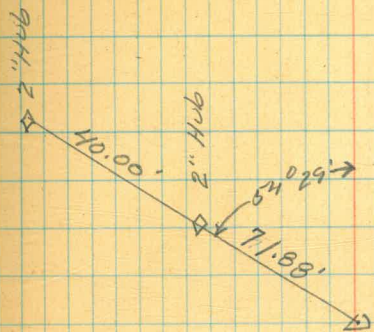
90+00

86+00

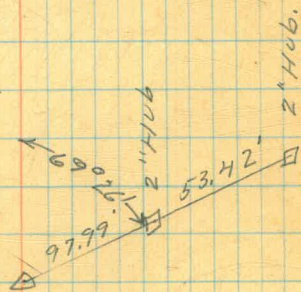
A 85+36.45 B.C.



April 28 7
Bonham
Super
Remman.

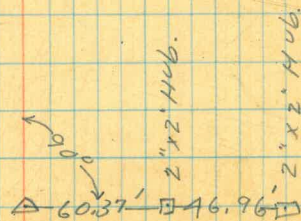


$\Delta 59+18.67$ P.I. $54^{\circ}29'$ Lt.



$\Delta 54+01.40$ P.I. $69^{\circ}26'$ RT.

V.A. $11^{\circ}30'$ $100.00 = 97.99$



A49+55.45 P.O.T. 90° RT. 60.37'

Location of Road as Built
 El Capitan to El Monte Park.

Sta. Angle Mag. Br. Calc. Br. Dist.

N67-40W N67-36-20W 300.20

26-55-15
 33-50-30

3+43.5' R.26-55-15

S84-30W S85-28-25W 165.69

13-55-4
 27-50

1+77.82 L.13-55-0

N81-0W N80-36-35W

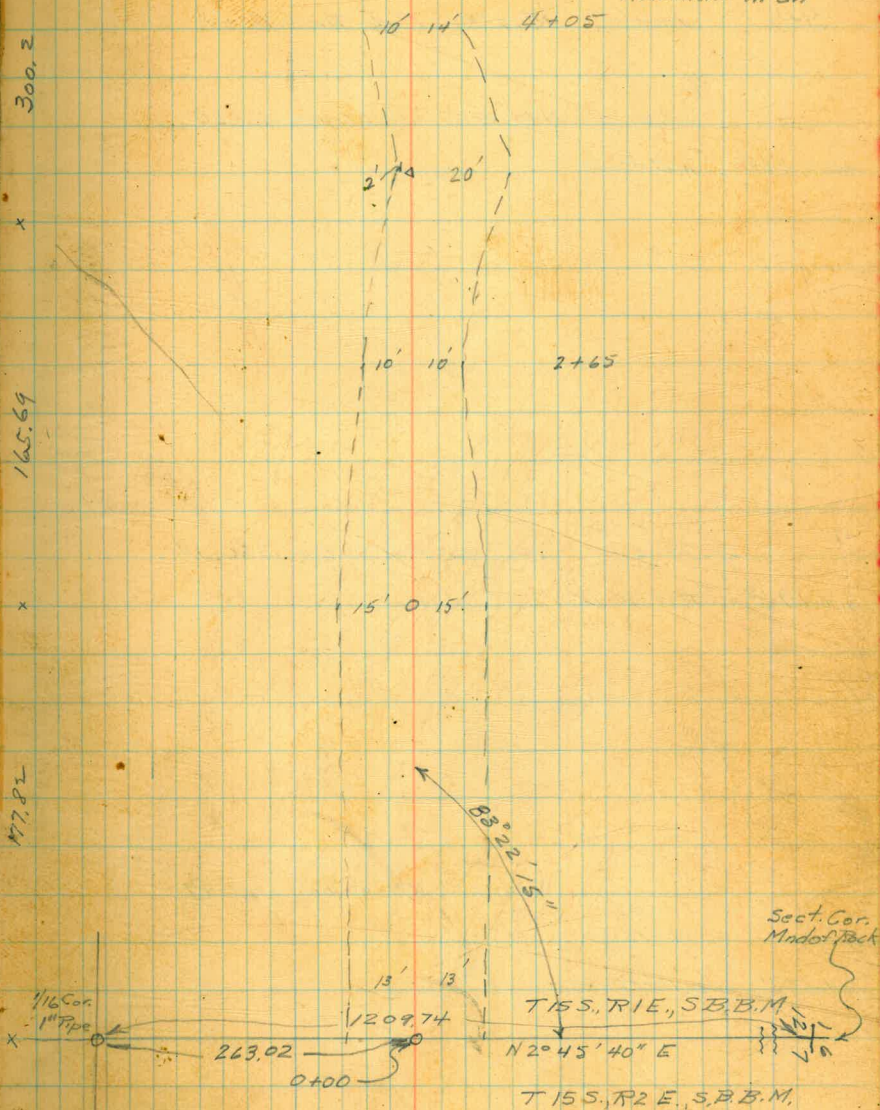
83-22-10
 166-44-30

0+00 L.83-22-15

N2-45E N2-45-40E

Aug 1-1932

Elliott-Notes 9
 Simpson-T
 Soper - Hd. Ch.
 Kemmer - Tr. Ch.



Cleveland National Forest

Sta. Angle Mag. Br. Calc. Br. Dist

21-55-10

43-50-30 N44-15W N42-03-40W 463.20

11
42+9932 R. 21-55-15

14-44-15

29-28-25 N65-15W N63-58-55W 350.14

8+4918 R. 14-44-15

11-07

22-13-40

N80-W N78-43-10W 205.47

6+4371 L. 11-06-50

463.20

x

350.14

x

205.47

x

12+50

9 x 22

5 Δ 22

11 x 11

11+65

10 x 10

10+70

12 x 12

9+50

9 Δ 14

13 x 12

8+00

11 x 12

7+40

10^E Δ 10^E

18 x 8

5+43

12 x 10

4+80

Sta. 40-24-30 Mag. Br. Calc. Br. Dist.
80-45-45
21+65.38 L. 40-24-25

8-41-45

17-29-50 N48-45W N48-40-05W 329.67

18+35.21 P. 8-44-55

15-21-15

30-42-45 N57-45W N57-25-0W 173.19

16+62.52 L. 15-21-20

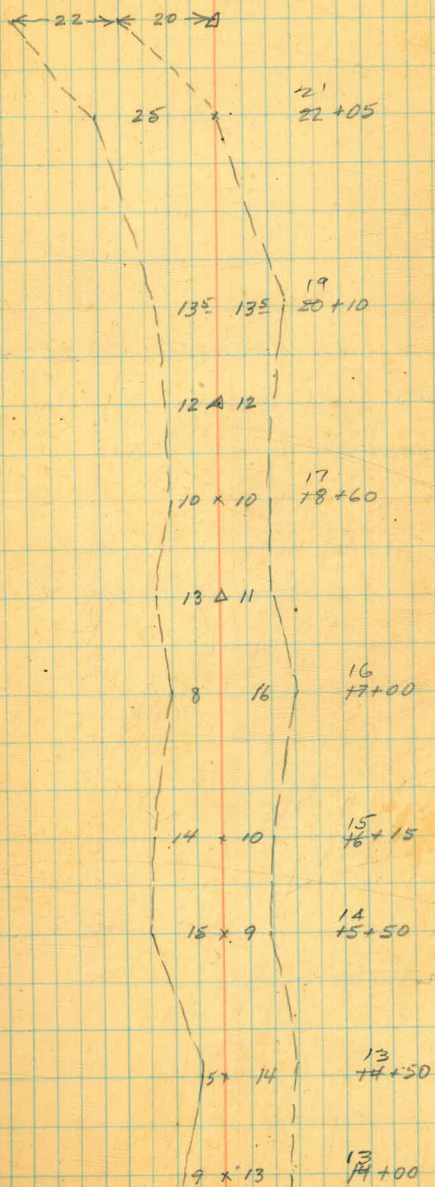
x

329.67

x

173.19

x



Sta. Angle Mag. Br. Calc. Br. Dist

31-14-0
 62-28-0 N88-0W N87-21-45W 259.40
 26+94 13 R. 31-14-0

29-31-20 560-15W 561-24-15W 142.07
 59-02-30

25+52 06 L. 29-31-15

N89-15W N89-04-30W 386.68

10 x 11 28
 27+95

10 x 11 27
 28+98

13 x 12 27
 28+44

54 18
 11 x 11 25
 26+60

Shields Place

9 x 14 25
 26+12

14 Δ 20 Start Aug. - 1932
 End Aug. - 1932

10 x 12 20
 25+65

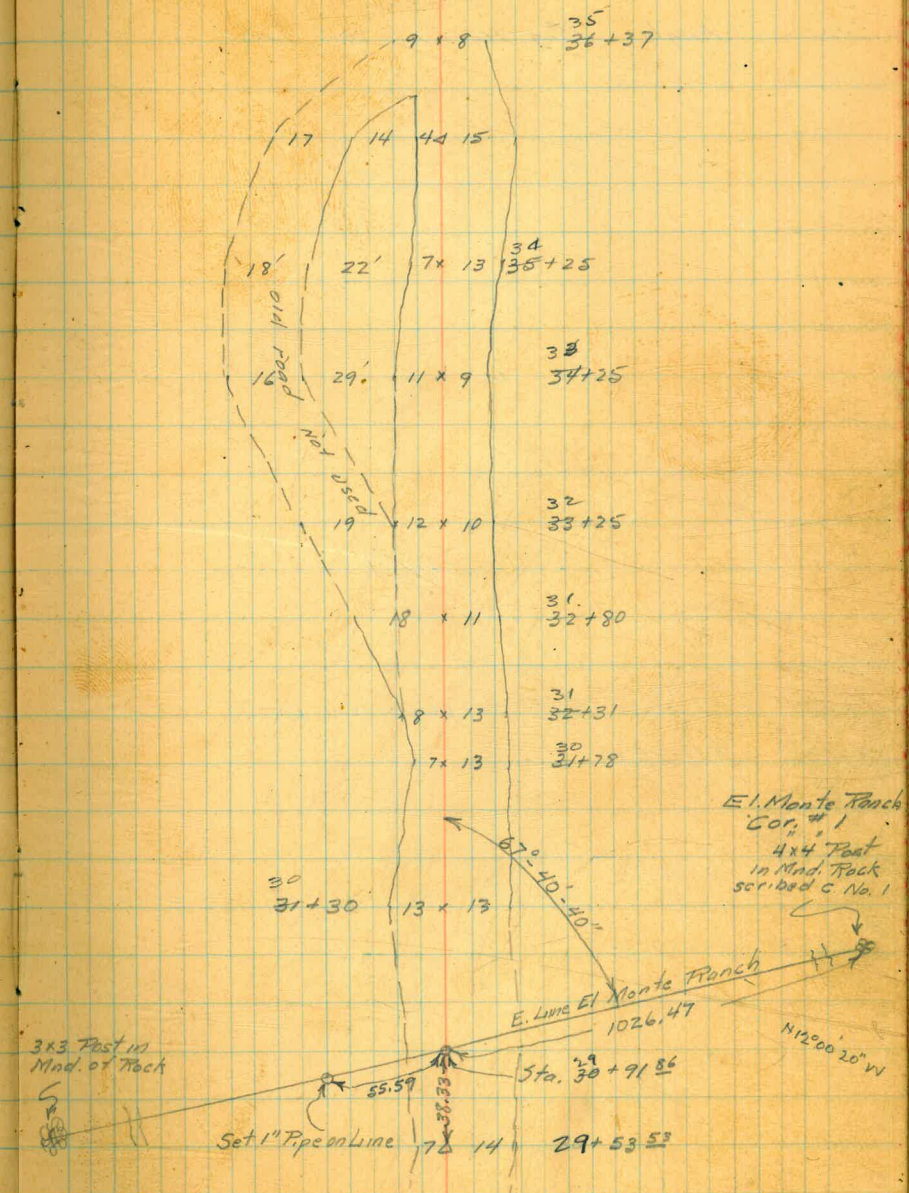
10 x 12 23
 24+10

12 x 9 22
 23+65

23 27
 23+25

Sta.	Angle	Mag. Br.	Calc. Br.	Dist.
	15-31-30			
	31-02-45	N64-30W	N64-09-35W	197.63
34+62 ¹⁴	R. 15-31-25			

	7-40-50			
	15-21-30	N80-15W	N79-41-0W	508.61
29+53 ⁵³	R. 7-40-45			



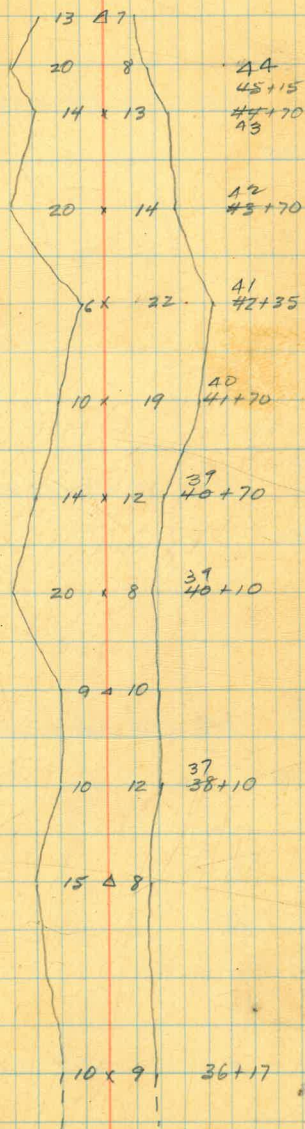
Sta.	Angle.	Mag. Br.	Calc. Br.	Dist
44 + 71.38	7-47-15 15-34-45 4.7-47-20			

17-25-15
 34-50-20 N62-15W N61-36-55W 601.36

38 + 70.22 R. 17-25-10

14-52-30
 29-45-0 N79-45W N79-02-05W 2.10.25

36 + 59.77 4.14-52-30



Sta Angle Mag. Br. Calc. Br. Dist

25-40-15
51-20-10 N 79-30 W N 79-19-55 W 235.47

53+80⁹⁹ 4.25-40-05

10-49-15
21-23-45 N 54 W N 53-39-50 W 438.88

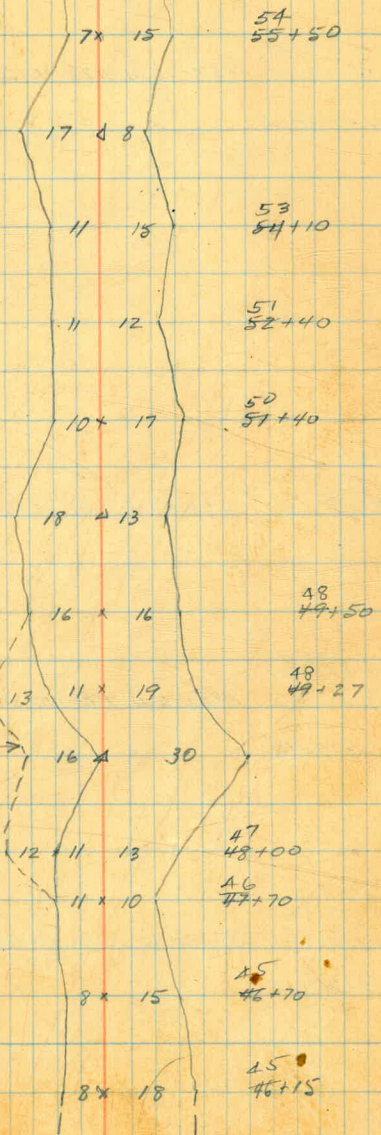
49+42¹¹ 4.10-49-20

26-33-40
53-07-30 N 42-45 W N 42-50-30 W 159.51

47+82⁶⁰ 7.26-33-45

N 69-20 W N 69-24-15 W 311.22

Toe of High
Cut Bank



Sta. Angle Mag. Br. Calc. Br. Dist.

47-11-20
 95-28-20 N28-15W N28-43.5SW 214.22

63+72.30 R. 47-44-10

284.82

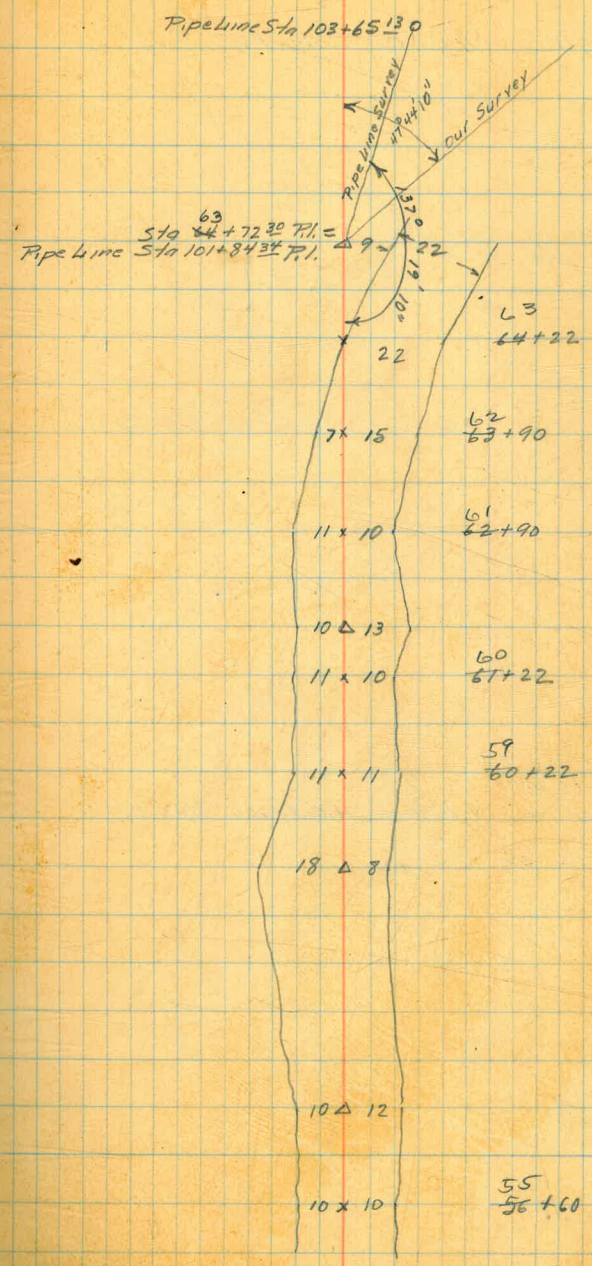
60+87.48
 5-12-40
 11-25-10
 R. 5-42-50 N74-45W N76-28.05W

8-26-15
 16-52-20 N82-0W N82-10.5SW 265.98

58+21.50 R. 48-26-10

5-35-10
 11-10-20 N74-0W N73-44-45W 205.04

56+16.46 R. 5-35-10



Sta. Angle Mag. Br. Calc. Br. Dist.

72+85.25

75-36-30

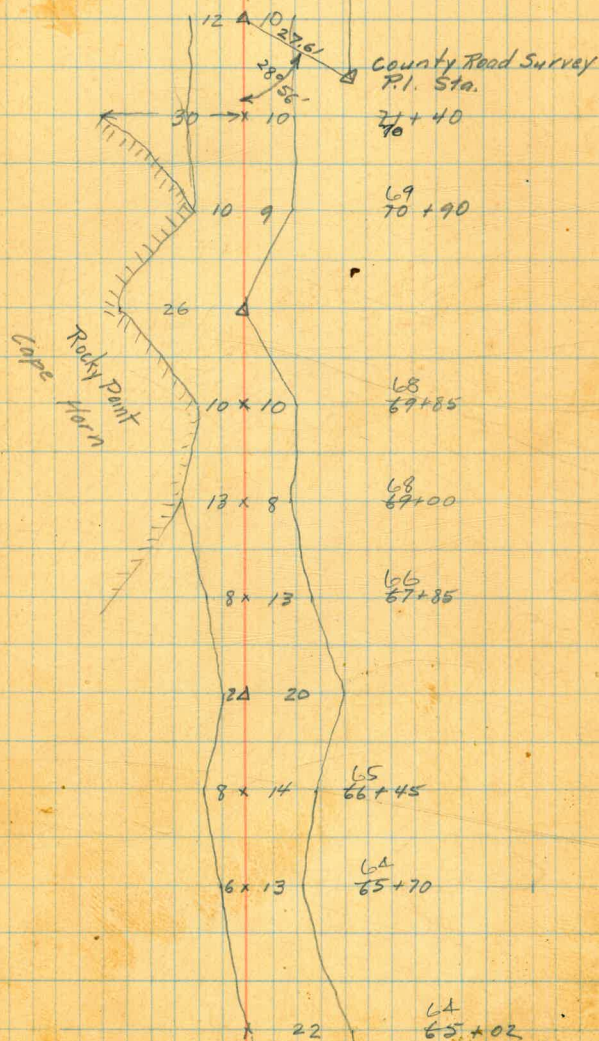
151-13-20 S 86-40W N 86-20-00W 345.70

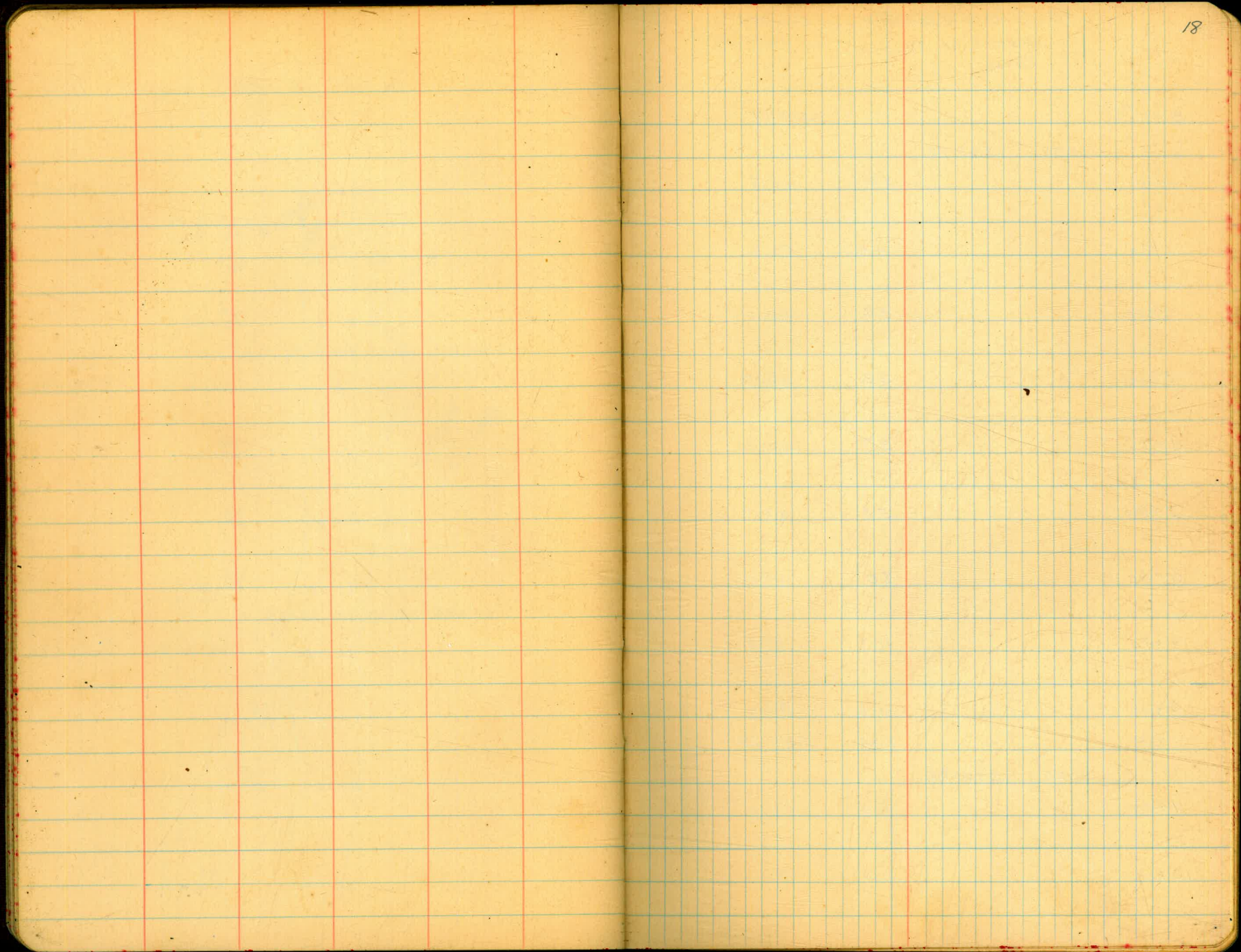
69+39.55 475-36-40

18-00-40

36-01-15 N 10-0W N 10-43-20W 353.03

65+86.52 718-00-35





Profile Levels, Road Survey
West Line Section 7 to El Monte
Park.

Simpson
Osborne.

Sept. 2nd 1932

19

B.M. #6		539.69	
	8.26	547.95	
0+00		5.2	42.8
1+00		4.4	43.6
2+00		3.9	44.1
3+00		5.2	42.8
4+00		3.7	44.3
5+00		5.4	42.6
6+00		8.0	40.0
7+00		10.2	37.8
8+00		11.6	36.4
T.P.		8.26	539.69
	1.26	540.95	
9+00		5.0	36.0
10+00		5.0	36.0

540.95

11+00 4.2 537.8

12+00 6.6 535.4

T.P 6.37 534.58

1.40 535.98

13+00 2.3 33.7

14+00 3.6 32.4

15+00 4.8 31.2

16+00 4.8 31.2

17+00 4.5 31.5

T.P 4.46 531.52

4.81 536.33

18+00 4.8 31.5

19+00 5.1 31.2

20+00 4.6 31.7

	536.33		
21+00		3.5	32.8
22+00		2.6	33.7
T.P.		2.47	533.86
	12.20	546.06	
23+00		11.2	34.9
24+00		9.6	36.5
25+00		5.5	40.6
26+00		2.9	43.2
27+00		2.0	44.1
T.P.		1.29	544.77
	4.42	549.19	
28+00		3.9	45.3
29+00		5.2	44.0
		0.73	548.46 = check
			on B.M. #8 El. 548.43.
30+00		11.0	38.2
T.P.		11.83	537.36
	0.37	537.73	

	537.73		
31+00		5.6	532.1
32+00		9.8	27.9
33+00		11.0	26.7
34+00		9.1	28.6
35+00		6.9	30.8
36+00		7.7	30.0
37+00		9.7	28.0
r.p.		11.96	525.77
	2.24	528.01	
38+00		3.5	24.5
39+00		4.7	23.3
40+00		4.7	23.3
41+00		4.5	23.5
42+00		3.8	24.2

	528.01		
43+00		2.6	25.4
T.P.		2.62	525.39
	7.59	532.98	
44+00		6.8	26.2
45+00		6.2	26.8
46+00		3.5	29.5
T.P.		0.50	532.48
	11.86	544.34	
47+00		9.8	34.5
48+00		5.8	38.5
49+00		3.5	40.8
+30		3.4	40.9
50+00		7.7	36.6
T.P.		12.13	532.21
	0.61	532.82	
51+00		1.5	31.3
52		5.9	26.9

	532.82		
53+00		8.5	24.3
54+00		10.6	22.2
T.P.		10.60	522.22
	7.11	529.33	
55+00		7.4	21.9
56+00		4.1	25.2
57+00		3.1	26.2
58+00		4.8	24.5
T.P.		4.81	524.52
	0.17	524.69	
59+00		1.8	22.9
60+00		4.5	20.2
61+00		7.1	17.6
62+00		7.9	16.8
63+00		8.5	16.2

	524.69		
T.P.		8.60	516.09
	5.73	521.82	
64+00		5.4	16.4
65+00		6.7	15.1
66+00		9.6	12.2
67+00		10.5	11.3
T.P.		10.57	511.25
	2.84	514.09	
68+00		3.4	10.7
69+00		4.9	09.2
+50		5.1	09.0
70+00		4.9	09.2
71+00		3.8	10.3
T.P.		3.78	510.31
	4.22	514.53	
B.M.		0.10	514.43

= check on B.M. #12

El. 514.43

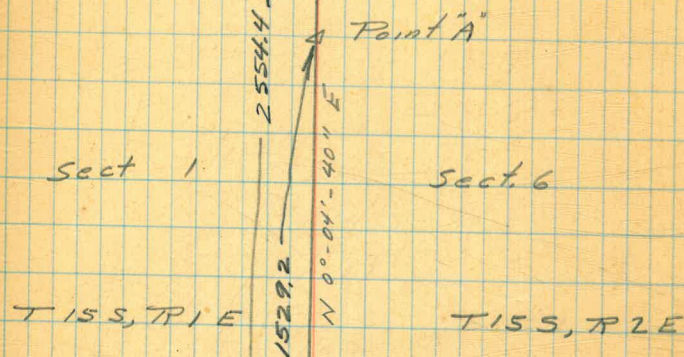
(G.I.R. Sta. 110+28)
Pipe line survey

El. Capitan Dam - Stadia Survey
of Quarry.

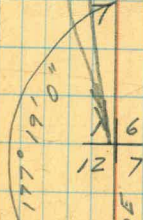
26

Rock Mkd. $\frac{1}{4}$ on W. face
Mnd. of Rock
3' West

$\frac{1}{4}$ Cor. between 1 & 6



Mnd. of Rock
Sect. Cor. Rock
5 notches on
south side



Sect. Cor.

Rock Mkd. $\frac{1}{4}$

$\frac{1}{4}$ Cor.

41. 241
15° 21'

179-60
2 40

177. 19

Sta Hor L Rod Vert L Hor Dist

AA

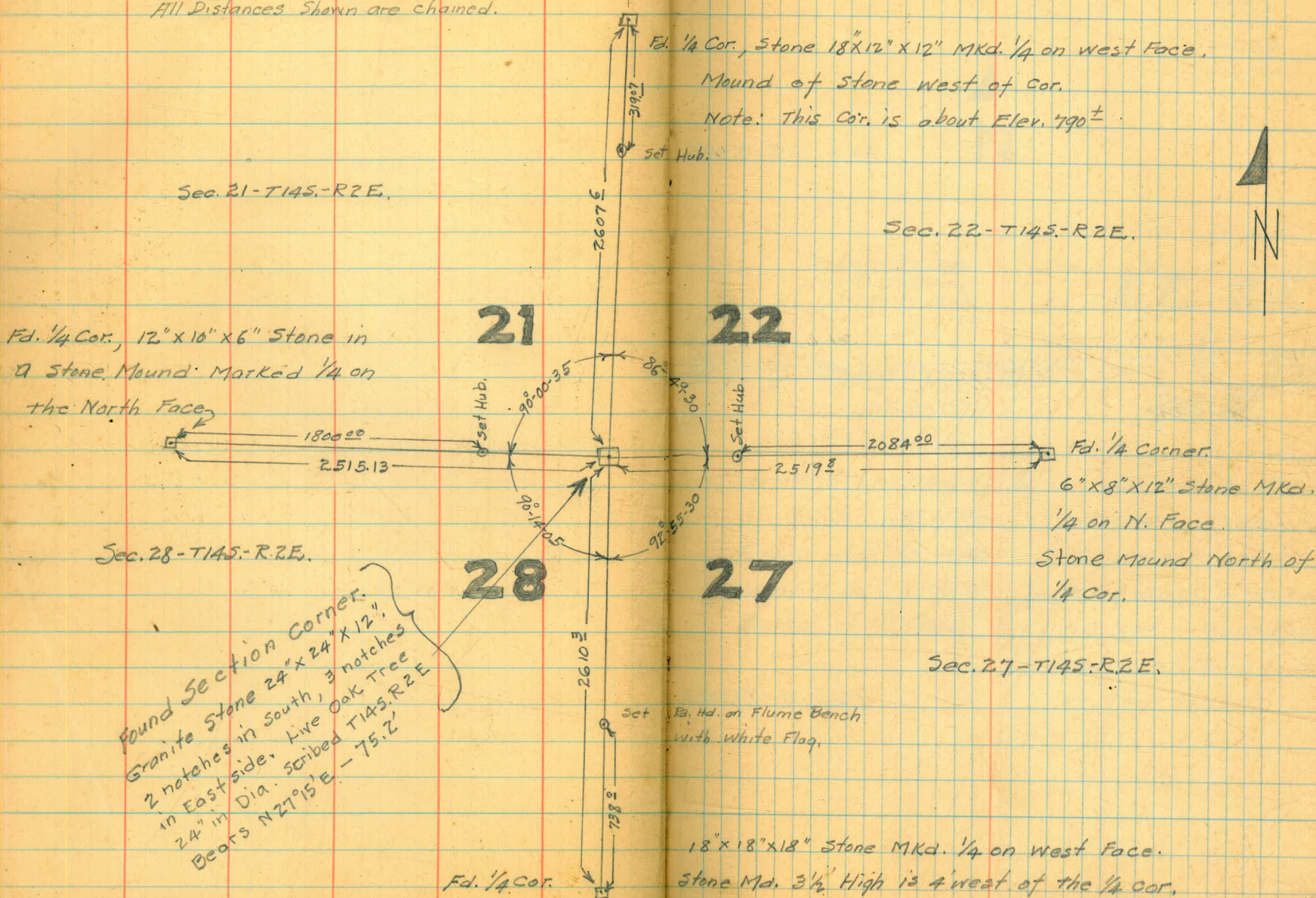
Section Line Surveys in upper Part of

Basin For Setting Witness Corners, 28

Dec. 1934 - Jan. 1935.

Simpson - Joper Remmen.

All Distances Shown are chained.



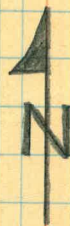
Section Line Surveys For Setting
Water Line.

Witness Corners above the High 29

Dec. 27-29. - 1934

Simpson
Soper
Isbell
Salgado
Reimann.

Sec. 33-T145. R2E,



32 33

5 4

Found Section Cor.

18" Live Oak Tree

Scribed on N.W., N.E.,
and S.W.

Mound of Rocks at Foot
of Tree.

2827.4

Set Hub.

1014.42

Set Hub For
1/4 Cor.

204.6

Distance as shown
in Gov. Re Survey
Notes of 1902.

181°07'

Found witness Cor.
cross on 5'x5' Boulder

Boulder 6'x6'x5' MKd. W.C. 1/4

on N. side, South of the
Rock with the cross.

Mound of Rock North of
Boulder with Cross.

2430.35

Found Cor. to Secs. 33-34

Stone 10"x12"x12", 2 notches
on west side. Rock

Mound N. of the Corner

33 34

4 3

114.8

Found C.C. Cor.

Stone 10"x12"x12",
2 notches in west
and East sides.

C.C. cut in south side.

Mound of Rock South
of the corner.

Sec. 4-T155. - R.2E.

Section Line Surveys For Setting witness Corners Above the High Water Line ³⁰

Dec. 26 - 1934.

Simpson - Soper

Isbell - Remmen

Salgado.



Sec. 4 T. 155. - R2E.

54
89

Found $\frac{1}{4}$ Cor.

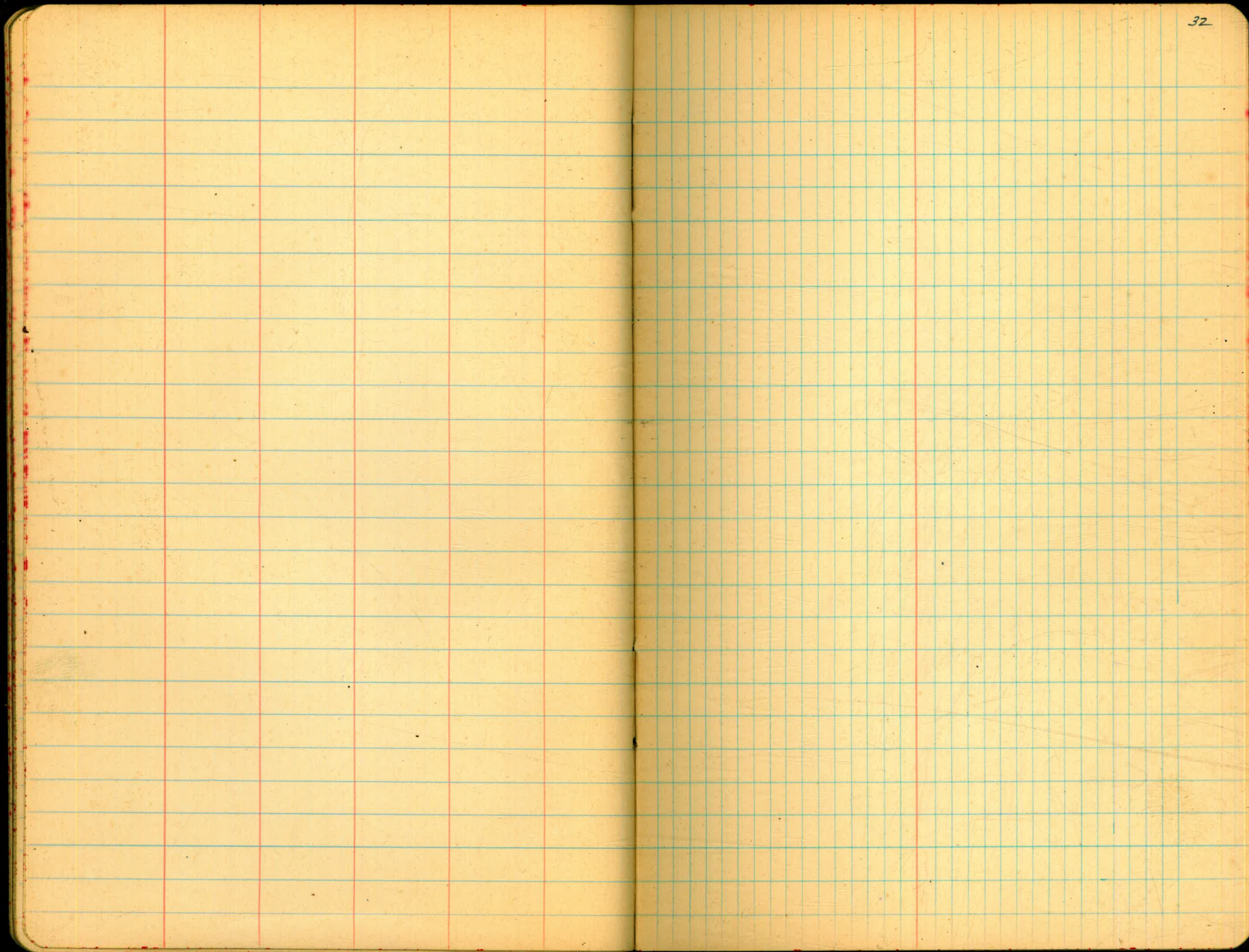
2643E

12" x 8" Stone

Mkd. $\frac{1}{4}$ on N.

Face

Sec. 9. T. 155. - R2E.



Profile of Proposed 6% Road Location
From South end of Dam, west to Co. Road.

Feb. 15-1935.

Simpson
Soper
Reimman

35

7.7

B.M.	4.86	774.53	769.67	= Spike in	South end of Corewall	N2998 E5000,
0+00 =	N2998 (Dam Coord.) E5000		4.2			
+11			4.6			
+30			10.7			
+66			12.2			
1+13.5			11.5			
+50			10.6			
+74.4			13.5			
T.P.			12.89	761.64		
	1.62	763.26				
+93			7.4			
2+25			10.2	= on	Flume Bench	
3+04.2			10.6	"	"	
+54			18.8			
+70.2			14.2	= on large	slipping Rock,	
T.P.			10.11	753.15		
	3.70	756.85				
4+02			19.6	= under-	neath Flume Trestle,	
			3.4	= Flow	Line of Flume at crossing.	
4+30			11.0			
+39.4			11.8			
+74			11.3			
Set B.M.			4.70	752.15	High Point of Rock at outside edge of Flume Bench	
T.P.			12.63	744.22	25' Left of Sta. 5+60 [±]	

Feb. 18, 1935.

Simpson
Soper
Remmen.

36

T.P.		744.22
0.66	744.88	
5+20.02		5.2
+43		8.0
+63.91		8.4
+90		8.3
6+00		10.2
T.P.		12.83
		732.05
1.62	733.67	
+24		4.3
+50		1.2
+68		1.6
7+00		6.7
+17		12.4
+33		7.7
T.P.		7.14
		726.53
2.55	729.08	
+72		10.2
8+00		9.2
+50		12.0
9+00		11.9
+40		5.7

B.M. & T.P.

9.38

719.70 Point on Large Boulder 25' Right of Sta. 9+50

Feb. 18-1935.

37

719.70

3.67 723.37

9+67 0.8

+98 12.1

10+07 0.0

on large Boulder.

+15 5.1

+47 4.4

+85 15.3

T.P. 12.91 710.46

0.38 710.84

11+10 19.8

+30 13.8

+81.30 10.5

12+20 14.3

T.P. 12.69 698.15

3.80 701.95

+76 14.4

13+20 12.2

T.P. 12.70 689.25

0.28 689.53

+50 1.6

+86 8.1

14+20.0 3.9

+70 9.7

T.P. 12.97 676.56

0.07 676.63

676.63

15+02

8.8

+22

2.5

Set B.M.

7.99

668.64 - Point on Large Boulder 83' RA. of Sta. 15+35.

15+47.39

2.9

+85

1.0

16+00.61

4.2

T.P.

10.25

666.38

1.21

667.59

16+16

+0.8

+60

8.7

+69.34

+0.7

Cross-section at P.I. on
the split of the angle

Lf.

¢

Rt.

16+69.34

+9.9

8.7

12.2

20.8

21.8

15

10

20

40

60

17+20

5.0

+50

7.6

+65.04

6.8

18+15

12.8

T.P.

13.02

654.57

6

5

Road Location North Side of Reservoir
Feb. 25-1935.

N 49° 15' E

2+71.52 ~ 15° 43' Rt.

109.45

N 33° 20' E

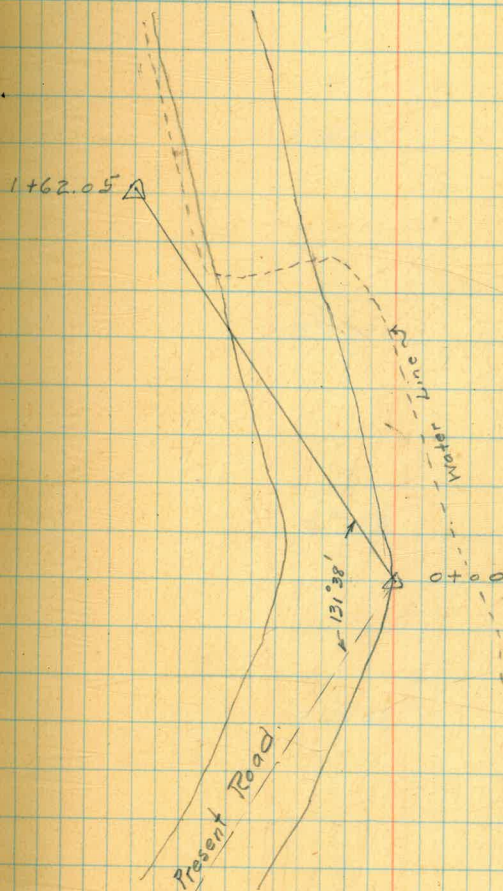
1+62.05 28° 55'
57° 50' Lf.
28° 55'

162.05

0+00

2/25/35
Converse
Simpson
Sefer
Remmen

42



Feb. 25-1935

43

Sta.	Angle	Mag. Bear.
150.25		N 69° 15' E
11 + 55.44	27° 39' Lf.	
369.00		S 82° 45' E
7 + 86.44	25° 50' Rt.	
192.50		N 71° 15' E
5 + 94.14	10° 32' Rt.	
94.10		N 61° E
5 + 00.04	56° 49' Rt.	
147.30		N 3° 40' E
3 + 52.74	45° 27' Lf.	
81.72		N 49° 15' E

Feb. 25-1935

44

Sta.	Angle	Mag. Bear.
130.92		N17°50'E
18+93.52	45°21' Lf.	N63°40'E
16.77		
17+76.75	24°30' Lf.	N87°45'E
71.63		
16+79.12	19°54' Lf.	S72°50'E
87.67		
15+91.45	8°19'30" Rt.	S81°0'E
78.08		
15+13.27	35°20' Rt.	N64°15'E
70.40		
14+42.97	18°40' Lf.	N83°0'E
80.8		
13+05.89	13°59'30" Rt.	N69°15'E

Sta.	Angle	Mag. Bear.
93.72		N33°45'E
25+77.62	54°35' Lf.	
88.99		N88°20'E
24+88.63	41°32'30" Rt. [?]	
210.77		N47°10'E
22+77.86	7°50' Lf.	
124.05		N55°15'E
21+53.81	9°27' Lf.	
129.37		N65°0'E
20+24.44	46°40' Rt.	
		N17°50'E

Road Location, North side of Reservoir Contd.

Feb. 26-1935

46

Converse
Simpson
Seber
Remmen.

Olive Orchard.

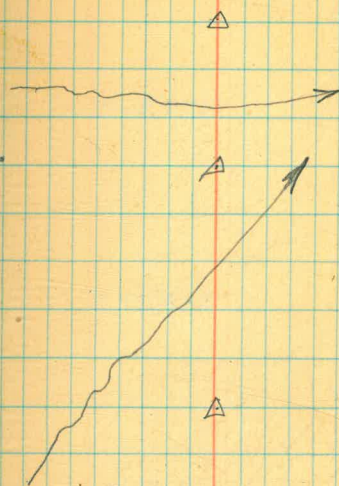
△

Sta:	Angle		Mag. Bear.
167.49			N23°0'E
39+96.00	3°35'	Lf.	N26°50'E
386.00			
36+10.00	1°29'	Lf.	N28°10'E
330.75			
32+79.25	22°34'	Rt.	N5°45'E
87.25			
31+92.00	17°55'15"	Lf.	N23°30'E
394.47			
27+97.53	6°15'	Rt.	N17°0'E
126.19			
26+71.34	16°50'	Lf.	N33°45'E

Feb. 26 - 1935.

47

Sta.	Angle	Mag. Bear.
		S 84° 30' E
46 + 46.19	33° 43' Rt.	
91.28		N 62° 30' E
45 + 54.91	44° 01' Lf.	
96.09		S 73° 40' E
44 + 58.82	67° 50' Rt.	
123.9		N 38° 30' E
44 + 16.43	43° 12' 30" Rt.	
65.44		N 4° 40' W
43 + 51.19	2° 57' Rt.	
187.70		N 7° 30' W
41 + 63.49	30° 20' 30" Lf.	
		N 23° 0' E



↑
Olive Orchard

Feb. 26-1935.

48

Sta.	Angle	Mag. Bear.
		N60°15'E
60+98.67	17°37' Lf.	
718.67		N77°30'E
58+80.00	14°18' Rt.	
717.90		N62°50'E
51+62.10	36°18' Lf.	
81.61		S80°0'E
50+80.49	37°09' Lf.	
113.41		S42°20'E
49+67.08	45°17'30" Rt.	
168.51		S88°10'E
47+98.57	4°24' Lf.	
137.38		S84°30'E

Feb. 26 - 1935

49

Sta.	Angle	Mag. Bear.
		S 78° 30' E
71 + 81.41	1° 31' RT.	S 80° 10' E
363.10		
68 + 18.31	26° 45' RT.	N 73° 0' E
198.78		
66 + 19.53	27° 52' Lf.	S 79° 15' E
221.81		
63 + 97.72	34° 26' 30" RT.	N 66° 10' E
104.31		
62 + 93.41	24° 25' RT.	N 41° 45' E
102.52		
61 + 90.89	18° 21' Lf.	N 60° 15' E
92.72		

Sta.	Angle	Mag. Bear.
85+02.00	12° 52' Rt.	N 6° 45' E
100.11		N 6° 10' W
84+01.89	37° 37' 30" Lf.	N 32° 20' E
108.09		
82+53.80	18° 04' 30" Lf.	N 49° 40' E
84.33		
81+69.47	21° 56' Lf.	N 72° 0' E
153.10		
80+16.37	23° 44' Lf.	S 84° 30' E
507.69		
75+08.68	5° 49' Lf.	S 78° 30' E
327.27		

△ Cross on Large Boulder.

Feb. 26-1935.

57

Sta.	Angle	Mag. Bear.
------	-------	------------

94+25 = intersection with Present Traveled Road

210.0

92+15 = P.O.T.

397.41

N31°30'E

88+17.59 36°15' Rt.

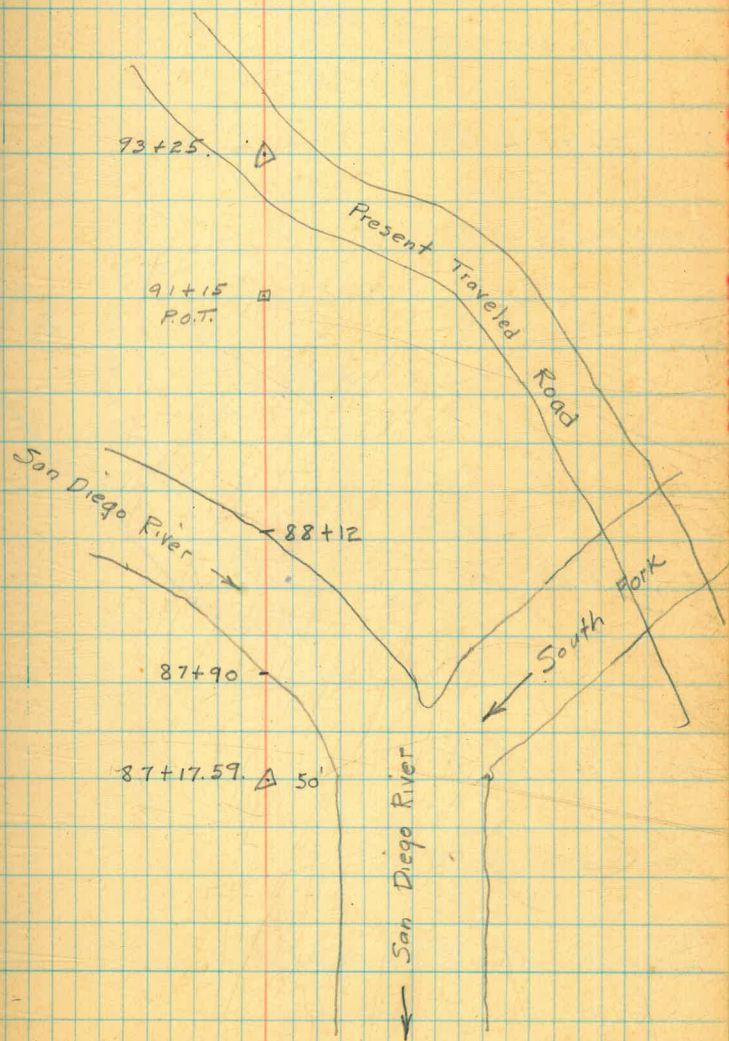
148.76

N4°10'W.

86+68.83 10°56' Lt.

166.83

N6°45'E.



County alignment from
El Monte Park to Dam.

325+53.71 E.C.

$\Delta 16^{\circ}17' L$

R. 1500

T 21459

L 42636

321+22.41 B.C.

L 185

~~311+86.22 B.C.~~

316+71.88 E.C.

$\Delta 7^{\circ}05'30'' R$

R. 1500

T. 92.94

L. 185.66

311+86.22 B.C.

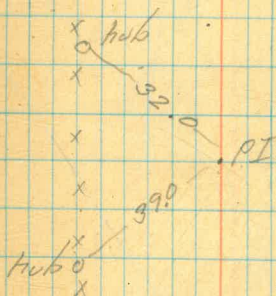
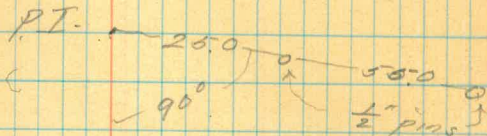
8+67.00 P.O.T.

7+13.66 P.O.T.

0+00 $\&$ Main + Woodside drive

Note
for alignment from
sta. 299+11.92 see
page 57

See book 317



o Pd stone man i' below
surface

cont. from page 52

341+22.12 E.C.

A 1643 R

R 5000

T 215.94

L 107.68

337+14.14 B.C.

336+30.00 P.O.T.

334+65.65 P.O.T.

330+95.78 Intersec. El Monte Ranch line

330+87.15 E.C.

A 12258 L

R 1000

T 113.64

L 226.31

328+10.84 B.C.

Seebook 317

335.00
1/2 P.O.T.
50.00 P.I.

79.22

330+95.78

98

P.I. 10.00 - 52.00

cont. from page 53

35742628 E.C.

$\Delta 14031' L$

R. 600.00

T. 75.84

L. 152.02

35577426 B.C.

35247.16 E.C.

$\Delta 801130'' L$

R. 1774.25

T. 127.05

L. 253.67

349463.19 P.C.C.

$\Delta 18026'36'' L$

R. 1000.0

T. 162.34

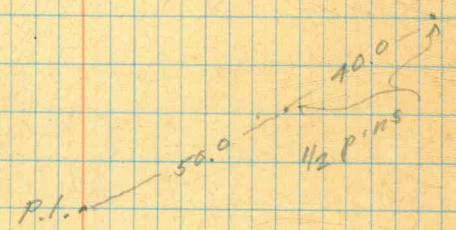
L. 321.84

34647165 B.C.

34448948 P.C.T.

34247380 P.O.T.

See book 317



cont. from page 54

3
369+13.10 E.C.

$\Delta 7^{\circ}55' L$

R. 1500.

T. 103.79

L. 207.06

3
367+35.81 B.C.

3
366+07.48 E.C.

$\Delta 20^{\circ}12' L$

R. 100.0

T. 71.25

L. 141.02

364+66.16 B.C.

362+76.07 E.C.

~~361+11.84~~

$\Delta 31^{\circ}30' R$

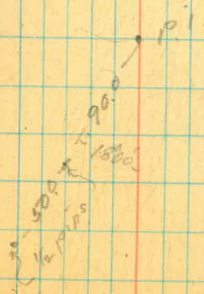
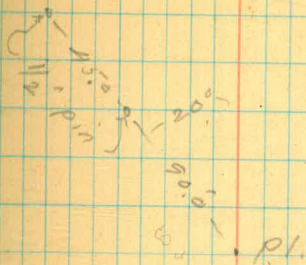
R. 450.0

T. 139.73

L. 270.96

360+05.11 B.C.

Seebook 317



cont from page 55

37846172 E.C.

 $\Delta 21950' R$

R. 500.0

T. 96.44

L. 19053

37647119 B.C.

37640508 E.C.

 $\Delta 19945' L$

R. 600.0

T. 104.95

L. 206.82

37349820 B.C.

37346333 E.C.

 $\Delta 6000' R$

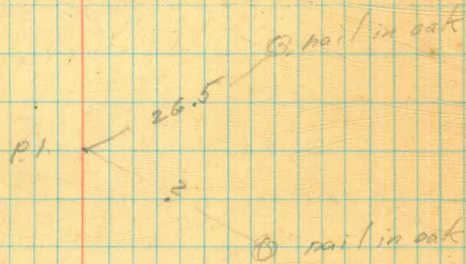
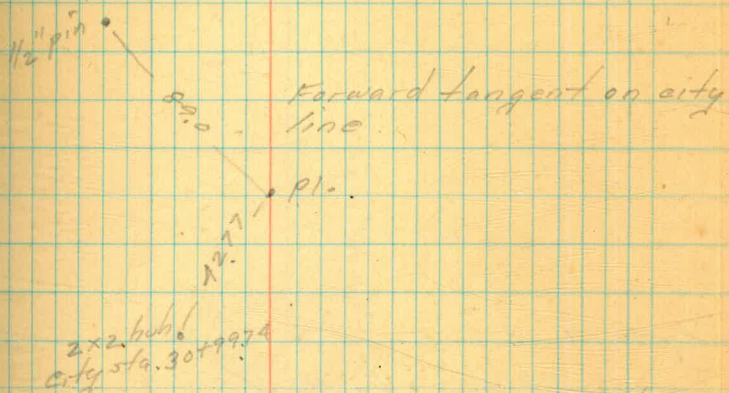
R. 2000.

T. 104.82

L. 209.44

37145389 B.C.

see book 317



cont. from page 56

3314+4039 E.C.

 $\Delta 21^{\circ}40'30''L$

R. 600.0

T. 114.86

L 226.98

312+13.11 B.C.

310+91.10 E.C.

 $\Delta 10^{\circ}00'R$

R. 1500.0

T. 131.23

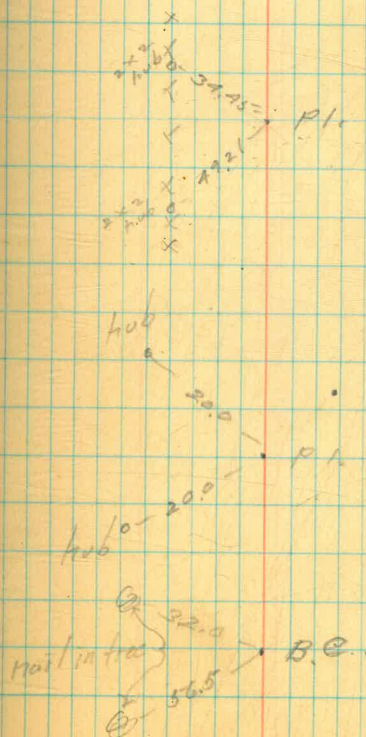
L 261.80

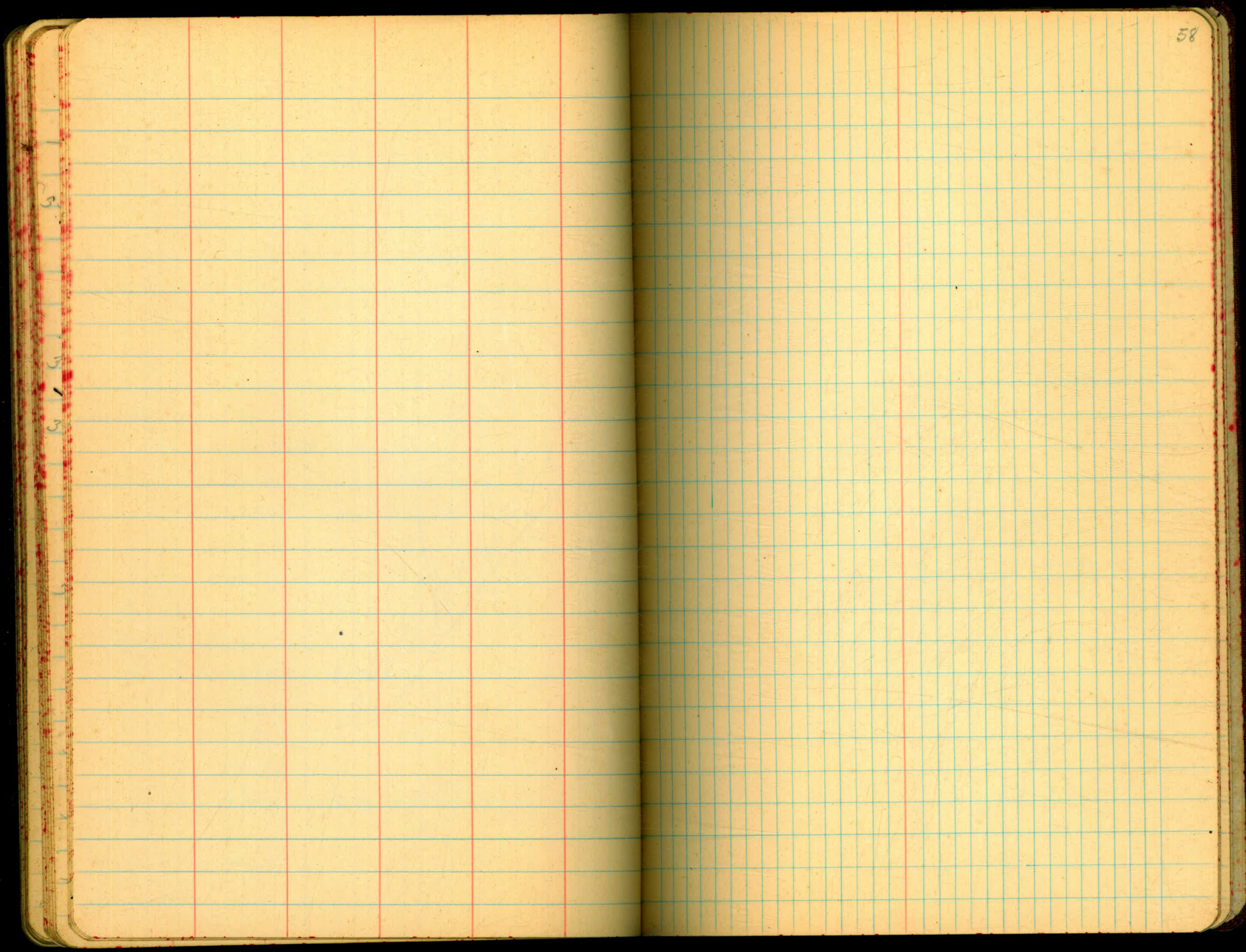
308+29.30 B.C.

304+23.72 P.O.T.

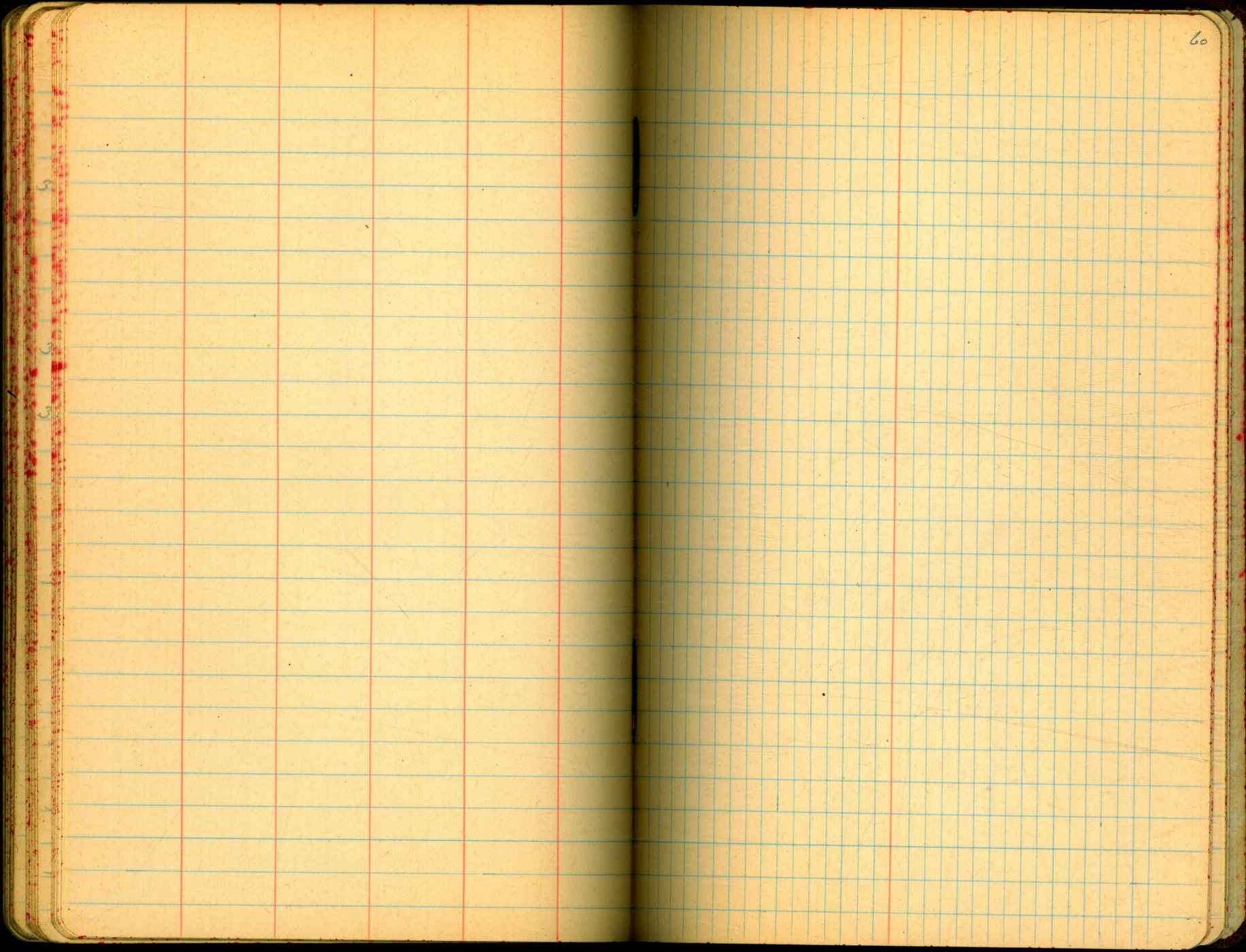
294+41.92 E.C. preceding curve.

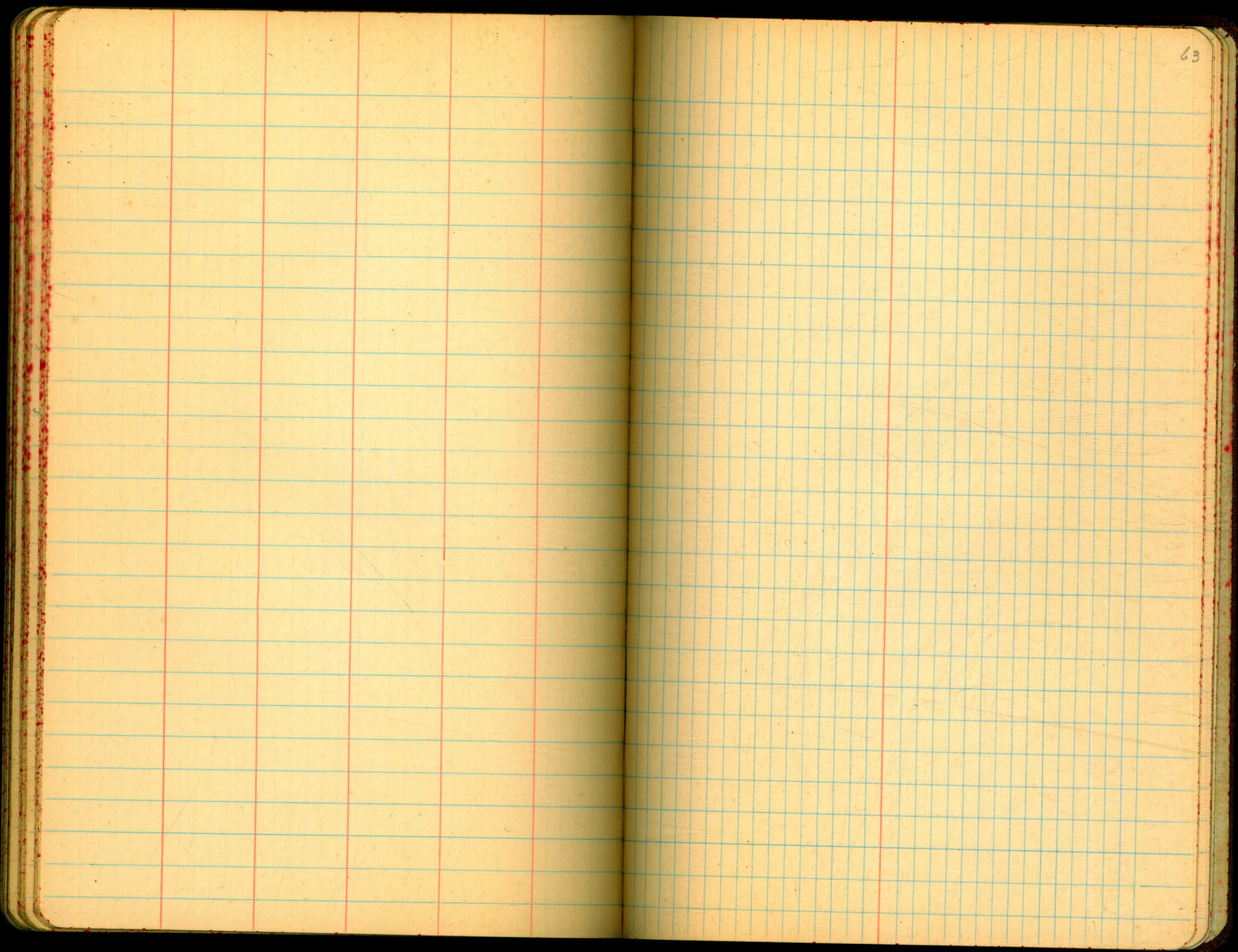
See book 317

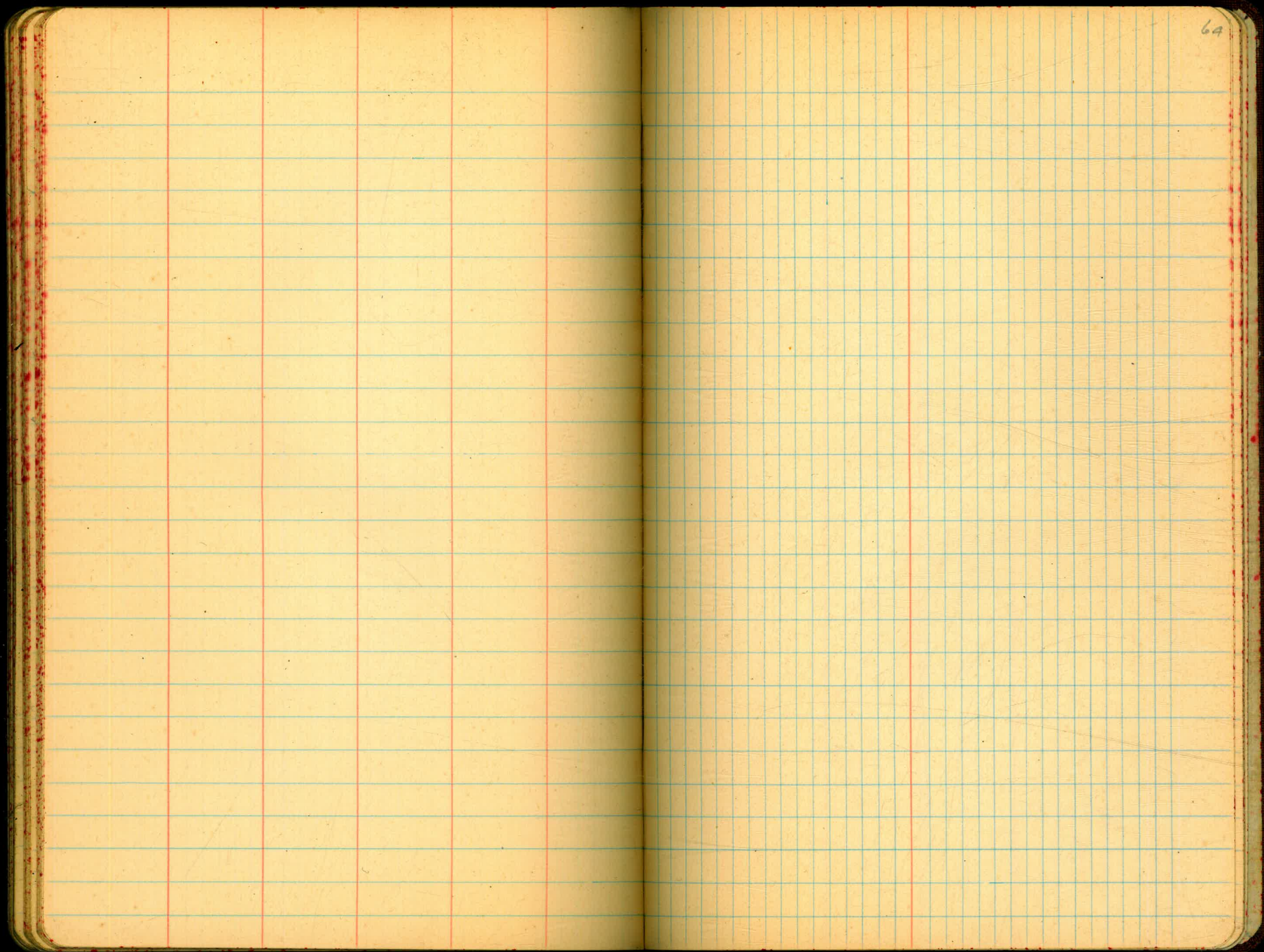


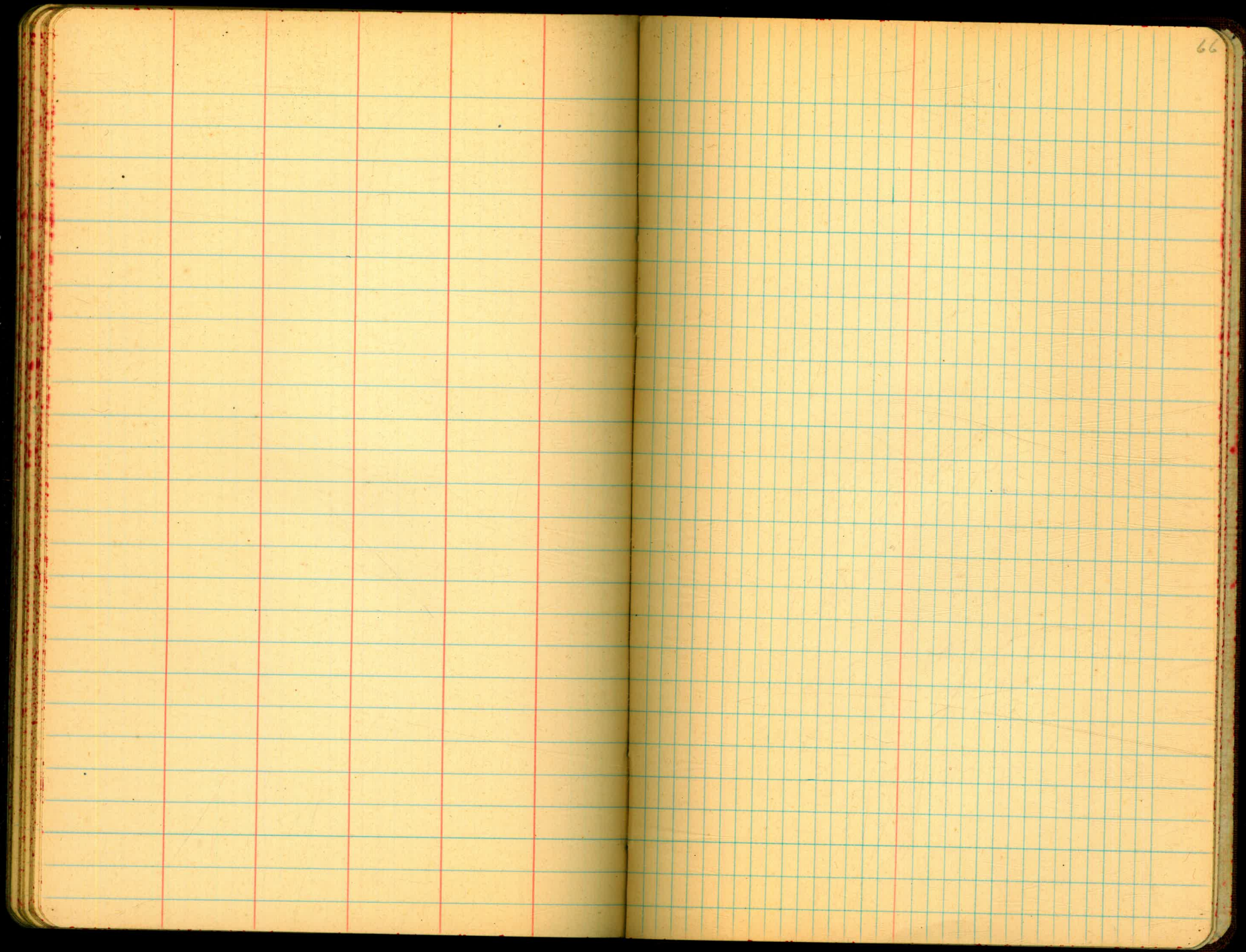


5
5
5









Survey for 3" water main
 from Prison Camp to City Camp.
 11+48.38 20°24'45" R.

140.38

5.69°39'30" N

10+08.0 18°27'30" L.

216.5

5.88°07" N

7+91.5 16°52" R

264.5

5.71°15" N

5+27.0 15°51" R

527.0

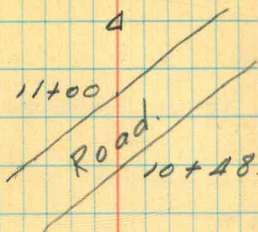
5.55°24" N

0+00 34°36" L.

West.

Feb. 23. 1935
 Converse
 Simpson
 Sober
 Remmen.

69



A

A

A

34°36'

Coordinate Line N. 4069.7

Coordinate N. 4069.7
 E. 3459.0

Tee in Prison Camp 2"
 Line above Cook House.

19+16.4

160.12

5.60°31'30"W

17+56.28 27°05' R.

131.28

5.33°26'30"W

16+25.0 18°34'30" L.

162.4

5.52°01' W

14+62.6 21°44'45" L.

92.6

5.73°45'45" W

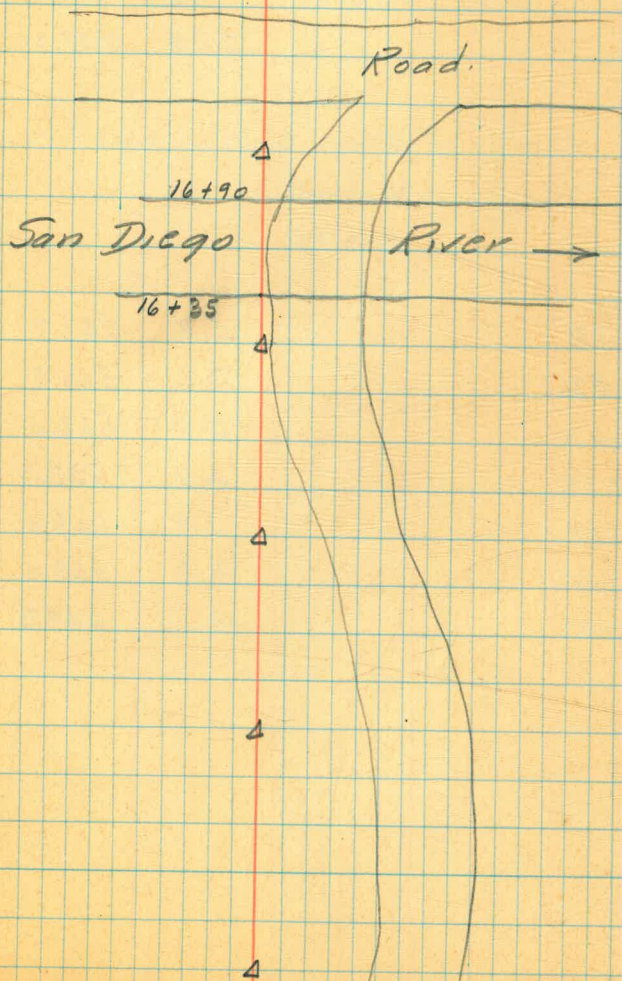
13+70.0 16°18'30" L.

221.62

N.89°55'45" W.

11+18.38

City Camp.
2" Fire Hydrant west of garage.



B.M.			563.65	
	0.96	564.61		
T.P.			10.03	554.58
	2.19	556.77		
B.M.			8.36	548.41
	4.58	552.99		Set B.M.
			3.79	549.20

Profile of Ramp Left in West end of
Tunnel.

552.99

9+72		5.8	547.2
+82		5.2	547.8
10+00		5.0	548.0
+50		4.7	548.3
11+00		5.0	548.0
+50		5.0	548.0
12+00		4.7	548.3

2nd.
on ladder rung at
tunnel outlet Portal

549.20
542.67
6.53

167
6.68

1472.7
280
8,927

Sta. Hor. L. Rod Vert L. Hor. Dist.

ΔA

1 00
 2 42-15
 3
 4
 5
 B 96-30

ΔB

A 263-30

B1

2

3

4

5

6

ΔC

B

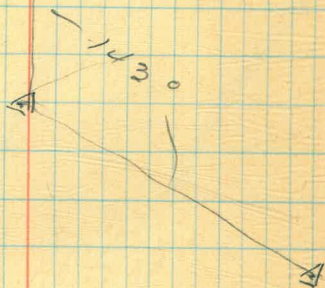
C1

2

3

72

640	360
96-30	<u>96-30</u>
543	263-30



56.00	9075	5632	96.62
9899	6675	4784	97
56	45376	22528	67671
56994	63525	45056	86967
48495	54450	39424	937311
541944	54450	50688	72+18.83
	60575625	51083488	85.57
			73+04.40
94.76	9210		
86	52		
56756	1962		
75808	4905		
815836	51012		

Table I - Radix Ordinates and Distributions

Dec	10	9	8	7	6	5	4	3	2	1	0
0.00	1.0000										
0.10	0.9000	0.1000									
0.20	0.8100	0.1800	0.0100								
0.30	0.7290	0.2700	0.0270	0.0010							
0.40	0.6480	0.3600	0.0432	0.0036	0.0001						
0.50	0.5670	0.4500	0.0603	0.0054	0.0009	0.0001					
0.60	0.4860	0.5400	0.0774	0.0072	0.0013	0.0002	0.0001				
0.70	0.4050	0.6300	0.0945	0.0090	0.0018	0.0003	0.0004	0.0001			
0.80	0.3240	0.7200	0.1116	0.0108	0.0024	0.0005	0.0006	0.0002	0.0001		
0.90	0.2430	0.8100	0.1287	0.0126	0.0030	0.0007	0.0008	0.0003	0.0004	0.0001	
1.00	0.1620	0.9000	0.1458	0.0144	0.0036	0.0009	0.0010	0.0004	0.0005	0.0002	0.0001
1.10	0.0810	0.9900	0.1629	0.0162	0.0042	0.0011	0.0012	0.0005	0.0006	0.0003	0.0002
1.20	0.0000	1.0800	0.1800	0.0180	0.0048	0.0013	0.0014	0.0006	0.0007	0.0004	0.0003
1.30		1.1700	0.1971	0.0198	0.0054	0.0015	0.0016	0.0007	0.0008	0.0005	0.0004
1.40		1.2600	0.2142	0.0216	0.0060	0.0017	0.0018	0.0008	0.0009	0.0006	0.0005
1.50		1.3500	0.2313	0.0234	0.0066	0.0019	0.0020	0.0009	0.0010	0.0007	0.0006
1.60		1.4400	0.2484	0.0252	0.0072	0.0021	0.0022	0.0010	0.0011	0.0008	0.0007
1.70		1.5300	0.2655	0.0270	0.0078	0.0023	0.0024	0.0011	0.0012	0.0009	0.0008
1.80		1.6200	0.2826	0.0288	0.0084	0.0025	0.0026	0.0012	0.0013	0.0010	0.0009
1.90		1.7100	0.2997	0.0306	0.0090	0.0027	0.0028	0.0013	0.0014	0.0011	0.0010
2.00		1.8000	0.3168	0.0324	0.0096	0.0029	0.0030	0.0014	0.0015	0.0012	0.0011
2.10		1.8900	0.3339	0.0342	0.0102	0.0031	0.0032	0.0015	0.0016	0.0013	0.0012
2.20		1.9800	0.3510	0.0360	0.0108	0.0033	0.0034	0.0016	0.0017	0.0014	0.0013
2.30		2.0700	0.3681	0.0378	0.0114	0.0035	0.0036	0.0017	0.0018	0.0015	0.0014
2.40		2.1600	0.3852	0.0396	0.0120	0.0037	0.0038	0.0018	0.0019	0.0016	0.0015
2.50		2.2500	0.4023	0.0414	0.0126	0.0039	0.0040	0.0019	0.0020	0.0017	0.0016
2.60		2.3400	0.4194	0.0432	0.0132	0.0041	0.0042	0.0020	0.0021	0.0018	0.0017
2.70		2.4300	0.4365	0.0450	0.0138	0.0043	0.0044	0.0021	0.0022	0.0019	0.0018
2.80		2.5200	0.4536	0.0468	0.0144	0.0045	0.0046	0.0022	0.0023	0.0020	0.0019
2.90		2.6100	0.4707	0.0486	0.0150	0.0047	0.0048	0.0023	0.0024	0.0021	0.0020
3.00		2.7000	0.4878	0.0504	0.0156	0.0049	0.0050	0.0024	0.0025	0.0022	0.0021
3.10		2.7900	0.5049	0.0522	0.0162	0.0051	0.0052	0.0025	0.0026	0.0023	0.0022
3.20		2.8800	0.5220	0.0540	0.0168	0.0053	0.0054	0.0026	0.0027	0.0024	0.0023
3.30		2.9700	0.5391	0.0558	0.0174	0.0055	0.0056	0.0027	0.0028	0.0025	0.0024
3.40		3.0600	0.5562	0.0576	0.0180	0.0057	0.0058	0.0028	0.0029	0.0026	0.0025
3.50		3.1500	0.5733	0.0594	0.0186	0.0059	0.0060	0.0029	0.0030	0.0027	0.0026
3.60		3.2400	0.5904	0.0612	0.0192	0.0061	0.0062	0.0030	0.0031	0.0028	0.0027
3.70		3.3300	0.6075	0.0630	0.0198	0.0063	0.0064	0.0031	0.0032	0.0029	0.0028
3.80		3.4200	0.6246	0.0648	0.0204	0.0065	0.0066	0.0032	0.0033	0.0030	0.0029
3.90		3.5100	0.6417	0.0666	0.0210	0.0067	0.0068	0.0033	0.0034	0.0031	0.0030
4.00		3.6000	0.6588	0.0684	0.0216	0.0069	0.0070	0.0034	0.0035	0.0032	0.0031
4.10		3.6900	0.6759	0.0702	0.0222	0.0071	0.0072	0.0035	0.0036	0.0033	0.0032
4.20		3.7800	0.6930	0.0720	0.0228	0.0073	0.0074	0.0036	0.0037	0.0034	0.0033
4.30		3.8700	0.7101	0.0738	0.0234	0.0075	0.0076	0.0037	0.0038	0.0035	0.0034
4.40		3.9600	0.7272	0.0756	0.0240	0.0077	0.0078	0.0038	0.0039	0.0036	0.0035
4.50		4.0500	0.7443	0.0774	0.0246	0.0079	0.0080	0.0039	0.0040	0.0037	0.0036
4.60		4.1400	0.7614	0.0792	0.0252	0.0081	0.0082	0.0040	0.0041	0.0038	0.0037
4.70		4.2300	0.7785	0.0810	0.0258	0.0083	0.0084	0.0041	0.0042	0.0039	0.0038
4.80		4.3200	0.7956	0.0828	0.0264	0.0085	0.0086	0.0042	0.0043	0.0040	0.0039
4.90		4.4100	0.8127	0.0846	0.0270	0.0087	0.0088	0.0043	0.0044	0.0041	0.0040
5.00		4.5000	0.8298	0.0864	0.0276	0.0089	0.0090	0.0044	0.0045	0.0042	0.0041
5.10		4.5900	0.8469	0.0882	0.0282	0.0091	0.0092	0.0045	0.0046	0.0043	0.0042
5.20		4.6800	0.8640	0.0900	0.0288	0.0093	0.0094	0.0046	0.0047	0.0044	0.0043
5.30		4.7700	0.8811	0.0918	0.0294	0.0095	0.0096	0.0047	0.0048	0.0045	0.0044
5.40		4.8600	0.8982	0.0936	0.0300	0.0097	0.0098	0.0048	0.0049	0.0046	0.0045
5.50		4.9500	0.9153	0.0954	0.0306	0.0099	0.0100	0.0049	0.0050	0.0047	0.0046
5.60		5.0400	0.9324	0.0972	0.0312	0.0101	0.0102	0.0050	0.0051	0.0048	0.0047
5.70		5.1300	0.9495	0.0990	0.0318	0.0103	0.0104	0.0051	0.0052	0.0049	0.0048
5.80		5.2200	0.9666	0.1008	0.0324	0.0105	0.0106	0.0052	0.0053	0.0050	0.0049
5.90		5.3100	0.9837	0.1026	0.0330	0.0107	0.0108	0.0053	0.0054	0.0051	0.0050
6.00		5.4000	1.0008	0.1044	0.0336	0.0109	0.0110	0.0054	0.0055	0.0052	0.0051
6.10		5.4900	1.0179	0.1062	0.0342	0.0111	0.0112	0.0055	0.0056	0.0053	0.0052
6.20		5.5800	1.0350	0.1080	0.0348	0.0113	0.0114	0.0056	0.0057	0.0054	0.0053
6.30		5.6700	1.0521	0.1098	0.0354	0.0115	0.0116	0.0057	0.0058	0.0055	0.0054
6.40		5.7600	1.0692	0.1116	0.0360	0.0117	0.0118	0.0058	0.0059	0.0056	0.0055
6.50		5.8500	1.0863	0.1134	0.0366	0.0119	0.0120	0.0059	0.0060	0.0057	0.0056
6.60		5.9400	1.1034	0.1152	0.0372	0.0121	0.0122	0.0060	0.0061	0.0058	0.0057
6.70		6.0300	1.1205	0.1170	0.0378	0.0123	0.0124	0.0061	0.0062	0.0059	0.0058
6.80		6.1200	1.1376	0.1188	0.0384	0.0125	0.0126	0.0062	0.0063	0.0060	0.0059
6.90		6.2100	1.1547	0.1206	0.0390	0.0127	0.0128	0.0063	0.0064	0.0061	0.0060
7.00		6.3000	1.1718	0.1224	0.0396	0.0129	0.0130	0.0064	0.0065	0.0062	0.0061
7.10		6.3900	1.1889	0.1242	0.0402	0.0131	0.0132	0.0065	0.0066	0.0063	0.0062
7.20		6.4800	1.2060	0.1260	0.0408	0.0133	0.0134	0.0066	0.0067	0.0064	0.0063
7.30		6.5700	1.2231	0.1278	0.0414	0.0135	0.0136	0.0067	0.0068	0.0065	0.0064
7.40		6.6600	1.2402	0.1296	0.0420	0.0137	0.0138	0.0068	0.0069	0.0066	0.0065
7.50		6.7500	1.2573	0.1314	0.0426	0.0139	0.0140	0.0069	0.0070	0.0067	0.0066
7.60		6.8400	1.2744	0.1332	0.0432	0.0141	0.0142	0.0070	0.0071	0.0068	0.0067
7.70		6.9300	1.2915	0.1350	0.0438	0.0143	0.0144	0.0071	0.0072	0.0069	0.0068
7.80		7.0200	1.3086	0.1368	0.0444	0.0145	0.0146	0.0072	0.0073	0.0070	0.0069
7.90		7.1100	1.3257	0.1386	0.0450	0.0147	0.0148	0.0073	0.0074	0.0071	0.0070
8.00		7.2000	1.3428	0.1404	0.0456	0.0149	0.0150	0.0074	0.0075	0.0072	0.0071
8.10		7.2900	1.3599	0.1422	0.0462	0.0151	0.0152	0.0075	0.0076	0.0073	0.0072
8.20		7.3800	1.3770	0.1440	0.0468	0.0153	0.0154	0.0076	0.0077	0.0074	0.0073
8.30		7.4700	1.3941	0.1458	0.0474	0.0155	0.0156	0.0077	0.0078	0.0075	0.0074
8.40		7.5600	1.4112	0.1476	0.0480	0.0157	0.0158	0.0078	0.0079	0.0076	0.0075
8.50		7.6500	1.4283	0.1494	0.0486	0.0159	0.0160	0.0079	0.0080	0.0077	0.0076
8.60		7.7400	1.4454	0.1512	0.0492	0.0161	0.0162	0.0080	0.0081	0.0078	0.0077
8.70		7.8300	1.4625	0.1530	0.0498	0.0163	0.0164	0.0081	0.0082	0.0079	0.0078
8.80		7.9200	1.4796	0.1548	0.0504	0.0165	0.0166	0.0082	0.0083	0.0080	0.0079
8.90		8.0100	1.4967	0.1566	0.0510	0.0167	0.0168	0.0083	0.0084	0.0081	0.0080
9.00		8.1000	1.5138	0.1584	0.0516	0.0169	0.0170	0.0084	0.0085	0.0082	0.0081
9.10		8.1900	1.5309	0.1602	0.0522	0.0171	0.0172	0.0085	0.0086	0.0083	0.0082
9.20		8.2800	1.5480	0.1620	0.0528	0.0173	0.0174	0.0086	0		

Table V. - Natural Sines, Cosines, Tangents and Cotangents

	Sine	Cos.	Tan.	Cot.		Sine	Cos.	Tan.	Cot.
20°	.3420	.9397	.3640	2.7475	70°	.5000	.8660	.5774	1.7320
10'	.3448	.9387	.3673	2.7228	50'	.5025	.8646	.5812	1.7205
20'	.3475	.9377	.3706	2.6985	40'	.5050	.8631	.5851	1.7090
30'	.3502	.9367	.3739	2.6746	30'	.5075	.8616	.5891	1.6977
40'	.3529	.9356	.3772	2.6511	20'	.5100	.8601	.5930	1.6864
50'	.3556	.9346	.3805	2.6279	10'	.5125	.8587	.5969	1.6753
21°	.3584	.9336	.3839	2.6051	69°	.5150	.8572	.6009	1.6643
10'	.3614	.9325	.3872	2.5826	50'	.5175	.8557	.6048	1.6534
20'	.3638	.9315	.3906	2.5605	40'	.5200	.8542	.6088	1.6426
30'	.3665	.9304	.3939	2.5386	30'	.5225	.8526	.6128	1.6318
40'	.3692	.9293	.3973	2.5172	20'	.5250	.8511	.6168	1.6212
50'	.3719	.9283	.4006	2.4960	10'	.5275	.8495	.6208	1.6107
22°	.3746	.9272	.4040	2.4751	68°	.5299	.8480	.6249	1.6003
10'	.3776	.9261	.4074	2.4545	50'	.5326	.8463	.6289	1.5900
20'	.3800	.9250	.4108	2.3342	40'	.5350	.8448	.6330	1.5798
30'	.3827	.9239	.4142	2.3142	30'	.5373	.8434	.6371	1.5697
40'	.3854	.9228	.4176	2.2945	20'	.5397	.8418	.6412	1.5597
50'	.3880	.9216	.4210	2.2750	10'	.5422	.8402	.6453	1.5497
23°	.3907	.9205	.4245	2.2558	67°	.5446	.8387	.6494	1.5399
10'	.3934	.9194	.4279	2.2369	50'	.5471	.8371	.6536	1.5301
20'	.3961	.9182	.4314	2.2183	40'	.5495	.8355	.6577	1.5204
30'	.3988	.9171	.4348	2.2000	30'	.5519	.8339	.6619	1.5108
40'	.4014	.9159	.4383	2.2817	20'	.5544	.8323	.6661	1.5013
50'	.4041	.9147	.4418	2.2637	10'	.5568	.8307	.6703	1.4919
24°	.4067	.9136	.4452	2.2460	66°	.5592	.8290	.6745	1.4826
10'	.4094	.9124	.4487	2.2286	50'	.5616	.8274	.6788	1.4733
20'	.4120	.9111	.4522	2.2113	40'	.5640	.8258	.6830	1.4641
30'	.4147	.9100	.4557	2.1943	30'	.5664	.8241	.6873	1.4550
40'	.4173	.9088	.4592	2.1775	20'	.5688	.8225	.6916	1.4460
50'	.4200	.9075	.4628	2.1609	10'	.5712	.8208	.6959	1.4370
25°	.4226	.9063	.4663	2.1445	65°	.5736	.8192	.7002	1.4281
10'	.4252	.9050	.4698	2.1283	50'	.5760	.8175	.7046	1.4193
20'	.4279	.9038	.4734	2.1123	40'	.5783	.8158	.7089	1.4106
30'	.4305	.9026	.4770	2.0965	30'	.5807	.8141	.7133	1.4020
40'	.4331	.9013	.4806	2.0809	20'	.5831	.8124	.7177	1.3934
50'	.4358	.9000	.4841	2.0655	10'	.5854	.8107	.7221	1.3848
26°	.4384	.8988	.4877	2.0503	64°	.5878	.8090	.7265	1.3764
10'	.4410	.8975	.4913	2.0353	50'	.5901	.8073	.7310	1.3680
20'	.4436	.8962	.4950	2.0204	40'	.5925	.8056	.7355	1.3597
30'	.4462	.8949	.4986	2.0057	30'	.5948	.8039	.7400	1.3514
40'	.4488	.8936	.5022	1.9912	20'	.5972	.8021	.7445	1.3432
50'	.4514	.8923	.5059	1.9768	10'	.5995	.8004	.7490	1.3351
27°	.4540	.8910	.5095	1.9626	63°	.6018	.7986	.7536	1.3270
10'	.4566	.8897	.5132	1.9486	50'	.6041	.7969	.7581	1.3190
20'	.4592	.8884	.5169	1.9347	40'	.6065	.7951	.7627	1.3111
30'	.4618	.8870	.5206	1.9210	30'	.6088	.7935	.7673	1.3032
40'	.4643	.8857	.5243	1.9074	20'	.6111	.7918	.7720	1.2954
50'	.4669	.8843	.5280	1.8940	10'	.6134	.7898	.7766	1.2876
28°	.4695	.8830	.5317	1.8807	62°	.6157	.7880	.7813	1.2799
10'	.4720	.8816	.5355	1.8676	50'	.6180	.7862	.7860	1.2723
20'	.4746	.8802	.5392	1.8546	40'	.6202	.7844	.7907	1.2647
30'	.4772	.8788	.5430	1.8418	30'	.6225	.7826	.7954	1.2572
40'	.4797	.8774	.5467	1.8291	20'	.6248	.7808	.8002	1.2497
50'	.4823	.8760	.5505	1.8165	10'	.6271	.7790	.8050	1.2423
29°	.4848	.8746	.5543	1.8040	61°	.6293	.7772	.8098	1.2349
10'	.4874	.8732	.5581	1.7917	50'	.6316	.7753	.8146	1.2276
20'	.4899	.8718	.5619	1.7796	40'	.6338	.7735	.8195	1.2203
30'	.4924	.8704	.5658	1.7675	30'	.6361	.7716	.8243	1.2131
40'	.4950	.8689	.5696	1.7556	20'	.6383	.7698	.8292	1.2059
50'	.4975	.8675	.5735	1.7438	10'	.6406	.7679	.8341	1.1988
30°	.5000	.8660	.5774	1.7320	60°	.6428	.7660	.8391	1.1918

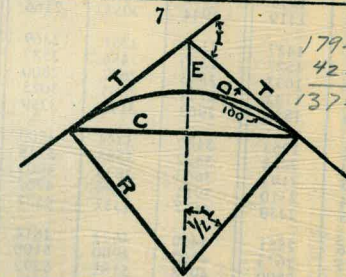
Table V.

	Sine	Cos.	Tan.	Cot.
40°	.6428	.7660	.8391	1.1918
10'	.6450	.7642	.8441	1.1847
20'	.6472	.7623	.8491	1.1778
30'	.6494	.7604	.8541	1.1708
40'	.6517	.7585	.8591	1.1640
50'	.6539	.7566	.8642	1.1572
41°	.6561	.7547	.8693	1.1504
10'	.6582	.7528	.8744	1.1436
20'	.6604	.7509	.8795	1.1369
30'	.6626	.7490	.8847	1.1303
40'	.6648	.7470	.8899	1.1237
50'	.6670	.7451	.8952	1.1171
42°	.6691	.7431	.9004	1.1106
10'	.6713	.7412	.9057	1.1041
20'	.6734	.7392	.9110	1.0977
30'	.6756	.7373	.9163	1.0913
40'	.6777	.7353	.9217	1.0850
50'	.6799	.7333	.9271	1.0786
43°	.6820	.7313	.9325	1.0724
10'	.6841	.7293	.9380	1.0661
20'	.6862	.7273	.9435	1.0600
30'	.6884	.7253	.9490	1.0538
40'	.6905	.7233	.9545	1.0477
50'	.6926	.7213	.9600	1.0416
44°	.6947	.7193	.9657	1.0355
10'	.6968	.7173	.9713	1.0295
20'	.6988	.7153	.9770	1.0235
30'	.7009	.7132	.9827	1.0176
40'	.7030	.7112	.9884	1.0117
50'	.7050	.7092	.9942	1.0058
45°	.7071	.7071	1.0000	1.0000

Table VI.

Curve	Lgth. of Rails			Curve	Lgth. of Rails		
	33'	30'	20'		33'	30'	20'
1°				13	3 1/2	3	1 1/2
2°				14	4	3 1/2	1 1/2
3°				15	4 1/2	3 1/2	1 1/2
4°	1			16	4 1/2	3 1/2	1 1/2
5°	1	1		17	4 1/2	4	1 1/2
6°	1	1	1	18	5	4 1/2	2
7°	2	1	1	20	5 1/2	4 1/2	2
8°	2	1	1	22	6	5	2 1/2
9°	2	2	1	24	7	6	2 1/2
10°	2	2	1	26	7 1/2	6 1/2	2 1/2
11°	3	2	2	28	8 1/2	7	2 1/2
12°	3	3	2	30			

Weight of Rails per mile of single track = weight per yd. x 11



CURVE FORMULAE.

Let:- R—Radius. T—Tangent I—Intersection Angle. E—External.

D—Def. Angle for 100° Chord. C—Long chord for Total I.

Then + $R = 50$ $\sin. D = 50$

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

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

$$D = 50x. \tan. \frac{1}{2} I$$

$$E = Rx. \text{Ext. Sec. } \frac{1}{2} I$$

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

$$C = \sin. \frac{1}{2} I \times 2 R$$

For approximate check on transit work and to run simple curves in roughly by tangent or chord deflection:-

Sine 1° for 1 ft. = .0175 = 1.75 per 100'

Given degree of curve and line of tangent
Offset from tan produced to any given point on curve = $\frac{.0175 \times \text{degree of curve} \times \text{given distance in ft.}}{2}$

Given degree of curve and line of chord
Offset from chord produced to any given point on curve = $\frac{.0175 \times \text{degree} \times (\text{length of chord} - \text{given distance})}{2}$

To find Middle ordinate for any curve
Middle ordinate of 1° curve for 100 ft. = .22'
Middle ordinate for any given degree of curve for 100 ft. = .22 × given degree of curve.
Middle ordinate for any given length of chord varies as the sq. of the lgth.
A rt. angle offset may be obtained from any point on a line, remembering that the sides of art. angle triangle are in the ratio of 3, 4 and 5.

Table VII. Excavation and Embankments, Cu. Yds. per 100 ft.

Slope	X to 1	1 to 1			1½ to 1				All Slopes 1 Ft. Base
		BASE			BASE				
		20'	20	22	24	14	16	20	
1	75	78	85	93	57	65	80	94	3.7
2	152	163	178	193	126	141	170	200	7.4
3	230	256	278	300	206	228	272	316	11.1
4	311	356	385	414	296	326	385	444	14.8
5	393	463	500	537	398	435	509	583	18.5
6	477	578	622	666	511	556	644	733	22.2
7	564	700	752	804	635	687	791	894	25.9
8	652	830	889	948	770	830	948	1067	29.6
9	742	967	1033	1100	917	983	1116	1250	33.3
10	833	1111	1185	1259	1074	1148	1296	1444	37.0
11	926	1263	1344	1425	1243	1324	1487	1650	40.7
12	1022	1422	1511	1600	1422	1511	1689	1867	44.4
13	1119	1589	1685	1781	1613	1709	1902	2094	48.1
14	1219	1763	1867	1970	1815	1919	2126	2333	51.8
15	1319	1944	2055	2166	2028	2139	2361	2583	55.5
16	1422	2133	2251	2369	2252	2370	2607	2844	59.2
17	1527	2330	2456	2582	2487	2613	2865	3117	62.9
18	1633	2533	2667	2800	2733	2867	3133	3400	66.6
19	1742	2744	2885	3025	2991	3131	3413	3694	70.3
20	1852	2963	3111	3259	3259	3407	3704	4000	74.0
21	1963	3189	3344	3500	3549	3694	4005	4317	77.7
22	2078	3422	3585	3748	3830	3993	4318	4644	81.4
23	2193	3663	3833	4003	4131	4302	4642	4983	85.1
24	2310	3911	4089	4267	4444	4622	4978	5333	88.8
25	2430	4167	4352	4537	4769	4954	5324	5694	92.5
26	2551	4430	4622	4814	5104	5296	5681	6067	96.2
27	2675	4700	4900	5100	5450	5650	6050	6450	100.0
28	2800	4978	5185	5392	5807	6015	6430	6844	103.6
29	2926	5263	5477	5691	6176	6391	6820	7250	107.3
30	3055	5556	5778	6000	6556	6778	7222	7667	111.0
31	3185	5856	6085	6314	6946	7176	7635	8094	114.7
32	3318	6163	6399	6635	7348	7585	8059	8533	118.4
33	3452	6478	6722	6966	7761	8006	8494	8983	122.1
34	3589	6800	7052	7304	8185	8437	8941	9444	125.8
35	3727	7130	7389	7648	8620	8880	9398	9917	129.5
36	3866	7467	7733	8000	9067	9338	9867	10400	133.2
37	4008	7811	8084	8358	9524	9798	10346	10894	136.9
38	4051	8163	8444	8725	9993	10274	10837	11400	140.6
39	4296	8522	8811	9100	10472	10761	11339	11917	144.3
40	4444	8889	9185	9481	10963	11259	11852	12444	148.0
41	4593	9263	9567	9871	11465	11769	12376	12983	151.7
42	4744	9644	9955	10266	11978	12289	12911	13533	155.4
43	4897	10033	10351	10669	12502	12820	13457	14094	159.1
44	5052	10430	10756	11084	13037	13363	14015	14667	162.8
45	5208	10833	11166	11499	13583	13917	14583	15250	166.5
46	5366	11244	11584	11924	14141	14481	15163	15844	170.2
47	5527	11663	12011	12359	14709	15057	15754	16450	173.9
48	5688	12089	12444	12799	15289	15644	16356	17067	177.6
49	5853	12522	12884	13246	15880	16243	16968	17694	181.3
50	6018	12963	13333	13703	16481	16853	17592	18333	185.0
52	6355	13867	14251	14635	17719	18104	18874	19644	192.4
54	6700	14800	15200	15600	19000	19400	20200	21000	200.0
56	7051	15763	16177	16591	20326	20741	21570	22400	207.2
58	7410	16756	17186	17516	21696	22126	22985	23844	214.6
60	7777	17778	18222	18666	23111	23555	24444	25333	222.0
70	9722	23332	23850	24368	30852	31370	32407	33444	259.0
80	11852	29629	30221	30813	39704	40296	41480	42667	296.0
90	14167	36666	37333	38000	49667	50333	51665	53000	333.0
100	16667	44444	45184	45924	60741	61481	62962	64444	370.0

97.87
179 60
29-10
16-20
179
149-46
20-14
179 60
41 13
138-47

73 85 51
72+18 33
167 18
23.57

Tables for Excavations and Embankments.
Distances from Edge of Roadway for Cross-Sectioning.
Any Roadway. Side Slopes 1½ to 1.
Half the width of roadway to be added to table to find distance from centre line.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

180
133 88
46-52

179-60
132-05
47-55
48-82.60
159.51
50+42.17
39+21.50
2+65.98
61+87.48
2 84.82
64+72.30
2 14.22
66-86.82
3+53.03
20+37.55
3+45.70
73+85.25